

EASTM 30 (2009): 74-92

Sexually Transmitted Diseases and Demographic Change in Early Modern Japan

William D. Johnston

[William Johnston is Professor of History, Wesleyan University, CT. Author of Geisha, Harlot, Strangler, Star: A Woman, Sex, and Morality in Modern Japan (2004), and The Modern Epidemic: A History of Tuberculosis in Japan (1995). His current research projects are: "The Historiography of Amino Yoshihiko" and "The Social and Cultural World of Dogen."]

* * *

This article's main goal is to emphasize place of disease in early modern Japan's demographic history and call for its inclusion in future research on the topic. It does not presume to present an exact or complete account of how disease influenced that history but rather aspires to make disease integral to the discussion. Its specific argument is that concomitant epidemics of gonorrhea and chlamydia influenced modern Japanese demographic history, and as a consequence its modern economic growth. However the success of this article does not depend so much on whether readers find this particular argument persuasive but on whether it makes disease, and sexually transmitted diseases (STDs; conditions with clear signs and symptoms) and sexually transmitted infections (STIs; conditions that lack overt signs or symptoms but can still affect a person's health) a lasting subject of inquiry in this field. By implication, it also calls for a closer examination of sexual customs and practices and their impact on early modern Japan's demographic history than previously attempted.

To make this case, it is necessary first to review the previous arguments regarding the relationship between early modern Japan's demographic history and modern Japan's economic development. Briefly stated, it is clear that Japanese economic growth during the eighteenth and early nineteenth centuries provided the foundation for its subsequent modern economic growth. When considered in an international context, the growth that occurred during that earlier period presents a conundrum. In most premodern societies, economic growth generates population growth. The opposite occurred in Japan, however, when demographic stasis—at least when considered nationally if not regionally—accompanied the economic growth of the eighteenth and early nineteenth centuries.

Based on evidence drawn from both modern epidemiology and the historical record, this paper argues that the two sexually transmitted diseases of gonorrhea and chlamydia were important causal elements in that demographic stasis. The role

these diseases played in reducing fertility rates primarily among women during this time has, for the most part, been overlooked. One reason is that historians and economists have tended to consider economic and demographic change in terms of structural elements or rational economic behavior, and have not included human disease ecology in their analyses of early modern Japan. On the other hand, except for a small number of notable exceptions, those historians who have examined the impact of disease during these centuries have tended to see the population stasis as the result of high mortality rates, especially among infants and children, and have downplayed the possible role of decreased fertility resulting from disease. Yet even those historians are in the minority. Until now, few have realized that disease needs to be considered when explaining the demographic trends and economic development of Japan from early modern to modern times. Before taking into account the evidence that supports this argument, it is useful first to review the prevailing lines of thought.

The Demographic Conundrum of Early Modern Japan

For decades, historians of modern Japan have worked to explain how that country developed the first modern economy outside the West. Within a half-century after the Meiji Revolution of 1868 the Japanese economy had been transformed from an agrarian to a mixed industrial base; within a century it was based on heavy industry and cutting-edge technologies and had become the second largest in the world. Historians and economists alike have examined how this happened. The most influential arguments have emphasized class conflict, Malthusian limits to growth, economic rationality, or some combination of those elements as determining forces. For economists and policy makers interested in spurring economic development in other nations, the Japanese case hinted that it could provide a model for imitation if its key elements could be reproduced.

By the 1950s, American scholars had started in earnest to explore how the pre-industrial Japanese economy facilitated later growth, starting a series of studies that has continued until the present.¹ Much of their work came in response to Japanese scholarship on this subject that appeared soon after World War Two.

From before the 1940s, scholars of Japan generally agreed that economic growth during the seventeenth century led to population growth, although the evidence for this assertion still calls for further inquiry. The economic history of the following two centuries, however, became the subject of dispute.

Some scholars asserted that from the early eighteenth century class oppression led to the impoverishment of Japanese peasants, resulting in the subsequent stagna-

¹ A survey of the works from this period can be found in Esenbel (2003). Important examples include Bellah (1985), Hanley (1972), Hanley and Yamamura (1977), Lockwood (1954), Sheldon (1958), Smith (1959), Spencer (1958), and Yamamura (1973).

tion of population growth. To Japanese historians, this stagnation reflected the dire economic situation not only of the peasantry but also of the lower ranking samurai. A number of forces all helped explain this stagnation of population growth among the peasants. These included onerous taxation, crop failures and starvation, exploitation by the *gōnō* 豪農 class of wealthy peasants, late marriage or the complete inability to marry because of economic difficulties, infanticide and abortion forced by the economic inability to raise children, and migration by people in search of work.² The foundations of this narrative were generally Marxian and analyses of evidence often focused on class conflict, although some Japanese historians stepped out of the Marxian paradigm and simply accepted a more straightforward Malthusian approach. Most Japanese economic historians emphasized the role of distribution over the role of productivity and tended to see economic transfers as zero-sum games rather than as possible win-win situations.³ The view that the Japanese economy and population both had become stagnant during the eighteenth and early nineteenth centuries implied that the country had fallen into a Malthusian trap. Production and population had capped, and until new technologies increased agricultural and industrial production from the mid nineteenth century the population was constrained by the economy's limits on productivity.

By the late 1960s and early 1970s, however, economic historians realized that this dire picture of peasant life was by no means true for the entire country. Kozo Yamamura, in his seminal study "Toward a Reexamination of the Economic History of Tokugawa Japan, 1600-1867," offered an alternative analysis by focusing on regional differences in economic growth. Broadly speaking, he divided Japan into a rapidly developing western region and an eastern region that developed only slowly, if at all. In western Japan, double cropping, the emergence of cash crops such as indigo, canola, tobacco, and cotton, and increased merchant activity resulted in economic prosperity for many peasants as well as for numerous merchants and artisans in urban settings including castle towns large and small. Economic growth occurred at least in large parts of Japan during the eighteenth and early nineteenth centuries while the total population grew slowly if at all.

It then became necessary to explain how the country had avoided a Malthusian trap—how economic growth had continued while maintaining population stability. This is the demographic conundrum of early modern Japan. The premodern Japanese case is a rare example of a population whose growth does not keep pace with economic growth over more than a century. Since the 1970s scholars have offered several interpretations of this conundrum. Many economic historians see its solution as central to explaining Japan's economic transformation after 1868. If economic growth from the seventeenth through the early nineteenth centuries facilitated capital formation for modernization then an explanation of that growth helps us understand what followed.

² A survey of Japanese scholarship that emphasizes this perspective appears in Yamamura (1973). A more recent recapitulation appears in Cornell (1996), pp. 23-24.

³ Yamamura (1973), p. 515.

Historians examined the mechanisms of early modern Japan's economic growth and overall demographic stasis. In a key work, Kozo Yamamura and Susan Hanley illuminated the regional differences in economic and demographic change during the early modern period.⁴ Where Yamamura focused on economic change, Hanley examined the demographic. Hanley, in addition to several other scholars—including Hayami Akira 速水融, Laurel Cornell, and Saitō Osamu 齋藤修—examined demographic records, which include the religious registries (*shūmon betsu aratame chō* 宗門別改帳), secular registries (*nin betsu aratame chō* 人別改帳) and death registries (*kako chō* 過去帳).⁵ Their conclusions strongly suggested that, except possibly for infants and children, mortality was not extraordinarily high. This raises the question whether population stability resulted from infant and child mortality, low fertility, or some combination of the two.

Many historians emphasized low birth rates and cited social forces as the main causes. Yamamura forwarded the hypothesis that although some population growth occurred it was slowed, he wrote, “by the preference ... of people to increase their standard of living by means of socially accepted and institutionalized abortion, delayed marriages, and other means of population control.”⁶ In other words, where the Marxian analyses had emphasized structural limits on economic activity and decisions to have fewer or more children, Hanley and Yamamura considered rational economic choice the most important explanation. Their book, *Economic and Demographic Change in Preindustrial Japan, 1600-1868*, became the classic statement of this view. Fewer children meant more wealth and people took the drastic measures of abortion and infanticide not so much out of desperation but as means toward ensuring economic stability.⁷ Other economists and historians agreed.⁸

Embedded within this analysis are the ideas of contemporary theorists who made rational economic choice a methodological assumption. Hanley and Yamamura explicitly stated this when they cited Richard Easterlin's influential article, “An Economic Framework for Fertility Analysis.”⁹ There, Easterlin wrote: “Although the economic theory of fertility based on consumer choice has noticeable limitations, I will argue here that a more comprehensive economic framework incorporating this theory remains the best point of departure for systematic fertility analysis.”¹⁰ He then spells out the main tenets of his theory: “The standard formulation of the microeconomic theory of fertility emphasizes the demand for children as

⁴ Hanley and Yamamura (1971), Hanley and Yamamura (1977).

⁵ Cornell (1983), Hayami (1980), Saitō (1983), Cornell and Hayami (1986).

⁶ Yamamura (1973), p. 520. Also see Hanley and Yamamura (1977), p. 320.

⁷ Hanley and Yamamura (1977), p. 324.

⁸ Eng and Smith (1976), p. 422.

⁹ Hanley and Yamamura (1977), p. 34.

¹⁰ Easterlin (1975), p. 54.

the key to understanding fertility behavior. It also treats, but less fully and systematically, the costs of controlling fertility.”¹¹

One scholar who challenged this approach was Carl Mosk. In 1981, he published a work that called for the inclusion of a broad range of forces to help explain limitations on population growth in early modern Japan. Notably, he emphasized the role of poor nutrition as one cause of infertility and permanent sterility. But he also wrote:

Finally, there are probably additional conditions related to health which also shape natural fertility in a pre-modern demographic regime. If venereal diseases cannot be controlled because public health practices are rudimentary, and medical knowledge and measures of treatment are lacking, permanent sterility may not be uncommon. In short, a wide variety of factors related to the health of the population and its economic circumstances, and linked to the standard of living and the state of public health and medicine, determines natural fertility.¹²

While suggestive, Mosk did not further develop this line of reasoning in this piece, but rather emphasized seasonal work patterns, inheritance, and labor migration as the main forces in limiting population growth. Thus, he also emphasized rational economic choice as important in limiting population growth after suggesting the possible influence of venereal disease on fertility.

Since the pioneering studies of the 1970s and 1980s, the main focus of historical demography in Japan has sometimes been on the relationship between economic behavior and population growth, while at others it has been on the relationship between fertility and mortality trends. In a review essay published in 1992, Saitō Osamu outlined the most important work in the field to that time, and concluded with a call for further analyses of “economic-demographic reciprocity”.¹³

Although Mosk has not further developed the reasoning he developed in his 1981 essay, Ann Bowman Jannetta and Laurel Cornell are two scholars who have gone further in examining the impact of disease on Edo period demographic trends. In her seminal work published in 1987, *Epidemics and Mortality in Early Modern Japan*, Jannetta notes that smallpox in particular could have had a significant impact on male fertility.¹⁴ Four years later, Ann Bowman Jannetta and Samuel Preston published an examination of changing mortality trends during the Edo period using the records from temple registers in Hida domain, in present-day Gifu Prefecture.¹⁵ In that essay, Jannetta and Preston conclude that high rates of infant and

¹¹ Ibid.

¹² Mosk (1981), pp. 38-39.

¹³ Saitō (1992), p. 379.

¹⁴ Jannetta (1987), p. 189.

¹⁵ Jannetta and Preston (1991).

child mortality were the main brake on population growth and that the use of vaccinations against smallpox from the 1870s were the key to decreasing mortality among those groups.¹⁶ Based on the reasoning that as a relatively isolated rural community Hida was probably healthier in many respects than more urban areas, Jannetta and Preston infer that high infant and child mortality was a more important determinant of the demographic changes that occurred in Japan from the seventeenth to the nineteenth centuries than were changes in fertility.¹⁷ In this respect, Jannetta and Preston's essay represents an important change away from previous scholarship that emphasized economic rationality as the primary reason for Edo period Japan's demographic stability. The year after this essay was published, Jannetta published another that used the same database to analyze the impact of famine on demographic trends over the eighteenth and nineteenth centuries.¹⁸ Her main conclusion was that famine was an important deterrent to population growth during these centuries not only in Hida but throughout the country.¹⁹ Jannetta uses Hida to emphasize the role of famine—and as a consequence of Malthusian forces over economic rationality—not only in checking but temporarily decreasing the population. Yet without a synthesis of national data, the impact of famine on national population trends cannot be known as clearly as its impact on Hida. Nevertheless, Jannetta's assertion that it must be considered as one of the contributing forces in limiting Edo period Japan's population growth is convincing.

Laurel Cornell, in her important study published in 1996, examined three possible forces that could have influenced the demographic patterns of early modern Japan. The first was migration, both national and international, which she concluded was insignificant. The second was changes in exposure and resistance that would have influenced mortality, which Cornell also concluded was probably not decisive in determining population trends. Fertility was the third, and Cornell raises the question directly: "Why was fertility in the early modern period so low?"²⁰ In answering this question, Cornell does pick up Mosk's suggestion and calls attention to the possible effect of sexually transmitted diseases on fertility rates in early modern Japan. She notes that sexually transmitted diseases were common in rural Japan and that they could have had a powerful influence on the early age of last birth for many Japanese women during the early modern period.²¹ Yet she concludes her discussion on this subject by stating: "There is not enough detail available to even hazard a guess about how much this factor might have contributed to fertility levels in the early modern period, but it is important enough to warrant further investigation."²²

¹⁶ *Ibid.*, pp. 430-432.

¹⁷ *Ibid.*, p. 430.

¹⁸ Jannetta (1992).

¹⁹ *Ibid.*, p. 427.

²⁰ Cornell (1996), p. 33.

²¹ *Ibid.*, p. 42.

²² *Ibid.*

In her final conclusion, Cornell addresses primarily the relative importance of infanticide (which she calls infant homicide), which she de-emphasizes, in favor of short-term economic and child-rearing considerations on the part of married couples. She writes:

The source of moderate fertility in early modern Japan was not primarily *deliberate* control of *fertility* by individuals through *infanticide*, but instead *unconscious* control by *society* through *cultural practices* of child feeding and spousal separation. This is not to say that individuals did not make choices, but that they made simple and short-term choices rather than large and long-term ones.²³ [Emphases in original.]

In other words, Cornell emphasizes economic choices—in this case to spend time away from families in favor of working away from one’s home village, or *dekasegi* 出稼—as key determinants of family size, and as a consequence of the demographic stasis of early modern Japan. She does, however, point out that a host of other forces, including “age at marriage, sexual networking, spousal separation, breastfeeding, and the other social determinants of fertility,” also must be taken into consideration.²⁴ By implication, based on her comments on the subject in this essay, she does consider venereal disease as another determinant of fertility.

In this way Cornell’s analysis succeeds at being a more complex and nuanced examination of the forces at play in the demographic conundrum of early modern Japan than most other scholars have attempted. While she does take the subject of the relationship between fertility and venereal disease beyond Mosk’s discussion, few if any other scholars have followed Cornell’s suggestion that the impact of sexually transmitted diseases should be investigated further. In the discussion that follows, I do try to show that this subject not only warrants further discussion, as she asserts, but that present medical knowledge of STDs and STIs indeed strongly suggests that they had a sizable impact on fertility in early modern Japan.

In a more recent study of demographic change during the Edo period, Hayami Akira and Kurosu Satomi 黒須里美 describe a paradox in northeast Japan where marriage ages were low but birth rates also were low, and another paradox in Ogaki 大垣 domain where marriage age was high but fertility rates were higher than one would expect in that situation.²⁵ This study, like Cornell’s, steps away from the assumption that economic forces can sufficiently explain the observed demographic phenomena, and instead turns to diverse societal norms as a way of explaining regional differences. Hayami and Kurosu find three distinct regional demographic and family patterns in the northeast, central, and southwest parts of Japan and posit

²³ Ibid., p. 46.

²⁴ Ibid.

²⁵ Hayami and Kurosu (2001), p. 296.

“societal norms (culture)” as the basis for explaining those differences.²⁶ Nevertheless, they do use those societal norms to explain family structure primarily in terms of economic values and behavior.

All of these analyses generally lack two elements central to the processes of reproduction, and hence of demographic change. The first is an accounting of sexual customs and practices and the ways that differences in sexual behavior beyond economically motivated abstinence can have an impact on demographic trends. Cornell, again, is exceptional here in that she does mention both withdrawal and abstinence as possible contraceptive practices. In addition, Hayami and Kurosu do mention premarital sex in their work published in 2001, but only in passing. Yet none of the key studies on Edo period demographic change make sexual behavior a central element in their analyses. Rather they simply equate marriage and sexuality while seeming to embrace the tacit assumptions that sexual contact between men and women did not occur before marriage and that marriages were invariably monogamous. The second element is the relationship between disease, and of venereal disease in particular, and infertility and sterility. Although Mosk, Jannetta, and Cornell have acknowledged the relationship between disease and fertility, none make it central.

A survey by Satomi Kurosu of the English language literature on the historical demography of early modern Japan published in 2002 provides a clear overview of the field and affirms that sexuality and disease are two topics mentioned only rarely.²⁷ Of the 113 works cited in this survey, only a handful make any mention of disease and none have a main focus on the relationship between sexually transmitted diseases and infertility. It is hard to surmise why scholars of early modern Japan have not raised these subjects in their analyses of demographic change, but one likely reason is the difficulties with evidence regarding both sexual behavior and venereal disease. While there is considerable anecdotal evidence regarding sexual behavior it is difficult to reach summary conclusions, much less to establish quantifiable results. Yet despite similar problems of evidence with regard to abortion and infanticide, numerous scholars have given these issues considerable attention. Another reason that scholars have been reluctant to examine sexual behavior in particular is possibly the assumption that it varies little over time or between regions and social classes. Yet even a cursory look at the evidence strongly suggests that this certainly is not the case. For whatever reasons, scholars of historical demography have not made regional and historic differences in sexual behavior part of their considerations regarding fertility. This seems counterintuitive since by definition fertility and sexual behavior go hand-in-hand. Similarly, the role of disease and of venereal disease also has not become an important subject of consideration although medical science has established an intimate link between venereal disease, and chlamydia and gonorrhea in particular, and infertility and sterility, especially among women.

²⁶ *Ibid.*, pp. 318-320.

²⁷ Kurosu (2002).

Sexually Transmitted Disease and Fertility

Medical research has firmly established a link between sexually transmitted disease, pelvic inflammatory disease (PID), and infertility in women. The most important diseases in this respect are gonorrhea and chlamydia, caused respectively by the bacilli *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. According to one standard reference, salpingitis, or inflammation of the fallopian tube, often accompanies PID, and results in sterility in 12 to 16 percent of women who experience one episode, and up to 60 percent of women who experience three episodes.²⁸ Because both gonorrhea and chlamydia can lead to PID, repeated exposure to their bacilli and development of untreated symptoms can result in high rates of female sterility, and to a lesser degree of male sterility as well. Syphilis, while a major STD in early modern Japan, is not closely tied to infertility and as a consequence probably had little if any role in suppressing population growth there. Nevertheless, syphilis is useful as an indicator of sexual behavior since its signs and symptoms are well known. It is also useful as an index for the presence of other sexually transmitted diseases that are known to exist in Japan at the time. Where syphilis is widespread, it is invariably the result of sexual contact among many members of a population; its presence strongly implies co-infection with the pathogens of other known STIs.

Gonorrhea is an important cause of PID and subsequent salpingitis and infertility among women. A study conducted in the United States in the early 1980s estimated that there were approximately two- to two-and-one-half million new cases of gonorrhea annually in that country, and that the disease was a major cause of subsequent infertility. The disease is spread primarily by sexual contact, but also can spread from mothers to newborn infants. While the disease usually becomes manifest in the urinary tract and reproductive organs it also can infect the conjunctivae of the eyes, which, if left untreated, can lead to blindness especially among infants infected at birth. Gonorrhea long has been a commonly reported sexually transmitted disease because of its characteristic symptoms, whereas infection with the chlamydia bacillus frequently remains silent.²⁹

Of all sexually transmitted diseases, chlamydia arguably had the largest impact on fertility in premodern Japan. The evidence for this is based first on recent research about this disease and its effect on fertility, and second on the evidence that it was widespread in premodern Japan.

Although the exact risk that chlamydia infection presents to infertility remains unclear, from the twentieth and into the twenty-first century this disease has remained a major cause of infertility throughout the world.³⁰ In recent times, chlamydia has been the most widespread bacterially caused sexually transmitted disease

²⁸ Rothenberg (1993), p. 757.

²⁹ Ibid.

³⁰ Cates, Rolfs, and Aral (1990), p. 211.

worldwide, followed by gonorrhea.³¹ A chlamydia infection can be completely asymptomatic or result in only mild symptoms. Nevertheless, it is a major cause of infertility because it often results in pelvic inflammatory disease or silent infections that in turn lead to tubal factor infertility brought on by salpingitis. In addition, it can cause ectopic pregnancy, premature delivery, and neonatal infections.³² One study conducted by the World Health Organization estimated that tubal factor infertility accounted for up to forty percent of all infertility in developed countries and up to eighty-five percent of all infertility in developing countries.³³ A recent survey of studies on the relationship between chlamydia and infertility revealed that the exact risk that chlamydial PID will lead to infertility is uncertain. One expert on the disease estimated that if left untreated up to ten percent of cases would result in infertility with the first episode, with an increase of approximately ten percent for each subsequent untreated episode, up to approximately forty percent with three or more untreated episodes.³⁴

Thus, while ambiguities remain with regard to the exact risk for infertility that chlamydia and gonorrhea present, there is no doubt that where these diseases are widespread they do lower fertility rates. If these diseases were indeed common in premodern Japan and tubal factor infertility was as common there as modern studies have shown it to be in modern populations where these diseases are widespread, we can expect a significant percentage of infertility in Edo period Japan to have been the result of gonorrhea and chlamydia. Of course this conclusion depends on the evidence suggesting that these diseases existed in Japan at the time and that there is reason to believe that they were widespread.

Venereal Disease in Early Modern Japan

There is extensive textual and some archaeological evidence that strongly suggests that sexually transmitted diseases were widespread in early modern Japan. Syphilis clearly was widespread, as made apparent by descriptions of symptoms that appear in both medical texts and popular literature, as well as substantial archaeological evidence—characteristic bone lesions—found in gravesites. Textual evidence for gonorrhea suggests that it also was a common malady; gonorrhea, however, did not cause bone lesions in the same way as syphilis or tuberculosis, so no archaeological evidence can be associated with this disease. Furthermore, it is not always possible to assume that the textual descriptions distinguished between these two diseases, or that others might not have been just as or even more common. Carl Peter Thunberg (1743-1828), who lived in Japan in 1775 and 1776, noted that “venereal com-

³¹ Stamm (2001), p. 686.

³² Paavonen and Eggert-Kruse (1999), pp. 433, 435-436.

³³ *Ibid.*, p. 436.

³⁴ *Ibid.*; Wallace et al. (2007), p. 174.

plaints” were “very prevalent” in Japan and asserted that Europeans had imported them.³⁵ While it is possible to assume that many of the “venereal complaints” he observed were indeed syphilis—which has innumerable symptomatic manifestations—it is not clear that Thunberg distinguished differences between venereal diseases. It was not until 1767 that syphilis and gonorrhea were first clearly differentiated in European medicine, and firm diagnoses were never simple even following the discovery, in 1905, of the spirochete that causes syphilis. Hence it is impossible simply to equate the disease names used in premodern texts with those of modern medicine. While many of the premodern disease names can be translated into modern medical terminology, a simple translation overlooks the nosological differences that exist between premodern and modern classifications of disease.

A useful indication of those differences can be found in a work entitled *Kan'yō byōmei taishō roku* 漢洋病名對照錄 (A compendium of Chinese and Western disease names) first published in 1882.³⁶ At that time bacteriology was beginning to establish itself as an effective means of identifying diseases, putting contemporary disease names common in Western medicine in a state of flux. Indeed, many disease names common in nineteenth-century Western medicine, such as consumption, catarrh, and others that appear in this text, were soon to become obsolete. This text is especially useful for understanding contemporary concepts of disease because in addition to listing the formal Chinese-character-based disease names, it also lists the common Japanese-based (*Yamato kotoba* 大和言葉) names.

The categories by which this work classifies what we now consider sexually transmitted diseases include “inflammations” for the Western term “gonorrhea” and “venereal diseases” (*airenbyō* 愛憐病) for a number of different symptoms included under the Western term “syphilis”. Some of these probably would have been classified under the modern category of “syphilis” in its secondary or tertiary stages, but many were symptoms that could have had multiple causes other than the syphilis spirochete.³⁷ In other words, while contemporary descriptions of sexually transmitted diseases abound, it is difficult to diagnose them in modern terms based on those descriptions or on the disease names and nosologies of early modern Japan.

As a consequence, any conclusions based on modern concepts of disease must depend on more than textual evidence. For example, whether the symptoms of discharge that the author used to classify the disease *rinbyō* 淋病, which is translated to mean “gonorrhea”, were indeed caused by the bacillus *Neisseria gonorrhoeae* cannot be said. However because we know that disease caused by that organism exists in modern Japan and no evidence suggests its recent migration, we can assume that it existed during the early modern period and caused infertility among infected women.

³⁵ Screech (2005), pp. 227-228.

³⁶ Ochiai (1888).

³⁷ *Ibid.*, pp. 109-116.

In addition, there is considerable evidence for the widespread existence of what we now call syphilis in early modern Japan. Using the methods of paleopathology and paleoepidemiology, Suzuki Takao 鈴木隆雄 has shown that syphilis was widespread at that time. He estimated that between 40 and 70 percent of persons had the disease, with evidence suggesting that it occurred more frequently among commoners than among samurai.³⁸ In a separate study, Suzuki concluded that syphilis was also widespread among the Ainu at this time, and that “the persistent epidemic of syphilis prevailed in every part of this country immediately after the transmission of this disease during the late Muromachi period” (the mid sixteenth century).³⁹ By itself, this conclusion does not have special implications regarding contemporary demographic trends. Syphilis has little impact on fertility rates. Nevertheless it is important to our understanding of demographic trends because it does establish the fact that sexually transmitted diseases were widespread at the time.

Evidence for the dissemination of chlamydia in early modern Japan, like the evidence for gonorrhoea, is circumstantial. The organism that causes the disease was not discovered until 1907, and despite its discovery at the beginning of the century chlamydia did not become an established disease category until the mid twentieth century. Because it is virtually asymptomatic, this disease does not appear as a separate category in the nosologies of the West or of Japan before contemporary times. Yet the widespread existence in Japan of trachoma, a distinct form of conjunctivitis, does point to chlamydia as an important venereal disease in premodern Japan. Although its symptoms appear in early modern ophthalmology texts, trachoma did not become a separate disease category in Japan until the late nineteenth century, with the first books on the disease appearing during the early 1890s.⁴⁰

Trachoma is a chronic follicular infection of the conjunctiva, which is to say the mucus membranes of the eyelids. It is frequently found in children under age ten, and long-term effects include the inversion of the eyelashes so that they irritate the cornea. This in turn leads to corneal ulceration and opacities, decreased vision, and frequently blindness. Early symptoms include redness and watering of the eyes, swollen eyelids, sensitivity to light, leading to small red lumps on the eyelid that increase in number and size. Eye pain and corneal scarring then follow, leading to decreased vision and blindness.

These symptoms appear frequently in ophthalmology texts from the eighteenth and early nineteenth centuries, and the pioneering medical historian Fujikawa Yū 富士川遊 (1865-1940) considered a description of symptoms by the eighteenth-century ophthalmologist Yuzuki Tajun 柚木太淳 (1762-1803) to be those of trachoma.⁴¹ Yuzuki was a leading innovator of his time. He had studied with Yamawaki Tōyō 山脇東洋 (1706-1762), the Kyoto physician and Confucian scholar

³⁸ Suzuki (1984a), p. 42.

³⁹ Suzuki (1984b), p.166.

⁴⁰ Kumagai (1893), Shiono (1897).

⁴¹ Fujikawa (1979), pp. 451-452.

who had performed the first recorded public dissection of a human body in 1754, and like Yamawaki had performed medical dissections himself. Unlike Yamawaki, however, Yuzuki became an early advocate of European medical texts, especially with regard to the human eye and its pathologies.⁴² While some of the cases Yuzuki describes would possibly have been caused by the gonorrhea bacillus and other pathogens based on his descriptions of symptoms, it seems certain that *Chlamydia trachomatis* was widespread in early modern Japan.

An additional strand of evidence that supports Suzuki's conclusion with regard to the dissemination of syphilis—and by inference other common sexually transmitted diseases—among commoners is that customs such as *yobai* 夜這い were widespread outside the samurai class in premodern Japan.⁴³ There is considerable textual evidence that non-samurai women and men alike often had multiple sexual partners during their lives. Depending on the region and social class, premarital sex was common, and divorce and sometimes even extramarital sex were not uncommon, especially in rural areas.⁴⁴ Ethnographic studies have presented considerable evidence that *yobai* and similar customs that allowed multiple sexual partners at different points during a lifetime were widely accepted in some rural villages, although with great regional differences.⁴⁵ In some areas, including villages in Fukui and Kyoto prefectures, it was the custom for young women to visit men at night, and only rarely did these encounters result in marriage.⁴⁶ In other areas, such as some villages in Nagasaki prefecture, young women stayed with young men in their communal dormitories although venereal diseases were known to spread that way. In addition, the resulting relationships often resulted in marriage without parents having any say in the matter.⁴⁷

These customs became increasingly uncommon with the economic and social changes that accompanied the rise of the modern economy from the Meiji period.⁴⁸ While *yobai* and similar customs gradually disappeared in the late nineteenth and early twentieth centuries, they remained relatively common in some regions even after that. For example, in 1926, Thomas Elsa Jones described sexual customs in a study of Ibaraki, Niigata, Gifu, Shimane, and Kumamoto prefectures. He noted that the head of a young man's association in Ibaraki had estimated that less than two percent of women were virgins at marriage.⁴⁹ In short, at least in some regions, premarital sexual contact was the norm well into modern times. These customs would have encouraged the widespread dissemination of sexually transmitted dis-

⁴² Ibid., pp. 440, 448-449.

⁴³ Akamatsu (1991), pp. 139-144.

⁴⁴ Smith and Wiswell (1982), p. 274.

⁴⁵ Segawa (1972), pp. 377, 390, 402, 478-479; Akamatsu (1991), pp. 139-144.

⁴⁶ Segawa (1972), pp. 414, 430, 431.

⁴⁷ Ibid., p. 536.

⁴⁸ Akamatsu (1994a), Akamatsu (1994b), Morikuri (1995).

⁴⁹ Quoted in Smith (1983), p. 74.

eases among village populations, although a decrease in premarital sexual activity could be expected to decrease rates of infection by STDs as well. A survey of the existing literature that describes customs that encouraged multiple sex partners over a person's lifetime would be necessary to gauge regional and class differences. Such a survey would contribute greatly to a more complete examination of how venereal disease possibly affected fertility in premodern Japan.

One source that sheds considerable light on both sexual customs and venereal diseases in early twentieth century Japan is *The Women of Suye Mura* by Robert J. Smith and Ella Lury Wiswell. While her husband, John Embree, conducted his more formal Chicago-school ethnographic research on this village in Kyushu, Wiswell compiled a rich if more informal ethnography of women's customs. Even at the time of their visit in the mid 1930s, *yobai* was still practiced, although she notes that it was not as common as it had been previously.⁵⁰ Indeed, interaction between the sexes among unmarried men and women—at least in public—seems to have been somewhat restricted by this time in Suye Mura. Yet indicative of the regional differences at the time, a female informant remarked to Wiswell that they “make a lot of babies” in a mountain village called Hirayama, suggesting that *yobai* and similar customs remained common there.⁵¹

A male informant told Wiswell, “young men don't visit local women as much as they used to, but several go off to [see prostitutes at] the Menda restaurants.”⁵² This corroborates Japanese scholars who have written that from the 1890s customs that allowed young men to visit unmarried women at night started to disappear, in no small part because those same young men were visiting prostitutes who then infected them with syphilis and other venereal diseases. Wiswell also reports at least one example of a venereal disease as causing an ophthalmological disease in a child, whose eyes were inflamed and discharging pus.⁵³ This could have been caused either gonorrhea or chlamydia, although the former might be the more likely since its symptoms as a venereal disease would have been well known.

Clearly, the sexual customs of early modern and in some cases of modern Japan would have facilitated the spread of various venereal diseases, which lends support to the claim that gonorrhea and chlamydia were important determinants of fertility in early modern Japan. If approximately forty to fifty percent of people were infected with STDs, and even if only half of those had infections of gonorrhea or chlamydia, it would still mean that at least approximately ten percent of women easily could have become infertile due to one or the other of these diseases, based on what modern medical science tells us about what occurs when they are left untreated. This would have a sizable impact on birth rates.

Still, if it was the case that these diseases contributed to a lowering of fertility during the eighteenth and early nineteenth centuries, another important series of

⁵⁰ Smith and Wiswell (1982), pp. 115-116.

⁵¹ *Ibid.*, p. 117.

⁵² *Ibid.*, p. 115.

⁵³ Smith and Wiswell (1982), p. 186.

questions comes forward: What happened that might have allowed these diseases to cause an increase in infertility from the eighteenth century? Or, perhaps, are our models of rapid increase during the seventeenth century followed by stability during the following century-and-a-half inaccurate, and fertility changed more slowly during the seventeenth century? And what changed during the nineteenth century that led to increased population growth? It is possible that sexual customs were actually more conservative until the eighteenth century, after which *yobai* and similar practices might have become more common. The ethnographic evidence we do have strongly suggests that there was a national decrease in these practices from the mid to late nineteenth century, which would have decreased the transmission of venereal diseases and thereby potentially have contributed to an increase in fertility. In any event, the available evidence does support the claim that gonorrhea and chlamydia were one important determinant of fertility during the early modern period.

Conclusions

The early modern demographic conundrum has long puzzled historians, economists, and demographers but a focus on structural causes or economic rationality has led many if not all scholars to overlook an important biological cause. Infertility resulting from sexually transmitted diseases must be included in any comprehensive analysis of early modern Japanese demography. In modern populations, chlamydia and gonorrhea are the two most common of sexually transmitted diseases and both frequently lead to pelvic inflammatory disorder and subsequent infertility. There is strong circumstantial evidence that these diseases were widespread in early modern Japan and consequently they must be considered a common cause of infertility at that time as well.

Unfortunately, there is little evidence that would allow for an accurate quantitative analysis of this phenomenon. However further research could possibly demonstrate that patterns of infertility that Kurosu and others have revealed could be associated with sexual behavior. If evidence could be found to demonstrate that *yobai* and similar customs that allowed for greater sexual activity at an early age were arguably more common in northeast Japan than in other parts of the country, for example, then it would support the finding that women there tended to have fewer children and to have them at an earlier age than in other parts of Japan. Indeed, evidence presented by Segawa Kiyoko 瀬川清子 does suggest that until modern times premarital sex was common in at least some parts of northeast Japan.⁵⁴ This reduced fertility would possibly be the result of infections leading to infertility, which also is suggested by the fact that women did not quit birthing

⁵⁴ Segawa (1972), p. 377.

because they had reached a certain parity.⁵⁵ In other words, low fertility rates were—at least in part—the result of infections rather than a decision to have fewer children, or even of other decisions, such as for spouses to work in separate locations, that would have lowered fertility rates. The rational choice model assumes that people controlled conception in an age before modern contraceptives but does not demonstrate how that could have happened. While Cornell, for example, does not support a rational choice model that results directly in the limitation of family size, she does in the end argue that economic forces indirectly had that result. In addition, as Cornell also asserts, it is possible that couples practiced withdrawal or even abstinence, although it remains necessary to find evidence regarding these practices during early modern times. Certain forms of contraception did exist, but how widely practiced they might have been and how efficacious they were remain open questions.

Perhaps the most important conclusion to be drawn is that, in the end, it will never be possible to differentiate all the forces that led to early modern Japan's population stasis. In addition to venereal diseases causing sterility, there is little doubt that in many cases decisions to work outside the household for extended periods extended the period of time between births and thereby decreased fertility rates. Infant mortality, infanticide, contraception, extended periods of breastfeeding and subsequent amenorrhea, and late age at first marriage also would have contributed. All of these varied by region to create a mix that prevented significant population growth, and the best we can hope for is a clearer but never precise definition of how these—and perhaps other—forces interacted.

Considerable research remains to be done on this topic and the present article represents only a beginning step. Nevertheless future discussions of demographic change in Japan between the sixteenth and twentieth centuries do need to include sexually transmitted diseases and infections as important elements in suppressing birth rates during the eighteenth and early nineteenth centuries.

⁵⁵ Cornell (1996), p. 39.

Bibliography of Works Cited

- Akamatsu Keisuke 赤松 啓介 (1991). *Hijōmin no sei minzoku* 非常民の性民族 (The Sexual Customs of Uncommon People). Tokyo: Akashi Shoten.
- (1994a). *Yobai no minzokugaku* 夜這いの民俗学 (The Ethnography of Yobai). Tokyo: Akashi Shoten.
- (1994b). *Yobai no seiairon* 夜這いの性愛論 (On Sex and Love in the Practice of Yobai). Tokyo: Akashi Shoten.
- Bellah, Robert Neelly (1985). *Tokugawa Religion: The Cultural Roots of Modern Japan*. New York: Free Press.
- Cates, W., R. T. Rolfs, and S. O. Aral (1990). “Sexually Transmitted Diseases, Pelvic Inflammatory Disease, and Infertility: An Epidemiologic Update.” *Epidemiologic Reviews* 12: 199-220.
- Cornell, L. L. (1983). “Retirement, Inheritance, and Intergenerational Conflict in Preindustrial Japan.” *Journal of Family History* 8.1: 55-69.
- (1996). “Infanticide in Early Modern Japan? Demography, Culture, and Population Growth.” *Journal of Asian Studies* 55.1: 22-50.
- Cornell, L. L., and Hayami Akira 速水 融 (1986), “The *Shūmon aratame chō*: Japan’s Population Registers.” *Journal of Family History* 11.4: 311-328.
- Easterlin, Richard A. (1975). “An Economic Framework for Fertility Analysis.” *Studies in Family Planning* 6.3: 54-63.
- Eng, Robert Y., and Thomas C. Smith. (1976). “Peasant Families and Population Control in Eighteenth-Century Japan.” *Journal of Interdisciplinary History* 6.3: 417-445.
- Esenbel, Selcuk (2003). “The People of Tokugawa Japan: The State of the Field in Early Modern Social/Economic History.” *Early Modern Japan: An Interdisciplinary Journal* 11.1: 31-53.
- Fujikawa Yu 富士川 游 (1979). *Nihon igaku shi* 日本医学史 (The Medical History of Japan). Tokyo: Keisei Sha.
- Hanley, Susan B. (1972). “Toward an Analysis of Demographic and Economic Change in Tokugawa Japan: A Village Study.” *Journal of Asian Studies* 31.3: 515-538.
- Hanley, Susan B., and Yamamura Kozo (1971). “A Quiet Transformation in Tokugawa Economic History.” *Journal of Asian Studies* 30.2: 373-384.

- (1977). *Economic and Demographic Change in Preindustrial Japan, 1600-1868*. Princeton: Princeton University Press.
- Hayami Akira 速水融 (1980). “Economic and Demographic Change in Japan, 1600-1868.” *Journal of Family History* 5.3: 329-333.
- Hayami Akira and Kurosu Satomi (2001). “Regional Diversity in Demographic and Family Patterns in Preindustrial Japan.” *Journal of Japanese Studies* 27.2: 295-321.
- Jannetta, Ann Bowman (1987). *Epidemics and Mortality in Early Modern Japan*. Princeton: Princeton University Press.
- (1992). “Famine Mortality in Nineteenth Century Japan: The Evidence from a Temple Death Register.” *Population Studies* 46.3: 427-443.
- Jannetta, Ann Bowman, and Samuel Preston (1991). “Two Centuries of Mortality Change in Central Japan: The Evidence from a Temple Death Register.” *Population Studies* 45.3: 417-436.
- Kumagai Ken 熊谷謙 (1893). *Torahoomu ni tsuite* トラホームに就いて (On Trachoma). Hamamatsu: Kumagai Ken.
- Kurosu Satomi 黒須里美 (2002). “Studies on Historical Demography and Family in Early Modern Japan.” *Early Modern Japan: An Interdisciplinary Journal* 10.1: 3-21.
- Lockwood, William W. (1954). *The Economic Development of Japan: Growth and Structural Change, 1868-1938*. Princeton: Princeton University Press.
- Morikuri Shigekazu 森栗茂一 (1995). *Yobai to kindai baishun* 夜這いと近代買春 (Yobai and Modern Prostitution). Tokyo: Akashi Shoten.
- Mosk, Carl (1981). “The Evolution of the Pre-Modern Demographic Regime in Japan.” *Population Studies* 35.1: 28-52.
- Ochiai Taizō 落合泰蔵 (1888). *Kan'yō byōmei taishō roku* 漢洋病名對照錄 (A Compendium of Chinese and Western Disease Names). Tokyo: Jitekidō.
- Paavonen, J., and W. Eggert-Kruse (1999). “Chlamydia Trachomatis: Impact on Human Reproduction.” *Human Reproduction Update* 5.5: 433-447.
- Rothenberg, Richard B. (1993). “Gonorrhoea,” in Kenneth Kiple (ed.), *The Cambridge World History of Human Disease*. Cambridge: Cambridge University Press, pp. 756-763.
- Saitō Osamu 齋藤修 (1983). “Population and the Peasant Family Economy in Proto-Industrial Japan.” *Journal of Family History* 8.1: 30-54.

- (1992). “Infanticide: Fertility and ‘Population Stagnation’: The State of Tokugawa Historical Demography.” *Japan Forum* 4.2: 369-380.
- Screech, Timon (2005). *Japan Extolled and Decried: Carl Peter Thunberg and the Shogun’s Realm, 1775-1796*. New York: Routledge.
- Segawa Kiyoko 瀬川清子 (1972). *Wakamono to musme o meguru minzoku* 若者と娘をめぐる民族 (The Customs of Young Men and Young Women). Tokyo: Miraisha.
- Sheldon, Charles David (1958). *The Rise of the Merchant Class in Tokugawa Japan, 1600-1868: An Introductory Survey*. Locust Valley, N.Y.: J. J. Augustin.
- Shiono Kenjirō 塩野健児郎 (1897). *Ganbyō torahoomu shin chiryō* 眼病トラホーム新治療報告 (A Report on New Therapies for the Ocular Disease Trachoma). Tokyo: Shiono Kenjirō.
- Smith, Robert J. (1983). “Making Village Women into ‘Good Wives and Wise Mothers’ in Prewar Japan.” *Journal of Family History* 8.1: 70-84.
- Smith, Robert J., and Ella Lury Wiswell (1982). *The Women of Suye Mura*. Chicago: University of Chicago Press.
- Smith, Thomas C. (1959). *The Agrarian Origins of Modern Japan*. Stanford: Stanford University Press (Stanford Studies in the Civilizations of Eastern Asia series).
- Spencer, Daniel Lloyd (1958). “Japan’s Pre-Perry Preparation for Economic Growth.” *American Journal of Economics and Sociology* 17.2: 195-216.
- Stamm, W. E. (2001). “Chlamydia Trachomatis—The Persistent Pathogen: Thomas Parran Award Lecture.” *Sexually Transmitted Diseases* 28.12: 684-689.
- Suzuki Takao 鈴木隆雄 (1984a). *Paleopathological and Paleoepidemiological Study of Osseous Syphilis in Skulls of the Edo Period*. Tokyo: University of Tokyo Press.
- (1984b). “Paleopathological Study on Osseous Syphilis in Skulls of the Ainu Skeletal Remains.” *Ossa* 9.11: 153-167.
- Wallace, Lesley A., Anne Scoular, Graham Hart, Margaret Reid, Phil Wilson, and David J. Goldberg (2007). “What is the Excess Risk of Infertility in Women Following Genital Chlamydia Infection? A Systematic Review of the Evidence.” *Sexually Transmitted Infections* 84.6: 171-175.
- Yamamura Kozo (1973). “Toward a Reexamination of the Economic History of Tokugawa Japan, 1600-1867.” *Journal of Economic History* 33.3: 509-546.