The Evolution of Disease Terms of Western Medicine in Chinese (1915--2020) and Suggestions for Terminology Policy in China

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“Language is the most massive and inclusive art we know, a mountainous and anonymous work of unconscious generations.”

— Edward Sapir, *Language: an Introduction to the Study of Speech*

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Abstract

In this doctoral thesis, we address the study of the linguistic evolution of Western medicine disease terms in the Chinese language from 1915 to 2020. This is a parameter that has not yet been investigated in the specialized communicative context of the Chinese language. The main hypothesis suggests that the evolution of Western medical terms in China is influenced by both Western and traditional Chinese medicine in terms of morphology, semantics, and variation, and that the influence of each medical system changes over time. Furthermore, it is argued that the characteristics of terminological evolution support recommendations for the normalization of medical terminology in China.

To verify the hypotheses, we constructed three historical periods' databases of disease terms extracted from a Western medicine journal in China from 1915 to 2020. The results allow us to establish the following: a) the adoption of traditional Chinese medicine terms and the adaptation of direct or phonetic loans have decreased since the initial introduction of Western medicine in China up to the present, while composition, especially calque and patrimonial composition, has become the most productive mechanism for creating new terms. b) Over time, disease terms have become longer and include more semantic parameters, with the indication of body parts and disease symptoms being the most frequent semantic parameters. c) The types of variation have reduced due to the standardization of terminology, particularly cognitive and diachronic variation, with interlingual variation prevailing in more recent times. d) These conclusions contribute to recommendations for the normalization of medical terminology in China.

Resumen

En esta tesis doctoral, se aborda el estudio de la evolución lingüística de los términos de enfermedades de la medicina occidental en la lengua china desde 1915 hasta 2020. Este es un parámetro que aún no ha sido investigado en el contexto comunicativo especializado de la lengua china. La hipótesis principal sostiene que la evolución de los términos de medicina occidental en China está influenciada tanto por la medicina occidental como por la medicina tradicional china en morfología, semántica y variación, y que la influencia de cada sistema de medicina cambia con el tiempo. Además, se plantea que las características de la evolución terminológica respaldan las sugerencias para la normalización de la terminología médica en China.

Para verificar las hipótesis planteadas, se construyeron tres bases de datos de períodos diferentes con términos de enfermedades extraídos de una revista de medicina occidental en China desde 1915 hasta 2020. Los resultados permiten establecer lo siguiente: a) la adopción de términos de la medicina tradicional china y la adaptación de préstamos directos o fonéticos han disminuido desde la introducción inicial de la medicina occidental en China hasta la actualidad, mientras que la composición, especialmente el calco y la composición patrimonial, se ha convertido en el mecanismo más productivo en la creación de nuevos términos. b) Con el tiempo, los términos de enfermedades se han vuelto más largos e incluyen más parámetros semánticos, siendo la indicación de la parte del cuerpo y el síntoma de la enfermedad los parámetros semánticos más frecuentes. c) Los tipos de variación han disminuido debido a la unificación de la terminología, especialmente la variación cognitiva y diacrónica, mientras que la variación interlingual ha predominado en los tiempos más recientes. d) Estas conclusiones contribuyen a las recomendaciones para la normalización de la terminología médica en China.

Resum

En aquesta tesi doctoral, s'aborda l'estudi de l'evolució lingüística dels termes de malalties de la medicina occidental en la llengua xinesa des de 1915 fins a 2020. Aquest és un paràmetre que encara no ha estat investigat en el context comunicatiu especialitzat de la llengua xinesa. La hipòtesi principal sosté que l'evolució dels termes de medicina occidental a la Xina està influïda tant per la medicina occidental com per la medicina tradicional xinesa en morfologia, semàntica i variació, i que la influència de cada sistema de medicina canvia amb el temps. A més, es planteja que les característiques de l'evolució terminològica recolzen les suggerències per a la normalització de la terminologia mèdica a la Xina.

Per verificar les hipòtesis plantejades, es van construir tres bases de dades de períodes diferents amb termes de malalties extrets d'una revista de medicina occidental a la Xina des de 1915 fins a 2020. Els resultats permeten establir el següent: a) l'adopció de termes de la medicina tradicional xinesa i l'adaptació de préstecs directes o fonètics han disminuït des de la introducció inicial de la medicina occidental a la Xina fins a l'actualitat, mentre que la composició, especialment el calc i la composició patrimonial, s'ha convertit en el mecanisme més productiu en la creació de nous termes. b) Amb el temps, els termes de malalties s'han tornat més llargs i inclouen més paràmetres semàntics, essent la indicació de la part del cos i el símptoma de la malaltia els paràmetres semàntics més freqüents. c) Els tipus de variació han disminuït a causa de la unificació de la terminologia, especialment la variació cognitiva i diacrònica, mentre que la variació interlingüística ha predominat en els temps més recents. d) Aquestes conclusions contribueixen a les recomanacions per a la normalització de la terminologia mèdica a la Xina.

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CHAPTER 1 INTRODUCTION

The 21st century is an era of information and scientific explosion. Science and technology are developing at an unprecedented rate. The division of labor becomes more specialized and refined, leading to the creation of new disciplinary fields. Thus, the new knowledge produced every day needs to be adequately expressed. Since terminology is crucial for transferring knowledge, it plays an increasingly important role in domestic and international communication of science and technology.

Geographically, the communication of science and technology between the Oriental and Occidental world has brought about remarkable changes globally. As a result, the terminology of different fields has found ways to be presented across languages. In China, Western science was introduced around 1600 when Xu Guangqi (1562-1633) and Matteo Ricci (1552-1610) translated the early parts of Euclid's Elements into Chinese. The translation introduced new concepts in mathematics and Western logic (Stone, 2007), which not only led China towards a more scientific mindset but also enriched the Chinese vocabulary. Today, with the advancement of knowledge and the trend of globalization, new terms from various domains comprise approximately 70% of the neologisms in the Chinese language (Lu Xiang, 2017).

Facing an enormous amount of new terms from different fields, an efficient and continuous study of the terminology is necessary for adequate communication and terminology planning. Terminology research not only helps us gain a better understanding of the development of a particular discipline but also establishes a foundation for terminology management and future terminology services.

In the specific field of science and technology, medical terminology holds significant importance for the advancement and effective communication within medicine. In the contemporary Chinese healthcare system, Western medicine coexists and collaborates with traditional Chinese medicine. Western medicine was introduced to China as a foreign study for the Chinese population. The intricate ecosystem of Western

medicine in China has resulted in a multidisciplinary nature of medical terms in the Chinese language.

Firstly, Western medicine was perceived as a novel science upon its introduction to China. Prior to the arrival of Western medicine, traditional Chinese medicine had been the predominant clinical practice in the country for over 2000 years, having developed its own philosophy and terminology (Deng Tietao & Cheng Zhifan, 1995). As a result, the initial transmission of Western medicine in China encountered cultural barriers and challenges.

Secondly, a large influx of Western medical terms entered the Chinese vocabulary as neologisms. The dissemination of Western medicine terminology in China began with medical missionary activities in the late 19th and early 20th centuries (Sun Zhuo, 2010). Medical missionaries faced the task of explaining biomedical concepts to the Chinese population, introducing entirely new terms to the Chinese language. This process encountered several challenges. Firstly, the Chinese language differs from Indo-European languages in terms of morphology and grammar. Secondly, Chinese and Western medicine have distinct cultural backgrounds and perspectives. Additionally, certain concepts in Western medicine lacked equivalents in Chinese, and vice versa. Consequently, the adoption and adaptation of Western medical terms into the Chinese language present linguistic challenges within the context of modern medical development.

Thirdly, the discipline and terminology in the field of medicine are influenced by societal factors and language policies. Presently, Western medicine holds a dominant position in clinical medicine in China, and the use of Western medical terms has become pervasive in modern medical practice. Furthermore, with the continuous discovery of new diseases and medical treatment innovations, there is a constant influx of new Western medical terms each year worldwide. Therefore, effective terminology management becomes imperative to provide better terminological services in the field of medicine.

Our dissertation aims to explore the evolution of disease terms in Western medicine

within the context of China, with the ultimate goal of facilitating more effective terminology planning. The field of medicine encompasses a vast array of terms, and the names of diseases alone amount to over 30,000 (Xiao Xizhe & Zhang Lanqing, 1982). Disease terms hold significant importance within the medical discipline and require careful consideration for accurate communication and understanding.

This study will be conducted within the framework of the Communicative Theory of Terminology (CTT) (Cabré, 1999, 2023). One of the significant advantages of this theory is its interdisciplinary nature, which enables an in-depth exploration of Western medical terms in the Chinese language. The study will involve the construction of *in vivo* terminology databases using a medical journal that has been in use for over 100 years. By examining the morphological and semantic mechanisms of terminological units in Western medicine when they are adopted or adapted to the Chinese language, we aim to understand the evolution of these terms beyond translation methods. Our hypothesis posits that the evolution of these terms is influenced by historical, cultural, and linguistic factors. The findings from this study will contribute to the application of the CTT theory in the Chinese language context and provide practical suggestions for enhancing the adequacy of terminology planning in China. To achieve these objectives, we will focus on analyzing the disease terms in Western medicine within the Chinese language from 1915 to 2020, utilizing this data as the basis for our terminology study.

Studying the evolution of Western terms in the Chinese language from a communicative perspective can serve as a valuable reference for modern terminology work in China. It is undeniable that Chinese terminology practice has a long history and has yielded fruitful results. The development of modern terminology work in China began with the establishment of the China National Committee for Terms in Sciences and Technologies in 1985. Since then, there has been growing attention to terminology practice, research, education, and theory construction within the Chinese academic community. However, in terms of the construction of terminology study as a modern and independent discipline, China started relatively late compared to some Western countries.

This delay in initiation, however, does not diminish the global significance of Chinese terminology research. Conducting terminology research with Chinese as the research object will contribute to the development of terminology theory. This research is not only a specific issue within Chinese terminology but also an integral part of universal terminology, holding worldwide significance and value. By studying the dynamics of Western terms in the Chinese language, we can enhance our understanding of terminological phenomena and contribute to the broader field of terminology studies.

Therefore, this thesis is structured into the following sections:

a) Background and previous literature: We will provide a detailed introduction to the background of our research and present a literature review of relevant studies, including the introduction and the development of Western medicine to China, the terminology research in China, the study of medical terminology in China, as well as the research achievements of Western medical terminology in Western contexts. This will enable us to gain a comprehensive understanding of Western medical terminology and its unique development in the Chinese context, which will serve as the basis for stating the objectives and hypotheses of our research.

b) Theoretical Framework: In this section, our emphasis will be on introducing the definition of terminology and the classification of terminological units within the Communicative Theory of Terminology (CTT). We will provide a comprehensive overview of the Chinese language, with specific attention given to linguistic aspects of both Classical or Ancient Chinese and Modern Chinese. Furthermore, we will review the most recent research on the treatment of neologisms in Chinese and other languages.

c) Methodology: In this section, we will provide a comprehensive overview of the methodology adopted for this study. We will explain the step-by-step process of constructing three corpora that represent distinct historical periods (1919-1949, 1950-1978, 1979-2020) by utilizing a journal dedicated to Western medicine in China as our primary data source. Furthermore, we will elaborate on the process of extracting relevant terms from each corpus and the subsequent construction of corresponding

databases specifically focused on Western disease terms within the Chinese language.

d) Data Analysis: This section will primarily concentrate on conducting a linguistic analysis of the extracted terms from the three databases corresponding to different historical periods. We will illustrate the morphological and semantic characteristics of these terms using examples and provide a comprehensive description of the variations observed in their usage within the texts.

e) Diachronic comparison and conclusion: This section will delve into a comparative analysis of the formation of Western medical terms in the three historical periods. We will examine the mechanisms that have contributed to the evolution of these terms over time. By tracing their development, we will identify the factors that have influenced the emergence and transformation of medical neologisms within the Chinese language. This diachronic comparison will provide valuable insights into the dynamics of terminological evolution and contribute to our understanding of the historical and societal context shaping the Western medical terminology in China. Ultimately, we will draw conclusions based on our findings and discuss the broader implications for the study of medical terminology in the Chinese language.

f) Based on the findings and insights obtained from the study, we will offer recommendations aimed at improving the adequacy of Chinese terminological planning in the field of medicine. These suggestions will be informed by the analysis of the evolution and characteristics of Western medical terms in the Chinese language, as well as an understanding of the cultural and linguistic factors influencing their development. By addressing the terminological needs that require attention, we aim to contribute to the enhancement of Chinese terminological planning in Western medicine, thereby facilitating effective communication and knowledge transfer in the field.

1. Background and Previous Literature Reviews

Prior to embarking on this research, we conducted a comprehensive review of

previous studies on the history of Western medicine in China, terminology research in China, and relevant studies on medical terminology. This extensive literature review has provided a solid foundation and background for our research topic, contributing to the existing knowledge in the fields of terminology and medical terms. The knowledge and understanding gained from the literature review have provided a solid foundation for formulating clear research goals and identifying the gaps and areas for further exploration in the field of medical terminology.

1.1. Western medicine in China

The history of Western medicine as a new discipline and profession in China provides the historical background for this research on the Western medical terminology in the Chinese context.

To discuss the history of Western medicine in China, it is important to clarify the terms *traditional Chinese medicine* and *Western medicine*. Many countries have their own traditional medicine systems, which may have religious or cultural components. In China, the term *traditional Chinese medicine* specifically refers to the traditional medicine practiced by the Han ethnic group. Other ethnic groups in China also have their own traditional medical practices, such as Tibetan medicine and Miao medicine.

On the other hand, *Western medicine* can be more accurately referred to as *modern medicine* (Luo Man, 2009; Zhou Hongxia, 2019). It originated from scientific study of health and the application of research findings to clinical practice. Modern medicine is a product of modern natural science and transcends boundaries of countries and cultures. If Western influence had not reached China, Chinese medicine would have followed the global trend and evolved toward modern medicine, albeit with some differences in its development.

Although the terms *Western medicine* and *traditional Chinese medicine* may cause confusion in the context of natural science, we will use these terms in this dissertation for several reasons. Firstly, they emphasize the origins of the two branches of medicine in China and highlight the aspect of intercultural communication. Secondly,

these terms are commonly used by both the general public and healthcare professionals in China when discussing medical practices.

The introduction of Western medicine in China has faced challenges due to its foreign nature and unfamiliarity. Acceptance of Western medicine in China has experienced ups and downs throughout history. There have been three distinct periods when Western medicine was introduced to China.

The "Sprout" period: Before 1800

In China, the earliest contact between medicine and the West began during the ancient period, coinciding with the spread of Christianity, before the development of modern medicine.

During the period between 1500 and 1800, as noted by scholars such as Gunn (2003) and Mungello (2012), China had its first significant encounter with the West. However, the initial communication between the two regions regarding medicine began even earlier, during the Tang Dynasty (618-907), when the Church of the East (Nestorian) [1] actively engaged in medical activities (Bays, 2011). Notably, in 1289, the Pope dispatched Giovanni da Montecorvino, an Italian missionary, to China, who utilized his medical skills as a means of spreading Christianity (Shen Dingping, 2001).

In the 19th century, the presence of Western medicine in China further expanded with the arrival of Jesuit missionaries, including prominent figures such as Matteo Ricci (1552-1610), Sabatino de Ursis (1575-1620), Miguel Bento (1562-1607), and Joannes Terrentius (1576-1630). These missionaries, while engaged in practicing medicine, also made efforts to translate medical books (Udías, 2014).

It is important to note that their primary focus remained on preaching, and their medical knowledge primarily consisted of ancient Western medicine. As a result, the

[1] The Church of the East or the sometimes referred to as Nestorian Church historically had a presence in China during two periods: first from the 7th through the 10th century, and later during the Mongol Yuan Dynasty in the 13th and 14th centuries. Locally, the religion was known as *Jingjiao* (景教).

dissemination of Western medical theory and clinical practice in China during this period was limited.

The "Springing up" in the 19th century

The presentation of Western medicine in China began in the mid to late 19th century (Wong K. Chimin & Wu Lien-Teh, 1932). The introduction of modern medicine by British and American medical missionaries during the late 19th and early 20th centuries marked a transformative period in Chinese healthcare (Balme, 1921; Bays, 2011). These missionaries played a crucial role in promoting the adoption of modern Western medical practices, establishing medical schools, hospitals, and medical associations, and training Chinese physicians in Western medical techniques. Beyond imparting medical knowledge, the missionaries brought with them the terminology and concepts of Western medicine. Collaborating closely with their Chinese counterparts, they translated and adapted Western medical terminology into Chinese, making it accessible to both Chinese physicians and patients.

The emergence of Western medicine in China coincided with the expansion of colonialism and Christian missionary activities, significantly influencing the medical landscape. The Medical Missionary Society in China, as outlined by Balme in 1922, had dual objectives: the promotion of Western medicine among the Chinese population for philanthropy and service and the education of Chinese youths in Western medicine to facilitate the adoption and integration of Western medical practices.

In the late Qing Dynasty, prominent missionary organizations, including the London Missionary Society (LMS), the American Board of Commissioners of Foreign Missions (ABCFM), and the American Presbyterian Church (PC), played key roles in advancing medical activities in China (Su Jing, 2020). Figures like Peter Parker and Benjamin Hobson were instrumental in initiating the medical mission of Christianity in China, translating Western medical books, and contributing to the development of Chinese modern medical terminology (Sun Zhuo, 2010).

As missionary physicians were engaged in the active translation and compilation of Western medical literature, Chinese intellectuals proficient in both Chinese and foreign languages also endeavored to introduce Western medicine to China through translation initiatives. However, they frequently held subordinate positions within the overall process.

In addition, the establishment of Western medicine education began to take shape with the efforts of medical missionaries. In 1866, John Glasgow Kerr (1804-1888) founded the first Western medicine school, Guangzhou Boji Hospital (Fu, 2018). Subsequently, in 1886, the China Medical Missionary Association (*Zhonghua Boyihui*, 中华博医会) was established in Shanghai by Western medical missionaries. They also published the *China Medical Missionary Journal* (*Boyi Huibao*, 博医会报) in 1887 to disseminate the latest research in Western medicine. Most of the articles published were in English, reflecting the predominance of the English language in the field at that time.

The "Dominant" since the 20th century

Following the Sino-Japanese War (1894-1895), a wave of studying in Japan and the West emerged in China. At the turn of the 20th century, Chinese scholars returning from abroad played a crucial role in introducing modern Western science and technology to their homeland. The knowledge acquired from Japan, which had absorbed Western learning, was particularly influential (Ma Boying, 1993; Xiong Yuezhi, 1994; He Xiaolian, 2006). This influx of knowledge, coupled with the growing number of Chinese doctors trained in Western medicine, led to the widespread adoption of Western medical practices and established it as a significant discipline in clinical practice.

During the 20th century, both traditional Chinese medicine and Western medicine underwent significant transformations. With the decline of the Qing Dynasty, the imperial hospital, which had represented the political significance of traditional Chinese medicine, faced uncertain prospects. In response, various churches began to allocate funds for the establishment of hospitals and medical schools. Notable medical

schools such as *Xiangya* (in south-central China), *Huaxi* (in southwest China), *Tongji* (in central and eastern China), *Boji* (in South China), and *Xiehe* (nationwide) emerged as important institutions for modern medical education in China during this period, and continue to play a vital role in medical education today (Qin Yongjie & Wang Yungui, 2006).

In addition to the establishment of medical facilities, significant progress was made in the medical community and academic research entities. In 1915, Wu Lien-Te (1879-1960) took the initiative to establish the Chinese Medical Association (*Zhonghua Yixuehui*, 中华医学会). Alongside the China Medical Missionary Association (*Zhonghua Boyihui*, 中华博医会), these associations worked together to promote Western medicine in China. Their objectives were to disseminate medical science and generate public interest in public health (Tao Feiya & Wang Hao, 2014).

The key distinction between these two associations was that the Chinese Medical Association primarily consisted of Chinese individuals with educational backgrounds in Western medicine, while the China Medical Missionary Association comprised Western medical missionaries. During this period, the medical missionaries encountered challenges in effectively communicating with their Chinese colleagues in terminology work. As a result, the task of managing Western medical terminology gradually shifted to Chinese medical practitioners.

To provide an official platform for the publication of medical research in China, the Chinese Medical Association inaugurated the *National Medical Journal of China* (*Zhonghua Yixue Zazhi*, 中华医学杂志), which is the first medical journal published in Chinese (Cui Junfeng, 2017). This journal is still in circulation and holds the record for being the longest-running modern medical journal published in the Chinese language.

In summary, the history of Western medicine in China reveals that British and American missionaries introduced modern Western medicine to China. Subsequently, a significant number of Chinese students who studied in Europe, America, and Japan actively contributed to the promotion of Western medicine. The collaboration between

these two groups of modern Western medical practitioners led to the establishment of a modern medicine system in China, along with research entities.

The historical background of Western medicine in China provides a rich context for the study of Western medical terminology. The interaction between Western medical missionaries and Chinese healthcare professionals created a unique context for intercultural communication in the field of medicine. The medical studies they published in the *National Medical Journal of China* (*Zhonghua Yixue Zazhi*, 中华医学杂志) document the development of Western medicine in China since 1915, and these articles written in Chinese serve as a valuable resource for our research.

1.2. Terminology in China

Terminology has held a significant role in language within Chinese culture since ancient times. Notably, Confucius, a highly regarded philosopher and educator, emphasized the significance of using accurate and precise names in language. He believed that language could not accurately convey truth if the names used were incorrect[2]. This recognition highlights the importance of terminology in conveying scientific facts and facilitating specialized communication.

Even in ancient China, scholars recognized the crucial role of naming words in the realms of science and technology. As early as the 3rd century AD to the 15th century AD, discussions on the principles of terminology emerged. Xun Kuang, a philosopher from the 4th century BC, delved into fundamental principles of terminology, exploring topics such as the relationship between names and concepts, the creation and establishment of terms, and the ease of understanding and conceptualization for users[3].

These principles showcased the foresight and advanced understanding of ancient Chinese scholars in recognizing the significance of terminology in scientific and

[2] Translated original texts by the author of this research: “名不正则言不顺.” (Confucius)

[3] Translated original texts by the author of this research: “制名以指实; 名定则实辨; 名闻则实喻.” (Xun Kuang, 325 BC)

specialized communication. Their insights laid a foundation for the development of terminology studies and underscored the importance of accurate and precise terminology in facilitating effective knowledge transfer and communication in various domains.

In modern times, the development of terminology as a discipline in China has been relatively slower compared to the West. Western scholars were pioneers in proposing a framework and protocol for terminology, and the field has continued to evolve within different schools of thought. Conversely, in China, the study of terminology emerged primarily from experts in different domains and translators who were actively involved in introducing foreign knowledge to the country.

As the exchange of knowledge between China and the rest of the world increased, the importance of terminology became more apparent. Recognizing this, Chinese scholars began to emphasize the need to establish terminology as an independent discipline with a specific focus on the construction, management, and investigation of terminology in linguistic and translation contexts across various fields. Over time, Chinese scholars dedicated their efforts to advancing the field of terminology, developing theories, and methodologies tailored to the nuances of the Chinese language and its unique cultural and linguistic characteristics. This evolution highlights a shift from terminology development driven by domain experts and translators to a more structured and systematic approach, aligning with global standards.

The study of terminology in China was initially introduced by linguists specializing in foreign languages who also brought with them the foreign theories and approaches of the discipline. These linguists played a significant role in familiarizing Chinese scholars with the concepts and methodologies of terminology.

In China, the majority of terminology investigations are conducted within universities and academic institutions. Zheng Shupu (2003), from Heilongjiang Univeristy, is considered the first scholar in China to emphasize the independent and comprehensive nature of terminology as a distinct discipline. He argued that terminology research

should not be limited to individual domains but should encompass a broader perspective, considering the synchronic study of terms across different disciplines and time periods. This approach allows for an examination of human cognition of the surrounding world, as well as the level of specialization and developmental stage of specific disciplines.

By recognizing the importance of terminology as an independent discipline and adopting a comprehensive approach, Chinese scholars have made significant contributions to the field. They have embraced both the foreign theories and methodologies while also adapting them to the unique linguistic, cultural, and disciplinary context of China. Scholars such as Feng Zhiwei (2001) have introduced various Western terminology schools to China, providing valuable insights into different theoretical frameworks and approaches. This exposure to international perspectives has enriched the understanding and development of terminology studies in China.

Nowadays, as terminology is a cross-disciplinary field, linguists, philologists, and experts from various disciplines have shown interest in this field. We acquired the distribution of terminology study papers from different areas through the largest academic paper database in China, CNKI (China National Knowledge Infrastructure). Figure 1.1 demonstrates that approximately 50% of terminology studies concentrate on foreign and Chinese languages. Additionally, we observe that research on medical terminology is the most prominent within specialized contexts.

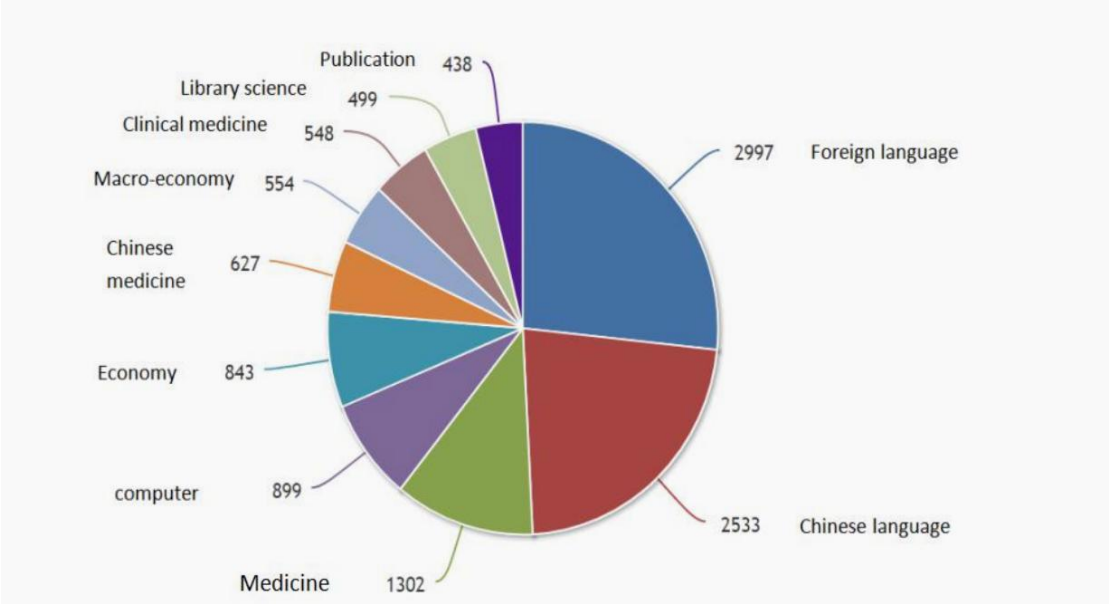

Figure 1.1: Distribution of articles on the topic of terminology in different knowledge areas in China (Source: https://www.cnki.net/)

In conclusion, despite China's rich history in science and technology, the discipline of terminology has not been established for a long period. Nevertheless, with the influence of foreign theories on the subject, scholars have started to devote attention to the study of terminology. Medical terminology, as one of the most intricate areas of research within this discipline, has received significant attention in China in recent years.

1.3. Medical terminology in China

Medical terminology is a rapidly evolving field due to the constant influx of new terms and developments in the medical industry. In China, medical terminology can be classified into two categories: traditional Chinese terminology and Western medical terminology. In this section, we will explore previous research on both types of medical terminology.

1.3.1. Studies on traditional Chinese medicine terminology

Traditional Chinese terminology, as used in traditional Chinese medicine (TCM), is deeply rooted in the philosophical and cultural traditions of ancient China. With a

history of over 2,000 years, TCM has developed its own unique system of terminology that reflects its theories, principles, and practices.

Previous research on traditional Chinese medical terminology has conducted linguistic analyses to explore the intricacies of its terminology and its relationship with traditional Chinese culture. These studies have examined the morphology, semantic structure, and syntactic patterns of TCM terms to uncover the underlying meanings and conceptual frameworks embedded within them. It has examined how TCM terms encapsulate not only biomedical concepts but also the interconnectedness of the human body, mind, and environment. This interdisciplinary analysis has shed light on the unique features and cultural significance of traditional Chinese medical terminology.

1) The morphology of traditional Chinese medicine (TCM) terminology

The terminology of traditional Chinese medicine (TCM) has its unique characteristics in morphology. In this literature review, we focus on previous studies that examine the composition patterns and formation mechanisms of TCM terms in morphology.

The TCM terms exhibit various composition patterns, which involve the combination of two, three, or four Chinese characters. Chen Xue (2013, 2018) conducted a quantitative analysis of the composition of basic theoretical terms from the nomenclature *Traditional Chinese Medicine Terminology and Phrases* (See Table 1.1). The results of the analysis revealed that terms composed of four characters constitute the largest proportion of TCM terms, followed by two-character terms. Although less common, phrases and one-character terms are also present in the nomenclature.

Number of characters	One-character	Two-characters	Four-characters	Phrase
quantity	64	311	336	93

Table 1.1: Number of basic TCM terms according to the number of Chinese characters (Chen Xue, 2013)

The choice of composition patterns in TCM terminology is not merely a linguistic

consideration, but also carries cultural connotations and philosophical implications. It is a testament to the historical and cultural development of TCM and its integration with the broader Chinese intellectual and linguistic traditions.

The preference for two-, three-, and four-character terms can be traced back to ancient Chinese literature and the influence of Confucianism, Taoism, and other philosophical traditions. Classical Chinese language, which was prevalent during the development of TCM, employed concise and compact expressions that conveyed rich meanings. This linguistic style favored the use of two-, three-, and four-character terms, allowing for brevity and efficiency in communication.

Furthermore, the use of these composition patterns in TCM terminology is also influenced by the cultural context of China. Chinese culture emphasizes the significance of balance, harmony, and the interconnectedness of various elements. The composition patterns of TCM terms, with their structured combinations of characters, reflect this holistic perspective and the interrelation between different aspects of health and disease.

The morphological structure of traditional Chinese medicine (TCM) terminology encompasses not only the number of characters but also the part of speech (POS) formation of its terminology units. Scholars have conducted lexicographic studies to explore the POS forms used in basic TCM terms, particularly those related to indicating symptoms. The analysis of TCM terminology has revealed three main POS forms that are commonly employed to express symptoms: noun-verb, verb-noun, and noun-noun (Cui Xizhang, 2006; Gong Qian, 2012).

The noun-verb form is used to describe the relationship between the disease or symptom and the patient's body part or organ. For example, *toutong* (头痛, 'head pain') is a noun-verb term that indicates the body part and the symptom.

The verb-noun form is used to describe the action or condition of the symptom. For example, *qufeng* (祛风, 'eliminate wind') is a verb-noun term that describes two clinical treatments.

The noun-noun form is used to describe the relationship between different objects. For example, *piwei* (脾胃, 'spleen-stomach') and *shenjing* (肾精, 'kidney essence') are both noun-noun terms that describe the relationship between two different organs or bodily functions.

This POS-based analysis enhances our understanding of the linguistic structure of TCM terminology and provides insights into the unique conceptual framework. The different POS forms of TCM terminology reflect the unique features of the Chinese language and the way that medical concepts are expressed in this language. Understanding the different POS forms of TCM terminology is important for accurately interpreting TCM texts, and can provide insights into the underlying medical concepts and theories.

Overall, the morphology studies on TCM terms highlight the unique composition patterns and formation mechanisms of TCM terms, which play an essential role in understanding and communicating in Chinese traditional clinical context.

2) The semantic features of the TCM terms

The formation of TCM terminology is closely related to the life experience of ancient Chinese people, and the semantic structure of TCM terms is based on the accumulation of these experiences. In TCM, terms and concepts are often derived from the observations and cognitive understanding of daily life and the natural world. The rich semantic resources available in the Chinese language allow for the creation of TCM terms in various ways, as explored by scholars such as Yang Yang (2007), Zhu Jianfei (2014), and Zhou et al. (2004).

These following examples illustrate different approaches to creating TCM terminology based on various factors such as medicinal properties, symptoms, and the cause of the disease.

1. Medicinal-based terminology: In TCM, certain diseases or conditions are named

after medicinal substances that are commonly used in their treatment. For instance, the term *baihebing* (百合病), meaning 'lily disease', is named after the medicinal herb 'lily' (百合, *baihe*). This term signifies an emotional disease that is treated using lily as the primary herb-drug.

2. Symptom-based terminology: TCM terms can also be formed based on specific symptoms experienced by individuals. For example, the term *leitoufeng* (雷头风), meaning 'thunder headwind', describes a type of headache accompanied by a sound in the head resembling thunder. The term captures the characteristic symptom experienced by patients, allowing for a more precise diagnosis and treatment approach.

3. Cause-based terminology: TCM recognizes that the cause of a disease can vary, and in some cases, specific terms are used to indicate the cause behind a particular condition. For instance, the term *kewu* (客忤), meaning 'guest disobedience', refers to a sickness in a baby that is believed to be caused by the visitation of a strange guest. This term highlights the specific cause of the disease and helps guide the treatment approach accordingly.

These examples demonstrate the diverse approaches used in TCM terminology creation, and TCM terminology has a literary tendency for subjective description, which allows it to vividly reflect the patient's feelings and provide clinicians with an easy-to-identify diagnosis basis.

The semantic formation of TCM terms reflects the holistic and comprehensive approach of TCM in understanding health and disease. By incorporating observations from nature, daily life experiences, and metaphorical expressions, and this semantic nature of TCM terminology allows for the production of neologisms and variants.

3) Variants in TCM terminology

The channel of inheritance is the primary cause of the variation in traditional Chinese medicine (TCM) terminology. The transmission and diffusion of TCM terms are essential factors that influence the development of TCM terminology.

The channel of inheritance refers to the means through which TCM terminology is passed down from generation to generation. It involves the transmission of knowledge, practices, and terminology from experienced practitioners and scholars to their successors. The traditional method of teaching and learning TCM mainly depended on oral transmission from teachers to students. In addition, there was a lack of academic communication and unification of terminology among doctors in ancient China, which contributed to the diversity and complexity of TCM terminology. As a result, different teachers had different communicative styles and used expressions, leading to variation in the usage and interpretation of TCM terminology (Mao Herong et al., 2013).

The existing researches provide valuable insights into the variations observed in TCM terms. These studies contribute to our understanding of the diverse and dynamic nature of TCM terminology and its evolution over time.

4) The phenomenon of polysemy in TCM terminology

The phenomenon of polysemy, which refers to the multiple meanings of the same word, is common in traditional Chinese medicine (TCM) terminology. This is because many TCM terms are derived from everyday language and metaphorical concepts, and a single character can possess different meanings depending on the specific context in which it is employed.

For instance, *feng* (风, 'wind') is a natural phenomenon, though in the traditional Chinese medicine context, it is often used to denote the external factors that cause diseases. Examples utilizing *feng* include *fenghan* (风寒, 'anemofrigid cold'), *fengre* (风热, 'common cold with wind-heat syndrome'), *fengshi* (风湿, 'rheumatic'), etc. Additionally, *feng* can also refer to the internal disorders, as seen in *zhongfeng* (中风, 'apoplexy'), *mianfeng* (面风, 'trigeminal neuralgia'), and *fengxian* (风痫, 'epilepsy') (Li Siqi, et al., 2016).

The presence of polysemy in TCM terminology highlights the significance of

comprehending the specific context in which a term is employed in order to fully grasp its intended meaning. It emphasizes the need for contextual understanding when interpreting TCM terms and underscores the intricacies involved in accurately conveying and interpreting TCM concepts and diagnoses.

5) Chinese traditional cultural feature in TCM terminology

Language is inherently intertwined with culture (Andrews & Lotman, 2003). Traditional Chinese medicine (TCM) terminology reflects this connection by incorporating terms from ancient Chinese philosophy and literature. Many fundamental theoretical terms, such as *yin, yang*, and *wuxing* (五行, 'five basic elements') are derived from ancient Chinese philosophical terminology.

Furthermore, the influence of Chinese literary metaphors is evident in TCM terminology. Metaphors serve as cognitive tools that bridge the gap between the concrete and the abstract. Scholars like Li Chenghua and Sun Huiming (2018), Chen Yi et al. (2020), and Chen Yuan (2021) have examined the metaphors present in TCM disease terms, highlighting the interplay between imagery and ideas. It is worth noting that metaphors can sometimes possess vague meanings and arbitrary connections.

From a cognitive perspective, the image schemas embedded in TCM terms have a profound impact on the structure of terminological conceptualizations, models, and categorizations (Hartzell, 2005). These image schemas form the basis for the semantic structures that underlie TCM terminology. The cognitive analysis of TCM terms provides valuable insights into the intricate conceptualizations of traditional medical systems and promotes dialogue between practitioners of traditional and modern medicine.

Rooted in ancient Chinese culture and life experiences, the knowledge system of traditional Chinese medicine (TCM) stands in stark contrast to the physiological knowledge of modern medicine. This distinction manifests in TCM terminology, which closely mirrors the vocabulary of everyday communication. The integration of TCM terminology with common language not only enhances accessibility but also

fosters familiarity among both practitioners and patients.

In conclusion, traditional Chinese medicine (TCM) terminology embodies the rich linguistic and cultural heritage of China. Its formation follows the morphosemantic characteristics of the Chinese language, and its development and interpersonal transmission from one generation to another contribute to its variations and colloquial nature. TCM terms not only serve as clinical descriptors but also carry literary and metaphorical elements that reflect the cognitive process of understanding the universe and health within Chinese culture. In essence, the formation, variations, and literary characteristics of TCM terminology are deeply rooted in the language, culture, and cognitive traditions of China, providing a unique and comprehensive framework for understanding and communicating within the TCM system.

1.3.2. Studies on Western medical terms in Chinese

Unlike the in-depth linguistic research conducted by Chinese scholars on traditional Chinese medicine terminology, Chinese scholars have focused their studies on Western medical terminology in the areas of history, translation, terminology examination in specialized monographs, and terminology standardization in history.

1) From an interlingual perspective

The process of introducing Western medicine into China is inseparable from the sinicization of western medical terms. Most scholars analyze the process from the perspective of translation.

Nan Yan (2003) listed translation strategies, such as borrowing and morphemic translation, for Western medical vocabulary. Sun Qingxiang and Li Dingjun (2012) proposed principles for Chinese translations of new English medical terms based on etymology, word formation, and Chinese language characteristics. Yu Wenhai (2010) and Wang Tian (2013) focused on the generation of new words in Western medical terms.

The influence of Japanese on Western medical terms in China has also been investigated. Shen Guowei (2010), a notable researcher, realized a historical comparison on the efforts made by Rangaku scholars in Japan and Western missionaries in China to create Chinese characters for new terms. The terminological work carried out by Japanese scholars has served as a source of inspiration for Chinese students who studied in Japan and later returned to China.

These scholars recognize the linguistic and cultural differences between Western and Chinese medical terminology and emphasize the creation of terminological neologisms. However, many studies primarily present their statements by providing examples from prescriptive databases. To provide more convincing evidence, a more systematic study utilizing descriptive data is needed. Additionally, studying the process of Western medical terms in the Chinese language solely from the interlingual perspective may overlook the essence of terms as it relates to the mechanisms of terminology.

2) From specific medical monographs

Some studies also focus on the medical terminology itself, and scholars examine the development of a particular medical term or the medical terminology found in a specific medical work from the perspective of textual research.

Gao Xi (2009) conducted a textual study of John Dudgeon's *Quanti Tongkao* (全体通考, 'Comprehensive General Examination') to verify the translation source of the term *jiepou* (解剖, 'anatomy'). She focused on reviewing the origins of individual terms using historical evidence. Similarly, Li Qian (2018) examined medical terms in Benjamin Hubson's *Quanti Xinlun* (全体新论, 'New Presentation of the Human Body'). She analized a comprehensive list of anatomical terms found in the book, including a small number of disease nouns. However, these studies still discussed translation issues without conducting a linguistic analysis of the terms themselves.

It is worth noting that, while these studies are based on specific works by particular authors and provide insights into the translation process of that era, they have

limitations. This approach falls short in explaining the overall terminological characteristics of the entire era. Therefore, a more comprehensive linguistic analysis encompassing a broader range of medical works would be beneficial in understanding the terminological features in a broader diachronic scale.

3) From the terminology management

As a new discipline, the management of Western medical terms involved the diffusion and unification of terminology. The diffusion of Western science and technology in 19th-century China was significantly facilitated by the collaborative efforts of missionaries, who recognized the linguistic challenges and actively engaged in compiling books and dictionaries. Previous studies have addressed these concerns and explored various aspects of early terminological management in Western medicine.

Compilation of books and dictionaries played a crucial role in the diffusion of Western science and technology during the 19th century, led by a group of missionaries residing in China. Recognizing the linguistic barrier, they collaborated with their Chinese counterparts to compile books and dictionaries. Sun Zhuo (2010) and Gao Xi (2014) examined the establishment process of Western medical terminology and documented the early efforts in terminological management. Examples of such works include *Quanti Xinlun* (全体新论, 'New Presentation of the Human Body'), *Yixue Yinghua Zishi* (医学英华字释, 'Explanation of Medicine in English and Chinese'), and *Fuying xinshuo* (妇婴新说, 'New Book of Women and Children') compiled by Benjamin Hobson (1816-1873). It is worth noting that during this period, medical practitioners worked independently on their dictionaries and medical books, resulting in a lack of unified examination and approval of terminology.

The unification of terminology in Western medicine began with the efforts of Philip Brunelleschi Cousland (1861-1930), who called for the standardization of medical terms in China. In 1890, Cousland and John Kerr established a committee to work on a standardized medical glossary in Chinese (Zhang Daqing, 2001; Gao Xi, 2014). This marked an important step towards achieving uniformity and consistency in Western medical terminology in China. The propose of the unification committee is to

have a series of unified translation methods.

Due to the cultural and linguistic differences between Chinese and English, a completely accurate translation between the two languages is unattainable and different translators may have varying understandings and approaches to translation. (Beinfield & Korngold, 2001). In light of this, Cousland (1905) put forth six methods for working on Western medical terms in Chinese: (1) utilizing existing local nouns, (2) translating based on the meaning of English terms, (3) employing transliteration, (4) creating new words through compounding existing words, (5) inventing new characters, and (6) adopting obsolete words.

Cousland (1908) also offered precautions and principles for the use of these methods. Firstly, he recommended the use of Chinese lexical units that already exist and are not overly colloquial. Secondly, when translating words or phrases based on their English meanings, he suggested simplifying them if they become too lengthy. Thirdly, he advised minimizing the use of transliteration whenever possible. Fourthly, he emphasized the limited use of creating new characters. Lastly, he noted that in certain cases, outdated vocabulary could be considered.

From Cousland's recommendations and adoption of terms, it can be deduced that early medical missionaries held great respect for the Chinese language and culture. The methods he proposed served as fundamental principles for the creation of new terms, indicating their commitment to finding suitable and respectful expressions within the Chinese medical context.

In general, Chinese scholars demonstrate a significant emphasis on medical terminology, with separate studies dedicated to traditional Chinese medicine (TCM) terminology and Western medical terminology. The linguistic research on TCM terminology has been relatively comprehensive, delving into its intricacies. However, the focus on Western medical terminology has been primarily directed towards translation studies, terminology compilation, and early management.

Consequently, there remains a gap in research on Western medical terminology from

the perspective of linguistics and terminology. Despite the attention given to its historical context and translation challenges, there is a lack of in-depth linguistic analysis and diachronic exploration of the terminological features of Western medical terminology in the Chinese language.

In summary, while TCM terminology has received extensive linguistic research, Western medical terminology still requires further investigation and analysis in the field of linguistics and terminology studies. Closing this gap would provide valuable insights into the linguistic characteristics and mechanisms underlying Western medical terminology in the Chinese language.

1.4. Western medical terminology

Western medicine was a foreign discipline when it was introduced to China, and Western medical terms in the Chinese context are greatly affected by its counterpart from the West. Thus, before proposing the equivalents in Chinese, the features of Western medical terminology have to be known. The study of Western medical terminology in the context of China is relatively limited in the field of linguistics. However, in the Western world, English medical terminology has been extensively researched.

English medical terminology is largely derived from Greek, Latin, or Latinized Greek, with new terms predominantly originating from English. Western scholars have conducted comprehensive historical research on Western medical terminology. They have explored the origins, development, and evolution of medical terms, tracing their roots back to ancient languages such as Greek and Latin. These studies have formulated on how medical terminology has evolved over time and how it has been influenced by different cultures and languages.

The earliest written sources of Western medicine date back to the 4th and 5th centuries BC, known as the Hippocratic writings. These texts already encompassed a multitude of medical terms, including *apoplexy* meaning ‘stroke’ and *diarrhea* meaning ‘throughflow’ (Wulff, 2004). The traditional Western medical terminology is

rooted in a Greek tradition until *Celsus' De Medicina*, published first in Latin. In the Middle Ages, medical texts were translated into Arabic, but few Arabic terms have been preserved in modern Western medical terminology. In the Renaissance, Latin flourished in medicine. In subsequent centuries, Latin effectively became the language for medicine, comparable to the status of English for science and medicine today (Lysanets & Bieliaieva, 2018; Marecková et al., 2002). In modern times, national languages start to play a more important role in medical communication like French and English. Since the 1950s, English has become the *lingua franca* for medical terminology. The English vocabulary is applied extensively in medical practice. The openness to different languages has led to variations in medical terminology, with different lexical units referring to the same concept, thing, or idea.

Western medical terminology has undergone significant changes throughout the 20th century, and this evolution continues to this day. Consequently, research has been dedicated to exploring various aspects of this evolution, including the rapid emergence of new terms, the disappearance or redefinition of existing terms, the influence of multiple languages, and the broader application of medical terms in pragmatic contexts.

1. Rapid emergence of new terms

The advancement of medical research and the introduction of new treatments, medicines, and diseases necessitate the creation of new terms. This dynamic nature of medical science leads to a continuous influx of novel terminologies to accurately represent and describe medical advancements (Džuganova, 2013).

2. Disappearance and redefinition of terms

Medical terms may fade into obsolescence or undergo reinterpretation due to developments in medical science or societal changes. Some terms may become outdated or inappropriate, while others undergo redefinition as new research and understanding emerge. Additionally, certain units within medical vocabulary acquire new meanings over time (Džuganová, 2019).

3. Influence of multiple languages

Western medical terminology draws upon an extensive range of linguistic influences beyond the classical Greek and Latin foundation. Other languages, such as Arabic, French, and English, have contributed to the enrichment and expansion of medical terminology through the integration of different linguistic mechanisms (Wermuth & Verplaetse, 2019).

4. Broader application of medical terms

The proliferation of medical terminology extends beyond clinical settings and permeates everyday language usage. Media coverage plays a significant role in disseminating medical terms to the general public, leading to their integration into common parlance (Pearson, 1998).

Scholars are concerned about the communicative challenges posed by Western medicine terminology. Some studies start by examining the ontology of medical terminology to explore the characteristics of Western medical terms in use. Others describe the challenges encountered in converting medical terminology across different languages. Additionally, some studies focus on developing more efficient terminology services for doctor-patient communication and terminology education. Here are some examples:

1. The existence of synonyms and variants in medical contexts is inevitable, and they have been taken into consideration in theoretical and applied studies (Contente & Magalhães, 2005; Tercedor Sánchez et al., 2014; Lorente et al., 2022).

2. The lack of international consistency is particularly evident in medical abbreviations and acronyms (Bodenreider et al., 2002). For example, *CT* (Computed Tomography) is referred to as *TAC* (Tomografía Axial Computarizada) in Spanish.

3. The cross-linguistic communication of medical terminology sparks discussions

between different languages and cultures. Healthcare practitioners from non-English speaking countries often face the choice of either directly importing English terms or adapting them into their own languages. Badziński (2019) conducted survey-based research focusing on the case of Poland, while Porras (2022) evaluated the linguistic characteristics of terminological anglicisms in Spanish-speaking medical classroom communication.

4. Medical terms used in doctor-patient interactions may pose obstacles to understanding. Vidal (2021) proposed a more efficient and educational approach to promoting the understanding of medical terms related to breast cancer treatment through linguistic-descriptive studies and semi-structured interviews.

This literature review emphasizes the dynamic nature of Western medical terminology, which constantly evolves in response to advancements in medical science, societal changes, linguistic influences, and broader cultural contexts. In Western medical terminology, the prominent characteristics of Latin-Greek neoclassical terms and eponyms hinder effective communication for native users who are non-experts and the development and communication of medicine require an improved terminology service. Extensive research on Western medical terminology can be observed in both theoretical and practical domains.Western research begins by studying the terminology itself, analyzing terminology issues in various communication scenarios, and providing guidance for terminology applications and services. Understanding the historical development and transformation of medical terminology offers valuable insights for medical professionals, linguists, and researchers in effectively communicating medical concepts and promoting interdisciplinary collaborations.

In conclusion, the development of Western medicine in China is the outcome of cross-cultural and cross-language communication. Chinese scholars studying medical terms primarily focus on traditional Chinese medicine terminology, while limited ontology studies have been conducted on terms in Western medicine, despite thorough investigations into the history of Western medicine. Previous studies provide valuable references to the historical background of modern medical development in China and the characteristics of Western medical terminology. The historical interaction between

Chinese and Western medicine presents a perfect case to explore the ecosystem of Western medical terminology in China. We believe that further discussion combining historical research and linguistic investigation can contribute to future studies and planning in the field of terminology. Therefore, our thesis aims to achieve a diachronic, descriptive, and corpus-based study of Western medical terminology from an interdisciplinary perspective.

2. Objectives, hypotheses, significance, and innovation of the research

The primary objective of this dissertation is to investigate the linguistic and sociolinguistic features of Western medical terms in the Chinese language. According to the Communicative Theory of Terminology (Cabré, 1999), terminological units are primarily lexical units, prototypically nouns, within specialized contexts. Therefore, special emphasis will be placed on disease names spanning the last century.

To conduct a diachronic analysis, the research will center on building terminological databases using authentic medical texts from three distinct historical periods, ranging from 1915 to 2020. Through an examination of the linguistic mechanisms employed in forming disease terms across these periods, the study aims to elucidate the evolution of disease names. The ultimate goal is to offer insights that can contribute to effective terminology planning in China.

The specific objectives of this research are as follows:

2.1. Specific Objective

In addition to the general objective, there are specific objectives to be achieved in three dimensions: instrumental operation, linguistic analysis, and sociolinguistic observation. Here are the specific objectives for each dimension:

1. Instrumental operation

Given the absence of a corpus-based terminology database for disease names in Western medicine in the Chinese language, several essential operations need to be conducted as the initial step of our terminology research.

a) Identify a representative medical journal focused on Western medicine in China.

b) Establish a historical periodization from 1915 to 2020 of the Chinese language, taking into account political, economic, and sociolinguistic changes.

c) Create corpora representative of significant historical periods using articles sourced from the selected journal.

d) Identify and extract disease terms from the articles within each corpus and construct terminological databases specific to the corresponding historical periods.

By undertaking these crucial steps, we can lay the instrumental foundation for our terminology research, enabling a comprehensive analysis of disease names in Western medicine within the Chinese language context.

2. Linguistic analysis

We conducted linguistic studies on terminology databases from different historical periods, focusing on the following aspects:

a) Analyze the morphosemantic formation mechanisms employed in the Chinese language for Western medical terms, with a specific focus on disease terms and identify and categorize the linguistic patterns and processes involved in the formation of disease terms in each period.

b) Examine the semantic shifts and extensions that have occurred in the meanings of disease terms in the Chinese language.

c) Identify and analyze terminological variants, and examine the changes in terminological variation over time, considering the sociocultural, historical, and professional influences on the adoption and adaptation of Western medical terminology in China.

Through this linguistic and sociolinguistic study, we will understand the morphosemantic formation of Western medical terms in the Chinese language, as well as the sociolinguistic evolution of terminological variation.

3. Sociolinguistic observation

A sociolinguistic observation helps bridge the gap between theoretical research and practical applications in social services. In this regard, the following objectives will be pursued:

a) Compare the morphosemantic mechanisms of Western medical terms in the Chinese language. This involves examining the changes and developments in the linguistic mechanisms employed for coining Western medical terms across different periods. The goal is to identify the most productive mechanisms during each specific period and uncover the linguistic trends and preferences that shape the evolution of terminology.

b) Explain the sociolinguistic factors contributing to the terminological evolution in terms of formation and textual presentation. We investigate the sociolinguistic factors that influenced the diachronic evolution of terminologies in terms of their formation and variation within texts.

c) Deduce criteria and suggestions for terminology planning in China. Through the linguistic observations and analysis, we aim to make suggestions for effective terminology planning in the Chinese context. The findings from the study can inform the development of guidelines and strategies for the creation, standardization, and dissemination of Western medical terms in China.

Through achieving these objectives, the study aims to contribute to the practical application of research findings and facilitate improved communication and understanding in social services related to Western medical terminology in the Chinese language and provide recommendations for medical terminology planning and implementation in China.

2.2. Hypotheses

Based on the objectives and a more complex parameter, we form these hypotheses about Western medical disease terms in Chinese during the period 1915 to 2020:

i. During the initial stages of the introduction of modern Western medicine in China, there is an expected higher occurrence of the incorporation of traditional Chinese medical terms within the realm of Western medicine to facilitate its expansion compared to periods marked by cognitive adaptation in Western medicine. This proposition suggests the potential coexistence of diverse variations involving both integrated TCM terms and freshly coined Western medical terms in the sphere of medical communication.

ii. The introduction of Western medicine to China has led to language contact with other foreign languages, especially English, potentially giving rise to new morphosemantic mechanisms. Therefore, it is hypothesized that a greater use of foreign languages, such as loanwords, may become more common, leading to diverse levels of linguistic hybridization within the context of Western medical terminology in China along with the Western medical development.

iii. Composition is the most applied mechanism in the formation of disease names. In composition, patrimonial lexical units in Western medicine that are authentically created in the Chinese language are envisaged to significantly contribute to the establishment of an autonomous Western medical terminology framework in China.

iv. With the development of modern Chinese and Western medicine in China, the mechanisms of morphological and semantic construction are becoming increasingly

complex and diverse. The understanding of disease names has progressed in step with the times, and the demand for more precise and detailed disease descriptions has also grown. Furthermore, the most productive mechanism is expected to encompass heightened semantic parameters reflecting an advanced comprehension of diseases.

v. More variation may arise during the process of consolidating the terminology. The effort to standardize Chinese medical terminology highlights the importance of achieving uniformity and consistency by incorporating international disease classifications. However, this endeavor requires accommodating diverse types of variations, which could unintentionally hinder effective communication among professionals and researchers working in the medical field.

These hypotheses offer a comprehensive perspective on various dimensions encompassing Western medical disease terms in the Chinese context spanning from 1915 to 2020. Effective terminology planning should encompass a meticulous examination of the most efficient patterns for term creation and the establishment of a coherent and communicative terminological framework. The presented hypotheses underscore that the enhancement of terminology planning within the realm of Western medical terminology in China necessitates the consideration of diachronic shifts in terminologies, the alignment of terminological choices with local contexts, and the recognition of the continuous evolution of medical language in response to cultural, scientific, and technological dynamics.

These hypotheses are anchored in the framework of social terminology, which posits that shifts in terminology are a natural consequence influenced by a myriad of factors. As is the case with any scientific hypotheses, further research and empirical data would be indispensable to substantiate and reinforce these assertions.

2.3. Significance and innovation of the research

This dissertation combines historical study and linguistic analysis to explore the evolution of Western medical disease terms in the Chinese language, aiming to transcend disciplinary boundaries. The study is highly significant and innovative for

two key reasons. Firstly, it represents the first comprehensive investigation into the evolution of Western medical terminology in China spanning the period from 1915 to 2020. Secondly, it pioneers the application of the Communicative Theory of Terminology (Cabré, 1999, 2023) to study Western medical terminology within the Chinese context.

I. New angle: The application of the Communicative Theory of Terminology in a Chinese environment offers a new perspective on terminology theory and expands the scope of its application beyond Western contexts.

II. New object: While there have been numerous studies on traditional Chinese medicine terminology, research on Western medical terminology in the Chinese language is scarce. Considering the significant development of Western medicine in China, studying the terms and terminological planning in this domain is valuable for medical specialists and the general public.

III. New methodology: In contrast to previous research that primarily relied on analyzing terms from dictionaries or standardized medical books, this study takes a unique approach that allows us to examine disease names in Western medicine as documented in a Chinese journal over a century, employing a diachronic and descriptive methodology. By observing the terminological units in their *in vivo* context and incorporating the communicative method, this study contributes to the ontology study of the Chinese language.

IV. Interdisciplinary approach: By drawing on knowledge from multiple disciplines such as history, linguistics, medical terminology, and language planning, this research offers valuable resources for translators, terminologists, language learners, and policymakers.

V. New perspectives: This research will adopt a communicative approach to terminology planning in China, offering novel insights into the field of Chinese language planning.

VI. Integral component of global conceptual history: Conceptual history, a field within historical and cultural studies, examines the historical semantics of terms. Analyzing the morphosemantic mechanisms of disease terms, including their etymology, provides valuable insights for the study of conceptual history, particularly in relation to the evolution of disease term naming in the Chinese language.

Overall, this dissertation presents a communicative and interdisciplinary approach to studying Western medical disease terms in the Chinese language, with the potential to contribute to terminology theory, language planning, and the understanding of conceptual history.

3. Organization of the dissertation

The dissertation aims to present a well-structured and cohesive exploration of terminological study, covering theory, methodology, empirical analysis, and recommendations. The organization of this research is as follows:

Chapter 2 establishes the foundation for the study by introducing the Communicative Theory of Terminology (CTT). It also provides essential linguistic knowledge of the Chinese language and exploring the study of neology. This chapter establishes the theoretical framework for the research.

Chapter 3 elaborates on the methodology employed in this study. It outlines the process of acquiring pertinent documentation on Western medicine in Chinese and the creation of communication-based contextual corpora. The chapter goes on to detail the manual extraction of disease terms from each corpus, serving as the foundation for constructing the terminological database. Additionally, the analysis method of these terms through the theoretical framework is also delineated.

Expanding on the methodology, Chapters 4 to 6 delve into a comprehensive morphosemantic analysis of the databases from three distinct periods: 1915-1949,

1950-1978, and 1979-2020. These chapters also interpret the behavior and evolution of terminological variants within specific contexts synchronically.

Chapters 7 and 8 further analyze the terminological evolution by providing a diachronic comparison of the three databases. These chapters offer suggestions and recommendations to enhance the adequacy of terminological planning in China.

Lastly, Chapter 9 summarizes the dissertation's key findings comprehensively, while also outlining potential directions for future research.

The appendix includes a compilation of bibliographic references, samples of the prooread version, and the online access directions to the *ad hoc* databases we constructed for this research.

Overall, the organization of the dissertation ensures a logical flow of information, starting from the theoretical framework and methodology, and progressing to the analysis and conclusions. The inclusion of an appendix adds value by providing additional resources for reference. The dissertation aims to provide a structured and cohesive exploration of terminological study, spanning from theory and methodology to practical analysis and recommendations.

CHAPTER 2 THEORETICAL FRAMEWORK

Our study aims to investigate the terminological evolution of disease terms of Western medicine in the Chinese language from 1915 to 2020, in order to provide suggestions for Chinese terminology planning. This study represents an interdisciplinary attempt that spans terminology, medicine, history, and languages. Thus, this chapter will explain the fundamental theories and findings that will guide our investigation, including the Communicative Theory of Terminology (CTT) by Teresa Cabré, the philological characteristics of the Chinese language, and the study of specialised neologisms.

1. The Communicative Theory of Terminology (CTT) is a comprehensive theory of terminology based on linguistic, cognitive, and communicative perspectives according to its author Teresa Cabré. It provides a framework for understanding and analyzing terminological phenomena in various domains. In this particular section, our focus will be on the concept of terminological units and variants.

2. A clear understanding of the Chinese language is crucial when studying Western medical terms in Chinese. Despite Western medicine being a relatively new discipline in the Chinese context, the terminology used is in the Chinese language. Therefore, a comprehensive knowledge of the history and philological characteristics of the Chinese language is essential for conducting a linguistic analysis of these lexical units.

3. The creation of disease terms in Western medicine in the Chinese language involves an intercultural neologic process. As new medical concepts and terminology are introduced from the Western medical domain into the Chinese context, there is a need to adapt and create new terms that accurately convey these concepts in Chinese. This process often involves the formation of neologisms, which are newly coined words or expressions. Studies on neologism play a significant role in understanding and classifying these terminological variants that arise during the communication of

Western medical terms in Chinese.

1. Communicative Theory of Terminology

The Communicative Theory of Terminology (CTT) (Cabré, 1999, 2023) is developed base on a descriptive approach to study terms and their variants in the texts, and reference to their multiple dimensions under an applied linguistics framework. It is firmly set in the sphere of linguistics which is better equipped to account for the various scenarios in scientific and technical communication.

The theory is constructed by questioning the General Theory of Terminology (GTT) and the reflections on the terminology in communication. The GTT studies the univocal normalized units and ignores descriptive study, therefore, it lacks the focus on the communicative environment of the terms.

[The GTT] Establece un objeto de análisis y unas funciones de trabajo muy restrictivos, por cuanto limita el objeto a las unidades unívocas normalizadas propias de los ámbitos científico-técnicos, reduce la actividad terminológica a la recopilación de conceptos y de términos para la normalización (fijación de nociones y denominaciones estandarizadas) de los términos, circunscribe los ámbitos especializados a la ciencia y la técnica y limita sus objetivos a asegurar la univocidad de la comunicación profesional, fundamentalmente en el plano internacional. (Cabré, 1999: 100)

Based on this critique, the Communicative Theory of Terminology (CTT) asserts that terminology is a discipline that combines language description and conceptual reality. Its function is to address the lexical needs of society. According to Cabré (1999), the traits of terminology are determined by communicative discourses, as the name of the theory indicates. In specialized communication, terminological units are employed to represent knowledge, and each unit serves a communicative purpose. The communication involves direct or indirect communication. Direct communication occurs among experts, in didactic discourse, or in materials aimed at popularizing science. Indirect communication, on the other hand, occurs through processes such as translation, interpretation, and technical writing. Thus, the analysis work of terminology should be framed in a specialised discourse.

This inherent nature of terminology necessitates an interdisciplinary approach, and it should be an open system that embraces multiple perspectives (Cabré, 1999). For that, Cabré (2003) presents a metaphor called the *Theory of Doors* to describe the characteristics of terminology from a multidisciplinary perspective:

a. From a linguistic standpoint, terms are a group of linguistic signs that form a subset within the lexical component of a language's grammar. They are lexical units that constitute part of a speaker's linguistic competence. These units can be general (known by all speakers) or specialized (restricted to a specific group of speakers). Thus, terms or terminological units are lexical units that acquire specialized meaning in certain contexts.

b. From a knowledge theory perspective, terms are cognitive units that represent specialized knowledge. On one hand, they serve as units of experience through which speakers perceive the world. On the other hand, they function as representational units that organize specialized knowledge.

c. In various scientific and technical disciplines, terms are a collection of expressions and communication units that facilitate the transfer of specialized knowledge. The study of terms necessitates a combination of linguistic and scientific knowledge.

The Communicative Theory of Terminology encompasses the study of terms as units of language, cognition, and social function within a specialized communication framework. One of its notable aspects is the analysis of terms within the context of texts that facilitate the transfer of specific knowledge among users at various levels of expertise (Cabré & Estopà, 2002).

In summary, according to CTT's definition, terminology is an interdisciplinary field that intertwines theories of language, communication, and knowledge. Its primary focus is on terminological units, which are integral components of natural language and language grammar, activated within specific contexts. This theory is rooted in a linguistic approach but extends beyond a mere linguistic perspective. Instead, the

eight principles of CTT (Cabré, 1999, p. 120-122) embrace an interdisciplinary viewpoint for examining terms within specialized discourse. The theory thoroughly encompasses the roles of terminology in communication and defines it as an open system with various facets. Operating under this assumption, the communicative nature of terms shapes this research's focus and terminology methodology, emphasizing the significance of understanding terminological units and their variations in communicative contexts.

1.1. Terminological unit

Cabré (1999) stated the central objects of terminology study are terminological units (TUs). The TUs are the lexical units whose specialized values are activated according to the determined specialized contexts in which they are used. The emphasis on the specialized discipline reveals that terminological units are cognitive vehicles of transmission of knowledge and the abstractness of knowledge determines the communicative units are linguistic.

Cabré's first principle of the Communicative Theory of Terminology (CTT) is that the terminological units belong to natural language (Cabré, 1999). The General Theory of Terminology (GTT) excludes the terms from lexical units. The CTT questions the isolation and distance of terminological units from the general language. The terminological units are lexical units with phonic and graphic forms, a morphological structure, function as a part of speech in grammar, and carry semantic descriptions of some signified, just as all the lexical units in general language. The terminological units follow the same lexical, grammatical, and construction regulars as the general lexical units in the phrases and discourses of the language (Cabré, 2004). That's to say, the terms and generally used words share the same lexical components in a natural language. In a wider range, the contexts or discourses where the terms appear are not that alien to those of general communication, on the contrary, all the formal, and semantic competencies they possess are the same as their general discourses. Therefore, terminological units belong to the natural language, and only the specialized filed where they are applied activates the terminological value.

While terminological units share a similar semiotic status with general words, they possess certain distinct characteristics:

1. Terminological units have more varieties in morphological structure. A general lexical unit can be monolexical or polylexical depending on the number of lexical constituents, and a terminological unit can be a monolexical word, a compound word, or a syntagmatic lexical unit, as long as it represents specialized knowledge as one unit (Cabré et al., 1996; Estopà et al., 2006). Multi-word terms are the primary type of phraseological units in specialized discourse. They are classified as terminological units when they meet specific criteria, including being formed by two or more elements, exhibiting frequent co-occurrence, functioning as a cohesive whole, and displaying a certain degree of lexicalization (León Araúz & Cabezas García, 2021). In our study, we adopt the view that the terminological units of disease names can be diversified in morphological appearance, focusing on the multi-words units.

2. In terms of part of speech, terminological units and general lexical units are distinguished in tendency. The general words include all categories of parts of speech and the TUs tend to be mostly nouns, and few adjectives, verbs, and phrases (Rey, 1995; Sager, 1990). As this study focuses on disease names, we suppose that all the terminological units of disease names are nouns, still, we have to analyze the part of speech of all the datas.

3. The terminological units and general words share the same mechanisms of lexical formation but with different frequencies of application for each mechanism. Compared to the arbitrariness involved in creating general language words, term formation is considered a conscious and well-thought-out activity because its purpose is to transfer knowledge in a specialized field (Sager, 1997). Furthermore, the frequency of usage of formation mechanisms differs between terminological units and general lexical units (Porras, 2022). Cabré (1999) concludes that compound neoclassical units and syntagmatic constructions are more frequently used mechanisms in terminological units than in general words. The specific generation mechanisms of words and terminological units will be presented in the section on neologisms.

4. Another difference between terminological units and general lexical units lies in the context in which they are found. General words can be found in lexicographic works, while terminological units are only encountered in specialized contexts. A terminological unit is a lexical form associated with semantic information, and it is the specialized context that activates its terminological function (Cabré, 1999). In other words, specialized discourse provides the lexical units of specialized pragmatic competence.

To summarize, a terminological unit is a conventional linguistic symbol used to represent concepts within a specific field of knowledge. These units can be derived from specialized discourses and utilize similar linguistic mechanisms as general lexical resources, while also prioritize their own distinct characteristics in formation. In the scope of this study, the terminological units under examination are disease names which are nouns or noun phrases within the specialized context of Western medicine, sourced from an authentic medical journal.

1.2. Variants

Terminological variants play a pivotal role in the study of terminology and communication, with the literature review exploring variations in naming and the influence of socio-cultural factors on language practice. This study adopts the Communicative Theory of Terminology (CTT) as its theoretical framework, emphasizing the dynamic nature of specialized discourse and the role of communication in shaping terminological variations.

Human beings (regardless of where or what ethnicity) have the same capacity to understand the objective world (all things in nature). However, the expression of things in the objective world differs (Ye Feisheng et al., 1997). Humboldt's concept of the language worldview, or *Weltanschauung*, recognizes that language can only partially capture the true essence of the world. This perspective acknowledges that the representation of reality through language involves a process of projection and reflection (Underhill, 2009).

The language worldview acts as an intermediary realm between thought and language, functioning as a prism through which individuals perceive and understand the world cognitively (Underhill, 2009). While ordinary individuals cannot directly perceive this realm, it influences their linguistic expressions and shapes their worldview. Therefore, even within the same national language, variations in naming can occur due to differences in the perception of the same entity. This suggests that language is not a fixed and objective reflection of reality but is subject to individual interpretations and cultural influences. These variations highlight the inherent subjectivity of language and demonstrate how different perspectives can shape the linguistic representation of the world.

The social terminology flow recognizes terminology as a social and cultural discipline (Gaudin, 2005). It emphasizes the practical use of terminology within specific contexts and takes into account various socio-cultural factors that influence language practice. This perspective highlights the importance of understanding the social and cultural dimensions of language in order to grasp its complexities fully. By considering the contextual factors that shape language use, the social terminology flow provides a comprehensive framework for studying terminology.

The Communicative Theory of Terminology is a multidisciplinary theory that incorporates a linguistic component to address terminological variations. While the General Theory of Terminology (GTT) emphasizes the principle of univocity and monosemy in terminology, the Communicative Theory of Terminology recognizes and embraces variations in communication as descriptive characteristics. Sager (1990) argues that the existence of different linguistic expressions for a concept is due to the varying communicative contexts that generate different needs. Variants, which refer to different expressions conveying the same meaning, are considered legitimate ways of representing concepts and can manifest in various languages, registers, or styles. Therefore, from a communicative perspective, the variation in terminology in response to different needs forms the theoretical basis for terminological variation in the field of communicative terminology studies.

According to Communicative Theory of Terminology, variation in terminology is attributed to dialectal and functional factors (Cabré, 1999). The dialectal factor pertains to variation arising from distinctions in geographical location, time, and social occupational groups. On the other hand, functional factors impact the use of terms in different communication situations. She also highlights that variation is influenced by variables such as the channel of communication (register), topic, degree of formality, and communicative purpose (Cabré, 2009). For example, terminology exhibits the highest degree of variation in less specialized areas of knowledge and in discourse aimed at popularizing scientific and technical information. Conversely, terminology standardized by expert commissions demonstrates the lowest degree of variation. Intermediate degrees of variation are characteristic of terminology used in natural communication among specialists. Terminological variation emerges as a result of different types of specialized communicative contexts and the evolution of knowledge over time.

Freixa (2006) understands variation as a natural and inherent phenomenon in language, considers that the same variation parameters affecting general language are involved in professional communication, and identifies all dimensions of variation that must be considered and described in terminology. Communication inherently involves variation, which can be observed through alternative forms of denomination for the same concept (synonymy) or the presence of multiple meanings associated with a single form (polysemy). Thus, the variation is a universal characteristic of terminological units. Variants can manifest explicitly as alternative forms of a single denomination for the same concept (synonymy) or as stable lexical units that facilitate communication at different levels and it's defined as the phenomenon where different denominations exist for the same concept (Freixa, 2006). This variation is limited to different lexicalized forms that have a certain degree of stability and consensus among users within a specialized domain.

Extensive research has been conducted to understand the different types and causes of terminological variation. In the field of terminology, scholars have provided valuable insights into the categorization and analysis of terminological variants. Dubuc and Lauriston (1997) explored various types of variants, including morphological variants,

orthographic variants, elliptic variants, and abbreviations. These variations arise from the specific linguistic structures and conventions used within specialized fields. Cabré (1999) introduced a framework for understanding variation based on two dimensions: horizontal and vertical variations. Horizontal variation is closely linked to the subject matter, where texts are categorized according to different specialized disciplines. On the other hand, vertical variation pertains to the degree of specialization, ranging from terms used in popularized science and technology contexts to standardized terms used by experts in the field.

Freixa (2006) delved deeper into the causes of terminological variation, proposing a classification system that encompasses dialectal, functional, discursive, interlinguistic, and cognitive factors. This classification acknowledges that variation can stem from different origins, such as regional dialects, variations in register or style, interlinguistic influences, and even diverse cognitive conceptualizations. Freixa's work provides a comprehensive understanding of the underlying factors that contribute to the existence of terminological variants.

Drawing from the Russian terminology school, Sun Huan (2011) expanded the understanding of terminological variation by categorizing variants based on linguistic elements. This classification system contrasts variants in terms of their phonetic, morphological, orthographic, and syntactic forms. By considering these linguistic aspects, the categorization of terminological variants becomes more precise, allowing for a detailed analysis of their forms and structures.

Understanding the factors and types of terminological variation is crucial for effective communication within specialized domains. It enables professionals to navigate the nuanced terminology and ensures precise and accurate information exchange. Furthermore, investigating terminological variation can shed light on the cognitive and conceptual processes involved in the formation and evolution of terminological units.

In this study, we adopt the Communicative Theory of Terminology (CTT) as our theoretical framework. The CTT offers a comprehensive perspective on terminology,

highlighting the role of communication and the dynamic nature of specialized discourse. By considering the natural lexical units activated in specialized contexts and the presence of denominative variants in communication, the CTT provides a pragmatic and communicative lens through which to analyze terminological variation.

By focusing on disease terms in the specialized context of Western medicine within a real medical journal, this study aims to contribute to the understanding of terminological units and the cause of their variants. Specifically, we will examine the contemporaneous variant types and diachronic variants of Western medical disease names in the Chinese context. Through this analysis, we aim to explore if there is a correlation between the development of Western medicine in China and the frequency of terminological variation.

In summary, the literature review demonstrates the significance of terminological variation and provides a theoretical foundation for our study. The categorization of variants, the factors influencing variation, and the impact of specialization and professionalization on terminological normalization all contribute to a deeper understanding of terminology and communication within specialized fields.

2. The Chinese Language

In the realm of natural language, terminology serves as a fundamental element intricately woven into the norms and vocabulary of a specific language (Cabré, 1999). In the context of this study, our focus lies on Western medical terms within the Chinese language. Chinese is an ancient language with a rich history, and its vocabulary is constantly adjusting and changing in line with the globalization trend. Being an analytic language, Chinese differs morphologically from Indo-European languages. Therefore, to conduct a morphosemantic analysis of these terms, it is essential to understand the historical trajectory of the Chinese language and its interactions with Western influences.

2.1. History of the Chinese language

The Chinese language, known as *Hanyu* (汉语, 'language of Han'), is spoken by the Han ethnic group, which constitutes the majority of the Chinese population. In addition to the Han Chinese, there are 55 other ethnic minority groups living in China, most of whom have their own languages. Furthermore, due to historical and geographical reasons, different dialects have emerged in various regions of China.

To facilitate communication among the diverse Chinese population, *Hanyu*, with the Beijing accent as its standard pronunciation and standard modern vernacular writings as its standard grammar, has become the national *lingua franca* known as *putonghua* (普通话, 'common language' or *mandarin* in English) (Huang Borong & Liao Xudong, 1991).

From a morphological typology perspective, Chinese belongs to the Sino-Tibetan language family and is considered an analytic language. It lacks inflectional features such as gender changes or conjugations. Instead, word order and auxiliary words play vital roles in conveying meaning, tense, and mode. For instance:

The semantic difference between the words *niunai* (牛奶, 'milk') and *nainiu* (奶牛, 'cow') is determined by the position change of *niu* and *nai*.

The phrase *wochi* (我吃, 'I eat') and *wochile* (我吃了, 'I have eaten') exemplify the use of the auxiliary word *le* after the verb *chi* to indicate a change in the activity's mode.

Over centuries of development, the Chinese language has undergone significant changes. Wang Li (1980) divided the entire history of Chinese into four major periods based on the evolution of Chinese grammar, vocabulary, and phonology.

1. *Shanggu Hanyu* (上古汉语, 'Upper Ancient Chinese'): Before the Third Century AD.
2. *Zhonggu Hanyu* (中古汉语, 'Middle Ancient Chinese'): 4th to 12th Century AD.
3. *Jindai Hanyu* (近代汉语, 'Modern Chinese'): 13th to 19th centuries AD.

4. *Xiandai Hanyu* (现代汉语, 'Contemporary Chinese'): May 4th Movement[4] in 1919 till now.

In this dissertation, our diachronic study will focus on the time range from 1915 to 2020, encompassing the late modern and contemporary periods of the Chinese language. This period represents a time of transition for China, marked by modernization processes, political changes, and interactions with the global community.

Scholars have established a more detailed chronology of the Chinese language in modern times. He Jiuying (2007) provides an in-depth exploration of the evolution of general Chinese during China's modernization process since 1862. In our research, we will focus on the specific time nodes relevant to our study. The evolution of the Chinese language can be traced through the following five stages:

1. From 1862 to 1894, China began to encounter Western languages, initiating linguistic transformations.
2. Between 1895 and 1916, a new style of Chinese emerged, influenced by both Western languages and Japanese.
3. From 1917 to 1949, Classical Chinese was preserved while vernacular Chinese gained prominence.
4. Between 1950 and 1979, Chinese underwent standardization and became increasingly intertwined with political ideologies.
5. Since 1980, the Chinese language has embraced globalization, opening up to external influences.

Each stage of the Chinese language's evolution is closely tied to China's domestic and international transformations.

1. Between 1862 and 1894, China embarked on an initial stage of modernization known as the Westernization Movement. This period witnessed increased contact

[4] The May Fourth Movement was an anti-imperialist, cultural, and political movement which grew out of student protests in Beijing on 4 May 1919.

between Chinese society and Western languages. Notably, individuals within the Chinese government and missionary groups played a significant role in fostering Chinese-Western exchanges, promoting technological advancements, and establishing translation agencies. These initiatives contributed to the modernization of the Chinese language through the translation of foreign languages into Chinese.

As aptly stated by He Jiuying (2007), the transformation of the Chinese language can be traced back to the intersection of Chinese and Western languages, which initiated a paradigm shift in the way the Chinese language was approached and utilized.

2. From 1894 to 1917, China's modernization entered a new phase that shifted the focus from material technology to the reform of social systems and political ideologies. This period witnessed several significant events that marked the transformation of the Chinese language. These included the integration of classical and vernacular Chinese, the establishment of vernacular newspapers, the proposal of various pinyin schemes by the Ministry of Education, the promotion of Chinese Mandarin, and the government's abolition of the old style of writing. The development of China's modern new style was greatly influenced by Western and Japanese learning, both in terms of content and form.

These developments in the late 19th and early 20th centuries played a crucial role in shaping the trajectory of the Chinese language, setting the stage for further linguistic changes in the following years.

3. From 1917 to 1949, classical Chinese and vernacular Chinese coexisted in China. Scholars advocated for the integration of vernacular speech and classic writings, proposing a shift in the language's usage. He Jiuying (2007) identified a pivotal moment for the Chinese language around 1917 with the establishment of the magazine *New Youth*[5] and the May 4th movement. In this magazine, Hu Shi (1917)

[5] *New Youth* (新青年) was a Chinese magazine in the 1910s and 1920s that played an important role in initiating the New Culture Movement and spreading the influence of the May Fourth Movement when literary Chinese has been largely replaced by written vernacular Chinese. The Early Republic of China period from 1911 to late 1930s was a period of revolutionary changes at all levels and across all sectors in China.

proposed officially the replacement of *wenyanwen* (文言文, 'classical Chinese'[6]) with *baihuawen* (白话, 'vernacular Chinese'). This proposal marked the beginning of the modernization of the written Chinese language.

4. The period from 1949 to 1979 witnessed significant political developments, including the establishment of the People's Republic of China and the subsequent implementation of the Reform and Opening Policy. These political activities shaped the evolution of the Chinese language, dividing it into two distinct phases:

a) 1949-1966: Systematic normalization of modern Chinese from the establishment of the People's Republic of China to the beginning of the Culture Revolution[7]. After establishing a country with a new political system, the Chinese language had a significant development:

1) Vernacular Chinese dominates the country.
2) Nationwide promotion of mandarin on the large scale.
3) Formulate and implement the *Hanyu Pinyin Fang'an* (汉语拼音方案, 'Chinese phonetic alphabet scheme plan').
4) Normalize Chinese character glyphs.
5) Conduct a nationwide survey on dialects.
6) Publish authorized dictionaries: the *Xinhua Dictionary* and the *Modern Chinese*

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[6] Classical Chinese, also known as Literary Chinese *wenyanwen* (文言文), or *guwen* (古文), is the language and a written form of the classic literature from the end of the Spring and Autumn period *chunqiushidai* (春秋时代), through to the end of the Han dynasty. It is different from any modern spoken form of Chinese. Literary Chinese was used for almost all formal writing in China until the early 20th century. (https://en.wikipedia.org/wiki/Classical_Chinese)

[7] The Culture Revolution, formally the Great Proletarian Cultural Revolution, was a sociopolitical movement in the People's Republic of China from 1966 until 1976. Launched by Mao Zedong, then Chairman of the Communist Party of China (CPC), its stated goal was to preserve Chinese Communism by purging remnants of capitalist and traditional elements from Chinese society, and to re-impose Mao Zedong Thought (known outside China as Maoism) as the dominant ideology in the CPC. The Revolution marked Mao's return to a position of power after a period of less radical leadership to recover from the failures of the Great Leap Forward, whose policies led to famine and approximately 30 million deaths only five years earlier. The Cultural Revolution damaged China's economy while tens of millions of people were persecuted, with an estimated death toll ranging from hundreds of thousands to 20 million.

Dictionary.
7) Popularize grammar and rhetoric knowledge.

These years saw the implementation of a systematic normalization effort, which demonstrated the effectiveness and success of the language policy. The policy aligned with the expectations of the people and the historical tendencies of the Chinese language.

b) 1966-1979: The Chinese language underwent significant impacts from political movements, specifically the Cultural Revolution and the subsequent period leading up to the Reform and Opening. These ideological reform movements were guided by the principle of class conflicts. Guo Fuliang and Xie Ru (2019) analyzed the effects of these movements on the Chinese language during this political movement and can be summarized as follows:

1) The Chinese language and characters lost their vitality and underwent a reduction in their diverse styles. The emphasis was placed on conformity and uniformity, leading to a decline in linguistic creativity and expression.
2) During this period, only Mao Zedong's speeches and revolutionary literature that aligned with the political ideology of the time were considered suitable as classical reading materials. These texts often contained elements of anger and criticism, reflecting the dominant revolutionary discourse.
3) Language itself, regarded as a weapon for struggle and combat, became vulgar and stripped of deeper meaning. The focus shifted towards using language as a means to propagate political ideology rather than for nuanced expression or communication.

The Cultural Revolution sabotaged the modernization process, which caused the collapse of the economy, the abandonment of widespread academies, increased illiteracy, and very limited communication with other cultures. The movement turns the Chinese language into a monopoly and violent expression.

5. From 1979 to the present day, China entered the period of Reform and Opening following the cultural stagnation of the Cultural Revolution. This period can be seen

as a remote continuation of the May 4th Movement, reinvigorating the Chinese language and carrying forward its traditions.

The Reform and Opening, which began in 1979, initially focused on language reform. The language policy of this era aimed to expand reading materials, restore the vitality of the Chinese language, and inject innovation into its usage. According to Wang & Sun (2015), China established institutions dedicated to language and character work from 1978 to 1999, marking the beginning of the normalization process. These institutions promoted Mandarin Chinese and the adoption of the *pinyin* scheme. Research on Chinese character information processing contributed to both basic and applied investigations of the Chinese language and characters, optimizing social studies and consultations.

For the Chinese language, the reform aimed to eliminate the linguistic violence that plagued the country and its people during the Cultural Revolution. The openness sought to free the language from the distortion and influence of political activities. As a result, Chinese became standardized, digitalized, and globalized.

The evolution of the Chinese language can be observed through changes in writing, grammar, vocabulary, and character glyphs over the course of nearly 150 years in mainland China. This evolution is closely intertwined with social transformations.

2.2. Characteristics of the ancient and modern Chinese

Our study adopts a diachronic approach to the Chinese language from 1915 to 2020. As we learn from the general history of Chinese, the period we study begins in an era when both classical and vernacular languages coexisted. It was a period when ancient Chinese declined, and the language gradually modernized. Generally, the May Fourth Movement, also known as the Vernacular Movement, is considered the demarcation between ancient Chinese and modern Chinese. In order to understand the morphological changes that occurred during this period, it is crucial to examine the evolution of the Chinese language and its lexical development. Therefore, we focus on the study of morphology. First of all, we present the characteristics of the

morphological features of **ancient Chinese**:

1. Monosyllabic words predominate in ancient Chinese vocabulary

This is the most prominent morphological feature of ancient Chinese, especially in written Chinese (Jiang Shaoyu, 1989). Graphically, monosyllabic words are formed by a single character. In ancient Chinese, a syllable in prosody or a character in written form can express a word or even a sentence. For example, the monosyllabic word *ran* (然) can mean 'all right'.

2. The monosyllabic words evolve into disyllabic words in the late stage of ancient Chinese

Due to the lexical development and limitations of expression with monosyllabic words, there are an increasing number of homophonic and homographic monosyllabic words. In order to effectively distinguish meaning in communication, monosyllabic words are transformed into compound words by increasing the number of syllables, leading to the flourishing of disyllabic words. The transition from monosyllabic to disyllabic words can be categorized into three main situations (Dong Weiguang, 1990):

A) Addition of an auxiliary component (suffix or prefix) after or in front of the original monosyllabic word.
a. Adding a suffix: *zhuo* (桌, 'table') to *zhuozi* (桌子, 'table'), *bi* (鼻, 'nose') to *bizi* (鼻子, 'nose'). The *zi* (子) is a typical suffix to indicate that the word's part of speeach is a noun.
b. Adding a prefix such as *shi* (师, 'teacher') to *laoshi* (老师, 'teacher') *hu* (虎, 'tiger') to *laohu* (老虎, 'tiger'). The *lao* (老) is a prefix to indicate the dignified feature of the subjects.

B) Addition of a synonym or semantically-related morpheme before or after the original monosyllabic word to form a compound word, with the original word becoming one of the morphemes (See Table 2.1).

Method	Original word	Added word	Disyllabic word
Add a synonym	*han* (寒, 'cold')	*leng* (冷, 'cold')	*hanleng* (寒冷, 'cold')
Add a related word	*guo* (国, 'country')	*jia* (家, 'home')	*guojia* (国家, 'country')

Table 2.1: Extention of monosyllabic words to disyllabic words by adding a related morpheme

C) Another way to transform a monosyllabic word into a disyllabic word is by substituting it with a completely different word. The original word becomes obsolete and is replaced by another word. For example, in a sentence from a short story by the Qing Dynasty novelist Pu Songlin:

Tu zihou duan qi gu, yi bi zhi (屠自后断其股，亦毙之), which translates to 'The butcher cut its thigh from behind and killed it'.

In modern Chinese, the term *gu* (股) has lost its original meaning of 'thigh', and a new word, *datui* (大腿), has been created to specifically refer to the concept of a thigh.

3. Homophones and polysemy are common in ancient Chinese

In the Mandarin Chinese phonetic system, a syllable consists of an initial and a final. The combination of 23 initials and 24 finals results in fewer than 500 syllables in Chinese. Additionally, the number of commonly used Chinese characters is less than 5000. As a result, there are a large number of homophones and polysemous words in ancient Chinese.

Polysemous words often acquire additional meanings through semantic extension of their basic meaning or through phonetic borrowing (Gao Shufan, 1982). A) The extension of semantics is not arbitrary but is based on related meanings. Each meaning of a polysemous word is not used equally; generally, the basic meaning is more frequently used. The presence of polysemy does not hinder the understanding of meaning because, depending on the context, polysemous words only have one suitable meaning while other meanings are excluded. B) The mechanism of phonetic borrowing, which is an internal borrowing, is more arbitrary (as seen in the mechanism of *jiajie* in the part of Chinese characters creation).

4. The part of speech in the Chinese language has an ambiguous boundary between the categories

The classical classification in ancient China classifies the words into two categories: *xuci* (虚词, 'functional word') and *shici* (实词, 'lexical word'). Ma Jianzhong (1898) took the Latin grammar as a reference and created a systematic linguistic description of Chinese grammar. He specified the *shici* group into nouns, pronouns, verbs, adjectives, adverbs, and *xuci* into prepositions, conjunctions, particles, and interjections.

Many Chinese words exhibit hybrid characteristics in terms of their part of speech. For example, *shi* (食) in ancient Chinese can mean 'food' as a noun or 'eat' as a verb. Although some scholars are criticizing his westernization of Chinese grammar, for a convenient comparison between the Chinese and English equivalents, we adopt Ma's definition of the part of speech for Chinese lexical units.

As we mentioned before, modern Chinese has evolved from ancient Chinese, with the May Fourth Movement serving as a turning point in history. In modern Chinese, lexical units are primarily disyllabic, although monosyllabic words still play vital roles in basic vocabulary. Furthermore, multisyllabic words have emerged to describe complex concepts and objects with intricate features.

The period that our research focuses on primarily encompasses the modern era of the Chinese language. Although Chinese continues to undergo dynamic development, previous studies have already summarized some of the characteristics of **modern Chinese**:

1. Disyllabic words constitute the majority of Chinese vocabulary

Lexicography studies indicate that 57% of Chinese vocabulary are disyllabic words (Liu Zhongfu, 2002). While ancient Chinese had many monosyllabic words, the creation of disyllabic words was driven by the need for efficient communication.

Disyllabization occurred as a result of self-regulation within the Chinese language.

For instance, in ancient Chinese, the term *ri* (日) had two meanings: 1. 'sun'; 2. 'day'. To specifically refer to the 'sun', the term *taiyang* (太阳) was created, leading to the standalone usage of *ri* losing its meaning of 'sun'. In this case, the original monosyllabic word was replaced by a disyllabic word.

2. The boundary between lexical units in modern Chinese is not clear

a. The boundaries between words and morphemes are often ambiguous. According to theory, a morpheme is the smallest combination of sound and meaning, while a word is the smallest independent unit. However, in modern Chinese, certain contexts activate the lexical function of morphemes.

For example, as we presented above, *ri* (日) cannot be used alone to mean the 'sun', but if it forms a compound word with other morphemes, such as *rizhao* (日照, 'sunshine'), *ri* obtains the meaning of the 'sun'.

The reason why a morpheme can function as a word in certain situations is that it has undergone delexicalization from a word in ancient Chinese, and certain lexical functions have been retained during the evolution process.

b. The boundaries between polylexical words and polylexical syntagmations are not clearly defined. Determining words and syntagmations in Chinese is not as straightforward as in phonetic languages, where word boundaries are determined by spaces. In Chinese, if a lexical unit can be expanded with an auxiliary word without a change in meaning, it is considered a phrase; otherwise, it is regarded as a word.

For example:

if we extend *shengcai* (生菜, 'lettuce') into *shengdecai* (生的菜, 'raw food'), the meaning is changed, thus, *shengcai* is a compound word.

If we extend *shengrou* (生肉, 'raw meat') into *shengderou* (生的肉, 'raw meat'), the meaning maintains, thus, *shengrou* is a polylexical syntagmation of modifier and

headword.

3. Modern Chinese exhibits a significant presence of synonyms

The proliferation of synonyms in modern Chinese is a response to the demands of expression. With diverse communication requirements in terms of style, emotional inclination, and nuanced descriptions, modern Chinese has generated a multitude of synonyms throughout its development.

Some synonyms in modern Chinese are variations of the same meaning, such as *chun* (春, 'spring') and *chuntian* (春天, 'spring'); some are words have the same meaning but differ in pragmatics. For example, *cesuo* (厕所, 'toilet') and *weishengjian* (卫生间, 'toilet'), with the latter being perceived as more elegant in communication.

4. In modern Chinese, certain words can function as different parts of speech depending on their collocations

Unlike in English, where words of different parts of speech often have distinct graphical forms, modern Chinese lacks morphological inflections to indicate the word's part of speech. For example, in English, the suffix '-ness' is typically used to form nouns, while adding '-ly' to an adjective transforms it into an adverb. However, in modern Chinese, the same word can assume different grammatical roles in different collocations without explicit morphological changes.

For example:

meili (美丽, 'beautiful or beauty')

1. ta shi yige meili de ren. (她是一个美丽的人. 'She is a beautiful person.')

2. wo wangbu liao ta de meili. (我忘不了她的美丽. 'I cannot forget her beauty.')

In the first sentence, *meili* is an adjective 'beautiful' an in the second sentence, *meili* is a noun 'beauty'.

jingli (经历, 'experience or go through')

1. zheshi yige henhao de jingli. (这是一个很好的经历. 'This is a good experience.')

2. ta jingli le henduo shiqing. (他经历了很多事情. 'He experienced a lot of things.')

The word *jingli* can serve as a noun (in the first sentence) or a verb (in the second sentence).

In Chinese, there are words that can change their part of speech without any morphological modification or grammatical inflection. These words are referred to as *concurrent words* (兼类). While modern English also has approximately 12% of concurrent words, modern Chinese, with its lack of formal marks and morphological changes, likely has a comparable or even higher proportion of concurrent words that can convert between nouns, verbs, and adjectives (Wang Renqiang, 2010). This flexible phenomenon in the Chinese language extends beyond general usage and can also be observed in specialized contexts.

In conclusion, through our revisions, we have discussed and clarified the distinguishing features of both ancient Chinese and modern Chinese. These insights serve as the linguistic analysis foundation for our research. By examining aspects such as monosyllabic words, disyllabization, polysemy, boundary ambiguity, synonyms, and part-of-speech flexibility, we have established a comprehensive understanding of the evolution and characteristics of the Chinese language. This understanding will undoubtedly contribute to our analysis and interpretation of the Chinese texts within our database, covering a wide range of linguistic developments from ancient to modern Chinese.

2.3. Chinese characters

When analyzing a lexical unit in Chinese, it is impossible to disregard the dimension of characters, which does not exist in Western languages. Wang Li (1980) believed that the fundamental unit in written Chinese is the *hanzi* (汉字, 'Chinese character') because a word consists of either a single character or a combination of multiple characters. Chinese characters are ideographic logograms developed for the purpose of writing Chinese. The creation of a character involves the representation of meaning through one or more graphemes. To understand the characteristics of the Chinese

language, we will first present the general features of Chinese characters.

Our presentation of Chinese characters will be based on the oldest and most significant character dictionary in China, the *Shuowen Jiezi* (说文解字, 'Explaining and Analyzing Characters'), compiled by Xu Shen (58-147). Xu Shen (121) classifies Chinese characters into *liushu* (六书, 'six categories'), which continue to serve as an instructive guide for character research in China.

The six categories are as follows:

1. *Xiangxing* (象形, 'pictograph')
2. *Zhishi* (指事, 'ideographic')
3. *Huiyi* (会意, 'compound ideographic')
4. *Xingsheng* (形声, 'pictophonetic')
5. *Jiajie* (假借, 'phonetic loan')
6. *Zhuanzhu* (转注, 'derivative cognates')

The first four categories represent mechanisms for character generation, while the last two categories are rules for their usage. In the following sections, we will explain each mechanism with relevant examples.

(1) ***Xiangying* (象形, 'pictograph')**

Characters created by the xiangxing method are pictograms that represent visually perceivable or imaginable objects. They are symbols that carry a figurative meaning. Figure 2.1 illustrates this method using the Chinese characters *ri* (日, 'sun') and *yue* (月, 'moon').

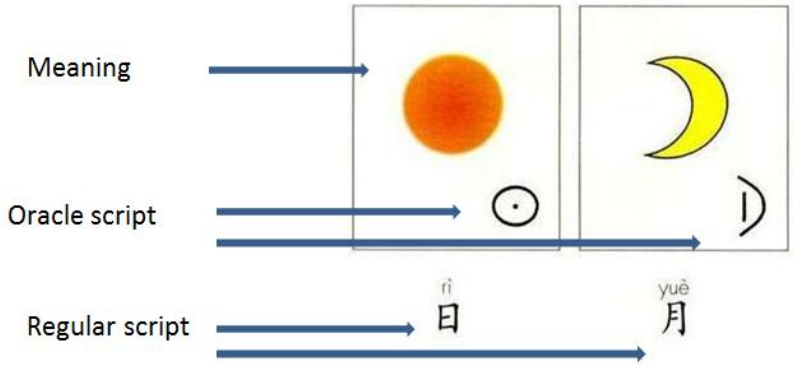


Figure 2.1: Pictogram characters *ri* (日, 'sun') and *yue* (月, 'moon')

Characters created by the *xiangxing* method represent objects such as human body parts, animals, natural phenomena, and daily utensils. These characters depict basic elements that people can concretely perceive in their early understanding of the world.

(2) *Zhishi* (指事, 'ideographic')

Characters created by the *zhishi* mechanism are ideograms that are often derived from pictograms. In these characters, one or more strokes are used to indicate the relationship between the new character's meaning and the original pictographic character. This allows for the expansion and abstraction of meaning beyond the literal depiction of the object.

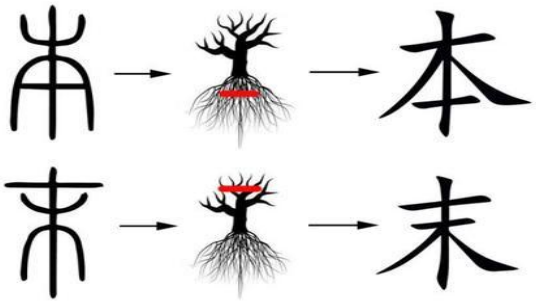


Figure 2.2: Ideographic character *ben* (本, 'root') and *mo* (末, 'tip of a branch')

The characters *ben* and *mo* have the common element *mu* (木, 'tree'). The *ben* has a line to mark the root part of the tree, and the *mo* has a line that indicates the very end

of the part of the tree crown. This ideographic mechanism demonstrates an abstract way of creating new characters by using graphical elements to convey specific meanings or concepts beyond their literal representation.

(3) *Huiyi* (会意, 'compound ideographic')

Huiyi is a mechanism that involves combining two semantic graphemes to create a new character. In Figure 2.3, we can observe an example of a character coined by the *huiyi* mechanism. The character consists of two pictogram constituents, one representing a person and the other representing a tree. By combining these two graphemes, the resulting character conveys the meaning of a person leaning on a tree and resting, which is represented by the character *xiu* (休). This mechanism allows for the creation of characters that symbolically represent actions, concepts, or relationships by combining relevant pictographic elements.

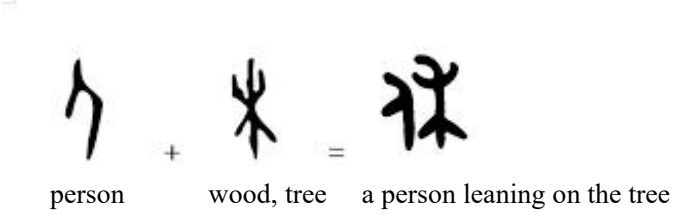


Figure 2.3: Compound ideographic character *xiu* (休, 'rest')

(4) *Xingsheng* (形声, 'pictophonetic')

Pictophonetic characters are created by combining two graphemes, where one indicates the pronunciation and the other indicates the meaning. The semantic grapheme is typically a pictograph or ideographic character, while the phonetic grapheme can be a pictographic character, a *zhishi* character, or a *huiyi* character. This method of character creation is the most productive and widely used.

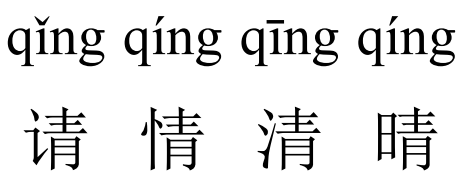


Figure 2.4: Examples of pictophonetic characters

In Figure 2.4, we can observe that all these characters pronounce as *qing*. The characters can be separated into a left part and a right part, with the right parts all being the character *qing* (青) which serves as their phonetic constituent. The left parts, represented by 讠 ('language'), 忄 ('heat'), 氵 ('water') and 日 ('sun'), respectively illustrate the meaning of the characters. These left parts combined with the phonetic constituent create the characters 请 ('invite'), 情 ('feeling'), 清 ('clear water'), and 晴 ('sunny').

These four mechanisms of character creation - pictogram, ideographic, compound ideographic, and pictophonetic characters - categorize the structure of Chinese characters. Chinese characters were not created by one person at one time or in one place, but rather emerged through the common usage and circulation among ancient people. The characters that were widely used by the majority have been passed down to the present day. It is estimated that the total number of Chinese characters ever recorded in dictionaries reaches tens of thousands, including graphic variants and obsolete characters that were used throughout history.

(5) *Zhuanzhu* (转注, 'derivative cognates')

It is a phenomenon where characters of the same etymology are used to mutually explain each other. This can be seen as variants of characters with the same meaning. Xu Shen (121) proposed two characters *lao* (老) and *kao* (考) that have the same semantic radical 耂 ('old') and similar phoneme *ao*. As a result, these characters can be interchanged in certain contexts, highlighting the flexibility and interrelatedness of Chinese characters.

(6) *Jiajie* (假借, 'phonetic loan')

Jiajie is a method of using borrowed characters to represent another morpheme that is pronounced the same or similar. It involves the substitution of homophones. When a new concept emerges without a specifically created character, an existing character with a similar pronunciation can be borrowed and repurposed. Over time, this new semantic usage of the borrowed character becomes accepted and widely used within

the community. For example, *bei* (北) originally indicate the human body part, the 'back'. However, over time, its usage extended to include the meaning of 'north' as well. This change in semantic interpretation was widely accepted by users and has been passed down to the present day.

Therefore, to study the morphological characteristics of the Chinese language, it is inevitable to consider not only the morphemes within words but also the constituents of Chinese characters. Chinese characters are ideographic and represent meaning through their graphical form.

In this section, we have introduced the historical development of the Chinese language in relation to social changes and language evolution. We have discussed the morphological characteristics of both ancient and modern Chinese, as well as the formation and mechanisms of Chinese characters. The gradual modernization of the Chinese language has involved influences from foreign languages, the coexistence of classical and vernacular forms, and a growing openness to globalization. The general characteristics of ancient Chinese and modern Chinese provide valuable insights for analyzing specialized lexical units within the Chinese language. The creation of Chinese characters represents a process of externalizing semantics into ideographic symbols, making the analysis of characters essential in morphology studies.

3. Neologism

As a new discipline, the establishment of Western medicine in China begins with the creation, selection, and unification of corresponding terminological units in Chinese. These terminological units, known as neologisms, play a significant role in capturing and conveying the emerging concepts and phenomena within society. Neologisms are new words in a language that reflect emerging concepts and phenomena in a society. These new words can be novel in their form, meaning, or usage. When a newly coined lexical unit is specific to a particular field, it is referred to as a *terminological neologism*, *new terminology*, or *specialized neologism* (Rondeau, 1981; Cabré, 1999; García Palacios, 2009). In this section, we will explore the concepts, resources, and mechanisms of specialised neologisms in the field of neology studies.

3.1. Neologism

A neologism refers to a newly coined or newly created word, phrase, or expression that has emerged in a language. Neologisms often arise to express new concepts, technologies, social phenomena, or cultural shifts that are not adequately represented by existing vocabulary. Neologisms can be formed through various processes, such as borrowing from other languages, combining existing words or morphemes, or creating entirely new words. They play a crucial role in language evolution and adaptation to changing contexts.

In the aspect of language, the neologism shows the change of the language and the morphological productivity of the language. Neologisms are important resources for lexical change. Lorente Casafont (2022) believes that exploring the generation of new words is the most relevant aspect to study in terms of lexical change.The creation of the terms is not arbitrary and the formation of terms has specific laws and must be more rational than the law of general vocabulary (Rondeau, 1981; Sager, 1998).

In the aspect of cognition, neologisms reflect the progress of the knowledge of humankind. The continuous evolution of science and technology require the incorporation of new lexical units. Rondeau (1981) puts specialized neologisms into those appearing in languages together with knowledge production, and those appearing in processes of knowledge transfer between different language communities.

The production of neologisms in specialized fields can occur in various situations. According to Estopà (2010), there are three circumstances that contribute to the creation of neologisms:

1) When a specialist discovers or invents a new entity and requires a name for it, resulting in neology stemming from scientific or technological innovation.

2) When a linguistic mediator encounters a term in a source text that lacks an equivalent in the target language, leading to the introduction of a new coinage.

3) When language planning institutions establish the most appropriate terms by adopting or adapting loanwords or proposing new formations. This classification elucidates the process of incorporating neologisms in terminological communication and management.

These circumstances can be divided into two modes of production. Cabré et al. (2012) differentiate between different activities in neology: the creation of original neologisms and the proposal or adaptation of new lexical units for terms that exist in another language. Sager (1993) refers to the first activity as *primary neology* and the second as *secondary* or *translation neology*. This distinction highlights the dual nature of neology, encompassing both innovative linguistic creation and cross-language lexical adaptation.

The process of neological formation to incorporate new lexical units into a language can be achieved through various mechanisms. Based on the origin of the lexical resources that form neologisms, Sablayrolles (2003) proposes two types of lexical generation channels for neologisms: internal and external. The internal channel involves generating neologisms within the patrimonial mechanisms of a language, including morphosemantics, syntactic, and pragmatic processes. The external channel, on the other hand, comprises loanwords. Therefore, we can categorize neologisms into genuine or patrimonial formations and borrowing formations. Cabré et al. (2022) offers multi-angle classifications of neologisms, including topic, origin, degree of acceptance in usage, and linguistic dimensions. Neologisms can enter the language through the creation of new words *ex nihilo*[8], the formation of new words by the patrimonial language system, or borrowing from other languages. Neologisms created through the patrimonial language norms can be further categorized as formal, semantic, or syntactic neologisms. Building on these ideas, the the OBNEO[9] (2022) conducts a specific classification of neologisms for the work protocol (see the website: https://www.upf.edu/web/obneo) as shown in Table 2.2.

Derivation	Prefix Suffix Prefix and suffix
Composition	Patrimonial compositon Cultism composition

[8] Latin: from nothing

[9] The Observatori de Neologia (OBNEO) is a public-funded consolidated group whose project is to analyze the appearance of new words or neologisms in the usage, both for Catalan and Spanish.

	Hybrid composition Syntagmatic composition
Truncation	Acronym Abbreviation
Change	Semantic Subcategory Conversion Lexicalization Variant
Loan	Loanword
Others	Others

Table 2.2: Classification of neology by OBNEO (2022)

According to Table 2.2, the OBNEO classification offers a more comprehensive categorization of neologisms, incorporating Cabré's neologism categories and considering the source of morphemes in neologisms. These classifications provide a linguistic perspective by encompassing formal neologisms (formed through affixation, composition, syntactic transformation, acronyms, abbreviations, or orthographic variants), semantic neologisms (formed by modifying the meaning of lexical units), syntactic neologisms (formed through changes in grammatical subcategories such as gender, number, or verb patterns), and loanwords. The OBNEO protocol states that loanwords can be classified as simple, derivative, compound, etc., regardless of their morphological formation, except for acronyms and proper names. In the following sections, we will provide a detailed introduction to the classification of neologisms within the OBNEO protocol.

Formal neology involves the creation of newly formed words, primarily through derivation and compounding. The compounds can be either single-word compounds or complex compounds. In Spanish, complex compounds can take the form of verb-noun, noun-noun, noun-adjective, and adjective-noun structures. Classical composition, also known as *composición culta*, is a type of neologism where morphemes from Greek or Latin prefixes, suffixes, or stems are combined. Initialism and acronyms (also called *siglación*) are additional mechanisms for formal neology, where selected letters represent a word. Blending involves combining segments of words to create a new term, while abbreviation entails removing a lexical base from a

word to form a new one. Variation refers to orthographic changes in a word's form.

Semantic neology involves assigning new meanings to existing words. The semantic neologisms have three categories: narrowing (specifying) the meaning of everyday words, changing the part of speech to create a new meaning, and the use of metaphor and metonymy. Semantic extension can also occur when a proper name becomes a general name.

Syntactic neology involves the creation of new words through changes in grammatical categories such as gender, number, and verb patterns. It also includes the formation of collocations and multi-word phrases.

Loanwords are lexical units transferred from one language system or subsystem to another. It is a natural process for the borrowing language to phonetically adapt words from the source language (Paradis & Lacharité, 1997). Loanwords can be categorized as either interior or exterior borrowings. Interior borrowings occur when loans are transferred between specialized languages within the same language system. Exterior borrowings can be further classified as integral loanwords (loanwords without formal modification) or adapted loanwords (words that undergo changes in spelling and pronunciation to fit the morphological and syntactic system of the receiving language).

It's important to note that the categorization of neologisms within the OBNEO protocol is based on studies conducted on Spanish or Catalan. However, this perspective can provide valuable insights for language analysis within the Chinese context.

Another focus on the neology is the terminological dependency on English. Terminological dependency, which refers to the unidirectional transfer of specialized terms from one language to another, is a significant aspect to consider in neologisms. Scholars have devoted attention to understanding and addressing the issue of terminological dependency (Humbley & Palacios, 2012; Sánchez Ibáñez, 2013; Porras, 2022).

The presence of numerous English words in Spanish and French terminologies has been a subject of discussion in language, politics, and language management. English currently holds a dominant position in the transfer of specialized knowledge, influencing the creation of new lexical units in other languages. Neologisms in various languages often rely on English terms and conceptual structures. Recognizing and studying the dependency on English in terminology is crucial for scholars. Numerous studies have explored the impact of English terminology on other languages, revealing linguistic asymmetries and the influence of English on the conceptualization of specialized fields. For example, research conducted by García Palacios (2009, 2015) examined the dependency of Spanish terms on English and discovered that imported English terms introduced linguistic asymmetries that affected the conceptualization of the specialized domain. Similar findings were reported by Vicente (2012) in her study of secondary term formation in the Spanish translation of English noun compounds in the field of remote sensing. Porras-Garzón (2022) evaluated the consequences of terminological anglicism in the use of English written texts in Spanish medicine classes. These studies underscore the intricate relationship between neologisms and the influence of English in specialized domains, underscoring the need for comprehensive morphological and semantic analyses.

These studies of neologisms in Western languages can provide valuable insights and inspiration for the study of neologisms in Chinese. By examining the approaches, classifications, and analyses employed in Western language studies, we can adapt and apply relevant methodologies to the study of neologisms in Chinese. The history of Western medicine in China reveals that the coinage of Western medical terminology in Chinese is mostly the secondary neologism that the Western medical practitioners propose terms to fill the lexical gap in Western medical terminology in the Chinese language. This cross-pollination of ideas and methodologies can contribute to a more comprehensive and nuanced understanding of neologism formation, usage, and impact in the Chinese language. It allows researchers to leverage the knowledge and insights gained from Western language studies to discover the specific dynamics and characteristics of neologisms in Chinese.

3.2. Neologism in Chinese

The study of neologisms, as a field of linguistic research, offers valuable insights into the dynamics of language change and the evolving sociocultural landscape of a society. In the context of the Chinese language, the exploration of neologisms has gained increasing attention due to China's rapid development, global influence, and the emergence of new concepts and phenomena. Building upon the theoretical foundations presented earlier, our focus now shifts towards synthesizing existing research on neologisms in Chinese and formulating a comprehensive classification of neologism mechanisms specific to the Chinese language. By examining the work already conducted in China, we aim to provide a comprehensive understanding of neologism formation within the broader linguistic context.

The study of neologisms in China has flourished in recent years, propelled by scholars' keen interest in understanding and documenting the ever-expanding lexicon of the Chinese language. Researchers in China have undertaken various approaches and methodologies to investigate neologism formation, usage, and impact within different domains. According to the results of keyword research in a database of academic papers, the study of neologism was firstly recorded in 1980. Around 1980 a huge number of occidental things entered China because of the reform and opening policy.

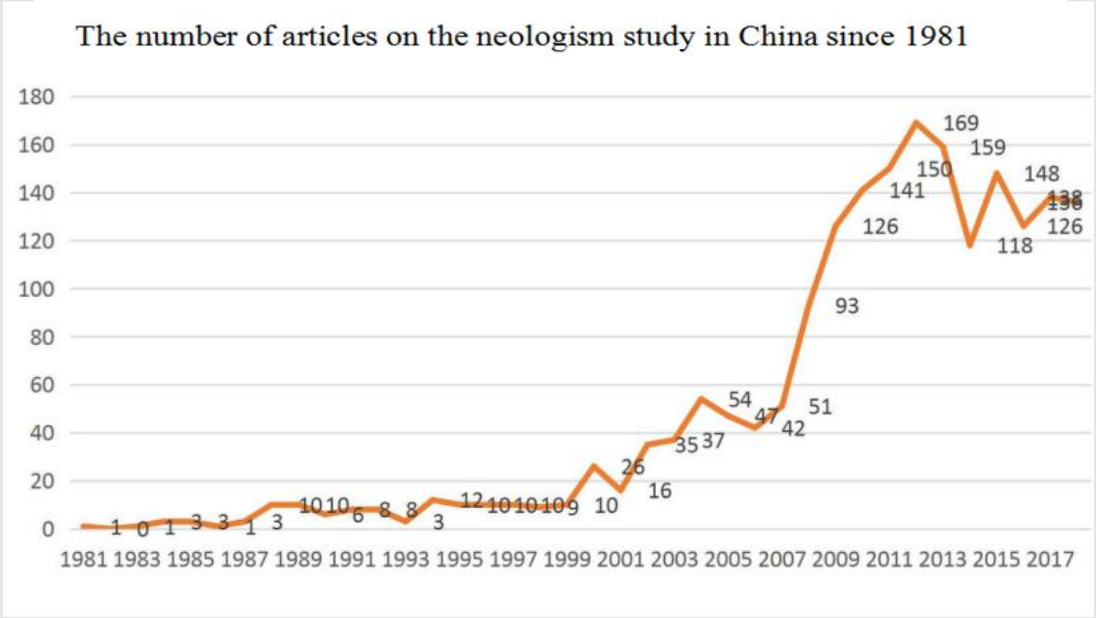


Figure 2.3 Number of articles on neologism in the Chinese language

In the twenty years from 1980 to 2000, there were about 100 articles on new words,

and research on new words gradually emerged. After 2000, the attention of Chinese academia on new words soared, reaching its peak around 2013, with 169 articles in that year. For academic articles about new words, the attention to new words is still high since then, and the number is about 100 per year.

The earliest studies that brought social attention to neologisms can be attributed to two notable scholars: Lyu Shuxiang (1984) and Chen Yuan (1984). Their works were representative of the 1980s.

The second period of the study is influenced by Western linguistic theories, and it shows diversity in both theoretical study and research methods. The research content involves both description and discussion, such as the emergence of new words, the composition of new words, translation of neologism, and elaboration of neologism dictionaries.

Since the 21st century, research broke through the field of linguistics and even social science study. The interdisciplinary penetration and inter-field participation brought about more abundant academic achievements in this period. Especially, the internet and electronic technology started to be widely used, which brought the emergence of new words in China and great changes to social life. The research topic became more extensive at this time: normalization of neologism, analysis of characteristics of annual new words, the relationship between new words and Chinese teaching as a second language, and the relationship between culture and neologism had become the focus of research in this period. *The Basic Principles Of New Words and New Language Standards* published by the China National Language Committee is the most noteworthy article, thus the neologism study at this time has attracted the attention of national authorities.

The synchronic investigations of neologisms of a certain historical period can chase from the very ancient time to the comtemporary era. Hu Ming (2016), Jiang Ying (2016), Pang Yaxing (2018), Chen Hui (2016) and Qiu Xuemei & Li Baojia (2011) have done synchronic neologism studies in their researches: including the Warring States Period and Qin Dynasty (475 BC-206 BC), Eastern Han dynasty (25-220),

Nothern and Southern dynasties (420-581), the period of the Republic of China (1919-1949), and comtemporary Chinese neologisms. It is an attempt to combine history study and linguistics and we believe that neologism research combined with history is persuasive. Most of the studies focus on general vocabulary and the research objects are extracted from dictionaries. Research on specialized purpose neologisms of descriptive texts is still in blank.

In this chapter, we delve into the classification of neologisms in the Chinese language, aiming to provide a comprehensive framework for categorizing and analyzing these linguistic innovations. By examining existing research and exploring the specific characteristics of neologism formation in Chinese, we seek to shed light on the mechanisms and patterns that contribute to the enrichment of the Chinese lexicon. The classification of neologisms involves organizing and categorizing these novel lexical units based on various criteria, such as their formation processes, semantic changes, syntactic structures, or borrowed origins.

3.2.1. Formal neologisms in Chinese

Regarding the formation of neologisms in Chinese, Masini (1993) presents his influential work *The Formation of Modern Chinese Lexicon and its Evolution toward a National Language: The Period from 1840 to 1898*. From the perspective of *the Other*, Masini explains the history and conducts a lexical study on Chinese vocabularies, particularly focusing on neologisms between 1840 and 1898. We appreciate his attempt to analyze the complex Chinese lexicon within a specific time period, and his study provides a valuable list of neologisms that we can refer to in our own research.

However, we only partially agree with Masini's statement regarding the categorization of the Chinese vocabulary into ancient words, loanwords, and neologisms. In this dissertation, we adopt Cabré's classification, which considers loanwords as a subset of neologisms. Therefore, our classification includes both patrimonial neologisms (newly created words within the Chinese language system) and loanwords. In this section, we summarize the classification of patrimonial neologisms based on

morphological and semantic dimensions.

A. Monolexical neologism

These neologisms are formed using only a single morpheme. Within the Chinese language, there are two types of monolexical neologisms (See Table 2.3).

The first type of monolexical neologisms consists of single Chinese characters that are assigned new meanings or involve the introduction of new characters. This type can be further divided into two subcategories: semantic neologisms and the creation of new characters, and we will explain later.

The second type of monolexical neologisms is formed by combining multiple Chinese characters. These words are created by combining existing characters to form a new word with a specific meaning. Most of the monolexical neologism only exists in the coinage of loanwords, we will present more details on loanwords in the next chapter.

Monolexical word	Chinese character #	Morpheme #	English
zuo （作）	1	1	work; capricious (new meaning)
qiaokeli (巧克力)	3	1	chocolate

Table 2.3: Monolexical neologism with one character or more characters

B. Compound neologism

According to Zong Shouyun (2007), compound neologisms are formed by *shici* (实词, 'lexical word') morphemes. It is a process that two or more lexical morphemes combine to coin a new word. Compound neologisms can be classified based on the syntactic relationship and part of speech of the morphemes, as follows:

1) Coordination (N+N, A+A);
2) Endocentric: modifier+head (A+N, N+N);
3) Verb+object (V+N);
4) Verb+complement (V+A);

5) Subject+predicate (N+V, N+A) formality.

Coordination refers to words where the morphemes are of the same part of speech. The morphemes forming this type of neologism can be synonyms, antonyms, relative morphemes, or partial semantic morphemes (see Table 2.4).

Compound word	Literal meaning	Morpheme relation	Part of speech (PoS) of morphemes	English equivalent
Jia+zhi (价 + 值)	'price + value'	synonyms	N+N	price, value
Chi+zao (迟 + 早)	'late + early'	antonyms	A+A	sooner or later
Ling+xiu (领 +袖)	'collar + sleeve'	relative meaning	N+N	leader
Guo+jia (国 + 家)	'country + family'	partial meaning	N+N	country

Table 2.4: Coordination words in Chinese

The modifier-head formality is the most commonly seen concerning hypernym and hyponym. For example, all kinds of individuals in the flower family will have a homologous word *hua* (花, 'flower') in Chinese words (see Table 2.5).

Chinese	Literal meaning	Morpheme relation	PoS of morpheme	English equivalent
hua (花)	'flower'	monolexical	N	flower
Kui+ hua (葵+花)	'helianthus annuus + flower'	hyponym + hypernym	N+N	sunflower
ju +hua (菊+花)	'chrysanthemum + flower'	hyponym + hypernym	N+N	chrysanthem-um

Table 2.5: Modifier-head words in Chinese

The endocentric or verb-object formality compound are words in which the second morpheme serves as the object of the first morpheme (see Table 2.6).

Compound word	Literal meaning	PoS of morpheme	English equivalent
si+ling (司+令)	'conduct + order'	V+N	general (military)

guan+jia (管+家)	'manage + house'	V+V	housekeeper
zhi+ji (知+己)	'know + self'	V+N	bosom friend

Table 2.6: Verb-object word in Chinese

The neologisms of verb-complement formality are words in that the second morpheme indicates the result of the action indicated by the first morpheme (see Table 2.7).

Compound word	Literal meaning	PoS of morpheme	English equivalent
tui+guang (推+广)	'push + wide'	V+A	popularize
shuo+fu (说+服)	'talk + convinced'	V+A	convince
da+dao (打+倒)	'hit + down'	V+A	overthrow
yan+chang (延+长)	'extend + long'	V+A	extend

Table 2.7: Verb-complement compound word in Chinese

The coinage of subject+predicate formality occurs when the morphemes used consist of a noun and a verb or adjective (See Table 2.8).

Compound word	Literal meaning	PoS of morpheme	English
di + *zhen* (地+震)	'ground + shake'	N+V	earthquake
kou + *chi* (口+吃)	'mouth + eat'	N+V	stammer
xin + *suan* (心+酸)	'heart + acid'	N+A	sad

Table 2.8: Subject-predicate compound word in Chinese

The examples provided in Table 2.8 illustrate the subject-predicate relationships between morphemes in compound words. This pattern of subject-predicate shares similarities with the syntactic rule observed in Chinese. In Chinese, words and phrases can be converted into each other based on the level of lexicalization they possess.

In language, compound words are an important mechanism for creating new words. From a linguistic perspective, the constituents of compounds are all native words. From a motivational standpoint, some compound words are formed within the native language environment, while others are created to find an equivalent for foreign words in the native language. In terms of semantic composition, they rely on the

semantic composition of the foreign words, which is not like loanwords that are integral transfer of foreign lexical items (Capuz, 1998). This mechanism is called *calque*, in which only a morphematic or semantic model is borrowed.

Capuz (2009) divided the calque mechanism into *calco léxico* ('lexical calque') and *calco semántico* ('semantic calque'). The **lexical calque** as creating a new unit by literal semantic translation (English: sky-scraper > Spanish: rasca-cielos), of which the structure is copied from the source language; the **semantic calque** is to modify the meaning of an existing lexical unit because of the influence of the source language, which includes the analogs, homologs, and homophones. That is to say, it is the adoption of a foreign meaning for a word already existing in the language. For example, *halcón* in Spanish adopts the meaning of 'hard-line politician' because of the influence of the word *hawk* in English (Capuz, 2009). A relevant study by Huang Heqing (2020) investigated the word *xinfang* (心房) in Chinese meant the 'four chambers of heart' (*Quanti Xinlun*, 全体新论, 'Anatomy', 1851). This term was transmitted to Japan, where its meaning was narrowed down to refer to the 'two chambers above heart', namely the 'atria'. The two lower chambers' *ventricles* are named after a coined term in Japanese *xinshi* (心室). At the beginning of the 20th century, *xinfang* and *xinshi* (*shinbō* and *shinshitsu* in Japanese) were introduced into China with the Japanese modified meanings. The return of *xinfang* to Chinese is the case of semantic calque from Japanese. In other words, an original Chinese medical term was exported to Japan and underwent a semantic change under the influence of Westernization, and then it was imported back to China with a changed meaning.

In the context of Western medical terms in Chinese, we suppose a higher prevalence of lexical calques rather than semantic calques becasue the field of medicine heavily relies on accuracy and precision in communication. The use of lexical calques ensures that the intended meaning of the Western medical terms is preserved as closely as possible when adopted into the Chinese language. Thus, a lexical calque involves finding equivalents from a source language for a target language.

Scholars have proposed the concept of equivalence from a translation perspective. Translation involves reproducing the closest natural equivalent of the source language

message in the receptor language in terms of both meaning and style (Nida, 1969). Richards et al. (1986) defined translation equivalence as the degree to which linguistic units can be translated into another language without loss of meaning. However, these statements primarily focus on the semantic aspect of equivalence. As we are aware, intercultural and interlanguage communication is not solely dependent on semantic correspondence. Factors such as culture and modes of expression also influence the degree of equivalence.

Newmark (1988) expanded on the concept of equivalence by introducing additional types: a) **Descriptive Equivalent**: This procedure involves providing a detailed description of the meaning of a word or phrase. b) **Cultural Equivalent**: This translation procedure aims to find the most suitable equivalent in the target language based on cultural aspects. An equivalent in the receptor language should fulfill two requirements: semantic equivalence and cultural accordance. Cultural accordance encompasses language usage and communicative methods.

Baker (2018) emphasized that the selection of an appropriate equivalent is not solely dependent on the linguistic system. It also relies on how both the source text author and the target text recipient handle the context.

García Palacios (2015) discussed multilingual translation and highlighted the consideration of cultural, political, and ideological factors in creating specialized neologisms. Therefore, in international communication, finding an equivalent for a foreign term necessitates considering linguistic correspondence, cultural adaptation, and political acceptance.

Overall, finding equivalents in translation is the primary task in the mechanism of calque, involving not only linguistic correspondence but also cultural adaptation and political acceptance in international communication.

C. Derivated neologism

As compound neologisms are formed by lexical morphemes, derived neologisms, on the other hand, are created by combining a lexical morpheme with a functional morpheme (Zong Shouyun, 2007).

According to Liu Lifen (2015), the Chinese language has fewer than 100 prefixes. It is noteworthy that a single Chinese prefix can be equivalent to multiple English prefixes. For example:

Chinese	English	example
chao- (超-)	super-, over-, sur-, extra-, ultra-	*chaofuhe*（超负荷, 'overload'）
dian- (电-)	tele-, elec-	*dianji*（电极, 'electrode'）
fan- (反-)	anti-, un-, counter-, re-, dis-	*fanqixuan*（反气旋, 'anticyclone'）
fei- (非-)	non-, un-, ir-, in-, de-	*feiyanyuxuexi*（非言语学习, 'nonverbal learning'）
fu- (副-)	vice-, under-, sub-, by-, para-	*fujiaoganshenjingxitong* (副交感神经系统, 'parasympathetic nervous system'）

Table 2.9: Chinese prefixes in the study of Liu Lifen (2015)

Suffixes have the ability to alter both the semantic meaning and grammatical classification of words. This allows for a wide range of word formations and modifications. For example:

English	Chinese	Example
-oma	*liu* (瘤)	*xueguanrouliu*（血管肉瘤, 'hemangiosarcoma'）
-itis	*yan* (炎)	*weiyan*（胃, 'gastritis'）

Table 2.10: Chinese suffixes in the data of Liu Lifen (2015)

She claimed that when translating English affixes into Chinese, the resulting Chinese affixes are used to create words through derivation. However, we hold a different perspective on this classification of derivation. Instead, we argue that these words are better classified as compounds. In Chinese, a morpheme cannot be classified solely based on its equivalent morpheme in English. This is because the translated morphemes in Chinese are lexical morphemes that can function independently.

D. Abbreviated neologism

Acronyms and abbreviations serve as mechanisms for creating new terms by compressing their length. When dealing with long terms that may be challenging to express or communicate efficiently, acronyms and abbreviations offer a concise solution.

In most Indo-European languages, an acronym is formed by taking the initial letters or letters from each part or major component of a compound term to create a new word. Examples include *NATO*, *radar*, or *laser*. On the other hand, an abbreviation consists of initial letters but cannot be pronounced as a word (according to Merriam-Webster's definition), such as *FBI*.

In Chinese, abbreviations are formed by selecting specific morphemes that represent the entire word or phrase and combining them to create a new word. The position of the extracted morpheme within the word is not fixed (Liu Lifen, 2015).

Methods	Original word or phrase	New word	English
Extraction of the first character of the two morphemes that form a term	*kexuejishu* (**科**学**技**术)	*keji* (科技)	'science and technology'
Extraction of the first character of the first morpheme and the last character of the second morpheme	*jiqifanyi* (**机**器翻**译**)	*jiyi* (机译)	'machine translation'
Extraction of the last character of the first morpheme and the first character of the second morpheme	*dianyingpinglun* (电**影评**论)	*yingping* (影评)	'movie comment'
Extraction of the last characters of the two morphemes	*jiaoshixuesheng* (教**师**学**生**)	*shisheng* (师生)	'teachers and students'
There are more than two free morphemes, then extract the representative characters of each morpheme	*Jiahuashengyuwei yuanhui* (**计**划**生**育**委**员会)	*jishengwei* (计生委)	'Family Planning Committee'

Table 2.11: Neologism of abbreviation

The abbreviations in Chinese have become conventionally accepted vocabulary through long-term communication. Due to the expressive nature of the Chinese

language, the neologisms formed by abbreviation do not cause understanding barriers in communication. Due to their efficiency, abbreviated neologisms are widely used in communication.

E. Creation of new characters

The creation of new Chinese characters is a unique neological method that exists within the Chinese character cultural sphere (Shen Guowei, 2010). This method is employed to develop equivalents for foreign terms and is considered a form of loanword adaptation.

Previous research has highlighted the role of missionaries in introducing Western chemical terms to China and their use of Chinese character creation as a mechanism for translating these terms. In recent times, there have been some notable practices in the coining of new Chinese characters specifically for chemical terminology. These efforts demonstrate Western scientists' understanding of Chinese culture and language. One early example is Lobscheid (1822-1893), who aimed to create Chinese characters to represent chemical elements. When modern was introduced to China in the late 19th century, Lobcsheid borrowed the traditional Chinese concept of *Wuxing* (五行, 'five elements'), divided the *xing* (行, 'element') into two symbols 彳 and 亍, and inserted a phonetic transcript character of the foreign term between 彳 and 亍, thus the coined compound character means 'the element of xx'. In the *Yinghua Cidian* (英华词典, 'English-Chinese Dictionary') compiled by Lobscheid, a total of 49 chemical element names are recorded, of which 21 are coinage characters.

英文名	造字法命名
Bromine	衜 Chau(溴)
Fluorine	衠 Hwang(氟)
Iodine	衡 Lan(碘)
Nitrogen	衛 Siau(氮)
Oxygen	衛 Yang(氧)
Potassium(Kalium)	衢 Kien(钾)
Selenium	衍 Hung(硒)
Silicon	衙 Shih(硅)
Sodium(Natrium)	衝 so(钠)
Strontium	衧 Peh(锶)
Tellurium	衹 ti(碲)
Thorium	衠 Hwui(钍)
Titanium	衍 hung(钛)
Uranium	衧 Tien(铀)
Vanadium	衢 Hau(钒)
Yttrium	衝 Kin(钇)
Zirconium	衢 Heh(锆)

注：罗存德对"衛 Siau(氮)"同时给出了译词"淡气"。

Table 2.12: Coinage characters in Chemistry (*Yinghua Dictionary*, W. Lobcsheid, 1866-1869)

Take the Chinese coinage name of *oxygen* for example, Lobscsheid inserted *yang* (养, foster) between 亻 and 亍. This choice reflects the characteristic of the element (as humans cannot thrive without oxygen). Although these specific coined characters are not commonly used in China today, Lobscheid's method provided inspiration for future endeavors.

Another notable contribution in improving chemical terminology was made by John Fryer (1839-1928) and Xu Shou (1818-1884). They devised a method of transcribing the first syllable or sub-syllable of Western names into Chinese characters based on their phonetics. Additionally, they added radicals to distinguish general categories (Wu Qing, Lu Sunnan, and Gao Shengbing, 2017). Table 2.13 showcases some examples of newly created characters following this principle.

Semantic constituent	Phonetic constituent	Chinese characters	English equivalents and notes
金 /钅 (metal) +	*lv*（吕）	*lv*（铝）	A**lu**minium
石(stone) +	*dian*（典）	*dian*（碘）	Io**dine**
气(gas) +	*fu* (弗)	*fu* (氟)	**Fluo**rine
石(stone) +	*xi* (夕)	*xi* (矽)	**Si**licon. (mainly used in Taiwan, Hong Kong, and Macau)
	gui (圭)	*gui* (硅)	Silicon. (from the Japanese term *kei* (珪, けい), mostly used in P.R.C.)

Table 2.13: Examples of characters created by Xu Shou and Fryer

Focusing on the new characters they created, we can see how they used Chinese character radicals: those elements of metal, the radical is *jin* (金 /钅, 'metal'); *shi* (石, stone, 'rock') for solid non-metals; *shui* (水/氵,'water') for liquids; and *qi* (气, 'air, steam') for gases. This set of terminology has been accepted by the Chinese vocabulary.

Nonetheless, the development and endorsement of new Chinese characters demand a considerable investment of time and effort. This linguistic mechanism is, therefore, rarely employed in neology, largely owing to the steadfast nature of the Chinese character system, which has remained unaltered for centuries. As the character system was firmly set, the introduction of new characters is an infrequent occurrence. This rarity offers a distinctive vantage point for understanding the Chinese language's enduring stability and the intricate processes that govern the creation and acceptance of new characters.

3.2.2. Semantic neologism in Chinese

Semantic neologisms involve assigning new meanings to existing Chinese characters.

They are not as obvious as formal neologisms and can be categorized into expansion, narrowing or reduction, and transfer of word meaning.

A. The expansion of word meaning occurs through association, where language users extend the attributes of one thing to other aspects or other things. For example, the character jiang (江) originally meant 'Yangzi River' but now also means 'river'.

B. The narrowing of word meaning happens when language users intentionally highlight the attributes of a certain thing. For instance, the term qizi (妻子) originally meant 'wife and child', but now solely refers to 'wife'.

C. The transfer of semantic occurs through metaphor or pragmatic change, often due to cultural or technological advancements that require the creation of words for new concepts. For example, the character yun (云), traditionally meaning 'cloud', now also represents 'cloud computing' or 'cloud storage'. Similarly, dangao (蛋糕, 'cake') has acquired new meanings such as 'market' or 'benefit'.

D. Semantic neologisms also include the transfer of meaning between general and specialized vocabularies. For example, the term zhanlue (战略, 'strategy of war') can be applied in a business context as 'business strategy'.

The classification of neologisms in Chinese incorporates principles from the classification of neologisms in Western linguistics, which typically focus on the relationship between form and semantics. However, Chinese also takes into account its unique nature as an ideographic language, especially considering the distinctive morphological differences it exhibits in comparison to Indo-European languages.

Regarding languages of specialized purpose, in the realm of international communication in modern science and technology, specialized purpose nomenclatures in modern languages are more influenced by loanwords than general-purpose languages. In other words, new terms are more readily absorbed from loanwords.

3.2.3. Loanword in Chinese

The incorporation of loanwords is a common phenomenon where a word, to some extent, is assimilated from one language (the donor language) into another language. In the course of language development, it is inevitable for a living language to assimilate elements from diverse sources in order to enrich itself. During the colonial era, Western languages such as English, Spanish, and French served as official languages in many countries. Following colonial independence, they have functioned as *lingua franca* and continue to play a crucial role today as tools for scientific and technological communication. Historical and sociohistorical linguists have dedicated their attention to studying this language change, specifically focusing on the interaction between internal linguistic features and external societal changes (Weinreich et al., 1968). The process of borrowing represents the socio-economic relationship between different languages and cultures.

The incorporation of foreign words into the Chinese vocabulary system is closely linked to China's communication and interaction with the rest of the world, with historical roots tracing back to the introduction of Buddhism to China. Throughout history, there have been three significant periods of loanword introduction in China (Zhao Aiwu, 2005):

1) The first period occurred during the Han and Tang Dynasties (around 220-900) when a relatively stable political and economic environment facilitated the influx of a large number of animal and plant loanwords, as well as Buddhist terms, from the Western region to the Han region, such as *putao* (葡萄, 'grapes'), and *heshang* (和尚, 'monk').

2) The second major wave of loanword introduction took place in the late Qing Dynasty (the late 19th century and the early 20th century). Influenced by semi-colonization, loanwords permeated almost every social level. The representative words are *delvfeng* (德律风, 'phone'), *minzhu* (民主, 'democracy'), and *kexue* (科学, 'science').

3) The most notable and recent wave of loanword introduction occurred since the

1980s, coinciding with the deepening of the Reform and Opening-up policy. This period saw the introduction of many zeitgeist-related words, particularly in the realm of science and technology. Examples of such loanwords are *jiyin* (基因, 'gene'), *leishe* (镭射, 'laser'), *heike* (黑客, 'hacker').

In the process of loaning words, various degrees of sinicization occurred, which promoted the continuous development and change of the entire Chinese vocabulary system. In this part, we will have an overall view of the loanword study in China and its mechanisms in Chinese.

3.2.3.1. Loanword investigation in China

The investigation and analysis of loanwords have been extensively documented in the CNKI (China National Knowledge Infrastructure) database since 1981 (See Figure 2.5). The study of loanwords by Chinese scholars gained momentum around the same time as the reform and opening up period. The number of research articles on loanwords reached its peak around 2012, and in the subsequent decade, the research output has continued to maintain a reasonable scale.

Figure 2.5: Number of articles on loanword study in the Chinese language

In recent years, Chinese scholars have dedicated significant efforts to the study of loanwords due to their special status in the Chinese linguistic system. Previous research in this field can be summarized as follows:

1. **Lexicographical compilation of foreign words:** Hu Xingzhi compiled China's first dictionary of Chinese loanwords in 1936, which contained 2850 entries reflecting the usage of Chinese vocabulary and the social context of the early 20th century. (Zeng, 2021). The *Dictionary of Chinese Loanwords*, co-authored by Liu Zhengtan, Gao Mingkai, Mai Yongqian, and Shi Youwei (1984), includes up to 10,000 loanwords and their sources. The *Dictionary of Chinese Loanwords* compiled by Cen Qixiang (1990) includes 4,370 Chinese loanwords and provided detailed interpretations of the original meanings of the source words. The *Chinese Loanwords* compiled by Shi Youwei (2000) provides a diversified and comprehensive introduction to the history, types, and research overview of loanwords. These dictionaries serve as valuable references for understanding the origins of lexical units in the study of loanwords.

2. **Cultural exchange based on loanwords:** Scholars such as Shi Youwei (2004) and Luo Changpei (2002) have explored the relationship between language and culture, delving into the cultural significance of Chinese loanwords in international communication. Luo Changpei (2002) combined theoretical analysis with case studies, focusing on the cultural psychology of countries such as Japan, the United States, and the United Kingdom. These studies shed light on the source languages of Chinese loanwords.

3. **Research on the standardization of loanwords.** It is important to establish norms and standards for the incorporation of loanwords. As early as 1955, the academic community held the National Chinese Character Reform Conference and the Academic Conference on the Standardization of Modern Chinese, emphasizing the need for normative policies and guiding the press, publications, and other media to strengthen supervision and enforcement.

The Chinese language exhibits tolerance and openness to new words, especially loanwords from international communication. The lexical resource, morphological mechanism, semantic composition, and the need for standardization have been studied in a general way.

Regarding the definition and division of Chinese loanwords, there have also been repeated debates in China, especially whether claques are loanwords. Hu Yilu (1913) strictly distinguished between *loanwords* (借词) and *translated words* (译词). He believed that if the pronunciation of the source language is adopted, then it is not a problem of translation, but a *loanword* from a foreign language; if a translated name follows the meaning of the source language, then it is a translation. Huang Borong and Liao Xudong (1991) define a *loanword* as "a word from abroad, also called as borrowed word or loanword, it is a word borrowed from another language."[10] In their opinion, loanwords are equal to foreign words and the loanwords only include words borrowed from another language both phonetically and semantically.

In the 1940s, Lyu Shuxiang (1942) pointed out that words of semantic translation (calque) should be classified as compound words because they use genuine words or roots and cannot be regarded as loanwords. Gao Mingkai and Liu Zhengtan (1958) agreed with Lyu's opinion, and they emphasized that "these words should be excluded in the scope of loanwords In addition, they are recognized as authentic neologisms in the native language, although the emergence of these neologisms is related to foreign novelties or concepts. Zhou Zumo (1958), Wang Li (1980) and others also advocated that claques are not loanwords.

Since the 1990s, there has been a gradual reversal in the understanding of loanwords in China, leading to an expanded scope of what is considered a loanword. In the past, Zhang Yongyan (1982) listed calques as one of the three major categories of loanwords, but his understanding was limited. He stated that if a newly coined word, referring to a foreign concept, has borrowed lexical materials but differs in internal form and morphological structure from the equivalent foreign word, then it should be classified as a general new coinage rather than a loanword.

However, the understanding of loanwords has evolved over time. In the period from 2000 to 2018, a total of 278 articles on loanwords were identified, and at least half of

[10] Translated from: "称为外来词、借用语、借词（loanwords），是一种语言从别的语言借来的辞汇。" (Huang Borong & Liao Xudong, 1991)

these papers considered calques as a type of loanword. This indicates a broader acceptance of calques as loanwords in the scholarly discourse during this period. For example, Yang Xipeng (2007), conducted ontology research on loanwords in Chinese, focusing on loanwords from the 20th century. He classified loanwords based on their translation methods, including phonetic translation, semantic translation, hybrid translation (combining phonetic and semantic aspects), formal translation from Japanese (adopting both form and semantic elements), and letter words. Yang's categorization emphasizes the linguistic elements and the translation perspective.Those words that loaning meanings from another language are counted as loanwords from the angle of conceptual history (Shi Youwei, 2000; Huang Xingtao, 2012).

It seems to have formed a new consensus in China that calque is part of loanword, nevertheless, exploring the issue of calques as loanwords from the perspective of lexicology and communication, we can consider the following different points:

1) The foreignness of a concept does not necessarily imply that the word expressing the concept must be loaned. Concepts are products of human thinking, which are derived from sensations, perceptions, and representations. The word that conveys the concept is a combination of phonetics and semantics. Loanwords occur when a foreign word, which does not originally belong to a particular language, is adopted into the language as a phonetic and semantic combination. Therefore, the concept itself should not be conflated with the word. Introducing a new word for a new concept is not considered borrowing but rather creating a new lexical unit. Hence, based on the distinction between adopting a lexical combination and forming a new lexical unit, calques should not be classified as loanwords.

2) From the perspective of native speakers, words that are foreign in form and phonetic expression may appear more obvious, especially in phonographic languages like English words in a Chinese context. Calques involve finding an equivalent for a foreign concept within the existing lexical resources of the language, rather than directly borrowing the foreign word. Calques are used in communication as native compounds to convey information to the recipient. Unless the user explicitly

compares the etymology of the source word, the motivation behind the calque of a compound word may not be apparent.

The classification of a word as a loanword should be based on lexical and communicative factors, rather than cultural considerations. Judging whether a word is a loanword should rely on observations and analysis of its lexical form, phonetic expression, and usage in communication, rather than solely relying on cultural factors. While culture may influence the selection and use of vocabulary, it cannot independently determine whether a word is a loanword.

3.2.3.2. Mechanisms of loanwords in Chinese

Loanwords denote a type of contact-interfered lexical change whereby a new complex word is created matching a foreign model (Haugen, 1950; Weinreich, 1979). Chinese loanwords have a close relationship with China's foreign exchanges, and their origins can be traced back to ancient times. Over the past two thousand years, Chinese has borrowed words from three main sources. During the Han and Tang dynasties, words and goods from Central Asia entered China. During the Jin, Tang, and Song dynasties, Chinese absorbed Buddhist terminology. In modern times, Chinese borrowed extensively from Western languages (Wang Ruli, 2021).

The introduction of loanwords in science and technology can be traced to the history of missionary activities and China's modernization process, which shaped the Chinese lexicon of Western science. Pellin (2008) stated that the loaned terms in Chinese primarily are influenced by English vocabulary, but actually there is a diversity of source languages. These loanwords can be classified into English-loaned words (coffee > 咖啡 *kafei*, sofa > 沙发 *shafa*, chocolate > 巧克力 *qiaokeli*), French-loaned words (bourgeois > 布尔乔亚 *buerqiaoya*, champagne > 香槟 *xiangbin*, salon > 沙龙 *shalong*), Russian-loaned words (большевики > 布尔什维克 *buershiweike*, советский > 苏维埃 *suweiai*), German-loaned words (gestapo > 盖世太保 *gaishitaibao*, Nazi > 纳粹 *nacui*), Mongolian-loaned words (gobi > 戈壁 *gebi*, lama > 喇嘛 *lama*), Japanese-loaned words (経済 > 经济 *jingji*, 社会 > 社会 *shehui*, 幹部 >干部 *ganbu*), etc (Yang Xipeng, 2007). Unlike loanwords from Indo-European languages, loanwords from Japanese into Chinese mostly consist of Chinese characters borrowed for their

writing forms but not their pronunciations, which is called graphic loanwords (Tranter, 2009).

Loanwords exhibit a duality, preserving the characteristics of the donor language while also reflecting the features of the target language. The mechanisms of loanwords in Chinese involve a complex interplay between language and culture. Zhang Jinwen (2003) proposed a classification based on the origin and morphological characteristics of the morphemes involved. This classification includes three categories: 1. Foreign language words, which directly borrow foreign words without modification; 2. Hybrid words, which combine Western letters and Chinese characters or vice versa; 3. Foreign original words, which encompass transliterated words in Chinese characters, semi-transliterated words, and words derived from Japanese *kanji*. We believe that this classification aligns with our discussion on loanwords. Furthermore, based on this foundation, we propose a classification that is more suitable for our research.

A. Graphic loans

In the Chinese language, graphic loans refer to words that are directly borrowed from Japanese or Indo-European languages, often in their written form. This category includes all letter words and certain Japanese words. Scholars such as Masini (1993) has compiled extensive lists of graphic loans between Japanese and Chinese, particularly during the nineteenth and early twentieth centuries, resulting from contact with the West and the introduction of modern Western concepts. For example, words like while *minzhu* (民主, 'democracy'), *geming* (革命, 'revolution') have been borrowed from Japanese, where they are written using Chinese characters. More recently, *wifi* in English are frequently adopted and used both in oral and written Chinese among the young people in China when they refer to 'wireless network'.

B. Phonetic loans

In the case of Chinese, phonetic loans are words that have undergone phonetic adaptation from the target language to Chinese. This category includes words that are

transliterated from their original pronunciation.

When borrowing phonetic loanwords from Western languages into Chinese, they are modified to fit the characteristics of the Chinese language. Chinese has 34 phonemes, including eight vowel phonemes, 22 consonant phonemes, and four tones, while English has 46 phonemes, including 20 vowels and 26 consonants. Due to this phonetic asymmetry, Chinese borrows foreign words by using a character with a similar sound to transcribe the original word (Tang Xianqing & Wang Zhe, 2005). For example:

Conversion of similar phonetics between English and Chinese	English words	Chinese equivalent
[v] to [f]/[u]; [i] to [ei]	vitamin ['vaitəmin]	*weitaming* (维他命)
[r] to [l]	radar ['reidɑ:]	*leida* (雷达)

Table 2.14: Conversion of English phonemes to Chinese phonemes

Table 2.14 presents examples of English phonemes transcribed into Chinese phonemes. The Chinese equivalents aim to retain the phonetic characteristics of the original words.

C. Partial loans

Partial loanwords are characterized by the adoption or adaptation of specific morphemes from foreign words, along with the incorporation of Chinese native morphemes. Consequently, partial loanwords take the form of compound words in their formation mechanism. These terms commonly manifest as neological compound words, where foreign and Chinese elements are intertwined to establish new lexical units. This mechanism enables the integration of foreign concepts or terms while preserving a connection to the Chinese linguistic system. For instance, in the word *pisabing* (披萨饼, 'pizza'), the term *pisa* serves as a phonetic loanword for 'pizza', while the patrimonial morpheme *bing* (饼, 'cake') conveys the object's characteristic feature. Due to the inclusion of the patrimonial morpheme, these newly formed words through partial loaning can be categorized as compound neologisms.

In this section, our objective is to refine and establish a comprehensive framework for classifying neologisms in the Chinese language by examining existing research and exploring specific characteristics of neologism formation. By doing so, we aim to provide a systematic and structured approach to understanding the formation and organization of new lexical units within the Chinese lexicon. This framework will contribute to our understanding of the mechanisms, patterns, and influences that shape the dynamic Chinese language. Moreover, it will offer valuable insights into the cultural, social, and technological developments within the Chinese-speaking community. By adjusting and refining the existing classification systems, we contribute to a deeper understanding of the evolving nature of the Chinese language. This research provides a valuable tool for linguistic analysis in the study.

4. Synthesis

In this chapter, we present a theoretical framework that combines various aspects of Communicative Theory of Terminology, focusing on the terminological units and variants, linguistic features of classical Chinese and modern Chinese, and studies on neologisms, especially the researches done in the context of the Chinese language.

To establish a foundation for our framework, we adopt the Communicative Theory of Terminology (CTT) to define terminological units (TUs) and variants. TUs encompass individual words, multiword expressions, and longer phrases that serve as essential building blocks in specialized terminology. Variants, on the other hand, refer to different forms or expressions used to represent the same concept within a specific terminological system. Understanding these units and variants is crucial for the construction of the terminological database for this research.

The historical division of the Chinese language and its linguistic characteristics play a significant role in conducting a linguistic analysis on the research objects. By examining the linguistic features of ancient and modern Chinese, as well as the historical periods encompassed in our study, we can better understand the evolution of Chinese for general purpose in China.

Previous researches on neologisms and loanwords provide valuable insights into our study, for the establishment of Western medical terms in Chinese involves language contact and cultural exchanges. Additionally, we propose a classification system for neologisms and loanwords in the Chinese language.

This framework sets the stage for further empirical research and analysis, contributing to our understanding of linguistic dynamics, cultural exchange, and specialized communication in the Chinese language. By defining our research objects as extracted terminological units from specialized texts, we aim to conduct empirical work that analyzes the morphological and semantic construction mechanisms of terminological units and observes terminological variation in communicative contexts. We propose an integrated approach that combines neology and terminology to explore the formation of specialized terminology in Chinese, particularly in the context of Western medicine.

CHAPTER 3 METHODOLOGY

The linguistic, cognitive, and communicative characteristics of terminological units prompt us to consider the multifaceted nature of these terms within a specialized context. Given the constant growth of scientific knowledge in medicine, medical terminology plays a pivotal role in cognitive development. By analyzing the terminological units of medical texts and studying terminological variations over time, we aim to elucidate the evolution of medical terminology.

The investigation's main objective is to examine the morphosemantic evolution of disease terms in Western medicine within the Chinese language from 1915 to 2020. To conduct a diachronic analysis, our study will be corpus-based, following the principles of the Communicative Theory of Terminology, as well as taking reference from the TERMMED project conducted by IULA at Pompeu Fabra University, which is a diachronic study that investigates the lexical and semantic changes of medical terms in Spanish within the framework of the Communicative Theory of Terminology (CTT).

It is important to note that in China, a diachronic research on communicative documentation in Western medicine has not been carried out thus far. As a result, we intend to draw upon some of the methods and approaches employed in the TERMMED project to inform our own work. By adapting and applying these methods within the Chinese context, we aim to contribute to the understanding of **diachronic** changes in disease terms in Western medicine in China.

The analytical nature of this research is **descriptive** in its approach. As linguistic theory evolves, there is a shift from prescriptive to descriptive methodologies. Prescriptive terminology aims to standardize and homogenize terminologies across different specialized areas, facilitating interlingual translations. In contrast, descriptive terminology focuses on the actual terms and their variants as they occur in real texts,

taking into account the multiple dimensions of specialized knowledge units in communication. The Communicative Theory of Terminology (CTT) is a representative theory of descriptive terminology. Argued that in a descriptive approach, terminology is understood as the compilation and illustration of identified forms within specialized discourse. This **corpus-based** method emphasizes the specialized cognitive and communicative functions of the corpus, ensuring the database of terminological units remains true to their in vivo nature.

The CTT proposes three essential steps for conducting terminological work (Cabré & Estopà, 2002):

1) Identify units of specialized knowledge.
2) Observe the formal, conceptual, and functional diversity of the terms.
3) Situate the units within a multi-relational framework.

Thus, our plan is to identify a suitable Western medical journal in China, select articles from different historical periods for the disease study corpus, extract terminological units of disease names and their variants from the corpus, and construct three databases of disease terms.

The three terminological databases will be constructed based on historical divisions outlined in the previous chapter:

1. 1915-1949 (missionary period to pre-People's Republic of China period)
2. 1950-1978 (Post People's Republic of China to the beginning of reform and opening up)
3. 1979-2020 (post-opening-up period)

We will conduct a linguistic analysis of the terminological units in each database, aiming to uncover the diachronic mechanisms behind the evolution of disease terms in Western medicine within China, and to provide suggestions for terminological planning in the country.

1. Documentation in this study

To conduct a diachronic study on disease terms spanning over a century, it is crucial to engage in terminology work using reliable documentation. Documentation work plays a significant role in the initial stage of the research, involving the gathering, systematization, and presentation of terms from a specific field.

The Communicative Theory of Terminology offers two observation points for analyzing terminological units: *in vitro* and *in vivo* (Cabré, 2005). *In vitro* units are those found in dictionaries, standardized databases, and thesauruses, which exhibit stability in both meaning and form. On the other hand, *in vivo* analysis involves observing units within natural specialized communication, including written and oral materials, which may exhibit greater diversity in performance. Given the focus on the communicative context that activates the terminological value of lexical units, an *in vivo* approach is necessary for conducting a descriptive analysis of terms.

Cabré et al. (1996) acknowledges that terminological data should be extracted from a genuine specialized corpus, depending on the research objectives. During the term collection process, it is necessary to examine existing terminological units within professional documentation. Typically, terms are not created by terminologists themselves but rather by the authors of the concept who introduce new notions and designations within a specific subject field. Specialists or translators propose and discuss terms in their professional context (Cabré, 1999). Our investigation focuses on **disease names in the Chinese language**, obtained from a genuine information source within the Western medical context. Therefore, we aim to select a reputable medical journal that has been continuously published in the Chinese language and serves as an influential reference in Western medicine.

The medical journal that meets our needs is the *Zhonghua Yixue Zazhi* (中华医学杂志, '*National Medical Journal of China*'). The journal is the first medical journal in China that published Western medical articles in the Chinese language since 1915 with its impact factor exceeding the average of Chinese general medicine journals. This journal records the significant achievement and important events in China's

modern medicine and health care over one century and it still plays an essential part in medical research in China[11]. In Figure 3.1, we present the cover of one volume of *Zhonghua Yixue Zazhi* in 1939.

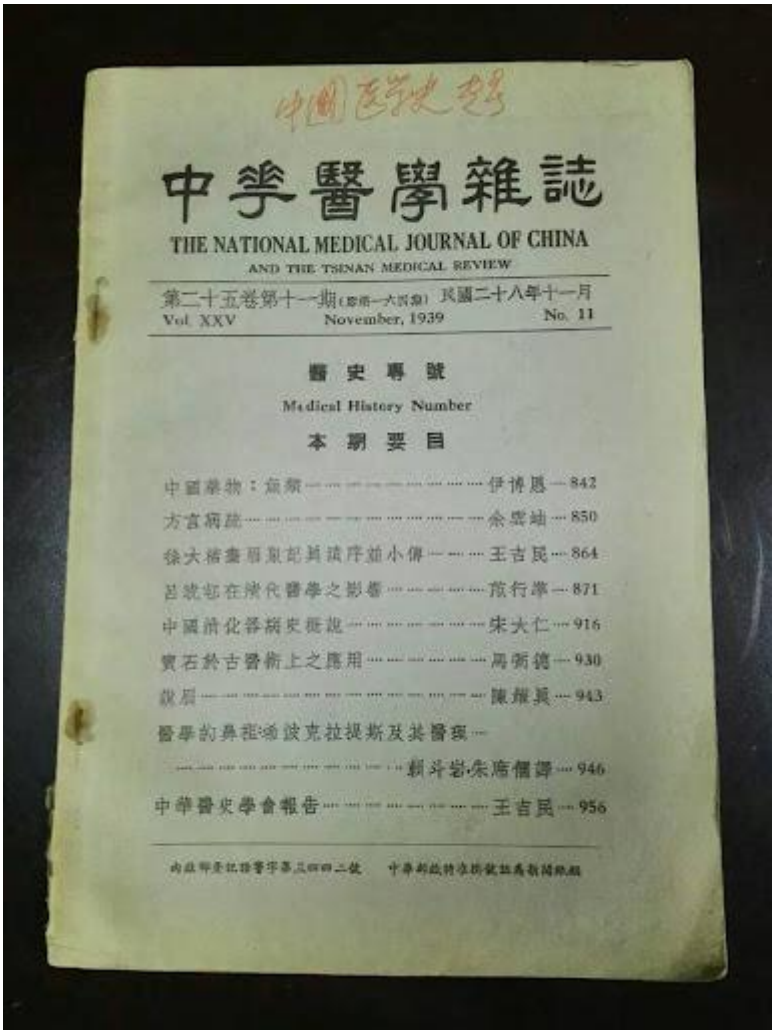


Figure 3.1: The cover of the *National Medical Journal of China* (1939)

According to the publication information of the journal provided by Chen Xinshi and Gao Runlin (2010), the number of volumes and articles has varied over time. The publication plan has undergone four changes since 1915.

1. From 1915 to 1933, 6 volumes were published annually.
2. From 1934 to 2000, 12 volumes were published annually.
3. From 2001 to 2004, 24 volumes were published annually.

[11] http://www.yiigle.com/Journal/Detail/2

4. From 2005 to the present, 48 volumes are being published annually.

However, it should be noted that the actual publication situation deviates from the original plan due to factors such as document loss, destruction, and disruptions caused by political movements and wars. Consequently, the number of existing volumes that we can access may differ from the expected quantity. Table 3.1 provides an overview of the estimated volume and article counts based on the available data.

Year	Interval of publication	No. of volumes in a normal situation	Total No. of existing volumes	Total No. of articles（approximately）	No. of articles each year
1915-1933	Bimonthly	114	70	700	36
1934-2000	Monthly	804	754	11310	168
2001-2004	Semimonthly	96	96	1920	480
2005-2020	Weekly	768	768	36000	2250

Table 3.1: Publication data of National Medical Journal of China (1915-2020)

Despite the significant loss of volumes and articles during the early period of the journal due to societal turbulence, the available resources are still substantial enough for constructing a corpus. With the existing volumes, we can proceed with our diachronic investigation of disease names in Western medicine within China.

2. Database construction

In the medical community, a diachronic study sheds light on the history and progression of medical development. In 1916, Saussure emphasized the significance of conducting synchronic and diachronic linguistic studies to understand word formation. A synchronic study examines the characteristics of a language during a specific period, while a diachronic approach helps trace its evolutionary changes over time. The TERMMED project conducted a corpus of texts segmented into distinct periods, allowing for the observation of the evolution of lexical changes (Estopà & Lorente, 2022). The construction of our study's database will also encompass important features: **communicative**, **specialized**, and **diachronic**.

To construct terminological databases that are relevant to names of diseases in Western medicine from the chosen journal spanning the years 1915 to 2020, the process includes the following phases:

a) To divide the historical periods.

b) To manually filter articles by detecting keywords.

c) To manually extract terminological units that refer to diseases.

2.1. Period division of the documentation

Within the framework of the Communicative Theory of Terminology, our study focuses on the linguistic perspective of terminology. While we have presented the documentation situation based on the publication system, we acknowledge that this division alone is not a scientific reference when investigating the evolution of terminology. Instead, we turn to the historical division of the Chinese language, which serves as an important reference for periodizing the medical journal corpora.

In line with our theoretical framework, He Jiuying (2007) divided the Chinese language from 1917 to the present into three periods based on linguistic characteristics and political influence (1917-1949, 1950-1979, 1980-2020). Consequently, we adjust the second period to 1950-1978 and the third period to 1979-2020, with the beginning of China's reform and opening serving as the end of 1978. This adjustment allows us to assign the entire dataset of medical journals (1915-2020) into three corpora based on significant historical events:

1. 1915-1949: The period from missionary influence to the pre-People's Republic of China era.
2. 1950-1978: The period following the establishment of the People's Republic of China until the pre-reform-and-opening era.
3. 1979-2020: The post-reform-and-opening and contemporary period.

With this division established, we will construct three distinct corpora of medical articles on diseases. Subsequently, we will provide detailed explanations on how each

corpus is built for the different periods.

2.2. Criteria to determine disease terms

The nomination of diseases is fundamental to clinical practice and development because it represents a generalization of the core and reflects the understanding of the diseases. It provides an outline and guidance for diagnosis and treatment. To conduct extraction work on disease terms, we first need to define what constitutes a disease. Since the study of diseases is a fundamental and introductory area in healthcare, we examine the relative concept of disease: *health*. According to the World Health Organization, *health* is not merely the absence of disease or pain but also a state of physical, psychological, and social well-being. In reality, health standards vary among regions, groups, and individuals.

Different interpretations of health shape the definition of disease. In the context of modern Western medicine, the term *disease* broadly encompasses any condition that impairs the normal functioning of the body. Specifically, it is commonly used to refer to infectious diseases supported by clinical evidence resulting from the presence of pathogenic microbial agents, such as viruses, bacteria, fungi, protozoa, multicellular organisms, and abnormal proteins known as prions (Murray et al., 2020). An infection or colonization that does not produce clinically evident functional impairment is not considered a disease. However, an infection that is asymptomatic during its incubation period but expected to manifest symptoms later is usually considered a disease. Non-infectious conditions encompass all other diseases, including most forms of cancer, heart disease, and genetic disorders.

In the traditional Chinese medical context, disease is understood differently. The Chinese word *jibing* (疾病) that refers to 'disease' provides some insights. By examining the etymology of this word, which is composed of two Chinese characters, *ji*(疾) and *bing*(病). We can deduce the perception of ancient Chinese people. Both characters share the same semantic radical *ne* (疒) which means 'disease' or 'sickness'. The character *ji* is composed of the radical *ne* and *shi* (矢) that means 'arrow'. Therefore, *ji* indicates the external invasion as an arrow piercing a human body and

causing discomfort, as shown in the evolution of the character in Figure 3.2. In *bing,* the phonetic and semantic grapheme *bing* (丙) that located under the radical *ne* refers to 'fire' in *wuxing*[12] and the 'heart' in the five centerpieces of visceral organs in traditional Chinese medicine (according to the dictionary of *Shuowen Jiezi*[13]). The imbalance of holistic health resulting from the 'fire' in the 'heart' leads to pathology. Thus, the *ji* and *bing* can refer to disease individually, and the combination of these two morphemes forms the compound word *jibing.*

Figure 3.2: Evolution of the character *ji* (疾)

However, Chinese modern medicine has been predominantly influenced by modern Western medicine. In the online encyclopedia of medicine in China, *disease* is defined as follows:

"Under the influence of external pathogenic factors and internal causes, the body undergoes a process of disrupted movement due to disturbance in the regulation of homeostasis. This leads to the body producing a defensive response against the cause and its damage, resulting in abnormal changes in tissue and cellular function, metabolism, and morphological structure. Diseases are characterized by symptoms, signs, and social behavioral abnormalities that reduce human adaptability to the

[12] *Wuxing* (五行, 'five phases') is a fivefold conceptual scheme that many traditional Chinese fields used to explain a wide array of phenomena, from cosmic cycles to the interaction between internal organs, and from the succession of political regimes to the properties of medicinal drugs.
The *wuxing* are Fire (火, *huo*), Water (水, *shui*), Wood (木, *mu*), Metal or Gold (金, *jin*), and Earth or Soil (土, *tu*). (Reference: wikipedia)

[13] *S*huowen Jiezi (Chinese: 說文解字; lit. 'discussing writing and explaining characters') is an ancient Chinese dictionary from the Han dynasty. It was the first dictionary to analyze the structure of the characters and to give the rationale behind them, as well as the first to use the principle of organization by sections with shared components called radicals. (reference: https://en.wikipedia.org/wiki/Shuowen_Jiezi)

environment.” (http://www.a-hospital.com /w/疾病)

In summary, diseases in Western medicine are determined through specific physical and experimental diagnoses, often attributed to pathogens, lesions with specific pathological changes, or abnormalities in physiology. In contrast, the Chinese understanding of disease encompasses symptoms, signs, pathological processes, and pathological states, which are more abstract and holistic, allowing for identification without clinical diagnosis. Western medicine in China has evolved based on modern medicine while being influenced by traditional medicine. Therefore, it is necessary to consider both perspectives in understanding diseases.

To address the challenge of managing the extensive content within the *National Medical Journal of China* database, our approach focuses on analyzing the titles of articles. This allows us to detect terms related to pathogens, physical abnormalities, symptoms, and signs, forming the basis of our database. The titles often contain keywords or patterns that provide insights into the articles’ content. Articles are selected for our corpus based on whether they include a disease term in the title. Drawing on the instincts of native speakers, we identify keywords and patterns commonly found in titles of articles related to diseases:

1) Some titles include disease terms with a marker word such as *bing* (病, ‘disease, *-osis*’), *zheng* (症,‘symptom’), *tong* (痛, ‘pain’), ai (癌, ‘cancer’), *zhong* (肿, ‘swelling’) or *yan* (炎, ‘inflammation, *-itis*’), etc. or with the disease grapheme *ne* (疒).

2) Some titles reveal hyperonyms, such as *xuanyun* (眩晕, ‘dizziness’), *chuanranbing* (传染病, ‘infectious disease’).

3) Some titles include words indicating a presentation or discussion about a disease, such as *lun XX* (论 XX, ‘discuss on XX’) and *shuo XX* (说 XX, ‘talk about XX’).

4) Some titles include words indicating treatment methods for a disease, such as *yanjiu* (研究, ‘research’) and *zhiliao* (治疗, ‘therapy’).

5) Some titles illustrate case records of diseases, such as *yili* (一例, ‘one case’) or *jili* (几例, ‘several cases’).

6) The title may indicate that the article discusses medical names, such as *yixue mingci* (医学名词, ‘medical nouns’).

By applying these criteria, we can select relevant articles for our corpus. In the next part, we will delve into the details of the terminological work, including the construction of a diachronic database of disease names.

2.3. First corpus (1915-1949)

The historical period 1915-1949 marks the earliest years of the *National Medical Journal of China*. Due to the passage of time and societal changes, many original copies of journals from this period have been lost. Thus, it is still possible to conduct an exhaustive extraction of disease terms from the available materials.

Materials from the Protestant missionary period are particularly difficult to find. Nevertheless, we have managed to gather materials from the library of Indiana University-Purdue University Indianapolis (IUPUI) and the official website of the National Medical Journal of China (http://zhyxzz.yiigle.com/). Our collection consists of a total of 250 volumes.

The articles within these volumes serve as the earliest literature to introduce Western medicine to China. They exhibit several characteristics:

1. The articles are written in Chinese and English to address medical issues.
2. Chinese articles account for more than half of the total number of articles.
3. Articles written in Chinese employ traditional Chinese characters and adhere to the Republic of China calendar[14].
4. Typesetting follows ancient Chinese protocol, with text arranged from top to bottom and from right to left. It was not until 1932 that the typesetting changed to the left-to-right format used in modern publications (See Figure 3.3).

[14] The **Republic of China calendar** (Chinese: 中華民國曆) is one of the calendars used in the Greater China area. The calendar uses 1912, the year of the establishment of the Republic of China (ROC), as the first year. Months and days are numbered according to the Gregorian calendar. The ROC calendar has been in wide use in the ROC since 1912, including in early official documents. Chorographies and historical researches published in mainland China covering the period between 1912 and 1949 also use the ROC calendar.

National Medical Journal of China, 1931, 17(03): 232. National Medical Journal of China, 1932, 18(04): 531.

Figure 3.3: Typeset change of early volumes 1931 vs 1932

The medical journal covers a wide range of topics related to healthcare. Table 3.2 presents examples from the first volume in 1915 to showcase the diverse subjects and contents featured in the journal.

Author	Title	Topic
Wu Liande (伍连德)	医学杂志之关系 ('the relation of medical journals')	Medical journal presentation
Yu Fengbin (俞凤宾)	自箴篇 ('self morality')	Medical morality
Wu Liande (伍连德)	医学现在之取缔及将来之挽救商榷书 ('Discussion on the current ban on medicine and the future rescue')	Health care situation
C. VOONPING YUI Hon. Secretary pro tem.	Minutes of the First Meeting of the National Medical Association of China	Medical conference information
J. W. H. M. B. (Cantab) M. R. C. S. L. R. C. P	Report of a case of Chondro-Sarcoma of the Upper Jaw	Disease case report
WULIEN-TEH A. M. M. D.	A Hygienic Chinese Dining Table	Health promotion

Table 3.2: Representative articles and contents from the first edition of the *National Medical Journal of*

China (1915)

According to the contents in Table 3.2, the journal played a crucial role in the dissemination and expansion of modern Western medicine. Its content encompassed various sections, including the introduction of the journal itself, the activities of the health care committee, news reports on healthcare, the promotion of hygienic ideas, general descriptions of medical studies in China, and case reports on diseases.

Among these sections, the articles focusing on diseases will serve as the primary materials for building the database in this study. These articles typically cover disease introductions, disease treatment methods, or medical case records. To select the articles for our corpus, we follow a manual examination of the titles rather than relying on automatic extraction. The specific steps involved are as follows:

a. We examine each article's title manually, relying on native speaker intuition, to determine if it contains a disease name. If a disease name is present in the title, the article is selected for our corpus, and both the title and the disease term are recorded in our working file.

b. We then carefully review the selected articles to identify any semantically related terms associated with the recorded disease name. These terms can include variants, hyponyms, or hypernyms of the disease term, and they are also recorded in our working file.

c. Variants of the same disease found in different articles are also recorded in the working file.

Throughout this period, we have collected a total of 228 articles on diseases for our first corpus.

2.4. Second corpus (1950-1978)

From 1950 to 1978, China experienced the post-People's Republic of China to pre-opening-up period. During this time, China underwent initial industrialization from

1950 to 1958, followed by setbacks in social development due to frequent political movements. The Great Leap Forward and the Cultural Revolution had significant impacts on the economy, science, and culture, resulting in a lack of medical journals.

In particular, from 1966 to 1972, no medical articles could be found, even on the official website. Despite these challenges, we conducted an exhaustive extraction of articles with disease terms using the available resources.

The procedure for selecting articles for our corpus during this period was the same as in the previous period.

Throughout this period, we have collected a total of 185 articles on disease treatment or research for our corpus. This includes 55 case reports and 130 articles on disease studies. Notably, there are more case reports in the corpus of this period compared to the previous period, highlighting the prevalence of this writing genre in medical texts.

2.5. Third corpus: (1979-2020)

During this post-opening-up period, which followed the reform and opening policy in China, there was a stable social environment and increased focus on Western science, technology, and medicine. The biomedical literature expanded rapidly, and subspecialty medical journals emerged, such as the *Chinese Journal of Infectious Disease*, the *Chinese Journal of Digestion*, the *Chinese Journal of Gynecology*, etc. Despite this, the *National Medical Journal of China* remained a major comprehensive medical journal in the country, addressing critical healthcare issues.

In this period, there was an increase in disease case reports, and from 2000 onwards, research articles began to follow a standard academic writing structure with abstracts and keywords. To extract thematic terms and variants, we consider both the novelties introduced during this period and the original texts.

Due to the large quantity of articles published between 1979 and 2020, exceeding 10,000 in total, it is not feasible to conduct an exhaustive extraction manually as done

in the previous corpora. Instead, we adopt a semi-exhaustive selection approach.

We systematically and randomly choose the first volume of the *National Medical Journal of China* published in January, June, and December of each year, resulting in a collection of 120 volumes. Although this represents approximately 25 percent of the total volumes, we believe it provides a representative sample covering the forty-year period.

The method we employ for selecting articles in this corpus is similar to the previous two corpora. Based on the recorded titles, we have identified 125 case reports and 128 articles on disease treatment or research in the corpus of this period.

In conclusion of the corpus selection work, we sum up the articles of each corpus as shown in Table 3.3.

Corpus	# of articles	method	% of total articles about disease
1915-1949	228	exhaustive, manual selection	≈100%
1950-1978	185	exhaustive, manual selection	≈100%
1979-2020	253	semi-exhaustive, manual selection	≈25%

Table 3.3: Summary of corpus selection

By selecting the disease names from the three volumes in January, June, and December of each year in the third corpus, we have ensured a representative sample for each year while keeping the corpus size manageable. With an average of 6-7 representative articles per year for each historical period, we have a substantial and reliable quantity of articles for your diachronic comparison of terminology characteristics. The terms extracted from this corpus should provide valuable insights into the characteristics of disease names in Chinese Western medicine across different eras.

2.6. Term extraction work and the database building

Terminology extraction involves analyzing vocabulary, syntax, and semantics in a

language and can be highly complex. In our study on large-scale *in vivo* corpus of Western medical terms in the Chinese language, we follow the guidance of the Communicative Theory of Terminology and edit the work files for the *ad hoc* terminological database.

The construction of the database is done manually. Chinese does not have clear boundaries between lexical units like spaces or hyphens, and modern Natural Language Processing (NLP) tools face challenges in achieving satisfactory segmentation of historical corpora. Therefore, term extraction is carried out manually based on the intuition of a native speaker. Manual term extraction from a large-scale and *in vivo* corpus is time-consuming and labor-intensive, but it ensures accuracy in terms of information. Kageura (2002) successfully conducted large-scale extraction of Japanese terminology based on intuition. Japanese and Chinese share similar characteristics in terms of morphology, such as fixed formats and written rule templates. Therefore, we rely on manual extraction for our work.

Following the schematic instruction provided by Cabré (2005c), the extraction records of terminological units must include the presentation of complementary information, as indicated in Table 3.4.

1The entry		
2 Grammatical category	3 Subject field	4 description of contents
5 Definition		
6 Reference	7 Author and date	

Table 3.4: *La ficha terminologica* for the terminological database (Cabré, 2005c)

In the specific case of this study, we modify the working file of the model according to our goals. The adapted version of the working file for each terminological entry includes the following items:

1. The title of the article.
2. The publication year of the article.
3. The entry (term of disease).
4. The variant (semantically-related terms of the entry).

5. Subject field.
6. English equivalent.
7. Context.
8. Note.

We record the **title** of the article from the corpus and its **publication year** to create a diachronic timeline. The **entry** represents the disease term that appears in the title of the selected article from the corpus. The **variant** refers to semantically-related terms found in the abstract and context. In the case of polysemic terms used in different subfields of medicine, we classify the **subject field** to which the disease name belongs. We modify the *definition* to the **English equivalent** as we aim to investigate the formation mechanism of the Chinese term and compare the morphosemantic patterns, thereby examining the terminological dependency of Chinese terms on their English equivalents. We adjust the *description of the content* to reflect the **context** in the article where the term or variant appears. The **note** provides additional information or explanations about the disease term. We remove the grammar category since all disease names are nominative and therefore considered nouns in the grammatical category.

For example, the Table 3.5 represents a working file sample for the term *hongrebing* (红热病) from the article *"Lun Hongrebing"* (论红热病, 'On Macule') published in 1915. This table showcases the process of manually extracting disease terms from articles in our corpus.

Title	论红热病
Edition year	1915
Entry	红热病 (*Hongrebing*)
Variant	红痧热病 (*Hongsharebing*)
Subject field	Epidemic disease
English equivalent	Macule
Context	美国有一学校发生红痧热病。
Note	中医术语 斑疹 (its TCM variant: *banzhen*)

Table 3.5: Modified working file of a disease term for this study

As shown in Table 3.5, the process of extracting disease terms from articles involves the following steps:

1. File the title of the article and its publication year.
2. Extract the entry of the disease term from the title.
3. Record any variant terms found in the text.
4. Classify the subject field of the disease term.
5. Search for the English equivalent of the selected term by referring to authorized bilingual term databases like www.Termonline.cn, the ICD-11 (International Classification of Diseases), or Wikipedia.
6. Search for the disease name in the encyclopedia at www.baidu.com, the Chinese national search engine, to find additional explanations or information about the disease term. These details are recorded in the note section.

Each term is recorded in a separate working file, but for a panoramic study on the terminological units, all the terms are compiled into one Excel file, as shown in Table 3.6.

Title	Year	Entry	Variant	Subject field	Equivalent	Context	Note
论红热病	1915	红热病	红痧热病	epidemic disease	macule	美国有一学校发生红痧热	中医术语 斑疹
医学名词意见书	1916	虫肠发炎		gastriology	apendicitis	四字西学名词举例	
医学名词意见书	1916	喉风	实扶的里	epidemic disease	diphtheria	通用名词举例，与日本音译名词和中国古字作对比	
医学名词意见书	1916	霍乱	虎列剌	epidemic disease	cholera	通用名词举例，与日本音译名词和中国古字作对比	
医学名词意见书	1916	鼠疫	百思笃	epidemic disease	pest	通用名词举例，与日本音译名词和中国古字作对比	
医学名词意见书	1916	疟疾	麻辣里亚	epidemic disease	malaria	通用名词举例，与日本音译名词和中国古字作对比	
医学名词意见书	1916	伤寒	肠窒扶斯	epidemic disease	typhoid	通用名词举例，与日本音译名词和中国古字作对比	

Table 3.6: Disease names database sample

According to Table 3.6, in the year 1915, the article *"Lun Hongrebing"* (论红热病, 'On Macule') is selected for the corpus. From this article, the disease term is extracted from the title, and any variant terms mentioned in the context are recorded. The subject field associated with this disease is an epidemic disease, and the English equivalent of the term is 'macule'. In the context, the variants traditional Chinese name *banzhen* (斑疹) is also recorded in the corresponding fields.

In the following year, 1916, more disease terms are extracted from the same article, "*Yixue Mingci Yijianshu*" (医学名词意见书, 'Opinion on the Medical Terms'). This article presents names of various diseases, including *chongchangfayan* (虫肠发炎, 'appendicitis'), *houfeng* (喉风, 'diphtheria'), *huoluan* (霍乱, 'cholera'), *shuyi* (鼠疫, 'rat-pandemic'), *nveji* (疟疾, 'malaria'), and *shanghan* (伤寒, 'typhoid'). Among these, *chongchangfayan* ('appendicitis') belongs to the field of gastrology, while the others are names of epidemic diseases.

The epidemic disease names also have variants indicated within the same article. For instance, the term *shuyi* (鼠疫, 'rat-pandemic') has a variant *baisidu* (百思笃, 'peste'). The article explains that these terms are derived from Japanese phonetic translations, and this information is recorded in the notes column.

In the case of the article "*Yixue Mingci Yijianshu*" (医学名词意见书, 'Opinion on the Medical Terms'), the selected article not only serves as a linguistic corpus but also provides valuable information that aids in studying the terms. It offers insights into the origins and explanations of the terms, expanding the understanding of their usage and context. By utilizing such informative resources in conjunction with linguistic analysis, researchers can gain a comprehensive understanding of the disease terms and their linguistic characteristics.

Some articles have a terminological hypernym in the title, we record it in the entry as well as the hyponyms in the context. Table 3.7 is the extraction of terms from the article "*Fubujiaotong bianbie zhi yiban*" (腹部疗痛辨别之一般, 'General diagnosis of abdominal pain').

Title	Year	Entry	Subject field	Equivalent
腹部疗痛辨别之一般	1916	腹部疗痛	gastroenterology	acute abdonimal pain
腹部疗痛辨别之一般	1916	伤淫胃痛	gastroenterology	rheumatic gastritis
腹部疗痛辨别之一般	1916	风疹胃痛	gastroenterology	urticaric gastritis
腹部疗痛辨别之一般	1916	胃溃烂	gastroenterology	gastric ulcer
腹部疗痛辨别之一般	1916	胃腹绞痛	gastroenterology	colic
腹部疗痛辨别之一般	1916	急性胃炎	gastroenterology	acute gastritis

腹部疠痛辨别之一般	1916	肠闭结	gastroenterology	intestinal obstruction
腹部疠痛辨别之一般	1916	内肾碛	gastroenterology	renal calculus
腹部疠痛辨别之一般	1916	膀胱碛	gastroenterology	vesical calculus
腹部疠痛辨别之一般	1916	胆管碛	gastroenterology	biliary calculus
腹部疠痛辨别之一般	1916	腹膜炎	gastroenterology	peritonitis
腹部疠痛辨别之一般	1916	阑尾炎	gastroenterology	acute appendicitis
腹部疠痛辨别之一般	1916	痢疾	gastroenterology	acute dysentery
腹部疠痛辨别之一般	1916	霍乱	epidemic disease	cholera
腹部疠痛辨别之一般	1916	卵管崩裂	gynecology	ovarian rapture
腹部疠痛辨别之一般	1916	急性子宫炎	gynecology	acute metritis
腹部疠痛辨别之一般	1916	急性子核炎	gynecology	acute ovaritis

Table 3.7: Extraction of hyponyms of abdominal pain

The extraction work presented in Table 3.7 demonstrates that the 16 terms mentioned in the text are hyponyms of the hypernym *fubujiaotong* ('abdominal pain') used as a keyword in the title.

Using this method, a total of 986 disease terms, including variants, have been extracted from the 666 articles on diseases spanning from 1915 to 2020. These extracted terms have been organized into three terminological databases based on the period covered by the corpus. The distribution of articles, terms, and average terms per year is presented in Table 3.8.

Corpus	Number of articles (% of the total articles about the disease)	Number of extracted disease terms (# of entries and the variants)	The average number of terms per year
1915-1949 (35 years)	228 (100%)	407 (307+100)	11.62
1950-1978 (29 years)	185 (100%)	264 (205+59)	8.75
1979-2020 (42 years)	253 (25%)	325 (257+68)	7.73
in total	666	986	9.3

Table 3.8: Number of articles and the extracted disease terms in each corpus

These statistics demonstrate the size and scope of the terminological databases and emphasize the feasibility of conducting a comprehensive diachronic study on disease names of Western medicine in China with the available data. The extraction work conducted resulted in a total of 986 disease terms being manually extracted from three corpora. The first corpus contained 307 terms with 100 variants, the second corpus had 205 terms with 59 variants, and the third corpus included 257 terms with 68 variants.

Furthermore, the average number of terms extracted each year is approximately nine, which indicates that it is sufficient for conducting a diachronic study on disease names of Western medicine in China.

The extracted terms have been organized into three terminological databases based on the period covered by each corpus. These databases enable researchers to analyze the development, evolution, and usage patterns of disease names within the context of Western medicine in China over time.

3. Analysis of the data

Having our terminological database constructed, we will proceed with conducting a morphosemantic analysis of the terms. The examination of morphemes and semantics holds significance in understanding the cognition and communication of medical terms. Given the particular characteristics of the Chinese language, it is essential to investigate factors such as physical length, morphological formation, semantic mechanisms, and terminological variation. By delving into these aspects, we can gain deeper insights into the linguistic evolution of the medical terms in our database.

3.1. Morphological formation

In the morphological analysis, we will calculate the length of terms and the number of morphemes or words, analyze the morphological structure, and determine the types of

morphological formation of disease terms.

The length of words in Chinese is a crucial topic in Chinese linguistic studies. The length of terms represents the explicit structure perceivable in communication. What's more, the length of lexical units determines the difficulty degree in vocabulary study and communication. The graphic length of a lexical unit depends on the number of its lexical component and the phonetic length is determined by the syllables a word includes. In most Indo-European languages, the length of a word is determined by how many letters the word has and the segmentation between words is clear by space or hyphens. In the Chinese language, the length of a word depends on the number of characters it includes. In the study of disease terms, we calculate the length of the terms according to the quantity of the characters most of the time.

By comparing the length of terms diachronically from data collected in different periods, we can observe changes over time. Henriksson et al. (2013) demonstrated how distributional analysis can be employed to extract synonyms of SNOMED CT preferred terms in the field of English medical terminology. Their study focused on synonyms of various lengths and their linguistic processing. One of their conclusions was that terms with more than three words or tokens are preferred, while unigram terms are less commonly used in the SNOMED CT corpus. In the context of Chinese word length, Zhou Jian (2006) discussed the length patterns of Chinese lexical units within the framework of lexicography. However, there is no research on the word length of disease names in Western medicine in the Chinese language so far.

We also will take some special cases in the disease names into consideration. Chinese words are mostly written with Chinese characters, however, when there is a foreign-originated word, there might be some other language elements in the new words. Fu et al. (2008) categorized the words in Chinese texts into standard words and non-standard words (NSWs), according to the types of characters of which they are composed. A standard word only consists of *hanzi* ('Chinese character'), and a non-standard word contains at least one non-Chinese character, like foreign letters (e.g. Arabic numerals and alphabets), punctuation, or other symbols. Narisong et al. (2008) analyzed the judicial terminology from the database of the Bilingual Law Information

System in Hongkong and named these non-standard terms as *teshu zuhe shuyu* (特殊组合术语，'terms of special combination'). These studies treat English letters in a Chinese context as part of the Chinese vocabulary. We accept this statement when calculating the length of terms in our study.

Therefore, our study aims to investigate the tendency of term length by counting the number of characters/syllables in the terminological units found within the communicative context. In the Chinese case, most disease terms are written in Chinese characters, with one character corresponding to one syllable. Some terms in the Chinese context contain English letters, with each letter counting as one syllable.

Regarding the morphological structures of disease names, our analysis will focus on the following aspects: 1) monolexical and polymorphic terms, 2) the part of speech (POS) of the components that form polylexical terms and marker words for diseases, 3) formation mechanisms of the disease names.

1) Monolexical and polylexical terms: Western Medical terms in Indo-European langauges can be divided into one-word and multi-word terms, and it's easy to detect from the space between words. However, the texts in the Chinese language are unspaced. Thus, we need to detect the morphemes of the terms and conduct part-of-speech tagging to find out the morphological mechanism, especially of the polymorphic terms.

2) The POS of the lexical components of terms: We will conduct human-assisted automated part-of-speech tagging. Since we already have manually segmented the terms, the part-of-speech tagging process relies on an NLP program called NLPIR (https://github.com/NLPIR-team/NLPIR) that can automatically tag the part of speech of each lexical component in the terms. We will manually input the terms into the database (Figure 3.4), code the results of POS tagging into an Excel file, and then manually check each one to correct any errors that the program may have missed (Table 3.9).

Figure 3.4: The POS tagging of NLPIR

Machine callout	Manual proofread
虫/n 肠/n 发炎/vi (*chongchangfayan*, 'appendicitis')	NV
百/m 斯/dg 笃/ag (*baisidu*, 'peste'	N
子/ng 宫颈癌/n (*zigongjingai*, 'cervical cancer')	NN

Table 3.9: Manual checking on the NLPIR machine tagging results

The manual checking process primarily focuses on identifying flaws in the program. Here are the specific issues we encountered:

a) The machine tagging sometimes divides compound words too finely, without considering the word as one term. For example, the term *chongchang* (虫肠, 'appendix') should not be separated into *chong* (虫, 'worm') and *chang* (肠, 'intestines').

b) Some monolexical words containing more than one character are not recognized as monolexical terms. For instance, the term *baisidu* (百斯笃, 'peste') is divided into three morphemes by NLPIR, even though it is a monolexical term with three characters.

c) The program fails to recognize ancient Chinese vocabulary. This limitation may arise from the historical evolution of the language. NLPIR is designed to analyze contemporary standard Chinese, so some terms in our database may now be considered obsolete. As a result, the segmentation of morphemes may not be accurate.

For example, the term *zigongjing/ai* (子宫颈/癌, 'cervical/cancer') is divided as *zi/gongjing'ai* (子/宫颈癌, 'son/cervical cancer') because *gongjingai* (宫颈癌) is the current normalized term.

d) Another issue with automatic tagging is its confusion when there are concurrent words. Concurrent words have different parts of speech based on the context but share closely related meanings. Although disease names are typically nouns, we observed that some headwords of disease names were tagged as verbs in the database. The concurrent nature of these verbs allows them to function as nouns in disease names. Consequently, manual checking becomes necessary to ensure the accuracy and validity of the POS analysis.

By addressing these limitations and performing manual checks, we aim to improve the accuracy of the morphological analysis of disease names manually.

Another morphological feature of disease terms that we will find is the evolution of marker words. Marker words contribute to terminological consistency within the medical domain. Consistent use of specific affixes or words to indicate disease types helps establish a standardized vocabulary that healthcare professionals and researchers can rely on. Regarding marker words for diseases, it is known that disease terms in English often have marker affixes, such as the suffix *-itis*. In Chinese, we have observed that certain marker words indicate the type of disease. Analyzing marker words in medical terms allows for a deeper understanding of the morphological structure of disease names in medical terminology. Comparing marker words across Western and Chinese terms and medical systems can provide insights into terminological dependencies and cross-linguistic influences. It allows us to explore how medical concepts are represented and expressed in various linguistic contexts.

3) Given that Western medical terminology in the Chinese language is a relatively new discipline in China, it is crucial to investigate the formation mechanisms of disease terms in Chinese based on Western medicine. As Western medicine was a novelty in China, the formation of medical terminology reflects the different ways in

which new concepts are named. From a morphological perspective, Western medical terms in English can be formed through derivation, compounding, and abbreviation (including acronyms and initialisms). Humbley & Palacios (2012) categorized these terms into three types based on their generation mechanisms:a) Creating new words that are unrelated to the source language. b) Borrowing words from the source language. c) Combination of the first two types.

In our study, we will investigate the mechanisms used to form disease names in Chinese and determine which methods prevail. Based on the mechanisms above and the features of the Chinese terms, we can categorize them into:

1. Loanwords from other languages. This involves the adoption of words directly from the source language, typically English and Japanese.

2. Newly formed compound terms using native Chinese morphemes. These terms are formed based on Chinese morphological rules and semantic considerations, taking into account the characteristics and features of the diseases. In this case, some new terms may be coined in Chinese with influence from the source language; Some new terms in Chinese may involve a combination of creating new words and borrowing from the source language. These terms are formed by incorporating Chinese morphemes or combining them with borrowed words to create a hybrid term that conveys the appropriate meaning and reflects both Chinese and Western medical concepts.

3. Adapted traditional Chinese medical terms. Some traditional Chinese medical terms have been incorporated into Western medical terminology to acknowledge and integrate the concepts and practices of TCM.

By examining these formation mechanisms, we can gain insights into how Chinese medical terminology has adapted and evolved to incorporate Western medical concepts. Understanding the origins and mechanisms of term formation is crucial for accurately interpreting and using medical terminology in Chinese.

In this process, we are also interested in terminological dependency. The presence of numerous English words in Spanish and French terminologies has sparked discussions on terminological dependency in the fields of language, politics, and language management, as mentioned in the theoretical framework. However, to date, no study has been conducted on terminological dependency in the Chinese language. Thus, we will discuss the terminological dependency between the target language (Chinese) and the source language (English or other languages). To determine the source language, the *Dictionary of Loanwords and Hybrid Words in Chinese* (1984) serves as a reference. Borrowed terms are often modified to fit Chinese phonetics and writing systems while preserving the essential meaning and concept.

3.2. Semantic categories

Taking the semantic classification of the World Health Organization, we will categorize the terms according to the semantic mechanism of the denomination. The semantic categories of disease names include symptom, body part, eponym, pathogen, severity, environment, species of animal or food, occupation, age and population, geographic indication, arbitrary identifier, etc (WHO, 2015).

In the process of semantic analysis, we emphasize cross-linguistic comparison, particularly concerning the etymology of Chinese terms and their English equivalents. This emphasis is crucial due to the greater linguistic distance and the complexities of language contact. The creation of disease terms in Western medicine in China heavily relies on finding appropriate equivalents for terms that already exist in other languages. However, this unidirectional transfer can directly influence the conceptual configuration of the target language speakers, resulting in asymmetries between the two specialist communities. Therefore, owing to the significant differences in morphology between Western languages and Chinese, cross-language etymology research becomes necessary to establish correlations between equivalents in both languages.

When it comes to etymology in Chinese, we utilize the electronic data website 汉典 (Figure 3.5), which compiles more than 80,000 words. This website serves as a

practical and authoritative tool for searching information regarding the evolution of Chinese lexical units. We refer to this resource whenever we encounter a disease term that retains ancient Chinese characteristics or requires validation of its original meaning.

Figure 3.5: Chinese etymology reference website (https://www.zdic.net/)

To explore the etymology of disease terms in English, we rely on the online dictionary of etymology available at the website: https://www.etymonline.com (Figure 3.6). This comprehensive dictionary encompasses over 50,000 words and is recognized by Oxford University as a valuable resource for investigating the origins of words. While it is not considered a definitive reference for etymology, it is frequently cited in academic work as a useful tool for this purpose.

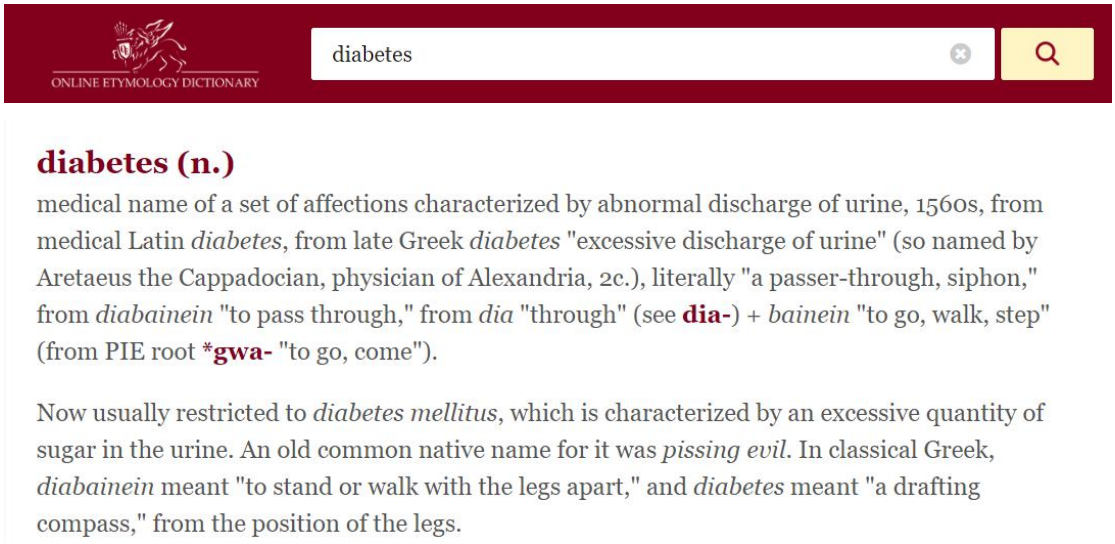


Figure 3.6: the English etymology reference website

3.3. Category of variation

In a communicative context, encountering variants of a term, particularly in the medical field in China, is inevitable. Western medicine in China is not solely influenced by Western medicine but also carries influences from traditional Chinese medicine culture. Depending on the term's origin, these two distinct languages also modify the morphosemantic formations of the terms. Furthermore, different authors presenting the same disease in the same or different periods may produce terms for the same disease in various ways.

Based on the theoretical framework we presented, , we will categorize the causes and formality of terminological variants of diseases from a sociolinguistic perspective as follows:

a) Diachronic variants caused by changes over time.
b) Functional variants related to different communicative registers.
c) Discursive variants related to varying stylistic and expressive author needs.
d) Cognitive variants related to different conceptualizations and motivations.
e) Interlinguistic variants that occur when terms from two languages intersect.
f) Orthographic variants caused by varying adoption of Chinese characters.

We aim to identify the most prevalent causes of variants in each period and track the evolution of these variations.

4. Synthesis

In this study, we have adopted the Communicative Theory of Terminology as our framework for documenting and analyzing the evolution of disease terms in Western medicine in China. To establish a comprehensive database, we have selected the *Zhonghua Yixue Zazhi* (National Medical Journal of China) as our primary source, considering its professional, communicative, and diachronic nature within the field of Western medicine. This journal has been instrumental in documenting the modernization of medical practice in China and remains an authoritative reference.

To ensure a systematic approach, we have divided our documentation into three historical periods: 1915-1949, 1950-1978, and 1979-2020. Each period represents distinct stages in Chinese society and language, allowing us to track the evolution of disease terms over time. By reviewing articles within these periods, we have identified disease keywords and typical patterns to construct our disease names databases. We have designed a working file, specifically tailored for our terminology study, to capture essential information related to disease names, including variants, subject fields, English equivalents, contexts, and notes (See Table 3.10).

Title	
Edition year	
Entry	
Variant	
Subject field	
English equivalent	
Context	
Note	

Table 3.10: Working file for the terminology study

Our corpora analysis reveals a sufficient abundance of documentation for each period, ensuring robust data for our research. The 666 selected articles from the three periods have resulted in a total of 986 disease terms, including variants. On average, there are 11.62 disease terms per year in the 1915-1949 period, 8.75 terms per year in the 1950-1978 period, and 7.73 terms per year in the 1979-2020 period. The information in detail on the three corpora and correspondent databases is shown in Table 3.11.

Corpus	Number of articles (% of the total articles about the disease)	Number of extracted disease terms (# of entries and the variants)	The average number of terms per year
1915-1949 (35 years)	228 (100%)	407 (307+100)	11.62
1950-1978 (29 years)	185 (100%)	264 (205+59)	8.75
1979-2020 (42 years)	253 (25%)	325 (257+68)	7.73
in total	666	986	9.3

Table 3.11: Information on the corpora and databases

Moving forward, our data analysis will focus on exploring the most adopted morphosemantic mechanisms and the prevailing semantic tendencies in disease denomination. We aim to understand the classifications of variants within the medical journal and draw a diachronic evolution of disease names in Western medicine in China. To facilitate this analysis, we will utilize POS tagging tools, etymology dictionaries, and medical databases to gain insights into the morphological structure, semantic category, and behavior of variants in disease terms. This multidimensional approach will allow us to examine disease terms from the perspectives of Chinese ontology, medical cognition, and specialized communication.

Overall, our methodology provides a rigorous and comprehensive approach to studying the evolution of disease names in Western medicine in China, offering valuable insights into the changing landscape of medical terminology within a specific socio-cultural context.

CHAPTER 4 ANALYSIS OF DISEASE TERMS (1915-1949)

In the previous chapters, we conducted a thorough literature review on Western medical terminology in China. We carefully examined existing scholarly works and research related to this topic. Additionally, we established our hypothesis and objectives, presented the theoretical framework, which includes the Communicative Theory of Terminology, the history of the Chinese language, and its linguistic features. Furthermore, we proposed a classification system for neologisms and loanwords in the Chinese language. Finally, we outlined the methodology we will employ to conduct our research.

The establishment of Western medical terminology in China not only facilitated the modernization of Chinese medicine but also enriched the Chinese vocabulary. Throughout history, the process of nominating and approving new medical terms of Western medicine in China has been a collaborative effort between Western doctors and Chinese local practitioners and scholars, especially during the early stages of Western medicine's development in China. However, as new diseases are discovered, new treatments are created, and modern medicine rapidly advances, the continuous denomination of medical terms remains a challenge.

The modernization of China is closely intertwined with the social changes that occurred in the early 20th century. The period covered in our study corresponds to the era of the Republic of China (1912-1949), which was marked by 38 years of non-stop turmoil, ranging from the overthrow of the feudal regime to domestic wars, World War II, and natural disasters. These events resulted in significant casualties and economic losses among the population but also reinforced communication and interaction within society. It was a time of cultural prosperity, as China embraced various modern subjects, leading to diversification in the economy, science, culture, language, and more.

During this period, Western medicine gradually developed and matured. Chinese revolutionaries, many of whom had studied abroad, including numerous medical students, advocated for the abolition of traditional Chinese medicine. Together with foreign doctors, they actively promoted Western medicine, contributing to its dissemination and popularization in China at the time.

Having outlined the methodology, our study involves extracting disease names and their variants from 228 Western medical articles in the corpus of the National Medical Journal of China, covering the period from 1915 to 1949. This process has allowed us to compile a database of 407 terms derived from these articles.

In this chapter, we aim to investigate the linguistic characteristics, recognition patterns, and communication aspects of disease names during this particular period. We will analyze various facets related to this topic, including:

1. Morphological structure: Our morphological study will encompass examining the distribution of term lengths, analyzing the morphological structure of disease terms, and exploring the morphological formations and terminological dependencies of these terms.

2. Semantic mechanisms of disease terms: We will categorize disease terms based on their semantic mechanisms and identify the most prevalent mechanisms, as well as any new semantic mechanisms that emerged during this period.

3. Variants in use: By presenting the presence of variants of disease terms in texts, we will summarize the types of variants based on their causes and analyze their function in facilitating textual communication.

By delving into these aspects, we aim to gain a comprehensive understanding of the linguistic characteristics, recognition patterns, and communicative dynamics of disease names during the Republic of China period. This analysis will contribute to a broader comprehension of the evolution and development of Western medical terminology in China and shed light on the linguistic and communicative challenges

encountered during this era.

1. Morphological analysis

1.1. Length ogf the terms	
1.2. Morphological structure	**1.2.1. Monolexical and polylexical terms**
	1.2.2. Part of speech patterns of polylexical terms
	1.2.3. Marker words of disease
1.3. Terminological formation	**1.3.1. Neological terms**
	1.3.2. Adoption of TCM terms

Morphology, the study of words and their formation within a language, plays a crucial role in understanding the structure and relationships of terms. In this section, we will explore the morphology of disease terms in Western medicine within the Chinese language, focusing on the database from 1915 to 1949.

Firstly, we will examine the length of the disease terms within this database. By analyzing the distribution of term lengths, we aim to identify any patterns or trends that may emerge. This analysis will provide insights into the preferred length of disease terms during this period, which can reflect linguistic preferences or cultural factors.

Additionally, we will investigate the structural aspects of these disease terms. This entails analyzing the part of speech patterns of the terms. By examining the patterns, we can uncover recurring morphological formations and identify any productive morphological processes involved in term creation.

Furthermore, we will explore the formation mechanisms of disease terms in Western medicine within the Chinese language during this timeframe. This analysis will involve examining the different lexical processes employed to form these terms. By studying the formation mechanisms, we can gain insights into the linguistic strategies used to incorporate Western medical concepts into the Chinese language.

Through this morphological analysis, we aim to deepen our understanding of the structure and formation of disease terms in Western medicine within the Chinese language between 1915 and 1949. By examining the length of terms, analyzing their structural composition, and exploring the formation mechanisms, we can uncover valuable linguistic patterns and trends. This research will contribute to our overall understanding of the evolution and integration of Western medical terminology in China during this specific time period.

1.1. Length of the terms

A lexical unit in a writing system is a visual representation of verbal communication. The length of a word is not only the graphic length of its written form but also the phonetic length of how long it is pronounced.

As mentioned in the methodology, most disease terms in our database are written in Chinese characters, with a few incorporating English letters due to the inclusion of foreign words in medical terminology. For example, *Kaschin-Beck shi bing* (Kaschin-Beck 氏病, 'Kaschin-Beck's disease') and its variant in the text: *K.B. shi bing* (K.B. 氏病, 'K.B.'s disease'). One character or an English letter corresponds to one syllable. Thus, the term *Kaschin-Beck shi bing* has five syllables, and *K.B. shi bing* has four syllables. In our database, we have seven Chinese terms embedded with English letters out of the 407 disease terms, accounting for 1.7%.

Based on this method, we calculated the number of syllables that the disease terms from 1915 to 1949 contain, and the quantitative distribution of terms of different lengths is shown in Figure 4.1.

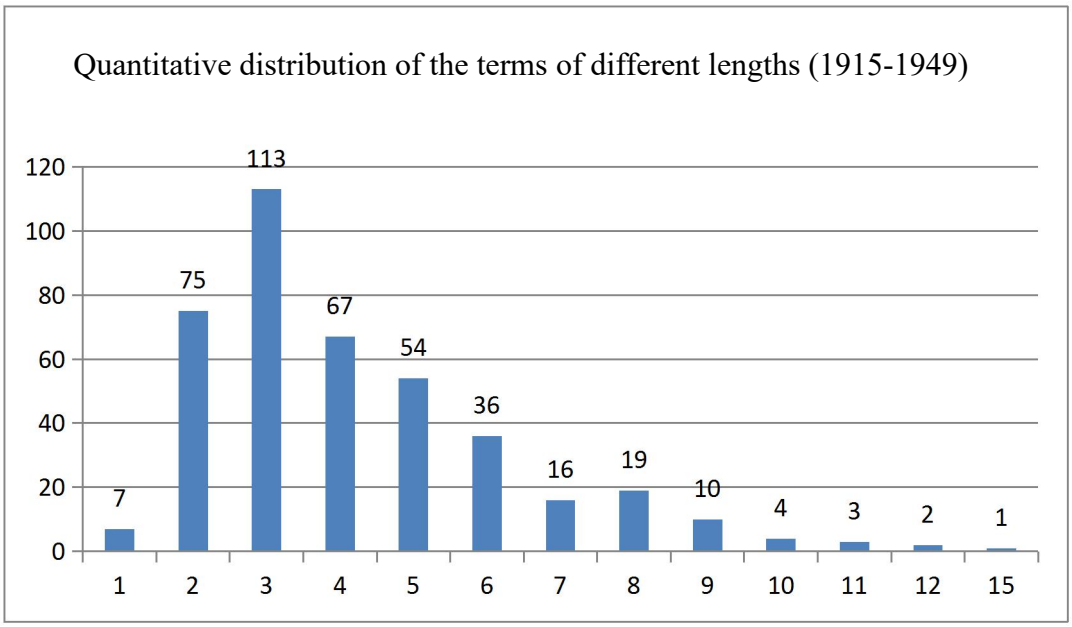


Figure 4.1: Quantitative distribution of the terms with different lengths (1915-1949)

Figure 4.1 illustrates that the database contains a higher number of polysyllabic words compared to monosyllabic words. Three-syllable terms are the most prevalent, with a count of 113, constituting 27% of the total. In general, terms with two to six syllables make up 84.7% of the data, totaling 345 units. Approximately 15% of disease names consist of one syllable, while terms with more than seven syllables are less common. Specifically, there are seven monosyllabic terms representing disease names, and the number of terms with more than nine syllables decreases as the number of syllables increases.

The length of medical terms can affect the difficulty and convenience of communication in clinical practice. According to a study on word length and memory span by Baddeley et al. (1975), memory span is inversely related to word length in cognition. Campoy (2008) claimed that the average human can hold 7 ± 2 objects in short-term memory. In this database, most of the disease terms fall within this range or are even easier to remember. From a cognitive perspective, they are adequate for users' communication.

1.2. Morphological structure

A word is a unit of language that carries meaning and consists of one or more sounds

or symbols, typically formed by a combination of morphemes. A morpheme is the smallest phonetic and semantic unit in a lexicon. A terminological unit is a word or a polylexical word used to describe a specific concept, object, process, or idea within a particular field of study.

To examine the morphological patterns of terminological units, we categorize the terms into monolexical terms and polylexical terms. A monolexical term is a word that contains only one morpheme, while polylexical terms consist of multiple morphemes. In addition to the number of lexical constituents, the part of speech (POS) of the constituents is studied to determine the most frequent POS composition in disease names. Moreover, Chinese terms often utilize marker words to aid in recognizing the genre or category of diseases.

1.2.1. Monolexical and polylexical terms

Monolexical words refer to those words that contain only one morpheme. As we mentioned in the theoretical framework, there are two types of monolexical words in the Chinese language: 1) monolexical words of one character; 2) monolexical words of more than one character. Table 4.1 presents examples of monolexical words in general-used Chinese.

Monolexical word	# of Chinese characters/syllables	# of word
ren (人, 'person')	1	1
putao (葡萄, 'grape')	2	1
qiaokeli (巧克力, 'chocolate')	3	1

Table 4.1: Monolexical words in the Chinese language

According to Table 4.1, *ren*, *putao*, and *qiaokeli* are formed by different numbers of characters, but they are monolexical words.

Based on the given feature, we initially collect monolexical terms by identifying one-character terms. Detecting monolexical words consisting of more than one character is more challenging due to the absence of word spacing in the Chinese language, making

it difficult for machine-based morpheme segmentation to be accurate. Consequently, we manually extract those words based on their holistic meaning.

During the period from 1915 to 1949, we identified 14 monolexical disease names, which account for 3.4% of the total terminological database of disease names. These monolexical terms include those formed by a single character as well as those formed by multiple characters.

1) Monolexical disease terms of one character

We have identified six disease names consisting of a single character/morpheme in the database from the period between 1915 and 1949.

Monolexical terms	*pinyin*	English	Year
痨	*lao*	tuberculosis	1916
癗	*lei*	infection	1916
瘰	*ke*	lupus	1917
疝	*shan*	hernia	1927
痔	*zhi*	hemorrhoid	1933
痈	*yong*	carbuncle	1940

Table 4.2: Monolexical terms of one character (1915-1949)

We can observe that the character/morpheme ratio in these terms is 1:1. All of these characters are associated with the radical *ne* (疒) meaning 'sickness' or 'disease', which is a typical grapheme found in disease names. Based on the transliteration of *pinyin*, we can identify these disease terms as pictophonetic characters within the Chinese character system.

It is noteworthy that over half of these terms appeared during the early period of the specified time range. Single-character/monosyllabic words were predominant in ancient Chinese, and these disease terms within the Western medicine context still retain the linguistic characteristics of ancient Chinese.

2) Monolexical disease terms of more than one character

There are seven monolexical disease terms consisting of more than one character in the database, as shown in Table 4.3.

Chinese terms	Literal meaning	*pinyin*	English	Year
虎列剌	'Tiger line sting'	*hu lie la*	Cholera	1917
实布的里	'Full cloth possessive article inside'	*shi bu di li*	Diphtheria	1917
百斯笃	'Hundred this firm'	*bai si du*	Peste	1917
安及那	'Peace and there'	*an ji na*	Angina	1923
歇斯推里	'Rest this pull inside'	*xie si tui li*	Hysteria	1923
赫尼亚	'Famous monk Asia'	*he ni ya*	Hernia	1927
希司忒利	'Hope conduct very benefit'	*xi si tui li*	Hysteria	1943

Table 4.3: Monolexical disease terms of more than one character in the database of 1915-1949

According to the literal meaning of the Chinese terms in Table 4.3, it may not be immediately clear what they refer to. However, when we focus on their pronunciation using *pinyin*, we notice a phonetic similarity with their English equivalents. These disease terms phonetically resemble their English counterparts through the use of homophonic Chinese characters. These terms can be considered loanwords from the English language.

The formation of these monolexical terms reflects two sources in the adoption of Western medical terminology. The single-character/monosyllable terms adhere to the ancient Chinese tradition of character creation, which involves using semantic graphemes. On the other hand, the multi-character/polysyllabic terms demonstrate the influence of Western languages, particularly English.

The remaining 96.6% (394 disease names) in the database are polylexical terms. These terms consist of multiple lexical components joined together in specific patterns. To identify these lexical patterns, we will analyze the part of speech of the constituents within the disease names.

1.2.2. Part of speech pattern of polylexical terms

Using the part of speech (POS) tagging function of NLPIR, combined with manual verification, we have identified 17 types of POS mechanisms present in all the disease terms. We have listed these mechanisms in Table 4.4, arranged according to their frequency along with examples and calculated the proportion of each pattern.

	POS patterns	Number of terms	%	Examples
1	NN	158	41%	*jiehe*/n *zheng*/n (结核/n 症/n, 'tuberculosis/n disease/n')
2	ANN	59	15%	*lunzhuang*/n *hongmo*/n *yan*/n (轮状/a 巩膜/n 炎/n, 'wheel-like/a scela/n inflammation/n')
3	NNN	47	13%	*xianggang*/n *zu*/n *bing*/n (香港/n 足 n/病/n, 'Hongkong/n feet/n disease/n')
4	AN	37	9%	*gan*/a *huoluan*/n (干/a 霍乱/n, 'dry/a cholera/n')
5	NV	19	5%	*wei*/n *kuilan*/v (胃/n 溃烂/v, 'stomach/n fester/v')
6	NVN	12	3%	*fengchu*/n *yaoshang*/v *zheng*/n (疯畜/n 咬伤/v 症/n, ' rabid/n bite/v disease/n')
7	NAN	11	3%	*yuejing*/n *guoduo*/n *zheng*/n (月经/n 过多/a 症/n, 'menstruation/n excessive/a disease/n')
8	NNNN	9	2%	*neizang*/n Leishman/n *yuanchong*/n *zheng*/n (内脏/n Leishman/n 原虫/n 病/n, 'organ/n/Leishman/n/worm/n/disease/n')
9	ANNN	7	2%	*xiantianxing*/n *hongmo*/n *yise*/n *zheng*/n (先天性/a 虹膜/n 异色/n 症/n, 'innate/a iris/n 10heterochrome/n disease/n')
10	AAN	6	2%	*xijunxing*/a *chi*/a *li*/n (细菌性/a 赤/a/痢/n, 'becterial/a red/a dysentery/n')
11	ANN	5	1%	*jixing*/a *wei*/n *yan*/n (急性/a 胃/n 炎/n, 'urgent/a stomach/n inflammation/n')
12	AANN	4	1%	*jixing*/a *danchunxing*/a *jiemo*/n *yan*/n (急性/a 单纯性/a 结膜/n 炎/n, 'urgente/a pure/a conjunctiva/n /inflammation/n')
13	VN	2	1%	*huigui*/v *re*/n (回归/v 热/n, 'return/v heat/n')
14	NNVN	2	1%	*bingzhong*/n *weishengsu*/n *quefa*/v *zheng*/n (丙种/n 维生素

				/n 缺乏/v 症/n, ‘C/n vitamin/n lack/n disease/n’)
15	NANV	2	0%	*ertong*/n *jixing*/a *yapian*/n *zhongdu*/v (儿童/n 急性/a 雅片/n 中毒/v, ‘child/n urgent/a opium/n be poisoned/v’)
16	AAANNN	1	0%	*xiaoxibaoxing*/a *suiyang*/a/ *jingyuan*/n *xibao*/n *ai*/n (小细胞性/a 髓样/a 精原/n 细胞/n 癌/n, ‘parvicellular/a myeloid/a gonoplasm/n cell/n cancer/n’)
17	ANVN	1	0%	*chuanranxing*/a *danheqiu*/n *zengduo*/v *bing*/n (传染性/a 单核球/n 增多/v 病/n, ‘contagious/a monocyte/n increase/v disease/n’)

Table 4.4: POS patterns of polylexical terms (1915-1949)

During the specified period, polylexical terms in disease names typically consisted of two to three words, while disease names with more than four words were relatively rare. The prototypical part of speech for a disease name is a noun, resulting in most disease terms having a noun as the headword. However, it is worth noting that there are 21 disease terms in Chinese where the headword is a verb (see types 5 and 15 in Table 4.4).

With the diverse range of patterns identified, we can determine the most prominent constituent patterns in disease names:

1) Approximately 78% of the disease terms exhibit patterns such as NN, ANN, NNN, and AN, which can be categorized as a modifier-headword pattern.

2) Patterns like NV and NANV, accounting for 5% of the database, are not typical disease name patterns. In the Chinese language, certain words can function as different parts of speech in distinct contexts, referred to as *concurrent words*. When expressing disease names, these verbs are transformed into nouns to serve as the headwords.

3) Patterns like NAN and NVN incorporate a subject-predicate structure within the modifier-headword pattern.

Furthermore, it is notable that a significant number of Chinese disease terms end with

a noun related to diseases. This marker word signifies that the lexical unit represents the disease and indicates the genre or category of the disease.

1.2.3. Marker words of disease

Based on our analysis of compound terminological units, we have observed the presence of fixed morphemes that serve as markers to indicate that the terms refer to diseases. Polylexical terms can be categorized into two groups: terms with a marker word that explicitly indicates the disease name, and terms without a marker word. Out of the 386 terms that end with a noun in the modifier-headword pattern, 267 of them (accounting for 69.2% of the terms in this pattern and 65% of the entire database) have marker words associated with diseases.

Terms with a marker word are relatively easier to detect and segment from the corpus and article titles. Diseases names in English often include marker words such as *-itis* or *cancer*, etc. In our database covering the period from 1915 to 1949, we have identified nine explicit marker words for diseases in Chinese: *yan* (炎, 'inflammation'), *bing* or *ji* (病 or 疾, 'disease'), *zheng* (症, 'symptom'), *tong* (痛, 'pain'), *ai* (癌, 'cancer'), *zhong* (肿, 'swelling'), *qi* or *shi* (碛 or 石, 'calculus'), *yang* (疡, 'ulcer') and *yi* (疫, 'epidemic'). Each of these marker words forms a cluster of terms, where the members of the cluster can be identified as hyponyms of a hypernym. The presence of marker words contributes to the semantic transparency of medical terms, and this tradition of using XX-marker words is still maintained in modern disease formation. Table 4.5 lists the disease markers in this period and we also calculate the frequency in the database.

	Marker words	English	# of terms	% in the terms with a marker word	Example
1	*yan* (炎)	Inflammation	77	28%	*zhogner yan* (中耳炎)
2	*bing/ji* (病/疾)	Disease	73	27%	*tangniao bing* (糖尿病)， *nve ji* (疟疾)

3	*zheng* (症)	Symptom	50	18%	*lao zheng* (痨症)
4	*zhong* (肿)	Swell	19	7%	*putao zhong* (葡萄肿)
5	*ai* (癌)	Cancer	13	4%	*shiguan ai* (食管癌)
6	*yang* (疡)	Ulcer	11	4%	*shi'erzhichang kuiyang* (十二指肠溃疡)
7	*tong* (痛)	Pain	10	4%	*sanchashenjing tong* (三叉神经痛)
8	*jieshi* (结石)、*qi* (碛), *shi* (石)	Calculus	8	3%	*neishen qi* (内肾碛), *niao jieshi* (尿结石) *guang shi* (胱石)
9	*yi* (疫)	Epidemic	6	2%	*shu yi* (鼠疫)

Table 4.5: Disease markers in the database (1915-1949) and their frequency

The following descriptions include the literal translations of each marker word and their significance in medical terminology.

1. The marker word *yan* (炎) corresponds to inflammation or *-itis* in English.
2. The marker word *bing* (病) or *ji* (疾) in English corresponds to *-ia*, *-osis*, *-pathy*, *pathia*, *disease*, or *disorder*. It is the most common and obvious marker word used to indicate a disease term.
3. The marker word *zheng* (症) means 'symptom', and when used at the end of a term, it signifies 'the symptom of XX'.
4. The marker word *zhong* (肿) refers to a visible bump or swelling.
5. The marker word *ai* (癌) is equivalent to *-oma* in English. The term *ai* is composed of the grapheme 嵒, meaning 'rock or stone' and the radical of disease. It was adopted to refer to 'cancer' in the late 19th and early 20th centuries and was included in the *Zhonghua Dazidian* (中华大字典, 'Great Dictionary of China') in 1915.
6. The marker word *yang* (疡) has its origins in the ancient Chinese text *Zhou li* • *Yishi* (周礼•医师, 'Rites of Zhou'), which dates back to the middle of the 2nd century BC. The *yang* is an archaic word in Chinese that refers to 'injury'. Its equivalent in English is *ulcer*, which denotes a 'sore' in etymology.
7. The marker word *tong* (痛) signifies 'pain' in English. It is a common perceptible sensation and symptom experienced when there are pathological

changes in the body.

8. The marker word *qi* (碛) is an ancient term for ‘stone’. Its variants in Chinese, *shi* (石, ‘stone’) and *jieshi* (结石, ‘accumulated stone’), are used to refer to calculus.
9. The marker word *yi* (疫) means ‘epidemic’, indicating that the disease affects the entire population.

Previous scholars believed that these marker words function as affixes, based on the structural correspondence between Chinese and English. Zhao Yuanren (1979) referred to them as *newly affixed words*, while Lu Zhiwei (1957) and Masini (1993) regarded them as *affix-like word formations*. Liu Lifen (2015) considered words with marker words as *derivative terms*. The corresponding structure between Chinese and English words, as asserted by these studies, is presented in Table 4.6.

Chinese marker words	English equivalent	Example
-liu (瘤, ‘swelling, tumor’)	*-oma*	*xueguanrouliu* (血管肉瘤, ‘hemangiosarcoma’)
-yan (炎, ‘inflammation’)	*-itis*	*weiyan* (胃炎, ‘gastritis’)

Table 4.6: Comparison of Chinese morpheme and the English suffix (adapted from the study of Liu Lifen, 2015)

Based on Table 4.6, the marker words appear to structurally correspond to affixes in English. However, we question these previous studies that rely on direct and graphic comparisons between Chinese and English. We believe that the analysis of medical terminology should consider both the English and Chinese languages. In the following, we present the reasons for our skepticism.

Firstly, medical terms in English containing suffixes like *-oma* and *-itis* are neoclassical compound words. These terms rely on approximately a thousand Greek and Latin stems and 80 related affixes that constitute the majority of the medical vocabulary. It is important to note that *-oma* and *-itis* are not standalone affixes attached to a word stem. Instead, they are Latin or Greek roots. These compounds are composed of elements derived from classical Latin and ancient Greek roots, which provide fixed meanings. Therefore, it is incorrect to categorize these English terms as

derived terms rather than compound terms.

Secondly, disease names in Chinese that include marker words are compound words. Unlike most Indo-European languages, Chinese is an isolating language in terms of morphology. It has a high ratio of morphemes per word, and there are no inflectional morphological changes. Thus, it is challenging to visually distinguish between a stem and an affix in Chinese. If a morpheme holds a notional significance and can be used independently without depending on another stem, it is considered a stem. Otherwise, it is an affix. In other words, an affix in a derivative word does not possess lexical function or independent meaning. In the case of medical terminology, the marker words in Chinese carry substantial meaning and classify the genres of disease terms, as we have previously presented. Therefore, the marker words in Chinese are stems, and the terms with marker words are compound words.

Thirdly, the quasi-affix cannot be the overarching conceptual rationale for their derivations (Shen Guanghao, 2011, 2015). This further confirms our assertion that terms with marker words are not derived. In Chinese medical terms, these markers of disease serve as determinants with superordinate meanings, while the morphemes preceding the marker words function as modifiers. This forms endocentric compounds following a modifier-headword pattern.

In conclusion, the analysis of the disease names in this database reveals that polylexical terms following a modifier-head pattern are predominant. Approximately 69.2% of the terms in this period include a marker word indicating the genre of the disease. The Chinese disease marker words exhibit distinctive morphological features:

1) Chinese marker words are more independent in terms of morphology, as we have discussed above.
2) Disease marker words in Chinese are Chinese patrimonial morphemes found in both classical and modern lexical units. In contrast, their English equivalents originate from neoclassical sources in Latin or Greek. As a result, Chinese terms tend to be more semantically transparent for Chinese users, while the Greek and Latin stems used in English are often more semantically opaque for English users.

Moving forward, our analysis will focus on examining the morphological formation of Western medical disease terms in China.

1.3. Terminological formation

Western medicine was introduced to China by medical missionaries, alongside the preexisting traditional Chinese medicine. Early practitioners of Western medicine faced terminological challenges due to the lack of equivalents in the Chinese language. The formation of Western medical terms involved a process of adopting, adapting, or creating terms specific to Western medicine. The lexical mechanism can result in both effective and inadequate formations, stemming from either non-existent null elements or the adoption of existing lexical resources.

Cabré (1999) stated that term creation follows certain regular patterns, and term formation strategies are universal. According to Sager (1997), the creation of new designations is accomplished through the utilization of existing resources, modification of existing resources, and the creation of new linguistic entities. In the Chinese context, we categorize the disease terms of Western medicine in our database into two groups: terminological neologisms and adopted traditional Chinese medical terms. In this section, we focus on the disease terms from the database (1915-1949) and analyze the morphological resources and mechanisms of Western medicine terminology formation in China by examining the morphological characteristics of disease names.

1) The terminological neologisms

In the context of terminological neologisms, loanwords serve as the first resource for incorporating new terms into a language. Based on the proposed theoretical framework, **loanwords** can be categorized in the database as follows:

A. Phonetic loans: These are loanwords where the phonetic characteristics of the source words are transcribed into the target language. In other words, the

pronunciation of the borrowed word is adapted to fit the phonetic system of the target language. This adaptation helps ensure that the loanword is pronounced in a way that is familiar to the speakers of the target language.

B. Graphic loans: These refer to direct loanwords that are borrowed without any adaptation. In this case, the written form of the borrowed word remains unchanged when it is incorporated into the target language. Graphic loans are typically used when the borrowing language has a writing system that can accommodate the borrowed word without significant modifications.

Another resource for neologisms is the process of creating **new compounds**. Compound words can be formed using entirely native (patrimonial) elements or by incorporating loanwords partially. In terms of morphological structure, compounding is known to be the most productive method for creating new words in Chinese (Huang Borong & Liao Xudong, 1991). Compounding involves combining existing lexical units (morphemes) within the language according to specific morphological rules.

Compounds are generated within the lexical component of the language and contribute to word formation. This means that compound words are created by combining morphemes in accordance with the morphological rules of the language. By utilizing this lexical resource, new terms can be coined to represent concepts or ideas in a precise and efficient manner. Estopà (2010 b) highlighted the concept of *patrimonial composition* in Catalan as a neologism formed by heritage composition or also a proper word when it has been created from two Catalan lexemes[15]. Thus, if a disease name in Western medicine is formed by combining multiple patrimonial Chinese lexemes, it can be classified as a patrimonial composition. This means that the constituents of the compound terminological unit are native Chinese lexemes that are combined to create a new term.

The motivation behind the selection of the constituents in compound terminological units can indeed be influenced by the source terms or concepts being translated. If a

[15] Translated from *"un neologisme és format per composició patrimonial o també dita pròpia quan s'hagi creat a partir de dos lexemes catalans."*(Estopà, 2010:125)

new term in Chinese has a semantic correspondence or equivalence to an equivalent term in another language, it can be considered a calque.

2) The adopted traditional Chinese medicine terms

Apart from loanwords and compounds, another resource for proposing a term for Western medicine in China is the adoption of a traditional Chinese medical (TCM) term to refer to the same concept.

By examining the terminological units within the database, we can observe the morphological patterns and mechanisms in shaping disease terminology during this specific timeframe. Analyzing these mechanisms sheds light on the linguistic processes and influences involved in naming diseases within the context of Western medicine in China.

To gain insights into the morphological mechanisms employed in creating disease names within the field of Western medicine in China between the years 1915 and 1949, we present the findings in Table 4.7. The information contained in Table 4.7 is a result from a comprehensive analysis of the strategies employed in naming diseases, providing valuable insights into the evolution and development of medical terminology during this particular historical period.

Mechanism			#	%	Example
Neologism (289)	loanwords (16)	phonetic loans	6	1.4	*xisituili* (希司忒利, 'hysteria') *heniya* (赫尼亚, 'hernia')
		graphic loans (adopted directly from Japanese term)	10	2.4	*shuijingti zhi Tuoluo* (水晶体之脱臼, 'lens luxation') *baisidu* (百斯笃, 'plague'); *yangchongbing* (恙虫病, 'scrub typhus')
	compound words	partial loans	82	20.1	*hexiesijishi bing* (何偕斯基(Aujeszky)氏病, 'Aujeszky's disease')

					dididi zhongdu (DDT 中毒, 'DDT poisoning') *feiyan shuyi* (肺炎鼠疫, 'pneumonic plague') *xiaowudao bing* (小舞蹈病, 'rheumatic chorea') *kataxingjiemoyan* (卡他性结膜炎, 'catarrhal conjunctivitis')
		calque	91	22.3	**Lexical calque:** *jixing mimanxing xizhiqiguanyan* (急性弥漫性细支气管炎, 'acute diffuse bronchiolitis') *jixing jianzhiyan* (急性间质炎, 'acute interstitial pneumonia') *laoshiyan* (老视眼, 'presbyopia') **Semantic calque:** *yan* (炎, '*-itis*') *shanghan* (伤寒, 'hyphoid') a semantically modified TCM term by the Japanese influence
		partial calque	78	20.1	**calque + patrimonial morpheme** *lin bing* (淋病, 'gonorrhea') *putao zhong* (葡萄肿, 'staphyloma')
		patrimonial composition	22	5.4	*shuidichenxiangbing* (水底沉箱病, 'Decompression sickness')
Adoption of TCM terms (118)			118	28.9	*furezheng* (瘕热症, ''febrile disease) *shuixie* (水泄, 'diarrhea') *shan* (疝, 'hernia') *zhibing* (瘈病, 'Rabies') *baihou* (白喉, 'diphtheria')

Table 4.7: Morphological mechanisms of the disease names (1915-1949)

Table 4.7 illustrates that the resources used for 407 disease names of Western medicine in China between 1915 and 1949 can be categorized into neologisms and adopted Traditional Chinese Medicine (TCM) terms. **Approximately 71.1% of disease terms are neologisms, while 28.9% are adopted traditional Chinese medical terms.** This indicates that more than half of the Western medical terms were newly created rather than being borrowed from existing Chinese medical terminology.

The patterns of new word formation vary in proportion. There are 16 terms that are loanwords, with 1.4% being phonetic loanwords and 2.4% being graphic loanwords. The majority, 94.6%, are compound terms, consisting of 20.1% partial loans, 22.3% calques, 20.1% partial calques, and 5.4% patrimonial compounds. In the following sections, we will provide specific examples of how these mechanisms are applied within the Chinese language to create disease terms.

1.3.1. Neological terms

When new concepts or ideas enter a culture, speakers often seek ways to create new words to express these novel notions. As mentioned at the beginning of this section, the incorporation of neologisms can involve various processes, such as borrowing loanwords or forming newly compounded words.

1.3.1.1. Loanwords

Within the Chinese context of Western Medical disease terms, loanwords are classified into two types: phonetic loans and graphic loans.

A. Phonetic loans

Phonetic loans involve modifying the prosody of a word from the source language to fit the target language. Davis et al. (2012) conducted a survey on various loanword prosody adaptation strategies in East Asian languages, focusing on Western (English) loans. In Chinese, phonetic loanwords are created through homophonic translation, where Chinese characters with similar prosodic features are chosen to transcribe the Western term (Yang Xipeng, 2007). Instead of maintaining the semantic connection between the source and target languages, phonetic loan terms serve as phonetic transcriptions of foreign terms into the target language. However, Chinese is not a phonogram-based language, and the transcription of foreign words cannot be directly converted into Chinese phonetics on a one-to-one basis.

In English-Chinese loanwords, each Chinese character represents a syllable in the English equivalent. For example, the term *cholera* is loaned into Chinese as *huliela*

(虎列剌). The English term *cholera* has three syllables, so the Chinese transliteration consists of three characters. Literally, these three characters mean 'tiger-column-cut', which poses a challenge for Chinese users to understand. Only those familiar with the pronunciation of *huliela* would recognize it as referring to *cholera*. Non-specialists may be able to read the term but would struggle to identify the corresponding disease. Chinese phonetic loanwords depend on the phonetics of English terms while maintaining independence in terms of morphology and meaning.

During 1915 to 1949, phonetic loaned terms accounted for only 1.4% of the total. According to explanations provided in the articles of the corpus, the origin of these transliterations was influenced by Japan. This mechanism deviates from the general rules of Chinese grammar and lexicon. The lack of semantic transparency poses challenges for understanding and dissemination, which explains why these terms are no longer found in contemporary Western medical terminology in Chinese.

B. Graphic loans

Graphic loans are words that are directly borrowed from other languages in form and meaning without any adaptation. The graphic loanwords from Japanese have played a significant role in the formation of modern Chinese language during 1915 to 1949.

China and Japan have had historical connections dating back to the Eastern Han Dynasty (25-220 AD). In ancient times, cultural exchanges between China and Japan were mostly one-way, with influence flowing from China to Japan. In Japan and other countries where Chinese characters were used, proper nouns were predominantly composed of Chinese characters.

However, words introduced from Japan did not enter the Chinese language until the modern era, beginning around 1840. During this period, China translated Western works independently while also borrowing vocabulary from Japan, which had already translated Western terms into kanji. This process of borrowing Japanese terms into Chinese terminology is referred to as *graphic loans* or *return loans* (Shi Youwei, 2000; Shen Guowei, 2010). The shared logographic writing system between the Japanese

language and Chinese characters enables direct borrowing. Additionally, modern Japanese also incorporated numerous new Chinese words through Chinese books and English-Chinese dictionaries, indicating a continuous circulation of vocabulary.

Loanwords from Japanese can be classified into two situations: Japanese-made Chinese words (*Wasei-kango*) and ancient Chinese general words that were terminologicalized through Japanese influence.

1) Japanese-made Chinese (*Wasei-kango*)

Japanese-made Chinese are those words in the Japanese language composed of Chinese morphemes but invented in Japan[16]. Before being adopted by the Chinese, the terms in Japanese underwent various neological mechanisms.

a. Japanese phonetic loans from Western languages

The article "*Yixue Mingci Yijianshu*" (医学名词意见书, 'Opinion on the Medical Terms') in 1916 from our corpus mentioned that the term *baisidu* (百斯笃, 'plague') is borrowed from Japanese and is a phonetic loanword from the source term *peste* to Japanese.

b. Japanese compounds through semantic imitation of terms in Western languages

The disease name *xinghongre* (猩红热, 'scarlet fever') is translated from English to Japanese. The Japanese term is legible and semantically transparent for Chinese readers. The other three loaned terms from Japanese are *niangmujunbing* (酿母菌病, 'blastomycosis'), *jiazhuangxianzhong* (甲状腺肿, 'goiter') and *shuijingtizhituojiu* (水晶体之脱臼, 'lens luxation'). They are all first coined as calques in Japan and then transmitted to China.

2) Returned Chinese general words that are terminologicalized by Japanese

[16] https://en.wikipedia.org/wiki/Wasei-kango

The Japanese vocabulary borrowed a general-used word from Chinese vocabulary, and applied it to name the disease. The word *yangchong* (恙虫，'pathological worm') in the graphic loaned term *yangchongbing* (恙虫病, 'tsutsugamishi') was a word for general purpose in ancient Chinese, referring to a poisonous bug (*Fengsu Tong*[17] said: "*yang*, a poisonous insect, likes to hurt people.") (Reference: https://baike.baidu.com/item/%E6%81%99%E8%99%AB/8733726). This word was imported to Japan where the Japanese adopted it as part of the disease name, and then the term was exported back to China. Therefore, the borrowed Chinese word underwent terminologicalization in Japan before returning to China.

In particular, Japanese scholars initially established certain terms that were originally Chinese words as equivalents of specific Western words. These terms were then adopted by Western medical terminology in China, and they are read using the Chinese characters' pronunciation instead of the original Japanese pronunciation. Such loans do not fit into the conventional classification of loans between Western languages, and research on loanword theory generally overlooks them.

Determining a graphic loan from Japan is not easy, as it requires information from articles and further historical research. In comparison to anatomical terminology, this mechanism is not commonly applied to disease terms.

1.3.1.2. New compound words

A. Partial loans
B. Calques
C. Partial calque
D. Patrimonial compounds

Composition is a process of term formation that which two or more free morphemes

[17] *Fengsu Tongyi* (風俗通義; ' Comprehensive Meaning of Customs and Mores'), also known as *Fengsu Tong*, is a book written about 195 AD. The translated sentence originates from《风俗通》曰："恙，毒虫也，喜伤人。"

combine to form a new term. According to Sager (1990), compounding a new term is coined/formed by combining existing words or independent terms. He emphasizes that the patrimonial lexical resource is essential for neological compounds. In the database from 1915 to 1949, 94.6% of the terminological neologisms are compound terms.

Terms formed through the composition mechanism are polylexical terms. While it is easier to detect compound terminological units in Indo-European languages where spaces can be used to mark the separation of compound elements, it is harder in Chinese due to the absence of spaces between characters and words. Additionally, there can be ambiguity in distinguishing morphemes and lexemes in the Chinese language. Hence, it is not easy to differentiate between compound words and phrases because of the multi-character nature of morphological appearances (Wang Hongjun, 1994), and the existence of conversions between words and phrases (Xiong Zhongru, 2010). In our thesis, we consider compound terms in Chinese to include all terminological units that have more than one patrimonial morpheme. Based on the degree of dependency on the source terms, compounds can be grouped into **A) Partial loans**; **B) Calques**; **C) Patial calque; and D) Patrimonial compounds**.

A. Partial loans

Partial loans are typically composed of a loanword and a Chinese patrimonial morpheme. In partial loans, the borrowed morphemes can be either phonetic or graphic loanwords, while the Chinese patrimonial morphemes often denote marker words for diseases or symptoms.

1) Phonetic/graphic loanwords+Chinese marker word of disease

Five partial loaned terms with the Chinese marker word of disease *bing* are found in the database during 1915 to 1949 (See Table 4.8).

Loanword		Chinese terms	Note
English graphic		Kaschin-Beck 氏病 /	*shi*（氏，surname), *bing*（病，

loanword	+Chinese marker word of disease *bing*	K.B 氏病	disease)
Japanese graphic loanword		小口氏病	小口 is the discoverer of this disease. *shi* (氏, surname), *bing* (病, disease)
Phonetic loanwords		*peigelabing* (陪格拉病)	'pellagra' (named after the symptom)
		yasibing (雅司病)	'yaws' (named after the symptom)
		amibabing (阿米巴病)	'amebiasis' (named after the pathogen)

Table 4.8: Partial compounds with loanwords and Chinese marker words of disease

Table 4.8 displays five compound terms following the pattern of graphic/phonetic loanwords + Chinese disease marker word. The Chinese marker word *bing* (病, 'disease') indicates that the terms are disease names.

The graphic loanwords in partial loaned terms mostly consist of eponyms. The English graphic loans within Chinese terms may appear foreign in the Chinese language, whereas the Japanese graphic loanwords assimilate to the Chinese language. The presence of *shi* (氏, 'surname') in Chinese terms indicates the eponymous feature of the disease names.

The phonetic loanwords are written using Chinese characters with similar pronunciations. The transcription of phonetic loanwords is not 100% faithful. For example, the term *peigela* only transcribes /pe/ /g/ /ra/ from *pellagra*. Although the appearance of these terms is more familiar to Chinese users, the semantics cannot be fully understood by simply reading the phonetic loaned terms. Without the Chinese marker words, it would be difficult to determine that these terms refer to diseases.

2) Phonetic/graphic loanword + Chinese morpheme(s) of symptom:

These partial loans consist of a phonetic or graphic loanword and a Chinese morpheme that indicates the symptom of the disease. Table 4.9 presents three

examples of this pattern.

Morphemic mechanism	Chinese terms	Literal meaning	English equivalent
phonetic loanword+Chinese morpheme	*denggere* (登革热)	*deng ge* heat	dengue
Chinese morpheme+graphic loanword	*fazhenzhifusi* (发疹窒扶斯)	rash *zhi fu si*	typhus fever
graphic loanword+Chinese morpheme	*diditizhongdu* (DDT 中毒)	DDT poisoning	DDT (Dichlorodiphenyltrichloroet -hane) Toxic

Table 4.9: Partial compound terms with loanwords and Chinese morpheme of symptoms

According to Table 4.9, The term *denggere* (登革热) consists two words in the Chinese term. The word *dengge* (登革) is a phonetic loan from *dengue*, and *re* (热, 'heat') refers to this tropical fever's notable symptoms. The Chinese patrimonial morpheme *zheng* indicating symptom is placed after the phonetic loanword.

The term *fazhenzhifusi* (发疹窒扶斯) is composed of two words. The word *fazhen* (发疹, 'rash') represents the symptom of the disease, and *zhifusi* (窒扶斯) is a graphic loan from Japanese that refers to *typhus* in English. The Chinese patrimonial morpheme is positioned before the graphic loanword.

The term *diditizhongdu* (DDT 中毒) is formed by a graphic loan from English acronym *DDT*, and it is the only graphic from English in this period. The Chinese morpheme *zhongdu* (中毒, 'poisoning') denotes the effect. The Chinese patrimonial morpheme is placed after the English graphic loanword.

In these partial loaning patterns, the loaned parts of the terms are not fully accessible to Chinese users semantically. The only semanitcally transparent morpheme is the patrimonial morpheme which indicates the category of diseases or expresses the symptoms of the diseases.

B. Calque

Compound terms motivated by calque depend on the semantic influence of the source term. Haugen (1950) stated that calques are not merely direct imitations but are secondarily created in the target language.

By utilizing calques, the semantic meaning and structure of the source term are preserved in the target language, facilitating direct correspondence between the two. This approach can help ensure accurate and precise communication of medical concepts and terminology across different languages and cultures. In this period, we observe that 22.3% of the disease names are calques. In the case of Western medical terms in China, calques are influenced by Japanese or Western languages, especially English. We adopt Capuz (1998)'s classification of calques, specifically lexical calques and semantic calques, to discuss the calque mechanism during this period. In the Chinese terminology corpus from 1915 to 1949, we observed both of these situations, as well as a combination of the two types of calques.

1) Lexical Calque

Lexical calques create new lexical units through the literal semantic translation and replication of the structure of the source word and this mechanism is the major method to create calques in Western medical context in China during 1915 to 1949.

For instance, the coinage process of the terminological pattern *xx+yan* is a lexical calque from English terms with the pattern *xx-itis*. In English, the hyponyms of inflammation are terms composed of a morpheme representing a body part and the root *-itis* in etymology, such as *rhinitis* (nose inflammation), *hepatitis* (liver inflammation), and so on. Modifiers can precede the neoclassical compound word to form a polylexical term that denotes additional characteristics, such as *allergic rhinitis*. The Chinese terms follow this semantic structure of their English equivalents by conducting a mostly one-on-one translation of each morpheme. The Chinese terms formed through this mechanism appear as *xx+yan* to enrich Western medical terminology in China. The 77 terms with the structure *xx+yan* in the database are lexical calques. Table 4.10 provides an example term following this pattern.

Terminological pattern	Example	Literal meaning	English equivalent
(body part) + *yan*	*lanweiyan* (阑尾炎, 'ending tail inflammation')	Appendix inflammation	appendicitis

Table 4.10: An example of pattern XX+ yan ('inflammation')

The Chinese pattern (body part) + *yan* follows the English semantic structure (body part) +-*itis*. The English term *appendicitis* in Table 4.10 is a neoclassical compound word with two morphemes: 'appendix' and 'inflammation'. Similarly, the Chinese term is also a compound word that maintains the same semantic and structural characteristics as its English equivalent, but with the words *lanwei* (appendix) and *yan* (inflammation).

Other terms coined through the mechanism of calque are disease names with the pattern of xx + *ai* (癌, 'cancer'). Table 4.11 shows some examples of this pattern.

Morphemic pattern	Chinese terms	Literal meaning	English terms
body part + *ai* (癌, 'cancer') or *aizhong* (癌肿, 'cancer')	*feibuzhiaizhong*(肺部之癌肿)	'lung's cancer'	lung cancer
	shiguanai (食管癌)	'food tube cancer'	esophageal cancer
	nvyinai (女阴癌)	'female shadow cancer'	carcinoma of the vulva
	zigongai (子宫癌)	'kid palace cancer'	endometrial carcinoma

Table 4.11: Terms of calque with patterns of XX + marker words (*ai*)

This pattern indicates different types of cancers. The semantic structure of the terms in Chinese is similar to their English equivalents. In English, terms indicating cancer typically include the word *cancer* or the neoclassical morpheme -*oma*. In Chinese, the marker word *ai* is an independent word meaning 'cancer'.

Regarding the modifier of *ai*, the nature of cancer's nomenclature restricts the preceding part of *ai* to be a noun, indicating a body part such as inner organs. When compared to the etymology of terms in both languages, the Chinese terms follow the

naming convention of the English terms, and although they exhibit strong semantic dependency on the source terms, the morphemes representing body parts in Chinese are words of general purpose and are semantically transparent for Chinese users.

2) Semantic calque by the influence of Western language

Semantic calques modify the meaning of an existing lexical unit due to the influence of the source language. In the disease names, Western medicine modifies the meaning of some word that was already in existence in traditional Chinese medicine into a modern medical term. The marker words in the examples of lexical calques mentioned above underwent a semantic calque mechanism during the period from 1915 to 1949.

The semantic conversion of the existing word *yan* (炎) is the result of semantic calque from English. The earliest use of *yan* as a medical term was after the Song Dynasty as a similar word for *huo* (火, 'fire'), which referred to the symptoms of redness, swelling, and pain in the body. The English neoclassic morpheme *-itis* refers to a complex biological response of body tissues to harmful stimuli. In traditional Chinese medicine, *re* (热, 'heat') is generally used to refer to *inflammation* in Western medicine concepts (Sun Zhuo, 2010). That *yan* began to appear as the equivalent of *inflammation* was from Benjamin Hubson's translation of *Xiy*i *Lvelun* (西医略论, A Brief Introduction to Western Medicine) that was published in 1857 (Chen Wancheng, Luo Wanwei, and Kuang Yongheng, 2010). Based on the morpheme of *inflame* ('fire') in the word *inflammation*, Hubson adopted the Chinese word *yan* with a fire radical *huo* (火) to refer to this English term. Since then, *yan* has been adopted as a new term to represent a microbial infection in organs, which corresponds to *inflammation* in Western medicine.

The introduction of Western medical technology has endowed the term with its modern meaning. In traditional Chinese medicine, there was a similar concept of *cancer* written as *yan* (岩), and *ai* (癌) appears as a variant of this term. The uage of *ai* in TCM was based on intuition and was only applied when cancer occurred on the surface of the body. However, with the advancements in Western medical technology,

cancer is now recognized as a disease that can be diagnosed within the body through medical techniques (Reference: https://www.jendow.com.tw/wiki/岩/中医学术语). Therein, the marker word *ai* also experiences a modification in semantics due to Western medicine.

3) Chinese terms with a semantic change by influence from Japanese

The influence between Chinese and Japanese is bidirectional. Many Chinese words have undergone changes in meaning after entering Japan and then re-entering China as loanwords, resulting in semantic changes to the original Chinese words.

In the article "*Yixue Mingci Yijianshu*" (医学名词意见书, 'Opinion on the Medical Terms') of our corpus, *houfeng* (喉风) refers to 'diphtheria', a serious infection caused by strains of bacteria called Corynebacterium diphtheria that produce toxins. It can lead to difficulties in breathing, heart failure, paralysis, and even death. The article indicates that this term is derived from a Japanese translation. However, in traditional Chinese medicine, the term *houfeng* in traditional Chinese medicine refers to 'laryngeal disease' (Shen Shanqian, 1847)[18]. Therefore, the loanword from Japan changed the meaning of the existing term and then adopted by modern medicine in China.

Four other terms are determined to be semantic calques: *shanghan* (伤寒) and *wenre* (瘟热) are indicated in the texts of our corpus that they are adopted from Japanese. *Jiehe* (结核) and *yemang* (夜盲) are recorded as calques from Japan according to the dictionary by Gao Mingkai and Liu Zhengtan (1958) and Wang Mindong (2006) confirmed the history resource of the term *jiehe*.

The smiliarity between Chinese and Japanese characters makes it challenging to detect this mechanism, and we can only identify these Chinese words with Japanese-modified meanings by consulting medical texts and dictionaries.

If we do not study the transmission path of these terminological units, we might

[18] Translated from 《喉科心法》卷上：考古称喉症，总其名曰喉风。

mistakenly believe that these terms represent semantic evolutions within TCM terminology itself. However, the process of semantic change actually takes place in the Japanese language. From the perspective of China, the semantic change of original TCM terms are motivated by Japanese. This mechanism is often overlooked in the study of calques in Chinese due to its occurrence in a small amount of TCM vocabulary and the difficulty in detecting them.

In this part, we introduce compound disease names that rely on the semantic structure of the source terms. The Chinese terms take on the meanings of their English equivalents and utilize commonly used lexical items to create Chinese terms. As a result, these Chinese terms are often more transparent and accessible to the general public compared to the neoclassical disease names in English, especially for native English speakers without specialized medical knowledge. The adoption of familiar lexical items helps bridge the understanding gap and facilitates communication about diseases and medical conditions in Chinese.

C. Partial calque

In the pattern of calque + Chinese patrimonial marker word, the Chinese marker words can be *bing*, *kuiyang*, and *zhong*, among others, which indicate disease or symptoms. These marker words serve as headwords in the terms. The modifier of these disease names is a calque from foreign languages. Table 4.12 presents 10 Chinese terms from the database of calque + Chinese patrimonial marker words, along with their literal meaning and the corresponding English equivalents with etymology.

#	Chinese terms calque+patrimonial morpheme	Literal meaning	English equivalents (etymology)
1	*lin**bing*** (淋**病**)	shower **disease**	gonorrhea (‘flow’)
2	*xuexichong**bing*** (血吸虫**病**)	blood suck worm **disease**	schistosomiasis (‘split’ ‘body’)
3	*sizhuangchong**bing*** (丝状虫**病**)	silk form worm **disease**	filariasis (‘thread’)
4	*xiluoxuanti**bing***	slim spin **disease**	leptospirosis (‘thin’ ’spira’)

	(细螺旋体**病**)		
5	*tangniao**bing*** (糖尿**病**)	sugar pee **disease**	diabetes mellitus (Greek word *diabetes* 'siphon', Latin word *Mellitus* 'sweet')
6	*heire**bing*** (黑热**病**)	black heat **disease**	Kala Azar (*Kala* means 'black' in Sanskrit, *Azar* means 'fever' in Persian and Hindustani)
7	*jiaomoruanhua**bing*** (角膜软化**病**)	cornea soften **disease**	karatomalacia (*erato* 'cornea', *malacia* 'soften')
8	*shierzhichang**kuiyang*** (十二指肠**溃疡**)	twelve finger intestine **ulcer**	duodenal ulcer (the Medieval Latin *duodenum* digitorium is a loan-translation of Greek *dodekadaktylon*, means 'twelve fingers long')
9	*putao**zhong*** (葡萄**肿**)	grape **bump**	staphyloma ('a bunch of grapes' in Greek)
10	*maoli**zhong*** (麦粒**肿**)	wheat grain **bump**	hordeolum ('grain of barley')

Table 4.12: Calque + Chinese morpheme(s)

The comparison between the literal meaning of Chinese terms and the etymology of their equivalents demonstrates that the Chinese terms are created through morphemic translation from foreign languages. The first four disease names in Table 4.12 follow the pattern of pathogen + *bing* (病, 'disease'), where the name of the pathogen carries a complete semantic dependency on the source terms. The reason for calquing the pathogens is that the study of pathogens relied on modern technology and apparatus, which were new concepts in China. Therefore, naming the pathogens depended on original Western terms.

In addition to these pathogens, there are also other calque + Chinese morphemes that describe symptoms or body parts. These terms describing symptoms or body parts may appear familiar to Chinese users due to the general-purpose nature of lexical resources. The calque feature becomes harder to detect if we don't refer to the etymology of Western neoclassical terms. For example, the term *staphyloma* in English implies 'a bunch of grapes' in Greek. The Chinese name incorporates the semantics of the English term by using the commonly used word *putao* (葡萄, 'grape') to indicate the uveal tissue. The calque adopts the metaphor, transferring the fruit's

semantic meaning into a biological tissue in a medical context. The medical context activates its terminological function and brings about a semantic conversion.

D. Patrimonial composition

Patrimonial composition, or genuine composition, serves as a mechanism for creating neologisms within a language without foreign influence. It involves the composition of multiple native language lexemes. This mechanism allows for the creation of new terms using patrimonial morphemes, thereby abandoning dependence on foreign terms.

Within the disease names database from 1915 to 1949, the patrimonial compound terms account for approximately 5.4% of the disease names. Table 4.13 presents some representative examples of patrimonial compound terms from this database.

#	Chinese terms	Literal meaning	English equivalents
1	*shuidichenxiangbing* (水底沉箱病)	bottom of water drawn box disease	decompression sickness
2	*xianggangzubing* (香港足病)	Hongkong foot disease	athlete's foot
3	*heishuibing* (黑水病)	black water disease	cannot find any

Table 4.13: Patrimonial compound terms in Chinese

There are two situations in which patrimonial composition occurs in Chinese disease names. The first situation is when the terms exhibit graphic, phonetic, and semantic independence from their English equivalents. Examples of this situation can be seen in the terms *shuidichenxiangbing* and *xianggangzubing* listed in Table 4.13. In comparison to the English terms, the Chinese disease names have no direct connection or relation, indicating a substitution mechanism.

The second situation arises when no foreign language equivalents for disease names can be found. This is evident in the term *heishuibing* in Table 4.13, for which no equivalent term can be identified. It is possible that *heishuibing* represents an endemic disease specific to China.

There is also a possibility that newly created terms through the mechanism of patrimonial composition coincidentally align with the semantics of disease names in Western languages. In such cases, the mechanism of calque is attributed to this semantic alignment between the Chinese and Western disease names.

1.3.2. Adoption of TCM terms

Before the introduction of Western medicine, traditional Chinese medicine (TCM) held the predominant position in medical practice within China. Western and traditional Chinese medicine differ in their clinical mentalities, but the recognition of the existence of diseases is universal. In addition to creating neologisms, the rich vocabulary of TCM also serves as a valuable lexical resource for Western medical terminology.

In our database covering the period from 1915 to 1949, we found that 28.9% of the disease names in Western medicine were adopted from TCM. These adopted names exhibit certain characteristics and patterns.

1) Monolexical words

The term *zhi* and its English equivalent *hemorrhoid* demonstrate different denomination mechanisms. The term *zhi*（痔, hemorrhoid）can be traced back to its first appearance in the book *Shanhaijing* (山海经, '*Book of Mountain and Sea*') during the period of 1046-771 B.C. Its etymology suggests that *zhi* refers to a 'disease at the back', indicating the location of the ailment within the Chinese term.

On the other hand, the English term *hemorrhoids* were also known as *Saint Fiacre's curse* during medieval times. The term *hemorrhoid* first emerged in English in 1398 and is derived from the Old French word *emorroides*, which in turn originates from the Latin word *hæmorrhoida*. The Latin term is derived from the Greek word *αἱμορροΐς* (*haimorrhois*), where *αἷμα* (*haima*) means 'blood' and ῥόος (*rhoos*) means

'stream, flow, current'[19]. The English term is primarily based on the symptom associated with the condition.

In some cases, adopted TCM terms correspond semantically to their English counterparts. For instance, the term *qi* (碛, 'stone') refers to *calculus*, and its etymology in Latin means 'pebble or stone'. Interestingly, *qi* (碛) is an ancient Chinese character with the radical of *shi* (石, 'stone'), which conveys the meaning of 'a stone by the water' [20]. The semantic overlap between *qi* and *calculus* reveals in this case, that traditional Chinese medicine and Western medicine share a similar understanding of this particular disease.

2) Adoption of words for general purpose

The word *re* (热, 'heat') is a general-purpose word in Chinese, but within traditional Chinese medical terminology, it specifically refers to 'fever' or the symptom of an irregular high temperature. Table 4.14 shows the three adopted TCM disease terms that incorporate the term *re* in their names within the context of Western medicine.

Chinese term	literal meaning	English term
*zhang**re** zheng* (瘴热症)	malaria pestilential heat symptom	malaria Fever
*wen**re** zheng* (瘟热症)	pandemie heat symptom	typhus Fever
*chang**re** zheng* (肠热症)	intestine heat symptom	typhoid Fever

Table 4.14: TCM Terms with re (热, 'heat') in the context of Western medicine

Another significant morpheme in TCM is *feng* (风, 'wind'). Wind is one of the *liuyin* (六淫, 'six kinks')[21] in traditional Chinese medicine. For instance, the term *fengshi*（风湿，'wind and dampness'）exemplifies how ancient Chinese people understood the

[19] https://en.wikipedia.org/wiki/Hemorrhoid

[20] From shuo wen jie zi (说文解字): "水渚有石者。"

[21] *Six kinks* are terms the six elements of wind, cold, heat, dampness, dryness, and fire that originate from the outside world and cause physical illness. (translated from *Zhongyi jichu liluntu biaojie* (中医基础理论图表解) [Basic theory of Traditional Chinese Medicien] Zhou Xuesheng (周学胜). Beijing：Renmin Weisheng Chubanshe, 2000).

disease of rheumatism. They believed that rheumatism was caused by the influence of wind and dampness.

3) Colloquial and semantically transparent words

TCM terms often utilize colloquial and semantically transparent words as their morphemes. This can be attributed to the oral transmission of knowledge from teachers to students in the field of traditional Chinese medicine. Table 4.15 presents some representative examples of such colloquial and transparent words in TCM terminology.

Chinese terms	literal meaning	English terms	etymology
shayan (沙眼)	sand eye	trachoma	roughness
huoluan (霍乱)	squanders and be messy	cholera	bile, melancholy
bairike (百日咳)	hundred-day cough	pertussis	thoroughly cough

Table 4.15: semantic comparison of the TCM terms and their English equivalents

TCM disease names often exhibit a higher level of semantic transparency. These colloquial words such as *shayan* (sand eye) and *bairi* (hundred days) tend to focus on describing perceptible and external symptoms. Concretely, the word *huoluan* (霍乱) is a TCM term recorded as the abbreviation of "挥霍撩乱" (squanders and be messy) by Liu Wansu in 1186. The term highlights the visible symptoms of the disease. In contrast, its English equivalent refers to 'bile, melancholy', which is more abstract. This disparity indicates that traditional Chinese medicine lacks the support of modern diagnostic and treatment technologies. However, it also results in disease names that are more closely aligned with everyday life and easier for native users to comprehend.

Although TCM terminology integrated into the Western medical terminology system is generally intuitive and easily understandable, certain TCM terms with subjectively descriptive features are not officially included in Western disease terminology. In our database, we discovered five such TCM terms from 1916, each appearing only once (as shown in Table 4.16).

Chinese term	Literal meaning	English equivalent
shangyinweitong (伤淫胃痛)	hurt kink stomach pain	rheumatic gastritis
fengzhenweitong (风疹胃痛)	wind measles stomach pain	dermatitis gastritis
fubujiaotong（腹部疒痛）	abdomen twisted pain	acute abdominal pain
weifujiaotong (胃腹绞痛)	stomach abdomen twisted pain	colic
fujibantong (腹肌扳痛)	abdomen muscle pulled pain	cramp in abdominal muscles

Table 4.16: Obsolete disease terms with descriptive features

The five disease terms listed in Table 4.16 are extracted from the article "*Fubu jiaotong bianbie zhiyiban*" (腹部疒痛辨别之一般, 'General distinguish of acute abdominal pain') from 1916. The term *fubujiaotong* (腹部疒痛, 'stomachache') mentioned in the title serves as a hypernym encompassing various types of stomachaches. The other terms presented in the article are hyponyms with modifiers indicating the cause (*shangyin*, 伤淫, 'rheumatic'), transmission medium, and symptom (*fengzhen*, 风疹, 'wind measles'), as well as descriptive signs of the disease (*jiao*, 疒, 'twisted'*; ban*, 扳, 'cramp'). These descriptions may be too subjective for these disease names to be adopted within the context of Western medicine.

4) Metaphorical words

Conceptual metaphors involve a set of correspondences or mappings between a source domain and a target domain (Kövecses, 2017). Metaphor is deeply rooted in Chinese literature and is evident in cognition, poetics, and rhetoric. It not only serves as a rhetorical device but also reflects a way of thinking.

The meaning of metaphorical linguistic expressions relies heavily on cultural context. The term *hualiubing* (花柳病) in TCM may cause some misunderstandings for non-native speakers. *Hualiu* means 'flower and willow', and it is a veiled reference to a brothel in ancient Chinese. In TCM, the term *hualiubing* represents a venereal disease (VD) or a sexually transmitted disease. Chinese ancients believed that visiting brothels could lead to venereal disease, hence the term being denominated after a euphemism for the place where people became ill. Although this kind of disease has a

long historical record, scientific development was limited at the time, resulting in only mysterious prescriptions and few medical records. The term is still sometimes used when discussing VD, as this euphemism fulfills the communicative need for obfuscation when referring to such a socially stigmatized disease.

5) TCM terms that have been given new meanings by Western medicine

Some TCM words exist with different meanings in both TCM and Western medicine contexts. The polysemous feature of these terms has been activated by foreign disciplines.

In Chinese, *weihuangbing* (萎黄病) is a term in botany referring to withered and yellow plants. In TCM, it is adopted as a symptomatic description of spleen and stomach weakness. However, in a Western medical context, it refers to 'postpartum anemia', describing the emotional and physical state of patients suffering from this condition after childbirth.

Another term that has undergone semantic variation in Western medicine is *fengzhen* (风疹). *Fengzhen* is included in the International Disease Classification as the equivalent of *rubella*. It is a disease caused by the rubella virus and spreads through the air via infected individuals' coughs. The English terms are named after the pathogen. However, the *fengzhen* in *fengzhenweitong* (风疹胃痛) from our database does not refer to 'rubella'. According to medical materials, rubella does not cause *weitong* (胃痛, 'stomachache'), so it might be a misjudgment in the medical article. To address this doubt, we consulted ancient Chinese medical literature and discovered that in traditional Chinese medicine, *fengzhen* referred to 'dermatitis', which is a disease caused by an allergy and could potentially lead to a stomachache. Therefore, in the term *fengzhenweitong*, *fengzhen* does not refer to 'rubella' but maintains its TCM meaning 'dermatitis'. In this case, the TCM term has acquired another meaning within the framework of Western medical understanding.

2. Semantic analysis

2.1. The symptoms, affected body part, and physiological process
2.2. Causal pathogen
2.3. Eponym
2.4. Time course, origin, and epidemiology
2.5. Severity, environment, species of animal or food, occupation, age and population, geography, and arbitrary identifier

The disease name is the first term that practitioners and patients encounter when perceiving a disease. It provides information such as symptoms, causes, severity, age group or affected population, and more. Inappropriate disease names can lead to misunderstandings and even stigmatization of certain groups or regions. To address this, the World Health Organization (WHO) issued guidelines in 2015, urging scientists, authorities, and the media to follow best practices when naming new human infectious diseases.

The WHO protocol recommends that disease names include generic descriptive terms (relating to symptoms, physiological processes, anatomy, or pathology) and specific descriptive terms (age group, patient population, time course, epidemiology, origin, severity, seasonality, environment, causal pathogen, associated descriptions, year or month of first detection or reporting, and arbitrary identifiers). However, it advises against including geographic locations, personal names, species, cultural or population references, occupational or industrial references, and terms that incite undue fear (WHO, 2015). Although these suggestions specifically target infectious diseases, they provide insights into the general semantic categories that disease names can encompass, which we can apply to our discussion of the disease terms database.

In this section, we classify the disease names based on their semantic indications. We focus on the underlying semantic features represented in each term, relying on our native instinct, and present the semantic distribution of the disease names from 1919

to 1949 in Table 4.17.

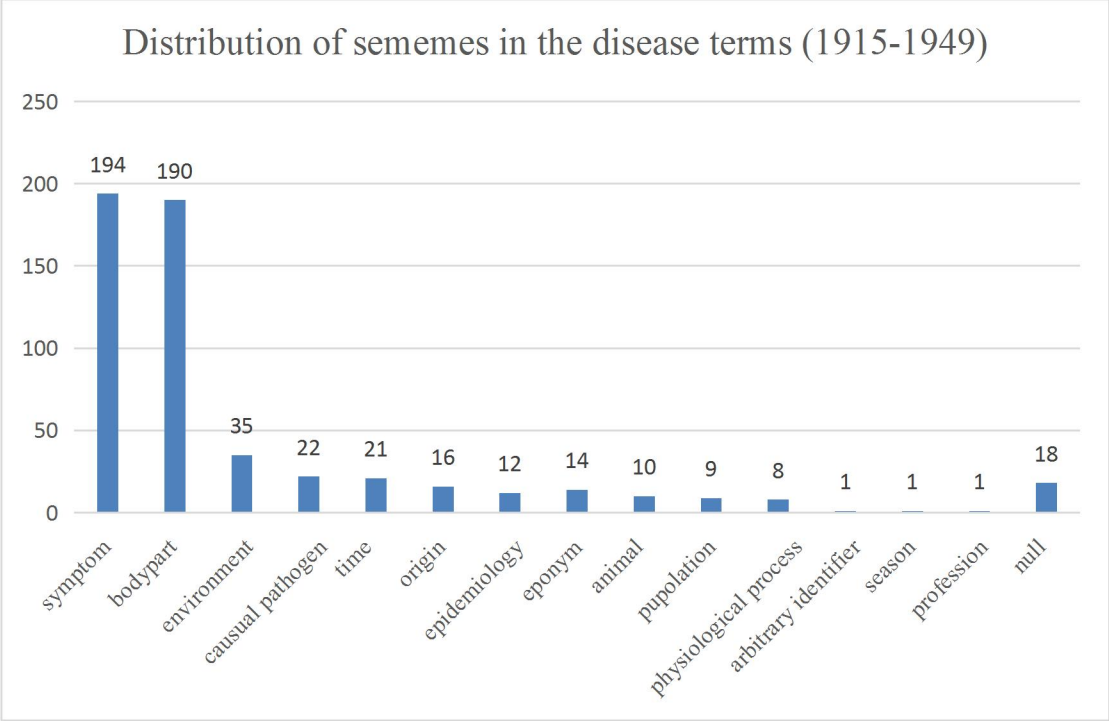


Table 4.17: Distribution of semantic categories (1915-1949)

Table 4.17 provides an overview of the semantic distribution of disease terms in the 1915-1949 database. We identified a total of 552 sememes across 407 terms, resulting in an average of 1.35 sememes per term. The majority of these sememes are related to body parts and symptoms. Additionally, there are eighteen terms that are difficult to judge based on native instinct alone, as they are often phonetic loanwords without marker words or monosyllabic Chinese medicine terms.

We have reorganized these categories according to the WHO classification. Approximately 70% of the sememes indicate symptoms, encompassing pure descriptions of symptoms as well as references to affected body parts. Sememes that include the causal pathogen of the disease make up around 3.9% of the total. Around 2.5% of the sememes are named after people (eponyms). Terms that provide supplementary information such as time course, epidemiology, and origin, which are advocated by the WHO, account for almost 8% of the sememes. The remaining less than 13% of disease names fall into categories that the WHO recommends avoiding, including indications of severity, environment, animal or food species, occupation,

age and population, undue fear, and arbitrary identifiers. We will present examples from our database for each of these categories.

2.1. The symptoms, affected body part, and physiological process

The International Disease Category (IDC) distinguishes symptoms, signs, and ill-defined conditions or abnormal clinical findings as separate from disease categories. However, in everyday communication, practitioners and patients often refer to diseases by mentioning the associated symptoms rather than using highly technical terms. In China, the influence of traditional Chinese medicine has led to the inclusion of symptom descriptions as disease names. In our database, approximately 73% of the terms include descriptions of symptoms, highlighting the importance of perceptible pathological references in disease naming.

The first category we will discuss consists of representative adopted TCM terms within the Western medical context that indicate symptoms. Table 4.18 provides some examples extracted from our database.

Chinese term	Literal meaning	English equivalent
lvneizhang (绿内障)	green inner block	glaucoma
shiuxie (水泄)	water discharge	dysentery
weihuangbing (萎黄病)	depressed-yellow-disease	postpartum anemia
nveji (疟疾)	torture-disease	malaria
huoluan (霍乱)	vomit-messy	cholera

Table 4.18: Examples of TCM terms in the database that indicate symptoms

As we discussed above, the terminology of traditional Chinese medicine has a tradition of being descriptive and figurative regarding symptoms and signs. According to the literal meanings of the terms in Table 4.18, the *lv* (绿, 'green') in *lvneizhang* (绿内障, 'glaucoma') illustrates the pathological result of glaucoma where the pupil color changes to green; the term *shuixie* (meaning 'water discharge') describes the typical symptom of dysentery; *weihuang* (meaning 'depressed and yellow') metaphorically represents the state of patients with depression and a destructive color; the term *nve* (meaning 'torture') in *nveji* express a subjective feeling of patients who suffer from

malaria. The disease name *huoluan* (meaning 'vomit and messy') originates from the perceivable symptom of cholera[22]. The TCM terms describe the symptoms in a clear and vernacular way although these terms still maintain morphological features of ancient Chinese. Compared to their English equivalents for English speakers, the TCM terms are more semantically transparent to the Chinese natives.

The second set of representative terms consists of new compound words that indicate symptoms. Some examples from the database are listed in Table 4.19.

Chinese terms	Literary meaning	English terms
xiaowudaobing (小舞蹈病)	tiny-dance-disease	rheumatic chorea
hongrebing (红热病)	red-hot-disease	macule
jinyinyan (金银眼)	gold-silver-eye	congenital heterochromia iridium

Table 4.19: New compound terms named after the symptoms

For Chinese speakers, these newly coined terms describe straightforwardly the symptoms. Take the term *xiaowudaobing* (小舞蹈病) for example, its English equivalent *rheumatic* is derived from Greek *rheumatismos*, with the root *rheuma* meaning 'stream'. Initially, the disease was thought to be caused by the internal flow of watery humor. *Chorea* comes from the Greek *khoreia* ('dancing in unison'). The English term indicates both the cause and the symptom, but its neoclassical composition mechanism poses a challenge to understanding, even for English native speakers. Without knowledge of the etymology, an English speaker may not grasp the meaning of this neoclassical compound term. In Chinese, the term *xiaowudao* (小舞蹈, 'little dance') colloquially records external symptoms of the disease. Therefore, the Chinese term is more transparent for native users.

The semantic transparency of Chinese Western medical disease terms is not only reflected in the straightforward description of symptoms, but also in the indication of the affected body parts. In 70% of the terms that indicate the affected body part, the morpheme that indicates the body part can be located at the beginning or the end of a

[22] '挥霍之间，便致缭乱' from 巢氏诸病源候总论 (四库全书本)/卷 22. Reference: https://zh.m.wikisource.org/zh-hans/

term. Table 4.20 presents some terms with the indication of body parts at the beginning of the term. In these terms, the words that indicate body parts serve as modifiers of the disease headwords.

Chinese term	Literal meaning	English equivalent
houfeng (喉风)	throat-wind	diphtheria
feilao (肺痨)	lung-overstrain	tuberculosis
weikuilan (胃溃烂)	stomach-fester	gastric ulcer
changbijie (肠闭结)	intestine-block	intestine obstruction
luanchaobenglie (卵巢崩裂)	ovary-burst-apart	ovarian rapture

Table 4.20: Terms that indicates body part (the morpheme of a body part is located at the beginning of the term)

Table 4.20 shows some examples that the body parts are placed at the beginning of the terms of diseases. The first two terms are traditional Chinese medicine words adopted in the context of Western medicine. When compared to their English equivalents, we can observe that the Chinese disease names clearly indicate the site of the lesion, while the English terms do not. The last three terms are newly created compound words. These terms begin with a noun and end with a verb, forming a subject-predicate structure. However, as disease terms, the verbs in this type of compound undergo conversion to nouns, resulting in the subject-predicate structure being nominalized into a disease name.

Table 4.21 displays some terms with body part indications at the end of the term. In these terms, the morphemes indicating the body parts serve as the headwords of the terms.

Chinese term	Literal meaning	English equivalent (etymology)
shayan (沙眼)	sand eye	trachoma (rough)
baihou (白喉)	white throat	diphtheria (hide)
tebeixiyajing (特倍喜亚颈)	*tebeixiya* neck	toxic goiter (toxic throat)

Table 4.21: Terms with morpheme of a body part at the end of the word

In Table 4.21, we compared the meanings of the Chinese terms and their Western equivalents and discovered that the Chinese terms describe body parts that are not mentioned in the English equivalents. In the first two examples, the English neoclassical terms do not specify body parts, while the Chinese adopted terms from TCM indicate the relevant body parts. In the third example, the English term indicates the organ *goiter*, whereas the Chinese term externalizes the position of the goiter by mentioning *jing* ('neck') in the term. During this period, as the Chinese people were not very familiar with anatomical vocabulary, externalizing the pathological body parts in disease names made the terms more accessible to the general population.

Certain marker words for diseases already indicate symptoms and help classify the diseases, such as *tong* (痛, 'pain'), *zhong* (肿, 'swelling') and *yang* (疡, 'ulcer'). These markers are highly productive. They serve as headwords at the end of terms and are transformed into disease names by adding nouns that indicate body parts or physiological processes in front of them. Table 4.22 illustrates two terms employing this semantic mechanism.

Semantic structure	Chinese term	Literal meaning	English equivalent
body part + *tong* ('pain')	*sanchashenjingtong* (三叉神经痛)	three folk nerve pain	trigeminal neuralgia
physiological process + *tong* ('pain')	*yuejingtong* (月经痛)	menstruation pain	dysmenorrhea

Table 4.22: Terms that indicate painful symptoms

Semantically, marker words normally serve as central words for classifying diseases, and there is some markers used to differentiate meanings among similar terms that indicate the same body parts and symptoms. Table 4.23 provides an example of such similar terms.

Chinese terms	Literal meaning	English equivaelnts
jiaoqi (脚气)	foot-gas	tinea pedis
jiaoqibing (脚气病)	foot-gas-disease	beriberi

Table 4.23: Similar terms that indicates the same bodypart and symptomatic reference

The term *jiaoqibing* is very similar in morphology to the term *jiaoqi*, but they but they have different meanings. The term *jiaoqibing* is equivalent to *beriberi*, which is derived from a Sinhalese word meaning 'extreme weakness'. It refers to a disease caused by a deficiency of vitamin B1, resulting in fatigue. On the other hand, the term *jiaoqi* refers to 'infection of the feet'. Thus, in this case, the marker word *bing* not only indicates a disease but also serves to differentiate the meanings of these two terms, despite the similarity between them leading to potential misinterpretation.

Naming diseases in Chinese often follows common semantic mechanisms that involve indicating symptoms and affected body parts. This approach applies not only to traditional Chinese medicine terminology but also to neologisms in Western medicine in China between 1915 and 1949. These neologisms explicitly convey indications of symptoms and body parts, whereas their English equivalents often lack such specificity.

Additionally, Chinese disease terms tend to utilize a greater number of lexical units for general purposes, resulting in a higher level of semantic transparency. These terms effectively communicate the intended meanings to Chinese natives. Overall, the semantic mechanisms employed in disease names, which involve genuine indications of body parts and symptoms, played a crucial role in making these terms more accessible to the Chinese population during the early establishment of Western medicine in China.

2.2. Causal pathogen

In the disease names of traditional Chinese medicine, there is a notable absence of sememes denoting causal pathogens. This is because modern medical detection technology has not yet influenced traditional Chinese medicine, which relies on diagnostic methods such as "look, listen, ask, and feel". However, with the introduction of Western medicine into China, there arose a need for Western medical disease terms that reflect pathogens, which highlighted gaps in technology and linguistic equivalents in Chinese. These terms also impacted the modernization of

Chinese medicine in diagnosis and treatment. Table 4.24 provides examples of terms that indicate pathogens in the disease names.

Causal pathogen+*bing*	Literal meaning	English terms
*xuexichong**bing*** (血吸虫病)	bloodsucking worm disease	schistosomiasis
*sizhuangchong**bing*** (丝状虫病)	silk-like worm disease	filariasis
*xiluoxuanti**bing*** (细螺旋体病)	thin spiral-shaped bacterium disease	leptospirosis
*feixichong**bing*** (肺吸虫病)	lung sucking worm disease	paragonimiasis
*niangmuju**bing*** (酿母菌病)	blastomycosis disease	blastomycosis

Table 4.24: Terms that indicate the causal pathogen

As shown in the example in Table 4.24, the Chinese terms involves a semantic pattern which is causal pathogen + the marker word *bing* (病, meaning 'disease'). The semantic representation of the causal pathogen is indicated by genuine Chinese words such as *chong* (虫, 'worm'), *ti* (体, 'body') or *jun* (菌, 'fungus'), which are mostly Japanese direct loaning. Interestingly, these words are predominantly direct loanwords from Japanese, which these Japanese words adopted them from Western terminology. Thus, the semantic pattern of pathogen + *bing* terms aligns with their English equivalents in terms of semantics.

The terms indicating pathogens are heavily influenced by the naming mechanisms of Western medicine. They reflect the advancements in modern medical diagnostics and treatment technology, contributing to the enrichment of Chinese medicine's understanding and approach.

2.3. Eponym

Eponyms are a long-standing tradition in medicine. Eponyms usually involve honoring a prominent physician scientist who played a major role in the identification of the disease (Ferguson & Thomas, 2014). In the corpus of Western medical disease names in the Chinese language from 1915 to 1949, we do encounter eponymous terms, which represent a new naming method for Chinese medical terminology. We have extracted these eponymous terms for diseases and presented them in Table 4.25.

Chinese term	English equivalent
Kaschin-Beck shibing (Kaschin-Beck 氏病)	Kachin-Beck disease
K.B shibing (K.B.氏病)	Kachin-Beck disease
MIKULICZ shibing (MIKULICZ 氏病)	Mikulicz disease
*Hejiesiji（Aujeszky）shibin*g (何偕斯基（Aujeszky）氏病)	Aujeszky disease
*leinashibin*g Raynaud's disease (雷纳氏病 Raynaud's disease)	Raynaud's disease
minniershibing (民尼尔氏病)	Meniere disease
xiaokoushibing (小口氏病)	Oguchi disease

Table 4.25: Eponymous disease terms (1919-1949)

Table 4.25 displays eponymous disease terms in Chinese that are typically structured as xx + *shi* (氏, meaning 'family name') + *bing* (病, meaning 'disease'). The term *shi* serves as a marker word indicating 'family name' in ancient Chinese, so *xx shi* means 'the family name of xx'. The *xx* component in this pattern is often borrowed from other languages. Examples such as *Kashin-Beck*, *K.B.*, *MIKULICZ*, *Aujeszky* represent graphic loans from English, which appear quite exotic within the Chinese writing system. On the other hand, 小口 is a graphic loan from Japanese, which is compatible with Chinese writing but follows the Chinese pronunciation. Lastly, *hejiesiji* (何偕斯基), *leina* (雷纳), and *mingnier* (民尼尔) are loans that have undergone phonetic adaptation to fit the Chinese pronunciation, originating from Aujeszky, Raynaud, and Meniere, respectively. As previously mentioned, this naming mechanism is unfamiliar to Chinese speakers.

Therefore, eponymous terms may present challenges in terms of semantic transparency for Chinese speakers from a communicative perspective. Recognizing this potential obstacle, the authors of these articles provided textual explanations, which greatly aid in understanding the underlying naming convention. Additionally, including quotes from contexts in which the eponymous terms are used can be particularly helpful in providing further clarity and context. Here are some examples of contextual explanations from our corpus:

> Kaschin-Beck 氏病(以下简称K.B.氏病)，1854 年军医 Kaschin 氏奉命开始调查研究，做成报告，此后由于 Beck 氏之研究，始认此病为一独立性疾患，于 1906 年发表。

"Kaschin-Beck's disease (hereinafter referred to as K.B.'s disease). In 1854, the military doctor Kaschin was ordered to start the investigation and made a report. After that, because of Beck's research, the disease was recognized as an independent disease and it was published in 1906." (translated)

本症为泪腺及唾液腺发生慢性相对性及无痛性肿胀之疾患。一八九二年，有 Mikulicz 氏首先报告，故即名之曰 Mikulicz 氏病。

"This disease is a chronic and painless swelling of the lacrimal and salivary glands. In 1892, Mikulicz first reported this disease. Hence it is named Mikulicz's disease." (translated)

The provided samples from Western medical articles in Chinese illustrate how eponymous terms are introduced by authors. By providing contextual explanations of the naming process, Chinese readers are able to better understand this unique naming mechanism. Eponyms in the Chinese language heavily rely on the donor language, with the use of English letters considered exotic to Chinese readers. However, this fusion of Indo-European and Chinese languages in coining Chinese words demonstrates the language's innovative and evolving nature.

Nevertheless, eponyms lack semantic transparency, which hinders effective communication, and it is not typically adopted in neologisms in China. The Chinese language has a strong capacity for word creation, often utilizing existing characters to form new words. Additionally, naming diseases after individual names is not considered modest or auspicious in Chinese culture. Therefore, while Chinese practitioners may adopt lexical resources and constructions of eponyms, it is unlikely that this naming mechanism will be widely applied to name new diseases discovered in the future.

2.4. Time course, origin, and epidemiology

According to the WHO protocol, disease terms in English often incorporate keywords such as *acute*, *sub-acute*, *chronic*, *progressive*, and others to indicate their time course.

Similarly, terms like *zoonotic* and *congenital* signify their origin, while terms like *transient* and *contagious* suggest their epidemiology. In our analysis of the Chinese terminological database, we identified 29 terms that contain sememes belonging to these categories, accounting for approximately 7% of the dataset. Table 4.26 showcases some exemplary terms that represent these semantic categories.

Semantic category	Chinese terms	Literal meaning	English equivalent
Time course	*bairike* (百日咳)	hundred-day cough	pertussis
	jixingweiyan (急性胃炎)	urgent (marker word to indicate characteristic) stomach inflammation	acute gastritis
Origin	*hualiubing* (花柳病)	flower willow (brothel) disease	venereal disease
	xiantianxingwuyanqiuzheng (先天性无眼球症)	congenital (marker word to indicate characteristic) non-eye ball symptom	congenital anophthalmia
Epidemiology	*shuyi* (鼠疫)	rat epidemic	plague
	liuxingxingshuizhong (流行性水肿)	popular (marker word to indicate characteristic (Zhu Dexi, 1982)) water swell	epidemic dropsy
	chuanranxingdanheqiuzengduozheng (传染性单核球增多症)	infectious (marker word to indicate characteristic) single-core ball increase symptom	infectious mononucleosis

Table 4.26: Disease terms that indicate time course, origin, and epidemiology (1919-1949)

Taking these terms in Tbale 4.26 for example, we can see in Chinese, the indication of time course can be a real specific indication such as *bairi* (百日, 'one hundred days'), or an attributive morpheme with a word *xing* (性) indicating the degree of urgency. The origin can be where and when the disease is acquired, such as *hualiu* (花柳, 'brothel') and *xiantianxing* (先天性, 'congenital'). The epidemiologic semantic can be carried by a marker word as *yi* (疫, 'pandemic'), or attributive morpheme to express the contagious characteristic with morphemes *chuanranxing* (传染性, 'infectious') or *liuxingxing* (流行性, 'epidemic'). Most of the terms have the same sememes as the

English equivalents.

Terms adopted from traditional Chinese medicine (TCM) often exhibit significant semantic differences from their Western equivalents. This can be observed in the semantic formation of terms like *bairike* (百日咳, 'one hundred days cough') and *hualiubing* (花柳病, 'flower willow disease') and their equivalents *pertussis* and *venereal disease* respectively.

In the Chinese terms, *bairi* refers to the duration of 'one hundred days', while *hualiu* is a euphemism for 'brothel'. On the other hand, the etymology of *pertussis* derives from the phrase 'thorough cough', describing the symptom, while *venereal* refers to 'intercourse', indicating the cause of the disease.

Another example that highlights the independence from English equivalents is the term *shuyi* (鼠疫, meaning 'plague'). While the English term conveys the meaning of 'malignant pestilence', the Chinese term not only indicates the concept of a 'pandemic' but also specifically demonstrates the contagious carrier *shu* (鼠, 'rat').

These terms, which are adopted from traditional Chinese medical terminology in the context of Western medicine, exhibit a significant degree of semantic independence from their English equivalents.

2.5. Severity, environment, species of animal or food, occupation, age and population, geography, and arbitrary identifier

English disease names often use words like *severe, mild* to indicate severity, incorporate constituents related to natural environment such as *subterranean, desert, ocean, coastal, river* or *swamp*, and include references to specific species or food sources like *swine flu, monkeypox paralytic, shellfish poisoning.* Some disease names also imply the occupation of the affected population, such as *occupational, legionnaire, miners, butcher, cook* or *nurses*. Additionally, geographic locations such as cities, countries, regions, and continents are sometimes referenced.

In the database during 1915 to 1949, we have identified 27 disease terms belonging to these semantic categories, which make up 5.8% of the overall term database.

Semantic category	Chinese terms	Literal meaning	English equivalent
Severity	*exingzhongyang* (恶性肿疡)	malignant swell	cancer
Environment	*gaoqiyabing* (高气压病)	high air pressure disease	decompression sickness
Species of animal	*shuyaore* (鼠咬热)	rat-bite heat	plague, peste
Occupation	*qianshuifubing* (潜水夫病)	diver's disease	decompression sickness
Age or population	*rierjiaoqi* (乳儿脚气)	baby feet gas	infant beriberi
Geography	*xianggangzubing* (香港足病)	Hongkong feet disease	tinea pedis
Arbitrary identifier	*bingxingfushanghan* (丙型副伤寒)	No. 3 vice typhoid	paratyphoid C

Table 4.27: Examples of terms from 1915-1949 that indicate severity, environment, species of animal or food, occupation, age and population, and arbitrary identifier

The examples provided in Table 4.27 showcase the presence of very colloquial vocabulary within disease names. These include sememes like *e* (恶, 'bad'), *gaoqiya* (高气压, 'high air pressure'), *shuyao* (鼠咬, 'rat bite'), *qianshuifu* (潜水夫, 'diver'), and *ru'er* (乳儿, 'baby'). These colloquial lexical units carry transparent meanings for term users.

These terms not only incorporate semantic components related to severity, environment, species, occupation, and age group, but also provide additional parameters such as body part, symptom, or pathogen, resulting in more detailed disease names. For example, the term *xianggangzu* (香港足, 'Hongkong feet') indicates the geographic location and the affected body part, thus providing more specific information in the disease name.

Terms that incorporate arbitrary identifiers reflect the influence of English conventions while retaining certain Chinese linguistic features. It's worth noting that the term *bingxingfushanghan* incorporates an arbitrary identifier borrowed from the English equivalent. In English, disease types are often classified using the English alphabet (A, B, C, etc.). In the Chinese traditional ordinal numbering system, *bing* (丙) signifies 'the third'. Thus, the term *bingxingfushanghan* combines English and Chinese elements to convey the classification of disease types.

During the period from 1915 to 1949, disease terminology in Chinese exhibited a wide range of parameters of information, encompassing symptoms, body parts, pathogens, and discoverers, among others. On average, each term conveyed approximately two parameters of information about the disease, highlighting the comprehensive nature of the terminology. The semantic composition of each term varied, with different terms covering different semantic items, resulting in a diverse range of disease names.

Among the various parameters, symptoms and body parts were the most commonly adopted indications in disease names, reflecting their significance in conveying information about the disease. Additionally, **new semantic mechanisms emerged during this period, including terms representing causal pathogens and eponyms, which typically carried only one semantic item**. These mechanisms brought fresh perspectives and naming conventions to Chinese medical terminology.

3. The terminological variation

3.1. Diachronic variation

3.2. Functional variation

3.3. Discursive variation

3.4. Cognitive variation

3.5. Interlinguistic variation

3.6. Orthographic variation

We have conducted a linguistic analysis on the morphosemantic features of disease

terms, aiming to facilitate efficient medical communication. The Communicative Theory of Terminology asserts that language variation in communication is essential for effectively expressing ideas across different contexts, encompassing diverse environments, topics, and perspectives. This theory is grounded in real-world observations. Our focus lies in how authors present, introduce, and explain these terms, which inevitably leads to variation. In our methodology, we initially identify disease terms within the titles, followed by a thorough scan of the text to detect any variants of a given term. We also document the manner in which these variants are explained.

Within our disease name database spanning the years 1915 to 1949, we have found 67 terms with one or more variants, comprising nearly 20% of the total. From these terms, we have identified and compiled 76 pairs of variants. According to the variants, we have observed neologisms and archaic words from a historical standpoint, as well as terms originating from diverse geographic locations and utilizing different forms of language, including written and oral expressions.

In this section, our focus will shift to the sociolinguistic perspective of disease names. We will employ the classification framework provided by the Communicative Theory of Terminology to categorize the variation observed in disease names between the years 1919 and 1949.

3.1. Diachronic variation

A diachronic variant refers to a linguistic term or expression that has undergone changes over time. Within our database, we have identified nine pairs of diachronic variants, which account for 11.8% of the data. We have observed that certain disease markers and morphological patterns have experienced diachronic evolution. For instance, *bing* (病) and its variant *ji* (疾) both refer to ‘disease’. Similarly, *ai* (癌)、*aizhong* (癌肿)、*zhongyang* (肿疡) indicate ‘cancer’. The terms *jieshi* (结石)、*shi* (石) suggest ‘calculus’. Additionally, the terminological units *yunzhibuzaiqiang* (孕之不在腔) and *yiweirenshen* (异位妊娠) include both antique and modern morphological patterns to indicate ‘ectopic pregnancy’. The existence and evolution of these variants

emphasize the diachronic variation within the same language.

1) *bing* (病) / *ji* (疾) (sickness, disorder, disease)

Within our database, we have identified 41 disease terms that follow the pattern of XX + *bing*, and two terms that follow the pattern of XX + *ji*. Notably, these two terms with *ji* are associated with traditional Chinese medicine. Based on this observation, we can infer that the disease terms containing *ji* are more antiquated compared to those with *bing*.

Over time, *bing* has emerged as the more commonly utilized term for naming new diseases. Its usage has surpassed that of its variant *ji*, which has lost its prominence in naming new diseases. Presently, *bing* is the preferred term for creating new disease names, regardless of the presence of its variant *ji*.

2) *ai* (癌) / *aizhong* (癌肿) / *exing zhongyang* (恶性肿疡) / *zhongliu* (肿瘤) (cancer)

According to the 1915-1949 database, there were variations employed to indicate 'cancer'. Specifically, we identified 11 terms within the database that referred to cancer, consisting of five with *ai*, four with *aizhong*, two with *zhongliu*, and one with *zhongyang*. During this period, *ai* and *aizhong* were the most commonly used terms for cancer.

It is important to notice that *aizhong* and *zhongyang* are antique words that were historically used to refer to cancer, but they are not as commonly employed in contemporary usage. Currently, only *ai* and *zhongliu* are the terms predominantly found in cancer-related contexts, while the other variants have fallen out of common usage.

3) XX+ *qi, jieshi, shi* (碛/结石/石, calculus)

Calculus is a concretion of material forming in an organ or duct of the body. The etymology of *calculus* is derived from the Latin words for 'stone' or 'pebble'. In the

database, we have identified three Chinese variants that serve as marker words to indicate ‘calculus’. Due to the limited number of terms, we have compiled Table 4.28 to present all the terms and their respective variants.

Variant	#	Chinese term	Literal meaning	English equivalent
qi (碛)	3	内肾**碛**(1916) 膀胱**碛**(1916) 胆管**碛**(1916)	inner kidney stone vesical stone bile vessel stone	renal calculus vesical calculus biliary calculus
shi (石)	1	胱**石**(1920)	bladder stone	vesical calculus
jieshi (结石)	2	尿**结石**(1936) 膀胱**结石**(1924)	urine condensed stone bladder condensed stone	urethral calculus vesical calculus

Table 4.28: Variations that indicate ‘calculus’ (1919-1949)

There are three Chinese variants, namely *qi*, *jieshi*, and *shi*, that refer to ‘calculus’. *Qi* (碛) is an ancient Chinese character, explained in the exegesis book *Shuowen Jiezi* as ‘a stone by the water’ (‘水渚有石者’). The three terms with *qi* were extracted from an article in 1916. In 1920, *shi* (石) replaced *qi* (碛) to refer to ‘calculus’. *Shi* is more commonly used than *qi* in disease names, and *shi* also refers to ‘stone’ in general language. Since 1924, *jieshi* (结石) has emerged as the medical term that refers to ‘calculus’, replacing *shi*. It is worth noting that *jieshi* does not carry the general sense of ‘stone’ in its meaning.

The diachronic change of this variant completed the professionalization and modernization of this term through the process of evolution. The diachronic evolution of the variants of ‘calculus’ illustrates a morphological tendency towards the use of disyllabic words rather than monosyllabic ones, which is a characteristic of modern Chinese. Semantically, *shi* is abandoned due to its polysemous nature, while *jieshi* is adopted for its terminological specificity in a medical context.

4) Antique and modern morphological patterns

Diachronic differences are not only evident in the term markers but also in the

morphological structure of disease terms themselves. Variations resulting from the word formation methods in ancient and modern Chinese are apparent in examples such as *yunzhibuzaiqiang* (孕之不在腔, 'pregnancy not in the chamber'), which contains a typical ancient Chinese mopheme *zhi* (之) linking the subject (*yun*, 孕, 'pregnancy') and the predicate (*buzaiqiang*, 不在腔, 'be not in the chanber '). On the other hand, its variant *yiweirenshen* (异位妊娠, 'ectopic pregnancy') follows the pattern of AN, which aligns more with the structure of most disease names in modern Chinese.

3.2. Functional variation

Functional variation is based on language registers, a sociolinguistic concept introduced by Halliday et al. (1964). Registers are determined by situational features such as mode, field, and tenor, and they influence the choice of linguistic features employed (Halliday & Hasan, 1976). Functional variation in language arises from the specific communicative functions observed in diverse modes of communication. Within the Chinese language, communicative modes can be categorized into oral and written forms. In ancient Chinese, a clear distinction existed between written Chinese (*wenyanwen*, 文言文) and vernacular Chinese (*baihuawen*, 白话文).

Based on the database analysis, we have identified seven pairs of variants resulting from different modes of communication, accounting for 9.2% of the data. In Table 4.29, we present four of these pairs to illustrate the functional variation.

Chinese term	literal meaning	variant	literal meaning	English equivalent
qibing (瘈病)	dog-bitten disease	*fengquanbing* (疯犬病)	crazy dog disease	rabies
zuxuan (足癣)	foot tinea	*xiangagngzubing* (香港足病)	Hongkong foot disease	athlete's foot
xiantianxing hongmoyisezheng (先天性虹膜异色症)	congenital iris different color system	*jinyinyan* (金银眼)	gold silver eye	congenital heterochromia

shazheng (痧症)	cholera symptom	*diaojiaosha* (吊脚痧)	hang foot cholera	cholera

Table 4.29: Functional variants in the context (1919-1949)

In comparison to the literal meanings of the terms and their variants, the variants exhibit more characteristics of spoken Chinese than the terms themselves. For instance, variants such as *fengquan* (疯犬, 'crazy dog'), *jinyin* (金银, 'gold silver'), *xianggangzu* (香港足, 'Hongkong foot'), *diaojiao* (吊脚, 'hang foot') represent spoken Chinese expressions.

This colloquial feature in terminology during this period is due to the political movement. Prior to the May Fourth Movement in 1919, written Chinese was perceived as more elegant and still retained the characteristics of classical Chinese, while oral Chinese had evolved into a simpler vernacular. The proponents of the May Fourth Movement advocated for "writing what one speaks" (Huang Zunxian, 2000). Influenced by this movement, professional medical articles also began to embrace the use of colloquial language. The inclusion of both written or classic register terms and colloquial or folkloric terms indicates that doctors took into account the communicative needs of laypeople.

3.3. Discursive variation

The discursive variation is related to the expressive need of the author. In this period, the discursive variants are presented as the abbreviated version in morphology of the original terms. There are seven discursive variants, accounting for 9.2% of the data, and they are sometimes introduced with the explanation of *yixiajiancheng* (以下简称, 'hereinafter called').

In the article about Kaschin-Beck disease (1948), the disease is described as:

"Kaschin-Beck氏病(以下简称K.B.氏病)，1854年军医 Kaschin 氏奉命开始调查研究，做成报告，此后由于 Beck 氏之研究，始认此病为一独立性疾患，于 1906 年发表。" ("Kaschin-Beck 氏病治疗法之经验"，1948)

"*Kaschin-Beck's disease (hereinafter referred to as K.B.'s disease). In 1854, the military doctor Kaschin was ordered to start the investigation and made a report. After that, because of Beck's research, the disease was recognized as an independent disease and it was published in 1906.*" ("The experience of Treatment of Kaschin-Beck's disease", 1948)

The full name of the disease is presented as *Kaschin-Beck shibing* (Kaschin-Beck 氏病, 'Kachin-Beck's disease') in the title and when it is mentioned for the first time in the article. However, in the subsequent content, the acronymous variant of this term is used as *K.B shibing* (K.B 氏病, 'K.B's disease'). The use of the acronymous variant makes the expression shorter, faster, and easier, thereby fulfilling the author's discursive need.

3.4. Cognitive variation

Before the arrival of Western medicine, traditional Chinese medicine was the dominant clinical practice in China, and many diseases already had established terms within the traditional medical system. However, the introduction of Western medicine brought about a revitalization of Chinese medicine, and doctors began to discover connections between traditional and modern medicine. The cognitive variants primarily reflect different cognitive perspectives on the same disease, leading to the development of different mechanisms for naming the terms. In the 1915-1949 database, 45 pairs of variants are attributed to cognitive differences, accounting for 60 % of the data.

The traditional Chinese medicine (TCM) names and neological names for diseases are presented together in the article. For instance, in an article titled "*Chuanranbing yixi tan*" (传染病一夕谈, 'Talking about Epidemic') published in 1917, eight severe epidemics were listed, accompanied by a figure labeled as an expert (Figure 4.2). This figure presented the disease terms discussed in the article, showcasing both the traditional Chinese medicine names and the newly coined neological

names.

Figure 4.2: Excerpt of an article: the coexistence of adopted TCM terms and neological terms

The excerpt of the article is originally written in the traditional version of Chinese characters with the writing order from right to left and from top to bottom. To make the text more accessible, we transcribe the text of this excerpt into simplified Chinese characters and add their English equivalents, as shown in Table 4.30.

Neological terms	*pinyin*	TCM terms	*pinyin*	English
(1) 虎列剌 (null)	*huliela*	霍乱 (‘extravagance and chaos’)	*huoluan*	*cholera*
(2) 赤痢 (‘red dysentery’)	*chili*	痢疾 (‘dysentery disease’)	*liji*	*dysentery*
(3) 肠窒扶斯 (‘intestine (null)’)	*chang zhifusi*	伤寒 (‘hurt cold’)	*shanghan*	*typhoid fever*
(4) 天然痘 (‘natural pox’)	*tianrandou*	天花 (‘sky flower’)	*tianhua*	*smallpox*
(5) 发疹窒扶斯 (‘rash (null)’)	*fazhen zhifusi*	瘟热 (epidemic hot)	*wenre*	*typhoid*
(6) 猩红热 (‘scalet hot’)	*xinghongre*	红痧 (red Sha)	*hongsha*	*scarlet fever*
(7) 实布的里 (null)	*shibudili*	白喉 (white throat)	*baihou*	*diphtheria*

(8) 百斯笃 (null)	*baisidu*	鼠疫 (rat plague)	*shuyi*	*plague*

Table 4.30: Variation of newly created terms of infectious disease terms and old terms of traditional Chinese medicine (1919-1949)

In Table 4.30, four of the neologisms are monolexical loan terms.

1) Phonetic loanword: *huliela* (虎列剌), *shibudili* (实布的里).
2) Graphic loanword from Japan: the morpheme *zhifusi* (窒扶斯); the term *baisidu* (百斯笃).

Five neological terms are compound terms.

1) Body part+loan term: *chang zhifusi* (肠窒扶斯, 'intestine + *zhifusi*'),
2) Symptom+markers words: *chili* (赤痢, ' red diarrhea/dysentery'),
3) Characteristic+symptom: *tianran dou* (天然痘, 'natural pimples/pox'),
4) Symptom (calque from English): *xinghongre* (猩红热, 'scarlet hot'),
5) Symptom+loanword: *fazhen zhifusi* (发疹窒扶斯, 'dermexanthesis + *zhifusi*')

The phonetic loanwords from English are merely imitations of the pronunciation of Western terms without preserving their semantic meaning. People can sense that they are foreign words, but they cannot discern their intended meaning. Another issue with phonetic loans is that due to phonetic evolution or the randomness of homophonic characters, some words may be transcribed with incorrect characters, causing diachronic and synchronic obstacles to comprehension.

Compared to multi-character phonetic loans, the variants adopted from traditional Chinese medicine terminology are shorter and simpler. Morphologically, TCM terms consist of two characters. Semantically, the adopted TCM terms in Western medicine are more accessible to Chinese readers.

When introducing variants, besides presenting them in a way that contrasts two forms of terms, there are also some key words in the text that introduce variants, such as *jiuming* (旧名, 'old name'), *sucheng* (俗称, 'folkloric name'), *youcheng* (又称, 'also

called'). The following are examples.

Hernia: "赫尼亚旧名疝，俗称小肠气。"
(*Heniya*'s old name is *shan*, its folkloric name is *xiaochangqi.*);
Diabetes: "糖尿病，印度人称之为"蜜尿"，中医称消瘅，消渴症。"
(*sugar pee disease*, the Indians call it *honey pee*, Chinese medicine named it *xiaodan*, *xiaokezheng.*)

The semantic focuses of these cognitive variants have different emphases. Taking *diabetes* as an example, the naming semantics in English and Indian are similar, focusing on the taste of urine, while TCM terminology emphasizes the emaciation and easy thirst characteristic of patients' physical appearance.

Another example of cognitive variant is the coexistence of *loumatisizheng* (偻麻梯斯症) and *fengshi* (风湿). *Loumatisizheng* is a phonetic loanword of *rheumatism* added with a patrimonial marker *zheng* ('symptom'), and *fengshi* is a term in TCM terminology. In this period, we can find the *fengshi* is replacing the *loumatisizheng* in most contexts and becomes the only equivalent for *rheumatism*. As the linguistic distance between the Indo-European language and the Chinese language in morphology, the direct loanword won't be the mainstream of loan words for the morphological obstacles that would cause a problem in the communication.

3.5. Interlinguistic variation

Five variants are presented in different origins of languages, including variants in Chinese and English, accounting for 6.5% in variation. An article from 1919 *furezhengbianzhi* (瘕热症辨治, 'the Treatment of Repeated Fever'）recorded various types of fevers using both Chinese terms and English terms in the same text: "此症初起与黄热症 Yellow fever, 瘴热症 Malaria Fever, 瘟热症 Typhus Fever, 肠热症 Typhoid Fever 等无甚分别." We transcribe them into the table 4.31 with *pinyin* added.

Chinese terms in the text	English terms in the text	the literal meaning of the Chinese terms

huangrezheng 黄热症	Yellow Fever	yellow heat symptom
zhangrwzheng 瘴热症	Malaria Fever	malaria heat symptom
wenrezheng 瘟热症	Typhus Fever	epidemic heat symptom
changrezheng 肠热症	Typhoid Fever	intestine heat symptom

Table 4.31: Transcription of the Chinese and English variants in the article (1919-1949)

The coexistence of Chinese and English variants is new in Chinese published journals from 1915 to 1949. The appearance of English words was considered too foreign for Chinese readers at that time, and it is only in this particular article that we find this manner of presenting disease names. However, the coexistence of variants in both Chinese and English does have its advantages. Firstly, having terms in both the target language and the source language makes it easier for both Western doctors and Chinese doctors to understand the corresponding terms. Secondly, the inclusion of English in a Chinese-oriented journal reflects the international trend of that period, which aligns with the spirit of modernization that started in China in 1919. The use of English variations reveals that Western medicine not only brought new medical concepts to China but also enriched the language in terms of vocabulary and graphic appearance.

Another type of interlinguistic variation occurs in the variants of Japanese loanwords and phonetic loans from Western languages. The term *jiazhuangxianzhong* (甲状腺肿, meaning 'morbid enlargement of the thyroid gland') is a graphic loan from Japanese, while in English, Graves' disease is an eponymous variant of *goiter*. Correspondingly, there is a loanword + Chinese morpheme structured term for Graves' disease, *geleifusizhibing* (格雷弗司氏病). This interlinguistic variation is caused by the different origins of the source languages.

3.6. Orthographic variation

The period from 1915 to 1949 was a time of transition in Chinese history, characterized by social unrest and a lack of unity in various aspects of China. The May Fourth Movement in 1919 played a significant role in promoting language

reform and modernization in China. During this time, there was a push to simplify the Chinese writing system and promote vernacular Chinese. However, due to the transitional nature of the language establishment and the evolving understanding of diseases, orthographic variations emerged as different authors and scholars proposed their own interpretations and transliterations.

This transitional period also manifested in the variation of disease names, particularly in terms of orthographic variation, where homophonic characters were substituted. Two examples of orthographic variants (accounting for 2.6%) during this period *meidu* (霉毒) and *meidu* (梅毒), both of which referred to 'syphilis', and *mafeng* (麻风) and *mafeng* (麻疯), which referred to 'leprosy'.

Although orthographic variants were not common in the Chinese language, we believe that the words used in these variants conveyed the authors' understanding of the diseases. For example, the character *feng* (疯) in *mafeng* (麻疯) means 'craziness', revealing a negative attitude towards the disease. The existence of orthographic variants also reflected the instability of the terminology of a new discipline in the early days of its establishment in China.

The unstable language establishment and lack of unified understanding of diseases in this period contributed to the presence of orthographic variants. The variations reflected the ongoing efforts to adapt Chinese terminology to new medical concepts and the influence of different linguistic and cultural sources. These orthographic variants represented different attempts to capture the nuances and characteristics of diseases, resulting in a lack of standardization.

In conclusion, during 1915 to 1949, Western medicine began to develop professionally in China and the variation is a sign that Western doctors and Chinese doctors were still in the process of constructing the Western medicine terminology system. The terminological variants reflected this transitional feature. Some variants were more vernacular and transparent, which aligned with the evolution of the Chinese language. Although there was a lack of unification in terms, the contextual explanation aimed at reader-friendly communication.

4. Synthesis

In this chapter, we provide a morphological and semantic analysis of disease terms from the first database and discuss the terminological variation in the communicative context. Based on our study of the disease terms from the first period, we are able to identify the features of each aspect.

In terms of **morphology**, we analyze the length, number, and part-of-speech structure of the lexical units in the terms, as well as the morphological mechanisms of the disease names in Western medicine from the 1915-1949 database.

The majority (96.6%) of disease names are polylexical terms. All the polylexical terminological units follow the **modifier-headword pattern, ending with a noun**. There are few nouns converted from verbs due to the presence of concurrent words in Chinese.

Within the polylexical terms, **65% of the names' headwords are marker words of diseases.** We can identify nine explicit marker words of disease during this period. The most frequently used marker words are *yan* (炎, 'inflammation'), *bing* (病, 'disease') and *zheng* (症, 'syndrome').

Regarding terminological formation, **71.1% are newly coined terms, while the remaining 28.9% are adopted from traditional Chinese medical terms**. This ratio indicates that, during this period, Western medicine did not completely separate itself from the influence of Chinese medicine. In the proposal of Western medical terminology, medical practitioners employed a mechanism that combined newly coined words with inherited existing Chinese medicine words.

Within the neologisms, both phonetic and graphic loanwords in Western medicine show **influences from English or Japanese**. The geographical relationship between the loanwords and China is illustrated in Figure 4.3. On one hand, Western terms were

introduced to China in search of suitable equivalents, and on the other hand, Japanese terms that were created or adapted from Western terms also started to enter China. The Japanese kanji characters were borrowed from Chinese characters, so in the process of borrowing Japanese terms, the Chinese lexical components circled back from China to Japan and then returned to China with semantic changes or becoming part of medical terminology.

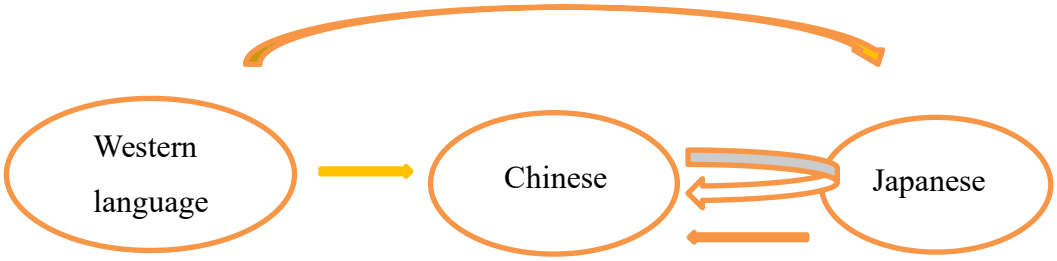


Figure 4.3: The paths of loaned terms in China

Phonetic loaning is the least popular mechanism during this period, accounting for only 1.4% of the disease terms. Chinese disease terms using phonetic loaning rely on the phonetic similarity to the source terms, transcribing them into Chinese characters without considering semantic transparency. Despite this, we can still recognize these terms as disease names due to the presence of marker words.

Chinese disease terms with graphic dependence are graphic loanwords, comprising 2.4% of the disease terms. **They originate from Japanese and partially from English**. The Japanese source words share both graphic and semantic accommodations with the Chinese language, making them less easily detectable. In contrast, direct English loanwords retain their Latin letters, which may appear foreign in a Chinese article. Graphic loaned terms are mainly found in the patterns of eponym + marker words and cause (pathogen) + marker words.

Composition is the major mechanism for neologisms, constituting 67.2% of the terms. Disease names generated through composition are phonetically and morphologically compatible with Chinese, and they possess transparent meanings, allowing Chinese users to quickly recognize them in communication. Within the

database, 20.4% of terms are partial loans, 22.3% are calques, and 25.5% are partial calques and patrimonial compound terms. Calques exhibit a semantic dependency on source terms, which are primarily English with a few Japanese terms. Chinese terms follow the semantic structure of English terms and translate morpheme by morpheme into Chinese. However, unlike neoclassical compound terms in English where Greek or Latin roots are used only as dependent morphemes and may pose comprehension obstacles for English lay users, the lexical resources that form Chinese disease names are general-purpose words that can be used independently. These characteristics of Chinese terms simplify cognition and communication for Chinese users.

Adopted traditional Chinese medical terms account for 28.9% of the disease names. These terms encompass monolexical words, general-purpose words, colloquial and semantically transparent words, metaphorical words, and words that have been assigned Western medical meanings. **The adoption of traditional Chinese medical terms into Western medical terminology helped Chinese users accept these terms cognitively and emotionally during the early stages of Western medicine establishment, and it also facilitated medical communication for Chinese users.**

In terms of **semantics**, the disease terms during this period can be categorized into various semantic categories, including symptoms, physiological processes, body parts, causal pathogens, eponyms, time course, origin and epidemiology, severity, environment, species of animals or food, occupation, age and population, and arbitrary identifiers. On average, each term encompasses approximately 1.35 sememes related to the disease.

Around 70% of the disease terms in Chinese describe symptoms, physiological processes, and body parts. Some of these terms have their origins in traditional Chinese medicine, where diseases are named after their corresponding symptoms. Additionally, neological compounds indicate both the symptom and the affected body parts within their names. Compared to their English equivalents, Chinese disease terms exhibit greater semantic transparency to the native term users in conveying information about symptoms and body parts.

From the disease names, we can gather additional information parameters regarding the time course, origin, infectivity, severity, environment, species of animals or food, occupation, age and population, geographic indication, and arbitrary identifiers associated with the diseases. Generally, terms representing these sememes contain more than two information parameters.

Approximately 3.9% of disease terms are named after the causal pathogens. Due to limited access to advanced technology and scientific knowledge for pathogen detection and classification in China during this period, disease names were either borrowed directly from Japanese or created as compounds with semantic reliance on English equivalents.

Eponymous disease terms account for 1.9% of the total. This naming mechanism is unique in Western medicine and was a novelty in terminology for the Chinese population during this period. Eponymous terms can be both graphic and phonetic loans, which may pose cognitive challenges for Chinese speakers. Authors often provide explanations for the origins of these terms when they appear. **Eponymous disease names exhibit the greatest dependence on English terms**, and their meanings are often as opaque as their English counterparts for native Chinese speakers.

Although disease terms named after pathogens and eponyms are relatively few during this period, these mechanisms represent new phenomena in Chinese medical terminology. They signify the influence of English equivalent terms on Chinese and indicate that modern medical technology has influenced the naming of disease terms. These new mechanisms have played a role in modernizing the process of creating disease terminology in Chinese.

Based on our analysis of disease name **variation** in context and classification according to sociolinguistic causes, we have identified several features of terminological variation during this period:

1. Diachronic variants reflect the trend of evolution, with ancient and monosyllabic

words gradually disappearing and modern disyllabic words with transparent meanings becoming the dominant terms for marking diseases.

2. Functional variants demonstrate the coexistence of terms from written and colloquial registers, aligning with the language reform trend of the era. They also indicate authors' consideration for the reading comprehension of non-expert readers.

3. Discursive variants in the texts cater to the need for shorter and simpler terms. Such variants are introduced with explanations to indicate that a more abbreviated term will be used in the subsequent text.

4. Cognitive variants exhibit a greater diversity in naming mechanisms based on different cognitive perspectives stemming from various medical mentalities. During this period, we observe that denominative variants can be influenced by English medical terms, traditional Chinese medical terms, and folkloric terms.

5. Interlinguistic variants involve terms appearing in different languages within the context. In this period, we find Chinese, English, and Japanese variants used to name the same disease.

6. Orthographic variants arise from the unstable language system and the lack of unification of terminology during the transitional period. Western medical terminology had not yet established a unified orthography and lacked a standard approach for adopting specific characters without causing cognitive confusion.

The variation in Western medical terminology in China from 1919 to 1949 reflects the creative attempts of medical practitioners during the early establishment of Western medicine. For **authors**, we can observe their hesitation in choosing the naming mechanism for diseases in the Western medical context, as well as their consideration for the communicative accessibility of the terms to Chinese readers. The adoption of traditional Chinese medicine (TCM) terms and the creation of compound terms through calques make the terminology more accessible. However, phonetic loan terms often require additional explanations in the context. For **readers**, the presence of

different nomination mechanisms may cause confusion, but it also exposes them to multiple terms for the same disease through different mechanisms. This allows readers to understand the corresponding concept based on their own cognition and gain access to different medical mindsets simultaneously. The existence of variants helps facilitate the understanding of diseases.

CHAPTER 5 ANALYSIS OF DISEASE TERMS (1950-1978)

The second database is built based on the corpus of 185 articles from the *Zhonghua Yixue Zazhi* (中华医学杂志, '*National Medical Journal of China*') from 1950 to 1978, covering the first 28 years after the establishment of the People's Republic of China. This period witnessed the initial development of the postwar socialist system in China. Between 1950 and 1958, China embarked on industrialization, while political movements from 1958 onwards resulted in setbacks in the economy, science, and culture.

The publication of the *National Medical Journal of China* reflects this period of dislocation. However, due to the drawbacks in medical research from 1966 to 1972, no articles were recorded during those years. Nonetheless, our database is still comprehensive, comprising a total of 264 disease terms, including hyponyms, hypernyms, and variants, extracted from the 185 medical articles in the corpus.

We will analyze these disease names using the same methodology as the first database, focusing on their morphological and semantic features, as well as identifying terminological variants within the texts.

1. Morphological analysis

1.1. Length ogf the terms	
1.2. Morphological structure	**1.2.1. Monolexical and polylexical terms**
	1.2.2. Part of speech patterns of polylexical terms
	1.2.3. Marker words of disease
1.3. Terminological formation	**1.3.1. Neological terms**
	1.3.2. Adoption of TCM terms

The morphological analysis aims to uncover the distribution of the lengths of disease name terms, the number of morphemes, the parts-of-speech (POS) mechanism, the morphological features, and the mechanisms involved in the formation of terminologies.

1.1. Length of the terms

We calculated the length of disease terms in our database and created a graph to illustrate the distribution.

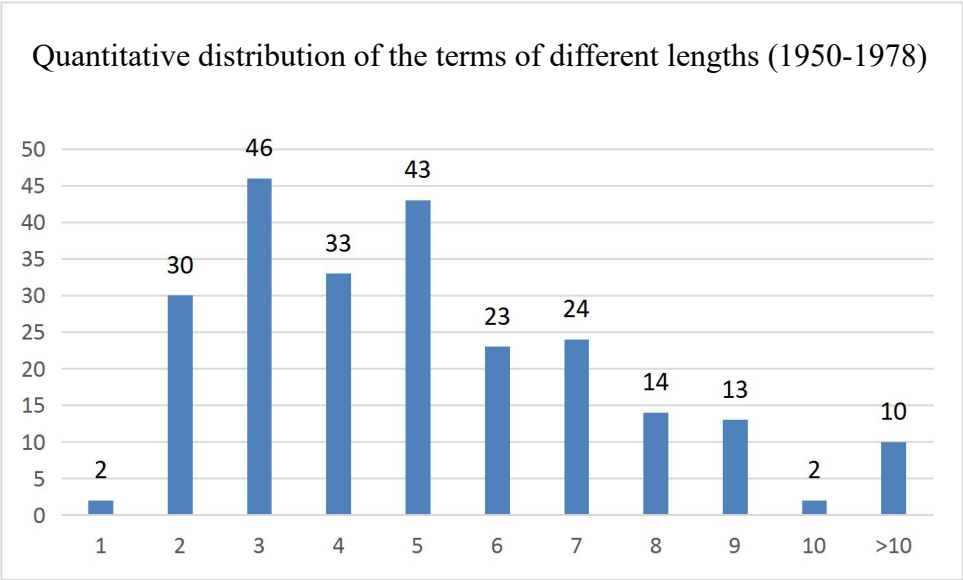


Figure 5.1: Length of the disease terms (1950-1978)

During 1950 to 1978, we observed the presence of two monosyllabic terms. The majority of disease terms consisted of three syllables, representing the highest proportion. Additionally, there was a significant number of terms ranging from two to seven characters or syllables. Notably, there was an increase in the occurrence of long terms consisting of eight syllables or more during this period.

1.2. Morphological structure

Within the scope of morphological structure analysis, we investigate the number of words comprising terminological units, the compositional relationship between lexical constituents, and the marker words that serve as significant morphemes in disease terms.

1.2.1. Monolexical and polylexical terms

Monolexical terms in Chinese can be categorized into two types: one-character terms and multi-character terms. In the database covering the period from 1950 to 1978, we identified two monolexical terms: *hou* (瘊, 'wart') and *zhang* (瘴, 'miasma'). Both of these terms are adopted from traditional Chinese medical terminology and share the common disease radical the radical 疒 (*ne*, meaning 'sickness, disease').

During this period, the majority of disease terms were also polylexical terms. We will

further discuss these terms in the sections focusing on morphological formation and semantic analysis.

1.2.2. Part of speech patterm

With the utilization of the part-of-speech (POS) tagging function provided by NLPIR, combined with manual verification, we have identified the various POS patterns present in the medical terms. The predominant POS categories observed in the formation of medical terms are nouns (n), adjectives (a), and verbs (v). Table 5.1 illustrates the identified patterns along with their respective proportions.

POS pattern	#	Percentage
NN	74	33%
NNN	51	23%
ANN	39	17%
AN	17	8%
AANN	14	6%
NV	9	4%
NA	6	3%
NNNN	5	2%
N	4	2%
ANNN	4	2%
NNV	4	2%
A	4	2%
NVN	3	1%
V	3	1%
NANN	3	1%
NAV	2	1%
NANV	2	1%
ANVN	2	1%
NAAN	2	1%
NAA	1	0%
ANNNNN	1	0%
ANANA	1	0%
NNNV	1	0%

NNVANN	1	0%
ANNAN	1	0%
NVVNNNV	1	0%
NVNVNNN	1	0%
NVNAN	1	0%
AVN	1	0%
ANV	1	0%
NNVN	1	0%

Table 5.1: POS of terms from the database 1950-1978

In this historical period (1950-1978), **we observed a greater variety of POS patterns compared to the previous period**. The terms can be categorized into three groups based on the part of speech of the ending morpheme: noun endings, verb endings, and adjective endings. The most frequent POS pattern, accounting for 87% of the terms, is characterized by the morphological form of noun(s) as a modifier followed by a headword.

1) Terms with noun endings

The patterns NN, NNN, ANN, AN, and AANN consist of modifier + headword structures, with the headword being a noun. Since these terms represent disease names, it is typical for nouns to serve as the headword, indicating the type of disease. The modifiers can describe the characteristics, body parts, or other details of the diseases, or form hyponyms by subcategorizing the disease. For instance, in the AANN pattern term *jixing sanboxing hongban langchuang* (急性散播性红斑狼疮, 'acute disseminative lupus erythematosus'), *jixing* and *sanboxing* express the acute and disseminative characteristics of the disease, while *hongban* describes the red spots (erythema) as the symptom of lupus (*langchuang*). The modifier in this disease name subcategorizes the disease to form a hyponym. For example, *ganyan* (肝炎, 'hepatitis') and *yixing ganyan* (乙型肝炎, 'hepatitis B') form a pair of hypernym and hyponym. The *yixing* in the hyponym term refers to 'number 2', which indicates a specific type of hepatitis (hepatitis B).

2) Terms with verb endings

The verb endings of some terms can fuction as nouns. For example, in the term 心肌梗塞 (*xinji gengse*, 'myocardial infarction'), *xinji* (心肌, 'hear muscle') is the subject, and *gengse* (梗塞, 'block') is the predicate. However, in contextual usage, the *gengse* can be considered a noun due to the phenomenon of the same word functioning as different parts of speech in the Chinese language without morphological changes, which is a concurrent word. Similar phenomenon occurs as *verbal nominalization* in English (Chomsky, 1970). Therefore, the verb located at the end of the term can be interpreted as a noun, and this pattern switchs to a NN pattern.

3) Terms with adjective endings

Terms with an adjective as the nucleus morpheme are relatively rare. There are two situations: 1) Two adjective morphemes are used in a parallel relationship to describe the patient's state. For example, *feipang* (肥胖) is two synonymous adjectives, meaning 'fat', resulting in the term representing 'obesity' as a disease. Another term *leishou* (羸瘦) is composed of two adjectives 'extremely weak' and 'thin'. 2) The adjective morpheme serves as an abbreviation for a disease name. The examples are three hyponyms of *diabetes: shangxiao* (上消, top skinny), *zhognxiao* (中消, middle skinny), and *xiaxiao* (下消, bottom skinny). These three terms combine a noun (*shang*, *zhong* or *xia*) and an adjective (*xiao*). The *shang*, *zhong*, and *xia* demonstrate the position of the affected organs (lung, spleen, and kidney). The *xiao* means 'skinny' in the term *xiaokezheng* (消渴症, 'diabetes'), and the *xiao* is used as an abbreviation for the adopted TCM term for *diabetes*. Since these adjective endings function as disease names within the medical context, they can be considered nominalized during the process of terminologicalization.

Overall, the majority of disease names appearing in Western medical journals during this period were polylexical terms, consisting of two to four morphemes, with nouns being the main headwords in terms of POS composition. Terms ending with verbs and adjectives were less common, reflecting the unique characteristics of Chinese word formation and the influence of Chinese medicine on Western terms.

1.2.3 Marker words of disease

Disease markers play a crucial role in the composition of disease names, aiding term users in identifying and recognizing disease names within texts. Furthermore, these markers prove to be productive in the creation of new terms. In this particular period, we identified 198 compound terms in which a marker word appeared at the end of the term, representing 75% of the total terms analyzed. Table 5.2 provides a list of disease marker words documented during this period.

Marker word	English	No. of terms	% in the markers
1. *bing/ji* (病/疾)	disease	60	29.9%
2. *yan* (炎)	inflammation	55	27.3%
3. *zheng* (症)	symptom	25	12.5%
4. *ai* (癌)	cancer	12	6%
5. *zhong* (肿)	bump	10	5%
6. *fei* (肺)	lung disease	8	4%
7. *jiehe* (结核)	tuberculosis	6	3%
8. *kuiyang* (溃疡)	ulcer	5	2.5%
9. *lou* (瘘)	fistula	4	2%
10. *zhen* (疹)	weasel	3	1.5%
11. *zheng* (征)	sign	3	1.5%
12. *shan* (疝)	hernia	3	1.5%
13. *tong* (痛)	pain	2	1%
14. *re* (热)	fever	2	1%
15. *xuan* (癣)	dermatomycosis	1	0.5%
16. *dian* (癜)	leucoderm	1	0.5%
17. *nve* (疟)	malaria	1	0.5%
18. *heniya* (赫尼亚)	hernia	1	0.5%

Table 5.2: Marker words of diseases (1950-1978 database)

In this period, several new phenomena emerged in the designation of diseases, particularly regarding the appearance of **new marker words**:

1) The introduction of *zheng* (征, 'sign') in disease terms of Western medicine reflects

the influence of traditional Chinese medicine on the nomenclature of Western medicine and the need for precise description of disease symptoms and signs. In traditional Chinese medicine, disease names often include signs and symptoms: The terms *zheng* (症) and *zheng* (征) can be easily confused due to their similar pronunciations and character forms. The *zheng* (症, 'symptom') refers to subjective abnormal sensations experienced of the patient, such as headache, nausea, and discomfort, while the *zheng* (征, 'sign') are objective manifestations of the disease and can be detected by clinical examination. The description of both symptoms and signs is essential for the diagnosis of diseases.

2) General-used words become specialized in medical usage. The morpheme *fei* (肺, 'lung') as an internal organ, appears in eight instances to indicate *lung disease*, for example, in the term *xifei* (矽肺, 'pneumoconiosis'), *fei* serves as a disease headword that indicate any lung disease in general. 热 (*re*, 'heat') is a generally used word, but in the database, it is specifically applied to refer to 'fever' in the medical context.

3) The use of phonological loanwords as marker words is another notable new phenomenon. One new pattern observed is the adoption of *heniya* (赫尼亚, 'hernia') as a disease headword. In the 1919-1949 database, *heniya* was used as a phonetic loanword in isolation. However, in the 1950-1978 database, it becomes a headword that can be combined with body parts to indicate more specific diseases. This phonological loanword was assimilated into the Chinese system during this period.

These phenomena demonstrate the evolving nature of disease naming during this period and highlight the impact of traditional Chinese medicine and the incorporation of loanwords in the Chinese medical terminology system.

1.3 Morphological formation

The terms of Western medicine disease names in this period can also be classified into neologisms and adopted traditonal Chinese medicine (TCM) terms. Neologisms are primarily consist of loanwords, compounds, and abbreviated terms. On the other hand, adopted TCM terms refer to traditional Chinese medical terms that are utilized within

the Western medical context.

Mechanism			#	Example
Neologism (86%)	Loanwords (4.5%)	Graphic loaning: Foreign words without adaptation (Adopted directly from Japanese terms)	11 (4.5%) JP	肝硬变 甲状腺肿 猩红热 流行性感冒
	Compounds (76.2%)	Partial loan 1) Graphic loanwords + patrimonial morpheme	4 (1.6%)	Purtscher 氏病 Wilson 氏病
		2) Phonetic loanwords+patrimomial morpheme	9 (3.7%)	包特金氏病 (Russian) 阿米巴痢疾 先天性赫尼亚
		Calque	116 (47.3%)	大脑气坏疽 十二指肠溃疡 弥漫性红斑狼疮 脑膜炎
		Partial calque	35 (14.3%)	潜水夫瘫痪症 潜水夫瘙痒症 黑尿病 白血病 荨麻疹
		Patrimonial composition	17 (7%)	克山病 肥胖病
		Syntactic units	3 (1.2%)	心包切开术后综合征
	Abbreviation (5.3%)		13 (5.3%)	尘肺 流脑 甲亢危象 上消
Adopted terms from TCM			34 (14%)	瘘 中风 萎黄病

Table 5.3: Morphological mechanisms of the disease names (1950-1978)

According to table 5.3, 86% of disease names are categorized as new terms, while 14% are identified as adopted TCM terms. In comparison to the previous period, **there is a decrease in the proportion of adopted TCM terms within Western medicine terminology**. Additionally, the presence of loanwords from English diminishes, while the utilization of calque mechanisms to coin new terms experiences a significant increase. Moreover, the emergence of abbreviations as a method to create new terms is observed.

1.3.1. Neological terms

Within the neological terms, 4.5% are loanwords, 76.2% are compounds, and 5.3% are abbreviated terms. The creation of newly coined terms remains the predominant method in Chinese Western medical terminology, with composition being the most frequent mechanism employed.

1.3.1.1. Loanwords

During the period from 1950 to 1978, the loanwords used in disease names were limited to graphic borrowings from Japanese terms. The phonetic borrowing from Western languages no longer played an independent role in the naming of diseases, and we will discuss the partial phonetic borrowing within the context of compound terms.

The loanwords without adaptation in this period originate from Japan, where the borrowing mechanism directly adopts the form and meaning of the term. We identified 11 Japanese-derived Chinese terms in the terminology database from 1950 to 1978. We will analyze them based on the types of creation mechanisms involved.

1) Terms for anatomy created in response to unprecedented new concepts in Japan

When Western medicine was first introduced to Japan, Chinese characters were utilized to create numerous anatomical terms to address the vocabulary gaps. Most of

the anatomical terminology in the Chinese language during this period originated from Japanese. For example, *menmai* (门脉, 'portal vein'), including hepatic portal vein and pituitary portal vein), and *jiazhuangxian* (甲状腺, 'thyroid') can be found in our terminological database.

2) Activation of ancient Chinese general-purpose words through Japanese influence

In these terms, the role of Japanese is to activate the terminological function of commonly used words in Chinese. For example *ganyingbian* (肝硬变, 'cirrhosis') and its variant *ganyinghua* (肝硬化, 'cirrhosis'). The morphemes *gan*, *ying, bian* and *hua* already existed in the Chinese language. The *gan* means 'liver', the *ying* means 'hard', the *bian* and the *hua* in Chinese mean 'change' in a general context. In the process of terminologicalization, the Japanese language absorbed the general-used nouns as *gan* and *ying* into disease terms without adaption and adopt *bian* or *hua* to refer to the pathological change. The Japanese activated the medical terminological function of these general words.

3) Japanese compound word

The term *menmaixingganyinghua* (门脉性肝硬化, 'portal cirrhosis') is a hyponym of *cirrhosis*. It follows an endocentric structure: *menmaixing* (modifier)+ *ganyinghua* (headword). The morpheme *xing* serves as an adjective phrase, it acts as an attributive in the hyponym term and is added in front of the hypernym, narrowing down the connotation of the hypernym. The compound term is a calque of Japanese from the Western term *portal cirrhosis*.

The loaned Japanese terms not only enriched Chinese terminology in terms of lexical resources but also influenced the Chinese morphological mechanisms. Japanese adapted English derivational suffixes into Chinese morphemes. Such affixes usually apply to words of one part of speech and convert them into words of another category. The suffix *hua* became the equivalent of verbal suffix *–ize* in English.

In the database for this period, there were no independent phonetic loanwords from

Western languages. The phonetic borrowings were accompanied by patrimonial morphemes as compound terms, which will be further explained in the mechanism of composition.

1.3.1.2. Composition

A. Partial loan
B. Calque
C. Partial calque
D. Patrimonial composition
E. Syntagmatic units

In this period, as in the last period, composition remains the primary mechanism for creating new terms. In the database from 1950 to 1978, we categorized compound terms into partial loans, calques, partial calque, and patrimonial compounds based on their dependency on foreign equivalents, and we also include syntagmatic units as compound terms.

A. Partial loan

Partial compound words combine two morphological formation mechanisms and are further divided into graphic loanwords + patrimonial morphemes and phonetic loans + patrimonial morphemes. One part is influenced by foreign words, borrowing the graphic or phonological characteristics of the source term, while the other part consists of Chinese patrimonial morphemes added to form disease name terms, usually incorporating Chinese disease name markers.

1) Graphic loanword + Chinese marker words

Despite the differences in writing systems between English and Chinese, we can find examples of graphic loanwords from English combined with Chinese patrimonial morphemes in the database of Western medicine disease terms from 1950 to 1978 (Table 5.4).

Terms from the database	English equivalent
Purtscher *shibing* (Purtscher 氏病)	Purtscher's disease
Wilson *shibing* (Wilson 氏病)	Wilson's disease

Table 5.4: Partly graphic loanwords from English

The terms listed in Table 5.4 follow the pattern of family name + *shi* + *bing*. These terms are eponymous, meaning they are named after individuals. The Chinese morpheme *shi* indicates 'family name', while *bing* means 'disease'. In terms of naming mechanism, there is a similarity between these Chinese terms and their English counterparts.

During that particular period, the adoption of eponymous terms without phonetic transcription in a Chinese context was a new trend in graphic borrowing. The use of English graphic loans in Chinese indicates a growing internationalization among Chinese doctors and medical practitioners. However, without an audio record documenting their usage, it remains challenging to ascertain the precise manner in which these terms were employed in practical contexts.

2) Phonetic loanword + Chinese marker words

The database includes phonetic loanwords in Chinese from Western languages, which are terms that use a series of Chinese syllables that sound similar to the source terms and transcribe them into Chinese characters. Table 5.5 presents six compounds of phonetic loanwords combined with Chinese marker words.

Chinese term	English equivalent
baitejin *shibing*（包特金氏病）	**Potkin**'s disease (translated from Russian)
meinier *shizheng*（美尼尔氏征）	**Meniere**'s sign
bulusi*junbing*（布鲁氏菌病）	**Bruce**llosis
kexing*shizonghezheng*（柯兴氏综合征）	**Cushing**'s syndrome
hejiejin*shibing*（何杰金氏病）	**Hodgkin**'s disease
amiba*liji*（阿米巴痢疾）	**Amoebic** dysentery (etymology: from Greek

	amoibē, ‘change, alteration, exchange’)

Table 5.5: Compound terms of phonological loans with marker words (1950-1978)

According to the English equivalent terms listed in Table 5.5, most of the compound terms are eponymous terms derived from the source languages. However, eponyms are not commonly used in the Chinese medical context. To aid comprehension and indicate that these terms refer to diseases, the strategy of appending a patrimonial disease marker word after the loanwords proves helpful.

Regarding the borrowing resources, **the data from this period reveals that the phonetic loaning units not only partially borrow from English but also from Russian**. This inclusion of Russian loanwords is a novelty from the influence of the alliance between China and the Soviet Union, where there was an exchange of knowledge, ideas, and expertise in various fields, including medicine.

B. Calque

Calque terms in this context refer to disease names in Chinese that have been directly translated from their Western language counterparts while maintaining semantic correspondence. **In the period being discussed, approximately 50% of disease names in the Chinese database were pure calques**. The majority of these terms followed a compound pattern, typically consisting of a body part followed by disease marker words.

1) Full calque

Full calque refers to those terms that each constituent corresponds to the source terms. The mechanism includes patterns that have typical disease makers such as body part+*yan* (炎, ‘-*itis*, inflammation’), body part+*ai* (癌, ‘-*oma*, cancer’), and other compounds with atypical markers or without markers.

a. Body part+*yan* (炎, ‘-*itis*, inflammation’)

As mentioned in the first period, the Chinese morpheme *yan* is the equivalent of *-itis* in English. The Chinese terms that are equivalents of the English terms with *-itis* follow the basic morphological structure of the body part morpheme + *-itis*.

To create a hyponym of the basic disease name, a descriptive attribute is often added before the body part+*-itis* structure. Chinese disease names adopt this structure by adding a modifier of the basic attributed structure XX+*xing* (性).. For example, the term *jixinghuaisixingchangyan* (急性坏死性肠炎, 'acute necrotizing enteritis') is a hyponym for *enteritis*. This name has two characteristic modifiers before the basic disease term *changyan* ('intestine inflammation') and the morpheme *ji* and *huaisi* indicating the characteristics of enteritis that are acute and mortifying.

b. Body part+*ai* (癌, '*-oma*, cancer')

The marker word *ai* corresponds to *-oma* or *cancer* in English. The English morphological structure of cancer is body part + *-oma* or *cancer.* When the cognition and detection methods of cancer were introduced to China, the naming and formation methods of cancer were also calqued.

Chinese terms	English equivalents
gongjing ai (宫颈癌)	Cervical cancer
biyan ai (鼻咽癌)	Nasopharyngeal carcinoma
zhiqiguan ai (支气管癌)	Bronchial cancer
zaoqi shiguan ai (早期食管癌)	Early esophageal cancer
rongmaomoshangpi ai (绒毛膜上皮癌)	Choriocarcinoma
zonggexing fei ai (纵膈型肺癌)	Mediastinal lung cancer

Table 5.6: XX+*ai* (1950-1978)

During the period of 1950-1978, traditional Chinese medical terms such as *aizhong* (癌肿) and *zhongyang* (肿疡) were not adopted as marker words for cancer in the Western medical context. Instead, *ai* (癌) steadily became implanted into the Chinese medical vocabulary as the marker word for cancer.

To coin more hyponyms, modifiers such as *zaoqi* (早期, 'early') and more detailed body parts such as *zongge* (纵膈, 'mediastinum') are added before the basic pattern, similar to their English equivalents.

c. Other compounds with semantic dependency on the source term

Some calques have disease markers that are not typical or even have no markers. These compound words composed of patrimonial morphemes may appear as genuine compounds, but comparing the etymology of their source terms reveals a one-to-one correspondence between the morphemes of the Chinese terms and the English morphemes in meaning. Examples of Chinese terms and their English equivalents with their literal meaning or etymology are shown in Table 5.7.

Chinese terms	The literal meaning of the Chinese morphemes	English equivalents	Etymology
jialiu (假瘤)	fake tumor	pseudotumor	false tumor
langchuang (狼疮)	wolf sore	lupus	wolf-bite scar
pinxie (贫血)	poor blood	anemia	without blood
ganran (感染)	paint	infection	taint

Table 5.7: New calque disease markers in the 1950-1978 database

By comparison of the literal meaning of the Chinese terms and English etymology, it becomes evident that the meaning and word-formation of the terminological equivalents correspond. In the process of calque, Chinese terms may undergo slight modifications. For example, *anemia* means 'without blood' etymologically, which is a preposition-noun structure, and the Chinese equivalent turns it into an adjective-noun structure 'poor blood'.

During this period, calques were primarily used in diseases related to inflammation and pathogenic bacteria. Additionally, the range of disease marker words expanded. With advancements in medical knowledge, the classification of disease courses and characteristics in Western medicine began to be reflected in Chinese calque terms.

C. Partial calque

Another type of compound word that shows semantic dependency on the source term is composed of calque and patrimonial morphemes. In this case, the added patrimonial morpheme serves the function of classifying newly created terms in the target language into disease denominations, even though its meaning may not be directly present in the semantics of the source term.

For example, the term *xunmazhen* (荨麻疹, 'urticaria') follows this mechanism. *Urticaria* comes from *urtica* in Latin meaning *nettle*, which describes the symptom of the dermatology disease. In the Chinese term, *xunma* refers to 'nettle'. The patrimonial morpheme *zhen* is then added to classify the term as a disease name in dermatology, denoting the presence of a rash.

This mechanism allows the Chinese language to incorporate the specific characteristics of the source term while adapting it to the medical classification system and linguistic conventions of Chinese. By combining calque and patrimonial morphemes, Chinese medical terminology can accurately convey the meaning and categorization of diseases, making them identifiable within the Chinese medical context.

D. Patrimonial composition

Patrimonial compounds in Chinese disease names of Western medicine can be created without any semantic dependency on the source terms. 7% of the disease names in this period's database belong to a patrimonial composition, which is 1.6% higher than the previous period. The quantity is not very significant, but the use of patrimonial composition is a sign that the Chinese are **trying to maintain their native identity in naming diseases.**

For example, the equivalent of *heiniaozheng* (黑尿症, 'alkaptonuria') is derived from the Arabic word *alkali* meaning 'to suck up oxygen greedily in alkali'. However, the Chinese term does not adopt the etymology of the foreign term. Instead, it indicates

the symptom of the disease through the patrimonial morpheme *heiniao* (black urine) and *zheng* (symptom).

Similarly, the term *alopecia* originates from the Greek word for *fox*, and the disorder was so-named due to fur loss seen in fox mange. *Areata* is derived from the Latin word *area*, meaning 'a vacant space or patch'. The Chinese equivalent *bantu* (斑秃) means 'spot bald'. The Chinese term focuses on describing the objective symptom of the disease rather than relying on the analogy or metaphor present in the English term.

In some cases, newly coined compound terms in Chinese may be the result of innovation when a disease is first discovered in China without any reference from another language. For example, *keshanbing* （克山病, keshan disease）is congestive cardiomyopathy caused by the combined effects of selenium deficiency and Kexackie virus infection. It was first discovered in Keshan County, Heilongjiang Province, China in 1935. The disease term was named after the place where it was identified.

These examples highlight the flexibility and creativity in the formation of Chinese disease names, allowing them to accurately represent specific symptoms or characteristics of diseases within the Chinese medical context, whether through patrimonial compounds or innovative terminology.

E. Syntagmatic units

There are three polylexical terms composed of multiple lexical units, which, while **numerically insignificant, are a recent addition compared to the previous period**. Each of these terms functions as a single entity and is constructed from multiple lexical units. They appear in the lengthiest formations and adhere to Chinese syntactic rules. These terms represent complications that arise under specific conditions. As they all pertain to the conditions of particular diseases, we will discuss them in the semantic components.

1.3.1.3. Abbreviation

In the context of neologisms related to disease terms, there are a total of 10 terms named through the abbreviation mechanism.

Most of these terms appear as variants, and there will be a textual explanation using phrases such as “以下简称” (hereinafter referred to as), “简称” (referred to as) yo indicate that this term is abbreviated. When these disease terms are introduced or mentioned in the text, the author or speaker will provide an explanation alongside the abbreviation, clarifying that the abbreviated term is being used. This allows for more concise and efficient communication, especially when discussing complex medical concepts or in technical contexts.

	Chinese abbreviation	Literal meaning	English	Full Chinese term
1	*xifei* (矽肺)	Silicon lung	Pneumoconiosis	***xifei****bing* (**矽肺**病)
2	*chenfei* (尘肺), *hiuchenfei* (灰尘肺)	Dust lung	Pneumoconiosis	***chenfei****bing* (**尘肺**病)
3	*meifei* (煤肺)	Coal lung	Pneumoconiosis	***meifei****bing* (**煤肺**病)
4	*meixifei* (煤矽肺)	Coal silicon lung	Pneumoconiosis	***meixifei****bing* (**煤矽肺**病)
5	*yinao* (乙脑)	No.2 brain	Encephalitis B	***yi****xing* ***nao****yan* (**乙**型**脑**炎)
6	*liunao* (流脑)	Fluid brain	Meningococcal meningitis	***liu****xingxing* ***nao****yan* (**流**行性**脑**膜炎)
7	*zaifaxinghuanao* (再发性化脑)	Regenerating changed brain	Recurrent suppurative meningitis	*zaifaxing* ***hua****nongxing* ***nao****moyan* (再发性**化**脓性**脑**膜炎)
8	*jiakang* (甲亢)	No.1 excitement	Hyperthyroidism	***jia****zhuangxian jineng* ***kang****jin* (**甲**状腺机能**亢**进)
9	*guanxinbing* (冠心病)	Crown heart disease	Coronary heart disease	***guan****zhuangdongmai zhouyangyinghuaxing* ***xin****zang****bing*** (**冠**状动脉粥样硬化性**心**脏**病**)
10	*kuangliu* (眶瘤)	Orbital tumor	Orbital tumor	*yan****kuang*** *zhong****liu*** (眼**眶**肿**瘤**)
1	*huashan* (滑疝)	Slippery	Sliding hernia	***hua****dongxingshiguanliekong****s***

1		hernia		***han*** **(滑**动性食管裂孔**疝)**

Table 5.8: The disease names of abbreviation mechanism in the 1950-1978 database (the adopted morphemes by the abbreviation are marked in bold in the full version terms)

According to the observations of the abbreviated disease terms in Table 5.8, we can categorize the abbreviation mechanism during this period into two types:

a) Using a body part to represent a disease: In examples No. 1 to 4, the term *fei* (肺, 'lung') represents *feibing* (肺病, 'lung disease'). Similarly, the term *nao* (脑, 'brain') in the disease terms No.6 to 9 refers to *naoyan* (脑炎, 'encephalitis') or *naomoyan* (脑膜炎, 'meningitis'). Here, a single body part is used as an abbreviation to represent the entire disease.

b) Adopting representative characters of each morpheme in polylexical terms: The full version of these terms consists of compound words with multiple morphemes. The abbreviated terms extract the key character, usually the first character, from each morpheme to form new terms. Terms No. 5 to No. 11 demonstrate this pattern, where the central semantic character of each lexical component is retained. For example, the term *guanzhuangdongmaizhouyangyinghuaxing xinzangbing* (冠状动脉粥样硬化性心脏病, 'coronary atherosclerosis') has three lexical components indicating the disease characteristics, body part, and disease marker. The abbreviated term *guanxinbing* adopts the first character of each component.

Some lexical components cannot be abbreviated for communicative reasons. For example, the morpheme *zaifaxing* in the term *zaifaxinghuanao* (再发性化脑, 'recurrent suppurative meningitis') hasn't processed an abbreviation. This is because the *zaifaxing* functions as a modified element that provides an explanation of the concept of recurrency as a whole word. Abbreviating this morpheme would introduce ambiguity and hinder clear communication. As a result, it is retained in its unabbreviated form.

Based on the abbreviated disease names in the 1950-1978 database, we can observe that:

1. The abbreviations are found in polylexical terminological units, and each lexical component can be deduced as a single character.

2. The abbreviations function more like new terms in terms of pronunciation and structure. Structural analysis can be conducted in the same way as with full compound terms. The purpose of abbreviation is to facilitate quick and efficient communication, serving as variants. Therefore, the terms aim to convey content while keeping the form as short as possible, adhering to the principle of linguistic economy.

1.3.2. Adoption of TCM terms

From 1950 to 1978, the adoption of TCM terminology in the context of Western medicine still existed, but to a much lesser extent than in the previous period. We found 34 traditional Chinese medical terms in the database from this period, which accounted for 14% of the total. **This rate reduction was almost half when compared to the previous period.**

The traditional Chinese medical (TCM) terms used in Western medical literature during this period had the following characteristics:

1. All monosyllabic terms in Western medical terminology were adopted from TCM terms.

The adopted monosyllabic TCM terms share some graphic features. The term *zhang* (瘴, 'miasma') is a phonological character. The graphene *ne* (疒) in the character serve as semantic radical 'disease', and the *zhang* (章) indicates the pronunciation of the character. Its original meaning is 'miasma', referring to the damp and hot steam from the mountains and forests in the south that causes people to suffer from the disease. Another adopted TCM term *hou* (瘊, 'wart') is also a phonological character with the disease radical *ne* (疒) and *hou* (候) that represents the pronunciation. Its etymology can be found in the orthography book *Zhengzitong* (正字通, 'Orthography'): 瘊，疣小者俗谓之瘊子. (translation: *hou*, or *houzi*, is a folkloric name for small condyloma.)

2. The syllables of adopted TCM terms did not exceed four syllables, with most terms consisting of two or three syllables.

There were 18 terms with two syllables, such as *nveji* (疟疾, 'malaria'), *tongfeng* (痛风, 'gout'), *feiji* (肥瘠, 'obesity'), *leishou* (羸瘦, 'emaciation'), and there were 11 terms withthree syllables including *baidianfeng* (白癜风, 'vitiligo'), *fengshire* (风湿热, 'rheumatic fever'), *jianrinve* (间日虐, 'tertian malaria'). Three terms had four syllables: *changchuanpozheng* (肠穿破症, 'intestinal perforation'), *yanganzaozheng* (眼干燥症, 'dye eye symptom'), *shouguzhengrong* (瘦骨峥嵘, 'emaciatiom').

3. TCM terms described symptoms, causes, or timing of onset with semantic transparency.

For instance, the term *vitiligo* was first used by the Roman physician Celsus, A. C. in his classic medical text *De Medicina* (1876). Its etymology is believed to be derived from *vitium*, meaning 'defect' or 'blemish'. However, in traditional Chinese medicine, the equivalent Chinese term *baibanbing* (白斑病') indicates the symptom of 'white spots'.

The term *jianrinve* (间日虐, 'tertian malaria) refers to a disease caused by the pathogen Plasmodium vivax. It is characterized by seizures occurring every 48 hours. The Chinese term describes the timing of disease. The term *jianrinve* was first recorded in 诸病源候论 (*On the Origin and Syndrome of Various Diseases*)[23] as "疟邪侵于少阳之经，以间日发作" (Malaria invades the meridians of less *yang* and attacks every two days). (See: https://www.wiki8.cn › jianrinue)

TCM terms tend to provide concrete descriptions of symptoms, and their usage in the lexical resource is colloquial. These features contribute to the semantic transparency

[23] A monograph on syndromes. Also known as "General Discussion on the Origin and Symptoms of Various Diseases", 50 volumes, published in 610. It is the first monograph in China to discuss the etiology, pathogenesis and syndrome of various diseases.

of the disease terms.

4. Adopted TCM terms often incorporate rhetorical analogy with natural things.

TCM syndrome differentiation, derived from life experience and clinical observation, often utilizes rhetorical analogies with natural things for denoting terms. The term *corns* in English means 'hardening or thickening of the skin', whereas the corresponding Chinese term, *jiyan* (鸡眼), literally means 'chicken eye'. It metaphorically describes the shape of the corn.

5. Hyponyms of TCM disease names are also adopted to the Western medical terminology.

Hypernyms and hyponyms denote a generative relation within the same knowledge ontology class, exhibiting compatible concept connotations with different extension widths. In the systematic terminology of TCM, certain terms reveal this generative relation. An example encountered in the corpus is the term *xiaodan* (消癉, 'diabetes') is recorded as well as the hyponyms: *shangxiao* (上消, 'upper diabetes'), *zhongxiao* (中消, 'middle diabetes') and *xiaxiao* (下消, 'lower diabetes') in the article "Records of Diabetes in Ancient China" (1953).

In TCM, *xiaodan* ('diabetes' in TCM) was first mentioned in *The Yellow Emperor's Classic of Internal Medicine: The Treatise on Strange Diseases* (黄帝内经・奇病论). In traditional Chinese medicine, the term *shangxiao* refers to lung heat and excessive thirst caused by diabetes; the *zhongxiao* indicates the stomach symptom of diabetes and causes excessive hunger; the *xiaxiao* refers to insufficient water intake by the kidney and frequent urination. The hyponyms of *xiaodan* represent subcategories according to the symptoms of different organs, and the hyponyms of the *xiaodan* illustrate the different types of diabetes.

Using the hyponyms of diabetes as an example, the naming of hyponyms in TCM follows a modifier-hypernym pattern. Semantically, the modifiers *shang*, *zhong*, and *xia* are transparent, but their references may be vague. From the perspective of

communicating disease terms, the hyponyms may not enable patients to fully understand the precise meaning of the disease. Despite this vagueness, this set of hypernyms and hyponyms still appears in the period's database of Western medicine terminology.

2. Semantic analysis

2.1. The symptoms, affected body part, and physiological process
2.2. Causal pathogen
2.3. Eponym
2.4. Time course, origin, and epidemiology
2.5. Severity, environment, species of animal or food, occupation, age and population, geography, and arbitrary identifier

In this section, we will perform a sememe analysis similar to what was done in the first database. Sememe analysis involves categorizing the sememes present in disease names within a semantic field for the purpose of analysis, comparison, and description. In the 1950-1978 database of disease names, the sememes can be grouped into categories such as symptoms, body parts, geographic locations, eponyms, occupational references, age groups, patient populations, time courses, epidemiology, origins, severity, seasonality, environment, causal pathogens, arbitrary identifiers, and so on.

There has been no change in the semantic categories of disease names compared to the previous period. In terms of distribution, words representing body parts and symptoms still constitute nearly 70%.

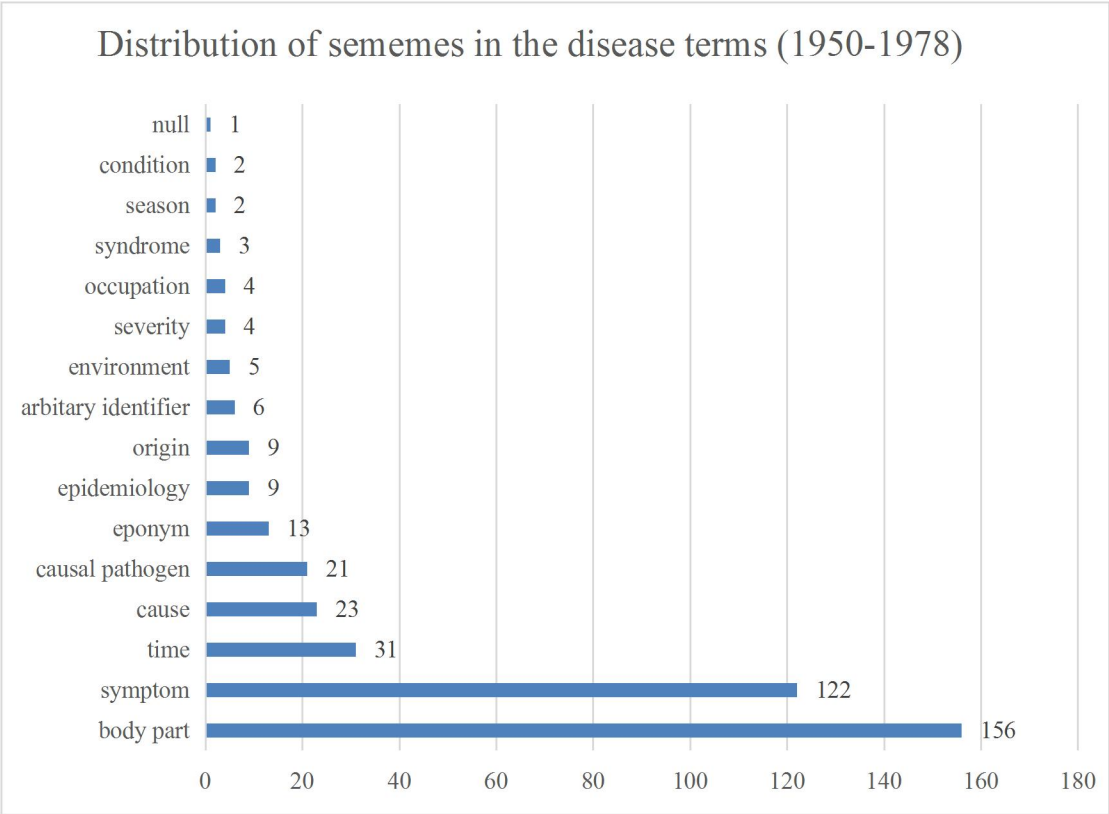


Figure 5.2: Number of sememes included in the disease terms (1950-1978)

According to Table 5.2, we have identified 413 sememes in the disease names from the 1950-1978 database. This indicates that each disease term, out of the 264 terms analyzed, has an average of 1.56 sememes. Based on the semantic types present in the terminology of this period, we have adjusted the division method used in the first period and categorized the terms into the following five categories, as shown in Table 5.3.

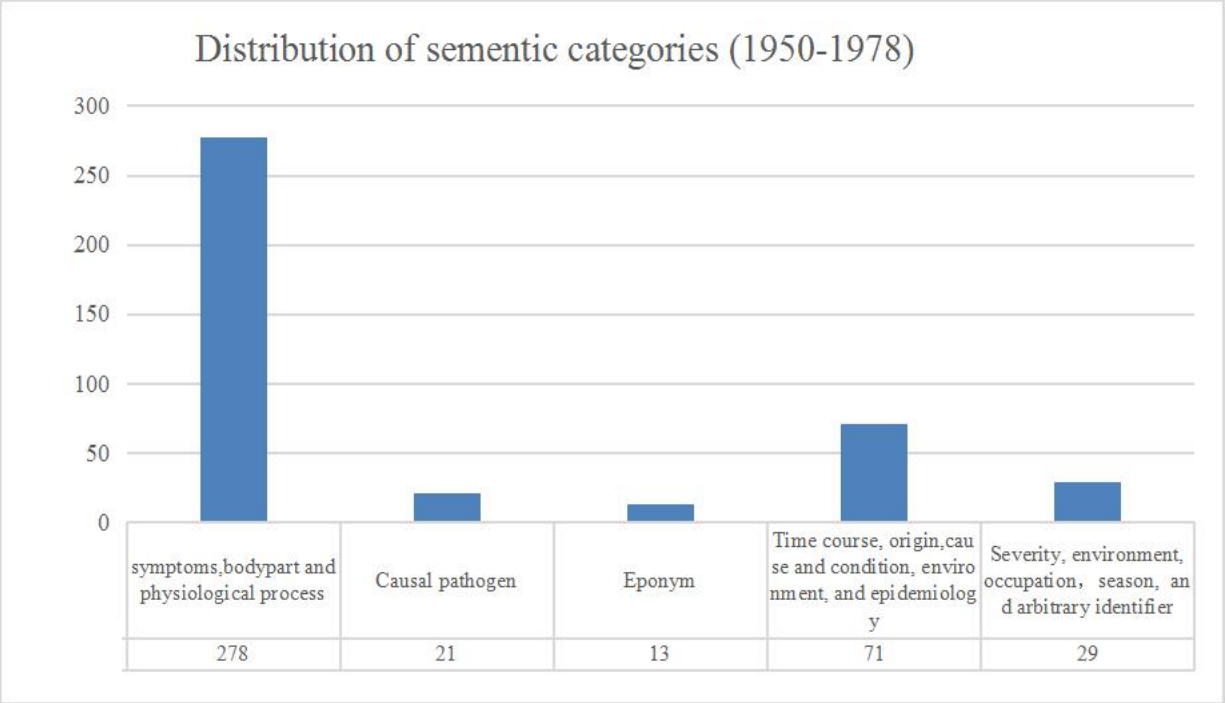


Figure 5.3: Distribution of semantic categories (1950-1978)

Figure 5.3 illustrates that the largest number of sememes corresponds to symptoms and affected body parts. Approximately 67.3% of the sememes represent symptoms, including both pure symptom descriptions and references to affected body parts. Sememes that indicate the causal pathogen of the disease make up 5% of the total. There are 2.9% of sememes that are named after eponyms. Sememes related to the time course, epidemiology, cause, condition, and origin account for almost 17% of the sememes. Additionally, 7% of the sememes indicate severity, environment, species of animals or food, occupation, age and population groups, undue fear, and arbitrary identifiers. We will provide examples from our database for each category.

2.1. The symptoms and affected body part

In this period, disease names that indicate body parts and symptoms comprise the largest proportion of disease terms. Among them, the percentage of sememes representing body parts is higher than that representing symptoms. Below are examples from Table 5.3 that demonstrate the semantic combinations of terms indicating body parts or symptoms:

Semantic component	Example	Literal meaning	English equivalent
Body part + *-itis*	脑膜炎	meninx inflammation	meningitis
Severity + body part + *-itis*	急性肾炎	urgent kidney inflammation	acute glomerulonephritis
Pathogen + body part + *-itis*	肺炎球菌脑膜炎	pneumococci meninx inflammation	pneumococci meningitis
Environment + body part	灰尘肺	dust lung	pneumoconiosis
Body part + eponym + disease marker word	胃何杰金氏病	stomach Hejiejin's disease	Hodgkin's disease of the stomach, malignant lymphoma of the stomach
Symptom	痛风	pain wind	gout
Body part + symptom + symptom marker word	肠穿破症	intestine perforate	Intestinal perforation
Environment + symptom	风湿热	wind wet heat	rheumatic fever
Severity + epidemiology + symptom	急性散播性红斑狼疮	urgent disseminative red spot lupus	acute disseminative cutaneous lupus erythematosus
Eponym + symptom	Wilson 氏红皮病	Wilson's red skin disease	Wilson brocq-type erythroderma

Table 5.3 Semantic combinations of a body part or symptom sememes

Based on the semantic components outlined in Table 5.3, the disease names in this period contain more semantic units that indicate specific details about the diseases. The term *Wilson shi hongpibing* (Wilson 氏红皮病) combines the symptom *hongpi* (红皮, 'red skin') with the eponymous part *Wilson shi* referring to the discoverer of the disease. This term signifies a disease characterized by the symptom of red skin and is named after the researcher Wilson.

Similarly, the *weihejiejinshibing* (胃何杰金氏病, stomach Hodgkin's disease)

incorporates the affected organ, *wei* (‘stomach’), in addition to the eponymous reference to Hodgkin’s disease. This updated term compared to the names in the database from 1915-1949 provides a more specific indication of the disease’s location, emphasizing its manifestation in the stomach. This inclusion of the affected organ in the disease name enhances the accuracy and specificity of the term.

In the term *jixing sanboxing hongbanlangchuang* (急性散播性红斑狼疮, ‘acute disseminative cutaneous lupus erythematosus’), the lexical units *jixing* and *sanboxing* illustrate the acute and contagious characteristics of lupus. This term denotes a specific type of lupus erythematosus characterized by its acute onset and disseminative nature.

These examples demonstrate how disease names can incorporate semantic complemental references to highlight specific aspects or characteristics of the diseases. By including additional information such as the affected organ, symptoms, or eponymous references, the disease names become more informative and descriptive.

Polilexical terms, which are terms composed of multiple lexical units, typically do not appear in the early stages of a discipline’s development (Cabré et al., 2022). In the early stages, disciplines tend to have simpler and more basic terminology that focuses on fundamental concepts and principles. This change means that there is an increased presence of modifiers for the disease headwords, which signifies the advancement of medicine and a deeper understanding of diseases. The inclusion of these modifiers reflects a more nuanced and comprehensive approach to describing and categorizing diseases during this period. It suggests that medical knowledge and awareness of diseases had developed, leading to a more refined and precise terminology in the field.

2.2. Causal pathogen

In the database from 1950 to 1978, we identified 21 terms with the sememe representing the causal pathogen. Among them, seven terms followed the pattern of causal pathogen-marker words. The marker words include *bing* (病, ‘disease’) in six cases and *liji* (痢疾, ‘dysentery’) in one case. Table 5.4 lists some representative terms.

Example	Semantic structure	English equivalent
taochongbing (绦虫病)	pathogen-marker word	taeniasis
sichongbing (丝虫病)	pathogen-marker word	filariasis
rentipiyingqubing (人体皮蝇蛆病)	pathogen-marker word	human skin myiasis
amibaliji (阿米巴痢疾)	pathogen-marker word	amoebic dysentery

Table 5.4 Terms with pathogen sememe

Compared to their English equivalents, these terms in Chinese show a dependency on the original English term. The first three terms, which include the marker word *bing* (病, 'disease') are calques and the modifier *amiba* in the term *amibaliji* (阿米巴痢疾) is phonetic loan from the English term *amoebic*.

In this period, we also observe that the other terms have more modifiers in addition to the pathogen sememe. Table 5.6 presents some examples that illustrate the inclusion of additional sememes alongside the pathogen sememe.

Example	Semantic structure	English equivalent
*jixingyinqiujunxing**nao**moyan* (急性隐球菌性脑膜炎)	urgency-pathogen-body part-marker word	acute cryptococcal meningitis
*baofaxing**nao**moyanqiujungan ran* (爆发型脑膜炎球菌感染)	epidemiology-body part-pathogen-marker word	fulminant meningococcal infection
***yan**mengshilietouyoubing* (眼孟氏裂头蚴病)	body part-pathogen-marker word	sparganosis ophthalmia
***fei**xichongbing* (肺吸虫病)	body part-pathegen-marker word	paragonimiasis

Table 5.6 Terms with sememe of pathogen and other semantic units

Most of these terms include two sememes: the causal pathogen and the body part. The Chinese terms clearly indicate the involvement of specific body parts, such as *nao* (脑, 'brain'), *yan* (眼, 'eye'), and *fei* (肺, 'lung'), which are marked in bold in Table 5.6. The inclusion of body part sememes in these terms provides clear information about the affected area.

The body part sememes can be discerned in the etymology of the source terms. For example, *paragonimiasis* means 'the infection caused by lung flukes' and the Chinese equivalent adopts the word *fei* (lung) for general uses with more semantic transparency for the native users. This approach ensures that the Chinese terms convey a clear understanding of the involved body parts.

2.3. Eponym

From 1950 to 1978, the use of eponyms created through a foreign semantic mechanism continued to exist. However, the semantics of these eponyms are not transparent to most Chinese term users, and the understanding of the disease they refer to relies solely on the marker words added after the phonetically borrowed names.

The formation of these eponyms during this period exhibits greater diversity. Table 5.7 presents some terms from the corpus that exemplify this phenomenon.

Eponym term	Semantic structure	English equivalent
包特金氏病	eponym	Botkin's disease; (infectious hepatitis; epidemic hepatitis)
柯兴氏综合征	eponym	Cushing's syndrome
何杰金氏病	eponym	Hodgkin's disease
Purtscher 氏病	eponym	Purtscher's disease
Hand-Schuller Cristian 氏病	eponym	Hand-Schuller Cristian syndrome
美尼尔氏征	eponym	Meniere's sign
布鲁氏菌病	eponym, pathogen	Brucellosis
胃何杰金氏病	body part, eponym	Hodgkin's disease of the stomach
眼孟氏裂头蚴病	body part, pathogen, eponym	Mansoni sparganosis ophthalmia
Wilson 氏红皮病	eponym, symptom	Wilson's erythroderma
Wilson 氏剥落性皮炎	eponym, symptom	Wilson's exfoliative dermatitis

Table 5.7 Eponymous terms (1950-1978)

Table 5.7 reveals that eponymous terms in this period were predominantly named after individuals' names, with the common marker word *shi* (氏, 'family name') corresponding to the possessive form *'s* in source languages. Among terms that solely consist of an eponymous sememe, phonetic loanwords make up the majority.

During this period, eponyms in Chinese medical journals exhibited a greater openness to English influence. Hybrid terms combining Chinese and English appeared, as seen in the example of *Purtscher 氏病*, which refers to a disease detected by the Austrian ophthalmologist Othmar Purtscher (1852–1927) in 1910 and described in 1912. The Chinese term is a compound term of partial loaning that adopts the English name graphically, combining it with *shi* (氏, 's) and the marker word *bing* (病, 'disease').

Another novelty of this period is the presence of terms phonetically loaned from Russian. The *baotejinshibing* (包特金氏病, Botkin's disease) is recorded in the medical literature as originating from Russia. The impact of Russian scientific literature can be observed in the corpus, starting from 1952, likely due to political cooperation with Russia.

The eponym mechanism is not only used to name diseases but also adopted to name pathogens. For example, *bulushijunbing* (布鲁氏菌病, 'brucellosis') is a highly infectious disease caused by brucella. Brucella is a bacteria named after the pathologist and microbiologist David Bruce, who made some of the key contributions in discovering a bacterium. The *Bulushi* in the Chinese term is a phonetic loanword from *Bruce*. In some cases, the English eponym is not fully adopted by the Chinese term phonetically. For example, the term *yanmengshilietouyoubing* (眼孟氏裂头蚴病) indicates the body part *yan* (眼, 'eye') and the pathogen *mengshilietouyou* (孟氏裂头蚴, 'spirometra mansoni'). The lexical unit of the pathogen only adapts the first syllable of *mansoni* phonetically into *meng* (孟) in Chinese.

According to the semantic structure of Table 5.7, more sememes appeared in the last five terms containing the eponym to indicate more information parameters about the disease, suggesting that **the eponym was further integrated into Western medical**

disease names in Chinese during this period, and began to be used in combination with the patrimonial semantic mechanism.

2.4. Time course, origin, epidemiology, cause, and condition

We have identified 71 terms from the 1950-1978 database that illustrate the time course, origin, epidemiology, cause, and condition of diseases. We have categorized them into different semantic categories and extracted keywords for each category. Please find them listed below:

Semantic category	Example	English equivalent	Keywords
Time course	急性乳腺炎	Acute mastitis	*jixing* (急性, 'acute')
	亚急性甲状腺炎	Subacute thyroiditis	*yajixing* (亚急性, 'subacute')
	逍遥性慢性心脏病	Chronic heart disease	*manxing* (慢性, 'chronic') *xiaoyaoxing* (逍遥性, 'chronic')
Origin	先天性隔赫尼亚	congenital diaphragmatic hernia	*xiantianxing* (先天性, 'congenital')
	原发性青光眼	primary glaucoma	*faxing* (发性, 'productive')
	复发性翼状胬肉	recurrent pterygium	
	特发性骨关节病	idiopathic osteoarthropathy	
	多发性黑头粉刺	multiple blackheads	
	再发性化脓性脑膜炎	recurrent suppurative meningitis	
	肺源性心脏病	pulmonary heart disease	*yuanxing* (源性, 'original')
Epidemiolo-gy	流行性乙型脑炎	Japanese encephalitis	*liuxingxing* (流行性, 'epidemic')
	流脑	meningitis	*liu* (流, 'epidemic')
	暴发型脑膜炎球菌感染	fulminant	*baofaxing*

		meningococcal infection	(暴发型, ‘fulminant’)
	急性播散性红斑狼疮	acute disseminated lupus erythematosus	*bosanxing* (播散性, ‘disseminative’)
Cause	*zhang* (瘴) *chenfei* (尘肺)	malaria pneumoconiosis	*zhang* (瘴, ‘bad air’) *chen* (尘, ‘dust’)
Complex Condition	*xinbaoqiekaishuhouzonghezheng* (心包切开术后综合征) *jianrinvebingfashenyandaozhiniaoduzhengchuxianleibaixuebingfanying* (间日疟并发肾炎引致尿毒症出现类白血病反应) *ziongshuangaihebingweimoxingchangyan* (子宫双癌合并伪膜性肠炎)	syndrome after pericardiotomy leukemia-like reaction in uremia caused by vivax malaria complicated by nephritis uterine double cancer complicated with pseudomembranous colitis	……*hou* (……后, after...) ……*yinzhi*……*chuxian* (……引致……出现, ‘leads to the appearance of...’) ……*hebing*……(……合并……, ‘combine’)

Table 5.8 Terms of the time course, origin, and epidemiology (1950-1978)

The scientific description of disease course, origin, and infectiousness in disease names is the result of a more specific classification of diseases in modern medicine. The terms of these semantic categories have keywords that modify the characteristics or types of the diseases. Most of the modifiers have an AN structure. The adjective in this patter holds the core meanings and the nous is a word that refers to an attribute *xing* (性) or type *xing* (型).

Take the keywords that express the time course and origins for example, the category of time course includes *jixing* (急性, ‘acute’), *yajixing* (亚急性, ‘subacute’), *xiaoyaoxing* (逍遥性, ‘chronic’), and *manxing* (慢性, ‘chronic’), indicating that the research on the disease in this period has already had a detailed classification. *Xiaoyaoxing* (逍遥性) is a term adopted from TCM terminology and it is a literary way to describe chronic diseases. It is only seen once and it is applied interchangeably with its synonymous term *manxing* (慢性, meaning ‘slow’).

The term *zhang* (瘴, 'miasma') indicate the cause of the disease *malaria* with the cause 'miasma', and the English equivalent *malaria*is from ancient Greek meaning 'pollution, defilement'. In the Western world, poisonous air had beesn believed to be the cause of malaria for a long history (Hempelmann & Krafts, 2013). Both the Chinese and English terms adopt the cause as the name of the disease, but the Chinese term is more semantically transparent to native speakers than its English equivalent.

The disease terminological units that explain the complex condition began to emerge during this period, demostrating the development of medical cognition. These units are composed of words organized hierarchically around a *syntactic nucleus* (Cabré et al., 2022). The syntactic nucleus that we can observe in the database can be a disease marker word such as *zonghezheng* (综合征, 'syndrome') in the first example, a compound disease name *leibaixuebingfanying* (类白血病反应, 'leukemia-like reaction') in the second example, o two nucleus *zigongshuangai* (子宫双癌, 'uterine double cancer') and *weimoxingchangyan* (伪膜性肠炎, 'pseudomembranous colitis') that are connected by a verb *hebing* (合并, 'combine').

2.5. Severity, environment, population, occupation, geographic indication, and arbitrary identifier

There are 30 terms belonging to the semantic categories of severity, environment, population, occupation, geographic indication, and arbitrary identifier.

Semantic category	Example	Literal meaning	English
Severity	恶性葡萄胎	Malignant grape fetal	malignant hydatidiform mole
Environment	风湿热	wind wet hot	rheumatism fever
Population	新生儿硬皮症	Newborn hard skin disease	neonatal scleroderma
Occupation	潜水夫病	diver disease	decompression sickness
Geographic indication	克山病	Keshan disease	Keshan disease
Arbitrary identifier	乙型脑炎	The second type of brain inflammation	Japanese encephalitis

Table 5.9: Examples of terms from 1950 to 1978 that indicate severity, environment, population, occupation, geographic indication, and arbitrary identifier

Table 5.9 presents examples of each semantic referent along with their literal meaning and English equivalents. Overall, the Chinese terms are more semantically transparent. For instance, the term *exingputaotai* vividly describes the deformed fetus caused by malignant hydatidiform mole by adopting the term *putao* ('grape').

Cultural differences are also evident in the choice of terms. For example, the *yixingnaoyan* (乙型脑炎) in Chinese adopts the ordinal number *yi* (乙, 'the second') in the traditional Chinese counting system, while the English equivalent term *Japanese encephalitis* includes the geographic indication.

Additionally, the Chinese and English terms may have different semantic focuses. For instance, the *qianshuifubing* (潜水夫病, 'diver disease') in Chinese reveals the typical profession of the patients, which is different from the semantic focus of its English equivalent *decompression sickness* that indicate the cause.

3. Variants in the texts

3.1. Diachronic variation
3.2. Functional variation
3.3. Discursive variation
3.4. Cognitive variation

In the database from 1950 to 1978, there are 39 terms with variants, accounting for 14% of all term entries. Among them, diachronic variants account for 5%, functional variants account for 7%, discursive variants account for 41%, and cognitive variants account for 47%. **Compared to the previous period, the interlinguistic and orthographic variants disappear**. The reduction of variation in the genre indicates the normalization and some degree of unification of medical terms. This can be a positive development in fields like medicine, where clarity and precision in communication are crucial.

3.1. Diachronic variant

The diachronic variant in Western medical terminology in the Chinese language generally refers to the coexistence of archaic and modern Chinese words. During this period, we identified two pairs of diachronic variants.

The terms *feiji* (肥瘠) and *feipang* (肥胖) are variants that refer to 'obesity'. *Feiji* adopts an ancient word, while the variant *feipang* is used in modern Chinese. Similarly, the ancient word *leishou* (羸瘦) and the comparatively more modern word *shouguzhengrong* (瘦骨峥嵘) both refer to 'extreme skinniness'.

3.2. Functional variant

In medical contexts, terms can have technical variants used in scientific or clinical settings, as well as lay variants used for general public communication. During this period, functional variants included classical and vernacular Chinese terms, as well as terms of the written and spoken style. Table 5.10 shows the two pairs of functional variants in the database.

Classical term	Vernacular variant	English equivalent
肝硬化	肝硬变	cirrhosis
白癜风	白斑病	vitiligo

Table 5.10: Functional variants in the database (1950-1978)

Classical terms in medical terminology consist of morphemes from traditional Chinese medicine, while vernacular terms are formed by general-purpose words. In the realm of functional variants, the more formal term *ganyinghua* (肝硬化) and the less formal term *ganyingbian* (肝硬变) are considered synonymous as they both refer to *liver cirrhosis*, describing the hardening process of the liver. According to more examples in the database, *ganyinghua* is gradually replacing its variant *ganyingbian* and is used as the normative term in the majority of cases.

Vernacular terms allow for a more transparent expression of diseases in oral communication, particularly to laypeople. Nevertheless, the broad meaning of

vernacular terms can lead to divergence between variants and subtypes. For instance, in one article from the corpus, *baidianfeng* (白癜风) and *baibanbing* (白斑病) refer to the same disease in different styles. The term *baidianfeng* is more formal while *baibanbing* is more colloquial. However, in a wilder context, these terms mean differently. The term *baidianfeng* specifically refers to the condition characterized by depigmented skin patches, while *baibanbing* encompasses a broader meaning of 'white patches disease'. In medical literature, *baidianfeng* is used as the Chinese equivalent of 'vitiligo' and *baibanbing* refers to a range of skin disorders that present with white patches or spots.

3.3. Discursive variants

During this period, the subtraction and addition of morphemes were used as methods to produce disease name variants in medical discourse. Abbreviations were used in the discourse, where complete terms appeared in the title, but an abbreviated form was adopted in the article. The use of abbreviations aligns with the economic principle of communication. Another discursive variant was to add morphemes to the original term, creating a longer compound term. The added morphemes made the expression of the disease name more precise.

There are sixteen pairs of discursive variants in the database, accounting for 41% of the variants, which is **almost four times the percentage of the previous period**. This aligns with the **increasing use of abbreviation terms**. We have discussed the ten abbreviated variants in 1.3.1.3 of this chapter, so we will present the variants of supplementary morphemes.

For example, the term *qianshuifubing* (潜水夫病, 'diver disease') that appears in the title has two discursive variants *qianshuifutanhuanzheng* (潜水夫瘫痪症 'diver paralysis symptom') and *qianshuifusaoyangzheng* (潜水夫瘙痒症, 'diver pruritus symptom') that are mentioned in the discourse. In these two variants, the added morphemes to the core term *qianshuifubing* are *tanhuan* ('palsy') and *saoyang* ('itchy'), which indicate the precise symptoms of the sickness.

Another set of discursive variants that refer to orbit 'paragonimiasis' are *yanbufeixichongbing* (眼部肺吸虫病) and *tuyanxingfeixichongbing* (突眼型肺吸虫病). The second term, with the extended morphemes *tuyan*, highlights the protruding eyes of patients who suffer from paragonimiasis.

3.4. Cognitive variant

Differences in cognitive dimensions can result in naming variants. The distinct conceptualization is revealed in the variants with different semantic focuses. Variants of the adopted traditional Chinese medical term and the newly coined term of Western medicine in China reflect the mentalities of different medical traditions. Variants of newly coined terms with different mechanisms demonstrate the variety of naming possibilities. We have identified 18 pairs of cognitive variants in the period. The cognitive variation of terms in this period has decreased from 60% in the previous period to 47% in the database. The cognitive variations in this period manifest in the following three situations.

1) **Within the traditional Chinese medical terminology**, the variants that refer to the same disease deliver different aspects of the sickness. The terms *zhangqi* (瘴气), *zhang* (瘴), and *nveji* (疟疾) are variants that refer to 'malaria'. The terms *zhangqi* and *zhang* mean 'miasma', which was believed to cause the sickness, thus the disease is named after the cause. The variant *nveji* contains the morpheme *nve* ('suffer') and the marker word *ji* ('disease') and it is named after the suffering symptom of the disease of malaria.

2) Variants exist within the medical terminology due to **differing cognition of various aspects of the disease between an adopted traditional Chinese medical term and a newly coined term for Western medicine**. In this period, we still can find the pair of variants for *diabetes*: *tangniaobing* (糖尿病) and *xiaokezheng* (消渴症) that we discussed in the last period.

There is an evolution in the adoption of the variation in different period as the understanding of diseases and terminology changes. For instance, the term

weihuangzheng (萎黄症) was a term used in traditional Chinese medicine to refer to *hypochromic anemia* through a metaphorical association. However, during 1950 to 1978, the meaning of this term is changed to 'chlorosis' which denotes the lack of chlorophyll in plants. In the 1950-1978 database, *weihuangzheng* was gradually replaced by *diliangxuesesupinxue* (低量血色素贫血, 'hypochromic anemia'), which is a calque from the English source term. This transition involved abandoning the use of metaphor as a formation mechanism and adopting a method of synthesizing the meaning from the equivalent English term, resulting in a more scientifically oriented terminological unit.

3) **Within the newly coined terms for Western medicine**, the lexical constituents reveal various focuses on the disease. Table 5.11 provides examples of cognitive variants in this situation.

Chinese term	Variants in the context	English equivalent
红皮病	Wilson 氏剥落性皮炎	erythroderma
弓形体虫病	毒浆原虫病	toxoplasmosis

Table 5.11: The cognitive variants between newly coined terms

These terms are neological compounds, but their semantic emphasis differs. The notable variations can be observed in terms that explain the disease's traits and eponymous terms. For example, the *hongpibing* (红皮病) and the *Wilson shiboluoxingpiyan* (Wilson 氏剥落性皮炎). The *hongpibing* indicate the symptom of the disease 'red skin', while the eponymous part of the term lacks obvious information about the disease. Additionally, the writing form of the term which is half English and half Chinese is not easily accessible to the cognition of Chinese native users.

In medical texts, it is noteworthy that variants resulting from translation actually highlight differences in semantics and cognitive focus when practitioners propose variants. Miyata and Kageura (2016) argue that translated texts (from Japanese into English) exhibit a high frequency of term variants due to different translation methods. Cognitive variations arising from translation are specifically observed in articles within the corpus, such as 弓形体虫病，或译为毒浆原虫病 ('*gongxingtichongbing*, or

translated to *dujiangyuanchongbing*'). Both multi-lexical terms refer to toxoplasmosis but use different language lexical units. The causal pathogen *gongxingtichong* (bow-shape worm) or *dujiangyuanchong* (poison paste worm), which is Chinese equivalents of 'toxoplasma', is indiacted in the variants. Based on the etymology of *toxoplasma*, *gongxingtichong* is a calque from the source language, while *dujiangyuanchong* has less dependence on the source word, and the semantic expansion *du* ('poison') of the *dujiangyuanchong* highlights the pathogen's danger to native speakers.

4. Synthesis

The period from 1950 to 1978 marks a significant phase of social development in the aftermath of the establishment of the People's Republic of China. During this time, Western medical terminology in Chinese underwent noteworthy advancements alongside the progress in medical research and communication. Despite the challenges posed by the formation of a new society, the field of medicine continued to evolve, and this period offers valuable insights into the development and characteristics of medical terminology. In this chapter, we delve into the linguistic and sociolinguistic analysis of medical terms, exploring morphosemantic aspects and the variation within the terminology databases of this era. By examining these linguistic dimensions, we aim to uncover the distinctive features and patterns that emerged during this transformative period, shedding light on the cognitive and cultural factors that influenced the evolution of medical terminology in China.

In **morphology**, we discuss word lengths, morphemes, and word formation mechanisms for lexical units in terminology databases from 1950 to 1978. We summarize the following characteristics:

1. Regarding word length, disease names during this period typically consisted of 2 to 10 syllables, with three-syllable terms being the most common. There was an increase in the number of terms exceeding ten syllables compared to the previous period, resulting in an overall longer average length of terminological units.

2. Concerning lexical units, the majority of terms were polylexical, with only two monolexical terms out of 264. This signifies a significant reduction in monolexical terms compared to the previous period, which had 14 monosyllabic terms.

3. Terms ending with a noun had the highest proportion, followed by those ending with an adjective and a verb. Analyzing the parts of speech of morphemes, disease names in this period can be categorized into modifier-headword and subject-predicate patterns. The most frequent pattern is the morphological formation of noun(s) as a modifier-headword, accounting for 87% of the terms. This pattern remains consistent with the previous period.

4. Approximately 75% of disease names were accompanied by disease marker words. The interplay between Chinese and Western medicine, as well as languages, resulted in a more diverse range of marker words during this period. **The types of marker words in this stage were more abundant compared to the previous period and included Traditional Chinese Medicine (TCM) terms, abbreviated terms, and phonetic loans. The marker words for many diseases had become settled, leading to fewer variants than in the previous period.**

5. In terms of word formation mechanisms, there were relatively few changes compared to the previous period. From a morphological standpoint, neological terms in this period can be divided into **loans, composition, and abbreviation**. **Composition is the most productive method for creating new terms**, and the percentage of new terms generated through composition increases as the adoption of Traditional Chinese Medicine (TCM) terms declines. Loanwords, on the other hand, maintain a consistent proportion. The mechanism of abbreviations gradually emerged during this period. Loans were further classified based on their degree of reliance on the source term, with neological terms relying more on the graphic or phonetic aspects of the source term. **Phonetic loans originated not only from English but also from Russian.** The composition mechanism involved semantic reference to the source terms, while partial loans demonstrated partial dependence on the source terms, and patrimonial composition displayed complete independence.

When examining the **semantic composition** of Western medicine disease terms in the Chinese language from 1950 to 1978, several key characteristics emerge:

1. **The semantic distribution and proportion of terms during this period are similar to those of the previous period**. However, in general, the terminological units contain more semantic parameters that contribute to greater specificity in disease naming.

2. **There is a notable acceptance of Western disease naming methods within the terms, particularly through the use of eponyms**. This mechanism has seen an increase compared to previous historical periods. However, the meaning behind these eponyms may be less transparent to Chinese users.

3. **Fixed semantic affiexes are starting to take shape within the terminology**. Certain patterns emerge where traits are emphasized as keywords, such as the combination of an adjective with 性 (*xing*, 'attribute'), which indicates the characteristics, or 型 (*xing*, 'type'), which denotes arbitrary identifers.

4. **The terminology of Western medicine in China gradually moves away from the use of metaphors or other rhetorical methods found in traditional Chinese medicine terminology**. Instead, the semantic constituents of the terms become more scientifically oriented.

These observations highlight the evolving nature of semantic composition in Western medicine disease terms during 1950 to 1978. The incorporation of specific parameters, adoption of eponyms, establishment of semantic frames, and a shift towards scientific expression all contribute to the development of Western medicine in China during this era.

The **variations** observed during this period primarily stem from within the Chinese language itself, influenced by diachronic features, functional styles, discourse needs, and cognitive aspects. Within the database spanning from 1950 to 1978, 39 terms exhibit variations, accounting for 14% of all term entries. Among these variations,

diachronic variants make up 5%, functional variants account for 7%, discursive variants make up 41%, and cognitive variants represent 47%.

1. **Diachronic variation within the Chinese language, characterized by the coexistence of archaic and modern words, is relatively limited compared to the previous era**. This indicates that the terminology of Western medicine is gradually moving towards modern linguistic expressions. From 1915-1949 to 1950-1978, diachronic variants decreased from 11.8% to 5%. This suggests that the use of historical or time-based language variations decreased over time.

2. **Functional variation in Western medical terms manifests in the contrast between classical formal terms and vernacular colloquial terms**. The presence of vernacular terms allows for a more accessible and transparent expression of diseases in oral communication with the general public. However, there is a tendency to adopt more formal terms in specialized texts. The use of functional variants decreased from 9.2% to 7%, and this minor decline suggests a slight shift in medical language use.

3. **In discourse, the addition or subtraction of morphemes depends on the requirements of the current knowledge dissemination process**. Abbreviations are employed to facilitate more convenient and efficient communication, while the addition of supplementary morphemes to the satellite term aids in ensuring clearer understanding. Discursive variants increased significantly from 9.2% to 41%. This suggests a notable shift in language use towards more context-dependent or discourse-based variations.

4. Cognitive variation in Western medical texts in the Chinese language during this period can be observed in three situations. Firstly, **variants exist within adopted traditional Chinese medical terminology** due to differing cognitions of the diseases. Secondly, variations between **adopted traditional Chinese medical terms and newly coined terms** in Western medicine reflect the distinct mentalities of different medical traditions. Lastly, variants of **newly coined terms with different mechanisms** show the diverse range of naming possibilities when transcoding the term from English to Chinese. **Cognitive variants decreased from 60% to 47%.**

The decrease indicates a shift towards more standardized or less cognitively influenced language use.

5. **Two types of variation disappeared during this period**. Interlinguistic variants decreased from 6.5% to 0, indicating a reduction in variations across different languages or interlinguistic influences. Orthographic variants also decreased from 2.5% to 0, suggesting a decline in variations related to spelling and writing style.

These various types of variation highlight the dynamic nature of the Chinese language within the context of Western medical terminology. The interplay between historical development, functional requirements, communicative preferences, and cognitive perspectives contributes to the richness and evolution of medical terminology during this period.

CHAPTER 6 ANALYSIS OF DISEASE TERMS (1979-2020)

The period from 1979 to 2020 witnessed a stable social environment in China, accompanied by the implementation of the reform and opening policy that promoted the integration of Western science and technology. During this time, Western medicine made significant progress and gradually became dominant in clinical practice in China. While subspecialty biomedical journals emerged, the *National Medical Journal of China* continued to serve as the primary comprehensive medical journal, focusing on critical healthcare issues.

Within our corpus for the third period, we observe an increase in disease case reports, and research articles adopt a standard academic writing structure, including abstracts and keywords, starting from 2000. These case reports, abstracts, and keywords greatly facilitate the identification of disease names. To construct our documentation, we systematically and randomly selected the first volume of the journal for each year in January, June, and December.

After a semi-exhaustive manual selection process, we have compiled a terminological database spanning from 1979 to 2020, containing 325 disease names (257 disease entries and 68 variants). We will analyze these disease names using the same methodology as employed for the previous two databases, focusing on their morphological and semantic features, as well as the presence of terminological variants within the texts.

1. Morphological analysis

1.1. Length ogf the terms	
1.2. Morphological structure	**1.2.1. Syntagmatic terms**
	1.2.2. Part of speech patterns of polylexical terms
	1.2.3. Marker words of disease
1.3. Terminological formation	**1.3.1. Neological terms**
	1.3.2. Adoption of TCM terms

In this period, we will apply the same pattern of analysis as in the previous two periods, focusing on various aspects such as the length of disease name terms, the number of morphemes, the POS mechanism, morphological features, and the morphological mechanism involved in the formation of medical terminology.

1.1. Length of the terms

Based on our data observations, we have noted a higher prevalence of disease name terms in this period that incorporate English letters, English words, Arabic numerals, and Roman numerals (63 terms in total, accounting for 19%) compared to the previous two periods. Therefore, when calculating the term length, we consider not only the number of syllables in the Chinese characters but also the presence of foreign letters and numerals within the term. Figure 6.1 illustrates the distribution of term lengths for disease names during this period.

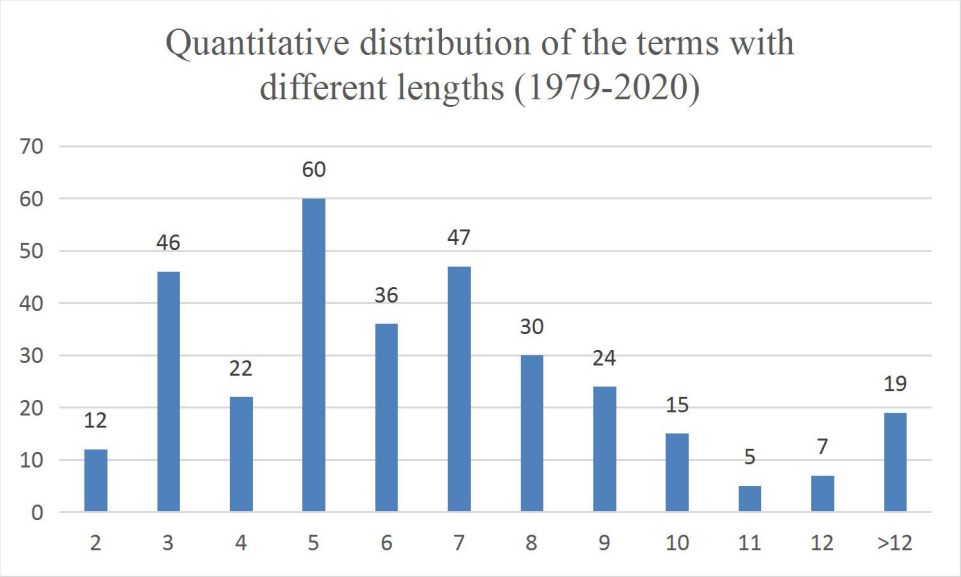


Figure 6.1: Quantitative distribution of the terms with different lengths (1979-2020)

Figure 6.1 reveals several noteworthy trends. Firstly, we observe the absence of monosyllable terms during this period. Instead, disease name terms consist of three to ten syllables, with a focus on terms with five, three, and seven syllables being the most prevalent. Furthermore, there is a notable presence of terms exceeding twelve syllables in length, indicating a significant number of longer and more complex disease name terms during this period.

1.2. Morphological structure

During this period, the terms exhibit greater length compared to the previous two periods. When counting the number of morphemes, we focus on the Chinese language, which means that terms formed using initial letters in English are not included in Chinese lexical studies. However, we will discuss the use of initials in abbreviation formation.

1.2.1. Syntagmatic terms

All the terms in this database are polylexical, meaning they consist of multiple lexical units. Monomorphic terms that rely on a single phonogram character mechanism or purely phonetic loan terms have disappeared. As we presented in the theoretical framework, specialized knowledge units can be matched with morphemes, lexical units, phraseological units, or even complete sentences, based on their internal

structure. Polylexical units and phraseological units are categorized as syntagmatic units in terminology (Cabré & Estopà, 2005). In this period, disease names are polylexical terms that indicate a specific disease, complications, or include attributive clauses that denote causes. These types of terms align with the concept of syntagmatic units.

1) Polylexical term

Out of the 324 terminological units analyzed, 307 of them (95% of the database) are polylexical terms, making them the predominant form in this period of Western medical terminology in Chinese.

For instance, the term, *jubuwanqiruxianai* (局部晚期乳腺癌, 'locally advanced breast cancer') includes four lexical units that indicate the area, the time course, the body part, and a marker word for 'cancer'. Similarly, the term *Kuxinzonghezheng* (库欣综合征, 'Cushing syndrome') is a term that contains the eponym (*Kuxing*, meaning 'Cushing') with the genre of the disease (*zonghezheng*, meaning 'syndrome').

2) Syntagmatic terms indicating complications

Syntagmatic terms play a crucial role in medical language by clarifying the relationship between diseases or conditions. These terms are used to describe the simultaneous occurrence or correlation of multiple diseases within a patient or a syndrome. They often utilize conjunction words such as *hebing* (合并, 'combined') or *ban* (伴, 'with') or hyphens to connect multiple disease terms, thus indicating the presence of syndromes. By employing these terms, medical professionals can effectively communicate the complex nature of diseases and their treatment.

For example, the unit *tongfenghebingfengshixingxinzangbing* (痛风合并风湿性心脏病, 'gout combined with rheumatic heart disease') combines two diseases with the conjunction word *hebing* (合并). In our database, there are seven terms indicating the complication of two diseases connected by *hebing.*

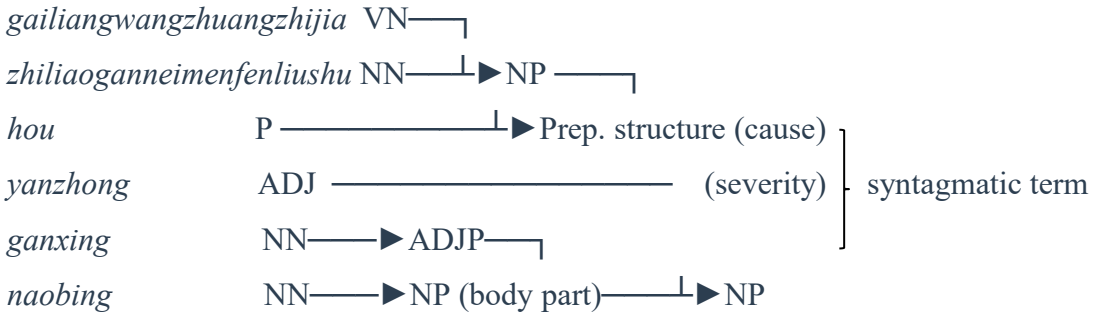
Another example is the terminological unit *jiakangbangaore* (甲亢伴高热, 'hyperthyroidism with high fever') , which combines two disorders using *ban* (伴, 'with'). There are two instances of this pattern in our database.

The terminological unit that indicates complications *yaotong-jixingshensunshang-luanyuankongweibi-gusuizengshengyichangzonghezheng* (腰痛—急性肾损伤—卵圆孔未闭—骨髓增生异常综合征, 'lumbar pain-acute kidney injury-patent foramen ovale-myelodysplastic syndrome') exemplifies a case where multiple disease names are connected using hyphens to indicate a complication. This pattern occurs in four cases and is commonly found in clinical case reports.

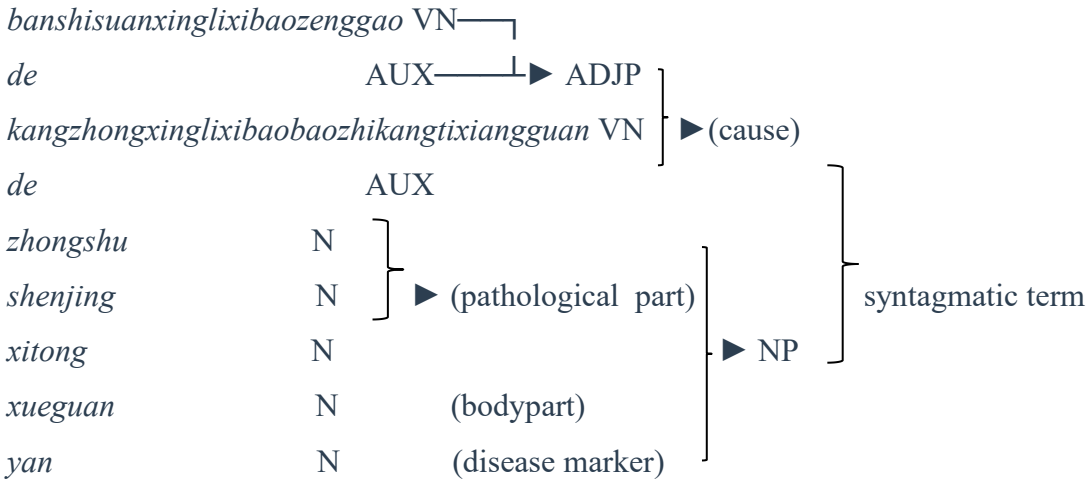
3) Syntagmatic terms with prepositional structures or attributive clauses indicating causes or conditions of diseases

This type of syntagmatic terminological unit involves a headword of a polylexical disease name combined with a modifier in the form of a prepositional structure or an attributive clause. The terms formed in this manner represent the two longest terminological units in the entire database:

1. The semantic constituency parsing as shown below of the terminological unit *gailiangwangzhuangzhijiazhiliaoganneimentifenliushuhouyanzhongganxingnaobing* (改良网状支架治疗肝内门体分流术后严重肝性脑病, 'severe hepatic encephalopathy after intrahepatic portosystemic shunt by improved mesh stent') reveals that it is a syntagmatic term. The disease name component is represented by the noun phrase (NP) *ganxingnaobing* ('hepatic encephalopathy'), while the prepositional structure with the preposition *hou* ('after') illustrates the cause of the disease.



2. *Banshisuanxinglixibaozenggaodekangzhongxinglixibaobaozhikangtixiangguande zhongshushenjingxitongxueguanyan* (伴嗜酸性粒细胞增高的抗中性粒细胞胞质抗体相关的中枢神经系统血管炎, 'central nervous system vasculitis associated with antineutrophil cytoplasmic antibodies with eosinophilia') is a syntagmatic term. The parsing below shows that the term is formed with an NP as a polylexical disease name (*zhongshushenjingxitongxueguanyan*, 'central nervous system vasculitis') and a modifier that is put in front of the name. The modifier is an attributive clause (*banshisuanxinglixibaozenggaodekangzhongxinglixibaobaozhikangtixiangguande*, 'associated with antineutrophil cytoplasmic antibodies with eosinophilia') to indicate the cause of the disease.



In the database, super-long terminological units like the ones mentioned are not common and typically occur in research articles discussing special cases. Lexical units of this length do not align with the characteristics of Chinese vocabulary, and it is not conducive to the convenience of communication, whereas it is clearly explained cognitively various dimensions of the diseases.

1.2.2. Part of speech pattern

After performing part-of-speech (POS) tagging using the NLPIR tool and manual verification, we have identified a total of 63 unique POS patterns in this database. Table 6.1 provides a comprehensive overview of these patterns, along with their

respective proportions in the dataset.

POS pattern	Term number (proportion)
1. NNN	55 *(18.3%)*
2. NN	34 *(11.3%)*
3. ANN	30 *(10%)*
4. ANNN	28 *(9.3%)*
5. NNNN	25 *(8.3%)*
6. NAN	6 *(2%)*
7. NNNNN	6 *(2%)*
8. NVN	6 *(2%)*
9. NV	6 *(2%)*
10. AANN	5 *(1.7%)*
11. NNA	5 *(1.7%)*
12. AAN	5 *(1.7%)*
13. NNV	5 *(1.7%)*
14. NANN	4 *(1.3%)*
15. ANNNN	4 *(1.3%)*
16. ANA	4 *(1.3%)*
17. VN	3 *(1%)*
18. ANV	3 *(1%)*

19. NA	3 *(1%)*
20. NAANN	3 *(1%)*
21. AANNN	2 *(0.7%)*
22. ANVN	2 *(0.7%)*
23. NNVN	2 *(0.7%)*
24. NANNVANNN	2 *(0.7%)*
25. AVN	2 *(0.7%)*
26. NNANN	1 *(0.3%)*
27. AAANN	1 *(0.3%)*
28. NNNNNN	1 *(0.3%)*
29. NVANN	1 *(0.3%)*
30. NNNANN	1 *(0.3%)*
31. ANAN	1 *(0.3%)*
32. NNAN	1 *(0.3%)*
33. NAV	1 *(0.3%)*
34. AAA	1 *(0.3%)*
35. NAAN	1 *(0.3%)*
36. AV	1 *(0.3%)*
37. NVNVNN	1 *(0.3%)*
38. NNAV	1 *(0.3%)*

39. ANNV	1 *(0.3%)*
40. AAANVN	1 *(0.3%)*
41. ANNNNNNAN	1 *(0.3%)*
42. ANNAV	1 *(0.3%)*
43. NNNVNNN	1 *(0.3%)*
44. NNNNAANN	1 *(0.3%)*
45. ANNNV	1 *(0.3%)*
46. ANVNVANNN	1 *(0.3%)*
47. ANAA	1 *(0.3%)*
48. ANVNV	1 *(0.3%)*
49. AAANANN	1 *(0.3%)*
50. ANNVN	1 *(0.3%)*
51. NVAAANN	1 *(0.3%)*
52. NANVANNN	1 *(0.3%)*
53. ANANN	1 *(0.3%)*
54. VNN	1 *(0.3%)*
55. ANNVNN	1 *(0.3%)*
56. ANNVANNN	1 *(0.3%)*
57. NVNNAANV	1 *(0.3%)*
58. NANA	1 *(0.3%)*

59. NNANA	1 ***(0.3%)***
60. NANNV	1 ***(0.3%)***
61. ANNAA	1 ***(0.3%)***
62. NNNA	1 ***(0.3%)***

Table 6.1: Types of all the POS patterns of the disease names in the 1979-2020 database

Disease terminological units in this period exhibit a greater diversity in the parts of speech (POS) of their constituents. Most of these terms follow an endocentric pattern, where the central word functions as a noun, and the structure of the terms is modifier(s)-disease headword. Additionally, there are terms that adopt a subject-predicate structure, with adjectives or verbs appearing at the end. These terminological units, with their terminologicalization, serve as specific references to diseases.

Among the various POS patterns observed, the top ten patterns in terms of frequency are NNN, NN, ANN, ANNN, NNNN, NAN, NNNNN, NVN, NV, and AANN, collectively accounting for 64.8% of the total patterns.

1.2.3. Marker words of disease

In the database covering the period from 1979 to 2020, we have identified 221 terms that include marker words, which represents more than 68% of the total number of terms. The following table presents the frequency of appearance for each marker word in the usage of disease terms:

Marker words	Frequency of Appearance (proportion)
1. *bing* (病, disease)	38 ***(17.1%)***
2. *liu* (瘤, tumor)	37 ***(16.7%)***
3. *zonghezheng* (综合征, syndrome)	33 ***(15.3%)***

4. *yan* (炎, inflammation)	31 ***(14%)***
5. *zheng* (症, symptom)	26 ***(11.7%)***
6. *ai* (癌, cancer)	18 ***(8.1%)***
7. *ganran* (感染, infection)	10 ***(4.5%)***
8. *lou* (瘘, fistula)	4 ***(1.8%)***
9. *chuang* (疮, ulcer)	3 ***(1.4%)***
10. *yinghua* (硬化, harden)	3 ***(1.4%)***
11. *jieshi* (结石, lithiasis)	2 ***(0.9%)***
12. *yingbian* (硬变, harden)	2 ***(0.9%)***
13. *nangzhong* (囊肿, cyst)	2 ***(0.9%)***
14. *zhongliu* (肿瘤, tumor)	2 ***(0.9%)***
15. *quexian* (缺陷, defection)	1 ***(0.5%)***
16. *fei* (肺, lung disease)	1 ***(0.5%)***
17. *quesun* (缺损, defection)	1 ***(0.5%)***
18. *nve* (疟, malaria)	1 ***(0.5%)***
19. *tong* (痛, pain)	1 ***(0.5%)***
20. *ji* (疾, disease)	1 ***(0.5%)***
21. *bingbian* (病变, patholigical change)	1 ***(0.5%)***
22. *nongzhong* (脓肿, apostem)	1 ***(0.5%)***
23. *zhong* (肿, swell)	1 ***(0.5%)***
24. *jiehe* (结核, tuberculosis)	1 ***(0.5%)***

Table 6.2: Disease marker words of the terms from the database from 1979 to 2020

According to Table 6.2, there are more disease marker words in this period compared

to the previous two periods. The most applied marker words in disease names are *bing* (病, 'disease'), *liu* (瘤, 'tumor'), *zonghezheng* (综合征, 'syndrome'), *yan* (炎, 'inflammation'), *zheng* (症, 'symptom'), *ai* (癌, 'cancer') and *ganran* (感染, 'infection'). These marker words play an important role in disease terminology as they contribute to the semantic transparency of the terms.

Here are some detailed features of disease marker words from 1979 to 2020:

1) Most of the marker words are monosyllabic words. Some monosyllabic marked words have disease-related radicals (疒, *ne*, 'disease'; 炎, *yan*, 'inflammation'), and some markers are body parts (肺, *fei*, 'lung').

The use of these monosyllabic marker words reflects the characteristics of the Chinese language, where a single character can represent a complete word with its own meaning. For example, *fei* (肺, 'lung') in *nongminfei* is a shortened version of *feibing* ('lung disease'). The character *fei* takes on a polysemous role, referring to both body parts and diseases. The selection of such abbreviations in disease names depends on the specific medical communication context, activating the polysemous and terminological functions of body nouns in medicine within the communicative context.

2) The use of *zheng* (征, 'sign') has significantly increased in this period, particularly in the term *zonghezheng* (综合征, 'syndrome'). The English word *syndrome* derives from the Greek word *sundrom*, meaning 'concurrence of symptoms'. A syndrome refers to patterns of symptoms, including behavioral patterns that indicate different conditions. In the Chinese database during this period, out of the 33 disease names containing *zonghezheng*, 13 are eponymous syndromes.

3) Compared to the previous two periods, there are fewer variations of disease marker words in this period. Over the course of nearly 100 years of communication, terms with redundant morphemes or strong traditional Chinese medicine (TCM) features have been eliminated. Marker words that are precise in expression and easy to remember have been gradually selected. This process has led to the establishment of a prescriptive system of marker words that facilitates more effective communication.

1.3 Morphological formation

The terms of Western medicine disease names in this period exhibit different morphological formation mechanisms, including neologisms and adopted traditional Chinese medicine (TCM) terms. Table 6.3 provides an overview of the 325 disease terms in Western medicine and categorizes them based on their respective morphological formations. This data is sourced from the 1979-2020 database, allowing us to analyze the patterns of word formation in these terms.

Mechanism			#	Example
Neologism 315 (97.8%)	Loanwords	Graphic loaning from English	26 (8%)	CS OSAHS FD COVID-19
	Compounds 282 (86.8%)	Partial loan 1) Graphic loanwords + patrimonial morpheme	49 (15%) EG	Möbius 综合征 AIDS 合并 ARDS IgG4 相关性眼病 Ⅱ型糖尿病
			7 (2%) JP	原发性胆汁性肝硬变
		2) Phonetic loanwords+patrimomial morpheme	16 (4.6%) EG	梅克尔憩室 林岛氏病 弗尼氏弧菌肠炎 大脑曼氏裂头蚴病 艾滋病 致命性过敏性休克
		Calque	122 (37.5%)	多器官功能障碍综合征(multiple organ dysfunction syndrome，MODS) 高血糖 青光眼
		Partial calque	29	21 羟化酶缺陷症

			(8.9%)	
		Patrimonial composition	55 (15.7%)	克山病 尿毒症 银屑病 重症肌无力
		Syntagmatic units	6 (1.8%)	腰痛—急性肾损伤—卵圆孔未闭—骨髓增生异常综合征
	Abbreviation		8 (2.5%)	冠心病 躁郁症 甲亢 甲减 妊高症 新冠肺炎
Adopted terms from TCM			6 (2.2%)	间日虐 风湿病 贲门癌 先兆子痫 鼻衄 尿石症

Table 6.3: Morphological mechanisms of the disease names (1979-2020)

From 1979 to 2020, the majority of disease terms in Western medicine (97.8%) were newly coined, while only a small portion (2.2%) consisted of adopted traditional Chinese medical terms. The ratio of newly coined terms to adopted TCM terms is notably disparate compared to the first period. This suggests a growing independence of Western medical terminology from the traditional Chinese medicine (TCM) terminology system. This shift reflects the evolving nature of medical practices in China, where Western medicine has gained prominence and established its own distinct terminology system separate from TCM.

1.3.1. Neological terms

In Western medical terms in Chinese, newly coined terms take precedence and are primarily formed through composition. Among the 315 terminological neologisms analyzed, 8.2% are loanwords, 89.5% are compounds, and 1.8% are abbreviated terms. This indicates that the majority of newly coined terms in Western medicine utilize a combination of existing morphemes to create compound terms, while a smaller percentage consists of loanwords borrowed from other languages and abbreviated terms. Composition emerges as the most frequent mechanism in the formation of these neologisms.

1.3.1.1. Loanwords

From 1979 to 2020, there were 26 pure loan terms in Western medical terminology in Chinese that were borrowed from English initialisms. These terms were directly adopted in the Chinese context. On the other hand, the phonetic loaning from Western languages did not maintain its independent role in the naming of diseases during this period. However, we will discuss the phonetic loaning in the context of partial loans within the composition mechanism.

During the period from 1979 to 2020, there was an emergence of graphic loaned terms from English, particularly in the form of initialisms. Examples such as *MTSM*, *CS*, *OSAHS*, *SRS*, *FD*, *COVID-19*, and others can be found in the database, especially towards the later years of this period. The direct adoption of English initialisms reflects the advancement of China's Western medicine in aligning with international standards. It also indicates the development of the Western medicine discipline to a more professional and independent level within the Chinese context.

Cabré and Estopà (2005) stated that it is common to use initialisms more frequently in professional medical articles compared to general-purpose articles. However, the adoption of English initialisms in a Chinese context poses some morphological challenges. These terms sound foreign when pronounced following the English source terms, and their formation may not align with natural Chinese morphological patterns.

1.3.1.2. Composition

A. Partial loan
B. Calque
C. Partial calque
D. Patrimonial composition
E. Syntagmatic units

Composition is the primary mechanism for creating new words in Chinese, and it is evident in the database from 1979 to 2020, where 86.8% of disease terms are compound words. The composition mechanism is often combined with other word formation mechanisms. In terms of dependency on foreign equivalents, the terms can be further classified into partial loans, calques, and patrimonial compounds.

A. Partial loan

The loaned part of the partial compound terms during this period exhibits a certain level of boldness in adopting diverse forms. There is a willingness to incorporate loaned elements from foreign languages in various ways, showcasing the adaptability and openness of Western medical terminology in Chinese.

1) Graphic loaned words + Chinese patrimonial morpheme

During this period, the use of graphic loaned words combined with Chinese patrimonial morphemes is more prevalent. Graphic loaning encompasses various elements, including eponyms (e.g., *Möbius zonghezheng*, Möbius 综合征, 'Möbius syndrome'), acronyms (e.g., *AIDS hebing ARDS*, AIDS 合并 ARDS, 'AIDS combined with ARDS'), symbols (e.g., *IgG4 xiangguanxingyanbing*, IgG4 相关性眼病, 'IgG4-related eye disease') and Roman numerals (e.g., *II xingtangniaobing*, Ⅱ型糖尿病, 'type II diabetes'). The patrimonial morpheme part of the structure often includes a disease marker word, such as *bing* in *Castleman bing* (Castleman 病, 'Catsleman disease'), *zonghezheng* in *Terson zonghezheng* (Terson 综合征, 'Terson syndrome'), and *ganran* in *HIV ganran* (HIV 感染, 'HIV infection').

During this period, the range of patrimonial morphemes that can be combined with

graphic loaned words is extensive. For example, the term *Merosin queshixingxiantianxingjiyingyangbuliang* (Merosin 缺失型先天性肌营养不良, 'Merosin-deficient congenital muscular dystrophy') retains the English graphic *Merosin* while providing more details of the disease through Chinese patrimonial morphemes.

The development and exchange of Western medicine in China have contributed to a more open and flexible structure for combining lexical units during this period, resulting in the creation of 49 disease names following this pattern. Additionally, a significant number of English abbreviations have been boldly borrowed into the Chinese context in Western medicine vocabulary, highlighting the stark contrast between the vocabulary systems of Western medicine and traditional Chinese medicine.

In contrast to the heavy borrowing from Western languages, we only found seven compound terms that included Japanese graphic loan words *ganyingbian* (肝硬变, 'liver cirrhosis') and *jiazhuangxian* (甲状腺, 'thyroid') from the previous period. Due to the isomorphic relationship between Chinese and Japanese, these terms have seamlessly integrated into Chinese vocabulary. However, there is no explicit mention of borrowing from Japanese in the texts during this period, indicating a gradual shift away from the transient dependence on isomorphic Japanese terms in the early days of Western medical terminology in Chinese.

2) Phonetic adapted loaning + Chinese patrimonial morphemes

The phonetic adapted loaning process involves integrating English words into Chinese by adopting Chinese characters with similar pronunciations. This form of loaning is observed in various situations within disease terminology during 1979 to 2020.

Firstly, eponymous disease names employ phonetic adaptation, where the eponym part is phonetically integrated into Chinese. Examples include terms like *meike'er qishi* (梅克尔憩室, 'Meckel's diverticulum') and *lindaoshibing* (林岛氏病, 'Lindau disease').

Secondly, pathogens named after eponyms borrow phonetic adaptations in Chinese terms. For instance, terms like *funishihujunchangyan* (弗尼氏弧菌肠, 'vibrio furnieri enteritis') and *danaomanshilietouyoubing* (大脑曼氏裂头蚴病, 'cerebral sparganosis mansoni') adopt the phonetic adaptation of English terms for the pathogens. In these cases, Chinese terms typically borrow the initial syllables of the English terms, creating an acronym-like structure.

Thirdly, phonetic adaptation is used for English acronyms. For example, the English acronym *AIDS*, pronounced as /aids/, is transcribed as *aizibing* (艾滋病) in Chinese. The transcribed term combines the phonetic loanword with the Chinese disease marker word *bing* (病).

Lastly, phonetic adaptation is applied to disease marker words. In the term *zhimingxingguominxingxiuke* (致命性过敏性休克, 'fatal anaphylactic shock'), the disease name *xiuke* is a phonetic loanword from the English word *shock*. This loanword has become an established equivalent in Chinese, facilitating the creation of new words in various contexts.

While phonetic loanwords may not align perfectly with Chinese pronunciation and may lack transparent meanings, their presence in this period has broadened the range of borrowed elements. Some loanwords have even integrated into the Chinese vocabulary system, serving various functions in a wider range of scenarios.

The willingness to adopt loaned forms in partial compound terms reflects an ongoing effort to incorporate the advancements and terminology of Western medicine into the Chinese medical context. It demonstrates the dynamic nature of language and the evolving needs of medical communication in a globalized world.

B. Calque

During this period, as modern medicine progressed globally and exchanges between China and other countries increased, we compared Chinese terms with their Western

equivalents and identified 122 pairs of terms that had semantically one-to-one correspondence. These terms fall into the category of calques.

Some Chinese terms imitate the meaning of neoclassical terms in English. For example, the Chinese term *gaoxuetang* (高血糖) is the equivalent of the English term *hyperglycemia* which is a neoclassical term from *hyper-* (‘over’)and *glycemia* (‘sugar in the blood’), indicating ‘high sugar in the blood’. The Chinese term conveys the meaning by adopting three words for general purposes: *gao* (‘high’), *xue* (‘blood’), and *tang* (‘sugar’).

Some calques in Chinese adopt the meaning of the multilexical English terms. The term *duoqiguangongnengzhangaizonghezheng* (多器官功能障碍综合征) consists of five words that correspond in meaning to the English multilexical term *multiple organ dysfunction syndrome*.

Some Chinese terms indicate historical events recorded in English terms. For example, the term *legionnaires pneumonia* directly translates the origin of the disease name, which comes from the French word *légionnaire*. The disease was named after the lethal outbreak of July 1976 at the American Legion convention in Philadelphia’s Bellevue Stratford Hotel (*Legionnaires Disease History, Burden, and Trends | CDC*, 2022). The Chinese name *juntuanfeiyanjun* (军团菌肺炎) which means ‘military group lung inflammation’ copies the origin of the disease name.

The calque mechanism is widely used in Chinese. Chinese is a paratactic language, and grammatical meaning and logical relationships are expressed through the meanings of words rather than formal changes. This linguistic feature highlights the critical role of semantic content in word formation, making calques that adopt the meaning of Western terms more suitable for effective communication in the Chinese language. In the calque process, Chinese Western medical terms not only imitate the meaning of Western terms but also undergo communicative adaptation by abandoning the use of difficult archaic words and employing everyday lexical units that are easier for Chinese native users to understand.

C. Partial calque

In this period, we find fewer partial calques in the database than in the previous period. The characteristic of a partial calque involves not only referencing foreign equivalents but also adding a native morpheme to aid in indicating diseases. With the assimilation of Western medicine, the calque is sufficient to describe a disease term.

D. Patrimonial composition

At the same time, we found that in word formation, there are Chinese terms that have their naming independence. These new terms denote the characteristics of the Chinese language and disease details, using a synthetic mechanism to create patrimonial compound terms.

The naming morphosemantic mechanism is independent of the source term. For example, the term *yinxiebing* (银屑病, psoriasis). The term *psoriasis* includes two morphemes *psora* ('itch'), and *-iasis* ('action, condition'), which describe the symptom of the dermatological disease. The Chinese term *yinxiebing* means 'sliver flakes disease', indicating the external lesions of the disease. Another example is the term *niaoduzheng* (尿毒症), meaning 'urine poison symptom', and the English equivalent *uremia* is a neoclassical term that includes two Greek roots *ouron* ('urine') and *haima* ('blood'). The Chinese term changes the 'blodd' to 'pooison', and adds a marker word *zheng* ('symptom'). Thus, these Chinese terms are recreated without relying on the English terms.

The designation of the disease occurs primarily in China as the disease is first identified in China. The disease *xinxing guanzhuang bingdu feiyan* (新型冠状病毒肺炎, 'new coronavirus pneumonia') was first identified in China. Although there have been terminological variants in the field of non-medical communication[24], such as *Wuhan pneumonia*, *new SARS*, etc., in official Western medical journals, *xinxing guanzhuang bingdu feiyan* is the name of the disease that we can find in the corpus. The

[24] Refers to the presentation "La Evolución de la Nomenclatura de COVID19 y la Política de Terminología de China" in XVII Simposio de la Red Iberoamericana de Terminología RITerm 2020-2021 (Lu Zebing, 2021)

international protocol of best practices for naming new human infectious diseases issued by the World Health Organization was of great assistance to this final term, as it avoided the stigmatization of the place where it was discovered and scientifically indicated the pathogen.

E. Syntagmatic units

The syntagmatic units are considered as a compound mechanism in creating new terminological units, as discussed in the section on polylexical terms (see 1.2.1 in this chapter). As an extended form of composition, syntagmatic units offer greater flexibility in expressing complications or providing additional details about diseases.

In this period, the number of syntagmatic units still remains in the minority, with only 8 in the database. However, the proportion has increased by 0.6% compared to the previous period, which to some extent indicates that in medical texts during this period, there is a greater degree of freedom and detail in explaining disease names, and research on complications is gradually increasing. By utilizing syntagmatic units, experts can construct more elaborate and descriptive terms that accurately convey specific conditions and complexities related to diseases.

1.3.1.3. Abbreviation

The word creation of abbreviations during this period retains the characteristics of the previous period, while also following the rules of Chinese vocabulary that prioritize representative morphemes of the polylexical units when abbreviating. For instance, the term *rengaozheng* (妊高症) is an abbreviation for *renshengaoxueyazheng* (妊娠高血压症); the term *xinguanfeiyan* (新冠肺炎) is the abbreviation of *xinxingguanzhuangbingdu feyan* (新型冠状病毒肺炎). Although abbreviations facilitate simple and rapid communication, they may not be as semantically transparent as the full names. The proportion of abbreviations in this period declined compared to the previous period.

1.3.2. Adoption of TCM terms

From 1979 to 2020, the adoption of traditional Chinese medicine (TCM) terminology in the context of Western medicine decreased significantly compared to the previous period. In the database of this period, we only found 8 traditional Chinese medical terms, which accounted for 2.2% of the terms.

Although the number of adopted TCM terms in Western medicine decreased significantly during this period, some of these terms have officially entered the terminology of Western medicine, replacing the names based on other morphological mechanisms. For example, *fengshibing* (风湿病) is the official name for *rheumatism*.

Monosyllable terms have completely disappeared, and the adopted TCM terms in this period typically have two to four syllables. For example, *binǜ* (鼻衄)， *niaoshizheng* (尿石症), and *xianzhaozixian* (先兆子痫).

In terms of semantic transparency, most adopted TCM terms aim to use words with general meanings to make the terms easily interpretable. However, it is worth noting that some terms may include archaic words, which can make the term sound unfamiliar for layman users. For instance, the term *jianrinve* (间日虐, 'tertian torture') is used to describe the symptoms of *malaria*, such as *benmen* (贲门, 'cardia')[25] and *nǜ* (衄, 'bleed')[26] also incorporate archaic words. While these terms may be more specific and accurate within the TCM context, they may require further explanation or clarification for those unfamiliar with the archaic terminology.

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[25] Li Zhongzi of the Ming Dynasty in China, "*Must-read Medical History*": "The mouth above the stomach is called the *benmen*." (translated by the author from 中国明代李中梓《医宗必读》：“胃之上口，名曰贲门。”)

[26] Chao Yuanfang of Sui Dynasty in China, "*On the Origin and Symptoms of Various Diseases Epistaxis*": "The lungs open up in the nose, and the heat takes advantage of the blood, so the *qi* is also hot. The blood and *qi* are both hot, and the blood comes out of the nose with the *qi*, which is binǜ. (translated by the author from 隋代巢元方《诸病源候论・鼻衄候》：“肺开窍於鼻，热乘於血，则气亦热也。血气俱热，血随气发出於鼻为鼻衄。”)

2. Semantic analysis

2.1. The symptoms, affected body part, and physiological process

2.2. Causal pathogen

2.3. Eponym

2.4. Time course, origin, and epidemiology

2.5. Severity, environment, species of animal or food, occupation, age and population, geography, and arbitrary identifier

In semantic analysis, we categorize the sememes contained in all terminological units based on the instinct of native speakers. We then present their distribution as follows:

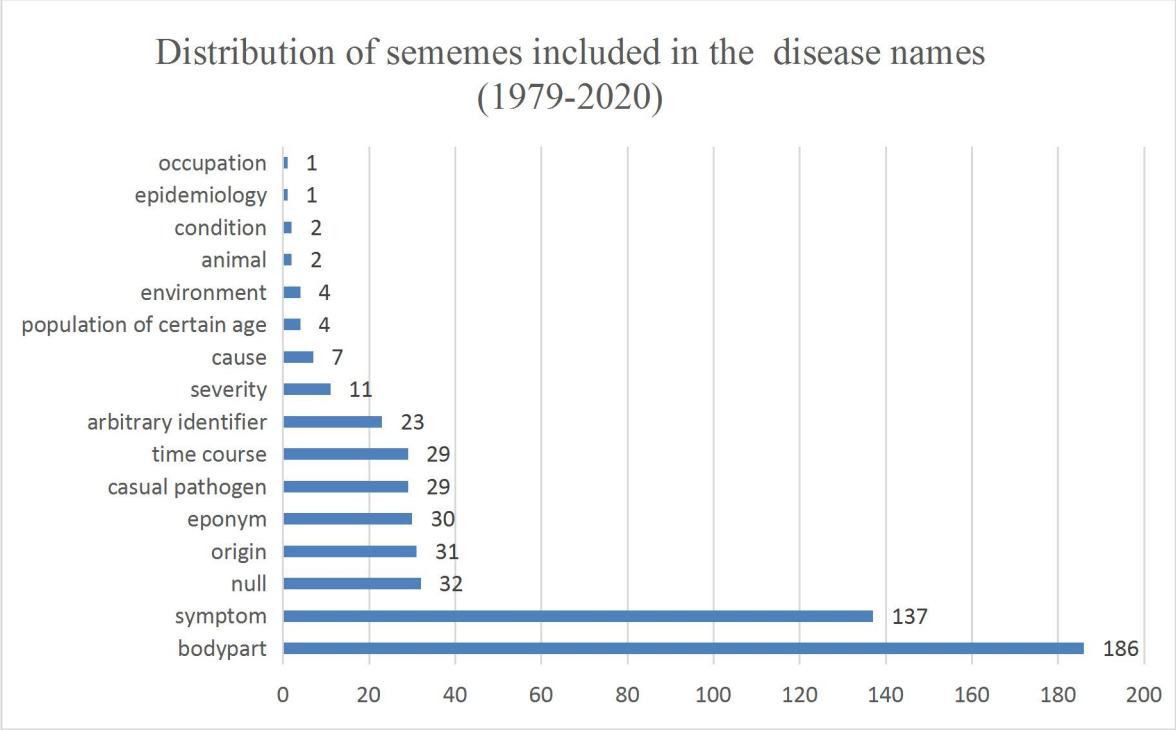

Figure 6.2: Distribution of sememes included in the disease terms (1979-2020)

According to Table 6.2, the database of disease names from 1979 to 2020 includes 325 terms, which contain a total of 529 sememes. This indicates that each term averages 1.62 sememes. The largest category of sememes is those denoting body parts,

which appear in 70.4% of the terms. Following that, 51.8% of the terms include sememes denoting symptoms. There are also 32 terms for which the meanings cannot be intuitively determined based on native language instinct, and most of these are graphic loanwords derived from English initialisms.

In terms of semantic types, we have adjusted the division method used in the previous periods and have categorized the terms into the following five categories, as shown in Table 6.3.

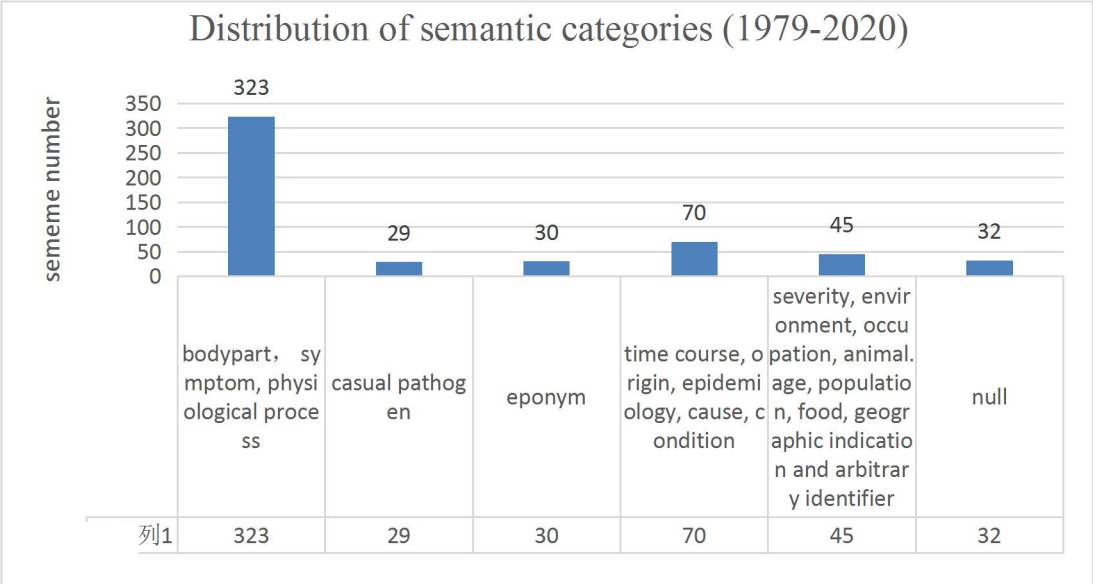

Figure 6.3: Distribution of semantic categories of WHO (1979-2020)

Figure 6.3 illustrates the distribution of semantic categories among the 529 sememes from the period 1979 to 2020. The largest number of sememes are related to symptoms and affected body parts, accounting for 61% of the total. Within this category, there are sememes that indicate pure symptom descriptions as well as specific body parts associated with the disease. Sememes that identify the causal pathogen of the disease constitute 5.4% of the sememes. Additionally, 5.6% of the sememes are eponymous, referring to terms named after individuals. Sememes that reveal information about the time course, epidemiology, cause, condition, and origin account for nearly 13.4% of the sememes. The remaining 8.5% of sememes indicate severity, environment, species of animal or food, occupation, age and population, as well as undue fear and arbitrary identifiers. Each category will be presented with

examples from our database.

It should be noted that the 32 semantic items marked as null refer to English initialism loanwords, which have been previously discussed in the section on loanwords. This chapter, however, focuses specifically on terminological units that possess lexical meanings.

2.1. The affected body part, symptoms, and physiological process

In this period, a total of 186 disease terms include references to specific body parts. The body parts mentioned in these terms refer to the affected body part, inner organs, and tissues. Among these 186 terms, 30 terms exclusively indicate body parts, while the rest are combined with other sememes. Additionally, there are 137 terms that incorporate symptoms in their names, with 16 terms solely indicating symptoms, while the others provide additional information parameters about the diseases.

Disease names that solely mention body parts typically follow the pattern of XX + a disease marker word, indicating a type of disease affecting a specific body part. For example, *pangguangai* (膀胱癌, 'bladder cancer'), *biyanai* (鼻咽癌, 'nasopharyngeal carcinoma'), *shenjieshi* (肾结石, 'renal calculus'), *shenjingmuxibaoliu* (神经母细胞瘤, 'neuroblastom'), and a*xiongzhudongmailiushguanlou* (胸主动脉瘤食管瘘, 'thoracic aortic aneurysm esophageal fistula').

Disease names that solely indicate symptoms are typically formed using nominalized verbs, adjectives, or verb + marker word constructions. Table 6.4 presents some representative terms that indicate symptoms along with their literal meanings and English equivalents.

Chinese term	literal meaning	English equivalent
shiyu (失语)	lose language	aphasia
xiaochuanbing (哮喘病)	asthma disease	asthma
kuangzaoyuyuzheng (狂躁抑郁症)	crazy depressed symptom	manic depression

Table 6.4: Examples of terms indicating symptoms

While most of the terms are calques from their English equivalents, the notable difference is that English terms tend to utilize Latin or Greek roots, whereas Chinese terms prefer to employ patrimonial and commonly used lexical units in their composition.

2.2. Causal pathogen

With the advancement of modern medical diagnosis and treatment technology, the identification and classification of pathogens have become fundamental in disease research, particularly in infectious diseases. Consequently, most infectious disease names indicate the causal pathogen.

In Chinese disease names, depending on the type of pathogen, the terms often include *jun* (菌), indicating bacteria or fungi, or *bingdu* (病毒), referring to viruses. For instance, the disease *youmenluoganjunganran* (幽门螺杆菌感染, 'helicobacter pylori infection') occurs when helicobacter pylori bacteria infect the stomach. The term *helico* denotes the helix or twisted spiral shape of the bacterium. The Chinese name for the pathogen *youmenluoganjun* (幽门螺杆菌) describes the spiral shape of the bacteria and the infected part of the stomach. In the term *juxibaobingduganran* (巨细胞病毒感染, cytomegalovirus infection), the pathogen *juxibaobingdu* is a calque compound derived from the neoclassical compound *cytomegalovirus* in English, which refers to a 'big cell virus'.

Disease names that refer to the pathogen often also denote the part of the body that is infected. For example, the *xinxingguanzhuangbingdufeiyan* (新型冠状病毒肺炎) that means 'new type coronavirus lung inflammation' not only illustrates the pathogen but also identifies the infected organ, namely, the lungs; Similarly, in the aforementioned term *youmenluoganjunganran*, the *youmen* is a term in Chinese acupuncture that refers to a part of the stomach connecting to the duodenum, as indicated in Figure 6.4.

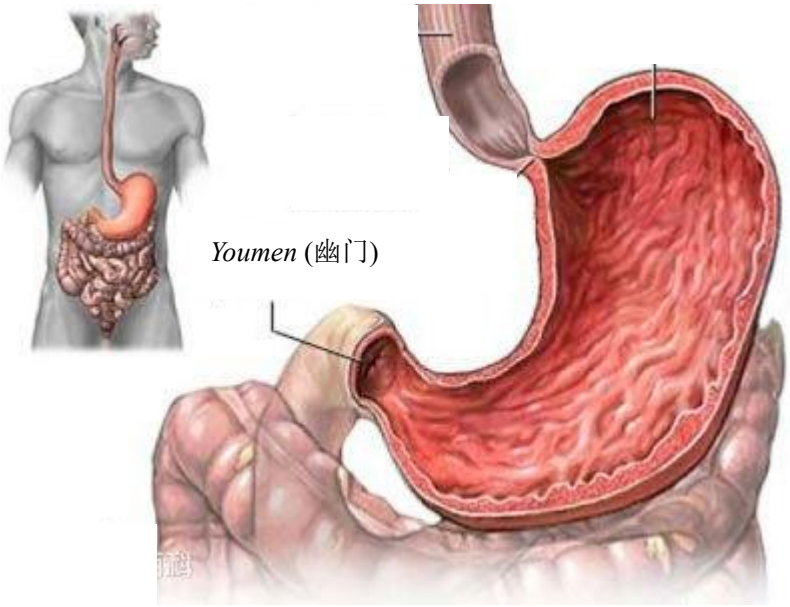

Figure 6.4: The position of *youmen* (幽门)

(Reference: https://baike.baidu.com/item/%E5%B9%BD%E9%97%A8/9380318)

During this period, when referring to pathogens, English initialisms are also directly loaned to the Chinese context, which causes blind spots in the cognition of ordinary people, and such disease names are not semantically transparent. Take *HIV ganran* (HIV infection) for example, users whose native language is Chinese do not get information about the pathogen from this disease name.

2.3. Eponym

According to the data from 1979 to 2020, approximately ten percent of terms in this period consist of eponyms. These eponymous terms can be classified into three types:

1) Some terms still follow the tradition to use *shi* (氏, 'family name') as a marker for eponyms, such as 海 - 斯 (Hallermann-Streiff) 氏 综 合 征 ('Hallermann-Streiff's syndrome'), and 弗兰索斯 (Francois) 氏综合征 ('Francois's syndrome').

2) In some cases, there is a departure from the traditional marker of a family name in eponymous terms. An example of this is seen in the term 梅 克 尔 憩 室 (Merkel's diverticulum). In these cases, the Chinese term phonetically resembles the eponym in the original language. Instead of explicitly indicating the family name with a marker

word like *shi* (氏), the Chinese term is constructed to closely resemble the pronunciation of the eponym in its original language.

3) More terms whose eponymous parts are directly graphic loans from English, Merkel 细胞癌 (Merkel cell carcinoma), and Castleman 病 (Castleman's disease).

In the first type of eponymous terms, the presence of a marker word indicating 'family name' explicitly highlights the eponymous nature of the terms. Additionally, these terms often include the English equivalent in parentheses, making it convenient for communication and understanding.

However, in the last two types of eponymous terms, it can be more challenging to identify them as eponyms without referring to the English equivalents. These terms may not include a specific marker word or indication of the eponymous nature, making it less apparent to native Chinese speakers that they are based on a person's name or derived from an individual's contribution or discovery. To fully recognize these terms as eponyms, one would need to refer to the English equivalents or have knowledge of the original source.

Therefore, the inclusion of the English equivalent in parentheses or the presence of a marker word indicating 'family name' in the first type of eponymous terms enhances their communicative convenience and clarity, while the identification of the last two types as eponyms may require additional context or cross-referencing with the English equivalents.

2.4. Time course, origin, and epidemiology

We extracted the semantic items representing time from the disease names in this period and found nine representative words, as shown in Table 6.5. These words encompass various aspects of time in relation to the diseases, including the speed, course, and frequency.

Chinese terms	English	Example

indicating time course	meaning	
speed of disease		
jixing (急性)	acute	急性盲肠扭转 (acute cecum torsion)
manxing (慢性)	chronic	慢性萎缩性胃炎 (chronic atrophic gastritis)
yajixing (亚急性)	subacute	亚急性皮肤型红斑狼疮 (subacute lupus erythematosus)
course of disease		
zaoqi (早期)	early stage	远侧残胃早期癌 (residual gastric carcinoma)
wanqi (晚期)	late stage	局部晚期乳癌 (locally advanced breast cancer)
frequency of disease		
duofaxing (多发性)	multiple	多发性颅外颈内动脉瘤 (multiple internal carotid artery aneurysm)
zhenfaxing (阵发性)	paroxysmal	阵发性睡眠性血红蛋白尿症 (paroxysmal nocturnal hemoglobinuria)
wanguxing (顽固性)	stubborn	顽固性间质膀胱炎 (refractory interstitial cystitis)

Table 6.5: The semantic items that indicate time course in disease names

We can observe that the semantic item representing time consistently appears alongside other semantic items that describe different characteristics of the disease. Furthermore, the semantic item representing time tends to be positioned further from the core disease name term, serving as a supplementary description of the disease.

The origin of a disease refers to the point or place where the disease originates, arises, or is derived from. Table 6.6 presents eight terms from the database (1979-2020) that denote the origins of diseases. The semantic items indicating origins can encompass the temporal origin (whether the acquisition of the disease is congenital or acquired), substantial origin (disease caused by a specific place or substance), or unknown origin.

The semantic items that indicate the origin	Meaning	Example
the disease acquisition is congenital or acquired		
xiantianxing (先天性)	congenital	先天性眼面麻痹 (congenital oculofacial paralysis)
jiazuxing (家族性)	familial	家族性高胆固醇血症 (familial hypercholesterolemia)
yuanfaxing (原发性)	primary	原发性扩张型心肌病 (primary dilated cardiomyopathy)
yichuanxing (遗传性)	hereditary	遗传性 FXI 缺陷病 (hereditary FXI deficiency)

substantial origin		
yayuanxing (牙源性)	dental origin	牙源性肿瘤 (odontogenic tumor)
Ir-192 yuan (Ir-192 源)	Ir-192 origin	Ir-192 源致右下肢Ⅳ度急性放射性皮肤损伤 (Ir-192 source causes acute radiation skin injury of the right lower extremity)
unknown origin		
tefaxing (特发性)	idiopathic	特发性突聋 (idiopathic sudden deafness)
tufa (突发)	burst	突发新型冠状病毒肺炎 (burst new coronavirus pneumonia)

Table 6.6: The semantic items that indicate the origin in disease names

n our terminological database, we have identified two cases that indicate epidemiology. The first case is the term *chuanranxingfeidianxingfeiyan* (传染性非典型肺炎, 'contagious atypical pneumonia'). The term serves as the Chinese name for SARS, emphasizing the contagiousness of the disease and the parts of the body it attacks.

The second case is the term *H1N1 zhuliugan* (H1N1 猪流感). The *liu* in this term is an abbreviated version of *liuxingxing* (流行性) that means 'influenza'. This term refers to the *H1N1 influenza*, commonly known as *swine flu*.

2.5. Severity, environment, species of animal or food, occupation, age and population, and arbitrary identifier

The disease names in this period include various keywords that indicate severity, environment, species of animal or food, occupation, age and population, as well as arbitrary identifiers.

Keywords marking the severity of a disease include *exing* (恶性, 'malignant'), *zhongxing* (重型, 'severe'), *zhongzheng* (重症, 'severe symptom'), *zhimingxing* (致命性, 'fatal') and *zhongliuxing* (肿瘤性, 'neoplastic'). These words, used to describe the severity of the disease, are typically placed at the beginning of the term, farthest from the headword placed at the end.

Disease terms that indicate the environment are *tieluxingyanzhen* (铁路性眼震, 'railway

eye shake', railway nystagmus) and *fengshibing* (风湿病, 'wind wet disease', rheumatism). The disorder *tieluxingyanzhen* refers to a kind of vertigo acquired on the rail train. The *fengshibing* is an adopted term from traditonal Chinese medicine terminology, and it emphesizes the windy and damp environment that cause the disease.

Disease names that incorporate animals include *shu shanghan shamenshi jun xuezheng* (鼠伤寒沙门氏菌血症, 'murine salmonella typhimurium') and *H1N1zhuliugan* (H1N1 猪流感, 'H1N1 swine flu'), where *shu* (鼠, 'rat') and *zhu* (猪, 'pig') indicate the animal hosts of the diseases.

The term *nongmingfei* (农民肺, 'farmer's lung') refers to occupational allergic alveolitis caused by the inhalation of organic dust containing thermophilic actinomycetes. It occurs when farmers or other individuals working in agricultural environments come into contact with moldy straw or rice. The *nongmin* (农民, 'farmer') in the term illustrates the occupation.

Two disease names incorporate age and population sememes: *xiao'er shamen ganran* (小儿沙门感染, 'infant salmonella infection') and *xiao'er xiantianxing xinzangbing* (小儿先天性心脏病, 'infant congenital heart disease'). The *xiaoer* (小儿, 'infant') in these two terms indicates the population of the disease.

Arbitrary identifier in this period has four forms: 1) the Chinese traditional way of counting: sexagenary cyclethe (*ganzhi*)[27], such as *jiaxing* (甲型, 'the first type') and *yixing* (乙型, 'the second type'); 2) Arabic numerals, for example, 2 型, 3 型, and 7 型; 3) Roman numerals, such as II *xing* (II 型); 4) combination of English letters and numbers, for example, H1N1. The latter three forms are more aligned with English expressions and simultaneously enrich the vocabulary of Chinese.

[27] *Ganzhi* is a cycle of sixty terms, each corresponding to one year, thus a total of sixty years for one cycle. (https://en.wikipedia.org/wiki/Sexagenary_cycle)

3. Variants in the texts

3.1. Interlinguistic variation

3.2. Cognitive variation

3.3. Functional variation

In the terminological database of disease names from 1979 to 2020, there are 52 disease names with one or more variants, accounting for 16% of the total. The variants from this period are influenced by interlinguistic, discursive, and cognitive factors. In the following section, we will discuss the characteristics of disease name variants during this period, providing examples to illustrate these variations.

3.1. Interlinguistic variant

In the database from 1979 to 2020, there are 25 disease names that have variants of English initialisms in Chinese Western medical literature. **The most dominant form of variation during this period is the co-occurrence of Chinese terms and their English equivalents in initialisms, which is a departure from the patterns observed in the previous two periods**. In the texts of the corpus, parentheses or *jiancheng* (简称, meaning 'abbreviated name') are often used after Chinese terms to introduce English variants. We have provided some representative examples of this variation in Table 6.7.

Chinese term	Textual variant	English equivalent
jiazuxing gaodanguchun xuezheng (家族性高胆固醇血症)	FH	familial hypercholesterolemia
a'ercihaimo bing (阿尔茨海默病)	AD	Alzheimer's disease
manxing weisuoxing weiyan (慢性萎缩性胃炎)	CAG	chronic atrophic gastritis
xitongxing hongbanlangchuang (系统性红斑狼疮)	SLE	systemic lupus erythematosus
xinxing guanzhuang bingdu feiyan (新型冠状病毒肺炎)	COVID-19	coronavirus disease 2019

Table 6.7: Interlinguistic variation in the database (1979-2020)

The co-occurrence of Chinese and English bilingual terms is indicative of the progress in Western medicine text writing. It signifies that the author is mindful of international standards during their research, and highlights the further specialization of Western medicine in China.

3.2. Cognitive variant

Cognitive variation is observed in the different naming mechanisms used for the same disease. It is the second most common form of variation, following interlinguistic variation.

The first type of cognitive variation involves disease names that describe the same disease from different semantic perspectives. For example, *weizhixing xuanyun* (位置性眩晕, 'positional vertigo') and *zishixing xuanyun* (姿势性眩晕, 'posture vertigo') both refer to *benign paroxysmal positional vertigo (BPPV)* but emphasize different objective and subjective factors. Another pair of variants, *shidongxingyanzhen* (视动性眼震) and *tieluxingyanzhen* (铁路性眼震) highlight the symptoms and circumstances in which optokinetic nystagmus occurs.

The second type of cognitive variation involves eponymous terms that have different contributors' names. For instance, the *hai-si (Hallermann -Streiff) shizonghezheng* (海-斯（Hallermann-Streiff）氏综合征) is an eponymous term, while another eponymous name *folansuosi (Francois) shizonghezheng* (佛兰索斯（Francois）氏综合征) is presented as its variant in the same article.

The third type of cognitive variation occurs when the same disease is referred to by both an eponymous term and another name based on different semantic mechanisms. Table 6.8 presents four groups of these cognitive variants found in medical texts.

Eponymous term	Textual variant
Terson 综合征 (Terson syndrome)	双眼玻璃体积血 (bilateral vitreous hemorrhage)

Merkel 细胞癌 (Merkel cell carcinoma)	皮肤神经内分泌肿瘤 (neuroendocrine tumors of the skin)
Crouzon 综合征 (Crouzon syndrome)	颌面部骨发育不良 (craniofacial dysostosis)、 遗传性颅面发育不全 (hereditary craniofacial dysplasia)、 颅-眶-面发育不全 (cranio-orbital-facial dysplasia)
Möbius 综合征 (Möbius syndrome)	先天性眼面麻痹 (congenital ophthalmoplegia)， 先天性神经核发育不全 (congenital neuronuclear hypoplasia)

Table 6.8: The eponymous terms and the textual variants of other mechanisms

From the provided examples, it is evident that most eponymous terms include the keyword *zonghezheng* (综合征, 'syndrome'). Additionally, certain eponymous disease names have multiple textual variants based on other naming mechanisms. These textual variants tend to be longer in syllable number compared to the eponymous terms, which may make them more challenging to remember. However, they are composed of Chinese patrimonial morphemes and describe the affected body parts and symptoms of the diseases. This characteristic enhances the transparency of disease names for Chinese native users.

3.3. Discursive variant

Discursive variation primarily occurs in the form of abbreviations of disease names in the text from 1979 to 2020. In the database, we identified 13 terms with abbreviated variants. Below are some typical examples presented in Table 6.9:

Chinese term	Textual variant	English equivalent
jia*zhuangxian jineng****kang****jin* (**甲**状腺机能**亢**进)	*jiakang* (甲亢)	hyperthyroidism
jia*zhuangxian gongneng****jian****tui zheng* (**甲**状腺功能**减**退症)	*jiajian* (甲减)	hypothyroidism
di*yaxing* ***qing****guangyan* (**低**压性**青**光眼)	*diqing* (低青)	low-pressure glaucoma
yuanfaxing ***kai****jiaoxing* ***qing****guangyan* (原发性**开**角型**青**光眼)	*kaiqing* (开青)	primary open-angle glaucoma

Table 6.9: Discursive variation in the database (1979-2020)

The abbreviated variants of Western medical terms in the Chinese language are derived by extracting morphemes from the full names. While most variants circulate alongside their full terms, such as *jiakang* (‘hyperthyroidism’) and *jiajian* (‘hypothyroidism’), some variants like *diqing* and *kaiqing* lose their terminological feature. This is because the general-purpose lexical units used in these variants can be misinterpreted by users as ‘low green’ and ‘open green’. These two variants are semantically incomplete, leaving users uncertain about their meaning. Consequently, their usage has the potential to create communication barriers.

4. Synthesis

From 1979 to 2020, spanning 41 years of China’s reform and opening up, the field of Western medicine in China has witnessed significant progress and increasingly participated in international cooperation across various domains. During this period, disease terms exhibited certain trends, including a tendency towards unified form, increased specialization in pragmatics, and consideration of international communication needs in morpheme selection.

1. Morphological feature

In morphology, **disease terms became more extended, with no monosyllabic terms observed in this period**. Polylexical terms, formed through composition and syntagmatic units with the use of attributive or prepositional clauses, allowed for a more precise description of diseases and related complications.

Terminological units in this period consisted of **more lexical components** on average, which enabled the creation of more descriptive and nuanced disease names. This increase in word count contributed to **a broader variety in parts of speech** within disease terms, allowing for a more comprehensive representation of diseases and their characteristics. Furthermore, the dominance of **endocentric patterns** emerged as a prevalent structure for disease names. In this pattern, modifiers precede the headword,

resulting in terms that effectively convey the specific attributes and features of diseases.

In this period, there is a notable trend towards **greater uniformity in disease markers**. Traditional Chinese medicine marker words, previously prevalent in disease naming, were gradually replaced with newly coined Western terms. This shift reflects the growing influence of Western medicine and the adoption of international standards in disease terminology. By employing Western terms as markers, Chinese medical literature achieved greater compatibility with global medical discourse and facilitated improved communication and collaboration with the international medical community.

In morphological formation, **the proportion of terms adopted from traditional Chinese medicine (TCM) decreased to 2.2%, with compound terms becoming the most prevalent**. Most compounds were motivated by calque. **The adoption of English initialisms for disease names led to an increase in English graphic loanwords**. From a morphological perspective, Western medicine in China demonstrated independent development, distinct from traditional Chinese medicine.

2. Semantic formation

During the period from 1979 to 2020, there was a notable **increase in the number of sememes employed in disease terms**, due to a more comprehensive medical knowledge. Among these sememes, those indicating **body parts and symptoms** were the most commonly utilized, as in the previous periods.

Despite being the most opaque and foreign way to name a disease, eponyms did not decrease in proportion during this period. Instead, they remained prominent within the overall semantic formation. However, to enhance user-friendliness and comprehension, the cooccurrence of adapted terms in both Chinese and Western terms emerged as the most preferred approach for presenting eponymous terms. This practice aligns with the adaptation of eponymous names in Chinese and ensures a smoother transition for users encountering these terms.

Significantly, this period saw the emergence of **a richer array of semantic elements**, including the use of Chinese expressions as arbitrary identifiers. These expressions cleverly combined elements from the **Chinese native language with English notations**, thus expanding and enriching the Chinese vocabulary. This linguistic fusion facilitated a more comprehensive and culturally adaptable representation of medical concepts. It met the needs of Chinese users while remaining compatible with international medical discourse.

3. Variation

During the period from 1979 to 2020, **there was a significant decline in diachronic and functional variants, a moderate decrease in discursive variants, and a substantial increase in interlinguistic variants**. **Cognitive variants decreased as well, and orthographic variants continued to be absent**. This suggests a shift towards more standardized and internationally influenced language use during this period.

Interlinguistic variants increased substantially, from 0% in the previous period to 44.8%. This indicates a significant rise in variations across different languages or interlinguistic influences, suggesting a more diverse linguistic landscape. Interlinguistic variants have emerged as a significant form of variation, facilitating comparisons between Chinese and English terms. This not only promotes effective communication within the international medical community but also contributes to the standardization and harmonization of medical terminology across different languages. By establishing correlations between Chinese and English terms, interlinguistic variants serve as valuable tools for cross-cultural understanding and collaboration.

Cognitive variants decreased during this period, from last period's 47% to 25.8%. While still substantial, the decrease suggests a potential move towards more standardized language usage influenced less by cognitive factors as we summarized in the last period. Cognitive variants in this period, often associated with eponymous terms and terms referring to symptoms and body parts, played a crucial role in reducing cognitive impairments during communication. By providing alternative

terms and perspectives, cognitive variants that involve body parts and symptoms aid in clarifying the meaning and conceptualization of complex medical conditions. Through the utilization of different cognitive mechanisms, these variants enhanced comprehension and facilitated effective communication among healthcare professionals and researchers.

The use of discursive variants decreased from 41% to 29.3% in this period. While still significant, there was a reduction in the use of context-dependent or discourse-based language variations. Discursive variation primarily manifested in the abbreviation of Chinese terms, resulting in concise and efficient communication. While some abbreviated terms may have caused ambiguity or semantic opacity, particularly when certain details were omitted, the context generally helped overcome these temporary difficulties. The inherent understanding within the medical community, combined with contextual cues, allowed for the successful interpretation and comprehension of abbreviated terms. As a result, discursive variation contributed to economical and efficient communication, particularly in written medical texts.

Diachronic variants, indicative of historical or time-based language differences, saw a complete reduction to 0%, signifying their effective disappearance during this era. This disappearance underscored a discernible shift towards the predominant use of modern language, aligning with contemporary linguistic norms. Alongside diachronic variants, **functional variants also decreased to 0%**. Much like their historical counterparts, this decrease pointed towards a diminishing prevalence of language variations rooted in functional aspects. Furthermore, **orthographic variants remained consistently absent, holding at 0%** throughout the 1979-2020 period. This persistence in the absence of orthographic variations indicated an enduring standardization of spelling and writing style during this time frame.

CHAPTER 7 DIACHRONIC COMPARISON AND DISCUSSION

In the above three chapters, based on a large amount of real data, we have completed a synchronic analysis of the terminology of disease names in the context of Western medicine in China from three historical periods (1915-1949, 1949-1978, 1979-2020). In this chapter, we will make a diachronic comparison of the features of disease terms in the three periods in order to describe the evolutionary characteristics in the morphology, semantics, and variation of Western medical terminology in China's history of more than one hundred years and discover the connection between the terminology, Western medicine in China, and social development.

1. Morphological evolution of disease terms of Western medicine in Chinese

Studying the morphological evolution of disease terms of Western medicine in Chinese is important. Firstly, as Western medicine continues to evolve and advance, new diseases and medical concepts emerge that need to have accurate terms, including equivalents in Chinese. Understanding how disease terms of Western medicine in China have evolved morphologically in real medical context can help us identify patterns and trends in their development.

Secondly, understanding the morphological evolution of disease terms of Western medicine in Chinese can help us identify inconsistencies or errors in the practice. For example, by examining how disease markers and other morphological elements have been used in the past, we can identify instances where some patterns may be inaccurate or incomplete, and work to improve them.

Finally, studying the morphological evolution of disease terms of Western medicine in Chinese can help us better understand the history and development of Western

medicine in China. By tracing the evolution of disease terminology over time, we can gain insights into how Western medical discipline was adopted and adapted in the Chinese context, and how they have influenced the development of medicine in China.

Next, we will demonstrate the morphological changes in Chinese Western medical disease terminology from 1915 to 2020, based on the length of the terminology, the number of words composing the terminology, and the disease markers.

The length of words used in a professional field can be indicative of the discipline progress and the development of language. In our study, we have calculated the graphic length of the disease terms of Western medicine in the Chinese language.

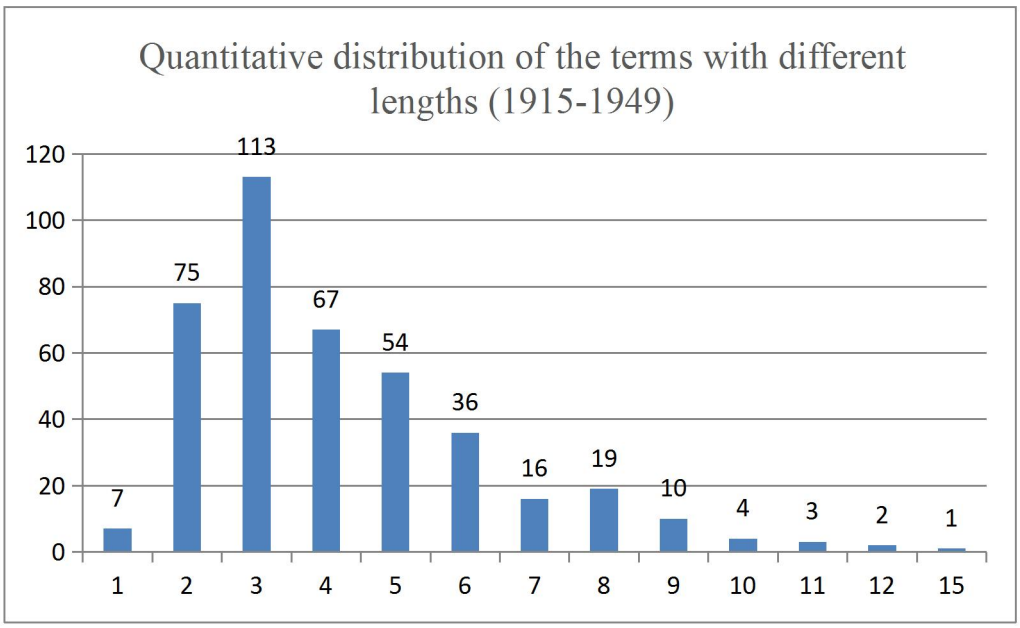

Figure 7.1: The distribution of the length of Western medical terminology in Chinese during 1915 to 1949

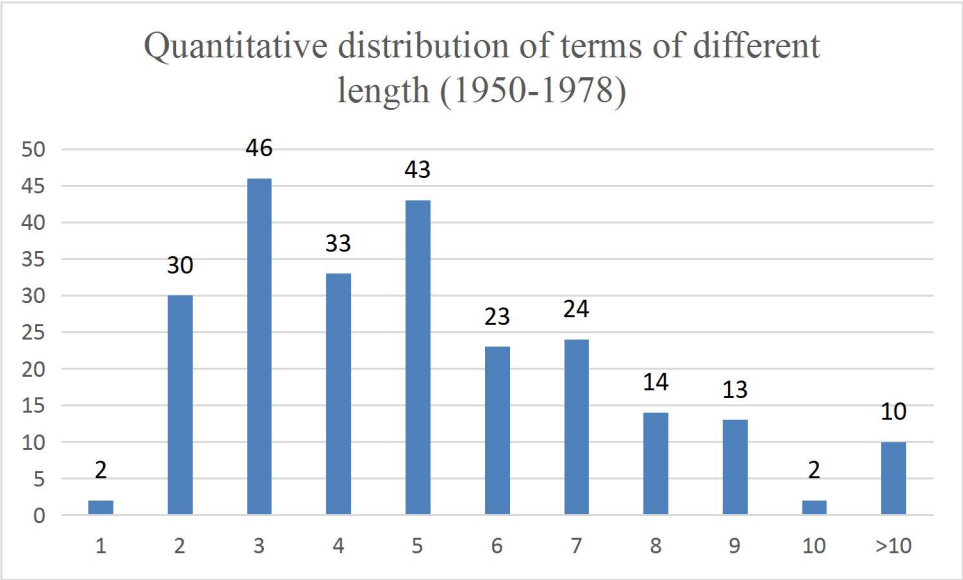

Figure 7.2: The distribution of the length of Western medical terminology in Chinese during 1950 to 1978

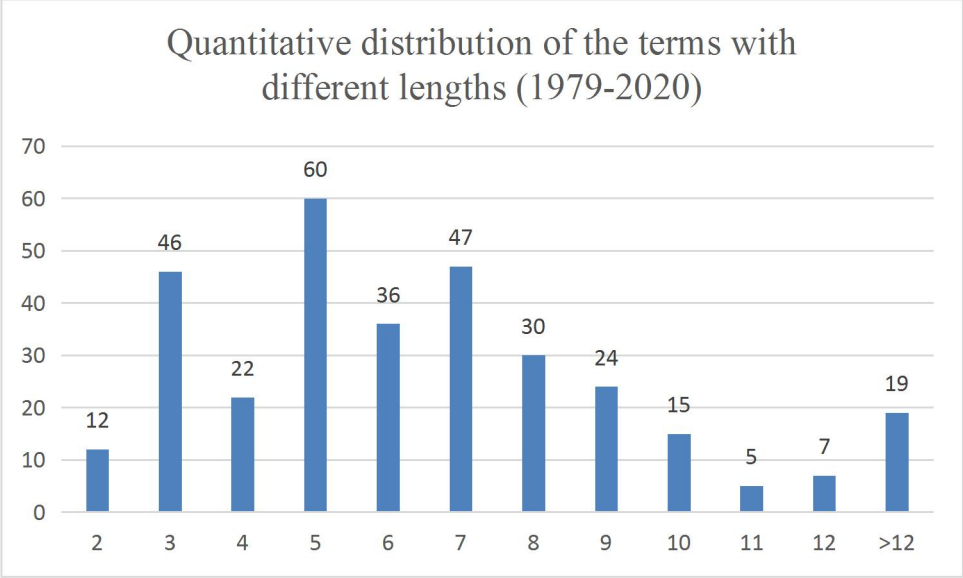

Figure 7.3: The distribution of the length of Western medical terminology in Chinese during 1979 to 2020

According to Figure 7.1-7.3, we can see that the polysyllabic terms are the mainstream of disease terminology while the monosyllabic terms are the least common at any stage. The monosyllabic disease names declined significantly from the first period to the second, and has completely disappeared by the period 1979-2020.

Polysyllabic terms predominate in three historical periods with different features. Disease terms from 1915 to 1949 are concentrated in two to six syllables, with three syllables accounting for the largest proportion of terms; from 1950 to 1978 the terms are more evenly distributed in two to seven syllables in length, with terms of three syllables accounting for the largest proportion; from 1979 to 2020 the terms are mostly in three to nine syllables, and five-syllable terms are the most numerous in this period. Terms of more than ten syllables are significantly increase compared with the previous two periods.

Longer, more complex terms may demonstrate a greater level of understanding and advancement within a specific discipline. The increase in the length of disease terminology is a result of the development of the medical discipline, the increased need for precise communication, and the trend towards internationalization. Over time, disease terminology has become longer, expressing more semantic dimensions due to the progressive evolution of medicine and the need for more detailed expression of diseases and clinical complications in communication. Additionally, incorporating terminological units from foreign languages has resulted in longer syllables for terms in Chinese.

In addition to considering syllables, we also pay attention to the number of words that make up disease nouns and changes in disease markers within disease names. Table 7.1 to Table 7.3 summarize the evolution of monolexical and polylexical terms, the number of words comprising a term unit, and disease marker words from 1915 to 2020.

Period	Monolexical terms	Polylexical terms	Total number
1915-1949	14	393 (97.5%)	407
1950-1978	2	262 (99%)	264
1979-2020	0	325 (100%)	325

Table 7.1: Numbers of monolexical terms and polylexical terms in each historical period

Table 7.1 shows that in the last period, monolexical terms of diseases in Western medicine have completely disappeared, and regardless of the historical period, polylexical terms remain the dominant disease names.

The monolexical terms reduce in quantity along with time. The monolexical terms during the earliest period were influenced by traditional Chinese medicine terminology, such as *zhi* (痔, 'hemorroides'). That mechanism of one syllable/character corresponding to one word is not compatible with modern Chinese that two syllable words are used most often. A second source of monolexical terms are completely phonetic loanwords from foreign terms, such as *anjina* (安及那, 'angina'). These loanwords create cognitive barriers to understanding. Both of the mechanisms of adopted TCM and phonetic loaning monolexical terms have been eliminated from contemporary medical communication.

In polylexical terms, words are combined according to a certain logical relationship. The most frequently occurring POS relationship patterns in each period are shown in the following table. At the same time, we can also find an increasing tendency in the number of words that form terminological units in each period.

Period	1915-1949	1950-1978	1979-2020
Most frequent POS patterns (According to the Pareto principle, we take the top 80% of data representing the main characteristics of each period.)	NN (41%) ANN (15%) NNN (13%) AN (9%)	NN (33%) NNN (23%) ANN (17%) AN (8%)	NNN (18.3%) NN (11.3%) ANN (10%) ANNN (9.3%) NNNN (8.3%) NAN (2%) NNNN (2%) NVN (2%) NV (2%) AANN (1.7%) NNA (1.7%) AAN (1.7%) NNV (1.7%) NANN (1.3%) ANNNN (1.3%)
Average lexical units in a term	2-3	2-4	3-4

Table 7.2: The frequent POS patterns and the avarage number of words in a term in three periods

From the frequent POS patterns in Table 7.2, we can see that In the first and second stages, significant part of speech patterns are relatively fixed. However, during the period of 1979-2020, the top 80% of POS patterns show a variety of forms, indicating that the vocabulary used in disease names and medical terms during this period was more flexible and free-formed.

According to the POS formation, Western medicine disease terms in Chinese basically end with a noun as the term headword, and the noun or adjective before the term headword serve as the modifier. In the first period, we also see that some terms end with a verb, but when the terminological unit is used as a disease name, the verb in the term unit changes into a noun as a concurrent word. Therefore, Western medicine disease terms in Chinese follow the modifier-headword pattern.

In addition, the most frequent POS patterns show that the number of the lexical units that a disease name includes has increased with the progress of the times. In contemporary medical texts, a disease name has multiple angles of modifiers, making the expression of the disease more precise. In clinical communication, users can obtain more information about the diseases from the disease names.

The analysis of POS patterns can provide useful insights into the composition and evolution of disease names of Western medicine in China over time. However, to gain a more complete understanding of how Chinese describes diseases, it is important to examine not only the syntactic structure of the terms, but also the specific words that are used to signal or reveal a disease. These marker words are commonly associated with a particular disease or clinical condition. By analyzing the frequency and distribution of these marker words over time, we can gain a deeper understanding of how it reflects changing attitudes and perspectives towards health and disease. Table 7.3 registers the percentage of the terms that carry a disease marker word in each period.

Period	1915-1949	1950-1978	1979-2020
Terms with disease markers %	65	75	68

Table 7.3: Situation of disease names with marker words in each period

The proportion of disease terms with marker words in the three periods shows that the **Western medical disease terms in Chinese tend to carry a marker word at the end of the term as the heahword to indicate the genre of disease**. In Table 7.4, we present the representative marker words in each period.

period	marker words
1915-1949	28% *yan* (炎, 'inflammation'), 27% *bing* or *ji* (病 or 疾, 'disease'), 18% *zheng* (症, 'symptom'), 7% *tong* (痛, 'pain'), 4% *ai* (癌, 'cancer'), 4% *zhong* (肿, 'swelling'), 4% *qi* or *shi* (碛 or 石, 'calculus'), 3% *yang* (疡, 'ulcer'), 2% *yi* (疫, 'epidemic')
1950-1978	29.9% *bing* or *ji* (病/疾, 'disease'), 27.3% *yan* (炎, 'inflammation'), 12.5% *zheng* (症, 'symptom'), 6% *ai* (癌, 'cancer'), 5% *zhong* (肿, 'swell'), 4% *fei* (肺, 'pneumonia'), 3% *jiehe* (结核, 'tuberculosis'), 2.5% *kuiyang* (溃疡, 'ulcer'), 2% *lou* (瘘, 'fistula'), 1.5% *zhen* (疹, 'weasel'), 1.5% *zheng* (征, 'sign'), 1.5% *shan* (疝, 'hernia'), 1% *tong* (痛, 'pain'), 1% *re* (热, 'fever') 0.5% *xuan* (癣, 'dermatomycosis'), 0.5% *dian* (癜, 'leucoderm') 0.5% *nve* (疟, 'malaria')

	0.5% *heniya* (赫尼亚, 'hernia')
1979-2020	17.1% *bing* (病, 'disease'), 16.7% *liu* (瘤, 'tumor'), 15.3% *zonghezheng* (综合征, 'syndrome'), 14% *yan* (炎, 'inflammation'), 11.7% *zheng* (症, 'symptom'), 8.1% *ai* (癌, 'cancer'), 4.5% *ganran* (感染, 'infection'), 1.8% *lou* (瘘, 'fistula'), 1.4% *chuang* (疮, 'ulcer'), 1.4% *yinghua* (硬化, 'harden'), 0.9% *jieshi* (结石, 'lithiasis'), 0.9% *yingbian* (硬变, 'harden'), 0.9% *nangzhong* (囊肿, 'cyst'), 0.9% *zhongliu* (肿瘤, 'tumor'), 0.5% *quexian* (缺陷, 'defection'), 0.5% *fei* (肺, 'lung disease'), 0.5% *quesun* (缺损, 'defection'), 0.5% *nve* (疟, 'malaria'), 0.5% *tong* (痛, 'pain'), 0.5% *ji* (疾, 'disease'), 0.5% *bingbian* (病变, 'patholigical change'), 0.5% *nongzhong* (脓肿, 'apostem'), 0.5% *zhong* (肿, 'swell'), 0.5% *jiehe* (结核, 'tuberculosis')

Table 7.4: Disease marker words of each period

The number of words used to categorize diseases is increasing with the development of the medical discipline, and the changes in the most frequently used marker words indicate the progress of clinical technology. The numbers of representative marker words for each period are 9, 18, and 24. The abundance of marker words for disease types indicates that the development of the discipline has led to a more systematic and refined categorization of terminology.

If we compare the first three frequent marker words, we can observe that the markers at the early stages refer to the symptoms or inflammations that can be determined by external examination or observation, the markers of the recent period such as *liu* (瘤, 'tumor') and *zonghezheng* (综合征, 'syndrome') that require a more advanced inspective technology to diagnose and a more comprehensive view of diagnosis and treatment. Therefore, the specialization of Western medicine in China has resulted in the evolution of marker words.

What's more, the number of syllables in the marker words is related to the characteristics of Chinese in that era. In the first and second periods, the marked words were predominantly monosyllabic, which was the continuation of the language style in which a single character represented a word in ancient Chinese. The newly emerged marker words in the third period are with two syllables. This trend is in line with the development of modern Chinese.

In morphology, disease markers in Chinese have unique features compared to those in Indo-European languages. Here are the summarized points:

1. Independence of Chinese Disease Markers: Chinese markers, such as *jieshi* (结石, 'accumulated stone'), *bing* (病, 'disease'), and *tong* (痛, 'pain'), can be used independently, unlike neoclassical roots in English disease names.

2. Patrimonial Source of Chinese Markers: Most Chinese markers are derived from Chinese patrimonial lexical sources, while English neoclassical roots in the medical field come from Latin and Greek.

3. Dual Usage of Chinese Markers: Many Chinese markers can be used in both medical and general contexts. For example, *re* (热) can refer to 'hot' in a general context or 'fever' in a medical context.

4. Unique Usage of Body Part Words: Chinese uses body part words differently to refer to diseases. For instance, *fei* (肺) means 'lung', but in the disease term *xifei* (矽肺), *fei* indicates 'lung disease', showing a distinct construction of disease terms in

Chinese compared to English.

5. Evolution of Chinese Markers: Over time, the field of Chinese medicine has gradually adopted and discarded various markers. Ancient words, variant terms, and phonetic foreign words have been phased out or incorporated. This process has been significantly influenced by the work of various committees, tasked with terminology standardization and normalization. Among them, the Education, Culture, and Academic Terminology Standardization Committee, established in 1950, as well as the National Committee for Science and Technology Terminology, founded in 1985, have made significant contributions to the management and standardization of Chinese medical terminology. These committees, through the development of unified standards, have helped ensure the accuracy and consistency of disease markers in the medical field, and have facilitated the growth and evolution of Chinese medical terminology.

The unique characteristics of Chinese disease name markers and the way they evolve over time reflect the complexity and adaptability of the Chinese medical terminology system to meet the continuous development and changes in the field of medicine. These features are an intriguing part of Chinese medical terminology and provide a rich set of language tools for professionals in the Chinese medical field.

2. Morphological formation of Western medical terms in China

As a foreign discipline, Western medicine develops in China, and while bringing new things, it is bound to be influenced by traditional Chinese medicine (TCM). Therefore, the terminology of Western medicine in Chinese is a dynamic sample for studying the terminology system generated by foreign disciplines in Chinese. In this process, the adoption of traditional Chinese medicine terminology and the mechanism of generating neologisms are the two basic means of Sinicization of Western medical terminology, and the neological mechanisms also show the possibilities of language contact and language productivity.

Mechanism	1915-1949	1950-1978	1979-2020
adopted TCM terms %	28.9%	14%	2.2%
neologism %	71.1%	86%	97.8%

Table 7.5: Proportion of adopted TCM words and neologisms in the disease names databases of the three periods

Table 7.5 shows the ratio of adoption of TCM terminology and newly coined terminology of Western medicine disease names in three historical periods. We can see that the adoption of TCM terminology has decreased with the times, which shows that the development of Western medicine in China has gradually got rid of the influence of TCM and has become an independent discipline. From 1915 to 1949, around 30% of the disease names of Western medicine were adopted from the TCM terminology system. On the one hand, it shows that the development of Western medicine is still in its infancy and relies on TCM terms. On the other hand, it also shows that Western medicine practitioners at that time (mainly medical Missionaries and Chinese medical students receiving Western medical education) respect for traditional Chinese medicine, and the compromise on terminology in order to reduce communication resistance in the process of promoting Western medicine.

Contrary to the adoption of TCM terms, we can see obvious changes on the ratio of the neological terms in the three periods. In the contemporary era, Western medicine terminology is almost completely separated from Chinese medicine terminology. Next, we will further analyze the newly coined terms from the perspective of neologisms.

Neological mechanisms		1915-1949	1950-1978	1979-2020
loanword	phonetic loan	1.4% (EG)	0	0
	graphic loan	2.4% (JP)	4.5% (JP)	8% (EG)
compound word	partial loan	20.1% (EG, JP)	5.3% (EG, JP, RS)	19.6% (EG, JP)
	calque	22.3%	47.3%	37.5%
	partial calque	20.1%	14.3%	8.9%
	genuine compound	5.4%	7%	16.7%
	syntagmatic unit with conjunctions and clauses	0%	1.2%	1.8%
abbreviation		0%	5.3%	2.5%

Table 7.6: Neological mechanisms of three periods and the proportion in the database

According to Table 7.6, we can see that throughout the recent more than 100 years of Western medicine in China, the mechanisms of neological Western medical terms include loaning, compounding and abbreviation. Loan words come from contact with foreign languages while compounding and abbreviation are both forms of Chinese patrimonial lexical formation. Among them, compounding is the most important mechanism for forming new terms in each historical period, followed by loanwords, and the mechanism of abbreviation accounts for less. The neological mechanisms reflect the productivity of Chinese itself and the acceptance and tolerance of foreign languages. Based on the above data, we have visualized the proportion of these mechanisms in each period in Figure 7.4.

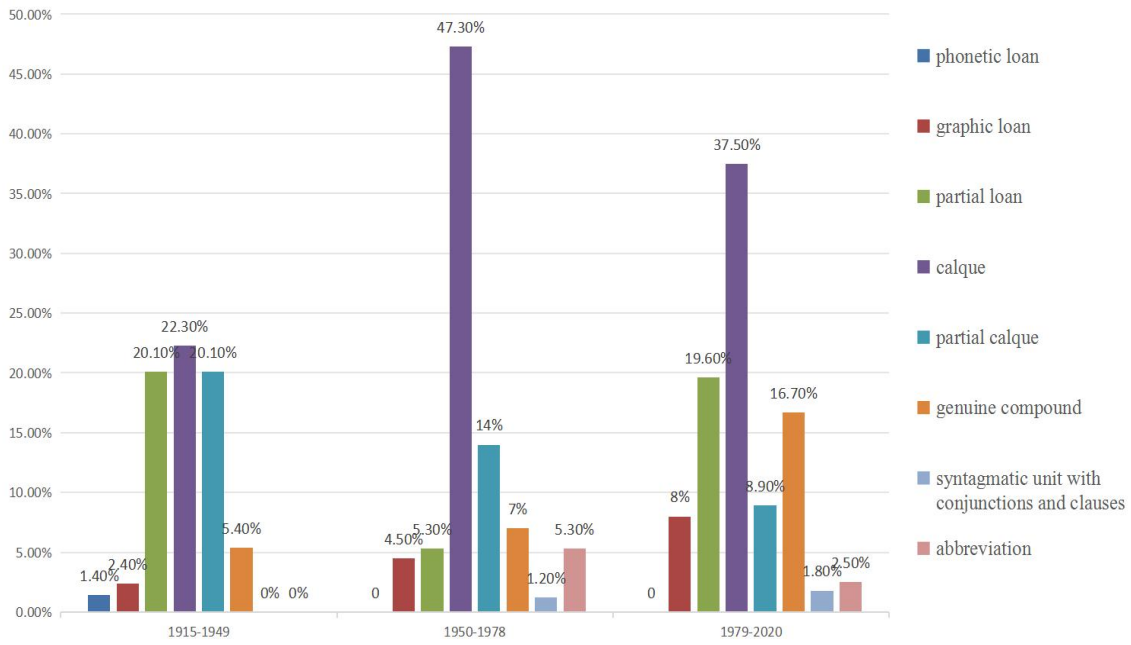

Figure 7.4: The proportion of each neological mechanism of morphological formation in three periods

Figure 7.4 illustrates the specific lexical formation mechanisms of Western disease terms and their distribution across three periods. In the subsequent discussion, we will examine these mechanisms in descending order of proportion, from high to low.

The terminological units formed through calque mechanisms (including partial calque)

and genuine composition comprised the majority. **The key distinction lies in the semantic reliance of calques on foreign language equivalents, while genuine compounds exhibit semantic independence**. In general, both mechanisms have a tendency to favour general-purpose words in their lexical selection, paying attention to the need for semantic transparency and conformity with the characteristics of Chinese parataxis composition. **The significant proportion of these mechanisms in each period and the increase in the number of genuine compounds in modern times may indicate that the development of Western medicine in China has followed a path of autonomous development and innovation**. Moreover, the Chinese language has been able to develop its own productive features to explain the complications of diseases or the conditions that cause them, in accordance with its own local adaptation.

Partial borrowing in the compound terms refers to the use of lexical units that are borrowed either graphically or phonetically from other languages and combined with native Chinese words, reflecting the linguistic inclusiveness of the Chinese language. **The changes in the proportion of partially borrowed words from other languages may be attributed to social changes in China**. The proportion of this mechanism was nearly identical from 1915 to 1949 and from 1979 to 2020. During these two periods, partial loans primarily consisted of English and Japanese loanwords. However, from 1979 to 2020, the source language for loaned components was predominantly English. Between 1950 and 1978, the proportion of this mechanism decreased, with the emergence of Russian loaned units. The proportion of partial loans in the first and third periods is approximately 20% of the total data, primarily due to significant international exchanges during these phases. In the initial stage, the presence of Western medicine missionaries and the disruptive impact of continuous wars drove China's engagement with the external world. In the third stage, beginning with the economic reforms and opening-up policy in late 1978, China proactively initiated integration with the global community. Conversely, during the period from 1950 to 1978, the establishment of the new society led to limited foreign relations, with relatively closer exchanges mainly with the Soviet Union.

The syntagmatic terms, which are composed of complex lexical units with

conjunctions, hyphens, or adjective and prepositional clauses that function as a single terminological entity, have been in use since the second period of Western medicine's development in China. These terms account for 1.2% of the terminological database from 1950 to 1978, and this percentage increases to 1.8% from 1979 to 2020, indicating their continued usage in modern medicine. These terms appear in their longest formation and follow Chinese syntactic rules. Their appearance indicates that the naming of diseases began to move away from the tidy and concise pattern of traditional Chinese medical terminology and towards more precise descriptions of specific diseases or cases. This morphological formation reflects the independent development of Western medicine in China and the increased understanding of medical conditions.

Loanwords are products of language contact, especially the influence of Western Indo-European languagess on the Chinese language, resulting from the exchange between Western and Chinese civilisations. As mentioned in the section on partial loan mechanisms, the incorporation of foreign linguistic forms into Chinese reflects the language's adaptability. From 1915 to 1949, foreign loanwords, predominantly from Japanese or English, were transcribed into Chinese using borrowed graphics or phonetics, emphasizing linguistic similarity with Chinese. During this period, there was a cautious approach to graphic loanwords from English. From 1950 to 1978, the loaned terms that we can find are graphic loanwords from Japanese. From 1979 to 2020, early Japanese terms had completely assimilated into the Chinese language, and newer borrowed Japanese terms are not mentioned in this text. In the same period, Western medical terminology introduced English abbreviations with both morphological and semantic meanings, reflecting convergence with Western medicine. However, unlike partial loans with one or more native morphemes, pure loanwords result in significant semantic opacity, so their proportion in each historical period is relatively small.

Since 1949, abbreviation has appeared in Western medical terms. Compared with other mechanisms, the abbreviation mechanism has the least number of terms. The abbreviated terms usually exist in the form of terminological variants. On the one hand, the existence of abbreviations is the result of the joint action of Chinese

modernization and communication needs. In ancient Chinese, a character usually represents a word. After the New Culture Movement that classical Chinese turning to vernacular Chinese is promoted, two-syllable and multi-syllable words appeared, and the lexical units became longer in communication expressions, so abbreviations were needed to improve communication efficiency.

Overall, The development of Western medical terminology in Chinese can be seen as a result of the interplay between different **cultures, languages, and ideologies**. Here are the summarized points:

1. Clash of Cultures and Early Acceptance of Chinese Medical Terms: The introduction of Western medicine to China clashed with traditional Chinese medicine (TCM), leading to the development of a unique medical terminology in Chinese. The period from 1915 to 1949 witnessed the acceptance of a large number of Chinese medical terms, demonstrating the respect for TCM and the promotion of Western medicine in China.

2. Development of Chinese Language and Increased Internationalization: The evolution of Chinese medical terminology reflects the progress of the Chinese language itself. Over 100 years, there has been a shift from phonetic loaning to graphic loaning from English, reflecting the internationalization of the Chinese language. From 1979 to 2020, China's efforts to connect with the international community led to an increase in the use of English graphic borrowings and a decrease in the adoption of Chinese medical terms, indicating the specialization and internationalization of Western medicine in China.

3. Impact of Political and Social Changes and Synchrony with the World: Between 1950 and 1978, China's political and social changes, including contact with the Soviet Union, influenced medical terminology, leading to borrowed terms from the Russian language. The spread and establishment of Western medicine in China kept pace with global advancements, eventually synchronizing with medical practices worldwide.

4. Influence of Language Policy: The language policy during the New Culture

Movement embraced Western language views, resulting in loanwords and loanword combinations in Western medical terminology (Tong Qingsheng, 2019).

These points highlight the dynamic nature of Western medical terminology in Chinese, influenced by cultural dynamics, language policies, and internationalization efforts.

3. Evolution of semantic mechanisms

The information capacity of terminology is accomplished by the sememes of the words that constitutes the terminological units. In disease terminology, the included sememes are supposed to describe information about different parameters of the disease. We referred to the semantic classification released by the World Health Organization in 2015. Common sememes in disease terminology include body parts, symptoms, pathogens, discoverers, locations, time, severity, contagiousness, etc. We conducted a semantic analysis of the terminological units in the three periods of the disease names database, and calculated the ratio of morpheme items to terms. Additionally, we also recorded the distribution data of the five major semantic classifications. We present the result of the analysis of three historical periods in Table 7.7.

	1915-1949	1950-1978	1979-2020
ratio of sememes/terms	1.35	1.56	1.62
body part, symptom	70%	67.3%	61%
causal pathogen	3.9%	5%	5.4%
eponym	1.9%	2.9%	5.6%
time, epidemiology, origin, cause, condition	8%	17%	13.4%
severity, environment, season, population of certain age, arbitrary identifier	13%	7%	8.5%
null	11.2%	0.8%	6.1%

Table 7.7: The ratio of sememes/terms and the semantic distribution of three periods

In Table 7.7, according to the ratio of sememes/terms that has increased over time, We can observe a tendency to semantic complexity on the disease terms. In average, a

term carries more and more sememes, as the medical discipline has evolved and the study of disease has become more specialised and comprehensive, thus, the need to depict more precise information on disease for disease terms has increased.

In the synchronic comparison, disease names representing body parts and symptoms comprise the majority of the disease terminology corpus for each period. Term users can intuitively obtain basic information about a disease from the description of body parts and symptoms. Diachronically, during the first historical stage, morphemes representing body parts and symptoms had the highest proportion, and then gradually decreased over time because the mechanism of semantic combinations to express diseases diversified. This is a result of the joint development of language and the medical field.

In the Chinese language system, sememes representing pathogens and eponyms are new semantic mechanisms for naming diseases. Disease terms named after pathogens in Chinese are influenced by their Western equivalents because the traditional Chinese medical terminology system did not allow for the scientific description of pathogens developed by modern medical treatment techniques. The naming of diseases after individuals in medical terminology is inconsistent with traditional Chinese values. This suggests that the introduction of foreign disciplines has influenced the original semantic construction of the Chinese language in naming diseases, enriching the semantic mechanisms used to form disease names, and that foreign semantic constructions have gradually been integrated into Chinese terminology. In terms of lexical composition, however, there are differences between the two semantic patterns. Naming after pathogens reflects the scientific nature of modern medicine. It is therefore more likely to be adopted to form new terms with patrimonial morphemes. The eponymous terms are the English or Japanese loanwords, as Chinese culture does not accept the use of an individual name for a disease term. Nevertheless, in the last period, morphemes denoting pathogens or eponyms often appear in terms together with sememes denoting other parameters.

The morphemes representing time, epidemiology, origin, cause, and condition are additional explanations for the disease. These morphemes usually cannot

independently become the name of the disease, and generally complete the description of a certain disease together with the morphemes of other parameters. We see that the proportion of morphemes representing these senses increases in the second period and stabilizes in the third. We also noticed that from the second period onwards, many case records appeared in the medical literature. The development of medicine would lead to changes in the way diseases are named and described in medical literature. Specifically, disease names have become more specific, and nowadays there is greater attention paid to providing detailed descriptions of particular diseases or cases.

Other morphemes that add explanations to diseases, such as severity, environment, season, population of certain age, arbitrary identifier, etc. These morphemes generally complete the description of a disease together with other parameter sememes, but such morphemes are not promoted by the World Health Organization as a semantic component of disease names. We see that the proportion of morphemes representing these senses begins to decline in the second period and stabilizes in the third period. This is because after the establishment of the new government, the management of modern medical terminology has been strengthened, and the meaning elements that are prone to discrimination, panic, or inaccurate meanings have been screened out in a planned way. The reduction of such sememes manifests the planning and management of terminology.

Finally, there are some disease names whose semantics cannot be judged by the language instinct of native speakers in each period, and we mark them as *null*, indicating that their semantics are completely opaque. We found the proportion of terms whose semantics cannot be determined in the first and third stages is relatively high, and the overall transparency of the terms in the second stage is the highest. Most of the semantically unclear terms in the first stage are completely phonetic loanwords, or adopted ancient Chinese medicine words (which are outdated in modern times), and most of the semantically unclear terms in the third stage are graphic loans of English initialisms, although these disease names composed of English capital letters appear in Chinese texts, their meanings cannot be perceived at all. In the second stage, due to the limited international communication, the mechanism of word creation is relatively conservative, and the number of borrowed words is reduced. After the TCM

vocabulary adopted in the first stage has been used, those terms that are not easy to communicate clinically have been eliminated, and the semantically transparent ones are retained, therefore, the overall transparency of terminology in this stage is the highest.

In a diachronic sense, the semantic dimension of Western medical disease terms in Chinese has continuously evolved and enriched over time, from the early days of Western medicine to the present. The use of more semantic complemental references in disease names enhances precision and aids in effective communication within the medical community (Cabré et al., 2022). Several key observations can be summarized as follows:

1. Dominance of Symptoms and Body Parts: Throughout different periods, the semantic elements representing symptoms and body parts consistently hold a prominent position in disease terms. This reflects the significance of conveying information about the symptoms experienced by patients and the specific affected body parts.

2. Influence of Western Medicine: The semantic mechanism representing pathogens in disease names has been influenced by Western medicine, with the incorporation of Western medical concepts and terminology. This inclusion of pathogen-related elements in disease names demonstrates the integration of Western medical knowledge and practices into Chinese terminology.

3. Eponyms and Internationalization: Eponymous terms, named after individuals' surnames, have also been influenced by Western terms. This phenomenon can be observed in Chinese medical texts, signifying the internationalization of Chinese terminology. However, due to cultural and value reasons, Chinese terminology tends not to proactively name diseases after individuals.

4. Detailed Descriptions with More Semantic References: The use of modifiers for disease headwords provides additional information and leads to more detailed descriptions of diseases. This trend reflects the advancement of medical knowledge

and a deeper understanding of diseases, enabling healthcare professionals and researchers to better comprehend the specific features and manifestations of various diseases.

5. Reduction of Non-Standard Semantic Items: There is a reduction in the inclusion of semantic items that are not advocated in international standards. This evolution in the semantic composition of disease names aligns with the development of modern medicine, China's internationalization efforts, and the planning and management of terminology.

The evolution of the semantic mechanism in Western medical disease names in Chinese is a result of various factors, including advancements in medicine, internationalization efforts, and terminology planning and management. These changes have contributed to the refinement and improvement of Chinese medical terminology, facilitating effective communication within the medical community.

4. Evolution in the variation of disease names

It is important to note that the morphosemantic mechanisms that adopted by the terms are measures of a cognitive progress, and the variants in the context can also play a significant role in a pragmatic way.

Variation is commonly present in the terms of Western medicine in Chinese. The percentage of medical terms with variant forms in the periods 1919-1949, 1950-1978, and 1979-2020 are 20%, 14%, and 16%, respectively. Based on these percentages, there has been a slight decrease in the proportion of medical terms with variant forms over time.

Regarding the types of variant forms, they can be classified as diachronic, functional, discursive, interlinguistic, cognitive variants, and orthographic variants. The following Table 7.8 shows the changes in the proportion of these types of variants in

the three historical periods, in order to infer the mechnaisms of variant generation in medical terminology of the field of Western medicine in China.

types of variation	1915-1949	1950-1978	1979-2020
diacronic variant	11.8%	5%	0
functional variant	9.2%	7%	0
discursive variant	9.2%	41%	29.3%%
interlinguistic variant	6.5%	0	44.8%
cognitive variant	60%	47%	25.8%
orthographic variant	2.5%	0	0

Table 7.8: The percentage of each variant type out of the total number of variants in three different time periods

The provided data represents the percentage of variants of different types of three period diachronic, functional, discursive, interlinguistic, and cognitive, from the years 1915 to 2020. In the early stages of the introduction of Western medicine to China, cognitive factors played the most significant role in causing variations. This phenomenon reflects the conflicts arising from the differing mindsets of Traditional Chinese medicine and Western medicine. In contrast, in more recent periods, interlinguistic variation has become more prevalent. This shift can be attributed to the changing referencing tendencies in both English and Chinese. We can also observe a decrease in the types of variations along with the development of Western medicine in China.

The following three Pareto charts display respectively the most significant types of variants for each period.

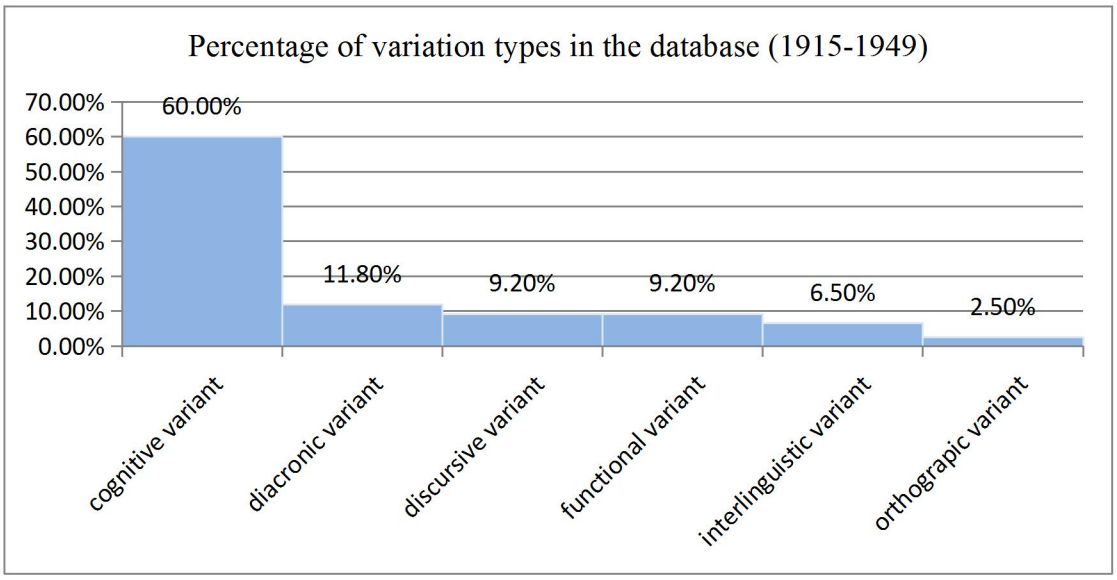

Figure 7.5: Percentage of variation types from the database (1915-1949)

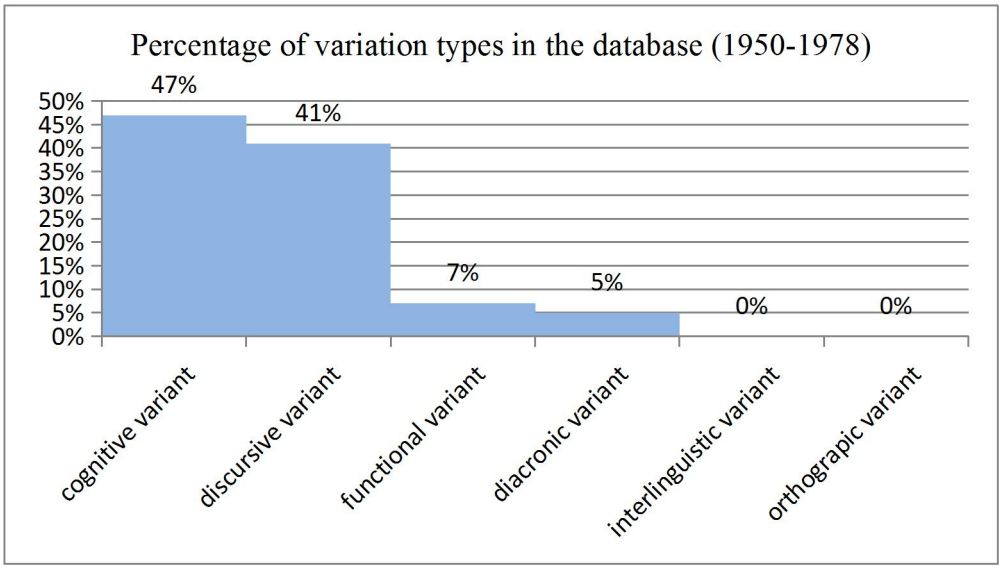

Figure 7.6: Percentage of variation types from the database (1950-1978)

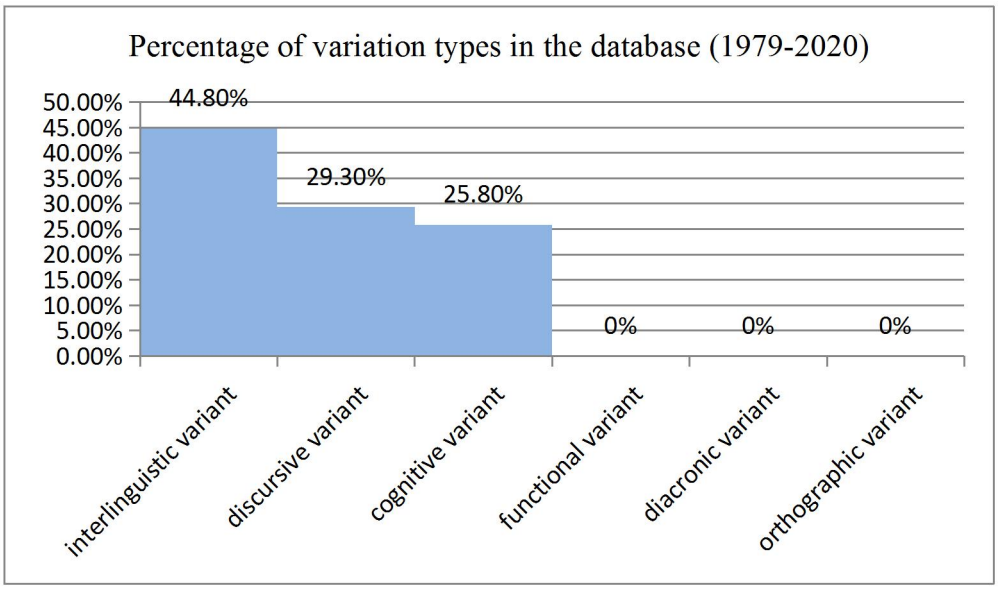

Figure 7.7: Percentage of variation types from the database (1979-2020)

Based on Figures 7.5-7.7, we can identify the key factors that drove variations and changes over time. These figures suggest that the first period has most types of variation in three historical periods, and the most significant variants were cognitive and diachronic, whereas in the second period, cognitive and discursive factors were most important. In the third period, interlingual, discursive, and cognitive aspects of communication all played significant roles, while functional and diachronic variants became less relevant. **This shift indicates that Western medical terminology achieved both specificity and modernization in the last period**. In the following sections, we will discuss each type of variant in each of the three periods.

The diachronic variants, which refer to changes in language over time, show that from 1915 to 1949, they account for 11.8%, while from 1950 to 1978, they account for only 5%. However, there are no diachronic variants recorded from 1979 to 2020. This may suggest that the language underwent significant changes during the first half of the 20th century. In this transitional period, **the change of language policy** caused Chinese to change from classical Chinese to vernacular, which also reflected the process from the coexistence of ancient words and modern words to the complete modernization of terminology in the field of Western medicine in China.

Functional variants refer to a disease that can be described using both formal and

informal terms. Between 1915 and 1949, functional variants accounted for 9.2% of disease references, and from 1950 to 1978, they accounted for 7%. However, no instances of functional variants were recorded between 1979 and 2020. This may suggest that **at the beginning of its establishment**, the medical journal of our corpus had a responsibility to **popularize knowledge for the general public**, and therefore a more colloquial term was used as a supplementary explanation after a formal term in some cases. However, in modern and contemporary times, the journal tends to focus more on **communication among professional practitioners**, resulting in increasingly specialized and formalized terminology.

Discursive variants in Chinese disease names are represented as abbreviations and expansions, mainly abbreviations. Between 1915 and 1949, discursive variants accounted for 9.2% of disease names, while from 1950 to 1978, they accounted for 41%. From 1979 to 2020, discursive variants accounted for 29.3% of disease names, suggesting that discursive changes have been more significant during the second half of the 20th century. **Discursive variants adapt to the need for simplicity or precision in communication, and they are also a manifestation of changes in language style due to social changes**. During the second period, some political movements in Chinese society led to shorter, more urgent language style and this affected medical terminology, which was blindly shortened sometimes, making it less conducive to the efficient expression of semantics. In the third stage, discursive variants generated by abbreviations were filtered to leave only the parts that were acceptable to users.

Interlinguistic variants refer to disease names of Western medicine in the Chinese context presented in different languages. Most interlingual variants exist in the co-occurrence of Chinese terms and English terms in Chinese texts, and a few also co-occur in Japanese and Chinese, but since Japanese also uses the Chinese character system, they are quickly assimilated. Interlinguistic variants account for 6.5% from 1915 to 1949, 0% from 1950 to 1978, and 44.8% from 1979 to 2020. This suggests that the language has been undergoing more changes due to **contact with other languages** in recent years. The early language contact was passive, and in order to spread knowledge more easily in medical journals, the presentation of foreign

languages was relatively restrained. In the second stage, due to the closedness of Chinese society, the presentation of any foreign language was almost cut off. In the third stage, there are many co-occurrences of Chinese terms and English initialism terms. This is a product of language contact and disciplinary international communication. During 1979 to 2020, China went through a period of active integration into internationalization, which is reflected in the terminology of Chinese medical texts by presenting internationally accepted English abbreviations. This reflects the increased contact with foreign countries and the desire to adopt and adapt to international medical standards and practices.

Cognitive variants, which refer to changes in language due to changes in cognition or thought patterns, accounted for 60% from 1915 to 1949, 47% from 1950 to 1978, and 25.8% from 1979 to 2020. This suggests that cognitive changes were most significant during the first half of the 20th century, but have been decreasing in recent years. In Chinese terminology of Western medicine disease names, cognitive variants are mainly manifested in the coexistence of newly coined terms and traditional Chinese medicine terms adopted into Western medicine. **This was most obvious in the first period, where the acceptance of Chinese users and the gaps in vocabulary were major factors**. Western medicine had not yet formed a mature naming mechanism in China. **The cognitive variants in the second and third periods were mainly caused by the differences in the naming mechanism and semantic emphasis between new words**. With the development of medicine and more robust terminology management, terminology is gradually being unified.

There has been a noticeable change in the orthographic variants over time. In the period from 1915 to 1949, orthographic variants accounted for 2.5% of the variations, but they seem to have declined in the later periods (1950-1978 and 1979-2020) to a reported 0%. The reason for **orthographic variation** during the May Fourth Movement and the subsequent period of **unstable language establishment** was the lack of unified understanding on diseases and terminology. As the social and language development and professionalization of Western medicine progressed in China, there may have been a push for standardization in terminology. This standardization could have led to a reduction in orthographic variants as a means of ensuring consistency

and clarity in medical communication.

Overall, these data suggest that the language underwent significant changes during the first half of the 20th century, with diachronic and cognitive changes being the most significant. However, in recent years, the language has been undergoing more changes due to contact with other languages and discursive changes. Functional changes have been less significant compared to other types of language change. The existence and type changes of terminological variants of disease names are an inevitable process for the generation of terminology systems, and also reflect the development of society and disciplines, the needs of internationalization and the influence of language policies. It's important to note that while standardization can reduce some types of variations, and it's also important to allow for adaptability and individualized care when necessary. The balance between standardization and personalized patient care is crucial in the field of medicine.

5. Synthesis

Building upon these analyses and conclusions, our scrutiny of corpus-based terminology databases has shed light on the evolution of Western medical disease terminology in China, under the influence of a diverse array of factors. The evolution of medical terms runs parallel to cognitive and societal changes, a correlation also substantiated by a study in Spanish (Montané et al., 2022).

Specifically, two primary forces emerge as instrumental in shaping Western medical terminology within the Chinese context. Initially, intrinsic factors within the discipline have exerted substantial influence. The ongoing evolution of Western medicine has yielded a more nuanced comprehension of diseases, transcending surface-level symptoms to grasp their underlying origins. Additionally, Western medicine has gradually disentangled itself from the confines of traditional Chinese medical disease terminology, giving rise to an autonomous lexicon of medical terms.

The second factor lies outside the discipline and can be dissected further into linguistic heritage and societal interaction. Firstly, the evolution of the Chinese language across the last century, transitioning from classical Chinese to modern Chinese, alongside interactions with foreign languages and various linguistic reforms enacted following the establishment of the People's Republic of China, has instigated morphological shifts within the Chinese language structure. Secondly, societal shifts, encompassing both domestic and international communication, have also wielded influence over the trajectory of Western medical disease terminology's evolution. These shifts have notably contributed to divergent variations in terminology.

CHAPTER 8 SUGGESTIONS TO THE TERMINOLOGY PLANNING IN CHINA

The evolution of Western medical terminology in the Chinese language is a comprehensive result of the Chinese language system, Western medicine development, and social changes. As a foreign discipline, the formation process of its terminology system has been influenced by historical changes, language policies, cognitive progress, cultural exchange, and communication needs. Studying Western medical terminology in Chinese from communicative corpora is of great significance for the suggestions of language policies in China, especially of the development of Chinese medical terminology.

The adoption of Western medical terminology in China began in the late Qing dynasty and continued through the early Republic of China (1912-1949). During this time, many Western medical terms were borrowed and adapted into Chinese, resulting in the creation of a new medical terminology system that incorporated both traditional Chinese medical terms and newly coined Western medical terms.

The evolution of Western medical terms in the Chinese language is important to terminology planning in China for several reasons. First, it provides a historical perspective on the development of medical terminology in China and highlights the importance of incorporating new terminology into the Chinese language as science and technology progress.

Second, investigating the evolution of Western medical terms in the Chinese language can help identify areas where the Chinese medical terminology system may need to be updated or improved. For example, some Western medical terms may not have a direct equivalent in Chinese, and the existing lexical units may not accurately convey the meaning of the term.

Finally, the evolution of Western medical terms in the Chinese language can provide

insights into the cultural and social factors that influence the adoption and adaptation of new terminology in China. Understanding these factors is essential for developing effective terminology planning policies that can support the continued growth and development of the Chinese language and medical terminology system.

1. Terminology planning in China

The history of terminological work in China can be traced back to ancient times, when early Chinese scholars began compiling dictionaries and classifying terminology for various fields of study. However, it was not until the 20th century that systematic efforts were made to standardize and modernize terminology across different domains. Lu Zebing (2022) provided a thorough overview of the terminological work in China, and we will present the main points below.

Terminology planning in China has undergone significant changes and developments since the 20th century. In the early 20th century, China's modernization movement led to the creation of new terminology in fields such as science, technology, and medicine. Still, there was no systematic terminology planning during this time.

In the 1950s, after the establishment of the People's Republic of China, the government began to focus on language standardization and terminology planning. The Chinese government established several institutions, such as the Academic Nouns Unification Working Committee, to develop standardized terminology in various fields.

In the 1980s, with the opening up of China's economy and increasing international exchanges, there was a growing demand for standardized terminology in foreign languages. The Chinese government began to establish terminology planning institutions and to develop terminology planning policies to address this need. Since the 1990s, China's terminology planning has become more systematic and comprehensive. The CNTERM has played a leading role in this process, establishing national terminological databases and terminology standardization systems. The

government has also invested heavily in the development of computerized terminology management tools and resources.

The CNTERM also establishes a standardized process on the terminological work. There are more than one hundred subcommittees of various scientific and technological fields for terminology examination and approval. Thousands of scientists have participated in the work. So far, more than 140 disciplines of terms have been published, including astronomy, physics, biochemistry, electronics, agronomy, medicine, linguistics, pedagogy, agricultural sciences, humanities and social sciences, and other fields. The publication of approved terms has played an essential role in scientific research, teaching, and academic exchanges, and laid the foundation for the standardization of scientific and technological terms.

The process of terminology review and approval is carried out as below (CNTERM, 2016):

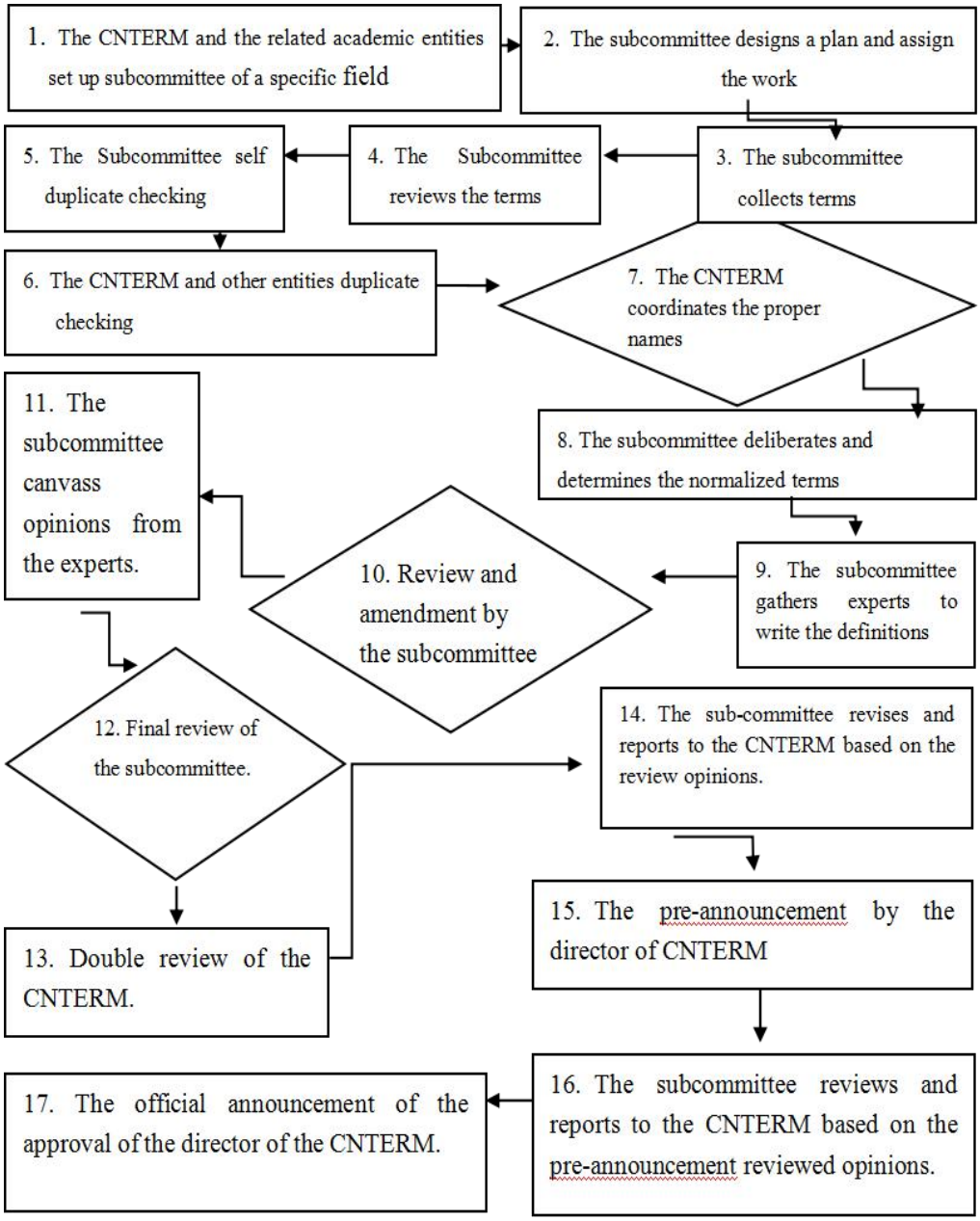

Figure 8.1: The process of terminology approval in China

As can be seen in Figure 8.1, the approval process for a term involves 17 steps. These 17 steps include top-down organization, with primary approval by experts within the field, as well as bottom-up user experience public announcement periods (pre-announcement on the website).

Based on the work of standardization of terms, the CNTERM has established a terminological database and provides readers with a free inquiry service of published scientific and technological terms through the website (www.termonline.cn). As an

example using *diabetes*, the term service on term.online is presented. We type in the Chinese term for *diabetes* in the search bar (Figure 8.2).

Figure 8.2: The search bar of www.termonline.cn

The approved terms will appear on the page with their English name and associated discipline, and the English name will include both the full name, varianrt, and initialism (Figure 8.3).

Figure 8.3: The approved term, the English name and the associated discipline

Next, related nuclear terms will be presented with their definitions, associated disciplines, year of publication, and sources (Figure 8.4).

Figure 8.4: Presentation of an approved term with definition, discipline, year of publication and source

The satellite terms which are formed from the nuclear term will also be presented with their definitions, associated disciplines, year of publication, and sources. In addition,

variant terms will be included and introduced with the phrase *youcheng* (又称, 'also known as') (Figure 8.5).

Figure 8.5: Two satellite terms of *tangniaobing* ('diabetes') under the entry of *tangniaobing*

What's more, there is a *jiucuo* (纠错, 'correction') button at the bottom right of each entry, which provides the public with an opportunity to correct and enrich terminology entries. Feedback is collected in the background and used to improve the presentation of the entry, resulting in a dynamic terminology planning system.

We can see that China's terminology data service leaded by the CNTERM is part of the terminology planning process, and its achievements reflect the standardization, application, and systematization of modern terminology.

Terminology study and planning are also gaining attention in Chinese universities, with the establishment of terminology research centers or institutes such as at Heilongjiang University. It is offered as part of translation, linguistics, and language

degree programs, teaching terminology theory, practice, and management. Research focuses on planning and standardization in fields such as science, medicine, law, and economics, often with collaboration between the government and industry. Chinese universities also host international conferences and workshops on terminology to encourage academic exchange and cooperation, reflecting the growing importance of terminology planning and standardization for effective communication and knowledge sharing (Wang Qi, 2021).

In conclusion, terminology planning in China continues to evolve and expand. The government is working to promote terminology planning, including standardization, management, and terminological services. Academic institutions are also making efforts to conduct more theoretical investigations and linguistic studies. In the future, the Chinese language is expected to become increasingly important globally, and China is playing a larger role in international standardization organizations.

2. The aim and need of Western medical terminology planning in China

Determining the aim and need for terminological planning (TP) is crucial. According to the study of Zarnikhi (2014), we have to consider linguistic and non-linguistic factors to frame the aim and need of TP. The aim of terminological planning is to provide a unified and revitalized terminology system along with the social development, promote consistency in professional communication, and support internationalization in various fields in such a modern era. The need for terminological planning arises from the challenges of technical communication. It is essential for developing technical communication-related activities and facilitates international collaboration and knowledge sharing. Our study conducted a synchronic and diachronic linguistic analysis of disease names in real Western medical texts from the past 105 years since the establishment of early Western medical terminology management in China. The morphosemantic change of Western medical terminology in China reflects the further specialization within the Western medicine discipline, as well as external factors such as the modernization of the Chinese language and

changes in social communication. Based on the analysis, we determine the following viewpoints as the aims and needs for the planning of Western medical terminology in Chinese.

The need for Western medical terms in the Chinese language has become increasingly important due to the quick medical investigation with forces of globalization. The globalization of medical research and healthcare has led to a growing demand for common medical terminologies that can be understood and shared by medical professionals and researchers from different countries. From the beginning of Western medical terms in the Chinese language, the intercultural factors plays a significant role. Chinese medical professionals and researchers need to be able to understand and communicate effectively with their Western counterparts, as well as with patients who speak different languages and come from different cultural backgrounds. The aim of Western medical terminology planning is supposed to bridge these cultural differences and promote effective communication and understanding.

The domestic communication factor is also an important consideration when it comes to Western medical terms in China. Domestic communication refers to the use of Western medical terms among Chinese medical professionals, researchers, and patients within the Chinese healthcare system. The domestic use of Western medical terms in China is not without its challenges. For one, there are often differences in terminology usage between Western medical practices and traditional Chinese medicine (TCM), which can lead to confusion and miscommunication. Additionally, there may be a lack of standardization and consistency in the use of Western medical terms within the Chinese healthcare system, which can hinder effective communication and knowledge exchange. Furthermore, due to the development of language and disciplines, there are different expressions and terminologies for Western medical terms in ancient and modern Chinese literature, which presents a challenge for terminology management. Lastly, the technical language, complex concepts, abbreviations and acronyms, cultural barriers, and contextual knowledge of Western medicine can present significant difficulties for a layman in China. It is important for healthcare professionals to communicate medical information in a way that is understandable and accessible to all patients, regardless of their background or

level of medical knowledge.

The particularity of Western medical terminology in China has also given rise to a need for interdisciplinary dialogue, namely, the comparison and reference between traditional Chinese terminology and Western medical terminology. These two seemingly different medical concepts have their own strengths in clinical practice, and many Chinese patients refer to both disciplines in the treatment process. However, there has not been effective communication at the terminology level.

Thus, we conclude the aims and needs as follow:

Aims for Terminological Planning of Western Medical Terms in Chinese:

1. Provide a unified and revitalized terminology system to support social development.
2. Promote consistency in communication within the medical field.
3. Support internationalization and facilitate collaboration in various medical disciplines.

Needs for terminological planning of Western medical terms in Chinese:

1. Establish standardization and consistency in the use of Western medical terms within the Chinese language and healthcare system.
2. Improve domestic communication among Chinese medical professionals and researchers and ensure medical information is understandable and accessible to patients with varying levels of medical knowledge.
3. Enable effective communication and understanding between Chinese and Western medical professionals and researchers and overcome challenges in technical communication arising from the forces of globalization.

In summary, based on the analysis of linguistic data over 105 years, we have summarized the goals and needs of terminology planning for Western medical terms in Chinese. Next, we will provide some suggestions for Chinese Western medical terminology within the framework of communicative terminology.

3. Suggestions for terminology planning basing on the evolution of medical terms

The importance of terminology planning in developing countries has often been overshadowed by the attention given to developed nations' efforts (Jernudd, 1983). Nevertheless, the significance of terminology planning in developing countries should not be underestimated. China, as the largest developing country globally, has a unique opportunity to learn from successful experiences in modern and contemporary terminology planning while preserving its distinctive characteristics.

In the first part of this chapter, as mentioned in the previous section on the current state of terminology management in China, we can observe that China's institutional development regarding terminology has been progressively improving. The significance given to terminology by universities and research institutions has yielded notable research outcomes in various aspects of terminology, and corresponding websites and interactive channels with the public terminology users have been established for terminology services. Thus, it can be concluded that the framework for terminology management in China has been established.

However, further study regarding the extensive collection of terminological data in use and ontological research is needed. Previous research has provided us with valuable insights for evaluating terminology planning. Terminology planning is an activity including terminology and lexicography, terminology management, translation, and translation management, and increasingly, corpus-based approaches (terms extraction, corpus analysis for spotting neologisms coined in discourse communities, etc.) (Cabré, 1999; Zarnikhi, 2016). Fathi (2017) in her dissertation, emphasized the importance of collecting and analyzing terminological data when evaluating terminology policies, as well as the institutional performance and terminological impacts. These scholars approached terminology and terminology management from an interdisciplinary and socialization perspective. Thus, study on terminological units in use can clarify the patterns of terminology formation from both diachronic and synchronic perspectives, guide linguistic decisions regarding the retention of old terms, the adoption and adaptation of foreign terms, and identify

changes in disciplinary development and communication needs.

The evolution of Western medical terms in Chinese is subject to ongoing change and adaptation, reflecting the dynamic nature of the medical field and the changing needs of the Chinese medical community. We present the parameters that impact the Western medical terminology in China as Figure 8.6.

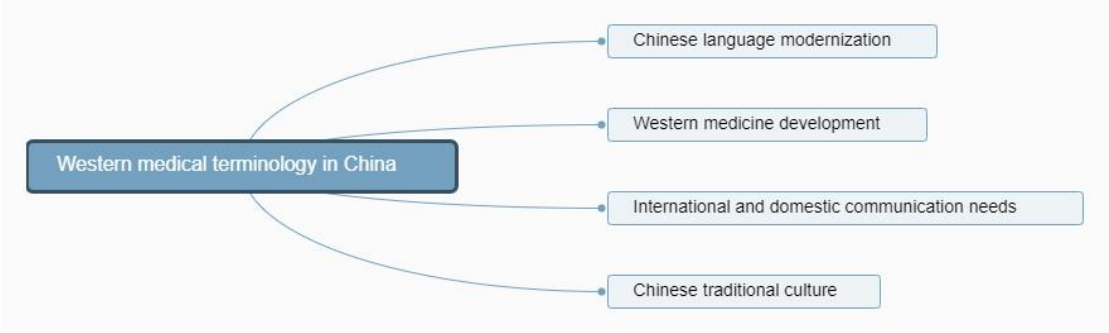

Figure 8.6: The parameters that impact the Western medical terminology in China

Building upon the outcomes of our own study, we are now able to propose several recommendations for the planning of Chinese medical terminology, taking into consideration the current state of terminology management. According to Cabré (1999), there are currently three orientations toward terminology, each related to distinct scopes. The first orientation is terminology oriented to language system, which emphasizes the standardization of concepts and terms. The second orientation is terminology oriented to translation, which focuses on interlingual translation. The third orientation is terminology oriented to language planning, which involves systematic interventions to manage the terminology. Based on the dimensions established in previous research, we adjust three orientations to poptimise the terminology planning for Western medical terminology in Chinese, taking into account language, shareholder, and the implementation of terminology planning (Figure 8.7).

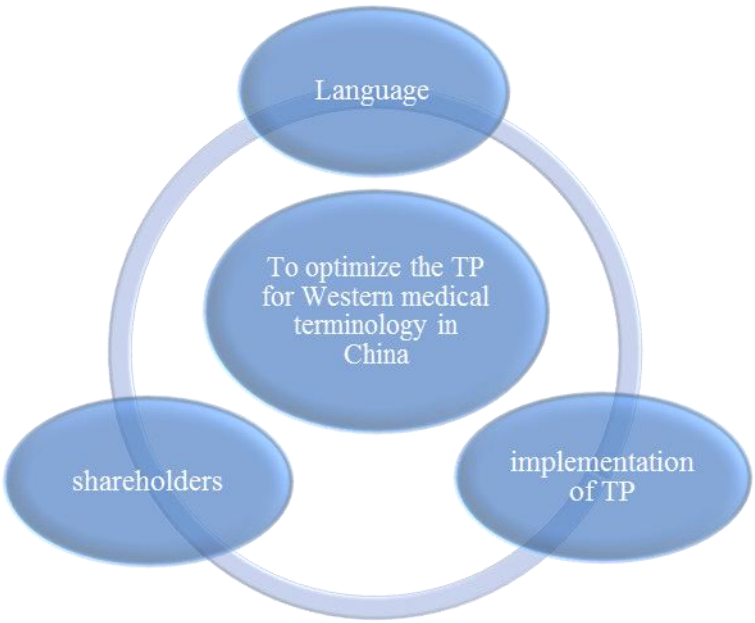

Figure 8.7: Three orientations to optimise the terminology planning for Western medical terminology in Chinese

Therefore, in view of the formation and evolution of the terminology system of Western medicine in China, and the needs of international and domestic communication of Western medical terminology today, we propose the following suggestions for China's existing terminology planning, ensuring accurate and concise communication among medical professionals, researchers, and patients.

Orientation 1: Language

The key point in the language orientation is the importance of linguistic accordance when proposing new terms. This means that new terms should be created in accordance with the linguistic rules and structures of the language. Therefore, terminology planning should also be aligned with the evolution of language. This is also an essential aspect of terminology planning in Quebec (Quirion & Freixa, 2013). For example, the formation of new medical terms should consider the morphology and semantics of existing words to ensure consistency and clarity in the language. This can help prevent confusion and ambiguity in the use of terminology and improve the accuracy of communication among medical professionals and the public.

The criteria for establishing a better lexical and semantic mechanism for a new term involve analyzing the linguistic structure of the term, considering its component parts, and ensuring that it is clear, concise, and accurate in meaning. When proposing a new language unit, several criteria need to be taken into consideration. These criteria should be carefully evaluated to ensure the success and acceptance of the new language unit within the language community (Estopà, 2022). We have adjusted these criteria based on the results of our analysis on the evolution of disease names in Western medicine in China.

1. To build a dynamic database that includes syntagmatic disease names with patrommonial lexical units. With the increasing complexity and diversity of disease names resulting from advancements in medical knowledge, it has become crucial to enhance the management of syntagmatic Western medical terms in the Chinese language. Syntagmatic terms, which manifest at the expression level and encompass valid combinations of conceptual relations, play a significant role in specialized discourses (Picht, 1991; Lorente, 2002; Kostina, 2010). Unfortunately, these terms have not received sufficient attention in the Chinese research community. Establishing this database will contribute to the organization and standardization of medical terminology, thus enhancing accessibility and comprehensibility for medical professionals and researchers.

2. To promote the use of disease marker words can significantly enhance the accuracy of identifying specific diseases while maintaining the distinctive linguistic characteristics of the Chinese language. A significant proportion of disease names in Chinese include a marker word for the disease, which is a unique linguistic feature of the Chinese language. Additionaly, incorporating these marker words into medical terms can make them more descriptive and informative, facilitating clearer communication and better understanding among healthcare professionals and patients.

3. To promote the compostion, especially the calque and patrimonial composition mechanisms will help reference the source term while maintaining the independence and authenticity of the Chinese language. By utilizing this most productive mechanism, new medical terms can be constructed in a way that respects both

Western medical terminology and the linguistic norms of Chinese, thus enhancing cross-cultural understanding. At the same time, this approach ensures the preservation of the purity and authenticity of the Chinese language, making it a valuable tool for effective communication and knowledge exchange in the medical field (Ye Feisheng, 1991; Fishman, 2003).

4. To provide clear and concise explanations for neological abbreviations used in medical terminology is essential. This will enable medical professionals and patients to comprehend complex concepts without confusion, improving the overall efficacy of healthcare communication.

5. To align the proposed terms with current semantic trends and cultural standards is vital for effective communication. Considering the official recommendations in the Chinese medical community will ensure that the chosen terms accurately reflect disease symptoms, body parts, pathogens, and other relevant features, promoting clarity and facilitating successful communication.

6. To include the presentation of interlinguistic, cognitive, and discussive variation in the discouse considering integration with globalization while also addressing domestic communication needs is crucial in morphological aspects.

We have made a suggestion to present from a positive perspective. Next, we will address aspects that should be avoided in terminology planning:

1. To reduce the use of direct loaning or phonetic loaning from English is another crucial aspect of effective terminological planning. Fathi (2017) mentioned that terminology planning plays a more important role in developing countries than general language planning because it manifests the struggle and competition in a bilingual or multilingual environment. Relying less on foreign language terms and adopting more native Chinese equivalents for Western medical terms will ensure consistency and coherence in the language. This effort to preserve linguistic independence in language planning is not only a form of power distribution and political expediency but also crucial for sustaining the language (Haugen, 1964; B.

Kaplan, 2013; Milligan, 2007), thus facilitating smoother communication.

2. To avoid the use of eponymous terms in disease names. Naming diseases after individuals may have been a tradition in Western science and medicine, but it leads to systematic variation across time, disorders, and journals. This lack of standardization can cause confusion and inaccuracies, hindering effective communication among medical professionals and researchers. Therefore, scholars suggest abandoning the use of eponyms (MacAskill & Anderson, 2013; McKusick, 1998; Waseem et al., 2005).

3. To avoid incorporating semantic parameters that refer to specific place names, professions, or animal names. This approach aligns with the guidelines set forth by WHO (2015), promoting the creation of more universally understandable and standardized medical terms. By excluding such specific references, the resulting disease names become more inclusive, facilitating effective communication among medical professionals and researchers worldwide.

Overall, basing on linguistic analysis, the language orientation emphasizes the importance of creating clear and consistent medical terminology that is rooted in the linguistic structure of the Chinese language, optimizes the morphological and semantic structure of new terminology, and follows international naming standards to make the naming of new medical units more scientific and objective, and reduce unnecessary discrimination, demonization, or negative social emotions. By doing so, it can help improve communication and understanding among medical professionals, patients, and the general public to promote more accurate and effective medical care.

Orientation 2: Shareholders

As Zarnikhi (2014, 73) stated, “the language police is a decision made by the powers of any level to fulfill the aim”. Most national-level language policies are formulated by authorized bodies and implemented by society. These policies guide the language planning process, with the community’s interaction testing the adequateness of the language planning efforts. The INFOTERM (http://www.infoterm.info/) also conducts multi-shareholders’ practices on terminology planning. The membership of the

organization INFOTERM covers international, regional, and national terminology institutions, organizations, and networks. INFOTERM defines *terminology planning* as an activity carried out by many institutions, organizations, or communities for an array of purposes.

In the context of medical terminology planning, it is essential to consider macro, meso, and micro planning (Kaplan & Baldauf, 1997), as well as the involvement of different stakeholders. The Canadian terminology planning practice serves as a reference for fostering effective communication within the medical community. This paper proposes the orientation of stakeholders in the terminology institutional performance, emphasizing the importance of considering human factors involved in terminology planning.

Macro Planning: Macro planning involves the overall language policy and its implementation at the national level. In the context of medical terminology, macro planning ensures the proper integration of medical language policies within the larger language policy framework of Canada. This approach is vital in promoting linguistic diversity and inclusivity within the medical field.

Meso Planning: Meso planning focuses on the specific needs of various social groups and stakeholders involved in medical terminology planning. This includes medical practitioners, patients, linguists, and language policy researchers. In the Canadian context, meso planning ensures that medical terminology meets the linguistic norms and structures of the Chinese language while being accessible to diverse linguistic communities.

Micro Planning: Micro planning deals with the technical aspects of terminology development. This includes naming and defining medical concepts accurately. In the Canadian context, micro planning aligns with international naming standards, promoting scientific and objective medical terminology.

Communicative Theory of Terminology (CTT) and its Relevance: The CTT is a theoretical framework that emphasizes the communicative nature of terminology

planning. It stresses the active involvement of different social groups and stakeholders in the process. Applying CTT to medical terminology planning encourages collaboration and a comprehensive understanding of various stakeholders' perspectives, thereby ensuring effective communication.

Interdisciplinary Cooperation: Effective medical terminology planning requires interdisciplinary cooperation. Collaboration among experts from different fields, such as linguistics, medicine, and policy-making, ensures that the terminology is clear, consistent, and suitable for the intended audience. The inclusion of linguists, language policy researchers, and the public in the approval process enhances the quality and acceptance of medical terminology.

Linguists' Role in Terminology Planning: Linguists play a crucial role in ensuring the effectiveness of medical terminology. They conduct linguistic analyses to optimize the morphological and semantic structure of terms. Additionally, linguists help bridge linguistic gaps and ensure that medical terminology aligns with Chinese language norms and is easily understood by diverse stakeholders.

Language Policy Researchers' Contribution: Language policy researchers contribute to terminology planning by considering broader social and political factors. Their insights help identify potential communication barriers and propose strategies to overcome them. By following international naming standards, they ensure the objectivity and scientific nature of medical terminology.

Public Involvement in Terminology Approval: The understanding and acceptance of medical terminology by the public are critical. To achieve this, the terminology must be accessible and easily understood by both medical practitioners and the general public. Popular science services should be provided to guide the public in understanding medical terminology accurately, thereby promoting effective communication between medical professionals and the public. In Canada, the Canadian Agency for Drugs and Technologies in Health (CADTH) is responsible for conducting health technology assessments and providing evidence-based information to healthcare decision-makers. As part of their terminology approval process, CADTH

actively involves the public in reviewing and understanding medical terminology. They conduct public consultations and seek feedback from patients, caregivers, and the general public on the clarity and accessibility of medical terms used in their reports and publications. For instance, when CADTH (Canadian Agency for Drugs and Technologies in Health) releases a health technology assessment report on a new medical device or treatment, they ensure that the terminology used is clear and easily comprehensible to the public.

In conclusion, the orientation of stakeholders in medical terminology planning recognizes the importance of considering the needs and perspectives of various participants. By fostering collaboration, adopting a communicative approach, and involving diverse social groups, this orientation ensures that medical terminology is effective, accurate, and accessible to all within the Canadian context. It aligns with macro, meso, and micro planning and draws insights from the Communicative Theory of Terminology, thus contributing to the enhancement of medical communication and understanding in Canada's multilingual society.

Orientation 3: Implementation of Terminology Planning

To effectively implement terminology planning and ensure the widespread dissemination of terms, several key strategies can be employed.

1. We can provide training and education for terminology users of different specialised cognitive levels. Offering training and educational opportunities on terminology planning and usage for professionals can involve organizing seminars, workshops, and training courses to help them understand and correctly use the planned terminology. It is important to start terminology education from elementary school, as proposed by Zhang Chunxin (2010). This involves introducing students to relevant terms during their elementary school years and fostering a strong foundation in terminology awareness. Furthermore, it is crucial to cultivate terminology proficiency among university students who will become future professionals in various fields. By integrating terminology education into their curriculum, universities can equip students with the necessary linguistic skills and conceptual understanding to

effectively navigate their respective disciplines. Raising the awareness of terminology is also promoted in Zarnikhi (2014)'s model for a successful terminology planning.

2. It is essential to foster collaboration among professionals, experts, and communication channels in various fields to ensure the adoption and widespread use of planned terminology. This collaboration can be achieved through the implementation of guidelines, promotional activities, and collaborative projects aimed at encouraging the adoption of the adequate terminology. An illustrative example of the impact of terminology promotion can be observed during the COVID-19 pandemic. The shift from referring to the disease as *Wuhan pneumonia* to the globally recognized term *COVID-19* highlights the importance of aligning terminologies across different cultures and regions. To further promote the adoption of standardized international terminology, public awareness campaigns and collaboration with mass media can play a vital role in disseminating and popularizing the terminology, thereby facilitating accurate and consistent communication among diverse populations. By actively engaging professionals and leveraging effective communication channels, the adoption and integration of planned terminology can be effectively promoted, fostering a shared understanding and enhancing communication within and across fields. (See: https://www.termcat.cat/en/services)

3. A cross-cultural dissemination of terminology needs more international exchange and cooperation. Engaging in communication and collaboration with terminology planning institutions and experts from other countries and regions, sharing experiences and best practices, participating in international standards and cooperative projects can facilitate effective communication in international settings. This fosters a cohesive global terminological framework that transcends language barriers.

By implementing these strategies, terminology planning can be effectively realized, and the dissemination of terms can be promoted both within professional communities and among the general public in domestic and international contexts.

4. Synthesis

This chapter discusses the planning of terminology in China and analyzes the objectives and necessity of Western medical terminology planning in China from both domestic and international communication perspectives. The suggested approaches for terminology planning in China can be summarized as follows: optimizing the linguistic structure of terminology, involving more stakeholders in the planning process, and implementing terminology planning in a manner that ensures consistency and facilitates interdisciplinary communication and understanding. By adhering to these recommendations, the planning of Western medical terms in the Chinese language can be carried out effectively and accurately, while taking into consideration linguistic, social, cognitive, communication, and cultural aspects of Western medicine in China.

CHAPTER 9 FINAL CONCLUSION AND FURTHER RESEARCH

So far, we have aimed to conclude each chapter with a section dedicated to relevant summaries or conclusions. This has allowed us to validate or reject the hypotheses we set out before starting the study and, at the same time, assess the fulfillment of the thesis objectives.

In this doctoral thesis, we set out to diagnose the evolution of Chinese terms in Western medicine, starting from the premise that it is a context in which Western medicine was a new discipline for China, and that traditional Chinese medicine was based on a mentality different from that of the West with its own terminological glossary. Therefore, the terms of Western medicine in Chinese have undergone a process of creation and unification for over a century. Given this sociocommunicative reality, we decided to conduct an empirical study that would allow us to account for the terminological evolution of the terminology extracted from a Western medicine journal in China from 1915 to 2020. We aimed to study disease terms and the variants in medical texts in three historical periods, based on three contrastive diachronic corpora.

The primary objective was to detect the terminological evolution of Western medicine terms in Chinese within a communicative context, as this was a topic that had not been explored globally hitherto. In the first hypothesis of our research, we assumed that the creation of these terms would distance them from traditional Chinese medicine terms. All the hypotheses were formulated based on the bibliographic review we conducted regarding the history of Western medicine in China and medical terminology both in traditional Chinese medicine and Western medicine.

We have divided the thesis into two main parts, which allowed us to address the research topic and object of the study. The first part is dedicated to the theoretical foundations that we consider necessary for framing the research. In this same part, we

also took the opportunity to provide a description and contextualization of the study we are going to undertake. The second part is devoted to the empirical study itself, meaning the methodology for data collection, corpus construction, and the quantitative and qualitative analytical methods that enabled us to accept or reject hypotheses and achieve the initially set objectives. In the sections that follow, we will summarize all the conclusions that we derived as we completed each part of the research.

1. Conclusion of the theoretical framework

The conclusions drawn from the theoretical foundations have primarily assisted us in two key aspects. Firstly, they have facilitated a precise demarcation of the scope of our study within a communicative framework. Secondly, they have contributed to the contextualization of the research conducted on the Chinese language and the mechanisms of lexical creation.

In the second chapter of this thesis, we explored the studies related to the Communicative Theory of Terminology, the Chinese language, neologisms, and the mechanisms of neologism within the Chinese lexicon. This allowed us to contextualize our study within the realm of terminological lexical units in a communicative framework. We also established a connection between medical terms in Chinese and the diachonic development of the Chinese language. Additionally, we provided valuable insights into the mechanisms of neologisms which served as references for the lexical creation in specialised communication.

The first part of the second chapter is devoted to the Communicative Theory of Terminology. In this part, we were able to confirm that terms belong to lexical units, primarily, nouns, and in our study, we focus on the disease names. Furthermore, previous studies have proved that it is a common phenomenon for terms to exhibit variation in specialized communication. This connection between terms and variation in real communicative context led us to undertake the construction of an *in vivo* terminological database.

The second section of the second chapter was indispensable for delving into the historical background, lexical analysis, and the specialized nature of the Chinese language. This exploration enabled us to approach our study from a diachronic perspective, facilitating the analysis of medical terms within the Chinese lexicon while considering the morphemes and graphemes that convey meaning in the Chinese language.

The third section of the second chapter offers valuable insights into neology and the research on Chinese neologisms. This enables us to examine Western medicine terms in the Chinese language through the lens of neology. Given that the establishment and development of Western medicine in China incorporate foreign elements, it becomes apparent that new mechanisms for lexical creation are indispensable in the formulation of corresponding Chinese terms. Studies on neology and neologisms offer us reference points for categorizing the neological formation of new disease names.

Taking into account all the aspects addressed in the theoretical foundations, as well as the established objectives and hypotheses, we conducted an empirical study within a methodology and carried out various quantitative and qualitative analyses on the study subject.

2. Conclusion of the methodology

To carry out this terminological study, we compiled manually three *ad hoc* textual corpora from three historical periods. This was necessary because no existing corpus enabled us to conduct an analysis of disease names and variants used in the discipline of Western medicine within the Chinese language. Extracting terms from authentic texts of Western medicine in Chinese was one of the key criteria in accordance with the Communicative Theory of Terminology, as it allowed us to observe the terms in their natural context, facilitating our understanding of the evolution of terminological lexical units.

Before starting with the constitution of the corpus, we had to adapt certain criteria that

would allow us to have our methodology. Nevertheless, special attention was given to the Communicative Theory of Terminology (Cabré, 1999, 2023)'s approach on how to carry out terminological work on specialized texts. To establish a comprehensive database, we have selected the *Zhonghua Yixue Zazhi* (National Medical Journal of China) as our primary source, considering its professional, communicative, and diachronic nature within the field of Western medicine. Additionally, Cabré (2005c) proposed the template for terminological units to build a database. We adapted her terminological template to our study and designed a working file, specifically tailored for our terminology study, to capture essential information related to disease names, including variants, subject fields, English equivalents, contexts, and notes.

To facilitate the empirical analysis, we had to make use of POS tagging tools with manual checking, etymology dictionaries, and medical databases to gain insights into the morphological structure, semantic category, and behavior of variants in disease terms. This multidimensional approach will allow us to examine disease terms from the perspectives of Chinese ontology, medical cognition, and specialized communication.

This methodology allowed us to obtain terminological data for disease names in the context of Western medicine in the Chinese language from 1915 to 2020 as our ad hoc database. This database includes the names and their English equivalents, as well as variants of the names (if any) in the corpus articles, enabling us to perform the qualitative and quantitative analyses.

3. Conclusion of objectives of the thesis

In this comprehensive doctoral thesis, we embarked on a multifaceted journey to explore and understand the complex terrain of Western medical terminology in the context of the Chinese language. Our research was driven by a set of specific objectives organized into three distinct dimensions: instrumental operation, linguistic analysis, and sociolinguistic observation.

Instrumental Operation

At the core of our research was the foundational dimension of instrumental operation. We recognized the absence of a corpus-based terminology database for disease names in Western medicine within the Chinese language. To address this gap, we meticulously undertook the following critical operations:

1. We identified a representative medical journal focused on Western medicine in China, setting the stage for our corpus construction.
2. We established a historical periodization spanning from 1915 to 2020, incorporating the socio-political and linguistic dynamics of the times.
3. We meticulously created corpora representative of significant historical periods, utilizing articles sourced from our chosen journal.
4. Within these corpora, we diligently extracted and identified disease terms, culminating in the construction of terminological databases specific to their corresponding historical contexts.

These essential steps were crucial in establishing the instrumental foundation for our terminology research, enabling a comprehensive analysis of disease names in Western medicine within the Chinese linguistic landscape.

Linguistic Analysis

With the groundwork laid, our research transitioned to the linguistic analysis dimension. Here, we explored the intricate linguistic aspects of Western medical terms in the Chinese language, focusing on:

1. Investigating the morphosemantic formation mechanisms employed for Western medical terms, with a particular emphasis on disease terms. We identified and categorized linguistic patterns and processes involved in the formation of disease terms within each historical period.
2. Examining the semantic shifts and extensions that shaped the meanings of disease terms in the Chinese language.

3. Identifying and analyzing terminological variants, and investigating changes in terminological variation over time while considering socio-cultural, historical, and professional influences.

Through this linguistic and sociolinguistic study, we not only unraveled the morphosemantic intricacies of Western medical terms in Chinese but also deciphered the sociolinguistic evolution of terminological variation over time.

Sociolinguistic Observation

The final dimension of our research, sociolinguistic observation, aimed to bridge the gap between theoretical research and practical applications in social services. To this end, we pursued the following objectives:

1. We compared the evolution of morphosemantic mechanisms for Western medical terms, revealing changes and developments in linguistic mechanisms used for coining these terms across different periods.
2. We delved into sociolinguistic factors contributing to the terminological evolution in terms of formation and textual presentation.
3. Finally, we deduced criteria and offered recommendations for terminology planning in the Chinese context, based on our linguistic observations and analyses.

In closing, this doctoral thesis represents a significant milestone in the exploration of cross-cultural medical terminology, made possible through the diligent pursuit of our meticulously defined objectives.

4. Conclusion of the hypothesis on the evolution of of disease terms of Western medicine in Chinese

This dissertation delves into the linguistic and sociolinguistic evolution of Chinese Western medical disease terminology across three historical periods, spanning from 1915 to 2020, and also addresses the implications of these findings for the field of

medical terminology planning and management in China. The hypotheses formulated earlier provide the framework for understanding the evolution.

To test the hypotheses we had set at the beginning of the research, we conducted analyses of various natures. It was necessary to combine both quantitative and qualitative analyses to account for the actual behavior of our study subject. The first hypothesis we had posed is:

> During the initial stages of the introduction of modern Western medicine in China, there is an expected higher occurrence of the incorporation of traditional Chinese medical terms within the realm of Western medicine compared to periods marked by cognitive adaptation in Western medicine.

To address this assumption, we considered it necessary to conduct both inferential and descriptive statistical analyses. The inferential statistical analysis allowed us to determine whether there is a statistically significant difference in the adoption of traditional Chinese medical terms between the three historical periods. To do so, we formulated the following null hypothesis and alternative hypothesis for a chi-square test:

Null Hypothesis (H0): There is no significant difference in the adoption of traditional Chinese medical terms across different time periods.

Alternative Hypothesis (H1): The adoption of traditional Chinese medical terms from 1915 to 1949 is significantly greater than in other periods.

From 1915 to 1949, out of 407 disease terms, 118 traditional Chinese medical terms were adopted. From 1950 to 1978, out of 264 terms in the database, 34 traditional Chinese medical terms were adopted. And from 1979 to 2020, out of 325 terms, 6 were adopted traditional Chinese medical terms.

Chi-square statistic for the first period (1915-1949):
P1≈68.98 is greater than the critical chi-square value of 5.991, so the null hypothesis

can be rejected.

Chi-square statistic for the second period (1950-1978):

P2 ≈ 64.21 is also greater than the critical chi-square value of 5.991, so the null hypothesis can be rejected.

Chi-square statistic for third period (1979-2020):

P3≈6.00 is almost equal to the critical chi-square value, so the null hypothesis cannot be rejected.

According to the results of the chi-square test, the number of TCM terms adopted in the first period (1915-1949) and the second period (1950-1978) was significantly greater than that in the third period (1979-2020). This indicates that **more TCM terminology was adopted in the first stage than in other stages.** Thus, the discernible impact of traditional Chinese medicine (TCM) terminology on Western medical disease terms during this foundational phase is evident. However, when examining the development and establishment of Western medical terminology in China, it becomes apparent that **the majority of Chinese Western medical terms demonstrate a semantic dependence on Western equivalents, while maintaining a trend of morphological localization**. **They have gradually distanced themselves from traditional Chinese medical terms, all the while preserving their native language identity.**

The second hypothesis is that a greater use of foreign languages, such as loanwords, may become more common, leading to diverse levels of linguistic hybridization within the context of Western medical terminology in China.

There were 16 loanwords among the 407 medical terms from 1915 to 1949, 11 loanwords among the 264 terms in the database from 1950 to 1978, and 26 loanwords among the 325 terms from 1979 to 2020. We formulated the following hypotheses allowing us to perform a chi-square test to test this hypothesis:

Null Hypothesis (H0): There is no significant difference in the number of loanwords in each period, and the direct impact of foreign words is similar in different periods.

Alternative Hypothesis (H1): Western medical terminology is increasingly influenced by loanwords, leading to a significantly different number of loanwords in different periods.

The results of the chi-square test are as follows:

For the first period (1915-1949), $p1 \approx 21.00$.
For the second period (1950-1978), $p2 \approx 31.07$.
For the third period (1979-2020), $p3 \approx 30.45$.

Based on the chi-square test results, if the chi-square statistic for each period is greater than the critical chi-square value, then the alternative hypothesis can be supported. This suggests that **Western medical terminology in Chinese is increasingly influenced by loanwords**, resulting in a significantly different number of loanwords across different periods. This prevalence resonates with the heightened depth of linguistic interaction.

The third hypothesis suggests that composition (the process of combining words or elements to form new terms) is the most common mechanism for forming disease names, especially in the context of Western medical terminology being integrated into the Chinese language.

The analysis of the data shows that terms of composition accounted for 66.9% of all disease names from 1915 to 1949, 65.8% from 1950 to 1978, and 86.7% from 1979 to 2020. Based on the data we've presented, it does appear that **composition is a prevalent mechanism in forming disease names in these time periods.** The percentages we've mentioned indicate a high frequency of composition-based disease names over the years, with an increasing trend from 1915 to 2020. **This conclusion aligns with the idea that compound words are the most common in the Chinese vocabulary for general purposes.**

In addition, across different historical periods, **compositional mechanisms utilizing native lexicons consistently emerge as the most effective approach for creating**

disease names. The distinct characteristics of Chinese markers in morphology, which differ from those in Indo-European languages, mainly encompass independent words derived from Chinese native lexical sources. The incorporation of native lexical units plays a pivotal role in establishing semantic transparency within the terminology for Chinese speakers.bolster its intrinsic linguistic identity in Chinese.

To prove the fourth hypothesis that, in terms of word formation and semantics, Western medical disease terminology in the Chinese language is becoming longer and incorporating more disease parameters, we can provide the following evidence:

1. Change in Syllable Count: **In the first period, single-syllable disease names still existed, but by the third period, they had completely disappeared**. Throughout the entire observation period, multi-syllable terms consistently dominated. Over time, the proportion of disease names with the most syllables has nearly doubled, increasing from 3 syllables to 5 syllables. The proportion of terms with 10 or more syllables also increased by approximately twofold between the three historical periods. Clearly, the elongation of syllables is a defining characteristic of Western medical terminology in the Chinese language.

2. Increase in Lexical Components: **The increase in word length is associated with a growth in the number of lexical components used to construct disease names.** From 1915 to 1949, only 3% of disease terms were monolexical, but by 1979-2020, all disease terms were composed of multiple lexical components. This indicates that in medical literature, a single word is no longer sufficient to encompass complex disease names, reflecting a deeper exploration of diseases in the field of medicine.

3. Richness in Word Formation: **The increase in word length results from the multidimensional description of diseases**. From 1915 to 2020, our data demonstrated a significant enrichment in the word formation of disease names. The variety of word formations increased from four types in the first and second periods to fifteen types in the third period.

This evidence supports the hypothesis that **Western medical disease terminology in**

the Chinese language is indeed becoming longer and more semantically rich. This transformation, which parallels advancements in the medical field, has enhanced the precision and comprehensiveness of disease names. **These shifts reflect the growth of the medical discipline and its adaptation to evolving clinical technologies**.

To conclude the fifth hypothesis, which posits that more variation may emerge during the process of consolidating medical terminology, possibly impeding effective communication among professionals and researchers in the medical field, we can summarize the findings as follows:

In the first period (1915-1949), cognitive variants predominated, constituting a significant 60% of the total variation. This indicates a strong emphasis on cognitive difference of language and medical terminology during this era. However, subsequent periods witnessed a decline in the percentage of cognitive variants, signifying a shift in linguistic focus.

During the third period (1979-2020), interlinguistic variants played a substantial role, accounting for 44.8% of the total variation. **This highlights a noteworthy influence of interlingual factors on the integration of Western medical terminology into the Chinese language during this timeframe.** In contrast, interlinguistic variants were conspicuously absent in the second period (1950-1978).

Functional variants remained relatively stable across all three periods, suggesting their consistent role in language variation. In contrast, discursive variants displayed significant variation, surging from 9.2% in the first period to 41% in the second period before subsiding to 29.3% in the third period. This suggests shifts in how medical communication was structured and the employment of discursive strategies during the second period.

Diacronic variants were evident in all three periods, although their percentage diminished over time, rendering them insignificant in the third period. Orthographic variants, however, were only present in the first period and subsequently became negligible.

These findings collectively underscore the dynamic nature of medical terminology consolidation, with shifts in the prevalence of types of variants over time. The hypothesis is supported by these observations, as they reflect the complexities and challenges inherent in standardizing medical terminology while adapting to evolving clinical practices and linguistic paradigms. The data indicates that the process of consolidating medical terminology, especially in the context of standardizing Chinese medical terminology, can lead to variation, thereby emphasizing the challenge of achieving uniformity and consistency. Notably, the effort to standardize medical terminology for effective communication among professionals and researchers in the medical field is essential for the reduction of the types of variation, while the persistent presence of diverse types of variations illustrates the ongoing complexity and challenges associated with standardizing medical terminology.

In conclusion, the confirmed hypotheses align with the research findings. The evolution of terms reflects the dynamic nature of medical communication and the integration of Western medical knowledge within the Chinese linguistic framework.

The study's insights into the evolution of disease names in Western medicine within the Chinese context have further strengthened our proposals for normalizing medical terminology in China. In particular, we recommend using composition mechanisms such as calque and patrimonial composition to develop new medical terms that strike a balance between Western medical terminology and Chinese linguistic norms. This approach promotes linguistic coherence and independence, which is vital in bilingual or multilingual settings. Additionally, it aligns with effective terminological planning, which calls for reducing reliance on direct or phonetic borrowing from English to maintain language consistency. Furthermore, discouraging the use of eponymous terms in disease names is essential for standardization and clarity in medical communication, preventing variations that can hinder effective communication among healthcare professionals and researchers.

5. Contribution of this study

This study makes several contributions to the field of terminology studies, specifically in the domain of Western medical terminologies in the Chinese context. We have solved some problems and some specific contributions of the study include:

1. This study demonstrates the interdisciplinary and variation principles of the Communication Theory of Terminology (CTT). By analyzing Western medical terms in a real Western medical journal in Chinese and focusing on their linguistic features and variation, we gain a deeper understanding of how Western medical terminology evolves in China's medical communication. This approach emphasizes the importance of considering not only the linguistic characteristics of terminologies, but also their social and contextual aspects. Thus, this study exemplifies the value and relevance of the CTT in a wider scale and highlights its potential to contribute to a more comprehensive and nuanced understanding of terminologies in various disciplines and domains.

2. One of the key contributions of this PhD research is the innovative methodology developed within the framework of the Communicative Theory of Terminology. Notably, this study marks the first application of this method to analyze Chinese medical disease names in the context of Western medicine. This novel approach provides fresh insights and a deeper understanding of the linguistic and communicative aspects of Western medical terminology adoption in the Chinese language, offering a unique perspective on this subject.

3. Another notable contribution of this study is the creation of three comprehensive databases of Western medical disease names in the Chinese language, sourced directly from an *in vivo* medical journal in China. To the best of our knowledge, this is the first instance of such databases being meticulously built and offered as an open-source resource. This initiative allows researchers, linguists, and medical professionals interested in this field to access and utilize these databases for further study and analysis. By providing this open-source repository, we aim to foster collaboration and knowledge sharing within the academic and medical communities, thereby advancing

the understanding of Western medical terminology adoption in the Chinese context.

4. In the field of linguistics, this dissertation contributes to resolving two heavily debated issues in the study of Chinese language, Firstly, it explores whether calques should be considered as part of loanwords. Secondly, it investigates whether medical terms composed of identical fixed morphemes should be classified as derivatives or compounds. To address these issues, the dissertation relies on a detailed analysis and discussion of authentic language data.

5. The research conducted a lexical research after the New Culture Movement in China, particularly from the perspective of specialized language, has not previously received attention in the field of medical language during this time period. From a communicative perspective, this study systematically reviews the establishment and evolution of Western medical terminology.

6. This dissertation not only describes the morphological and semantic features of Western medical terms during three historical period from 1915 to 2020, but also emphasizes the critical importance of optimizing the linguistic structure of medical terminology by taking reference from the most prominent mechanisms in each period. This optimization is effectively achieved through the strategic utilization of calque and genuine composition mechanisms that incorporate native morphemes. By embracing these techniques, disease names gain enhanced semantic transparency, with a specific focus on symptoms, body parts, and pathogens within the nomenclature. This targeted approach fosters scientific precision and inclusivity, while also mitigating unnecessary stigmatizations that might arise from factors such as eponyms or geographic indications.

7. Additionally, it pays attention to the variations that occur in real communicative situations at the sociolinguistic level. This dissertation employs a communicative approach of Communicative Theory of Terminology to highlight the significance of variation in medical communication. We construct an *in vivo* corpus from the first Western medical journal published in Chinese, which provides a rich source of Western medical terminological data along with the development of Western medicine

China. We investigate the reasons behind the formation of different variants and explores their use in medical communication. By analyzing the variants, we recognize that terminologies are dynamic and subject to change. The focus on the variation marks the first study of its kind to investigate Western medical terminology in a Chinese context.

6. Limitation and recommendations for future research

Despite the insights gained from this study regarding the development and characteristics of Western medical terminology extracted from the most authorized medical journal in China, there are several avenues for future research that could further enrich our understanding of medical terminology in Chinese.

1. One notable limitation of this thesis lies in the method employed for disease term extraction. The primary approach involved searching for keywords in the titles or abstracts of medical literature. While this method is efficient, it may have missed disease terms buried within the main text. Future studies could explore more sophisticated natural language processing techniques to comprehensively extract disease terms from medical texts, potentially improving the accuracy and completeness of the dataset.

2. Future research could investigate advanced data extraction techniques, such as natural language processing, machine learning, and semantic analysis, to extract disease terms from a broader range of medical texts. The manual construction of the database relied on native instinct, which might introduce imprecision due to potential errors. Future studies can aim to address the issue of term segmentation in Chinese and attempt to achieve automatic or semi-automatic extraction of terms from specialized corpora.

3. This study concentrated on terminologies used in written communication without considering oral materials. Future studies can delve into the evolution of medical terminologies in oral communication by analyzing spoken materials. Researchers

could analyze recordings of medical consultations or interviews with medical professionals. Surveys could also be conducted to gather data on the use of medical terminologies in spoken communication, including the frequency of certain terms and how they are pronounced or adapted in different contexts.

4. In the future, researchers can focus their studies on specific medical disciplines to explore the characteristics of Western medical terminologies in more specialized contexts, such as cardiology or neurology. This can involve analyzing specialized medical journals and conducting interviews with medical professionals to gain insights into the characteristics and evolution of specialized terminologies.

5. This study primarily emphasized the linguistic description of disease names from medical journals. To gain a deeper understanding of how users perceive and use medical terminologies in different contexts, future studies can conduct surveys or focus on groups consisting of medical professionals, medical students, and patients. These studies could explore how users interpret and apply medical terminologies, and how their perceptions and use of these terminologies may vary based on their level of expertise or familiarity with the terminology.

6. Future research could delve into the implementation and effectiveness of terminology training programs designed for healthcare professionals. Investigate how standardized terminology training impacts communication, diagnosis, and treatment. Examine whether such training programs enhance cross-cultural competence and whether they lead to improved patient care.

7. Future studies can also explore strategies for the publication and dissemination of evolving medical terminology. Assess how journals, textbooks, and online resources can keep pace with changing terminology, ensuring healthcare professionals have access to the most up-to-date terms. Investigate the impact of evolving terminology on patient communication and engagement in medical decision-making.

Our study represents a pioneering attempt to apply the Communicative Theory of Terminology to medical terminology in Chinese. In the future, further studies within

the framework of the Communicative Theory of Terminology, such as expanding our understanding of Western medical terminologies across different subdisciplines and their usage in various contexts, can contribute significantly to the enhancement of medical terminology services in China. A more nuanced comprehension of how these terminologies are employed within different medical specialties and communication contexts can pave the way for the development of more precise and effective terminology tools and resources that cater to the needs of medical professionals, educators, and patients. Moreover, by integrating user perspectives and feedback into the development process, we can ensure the user-friendliness and accessibility of these resources to a broader spectrum of individuals. Ultimately, these endeavors can play a pivotal role in bridging language and communication gaps within medical settings, consequently elevating the quality of healthcare services in China.

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Proofread samples

Original text:

The 21st century is an era of informative and scientific explosion. Science and technology develop at an unprecedented rate. The division of labor is becoming more specialized and refined and it leads to the creation of new disciplinary fields. The new knowledge that is produced every day needs to be expressed adequately. Since terminology is very crucial in the transference of knowledge, now it plays a more and more important role in the domestic and international communication of science and technology.

Figure 4.1 shows that the polysyllabic words outnumber the monosyllabic words in this database. Three-syllable terms are the most, with 113, accounting for 27% of the total. In general, 84.7% of the data are terms of two to six syllables, with a total of 345 units. Nearly 15% of the disease names are of one syllable and the terms of more than seven syllables. 7 monosyllable terms can represent disease names with only one syllable and the terms of more than nine syllables reduce as the number of syllables increases.

Proofread text:

The 21st century is an era of information and scientific explosion. Science and technology are developing at an unprecedented rate. The division of labor is becoming more specialized and refined, leading to the creation of new disciplinary fields. The new knowledge produced every day needs to be adequately expressed. Since terminology is crucial for transferring knowledge, it plays an increasingly important role in domestic and international communication of science and technology.

Figure 4.1 illustrates that the database contains a higher number of polysyllabic words

compared to monosyllabic words. Three-syllable terms are the most prevalent, with a count of 113, constituting 27% of the total. In general, terms with two to six syllables make up 84.7% of the data, amounting to a total of 345 units. Approximately 15% of disease names consist of one syllable, while terms with more than seven syllables are less common. Specifically, there are seven monosyllabic terms that represent disease names, and the number of terms with more than nine syllables decreases as the number of syllables increases.

Database online resource

The terminological database for this dissertation has been uploaded to https://zebinglu.github.io/terminologia/. It is available for free to anyone interested in using it. Please feel free to proofread it and let me know if you have any questions or suggestions.