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ARTICLE

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Climate, diseases and medicine: the welfare of soldiers during the East Asian War of 1592–1598

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Abstract

This article examines the care provided for the welfare of soldiers by the three combatant countries – China, Korea and Japan – during the East Asian War of 1592–8. Also known as the Imjin War, this large-scale military conflict can also be understood as an encounter between different state cultures and strategies of military medicine. This study focuses on cold-induced injuries, epidemic outbreaks and external wounds suffered during the war. I illuminate provision of prophylactic measures against cold by the Ming state, as well as attempts by the Sino-Chosŏn medical alliance to manage epidemics and treat wounded soldiers. I contrast these measures with the lack of similar centralised support for the Japanese forces, and examine the effect these differences had upon on military outcomes during the war. The difference in the amount of time, efforts and resources that the three combatant states devoted to sick and injured soldiers has implications not only for our understanding of the war but also for illuminating the early modern history of military medicine in East Asia. By exploring East Asian military medicine during and after the Imjin War, this article responds to recent calls for more detailed examination of histories of military medicine in premodern periods and non-European regions.

Keywords: Imjin War; Military medicine; East Asian War of 1592-1598; Frostbite; Infectious diseases; Wounds

This study investigates the concern for the health of soldiers during one of the largest military conflicts of the sixteenth century, the East Asian War of 1592–1598 (also known as the Imjin War) by utilising war-related documents and medical and military manuals. The ruling Japanese warrior Toyotomi Hideyoshi invaded Korea in 1592, with 120 000 seaborne troops. The Ming central court decided to dispatch armies to Korea to aid them in fighting against the Japanese. The resulting conflict involved over 500 000 combatants from East Asia and up to 100 000 Korean captives were sent to Japan.[1] The Imjin War is not widely known outside East Asian history circles but historians are increasingly turning their attention to this significant conflict for the light it can shed on the world history of warfare, the environment and medicine, among other topics.[2] Rather than attempting to evaluate the effectiveness of wartime medical

[1]James B. Lewis (ed.), *The East Asian War, 1592–1598: International Relations, Violence, and Memory* (London and New York: Routledge, 2015), 6.

[2]E.g. Kenneth M. Swope, *A Dragon's Head and a Serpent's Tail: Ming China and the First Great East Asian War, 1592–1598* (University of Oklahoma Press, 2012); John S. Lee, 'Postwar Pines: The Military and the Expansion of State Forests in Post-Imjin Korea, 1598–1684', *The Journal of Asian Studies*, 77, 2 (2018), 319–32; Baihui Duan and Rebekah Clements, 'Fighting for Forests: Protection and Exploitation of Kŏje Island Timber during the East Asian War of 1592 to 1598', *Environmental History*, 27, 3 (2022), 415–40; Kim Munja, 'Toyot'omi chŏnggwŏn ŭi ŭiryo chŏngch'aek -Imjin chŏnjaeng kwa ŭiryo munje' [Medical Policies of Toyotomi's Regime], *Han Il kwangyesa yŏn'gu*, 72 (2021), 3–42.

practices, instead I use diseases and medicine as a lens through which to assess the extent to which authorities were willing to invest time, effort and resources in the health of their armed forces. Drawing on contemporary perspectives, theories and practices of East Asian medicine during the war and its aftermath, this paper aims to contribute to the global health historiography of the sixteenth and seventeenth centuries.

While historians of military medicine have traditionally focused on modern conflicts, recent scholarship, such as works by Geltner and Pranghofer, has called for more attention to be paid to the history of military medicine in earlier periods and beyond Europe.[3] The aim of this shift is to identify continuities in the development of military medicine from earlier practices to their later manifestations. In this study, I contend that concern for the health and welfare of soldiers may be observed in early modern East Asia, challenging assumed ruptures between modernity and premodernity through the lens of preventative and curative practices in military medicine.[4] By focusing on the three specific medical challenges of exposure to cold, outbreaks of infectious diseases and severe injuries during the Imjin War, this study examines the various efforts made by the combatant countries – China, Korea and Japan – to promote the welfare of their soldiers, including the provision and distribution of prophylactic food, clothing, shelter and medicine; the dispatch of physicians; the medicalisation of military institutes; and the use of acupuncture. These cover a surprisingly diverse range of categories in military medicine even by modern standards.

The diseases and injuries that resulted from the Imjin War illustrate the differences in the approaches to military medicine in the three combatant countries. Japan did not have a strong central state at the time to gather and mobilise medical resources, and thus the disparate Japanese forces, led by powerful warlords (daimyo), relied instead on looting locals and recruiting Buddhist monks as physicians by each daimyo for their own troops. These strategies lacked prophylactic measures against cold, frostbite and epidemics, which ultimately contributed to their defeat in the winter battles. In contrast, the centralised Ming state and generals on the battle front, with the help of Chosŏn Korea as a medical ally, mobilised greater medical resources and took a more systematic approach to preparing for cold-induced injuries and infectious diseases and wounds, consistent with the traditional Chinese medicine contained in military and medical manuals. The Chosŏn government was also able to respond quickly to medical needs by distributing medicine, dispatching royal physicians and mobilising medical rations at a local level. This study will show how such efforts – although not always effective at saving lives – provide insights into the diverse treatments for sick and wounded soldiers during the war. One particular legacy from amongst these measures was the use of acupuncture to treat internally and externally caused diseases during the war, a practice that seems to have had a lasting impact on postwar medical communications in East Asia. These wartime medical practices also led to the reform of the Chosŏn Korean military system, which went on to incorporate physicians, acupuncture practitioners and veterinarians and thus a premodern Asian case to the wider discussion on the role of war in medical development.[5]

One approach to studying the history of military medicine of this period, as suggested by Geltner, is to utilise military manuals as a source. Geltner notably includes several Asian military manuals in his studies, marking a significant step in the recognition of premodern Asian military medicine within

[3]For the future of the early modern medical-military studies, see G. Geltner, 'In the Camp and on the March: Military Manuals as Sources for Studying Premodern Public Health', *Medical History*, 63, (2019), 54–6; Sebastian Pranghofer, 'The Early Modern Medical-Military Complex: The Wider Context of the Relationship between Military, Medicine, and the State', *Canadian Journal of History*, 51, 3 (2016), 469–71.

[4]Welfare in this paper refers to the Chinese and Korean governmental support intended to ensure that soldiers can meet basic human needs such as food and shelter, similar to the concept of relief. However, the government support implies welfare initiatives rather than the establishment of a welfare state.

[5]For more discussion of war and medical innovation, see Roger Cooter, 'Medicine and the Goodness of War', *Canadian Bullet Medical History*, 7 (1990), 147–59; Mark Harrison. *Medicine and Victory British Military Medicine in the Second World War* (Oxford: Oxford University Press, 2004), 279; Leo van Bergen, 'Surgery and War: The Discussions about the Usefulness of War for Medical Progress', in Thomas Schlich (ed.). *The Palgrave Handbook of the History of Surgery* (London: Palgrave Macmillan, 2018).

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Anglophone academia.[6] Partly because of the limited number of primary sources and their coverage, military manuals have been largely ignored in the discussion of medicine in Asian scholarship, which has traditionally focused on common diseases and medical policies in military camps.[7] Building on current calls for more narratives of non-European military medicine before the modern period, this study links prescriptive military medical texts with actual military practices during the Imjin War, thereby shedding light on traditional East Asian military and medical discussions and reassessing their influence on military strategy and the course of the war.

In particular, this article utilises a military medical manual preserved in South Korea, a small book called *Kunjung ŭiyak* (Military Medicine). Based on its style of printing, scholars believe that it was printed during the reign of Kwanghae-gun (1608–1623) by the Directorate for Military Training (*Hullyŏn togam*) and that it reflects recognition of the importance of military medicine in the post-Imjin period.[8] The contents of this manual are the same as the medical section of a Ming military manual, *Dengtan bijiu* (Ascending the altar for necessary investigations), compiled by the Ming general Wang Minghe and printed in 1599.[9] The medical section of this manual concentrates on remedies for infectious diseases, injuries and other medical emergencies and reflects the flourishing of Ming medicine at the same time as underscoring the centrality of medical care in traditional East Asian military strategy.

The beginning of the medical section in *Dengtan bijiu* describes the long tradition of caring for the welfare of soldiers in Chinese military service. Dating back to the late spring and autumn period in China (770–481 BCE) and citing ancient stories that demonstrate this ethos, such as Rangju's distribution of medicine to his troops and Wu Qi's selfless act of sucking the pus and boils of his soldiers to win their loyalty, Wang argues that the duty of generals is to protect them with love and compassion.[10] This military philosophy prompted generals to highlight the provision of medical care within their armies, as the health of soldiers directly impacted their ability to wage war.

Drawing on military and medical manuals, war diaries and official documents from the three states, this article examines the theory and praxis of military medicine in early modern East Asia during one of the largest premodern conflicts to occur in the region. Although military and medical manuals were aimed at different groups of readers, Ming Chinese and Korean physicians, generals and government ministers, regardless of their source reading material, acquired similar military medical knowledge, which they applied on the battlefield. The various points of intersection between military and medical knowledge also reveal the importance of climatic conditions for military victory and diseases, as well as the underlying Confucian benevolence discourse around saving the sick and relieving the suffering of soldiers.[11]

[6]Geltner, *op. cit.* (note 3), 53–6.

[7]For diseases during the Imjin War, see Miki Sakae, *Chōsen igakushi oyobi shippeishi* [History of Chosŏn Korean Medicine and Diseases] (Osaka: Ishiyaku shuppan 1962); Na Sŭnghak, 'Imjin waeran'gi Chosŏn sugun chinyŏng chŏnyŏmbyŏng ŭi palsaeng shilt'aewa yŏnghyang'[A Study of the Occurrence of Infectious Diseases and Their Influence on Joseon's Naval Forces Camp in the Japanese Invasion of Korea in 1592], *Kunsayŏn'gu*, 144 (2017), 57–81; Lo Lee-hsin, 'Fengchen Xiuji qinlüe Chaoxian: Ri, Chao, Ming sanguo junzhong zhi jiyi, qingsou yu tongxun'[Toyotomi Hideyoshi's Invasions of Korea: Diseases, Information and Communications among the Armies of Japan, Korea and the Ming Dynasty], *Guoli zhengzhi daxue lishi xuebao*, 47 (2017), 117–58. For research on the institutionalisation of military medicine, see Kim Munja, *op. cit.* (note 2); Pak Hunp'yŏng, 'Chosŏn hugi chung'ang kunyŏng ŭi kunjin ŭihak chedo yŏn'gu' [A Study of the Military Medical System of the Central Military Camp in the Late Chosŏn Dynasty], *Ŭisahak*, 35 (2022), 1–12. For the use of rare materials in the treatment of wounds, see Bian He, 'Of Wounded Bodies and the Old Manchu Archive: Documenting Personnel Management in the Early Manchu State', *Saksaha: A Journal of Manchu Studies*, 16 (2019), 1–29.

[8]Wang Minghe, *Kukyŏk Kunjung ŭiyak*. Han'guk hanŭihak yŏn'guwŏn. 2014. Names of places, people and books in Korean follow the McCune–Reischauer romanization system, in Japanese the revised Hepburn system and in Chinese Pinyin. Names are given in the East Asian order of surname followed by given name or names, and dates follow the lunar calendar.

[9]Wang Minghe, *Dengtan bijiu* [Ascending the Altar for Necessary Investigations] (Shanghai: Shanghai guji chubanshe, 2002 [1599]), vol. 30, 226.

[10]Wang, *op cit.* (note 8), 5.

[11]No similar military manuals were discovered in seventeenth-century Japan. Lacking the mentioning of relieving soldiers and medical care can be partly explained by the military mentality that deemed dying in warfare a great honour. Zhuge Yuansheng, a Ming historian, commented that, 'The Japanese are not afraid of death and consider dying of disease to be shameful while dying on the battlefield is an hour'. Zhuge Yuansheng, 'Liangchao Pingranglu' [Records of P'yŏngyang in Two Dynasties], in *Renchen zhi yi shiliao huiji* (Quanguo tushuguan wenxian suowei fuzhi zhongxin chuban, 1990), vol. 2, 196.

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The transition from the premodern to the modern period witnessed many changes in the understanding of both bodies and diseases as well as in the corresponding terminology. Because this article attempts to examine military medicine within the context of late sixteenth-century Asian perceptions,[12] it adheres to the usage in historical records of the Korean word *yŏk* (Ch: *yi*; J: *eki*) to refer to epidemics. The fact that *yŏk* refers to different types of infectious disease makes it difficult to judge the specific type of epidemic or disease that appears in a record as most records did not provide information about symptoms, and similar prescriptions were often used to treat a variety of diseases. Traditional Asian medical philosophy emphasised the connection between the environment and health, shaping premodern perceptions of the causes of epidemics and determining appropriate treatments. Within living beings, the internal essence or life force and, throughout the cosmos, the air or the universe, both referred to as *qi* in traditional Chinese medicine, exert influence on health.[13] Each individual possesses their own life force or vital energy of *qi*, which circulates throughout the body in energy channels (*luo*) known as meridians, forming the essence of acupuncture technique. The approach of military medicine during the Imjin War extended beyond medicine and encompassed preparations for food, clothing and shelter, serving as preventative medical measures to improve the circulation of *qi*, differing from curative health care.[14]

Given the chasm that exists between late sixteenth-century medical knowledge and modern epidemiology, rather than prescribing what practices should be included (or excluded) within the scope of military medicine, this study focuses on contemporary medical thought and practice. It also examines the evolution of the term 'surgeon' from its usage in premodern East Asian contexts to that in modern medicine, along with the replacement of Confucian revulsion surrounding operating on 'parent-gifted bodies'.

Cold foreign climes, frostbite and Japanese war planning

The arrival of eight Japanese contingents on the southern coast of the Korean peninsula in the warm spring months of 1592 heralded the outbreak of the Imjin War, which drew to a close in 1598 after a gruelling conflict that wreaked devastation on East Asia and embroiled around half a million combatants.[15] After unifying a large part of the Japanese archipelago under his military and political control, Toyotomi Hideyoshi (1536–1598) launched this invasion ostensibly with the ambition of conquering Korea and eventually Ming China. His forces, commanded by his daimyo, initially met with overwhelming success, occupying Hansŏng, the capital of Chosŏn, and later advancing to the northern borderlands of the Korean peninsula, where they posed a threat to Ming China. Their success, however, was constrained by reinforcements led by the Ming general Li Rusong (1549–1598), who crossed the frozen Yalu River in the first month of 1593 and attacked the Japanese armies from the north. Better prepared and more suitably dressed for the cold Korean climate than the Japanese invaders and also benefitting from the support of the Ming court and its ally Chosŏn on the battlefield, the Ming forces were able to recapture significant cities, including P'yŏngyang, Kaesŏng and Hansŏng.

Differences in climate and weather-related prewar preparation played a decisive role in the military performance of Japanese soldiers in combat. The majority of Hideyoshi's troops originated from Kyushu and Shikoku (32–33° N), which lie in a humid, subtropical zone.[16] However, as they advanced

[12]For a detailed study of Korean medicine and terminology in the late Chosŏn dynasty, see Soyoung Suh, *Naming the Local: Medicine, Language, and Identity in Korea since the Fifteenth Century* (Cambridge, MA: Harvard University Press, 2017).

[13]For more discussion on *Qi*, see alsoDaniel Trambaiolo, 'Translating the Inner Landscape: Anatomical Bricolage in Early Modern Japan', *Osiris*, 37 (2022): 189; Shigehisa Kuriyama, 'Epidemics, Weather, and Contagion in Traditional Chinese Medicine' in Lawrence Conrad and Dominik Wujasty (eds.), *Contagion: Perspectives from Pre-Modern Societies* (Routledge, 2000), 17–18.

[14]Shigehisa, *op. cit.* (note 13), 11–12.

[15]Lewis, *op. cit.* (note 1), 1.

[16]*Ibid.*, 266; Lo, *op. cit.* (note 7), 120.

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northwards on the peninsula, the Japanese forces would have experienced cold northerly winds blowing from north China and southern Siberia, which became one of the greatest challenges for the Japanese forces. Differences in the subtropical climate of Japan and the Siberia-like weather in northern parts of the Korean peninsula determined health concerns accordingly and shaped Japan's approach to medicine and health threats for which they were not prepared sufficiently.

After their arrival in the Korean peninsula in the fourth month of 1592, the Japanese troops faced many difficulties in adapting to the Korean climate and many became sick even before the onset of winter.[17] For example, Hashiba Hidekatsu (1568–1592), a samurai, unable to properly acclimatise, fell ill on Kŏje Island off the coast of the peninsula in the ninth month of 1592.[18] Another general, Kobayakawa Takakage (1533–1597), who had been coughing since the early months of winter, was granted permission by Hideyoshi to return home out of consideration for his advanced years.[19] By the same token, sick daimyo unable to receive adequate medical treatment in Korea were sent back to Japan.[20]

The majority still remained on the peninsula where they experienced disease, exhaustion and a high death rate during the winter of 1592. Winter came early in the ninth month with one diary recording that 'when an extremely cold wind blows, you know that winter is coming'.[21] Snow fell heavily early in the tenth month, covering the valleys and peaks, and the rivers froze over. The snow reached a height of six *shaku* (about 2 metres), while the ice was estimated to be five *shaku* (about 1.7 metres) thick.[22] In one record, the Japanese general Katō Kiyomasa (1562–1611) describes how the cold wind cut through his flesh and bones and how his exhausted soldiers were unable to feel their hands and feet.[23]

Because of their lack of experience and preparation for the cold weather, frostbite became a serious problem for the Japanese forces. Following the capture of the Japanese fortress at Kilchu by Chosŏn forces, carpenters began work on building another fortress, but after a hundred days of exposure to the cold, they became exhausted with suppurating sores on their exposed fingers and toes. Many of the labourers and boatmen froze to death, thus delaying the construction.[24]

Frostbite might have been avoided if the expedition had been equipped with warm clothes and other protective measures, but the war lasted nearly seven years and Japanese leaders – accustomed to quick victories during the domestic campaigns of the previous few decades – had not foreseen such lengthy warfare and difficult conditions. Moreover, the logistics of Japanese domestic warfare relied heavily on the acquisition of provision locally.[25] When winter arrived, the Japanese troops had only the light kit in which they had travelled from Japan in the spring of 1592, as this had been considered preferable for the sea voyage to the Korean peninsula and their long march northwards. According to a Ming eyewitness, 'the soldiers wore no armour; they wore sleeveless calico jackets and short trousers regardless of the season, and moved very quickly.'[26] A Japanese record confirms that it was unusual to see anyone wearing a double-lined coat and that everyone suffered in this respect regardless of their rank.[27] There is no doubt that light clothing enabled troops to move quickly in suitable weather, consistent with the Japanese style of sword fighting in hand-to-hand combat, but such attire proved totally inappropriate for the Korean winter.

[17]Months follow the lunar calendar, as recorded in the primary sources. As the lunar new year falls in February, lunar months are several weeks later than their equivalent in the Gregorian calendar.

[18]Sanbō Honbu, *Nihonsenshi: Chōsenyaku* [History of Japanese War: The Imjin War] (Japan: Kaikōsha, 1924), 92.

[19]Tōkyo Teikoku Daigaku Bungakubu Shiryōhensan Gakari (ed.), *Kobayakawa-ke monjo* [Documents of the Kobayakawa household], vol. 11 in *Dai Nihon komonjo: Ie wake* (Tōkyō: Tōkyō Teikoku Daigaku, 1927), 313.

[20]Kim Munja, *op. cit.* (note 7), 30.

[21]Shimose Yorinao, *Chōsen tokai nikki* [Diary of a Sea Crossing to Chosŏn Korea] (Tōkyō: Bōchōshi tankai, 1934), 1592/9/2.

[22]Kitajima Manji, *Toyotomi Hideyoshi Chōsen shiryaku kenke shiryō shūsei* [Collections of Historical Materials on Toyotomi Hideyoshi's Invasion of Korea], (Japan: Heibonsha, 2017), vol. 3, 885; *Ibid.*, 1592/10/28, 1593/11/2–3, 1593/11/13–6.

[23]Kitajima, *op. cit.* (note 22), vol. 2, 39, 41.

[24]Kitajima, *op. cit.* (note 22), vol. 2, 44; Yoshino Jingozaemon, 'Yoshino Jingozaemon oboegaki' [Letter from Yoshino Jingozaemon], in *Zoku gunsho ruijū* (Tokyo: Zoku Gunsho Ruijū Kanseikai, 1923–28), vol. 20, 386; Lo, *op. cit.* (note 7), 121–2.

[25]Lewis, *op. cit.* (note 1), 95.

[26]Zhuge, *op. cit.* (note 11), 7.

[27]Kagoshima-ken Rekishi Shiryō Sentā Reimeikan, *Satsumahan hōrei shiryōshū* [Collection of Law-Related Documents for the Satsuma Domain] (Kagoshima-ken, 2004), vol. 6, 311.

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It was difficult for the Japanese troops to obtain warm clothes and footwear in Korea by purchase or plunder, as Chosŏn Korea had suffered a poor cotton harvest that year and such items were in short supply. Upon occupying the capital and some nearby towns in the eleventh month of 1592, the Japanese plundered winter clothes from the local populace, which temporarily provided them with protection from cold-induced diseases and injuries.[28] However, local stocks of winter clothing had been depleted by early 1593, leaving the Japanese forces insufficiently prepared for temperatures that continued to plummet. The Japanese set up long braziers in their military huts, and everyone slept on either side with their feet pointing towards them to benefit from the heat.[29] They placed straw over the ice to prevent the horses and troops from slipping, but many soldiers still lost toes to frostbite as they made their way through deep snow in straw sandals that provided no protection from the cold or wet.[30]

Military preparations by the Ming and their subsequent victory

Knowledge of the winter climate, at least on the Korean side of the Yalu River, and previous experience of cold-induced injuries and their prevention and treatment based on contemporary medical development enabled the Ming commanders to better prepare their troops for war. The experienced Ming general Li Rusong and Song Yingchang (1536–1606), the Ming commander in Korea, had lived in Liaodong, the cold northeast region of the Ming empire, and would have understood the severity of conditions such as frostbite. This is evidenced by the fact that most of their soldiers had prepared both straw sandals and shoes in their marching kits to protect their energy channels and enough cooked dry food for five days before entering the battlefield.[31] Knowledge of the conditions that lay ahead meant that the Ming troops wore thick winter clothes when they crossed the Yalu River into Korea on the fourth day of the first month in 1593.

Medical theories flourished in the Ming dynasty and military manuals from this period combine contemporary medical knowledge with experience from the battlefield. *Kunjung ŭiyak* recognises frostbite as a common affliction suffered by soldiers and describes how 'soldiers crossing the water in winter will suffer from biting winds, snow, and frostbite; hands and feet and chilblains on the face will bleed'. Along with several prescriptions for the treatment of frostbite,[32] the manual also describes how frostbite can occur when a soldier is almost frozen to death or falls into freezing cold water, listing it as one of the five main deadly diseases, being more severe than frostbite as it proves fatal. Since these cold-induced injuries were common knowledge in military circles, the Ming generals made careful preparations for their troops before venturing out onto the frozen Yalu River in the first month of 1593.

The Ming emperor also expressed concern for the health of his armies as the first winter approached in 1592. In the eleventh month, concerned that his soldiers defending against the Japanese might cross the river in thin clothes and suffer in freezing and starving conditions, he ordered that 10 000 taels of silver should be sent to Song Yingchang to prepare winter resources and distribute them equally among the soldiers.[33] Such relief supplies of winter clothing followed the traditions and disciplines in the state code of the Ming dynasty, which guaranteed a centralised system for distributing prophylactics from the Ming central court in Beijing to officers on the frontline.[34]

[28] *Sŏnjo sillok* [The Veritable Records of King Sŏnjo]32: 16a (1592/11/16).

[29] Kagoshima-ken Rekishi Shiryō Sentā Reimeikan, *op. cit.* (note 27), 311.

[30] Lo, *op. cit.* (note 7), 121.

[31] See Song Yingchang. *Jinglue fuguo yaobian* [Important Documents from the Military Commissioner's Restoration of the State]. (Taiwan xuesheng shuju, 1986), 193.

[32] Wang, *op. cit.* (note 8), 38.

[33] A *tael* is a measurement of weight equivalent to approximately 37.5 grams. Song, *op. cit.* (note 31), 522.

[34] *Da Ming huidian* [Statutes of the Great Ming], vol. 40, Chinese Text Project edition, available online at https://ctext.org/wiki.pl?if=en&res=706630. For more information on the system of Ming military supplies, see Masato Hasegawa, 'War, Supply Lines, and Society in the Sino-Korean Borderland of the Late Sixteenth Century', *Late Imperial China*, 37 (2016), 113–4; Swope, *op. cit.* (note 2), 184.

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With the Japanese suffering from a lack of warm clothes and shoes, the odds swung in favour of their opponents. The Chosŏn and Ming generals were well aware of their enemy's plight and believed they had a good opportunity to bring the war to a close by the end of winter,[35] although there was some concern among the Chosŏn forces that the Japanese soldiers might become accustomed to the harsh climate.[36] Even before the arrival of winter, the Chosŏn government had started to prepare winter clothing for their generals and soldiers, but the cold weather still claimed many lives.[37] Moreover, the Chosŏn government recognised the importance of keeping their Ming allies warm to avoid complaints and maintain their focus on fighting battles.[38] Thus, better prepared for the cold winter and benefitting from superior supplies, Li Rusong's cavalry rushed to surround Konishi Yukinaga's (1558–1600) troops at the fortress of P'yŏngyang and were victorious in the Battle of P'yŏngyang on the seventeenth day of the first month of 1593.

Epidemic outbreaks, medicine and military stalemate in the war

The brutal winter weather and continuous early spring rain in 1593 left soldiers on both sides of the conflict exhausted, starving and vulnerable to disease. Outbreaks of an equine plague and other epidemics from the first to the third month of 1593 challenged the prophylactic preparations, weakened the health of both soldiers and horses and contributed towards a state of stalemate in the war.[39] Whereas the Japanese withdrew from the epidemic-stricken capital of Hansŏng, leaving their sick behind, the Ming commander in Korea and the Chosŏn government sought herbs to distribute to their soldiers to combat illness.

Despite their victory at the Battle of P'yŏngyang, Li Rusong's troops had been engaged in continuous combat from early in the first month of 1593 and were suffering from exhaustion and the climatic conditions contributed towards their deteriorating health. Song Yingchang describes how the Ming soldiers since crossing the Yalu River in their relentless pursuit of the Japanese 'have been unable to dismount from their horses and have been unable to eat or drink. They are completely exhausted in both body and spirit'. His report also describes the miseries of life in camp without steady shelter in the winter season, where 'the generals and soldiers fighting in the east have had to lie down [to sleep] on the ice and snow every day'.[40]

As the ice and snow gave way to continuous spring rain, Li Rusong informed the Ming emperor about the miseries suffered by his soldiers and their need for new supplies. 'Every soldier marched more than 2 000 *li* to assist this vassal state [Chosŏn]' and 'fought bravely in several bloody battles', but their shoes and socks were worn out, they were almost barefoot, wearing wet, muddy shoes and rotting socks.[41] Such reports provide evidence that the Ming army was suffering from the cold, the wet, hunger and exhaustion and that their supply lines were overextended when they took part in the Battle of Pyŏkchegwan and subsequent skirmishes at the end of the first month in 1593. In response to this urgent need, the Ming commander in Korea immediately granted permission to buy shoes and boots, and the central camp

[35]Song, *op. cit.* (note 31), 284, 329.

[36]There is little evidence that the Japanese became accustomed to the cold. Later historical records show that Japanese soldiers continued to suffer diseases related to the cold throughout the war with boatmen freezing to death on the last day of the eleventh month in 1597. See Chōsen Nichinichiki Kenkyūkai, *Chōsen Nichinichiki o yomu: Shinshūsō ga mita Hideyoshi no Chōsen shinryaku* [Reading a Diary of Chosŏn: Hideyoshi's Invasions as Seen by a Pure Land Buddhist Monk] (Tokyo: Hōzōkan, 2000), 61.

[37]*Sŏnjo sillok* 30:9a (1592/9/11); *Sŏnjo sillok* 33:1a (1593/12/1).

[38]*Sŏnjo sillok* 33:12b (1593/12/13).

[39]For the impact of logistical problems and environmental conditions on the Imjin War, see Kitajima, *op. cit.* (note 22), vol.2, 85; Hasegawa, *op. cit.* (note 34); Wang Chongwu, 'Li Rusong zhengdongkao' [An Examination of Li Rusong's Campaign in the East], Zhongyang yanjiuyuan lishi yuyan yanjiusuo jikan 16 (1947), 343–74.

[40]Song, *op. cit.* (note 31), 494. Historians are cautious about the trustworthiness of some aspects of Song Yingchang's reports given his natural desire to emphasise his efforts and minimise his failures when reporting to the Ming court.

[41]Song, *op. cit.* (note 31), 534.

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delivered 12 000 pairs of shoes from Liaodong to each base in Korea on the thirtieth day of the second month of 1593. Silver was not yet circulating as a currency in Chosŏn, so the Ming soldiers could not use payments made to them by the Ming court to make purchases locally, even if such items had been available. Instead, to guarantee their soldiers warm clothes and shoes, the Ming central court in Beijing made strategic decisions on preparing winter resources so that when officials on the frontline faced shortages, the central camp commanded by Song Yingchang could respond quickly with supplies from Ming China. From later in 1593, the Chosŏn court also shared the responsibility of providing the Ming soldiers with clothes, footwear and food.[42]

From the perspective of traditional Chinese medicine, the cold suffered by the soldiers was the cold *qi* that had gradually penetrated the bodies of those who had been sleeping on the ice and snow and marching almost barefoot in wet and muddy shoes.[43] Warm alcohol, ginger soup or some porridge were the standard measures taken to reduce such threats of cold *qi* in military contexts.[44] They needed rest and nutritious food to revive their strength, but the Ming army was suffering from a shortage of food for soldiers and fodder for their horses, as Yukinaga's troops had burnt the surrounding grass and crops in the areas that they passed through near Kaesŏng city.[45]

The continuous rain since late in the first month of 1593 also affected the health of horses, which were essential for the cavalry regiments and also the transportation of both armies. As the ice melted and the mud deepened, parts of Hansŏng became treacherous to the extent that horses were unable to move, and both people and horses were trampled in the mud.[46] In the following month, the situation deteriorated further and relentless rain brought the Imjin River close to bursting its banks. The horses' coats were drenched and the mud reached the height of their bellies.[47]

Although these factors undeniably contributed to the deteriorating health of the horses, it was ultimately an epidemic that led to their deaths in such numbers as to cripple the Ming war effort. After suffering a defeat at the Battle of Pyŏkchegwan, the Ming cavalry regiments crossed the Imjin River and were stationed on the eastern bank. The Chosŏn minister Li Hangbok (1566–1618) and the second-ranked Ming general Yang Yuan (?–1598), reported thousands of horses died. Based on these reports of sudden and widespread deaths, King Sŏnjo (1567–1608) of Chosŏn concluded that they must have been due to an outbreak of equine plague (*mayŏk*).[48] The records are not more specific, merely describing the horses' illness as an equine plague as sudden numerous deaths were the typical premodern perception of contagious diseases and premodern veterinarians were not used to looking for their earlier symptoms.[49] These horses had experienced many difficulties on their journey to the Korean peninsula from Liaodong, crossing rivers, making their way through deep mud, taking part in a series of battles and being exposed to the continuous cold rain. These conditions, combined with other unsanitary factors, would have increased their susceptibility to infection. Regardless of the specific number, there is no doubt that this outbreak of equine plague substantially weakened Li Rusong's forces.

While the equine plague was raging, the extreme environmental conditions also contributed to fatigue and a deterioration in the health of the Ming soldiers, resulting in many deaths.[50] As the rain continued in the second month of 1593 the large Ming contingent were forced to set up camp in muddy fields near Kaesŏng,[51] where many of the exhausted and starving soldiers resorted to eating horse flesh, believing the

[42]*Ming shilu* [Veritable Records of the Ming Dynasty]. Shenzong 264 (1593/9/17).

[43]See Zhang Zhongjing, Shanghanlun [Treatise on Cold Damage and Miscellaneous Diseases], vol. 3. Chinese Text Project edition, available online at https://ctext.org/library.pl?if=en&file=86795&page=1.

[44]Wang, *op. cit.* (note 8), 17.

[45]Kitajima, *op. cit.* (note 22), vol. 2: 90–1.

[46]Kitajima, *op. cit.* (note 22), vol. 2, 78–85.

[47]Song, *op. cit.* (note 31), 497.

[48]*Sŏnjo sillok* 35: 6a (1593/2/5); *Sŏnjo sillok* 35: 29a (1593/2/17).

[49]Conrad, Wujasty, *op. cit.* (note. 13), 6.

[50]Song, *op. cit.* (note 31), 497; *Sŏnjo sillok* 35: 6a (1593/2/17); 46a (1593/2/22).

[51]Hŏ Chun, *Tongŭi pogam* [Treasured Mirror of Eastern Medicine], (1610), vol. 7, Hanŭihak kojŏn DB [Korean Institute of Oriental Medicine] online edition, available at https://mediclassics.kr/.

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meat would protect them from the cold and unaware that it was contaminated and could cause illness.[52] According to contemporary medical thought as evidenced in *Tongŭi pogam* (Treasured Mirror of Eastern Medicine), a medical treatise compiled during and after the Imjin War, abnormal climatic conditions such as unusually cold weather in spring could give rise to infectious diseases. Regardless of its cause, the epidemic that subsequently broke out among the soldiers reduced their ability to fight and forced them to remain in Kaesŏng to recuperate during the rainy period.[53]

An epidemic also broke out among the Japanese troops, with one Japanese diary suggesting that it began during their stay at Hansŏng in 1593. The family records of Nabeshima Naoshige (1538–1618) note that after their withdrawal to Hansŏng, nearly thirty family members died because of the cold weather and the unclean air of the capital, which had a disgusting smell.[54] This odour may refer to the stench given off by abandoned and rotting corpses, as Zetaku Meirin (1561–1620), a monk serving under Nabeshima Naoshige, describes how the corpses 'reeked to high heaven' during their stay in Hansŏng late in the second month.[55] *Tongŭi pogam* sheds light on contemporary medical philosophy in noting that aspects of the external environment (referred to as *qi*), such as dirtiness, death and injustice, could trigger outbreaks of epidemics. By the same token, odours were also viewed as a source of contagion.[56]

Hansŏng, which the Japanese armies had occupied, was struck by severe epidemics at this time, and they were forced to retreat to prevent further loss of their soldiers to disease. When the Ming and Chosŏn armies entered the capital after the Japanese withdrawal on the nineteenth day of the fourth month, they found sick and dying people abandoned in the streets, along with piles of corpses. Those who remained were mainly sick and starving Japanese soldiers, whom Yukinaga had been forced to leave behind when he withdrew from Hansŏng.[57] Retreat for the Japanese thus became a strategy for avoiding further losses in the face of an epidemic; it represented the failure of Japanese disease management practices.

By contrast, the Ming court paid considerably more attention to the health of their soldiers when they learnt of the problems they faced with infectious diseases. To counteract the spread of disease, local officials in Liaodong used the money allotted for buying horses to prepare 4 000 herbal packets for each contingent on the front line.[58] These officials also sent urgently needed medicine such as sage pills (*shengsanzi fang*) and drinks for purifying toxins (*xiaoduyin*) on the eleventh day of the second month of 1593.[59] Sage pills are listed in the *Tongŭi pogam* as one of the main remedies used to treat epidemics and are praised for protecting both the young and the old from pestilence, while the so-called 'drinks for purifying toxins' was another remedy primarily aimed at the treatment of epidemics-induced fever and rashes.[60] Some of their herbal constituents are still used to treat diseases such as the common cold today.

Having observed that the severe epidemic outbreak in 1593 took place in the transition from the cold of winter to the early spring rains, the Chosŏn government recognised that epidemic outbreaks were usually accompanied by the arrival of warmer spring weather and undertook better medical preparation in subsequent years.[61] Alarmed by the pattern they had observed, the central court offered the armies three remedies to treat illnesses and injuries: 'clearing-the-heart pills' (*ch'ŏngsimwŏn*), thought to cure heart problems and remedy the dazed spirits caused by infectious diseases in winter; a treatment for

[52]Song, *op. cit.* (note 31), 493; *Sŏnjo sillok* 35:46a (1593/2/22), *Sŏnjo sillok* 42:52a (1593/8/26).

[53]Song, *op. cit.* (note 31), 492–93, 498; Kitajima, *op. cit.* (note 22), vol. 2, 85–6.

[54]Lo, *op. cit.* (note 7), 125; Saga Kenritsu Toshokan (ed), Naoshige Kōfu. vol. 8 of Saga-ken kinsei shiryō [Historical Materials for Early Modern Saga-ken] (Saga: Saga Kenritsu Toshokan, 1993),197.

[55]Zetaku Meirin, 'Meirin Chōsen'yaku nikki' [Diary of the Korean Campaign by Meirin], in Saga-ken shiryō shūsei, vol. 5 (Saga: Saga Kenritsu Toshokan, 1960), 354; Lo, *op. cit.* (note 7), 124.

[56]Hŏ, *op. cit.* (note 51), vol.7.

[57]Song Yingchang also mentions that sick Japanese soldiers were left behind in Hansŏng. See Song, *op. cit.* (note 31), 659.

[58]Song, *op. cit.* (note 31), 490.

[59]Song, *op. cit.* (note 31), 491–2.

[60]Hŏ, *op. cit.* (note 51), vol. 7. Onyŏk [Epidemics].

[61]*Sŏnjo sillok* 34: 47b (1593.1.29).

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dysentery, malaria and jaundice; and another for severe wounds.[62] The herbs and ingredients in these prescriptions for injuries and epidemics were sourced locally and were therefore unfamiliar to those from other regions. The generals received training in how to use these prescriptions, which served to disseminate local medical knowledge more widely throughout the Korean peninsula.

While Ming officials were able to follow prescriptions and respond quickly to the outbreak of infectious diseases, a closer examination of the military manual *Kunjung ŭiyak* reveals that such knowledge also reached the generals in the Ming dynasty. The manual outlines different medical treatments for outbreaks in the first two days and the following three or four days, as well as prescriptions for dysentery, diarrhoea, heatstroke in summer, cold stroke in winter and sore throat.[63] Regardless of whether such knowledge was acquired from military or medical manuals, the flourishing of medical schools throughout the Ming empire paved the way for the Ming generals and later Chosŏn generals to acquire medical knowledge and apply medical expertise to battlefield situations.[64]

Despite this, given the calamities brought about by the climate, battles, starvation and infectious diseases, the war entered a period of stalemate that coincided with the most severe period of the epidemics from the end of the first month of 1593.[65]

The Sino-Chosŏn medical alliance and the Japanese lack of support

To respond to wartime injuries and diseases, the Ming and Chosŏn dynasties formed a Sino-Chosŏn medical alliance to treat sick and injured soldiers, whereas the Japanese armies remained relatively isolated on the Korean peninsula without prompt state support. While the Ming centralised military apparatus with the assistance of the Chosŏn court was able to nominate local magistrates and dispatch physicians to collaborate and supervise medical treatment and medicine distribution, physicians recruited independently by each Japanese daimyo found it difficult to treat illnesses that spread across entire armies without timely delivery of medical resources from Japan. Measures taken by the three combatant states are an indication of the availability of medical resources, state military strategies and their attitudes towards the welfare of their soldiers.

As an ally of the Ming, the Chosŏn court provided medical treatment for wounded Ming generals from the early days of the first month of 1593, bolstering their political alliance. At the Battle of P'yŏngyang, the Ming general Fang Shichun was shot and had to retreat from the battlefield. When the Chosŏn King Sŏnjo met Fang on the road, the king dismounted his horse, expressed his condolences and ordered a royal physician to prepare medicine and take care of him, while also presenting him with a gift of a bow and arrows.[66]

The provision of medical care was not reserved just for Ming generals but extended to all Ming soldiers, further strengthening the politicisation and militarisation of the Sino-Chosŏn medical alliance.[67] On the nineteenth day of the first month of 1593, King Sŏnjo addressed his military officers and emphasised the importance of saving and restoring to health of the Ming soldiers who had been injured while fighting for Chosŏn's interests. He declared that those who failed to treat injured Ming soldiers or did not give them water or alcohol to drink would be punished according to military

[62]*Sŏnjo sillok* (1594.1.2). See also the prescriptions for 'clearing-the-heart pills' in Sŏ Myŏng'ŭng. *Kosa sinsŏ* [New Book of Verified Facts], 1771. Kyujanggak Archive. Kyu 6770-vol. 15. Accessed 11 May 2020, https://db.itkc.or.kr/.

[63]Wang, *op. cit.* (note 8), 7–18.

[64]Marta E. Hanson, *Speaking of Epidemics in Chinese Medicine: Disease and the Geographic Imagination in Late Imperial China* (London and New York: Routledge, 2011), 48.

[65]See also Kitajima, *op. cit.* (note 22), vol. 2, 2–6; Wang Chongwu, *op. cit.* (note 39), 349–54; Kim Kyŏngt'ae, 'Imjin chŏnjaeng ch'okiŭi kunnyang munjewa kanghwa kyosŏp nonŭi' [A Study on the Issue of Provisions and the Peace Negotiation during the Early Days of the Imjin War], *Yŏksa wa tamnon*, 70 (2014), 54–66; Swope, *op. cit.* (note 2), 180.

[66]*Sŏnjo sillok* 34: 30b (1593/1/18).

[67]Mark Harrison first coined the term 'the militarization of medicine' to describe the influence of wars and the militarisation of societies on modern medicine. See Mark Harrison, 'The Medicalization of War–The Militarization of Medicine', *Social History of Medicine*, 9 (1996), 267–76.

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disciplines.[68] This decree was widely circulated throughout several regions, highlighting the determination of the Chosŏn king to ensure the welfare of the Ming soldiers. In addition, he urged his subjects to dismount their horses to comfort any Ming soldiers they discovered injured on the street and to donate money for those bearing the dead bodies of Ming soldiers to hold funerals. On the twentieth day of the first month, violators of these regulations were publicly punished with a cane in the presence of the Ming armies, underscoring the politicisation and militarisation of the medical care for injured Ming soldiers.[69] The king's explicit declaration that the Ming armies had come to fight for Chosŏn and that Chosŏn had an obligation to look after their injuries reflected the strong Sino-Chosŏn relationship and Chosŏn's role as 'servant of the Great Ming'.[70] By making this declaration, it is likely that he hoped to raise the morale of Ming soldiers, ultimately leading to victory against the Japanese invaders.

The transportation of wounded soldiers and caregivers has historically been a crucial issue in military medicine and was especially pertinent as the Ming court dispatched vast armies to foreign lands.[71] To address this issue, the Chosŏn court established a Sino-Chosŏn medical alliance and a medical supply line that was supported by both Chosŏn court medicine and its local administration. Following King Sŏnjo's commission, medical aid gradually became available in many locations in P'yŏngan province, where local magistrates waited to receive injured soldiers. In response to Li Rusong's complaint that his injured soldiers were not receiving proper care and many were dying, No Chik (1545–1618), an administrator at the Central Council (*chi Chungch'ubu sa*) at court, was dispatched to supervise medical treatment for the Ming armies in Sun'an in P'yŏngan province. The government recruited more military officers to work under No Chik in different locations to look after injured soldiers, thus establishing a system for providing wartime medical aim. Making use of established food transportation lines, these newly recruited officers escorted injured Ming soldiers and the bodies of the deceased to areas where local officers in charge of the food supply could offer medical aid. By the end of the first month of 1593, a fortress in P'yŏngan province had received almost one hundred sick Ming soldiers with various injuries requiring urgent medical attention.[72]

Meanwhile, significant reforms to the Chosŏn military system during the Imjin War strengthened the medicalisation of military service. Chosŏn Korea reprinted the *Jixiao xinshu* (New Treatise on Military Efficiency) and reformed its military system in line with the principles outlined in this manual.[73] Under this central military directorate, there was one physician, one acupuncture practitioner responsible for external diseases and a horse veterinarian. Provincial military and naval garrisons were equipped with physicians and horse veterinarians; for example, the military roster of 1596 for P'yŏngan province records the recruitment of one physician in one garrison.[74] Despite these reforms and practices, however, the scale of the conflict and the number of those requiring treatment quickly overwhelmed the capacity to provide local medical aid. The medicalisation of military service was strengthened in the postwar period, with physicians treating generals and soldiers in local military garrisons.[75]

The Chosŏn court also drew on royal medical resources to provide medical treatment to the Ming armies. Yi Konggi, a skilled royal acupuncturist who held the military title of 'protector of the army'

[68]*Sŏnjo sillok* 34: 31b (1593/1/19).

[69]*Sŏnjo sillok* 34: 32a (1593/1/20).

[70]*Sŏnjo sillok* 34: 37b (1593/1/24). See also Sun Weiguo, 'An Analysis of the "Little China" Ideology of Chosŏn Korea', *Frontiers of History in China*, 7, 2 (2012), 220–39.

[71]M. M. Manring et al., 'Treatment of War Wounds: A Historical Review', *Clinical Orthopaedics and Related Research*, 467, 8 (2009), 2168–91.

[72]*Sŏnjo sillok* 34: 44b (1593/1/27).

[73]*Sŏnjo sillok* 41: 44a (1593/8/19); Namgung Seungweon.'Overlap of Duties: Expansion of the Korean Militia System after the Imjin War', Aftermath of the East Asian War of 1592–1598 Webinar Series, 2022.

[74]Miki Sake, *op. cit.* (note 7), 402; Chŏng Kubok, '1596 Chingwan kwanbyŏng p'yŏn'och'aek' [Military Roster of Officers and Soldiers on the Frontier], *Komunsŏ yŏn'gu*, 5 (1994), 185.

[75]Pak Hunp'yŏng. 'Chŏn sidae ŭigwanjik simyak e taehan koch'al' [Research on an Official Medical Position -*Simyak* in the Chosŏn dynasty]. *Hanguk ŭisa hakhoeji,* 28 (2015), 59–72.

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(*hogun*), was dispatched to the battlefield to treat sick and wounded soldiers, where his contribution to the war effort earned him the title of 'meritorious statesman of the third rank'.[76] The military title of 'protector of the army' for physicians reflected the Chosŏn government's determination to integrate medical services into the army and post-Imjin War Korea witnessed a surge in the number of royal physicians with military titles after the Imjin War.[77]

Royal physicians played an important role in wartime relations between the Ming and Chosŏn courts. During times of peace, physicians from both sides visited each other to promote mutual cultural and diplomatic communications, as was also seen in Europe and India.[78] In the post-Imjin period, as soon as Chosŏn Korea reestablished its foreign relations with Japan in 1609, royal Chosŏn Korean physicians also visited Japan and brought a wealth of medical knowledge at the request of the Japanese in the form of brush-talk dialogues, which fostered mutual medical communications.[79]

To further improve the welfare of soldiers, both the Ming commander and the Chosŏn court adopted various supplementary measures aimed at alleviating pain and reducing infections. After a series of intensive battles in the second month of 1593, the Ming commander in Korea allowed sick soldiers to rest and recuperate in order to regain their strength, a proven prophylactic strategy for maintaining health as evidenced elsewhere.[80] Noting that the Ming soldiers were losing weight and suffering from a lack of salt and soybean paste in their diet, the Ming commander decided to distribute 264 cows, 30 000 taels of salt and another 2 100 taels of silver to the armies, which was later supplemented by additional supplies of salt and soybeans from the Chosŏn court.[81]

Providing soldiers with alcohol was a well-established practice that was known to boost morale and alleviate pain in both European and Asian military history.[82] The Ming generals used alcohol as an occasional bonus for soldiers and the Chosŏn king ordered local officers to provide them with alcoholic drinks.[83] Alcohol can numb pain and create the illusion of warmth in the body, thus encouraging soldiers to continue their duties.

The care of soldiers extended beyond their physical needs to the provision of spiritual comfort for the deceased during the Imjin War. The Chosŏn government held grand funeral rites in accordance with the medical philosophy presented in *Tongŭi pogam*, where the wandering spirits of the dead are viewed as a possible cause of epidemic outbreaks. Thus, provision for the afterlife of dead soldiers was considered a form of medical care in premodern Korean contexts, while also serving to comfort the living and boost morale.[84] The number of deaths that had taken place by the end of the first month in 1593 following the Battle of Pyŏkchegwan prompted the Chosŏn court to provide funeral rites, which entailed collecting and burying corpses, erecting memorial tablets and altars, carrying out ceremonial oration and the offering of condolences.[85] In recognition of the importance of the Ming horses, Yi Rusong also arranged a ritual for the countless numbers of their dead, highlighting the concern that was extended to both man and beast.[86]

[76]*Sŏnjo sillok* 34: 47b (1593.1.29); *Sŏnjo sillok* 68: 4a (1595.10.4).

[77]Pak Hunp'yŏng. 'Ŭigwan ŭi wŏnjong kongsin rokhun yŏn'gu' [Research on Medical Bureaucrats Invested as Meritorious Retainers], *Han'guk ŭisa hakhoeji*, 27 (2014), 90–1. See also Harrison, *op. cit.* (note 67), 267.

[78]Baihui Duan. 'Smallpox Panic: Managing Diseases and Sino-Chosŏn Relations', in *Managing Epidemics in Post-Imjin Korea: War, Environment, Infectious Diseases, and Medicine, 1576–1720*, (Ph.D. dissertation, Autonomous University of Barcelona, 2022); Vivian Nutton, *Medicine at the Courts of Europe: 1500–1837* (London: Routledge, 2018); Hugh Trevor Roper. *Europe's Physician: The Various Life of Sir Theodore de Mayerne* (New Haven, Conn.: Yale University Press, 2006).

[79]Daniel Trambaiolo. 'Diplomatic Journeys and Medical Brush Talks: Eighteenth-Century Dialogues between Korean and Japanese Medicine', *Studies in History and Philosophy of Science*, 30(2013), 93–113; Hong Sŏngdŏk. 'Chosŏn hugi t'ongsinsa suhaeng ŭiwŏn e taehayŏ'[Physicians in Diplomatic Mission to Japan in the Late Chosŏn Dynasty], *Han Il kwangyesa yŏn'gu* 32(2009), 103–32.

[80]For *tael*, see note 33. Song, *op. cit.* (note 31), 522; Geltner, *op. cit.* (note 3), 45.

[81]*Sŏnjo sillok* 35: 36a (1593.2.19). Song, *op. cit.* (note 31), 522.

[82]Song, *op. cit.* (note 31), 522.

[83]*Sŏnjo sillok* 34: 31b (1593/1/19).

[84]Hŏ, *op. cit.* (note 51), vol. 7.

[85]*Sŏnjo sillok* 34: 49a-51a (1593.1.30).

[86]*Sŏnjo sillok* 34: 49a (1593/1/30).

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In contrast with the resources provided by the Sino-Chosŏn medical alliance, the Japanese forces suffered from a lack of physicians during the Imjin War, being forced to depend on the few that had accompanied the invading forces as part of prewar planning and those who were dispatched from Japan after much delay. This could not maintain the welfare of their soldiers and resulted in the loss of advantage they had gained on the battlefield before the outbreak of epidemics. As part of their preparation for war, the troops under Gotō Sumiharu (1562–1594) were divided into three levels comprising 120 military soldiers, 518 other staff such as boatmen and craftsmen and sixty-seven officers, of whom only five were monks, physicians and scribes, the remainder being generals and mounted troops.[87] At the time, monks possessed a certain amount of medical knowledge as medicine was taught as part of a Japanese Buddhist education.[88] For example, Kyōnen, a monk who served under Ōta Kazuyoshi (?–1617) during the conflict, was a well-known Buddhist medical practitioner.[89] Some Japanese troops also enlisted the assistance of Chinese physicians who shared their medical expertise, geographic knowledge and diplomatic intelligence.[90] These physicians likely had to prioritise the higher-ranking officers and neglect the lower ranks, and this policy may have contributed to the decision to abandon sick and injured soldiers during the withdrawal from Hansŏng.[91] When Hideyoshi was informed of the difficulties facing his forces and the lack of medical treatment on the frontline, he dispatched twenty physicians along with other provisions on the twelfth day of the fourth month of 1593; however, this order came after the Japanese armies had already left behind severely ill soldiers and withdrawn to the south.[92] Before this urgent dispatch by Hideyoshi, the health of soldiers had been largely neglected, with each daimyo responsible for recruiting their own private physicians for their forces during the early stage of the Imjin War.[93]

Despite their different approaches to dealing with the epidemics, none of the combatant countries was able to maintain the health of their armies and address the impact of a shortage of manpower and horses if the war continued. The first year of warfare leading up to the sixth month of 1593, combined with famines and epidemics, led to a shortage of young, strong Chosŏn men available to fight, provide transport and gather in the harvest.[94] The calamities brought about by battles, starvation and diseases brought both sides of the conflict to the negotiation table and kept them there for a substantial period from the spring of 1593 until the end of 1596 in order to recuperate and save their energy and resources for renewed conflict in the future.[95]

‘External medicine’ during and after the war

There are significant differences between Europe and East Asia concerning the concepts of surgery in military medicine and the extent that it was employed on the battlefield. Early modern European polities paid barber surgeons to care for their troops, although most professional physicians in the seventeenth century still avoided difficult operations given the legal liability and potential damage to their

[87]Sanbō, *op. cit.* (note 31), 92. Appendix 2. *Gotō Sumiharu tai henseihyō* (table showing the composition of Gotō Sumiharu’s troops).

[88]For Buddhism and Japanese medical history, see also Katja Triplett, *Buddhism and Medicine in Japan: A Topical Survey 500–1600 CE of a Complex Relationship* (Boston: de Gruyter, 2020).

[89]Lo, *op. cit.* (note 7), 125–30.

[90]Kitajima 2017, *op. cit.* (note 22) 2: 971; Kang Hang. *Kan’yōroku Chōsen jusha no Nihon yokuryūki* [Records of Sheep Watching: Diary of a Korean Confucian Scholar Captive in Japan], (Tōkyō: Tōyō Bunko, 1984).

[91]*Sŏnjo sillok sujong* 27: 9b (1593.4.1)

[92]Kitajima, *op. cit.* (note 22), vol. 2, 181.

[93]For the medical policy of Toyotomi Hideyoshi’s regime in Japan, see also Kim Munja, *op. cit.* (note 7).

[94]*Sŏnjo sillok* 39:19b (1593/6/13); *Sŏnjo sillok* 40:3a (1593/7/3), *Sŏnjo sillok* 41:30a (1593/8/13). Some estimates suggest around two million people, which is roughly equivalent to 20 percent of the Korean population, died during the Imjin War, although the decrease in population could be partially due to the loss of records during the war. See Swope, *op. cit.* (note 2), 287.

[95]See also Kim Kyŏngt’ae, *op. cit.* (note 39), 40–54.

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reputations.[96] A comparative study of military history in Asia provides further insight into this issue of surgery as such medical preparations for wounded soldiers were also necessary during the war. While there are no existing records of physical surgery performed during the Imjin War, medical manuals and military medicine manuscripts from this period suggest that external injuries were treated by acupuncture and 'surgery-like' techniques. There is also evidence of a physician conducting anatomical studies during the war. These developments are significant medical legacies of the Imjin War, with the use of acupuncture in particular spreading not only within the Korean peninsula but also beyond East Asia to the wider world.

Despite evidence of attempts made in prehistory thousands of years ago, surgery was not widely practised in traditional East Asian medicine. To better understand this phenomenon, we need to consider the concept of 'surgery' and perceptions of bodies in Korean society and traditional Asian medical thought. Surgery, as defined in modern biomedicine, is the art or practice of treating injuries, deformities and other disorders by physically intervening in organs or tissues for diagnostic or therapeutic purposes.[97] There is, however, no equivalent concept of surgery in traditional East Asian medicine. Instead, the term 'external medicine' (K. *Oegwa*, C. *waike*) is used to describe medical treatments for external injuries and wounds that are visible on the surface of the body, including some skin problems such as lumps and pustules, although *Oegwa* in modern Asian contexts also refers to surgery.[98] Its counterpart, 'internal medicine' (K. *naegwa*, C. *naike*), focuses on diseases that originate from internal body conditions, and it is this distinction which underpins the essential principles of disease and treatment in traditional East Asian medicine. Surgical practices have traditionally played only a minor role in the treatment of external injuries, as the usual practice was to prescribe internal medicine for consumption and external medicine for topical application, sometimes accompanied by acupuncture treatment.[99] When considering military medicine in sixteenth- and seventeenth-century East Asia, it is necessary to bear in mind such differences in medical traditions and cultural backgrounds.

One major section of *Kunjung ŭihak* is the treatment of wounds and injuries, which exemplifies the internal consumption of herbal medicine and the external application of poultices rather than surgery as the hallmark of traditional East Asian medicine.[100] For example, *Kunjung ŭiyak* recommends the internal consumption of herbal medicine to alleviate pain and promote the growth of new skin, and the Chosŏn royal court distributed a medicine obtained from the locals to treat wounds to their armies stationed in the south.[101]

Surgery was reserved only for severe cases, such as when the intestines protruded from the body due to a wound. *Kunjung ŭiyak* provides detailed instructions for performing such surgery, whereby the practitioner should first move the injured person to a place sheltered from the wind, apply oil to his hands and put the intestine back into the body before carefully suturing the wound with a suture string made from mulberry bark. Postoperative care included applying a wound-sealing medicine made from chicken blood overnight and smearing a blood-dispersing plaster such as powder made of flowers over

[96]Richard A Gabriel, *Between Flesh and Steel: A History of Military Medicine from the Middle Ages to the War in Afghanistan* (Sterling, Va.: Potomac Books, 2016), 62; Donatella Bartolini, 'On the Borders: Surgeons and Their Activities in the Venetian State (1540–1640)', *Medical History*, 59 (2015), 94.

[97]Surgery. Oxford English Dictionary. Accessed 18 February 2023.

[98]See Xiaofeng Hu, 'A Brief Introduction to Illustration in the Literature of Surgery and Traumatology in Chinese Medicine', in *Imagining Chinese Medicine* (Leiden: Brill, 2018), 184.

[99]Yu Gengzhe, 'Bei huaiyi de Hua Tuo- Zhongguo gudai waike shoushu de lishi guiji' [Hua Tuo in Suspicion: The Historical Path of Surgery in Ancient China], *Qinghua daxue xuebao (zhexue shehui kexueban*, 24 (2009), 90.

[100]Wang, *op. cit.* (note 8), 22–3; Mao Yuanyi (1594–1640), *Wubeizhi* [Treatise on Armament Technology] (Shanghai: Shanghai guji chubanshe, 1995[1621]); Li Jianmin, *Hua Tuo yincang de shoushu: Waike de Zhongguo yixueshi* [The Secret Surgery of Hua Tuo: A History of Chinese Surgery] (Taibei: Tongda tushu gongsi, 2011), 77. As a hallmark of medieval Japanese medicine, see Andrew Edmund Goble, 'Warfare, Wound Medicine, and Song Medical Knowledge', in *Confluences of Medicine in Medieval Japan: Buddhist Healing, Chinese Knowledge, Islamic Formulas, and Wounds of War* (Honolulu: University of Hawai'i Press, 2011), 89–112.

[101]Wang, *op. cit.* (note 8), 22, 27; *Sŏnjo sillok* 47:2a (1594.1.2).

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the wound to ensure that the sutured wound was sealed and did not break open. This procedure was similar to that for hare-lip surgery in traditional Chinese medicine.[102] Afterwards, it was recommended that the injured person should drink a medicinal decoction twice or three times with warm alcohol as a base supplemented by red vinegar and various simmered ingredients.[103]

Tongŭi pogam, the representative medical manual from this time, also records a similar surgical process.[104] The *Tongŭi pogam* instructions include giving medicine before surgery, such as 'invigorating blood powder', or 'Buddha's hand powder', which were used to promote blood circulation and prevent blood stasis.[105] After surgery, patients were instructed to drink decoctions to aid recovery. A similar surgical process was also used to treat cows in the seventeenth century and was added to various emergency chapters of encyclopaedias.[106]

The lack of surgeons during this period did not impede medical practices, as the Imjin War and its aftermath witnessed medical breakthroughs in both acupuncture and anatomy.[107] For example, Chŏn Yuhyang, a general who served the Righteous Armies during the Imjin War, dissected three corpses on the battlefield, which enabled him to better understand the workings of the human body.[108] However, cultural attitudes towards the human body and dissection prevented a more widespread exploration of anatomy.

Chosŏn society was deeply rooted in Confucianism, which dictated that the human body had been bestowed by one's parents and thus any damage caused to it violated the principles of filial piety. Cutting the skin and releasing blood was not therefore culturally acceptable and any doctor who induced bleeding, for example during acupuncture treatment, was considered a quack.[109] Damage to the body was instead viewed as punishment, as evidenced by the state codes in the Chosŏn dynasty that outlined harsh punishments including whipping, flogging and the use of a cangue and feet locks.[110] Cutting skin for the purpose of surgery was thus regarded rather than treatment, which impeded the development of surgery and dissection in traditional East Asian Confucian culture.

Instead, acupuncture, as a more convenient and affordable alternative to traditional medicine, played a crucial role in treating external injuries during the Imjin War, and its influence extended far beyond the borders of the Korean peninsula. The Korean admiral Yi Sunsin (1545–1598) received acupuncture for various ailments including humidity and heat-induced sickness, as well as for oedematous wounds.[111] The postwar period in Korea witnessed increasing interest in acupuncture

[102]Kanwen Ma, 'Hare-Lip Surgery in the History of Traditional Chinese Medicine', *Medical History*, 44, 4 (2000), 504.

[103]Wang, *op. cit.* (note 8), 27.

[104]Hŏ, *op. cit.* (note 51), vol. 9. This entry is cited from Wei Yilin (1277–1347), *Shiyi Dexiao Fang* [Effective Formulas of Inherited Medical Works]. The earliest Chinese example of a colorectal suturing operation is found in *Zhubing yuanhou lun* [Discourse on the Origins and Symptoms of All Diseases] vol. 36. Chinese Text Project edition, available online at https://ctext.org/wiki.

[105]Wei Yilin. *Shiyi Dexiao Fang* [Effective Formulas of Inherited Medical Works]. 1337. Chinese Text Project edition, available online at https://ctext.org/wiki.pl?if=en&res=522092.

[106]Yi Sŏkkan *et al*, *Saŭi kyŏnghŏmbang* [Established Formulas from Four Physicians]. Chapbyŏng [Miscellaneous Diseases]. Ch'anghŏl pulchi [Wounds That Do Not Stop Bleeding]. https://mediclassics.kr/books/1/volume/1#content_758. Accessed 20 February 2023. Hong Mansŏn, *Sannim kyŏngje* [Farm Management], vol. 4, Han'guk kojŏn chonghap DB [Institute for the Translation of Korean Classics] online edition. Available at https://db.itkc.or.kr/.

[107]Some forms of surgery were carried out in early modern China and Japan. For example, cataract couching techniques were transmitted from China to Japan, see Triplett, *op. cit.* (note 88), 92.

[108]Miki, *op. cit.* (note 7), 371; Yi Yik, *Sŏngho sasŏl* [Sayings of Sŏngho] vol. 15. Ojangdo [Map of Five Viscera], Han'guk kojŏn chonghap DB [Institute for the Translation of Korean Classics] online edition. Available at https://db.itkc.or.kr/.

[109]Kim Chŏngguk. *Sajaejip* [Collection of Self-Reflections], 1591, Han'guk kojŏn chonghap DB [Institute for the Translation of Korean Classics] online edition. Available at https://db.itkc.or.kr/dir/item?itemId=MO#/dir/node?dataId=ITKC_MO_0117A.

[110]*Kyŏngguk taejŏn* [State Code]. Hyŏngjŏn [Section of Criminal Law]. National Institute of Korean History online edition, available at https://db.history.go.kr/law/.

[111]Yi Sunsin, *Nanjung ilgi: War Diary of Admiral Yi Sun-sin* (Seoul: Yonsei University Press, 1977), vol. 5 (1593.8.2); vol. 7 (1596.4.19).

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with the Chosŏn minister Yu Sŏngnyong (1542–1607) compiling and publishing an acupuncture book shortly after the Imjin War in 1600.[112]

The Japanese were interested in Korean acupuncture and during the war they captured acupuncture practitioners who pioneered its development in early modern Japan.[113] In 1593, a Japanese general serving under Chōsokabe Motochika (1539–1599) captured a Korean acupuncturist called Kim Tŏkpang from whom he received treatment for an injury. The general subsequently brought Kim back to Tosa, Shikoku, where his medical activities were initially unsuccessful due to the challenge of adapting Korean medicine to a foreign land.[114] After adapting his prescriptions by using Japanese herbs as substitutes for Korean ginseng, he enjoyed success among the locals in Tosa and later in Kyoto. Many Japanese physicians studied his methods during his stay in Japan, including Nagata Tokuhon (1513–1630), who became known as the sage of Japanese medicine, as evidenced in the preface to his book *Shinkyū gokuhiden* (The Secret of Acupuncture).[115] It is thought that Kim learned acupuncture from a Ming physician called Yun Hai, but it was clearly Kim who transmitted the acupuncture technique to Japan and made it possible for the Japanese to acquire this skill and develop it afterwards.

Beyond the borders of East Asia, the technique of acupuncture attracted the attention of the Dutch in Japan, who brought back this knowledge to Europe in the late seventeenth century. In one of the earliest detailed Western accounts of acupuncture, published in 1683, Willem ten Rhijne, a Dutch doctor who had been employed by the Dutch East India Company in Japan, wrote that, 'the best needles are made on the island of Korea and are sold for a high price at the Japanese emporium of Kio or Miaco [Tokyo or Miyako, the capital]'.[116] This record suggests that Korean acupuncture, especially the technique of making needles, fascinated Europeans at this time. By examining records from Korea, Japan and Europe, it is possible to trace one path of the circulation of knowledge about acupuncture, commencing from a Ming physician and a Korean captive during the Imjin War and passing through Japanese acupuncture practitioners and Dutch traders and missionaries. The Imjin War appears to have played a role in the introduction of acupuncture to Japan. However, further research is needed to take account of other possible contributing factors such as the direct importation of medical knowledge from Ming and Qing China, frequent commercial communications with the Dutch, and domestic medical developments in Japan before acupuncture techniques eventually completed their global transmission to Europe.[117]

[112]Yu Sŏngnyong, and Ch'an Li, *Ch'imgyŏng yogyŏl* [Essential Formulae for Acupuncture], 1600. Accessible at the University of California Berkeley Library, 7989.4232. Sŏ Chiyŏn, Kim Namil, and An Sangu, 'Ch'ijongchŏng e taehan ŭisahakchŏk koch'al' [Historical Research of the Chijongcheong-Korean Ancient Tumour Medical Centre], *Han'guk ŭisa hakhoeji*, 20 (2007), 14–16.

[113]For Japanese interest in Korean medical manuals, see Peter Kornicki, 'Korean Books in Japan: From the 1590s to the End of the Edo Period', *Journal of the American Oriental Society*, 133 (2013), 71.

[114]According to Korean sources, there was a Korean army leader called Kim Tŏkpang in Hŭngyang Chŏlla province in 1597, who would have been known to Admiral Yi Sunsin. However, it is likely that this was a different person from the physician Kim Tŏkpang who was brought back to Japan.

[115]The students who learned acupuncture skills from Kim subsequently established four Japanese medical lineages including the school founded by Kuwana Gentoku who compiled *Shinyōshū* [Collection of the Essentials of Acupuncture], Murakami Keinan and Kogawa Shunkyō. See also Matsuoka Takanori, Yamashita Kōichi and Murasaki Tōru, 'Bunroku no eki (Jinshin no ran) ni okeru Nihon, Chosēn, Myō igaku no majiwari' [The Association between the Medical Arts of Japan, Korea, and Ming Dynasty China during Toyotomi Hideyoshi's War], *Nihon Ishigaku Zasshi*, 52 (2006), 273–92; No Sŏnghwan, 'Yangdong ch'anghwa hurok esŏ ch'ajŭn Chosŏnin ŭisa Kim Tŏkbang' [Kim Tŏkpang, a Korean Doctor Found in a Collection of Writings on Korean Japanese Medicine], *Ilŏ Ilmunhak yŏn'gu*, 101 (2017), 173–96.

[116]Robert W. Carrubba and John Z. Bowers, 'The Western World's First Detailed Treatise on Acupuncture: Willem Ten Rhijne's De Acupunctura', *Journal of the History of Medicine and Allied Science*, 29 (1974), 393; Ko Taewŏn, *et al*, *Chosŏn wangjo kŏngang sillok* [The Health Records of the Chosŏn Dynasty] (Hansŏng: T'ŭroyimongma, 2017).

[117]Roberta Bivins, 'Imagining Acupuncture: Images and the Early Westernization of Asian Medical Expertise', *Asian Medicine*, 2 (2012), 345; Katai Shuichi. 'Nibon shinkyū no rekishi [History of Japanese Acupuncture]', *Zen Nihon Shinkyū Gakki*, 62 (2012), 12–28.

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Conclusions

The Imjin War was more than a mere military conflict involving three states; it was arguably also an encounter between three state cultures and strategies of military medicine. By examining how the three combatant states approached wartime injuries and diseases, this study not only adds a new perspective to our understanding of the conflict but also sheds light on the early modern history of medicine in wartime. The different responses of the Chinese, Japanese and Korean states to the harsh Korean winter climate and the various health challenges brought about by the war, such as frostbite, epidemics and battlefield injuries, highlight the importance of adequate preparation and dispatch of prophylactics, physicians and medical resources to ensure the health and welfare of soldiers. While the Japanese armies suffered from being unacclimatised and lacked centralised supplies of military medicine, the Ming court and generals took a more proactive approach to mitigating the impact of cold and infectious diseases on their troops. The Chosŏn government also mobilised its court and local medical resources to provide treatment for the sick and injured Ming soldiers in a notable display of wartime medical collaboration and communication. However, the severe equine plague and outbreaks of epidemics posed significant challenges for the medical strategies and fighting capacity of all sides.

The Imjin War also left medical legacies in Korea and throughout East Asia, offering another premodern Asian example for the global discussion on the benefits of wars. During the conflict, the Chosŏn government reformed its military system to include physicians and horse veterinarians at central and provincial military levels. Because of renewed government interest in military medicine, the institutionalisation of military medicine became a key vehicle for widening the scope of healthcare among soldiers in the postwar period. Although an individual physician attempted to dissect corpses and may have attempted surgery, such practices were viewed negatively and failed to gain wide acceptance because of deep-seated Confucian beliefs about the physical body. Acupuncture treatment, however, experienced rapid development both during and after the Imjin War, with the capture of a Korean acupuncturist leading to skills being transmitted to physicians in Japan and paving the way for the future transmission of acupuncture and its development in Japan in the seventeenth century.

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