Population Dynamics in Pre-Modern China
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Introduction

China constituted one of the earliest civilizations in the world. During most of the past two millennia, China was also one of the most advanced economies and the home of around a quarter of the world's population. By the start of the first millennium, the Chinese population was already about sixty million. In the next two thousand years, China's population growth and economic development significantly influenced the world's population changes and history. Partly for these reasons, in the study of population and social history, China's historical population growth, demographic regimes, marriage patterns, and household formation systems are frequently used as examples in the discussion of population changes, microsocial structure, and their relationships with natural resources and economic development in past times. Population changes were one of the key components of Chinese history. The size and density of the population, the rise and fall of fertility and mortality, and the increase and decrease of population movements were not only related to demographic factors such as age structure. They were also strongly affected by political and economic conditions, social institutions and cultural traditions, and natural and social environments. Therefore, studies of demographic history, those conducted recently in particular, often shed new light on economic, political, social, and environmental changes in the past. This bibliography, through reviewing major works published in Chinese and English, provides an introduction to China's main historical population data sources, major research questions, and debates in the study of Chinese population history. It also introduces recent advances in Chinese historical demography and important research findings made by these developments.

Data Sources

Studies of population history, detailed studies of past demographic changes in particular, rely heavily on surviving population data. China has a long history of collecting demographic data. A large amount of these data are still available, and they have been used widely in the investigation of population history. This section discusses Aggregate Population Statistics, Population or Household Registers, Family or Lineage Genealogies, and some Other Data Sources that have been commonly used in the study of Chinese historical demography. Understanding the nature and characteristics of these historical data is essential for those who want to use them to study population history or want to correctly interpret the results of such studies, including those to be discussed in later sections of this bibliography.

AGGREGATE POPULATION STATISTICS

To meet the need of collecting taxes, recruiting soldiers, conscripting for labor, and other demands, the Chinese government started collecting population data a long time ago. According to Liang 1980, population and land registration systems had already existed in the Zhou Dynasty (c. the mid-11th century to 256 BCE). Aggregate data such as population totals, number of households, number of adults or eligible taxpayers, and other statistics recorded in various dynasties are still available for many counties, prefectures, provinces, and the country as a whole. These data are often found in official records, government reports, history books, and gazetteers. Chen 1947 and Durand 1960 (cited under Studies Using Aggregate Population Statistics) were among the earliest assessments of China's historical population data. The author of Liang 1980 systematically examined, compiled, and edited China's population, land, and taxation statistics recorded in the past two millennia. Yang 1996 is a similar effort, though scholars had different views about its contribution, as shown in Li 1997 and Ge and Cao 1998. Aggregate population statistics, which usually cover a long period, are easy to use because they may not need further calculation. But they are often affected by registration problems. The boundary of administrative areas from which population data were collected could change over time, though this may not have been noted when population statistics were recorded. Also, the rise or fall in recorded population totals might not represent actual population growth but

might reflect only changes in the ability of the government to control or register its population. Furthermore, population data were often collected for different purposes or according to different rules. The recorded figure might not refer to the total but only parts of a population. Sometimes, the statistics might not be the number of people but tax units. Ho 1959 critically evaluates aggregate population statistics recorded from 1368 to 1953 and studies some of these issues. Skinner 1986 carefully investigates the inconsistencies between disaggregated data collected from Sichuan in the 19th century and the population totals. Zhao and Xie 1988 also systematically examines aggregate population statistics for around two thousand years, and the effect of territory changes on recorded population growth. Another limitation of surviving aggregate population statistics is that they show only changes in total population, sometimes with its regional distribution, but provide no information about past fertility, mortality, and marriage patterns. Because of this, studies based exclusively on aggregate population data often result in considerable uncertainties.

Chen, Ta. "An Appraisal of China's Historical Population Data." *American Journal of Sociology* 52, supp. (1947): 1–6.

This is a short introduction to China's historical population data, and it provides one of the earliest examinations of their nature, limitations, and major uses.

Ge Jianxiong 葛剑雄 and Cao Shuji 曹树基. "Shi xueshu chuangxin, haishi di shuiping de zillao bianzuan? Ping Yang Zihui zhubian zhongguo lidai renkou tongji zillao yanjiu" (是学术创新, 还是低水平的资料编纂? 评杨子慧主编中国历代人口统计资料研究). *Lishi yanjiu* (历史研究) 1 (1998): 154–166.

This review suggests that the work edited by Yang Zihui is just a low-quality collection of historical data, and challenges its importance and contribution.

Ho, Ping-ti. *Studies on the Population of China, 1368–1953*. Cambridge, MA: Harvard University Press, 1959.

This pioneering book, among others, has critically and systematically examined population data and other aggregate statistics recorded in China since the 14th century. It investigates a wide range of registration problems and, on the basis of that, estimates China's long-term population growth.

Li Jingneng 李竞能. "Zhongguo renkoushi de juzhu: Ping Yang Zihui jiaoshou zhubian de zhongguo lidai renkou tongji zillao yanjiu" (中国人口史的巨著: 评杨子慧主编中国历代人口统计资料研究). *Renkou yanjiu* (人口研究) 21.4 (1997): 78–80.

This review paper highly praises the importance and contribution of the work edited by Yang Zihui.

Liang Fangzhong 梁方仲. *Zhongguo lidai hukou, tian di, tian fu tongji* (中国历代户口、田地、田赋统计). Shanghai: Shanghai renmin chubanshe, 1980.

This publication is one of the most comprehensive collections of China's historical population, arable land, and land tax statistics. It is an important reference and a major data source for scholars working in demographic, economic, and social history. In this work, Liang systematically examined major registration problems and edited China's population, arable land, and land tax statistics recorded in the past two thousand years.

Skinner, G. William "Sichuan's Population in the Nineteenth Century: Lessons from Disaggregated Data." *Late Imperial China* 7.2 (1986): 1–79.

This paper carefully analyzes disaggregated data collected from Sichuan in the 19th century, comparing them with the province population totals produced in the same period. It examines inconsistencies between these population statistics and discusses major lessons drawn from this study.

Yang Zihui 杨子慧, ed. *Zhongguo lidai renkou tongji ziliao yanjiu* (中国历代人口统计资料研究). Beijing: Zhongguo gaige chubanshe, 1996.

This edited work, contributed by more than thirty researchers, is nearly 3.7 million words in length. It has systematically compiled and assessed China's historical population data according to major areas of research. On the basis of that it also comments on or analyzes demographic changes in these areas.

Zhao Wenlin 赵文林 and Xie Shujun 谢淑君. *Zhongguo renkou shi* (中国人口史). Beijing: Renmin chubanshe, 1988.

The authors systematically collected and analyzed China's aggregate population statistics. Differing from many other researchers, Zhao and Xie were very careful in selecting and using historical data and paid particular attention to the impact of territory changes on population growth in the past.

POPULATION OR HOUSEHOLD REGISTERS

Aggregate population statistics were generally obtained through censuses or population or household registration, which were administered by governments. Population or household registers usually recorded the population in a clearly defined area. The records often included the name, age, sex, relationship to the household head, and marital status, and sometimes the occupation of the recorded household member and other information. Household registers found in Dunhuang were used in Liao 2001. They were made during the Tang dynasty (618–907 CE) and are among the oldest available records of this kind. In recent centuries, population or household registers in many areas were made or updated at regular intervals; for example, every three years. Records of this kind include those made in the Ming dynasty (1368–1644 CE), discussed in Zhou 2001, and those produced during the Qing dynasty (1644–1911) and used in Campbell, et al. 2004 and Lee, et al. 2010. In the first half of the 20th century, population or household registration was also made under Japanese rule in Taiwan and parts of Mainland China. These records, which were used in Wolf and Huang 1980 (cited under Demographic Changes, Household Formation, and Composition), were very similar to but sometimes provided more details than those made before them. Surviving population or household registers are one of the most common and important data sources for historical demography. These data, being recorded at the level of individuals, offer an opportunity for researchers to assess the reliability of the general demographic trends indicated by recorded population totals and to conduct detailed studies of population dynamics in the past. However, as is discussed in Lee, et al. 2010; Zhao 2010; and Campbell 2012, population or household registers do not usually record numbers of marriages, births, and deaths, though such numbers may be estimated if successive registration data are available and can be linked together. Population or household registers also tend to miss out on the information about people who migrated to other areas and to underenumerate women and young children. Such underregistration may not be distributed randomly across subpopulation groups or households. For these reasons, uncertainties are sometimes found in population size and structure, infant and child mortality rates, birth rates, and marriage rates calculated or estimated from surviving population or household registration data.

Campbell, Cameron. "Historical Demography." Los Angeles: California Center for Population Research, University of California, Los Angeles, 2012.

The paper reviews the development of historical demography and provides a detailed examination of population or household registers and other census-type materials.

Campbell, Cameron, with Satomi Kurosu, Matteo Manfredini, Muriel Neven, and Tommy Bengtsson. "Appendix: Sources and Measures." In *Life under Pressure: Mortality and Living Standards in Europe and Asia, 1700–1900*. By Tommy Bengtsson, Cameron Campbell, James Lee, et al., 441–476. Cambridge, MA: MIT Press, 2004.

In this chapter, the authors reviewed data sources that are commonly used for the study of population and family history. They particularly examined household registers collected from Belgium, China, Italy, Japan, and Sweden, and described how such data were used in their comparative studies of demographic behaviors and family life in the past.

Lee, James Z., Cameron D. Campbell, and Shuang Chen. *China Multi-generational Panel Dataset, Liaoning (CMGPD-LN), 1749–1909: User Guide*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research, 2010.

This user guide provides detailed information about population or household registration in Liaoning over the period 1749–1909. It presents an introduction to the data sources, examines their characteristics and limitations, and offers examples on how these data can be used for the study of historical demography.

Liao, Tim Futing. "Were Past Chinese Families Complex? Household Structures during the Tang Dynasty, 618–907 AD." *Continuity and Change* 16.3 (2001): 331–355.

In the paper, the author discussed the household registers found in Dunhuang, which were made more than one thousand years ago, and used them to examine household composition at the time.

Zhao, Zhongwei. "Historical Demography." In *Demography*. Edited by Yi Zeng, 38–64. Oxford: Online Encyclopedia of Life Support Systems (EOLSS), 2010.

The chapter provides an introduction to the development of historical demography in the world and discusses its major data sources, including population or household registers. Available online by subscription.

Zhou Shaoquan 周绍泉. "Zhongguo Mingdai renkou tongji de jingwei yuxian cunhuang cediji" (中国明代人口统计的经纬与现存黄册底籍). *Zhongguo xueshu* (中国学术) 4 (2001).

The paper discusses population registration in the Ming dynasty (1368–1644 CE) and examines the question whether Huangce or population registers had recorded women and children. It shows that at least in the early period and in some areas, women and children were included in the records, although there were notable variations in the quality and practice of the registration over time.

FAMILY OR LINEAGE GENEALOGIES

The Chinese have a long history of compiling family or lineage genealogies, which record family or lineage members, their descent from common ancestors, and the relationships between them. Pan 1929 suggests that this practice was already common among upper classes in the *Wei Jin Nanbei Chao* period (220–589 CE) and then spread gradually to other parts of the population. This resulted in a great number of genealogies, and many of them have survived to present, as indicated in Telford, et al. 1983. Family or lineage genealogies can cover a very long period, can map detailed kinship networks between recorded individuals, and may include information on migration of their members. All these make them a major data source for Chinese historical demography, as suggested in Telford 1986. However, the information included in genealogies varies greatly. Using genealogical records for demographic research is not easy because of the following reasons. According to Harrell 1987, Telford 1990, and Zhao 1994 (cited under Demographic Constraints), genealogical records can be affected by various types of underregistrations, such as underrecording of females, children who died young, and members who brought disgrace to the family or moved to other places. Patching the holes created by these underregistration problems can be a major challenge. Oeppen 1999 also shows that genealogies may be affected by selective biases if they were compiled by people of later generations through tracing their ancestors back through time. This resulted in an ascendant genealogy, which requires each generation to have at least one member to survive into adulthood. Thus, comparing with the whole population, the recorded family or lineage members tended to experience lower mortality and higher fertility. Even if a genealogy was not compiled in an ascendant way, it can still be affected by demographic selection. Zhao 2001 suggests that most available genealogies are records of families or lineages surviving to recent or current times. In comparison with families or lineages that were extinguished a long time ago, they were more likely to have experienced favorable demographic conditions such as higher fertility, lower mortality, higher proportion, and younger ages of marrying (for patrilineages, also slightly higher sex ratios at birth). Such selective biases tend to be found in the first few generations recorded in a genealogy. Their impacts usually become less observable thereafter.

Harrell, Stevan. "On the Holes in Chinese Genealogies." *Late Imperial China* 8.2 (1987): 53–79.

The paper examines a wide range of registration problems found in genealogical records and their potential impacts on the study of Chinese historical demography.

Oeppen, Jim. "Genealogies as a Source for Demographic Studies: Some Estimates of Bias." Paper presented to the workshop on Genes, Genealogies and Longevity, Rostock, Germany, 1999.

The paper discusses major differences between descendant genealogies and ascendant genealogies. It particularly examines the bias of ascendant genealogies when they are used to study demographic changes in an average population. It is a useful reference for those who want to use genealogies for demographic research.

Pan Guangdan 潘光旦. "Zhongguo jiapu xuelue shi" (中国家谱学略史). *Dongfang zazhi* (东方杂志) 26.1 (1929): 107–120.

The paper is one of earliest introductions to Chinese genealogies, especially changes in the practice of compiling family or lineage genealogies in Chinese history.

Telford, Ted A. "Survey of Social Demographic Data in Chinese Genealogies." *Late Imperial China* 7.2 (1986): 118–148.

In this paper, the author systematically examined the nature and major characteristics of Chinese genealogies, social demographic information contained in such materials, and how such information may be used in the study of population history. It is a useful reference for historical demographers.

Telford, Ted A. "Patching the Holes in Chinese Genealogies: Mortality in the Lineage Populations of Tongcheng County, 1300–1880." *Late Imperial China* 11.2 (1990): 116–136.

In this study, the author not only discussed the underregistration problems found in genealogies and their impacts on the study of mortality. He also used demographic techniques to estimate such impacts and provided a useful example of using incomplete genealogical data to study past mortality changes.

Telford, Ted A., Melvin P. Thatcher, and Basil Pei-nai Yang, comps. *Chinese Genealogies at the Genealogical Society of Utah: An Annotated Bibliography*. Taipei: Ch'eng wen chubanshe, 1983.

This publication provides an annotated bibliography for the Chinese genealogies collected by the Genealogical Society of Utah up to the early 1980s. It is also a useful introduction to Chinese genealogies and examines many issues about the genealogical materials and their uses.

Zhao, Zhongwei. "Chinese Genealogies as a Source for Demographic Research: A Further Assessment of Their Reliability and Biases." *Population Studies: A Journal of Demography* 55.2 (2001): 181–193.

In this paper, the author suggested that most available genealogies are records of families or lineages surviving to recent or current times. The survival of these families or lineages is partly attributable to the fact that they have experienced comparatively favorable demographic conditions. Therefore, their genealogical records, especially those of the first few recorded generations, still tend to show some selective biases.

OTHER DATA SOURCES

In addition to the three types of data discussed above, many other available data sources can also be used in the study of Chinese population history. They include, for example, land registers produced in many historical periods; aggregate land and farm tax statistics, as discussed in Liang 1980 (cited under Aggregate Population Statistics); registers of births; registers of deceased children and adult men; registers of engagements and marriages, lists of widows, and regular population reports kept for the Qing imperial lineages, described in Ju 1994; records of longevity and biographies of virtuous women or faithful widows collected by prefecture or county gazetteers, discussed in Elvin 1999 and Elvin and Fox 2009; court records and legal settlements (especially those of civil disputes and associated criminal cases) and related official reports, analyzed in Wang 2000; and epitaphs, examined in Ebrey 1995 (cited under Marriage) and Jiang 2003. These records, in comparison with those discussed earlier, tend to be less common, more selective, and more difficult to analyze using conventional demographic methods. But they and some other historical data have also been used in the studies of population and social history, which led to some important research findings. In addition, some historical Chinese demographic databases have been constructed and made available recently, such as the one described in Lee, et al. 2010. They will become a useful data source for research and teaching in historical demography.

Elvin, Mark. "Blood and Statistics: Reconstructing the Population Dynamics of Late Imperial China from the Biographies of Virtuous Women in Local Gazetteers." In *Chinese Women in the Imperial Past: New Perspectives*. Edited by Harriet Zurndorfer, 135–222. Boston: Brill, 1999.

This book chapter introduces the biographies of virtuous women found in local gazetteers and examines their usefulness and limitations in the study of Chinese population history. The author also developed a method and used it to analyze these historical data and to model demographic patterns in the past.

Elvin, Mark, and Josephine Fox. "Marriages, Births, and Deaths in the Lower Yangzi Valley during the Later Eighteenth Century." In *Windows on the Chinese World: Reflections by Five Historians*. Edited by Clara Wing-chung Ho, 67–112. Lanham, MD: Lexington, 2009.

This is a further study that uses the biographies of virtuous women found in local gazetteers to investigate marriage, fertility, and mortality patterns in the lower Yangzi valley in the 18th century.

Jiang Yibin 蔣義斌. "You Songdai muzhiming kan Songdai jiating de kunjing: Fenjia jiqi xiangguan wenti" (由宋代墓誌銘看宋代家庭的困境: 分家及其相關問題). Paper presented to Songdai muzhiming guoji xueshu yantaohui (宋代墓誌銘國際學術研討會), Taiwan, October 2003.

The study analyzes the information obtained from epitaphs, and examines family life and household division in the Song dynasty (960–1279 CE).

Ju Deyuan 鞠德源. "Qingdai huangzu renkou ceji" (清代皇族人口冊籍). In *Qingdai huangzu renkouxingwei he shehui huanjing* (清代皇族人口行为和社会环境). Edited by Li Zhongqing 李中清 (James Z. Lee) and Guo Songyi 郭松义, 170–190. Beijing: Beijing daxue chubanshe, 1994.

The article systematically introduces demographic data collection in the Qing imperial lineage and more than ten types of population registration registers.

Lee, James Z., Cameron D. Campbell, and Shuang Chen. *China Multi-generational Panel Dataset, Liaoning (CMGPD-LN), 1749–1909: User Guide*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research, 2010.

As suggested by this user guide, the authors constructed a large historical demographic database and made it available online. The user guide provides detailed information about these demographic data and how the database can be used for the study of historical demography.

Wang Yuesheng 王跃生. *Shiba shiji Zhongguo hunyin jiating yanjiu* (十八世纪中国婚姻家庭研究). Beijing: Falü chubanshe, 2000.

This book, in addition to studying marriage and family in the 18th century, introduces court records, legal settlements, and related official reports made during the Qing dynasty (1644–1911). It examines the information about population, marriage, family, and household that can be obtained from these records, and their selective biases. It provides a useful example of using these data for study of population and social history.

Studies of Past Population Dynamics

In the first half of the 20th century, scholars had already used available demographic data to study population dynamics in the past. In Liang 1965 (first published in 1903) the author examined population changes in Chinese history and concluded that China's population had reached one hundred million in the Song dynasty (960–1279 CE). Yuan 1931 analyzes mortality data obtained from genealogies and constructs life tables for a lineage population. More-systematic investigations of past demographic regimes and population changes started from the mid-20th century. In the early period of this development, studies were confined mainly to the examination of population totals calculated at national or provincial levels. Ho 1959 (cited under Aggregate Population Statistics) is a pioneering work and is widely regarded as a landmark study of this kind. Liang 1980 (cited under Aggregate Population Statistics) is also a major effort made in the early period, though it concentrates mainly on editing and compiling surviving population statistics. Since the 1970s, an increasing number of researchers have used historical population data recorded at the level of individuals to investigate past demographic changes, their variations, and a wide range of factors that affected these changes and variations. This was begun by a dozen researchers in Western countries and Taiwan, and similar changes have been observed in Mainland China in recent years. This led to a remarkable development in historical demography, as indicated by a growing number of publications—for example, Wolf and Huang 1980 (cited under Demographic Changes, Household Formation, and Composition), reporting the authors' study of marriage, fertility, and adoption under Japanese rule in colonial Taiwan; Hanley and Wolf 1985, a comparative study of population and family in historical China and Japan; Liu 1992, a large investigation of lineage population history; Harrell 1995, reporting historical microdemographic studies conducted by several scholars; Lee and Campbell 1997 (cited under Studies Using Demographic Data Recorded at the Individual or Household Level), an examination of historical household registers in northeast China; and Lee and Wang 1999, a study that on the basis of recent research findings in historical demography challenges the Malthusian views about demographic systems in Chinese history.

Hanley, Susan B., and Arthur P. Wolf, eds. *Family and Population in East Asian History*. Papers presented at a conference held in Oxford, 20–25 August 1978. Stanford, CA: Stanford University Press, 1985.

This is one of the early collections of historical demographic studies that use detailed population data to examine past demographic patterns. The book includes six chapters that examine demographic changes both in Taiwan and Mainland China in the past, and the debate on fertility levels in historical Chinese populations.

Harrell, Stevan, ed. *Chinese Historical Microdemography*. Berkeley: University of California Press, 1995.

This edited book includes eight chapters contributed by several leading scholars. Through analyzing genealogical records, population registers, and epitaphs, they examine marriages, fertility, mortality, demographic constraints on family structure, and migration in several historical Chinese populations living in the past millennium.

Lee, James Z., and Wang Feng. *One Quarter of Humanity: Malthusian Mythology and Chinese Realities, 1700–2000*. Cambridge, MA: Harvard University Press, 1999.

On the basis of their recent analysis of population registers and genealogical records as well as research findings reported by other studies, the authors of this book examine demographic changes in historical China and challenge the Malthusian views about demographic systems in Chinese history.

Liang Qichao 梁启超. "Zhongguo shishang zhi renkou tongji" (中国史上之人口统计). In *Zhongguo lidai renkou wenti lunji* (中国历代人口问题论集). Edited by Xianggang yadong xueshe, 300–311. Hong Kong: Yadong xueshe, 1965.

This may be one of the earliest studies that tried to use modern statistical and demographic methods to examine and comment on China's population data and historical population growth. First published in 1903.

Liu Ts'ui-jung 劉翠溶. *Ming-Qing shiqi jiazu renkou yu shehui bianqian* (明清時期家族人口與社會經濟變遷). 2 vols. Taipei: Zhongyang yanjiu yuanjing jiyuan jiusuo, 1992.

Title translates as Lineage population and socio-economic changes in the Ming-Ch'ing periods. This is one of the largest studies in Chinese historical demography, and it analyzes genealogical records of some fifty lineage populations. The study systematically examines marriage, fertility, mortality, demographic constraints on household formation, and migrations in these lineage populations during China's Ming (1368–1644 CE) and Qing (1644–1911 CE) periods.

Yuan, I-chin. "Life Tables for a Southern Chinese Family from 1365 to 1849." *Human Biology* 3.2 (1931): 157–179.

This is the first historical demographic investigation that used surviving genealogical materials and modern demographic techniques to study mortality in the Chinese lineage population.

STUDIES USING AGGREGATE POPULATION STATISTICS

A considerable number of studies, which mainly used aggregate population statistics and secondary data sources of other kinds, have been published since the mid-20th century. These studies concentrate primarily on long-term population changes and their relationships with economic development, social changes, political stability, and impacts of wars and natural disasters. Their major results have been reported in a dozen books and some journal articles. Ho 1959 was one of the earliest and most influential books in English. Another English publication examining China's long-term population changes is Durand 1960. In addition, Chao 1986 investigates population growth and changes in people-land ratios in Chinese history, and Barclay 1954 (cited under Population History of Taiwan) examines economic development and population changes in Taiwan in the first half of the 20th century. Zhao and Xie 1988 (cited under Aggregate Population Statistics) was one of the earliest major studies published in Mainland China, which was followed by Jiang 1993, Duan 1995, Wang 1995 (cited under Long-Term Population Growth), Ge 2000–2002, and some other studies. In comparison with other similar works, the six-volume publication edited by Ge provides a more detailed and systematic examination of population changes in Chinese history. In addition to these books, many articles have been published. Although a number of them, such as Zhu 1998, also describe China's long-term population changes, most of these studies tend to focus on population changes in a particular region or a historical period. Studies that use aggregate population statistics are very useful in describing recorded population changes and major factors associated with them. But because their analyses have often been based on population totals, they could not provide detailed information about fertility, mortality, and marriage. Partly due to the lack of such details, conclusions drawn from aggregate population statistics sometimes can be uncertain or even incorrect.

Chao, Kang. *Man and Land in Chinese History: An Economic Analysis*. Stanford, CA: Stanford University Press, 1986.

This book examines population growth and changes in people-land ratios in Chinese history. It also examines changes in urban population and in areas of cultivated land, changes in productivity and living standards, land distribution and

fragmentation, and tenancy and landlordism, testing a number of hypotheses.

Duan Jixian 段纪尧. *Zhongguo lidai renkou shehui yu wenhua fazhan* (中国历代人口社会与文化发展). Beijing: Zhongguo kexue jishu chubanshe, 1995.

In this book, the author examined China's historical population changes and their patterns, impacts, and major determinants. The author also examined Chinese society and family, Chinese culture, and some other issues.

Durand, John D. "The Population Statistics of China, A.D. 2–1953." *Population Studies: A Journal of Demography* 13.3 (1960): 209–256.

It systematically examines the data sources, consistencies, credibility, and uses of aggregate population statistics recorded in China in the past two millennia.

Ge Jianxiong 葛剑雄, ed. *Zhongguo renkou shi* (中国人口史). 6 vols. Shanghai: Fudan daxue chubanshe, 2000–2002.

This is a major publication on Chinese population history that is based largely on aggregate population statistics and other secondary data sources. Several researchers contributed to this edited book, which provides a more detailed examination on many aspects of Chinese population history than many similar books published previously.

Ho, Ping-ti. *Studies on the Population of China, 1368–1953*. Cambridge, MA: Harvard University Press, 1959.

This pioneering book critically examines population data and other aggregate statistics and estimates China's population changes since the mid-14th century. The author also examined how these changes were related to changes in the area of arable land, agricultural production, taxation policies, land tenure practice, the state of government, social stability, and the effects of natural disasters and wars.

Jiang Tao 江涛. *Zhongguo jindai renkou shi* (中国近代人口史). Hangzhou, China: Zhejiang renmin chubanshe, 1993.

In the book, the author systematically examined population changes in China since the 17th century, including population growth, regional distribution, migration trends and patterns, urban and rural populations, and population policies.

Zhu Guohong 朱国宏. "Zhongguo lishi renkou zengzhang zai renshi: Gongyuan 2—1949" (中国历史人口增长再认识: 公元2—1949). *Renkou yanjiu* (人口研究) 22.3 (1998): 14–20.

This article, through analyzing surviving aggregate population statistics, examines population growth in Chinese history and major factors that affected national population changes in the past.

STUDIES USING DEMOGRAPHIC DATA RECORDED AT THE INDIVIDUAL OR HOUSEHOLD LEVEL

To meet the challenge of providing detailed information about past population dynamics, many researchers, especially demographers or historical demographers, have used conventional and nonconventional demographic methods to analyze surviving population data recorded at the level of individuals or households. Wolf and Huang 1980 (cited under Demographic Changes, Household Formation, and Composition); Liu 1992; Harrell 1995; Lee and Campbell 1997; Lee and Wang 1999 (cited under Studies of Past Population Dynamics); Zhou, et al. 2004; and many other studies examine past fertility, mortality, and marriage patterns; variations in people's demographic behaviors; and major factors affecting such behaviors and demographic patterns. On the basis of these microinvestigations, researchers also examined long-term demographic changes and related theoretical issues. While some of these studies covered a relatively short period and a comparatively small population because of their data-demanding nature, Liu 1992, Harrell 1995, Lee and Campbell 1997, and Lee and

Wang 1999 analyze demographic data from fairly large historical populations. The authors have provided considerable insights about past demographic regimes and people's demographic behaviors, which are very difficult to achieve through analyses of aggregate demographic data. It is important to emphasize, however, that surviving individual- or household-level data could also be affected by various types of registration problems. These too need to be treated carefully. Otherwise, the study results can be affected as well.

Harrell, Stevan. "Introduction: Microdemography and the Modeling of Population Process in Late Imperial China." In *Chinese Historical Microdemography*. Edited by Stevan Harrell, 1–20. Berkeley: University of California Press, 1995.

In this chapter, the author provided a useful introduction to the development of Chinese historical demography, major data sources, and research questions.

Lee, James Z., and Cameron D. Campbell. *Fate and Fortune in Rural China: Social Organization and Population Behavior in Liaoning, 1774–1873*. Cambridge, UK: Cambridge University Press, 1997.

This study uses population registers collected from Liaoning to study demographic changes in the recorded population over the period 1774–1873. It is a large study and also one of the earliest studies of this kind.

Liu Ts'ui-jung 劉翠溶. *Ming-Qing shiqi jiazu renkou yu shehui bianqian* (明清時期家族人口與社會經濟變遷). 2 vols. Taipei: Zhongyang yanjiu yuanjing jiyuan jiusuo, 1992.

Title translates as Lineage population and socio-economic changes in the Ming-Ch'ing periods. This is a large investigation of population history conducted through analyzing genealogical data. The author, among others, systematically examined demographic changes in some fifty lineage populations. The study provides detailed information about marriage, fertility, mortality, demographic constraints on household formation, and migrations in these populations, for a period of more than half a millennium. It provides an example of using genealogical records to study population history.

Zhou Shaoquan 周紹泉, Emiko Ochiai 落合惠美子, and Hou Yangfang 侯楊方. "Mingdai huangce diji zhongde renkou yu jiating—Yi Wanli Huizhou huangce diji wei zhongxin" (明代黃冊底籍中的人口與家庭—以萬曆徽州黃冊底籍為中心). In *Jiatingshi yanjiu de xinshiyue* (家庭史研究的新視野). Edited by Zhang Guogang 張國剛, 218–261. Beijing: Sanlian chubanshe, 2004.

Using population registers made during the Ming dynasty (1368–1644), the author examined household formation and composition in the recorded population.

Population Changes in Premodern China

Population changes in a country or an area are determined directly by the levels of fertility, mortality, and migration. These three components are closely related to and influenced by marriage patterns, household formation and composition, and a wide range of environmental, social, economic, and political factors. This section provides a brief introduction to Long-Term Population Growth, Past Demographic Systems, Marriage, Fertility, Debates on Fertility Levels and Reproductive Behaviors in Historical China, Mortality, and Migration. It also discusses Demographic Changes, Household Formation, and Composition, and Population History of Taiwan.

LONG-TERM POPULATION GROWTH

According to available records, the Chinese population was already close to sixty million in the year 2 CE. Zhao and Xie 1988 shows that although there were marked fluctuations in recorded population size during the first millennium, China's population reached one hundred million by the 11th century. Since then, it has continued to grow despite notable oscillations. Ho 1959 (cited under Aggregate Population Statistics) suggests that the Chinese population reached 150 million by the late

16th or the early 17th century. While not all scholars shared this view, most of them, such as the authors of Zhao and Xie 1988, Duan 1995 (cited under Studies Using Aggregate Population Statistics), Wang 1995, and Ge 2000–2002 accepted that the Chinese population reached about three hundred million by the year 1800 and 430 million by 1850. According to China's 1953 census, the population grew further to around 550 million by the mid-20th century. Despite the uncertainties in estimated population size for China and the world, McEvedy and Jones 1978, Maddison 2003, and other studies conclude that the Chinese population probably comprised a quarter or more of the world population for most of the past two millennia. According to the statistics presented above, China's average annual population growth rate was very low before the 15th century, although an appreciable increase might have taken place during certain periods. Since then, population growth became more evident, as pointed out in Zhao 1997 (cited under Past Demographic Systems). The average annual population growth rate was about four per thousand from the early 16th century to the mid-20th century. During this period, accelerating population growth was also recorded in many parts of the world. From the early 19th century to the early 20th century, for example, average annual population growth rate in many European countries was above nine per thousand, much higher than that observed in China in the same period. Since 1950, China's population entered a period of very rapid growth. It more than doubled in the next six decades and reached 1.3 billion by 2010.

Ge Jianxiong 葛剑雄, ed. *Zhongguo renkou shi* (中国人口史). 6 vols. Shanghai: Fudan daxue chubanshe, 2000–2002.

This major publication, which several researchers contributed to, examines population changes by historical periods and by regions, and the impacts of major historical events on these changes. It presents more details about China's population history than most books, which were published earlier and written on the basis of analyzing aggregate population statistics, and addresses some theoretical issues.

Maddison, Angus. *The World Economy: Historical Statistics*. Paris: Development Centre of the Organisation for Economic Co-operation and Development, 2003.

This publication is a useful reference. It examines long-term population changes and economic developments by major regions and countries in the world. Some related demographic and economic data are provided by the Conference Board Total Economy Database and can be accessed online.

McEvedy, Colin, and Richard Jones. *Atlas of World Population History*. Harmondsworth, UK: Penguin, 1978.

In this book, the authors graphically present population estimates and comment on population growth for many regions and countries in the world over a period of more than two thousand years.

Wang Yumin 王育民. *Zhongguo renkou shi* (中国人口史). Nanjing, China: Jiangsu renmin chubanshe, 1995.

In this publication, the author studied population changes in China's long history. On the basis of his analysis, Wang divided China's population development of more than two thousand years into five major phases and examined the major trends and characteristics of population changes in each of these historical periods.

Zhao Wenlin 赵文林 and Xie Shujun 谢淑君. *Zhongguo renkou shi* (中国人口史). Beijing: Renmin chubanshe, 1988.

The book, on the basis of systematically collected aggregate population statistics, examines China's population changes for more than two thousand years. It also investigates population distributions in urban and rural areas and in different regions, population changes and economic growth, major factors that affected population changes in the past, and many other issues.

PAST DEMOGRAPHIC SYSTEMS

Malthus 1992 suggests that population has a tendency to grow faster than food supply. When this happens, real income in the population falls, resulting in deterioration in standards of living. In the absence of the preventive check, this leads to a rise

in mortality, which in turn reduces population size. This is how mortality as a positive check influences population growth and helps maintain the balance between population growth and food supply. Malthus believed that a similar demographic system existed in historical China; this view has had a very strong influence throughout the world. Recent studies have shown that mortality was rather high in Chinese history (see Mortality), which obviously prevented the population from growing too fast. China's marital fertility was not high in comparison with that in many historical European populations, nor was the country's natural fertility. There was also evidence showing that a considerable number of Chinese couples deliberately controlled their fertility (see Fertility and Debates on Fertility Levels and Reproductive Behaviors in Historical China). On the basis of these new research findings, Zhao 1997 examines China's past demographic systems, and Lee and Wang 1999 and Lee, et al. 2002 challenge the Malthusian view about demographic systems in historical China, while Chuang, et al. 2006 expresses different opinions and suggests that the Chinese did not control their reproduction in the past.

Chuang Ying-chang, Theo Engelen, and Arthur P. Wolf, eds. *Positive or Preventive? Reproduction in Taiwan and the Netherlands, 1850–1940*. Amsterdam: Aksant, 2006.

This study examines and compares marriage, fertility, illegitimate births, and infant and early child mortality in Taiwan and the Netherlands in the past. A major argument made by this book is that while marital fertility was relatively low in Chinese history, it was not a result of deliberate control but was caused by other factors.

Lee, James Z., Cameron Campbell, and Wang Feng. "Positive Check or Chinese Checks?" *Journal of Asian Studies* 61.2 (2002): 591–607.

In this article, the authors describe major research findings made in recent historical demographic investigations. On the basis of that, they further examine China's historical demographic systems and challenge the Malthusian view that Chinese past population growth was controlled largely by the positive check.

Lee, James Z., and Wang Feng. *One Quarter of Humanity: Malthusian Mythology and Chinese Realities, 1700–2000*. Cambridge, MA: Harvard University Press, 1999.

This book summarizes major research findings made by the authors and other researchers in their recent investigations into Chinese historical demography. On the basis of these results, it describes marriage, fertility, and mortality patterns found in Chinese history and challenges the Malthusian views about demographic systems in historical China.

Malthus, Thomas R. *An Essay on the Principle of Population; or, A View of Its Past and Present Effects on Human Happiness: With an Inquiry into Our Prospects respecting the Future Removal or Mitigation of the Evils Which It Occasions*. 2d ed. Edited by Donald Winch. Cambridge, UK: Cambridge University Press, 1992.

In this very influential book, Malthus developed his population theories and made some major comments on population changes in Chinese history. These views have a great impact on the study of Chinese historical demography. Originally published in 1798.

Zhao, Zhongwei. "Demographic Systems in Historic China: Some New Findings from Recent Research." *Journal of the Australian Population Association* 14.2 (1997): 201–232.

In this paper, the author reviewed major research findings made in historical demography, especially in the studies of past marriage, fertility, mortality, and population growth up to the mid-1990s, and examined demographic systems in Chinese history.

MARRIAGE

Chen 1992, Wang 2001, and other studies suggest that in Chinese history, marriage was often regarded as a precondition to

having children and an obligation of a man to his family and ancestors, although it was also a means of establishing or consolidating the political alliance between the two families, which was particularly true among upper classes. Arranged marriages were commonplace, and parents played a major part in their children's marriage. According to Sa 1985 (cited under Population History of Taiwan); Ebrey 1995; and Lee, et al. 2001, the chance of marrying, the age at marriage, and the form of marriage were closely related to the social status of the families involved. Polygamy was often found among rich and upper-class men. In most historical populations, virtually all women married, and they did so at young ages. In contrast, some men were still unmarried by their thirties, and many of them would remain single throughout their life, as shown in Liu 1992 (cited under Studies Using Demographic Data Recorded at the Individual or Household Level); Telford 1992; Lee and Campbell 1997; and Lee, et al. 2001. According to Telford 1992, this was partly caused by comparatively high female infant and child mortality and by polygamy among upper classes, which led to a shortage of marriageable women. There were notable variations in age differences between husbands and wives, although husbands tended to be a couple of years older than their spouses, on average. Wolf and Huang 1980 (cited under Demographic Changes, Household Formation, and Composition) and Pasternak 1985 (cited under Population History of Taiwan) show that child marriage was common in parts of China and had considerable implications on the socialization of the involved couple, their reproductive behaviors, and family life. In Chinese history, finding another wife was never an issue when a man became a widower, though remarriage of a woman was strongly discouraged by the Confucian ideology in most of the last millennium. Despite that, Barclay 1954 (cited under Population History of Taiwan), Liu 1992, Telford 1992, Lee and Campbell 1997, and Zhao 1997 (cited under Past Demographic Systems) show that remarriage was fairly common among widows in many historical populations.

Chen Guyuan 陈顾远. *Zhongguo hunyin shi* (中国婚姻史). Shanghai: Shanghai shudian, 1992.

This book was originally published in 1936 (Shanghai: Shangwu yinshuguan) and was reprinted in 1992. It examines the historical development of marriage, differences in various forms of marriage and related customs, relationship between spouses, marriage and family, and many other related issues.

Ebrey, Patricia. "Marriage among the Song Elite." In *Chinese Historical Microdemography*. Edited by Stevan Harrell, 21–47. Berkeley: University of California Press, 1995.

The chapter analyzes the information obtained from epitaphs made in the Song dynasty (960–1279 CE), examining age at marriage, age differences between spouses, age at death, age at widowhood, and number of children in the recorded population.

Lee, James Z., and Cameron D. Campbell. *Fate and Fortune in Rural China: Social Organization and Population Behavior in Liaoning, 1774–1873*. Cambridge, UK: Cambridge University Press, 1997.

This study uses population registers collected from Liaoning to investigate demographic changes in the past. Among other topics, the book studies mortality changes and estimates mortality levels in the population. It also examines marriage patterns and shows that the proportion of never marrying was rather high among males, and that remarriage was fairly common in the population.

Lee, James, Wang Feng, and Danching Ruan. "Nuptiality among the Qing Nobility, 1640–1900." In *Asian Population History*. Edited by Ts'ui-Jung Liu, James Lee, David Sven Reher, Osamu Saito, and Wang Feng, 353–374. Oxford: Oxford University Press, 2001.

This paper studies marriage patterns in the Qing imperial-lineage population, especially their changes over time and variations across populations with different social status over a period of more than 250 years.

Telford, Ted A. "Covariates of Men's Age at First Marriage: The Historical Demography of Chinese Lineages." *Population Studies: A Journal of Demography* 46.1 (1992): 19–35.

This article analyzes data collected from Chinese genealogies and examines marriage patterns in the lineage population. The

study shows that substantial numbers of men never married because of a shortage of marriageable women. This was related to female infanticide and polygyny, which helped to produce a marriage squeeze in the society.

Wang Binling 汪玢玲. *Zhongguo hunyin shi* (中国婚姻史). Shanghai: Shanghai renmin chubanshe, 2001.

This book provides a detailed introduction to various forms of marriages that existed in different regions, ethnic groups, social classes, and periods of Chinese history.

FERTILITY

It was widely believed that fertility in historical China was very high because the Chinese wanted to have many children. However, Barclay, et al. 1976; Coale 1985; and other studies show that total marital fertility in most historical populations was not high, but that it was relatively low or moderate in comparison with that recorded in many historical European populations. Wang, et al. 1995; Zhao 1997; and Lee and Wang 1999 (cited under Past Demographic Systems) also show that relatively low marital fertility was attributable largely to the following: despite that the Chinese married young, fertility among the newly married was relatively low; their interbirth intervals were comparatively long; and many women stopped having children at relatively young ages. According to Wolf and Huang 1980 (cited under Demographic Changes, Household Formation, and Composition), moderate marital fertility was related to social customs or practices such as child marriage, while Barclay, et al. 1976 and Lavelly 2007 report that it might result from intensive and prolonged breastfeeding and relatively low coital frequency. In addition, Wang, et al. 1995; Zhao 1997; and Lee and Wang 1999 suggest that China's relatively low marital fertility was also affected by people's intentional control of their reproduction. The level of parity progression ratio, the length of birth interval, and the age at stopping reproduction are all closely related to the sex composition of children that couples already had. Couples' reproductive behaviors were also related to the survivorship of their children, especially sons. Wang, et al. 2010 (cited under Impact on Demographic Changes) further shows that variations in reproductive behaviors and fertility levels were closely associated with a person's status in the family and society, the composition of the household, and other socioeconomic factors.

Barclay, George W., Ansley J. Coale, Michael A. Stoto, and T. James Trussell. "A Reassessment of the Demography of Traditional Rural China." *Population Index* 42.4 (1976): 606–635.

This paper, through analyzing demographic data collected around 1930, examines fertility levels and patterns in the Chinese peasant population at the time. It shows that marital fertility in the population was not very high, but only moderate.

Coale, Ansley J. "Fertility in Rural China: A Reconfirmation of the Barclay Reassessment." Paper presented at a conference held in Oxford, 20–25 August 1978. In *Family and Population in East Asian History*. Edited by Susan B. Hanley and Arthur P. Wolf, 186–195. Stanford, CA: Stanford University Press, 1985.

In the paper, which is a reply to the criticism in Wolf 1985 (cited under Debates on Fertility Levels and Reproductive Behaviors in Historical China), the author examined fertility levels in several Chinese historical populations. The paper shows that even after underregistration of births has been taken into account, marital fertility in these populations was still lower than that in many historical European populations.

Lavelly, William. "Sex, Breastfeeding, and Marital Fertility in Pretransition China." *Population and Development Review* 33.2 (2007): 289–320.

This paper suggests that the relatively low coital frequency found in modern China is indicative of sexual behavior in the past. Such sexual behaviors and breastfeeding practices contributed to the low marital fertility in Chinese history.

Wang Feng, James Z. Lee, and Cameron Campbell. "Marital Fertility Control among the Qing Nobility: Implications

for Two Types of Preventive Check." *Population Studies: A Journal of Demography* 49.3 (1995): 383–400.

This paper examines marital fertility in the Qing imperial-lineage population. It suggests that fertility control has been observed in the population, where women started their reproduction later, had a longer birth interval, and stopped their childbearing at younger ages.

Zhao, Zhongwei. "Deliberate Birth Control under a High-Fertility Regime: Reproductive Behavior in China before 1970." *Population and Development Review* 23.4 (1997): 729–767.

The paper studies fertility in rural China before the start of the nationwide family planning campaign. It shows that people's reproductive behaviors were related to gender composition of children they already had and the surviving state of their children. The paper also examines the impacts of traditional beliefs and culture on fertility in the past.

DEBATES ON FERTILITY LEVELS AND REPRODUCTIVE BEHAVIORS IN HISTORICAL CHINA

The debates on fertility levels and people's reproductive behaviors in historical China, which had important theoretical implications, started in the late 1970s, when Barclay, et al. 1976 (cited under Fertility), containing an analysis of demographic data collected around 1930, reported that marital fertility was not very high in the Chinese peasant population at the time. The author of Wolf 1985 disagreed with their conclusion and suggested that the observed moderate fertility was a result of underreporting of births. After further analyzing the data used by Barclay and collaborators and those mentioned by Wolf, the author of Coale 1985 (cited under Fertility) showed that even after considerable underreporting was taken into account, marital fertility in Chinese populations, including that studied by Wolf, was still notably lower than that in many historical European countries and the so-called natural fertility. While Wolf gradually accepted that marital fertility was not very high in Chinese history, he and some other researchers still held the view that "whatever the reason for moderate fertility in China, it was not deliberate fertility control" (Wolf 1985, p. 177). Wang, et al. 1995 and Zhao 1997 (both cited under Fertility) challenge this claim and show that intentional control of fertility existed in historical Chinese populations. This led to a further round of debates on these and related issues. Wolf 2001; Chuang, et al. 2006 (cited under Past Demographic Systems); and Wolf and Engelen 2008 continue to defend the view that the Chinese did not deliberately control their fertility and that antinatalist ideas were hardly discussed among Chinese intellectuals in the past. However, Campbell, et al. 2002; Zhao 2002; Zhao 2006; and Campbell and Lee 2010 provide further evidence showing that the conclusions reached by Wolf and his collaborators are closely related to the flaw in their analysis and that the Chinese had the desire and controlled their family size in the past.

Campbell, Cameron D., and James Z. Lee. "Fertility Control in Historical China Revisited: New Methods for an Old Debate." *History of the Family* 15.4 (2010): 370–385.

This article revisits the debate on whether there was deliberate fertility control in Chinese history. Through analyzing Qing imperial genealogical records, the authors showed that the lineage members adjusted their reproductive behavior on the basis of the number, gender composition, and survival of their children. The paper also comments on the confusion over the definition of fertility control.

Campbell, Cameron D., Wang Feng, and James Z. Lee. "Pretransitional Fertility in China." *Population and Development Review* 28.4 (2002): 735–750.

A reply to the critique in Wolf 2001, it provides further evidence showing that intentional fertility control existed in China in the past.

Wolf, Arthur P. "Fertility in Prerevolutionary Rural China." In *Family and Population in East Asian History*. Paper presented at a conference held in Oxford, 20–25 August 1978. Edited by Susan B. Hanley and Arthur P. Wolf, 154–185. Stanford, CA: Stanford University Press, 1985.

In this paper, Wolf criticized the study conducted by Barclay and his collaborators (Barclay, et al. 1976, cited under Fertility) and suggested that the observed moderate fertility was a result of underreporting of births and that fertility was high in

Chinese history.

Wolf, Arthur P. "Is There Evidence of Birth Control in Late Imperial China?" *Population and Development Review* 27.1 (2001): 133–154.

In this paper, the author commented on some research findings in the study of fertility made in the 1990s and suggested that there was no evidence of birth control in late imperial China.

Wolf, Arthur P., and Theo Engelen. "Fertility and Fertility Control in Pre-revolutionary China." *Journal of Interdisciplinary History* 38.3 (Winter 2008): 345–375.

The debate about China's historical fertility levels was largely completed in the mid-1980s. After nearly a quarter of a century, this paper once again suggests that fertility in historical China was far higher than in Europe, and that it would be even higher if there was no positive check. The authors also further argue that there was little or no deliberate fertility control in Chinese history.

Zhao, Zhongwei. "Fertility Control in China's Past." *Population and Development Review* 28.4 (2002): 751–757.

In his reply to the criticism in Wolf 2001, the author examined the limitations of the methods and analyses used by Wolf, and showed how these limitations had led to some incorrect conclusions.

Zhao, Zhongwei. "Towards a Better Understanding of Past Fertility Regimes: The Ideas and Practice of Controlling Family Size in Chinese History." *Continuity and Change* 21.1 (2006): 9–35.

This paper reviews major research findings made in historical investigations of fertility, up to 2005. It provides evidence showing that in Chinese history, many people had desires to control their family size, and that Chinese intellectuals and officials did discuss antinatalist ideas. The paper also examines the impact of Chinese culture on fertility and some related issues.

MORTALITY

For a long time, it was widely accepted that mortality was high in Chinese history. But this does not necessarily mean that we knew how high mortality was in the past, because detailed information about historical mortality patterns, those existing before the 20th century in particular, was not available. This has been changed by recent demographic studies. Telford 1990, Liu 1992 (cited under Studies Using Demographic Data Recorded at the Individual or Household Level), Lee and Campbell 1997 (cited under Marriage), and Hou 2000 show that mortality was rather high in some historical Chinese populations. A comparison with those results presented in Coale and Demeny 1983 shows that in these populations, the estimated mortality levels were generally within the range defined by the Coale-Demeny model life tables, Region West levels 5 to 8, although there were variations among populations and fluctuations over time. Zhao 1997 suggests that although period mortality showed notable changes, cohort adult mortality observed in a large lineage population seemed rather stable over a period of more than one thousand years. In many historical populations, the level of female mortality was very close or even higher than that for males. Although underregistration of children often prevented detailed studies of infant and child mortality from being undertaken, Lee, et al. 1994 finds that in the Qing imperial-lineage population, infant and child mortality was very high, especially among females. Similarly, Engelen, et al. 2011 (cited under Population History of Taiwan) shows that infant and child mortality in some historical populations in Taiwan was relatively high and was related to some demographic and nondemographic factors. Campbell and Lee 2004 (cited under Impact on Demographic Changes), and Hou 2000 also show that variations in the risk of death were often related to the status of a person in the family and society, the composition of his or her household, and changes in socioeconomic conditions.

Coale, Ansley J., and Paul Demeny. *Regional Model Life Tables and Stable Populations*. 2d ed. New York: Academic Press, 1983.

On the basis of their study of mortality patterns in many populations in the world, Coale and Demeny compiled four sets of model life tables, which have been used widely by demographers in their studies of mortality and population projections. Originally published in 1966 (Princeton, NJ: Princeton University Press).

Hou Yangfang 侯杨方. "Zhongguo renkou chuantong siwang fangshi: Yi Ming-Qing Jiangnan diqu liangge jiazu wei gean de lishi renkouxue yanjiu" (中国人口传统死亡方式: 以明清江南地区两个家族为个案的历史人口学研究). In *Hunyin jiating yu renkou xingwei* (婚姻家庭与人口行为). Edited by Li Zhongqing 李中清 (James Z. Lee), Guo Songyi 郭松义, and Ding Yizhuang 定宜庄, 220–232. Beijing: Beijing daxue chubanshe, 2000.

This is one of the very few studies of this kind conducted in Mainland China. It analyzes mortality patterns in two lineage populations and also examines their relationships with changes in the price of rice.

Lee, James Z., Wang Feng, and Cameron Campbell. "Infant and Child Mortality among the Qing Nobility: Implications for Two Types of Positive Check." *Population Studies: A Journal of Demography* 48.3 (1994): 395–411.

This is one of the few studies that investigate infant and child mortality in Chinese history. The paper shows that even in the Qing imperial-lineage population, infant and early child mortality was high, especially among females. This is a clear indication of the existence of infanticide and negligence of girls.

Telford, Ted A. "Patching the Holes in Chinese Genealogies: Mortality in the Lineage Populations of Tongcheng County, 1300–1880." *Late Imperial China* 11.2 (1990): 116–136.

This paper presents a useful example of using genealogical materials to study mortality changes in the past. The author carefully examined the problem of underregistration and then, through the use of model life tables, estimated the impact of underregistration and the mortality level in the lineage population.

Zhao, Zhongwei. "Long-Term Mortality Patterns in Chinese History: Evidence from a Recorded Clan Population." *Population Studies: A Journal of Demography* 51.2 (1997): 117–127.

Through analyzing genealogical data collected from a large lineage population, the author constructed truncated cohort life tables for the adult population for more than one thousand years. The paper shows that over the study period, the cohort adult mortality was fairly stable in the population.

MIGRATION

Migration has been an important part of Chinese history. As shown in Zhu 1994, Zhang 1996, and Ge 1997, large-scale migrations were recorded during many historical periods. Over the last two millennia the Chinese, largely from the middle and lower reaches of the Yellow River plain, gradually populated China's current territory and moved to many parts of the world. Migration data were seldom systematically collected during Chinese history, however. Unlike the detailed historical investigation of fertility, mortality, and marriage, in which surviving genealogical records or population registers were used, studies of past migration have been based primarily on limited secondary data sources about population movements in past times. Despite these difficulties, Tian and Chen 1986, Shi 1990, and Ge 1997 reveal main trends of historical migration and major factors affecting such population movements. In Chinese history, migration was often caused by wars, natural disasters, political upheavals, and economic hardship, though it could have also been used by governments as a strategy of consolidating its control of the country or developing the remote areas. While China's population movements were largely dominated by north to south migration during its long history, historical migration patterns showed great diversity and complexity.

Ge Jianxiong 葛剑雄, ed. *Zhongguo yimin shi* (中国移民史). 6 vols. Fuzhou, China: Fujian renmin chubanshe, 1997.

This edited book consists of six volumes and is perhaps the most impressive publication on the history of Chinese migration. The book describes the processes and major trends of population movements in Chinese history and examines their major causes and impacts.

Shi Fang 石方. *Zhongguo renkou qianyi shigao* (中国人口迁移史稿). Harbin, China: Heilongjiang renmin chubanshe, 1990.

In this book, the author systematically examines population movements in Chinese history, especially their impacts on and the relationships with economic development and political changes.

Tian Fang 田方 and Chen Yijun 陈一筠, eds. *Zhongguo yimin shilue* (中国移民史略). Beijing: Zhishi chubanshe, 1986.

This is one of the early publications on population movements in historical China. It describes different types of migration taking place in China over the last two thousand years, examining their major impacts in Chinese history.

Zhang Guoxiong 张国雄. "Zhongguo lishi shang yimin de zhuyao liuxiang yu fenqi" (中国历史上移民的主要流向与分期). *Beijing daxue xuebao* (北京大学学报) 2 (1996): 98–107.

This article examines population movements in Chinese history. The author divided past population movements into four periods and studied the major patterns and characteristics of migration in each period.

Zhu Guohong 朱国宏. *Zhongguo de haiwai yimin: Yixiang guoji qianyi de lishi yanjiu* (中国的海外移民: 一项国际迁移的历史研究). Shanghai: Fudan daxue chubanshe, 1994.

Title translates as Chinese emigration: A historical study of the international migration. In this book, the author examines overseas migration in Chinese history. It describes such population movements by major historical periods and studies the demography of overseas Chinese population.

DEMOGRAPHIC CHANGES, HOUSEHOLD FORMATION, AND COMPOSITION

Family and household are the building blocks of a society. Zhang 2007 provides a detailed discussion about their changes in China's long history. Skinner 1997 suggests that these had considerable impacts on the demographic behaviors of the family members and their demographic outcomes. At the same time, household formation and composition are also affected by demographic conditions. For these reasons, household formation and composition are regarded as important components of the studies of past population dynamics. Freedman 1979a and Freedman 1979b propose that there were two distinct models or versions of Chinese families: one for the rich, where all married sons lived with their parents, and the other for the poor, where only one married son stayed in the home of his parents. In contrast, Hajnal 1982 (cited under Impact on Demographic Changes), Wolf and Huang 1980, and some other studies suggest that joint household systems existed in Chinese history. Wolf 1984, Lee and Gjerde 1986, and Lee and Campbell 1998 also show that large, complex households were common in some historical Chinese populations. It is noteworthy, however, that household formation was also affected by demographic conditions (see Demographic Constraints). While many people may have wished to live in a large joint household, their desires could be shattered by severe mortality or economic hardship. Consequently, small and simple households were also fairly common in the past.

Freedman, Maurice. "The Chinese Domestic Family: Models." In *The Study of Chinese Society: Essays by Maurice Freedman*. Edited by G. William Skinner, 235–239. Stanford, CA: Stanford University Press, 1979a.

In this short essay, Freedman proposed that there were two distinct models or versions of Chinese families. According to the

author, in rich families all married sons lived with their parents, while in poor families only one married son stayed in the home of his parents.

Freedman, Maurice. "The Family in China, Past and Present." In *The Study of Chinese Society: Essays by Maurice Freedman*. Edited by G. William Skinner, 240–254. Stanford, CA: Stanford University Press, 1979b.

This paper examines the nature and major characteristics of the family in premodern China, the relationship between family members, and the linkage between family and wider society. It also discusses some notable changes in Chinese families in the early years of the People's Republic.

Lee, James, and Cameron Campbell. "Headship Succession and Household Division in Three Chinese Banner Serf Populations, 1789–1909." *Continuity and Change* 13.1 (1998): 117–141.

This paper examines microsocial structure and household composition and headship succession in three historical Chinese populations, finding both similarities and notable differences in household composition among the three populations.

Lee, James, and Jon Gjerde. "Comparative Household Morphology of Stem, Joint, and Nuclear Household Systems: Norway, China, and the United States." *Continuity and Change* 1.1 (1986): 89–111.

This study examines household composition under different household systems. It analyzes population registers collected from northeastern China and reveals that large and complex households were rather common in the population.

Skinner, G. William "Family Systems and Demographic Processes." In *Anthropological Demography: Toward a New Synthesis*. Edited by David I. Kertzer and Tom Fricke, 53–95. Chicago: University of Chicago Press, 1997.

The paper examines the relationship between family systems and demographic processes, suggesting that the two are closely intertwined. The decisions about marriage, reproduction, and migration are usually related to family strategies and are made in the context of families. Household composition and family decisions could even affect the chance of death of some family members.

Wolf, Arthur P. "Family Life and the Life Cycle in Rural China." Paper presented at a conference held 9–15 October 1981, Mt. Kisco, NY. In *Households: Comparative and Historical Studies of the Domestic Group*. Edited by Robert McC. Netting, Richard R. Wilk, and Eric J. Arnould, 279–298. Berkeley: University of California Press, 1984.

This study examines changes in residential patterns over people's life course. It reveals that in the study population, many people have lived in large, complex households over their lifetimes.

Wolf, Arthur P., and Chieh-shan Huang. *Marriage and Adoption in China, 1845–1945*. Stanford, CA: Stanford University Press, 1980.

In this book the authors, among others, provided detailed examinations of marriage, fertility, adoption, and household formation and composition in historical Taiwan. They studied different forms of marriage and their impacts and also found that many people lived in grand or stem families. On the basis of these results, they made some comments on the "two models" proposed by Freedman.

Zhang Guogang 张国立, ed. *Zhongguo jiatingshi* (中国家庭史). 5 vols. Guangzhou, China: Guangdong renmin chubanshe, 2007.

This multivolume publication, which several researchers contributed to, systematically examines changes in family and

household in Chinese history, with each volume concentrating on one broad time period. The book examines household size and composition, their variations across regions, marriage, relationships between family members, family life and economy, inheritance practices, relationships between the family, lineage and the state, and other related issues.

Impact on Demographic Changes

Demographic events such as marriage, birth, and death were considerably affected by the wealth, social status, and the structure or composition of a family or household where these events usually took place. Hajnal 1982 suggests that in preindustrial northwestern Europe, where the simple household system predominated, a couple formed, and were in charge of, their household after marriage. Under this system, people tended to marry late, and the proportion not marrying was relatively high. In contrast, under the joint household system, such as that in historical China, people married young and the proportion of those who married, especially among women, was high. Marriages also tended to be arranged by the parents rather than the couple. In comparison with those in historical northwestern Europe, China's traditional households often had a complex structure, and the relationships among their members were more complicated and hierarchical. Harrell 1985; Campbell and Lee 2004; and Wang, et al. 2010 show that in comparison with those having a less favorable position (e.g., a younger son of other household members), household members with a more prominent position (e.g., an eldest son of the household head) tended to have a greater chance of marrying and of doing so at younger ages. They were likely to give birth earlier and to have a larger number of children, and they might also have experienced a lower mortality. Similarly, household composition or the presence of certain family members (e.g., a grandmother) was closely related to variations in certain demographic outcomes (e.g., the risk of death for female children) among households. These results provide further evidence for the suggestions made in Skinner 1997 (cited under Demographic Changes, Household Formation, and Composition) that household formation, family structure, and the relationships among family and household members had notable impacts on demographic patterns and outcomes of their members.

Campbell, Cameron, and James Z. Lee. "Mortality and Household in Seven Liaodong Populations, 1749–1909." In *Life under Pressure: Mortality and Living Standards in Europe and Asia, 1700–1900*. By Tommy Bengtsson, Cameron Campbell, James Lee, et al., 293–324. Cambridge, MA: MIT Press, 2004.

The study analyzes population registers collected in Liaodong and examines mortality changes in the population. It shows that variations in the risk of death and in the level of mortality were often related to the status of a person in the family and society, and to the composition of his or her household.

Hajnal, John. "Two Kinds of Preindustrial Household Formation System." *Population and Development Review* 8.3 (1982): 449–494.

The author discusses two kinds of household formation system and suggests that joint household systems were found in Chinese history. Under such systems, people, especially women, married at young ages; a newly married couple usually lived together in a household where the older generation was in charge; and households with several married couples might split to form a number of new households.

Harrell, Stevan. "The Rich Get Children: Segmentation, Stratification, and Population in Three Chekiang Lineages, 1550–1850." Paper presented at a conference held in Oxford, 20–25 August 1978. In *Family and Population in East Asian History*. Edited by Susan B. Hanley and Arthur P. Wolf, 81–109. Stanford, CA: Stanford University Press. 1985.

This book chapter examines the processes of segmentation, stratification, and population growth in three lineage populations. It shows that men of wealthy lineage branches tended to marry young, to have more wives, and to have more children. Therefore, their lineage branches grew faster. At the same time, these branches segmented into rich and poor branches. The process repeated itself over the study period.

Wang Feng, Cameron Campbell, and James Z. Lee. "Agency, Hierarchies, and Reproduction in Northeastern China."

1789 to 1840." In *Prudence and Pressure: Reproduction and Human Agency in Europe and Asia, 1700–1900*. Edited by Noriko O. Tsuya, Wang Feng, George Alter, James Z. Lee, et al., 287–316. Cambridge, MA: MIT Press, 2010.

This paper examines fertility and reproductive behaviors in a historical population in northeastern China. It shows that there were notable variations in people's reproductive behaviors and fertility levels, which were related to a person's family and social status, the composition of the household, and some socioeconomic factors.

Demographic Constraints

Whether people could spend most of their lifetimes in certain types of households was affected not only by the predominating household formation system or residential propensity, but also by demographic conditions that prevailed before and over their lifetimes. In Chinese history, virtually all women would marry, and they did so at young ages. But some men remained unmarried in their thirties or forties, and a considerable portion of them would not marry at all. While fertility was relatively high in comparison with that in modern China, a large number of children died young because of high mortality. Such demographic conditions, especially severe mortality, had a great impact on the type and number of surviving kin. This in turn influenced the formation of large multigeneration households, despite the fact that such households were often regarded as ideal. Liu 1992 (cited under Studies Using Demographic Data Recorded at the Individual or Household Level), Liu 1995, and Harrell and Pullum 1995 examine demographic constraints on household formation, especially the formation of stem and joint families in the past. Zhao 1994 compares potential coresidential patterns revealed by genealogical records and the results obtained through computer microsimulation. This study showed that in comparison with the simulation results, the probability of three or four generations sharing their lifetimes tended to be higher in the first few generations recorded in the genealogies, which was affected partly by the selective biases identified in such records. But for later generations, the probabilities computed from the two sources were fairly close. Zhao 2000 also shows that under demographic conditions similar to those observed in most historical Chinese populations, many people would have experienced substantial changes in their household composition and would have spent a considerable number of years in simple households during their lifetimes, even if rules of joint household formation were followed strictly by all simulated individuals, and many of them would live in such households at some stages of their life courses.

Harrell, Stevan, and Thomas W. Pullum. "Marriage, Mortality, and the Developmental Cycle in Three Xiaoshan Lineages." In *Chinese Historical Microdemography*. Edited by Stevan Harrell, 141–162. Berkeley: University of California Press, 1995.

In this book chapter, the authors analyze genealogical records collected from three lineage populations. They examine demographic conditions in the populations and the potential for people to live in stem or joint families. The results show that under the demographic conditions experienced by these lineages, the chance for men to live in a stem or joint family was not very high at any given point of their life course.

Liu Ts'ui-jung. "Demographic Constraint and Family Structure in Traditional Chinese Lineages, ca. 1200–1900." In *Chinese Historical Microdemography*. Edited by Stevan Harrell, 121–140. Berkeley: University of California Press, 1995.

This paper analyzes genealogical records and examines whether the demographic regime in the lineage populations would support the formation of large multigeneration households of various kinds. The results suggest that in these lineage populations, the chance of a man to share his lifetime with his grandfather, or with at least a grandson, was not high in the past.

Zhao, Zhongwei. "Demographic Conditions and Multi-generation Households in Chinese History: Results from Genealogical Research and Microsimulation." *Population Studies: A Journal of Demography* 48.3 (1994): 413–425.

This study compares the potential residential patterns shown by several Chinese genealogies and those obtained through computer microsimulation. It also examines underregistration problems in such genealogical data, such as underrecording of females, children who died young, members who brought disgrace to their families, or those who moved to other places, and

their impacts on the study of population history.

Zhao, Zhongwei. "Coresidential Patterns in Historical China: A Simulation Study." *Population and Development Review* 26.2 (2000): 263–293.

Using computer microsimulation, this author studies the impact of demographic conditions on the formation of large and multigeneration households. It investigates variations in people's potential residential patterns at different stages of their life courses and their lifetime residential experiences.

POPULATION HISTORY OF TAIWAN

In comparison with its Mainland China counterpart, the population in Taiwan is much smaller. Partly for this reason, interest in the population history of Taiwan has sometimes been overshadowed by that of the population history of the Mainland or of China as a whole. For the last century, however, the quality of Taiwan's demographic data has been among the best in Asia. Some major studies on population changes since the late 19th century have been conducted. These include the study of long-term demographic changes, in Barclay 1954; investigations of past fertility, marriage, and family (Wolf and Huang 1980; Sa 1985; Pasternak 1985; Chuang, et al. 2006, cited under Past Demographic Systems; and Engelen and Hsieh 2007); examinations of mortality, in Mirzaee 1979 and Engelen, et al. 2011; and comparisons of population changes in Taiwan with those in some European populations.

Barclay, George W. *Colonial Development and Population in Taiwan*. Princeton, NJ: Princeton University Press, 1954.

This is a major book on the social, economic, and demographic history of Taiwan in the first half of the 20th century. Using government-released data, the author systematically examines economic development, social transformation, and major changes in marriage, fertility, population health, mortality, and migration during this period. Reprinted as recently as 1972.

Engelen, Theo, and Hsieh Ying-hui. *Two Cities, One Life: Marriage and Fertility in Lugang and Nijmegen*. Amsterdam: Aksant, 2007.

This book compares marriage, fertility, and mortality patterns found in Lugang of Taiwan and Nijmegen of the Netherlands. The major aim of the study is to find similarities and differences in people's demographic behaviors between the two cities. On the basis of the study results, the book also examines whether preventive check existed in the two populations in the past.

Engelen, Theo, John R. Shepherd, and Yang Wen-shan, eds. *Death at the Opposite Ends of the Eurasian Continent: Mortality Trends in Taiwan and the Netherlands, 1850–1945*. Amsterdam: Aksant, 2011.

This study examines and compares long-term mortality declines, changes in major causes of death, improvements in public health, disease prevention, medical care and its relationship with mortality transition, changes in maternal and infant mortality, and other related issues in Taiwan and the Netherlands.

Mirzaee, Mohammad. "Trends and Developments of Mortality in Taiwan, 1895–1975." PhD diss., University of Pennsylvania, 1979.

In this dissertation, the author systematically examined long-term mortality changes in Taiwan, especially their relationship with colonial development and economic and social changes. The author also investigated other major factors that affected Taiwan's mortality decline.

Pasternak, Burton. "On the Causes and Demographic Consequences of Uxorilocal Marriage in China." In *Family and Population in East Asian History*. Paper presented at a conference held in Oxford, 20–25 August 1978. Edited by Susan B. Hanley and Arthur P. Wolf, 309–334. Stanford, CA: Stanford University Press, 1985.

This study investigates uxorilocal marriage in Taiwan in the late 19th century and the first half of the 20th century, especially the causes and demographic consequences of this form of marriage, in which the couple lives with or near the wife's parents.

Sa, Sophie. "Marriage among the Taiwanese of Pre-1945 Taipei." In *Family and Population in East Asian History*. Paper presented at a conference held in Oxford, 20–25 August 1978. Edited by Susan B. Hanley and Arthur P. Wolf, 277–308. Stanford, CA: Stanford University Press, 1985.

In this book chapter, the author examined marriage patterns in Taipei in the late 19th century and the first half of the 20th century. The study shows that there were considerable variations in age at marrying, in age differences between spouses, and in forms of marriages. These variations were closely related to the social status of the husband's household and some other factors.

Wolf, Arthur P., and Chieh-shan Huang. *Marriage and Adoption in China, 1845–1945*. Stanford, CA: Stanford University Press, 1980.

In the book, the authors provide a detailed examination of household registers made under Japanese rule in colonial Taiwan. They used these data to study marriage, fertility, adoption, and many other issues in Taiwan in the first half of the 20th century.

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