Cross-Cultural Knowledge Transfer and The Adaptation of Chinese Medical Practice in Mongolia

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Abstract

This study explores the impact of Chinese medicine on Mongolian medical traditions in the 18th and 19th centuries. Through the analysis of Mongolian medical texts, the literature reveals the selective approach Mongolian healers used when integrating Chinese concepts and treatments into their own. As infectious diseases was an important factor in shaping the Mongol population, a key focus is found on their strategy against this, particularly to smallpox. By filtering and engaging with Chinese knowledge, Mongolian scholars actively tailored it to the contextual needs of their country to strengthen their preexisting medical system. Alongside this, this article further aims to unpack the importance of translation in the dissemination of medical knowledge, notably through the Mongolian translation of *The Fine Words of Smallpox* (1814). Ultimately, this research underscores the impact of Chinese medical pratices on Mongolian medicine, illustrating the significance of cross-cultural connections in advancing medical traditions and public health.

Key Words: Mongolian traditional medicine, Chinese medicine, Medical adaptation, Inoculation, Medical translation, Medical knowledge transfer.

1. Introduction

The evolution of medical practices through cross-regional interactions has long intrigued historians as they reveal how medical systems are constantly shifting over cultural and intellectual exchange. For example, Tibetan medicine emerged as a synthesis of Indian Ayurveda, Chinese medicine, and to some extent Western medical knowledge, creating a harmonious hybrid system despite integrating knowledge from diverse regions. Similarly, Mongolian medicine was greatly impacted by this due to the key role Tibetan medicine held in its infrastructure, as well as Mongolia's independent absorption of medical knowledge determined by its historically unique contextual conditions.

Amalgamating Tibetan knowledge into Mongolian medicine occurred as a product of multiple forces, including the recurrent threat of epidemic diseases, shifting political alliances, and patterns of economic exchange with neighboring powers. Janes (2008: 35-61) emphasises that medical change in both Mongolia and Tibet unfolded under intense social and cultural pressures generated by such transregional interactions. In this context, Kloos (2022: 281) convincingly argues that "Mongolian Traditional Medicine" is best understood

as a relatively recent construct rather than a long-standing, autonomous system. Prior to the twentieth century, medical practice in Mongolia largely functioned as a regional reflection of Tibetan medicine, lacking a distinct institutional or epistemological identity.

Norov (2021: 315) highlights how centuries of locally accumulated knowledge and the implementation of external medical intellect created the basis for what is now recognised as contemporary Mongolian Traditional Medicine. Thus, Mongolian Traditional Medicine represents a layered foundation, consisting of Tibetan theory and practice, Ayurveduc disease classifications, Chinese therapeutic methods and Western diagnostic tools. Within this complex interplay, the fundamental principles of Chinese medicine, such as yin-yang theory, pulse diagnosis, and the five elements of Chinese astrology, exerted a distinct influence on Tibetan medicine and, indirectly, on Mongolian medicine, as documented in both Tibetan and Mongolian sources.

A key example of this influence is the incorporation of the yin-yang theory into Mongolian diagnostic practices, as discussed by Yu and Amri (2016: 79-86). However, several researchers have hazardously exaggerated the impact of Chinese medicine in this context, hence wrongly misrepresenting Mongolian medicine as a direct derivative of it. For example, Long et al. (2022: 362-66) emphasise that Mongolian pharmacological knowledge, while rooted in Chinese traditions, draws upon Tibetan and Ayurvedic teachings. Evidently, though Mongolian medicine contains some Chinese characteristics, Tibetan medicine has also played a substantial and formative role in shaping Mongolian medical knowledge.

On a similar note, Wang Bin and Zhu Meixiang (2007: 743-45), in their study of the influence of Chinese medicine on Mongolian medical traditions, note that Chinese medical astrology came to be used in both Mongolian and Tibetan medicine. They further point out that the *Huangdi Neijing*, an ancient Chinese medical classic, and the *Four Tantras of Medicine* (*rGyud bzhi*) are both composed in a question-and-answer format, which they suggest may reflect the stylistic influence of Chinese medical writing. Yet this argument should not be overstated, since such stylistic literature were also a staple of Tibetan Buddhist scholarship, particularly when used in logic and debate.

Despite this, the influence of Chinese medicine on Mongolian practices remains understudied, particularly within Western literature, leaving significant gaps in the historiography. This article seeks to address these gaps by examining eighteenth and nineteenth centuries Mongolian medical texts alongside translations of Chinese work, using smallpox prevention and treatment as a case study.

2. Mongolian Engagement with Chinese Medicine in the Qing Era

While the Tibetan imprint is widely acknowledged, the influence of Chinese theory is far less clear. Though there is some Mongolian engagement with Chinese theories, like the translation of medical texts, evidence for the deeper adoption of key concepts, such as *qi* and the meridian system, remains limited. This begs the question whether Mongolian physicians conciously favoured Tibetan frameworks over their Chinese counterparts, and whether the integration of Chinese knowledge was done slowly through local integrational practices. Addressing these questions allows us to move beyond simplistic categorisations to better appreciate the complex trans-regional processes that contributed to the formation of Mongolian medicine.

The Qing dynasty (1644-1911) created extensive opportunities for cultural and intellectual exchange across its vast territories, fostering sustained connections between Mongolian and Chinese communities. In particular, Mongolian scholars that travelled to Chinese cities could

interact with Chinese medical knowledge; hence, driving the transmission of information between foreign districts into an elevated combined force.

The incorporation of Chinese medical knowledge into Mongolian medicine during the eighteenth and nineteenth centuries illustrates nuanced interactions between distinct medical systems. This selective engagement is seen through prominent Mongolian scholars, including Sumpa Khenpo Ye shes dpal ’byor (1704-1788), Chakhar Géshé Lobsang Tsültim (1740-1810), Mindol Qutuɣtu Jambalchoijidanzanperenlei (1789-1839), and Ishdanzanwanjil (1853-1906), though many still remained deep rooted in Tibetan medical theory.

Sumpa Khenpo visited Beijing (in 1737, 1742, and 1755), Gansu (in 1747), Ganzhou and Suzhou (in 1760 and 1762), and Mount Wutai (in 1750, 1767, and 1775) (Kim 2018: 268-270). Undoubtedly, these journeys directly exposed him to Chinese communities and medical experts, allowing him to observe their medical practices firsthand. Similarly, Chakhar Géshé studied at the East Yellow Temple in Beijing between 1762 and 1768 (Ochi 1996: 22-23), exemplifying his sustained engagement with Chinese scholarly and medical teachings. Furthermore, Mindol Qutuɣtu resided at the East Yellow Temple from 1815 until his death (Yongdan 2016: 582), during which time he focused on Buddhist activities while extensively studying and reading Chinese medical literature.

These physical journeys highlight the proactive role of Mongolian practitioners in acquiring, evaluating, and integrating Chinese medical knowledge. By positioning themselves within Chinese communities, they were able to adapt techniques to the context of Mongolian communities and their widely predisposed Tibetan medical frameworks. These examples determine the importance of travelling, observation, and personal engagement in the cross-cultural development of Mongolian medicine during the Qing period. The following analysis explores both the presence and the principal areas of influence of Chinese medical elements in the works of these scholars.

3. Traces of Chinese Medicine in Mongolian Scholarship

Mongolian medical scholarship in the eighteenth and nineteenth centuries demonstrate a substantial engagement with Chinese medical knowledge, particularly in the management of infectious diseases, injuries, and several miscellaneous conditions. Prominent texts, such as *The White Dew of Medicinal Elixir* (Mong. *Rašiyan-y Čaɣaɣan Sigüderi*) by Sumpa Khenpo Ye shes dpal ’byor (1704-1788), *The Method to Prepare Oil-Based Basam Medicine and Five Elixir Medicinal Baths* (Mong. *Basam-yn Toson Em bolon Tavan Rašiyan-y Devteeleg Tergüüteng Nairuulakh Yos*) by Chakhar Géshé Lobsang Tsültim (1740-1810), *The Treasury of All Precious Instruction* (Mong. *Ubidas-yn Dalai*) by Mindol Qutuɣtu Jambalchoijidanzanperenlei (1789-1839), and *The Coral Ornament* (Mong. *Šuren Chimeg*) by Ishdanzanwanjil (1853-1906), collectively reveal the adaptation of Chinese practices within Mongolian medical traditions (Table 1).

In *The White Dew of Medicinal Elixir*, Ye shes dpal ’byor frequently cites Chinese treatments for twenty-one disorders, including smallpox and cataracts, and devotes an entire chapter to remedies addressing injuries, tumours, and syphilis. Chinese methods were most commonly applied to infectious diseases (42.8% of cases), followed by injuries (23.8%) and a diverse set of other conditions such as eye diseases, tumours, pruritus, and memory-related issues (33.3%). This distribution highlights the suitability of Chinese therapies in in the Mongolian context for a wide range of conditions.

Lobsang Tsültim's work further illustrates the practical application of Chinese knowledge. His preserved treatise on smallpox inoculation, included in Volume VI of his complete works (1802), highlights his hands-on engagement with infection management. Furthermore, his records of malaria indicate attention to diseases beyond the predictable scope of Mongolian health. Roughly half of his documented cases relate to infectious diseases, with the remainder addresses non-infectious conditions, including dermatological issues such as facial eruptions, scabs, and mole/freckle removal (Lobsang Tsültim 1802: 1-8).

Mindol Qutuɣtu's *Treasury of All Precious Instruction* documents Chinese interventions for seventeen disorders, ranging from eye and dental conditions to ointments for scabies and procedures for broken bones. Nearly half of the recorded cases (47%) correspond to modern definitions of infections, highlighting the enduring focus on contagion control. Treatments for injuries accounted for 24%, while the remaining cases encompassed a variety of acute and chronic conditions, illustrating the flexibility of Chinese methods in both clinical and preventive contexts.

Ishdanzanwanjil's *The Coral Ornament* marks a later period of medical integration, cataloguing sixteen diseases with an overwhelming emphasis on infections (87.5%), alongside references to exotic substances such as Sichuan peppercorn, Coptis chinensis, honey-suckle, and even unconventional materials like copper and aluminium rust. This text's pragmatic and syncretic approach, by combining traditional Chinese remedies with local and foreign materials, pushed the boundaries of Mongolian knowledge into new therapeutic and empirical domains.

Together, these texts reveal a pattern of careful engagement with Chinese medicine, particularly with the treatments of infectious diseases, while modifying them to align with the existing medical practices and environmental landscape of Mongolia.

Table 1. A summary of the four Mongolian texts, the number of disorders treated with Chinese medical methods, and the distribution of focus across categories.

Scholar / Text	Total information	Infectious Diseases (%)	Injuries (%)	Miscellaneous Conditions (%)	Notable Highlights
Sumpa Khenpo Ye shes dpal 'byor (1704-1788), *The White Dew of Medicinal Elixir*	21	42.8	23.8	33.3	Smallpox (Ye shes dpal 'byor 1994: 299-302), cataracts (ibid., 319), a chapter on Chinese remedies (ibid., 396-99).
Chakhar Géshé Lobsang Tsültim (1740-1810), *Oil-Based Basam Medicine & Five Elixir Baths*	6	50	0	50	Smallpox inoculation; malaria and syphilis; dermatological treatments (Lobsang Tsültim 1802:1-8).
Mindol Qutuɣtu (1789-1839), *The Treasury of All Precious Instruction*	17	47	24	29	Cataract (Jambalchoijidanzanperenlei 2007: 278), dental (ibid., 341), scabies (ibid., 469), and broken bone treatments (ibid., 512).

Scholar / Text	Total information	Infectious Diseases (%)	Injuries (%)	Miscellaneous Conditions (%)	Notable Highlights
Ishdanzanwanjil (1853-1906), *The Coral Ornament*	16	87.5	6.25	6.25	Chinese medicinal materials throughout the book (such as jellyfish, Hăi kuí, 海蝰) Ishdanzanwanjil 2023: 69); malaria (ibid., 19), jaundice (ibid., 43), smallpox (ibid., 38-9), syphilis (ibid., 48; 69), leprosy (ibid., 69), and sunstroke (ibid., 37; 41; 57).
Overall	60	56.66	16.66	26.66	

3. Discussion

3.1. The thematic analysis of the literature content

The findings from the analysis reveal that infectious diseases were a major focus in the works of the four Mongolian authors analysed (Tab. 1). This significant attention is consistent across all four authors, though the percentages do vary. Notably, the high content devotion of 87.5% in Ishdanzanwanjil's *The Coral Ornament* to 'infection' highlights the prominent position infectious diseases held in his medical works. This is followed by Chakhar Géshé's work, whom also devotes a substantial portion (50%) to 'infection', and Mindol Qutuγtu's writing with 47.05%. Even Sumpa Khenpo's work, despite holding a relatively smaller percentage (42.8%), demonstrates that the treatment of infections was a central concern in Mongolian medicine during this period.

By analysing this heightened focus on infectious diseases, it is credible to infer that this was a major health threat to the Mongolian population during the period these texts were written. The rich literature on infection could be a secondary consequence of the public health challenges posed by infectious diseases, particularly by smallpox and syphilis. This interpretation is further supported given that infectious diseases accounted for over half (56.66%) of the 60 cases prescribed for treatment using Chinese medicine in our analysis. Hence, aligning with the contextual ambiguity and urgency of medical treatments for infectious diseases, such as smallpox.

In contrast to the principle focus on infectious diseases, the theme of 'injury' appears less frequently in Mongolian medical texts. This lower representation does not necessarily indicate a lesser prevalence of injuries but rather reflects the different ways Mongolian healers approached these conditions. Given the nomadic culture of the Mongols, characterised by horseback riding, herding, and frequent physical labour, injuries were likely common. Therefore, Mongolian medicine had long-established traditional remedies for wounds, which may have resulted in its lower medical documentation as it was considered known knowledge - whereas infection was far less predicable but threatening when present.

Despite this, several Mongolian texts do cite Chinese approaches to injury treatments; indicating Mongolian scholars' receptiveness towards Chinese knowledge though already possessing well developed traditional practices for this. Hence, further demonstrating

the adaptable and intercultural nature of Mongolian medicine. Within the literature, the distribution of injury-related cases varies, with Sumpa Khenpo's work containing the highest percentage (33.3%), while Chakhar Géshé's work includes no information on injuries at all (Tab. 1). Therefore, though generally 'injury' is still a major topic of focus in the analysed texts (Tab. 1), its comparatively lower proportion to 'infection' highlights the keen focus scholar's had on communicable diseases during this time.

'Miscellaneous conditions' encompassed a wide variety of diseases, including cataracts, pruritus, tumours, tropical jaundice and memory related disorders. Yet, though this category contained a range of diseases, it only accounted for 26.66% of the literature on average (Tab. 1). Undoubtably, these conditions were still concerns of Mongolian public health, however they were likely less hazardous to the population in comparison to infectious diseases. Nonetheless, the breadth of disorders under 'miscellaneous conditions' reflects diverse knowledge known in Mongolian medicine.

Interestingly, the narrow focus on 'infection' and 'injury', in conjunction to shallower studies on the broader ailments, grouped as'micellaneous conditions', indicates Mongolian scholars' specialisation in these fields, over a more generalised approach to other conditions.

The findings of this study assert the historical significance of infectious diseases in Mongolian medical practice and emphasise the essential role of Chinese medicine in addressing these challenges. The extensive focus on smallpox treatment in these works suggests that it was a primary concern for Mongolian medical practitioners of the time. Detailed discussions and dedicated chapters on smallpox not only indicates its high prevalence but also underscores the urgency of developing effective treatment and prevention strategies.

This emphasis reflects broader public health challenges in Mongolian society, which discussed by Norov, 2019a, where smallpox posed a severe threat, demanding both medical innovation and the integration of external knowledge, particularly from Chinese medicine. Given the significant impact of smallpox, Mongolian medical scholars actively sought methods to combat its spread, showing the adaptability of Mongolian medical traditions in times of crisis.

Beyond addressing immediate public health concerns, our study also situates these medical efforts within a broader historical and cultural framework. It demonstrates how Chinese medical knowledge, particularly in the treatment of infectious diseases, influenced the practices of Mongolian medical practitioners. The gradual accumulation of medical insights into infections, especially smallpox, not only advanced treatment methods but may have also contributed to the development of preventative measures, such as inoculation.

The works of the four authors examined in our research reveal that smallpox inoculation and treatment make up a substantial portion of the broader "infection" theme. This raises a critical question: why did Mongolian medical practitioners of the time place such a strong emphasis on managing smallpox? By exploring the historical incidence and devastating effects of infectious diseases, particularly smallpox, we can assert its profound impact in shaping the medical priorities of Mongolian Practitioners the urgency of smallpox as a crisis to address, signifies its role in the evolution of Mongolian medicine and as a catalyst for engagements with Chinese medical knowledge.

3.2. Mongolian medicine's fight against smallpox

Within Mongolian medical literature, smallpox continually emerges as a critical and devastating disease to Mongolian society. The smallpox virus comprises two distinct variants:

Variola major and *Variola minor*. Infections by *Variola major* is characterised by a severe clinical course and a high case fatality rate estimated at approximately 30%. By contrast, *Variola minor* is typically a comparatively mild form of the disease, with mortality rates ranging from 1-2% (Loveless 2009: 166-70.). As one of the deadliest diseases in history, its widespread outbreaks prompted Mongolian scholars to focus extensively on its classification, symptoms, treatment, and prevention. Cross-boarder knowledge, particularly from China, played a crucial role in developing Mongolia's barricade against the disease, for example through the adoption of inoculation techniques.

As documented by Norov (2019a: 229), the extensive impact of smallpox on Mongolian society during the Qing era (1644-1911) not only lethally effected the population, but also caused profound social and economic turbulence to communities. These recurring outbreaks prompted Mongolian medical scholars to seek effective methods for controlling smallpox, leading them to implement practices from neighbouring medical traditions. One debated characterisation of Mongolian smallpox treatment was the adaptation of inoculation techniques from China. Somescholars argue that Mongols did not learn smallpox inoculation from China (Perdue 2005: 47). However, numerous Mongolian medical texts describe procedures closely resembling Chinese techniques. This confusion could be explained by each discussed author's inoculation technique, derived from Chinese practices, that developed its own distinctive features through their own careful assimilation of specific attributes

A notable figure in Mongolian medicine during the smallpox outbreaks was Sumpa Khenpo Ye shes dpal 'byor (1704-1788). His autobiography recounts an outbreak in 1760, the Year of the Iron Dragon, near Blue Lake where a smallpox epidemic spread rapidly among herders near Gonglun Monastery. Recognising the urgent need for intervention, Ye shes dpal 'byor successfully inoculated over 3,000 individuals. Ye shes dpal 'byor's use of inoculation not only halted the epidemic, but also earned him widespread recognition within the community through his life saving work (Ye shes dpal 'byor 2011: 93).

In addition, medical treatments of smallpox reported the utilisation of smallpox scabs, goat's blood, and mercury (Ye shes dpal 'byor 2007: 291). According to Norov (2021), smallpox scabs produced by *Virola minor* would have contained a high concentration of the pathogenic antigen. Therefore, the oral administration of this likely manifested a mild form of smallpox, meaning the individual could develop immunity against the disease. Furthermore, the use of goat's blood could be explained by the possibility that alternative smallpox varients similarly infected Mongolian goat herds. Thus, a surviving goat's blood would contain the antibodies required to defeat the disease again – this may have had an enhanced effect in conjunction to the application of smallpox scabs.

Another key figure in the history of smallpox inoculation in Mongolia was Chakhar Géshé Lobsang Tsültim (1740-1810). Having survived an outbreak at the age of 14, which claimed the lives of his uncle and four younger brothers (Lobsang-Samrübnima 2008: 116), the traumatic loss of his family likely intensified his determination to find a solution, which led him to incorporate and modify Chinese techniques to better serve Mongolian communities. This shows the influence of his lived experience in understanding the need to learn and draw from knowledge beyond Mongolian borders. According to Lobsang-Samrübnima (2008: 68-69), Chakhar Géshé Lobsang Tsültim created the medicine for smallpox inoculation in 1785 and saved countless lives.

Chakhar Géshé Lobsang Tsültim's work on smallpox was translated into English by Norov (2019b: 33-37). According to this version, his method incorporates smallpox scabs, gallbladder stones, and a special compound known as the "Six Good Medicines", which includes *Bambusa arundinacea*, saffron, nutmeg, clove, green cardamom, and black cardamom.

In addition, Chakhar Géshé Lobsang Tsültim also stressed the necessity of conducting meditation rituals before administering the treatment and of maintaining careful control over the patient's surroundings afterward. For instance, unethical speech and unpleasant odours, such as those from alcohol or smoke, were strictly avoided. Loud noises from livestock, visits from outsiders, the exchange of items like clothing or bedding, and the shaking or dusting of garments, especially on windy days, were similarly prohibited. Additional restrictions included barring visitors from the Han Chinese community, refraining from negative speech, avoiding references to grains such as rice, and prohibiting the consumption of camel meat. Activities that produced noise, including religious ceremonies or musical performances, were discouraged, with the patient confined to the inoculation space and accompanied only by soft religious chanting nearby. Meticulous cleaning and dusting were required, while mantras, particularly those invoking Dolma, Loma Gyonma, and Palden Lhamo, were to be recited continuously. These practices highlight the close integration of medical procedures with ritual and spiritual traditions.

This passage illustrates that inoculation in Mongolia was not simply a technical procedure imported from Chinese medicine but one deeply embedded in local customs and ritual practices. The restrictions reflect long-standing Mongolian taboos observed during important life events, while the emphasis on purity, controlled behavior, and protective chanting demonstrates the integration of medical practice with Buddhist ritual. The result is a localised form of inoculation that synthesises therapeutic technique, cultural norms, and spiritual safeguards, which is characteristic of how foreign medical knowledge was adapted within the Mongolian medical tradition. Chakhar Géshé Lobsang Tsültim exemplified a sophisticated integration of Chinese healing traditions by interpreting them through the Tibetan-Mongolian medical approach, which were "deeply connected to Buddhist meditational and devotional practices as well as to the Mongolian nomadic lifestyle" (Norov et al. 2019b: 33-5). In addition, Chakhar Géshé Lobsang Tsültim's work not only documented symptoms and treatment methods but also emphasised appropriate hygiene standards to prevent the transmission of infections, an important advancement in Mongolian public health.

Mindol Qutuɣtu (2007: 211) further stressed the severity of smallpox by referring to it as *"the king of all diseases"*. This evocative phrase encapsulated the catastrophic toll smallpox had on Mongolian society, underlining the urgency of developing effective treatments and preventive measures. Recognising the immense societal impact of smallpox, Mindol Qutuɣtu and his contemporaries prioritised the advancement of inoculation as a key strategy for disease control.

When discussing inoculation, Mindol Qutuɣtu highlighted the importance of selecting a propitious day and performing merit-generating rituals, reflecting the intersection between medical practices and Buddhist rituals. Strongly scented substances such as garlic and onion, as well as protective guards (dharma protectors) and sacred objects, were to be avoided; through a modern perspective, this was likely done to prevent the inactivation of the pathogens used during the inoculation, so that immunity could be formed. Smallpox scabs were combined with medicinal materials, including *Bambusa arundinacea* and rhubarb, and the mixture was carefully ground into a fine, dense powder (Jambalchoijidanzanperenlei 2007: 211-12).

This great attention to ritual, timing, and purity demonstrates that inoculation was well ingrained into the medical, cultural and religious sphere. The selection of auspicious days and the performance of merit-generating rituals aligned the medical act with Buddhist principles, while protective amulets and sacred objects were believed to interfere with the procedure because of their protective action against contamination. In this way, the preparation and

administration of smallpox inoculation became both a therapeutic and spiritual act, illustrating the syncretic adaptation of foreign medical knowledge into the Mongolian Buddhist context.

The earliest recorded account of smallpox inoculation preparation appears in 1549, documented by the Ming dynasty physician Wan Quan (1499 -1582) in *The Essential Knowledge and Secrets of Smallpox* (*Douzhen Xinfa*, 痘疹心法) (Needham, 1999:143). Chinese medical texts from the eighteenth century, such as *The Golden Mirror of the Orthodox Lineage of Medicine* (*Yuzuan Yizong Jinjian*, 御纂醫宗金鑑), compiled under the supervision of Wu Qian in 1742, describe three primary methods of inoculation: wearing clothing contaminated by smallpox, applying infectious matter to the skin, and inhaling powdered smallpox scabs.

These methods reflect a sophisticated understanding of disease transmission and immune response. As smallpox inoculation spread globally, different regions developed unique techniques. Near the Russian city of Kazan, dried and crushed smallpox scabs were inhaled nasally (Grant 2019), whereas in England, powdered scabs were applied to skin incisions (Dudgeon 1963: 1367-72). Other historical accounts mention alternative methods such as drinking smallpox scabs mixed with honey or dissolving powdered scabs in water stored in wooden containers (Hubert 1896: 533). Mongolian medical texts often describe combining scabs with medicinal substances and then inoculating an individual through their respiratory system.

The works of Sumpa Khenpo, Chakhar Géshé, and Mindol Qutuɣtu illustrate how Mongolian medicine evolved in response to smallpox outbreaks. Their collective experiences with smallpox, both as scholars and practitioners, informed the development of unique inoculation formulations. While they all used smallpox scabs, each scholar applied them through distinctly personal methods, reflecting each of their individual medical expertise and strong understanding of the disease. This dynamic interplay of Chinese, Mongolian, and Buddhist medical knowledge not only enriched Mongolian medicine but also reinforced its adaptability in addressing pressing public health challenges.

The adoption of Chinese inoculation techniques in Mongolian medicine highlights the pragmatic and open approach Mongolian practitioners took to protect public health. Therefore, the integration of these practices underline a careful adaptive process used by scholars to amalgate knowledge best-suited to support their communities and local traditions. This was done through the adjustment of techniques by adding different medicinal plants and substances and by incorporating Buddhist rituals, such as mediation.

On that account, Mongolian scholars like Sumpa Khenpo, Chakhar Géshé, and Mindol Qutuɣtu evidences the importance of exchanging medical knowledge through a cross-cultural manner. Their contributions to smallpox prevention not only saved lives but also paved the way for a more systematic approach to infectious disease management in Mongolian medicine. By adopting and adapting Chinese medical practices, Mongolian practitioners developed a combined medical system, that strengthened their resilience against infectious diseases.

3.3. The role of Chinese medical theory in Mongolian medicine

Mongolian doctors not only documented inoculation methods in their own works but also translated Chinese medical texts, demonstrating both a commitment to public health and an receptive attitude to cross-cultural intellect exchange. A notable example is the 1814 translation of *The Fine Words of Smallpox* by Beile (a rank in the Qing Dynasty's nobility system) Gonchigbalsan, governor of Tumed Left Banner. Originally written by Yuan Ju in

1753, this text offered practical insights into smallpox treatment (Chen Rong 2007: 1148). Gonchigbalsan's preface emphasises his humanitarian motivation: smallpox treatment was limited in Mongolia, and he sought to reduce the suffering of children by making this information accessible in the Mongolian language (Gonchigbalsan's translation, Yuan Ju 1814: preface).

This translation demonstrates several themes: the proactive role of Mongolian leaders in public health, the significance of cross-border knowledge exchange, and the severity of smallpox as a public health threat. However, despite the early translation and circulation of Chinese medical texts, Mongolian medical scholars did not immeadiately accept Chinese medical theory. While certain practices, such as inoculation, were acknowledged, Mongolian physicians largely refrained from quickly assuming Chinese etiological explanations or theoretical treatments. This selective engagement reflects a nuanced approach, balancing foreign knowledge with established local and Tibetan medical traditions.

In Chinese medicine, the aetiology of smallpox was believed to be a combination of external and internal causes. On the one hand, it was understood as the effect of epidemic seasonal *qi*, a pernicious force that arose during particular seasons causing epidemics (Volkmar 2004: 78). On the other hand, many texts pointed to embryonic poisons (胎毒), a congenital impurity inherited during gestation. For example, the *Golden Mirror of the Orthodox Lineage of Medicine* (*Yuzuan Yizong Jinjian*, 1742) attributed the rarity of smallpox north of the Great Wall to climatic conditions: "Smallpox does not occur north of the Wall, for there the cold *qi* exceeds the pernicious *qi* that accumulates south of the Wall" (Wu Qian 1742: 1433). By contrast, the *Fine Words on Smallpox* (1814) stressed internal causation, stating: *"Smallpox is an embryonic poison which emerges from the parents' sexual desire"* (trans. Gonchigbalsan; Yuan Ju 1814: 1). These models incorporated cosmological theory with moral and physiological reasoning, situating smallpox within a broader system of seasonal and congenital imbalances.

Mongolian medical scholars, however, articulated alternative causational explanations that diverged significantly from those by Chinese scholars. Ye shes dpal 'byor (1994: 299) described smallpox as a "hot disease descending into the lymph fluid (tib. chu gser)", indicating a disturbance within bodily fluids rather than cosmological qi. Lobsang Chos 'phel (1999: 106), another Mongolian scholar of the time, instead related its origin to that of common infectious diseases, thereby normalising smallpox within a general category of epidemic conditions. Mindol Qutuɣtu refrained from offering a specific aetiology, instead distinguishing smallpox by its disease types and clinical manifestations. Hence, with comparison to Chinese causational explanations, these aetiological reasons may be an indication of Mongolia's progressive approach to medicine, as they favoured physiological observation over cosmological causes.

The concept of "chu-ser" ("yellow liquid"), in Tibetan medicine, refers to the body's lymph fluid (Bauer-Wu, et al., 2014: 502-12) which was pertinent in Mongolian scholar's understanding of smallpox. Within the Tibetan and Mongolian medical systems, infectious diseases were further categorised into three main classes: *rims nad* (infectious diseases), *dug nad* (poison-related illnesses), and *gnyan nad* (spirit-related disorders). Smallpox was classified under *rims nad*, alongside conditions such as diarrhea, diphtheria, anthrax, and influenza (Norov, 2019a).

This comparison highlights a broader epistemological divide between Chinese and Tibetan / Mongolian approaches. Chinese medical texts provided elaborate aetiological models

grounded in *qi* theory and congenital toxicity, linking smallpox to cosmic, seasonal, and moral frameworks. Mongolian and Tibetan physicians, by contrast, adopted pragmatic, locally adapted classifications rooted in bodily fluids, contagion-like phenomena, and environmental context. Crucially, there is no evidence that Mongolian practitioners applied Chinese medical theory to the causation of smallpox, demonstrating their consistent adherence to Tibetan medical concepts and localised reasoning.

Wallace (2012: 25-46) notes that Mongols were familiar with Chinese medical texts on diverse subjects, including *The Great Compendium of Acupuncture and Moxibustion* (*Zhen jiu da cheng*, 1601), translated around 1660 by a disciple of Zaya Pandita Namhaijamts (1599–1662). By the seventeenth century, Mongolian physicians were acquainted with key texts such as the *Yellow Emperor's Inner Canon* (*Huangdi Neijing*) and Hua Shuo's *Elucidation of the Fourteen Channels* (*Shi si jing fa hui*, 1341). Nevertheless, there is no evidence that Mongolian doctors adopted Chinese acupuncture techniques or theory in their writings.

Overall, the adoption of Chinese medical theories and practices in Mongolia was selective. Mongolian physicians translated and studied Chinese texts, but core concepts such as meridians, blood, and *qi* do not appear to have influenced Mongolian medical principles directly. Instead, Mongolian practitioners mainly adhered to their familiar Tibetan theoretical framework, incorporating only practical elements that addressed local needs. The case of smallpox treatment demonstrates this selective integration, where practical measures like inoculation were adopted, but theoretical Chinese concepts were largely disregarded. This process highlights both the adaptability of Mongolian medical traditions and the broader dynamics of cross-cultural scientific exchange in early modern Asia.

4. Conclusion

This research aimed to bring to light the intellectual interchange between Chinese and Mongolian medical traditions that played a profound role in shaping medical knowledge. The influence of Chinese medicine on Mongolian medical traditions was not a passive process but instead a dynamic progression where practitioners selectively incorporated Chinese medical principles, contextualising them to the Mongol environment. A key example of this is the influence of Chinese smallpox inoculation techniques, in which Mongolian scholar's refined and enhanced to better suit their society's needs. The emphasis on infectious disease treatment, particularly smallpox, reflects the urgency of public health challenges faced by Mongolian medical scholars in the 18th and 19th centuries. Hence, their adaptation of Chinese inoculation methods, evidence their ability to successfully aqquire and learn from international sources.

Beyond medical techniques, the translation of Chinese medical texts, such as *The Fine Words of Smallpox*, played a vital role in the dissemination of medical knowledge. These efforts illustrate the proactive attitude of Mongolian scholars in shaping their own medical structures by synthesising external knowledge with indigenous healing traditions. The blending of Chinese, Tibetan, and Mongolian medical models resulted in a unique, eclectic approach that satisfied both cultural and scientific requirements.

Overall, this study reaffirms the significance of cultural exchange in medical history. The Mongolian case exemplifies how medical strategies progress through continuous contact with external influences. Understanding these historical interactions not only deepens our appreciation of traditional medical systems but also highlights the enduring value of collaborating cross-cultural knowledge in addressing health challenges, both in the past and present world.

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None

References

Bauer-Wu, S., et al. 2014. Tibetan Medicine for Cancer: An Overview and Review of Case Studies. *Integrative Cancer Therapies*. 13(6):502-512. doi:10.1177/1534735414549624

Dudgeon, J.A. 1963. Development of Smallpox Vaccine in England in the Eighteenth and Nineteenth Centuries. *British Medical Journal* 1: 1367-72.

Grant, Alicia. 2019. *Globalisation of Variolation: The Overlooked Origins of Immunity for Smallpox in the 18th Century*. Singapore: Stallion Press.

Hubert V.O., 1896. *Ospa i ospoprivivanīe* [Smallpox and vaccination]. St. Petersburg: Tip.P.P. Soikino.

Ishdanzanwanjil. (1904) 2023. *The Essence of Elexir* (Ishdanzanvanjil's The Coral Ornament: Mongolian-Tibetan Old Manuscripts). Beijing: National Press Committee.

Jambalchoijidanzanperenlei. (around 1830) 2007. *Man ngag rin chen 'byung gnas* [The Treasury of All Precious Instruction]. pe cin: mi rigs dpe skrun khang.

Janes, C., Hilliard, C. 2008. Inventing tradition: Tibetan medicine in the postsocialist contexts of China and Mongolia, in L. Pordie (ed.), *Tibetan Medicine in the Contemporary World: Global politics of medical knowledge and practice:* 35–61. Abingdon*:* Routledge.

Jigmed, B. 2009. *Mongol anagaakh ukhaany tüükh bolon ertnii survalj bichgiin shinjilgee* [The History of Mongolian Medicine and Analysis of Ancient Sources]. Ulaanbaatar, Mongolia: Soyombo Printing.

Kim, H. (2018). *Renaissance Man from Amdo: The Life and Scholarship of the Eighteenth-Century Amdo Scholar Sum pa Mkhan po Ye shes dpal'byor (1704-1788)*. Harvard University.

Kloos, S. 2022. The emergence of the traditional Mongolian medicine industry: communism, continuity, and reassemblage, in Kloos & Blaikie (eds) *Asian Medical Industries: Contemporary Perspectives on Traditional Pharmaceuticals:* 280-304. New York: Routledge.

Long B, Aodungerile, Bai L. 2022. Discussion on evolution of Mongolian medicinal material names and countermeasures for standardization. *Chin Herb Med*. 14(3):362-66.

Lobsang-Samrübnima. (1817) 2008. *Getülgegči degedü blam-a adiltğal ügei ačitu Bogda Sumadi Šila Širi Badr-a-yin gegein-ü eirünghei-yin ǰokhiol namtar-i tobči-yin tedüi egülegsen süsüg-ün linqu-a-yi müsiyelgegči naran-u gerel degedü mör-i geyigülün üildügči khemegdekhü orošiba* [The Biography of Lobsang Tsültim]. Translated from Tibetan by Jurmeddanzan. Khokhot: People's Press Bureau of Inner Mongolia.

Lobsang-Tsültim. 1802. *'Ba' sam sman mar dang 'dud rtsi lnga lum sogs bya tshul bzhugs so* [The Method to Prepare Oil-Based Basam Medicine and Five Elixir Medicinal Baths]. Wood block Print, Folios. Chakhar: Tsagaan Uulyn Süm, pp. 1-8.

Lobsang chos 'phel. (19th century) 1999. *gces bsdus snying nor*. Khokhot: People's Press Bureau of Inner Mongolia.

Needham J. 1999. *"Part 6, Medicine". Science and Civilization in China: Volume 6, Biology and Biological Technology.* Cambridge: Cambridge University Press. p. 143.

Loveless, Mucker, Hartman, Craw, Huddins, and Kulesh. 2009. Differentiation of Variola major and Variola minor variants by MGB-Eclipse probe melt curves and genotyping analysis. *Mol Cell Probes* 23(3-4):166-170.

Norov, B. 2019a. Mongolian Buddhist Scholars' Works on Infectious Diseases (Late 17th Century to the Beginning of the 20th Century). *Religions 10*(4): 229. doi:https://doi.org/10.3390/rel10040229

Norov, Batsaikhan, Wallace, Vesna A. and Usukhbayar, Batchimeg. 2019b. An Eighteenth-Century Mongolian Treatise on Smallpox Inoculation: Lobsang Tsültim's "The Practice of Preparing Medicine for the Planting of Heaven's White Flower" (1785)". *Buddhism and Medicine: An Anthology of Modern and Contemporary Sources*, edited by C. Pierce Salguero, New York Chichester, West Sussex: Columbia University Press.

Norov, Batsaikhan. 2021. *Mongol Ulamjlalt Anagaakh Ukhaan: Zarim Ekh Survaljiin Nyagtlan Shinjlel* [Mongolian Traditional Medicine: Analysis of Some Sources]. Ulaanbaatar, Mongolia: Nom Khur Press. 315

Ochi. 1996. *Chahar Géshé Lobsang Tsültim*. Khailaar: Inner Mongolia National Printing.

Perdue, Peter. 2005. *China Marches West: The Qing Conquest of Central Eurasia*. Cambridge: Harvard University Press.

Volkmar, B. 2004. On Sense and Non-Sense of Premodern Medical Theories: The Example of Theories on Smallpox. 古今論衡, (1), 73-94.

Wallace, Vesna A. 2012. "The method-and-wisdom model of the medical body in traditional Mongolian medicine." *Arc: The Journal of the School of Religious Studies* 40: 25-46.

Wang Bin and Zhu Meixiang. 2007. The influence of Traditional Chinese medicine theory on Tibetan medicine and Mongolian medicine theory. *Chinese journal of Basic Medicine in Traditional Chinese Medicine*. 13 (10): 743-45.

Wu Qian. 1742. *Yuzuan yizong jinjian* [The Golden Mirror]. j.56, 1433.

Ye shes dpal 'byor. 2011. *Sümbe Ishbaljiryn ööriin namtar orshvoi* [Sumbe Ishbaljir's Autobiography]. Elaanbaatar: Soyombo Printing.

Ye shes dpal 'byor. (1752) 1998. *The White Dew of Medicinal Elixir* in *Durben Rašiyan* [The Four Elexirs]. Khuh hot, China: People's Press Bureau of Inner Mongolia.

Ye shes dpal 'byor. 1994. *gso rig gsung rtsom phyogs bsgrigs* [*Collection of Medical Writings*]. Lha sa: People's Publishing House.

Yuan Ju. (1753) 2018. *Tián zhèng jīng yán* (The Fine Words of Smallpox) translated by Beile Gonchigbalsan in 1814. Liaoning: Liaoning People's Publishing House.

Yu E, Amri H. 2016. China's Other Medical Systems: Recognizing Uyghur, Tibetan, and Mongolian Traditional Medicines. *Global Advances in Health and Medicine* 5(1):79-86.