

Koen Matthijs, Saskia Hin, Jan Kok
& Hideko Matsuo

THE FUTURE OF HISTORICAL DEMOGRAPHY

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The future of historical demography

Upside down and inside out

Koen Matthijs, Saskia Hin, Jan Kok & Hideko Matsuo

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Introduction

Without the threat of punishment, there is no joy in flight

Kobo Abe

The editors prickle you to join them in thinking upside down and inside out about historical demography, and introduce the background to this book project.

A soapbox

Most, if not all, academic settings ask scholars to think and talk rigorously, to demonstrate how their arguments correspond with existing theory, and provide evidence for their hypotheses. These conditions are the foundations of science. But the tight, well-designed framework within which we normally operate also comes at a cost. Frameworks direct us to think inside boxes, sometimes leaving little room for creativity and meta-reflection. With this book, we want to offer a platform – an opportunity for scholars to think outside the box, to let their peers know what they had always wanted to express but never found the occasion to do so. We set only two conditions: first, everyone’s reflections should not take more than a page or four, because we wanted to offer as many people as possible the time and space for a soapbox speech. Second, their reflections should somehow cast light on the past and especially the future of historical demography.

Reflections on past, present and future

Why reflections on the past *and* present *and* future? It was about time, we thought, to open the floor for an inspiring debate as to what the future of historical demography should look like. Of course, this debate would not amount to much without considering both the past and present. The field of historical demography studies human population characteristics and change in the past. It pays particular (but not exclusive) attention to the main components driving population changes: fertility, mortality, and migration.

Over the past four decades, historical demography has developed from a “young” discipline that used painstakingly collected new materials to uncover patterns and trends in marriage, fertility, migration, mortality and household formation, to an “adolescent” or even “adult” discipline adopting longitudinal approaches, and delving into heterogeneity, change, dynamics, and transitions. Throughout this process, historical demographers have tried to balance factors and actors, structure and culture, contexts and agents. Historical demography has undergone sweeping theoretical and methodological shifts. We have accomplished much. Among the particular strengths of the field we may count our ability to build bridges with other disciplines around topics that deserve attention because they form part of today’s societal challenges. Solid interpretations of qualitative and quantitative evidence about the past have produced insights on the drivers of population dynamics that reach beyond those the expertise of demographers can provide. Also, they yield insight and tools to inform predictions of future population and family dynamics.

But there are signs of some growing pains. In this volume, younger, older, female and male scholars from different geographic and research backgrounds offer their reflections on where the discipline of historical demography currently stands now, reproach us for what we have overlooked, indicate key trends in research we must investigate further, and stimulate us to link our future work to other disciplines. Their contributions can, in our view, ultimately be centred around three key issues. These are briefly set out below, and we count on your curiosity to flip through the pages and read the 59 thought-provoking ideas about how to resolve these puzzles in the future.

Upside down: theories and methods

In many articles, theories and methods are mentioned in the same breath, or at least in a single subsection. In historical demography, more and more publications rely on a ‘scientific design’ in which quantitative methods take pride of place. But does a significant statistical difference also make a historical difference that is both meaningful and insightful? Ultimately, we need theory to make sense of statistical results. While theory has traditionally been a weaker area in demography, history is full of it, and so are several adjacent disciplines (in particular, sociology) that shed further light on behaviour. Certainly, the perspectives that have become mainstream in historical demography over the past decades, such as the life-course concept of linked lives (culturally, structurally and genetically), offer potential for stronger theory-building. But to date this potential has barely been realized. Have we, as historical demographers, focused too much on developing or adopting ever more sophisticated methodologies, while losing sight of and interest in the rich theoretical and qualitative side of our historical material?

Inside out: from periphery to core?

During what some identify as the golden age of historical demography, scholars from several countries started to excavate the demographic past of populations by initiating data collection projects. The analysis of the resulting, unprecedented archival materials produced spectacular new findings that found their way into mainstream history and demography. In the decades that followed, historical demographers mostly dug deeper (although some expanded the geographic horizons of historical demographic research by looking into Asia). This process has been characterized by a certain path dependency: new research projects stood on the shoulders of the giants and built further upon what was already there. As a result we have primarily come to know in much greater detail the populations that were studied from the beginning, with ever more attention for heterogeneity, change over time, and so on. It is evident that digging deeper into the same holes has taught us much, and there is still more to learn. But at the same time, the community of historical demographers has paid very little attention to places and time periods outside of this already established range.

There are good reasons for this development. It is always more efficient to build upon what is already available, especially in a quantitative field where data collection is costly, both in terms of time and money. That money tends to be more easily accessible in Northern and Western Europe, Northern America and a few other regions of the world. For periods further back than the 19th century, data quickly become ever more scarce, and the data reliability standards we tend to use as benchmarks become ever harder to meet.

But perhaps it is too easy to push aside all of demographic history outside of the narrow time and place of 19th century (Western) Europe and North America. Is it legitimate for us as *historical* demographers to do so on the grounds that all the rest of history is not really, and could never become, historical demography, given its lack of equally sophisticated and precise longitudinal sources? By implicitly viewing most of history as periphery, and sticking to a narrow definition of the core of historical demography, we lose a lot. Are the demographic fates of small farmers in Northern Europe really that important for world history? If the strength of the field of historical demography

rests in the fact that we can offer important insights in areas where we have relative advantages – as a sub-discipline of history as well as demography – is it not our task and responsibility to also start digging further away, in Africa, in Latin America, Asia, the Pacific and other understudied regions? And also to dig deeper into history, into medieval and ancient times, to cover all of history? Should we not imagine a future in which we devote part of our talent for methodological sophistication to the development of new methodologies and techniques for studying areas with different kinds of data, in collaboration with adjacent disciplines?

How deeply should we foster links with other disciplines?

As several contributions to this volume point out, historical demography has perhaps spent too much time gazing at its own navel in recent years, and, at least from the perspective of demographers, has become less relevant. This observation invites self-reflection. One might counter-argue that the impression of a marginalization of historical demography ensues naturally from the maturation of the discipline: research findings that used to be presented at general demography conferences or published in demographic journals are now channelled into more specialized avenues. At the same time, we are losing opportunities to offer historical perspective on core current issues such as international migration and cultural dynamics, longevity and genetic components of health, sub-replacement fertility and social policy, predictions of future demographic developments, healthy ageing and public finances. How deeply, and with which disciplines, should ties best be fostered so that we can learn from the past to create a blossoming future?

The future of historical demography. Upside down and inside out invites you to reflect on these issues, and open new discussions that will lead towards an inspiring and intellectually challenging future.

Koen Matthijs

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Chapter 1

The whole of history

The charm of history and its enigmatic lesson consists in the fact that, from age to age, nothing changes and yet everything is completely different

Aldous Huxley

Four pleas illuminating why, as historical demographers, we should investigate demographic patterns in periods outside of the ‘canon-period’ of 1850-1940.

Dare to dig! More history is needed to take historical demography a few steps further...

Tine De Moor

Demography is essential for historians to understand the dynamics of, the change in, and the evolution of many different aspects of society over time. If you have no idea about a population's evolution, about population pressure, about migration, etc., there is no point in even trying to understand economic growth, political turmoil, the spread of culture, and many more interesting historical phenomena. Nobody would dare to deny this, although many historians may not immediately put this implicit knowledge into practice either! Yet even with this knowledge at the back of our minds there is still a problem: most historical demographers keep silent on even the most basic demographic data about any period preceding the 1800s. Before 1800 seems to be 'a faraway land', where demographers prefer not to go. Overviews of population density in the medieval or early modern period are not reconstructed by specialists of historical demography but by specialists in other sub-disciplines of history, such as social and economic history. This short article should be read as a call to historical demographers to care more about those periods they have long shunned in order to avoid the need to deal with unfamiliar sources. To tackle these difficult periods for which we lack complete and continuous sources, more creativity is needed, as well as a greater willingness to think about pre-industrial demographic regimes without having all the data one would like to have at hand. And a slightly more pragmatic attitude might help as well.

But first of all: why should historical demographers even bother? To begin with, the post-1800 period is – seen from the very long-term perspective – (although in demographic terms a very important one [says the economic historian...]), the focus on the years after 1800 leaves us in the dark about the foundations of our current demographic regime. Why had the Western-European demographic regime already shifted away from that of the rest of the world before 1800? And why are some regions in the world still 'stuck' in a regime that looks similar to European medieval demographic behaviour? Economic historians would really like to know the answer to these questions, so they can use that information to better estimate the impact of changes that take place at the very basis of society and the economy. Second, many nineteenth-century developments have had, and continue to have, a deep impact on our life expectancy. But focusing primarily on these positive developments severely limits our understanding of the 'default' situation; in other words, a situation without increasing hygiene, without new obstetric practices, etc. As historical demographers, our knowledge on individual health prior to the 1800s is heavily dependent on what biologists and – for even earlier periods – archaeologists can tell us. But often, these perspectives lack a thorough understanding of the historical context. Biologists are driven by their interest in understanding evolution, and hence primarily search for those conditions that are common to all humans, regardless of the societies they live in. Archaeologists are usually interested in periods that are so remote that

historians don't even think about them in terms of consolidated societies – or at least lack the data to support such claims. Historical demography would be the discipline best suited to add knowledge not only about environmental conditions but also about the economic context, the role of social conditions in partnering, and the methods at hand for limiting fertility. All of these are vital to our understanding of the link between human capital and family formation. They are also relevant to how individuals behave as parts of groups, how these groups in turn form societies, and to whether and how these societies develop institutions to cope with changes in demographic behaviour. To give just one example: from a purely biological perspective, the nuclear households and late ages at first marriage that we find in Northwestern Europe from the Late Middle Ages onwards are poor choices (Laslett 1983). Pooling income and keeping fertility as high as possible would have been a much better strategy to spread risks and increase the survival chances of the population. But Northwestern Europe has been thriving on this supposedly sub-optimal model for a long time (Hajnal 1965). Understanding this evolution demands that we understand what role institutions had in 'countering' the negative side-effects of a marriage pattern that may have influenced Western economic development in a substantial way (De Moor & van Zanden 2010). But getting a clear picture of the demographic parameters which represent and influence household formation is not a straightforward operation...

What has kept historical demographers from digging deeper *en masse* until now? The things that make the discipline so attractive and solid are also, in my view, what keep it from thinking out of the box a little bit more. Although other historical disciplines can learn a great deal from the quantitative rigour and methodological specificity exemplified by historical demographers, it can also be a limitation to creativity in searching for new approaches to use sources and combine methods. Our focus might need to shift somewhat away from analysis towards synthesis and an understanding of long-term demographic trends. It would make many specialists of adjacent fields happy if specialists in historical demography would dare to dig deeper, and – though this might a bit of an exaggeration – to boldly go where no demographic historian has gone before. By doing so, they could provide a more solid demographic basis – both methodological and empirical – that would allow others to study the richness of history in all its dimensions.

References

- De Moor, T. & van Zanden, J. L. (2010). Every woman counts: a gender-analysis of numeracy in the Low Countries during the early modern period. *Journal of Interdisciplinary History*, 41, 179-208.
DOI: http://dx.doi.org/10.1162/JINH_a_00049
- Hajnal, J. (1965). European marriage patterns in perspective. In: Glass, D. V. & Eversley, D. E. C. (Eds.). *Population in history: Essays in historical demography*. Surrey: Edward Arnold.
- Laslett, P. (1983). Family and household as work group and kin group: areas of traditional Europe compare. In: Wall, R., Orbin, J. & Laslett, P. (Eds.), *Family forms in historic Europe*. Cambridge: Cambridge University Press.

Biography

Tine De Moor coordinates a team of researchers at Utrecht University working on the development of institutions for collective action and the long-term changes in family patterns in Europe. Her research interests include European marriage patterns throughout the late medieval and early modern periods.

Historical demography in the very long run: how long is very long?

Walter Scheidel

How far back does historical demography go? It used to be thought that the lack or poor quality of quantitative or quantifiable evidence from early societies prevented serious demographers from reaching back more than a few centuries. After all, if “demography without numbers is waffle”, as David Schofield memorably put it thirty years ago, how can we hope to engage with the more distant past? Even so, the time frontier has steadily been pushed back. Ancient demography has carved out a small but growing niche within population studies, with “ancient” referring to conditions thousands rather than merely hundreds of years ago. Egyptian papyrus documents that preserve census records from the Roman period have been milked for valuable insights into life expectancy, fertility regimes, household structure and arguably even nuclear-family incest as far back as 2,000 years ago. Ancient Greek and Roman tombstone inscriptions that have survived in vast numbers from different parts of the Mediterranean basin reveal distinctive seasonal distributions of mortality that hint at the nature of the underlying disease environment and allow us to track continuity and change over two millennia. They also enable us to explore the antiquity of the so-called Mediterranean marriage pattern or the regional prevalence of endogamy. While the Mediterranean holds pride of place in these endeavours, East Asia likewise contributes useful data. Lineage records from China that go back into antiquity have been used to reconstruct life expectancy, while the Standard Histories are replete with detailed census tallies and a number of original census registrations from the Tang period have also come to light. And sometimes we can go even further back in time. Pioneering work has been performed on the records from the workers’ village of Deir-el-Medina that serviced the royal tombs in the Valley of the Kings in Upper Egypt during the New Kingdom period, three and a half millennia ago. It has found that its residents suffered from higher rates of illness at exactly the same time of the year as when elevated mortality appears in regional funerary records 1,500 or 2,500 or even 3,300 years later.

Yet beyond a certain point this kind of research cannot be extended into an ever more distant past, if only because writing itself dates back no more than 5,000 years, and much less than that in most of the world. This is where other types of evidence come in, most notably the human body. Here I am thinking less of paleodemography, the quest to derive longevity and sex ratios and related matters from the assemblage of skeletons recovered from cemeteries. The debate on this issue has been drawn-out and often frustrating: every so often we are told that the problems of reliably aging adult bones have now been solved, and yet we must continue to wonder if the demographic extrapolations are correct, let alone representative. But perhaps we have been asking the wrong questions. The one thing that bones are really good at telling us about is migration. Isotope signatures indicate whether individuals had moved far from where they had been born, and where that birthplace might have been. Ancient DNA is now adding another layer of vital information: while not so long ago the analysis of

DNA extracted from ancient bones seemed like “Jurassic Park”-style science fiction, it is now quickly becoming standard procedure. All of a sudden, it has become possible for a man from East Asia, possibly China, to be identified at a Roman burial site in southern Italy – and that is just one example. The sequencing of ancient, medieval and modern DNA from Tuscany suggests that the Etruscans were more closely related to Eastern Mediterranean populations than later inhabitants of this region, and that medieval and modern Tuscans may not descend from the Etruscans at all. DNA likewise helps to diagnose causes of death: we can finally be sure that the plague pandemic that ravaged western Eurasia for two hundred years starting in 541 CE really was the same disease as the Black Death of the Late Middle Ages. But we do not even need DNA from the past to recover demographic information. The genetic makeup of present-day populations forms a giant archive of differential reproduction and migration that reaches back to the beginnings of our species. This line of research, which focuses on blood alleles, has a longer pedigree than ancient DNA studies and has produced a steady flow of striking results. For instance, the observation that male ancestors from the Aegean region made a large contribution to the Y-chromosomal make-up of contemporary Sicilians or the inhabitants of the Marseille area (prominent destinations of ancient Greek colonizers over 2,500 years ago), whereas corresponding female contributions are lacking, tells us much about the sex ratio of past population transfers and the violent nature of settlement. Similar patterns have been observed in many other target areas for foreign takeovers, from England to Turkey and China and the New World.

But how far back do we want to go? As far back as the moment when anatomically modern humans first moved out of Africa? What does a newly discovered jawbone of a man who lived 40,000 years ago and carried up to 9 percent Neanderthal DNA tell us about mating practices in the very remote past? Most importantly, should we care? Does this fall within the remit of historical demography? It may be tempting to say that all this is a matter for other disciplines to deal with, and that is surely true as far as data gathering and processing are concerned – but where are the temporal boundaries for demographic interpretation? The existence of conventional archives of written material is not an intellectually satisfying criterion for inclusion or exclusion. At the very least, historical demographers need to be aware of these new types of evidence and analyses, appreciate the new horizons they open up, and think about how to engage with this brave new world. It goes without saying – but I will say it anyway – that transdisciplinary collaboration will be an indispensable means to this end.

Further reading

Scheidel, W. (Ed.) (2017). *The Science of Roman History: Biology, Climate and the Future of the Past*. Princeton NJ: Princeton University Press.

Scheidel, W. (forthcoming). *The Demography of the Greco-Roman World*. Cambridge: Cambridge University Press.

Biography

Walter Scheidel is the Dickason Professor in the Humanities, Professor of Classics and History, and Kennedy-Grossman Fellow in Human Biology at Stanford University. He works on ancient social and economic history, pre-modern historical demography, and the comparative world history of labor, state formation and inequality.

Why paleodemography?

*Irene Barbiera, Maria Castiglioni &
Gianpiero Dalla Zuanna*

Throughout history, many societies have lacked intentionally written descriptions of demographic matters. It is only with the diffusion of ecclesiastical records, promoted by the Council of Trent (1545-1563), that the life history of individuals, families and communities can be reconstructed with accuracy, thereby shedding new light on population mechanisms. For the preceding period, only patchy fiscal or health sources remain. While these offer information on deaths and household compositions, we can only reconstruct partial fertility and mortality trends with their help. Ancient and medieval demography is therefore largely a matter of speculation. The available sources only let us grasp conclusions sporadically; for example, the average number of children born to women in different periods and how many of these were carried away by infant mortality; or the ways in which the relationship between population and resources changed over time, generating inequality and tensions at different levels of society; or the extent to which different social groups experienced hunger; or the kinds of sicknesses and pandemics people feared, and the ways that social and political changes affected all these phenomena. The attempts that have been made to reconstruct Europe's population size from Roman times to the present day may be useful for our understanding of general trends of increasing and decreasing population across the centuries, but they offer little explanation for the mechanisms that determine such trends.

Due to this scarcity of written sources, archaeology plays an important role in the understanding of demographic mechanisms. In this field, the changing dimensions of settlements and buildings, together with trends in production levels, are normally considered as indicators of population increase or decrease. Starting in the 1940s with the pioneering work of Lawrence Angel, skeletons also began to be taken into consideration as an important source for demographic inquiry. However, it was only from the 1970s onwards that the methods of what is now known as paleodemographic research became widespread, thanks to the development of new methods of physical anthropological analysis.

Several important syntheses were coming to fruition in the 1980s. However, it was also in this decade that a number of scholars began to express scepticism with regard to the possibilities, for any historical epoch, of reliably employing cemeteries as sources of demographic inquiry (Hoppa and Vaupel 2002). The main reasons put forward were that age at death can be difficult to correctly determine; that migratory movements can distort the results; and that discovered skeletons may not be representative of the population as a whole (in other words, one must take into account the effect of selection factors such as social class, age, sex, cause of death, etc.). The most serious doubts raised concern the frequent and systematic underestimation of the deaths of children, which in ancient demographic regimes constituted a large portion of total mortality. These critiques were indeed useful in pointing to the main limitations of the paleodemographic approach and in developing new methods

for using cemeteries as sources for demographic research. At the same time, recent methods of biomolecular archaeology (DNA and isotopic analyses) have offered new potential for the study of ancient human remains.

Against this background, Bocquet-Appel and Naji (2006) recently tested a method for estimating mortality trends using skeletal samples from prehistoric cemeteries. This method disregards young children, aged 0-5 years, who are not accurately represented in the cemeteries, but does take into account the age group 5-19 years, which can be accurately identified with the help of current methods of anthropological analysis. The method compares the number of individuals who died between ages of 5 and 19 years with the number of individuals aged 5+. In other words, it calculates the proportion d , where $d = D_{5-19}/D_{5+}$. This simple and intuitive proportion is particularly interesting when measured and juxtaposed with the results from a wide sample of cemeteries: it allows us to draw major trends.

As the value of d increases, the proportion of individuals dying between 5 and 19 years is higher. This can be connected to an increase of fertility and/or an increase of mortality.

In particular, the meaning of the d -ratio may vary in three significant ways:

- (1) In a *stationary population*, d is closely associated with several parameters of mortality. If the stationary hypothesis holds, high levels of d mirror high mortality, as a greater proportion of people die between the ages of 5 and 19 years.
- (2) Similarly, in a *population affected by recurrent epidemics*, d may be quite high because epidemics usually have a stronger impact on younger people than on adults. Moreover, severe epidemics were often followed by a significant increase in marriages, immediately producing a rise in the number of births and therefore a consequent “swelling” of the younger age classes and the number of deaths aged 5-19.
- (3) Finally, in a *growing population*, d increases because the number of births surpasses the number of deaths, and the young age classes (and the deaths of young people) become ever more numerous. Conversely, in a *declining population*, d diminishes.

At first sight, these three alternatives seem to leave us with an insolvable puzzle. However, there is a general consensus among paleodemographers that pre-industrial populations were stationary over the long term, with pronounced fluctuations only occurring over shorter time spans. In other words, the balance between births and deaths maintained a constant population structure, if considered across the centuries (Séguy, Buchet *et al.* 2013). Populations of this kind are ultimately governed by the laws of mortality. In this context, the changes in the proportion of young individuals dying as expressed by d can be directly connected to different parameters of mortality (more details on the method and its correlation to mortality parameters are discussed in Barbiera & Dalla Zuanna 2009). Using Coale and Demeny’s life-tables, it is possible to associate the values of d with several parameters of mortality. For example, for the low survival levels of the West model life-tables ($e_0 < 40$), there is a linear correlation between d and life expectancy at birth (e_0), as well as between d and the probability of dying at birth (q_0), as d grows life expectancy at birth diminishes, while the probability of dying also grows; see figures 1 and 2.

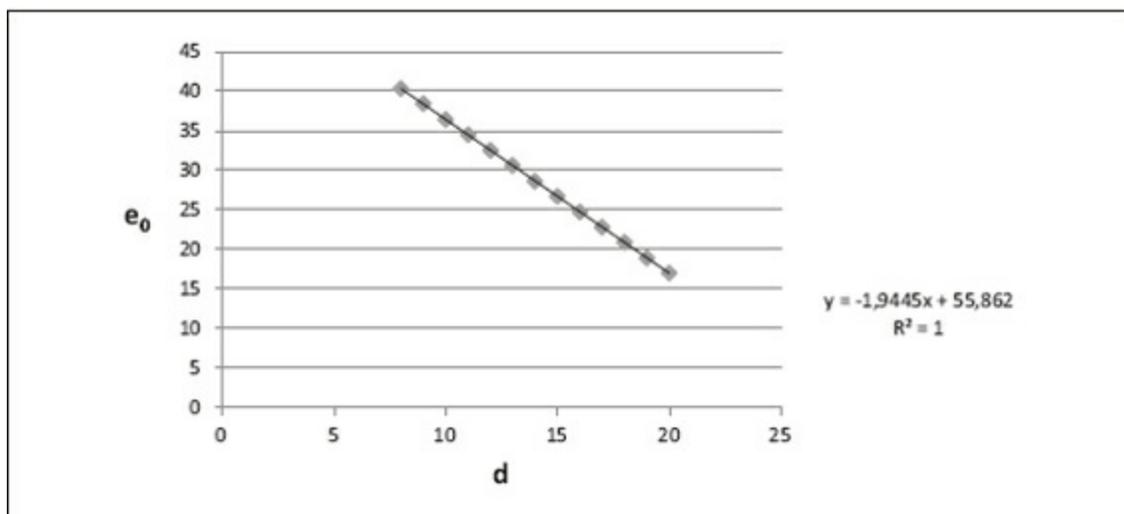


Figure 1. d ratio and mortality, family West, linear relation between d and e_0 (standard life tables of Coale and Demeny).

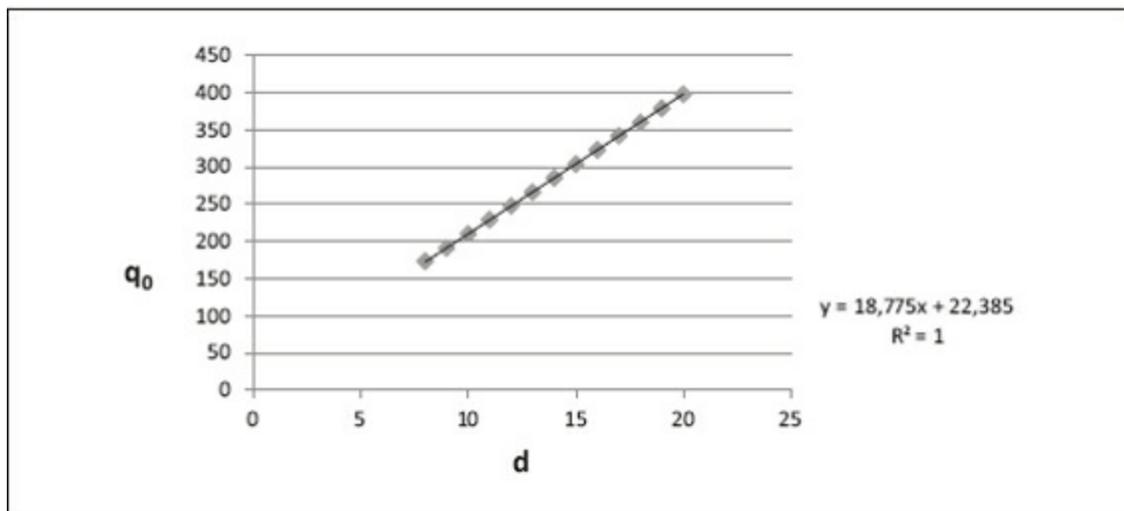


Figure 2. d ratio and mortality, family West, linear relation between d and q_0 (standard life tables of Coale and Demeny).

We applied this method to a large Italian sample of skeletal data (4,258 individuals in total), dating from the first until the thirteenth century CE. This study indicated an increase of mortality rates in the period between the sixth century and the ninth century in Italy (Barbiera & Dalla Zuanna 2009). With the aim of finding an explanation for this worsening situation, we used skeletal data to investigate changes in standards of living during this period. The initial analyses suggest that the Early Middle Ages were not characterized by a worsening of wealth conditions: we observed an increase in adult stature, decreasing frequencies of different pathologies, and signs of a better diet, as indicated by nutritional analyses of bones. We therefore advanced the hypothesis that epidemiological factors might have caused an increase in mortality during this phase.

One problem which emerged during this study is that the investigated cemeteries were under-representative not only of children, but also of adult females (see Barbiera 2012). A comparison of this data with historical, archaeological and paleodemographic data from other European countries shows that this underrepresentation of females is documented only in Italy and can be explained partly by different mortality patterns among males and females (Barbiera, Dalla Zuanna & Castiglioni, forthcoming) and partly by the exclusion of women from cemeteries (Barbiera 2015). These outcomes raise new questions about the role of women within the household and about the way gender roles shaped access to resources and, consequently, affected the different chances of survival for different

social groups.

Viewed from a broader perspective, this work further contributed to the recent change of direction in paleodemographic research, which in the last decade has opened up new perspectives for the understanding of historical demography. Besides contributing to the study of mortality trends, ancient human remains retain crucial records of individual life histories that can now be decoded and interpreted, thanks to new analytical methods. Body dimensions, nutritional markers and pathologies are the most relevant aspects of an individual's life that a skeleton can preserve. More recent work has demonstrated, however, that the age at weaning and the onset of puberty can also be explored with the help of skeletal evidence: the former thanks to teeth, the latter thanks to the process of fusion in the long bone epiphyses. Reading this information with the proper methods offers insights into the fertility regimes and living standards in the past. These new directions of research have proven fruitful in understanding the interaction between demographic transformations and social dynamics, the history of family, gender and everyday life. Moreover, the extensive presence of burials allows us to test the diffusion of certain phenomena during periods for which written sources are lacking.

A long-term paleodemographic perspective is particularly interesting for understanding demographic transformations in periods of social and economic change. For instance, the long trend study by Bocquet-Appel and Naji (2006) has contributed significantly to our understanding of the Neolithic transition, while our work on Italy has offered a new perspective on the transformations triggered by the end of the Roman Empire.

Last but not least, the application of paleodemographic research has also potential beyond the times and places for which no historical data exist. Widening paleodemographic research to include later periods, when written sources are numerous and population mechanisms are better clarified, can help to cross-check the potential of the different types of sources, as well as testing existing theories on demographic and socio-cultural phenomena.

Paleodemography has only recently been regarded a constituent discipline of demography in France (Institute Nationale d'Études Démographiques) and in Germany (Max Planck Institute for Demographic Research in Rostock), yet still remains entirely unexplored in other European countries. Through our research we have begun to appreciate the potential of this discipline for understanding life histories in the ancient and medieval world, and we fervently hope that more studies will be initiated in this field.

References

- Barbiera, I. & Dalla Zuanna, G. (2009). Population dynamics in Italy in the Middle Ages: new insights from archaeological findings, *Population and Development Review*, 35(2), 367-389.
DOI : <http://onlinelibrary.wiley.com/doi/10.1111/j.1728-4457.2009.00283.x/full>
- Barbiera, I., Castiglioni, M. & Dalla Zuanna, G. (2012). Missing women in the Italian Middle Ages? Data and interpretation. In: Huebner, S. & Nathan, G. (Eds.), *The "Mediterranean family" from antiquity to the early modern period. Proceedings of the International Conference at the Max-Planck Institute for Demographic Research, Rostock, 14/15 June 2012*. Malden, Oxford: Wiley-Blackwell, forthcoming.
- Bocquet-Appel, J. P. & Naji, S. (2006). Testing the hypothesis of a worldwide Neolithic demographic transition: corroboration from American cemeteries. *Current Anthropology*, 47(2), 341-366.
DOI: <http://www.jstor.org/stable/10.1086/498948>
- Hoppa, R. D. & Vaupel, J. W. (Eds.) (2002), *Paleodemography. Age distributions from skeletal samples*. Cambridge: Cambridge University Press.
- Séguy, I. & Buchet, L. (2013). *Handbook of Paleodemography*. New York: Springer.

Biographies

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Stretching from the past into the present: using historical demography to understand current trends

Glenn Sandström

In this text I will argue that the field of historical demography should to a larger extent focus on the substantial changes in demographic behaviour that occurred during the first half of the twentieth century and on how these changes can be explained in terms of their connection to economic, institutional and normative shifts during this period.

Historical demography has achieved large advances since the birth of the discipline some sixty years ago, when family reconstitution techniques were first introduced by Louis Henry. Recognizing that we fail to understand how and why the recovery of nuptiality and fertility took place during the interwar years (Van Bavel 2010), demographers such as Henry and John Hajnal turned to history to better understand the present (Rosental & Mandelbaum 2003). They argued that demographic research needed access to individual level data and that it was necessary to adopt a “micro-history” approach that directly addressed the behaviour of individuals and couples (John Hajnal 1947). This resulted in a focus on the origins of the fertility and mortality decline during the eighteenth and nineteenth centuries and led to a flurry of projects to collect individual level data for historical populations. The research that emerged in the decades following the institutionalization of historical demography has provided vast improvements in our understanding of demographic behaviour in the past. However, the data sources that were collected do not cover the period after 1900. Furthermore, the national statistical agencies have only produced aggregated data for the period that predates modern computers. This has limited the possibilities to analyze how individual level determinants of demographic behaviour developed during the first half of the twentieth century.

This does not mean that nothing important happened in the West during this period. For example, the first decades of the twentieth century are characterized by the completion of the historical fertility and mortality decline; by the recovery of fertility during the baby boom; by marriage becoming near universal and then gradually losing its exclusive status; by the first substantial international upshift in the divorce rate occurring in the 1940s, which made divorce increasingly common rather than fringe behaviour; by rapid improvements in medical knowledge and health, etc. I would argue that the origins of more or less all of the demographic patterns that have taken form in the West since the 1960s can be traced back to changes during this earlier period. It has rightly been pointed out that even today we still do not have a firm grip on what caused some of the major shifts during the first half of the twentieth century, such as the baby boom (Van Bavel & Reher 2013). Arguably, this is also true for a number of other theoretically important changes that took place between the early decades of the twentieth century and the 1960s.

During this period central aspects of the economic, institutional and normative structures that prevail in Western societies today took shape. These include political democratization; the expansion

of education and the shift towards increased gender equity; the institutionalization of social insurance through the market or in the context of a growing welfare state; the commodification of female labour; and a shift from a single earner to a dual provider model, to name but a few. Although the timing and extent of these processes vary across different countries in the West, there are substantial developments prior to the 1960s that must be accounted for to make sense of the demographic developments that took place during the latter part of the century.

Demographers who have contributed to the field of historical demography, such as Ron J. Lesthaeghe and Dick J. Van de Kaa have made a substantial impact on the discussions of contemporary demographic patterns with their idea of a Second Demographic Transition. However, their studies have either been theoretical or have focused on the empirical developments of recent decades. The patterns they identify grew out of shifts that had already occurred during the first part of the century. Moreover, the way these changes emerged in different layers of the population is not well understood.

It is only in the last couple of years that individual level longitudinal data that include vital events and rich background information have become available for the first half of the twentieth century. Today datasets covering this period exist for a number of settings, including Sweden, The Netherlands, Spain and Utah in the USA. These and other ongoing projects to collect microdata for the period 1900-1960 are laying the groundwork needed to further research this highly dynamic period in Western history. In addition, census data for this period are becoming increasingly available and accessible. They now exist for the USA, thanks to the IPUMS project run by the Minnesota Population Centre, and to some extent for other countries, thanks to their own specific national projects.

In my view, historical demography can extend its impact within the scientific community and on society in general by seeking to provide a long-term perspective on the driving forces and mechanisms behind demographic developments during the entire twentieth century. By applying this long-term perspective to demographic development, a perspective that stretches from the past into the present, the results reached within the field can further fertilize the discussion about how we should understand societies in the West today. Such a perspective is not only important to realize how we got to where we are now, but can also provide a basis for discussion about the future of Western populations in the years to come.

References

- Hajnal, J. (1947). Aspects of recent trends in marriage in England and Wales. *Population Studies*, 1(2),137-164.
- Rosental, P. A. & Mandelbaum, J. (2003). The novelty of an old genre: Louis Henry and the founding of historical demography. *Population* (English Edition, 2002-), 58(1), 97-129.
DOI: <http://www.jstor.org/stable/3246646>
- Van Bavel, J. (2010). Sub-replacement fertility in the West before the baby boom: past and current perspectives. *Population Studies*, 64(1), 1-18.
DOI: <http://www.tandfonline.com/doi/full/10.1080/00324720903362806?>
- Van Bavel, J. & Reher, D. S. (2013). The baby boom and its causes: what we know and what we need to know. *Population and Development Review*, 39(2), 257-288.
DOI: <http://doi.org/10.1111/j.1728-4457.2013.00591.x>

Biography

Glenn Sandström is a Senior Researcher in Historical Demography at Umeå University, Sweden. Sandström's research focuses on changes in family dynamics in Western countries from the late nineteenth century up to the present day. His latest publication looks at the way child mortality and the sex composition of the surviving children influenced fertility decisions in Spain during the demographic transition.

Chapter 2

Go forth into the world

Better tell ten things which are interesting, some of which prove to be false, than ten things which are true, none of which prove to be interesting

Michaël Corner

Six contributions highlighting what we may gain from studying regions and populations that have hitherto remained little understood as historical demographers have shied away from studying them.

Historical demography: beyond eurocentrism

Lionel Kesztenbaum

Introduction

The cornerstone of the beginnings of historical demography – family reconstitution *à la* Louis Henry – proved both easily replicable and useful to describe, explore and analyze the populations of the past. As a result, historical demography provided a critical reassessment of demographic processes, sometimes in addition and sometimes in opposition to demography itself. But in so doing, it also contributed in many ways to the shaping of a view of the historical evolution of demographic behaviours centred on the European (and in many instances simply the British or the French) experience. The demographic transition or the behaviour of the so-called pre-transitional populations were defined and conceptualized mostly with reference to European populations. Recently, an increasing number of studies are challenging the prevailing theories and views (for example, Bengtsson *et al.* (2004)). But much still remains to be done to ensure that this bias does not affect large spans of historical research (Goody 2006).

The demographic legacy of colonialism

One opportunity to test existing theories lies in studying the demographic legacy of colonialism. As time has passed since the end of colonial regimes, historians, as well as other social scientists (notably economists and sociologists), have started to build up a critical assessment of colonialism and the colonial legacy (among many works, see Austin (2007); Cogneau *et al.* (2016); Davis & Huttenback (2007)). Their self-proclaimed intention to move beyond the initial opposition of the pro- and anti-colonialist positions has been partially successful, although it is still, in various ways, a work in progress. Recently, historical demographers have also tried to explore the fate of colonial societies by taking up the challenge to collect all the various available sources – however biased they may be. Discussing their bias and limitations; reconstructing the context in which they were produced; and exploring their significance for the larger models that demographers have in mind is even more challenging. But it is a task that is both necessary and rewarding, since it will expand our understanding of the ways populations interact with and are shaped by cultural, economic, political and/or social circumstances. Unfortunately, as expected, the most numerous and best quality data are on the colonizers themselves, not on the colonized. Moreover, both the data and the way they were produced are *a priori* tainted by colonial thoughts and perceptions. They therefore suffer from double selection: both the observed population and the way this population is observed are biased.

However, these limitations should not impair the study of colonial populations. On the contrary, they should be an incentive to develop critical tools and innovative analytical methods. Such tools and methods are needed all the more because the problem of double selection is in no way specific to colonial populations, but is a phenomenon that affects all historical sources. Think, for example, of the skewed distribution of information on socio-economic status groups: we know much more about the European upper classes of the past than about the average person, and even less is known about the penniless and the destitute.

But, for the sake of brevity, let us focus here on the example of colonial populations, and on what a better understanding of these populations may bring us. The way colonial populations experienced the mortality decline might, for instance, help us to understand the relative contributions of public policies, income growth and medical advances in this decline. Moreover, the long-run mortality decline happened at different paces and levels of intensity within populations: the gains in life expectancy varied between rich and poor; between men and women; between colonized and colonizers; between rural and urban dwellers; etc. Describing inequality within the decline of mortality is of the utmost importance to an understanding of the process itself. All this will help to discuss and re-assess the meaning of the current demographic models that draw so heavily (certainly too heavily) on the Western experience.

More than half a century since Louis Henry's initial work, historical demography must reinvent itself, if it is to survive. In that sense, the study of colonial populations forms one way in which two decisive challenges faced by the field can be overcome. The first is the risk getting carried away by the methodological advantages of 'big data', which in practice might give more importance to populations with more data available. The second, which is connected to the first, is the risk of linear thinking and a lack of attention for historical diversity. In the following paragraphs, I will discuss both of these challenges in more detail.

Big data

The rise of large individual micro-level datasets, such as those freely available on IPUMS, has started to dominate the field. Paradoxically enough, this feast of data mostly feeds those who were already well fed, since the majority of datasets relate to countries already studied at great length. This can be explained by the quality of the original sources and by path dependency in constructing large-scale historical demographic datasets. The risk of this trend is that it will turn historical demography, once again, into the history of a few leading (and primarily North American and European) countries. A challenge for the very near future is therefore to move beyond these large datasets. Moreover, historical demography should not simply measure demographic behaviour in the past, but also take into account the broader historical (social, cultural, economic and political) settings in which this behaviour took place. In other words, demographic studies of the past should historicize past populations. A very good example of a recent study that perceptively places demographic processes in their context and explores the interactions between context and behaviour is Drixler (2013). Unfortunately, this historicizing task becomes an ever greater challenge as data have become more readily available, and there is an ever greater distance between those producing databases and those analyzing them.

Deconstructing models of modernity

The idea, or some might say the model, of a linear demographic transition linking modernity with various demographic outcomes (birth control, lower mortality, high urbanization, etc.) is still prevalent among many demographers – not to mention other social scientists. In truth, surprisingly little is known about both the details and the diversity of this process; for instance, who first started birth control and how? To further deconstruct linear models, historical demographers need to draw on various populations that have, so far, been too marginalized in research endeavours. Expanding our knowledge will prove useful to advance our insights in demographic behaviour, in both Europe and the world, in both the past and in the present. Developing our understanding of all the populations of the past – non-European populations, poor people from Europe and elsewhere, etc. – is therefore of the utmost importance for the future of historical demography.

References

- Austin, G. (2007). Reciprocal comparison and African history: tackling conceptual Eurocentrism in the study of Africa's economic past. *African Studies Review*, 50(3), 1-28.
DOI: <http://dx.doi.org/10.1353/arw.2008.0009>
- Bengtsson, T., Campbell, C. & Lee, J. (2004). *Life under pressure. Mortality and living standards in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Cogneau, D., Dupraz, Y. & Mesplé-Somps, S. (2016). African states and development in historical perspective: colonial public finances in British and French West Africa. *Working paper*.
- Davis, L. E. & Huttenback, R. A. (2007). *Mammon and the pursuit of the Empire – The political economy of British imperialism 1860-1912*. Cambridge: Cambridge University Press.
- Drixler, F. (2013). *Mabiki. Infanticide and population growth in Eastern Japan: 1660-1950*. Berkeley: University of California Press.
- Goody, J. (2006). *The theft of history*. Cambridge: Cambridge University Press.

Biography

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Mission: possible – what church records can tell us about non-Western societies' demographic past

Felix Meier zu Selhausen & Jacob Weisdorf

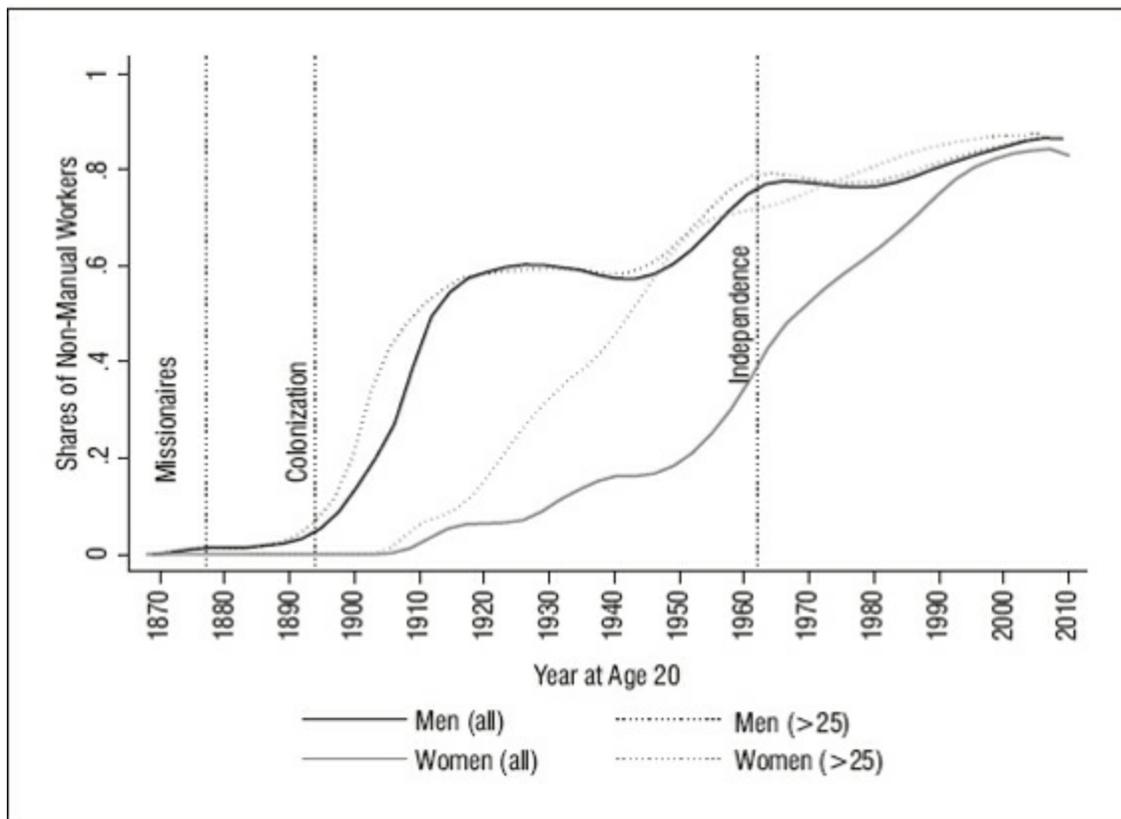
Christian conversion efforts have left their traces. The spread of Christianity from Western Europe to the rest of the world represents one of the more remarkable cultural transformations of humankind. Christian global expansion provides an extraordinary heritage to historical demographers with particular interest in the long-run development of non-Western societies. The detailed and systematic ecclesiastical record-keeping of Western missionaries, as well as their local successors, not only make Christian church book registers an exceptional empirical basis for the study of demographic history in today's developing world, but they also constitute an excellent source of information for examining the demographic reception of, and the responses to, Western European encounters. Moreover, they offer equally excellent opportunities to investigate the impact of Western European institutions on the educational achievements and occupational opportunities of, or discrimination against, colonized populations. One of the key advantages of using Christian Church vital sources is that missionaries in European colonies followed the same procedures as their colleagues at home, meaning that most Christian records are written on standardized forms that are typically identical to those used by parish ministers in Western Europe (Weisdorf 2016). Like their Western equivalents, non-Western church book registers provide statistics regarding three main life events: baptism, marriage and burial. They inform scholars about historical patterns of births, nuptials and deaths in parts of the world where such data are usually hard to find, even in more modern times. Such statistics are especially relevant in societies in which individual-level data dating back before the 1980s – when systematic census taking and survey statistics began to emerge – are otherwise absent, which is the case in most developing regions, such as sub-Saharan Africa.

Ecclesiastical recordings made by missionaries of the Anglican Church Mission Society (CMS) are especially relevant for scholars interested in tracing the historical development of educational and occupational structures. The passing of Rose's Act by the English parliament in 1812 obliged the Anglican Church to record the occupational titles of people directly involved in ecclesiastical events, including spouses and their fathers-in-law, parents baptising their children, and individuals who were buried. These occupational titles present an extraordinary opportunity to link individual demographic patterns and behaviours to individual social and educational qualities. Thanks to recent advancements in the construction of social classification schemes, such as HISCO and HISCLASS (Van Leeuwen *et al.* 2002), occupational titles are relatively easy to classify, not just in terms of social status, but also with respect to a wide variety of work-related particularities, including household income potential, human capital attainments, informal employment, disease hazards, and so on. Furthermore, the ecclesiastical recording of the occupations of fathers and their sons provides a unique possibility for the study of inter-generational social mobility at the family level, something that is otherwise rarely

possible in historical Christianized societies. For demographers interested in gender history, many non-Western church books hold information about the occupation of men *and* women, which makes it possible to track and study gender-specific effects and within-marriage inequalities in a long-term perspective. Moreover, because social classification schemes such as HISCO and HISCLASS code occupations by nation, international comparisons have become possible.

Despite the widespread prevalence of parish registers in developing regions, such as sub-Saharan Africa, there has been no ‘rush’ to collect and analyze the data contained in the earliest parish registries held by Christian churches in Africa. Over the course of the twentieth century, Christianity expanded dramatically in sub-Saharan Africa, from nascence into one of the most powerful cultural forces on the continent. African Christianization brought wide-ranging demographic and socio-economic changes through the establishment of mission schools, vocational training centres and hospitals, as well as through the intervention of the Church in African family life and moral values. That being said, relatively little is known about Africa’s demographic history. Scattered studies, summarised in Walters (2016), have recently shown the way, using Christian baptism and burial registers in combination with family reconstitution techniques to reconstruct fertility and mortality patterns in various parts of sub-Saharan Africa during the twentieth century. They represent examples of how to link Christian Africa’s colonial past with its post-colonial present at the micro-level. Other recent studies, exploiting Anglican marriage registers from historical Uganda, have illustrated the usefulness of ecclesiastical sources for examining African class formation during the colonial era in general and the social and demographic effects of missionary activities in particular (Meier zu Selhausen 2014; Meier zu Selhausen *et al.* 2015; Meier zu Selhausen & Weisdorf 2016; see also the Economic History of Christian Africa under weblinks). The fact that Christian missionaries often arrived prior to the European colonial powers leaves a window of opportunity for capturing the demographic characteristics of pre-colonial indigenous societies. These characteristics may then serve as a backdrop for investigating the impact of colonial and post-colonial influences on a wide range of dimensions of African demography. As examples, Figures 1 and 2 illustrate the influence of British colonialism in Uganda on the shares of Christian converts engaged in salaried and white-collar work in historical Kampala. The graphs show the dramatic transformation of Anglican Kampala, from an entirely blue-collar, informal economy to a modernized, largely white-collar society made up of formally employed workers.

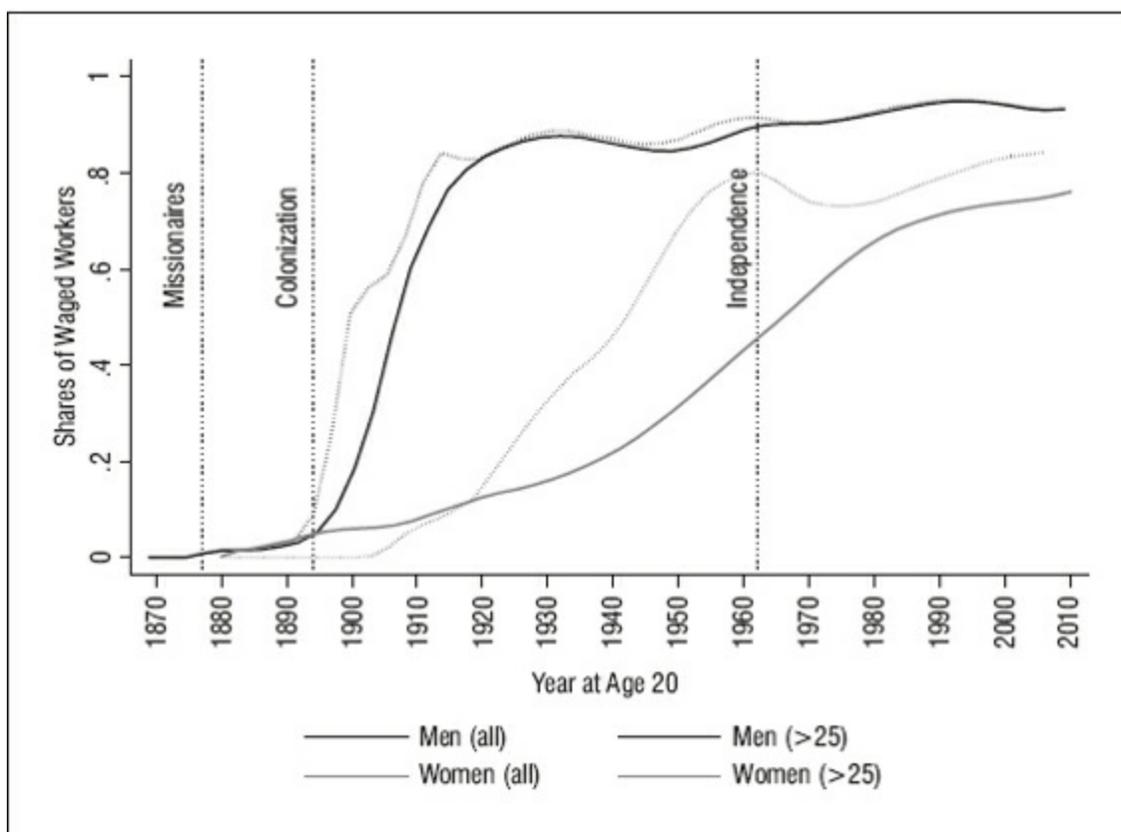
Of course, the works summarised here only scratch the surface. Millions of ecclesiastical records, openly exposed to the hazards of fire, tropical insects and theft, and hence at high risk of being lost, are waiting to be digitized and analysed by historical demographers with a taste for more exotic archives.



Note: A white-collar worker performs non-manual professional, managerial, or administrative work tasks (Van Leeuwen *et al.* 2011). Housewives are excluded.

Source: Meier zu Selhausen & Weisdorf (2016).

Figure 1. The share of grooms and brides holding a white-collar occupation; from Anglican marriage registers of Kampala (Uganda), 1870-2011.



Note: A waged worker is someone who holds a formal, salaried job. Housewives are excluded.

Source: Meier zu Selhausen & Weisdorf (2016).

Figure 2. The share of grooms and brides with a wage-labour occupation; from Anglican marriage registers in Kampala (Uganda), 1870-2011.

References

- Meier zu Selhausen, F. (2014). Missionaries and female empowerment in colonial Uganda: new evidence from Protestant marriage registers, 1880-1945. *Economic History of Developing Regions*, 29, 74-112.
DOI: <http://dx.doi.org/10.1080/20780389.2014.927110>
- Meier zu Selhausen, F. & Weisdorf, J. (2016). A colonial legacy of African gender inequality? Evidence from Christian Kampala, 1895 – 2011. *Economic History Review*, 69(1), 229-257.
DOI: <http://dx.doi.org/10.1111/ehr.12120>
- Meier zu Selhausen, F., van Leeuwen, M. H. D. & Weisdorf, J. (2015). Social mobility among Christian Africans: evidence from Ugandan marriage registers, 1895-2011. *CAGE Working Paper*, no. 239-2015.
Link: <https://ideas.repec.org/p/cge/wacage/239.html>
- Van Leeuwen, M. H. D., Maas, I. & Miles, A. (2002). *HISCO: Historical International Standard Classification of Occupations*. Leuven: Leuven University Press.
- Walters, S. (2016). Counting souls: towards an historical demography of Africa. *Demographic Research*, 34, 63-108.
DOI: <http://dx.doi.org/10.4054/DemRes.2016.34.3>
- Weisdorf, J. (2016). Church book registry: a cliometric view. In: Diebolt, C. & Hauptert, M. (Eds.) (2016). *Handbook of Cliometrics*. Berlin: Springer.

Weblinks

The Economic History of Christian Africa: <http://ehca.info>

Biographies

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Demography and the prison

Kris Inwood & Hamish Maxwell-Stewart

The reconstruction of past population and demographic behaviour inevitably relies on church records, on civil registration and, especially in North America, on census manuscripts. While these sources provide an indispensable core for the discipline, complementary information from other nominal sources can extend our knowledge of demographic structures and processes in useful ways. Particularly interesting is the rich personal detail found in prison registers.

The rise of the prison as an institution of mass incarceration for offenders has for long fascinated historians. Since the 1970s a series of influential works have explored the shift in punishment from the body to the mind that accompanied the increased use of imprisonment as an instrument of justice. Much of this literature has focused on the role prisons played in the shaping of a new form of relationship between the state and its citizens. Important as these works are, there have been fewer attempts to describe the impact of imprisonment and punishment on the lives of prisoners and their families, or to use the data recorded in prison registers and related criminal justice record series to explore conditions experienced by working class populations.

From the late eighteenth century prisons and court systems started to maintain ever more detailed registers of offenders. It was important to track offenders because judges took prior conviction into consideration when determining sentencing options. As a result information routinely circulated among courts, prisons and other institutions. The speed with which such record keeping systems spread across jurisdictions, including to colonial societies, is striking. Indeed, in Australia the initial settler populations consisted largely of convicted criminals whose details, down to the scars on their bodies, were captured on paper.

Because of the importance of personal identification, criminal justice records often included information absent in other series. The heights of prisoners were routinely recorded, for example, as was their place of birth. It is not uncommon for details of the prisoner's family to be placed on file – some even provide addresses for next of kin. As prisoners circulated from one institution to another they often accumulated impressive paperwork trails. This was particularly the case for those with multiple conviction histories. In order to keep track of burgeoning filing systems, administrators devised identifiers in order to retrieve data about a prisoner that had been recorded elsewhere.

Prisons, as well as prisoners, were the subject of a great deal of scrutiny. As prisons were expensive to maintain they were regularly inspected. Debates about the severity of different forms of punishment meant that some prisoners were weighed on admission and discharge – a means of measuring the impact of institutional diets and work regimes on the constitutions of inmates. As well as isolating offenders, prisons were responsible for the health and education of their charges. As a result, many contained hospitals and schools – internal institutions that generated information on prisoners' health and literacy levels.

The plethora of identifiers recorded in prison, police and other criminal justice record keeping

systems often assist with linkage to other series, such as censuses and birth, death and marriage records. As many family historians will testify, it is not uncommon to be able to assemble cradle-to-grave profiles for convicted criminals. They are an important, perhaps unparalleled, source of longitudinal data for relatively poor and often disadvantaged people, who otherwise are not easily visible in other sources. Where there are comparable institutional record series – enlistment registers spring to mind – these are restricted to men. A particularly striking feature of criminal justice series is the wealth of data that they contain for working class women.

Of course, as with any source, some care is needed in the use of prison records. Career offenders had a vested interest in not being identified, if for no other reason than the fact that knowledge of a previous conviction history might influence the decision to prosecute. On the other hand, unlike census records, prisoners who provided misleading or incorrect information risked punishment. Data captured in criminal justice series might be thought of as a product of a cat-and-mouse game, as the state attempted to probe past offending histories and criminals tried to conceal as much as possible.

The shortcomings commonly associated with criminal justice record series may have curtailed their use by demographers and historians. Their detailed nature, however, provides researchers with abundant opportunities to test for internal inconsistencies. Information about literacy and scar patterns, for example, can be used to check the validity of occupational information volunteered by inmates. Clerks should be able to read and write, while coal miners' bodies should be marked by blue scars (cuts incurred while working underground quickly became discoloured by coal dust).

It is both a strength and a weakness that prisoners by and large were atypical of the populations from which they were drawn. It is advantageous insofar as many research questions focus on the kind of person who ended up in prison. The difficulty arises with any attempt to infer characteristics and experience of the broader population from those of the prisoners. Generally, it is helpful to contextualize this information by locating prisoners and their families within the wider population, as documented, for example, in censuses and in parish records. And it helps to know how representativeness varied with social and economic circumstance. For example, a cyclical increase of unemployment can drive better educated people into crime and therefore into prison (Bodenhorn *et al.* 2012). Thus, any analysis of short periods should take into account the state of the business cycle. Long period analysis that spans multiple business cycles is less vulnerable to this concern.

In recent years demographic historians interested in crime and health have increasingly turned to prison records. No other source illuminates so clearly the patterns of offending and the impact of changing nutrition, sanitation and living conditions more generally. Scholars have assembled life course data to explore the factors that helped some prisoners to desist from offending. They have also explored the prevalence of intergenerational offending after linking criminal justice records to census data and birth, death and marriage registers. Others have taken advantage of recorded heights and weights to calculate the body mass index of offenders on admission and discharge to explore the comparative well-being of male and female prisoners committed to institutions in different parts of the British Isles. This work has exposed striking regional differences in working class circumstance. Likewise, the stature of prisoners is used as a guide to changing early childhood conditions, notwithstanding the challenge of such research to assemble datasets of sufficient size and to control for the potentially confounding influences of selection bias and idiosyncratic genetic inheritance. Prison records have been particularly useful in exploring the impact of migration on both European and indigenous populations (Horrell *et al.* 2009; Inwood *et al.* 2015a and 2015b).

New criminal justice records are being digitized and linked to other sources at impressive rates. The new records provide an opportunity to analyze an ever growing number of past populations and

to forge productive collaborations with other areas of scholarship, including, among others, the history of incarceration and criminal justice systems, the history of mental and physical health, and economic history. Prison registers will never replace vital registration or the census, but they complement the core sources in ways that suggest important new directions for historical demography.

References

- Bodenhorn, H., Moehling, C. & Price, G. N. (2012). Short criminals: stature and crime in early America. *Journal of Law and Economics*, 55, 393-419.
DOI: <http://www.jstor.org/stable/10.1086/663347>
- Horrell, S., Meredith, D. & Oxley, D. (2009). Measuring misery: body mass, ageing and gender inequality in Victorian London. *Explorations in Economic History*, 46, 93-119.
DOI: <http://dx.doi.org/10.1016/j.eeh.2007.12.001>
- Inwood, K. H., Maxwell-Stewart, H., Oxley, D. & Stankovich, J. (2015a). Growing incomes, growing people in nineteenth-century Tasmania. *Australian Economic History Review*, 55, 187-211.
DOI: <http://onlinelibrary.wiley.com/doi/10.1111/aehr.12071/full>
- Inwood, K. H., Oxley, L. & Roberts, E. (2015b). Physical well-being and ethnic inequality in New Zealand prisons, 1840-1975. *History of the Family*, 20, 250-270.
DOI: <http://dx.doi.org/10.1080/1081602X.2015.1006653>

Biographies

Kris Inwood teaches Economics and History at the University of Guelph, Canada. His recent book with Peter Baskerville, *Lives in Transition: Longitudinal Analysis from Historical Sources* (McGill-Queens 2015) examines the economic and demographic experiences of indigenous and settler populations since 1850.

Hamish Maxwell-Stewart teaches History at the University of Tasmania. He has published several books including *Closing Hell's Gates* (2008). His current work involves the use of criminal justice and related record series to explore questions about offending and health.

Towards a comparative study of local communities

Péter Óri

Like contemporary demography, historical demography is an interdisciplinary scientific field *par excellence*. As a social historian, I am always interested in understanding human behaviour in a perpetually changing biological, geographic, social, economic and political environment. In this respect, an interdisciplinary approach is not a simple feature or consequence of a science focusing on a very complex aspect of human behaviour, but an inevitable means of analysis and understanding. As a social historian, my focus is on the determinants and consequences of individual decisions, and on the interactions between individuals and their changing environment. My principal purpose is to better understand demographic behaviour. Consequently, interactions, spatial or social differences, and changes over time all have a central role in demographic analysis. Social dimensions take pride of place in demography, while exogenous factors like communicable diseases or epidemics matter primarily because, by generating individual level or community level responses, they affect human behaviour and shape mortality levels.

My ideal goal is some kind of ‘total history’ that will allow us to understand a society as perfectly as possible, at least from a demographic perspective. Naturally, this is only feasible at the local level, studying small groups of individuals, micro-regions or small towns or urban districts. Achieving the goal of ‘total history’ requires the complex approach of social history and the use of different types of sources and analysis tools. Equally, we need data at the individual level that cover a period long enough to enable longitudinal analysis and to understand changes over time.

As I have already mentioned, the study of spatial or social differences is inevitable in order to understand demographic behaviour. A greater focus on local studies can provide us with such insights by ensuring the necessary comparative perspective. We have numerous examples of this kind of approach: comparative studies of communities that differ in terms of geographic situation, religion, ethnicity, etc. The Eurasia project is a perfect example of its kind. For this project, micro-demographic databases of communities from different geographic localities and cultures have been created and harmonized. Subsequently, similar models were elaborated to allow for longitudinal and comparative analyses of different types of demographic behaviour (Bengtsson *et al.* 2004; Tsuya *et al.* 2010; Lundh *et al.* 2014). Geographic differences in the level of mortality, fertility and nuptiality or the different responses to economic crises revealed the basic elements of how the societies under study were functioning. Obviously, similar projects aiming at comparative micro-demographic studies should be launched, while I would also argue for a broadening of the Eurasia project in both space and time.

In order to better understand demographic developments, we also need to lengthen the time frame of the periods we study. Currently, the focus is on the eighteenth and nineteenth centuries, which is obviously a consequence of the various possibilities offered by the availability of sources. These sources not only allow us to investigate demographic differences in traditional societies and the

process of demographic transition, but also the geography, the timing and the determinants of the fertility and mortality transitions. However, change does not end with the demographic transition. In more recent times, societies have become in part more homogeneous with the spread of a 'uniform' modern way of life, and in part more divergent in terms of socio-professional status, values and certain elements of demographic behaviour (for example, partnership). Therefore, it seems necessary to extend our analyses into the twentieth century and to study the impacts of (amongst other things) world wars, economic crises and the development of different welfare systems. The sources required for such analyses are available and it seems that efforts in this direction are starting to become more numerous.

By merely studying the last two centuries, we cannot hope to understand the origin and functioning of important phenomena, such as the custom of late or early marriages, household formation rules and the elaboration of different inheritance systems. However, moving back in time towards the early modern period is only possible very exceptionally. This is particularly true for quantitative demographic analyses. If, however, we wish to engage instead in complex longitudinal studies of local communities, qualitative analysis of different kinds of sources (inventories, donations, last wills, correspondence, diaries, memoirs, etc.) can form a starting point to understand the local context of demographic data from later periods. In this way, demographic analysis should be integrated into a thorough analysis of local societies. This can help us to place various highly contentious phenomena, such as household formation, in a different context. In this respect, I would like to mention two examples. The first is the well-known work of Giovanni Levi on a north Italian community, which is one of the masterpieces of micro history (Levi 1988). Here, qualitative analysis of the available household lists revealed how people who were related to each other but lived separately were able to collaborate in an effective manner. The other not-so-well-known example, at least internationally, is a local study by the Hungarian social historian Gyula Benda, who examined the small west Hungarian town of Keszthely (Benda 2008).

In his book, which unfortunately has only been published in Hungarian, Benda managed to unveil the process of inheritance on the basis of qualitative sources. In Keszthely, the division of property between household heads and heirs was a drawn-out process. Its consequence was that households were sometimes split in a spatial sense, while shared farming and collaboration naturally continued. While both the Italian and the Hungarian communities in question were dominated by simple family households, albeit to a different extent, living separately or together was only one element of household formation. The problem of individualism, for instance, needs to be understood within a different context. In short, these two studies demonstrate how social history in a broader sense, by using the most wide-ranging sources, has the ability to enrich demographic analyses. In some ways, this approach may seem to be a return towards the dominance of local studies that characterised the 1960s and 1970s, instead of the more problem-oriented approach that has been popular in recent decades. Nevertheless, because of the more refined techniques for statistical analysis that are now available and because of the opportunities it provides for a more entire understanding, it is, in my opinion, well worth a try.

The collaboration of social historians and historical demographers is especially worthwhile for those geographic areas where historical demographic research has not been as rich as in Northwestern Europe or Northern America. Central Europe and East/South-Eastern Europe sometimes offer similar demographic sources (parish records, population censuses, household enumerations, sometimes repeated during a longer period), but societies in these regions were (and often still are) much more multicultural than the more 'advanced' North and West. The same holds

true for the colonial world and many other areas outside Europe. Studying small but multicultural geographic areas would allow us to analyse demographic differences, while simultaneously controlling for the local context. This will make it possible to gain deeper insight into the way different ethno-cultural groups live together, and how they tackle integration and acculturation over the longer run. Consequently, the geographic extension of research would not simply mean a multiplication of quantitative results, but also a qualitative change for the better in comparative historical demographic studies.

References

- Benda, G. (2008). *Zsellérből polgár. Keszthely társadalma, 1740-1849*. [From serf to burgeois. The society of Keszthely, 1740-1849]. Budapest: L'Harmattan.
- Bengtsson, T., Campbell, C. & Lee, J. (2004). *Life under pressure. Mortality and living standards in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Levi, G. (1988). *Inheriting power. The story of an exorcist*. Chicago: University of Chicago Press.
- Lundh, C. & Kurosu, S. (2014). *Similarity in difference. Marriage in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Tsuya, N. O., Feng, W., Alter, G. & Lee, J. (2010). *Prudence and pressure. Reproduction and human agency in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.

Biography

Péter Óri's main research field is historical demography, with special regard to the population history of eighteenth and nineteenth century Hungary. He is particularly interested in the history of population censuses and demographic thoughts, in marriage customs and household formation rules, and in the different patterns of demographic transition.

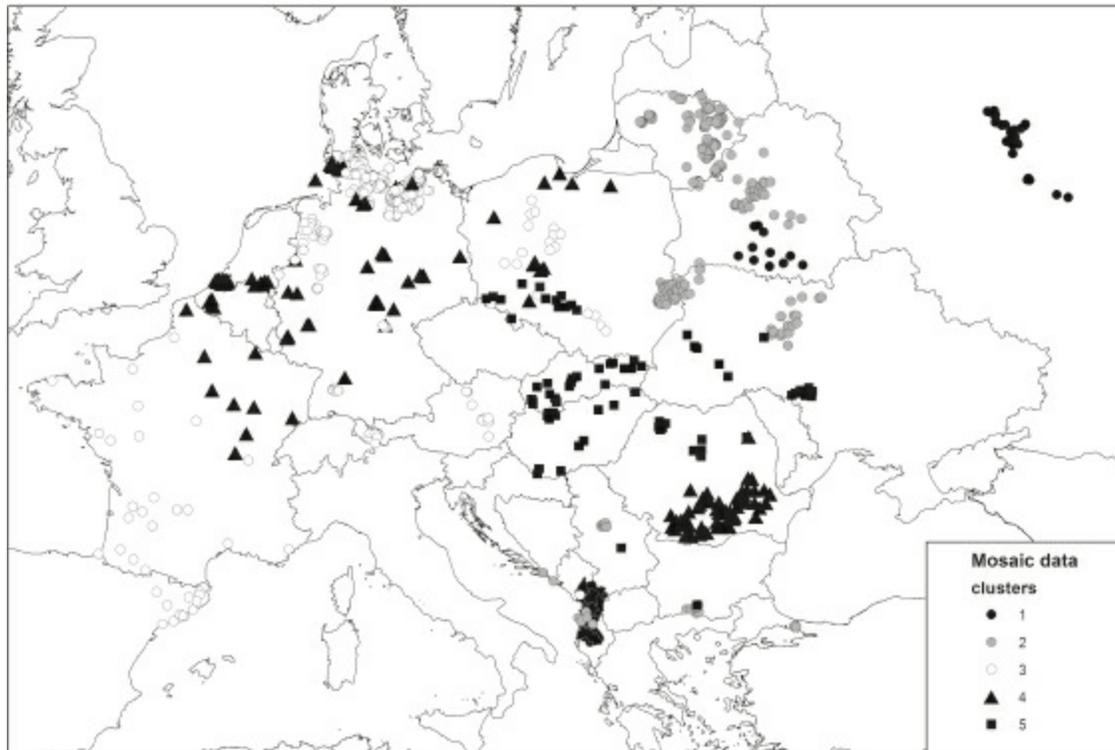
Historical family systems and European inequalities: a way forward for the future

Mikołaj Szoltysek

Can we draw on a common ‘European culture’ to deal with the problems of ageing, low fertility and developmental inequalities? Or are we faced with persistent cultural differences, stemming from the way in which divergent family forms have shaped elementary interpersonal relations? As the family is a prime arena for socialization, economic cooperation and the transmission of values, many institutional barriers to social policies may be intertwined with inherited family structures. The way contemporary European families are organized does indeed differ markedly, and it is likely that this variation has important consequences for the status of women, for inter-generational relations, and for human capital formation (Alesina & Giuliano 2014). However, the historical roots of this familial variation have never been successfully traced, despite growing demand for such global accounts among social scientists, who increasingly turn to demographic behaviour in order to explain developmental disparities in Europe. Previous attempts to map historical family forms fell victim to the limitations of case studies, selective methodologies and significant gaps in evidence. Neither the causes of familial variation, nor the possible influence of family systems on wider societal outcomes have ever been systematically investigated. The historical demography of the future (hereafter: HDTF) will provide the first comprehensive history of the European family, based on systematic, multi-strand research into the patterns, causes and developmental implications of variation in family systems from the North Atlantic to the Urals.

In order to elevate the study of historical family patterns in Europe to these new heights, it will be essential to break away from the older paradigm based on dispersed case studies or the classification of family systems based on the world’s geographic regions. HDTF will accomplish this goal by mobilizing Europe’s largest collections of harmonized microdata from the Mosaic and the NAPP initiatives (Szoltysek & Gruber 2015, Figure 1) and by developing the first database of the European family. This database will allow for a radical re-thinking of how family systems have varied across time and space – from the North Atlantic to the Urals, and from 1700 to 1918. It will shed light on the boundaries of family systems, their frontiers and their contact zones, and will enable researchers to suggest spatial constellations free from simplifying categories. Building on the spatial turn and on future developments in the digital humanities, HDTF will enable historical demographers to scrutinize whether a specific variation resulted from economic and/or environmental differences, or whether it had a deeper socio-cultural basis. Unlike previous studies, it will also demonstrate the extent to which the geography of family patterns across European regions was vulnerable to the underlying demographic heterogeneities in fertility and mortality, by using micro-simulation to estimate what proportions of people with a particular category of living kin actually co-resided with them in particular regions (Szoltysek 2015a). However, the interests of HDTF will not stop there: by

showing how different historical family systems have systematically enhanced or diminished the agency of specific family members, HDTF will push historical demography out of a disciplinary niche and link it to major scientific debates about developmental disparities in Europe (known as the ‘little divergence’) and beyond. HDTF’s foreseeable synthesis will constitute a new history of the European family, with a focus on the societal implications of regional variation and change over time. It will also form a crucial building block for future comparative studies, covering the whole of Eurasia.



Legend: 1: ‘extreme eastern’ family pattern; 2: ‘deviant’ version of 1; 3-4-5: three variants of Hajnal’s European Marriage Pattern. Data clustered on the marriage-headship nexus (MHN), the incidence of life-cycle service, the male/female age pattern of marriage, the extent of patrilocality, household structure. (Source: Mosaic data files, <http://www.censusmosaic.org/data/mosaic-data-files>). *Note:* Mosaic contains records for one million individuals in ca. 200,000 households, dating from 1700-1918. NAPP provides millions of full-count census records available in samples of various densities (mainly nineteenth century).

Figure 1. The five-cluster structure of Mosaic data on family systems, plotted on geographic coordinates.

While pursuing these goals, HDTF will build on a ‘mixed mode’ approach, in which quantitative and qualitative approaches are combined. Together, they form a methodology that takes the reconstruction of the whole complexity of family patterns as a point of departure, and contextualizes it with deep qualitative knowledge to form a balanced outcome. The cornerstone of HDTF’s empirical outlook will be a common geo-referenced database of historical census and census-like microdata that provides harmonized demographic measures of all the crucial attributes of family systems across multiple settings, both at the household level and at the individual level. This will facilitate the assessment of all the crucial dimensions of family organization; for example, leaving home, marriage, post-marital residence, household structures, and life course patterns of kin co-residence (Szołtysek 2015b). It also enables scholars to evaluate patriarchy and other measures of gender inequality comparatively at the meso-level (in other words, regionally) for all major European societies. Furthermore, it will allow historical demographers to map out various family constellations in order to understand how family systems in one area were similar to or different from those in other places.

Nesting this spatial-structural variation in environmental, socio-economic, institutional and

cultural contexts will follow. The required contextual information will be acquired through a mixed bag of strategies; for example, by mining multiple open-access repositories, such as the European Global Digital Archives of Soil Quality Maps, the Digital Atlas on the History of Europe, the Clio-infra Project, the Global Collaboratory on the History of Labour Relations, and CLARIAH, or by querying wide-ranging omnibus-type or local in-depth studies (Todd 2011).

Finally, the implications of family patterns will be addressed. Given that households constitute fundamental units of economic, demographic and social behaviour, the question that ought to be asked is: could variations in family patterns contribute to developmental inequalities between societies? HDTF will be able to explore various channels through which family variation could produce such developmental inequalities: by inspecting gender inequalities at various stages in the life course, and in residential and demographic spheres across different family systems; by reconstructing the living arrangements of vulnerable individuals (widows, widowers and the elderly) and studying them comparatively; by inspecting the relationships between family-generated inequalities (with the help of the Index of Patriarchy, see Gruber & Szoltysek 2015); and by looking into divergences in human capital formation (numeracy and age-heaping estimates).

By pursuing this agenda, HDTF will come much closer to addressing key societal challenges from a scientific perspective – that is, the cross-cultural variation in family patterns, their configurations in space, and their influences on lasting inequalities. The new detailed geography of family types will become an omnibus reference study, not only for social historians and family historians, but also for demographers, sociologists and economists alike. Standardized measures of family organization for hundreds of European regions will expand the current efforts to map global historical inequalities, such as those of Clio-Infra or the Global Collaboratory on the History of Labour Relations. By providing insights into the heterogeneous residential situations of the elderly in the past, HDTF will help to highlight the enduring effects of regional cultures of ageing in different areas of the continent. HDTF will also link to the expanding research on the family contexts of low fertility in Europe. By revealing the existence of regionally bounded clusters of familial-demographic culture systems, HDTF will prove useful in making further progress toward the formulation of a comparative theoretical framework for explaining long-term differences in patterns of fertility decline. This newly accumulated knowledge will enable HDTF to reach stakeholders in public administration and politics more effectively. Through social media platforms, lectures, workshops and press releases, it can alert them to historical path dependencies in the familial realm, to the chronological roots of some policy situations, and to the large degree of variability in the family, the life course, and residential situations in the past.

References

- Alesina, A. & Giuliano, P. (2014). Family Ties. In: *Handbook of Economic Growth*, 1(2), 177-215. Elsevier.
- Gruber, S. & Szoltysek, M. (2015). The patriarchy index: a comparative study of power relations across historical Europe. *The History of the Family*.
DOI: <http://dx.doi.org/10.1080/1081602X.2014.1001769>
- Szoltysek, M. (2015a). *Rethinking East-Central Europe: family systems and co-residence in the Polish-Lithuanian Commonwealth*. Bern: Peter Lang.
- Szoltysek, M. (2015b). Households and family systems in early modern Europe. In H. Scott (Ed.), *The Oxford Handbook of Early Modern European History, 1350-1750, Volume I: Peoples and Place* (pp. 313-341). Oxford: Oxford University Press.
- Szoltysek, M. & Gruber, S. (2015). Mosaic: recovering surviving census records and reconstructing the familial history of Europe. *The*

History of the Family, 21 (1).

DOI: <http://dx.doi.org/10.1080/1081602X.2015.1006655>

Todd, E. (2011). *L'origine des systèmes familiaux*. Paris: Gallimard.

Biography

Mikołaj Szoltysek is a senior researcher at the Max Planck Institute for Social Anthropology in Halle/Saale (Germany) and former Deputy Head of the Laboratory of Historical Demography at the MPI for Demographic Research in Rostock (Germany). He was one of the founders of Mosaic – one of the largest data infrastructure projects in historical demography for research on family patterns in historic Europe.

Pessimism from the periphery? A reflective note on the development and future of historical demography in Germany

Georg Fertig

The prospect for historical demography in Germany has often been depicted in very bleak colours. Pessimism not only tallies nicely with the general German academic *habitus*, but may also be justified in terms of various indicators, such as the number of publications in German historical journals, the number of projects funded, the number of German participants in international conferences, or the spread of institutions devoted to research in the field. Historical demography was popular and important in Germany in the 1970s, when German historians (with a little help from Franklin Mendels and Richard and Charles Tilly) triggered a truly global debate about the demographic and economic role of proto-industrial households. However, interest soon started to decline – even the summary volumes about historical demography before and after 1800 in the important German study series *Enzyklopädie Deutscher Geschichte* were both written by non-Germans.

Possibly, this negative picture is too bleak. There is in fact some important output by German researchers in the field, albeit somewhat scattered across multiple disciplines and contexts, and perhaps not as ground-breaking as research by non-Germans such as Imhof, Knodel or Galloway, who worked on German sources. Our best output is probably not books and articles, but people: the young scholars who leave Germany and go to places like Utrecht, Southampton or Lund. Even so, there is no escaping the fact that in comparison with countries like Sweden or the Netherlands, each with a large and scientifically developed community of historical demographers, ‘tiny’ Germany is still way out somewhere on the periphery. So what can we do about this? What is our comparative advantage? I can identify three of them: (1) historical Germany was a polycentric and heterogeneous country, which makes it an excellent area to study wealth and poverty, Catholicism and various forms of Protestantism, liberal and repressive population policies, divergent ecotypes, and phases of economic growth. (2) German administrators of the Church, the state and various local communities and authorities have left us with an *embarrasement de richesses* in terms of sources, starting with the meticulous documentation of household wealth in early modern Württemberg and perhaps reaching their highpoint (but not ending) with the aggregate publications of the Prussian Statistical Office. (3) The biggest asset, and one I would like to discuss further, is the highly developed state of (computer) genealogy.

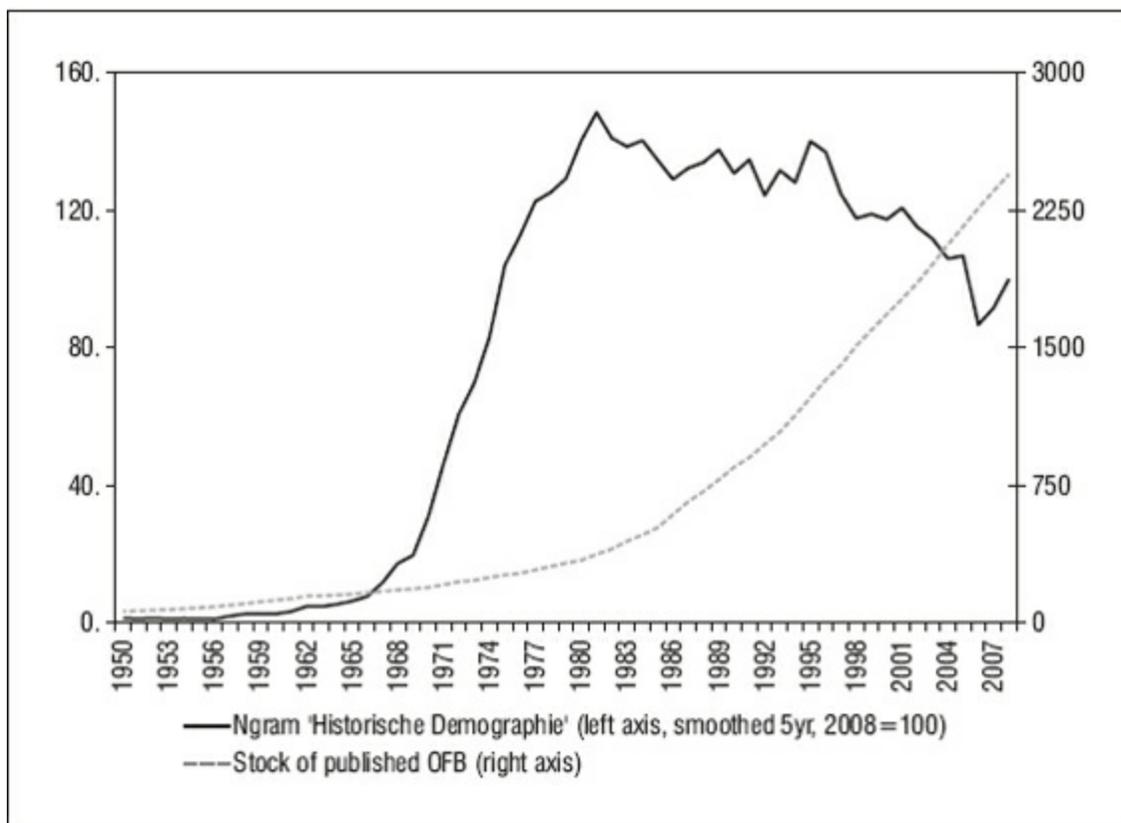


Figure 1. Trends in German historical demography: popularity of the field in German language books and availability of genealogical source material, 1950-2008.

Figure 1 shows us two trends: Google Ngram Viewer statistics for the term ‘*Historische Demographie*’ in digitized German language publications available through Google Books, and the annual available stock of published local genealogies (*Ortsfamilienbücher*). With regard to the prominence of historical demography in book publications, we can clearly see a boom in the 1970s and an ensuing decline, lasting well into the 2000s. However, this decline was relatively undramatic (*‘Sozialgeschichte’* – social history – had a much sharper decline after 1990) and the topic has certainly not disappeared. Looking at other indicators, such as the number of articles in the leading journal of German social and economic history (*VSWG*), would lead to similar results: there was a boom phase in the 1970s (after the publication of no articles whatsoever in the 1960s), but interest has never really faded away altogether, although it is at a very low level. In this boom phase, *Ortssippenbücher* (as they were called at the time) played a crucial role. Both Knodel and Imhof used them heavily, and Knodel, in the very first issue of the leading journal of the Bielefeld School in social history, founded in 1975, assessed their value for demographic analysis and called for more studies to be made on the basis of this material. At the time, there were about 250 such books. The standard story, as told among demographers, is that these useful German village genealogies were created by the Nazis. There is some truth to this piece of demographic folklore, but not much: a number of *Sippenbücher* already existed in 1932 (five according to my documentation), and only about a fifth of those available to Imhof and Knodel were published between 1933 and 1945. But there is no denying that popular interest in genealogy was certainly fostered under National Socialism. Its main driver was an interest in descent in general: in proving the absence of Jews from the researcher’s ancestry; in demonstrating the continuity of peasant bloodlines; and in showing that one’s family was related to medieval nobility (with Charlemagne and Widukind as the best case scenarios). Elisabeth Timm has labelled this kind of interest as ‘*Reverenz*’: tracing and looking up to one’s revered ancestors. Quite obviously, this older type of popular research tended to focus on

privilege and observed more closely those who stayed in place, property owners and legitimate children. Analyses based on these sources ran the risk of ignoring non-biological social relations, such as godparenthood or affinal relations, and of under-sampling social groups such as day-labourers, movers and the non-inheriting or illegitimate children.

After 1980, the annual production of village genealogies increased, but German historical demographers have made little use of this massive influx of data. There has also been an increase in the membership of genealogy associations; an increase in communication, particularly via the internet since the 1990s; an increase in the proportion of younger genealogists; and a wider use of computing methods. Timm thinks the driving force for this new genealogical wave is no longer ‘*Reverenz*’, but ‘*Referenz*’, in the sense of finding lateral connections. While the older genealogy tended to exclude, the new genealogy tends to include. From the standpoint of usability and bias reduction, demographers who use this material now have to deal with the new problem of how to avoid irrelevant data. In particular, computer genealogy, digitization, transcription and linkage through collective work are currently pushing forward in many fields: German genealogists transcribe address books, casualty lists and population registers, using Zedlitz’s shrewdly programmed data entry system (see Genealogical Data Entry System under weblinks). The production of *Ortsfamilienbücher*, now also online (see weblinks), continues unabated. The historical profession in Germany has largely ignored this process, apart from being slightly annoyed by the massive presence of genealogists in the archives!

The task at hand is, however, is twofold. First, we need to understand these new processes of data production. Genealogists do not simply produce data for historical demographers to analyze. That may be the case when they transcribe lists or registers that professional historians find useful. But the crucial activity of the genealogists is record linkage. Data based on record linkage are, as a rule, much more interesting than data that simply represent the structure of a given source. Family reconstitution gives more longitudinal information than a census, and the combination of both is even better. Can we trust the record linkages the genealogists produce? Could Imhof and Knodel? We actually do not know, and it would be beneficial if we could find ways to assess the prevalence of false positive as well as false negative links in genealogical data. It will never be possible to use some kind of fundamental ground truth as a benchmark for such an assessment, but by combining different source types in different ways it may be possible to understand which sources provide indispensable information and under which conditions proposed linkages are just informed guesses. Historians and information scientists should cooperate to pursue this joint interest. Second, scholars who understand the sources and the way they were produced, as well as the way the genealogists construct their databases, should actually – and in cooperation with the data authors – make use of them. Historical demographers from Germany and beyond will find ample opportunities to cooperate with both historians and genealogists in Germany, and to use genealogical data for the wider benefit of the future of historical demography.

References

- Ehmer, J. (2004). *Bevölkerungsgeschichte und Historische Demographie, 1800-2000*. Munich: Oldenbourg.
- Knodel, J. E. (1975). Ortssippenbücher als Quelle für die Historische Demographie. *Geschichte und Gesellschaft*, 1, 288-324.
DOI: <http://www.jstor.org/stable/40184986>
- Pfister, C. (1994). *Bevölkerungsgeschichte und historische Demographie, 1500-1800*. Munich: Oldenbourg.

- Sieglerschmidt, J. (2004). Bevölkerungsgeschichte. In: Schulz, G. *et al.* *Sozial- und Wirtschaftsgeschichte. Arbeitsgebiete -Probleme- Perspektiven. 100 Jahre Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte*. Stuttgart: Franz Steiner Verlag.
- Timm, E. (2016). Reverenz und Referenz: Zwei Weisen der populären Genealogie seit dem 19. Jahrhundert und ein neuer genealogischer Universalismus? In: Fertig, C. & Lanzinger, M. (Eds.). *Beziehungen, Vernetzungen, Konflikte. Perspektiven Historischer Verwandtschaftsforschung*. Köln: Böhlau Verlag.

Weblinks

Genealogical Data Entry System: des.genealogy.net
Ortsfamilienbücher: online-ofb.de

Biography

Georg Fertig is a Professor of Economic and Social History at Martin Luther University in Halle-Wittenberg (Germany). His main fields of research are eighteenth-century migration in south-west Germany; nineteenth-century kinship and the land market in north-west Germany; and the historical demography of Germany from 1600 to 1870. His current projects focus on the use of time in Saxony (1650 to 1840) and on fertility in German rural parishes between 1700 and 1900.

Chapter 3

Learn from the past

Hegel was right when he said that we learn from history that man can never learn anything from history
George Bernard Shaw

Four contributions look back to successful large projects in the past, and what we can learn from those in terms of best practices.

Historical demography going ‘glocal’: the Eurasia project and Japan

Satomi Kurosu

“...the Asian field lags far behind the European field and has much to learn from it, but we believe that in time the Asian field will repay its debt by providing a fresh perspective on European developments.”

Wolf and Hanley made this assessment in the introduction to their 1985 book on *Family and Population in East Asian History*. Thirty years on, where are we now and where are we heading? I would like to take this opportunity to reflect on the development of Japanese historical demography and its potential to contribute to the field.

Akira Hayami’s application of the method of family reconstitution to Japanese household registers in the late 1960s opened up an array of possibilities for investigating the demographic behaviour of commoners in the Tokugawa era (1603-1868). From the debates in the 1970s on the eighteenth-century population stagnation to the comparative approach of the 1980s towards rural households, and the integration of anthropological and gender perspective approaches in the 1990s, Japanese historical demography has advanced the understanding of people’s lives. This did not happen through traditional analyses of institutions and governing structures, but through the analysis of the behaviour and organization of individuals, married couples and households.

The historical demography of Japan has developed even more quickly in the last two decades. With the generous support of the Japanese Ministry of Education (1995-1999), Japanese historical demography has taken a big leap forward through the extensive collection and digitization of sources, through collaboration between scholars from various disciplines and countries, and through participation in international comparisons.

One of the most important developments was the involvement of researchers working on Tokugawa Japan in the Eurasian Population and Family History Project (EAP), an international collaboration and comparison conceived and initiated by Akira Hayami and Tommy Bengtsson. This project evolved to include more than 20 scholars from six countries. The EAP used household register data from eighteenth and nineteenth-century communities in Europe and Asia, and applied identical or nearly identical models relating mortality, fertility and marriage outcomes to characteristics of the community, the household and the individual. Going beyond Malthusian and related dichotomous views towards East and West, we found more similarities than differences across regions, as well as variations within regions. In all communities and for every demographic event we examined and analyzed, the effects of *property* (the socio-economic status of the household) and *power* (within-household relations) were important (Bengtsson, Campbell, Lee, *et al.* 2004; Tsuya, Wang, Alter, Lee *et al.* 2010; Lundh, Kurosu *et al.* 2014).

While the project, with its unique approach, has been productive and has become a model for

international collaboration, it was also extremely demanding, as it required the construction of ‘big data’; advanced statistical and data management skills; and the adoption of a scholarly style with a more ‘global’ approach (seeking similarities in difference, international collaboration, etc.) rather than one focused on ‘local’ historical investigation (with a primacy of the local context, historical peculiarities, etc.). As a result, it was challenging for the core members of the Japanese EAP team to recruit other members and, more importantly, to apply the EAP model to more than two villages. The two villages we chose for the EAP – Niita and Shimomoriya in the north-east of Japan – are probably the best in terms of data quality and time span (more than 150 years) and can still serve to test additional sociological and even biological questions. Nevertheless, there are many more similar population records that have yet to be explored: at least 32,000 village-years of 1,500 villages. These are the records that Hayami called a “treasure of humankind” and they are yet to be fully exploited. It is time that Japanese historical demography, while cherishing the ‘local’ approach with its careful attention for and integration of descriptive sources of context and institutions, becomes more ‘global’, with new collaborations beyond disciplines and nationalities. That is to say, we need to go simultaneously global and local. In short: ‘glocal’!

Collaboration and comparison among East Asian countries is one way forward, since similar household registers exist for the seventeenth to the mid-twentieth century. East Asian populations share many features that are distinct from the West (Dong *et al.* 2015). These include a collective orientation of demographic decisions; age-gender hierarchy in households; and the importance of family succession. These shared features might relate to those findings of the EAP that were unexpected for East Asia, including egalitarian distributions of land, extremely low (and planned) reproduction, and marriage as a factor not linked directly to reproduction. Indeed, as Wolf and Hanley predicted, East Asian historical demography has started to provide fresh perspectives to the field.

What Wolf and Hanley did not predict in the 1980s, however, was the development of information technology and methods that allow us to deal with the massive amount of information on individual lives and households in the Asian and Western population registers. We can build on a ‘glocal’ approach, as exemplified by the EAP, by applying its methods and models to other historical populations. This will be particularly interesting for examining regional variations within a country, something that EAP did not deal with. Or even for the comparison of populations with complex household organization or strong family ties, such as the sharecroppers in Tuscany and the rice-paddy peasants in Fukushima in the EAP. In a similar vein, we can compare populations in the past and present. For example, comparable traditions that place importance on patriarchy, gender roles and demographic planning (family size control via marriage, adoption and infanticide) in pre-industrial East Asia may relate to some of the striking similarities in the speed of fertility decline and ageing in contemporary East Asia (Kurosu 2010). Going ‘glocal’ is a way to transcend our preoccupations with the dichotomous views of East-West and past-present, and to examine how our lives have been – and continue to be – affected by *property* and *power*.

References

- Bengtsson, T., Campbell, C., Lee, J. Z. *et al.* (2004). *Life under pressure: Mortality and living conditions in Europe and Asia, 1700 – 1900*. Cambridge, MA: MIT Press.
- Dong, H., Campbell, C., Kurosu, S., Yang, W. & Lee, J. Z. (2015). New sources for comparative social science: historical population panel data from East Asia. *Demography*, 52(3), 1061-1088.

DOI: <http://dx.doi.org/10.1007/s13524-015-0397-y>

Kurosu, S. (2010). Reproduction in East Asian historical demography: an introduction. *The History of the Family*, 15(4), 365-369.

DOI: <http://dx.doi.org/10.1016/j.hisfam.2010.10.004>

Lundh, C., Kurosu, S. *et al.* (2014). *Similarity in difference: Marriage in Europe and Asia, 1700-1900*. Cambridge, MA: MIT Press.

Tsuya, N. O., Wang, F., Alter, G., Lee, J. Z. *et al.* (2010). *Prudence and pressure: Reproduction and human agency in Europe and Asia, 1700 – 1900*. Cambridge, MA: MIT Press.

Biography

Satomi Kurosu is Professor of Sociology and the Director of the Population and Family History Project at Reitaku University, Japan. Her research interests include marriage, divorce, remarriage, adoption and how family systems interact with demography. She is currently working on the construction of a large-scale micro-level database for eighteenth and nineteenth century Japan, as a further step towards a more ‘glocal’ approach.

Historical demography and the social history of godparenthood

Guido Alfani & Vincent Gourdon

For a few years now, godparenthood and spiritual kinship have been at the centre of attention of social historians and historians of the family, and have, moreover, attracted the interest of some historical demographers and economic historians. This is a fundamental change compared to the recent past, when only anthropologists pursued these topics.

At least in part, the recent ‘success’ of godparenthood has been fuelled by the activities of the scientific network known as *Patrinus* – the European network for a social and cultural history of baptism and godparenthood, founded in 2006 by Guido Alfani and Vincent Gourdon, which has organized many scientific meetings and to date has published three collective books (Alfani, Castagnetti & Gourdon 2009; Alfani & Gourdon 2012; Alfani, Gourdon & Robin 2015). However, this instant success would not have been possible had the activities of *Patrinus* not met the demands and the needs of many scholars who, at the beginning of the twenty-first century, were following research paths leading them to wonder about the significance of godparenthood and spiritual kinship. In fact, the interest in godparenthood is connected to 1) the development of the history of the family, which expanded its coverage of research topics and underwent significant methodological innovation, and 2) the development of new ways of approaching the analysis of social ties, which in large part is connected to the development of formal social network analysis.

By using parish registers of baptism to provide quantitative reconstructions of long-term changes, the researchers related to *Patrinus* have demonstrated that different ‘models’ of godparenthood can be found in the Christian world, and that the practices that were followed changed according to place, time and religious denomination. Already in 2006, Guido Alfani introduced a classification of godparenthood models (Table 1) that has been widely adopted and has considerably eased international comparisons (Alfani 2009). This has also made it possible to demonstrate beyond doubt that after the Council of Trent (1545-63) a major process of change in social practices took place in the Catholic world. The large variety of godparenthood models typical of late medieval times disappeared in favour of much simpler models: either the couple model (one godfather and one godmother) or the asymmetric single godfather model (one godfather or one godmother). However, ‘multi-godfather’ models (in which each child received many godfathers and/or godmothers) continued to flourish among the Protestants. This created divergence between societies and differences in the width and composition of social networks. The significance of this divergence still needs to be fully explored.

Table 1. Typology of godparenthood models.

	Multi-godfather		Single godfather	
	Symmetric	Asymmetric	Symmetric	Asymmetric
Unlimited	Pure multi-godfather (type 1)	Asymmetric multi-godfather (type 2)		
Limited	Limited multi-godfather (type 3)	Limited asymmetric multi-godfather (type 4)	Pure single godfather (couple model) (type 5)	Asymmetric single godfather (type 6)

Note: see the main text for the distinction between single-godfather and multi-godfather models. Notice that multi-godfather models can be further distinguished between ‘limited’ models, in which the overall number of godparents almost never (at least 99% of cases) exceeds a maximum of four, and ‘unlimited’. Limited and unlimited multi-godfather models can be divided between ‘symmetric’ models, when usually (at least 2/3 of cases) a child gets both godfathers and godmothers, and ‘asymmetric’ models, when frequently children are given only godfathers or godmothers. See Alfani 2009 for further details about the typology.

Much research has also been dedicated to the strategies for the selection of godfathers and godmothers, and to their social, chronological and regional variation. We now know that the reduction in the number of godparents following the Council of Trent led, in particular during the seventeenth century, to the verticalization of this social institution. Families faced with the legal requirement of selecting no more than one godfather and one godmother favoured the ties connecting them to higher social strata. Additionally, while during the Middle Ages and the beginning of the early modern period most godparents were selected from outside the circle of kin, subsequently a process of ‘familialization’ of choices started. During the nineteenth and twentieth century, the selection of godparents from within kin became the dominant choice (Table 2). Once again, the *Patrinus* network enabled comparative studies to be made by promoting the use of standardized methods and indicators, like homonymy rates, which allow for broad comparisons across time and space. However, for many areas, especially for the Protestant and Orthodox parts of Europe and the Americas, the scale and the chronology of this process of familialization still remain unknown.

Table 2. Surname homonymy between godparents and parents. Aubervilliers (France), sixteenth-nineteenth centuries.

	1552-1631	1705-1710	1745-1749	1785-1790	1841-1844
Homonymy (%)	19.7	24.2	24.7	31.6	39.1
N. of godparents	8979	904	616	939	706

Source: Berteau, Gourdon & Robin (2015).

The long-term changes in godparenthood practices can be understood only by remembering that the ceremony of baptism provided the parents of the child with the opportunity to establish ritualized and publicly recognized ties with other individuals and families. These ties could be used to pursue social, economic or even political objectives – their religious meaning is of only secondary importance in understanding the way in which godparents were chosen, as well as the way in which spiritual kinship affected human interactions. Although some research has been done on these aspects, the manner in which past populations made use of godparenthood as a tool to achieve specific objectives is still imperfectly known.

The interest in godparenthood, which has been growing across the social sciences, should be considered as good news for historical demography. Many recent studies make use of nominative databases built by historical demographers or contribute to completing them by adding new

information. Deeper analyses – for example, those that take into account the birth order of the baptized child relative to his/her brothers and sisters – rely on family reconstitution techniques. Finally, there is increased cooperation between scholars working on godparenthood and experts in social network analysis, since ties of spiritual kinship (which do not generally overlap with those established by blood or marriage alliance) can be used to reconstruct networks more completely. Reconstructing the ties of godparenthood that existed within a community allows the measuring of relational variables, which in turn can be used as explanatory variables in the analysis of fertility, nuptiality, mortality and spatial or social mobility (Munno 2010). But one could also fruitfully pursue this analytical process in the opposite direction, as we still know too little about how long-term demographic change is affecting and will affect the selection of godparents. An important example in this respect concerns the question of how the number and the composition of kin available at the moment of baptism in lowest-low fertility countries is affected by the steady overall decline in the number of cousins, uncles and aunts of each individual (Alfani, Gourdon & Vitali 2012).

References

- Alfani, G. (2009). *Fathers and godfathers. Spiritual kinship in Early-Modern Italy*. Aldershot: Ashgate.
- Alfani, G., Castagnetti, P. & Gourdon, V. (Eds.) (2009). *Baptiser: pratique sacramentelle, pratique sociale (XVI^e-XX^e siècles)*. Saint-Étienne: PUSE.
- Alfani, G. & Gourdon, V. (Eds.) (2012). *Spiritual kinship in Europe, 1500-1900*. London: Palgrave.
- Alfani, G., Gourdon, V., & Robin, I. (Eds.) (2015). *Le parrainage en Europe et en Amérique. Pratiques de longue durée (XVI^e-XXI^e siècles)*. Brussels: Peter Lang.
- Alfani, G., Gourdon, V. & Vitali, A. (2012). Social customs and demographic change: the case of godparenthood in Catholic Europe. *Journal for the Scientific Study of Religion*, 51(3), 482-504.
- Berteau, C., Gourdon, V. & Robin, I. (2015). Trois siècles de parrainages à Aubervilliers: de la Réforme catholique au temps des banlieues industrielles. In Alfani G., Gourdon, V. & Robin, I. (Eds.). *Le parrainage en Europe et en Amérique. Pratiques de longue durée (XVI^e-XXI^e siècles)* (pp. 39-68). Brussels: Peter Lang.
- Munno, C. (2010). *L'Écheveau des parentèles au village. Dynamiques démographiques, mobilisations réticulaires et parcours individuels dans une communauté de Vénétie au XIX^e siècle*. PhD History, EHESS: Paris.

Biographies

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Vincent Gourdon is a member of the Centre Roland Mousnier (Centre National de la Recherche Scientifique), Paris, France. A historian of the family, his main research interests are baptism and godparenthood in early modern and modern Europe, old age and grandparenthood in France, family life in colonial societies and stillbirth registration practices in nineteenth-century France.

Boys, girls, preferences and the links between past and present

Gunnar Andersson

Modern and historical demographers share many interests in terms of research topics and research design. We all appreciate high quality data with accurate information on life course dynamics and we likewise appreciate having the opportunity to analyze such data along the dimensions of space and time. As a modern demographer in Sweden, I am fortunate to have access to one of the best demographic data sources in the world: population registers with very precise longitudinal information on the residence and vital events of the inhabitants of Sweden. This allows for excellent research on childbearing, migration, mortality and nuptiality, because the data sources enable the linkage of registered vital events with carefully defined populations of individuals under risk. A unique identifying code that each individual with *de jure* residence in Sweden has, further allows for additional linkages of related socio-economic information from the country's many administrative registers. Together, these registers serve as an excellent infrastructure for research. Inspired by the Nordic case and triggered by the declines in response rates in sample surveys and conventional censuses, demographers in other countries are increasingly turning their attention to the possibility of developing population registers as an infrastructure for research.

So how does all this link to history and historical demography? What matters for us is that today's Nordic research infrastructure would never have existed had it not been for the long historical tradition of the meticulous recording of demographic data in this region. Statistics Sweden and its predecessor *Tabellverket* have produced very accurate statistics on population numbers and vital events ever since 1749. These statistics were collected and summarized at the national level, based on an infrastructure that was no less impressive than today's modern population registration system: the parish registers of the State Church of Sweden. Thanks to the lack of freedom in terms of religious affiliation and thanks to a relatively high literacy rate, the parish priests were in a position to collect very detailed demographic data on all the inhabitants in every parish. The all-encompassing nature of the historical system of data collection has been readily transformed into the modern system of population registers.

These links between modern and historical demographic data in terms of infrastructure and systems of data collection are significant. For me and my colleagues, an appreciation of the qualities of modern demographic data comes quite naturally. With some reflection, this easily translates into the same appreciation for the qualities of historical data, without which the modern registers would never have existed. After all, the logics of these data are very similar and similar types of research can be carried out on the basis of both modern and historical register data. An appreciation of the quality of the data easily translates in turn into an interest in substantive research questions based on historical data and historical contexts. In particular, it seems natural to seek connections between

patterns in demographic behaviour and demographic change as they appear today and in historical times. My own research has a focus on demographic change at the individual and family level in contemporary Sweden, and many of my colleagues study new patterns in family complexity in the Nordic countries (e.g. Thomson 2014). Many of the patterns we observe stem from path dependencies in social change. In some cases, new patterns in behaviour may reflect a re-emergence of old historical patterns of behaviour, rather than radical shifts to entirely new modes of family life. For example, Ron Lesthaeghe and Karel Neels (2002) linked patterns in demographic change from one century to another in a number of countries in Europe, and referred to these links as the “revenge of history” in contemporary demographic change. Their examples highlight the need for contemporary demographers to carry out their research with a better anchoring in its historical context. European family demographic research has recently developed in a positive direction, applying a comparative perspective in which national findings are linked to findings from other contexts across the continent. In the same way, the field of family demography would benefit from drawing on comparative perspectives with a better anchoring in historical patterns of social change.

Swedish and Nordic family demography has many opportunities to develop this approach more vigorously. Patterns like the emergence of non-marital cohabitation in the 1960s were not always as novel as they were once perceived to be. Modern demographers would certainly gain from linking current findings to findings based on available historical data from the same region. However, in many cases we are hampered in this task by the fact that the computerized versions of the modern population registers stretch back no further than the 1960s. In these cases, we have to rely directly on our colleagues in historical demography and their collections of data. A recent project organized by my colleague Martin Kolk at Stockholm University provides a good example of the available opportunities for this type of research. It is based on linked register data from modern as well as historical population registers, which enables the study of long-term demographic change in terms of kinship and family complexity. For example, Kolk and Hällsten (2015) studied patterns in socio-economic stratification across generations in northern Sweden, while Turunen and Kolk (2015) investigated the prevalence of half-siblings over the demographic transition in the same region.

I would like to conclude with an example from my own research, where I have studied a number of emerging developments in family demographic behaviour, in which I felt the need for supportive evidence based on historical data. One of these developments is the question of new gender preferences for children in the Nordic countries, as studied through the lens of the parity progression of two-child parents (Andersson *et al.* 2006). In all Nordic countries I found evidence of preferences for a mixed sex composition of children, as expressed in elevated third-birth rates for parents with either two boys or two girls. In Denmark, Norway and Sweden I also found an emerging excess preference for having daughters, as expressed in even higher propensities for having a third child when parents have two sons rather than two daughters. However, for Finland I found a preference for having sons. Based on the data at hand, my team of co-authors could not identify the factors behind these changes in behaviour. We linked the emerging girl preference to other aspects of recent gender change in Nordic societies and that of boy preference possibly to older patterns of behaviour that may be rooted in a more agricultural type of society. Supportive analyses based on historical demographic data would certainly be helpful in situations of this kind, but we found little conclusive evidence based on such data. Consequently, we wondered what patterns in gender preferences for children were like in our part of the world in historical times. Were they visible in a society with limited scope for parity-specific birth control? Did any such patterns change or perhaps first appear during the demographic transition, when we moved towards the current low fertility-regime? Recent

research by Sandström and Vikström (2015) and others has since provided helpful insights into these matters. Their conclusions demonstrate evidence of at least some degree of boy-preference for children in historical agricultural contexts in Northern Europe. Sandström and Vikström (2015) found that the ‘modern’ pattern of seemingly symmetrical sex preferences for children was already emerging during the nineteenth century.

These and other studies certainly demonstrate the potential for constructive dialogue between demographers working in the fields of historical and contemporary demography. This dialogue is helped by the better availability of data and by the organization of historical data in a manner that makes it possible to study them with the same techniques that are used to analyze modern demographic data. When modern and historical demographers speak the same language in terms of research design and analysis, they can easily extend their dialogue to more substantive issues of actual demographic behaviour.

References

- Andersson, G., Hank, K., Rønsen, M. & Vikat, A. (2006). Gendering family composition: sex preferences for children and childbearing behaviour in the Nordic countries. *Demography*, 43(2), 255-267.
DOI: <http://dx.doi.org/10.1353/dem.2006.0010>
- Kolk, M. & Hällsten, M. (2015). Number of descendants and their socio-economic outcomes. A prospective analysis of multi-generational demographic stratification in northern Sweden in the 19th and 20th centuries. *Paper for the 2015 World Economic History Conference*.
- Lesthaeghe, R. & Neels, K. (2002). From the first to the second demographic transition: an interpretation of the spatial continuity of demographic innovation in France, Belgium and Switzerland. *European Journal of Population*, 18(4), 325-360.
DOI: <http://dx.doi.org/10.1023/A:1021125800070>
- Sandström, G. & Vikström, L. (2015). Sex preference for children in German villages during the fertility transition. *Population Studies*, 69(1), 57-71.
DOI: <http://dx.doi.org/10.1080/00324728.2014.994667>
- Thomson, E. (2014). Family complexity in Europe. *Annals of the American Academy of Political and Social Science*, 654, 245-258.
DOI: <http://dx.doi.org/10.1177/0002716214531384>
- Turunen, J. & Kolk, M. (2015). The prevalence of half-siblings over the demographic transition – Northern Sweden 1730-2007. *Paper for the IUSSP International Seminar on Separation, Divorce, Repartnering and Remarriage around the World*. Montreal, 4-6 May 2015.

Biography

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Historical demography and population projection for a new regime: the experiment of Japan

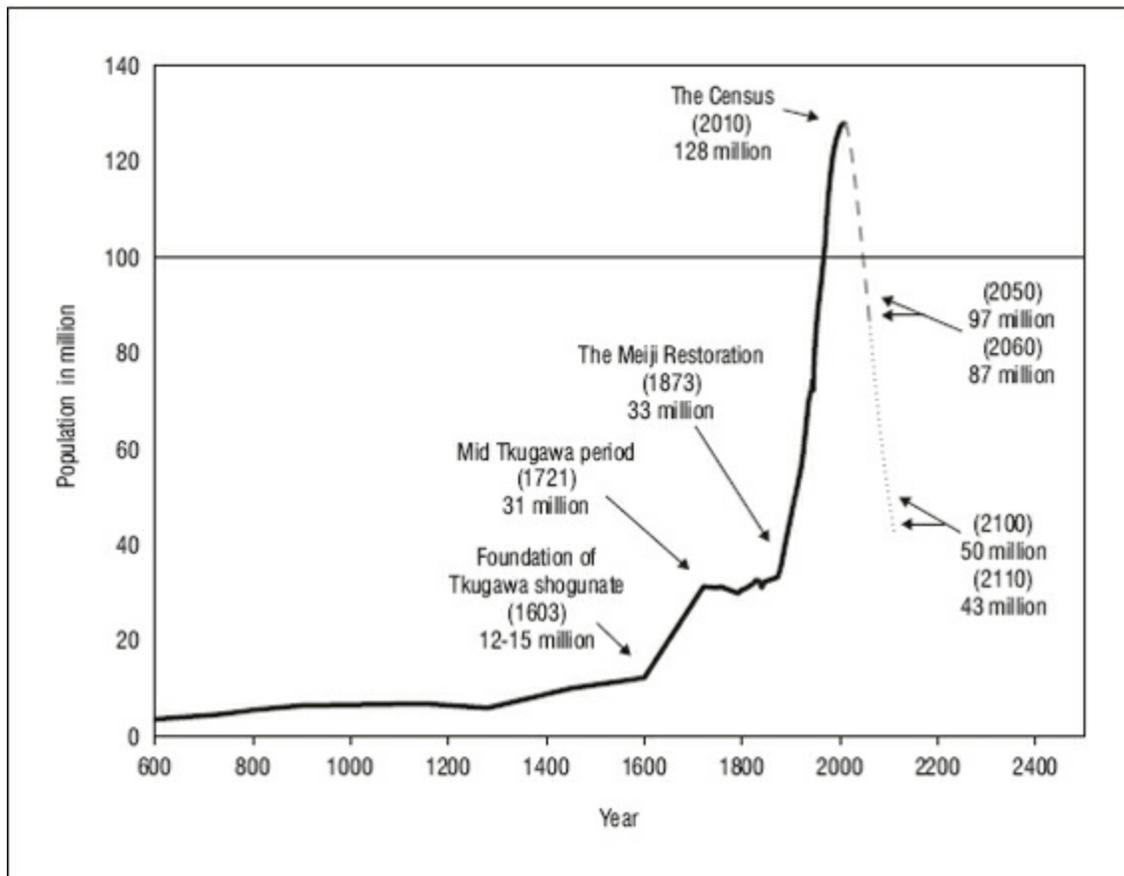
Ryuichi Kaneko

Japan is the first country to enter a new demographic regime characterized by a profoundly ageing and shrinking long-term population. According to the official population projection (see Figure 1), the population of Japan will have decreased by some thirty million by 2050, with the proportion of elderly people aged 65 and over reaching 39%. Manifestations of this demographic change, such as budgetary pressures on the social security programs that have to support an expanding elderly population, have already become tangible at a national level. At a local level, depopulation is reflected in declining provincial urban areas with vacant retail premises and housing. Central and local governments are seeking systemic solutions for this changing demographic regime. Individual authorities are trying to reverse urban decay, with almost all municipalities taking action based on their own local population projections.

Many countries around the world, except those in Africa, will experience the end of population growth and the start of greying during this century, thus sharing the experience of Japan. Japan, an island state with little international migration, is the forerunner of this historic event and can be regarded as a test case for this demographic experiment. There is a unique historical background to the current situation: Japan's long isolation as a result of the Tokugawa shogunate policy, 'Sakoku'. Sakoku prohibited foreign contact for more than two hundred years between 1641 and 1853, during which time a self-sufficient society with a closed economic and ecological system was maintained.

During the past 200 years, Japanese modernization has coincided with demographic transition and a fluctuation of demographic dividend, which has been linked to its remarkable economic growth since the end of the Second World War. Japan, as a place for social experiment, seems to illuminate causal relationships between developments in various domains much better than any other country in the world. Specifically, Japanese modernization was triggered by technology transfers from Western countries, which mainly occurred after the Meiji Restoration, and coincided with a drop in death rates that initiated the demographic transition. The growth of Japan's population and the excess labour force that was generated by the process of demographic transition promoted overseas emigration, invasion into neighbouring countries and territorial expansion. It formed a major cause of the country's involvement in the Pacific War. After Japan's defeat, under a newly adopted system of economic growth, excess workers in rural areas were absorbed into the metropolitan area within a short period of time, and supported the growth of new industries as employees. On the other hand, after three years of post-war baby boom, which was caused by births that were postponed during wartime, prolonged food and supply shortages made parents hesitate to have many children. This resulted in a decline in the total fertility rate by half over a period of eight years, from 4.32 children in 1949 to 2.04 in 1957, which was around population replacement level at that time. The fall in the

total fertility rate contributed to a rapid expansion of demographic dividend: the burden of the dependent population of children was lowered and productivity rose. This promoted remarkable economic development.



Population in millions.

Figure 1. The rise and fall of population in Japan (600 CE – 2110).

Let me permit myself to look at the above process in more detail, and to broaden my outlook from pre-modern to future. This will allow me to set up a number of interesting hypotheses on the relationship between socio-economic changes and the process of population change. For example, let us consider what made the fertility transition occur so rapidly after the war in Japan. Japan's closed-door policy and the system of binding people to earmarked land during the pre-modern Tokugawa period raised people's awareness of the finite nature of land resources. It seems reasonable to think that during the post-war shortage of food and supply a certain ecological sense was fostered in people's patterns of thinking. The rapid fertility transition after the war was realized primarily by induced abortion, which may not have been wholly independent of 'mabiki' or infanticide, the custom of putting newborn children to death as a form of 'birth control' in the pre-modern period. Japanese people have a sense of morality that originates in the animistic worship of life and forbids being wasteful of life – a moral sense that seems common to most religious doctrines, including Christianity. The fact that, despite the existence of such morality, induced abortion was widely practiced by parents who already had a baby would be difficult to explain without considering the rationality of giving priority, in the context of limited resources, to the survival of existing family members over compliance with a sense of morality.

Although the above relationship between infanticide in the pre-modern age and induced abortion after the war has not been verified, the pre-adaptation of the Japanese population to methods of

limiting their family size seems an attractive hypothesis to explain the unprecedented swiftness of the fertility transition in Japan. The tendency to give high priority to the well-being of existing family members may even explain the recent lowest-low fertility in Japan and other East Asian nations that share high population density. Modernization and the demographic transition had a clear causal relationship to each other, and in the course of this relationship many events seem to have been predestined to happen. Moreover, the demographic change that is steadily prevailing at the present time, including the end of population growth and population ageing, is a global trend. Many events that form part of this trend should also be considered as part of a historical chain that was meant to happen. Since Japan is still a place for social experiment with limited international population movement, population projection can indicate the country's future development somewhat more mechanically. In the next fifty years, its total population will decrease to two-thirds of its current size, and, as described at the outset of this article, elderly people aged 65 years or older will constitute two out of every five Japanese citizens. I believe that the shapes taken by dynamic population movement are nothing more than a natural development of the socio-economic and demographic system that has been in place since pre-modern times. However, if only because we do not know how the relationship between cause and effect has developed, we can envisage a wide range of alternative future images. In order to be able to narrow this range down, or to describe the effects of future political actions more concretely, we need to investigate in more detail the cause-effect chains as they existed in the process of historical development. The results of this analysis can then be directly linked to current and future development.

The classic form of demographic transition theory used to serve as a powerful guiding principle for drawing up visions for the future of societies through population projections. Within this framework, we tended to end up with a stationary population, with balanced vital rates at the final stage of the transition – a pre-arranged harmony. However, the present world does not seem to be moving towards any pre-determined equilibrium. Instead, divergent prospects exist, even for the near future. We must therefore seek a new way of looking at this future, trying to find the rules or laws according to which socio-economic-demographic systems evolve. We still do not have an integrated theory that could have accurately pointed us in advance to the emergence of below-replacement fertility in the developed world. Consequently, efforts to identify the causal mechanisms of historical events are inevitable if we wish to construct such a theory and to provide new guidance for the future, in addition to describing its historical particularity.

An awareness of what population projections about the future might suggest about the development and direction of modern socio-economic movements may in turn assist the study of historical demography, since it can help us to identify which historical events were particularly significant. One interesting example relates to the clear division of developed countries into two groups based on their current fertility level. France, the US, the UK and Sweden, for instance, are among those countries maintaining moderately low fertility. Within this group, some maintain fertility rates around the population replacement level. Germany, Italy and Japan belong to the other group, with very low total fertility rates of less than 1.5. This division broadly corresponds to the Allied and Axis powers, the alliances that once opposed each other during the 1939-1945 war period. It suggests that socio-cultural and historical backgrounds differ distinctly between these two groups, but that there are share commonalities within each of the groups. Based on the current divergence of fertility levels, the visions of the future that population projections provide for these societies are also divergent. In other words, they magnify the differences between the two groups. The picture of a rapidly shrinking and excessively aged population that is projected for Japan is therefore one that the latter group of

societies all share. Differences of the past continue to matter in future, and on the large screen called 'future population' to which roots of the problems are projected these once unclear differences are brought into sharper focus and given new meaning.

In conclusion, if we wish to obtain a correct understanding of demographic phenomena, it is essential to take a very long-term view, reaching from the pre-modern past far into the future. This is equally true both for those who seek to predict the future of societies and for those who are searching to explain past events. After all, the influence and societal significance of these past events can only be understood by looking at current and future developments. In this context, Japan may provide a useful test case to form new demographic-socio-economic theories, which, hopefully, will describe new demographic regimes by integrating classic demographic transition theory with the current and prospective evolutions of populations and people's life courses.

Biography

Ryuichi Kaneko is Deputy Director-General of the National Institute of Population and Social Security Research in Tokyo. His main research interests are population dynamics, population projection, fertility, longevity and the biological aspects of human populations.

Chapter 4

Think of the neighbours

The most exciting phrase to hear in science, the one that heralds the most discoveries, is not “Eureka!”, but “That's funny...”

Isaac Asimov

Six scholars, some of whom experts in neighbouring disciplines but working on historical demography, discuss the importance of thinking of engaging with these “neighbours” in order to advance our understanding of populations in the past.

Getting native population history right: the importance of neighbouring disciplines

Raquel Gil Montero

The main research on the historical demography of the native populations in South America was developed in the late 1970s, in a context of new questions and theories on Andean history (Murra 1975; Sánchez Albornoz 1978; Cook 1981). This increase of new ideas was possible thanks to the fact that groups of intellectuals coming from different fields, such as history, archaeology and anthropology, joined forces. Within this developing context, historical demographers began to ask and answer questions on the decline of the native population since the conquest, and, more importantly, they started new demographic inquiries. This was the ‘golden age’ of Andean historical demography, and although there were many other contributions to the field later on, it was this multidisciplinary context that made possible the rich atmosphere for research, mutual exchange and innovations in the field.

The history of native population subsequently developed in different directions, including other geographies and subjects. However, in my opinion, we still have questions that cannot be answered without key two skills: identifying the demographic challenges indigenous people faced during colonial times; and interpreting, combining and complementing historical sources. Multidisciplinary research projects are, in my opinion, the best way to respond to the challenge of how to combine these two required skills – or at least such is my proposal for this essay.

The conquest of South America caused a demographic decline among the native population, the overall extent of which is not known. However, we do have some estimates of regional decline rates, mostly for the areas of the former Inca and Aztec Empires. What we still do not know is what impact the conquest had on native family life, and how families evolved in the light of all the violence they experienced (not only the war, but also the destruction of their social, political and religious worlds). How did this violence affect their reproduction? How did the changes – in births, family forms, marriage, etc. – affect population trends? The decline, although tremendous, was only the starting point of a total reorganization of the lives of the natives. In the 1570s, the geographic distribution of the Andean population was forcibly changed, and dispersed rural people had to live in towns that were organized in a Castilian form (Mumford 2012). What subsequently happened was that many Andeans abandoned these new towns, with some returning to their old villages and others migrating to other regions. Many others died. Even so, in the 1570s Viceroy Francisco de Toledo organized a massive form of forced labour known as the *mita*, whose main objective was to provide a labour force for the most important mines in the region: Potosí (silver) and Huancavelica (mercury). A percentage of the male population of the provinces located in the highlands had to migrate annually to work in these mines, and they went with their families. The main *mita* – in terms of the size of the labour force – was that of Potosí, the principal producer of silver in the world at that time. The

combined effect of the reorganization of the new towns and the *mita* spurred a massive migration in the region that changed the distribution of the population in present-day Bolivia until its independence in the early nineteenth century. Many of the migrants were living in new cities: during Potosi's heyday (ca. 1590-1670), the urban centres grew and were sizeable in terms of population, a pattern that later changed in the eighteenth century. But we only know what happened in general terms. We still ignore details that are difficult to trace, in part because of the limitations of our sources.

Colonial documents were made for many different purposes, but almost never for answering demographic questions. All the documents differ in nature, and interpreting them requires a deep knowledge of the historical context. All of them include definitions of the natives' status that have different meanings. The majority of them are manuscripts dispersed across archives all over the continent and in Spain, some of which are badly preserved. In many cases, reading them requires palaeographical knowledge. What's more, they only show details of a population that was under the control of colonial authorities. However, because of the fiscal relevance of this populations (they paid taxes), these authorities also organized many inspections that collected information on the native peoples, starting in the early sixteenth century. This is, of course, a great advantage.

Because the population development of native peoples in the Americas was very particular, models based on stable populations are useless. We need to rethink models and patterns; we need new methodologies, new sources or combinations of sources that allow us to see beyond the words. We need to work multidisciplinarily.

What I understand as a multidisciplinary approach to history and demography, particularly with regard to their interaction, is that the former should not only be considered as context of and background to population development, but also as a part of the explanation. Such an interactive approach implies that we, as historical demographers, need skills in both disciplines, as well as knowledge of the sources, in order to interpret and evaluate their contents. Why is the interaction with other disciplines so important for this analysis? Here are some short answers, in the form of three examples:

Interaction with anthropology. It is interesting to note that one of the main documents used by historical demographers, the General Inspections (a kind of ancient census), were first 'discovered' by anthropologists and ethno-historians, who were more interested in the culture, the kinship, and the economic and social organization of the native populations than in their demography (Murra 1964). Their research helped us as historical demographers to deal with the native populations of the past, whose family organization, territorial perception and political configuration – among other things – were so different from those of the Spanish – the people who wrote the sources we now find in the archives. Anthropologists are trained in dealing with 'the others'. They have developed methods to do this, but, more importantly, they also raise questions that matter to the study of these 'others'. Their knowledge helps us to better interpret the original sources and, in general, all the other documents we are dealing with.

Interaction with archaeology. Most of the demographic sources on South America cover populations that were under colonial control, but they do not cover the whole population. Some natives ran away, but remained in contact with people who were living in the colonial world, and 'entered' this world when they needed to. Some of the Spanish colonist were also living on the fringes of society or were avoiding the law: the territory of the Americas was vast and difficult to control. A number of the sources we have for population study pretended to include all the people, but failed. So how can we know which share of the native population is present in our documents, and which is absent? In this respect, archaeological sources are an excellent complement to historical

documents. Without the limits that the archives impose, they show (amongst other things) where people lived, where towns were located, and where there were ‘empty’ places.

Interaction with geography. Maps are key tools: they allow us to describe our results in a way that was impossible in the past and offer opportunities for dense descriptions. With maps, we can show changes, distribution patterns, population compositions, ‘empty’ places, density, etc. We can combine the results of the analyses of different sources. Maps can suggest new questions. They are not simply a tool for representing the data: they can also explain. Moreover, the interaction with geography is not only about making maps of populations. For example, the environment has a more far-reaching impact on life in the mountains than on life in the plains, particularly in terms of dealing with the challenges of altitude. It is in assessing such matters that geography can come to our help.

In short: the three examples above show what historical demography can gain from interaction with three adjacent disciplines, demonstrating how multidisciplinary work can be interesting for our field in the contemporary context of stagnation.

References

- Cook, N. D. (1981). *Demographic collapse. Indian Peru, 1520-1620*. Cambridge: Cambridge Latin American Studies.
- Mumford, J. R. (2012). *Vertical Empire. The general resettlement of Indians in the Colonial Andes*. Durham and London: Duke University Press.
- Murra, J. (1964). Una apreciación etnológica de la visita. In: *Visita hecha a la Provincia de Chucuito por Garci Diez de San Miguel en el año 1567 por Garci Diez de San Miguel*, transcription Waldemar Espinoza Soriano, 421-444. Lima: Casa de la Cultura del Perú.
- Murra, J. (1975). *Formaciones económicas y políticas del mundo Andino*. Lima: Instituto de Estudios Peruanos. Reprint of essays originally published between 1958 and 1970.
- Sánchez Albornoz, N. (1978). *Indios y tributos en el Alto Perú*. Lima: Instituto de Estudios Peruanos.

Biography

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Context is everything: situating demographic patterns

Tracy Dennison

Our empirical knowledge of family and household patterns over a broad range of historical societies has increased dramatically over the past few decades, but we still do not understand the underlying contexts that generated those patterns. Broad categorizations – such as ‘agrarian’ versus ‘proto-industrial’ – only take us so far. We do not know, for instance, why two such different institutional environments as England and German-speaking central Europe generated very similar household formation patterns, while broadly similar institutional systems such as those of Russia and Prussia (both had serfdom) generated very different patterns. Any explanation will require a better understanding of the underlying institutional features of pre-modern societies. In particular:

- 1) Factor markets. Land, labour, and credit markets are frequently mentioned as determinants of demographic patterns, but they are often treated as either present or absent in a society. In fact, these markets existed in some form in all societies, but they operated differently in different places, even across Northwestern Europe. Rules governing tenancy arrangements, land use restrictions and the alienability of land all varied considerably from place to place, and had the potential to affect decisions about marriage and household formation. Labour markets varied similarly, and existed even in societies characterized by ‘unfree labour’. How did labour mobility affect household patterns? Not in a straightforward way, evidently, as serfdom did not always produce the same demographic regime. Furthermore, the operation of land and labour markets in a given locality affected savings and credit, which in turn influenced decisions about marriage, fertility, and inheritance. The question, then, is what *particular* features of markets shaped demographic outcomes at the local level?
- 2) Welfare provision. How did systems of poor relief influence demographic decisions? Pre-modern poor relief systems are often associated with late marriage and neo-locality – the ‘European’ marriage pattern. But many societies outside Northwestern Europe had ways of providing for the indigent. And the forms of welfare provision that existed within Northwestern Europe were also very heterogeneous. Why were some poor relief systems compatible with late marriage and nuclear family households while others were not? Can variation in forms of welfare provision account for differences in ages at first marriage and in household size and structure?
- 3) Local politics. How were rules and regulations generated and enforced in localities? What were the roles of specific entities, such as communes, towns, landlords or guilds? Demographic outcomes were clearly sensitive to these parameters of social structure. In some places, the influence of certain groups on demographic behaviour was obvious: landlords in many serf societies, for instance, had explicit demographic aims and regulated serf behaviour accordingly. In other cases, the influence was less straightforward: a commune regulated access to land or mobility of labour; a landlord insisted that householders be in good economic standing before they could marry; a guild insisted on marriage before one could gain admission. To explain

demographic outcomes we have to understand all the channels by which the institutional environment influenced people's choices.

- 4) Institutional systems. This is perhaps the most important point of all. None of the factors mentioned so far exerted its influence in isolation from all the other influences. Markets, poor relief systems, social structure – all were interlinked and mutually reinforcing. They formed a coherent institutional system; changes in any one area could shape other parts of the system. Any given feature could, under different conditions, generate different outcomes, while very different features could generate very similar demographic outcomes. We need to know how the interlocking parts of an institutional framework fitted together in order to understand their impact on demographic behaviour.

In short, it is the particular features of a local institutional system that appear to matter for demographic outcomes, and yet those particular features are rarely defined with sufficient precision to make convincing explanations possible. We still know too little about them. Statistical and econometric methods have been used very successfully to test the effects of crudely defined determinants, but they cannot effectively illuminate the context, or help us to define the 'particular features' of a society with greater accuracy. For this, we need greater *depth* of analysis. Statistical analyses provide us with starting points; they enable us to refine our questions. They tell us, for instance, that occupations or poor relief systems or literacy rates can be important determinants of demographic outcomes. But in order to understand why and how these variables affect demographic decisions, we require a more comprehensive picture of the societies we study. How did greater literacy affect demographic preferences? Did it generate greater market opportunities for the literate? If so, did this raise or lower the marriage age? In what ways were occupational structure, literacy rates, poor relief systems and demographic behaviour interrelated? Did changes in any of these variables bring about changes in the others? Drawing on a broad range of local sources, qualitative as well as quantitative, can help us address these kinds of questions. Sources that detail the enforcement of regulations (religious, communal, occupational) are especially valuable, as they can shed useful light on the specific constraints people faced in their economic and demographic decisions, and on how these might have changed over time. Such sources might include court records, petitions, or other forms of official correspondence.

Research in historical demography has uncovered much about demography. To understand these findings better, we need to focus more on history.

Biography

Tracy Dennison is Professor of Social Science History at the California Institute of Technology. Her research interests include the economic history of Eastern Europe, especially that of institutions and their impact on people's economic and demographic decisions. She is currently undertaking a comparative study of serfdom in eighteenth and nineteenth-century Prussia and Russia.

Genetic genealogy 2.0: verifying biological relatedness in historical demographic data

Maarten H.D. Larmuseau

“It is a wise father that knows his own child.”

William Shakespeare, *The Merchant of Venice* (circa 1596-1597), Act 2, Scene 2.

Genetic genealogy is a recent scientific discipline, which combines the analysis of DNA data with traditional genealogical research. It has current applications for both (amateur) genealogical and scientific purposes within forensic biomedical sciences, evolutionary genomics and socio-biology (Larmuseau *et al.* 2016; Larmuseau *et al.* 2013a). In addition, its technological advances are bound to bring about a scientific breakthrough in the field of historical demography (Larmuseau *et al.* 2013a and Larmuseau *et al.* 2015). So far, historical demographic databases have used only juridical descent to define relatedness. Genetic genealogy, however, allows for complementing this information with data based on biological descent, opening up a wide field of new research opportunities with scientific relevance for historical demography.

There are various genetic markers that have potential for historical demographic research. Autosomal DNA markers – i.e. the variation on all chromosomes apart from the sex chromosomes – are not particularly useful to test historical biological relatedness, since the genetic similarity is halved when making a new generation because of genetic reshuffling, so that after just a few generations the relatedness is already no longer traceable. In contrast, the Y-chromosomal and mitochondrial DNA (mtDNA) have a uniparental inheritance pattern, which makes them more useful for historical relatedness tests. The Y-chromosome is inherited from father to son, while mitochondrial DNA is matrilineally inherited. At present, the Y-chromosome is particularly relevant for historical demographic research because, unlike mtDNA, it contains much family-specific genetic variation (Jobling *et al.* 2013). Moreover, the Y-chromosome can also give information on (non-) paternity, which has often been considered as a limiting factor in evolutionary demographic research using historical data. As a result, the use of a Y-chromosomal genetic genealogical approach can be used to verify agreement between genetic descent and the historical descent data.

Recent studies have already shown that the rate of so-called extra-pair paternity (EPP), meaning that a child has a different biological father than its legal one, only averages around 1-2% per generation over the past 400 years in Western Europe and Flanders (Larmuseau *et al.* 2016; Larmuseau *et al.* 2013b). This is significantly lower than the high figure of 10-30% that has often been mentioned in both the scientific and popular literature. This low figure implies that the juridical descent recorded in historical databases is largely in agreement with biological descent. Assuming a general correspondence between historical databases and biological descent is therefore justifiable. However, the possibility that extra-pair paternity is present cannot be neglected.

Since the studies published so far only provide a mean past rate of extra-pair paternity over a long

time-frame and an extended geographical area, it is likely that the results conceal small temporal and spatial differences in the EPP rate, including differences between socio-economic groups. Future research aims to unravel these differences. For example, the demographic transition in the eighteenth century unquestionably changed the fertility environment. Since paternal investment per child has been shown to be lower during periods with a high birth rate, socio-biologists expect the EPP rate to have dropped over the course of the demographic transition, accompanied by a drop in fertility and an increase in paternal investment. A spatial difference might exist between rural and urban areas: the anonymity of big cities suggests a higher EPP rate, while greater social control in the countryside suggests a lower rate. By testing many pairs of patrilineally related men from different regions, it will be possible to determine other factors that may have influenced spatial differentiation in (past) EPP rates. One factor of interest is differences in religious practices, which were most likely to have an impact on EPP behaviour. In addition, it will be interesting to test EPP rates in different socio-economic groups within populations, using available historical records at the familial level. In line with the different life-history strategies followed by these groups, socio-biologists expect that their EPP rates will also differ (Laland & Brown 2011).

There are many more applications of genetic genealogy that can be used to verify biological relatedness in historical demographic databases. For example, Y-chromosomal research can show whether pre-marital children in a certain region and time were legitimized by their biological father. It is expected that the EPP rate in genealogies with a pre-marital child will be much higher than in those with children only born after marriage. Finally, as the male sex-determining chromosome, the Y-chromosome also contains biological information about fertility. By combining molecular methods to define Y-chromosomal variants with demographic data, it is possible to investigate whether or not genetic elements were at play in determining the observed levels of fertility.

As technological possibilities develop and genomic variation is explored still further, genetic data will undoubtedly have significant new applications in historical demography. Genetic genealogy therefore has the ability to provide historical demography with additional insights, to show other directions for research, and to breathe new life into this scientific discipline.

References

- Jobling, M. A., Hurles, M. E. & Tyler-Smith, C. (2013). *Human Evolutionary Genetics*. New York: Garland Science Publishing.
- Laland, K. N. & Brown, G. R. (2011). *Sense & nonsense. Evolutionary perspectives on human behaviour*. Oxford: Oxford University Press.
- Larmuseau, M. H. D., Boon, N. A. M., Vanderheyden, N., Van Geystelen, A., Larmuseau, H. F. M., Matthijs, K. & Decorte, R. (2015). High Y chromosomal diversity and low relatedness between paternal lineages on a communal scale in the Western European Low Countries during the surname establishment. *Heredity*, 115, 3-12.
DOI: <http://dx.doi.org/10.1038/hdy.2015.5>
- Larmuseau, M. H. D., Matthijs, K. & Wenseleers, T. (2016). Cuckolded fathers rare in human populations. *Trends in Ecology & Evolution*, 31, 327-329.
DOI: <http://dx.doi.org/10.1016/j.tree.2016.03.004>
- Larmuseau, M. H. D., Van Geystelen, A., van Oven, M. & Decorte, R. (2013a). Genetic genealogy comes of age. Perspectives on the use of deep-rooted pedigrees in human population genetics. *American Journal of Physical Anthropology*, 150, 505-511.
DOI: <http://dx.doi.org/10.1002/ajpa.22233>
- Larmuseau, M. H. D., Vanoverbeke, J., Van Geystelen, A., Defraene, G., Vanderheyden, N., Matthijs, K., Wenseleers, T. & Decorte, R. (2013b). Low historical rates of cuckoldry in a Western European human population traced by Y-chromosome and genealogical data. *Proceedings of the Royal Society: Biological Sciences*, 280(20132400).
DOI: <http://dx.doi.org/10.1098/rspb.2013.2400>

Biography

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Health and historical demography

Bernard Harris

Demography, in the words of one well-known textbook, is “the study of population structure and change” (Hinde 1998). Its essential building blocks include measures of fertility, nuptiality, migration, family and household structure, and mortality. However, contemporary demographers have also become increasingly interested in ways of measuring the ‘quality’ of people’s lives, as reflected in a range of anthropometric indicators, such as height, weight and body mass, cognitive performance, and morbidity.

Although at least some of these indicators have played a significant role in recent historical debates, these have often taken place outside the strict boundaries of the community of historical demographers. At recent meetings of the European and North American Social Science History Associations, for example, papers dealing with either anthropometry or the history of morbidity have been at least as likely to appear under the headings of *Economics*, *Economic History*, *Health and Environment*, or *Health/Medicine/Body*, as under *Family/Demography* or *Family and Demography*. This pattern was also reflected in the organisation of the inaugural meeting of the European Society for Historical Demography. The conference programme for this meeting included thirty papers whose titles contained the words ‘mortality’, ‘deaths’, ‘survival’ or ‘life expectancy’, but none which referred explicitly to such topics as illness, sickness, disease, disability, height, weight, obesity, body mass or morbidity.

It is interesting to contrast the comparatively narrow focus suggested by this analysis with the somewhat broader focus of contemporary demography. Figure 1 is based on an admittedly cursory analysis of key terms used in the titles of articles which appeared in *Demography*, *Population Studies* and *Population and Development Review* between 2011 and 2015 (inclusive). It focuses on articles that were explicitly concerned with issues such as health, morbidity and mortality, and excludes articles that focused on issues such as fertility, fecundity, nuptiality, migration and household structure. As one might expect, the majority of these articles were concerned with the specific question of mortality, but there were also significant numbers that focused on other aspects of health, disease, and either physical or mental development and well-being.

It is also interesting to compare the treatment of these issues by historical demographers with their coverage by practitioners of other historically-minded social science disciplines. The literature on the quantitative history of non-fatal morbidity is still relatively small, but the number of publications dealing with anthropometric history has expanded very dramatically. In 1994, in a paper which I published in *Social History of Medicine*, I cited 63 books, chapters and articles that were primarily concerned with the anthropometric history of the United Kingdom, Sweden, the Austro-Hungarian Empire and the United States (Harris 1994). In 1995, Richard Steckel published a much more comprehensive review, listing 145 references, of which 83 were defined explicitly as ‘height studies’ (Steckel 1995). However, when Steckel revisited the field in 2009, he identified a total of 326

articles on the history of height, weight, or body mass, which had appeared between 1995 and 2008. The vast majority of these articles had either been published in interdisciplinary journals or in journals aimed primarily at economists and economic historians, with very few in demographic publications (Steckel 2009).

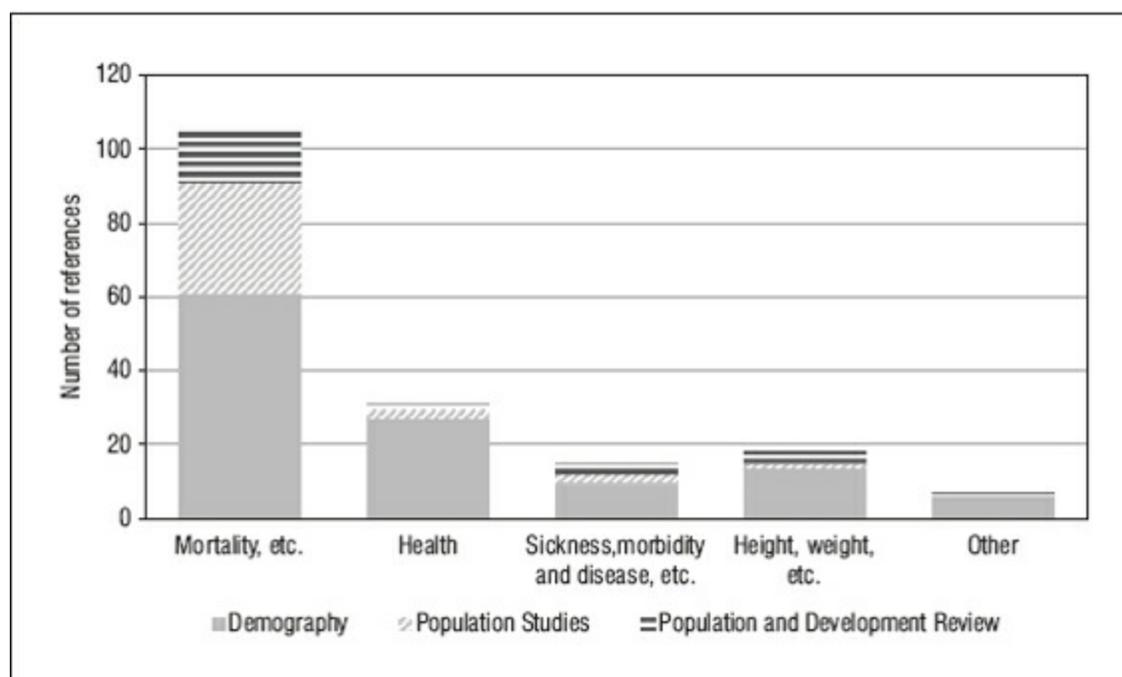


Figure 1. Key terms used in the titles of articles in leading demographic journals, 2011-15.

The literature on each of these topics remains controversial. A large proportion of the historical data on non-fatal illnesses, injuries and disabilities comes from insurance records and this has led to debates as to what the data actually represent (for an initial discussion, see Edwards *et al.* 2003). Some authors have argued that the figures are not ‘true’ sickness statistics because they measure absence from work, and others have claimed that they also reflect the financial health of the institutions making insurance payments. Yet others have argued that they are too susceptible to the effects of fluctuations in the labour market or that they represent a form of ‘rubber ruler’, whose dimensions have changed in response to changes in social, cultural and diagnostic conventions. The value of anthropometric data has also been questioned, both conceptually and methodologically. Many of the data come from the recruitment records of military organisations which applied minimum height standards. This has generated a vigorous debate over the use of different statistical procedures to correct for truncation. Other writers have argued that the statistics are invalidated by the impact of labour market conditions on both the recruitment of soldiers and the ‘supply’ of prisoners, although these claims have also been challenged.

Despite these concerns, the literature on both anthropometric history and the history of morbidity has much to offer. As George Alter and James Riley have observed, the history of morbidity is not the same as the history of mortality, and a better understanding of the nature and extent of non-fatal illnesses could reveal much about the lived experience of past populations. The history of human height can also reveal a great deal about the impact of environmental and nutritional circumstances on the lives of past generations from conception to maturity. The discovery of new information about historical weights, in turn, has provided fresh insights into the development of nutritional conditions during adulthood. These statistics can also be used to improve our understanding of human development throughout the life course and to explore the impact of both early- and mid-life

conditions on health and mortality at higher ages. Using these data therefore has the potential to add to the value of historical demography by reinforcing the links between historical demography and contemporary demography, and by improving our understanding of the challenges facing present-day societies.

References

- Edwards, C., Gorsky, M., Harris, B. & Hinde, P. R. A. (2003). Sickness, insurance and health: assessing trends in morbidity through friendly society records. *Annales de Démographie Historique*, 1, 131-167.
DOI: http://www.cairn.info/resume.php?ID_ARTICLE=ADH_105_0131
- Harris, B. (1994). Health, height and history: an overview of recent developments in anthropometric history. *Social History of Medicine*, 7(2), 297-320.
DOI: <http://dx.doi.org/10.1093/shm/7.2.297>
- Hinde, A. (1998). *Demographic methods*. London: Edward Arnold.
- Steckel, R. (1995). Stature and the standard of living. *Journal of Economic Literature*, 33(4), 1903-1940.
DOI: <http://www.jstor.org/stable/2729317>
- Steckel, R. (2009). Heights and human welfare: recent developments and new directions. *Explorations in Economic History*, 46(1), 1-23.
DOI: <http://dx.doi.org/10.1016/j.eeh.2008.12.001>

Biography

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The relevance of quantitative economic theory for historical demography

David de la Croix

I am an economist. As such, I am interested in unravelling long-term patterns and mechanisms that affect human choices in a variety of contexts, including the more or less remote past. Demographic history provides unique material for this approach, because of the wealth of carefully built-up data and detailed contextual information. It seems very natural as an economist to be interested in historical demography. Indeed, demographic variables are important determinants of economic choices and trends. Furthermore, as the British economic historian John H. Clapham said in 1922: “The economist is, willy-nilly, an historian. The world has moved on before his conclusions are ripe” (quoted from McCloskey 2014). If you are going to be a scientific economist, McCloskey adds, “the past should be your present”.

Economists use various methods to understand reality, including a variety of statistical techniques, pure economic theory and quantitative theory. I think the latter is of particular relevance to the study of historical demography, which is precisely the point I would like to make in this paper. King noted as follows:

“Quantitative theory uses simple, abstract economic models, together with a small amount of economic data, to highlight major economic mechanisms. Economic models are employed in two ways. First, they are used to organize economic data in a new and suggestive manner. Second, models are combined with economic data to display successes and failures of particular theoretical mechanisms” (King 1995).

A model is usually a mathematical representation of a maximization problem: some agent maximizes an objective function that is subject to a series of explicit constraints. The solution to the problem describes how the agent behaves; in other words, how he or she reacts to incentives provided by the outside world. A quantitative model amounts to looking at the data through the lens of this particular model; for example, by calibrating or estimating the parameters of the objective function and the constraints, and then analyzing the extent to which what we observe matches the behaviour predicted by the model.

The objective of this method is not to provide a complete explanation of a given phenomenon, but rather to evaluate how much we can explain by modelling one or a number of specific mechanisms. I will give two examples below. Before doing so, however, I would like to stress that, unlike statistical inferences, which (over) emphasize statistical significance, quantitative theory is more concerned with the size of effects; that is, with their economic or social significance. And unlike pure theory, it is interested in quantitative implications.

Unravelling the reasons behind childlessness

The first example where there are benefits to be had from using quantitative theory in a historical context is in the analysis of the reasons for being childless. There are two main types of childlessness discussed in the literature: 1) voluntary childlessness; namely, a utility-enhancing life choice for those who decide not to have children; and 2) involuntary childlessness. The latter involves situations in which people are physically unable to become parents and in which the lack of experiencing parenthood is likely to be a heavy burden. Involuntary childlessness depends on biological constraints and can be further divided into innate (or natural) sterility and social sterility. Social sterility occurs when fecundity is affected by poor living conditions and societal underdevelopment. It arises from poverty-related diseases or malnutrition and can be regarded as a measure of poverty. Voluntary childlessness, by contrast, is primarily prevalent in richer and more gender-equal societies.

In historical populations, childlessness is often regarded as a phenomenon driven solely by sterility. An exception can be found in Bardet (1983), who provides a comprehensive analysis of the population of Rouen in the seventeenth and eighteenth centuries. Bardet included a table (p. 300) with the percentage of childless women in Rouen by year of marriage and social class. Beyond a baseline of natural sterility of about 4%, childlessness increased over time for all social classes, but more so for the nobles, as well as for the shopkeepers who were eager to imitate them. Bardet interprets the rise in childlessness observed in Rouen as voluntary: the number of women refusing to have children was on the rise. Yet notwithstanding a very detailed analysis of this population, his study lacks a conclusion about the reasons behind this rise.

One main limitation of measurement without theory resides in the impossibility of distinguishing biologically and poverty-driven childlessness from voluntary childlessness in the data. We know that for Simone de Beauvoir it was a conscious choice to remain childless, while for King Baudouin and Queen Fabiola it was not. But, in general, we do not observe the reasons behind childlessness. Censuses never ask childless persons why they are childless. While surveys do sometimes ask this question, they only contain a limited number of observations. Furthermore, a significant number of respondents provide contradictory answers. Consequently, the interviewers are unable to determine the voluntary or involuntary nature of the childlessness. An alternative approach, which would enable us to unravel the reasons behind childlessness, is to use quantitative theory.

The structural model devised by Baudin *et al.* (2015) provides a way to use data in order to weight the various causes of childlessness. This model is essentially based on two assumptions. The first assumption is that the ability to have children increases with the standard of living, since the availability and quality of nutrition, shelter and hygiene are matters of importance for fecundity. The second assumption is that the main cost of children is the time it takes to rear them. This implies that children are more expensive for highly educated people, because of their high opportunity cost. The presence of the first mechanism can be confirmed and its size can be measured from the fact that childlessness is more prevalent among the very poor than among the middle classes (despite the fact that fertility among the poor is higher). The second assumption rests on a mechanism observed among the educated: namely, that the occurrence of childlessness increases with the mother's level of education. The fact that childlessness displays a U-shaped curve when plotted against the level of education of the mother allows us to identify (= quantify) the strength of the assumed mechanisms and to make quantitative predictions.

Breaking down childlessness into its causes helps us to understand how the phenomenon has

changed over the last century in the US. At the end of the nineteenth century, wages were low and people were generally poorly educated. This made levels of social sterility very high. In addition to the causes mentioned above, the Spanish influenza epidemics, which especially affected the generations born between 1890 and 1910, meant that pregnant women who were infected were particularly vulnerable to miscarriages. The Great Depression also impoverished these same generations, among whom voluntary childlessness was almost absent. The rise in both education and overall income allowed subsequent generations to escape from situations where couples were constrained from having children. As a consequence, rates of childlessness began to fall. Over time, the nature of childlessness gradually changed: it increasingly became the result of choice for many educated women. In the US, the social causes of childlessness have now completely disappeared for married women. However, this is not true for single women, who are usually poorer.

The fertility transition: the diffusionist view versus socio-economic theories

A second example concerns the possible role of quantitative theory in weighting explanations for the fertility decline observed in Europe over the last two centuries. Scientists are divided between those who believe that fertility was not subject to rational choice or control, and those who believe it was. Most economists are on the ‘rational choice’ side, while demographers tend to subscribe to the ‘no choice’ view (see Lee 2015). This divide overlaps with a divergence between socio-economic theories for the fertility decline on the one hand, and diffusionist/ cultural views on the other (again following the terminology of Lee 2015). The ‘rational choice’ approach of Nobel Prize winner Gary Becker clearly belongs to the first strand, while, for example, the Princeton study, which examined the timing of fertility change at the county level in Europe, concludes in favour of the diffusionist/cultural view.

Understanding which mechanism matters most is important for policy design. If, according to the diffusionist/cultural view, fertility is a question of culture and norms instead of incentives, policy focusing on incentives (family allowances, tax breaks for families, etc.) will have little impact.

In a current project (de la Croix & Perrin 2016), we are pursuing the following strategy. First, we develop a structural model for the optimal choice of children, in which parents maximize their well-being subject to a budget constraint and a time constraint. We then evaluate how much can be explained by relying strictly on this structural model. One original aspect of our approach is to assume that parents choose both fertility and education (education only became compulsory in the late nineteenth century). Unlike many atheoretical approaches that use regressions to analyze the determinants of fertility, our approach allows us to exploit the idea that fertility and education are joint decisions; for example, in counties where parents are more educated, theory predicts that they will have fewer children but will educate them more. Our method makes it possible to exploit the restrictions that link fertility and education behaviours in a precise way. Preliminary results indicate that, with this parsimonious ‘rational choice’ model, we can explain 38% of the variation of fertility over time and across counties, and 71% and 83% of the school enrolment for boys and girls respectively.

In a second step, we plan to correlate the part of fertility and school enrolment that was not explained by the ‘rational choice’ model with other determinants mentioned as important in the

literature, such as family structure, religion and cultural distance from Paris (where fertility control supposedly started). This analysis can be used for two purposes. First, it can be used to assess the importance of these factors in explaining family decisions. Second, it can be used to indicate the direction in which the theories of fertility decline should be developed further.

3. Conclusion

Many historians and demographers who want to increase the quantitative aspect of their research naturally lean towards the use of regression analysis. Such an approach is not based on theory (apart from knowing which variable to include in the regression) and focuses instead on knowing which explanatory variable is statistically significant. As an alternative, they may wish to consider giving a chance to quantitative theory. This latter approach aims at evaluating the quantitative importance of a limited number of specific mechanisms. It does not aim at providing a comprehensive understanding of the phenomenon under scrutiny, but instead aims at leading to cumulative research: “progress, do not regress” was the motto of Edward Prescott, one of the leading promoters of quantitative theory. In this sense, further research is always needed to look at the neglected implications of selected mechanisms, to discard previously developed theories, and to promote better ones.

References

- Bardet, J. P. (1983). *Rouen au XVIIe et XVIIIe siècles*. Paris: SEDES.
- Baudin, T., de la Croix, D. & Gobbi, P. E. (2015). Fertility and childlessness in the United States. *American Economic Review*, 105(6), 1852-1882.
DOI: <http://dx.doi.org/10.1257/aer.20120926>
- de la Croix, D. & Perrin, F. (2016). French fertility and education transition: rational choice vs. cultural diffusion. *IRES Discussion Paper 2016/7*.
DOI: <http://hdl.handle.net/2078.1/172572>
- King, R. G. (1995). Quantitative theory and econometrics. *Economic Quarterly*, Federal Reserve Bank of Richmond, 53-105.
DOI: <https://ssrn.com/abstract=2129324>
- Lee, R. (2015). Becker and the Demographic Transition. *Journal of Demographic Economics*, 81, 67-74.
DOI: <http://dx.doi.org/10.1017/dem.2014.9>
- McCloskey, D. N. (2014). Measured, unmeasured, mismeasured and unjustified pessimism: a review essay of Thomas Piketty's 'Capital in the twenty-first century'. *Erasmus Journal for Philosophy and Economics*, 7(2), 73-115.
DOI: <http://ejpe.org/pdf/7-2-art-4.pdf>

Biography

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Population and economy: towards a conceptual framework for pre-transitional demography

Osamu Saito

Societies before the demographic transition have been characterized by a low level of population growth. There were high-pressure and low-pressure demographic regimes, but both exhibited a long-term rate of natural increase falling within a narrow range of zero to one percent. However, pre-modern demographic change did happen from time to time. The Malthusian model was formulated by Thomas Malthus to account for such demographic change, in which adjustment was made through a mortality-income link, with marital fertility kept constant. In the later editions of his *Principle of Population* Malthus gave a greater role to nuptiality in differentiating between the potential and the realized levels of fertility, which has proven successful in accounting for the functioning of the pre-transitional Western European demographic system. But the model's principal adjustment mechanism remains mortality-centred. The index of real wages acts as the sole variable reflecting economic conditions: structurally, it is a closed, self-regulating system.

In contrast, my formulation of the drivers of demographic change in pre-modern times is much less rigorous. My supposition is that changes in fertility and mortality were driven by two sectors of the economy: the agricultural and the non-agricultural sector. Undoubtedly, it is harder to obtain quantitative evidence for change in economic sectors than for change in real wages. However, agricultural and non-agricultural growth took place at different rhythms, and the chronology of the former is readily available in many instances. Although this is not the case for the non-agricultural sector, one way to skirt around such data problems is to use the level of urbanization as a surrogate measure of non-agricultural growth. Of course, definitions matter: for periods when proto-industry was spreading, it would be misleading to focus exclusively on cities – country and market towns should also be included. But the point is that urbanization is a process that keeps people on the move, and has unmistakable implications for the demography of pre-transitional societies; for example, the way in which exposure to infections increases with migration. This makes the task of linking demography to economics easier, allowing us to place the observed changes in demographic indicators within the contexts of long-term economic growth and structural change.

Some stylized facts are known about pre-transitional demographic change. On the fertility side, marital fertility tended to rise rather than decline, because pre-modern conditions tended to be characterized by an “excess demand” situation (Easterlin 1978). This pre-transitional *rise* in fertility may not have been universal, but it took place across many of the world's regions – from eighteenth-century England to twentieth-century Asian countries. In some cases, the change was occasioned by exogenous interventions or by a switch in dietary practice, but in many cases it was associated with an improvement in the nutritional status of mothers, and, hence, with growing food production (Dyson & Murphy 1985; Wrigley 2004).

On the mortality side, things are less clear. According to the Malthusian interpretations, mortality variations were related to changes in economic conditions. It can be argued that the probability of dying in early childhood was higher among lower-income families, but such cross-sectional evidence does not necessarily imply that an increase in earnings would lead to a decline in mortality. In fact, Wrigley and Schofield's study of England (1981) gives little to support that expectation. Instead, the evidence suggests that: "A slowly changing balance between infective parasites and their human host was probably a weightier factor, a balance which tilted to and fro largely outside the consciousness of men and, with few exceptions, quite outside their power to influence" (p. 416). Clearly, *exposure* was weightier than *resistance* as a determinant of mortality. Exposure risk increased with the concentration of people in already densely populated places, and was in most cases associated with an increase in the share of non-agricultural employment in the workforce, or with an expansion of long-distance trade, or both. Given the prevalence of the 'urban graveyard' effect, it is therefore possible that pre-modern economic growth may well have led to an *increase* in mortality.

As for the actual patterns of change, there is evidence that when mortality declined over time, it took the form of an attenuation of short-term fluctuations, which constituted the first phase of the mortality transition. Behind these attenuated fluctuations were agricultural growth and the rise of better-functioning grain markets. The increased availability of food raised the level of resistance among the poor. The reduced incidence of crop failure was therefore one important resistance factor. As noted earlier, marital fertility also rose in conjunction with the increase in food availability. Agricultural growth, if aided by market growth, was a strong contributory factor for both mortality decline and fertility increase.

All this points to how the model works. The timing and magnitude of demographic change was dependent on the strength of the tendency for marital fertility to increase and, more importantly, on how the balance between exposure and resistance shifted in response to changing agricultural and non-agricultural shares. In pre-modern contexts, while agrarian growth unmistakably acted as a positive factor for population increase, the net effect of urban growth is likely to have raised the level of death rates in the age of the urban graveyard.

Simplistic as it may sound, this model has a number of important implications. Given the pre-modern context, it is likely that the exposure effect outweighed the resistance effect: it is the former that kept the growth of population in check. Moreover, the varying balance between exposure and resistance enables us to account for, at least in part, the diversity in demographic patterns before the onset of modern economic growth. Even during the subsequent period of industrialization and urbanization, the importance of exposure did not necessarily diminish. Take England and Japan, for example. Early modern England was already extremely 'open' and hence susceptible to imported infections (Smith 2001). During the seventeenth century, the negative effect of urbanization was probably intensified by the ever increasing openness of the nation, which explains much of its tardy growth in population. In the eighteenth century, the attenuation of mortality crises and rising birth rates (occasioned by rising marital fertility, as well as an increasing number of marriages) pushed the growth rates upwards. But infant mortality remained unchanged, due primarily to the exposure effect of nineteenth century urbanization. In contrast, Japan was closed to outside influences under Tokugawa rule. Consequently, the outbreak of epidemics was less frequent – a factor that kept the overall level of mortality lower than the *per capita* income estimates of the country would suggest. However, it did not result in population growth, since a lower level of marital fertility offset this mortality advantage. Marital fertility seems to have started to rise gradually before the collapse of the Tokugawa regime. But this upturn of fertility was in part counterbalanced by an increased risk of

exposure to infectious diseases after the country opened trading ports and by the resurgence of urban growth that followed. Exposure continued to play a part, even during the early stages of industrialization and urbanization.

As Easterlin (1978) remarked with respect to fertility change, there is no necessity for any one factor to “exhibit an invariant timing pattern”: instead, various factors come together in different combinations. It is certainly impossible to accommodate all those factors in model building. However, it is self-evident that any two-sector conceptual framework will do the job better than the single-sector Malthusian one.

References

Dyson, T. & Murphy, M. (1985). The onset of fertility transition. *Population and Development Review*, 11, 399-440.

DOI: <http://www.jstor.org/stable/1973246>

Easterlin, R. A. (1978). The economics and sociology of fertility: a synthesis. In: Tilly, C. (Ed.), *Historical Studies of Changing Fertility*, 57-133. Princeton: Princeton University Press.

Smith, R. M. (2001). Plagues and people: the long demographic cycle, 1250-1670. In: Slack, P. and Ward, R. (Eds.). *The Peopling of Britain: The Shaping of a Human Landscape*, 177-210. Oxford: Oxford University Press.

Wrigley, E. A. (2004). Explaining the rise in marital fertility in England in the ‘long’ eighteenth century. In: Wrigley, E. A., *Poverty, Progress, and Population*, 317-350. Cambridge: Cambridge University Press.

Wrigley, E. A. & Schofield, R. S. (1981). *The Population History of England 1541-1871: A Reconstruction*. London: Edward Arnold.

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Chapter 5

Deliverance through stronger methods

All exact science is dominated by the idea of approximation

Bertrand Russell

How can we improve our quantitative methods to provide better results? And is a focus on better quantitative methods the best way to move forward? This chapter provides critique on as well as further explorations of statistical methods for historical demography.

Dead ends and new paths in historical demography

Daniel Courgeau

Historical demography has recently known two important trends in the realm of methodological approaches: the first is the adoption of behaviour genetics to explain demographic outcomes and the second is the development of fully Bayesian approaches. In this contribution, I argue that the first trend leads us to a dead end, but that further development of fully Bayesian approaches provides an important way forward for historical demographers.

Behaviour genetics: a dead end

Until 2005, historical demography sought the determinants of the evolution of a population in society itself. Society was seen as characterized by its social rules, the economy, the political system, and geographic and climatic conditions (Bengtsson *et al.* 2004). At the time, biology and genetics were clearly regarded as secondary. More recently, however, these latter two factors have been assigned an increasingly important role. Should historical demographers strengthen their research efforts further in this direction in future? I argue that they should refrain from doing so, as the path of behaviour genetics leads us to a dead end.

Even if the emergence of behaviour genetics can be dated to around 1960, it developed from the works of Galton in the nineteenth century and Fisher in the early twentieth century. In particular, the subsequent development of behaviour genetics relied heavily on the hypotheses and concepts of Fisher (1918), which were later applied to human populations. Fisher held that a trait is determined by a large number of polygenes, either uniquely or in combination with polygenes associated with another trait – an assumption that came to be known as the polygenic hypothesis. He also assumed that there is an infinite number of polygenes, and that genes and environment act additively and operate independently. Behavioural genetics, as it currently tends to be used with increasing frequency by (historical) demographers, followed in the footsteps of these premises. Hence we find studies in the field of historical demography arguing that genes have an independent effect on behavioural outcomes in the realm of fertility, mortality, morbidity, etc. (for example, Bengtsson & Mineau 2008).

However, our understanding of the human genome has dramatically advanced since the theory of behaviour genetics was first elaborated. While, at the time, biologists believed that humans might count around 2 million protein-coding genes, we now know that we have only 19,797 of them. The amount of coding DNA that a human body contains is much lower than previously thought, and forms only about 2% of the total of our DNA. As the human characteristics that behavioural genetics study are innumerable – fertility, nuptiality, longevity, intelligence, homosexuality, alcoholism, femininity, autism, maniac depression, aggression, happiness, spatial and verbal reasoning, criminal behaviour,

obesity, political participation, and so on – it is implausible to think that they are all linked to so small a number of genes. Similarly, the human organism produces well over a million proteins: the polygene hypothesis cannot explain this with only 19,797 genes at the body's disposal. The advancement of our understanding of genes has settled that human traits are always shaped by an interaction of genes and environment, not by genes alone. As, for example, Gottlieb (2001) clearly states:

“It is now known that both genes and environments are involved in all traits and that it is not possible to specify their weighting or quantitative influence on any trait... This has been a hard-won scientific insight that has not yet percolated to the mass of humanity.”

Genes and environment operate through interaction, not through addition. We can, therefore, conclude that the use of the concept of heritability, as linked to Fisher's assumptions, leads to a dead end. The problem to be studied is the interaction between genes and environment, and behaviour genetics cannot provide the answer. Considerable further research in molecular genetics and epigenetics will be required to unravel the complex ties between nature and culture, and we may even ask if this will ever be possible.

Beyond its scientifically inaccurate results, behaviour genetics hint at a desire for control over human destinies that strangely resembles Galton's eugenics – routinely resurrected since Nazism and, more recently, by governments seeking to improve society by locking up persons regarded as genetic misfits. Rather than to follow the blind alley of heritability, historical demography will do better to consider the social, economic, political, climatic and geographic factors to which they can have access.

What, then, is the way forward for historical demographers in the realm of methodology?

A truly Bayesian approach: new paths

Demographers – whether studying the present or the past – have long taken an objectivist view of the probability of events. Under this approach, first presented by Pascal and Fermat in 1654, probability is seen as a measure assigned to the elements of sets. The population sets observed in the major large-scale surveys, censuses and registers are large enough for us to assume that demographic phenomena can be repeated in identical conditions at a given point in time. Probabilities can therefore be measured by their frequencies. For objectivists, the ‘probability’ of a hypothesis is thus meaningless. All that can be calculated is the probability of obtaining a given sample.

More recently, however, the Bayesian approach has emerged in various branches of historical demography. Under this approach, first given by Bayes in 1763, probability is no longer a measure assigned to sets, but to states of knowledge. The role of experience is now to modify this knowledge in a consistent manner; in other words, by transforming the *prior* probabilities into improved *posterior* probabilities. As a result, the probabilities of different hypotheses become truly meaningful and can be estimated and compared.

I argue that further development of Bayesian approaches provides an important way forward. One possible field of application, which illustrates the potential benefits, is paleodemography.

Paleodemography, a discipline based on archaeological data, seeks to estimate its various demographic parameters with the aid of skeletal remains. From a reference population and under the

assumption of biological uniformity, it notably aims to determine the sex and age structure of the population of a given site, for which the only available evidence is the structure by stage of the biological evolution of a set of indicators. Moreover, the number of skeletons observed is very often small – sometimes no more than a few hundred individuals.

Until 2010, the methods prescribed by objectivists were unable to take fully into account the variability of some of the observations. While the methods proposed by Bocquet-Appel, Hoppa, Vaupel and others used Bayes' theorem, the paradigm on which they were based was actually objectivist and the results obtained were highly unstable; in some cases, the population size of specific age groups was even estimated as zero. In 2010, with Henri Caussinus, I proposed a fully Bayesian method that avoids all these negatives. Our method starts from a prior distribution – chosen to reflect the researcher's knowledge – to arrive at a posterior distribution obtained with the aid of observations. This approach has proved far more effective than its predecessors when working on populations whose mortality is known from other sources. It avoids the aberrant results obtained with non-Bayesian methods and offers more robust conclusions about the structure of the observed population.

The recent use of Bayesian methods in historical demography across diverse fields and around the world is now growing. For example, under some assumptions, approximate Bayes computation (ABC) permits, by coupling historical data with genetic data, the estimation of models of population expansion and dispersal at the continental scale over long past periods. Similarly, Bayesian population reconstruction also makes it possible to estimate past populations by age, fertility and mortality rates, and net international migration, with fully probabilistic statements of uncertainty and expert opinions.

I therefore advocate the use of the Bayesian paradigm for a greater number of historical demographic questions. Doing so will permit historical demographers to judge states of knowledge about the studied population.

References

- Bengtsson, T., Campbell, C. & Lee, J. Z. (Eds.) (2004). *Life under pressure*. Cambridge, MA: MIT Press.
- Bengtsson, T. & Mineau, G. (2008). *Kinship and demographic behaviour in the past*. Dordrecht: Springer.
- Caussinus, H. & Courgeau, D. (2010). Estimating age without measuring it: a new method in paleodemography. *Population-E*, 65 (1), 117-144.
DOI: <http://www.ingentaconnect.com/content/ined/pop/2010/00000065/00000001/art00002>
- Fisher, R. A. (1918). The correlation between relatives on the supposition of Mendelian inheritance. *Transactions of the Royal Society of Edinburgh*, 52, 399-423.
- Gottlieb, G. (2001). Genetics and development. In: Smelser, N. J. & Baltes, P. B. (Eds.). *International Encyclopedia of the Social and Behavioral Sciences, Genetics, Behavior and Society*. New York: Elsevier.

Biography

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Evolutionary approaches to historical demography and agent based modeling

Jan Van Bavel

“[D]emography is neither theoretical physics nor is it mineralogical chemistry”: with this truism, Charbit (2009) highlighted what he thinks is particular for the human sciences: explanations should be based on factors that are peculiar to a given historical context. Indeed, doing historical demography is not about finding eternal ‘laws’ but rather about carefully documenting and analyzing population patterns and demographic change in particular historical contexts. It might therefore be tempting to follow Charbit in dismissing altogether the ambition for general population theory, and to stick instead with idiosyncratic narratives.

Although historical peculiarities do and should play a role, historical demography should not give up the ambition to develop and test general theories. After all, why would Charbit’s argument hold for demography and not for a field like biology? Aren’t populations of plants and animals just as peculiar for their historical environment as human populations? It is precisely the uniqueness of every organism that is highlighted in the population biology inherited from Charles Darwin. Darwinian evolutionary theory can be considered superior to the earlier theories because it is able to account for changing biological diversity and for developments that occurred not only before and during, but also after the formulation of the theory.

It would be fruitful to intensify the dialogue between historical demography and evolutionary theory.”Human culture and biology jointly and collaboratively drive the evolution of human demography” (Levitis 2015). By recognizing that birth, marriage, migration and death have both biological and cultural significance, demographic approaches to evolution and evolutionary approaches to demography may integrate important aspects of cultural and biological evolution. Evolutionary demography may even be able to cross barriers between social scientific and biological approaches to population processes (Sear 2015; Levitis 2015).

To aid the development of evolutionary approaches in historical demography, Agent-Based Modelling (ABM) is a promising method. ABM simulates how populations of agents evolve over time, based on theoretically assumed rules of action and interaction between agents and with the environment (Grow & Van Bavel 2015). It is a particularly useful addition to the toolkit of historical demographers: first, because – and in contrast to other approaches to micro-simulation – it is strongly theory-oriented; second, because it offers a way to handle crucial gaps in the data; and, third, because it is fundamentally oriented towards heterogeneity and change, which is in line with evolutionary theoretical approaches.

In historical demography, data are often available on some aggregate level, while a lot of information about the underlying micro-level processes is lacking: the individuals involved can no longer be asked questions. In these circumstances, ABM can be used as a way to simulate how the

process may have worked on the individual level, and as a way to calculate whether the micro-mechanisms proposed by theory can indeed explain what is observed on the macro level. This approach consists broadly of the following three steps: 1) document the target facts A and B; for example, correlation patterns; 2) hypothesize what are theoretically the mechanisms that may link the observed patterns A and B; 3) simulate the theoretical mechanisms and quantify their implications, in order to see which of them could indeed explain how A is connected to B.

An evolutionary approach to historical demography implies that human populations are studied as complex adaptive systems. ABM has a range of characteristics that makes the approach particularly well suited to study such systems: its focus on dynamics and processes; its scalability and flexibility; its feasibility to model adaptive rather than optimizing agents; and its enhanced ability to address the role played by heterogeneity and variation (Miller & Page 2007).

ABMs are inherently *dynamic*: even if one can take snapshots of the system's situation at discrete points in time, the results of the model inherently change over time and the focus is drawn to the process at least as much as to the state. Like evolutionary theory, ABMs are inherently *process-oriented*: the focus is on understanding the mechanisms of change. Evolutionary demography should also be able to integrate insights gained at different scales of observation and from diverging scholarly disciplines. The *scalability* of ABMs and the *flexibility* of specifying agent behaviour and interactions are particularly useful here. The scalability refers to the ability of ABM to explore a system's behaviour, both with a very low and a very high number of agents, and to switch the focus from micro- to macro-level system properties. The flexibility refers to the fact that ABMs can capture a very wide class of behaviours, which is particularly useful for implementing insights from different study disciplines: agents may respond to the constraints imposed by the human metabolic system, as well as to the cultural rules implied by human society. Both kinds of rules can be specified in the same ABM. A model may implement mechanisms from multiple inheritance models, involving genetic, ecological and cultural inheritance, and change across generations can be simulated over thousands of generations. Snapshots can be taken at each point in time, thus enabling comparison with real life data with the help of standard statistical tools.

Given the dynamic nature and the flexibility of ABMs, agents can be designed to be *adaptive*; in other words, they can learn from previous experiences, both within and across generations. This makes it possible to move away from unrealistic models of well-informed agents, who rationally process all the relevant information and optimize their behaviour to maximize utility. Agents may learn, build networks, and inherit knowledge and resources from previous generations. Such an approach is consistent with evolutionary theory, as well as with basic insights from psychology and sociology.

Finally, ABM facilitates a focus on *heterogeneity*. While the focus of statistical regression analysis is on how averages depend on a set of variables, this may be insufficient to do justice to the role played by diversity and variation in explaining population patterns and change. Enhancing the ability to address the role played by heterogeneity seems important for improving population theory. Through applications of ABM, it has become clear that a given outcome may be produced by different pathways, and that a given pathway may lead to very different outcomes, depending on the size and composition of the population.

ABM has proven itself able to yield results exemplifying convergent as well as divergent evolution. This matches very well with the observation that, while the transition from moderately high to low mortality and fertility is a very general phenomenon, uniform explanations in terms of macro-level processes, such as industrialization, urbanization and modernization, have failed the empirical

tests to a large extent. The decline of fertility started in different places under very different economic conditions or failed to kick off when theory predicted. Theories such as those developed by Frank Notestein and others spoke about interactions between the economy and population largely at the macro-level, without accounting for the heterogeneity within economies and populations. This approach failed to pay due attention to the role played by this heterogeneity. Thanks to more detailed research in historical demography, often looking at very specific local communities and populations, it became clear that fertility and mortality declines can take place under wildly differing conditions. In-depth study of local populations helped us to understand more about the role played by distinctive environmental and cultural constraints, and showed that there is no single universal transition pathway towards fertility and mortality decline. The continuing diversity observed in demographic phenomena like ‘the’ demographic transition highlights that it will be key for the demographic theory of the future to understand the mechanisms that continue to renew population heterogeneity.

References

- Charbit, Y. (2009). *Economic, social and demographic thought in the XIXth century. The population debate from Malthus to Marx*. Dordrecht: Springer.
- Grow, A. & Van Bavel, J. (2015). Assortative mating and the reversal of gender inequality in education in Europe: an agent-based model. *PLoS ONE*, 10(6), 1-24.
DOI: <http://dx.doi.org/10.1371/journal.pone.0127806>
- Levitis, D. A. (2015). Evolutionary demography. In: Wright, J. D. (Ed.). *International encyclopaedia of the social & behavioural sciences* (Second Edition). Oxford: Elsevier, 413-419.
- Miller, J. H. & Page, S. E. (2007). *Complex adaptive systems. An introduction to computational models of social life*. Princeton: Princeton University Press.
- Sear, R. (2015). Evolutionary demography: a Darwinian Renaissance in demography. In: Wright, J. D. (Ed.). *International encyclopaedia of the social & behavioural sciences* (Second Edition). Oxford: Elsevier, 406-412.

Biography

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Methodological challenges of life course analysis in historical demography

Antti Häkkinen

One of the basic problems in historical demography is how to connect individual behaviour and action – which have been analyzed so extensively by our discipline – to the significant structural changes of societies. The latter have been studied thoroughly by the more traditional disciplines of history. In other words, the problem is how to define and analyze those mediating factors that link human actors to structural entities in the historical context. It seems obvious that the progress in digitizing large historical materials and data, such as digitized newspapers, together with the methodological progress occurring simultaneously, opens up new perspectives to solve this problem. In this contribution, I will discuss the possibilities opened up by the digital humanities for life course analysis, one of the most promising methods for the future of historical demography. To do so, I will problematize each of the five key elements of life course analysis in the light of these new perspectives, based on my experiences with Finnish demographical data.

Life course analysis is a method developed for historical analyses. It strives to fit the analysis of human lives into the structural, cultural and social contexts of their societies. As, among others, Janet Z. Giele, Glen Elder Jr. and Jan Kok have argued, the life course can be understood as a series of positions that follow each other, differ and overlap. Life course analysis studies the continuum of these positions and the changes taking place within them, while monitoring the timing of the transitions. The trajectories or paths of a life course consist of different combinations of sequences of positions, which may differ in duration. It is customary for the life course to become culturally and socially institutionalized as ideal lifestyles. For instance, ‘the model of a good life’ is a deeply rooted concept of how a person should live his or her life.

Life course analysis consists of five key elements. First, a life course must be seen in its entirety, as a cumulating process continuing throughout life. An individual’s decisions can be interpreted only by taking the earlier experiences of the life course into account. Second, people steer and control their own lives within the framework of their constraints and opportunities. Third, a person’s life is tied to a certain historical time, which shapes the societal context surrounding him or her, and the changes taking place in this society. These changes in the societal context of an individual’s life course play a central role in the analytical framework. Fourth, people live their lives in reciprocal networks of social relations. Social and historical impacts are transmitted through these networks. In turn, it is also possible for individuals to affect society by means of these networks. Finally, the timing of key transitions in the life course is important and has various consequences. For life course analysis, it is essential that these five axioms constitute a uniform, interactive entity.

So what are the concerns, challenges and problems? The first of the five basic elements of life course analysis is its cumulative nature – and hence the need for linked information. In Finland, the

historical data that have been digitized include administrative documents, societal statistics, church records, migration registers, newspapers, reminiscences, periodicals and ephemeras (from the eighteenth century onwards), private correspondences, and Finnish literature. The Finnish effort to digitize a huge amount of important historical data not only means an increase in the number of available sources, but also deepens our knowledge of exceptional and unusual events and processes. Most importantly, it enables us to link, both vertically and horizontally, historical events that were seemingly unrelated. The availability of church records enables both the construction of a person's life events from the cradle to the grave, as well their linkage to important background information about life courses, including marks on health, literacy and penmanship, Christianity, reputation and possible illegal acts, crimes and bad behaviour. These advances raise problems of a new kind. Our methodological knowledge in the field of digital humanities – analyzing big data – is still rather limited. How can we interpret the mass of material produced by data mining or how can we connect different kinds of qualitative and quantitative data in sensible ways? The adoption of methodological triangulation and data triangulation has become common, but this does not answer the question of how to use massive amounts of digital data in such a manner that it brings additional value to our studies. In this sense, our increasing capacity to process data does not solve methodological problems, but rather increases the complexity of analyses.

The second key element of life course analysis – the question of human agency – has always been a minefield of historical analysis. Due to the difficulties involved in reconstructing the intentions of people who lived in the past, researchers' interpretations have tended to follow the logic of what has happened, rather than trying to establish people's real intentions or aims. For the first time, we can now, at least in principle, get a grasp of people's mindsets and mentalities at the time, thanks to the written material provided by literature, newspapers, periodicals, letters, reminiscences, etc. Again, however, problems of a new kind emerge whenever these kinds of sources are utilized. The world views of the so-called 'common people' of the eighteenth and nineteenth century are soon found to be far from straightforward. For example, the ideas of Christianity, the Enlightenment and ancient superstition are all intermingled. How can we interpret human agency while still taking this complexity into account?

The third element – the factor of time and place – will gain new significance as new and more detailed information about the local economic and social circumstances is integrated into the analyses. Even changes in the conditions of local communities that occurred during the lifetime of individuals can be matched to the relevant stages of the life course of those individuals. This progress enables us to perform more detailed and more precise analyses, and to compare life courses across different contextual circumstances. But given the amount of new data researchers need to handle, there is a severe risk of making easy generalizations.

The fourth element – linked lives – can now be taken into account by analyzing changing family networks and changing local social networks. The power of the family has always been an important factor in historical explanations. The families of elites, in particular, have been given much attention, but now our analyses can be expanded to include the lives of the common people as well. In principle, with the help of digitized records, a large number of family pedigrees can now be constructed, covering several decades. This means that we will soon be able to connect the study of biological generations with the analysis of social generations. In addition, immaterial relations in local communities have also become an object of study; for example, those with godparents, which form an important reflection of the social capital in a given society. Such analyses bring 'the social element' to historical demography in a new way. But is life course methodology able to cope with the

complexities of simultaneously analyzing complex biological and social inter-generational networks in large digital data? Are we technically and conceptually able to incorporate the influence of wide social networks into our perspectives?

The fifth element is the timing of key transitions in the life course. In the light of the growing ease of access to a wide range of ego-documents, it will become possible for researchers to evaluate the exact timing of an individual's demographic actions, as well as the intentionality of the process. But such analyses sometimes tend to replace a picture of unconscious and passive common people with a new image highlighting the rationality of behaviour in very complex situations. How can this kind of simplification be avoided?

In a nutshell, the problem for the future will be how to knit these five elements together. What's more, it is a problem that is destined to become much more complicated than ever before. It is obvious that modelling historical life courses will be difficult. Perhaps the final outcome will be that the secrets of human life remain largely a mystery. That being said, the new possibilities now at the disposal of today's researchers will inevitably deepen the analyses in historical demography. Even so, there will always be open questions, and new ones will probably arise from the new methodology and new data that are becoming available. We still have a lot to do.

Biography

Dr. Antti Häkkinen has worked as a researcher and senior lecturer at the Department of Political and Economic Studies at the University of Helsinki, Finland, since the 1980s. His research fields cover health, ethnic relations, social problems, economic and hunger crises, and the inter-generational transmission of economic, social and human capital. The life course perspective, network analyses and oral history methods have been central to his research.

Recommendations for the analysis of life histories in historical demography

Frans Willekens

Harmonized databases offer unique opportunities for comparative research. That is particularly true for longitudinal microdata in the form of life histories. Alter *et al.* (2009) propose a strategy for sharing historical longitudinal data based on the Intermediate Data Structure (IDS). Version four of IDS became available in 2014 (Alter & Mandemakers 2014).

In this contribution, I argue that the way forward is to develop utilities that transform the IDS into a format suitable for the analysis of life histories. For the study of life histories, IDS needs to be converted to a data structure that is suitable for event history analysis (also known as survival analysis or duration analysis) and sequence analysis.

In life histories, chronology and censoring are main issues. Events and declarations of attributes need to be dated. Observations usually cover only part of the life course (the so-called ‘observation window’). Events and exposure times outside of the observation window remain unknown. Data need to be organized in intervals, also known as episodes and spells. Episodes represent periods of time during which personal attributes do not change. An episode has a starting date and an ending date, and contains the personal attribute during that interval, as well as the reason why the episode ends. This reason may be a change in the attribute (i.e. a transition) or the end of the observation (i.e. censoring). The episode data format is closely linked to the statistical theory of counting processes, which is the main theory used today for estimating life history models.

The episode file is the most common file structure used in event history analysis, but it is not the only one. Several packages use other data formats. For an overview of data formats in event history analysis, see Willekens (2014: 62ff.). The R package Biograph by Willekens, archived on CRAN (see weblinks), contains several utilities that convert a common data format (the Biograph data format) into the data formats required by packages for statistical analysis of life histories. Utilities should be developed to convert IDS data to some of the other data formats in use.

The following practical recommendations are intended to facilitate event history analysis in historical research:

- a. Distinguish between a single event/episode and a sequence of events/episodes. Most applications of event history methods focus on one event/episode only. In that case, the object of study is the waiting time to the event.
- b. Conceptualize the life course as a sequence of states and transitions between the states. Clearly distinguish between states (attributes) and transitions (changes in attributes).
- c. Distinguish two approaches to the study of life histories, as recommended by Abbott (2001). The first approach – sequence analysis – involves comparing state sequences and identifying similar sequences using matching techniques. The second approach – multistate modelling – involves

modelling sequences of transitions and state sequences. The model must predict (a) the waiting time to a transition and (b) the destination state following a transition. The second approach uses methods of event history analysis (to estimate transition models) and may use micro-simulation (to generate state sequences).

- d. Adopt a process perspective on the life course. The life course is an outcome of an underlying process (or processes). Since random factors play an important role in the occurrence, timing and sequence of events, processes are stochastic processes. Apply the theory of stochastic processes, which forms a part of probability theory, to analyze and model life histories. View the life course as a continuous-time Markov process. This is a system of differential equations that relates state occupancies at a given time to an initial condition and to instantaneous rates of transition between states. Transition rates depend on personal attributes and contextual variables, and vary by age and in time. The model is widely used in studies of life histories. Use probability theory in the model specification stage (first stage) and the theory of statistical inference (regression models) to estimate (predict) the parameters of probability models (second stage). A probabilistic perspective on the life course offers a powerful and unifying framework that gives the study of life histories a sound mathematical basis.

References

- Abbott, A. (2001). *Time matters. On theory and method*. Chicago: The University of Chicago Press.
- Alter, G., Mandemakers, K. & Gutmann, M. (2009). Defining and distributing longitudinal historical data in a general way through an intermediate structure. *Historical Social Research*, 34(3), 78-114.
DOI: <http://www.jstor.org/stable/20762377>
- Alter, G. & Mandemakers, K. (2014). The Intermediate Data Structure (IDS) for longitudinal historical microdata, version 4. *Historical Life Course Studies*, 1, 1-26.
DOI: <http://hdl.handle.net/10622/23526343-2014-0001?locatt=view:master>
- Willekens, F. (2014). *Multistate analysis of life histories with R*. Heidelberg: Springer.

Weblinks

CRAN: <https://cran.r-project.org/>

Biography

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Encomium oomphis: regressions, measure and meaning in historical demography

*Fabian Drixler & Anne C. McCants**

Our field looks back on great achievements. Historical demographers have overturned the myth of the past as universally inhabited by large, multi-generational families of immobile people rarely living into middle age. They have discovered and documented starkly different ways of being in the world, as well as the paths that sometimes lead between them. In doing so, they have uncovered some of the greatest revolutions in the history of human behaviour. Yet the myths die hard, and even radical results remain widely unknown outside of our own specialized circle. The fertility revolution has proved both more durable and contagious than the French Revolution, yet how many people could even identify the former, let alone correctly place its origin also in France?

The seeming public obscurity of historical demography may be at least partly our own fault. Too often, we argue, the discipline expends tremendous effort to answer questions of meagre relevance with potentially dubious results, all to a narrow end.

The currently dominant technology of demographic research – regression analysis – must shoulder part of the blame for this sad state of affairs. When used discerningly, multi-variable regression is in fact a wonderful tool. It can allow us to see patterns in our data that we would miss on unaided inspection. And it can help identify strong and weak relationships between variables of tremendous historical interest. Yet the easy availability of the regression technique in packaged software and the seductive precision of its results have also distracted historical demographers from asking big questions, from mining new archives, and from communicating the results in a format that is both accessible and appealing to a wide audience.

The concerns we articulate in this essay are not about the straightforward errors of method and interpretation that regression analysis also invites, and that have been shown to invalidate a worrisome proportion of published papers across the disciplines that rely on this methodology (see, for example, Ioannidis 2005; Bakker & Wicherts 2011; Nieuwenhuis *et al.* 2011; Marozzi 2015, Wasserstein & Lazar 2016). Many of these errors could be avoided with improved training or a good infrastructure for consulting statisticians. Our essay discusses a separate problem: the structural consequences of making the regression table the key intellectual product of our discipline.

In much current work, the sophistication of the statistical apparatus gives off an aura of importance belied by the findings themselves. The technical skill required for the computation easily becomes the centre of attention, creating the semblance of an intellectual contribution even when the results are of questionable value. If the same questions were posed without statistical bells and whistles, it would be clear from the outset that the answers are unlikely to repay the effort. Moreover, reliance on regression analysis creates its own self-reinforcing cycle. Many others who study the past are shut out by insufficient technical training or put off by the narrowness of so many of the findings. In

consequence, historical demographers increasingly only talk to those for whom odds ratios and regression coefficients are an end in themselves, and who rarely raise uncomfortable questions about the larger meaning of such results.

One reason that regression studies in historical demography tend toward narrowness is that most datasets in our field cannot be paired with a particularly rich complement of explanatory variables. Many variables of interest are difficult to quantify – who gossiped with whom? What were the social aspirations of the study population? Did they think an infant death a tragedy, a routine part of life, or a great good fortune that would speed the little soul to Heaven? The variables that remain, like the price of grain or the size of family landholdings, are, even when important, no more than a few threads from the tapestry of reality. For analyses that are not dependent on the use of regression, this need not be a problem. They can embed their findings – whether about fertility, mortality, nuptiality or migration – into broader cultural, political or economic histories. For the regression-centred studies, however, reality often shrinks to that handful of threads that we happen to be able to quantify at a remove of one or more centuries.

Nor does the narrowing down end here. Reliance on regression results and the ubiquitous calculation of the p -value for every coefficient – what is known as statistical significance, but is unhelpfully shorthanded as ‘significance’, as if it were a measure of importance – leads us to emphasize those among our already limited selection of variables that produce low p -values and are therefore deemed worthy of additional exploration.

Why would this be a problem? Because we routinely mistake precision for importance. Precision is not undesirable in and of itself, but the small, reliable effect of one treatment may well be less consequential than the large but noisier effect of another. As two of the most prominent critics of “the cult of significance”, Stephen Ziliak and Deirdre McCloskey (2008: 2), have argued, “statistical significance should be a tiny part of an inquiry concerned with the size and importance of relationships.” Yet historical demography has fallen victim to the same rule of research and publishing that now dominates fields from economics to epidemiology: variables that do not meet the 5% standard are routinely discounted and papers that cannot report statistical significance remain unpublished.

This two-step narrowing creates opportunities for both missing evidence (ignoring variables we cannot measure) and creating fictions (emphasizing the importance of variables that have high statistical significance but little real effect on the dependent variable, what McCloskey has memorably called *oomph*). This problem may be especially acute in historical demography. Our samples are often so large that calculations of the p -value are likely to be robust even when the relationship between the independent and dependent variables is weak.

Even when researchers are judicious enough to avoid mistaking statistical significance for the strength of the relationship and pay due attention to those with large ‘effects’, they often make the discovery of causal connections the ultimate goal of their research design. Although we all know that correlation never implies causation, the very language of statistical significance – “one variable influences another” – leads many of us to nonetheless imagine causality where none may exist. This critique is made in a spirit of humility. The misreading of significance is easy to do, and is a mistake that one of the authors has committed herself in earlier work.

In an even stronger version of this pitfall, we proceed as if we can infer people’s intentions from the correlations that we assume to be causal. In studies of fertility, marriage, migration and household formation, papers that rely entirely on regression often use ‘strategy’ as a key metaphor. They impute intention even though the regression can supply no direct evidence of the inner life of its study

population.

Furthermore, regression analysis has as its implicit metaphor a system or machine, the size and the placement of whose cogs the researcher tries to reconstruct. Sometimes, this conceit may be a helpful model for understanding an aspect of a past society. But it also draws attention away from the many factors that are not amenable to quantification: from the fluidity of social formations, from social phenomena whose very categories were not stable over time, and from the process of historical change itself. Turning the year of the observation into a categorical variable does not fully solve this problem. All but the largest of samples will require that the time categories be several decades in length, thereby potentially obscuring time-sensitive processes.

The search for causality through regression analysis too easily isolates variables from their larger context, context that cannot be modelled but might be crucial in enabling the mechanism. For example, higher female literacy may lead to lower fertility in one historical setting, in which it increases the opportunity cost of childrearing or exposes the woman to ideas that argue for raising fewer children. But we cannot deduce from this that it is female literacy that is the salient cause of the observed decline in fertility; in another context – for example, one in which the written word argues in favour of maximizing the number of children – increasing female literacy might in fact lead to higher fertility. The Hutterites, for instance, prized literacy among both men and women, yet still had enough children to become the benchmark for human reproductive potential. The direction of the change in fertility is determined not by female literacy, but by its interaction with the wider cultural context. But that context will be very difficult to capture in a regression model.

We should not be surprised if causality proves to be elusive in the complex systems that constitute much of the human experience. In many cases, we have to be content with establishing what, when, and how much, and accept that the ‘why’ is beyond our grasp. Indeed, most of the great achievements of historical demography to date have been answers to what happened, rather than why.

We do not mean to criticize the work of any individual here, but to encourage those who share our doubts about the wisdom of relying so heavily on a single methodology. We might instead conceive of research projects that produce descriptive statistics on new populations, or that start with a big question rather than with a big dataset. We should only use regression analysis in cases in which the data can bear it. We should be as interested in negative results as we are in positive ones. We should present and publish worthwhile papers, even if they do not conform to the current orthodoxy of reporting conventions; what they lack in technical bravado they can compensate for in importance. Such work could mobilize our collective effort toward new and unexpected insights. It would certainly give a better account of the complexity of demographic history than the single-minded pursuit of odds ratios and *p*-values. It would also ring truer to our shared human experience. A renewed focus on big questions, rich description and historical narrative might even draw to our field the wider attention it so richly deserves.

References

- Bakker, M. & Wicherts, J. M. (2011). The (mis)reporting of statistical results in psychology journals. *Behavioral Research Methods*, 43(3), 666-678.
DOI: <http://dx.doi.org/10.3758/s13428-011-0089-5>
- Ioannidis, J. P. (2005). Why most published research findings are false. *PLoS Med*, 2(8), 696-701.
DOI: <http://dx.doi.org/10.1371/journal.pmed.0020124>

- Marozzi, M. (2015). Does bad inference drive out good? *Clinical and Experimental Pharmacology and Physiology*, 42(7), 727-733.
DOI: <http://dx.doi.org/10.1111/1440-1681.12422>
- Nieuwenhuis, S., Forstmann, B. U. & Wagenmakers, E. J. (2011). Erroneous analyses of interactions in neuroscience: a problem of significance. *Nature Neuroscience*, 14(9), 1105-1107.
DOI: <http://dx.doi.org/10.1038/nn.2886>
- Ziliak, S. & McCloskey, D. (2008). *The cult of statistical significance: how the standard error costs us jobs, justice and lives*. Ann Arbor: University of Michigan Press.

Weblinks

- McCloskey, D., 'Cult of statistical significance', <<http://www.deirdremccloskey.com/academics/stats.php>>
- Wasserstein, R.L., & Lazar, N.A. (2016). The ASA's statement on p-values: context, process, and purpose. *The American Statistician*, DOI: 10.1080/00031305.2016.1154108

Biographies

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* This paper was fully co-authored, with both authors contributing equally in the collaboration.

The tyranny of averages

Stephanie Coontz

Although I do not have a blueprint for the future of historical demography, I would like to see wider use of methods that allow us to combat what I have come to think of as the ‘tyranny of averages’ – a problem that plagues all who try to generalize from large datasets, whether historians, sociologists, psychologists, criminologists or medical epidemiologists.

Averages are especially useful when the distribution of outcomes falls within a relatively narrow range. In the 1950s and 1960s, most women married within a few years of the average age, which was 20.2 years in 1960, a date when less than 3% of American women married for the first time in their 40s and 50s. Accordingly, the proportion of women who reached age 35 or 40 without ever having married yielded fairly accurate predictions of lifelong singlehood. Today, by contrast, with a much wider spread in the age of first marriage, rates of singlehood for women in their 30s and 40s have less predictive power. Sociologist Philip Cohen estimates that 23% of women who reach age 40 without having married will wed in the ensuing ten years, and rates of first marriage for women in their 50s are rising as well.

Sometimes a distribution contains such sharp differences at both ends that the average creates a mythical middle. In the 1960s, the Cambridge Group for the History of Population and Social Structure reported that mean household size in England stayed fairly constant, at under five members, from the sixteenth to the nineteenth century. They concluded that complex families were never a backdrop to the lives of ordinary people. But we now know that this average disguised the social and psychological realities of pre-industrial communities, where the poor often lived in truncated families, whose arrangements were fundamentally dependent on the larger households of the rich.

In late nineteenth-century America, only a small proportion of the population lived in three-generation households, because few families had enough living generations to form such households. But when families did have enough living members to form extended households, a high proportion of them did so, making the possibility of extended family living a highly salient part of people’s lives in ways qualitatively different than today.

In other cases, small variations from the norm skew the averages differently, often leading to inaccurate claims about causation. If most people remain the same after an event such as divorce or marriage, but a small sub-set changes dramatically for better or worse, this creates an average outcome that does not reflect the event’s impact on *most* people.

Psychologists Anthony Mancini, George Bonnano and A.E. Clark, who worked with the first twenty waves of the German Socio-economic Panel Study, a nationally representative sample interviewed every year from 1984 to 2003, were able to assess people’s well-being in the years before and after events such as marriage, divorce or widowhood (Bonanno & Mancini 2012). Almost 80% of the people who married reported high subjective well-being in the years both before and after the marriage, with *no significant change* as a result of marrying. Just over 5% experienced a large

increase in well-being in the years *prior* to the marriage, with no change thereafter. A further 6 % demonstrated a sharp *decrease* in well-being after marriage. Fewer than 10% experienced declining well-being in the years before marriage, but increasing well-being afterwards – the romantic convention of marriage ending a life of loneliness. This supports an earlier study by sociologists Adrienne Frech and Kristi Williams, which showed that the average association of marriage with improved mental health is largely driven by the small number of individuals who are seriously depressed before getting married (Frech & Williams 2007).

Among individuals who divorced during the study, 19% reported a decline in life satisfaction after divorce, while almost 10% demonstrated a substantial increase in well-being. But the typical experience was one of essentially no change.

Similarly, a recent study of children in the U.S. found that problems such as aggressiveness and bullying increased among 18% of children following their parents' divorce, but declined for 14%. There was no change for the other 68%. Other researchers have found comparable variation when they accounted for heterogeneity in children's experiences in the years before divorce, as well as during its aftermath.

In many cases, the 'average' experience conflates three or four distinct 'typical' experiences. For example, a recent review of the employment patterns of early baby boom women in the United States between ages 20 and 54 shows four different patterns beneath the average trend toward increasing attachment to the labour force: 40% of the women were consistently attached, and another 27% became more attached as they aged. But 21% were consistently detached across their lives, while 13% started out attached and became detached over time (Garcia-Mangano 2015). Interestingly, although women who were consistently detached from the labour market tended to be less educated than the others, they were more likely to marry men at the top as well as the bottom of the earnings distribution ladder – a bimodal pattern that may call for an even finer set of distinctions.

Family patterns and outcomes result from a complex interplay between experiences, constraints and opportunities provided by people's family of origin, communities, schools, work histories and social networks, both beyond as well as within the neighbourhood, together with their personal sexual and romantic histories. Individual and family trajectories are also influenced by people's interactions with larger legal, political and economic institutions, and their experience – or lack thereof – with different kinds of discrimination and favouritism.

Recently, researchers have begun using techniques such as latent class analysis or profiles, event history analysis, sequence analysis, optimal matching, heterogeneous treatment effects, and person-centred methodologies focusing on egohoods or activity spaces. They have made impressive progress in showing how variations in individual and family trajectories develop and change over time, adding considerable nuance to traditional cumulative risk models.

One area where innovative research methods are badly needed is in explaining the high rates – especially in the United States – of non-marital child-bearing among low-income, poorly educated women. Chronic economic stress can undermine efficacy in decision-making and consistency in use of contraceptives. Interpersonal vulnerability is also a factor. A study of disadvantaged African-American women found that those who depended on their boyfriends for spending money or for transportation were especially unlikely to use condoms, while those who developed another source of finances tended to begin using them. In general, high poverty in a woman's immediate neighbourhood increases the likelihood she will have an out-of-wedlock birth. But one study found this effect was magnified when adjacent neighbourhoods were more economically advantaged than a woman's own, and reduced when surrounding neighbourhoods were more impoverished. Another study found that

when a woman moved from a state with low levels of inequality to one with high inequality, this increased the likelihood that she would carry a pregnancy to term and decreased the chance that she would marry the father of her child. Yet the economic hardships of the Great Recession did lead to a significant reduction in the fertility rates of low-income women.

In this, as in so many other instances, policy-makers and the general public often ignore such complicated interactions and make decisions based on oversimplified averages or causal claims. My hope for the future of historical demography is to see more researchers reach beyond the academy to help non-specialists achieve a better understanding of the variations, complexities and contradictory outcomes of family trends.

References

- Garcia-Manglano, J. (2015). Opting out and leaning in: the life course employment prospects of early Baby Boom women in the United States. *Demography*, 52, 1961-1993.
DOI: <http://dx.doi.org/10.1007/s13524-015-0438-6>
- Bonanno, G. A. & Mancini, A. D. (2012). Beyond resilience and PTSD: mapping the heterogeneity of responses to potential trauma. *Psychological Trauma: Theory, Research, Practice and Policy*, 4, 74-83.
DOI: <http://dx.doi.org/10.1037/a0017829>
- Frech, A. & Williams, K. (2007). Depression and the psychological benefits of marriage. *Journal of Health and Social Behavior*, 48, 149-163.
DOI: <http://dx.doi.org/10.1177/002214650704800204>

Biography

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Ageing and the reconciliation of history and biographies: an approach to fill the gap

Michel Oris

From the Second World War until now, a country like Switzerland has gained, on average, three months of life expectancy each year. Cross-sectional estimates for 2014 situate the average duration of life at 85.02 years for women and 80.84 years for men. For women, the mortality table shows that 75% are still alive at age 80, but only about one in four at the age of 93. Among men, the first- and third-quartile ages at death are 75 and 90 years, respectively. These data illustrate the rectangularization of the survival curves and express quite concretely the impact of increasing longevity.

This enumeration of facts is nothing new; both demographers and historical demographers are well aware of the impressive progress that has been made. Only a few scholars in our field, however, have used this as an opportunity to interview elderly persons, using oral history methods (see Rusterholz 2015 for a recent illustration). Indeed, more people with long lives are staying alive for even longer. To a large and growing extent, the twentieth century is living with us through people whose biographies span a history that they themselves made, in a manner that affected their lives and the lives of others. Embedding macro- and micro-dynamics is typical of the life course perspective, which has deeply transformed demography and historical demography during the last three decades. It spurred a shift from populations to individual trajectories, from structures and average behaviour to changes and heterogeneity, and from descriptive to causal analyses (Ritschard & Oris 2005).

Before this evolution, statisticians and demographers had already modified their data collection procedures to question the pasts of individuals. In a context of demographic transition that attracted both public and scientific attention, they came to realize the limitations of cross-sectional data, especially for studying fertility and reproduction. In several countries, household census sheets have been preserved and are now being rediscovered by researchers. The resulting databases are increasingly exploited to reconstruct the twentieth century fertility transition (Van Bavel 2014). The first surveys on fertility and family were conducted in the Western world between 1966 and 1972, as a reaction to the shift from baby boom to baby bust, and in order to understand this change. These initial efforts, which have only recently been re-assessed (Oris 2009), inspired the World Fertility Survey (1974-1983). This in turn diffused the survey-based approach throughout developing countries, following which the use of Demographic Health Surveys became standard practice from 1984 onwards. Most of the data have been preserved in the repositories of the main demographic centres in the US and are now being used to reconstruct historical trends, such as those of infant and child mortality.

In other words, looking at the past from today with the help of retrospectively collected data is not new. However, there is an increasing trend of secondary data analysis, which involves using old data

but applying the new methods developed during the last decades to exploit individual longitudinal records. These studies have identified the main limitations of such an approach fairly well. Of course, the survey population is selected by death, since only the survivors can answer questions about their current and past life. It is common to validate the retrospective information communicated by survivors through vital registration data. However, we must bear in mind that not only mortality but also outmigration and, in some cases, non-responses can affect estimates (Van Bavel 2014). It is also the case that the effect of the selection of respondents decreases in size with the rise of longevity. The proportion of survivors in each age group can be estimated with longitudinal life tables. For example, if we consider a Swiss data collection performed in 2011 for the birth cohort 1942-1946, around 80% were still alive at that time. However, this proportion drops to 17% for the generations born between 1922 and 1926. The continuous expansion of life expectancy and the parallel increase of the first-quartile age at death imply a ‘democratisation of old age’ or a reduction of the potential impact of differential premature mortality on population composition at the age of retirement.

Surveys, much more than censuses, are taking advantage of this evolution. Under the influence of the life course paradigm, specific tools to collect retrospective data have been elaborated and developed: life calendars. These can take several forms, which can be more or less sophisticated and more or less rigid. Basically, they all look like tables in which years and ages of life are the rows and life domains (residential/migratory, family, education and labour, and, more rarely, health, etc.) are the columns. Several studies have demonstrated that the graphic representation of life helps people to locate the events they lived, as well as to date and order these events with a higher level of accuracy than in a conventional questionnaire. The tool also benefits from the interrelations between the life domains (“I always remember where I lived when I married,” for example). Of course, memory problems can affect the answers, but forgetting things like marriage(s) or the birth of children implies the existence of serious cognitive impairments (Morselli *et al.* 2016).

Life calendars have been used in social science surveys since the late 1980s and, when applied to an aged population, cover a large historical time. They result in databases that are potential goldmines for the history of demographic dynamics, family life and social changes across the twentieth century. Indeed, they can be used to study changes across birth cohorts and differentiation by gender or by some other discriminating factor. Such data are perfect for sequential analysis and more generally for the holistic data-mining perspective (Ritschard & Oris 2005). They could also fuel sequential mixed methods, which may start from quantitative analyses revealing interesting enigmatic results that call for in-depth interviews with a sub-sample of participants, or for combinations between objective and subjective assessments of life histories.

The potential of life calendars has, however, been largely neglected by researchers, especially by historical demographers. Some courageous teams are working to fill the gap between individual nominal databases for the nineteenth century and the various data collected in the late twentieth century. This approach, which links the present and the past, will ultimately be highly fruitful. Indeed, a consequence of legislation protecting privacy and prohibiting the use of nominal data (usually for the last 100 years) is that we know more about nineteenth century micro-dynamics than about those of the twentieth century. We still only poorly understand the individual contributions to the impressive evolutions that created the society in which we live and remain unable to propose a meaningful “history from the bottom”. With this short contribution, I hope to attract the attention of the historical demography community to data that certainly have limitations, but have already been collected, are available, and are highly informative. Ageing creates the conditions under which to reconcile history and biographies and, consequently, offers an alternative approach to fill the gap between the two.

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References

- Morselli, D., Dasoki, N., Gabriel, R., Gauthier, J. A., Henke, J. & Le Goff, J. M. (2016). Using life history calendars to survey vulnerability. In: Oris, M., Roberts, C., Joye, D. & Ernst-Stähli, M. (Eds.). *Surveying human vulnerabilities across the life course*. Heidelberg: Springer.
- Oris, M. (2009). Aux origines de la seconde transition démographique en Europe: une relecture des enquêtes fécondité-famille entre 1966 et 1972. In: Marcoux, R. (Ed.). *Mémoire et démographie: regards croisés au Sud et au Nord*. Québec: Presses de l'Université Laval.
- Ritschard, G. & Oris, M. (2005). Life course data in demography and social sciences: statistical and data-mining approaches. In: Levy, R., Ghisletta, P., Le Goff, J. M., Spini, D. & Widmer, E. (Eds.). *Towards an interdisciplinary perspective on the life course*. Amsterdam: Elsevier.
- Rusterholz, C. (2015). Costs of children and models of parenthood: comparative evidence from two Swiss cities, 1955 – 1970. *Journal of Family History*, 40(2), 208-229.
DOI: <http://dx.doi.org/10.1177/0363199015569710>
- Van Bavel, J. (2014). The mid-twentieth-century baby boom and the changing educational gradient in Belgian cohort fertility. *Demographic Research*, 30, 925-962.
DOI: <http://dx.doi.org/10.4054/DemRes.2014.30.33>

Biography

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Chapter 6

Strengthening our theories

It is the theory which decides what can be observed
Albert Einstein

Five contributions discuss weaknesses in current theories or theoretical perspectives on various aspects of historical demography, and provide suggestions of how these theories and perspectives might be strengthened.

Re-orienting historical mortality studies

Angélique Janssens

Within the historical study of population trends and patterns, the topics of fertility and mortality have received most of the research attention. Traditionally, researchers were focused on the reconstruction of patterns over time pertaining to entire countries, regions or perhaps individual cities. The datasets they used were mostly aggregated sets of individual events of births and deaths, originating from a wide variety of source material, such as censuses, parish registers or other materials. In recent decades, the field has been strongly invigorated by the introduction of new types of datasets based on population registers and other similar sources that are exploited on a large scale. These datasets enable the study of large numbers of individual life courses in the geographic context in which they were unfolding in past times. The Dutch Historical Sample of the Netherlands is a good example, but elsewhere too large databases have been set up (in China and in Sweden, to name but two). New approaches have been facilitated in recent decades thanks to these datasets.

However, in the field of mortality studies further new advances are now called for and new avenues need to be taken. The potential of some of the new databases that are currently available has not yet been exploited to the full, although I will also argue that some of these databases are not well suited to the analytical and substantial challenges we need to face. Historical demographers studying mortality need to seriously connect with and expand on the new interdisciplinary opportunities arising in academic fields such as epidemiology, evolutionary biology, genetics and other specialised sub-fields in the medical and life sciences. It will be easier to respond to these opportunities if we stop thinking of individual lives as atoms floating around in a vacuum.

By this I mean that, in general, researchers in mortality studies are still clinging too much to a focus on individual lives and individual events; they still fixate on the individual event of death and how the risk of dying differs between individuals. The field needs a shift of focus in at least three different ways. First of all, the analytical focus should shift towards the family and to the investigation of how the risk of dying varies between families. Second, we should incorporate a new focus on how patterns of early death and late survival are correlated between different members of the same family. Third, a firm focus on the family also entails that we must take a look at survival chances across generations. The historical study of mortality would reap theoretical, substantial and analytical benefits from such a threefold change.

The first shift in focus – studying the variation between families – follows from the growing awareness that death, health and disease are strongly correlated within families. For a number of historical populations research has already shown that infant and child deaths are clustered within familial settings. The death of a sibling is a very strong predictor for the survival chances of other children in the same family. Despite the fact that several researchers have already noted this type of death clustering, both for historical populations and for contemporary ones, researchers are slow to incorporate the analytical consequences of these findings. Most researchers still follow an analytical

strategy, which does not target the variation between mothers or between families in regressions, but continues to look instead at the attributes of individual children and their individual risk of dying. This is the case, for example, in studies in which the death of a previous sibling is incorporated into the regressions as one of the attributes of an ego; in other words, the individual child, which affects the ego's risk at death. This strategy suggests that death clustering is being investigated, but that is an optical illusion, since the family itself remains far beyond the analytical scope of this technique. As a consequence, we still do not know what makes these families different from other families in the population. This is a pressing issue, given that in the past the distribution of the mortality risks of infants and children between families was hugely unequal.

Second, in historical mortality studies we should firmly embrace the idea that within families individual mortality hazards are also linked in a variety of other ways. This follows the principles of the life course approach, but above all it fundamentally acknowledges the idea that the family arena, through a variety of social, economic, ecological and genetic mechanisms, was the most important arena in which survival was determined in the past, and not just for infants and children. The issue then becomes whether and how the early deaths of some family members – in infancy or in childhood – are related to the risks of death and survival of the other members of the family in the later years of their lives, beyond childhood and up to and including the period of (exceptional) old age. Insight into these matters would greatly increase our understanding of what goes on in families. There is no lack of theory building that can be used to frame the various research questions that are necessary to examine these issues – quite the contrary. Survivors in families with multiple child losses – and by 'survivors' I mean both the parents and the siblings of the children who died – are either thought of as having been scarred as a result of living through the experience of high (childhood) death penalties, or as surviving with enhanced survival chances. In recent years, a great deal of attention has been devoted to the manner in which the early life conditions of an individual influenced his or her survival in later years. However, in these studies the analyses were centred on the individual life course and on whether the experience of, say, famine or economic crisis affected the chance of that same individual living to a high age. My argumentation here is aimed at encouraging a perspective in which all family members' mortality risks and their interrelationships are viewed and assessed together. Obviously, this calls for new methods and new ways to measure these interrelationships. Such an approach also has the advantage that it will give attention to the very old as well the younger members of the family. It makes us ask questions such as: how are the mortality risks of the other family members affected, if one or two of the family's offspring live to exceptionally high ages?

Third, this family-based approach should be extended to cover several generations and include a full pedigree perspective. Inter-generational perspectives and transmission mechanisms have already become fashionable in recent years, also in fertility studies. However, following on from my second point, we need to take into account the overall mortality experiences of previous generations, asking whether or not, and in what way, these experiences are transferred to the subsequent generations. This perspective involves more than just taking into account vertical kin lines (parents and grandparents); it also needs to incorporate lateral kin, such as aunts, uncles and cousins. In addition, generational transmissions should also be investigated across more than just two generations. Clearly, health and survival do have their biological aspects, and we cannot ignore this. The challenge is not only to find out how important these biological aspects really are, but above all to find out how they relate to economic, social, environmental and cultural factors in different periods in the past! Moreover, from various extant studies we already know that families are important channels in the transmission of all kinds of behaviour and social norms. Surely, they must also impact upon health and survival?

This kind of full family and pedigree approach is important if we want to respond to the challenges and the opportunities emerging in the health and life sciences. In order to connect to these fields, it is vital that mortality risks are systematically compared between various groups of individuals. These include close kin (for example, siblings); more distant kin (for example, cousins); those who are non-kin but who share the same social and family environment (for example, marital partners); and those who are not related in any way and also do not share the same social and familial environment. By making such comparisons, the relative importance of various biological, genetic, social and environmental factors can be tested systematically. Finally, this also entails that we urgently need to seek the cooperation of biostatisticians, who can introduce us to the complexities of family and pedigree-based statistical modeling and to the estimation of variance components in family data.

These new avenues for research will run up against the serious limitations of some of the new and large databases that have been developed in recent years. Obviously, these datasets need to be able to provide more than just information on individual life courses: we need data pertaining to parents and siblings, and/or to their descendants in generations further down the line. Datasets based on individuals alone are insufficient for the new interdisciplinary research challenges that lie ahead. Mortality risks are not created in some sort of vacuum; not in the past and not nowadays. We need datasets that can be converted into pedigree formats, such as those in the Dutch project LINKS, in which all births, deaths and marriages in the population are linked in order to form families, which in turn can be used to form pedigrees. Other datasets, such as the HSN, need to be expanded.

Colleagues, we still have a lot of work to do! Health and survival are important topics; too important to leave them to the health and life sciences.

Biography

Angélique Janssens is affiliated with Radboud University Nijmegen and Maastricht University. Her research interests cover a broad area, ranging from the history of women's work and male breadwinning to issues relating to historical patterns of marriage, fertility and mortality. Currently, she is involved in projects studying familial factors in adult mortality and exceptional longevity in the past, as well as in projects examining cause-of-death specific mortality patterns in the nineteenth and twentieth centuries.

Research on the European fertility decline: has there been any progress?

Jona Schellekens

Thomas Kuhn (1962) argued that scientific progress, or a paradigm shift, occurs when an old paradigm is rejected by empirical studies and replaced by a new one. In historical demography, however, the use of inappropriate statistical methods has hampered progress, as I will try to illustrate with the study of the European fertility decline. To keep things short, I will only discuss two sociological paradigms: functionalism and social conflict theory.

Demographic transition theory provided one of the first explanations for the European fertility decline. The intellectual roots of demographic transition theory in functionalism are well known. In analyzing demographic systems, functionalists emphasize the interdependence of the parts of the system; the existence of a state of equilibrium; and the way in which all parts of the system reorganize themselves to bring things back to normal. In demographic transition theory, the critical destabilizing factor undermining the equilibrium is declining mortality, which leads to economic strains on households, and, eventually, to a new state of equilibrium by limiting fertility.

Innovation theory is the major alternative to demographic transition theory. The intellectual roots of innovation theory in social conflict theory become apparent in a search for the origin of innovative ideas. Imitation is central to innovation theory. Without a class structure, there would not be a group to imitate and, consequently, no diffusion of innovative ideas (Schellekens & van Poppel 2012).

Social conflict theory is the major alternative to the functionalist paradigm. Where functionalists see interdependence and unity in society, conflict theorists see groups, such as the bourgeoisie and the working class, fighting for power. Conflict theorists emphasize coercion rather than consensus as the cause of social order. Conflict theory has become increasingly popular in modern sociology at the expense of functionalism. Similarly, innovation theory has become increasingly popular at the expense of demographic transition theory. This paradigm shift, however, was justified by the use of inappropriate statistical methods.

The Princeton European Fertility Project rejected demographic transition theory because it did not appear to be consistent with the empirical evidence. They did so on the basis of cross-sectional analyses of Germany, for example, which showed that fertility was weakly related to infant mortality. However, causal links detected at the cross-sectional level will not necessarily hold from a time-trend perspective (Brown & Guinnane 2007). Statistical models of change over time are a more appropriate method to test theories of change than cross-sectional analyses.

When enough macro-level data points are available, time series regression models may be used to analyze change. Correlations at the aggregate level are often biased, however, and turn out to be much lower when measured at a lower level of aggregation (Brown & Guinnane 2007). With the availability of data at lower levels of aggregation, district level analyses have become more common.

But in most cases, there are not enough data points for an analysis of individual districts. The solution is to pool time series. The first example is the analysis of the fertility decline in Germany by Richards (1977). Her results show that demographic transition theory does very well in explaining the decline. However, analyses that use district data may still be biased, because the decision to limit fertility is made at the individual level.

Historical data at this individual level are becoming increasingly available. Event history models are the appropriate method to study change in such data. When the dataset includes individuals belonging to different cohorts, event history models can be applied to study historical change. As in pooled district level-time series regression models, testing theories of fertility decline in individual level-event history models is not straightforward. To test these theories, one needs to estimate the amount of the temporal component of the variance that each variable explains. No matter how large its (standardized) coefficient, a variable that only explains part of the cross-sectional component of the variance cannot have contributed to fertility decline (Richards 1977).

The use of individual level data instead of district level data, however, often comes at a price: fewer variables are available. The omission of variables that explain major trends in fertility decline may bias estimates for coefficients in individual level models. One solution is to include time-fixed effects or period dummy variables. Even though period dummy variables solve the statistical problem of bias caused by omitted variables, it is difficult to test theories of fertility decline with these period dummy variables. Therefore, a better solution is to include period proxy variables, such as a measure of average income and the infant mortality rate. 'Period' is a poor proxy for an undefined set of contemporaneous influences. When most of these influences can themselves be directly measured, there is no reason to use period dummy variables.

As an example of an individual level study, I refer to our study of the marital fertility decline in the Netherlands (Schellekens & van Poppel 2012). Our results show that innovation theory is not consistent with the data. The rejection of innovation theory does not, however, necessarily imply a return to functionalism, because there is a third paradigm, rational choice theory, which is also consistent with the data.

So far, the empirical evidence presented by studies that use statistical models of change has not led to the overall rejection of innovation theory or to a paradigm shift. One explanation may be that as of yet there are not enough individual level studies of change, perhaps because of the unfamiliarity of demographers with these models of change. Another explanation may be resistance to change. Most demographers were trained as sociologists. Given this background, they may want to hold onto the dominant paradigm of social conflict theory and prefer to modify innovation theory to fit the data instead of rejecting it. The result of such a modification is often referred to as a 'blended' model. Our results show, however, that blended models are not consistent with the Dutch data.

I will end with an optimistic note. According to Kuhn (1962), resistance to change does not prevent scientific progress, but only delays it. He argued that a major mechanism for a paradigm shift is the dynamic of cohort succession: when an older generation of scientists dies out, it is replaced by a new cohort that is not committed to the dominant paradigm of a previous generation.

References

Brown, J. C. & Guinnane, T. W. (2007). Regions and time in the European fertility transition: problems in the Princeton Projects

statistical methodology. *Economic History Review*, 60, 574-595.

DOI: <http://dx.doi.org/10.1111/j.1468-0289.2006.00371.x>

Kuhn, T. S. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.

Richards, T. (1977). Fertility decline in Germany: an econometric appraisal. *Population Studies*, 31, 537-553.

DOI: <http://dx.doi.org/10.1080/00324728.1977.10412765>

Schellekens, J. & van Poppel, F. (2012). Marital fertility decline in the Netherlands: child mortality, real wages and unemployment, 1860-1939. *Demography*, 49, 965-988.

DOI: <http://dx.doi.org/10.1007/s13524-012-0112-1>

Biography

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Some reflections on how replacement fertility was achieved in historical Europe

Andrew Hinde

More than 30 years ago, as a PhD student investigating the decline of fertility in late nineteenth and early twentieth century England, I read E. Lewis-Faning's report on *Family limitation and its influence on human fertility during the past fifty years*, which informed the United Kingdom's Royal Commission on Population (1944-1949). A key finding of this report was that, among couples married before the First World War, only a tiny minority had used any modern or appliance method of birth control. Even so, in England and Wales fertility fell between the 1870s and the 1930s from an average of about five births per woman to a level below two. Almost all of those who participated in this decline were married before the First World War, and hence the decline was achieved almost entirely without modern methods of birth control. This fact is rarely appreciated by demographers studying more recent fertility declines in Asia and Africa, and sits uneasily with some demographic models of fertility behaviour.

How did couples in inter-war England and Wales achieve replacement-level fertility? They used a combination of withdrawal, a low frequency of sexual intercourse and – more rarely – abstinence from sexual intercourse for longer periods, supplemented by abortion, as was demonstrated by Kate Fisher in her path-breaking study of birth control among a sample of English couples in the early twentieth century (Fisher 2006). The most widely used method was withdrawal, which had several advantages over the available alternatives. It did not interfere with the spontaneity of sexual relations (unlike condoms, caps and pessaries); it did not necessitate inconvenient and embarrassing visits to clinics or pharmacies; it was a male method at a time and in a culture where men were supposed to take the lead in the practice of birth control; and it was viewed as less demanding than abstinence. Of course, it was not as effective as some of the alternatives, but Fisher's respondents did not see this as a problem. Couples practising withdrawal were reducing their fecundity not to zero, but to a level at which their likely completed family size was close to the (small) number they wanted. As the Royal Commission concluded: "The great majority of married couples... practise some form of birth control and... they are successful, not in the sense that birth control never fails, but in the sense that it reduces the number of conceptions considerably below the number that would otherwise take place" (Royal Commission on Population 1949).

The success of historical couples in reducing fertility in this way has, I believe, several implications for our understanding of fertility behaviour in general, which are not as widely acknowledged in the demographic literature as they might be.

(1) *'Traditional' methods of birth control work*. It is often argued by those studying contemporary fertility that access to 'modern' contraception is a necessary pre-condition for fertility to fall to a level close to replacement. According to the widely-used Demographic and Health Surveys (DHSs),

‘modern’ methods include condoms, the pill, injectables, intra-uterine devices and sterilization; other methods, including withdrawal and the rhythm method, are described as ‘traditional’ (Ghana Statistical Service *et al.* 2015: 83). In some surveys, a method described as ‘periodic abstinence’ was identified separately. This potentially included both the rhythm method, with its regular monthly days of abstinence, as well as longer periods of abstinence, and so conflated two different types of fertility behaviour. Both periodic abstinence and withdrawal are categorized together with ‘folk methods’, such as the wearing of charms and bracelets, with the implication that they are ineffective. The evidence from historical demography demonstrates either that this is false or that between the 1930s and the 1960s there was a major change in the psychology of humankind, to such an extent that the self-discipline required effectively to implement withdrawal and abstinence was lost.

(2) *Contraception can be analogue as well as digital.* Demographers often view birth control as being about the switching of fecundity on and off with efficient contraceptives. In the past, this was not possible, because the available methods could not be used in this way. But the same fertility outcome was achieved by couples systematically practising withdrawal (and possibly reducing the frequency of intercourse). These couples were ‘turning fecundity down’ rather than switching it on and off.

(3) *Couples in the past made rational decisions about fertility.* To achieve low fertility using traditional methods by ‘turning fertility down’, couples had to implement fertility control from the start of their relationships. This is perfectly rational behaviour in a situation where access to efficient contraception is absent. It implies that couples had formulated some idea of their desired family size; in other words, they had fertility goals and ‘turning fecundity down’ was their way to achieve them. But the outcome was inherently more uncertain than would be the case if fertility could be switched off once desired family size had been achieved (as is implied by parity-specific fertility control or ‘stopping’ behaviour (Henry 1961)). As a result, fertility goals were imprecisely formulated (Fisher 2006). To the extent that fertility control in the past involved family planning, it was a vague and inarticulate form of planning: family planning for an analogue age, not a digital one. The ideas of ‘starting’, ‘spacing’ and ‘stopping’ sit uneasily in the world of our ancestors. These are modern concepts from the digital age and cast only a very dim light on historical fertility declines.

One lesson to be taken from these observations is that the historical fertility decline in Europe and North America is best understood on its own terms and in the light of the historical context in which it took place (Gillis *et al.* 1992). It is not always helpful to try to compare it with fertility declines that took place in other parts of the world in the second half of the twentieth century, or to try to understand historical fertility declines with reference to models of fertility behaviour that presuppose levels of technology which were not available in the past. A fruitful agenda for future research might be to test the plausibility of different models of fertility decision-making under uncertainty in reproducing the kinds of fertility histories we observe in early twentieth-century European populations, alongside a closer study of the methods of birth control actually available to ordinary couples marrying and having children at that time. In the meantime, we know that in the early twentieth century our ancestors managed to reduce their fertility to levels below replacement without access to modern contraceptive methods, and we might emphasize the implications of this more strongly than we have hitherto, not least in discussions with our colleagues studying the contemporary world.

References

- Fisher, K. (2006). *Birth control, sex and marriage in Britain, 1918-1960*. Oxford: Oxford University Press.
- Ghana Statistical Service (GSS), Ghana Health Service (GHS) & ICF International (2015). *Ghana Demographic and Health Survey 2014*. Rockville, MD, USA: GSS, GHS and ICF International.
- Gillis, J., Tilly, L. A. & Levine, D. (Eds.) (1992). *The European experience of declining fertility, 1850-1970: a quiet revolution*. Oxford: Blackwell.
- Henry, L. (1961). Some data on natural fertility. *Eugenics Quarterly*, 8, 81-91.
DOI: <http://dx.doi.org/10.1080/19485565.1961.9987465>
- Royal Commission on Population (1949). *Report presented to parliament by command of His Majesty, June 1949*. London: Her Majesty's Stationery Office.

Biography

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Lost regimes of low reproductivity: how past societies that did not replace themselves matter for the future

Fabian Drixler

The term ‘family planning’ is relatively new. The behaviour it describes is ancient. High fertility was, of course, common in many past societies. But we should not imagine the world before the modern fertility decline as only inhabited by people who did little to control how many children they had. Large datasets show that in the eighteenth century, the people of Japan’s Deep East raised so few children that they failed to replace themselves (Drixler 2013 and 2015). In an exhaustively documented district of eighteenth-century Ceylon, ‘rearing rates’ (TFR net of infanticides) were even lower (Drixler & Kok 2016). Descriptive sources suggest that family planning was also common in some societies for which we have no large troves of demographic data. In ninth-century Iraq, al-Jahiz pronounced in his *Book of Animals* that “among the animals that mate, only man practices withdrawal when he does not want children” (Musallam 1983). In eleventh-century China, the scholar Su Dongpo complained that “as a rule, the common people of Yue and E raise only two boys and one girl”. In medieval France, the Cathar church taught that non-procreative sex was to be preferred to childbearing. Perhaps these are exceptions. But it is equally possible that in past centuries, rearing only a few children and preventing the conception, birth or infancy of many others was not rare. This is what I will here call ‘low reproductivity’, for lack of a more elegant phrase.

The search for lost regimes of low reproductivity can take a number of paths. Most societies of the past have left us no nominative data. At present, this makes the assessment of their fertility levels an art of interpolating and interpreting indirect evidence. Perhaps this will be as much as we can ever accomplish for the Roman Republic, the Han dynasty, the Maurya Empire and most other past societies, large and small.

It is also possible that one day new technologies will open other windows onto distant fertility regimes. For example, it has been known for years that during pregnancy fetal cells migrate into the mother’s body, and often remain there for the remainder of her life. I have no expertise in this area, but in the bold spirit of this book, let me share a dream. If the DNA of fetal cells is reliably preserved in the mother’s bone marrow, perhaps we will one day be able to reconstruct from an ancient femur how many children its owner bore before she was lowered into her grave.

In the meantime, where might historical demographers look for traces of societies that chose not to replace themselves? As has recently happened in Dutch Ceylon, new cases of this kind may emerge in lands that have not yet been closely examined with the tools of our discipline. But even in the most intensely studied slices of the demographic past, such as early modern Europe, a dedicated search may find islands of low reproductivity in what many now imagine as a featureless pre-transition sea. A good deal of research in historical demography has used village studies as stand-ins for entire regions, assuming at least implicitly that regions share a broadly uniform demographic regime. But it

is clear that in some historical settings, demographic behaviour varied dramatically across small spaces; for example, because neighbouring villages disagreed about fertility norms or attitudes in critical areas such as breastfeeding, child neglect, or marriage. Before the spread of mass media and compulsory schooling, this granular geography of demographic behaviour may have been common, as examples from Japan, France, Germany and Sri Lanka suggest. We should therefore not be content with the data that has been gathered so far. The potential for new research remains vast. Not every village study will blaze new trails for our field, but we should welcome it as a lasting contribution regardless. Little by little, such studies add contour and resolution to our knowledge of the demographic past. And some may yet uncover forgotten cultures of reproductive restraint.

There are two ways in which a low reproductivity regime can end: either the population changes its behaviour, in what David Henley (2006) has termed “the first fertility transition” in the case of colonial Sulawesi and I call “a reverse fertility transition” in the case of nineteenth-century eastern Japan; or the regime fails to sustain itself due to its defining feature – a paucity of descendants – while children with many siblings inherit the earth. Both processes have large implications.

With every reverse fertility transition we discover in the demographic record, we have a new reason to abandon the Demographic Transition Theory. Doing so affects our expectations for the future, along with our knowledge of the past. Few publications shape the world’s collective expectations as much as the United Nations *World Population Prospects*. In the 2015 revision, the UN demographers introduced probabilistic projection methods to adequately address the uncertainty of future demographic developments. Yet for all their mathematical sophistication, the projections remain based on a simple assumption about human history: that fertility must fall, and that once it has fallen, it remains low, to ultimately “fluctuate around or below 2.1 children per woman” (Department of Economic and Social Affairs, Population Division, 2015). For no country do the probabilistic fertility paths allow for sustained rises in fertility above replacement level. Often misread as predictions, the UN projections have contributed to widespread complacency that the end of the population explosion is imminent and inevitable, and that it will occur through a gentle reduction in fertility rather than in a new age of mortality crises. With such enormous stakes, examining the empirical and narrative foundations of the UN models should be a pressing task for historical demographers.

Regimes of low reproductivity that ended in extinction rather than in rising fertility have momentous implications of their own. We already know or suspect that many past populations left few or no descendants. Plagues and marauding armies could see to that, as could the urban graveyard effect. Yet if we discover more populations that dwindled or disappeared because their married couples raised few children, we will establish population decline amid benign mortality conditions as a longstanding part of the human experience, not an aberrant feature of some present-day societies in Europe and East Asia. Such decline and its psychological, cultural, economic and political ramifications deserve close study. It may or may not inform our public policy, but it can help us decide how we should think and feel about low fertility and its consequences in our own futures.

References

- Department of Economic and Social Affairs, Population Division (2015). *World population prospects: the 2015 revision*. New York: United Nations.
- Drixler, F. (2013). *Mabiki: infanticide and population growth in eastern Japan, 1660-1950*. Berkeley: University of California

Press.

Drixler, F. (2015). Conjuring the ghosts of missing children: a Monte Carlo simulation of reproductive restraint in Tokugawa Japan.

Demography, 52(1), 667-703.

DOI: <http://dx.doi.org/10.1007/s13524-015-0378-1>

Drixler, F. & Kok, J. (2016). A lost family planning regime in eighteenth-century Ceylon. *Population Studies*, 70(1), 93-114.

DOI: <http://dx.doi.org/10.1080/00324728.2015.1133842>

Henley, D. (2006). From low to high fertility in Sulawesi (Indonesia) during the colonial period: explaining the 'first fertility transition'.

Population Studies, 60(3), 309-327.

DOI: <http://dx.doi.org/10.1080/00324720600896130>

Musallam, B. (1983). *Sex and society in Islam*. Cambridge: Cambridge University Press.

Biography

Fabian Drixler is Professor of History at Yale University. His research interests include early modern Japan, climate history and the global history of low fertility.

Where are all the feminist historical demographers?

Alice Reid

Over breakfast at a recent interdisciplinary conference I was asked where all the feminist historical demographers were. My companion was not convinced by my replies that historical demographers look at women all the time (her reply being that that made it all the more strange that we did not engage with feminist approaches) and that demography was an empirical subject (apparently, feminist-physics is a thing). I came away from the conference wondering whether historical demographers could or should have more engagement with feminist approaches.

In a helpful article, 'Doing feminist-demography', Jill Williams suggests that feminist-demographic research, particularly that on gender, must be emancipatory, must have a theoretical basis (that gender bestows power), must acknowledge its political underpinnings, and must incorporate reflexivity about the influence of social position on the knowledge produced. In particular, feminist-demographers must go beyond an analysis of the biological forces of sex to examine the socially constructed forces of gender, and must consider the ways that differential power bestowed by gender produces differential demographic outcomes.

How far away are historical demographers from this image of a feminist-demographer? Is it desirable or even possible for us, with our demographers' commitment to positive, quantitative and objective research, to move closer towards such an intensely ideological and theoretical approach? Although feminist-demography involves far more than simply remembering to think about women, are there any ways we are already addressing the feminist agenda?

The emancipatory research required from practitioners of feminist-demography aims to confront social oppression. I would not argue that social oppression was absent, but the way much of the feminist-historical literature condemns maternal and child welfare as inherently sinister reproductive governmentality seems to assume it was. Surely this is as much a unilinear view of history as the modernization theories which feminist-scholars assume to be the bedrock of historical demography? In fact, although it is true that early demographic models were predicated on modernization hypotheses, historical demography has since played a leading role in the diminution of modernization and westernization theory as frameworks for the investigation of demographic and broader social change. In certain key areas this has been achieved by giving a greater place to the investigation of female agency. There are prominent areas in historical demographic studies of marriage and household, migration, infant and child care, fertility, contraceptive behaviour, and illegitimacy where considerations of female agency have a prominent, often key, analytical role. Scholars such as Tine de Moor and Jan Luiten van Zanden, for example, suggest that the status of women was one of the more important drivers of the industrial revolution.

Perhaps the largest gulf between demography and feminist scholarship relates to the possibility of objectivity. A belief in objectivity is central to the demographic endeavour and justifies quantitative approaches, but feminism maintains that researchers cannot be objective – they cannot fail to be

influenced by their social locations, their motives and their interests. Knowledge produced from research is therefore always socially situated. Nevertheless, Williams claims that quantitative research is possible under a feminist agenda, as long as the social construction of gender is considered and as long as scientific objectivity is questioned. Treating gender as a social construction, however, means it will have a different meaning in each context and this makes comparative and longitudinal research extremely problematic.

Relinquishing a commitment to objectivity does not come easily to historical demographers; however, we are good at questioning the validity and meaning of our data. We need to be particularly careful, as we often use data which was created for purposes quite different to demographic analysis, and this demands thoughtful interrogation of what the measures used actually mean and who the data do and do not represent. Historical demography is also contingent on the survival of particular datasets and measurements, and often depends on the use of proxy variables to stand in for characteristics that cannot be measured. We therefore need to be both creative in our construction of proxy variables and very critical of what they might mean. In my experience, historical demographers do this very well, and we do it for a range of variables. We are fully aware that how we categorize, transform and interpret our data will affect our results. Key variables of interest relating to women, such as working patterns, wages and weight, are less readily available in the historical record than those for men, so inferences about women need to be made with particular care.

Furthermore, historical demographers do consider the social construction of gender when 'sex' is a key variable in the analysis. Perhaps feminists fail to notice this because in a quantitative analysis sex and gender use the same identifier, and there are no ways to distinguish them. Differences in mortality provide a good example. A consensus has been established that there are both biological differences in the risks of death between men and women, as well as strong social differences, the latter being related to gendered behaviours, access to services and other factors. The label that we use, whether 'sex' or 'gender', cannot tell us whether the effects we find are biological or socially constructed. What can help to answer this question is consideration of the way men and women responded differently to different mortality risks, over time, between places, and as affected by other variables. Higher mortality among males in the first month of life is principally biological: it is relatively constant between places, and most responsive to factors such as gestational duration and the progress of labour. Differentials in mortality during adulthood, however, are more strongly linked to gendered behaviours by and towards the individual: risk-taking, health-seeking and treatment-receiving. Power relations conferred by gender may also play a part in gendered behaviours: these are rarely overtly discussed by historical demographers, and perhaps should receive more attention. Far from being inherently problematic, as claimed by Williams, comparisons of different places and times, using different outcome measures, and interactions with different variables can help to disentangle the extent to which our 'man or woman' indicator reflects sex or gender. It can also help to distinguish the different ways in which gender has been socially constructed in different contexts.

The requirement that analysis must be based on the social construction and power-bestowing nature of gender is predicated on the assumption that gender will be the supreme characteristic of interest. A large part of why the detailed discussion of the different meanings and social constructions of gender does not loom as large in our papers as feminists might like is that we are usually considering and comparing the effects of a large array of variables. This, for that matter, also holds true for other variables, such as the social construction of age, which is also likely to result in different risk-taking, health-seeking and treatment-receiving behaviour. Length limitations (and reader fatigue) preclude historical demography from discussing overtly and in detail the social construction

of all variables, and from interpreting them in-depth. But particular variables of interest are often discussed in this way. While gender is undoubtedly important and interesting, it is certainly not the only influence on demographic events. If a feminist-demographer is one for whom gender is the most important variable, then although I am myself a feminist and mindful of the importance of the ways the social construction of a variety of characteristics might influence their demographic effects, I am happy to be simply a historical demographer. Otherwise I hope we can all be feminist historical demographers.

Reference

Williams, J. (2010). Doing feminist-demography. *International Journal of Social Research Methodology*, 13 (3), 197-210.
DOI: <http://dx.doi.org/10.1080/13645579.2010.482250>

Biography

Alice Reid works at the Department of Geography, University of Cambridge. Her research has concentrated on the determinants of mortality and fertility in the British Isles in the late nineteenth and early twentieth century, addressing the impact of factors such as location, socio-economic status and medical personnel on the creation and interpretation of data, as well as on demographic outcomes.

Chapter 7

Culture is core

99% of all statistics only tell 49% of the story

Ron Delegge II

Four scholars lay out their view on the future of historical demography as a discipline with more attention for culture and qualitative approaches.

Why have historical demographers abandoned history?

Anders Brändström

In August 2010, Bruce Fetter organized a round table at the 21st International Congress of the Historical Sciences (CISH) in Amsterdam, which was entitled: “What can general historians learn from historical demography?” The session was well attended and the subsequent discussion among the audience was intense. However, a majority of the comments turned out to have a slightly different perspective; namely: “Why have historians abandoned historical demography?” Proposed reasons ranged from the lack of, or loss of, channels of communication, to paradigm shifts within the historical sciences: quantitative history is more or less out of fashion. One suggested solution was to keep or reinstall an open dialogue, perhaps through interdisciplinary projects and conference sessions. Another was to introduce statistics at an early stage for students in history, in order to revive the lost art of quantitative history. But it was also suggested that we must ‘ride out the storm’ until the next paradigm shift, when quantitative history will see a renewal. Those in favour of this solution applauded the excellent research infrastructures within historical demography. We have at our disposal large and detailed longitudinal population databases and censuses. And they are growing in number, increasing in time-span and in geographic coverage, and improving in terms of ease of access through pioneering work from organizations such as ICPSR, IPUMS, EHPS-Net, and so on.

“Pour faire de l’histoire, il faut savoir compter”. “To do history, one must count”, wrote the famous French historian Georges Lefebvre. The equally famous Emmanuel Le Roy Ladurie proclaimed in his book *The Territory of the Historian* that “tomorrow’s historian will have to be able to programme a computer in order to survive” (Le Roy Ladurie 1979). In an interview in 2011, he somewhat regretted this as an overstatement, but still claimed that “the final aim of history, if it is not purely cultural history, is to be quantitative wherever possible; but that is the final aim, the validation: not all the research has to be quantitative” (Von Lünen 2013).

Is this perhaps true? And, if so, could we reformulate the question and ask: “Why have historical demographers abandoned history?” From my perspective, this is a valid question, and one well worth asking. Historical demographers come from a wide range of academic disciplines: history, economic history, sociology, geography, statistics, etc., but they share the common factors that they can all count, and that they are all historians in one way or another. But what actually makes a historian?

Steven Gunn of Oxford University defines a historian as someone who is good at studying the past and using the evidence effectively. He or she should have historical imagination – the ability to think back into a situation in the past and examine why people acted the way they did, or why they might have acted the way they did. A historian should be able to examine how people understood the world when they took the decisions that they took. Finally, a historian should be good at explaining all these things to the rest of us. Natalie Davis, Professor Emeritus at Princeton, defines a historian as one who begins to see a pattern; begins to see how parts of a community fit together; begins to see the fault lines of conflict and the directions of change – and then begins to write about the past, and, in this

writing, savours its strangeness and its familiarity, before finally delighting in his or her ability to make the past live for others.

Do we, as the historical demographers of today, recognize ourselves in those descriptions? I am not sure that we do. Historians tell stories, they interpret the past and make the past live for others. This should and must also be true for historical demographers when studying populations in the past.

Instead, through extensive reading of articles in our key journals of publication and through attending numerous conferences in the social sciences, etc., it becomes clearer and clearer to me that historical demography is increasingly driven by data and methodology. Lost are the stories. Advanced statistical methods, described in detail, are often the centrepiece of papers, and give a false (?) sense of strong validity. In my experience, peer reviewers increasingly focus on methodology and tend to request additional statistical analyses, rather than to ask for more and clarifying historical context. If this trend continues, historical demography will become a purely statistical discipline and will no longer be part of the historical sciences – or so I fear.

One of our main sources in historical demography, the parish registers, were created and kept for entirely different reasons than the research and statistics of today. They were part of a religious context that differed between countries and changed over time. The clergymen who kept the records interpreted the world with the eyes of their religion, not primarily with those of the secular world. The church decided what was important to register and what was not, and how it was going to be done. A good example is occupational titles – a key variable in historical demography. Precision in titles was seldom regarded as something of importance in the religious context, especially when dealing with the lower echelons of society. Today, historical occupations are used as co-variables for wealth, status and social class – and we are increasingly referring to them as measures of SES (socio-economic status). But they are *not* – and have *never* been – measures of SES. At their best, they are only rough proxies for social status or class.

Causes of death form another example where context is often lost. In Sweden, causes of death were seldom registered by physicians. In most cases, clergymen and midwives did so, usually through a ‘verbal autopsy’ in which information and a description of the events prior to death were acquired through conversations with a person familiar with the deceased. Today verbal autopsies follow very strict protocols and procedures, but in the nineteenth century they did not. In remote and sparsely populated areas it could even be weeks between the actual death of a person and the ‘verbal autopsy’. Regardless of the quality of causes of death, it becomes problematic when they are used, too often and too uncritically, as measurements of morbidity or ‘disease load’. How can we allow this, when we have practically no knowledge of historical fatality rates?

In my opinion, we enter our data into regression analyses without sufficiently considering the weaknesses and the shortcomings of the original sources, while precision, definition and understanding of the data are of key importance. No wonder that our results many times end up as ‘inconclusive’!

To a historian, the context in which an event occurs is of central importance. A common critique against historical demography and quantitative history at large has been that quantifiable data are “too immersed in discursive fields to be translated into a more or less value-free series of social facts from which valuable historical statistics might be obtained” (Rogers 2007). This is, of course, taking an extreme position. But clearly, understanding the context and the discourse within which events occur must also be central in historical demography.

To conclude, and to paraphrase Le Roy Ladurie: “Tomorrow’s historical demographer will have to re-conquer history in order to survive”. To that, I would also add the importance of writing ‘stories’

that read well. Honestly, what could be better, if we want to “delight in making the past live for others”, than historical demography obtained from the life courses of individuals, families and households?

References

- Le Roy Ladurie, E. (1979). *The territory of the historian*. Harvester: Hassocks.
- Rogers, N. (2007). *The press gang: naval impressment and its opponents in Georgian Britain*. London: Bloomsbury.
- Von Lünen, A. (2013). Immobile history: an interview with Emmanuel Le Roy Ladurie. In Von Lünen, A. & Travis, C. (Eds). *History and GIS: Epistemologies, Considerations and Reflections*. New York: Springer.

Biography

Anders Brändström is a Full Professor in Historical Demography at Umeå University, Sweden. His research has focused on long-term trends in mortality, on public health, and on health transitions. Brändström has played a key role in the establishment and expansion of the Demographic Data Base at Umeå University. In 2005 he received the prestigious ‘Strong Research Environments’ award, and in 2006 the even more prestigious ‘Linnaeus Excellence’ award, with a research grant for the period 2006-2016.

Being and time and historical demography

Trent MacNamara

I once asked a historian of medieval Europe whether her scholarly interests had anything to do with the popular romance of her period: the fantasy novels, ruins tourism, and so on. I expected her to disavow these mere escapes in favour of dispassionate commitment to empirical research and theory. Instead she said “Of course!”

Many historical demographers, I suspect, work from similarly poetic points of departure. Past populations have a statistical life, austerely beautiful. But without a sense that demographic work can also recuperate the lives of eating, walking, working, suffering, celebrating people, perhaps we would not bother. The whole edifice of historical demography, in this sense, seems to be animated by our ability to imagine human ecological fallacies stalking the land.

I want to suggest that this sort of motivating humanism need not be walled off completely from empirical research, and that in limited doses quasi-ecological subjectivism may increase demography’s contribution to knowledge without compromising its high empirical standards.

Historical demography’s pre-eminent reason for being, to be clear, is to offer a point of contrast with the sometimes haphazard evidentiary standards and persistent ‘great man bias’ of traditional narrative history, where whole societies may quiver and quake with the scribblings or arsons of a few noisy partisans. Yet it is well accepted that statistical, descriptive demography can benefit from some contact with humanism. Neither the discipline nor human knowledge seems well served by demographers’ self-confinement to questions of data quality and methodology. Appeals for more ‘cultural’ and theoretical demography have thus become common (particularly in the sub-field of historical fertility transitions, with which I am most familiar). This ongoing cultural-demographic project employs many viable methods and philosophical approaches. I wish to suggest the applicability of two additional concepts from existential philosophy: being and time.

At first glance, existentialism and demography make strange bedfellows. Existentialism is anti-positivist, intuitive and subject-focused. Many existentialists define themselves in opposition to categorical, objective social science. In a typical existential view, individuals are radically free: they make themselves; attempts to systematize their experience are inauthentic and misleading as descriptions of reality.

And yet demography studies the rudiments of human existence. It works empirically with life contingencies that are basic, universal and tend to be important centres of meaning for individuals. Very few adults avoid making intimate, important-seeming decisions about, for example, reproduction, family and institutional life, health, material circumstances, and migration. Such aspects of human life force people to apply intimate ideas to worldly action, even when it is difficult or unnecessary to articulate those ideas.

Being. Because these life contingencies are so fundamental, demography offers the potential to provide unprecedented empirical depth to the existential notion of ‘being’ – that is, the whole

experience of life from the perspective of free actors. Without adopting the defiantly anti-categorical approach of existential purists, a more subject-centred demography might try to recuperate plausible individual experience from the past: not just as a semi-concealed motive for demographers to work, but as a rigorous contribution to knowledge.

The difficulty of knowing ourselves according to researchers' categories is perhaps especially apparent in the study of fertility. To study individuals' thoughts on childbearing is to know that people struggle to articulate the reasons why they have (or want) one specific number of children or another. Economic, spiritual, moral and cultural factors are often too wide-ranging and taken-for-granted to untangle and articulate. People resort to various moral and aesthetic shorthands, declaring, for example, that having a third child "felt right" or "seemed natural". Frustrating as these soft-focus sensibilities may be for the researcher, they represent the mental constructs from which action often proceeds.

Writing from the perspective of 'plausible individuals' need not be mystical, vague or anything more than complementary to traditional empiricism. It need not claim to identify unitary 'personalities' or 'mentalities' that characterize modernity or large populations. But it can distinguish micro-ecologies that arise when a small group of individuals at a specific time and place share viewpoints. Even on a small scale, such projects might help historical demography in two ways. First, they would add to the discipline's accessibility, tying statistical demography to easily imagined life scenarios. Second, they would integrate existing theories – such as micro-economic and cultural interpretations of fertility transitions – that appear less mutually exclusive, and more compatible and interconnected, when viewed from an individual perspective.

Time. Existentialists take holistic approaches to time, emphasizing individuals' immersion in past-to-future continuums. In this view, we do not simply act in a series of discrete present moments, adapting to changing environments, but within narratives of our own creation that incorporate and can switch between different moments in time.

This idea already permeates historical demography in the form of life course theory, which examines people's own narratives concerning the timing of vital events in their lives. But my experience with American sources suggests that subjective time continuums are not only important for narratives of the self, but also for our understanding of social history. People act not only on norms that directly concern the sequencing of life events; they also incorporate themselves into impressionistic macro-historical narratives that connect personal behaviour to perceived directions of history. In the early twentieth-century United States, for example, self-defined 'modern' people tended to implicitly accept the inevitability – if not the righteousness – of the trend towards smaller families. They had smaller families because the course of civilization appeared to demand it. Incorporating this sort of social time continuum into social demographic theory may help explain attitudes towards health care or migration, or, in the study of fertility, empirically tricky subjects such as the baby boom or high frontier fertility.

All this leaves the practical question of where to find data for a more existential demography. Present sources such as the World Values Survey allow some entry points. Perhaps equally promising for future research is the nexus of historical digitization, optical character recognition and qualitative analysis software. Oral history interviews, publications, letters and, eventually, the infinite world of internet commentary may soon provide a basis for large-scale, empirically grounded humanistic analysis that supplements and checks itself against demographic measurables. At the very least, the widening availability of these sources should enable historical demographers to make greater evidentiary demands on traditional narrative historians.

But high-volume qualitative research is not the only possible way to approach demographic questions from a more existential angle. Formal demographers might also occasionally venture into micro-ecological thought patterns, briefly imagining post-hoc categories as they might have appeared in the minds of individuals. This might take the form of an occasional paragraph, paper or chapter supplemental to other work. Perhaps also it would be useful to cultivate more spaces like this one, where scholars writing from varying perspectives may engage in the sort of conversational, back-channel speculation that is rarely set to ink, but often fuels innovation. Demographers might be encouraged to exit the temple from time to time, synthesizing their accumulated empirical knowledge *of* humans with their grey-matter knowledge *as* humans. Such ventures would help connect the measurement of life to the experience of life, and contribute to our working self-knowledge, past, present and future.

Biography

Trent MacNamara is a lecturer in history at Texas A&M University. He is preparing a manuscript entitled *Birth Control and the Good Life in America, 1900-1940*. His research examines U.S. social, cultural and intellectual history.

Not everything that counts can be counted, and not everything that can be counted counts*

Isabelle Devos

In 1997, the American anthropologist and historian David Kertzer stated that “demographic change cannot be wholly understood without paying attention to historical detail that is not in itself discoverable through quantitative materials” (Kertzer 1997: 841). Nearly twenty years later, a great deal has changed, but some things remain the same. Obviously, current historical demography does not significantly differ from that performed in the twentieth century, in that it is still predominantly quantitative, rather than qualitative. However, while earlier studies aimed to reconstruct trends and patterns in aggregate data pertaining to past demographic behaviour and household composition, more recent work has focused on studying demographic processes across the life course or across generations (Campbell 2012). As a result, analyses of their interplay with social, economic and cultural processes have become even more important, and data collections have become increasingly ambitious. Since the mid-1990s, tremendous efforts have been made in organizing censuses, parish and civil registers, and population registers in particular into large datasets of individuals and households. Together with a whole range of new, sophisticated statistical methods, these ‘big data’ have reinvigorated the discipline, which has now entered a mature stage, with its own publishing networks, a range of regional and national societies, and even its own European society and conference. But although the discipline is proficient in statistical analysis, it is still far from familiar with qualitative approaches. Because qualitative analysis does not involve large numbers and because statistical representativeness is not its main aim, historical demographers remain reluctant to use qualitative sources. Even so, there are strong arguments for using such source materials in historical demography.

Quantitative methodologies are at the forefront of historical demography, and life course analysis is beyond doubt the most popular approach today. George Alter’s 1988 treatise on the women of Verviers laid the foundations for the use of the life course perspective in international historical demography, and has in turn led to an avalanche of publications. These days, life course analysis is still producing innovative work, but researchers are increasingly frustrated with the limited ability of statistics to grasp the motivations of individuals in the past. With the rising importance of human agency within historical demography, it is essential to document choices and constraints by using contemporary sources that shed light on the lives of these individuals. Belgian sociologist Jan Van Bavel already acknowledged in his 2010 literature review that “we are running up against the limitations of quantitative history” (Van Bavel 2010: 455), since we cannot ask early modern and nineteenth century people about their attitudes and motivations.

In fact, the source kit for historical demographers consists primarily of censuses, civil and population registers. Over the years, the datasets have become larger, but not necessarily more

complex. Demographic datasets, in which other historical sources such as fiscal lists, military records, criminal files, hospital records, etc. have been integrated, are scarce. Even with the shift towards the life course approach, qualitative methods remain remarkably underrepresented. Since the use of textual sources is most familiar to historians, they could lead the way towards to a more mixed method approach. Historians have the skills to trace, access, and analyze dispersed materials in order to highlight particular aspects of the past. However, the emphasis on statistical methods of the last few decades has reduced their number in the demographic field, as sociologists, economists and other social scientists have become more prominent. The result is that the initial benefits that the discipline derived from collaborating with historians have dissipated. Nevertheless, the advantages of qualitative methods, together with interdisciplinary initiatives, could lead to a new turn in historical demography, with either original or reprised research topics. It could, for example, help to rekindle scholars' interest in early modern demography, a period for which statistical demographic sources are rare.

Having said this, qualitative materials should not just be used in the absence of other data. They can also serve a variety of other purposes: to confirm or refute results; to explain some of the relationships found; to help determine which data to collect; to set the historical context for the demographic analysis; etc. But above all, they are useful for reconstructing the attitudes and behaviours of the past and for understanding processes at the individual level. In this sense, the work of the British historians Simon Szreter and Kate Fisher is a prime example of what can be achieved. Using oral history, they have challenged previous studies by showing how testimonies of men and women can lay bare the private realm of married life with regard to courtship, love, sex and birth control. Their evidence is not to be found in numbers, but in words and their meaning. As a result, today we are far removed from Wally Seccombe's accusation that "demographers believe in the immaculate conception" (1995: 157). It is probably also one of the main reasons, as stated by John Caldwell, why fertility research has achieved a robustness that mortality theory has not.

Indeed, we still have much to discover about the nature and causes of the mortality decline. Following Thomas McKeown's work of the late 1970s, mortality research has been dominated – and according to some 'misfocused' – for decades by explanations that rely exclusively on economic causes, and on nutrition theory in particular. Even today, for many scholars health only has meaning in relation to quantitative and monetary measures, such as per capita income. Over the years, however, research has raised serious doubts regarding the relation between mortality and living standards, by revealing the weak correlation between their historical evolutions and by drawing attention to the lack of a balanced assessment of social class differences in health in the past. According to Massimo Livi-Bacci, these inconsistencies can primarily be explained by the strong exogenous component of mortality, constituted by infections and epidemics. Yet historical mortality research has largely ignored medical literature and evidence. This is unfortunate, because bio-medical scientists force scholars to think about nutrition, environment and the complex interplay of the many factors influencing disease. In fact, it is mainly through their involvement that the field of historical anthropometry has been able to flourish. By focusing on the immediate causes of death, they highlight the importance of exposure to specific pathogens and the mode of transmission, thereby stressing the relevance of public health and medical history. Although biological and ecological factors are difficult to grasp in a historical context, medical journals, textbooks, conduct books, correspondence and reports from local medical commissions and other governmental agencies provide an appropriate framework. Together with the know-how of bio-medical experts, these textual materials can provide a more thorough medical interpretation of health evidence from the past. Most scholars, however, still

have difficulties in combining statistical and qualitative results. The work by Ian Gregory (2015), an English geographer, who together with historians is examining how textual medical sources can be integrated with statistical demographic data to shed new light on the mortality decline, is promising in that regard. Clearly, interest in textual sources and qualitative methods reflects the awareness of the importance of interdisciplinary collaboration in analyzing historical demographic issues.

References

- Campbell, C. (2012). Historical demography. In: Liang, Z. (Ed.), *Demography*, 233-265. Beijing: Renmin University Press.
- Gregory, I., Porter, C. & Atkinson, P. (2015). Geographical text analysis: A new key to nineteenth-century mortality. *Health and Place*, 36, 25-34.
DOI: <http://dx.doi.org/10.1016/j.healthplace.2015.08.010>
- Kertzer, D. I. (1997). Qualitative and quantitative approaches to historical demography. *Population and Development Review*, 4, 839-846.
DOI: <http://dx.doi.org/10.2307/2137385>
- Secombe, W. (1995). *A millennium of family change: feudalism to capitalism in north-western Europe*. London: Verso.
- Van Bavel, J. (2010). The decline of fertility in the nineteenth century. What have we learned since the Princeton project? In: Eggerickx, T. & Sanderson, J.(Eds.), *Histoire de la population de la Belgique et de ses territoires*, 429-461. Louvain-la-Neuve: Presses Universitaires de Louvain.

Biography

Isabelle Devos is a historian and demographer working at Ghent University, Belgium. Over the years her research has revolved around social and economic issues of the early modern period and the 'long' nineteenth century in a comparative perspective, with a particular focus on mortality and living standards.

* Quotation (often incorrectly attributed to Albert Einstein) from Cameron, W.B. (1963). *Informal sociology, a casual introduction to sociological thinking*, 13. New York: Random House.

Demographic history should always start with numbers but it should never end with numbers

Simon Szreter

Demographic history depends on reliable observations of certain defined events and proceeds with the careful counting of those events and their construction into meaningful, age-standardized rates specific to populations in known times and places. These sources and methods are necessary to construct an object of study in demographic history. However, although the study of demographic history is a subject which should always start with numbers, it should never end with numbers. To advance our understanding we always need to bring less quantifiable concepts, contingent historical events and qualitative sources of evidence to bear in our accounts.

The study of historic fertility declines is clearly entering a revolutionary period in terms of the detailed, individual-level quantifiable data that is becoming available for a number of important countries. Historical demographers such as George Alter and colleagues in North America and Tommy Bengtsson and his collaborators in Sweden have already pioneered the analysis of high quality individual-level data through life course analysis. Nominative, individual-level data is now becoming extensively available for the periods of rapid fertility decline in Spain, Ireland, England and Wales, Scotland, the Netherlands, and other countries – even if not always in the ideal, population register form. This opens up the possibility to study fertility declines in these countries, too, in more detail than previously, while the emergence of GIS has also facilitated important new ways of analyzing data spatially.

For instance, the relationship between fertility change and migration processes is an enormously important area where the range of new data available promises substantial advances in our understandings of the dynamics of population change. Migration has been both a strength and an Achilles heel of demographic history. In some circumstances, usually when crossing borders overseas in the past, migratory populations have been exceptionally well documented, providing insights unavailable elsewhere in the historical record. Ships' manifests and medical records, along with immigration and quarantine records, have, for instance, enabled historians of the populations arriving in Tasmania and Australia to mount a range of significant historical demography studies, notably of health and mortality (for example, McCalman and Kippen 2015). The mobility of individuals within a national state jurisdiction has, however, often been less carefully documented. These poorly documented internal migratory segments and flows often involve age and sex selection effects which must have had strong influences on the changing character of nuptiality, fertility and, indeed, mortality, both in receiving and donating communities. In the case of Britain, the new ICeM database, with its information on the birthplaces of all individuals at each successive census from 1851 to 1911, promises the capacity to study the interaction between migratory movements and the fertility declines of different communities to a much greater degree of rigour than before.

There is much to look forward to in the greater precision of much higher-resolution, more detailed pictures of demographic change during fertility declines. However, for the full intellectual return on this data revolution to be achieved, it will be important for demographic historians not to be content merely with numbers, rates, quantitative modelling exercises and tests of statistical significance. This capacity to study demographic change in much more dynamic and spatially flexible ways can enable demographic history to reconnect with a more political and cultural formulation of the drivers of demographic change, in terms of what Philip Kreager has coined the ‘compositional demography’ of open population behaviour (Kraeger 2015), what Jennifer Johnson-Hanks calls ‘vital conjunctures’ and what I have called ‘communication communities’. When combined with the appropriate qualitative archival evidence, the current data revolution in the study of fertility change can, for instance, help us to examine how communities were formed by different kinds of persons both moving into and moving away from them, and how those flows related to changing and often gendered local labour market opportunities. It may also help us to understand how all of this was associated with locally circumscribed collective institutions of civic society and self-government, as well as prevailing values and norms of childrearing (see Praz 2005 for an excellent example of a local comparative study of this sort).

In this way, a greater richness of quantitative data on fertility, migration and mortality should facilitate a greater engagement between demographic history and historians of the culture, institutions, government and policies pursued in specific communities in the past. With falling fertility rates more precisely understood, it should also be possible at last to study its relationship with two other major factors of relevance, which have previously been largely unstudied by demographic historians: sexual relations and disease.

Several diseases have implications for fertility, such as malaria, tsetse fly disease, genital tuberculosis and filariasis. However, the single category of disease that most unequivocally directly affected the fertility of certain groups during the era of modern fertility declines were the sexually transmitted diseases. Gonorrhoea was untreatable before the appearance of the sulphonamides in the 1930s. It is well-known that it caused both chronic pain and sterility in a proportion of female sufferers, due to pelvic inflammatory disease and blockage of the fallopian tubes. It is less well-known that it also sterilized a proportion of infected males, due mainly to epididymitis. Chlamydia, which was unknown to science before the 1950s but certainly existed, also causes female sterility but probably rather less frequently than gonorrhoea. Syphilis, which was known and feared, did not necessarily have much overall net effect on fertility but certainly contributed to higher rates of miscarriage; spontaneous abortion; neonatal, perinatal, infant and maternal mortality; and, of course, to general severe ill-health and premature mortality in the population.

It is somewhat surprising that demographic historians have almost completely ignored the possibility of a relationship between what were historically called venereal diseases and fertility decline, since several medical contemporaries were convinced of its importance, as also were many feminists around 1900. It is known to be a disease more strongly associated with urban than with rural communities and so it is curious that demographic historians should have ignored it, given the repeated findings that fertility declines have tended to occur first in urban settings. Almost certainly the main reason demographic historians have avoided studying venereal disease is the difficulty of accessing appropriate quantitative data to produce estimates of its incidence. Some progress has recently been made in this direction in relation to the demographic history of England and Wales and it is quite possible that efforts to locate and work with appropriate evidence in other countries could produce estimates with which to evaluate the importance of sexually transmitted infections (Szreter

2014).

As far as the relationship of fertility decline to sexual attitudes and behaviour is concerned, it would be a great shame if the last opportunity was lost to conduct oral history projects. Only during the next decade or so can we still interview cohorts whose marriages were involved in the fertility declines in their respective countries. There are already many countries in which that possibility is no longer available, because their fertility declines were completed by the end of the 1930s. However, there are many other countries, both in Europe and elsewhere, which have experienced dramatic secular reductions in marital fertility more recently. In these countries there is still the possibility to conduct interviews with sample couples and individuals. Such interviewing work has proved invaluable where it has been conducted, producing findings simply unavailable from other approaches (see, for example, Johnson-Hanks 2006 and Szreter and Fisher 2010). Demographic historians should not restrict themselves to quantitative methods and should engage with and encourage or collaborate with scholars with the requisite skills to mount these demanding and intensive interview projects as a matter of urgency.

References

- Johnson-Hanks, J. (2006). *Uncertain honor. Modern motherhood in an African crisis*. Chicago: University of Chicago Press.
- Kreager, P. (2015). Population and the making of the human sciences: a historical outline. In: Kreager, P., Winney, B., Ulijaszek, S. & Capelli, C. (Eds.). *Population in the human sciences. concepts, models, evidence*. Oxford: Oxford University Press.
- McCalman, J. & Kippen, R. (2015). Mortality under and after sentence of male convicts transported to Van Diemen's Land (Tasmania), 1840-1852. *History of the Family*, 20, 3.
DOI: <http://dx.doi.org/10.1080/1081602X.2015.1022198>
- Praz, A.F. (2005). *De l'enfant utile a l'enfant precieux. Filles et garcons dans les cantons de Vaud et Fribourg (1866-1930)*. Editions Antipodes: Lausanne Suisse.
- Szreter, S. (2014). The prevalence of syphilis in England and Wales on the eve of the Great War: re-visiting the estimates of the Royal Commission on Venereal Diseases, 1913-1916. *Social History of Medicine*, 27 (3), 508-529.
DOI: <http://dx.doi.org/10.1093/shm/hkt123>
- Szreter, S. & Fisher, K. (2010). *Sex before the sexual revolution*. Cambridge: Cambridge University Press.

Biography

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Chapter 8

Concepts and proxies: refining the old, and introducing new

In a gentle way, you can shake the world

Mahatma Gandhi

Five bottom-up approaches to improving future theories discuss the limits of definitions we currently employ, introduce new ones, and refine the old.

Sedentariness and rootedness: a socio-demographic history that remains to be written

Fabrice Boudjaaba

Sedentariness is a research subject with a paradoxical status in historical demography and perhaps even more so in the social sciences. Implicitly associated with rural regions or societies that have not yet undergone the processes of mass industrialization and urbanization, sedentariness has rarely been examined in its own right. It is usually an undemonstrated pre-requisite, or even an implicit element, of discourse. A keyword search in any library or online catalogue is proof enough of this. Hits reveal two types of sedentariness, which are only indirectly or distantly related to historical demography. The first type of sedentariness, as defined by prehistory and anthropology, is the transition from nomadism to permanent settlement in a given place, accompanied by a complete change in the way of life of a population. The second definition we encounter, in the fields of medicine and sociology, is that of behaviour that can have a severe impact on public health.

Extended to the broadest sense of populations who live in one place, as opposed to migrant populations, sedentariness yields very few hits in keyword searches of the library catalogues. And yet – and this has been a frequent criticism - the whole of historical demography has been constructed on the study of sedentary populations, because only the fertility of settled families can be studied through family fiches reconstituted from parish records. Only in these cases are both a marriage date and an end date to the marriage known, so that we can track the whole lifespan of the couple, from their marriage to the death of the first spouse. The current crisis in historical demography is partly due to this constitutive bias. Indeed, we could see the boom in studies on mobility and migration as a reaction against an approach that has been dominant for too long. The interest in migrant populations has simultaneously been accompanied by a strong methodological renewal, with, in particular, the development of life course approaches and the emergence of refined models to explain individual and family behaviours, which break with the conventional approach based on aggregate statistics.

In sum, sedentariness as a concept has been almost entirely absent from historical demographic research during the past 20 years, other than implicitly, as the reverse of mobility. Sedentary populations themselves seem not to have been on the radar of historical demographers, as though change in societies could only occur through geographical mobility, and as though sedentariness necessarily means ‘immobile history’, to cite the title of a book by the Canadian historian Gérard Bouchard (1972). In terms of our knowledge of demographic behaviour in the narrow sense (fertility, mortality, nuptiality, etc.), this lower level of interest is perfectly understandable. Those issues, already well covered by village monographs, are unlikely to yield the breakthroughs in knowledge that would justify major new surveys of that kind. Meanwhile, the history of mobile populations has benefited from the methodological developments in the discipline. The motivations of migrants, the family configurations in which they develop and other related topics have been examined through the

prism of life course and longitudinal studies and the social and family networks of solidarity. More broadly, the social history of populations has focused on mobile populations, particularly in the nineteenth century in connection with urbanization, rural exodus and the industrial revolutions. This is evidenced by the multitude of studies on working-class populations and industrial cities. Conversely, scant attention has been paid to sedentary populations, whether rural populations or indigenous populations of areas undergoing industrialization.

Therefore, it is not just a demographic but also a social history of sedentary populations that remains to be written. Such a history would also have to take into account the motivations, family configurations and relationship networks of those who stay put. Perhaps it should even look into family strategies that depend on sedentariness, by estimating the economic, social and political benefits of rootedness. The history of these populations should also benefit from new methodological developments in the discipline, particularly from the new emphasis on the analysis of individual behaviours and motivations that moves beyond the analysis of aggregate data (Lucassen & Lucassen 1997). Such approaches have almost completely been overlooked. The history of the populations of the suburbs is symptomatic of this. Only a handful of volumes devote more than a few pages to the village populations that in fact form the substratum of the populations of industrial cities. Although the descendants of these villagers become a tiny minority in the cities, they are sometimes more numerous in absolute terms than their village forebears (*Annales de Démographie Historique* 2013).

Behind these surveys on the sedentariness of populations, there is a research subject for the social history of populations: rootedness – that is, the processes through which people feel they belong to the territory in which they live. This involves investigating the identity of sedentary populations and understanding, with the new tools of demography, how that rootedness may be both an explanatory factor in sedentariness and an element to be taken into account in the analysis of the pathways and strategies of individuals. Most historical analyses of behaviour of any kind continue to be constructed on the basis of a distinction between natives and non-natives, or between stayers and leavers. These distinctions have proven useful, but they do not capture the full picture. For example, we have yet to examine and measure the effects of varying degrees of family and genealogical rootedness on the mass behaviour of sedentary people. While all sedentary people are natives, according to the minimalistic definition of historical demographers, they do not all benefit from the same networks of relationships or the same resources in their home municipalities. Through a systematic analysis of the benefits that rootedness in a given place can confer on families, we may begin to approach sedentariness as a behaviour and a pathway of life with as much complexity as mobility.

Beyond that, from an epistemological perspective, the fact that historians have focused on mobile populations for the past 30 years is in itself a phenomenon to be investigated, as though the study of change – the fundament of our discipline – were synonymous with geographical mobility.

References

- Bouchard, G. (1972). *Le village immobile – Sennely en Sologne au XVIIIe siècle*. Paris: Plon.
- Boudjaaba, F. & De Luca Barrusse, V. (Eds) (2013). Populations de banlieue. Une histoire à revisiter. [Special issue]. *Annales de démographie historique*, 7-172.
- Lucassen, J. & Lucassen, L. (Eds.) (1997). *Migration, migration history, history: old paradigms and new perspectives*. Bern: Peter Lang.

Biography

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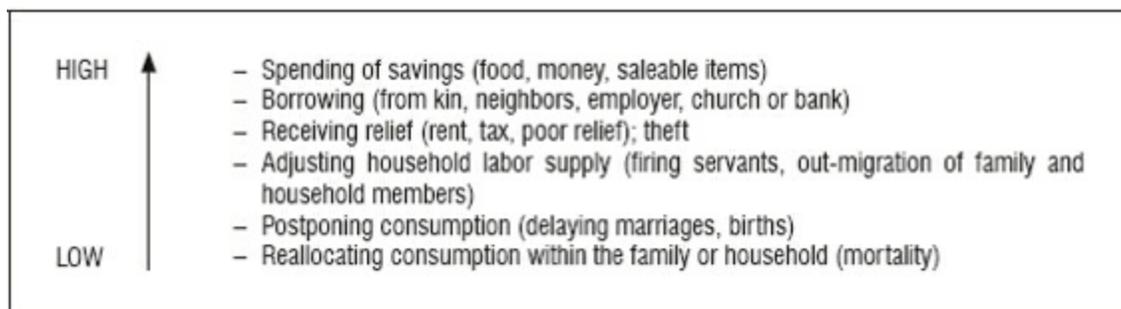
Using a dynamic standard of living concept on cross-sectional data

Tommy Bengtsson

There is a rich body of literature describing the long-term development of living standards based on macro records such as gross domestic production per capita, real wages, heights, literacy rates, and life expectancy. While most measures refer to the entire population, some, like real wages, refer to a particular segment of the population, in this case wage earners. Heights, likewise, typically refer to males, since the data stem from military records. Studies based on such records tell us about striking improvements in every aspect of life, starting in the mid-nineteenth century. From then until today, consumption and literacy have increased tenfold; heights have increased by more than ten centimetres; and life expectancy has almost doubled (Floud *et al.* 2011). Macro studies also tell us that vulnerability to short-term economic stress, expressed as a mortality response to high food prices, has diminished over time (Lee 1990). The fertility response has, however, been remarkably similar across space and time. These studies of macro-data inform us about the timing of economic and demographic trends and about variation from year to year in different countries, but obviously not about how the situation has changed for different socio-economic groups. To investigate such questions, we turned our interest to cross-sectional micro-level data in the 1980s.

Cross-sectional data on the economy of individuals and households provided the necessary details on the extent of poverty and the distribution of wealth. They show that while 80% of the world population lived in poverty in the 1900s, it was 50% in 1980, and is 10% today. While economic theory stipulates that inequality tends to increase over time when a country develops, as certain areas, individuals and classes are forerunners, and then decreases, as others catch up, the empirical evidence only partly confirms this pattern. Income inequality did indeed decrease in the West between 1910 and 1945, and it did so dramatically, but it has increased again in recent decades. The problem with cross-sectional microdata is that they do not allow for dynamic and causal analysis, which is why we turned our interest to longitudinal micro-level data in the 1990s.

Longitudinal microdatasets for pre-industrial populations in Sweden, Belgium, Italy, China and Japan show strong differentials in the distribution of wealth, with the West being much more unequal than the East (Bengtsson *et al.* 2004). Such data has allowed us to use a new dynamic standard of living concept: *the ability to overcome short-term economic stress* (Bengtsson 2004). The focus of this concept is on demographic responses, whether intentional, such as migration, postponed marriages and delayed births, or non-intentional, such as mortality. A mortality response to food price increases is obviously an indicator of very low living standards, since it indicates a decreased response of the immune system to normally rather harmless diseases, while, conversely, an absence of demographic response is an indicator of high living standards, with levels in between as shown in Figure 1.



Note: see Bengtsson (2004).

Figure 1. The new standard of living concept: economic and demographic responses to short-term economic stress – from low to high standard of living.

Patterns of demographic response to food price fluctuations mirror the nature and security of food entitlements both in Europe and Asia: in the West with a socio-economic gradient, in the East with a household gradient. Measures taken to smooth consumption, such as delaying births, postponing marriages and out-migration, were not sufficient to prevent family members from dying after years with high food prices. Not only children but also adults of working age suffered in bad years (Bengtsson *et al.* 2004). In the West, individuals who were net producers, such as free-holding and tenant farmers, were buffered from the effects of high prices, as they produced more food than required by their own households. Labourers were at especially high risk, since they must both sell their labour on the market and purchase food at market prices. In the East, it was non-stem kin belonging to the household that suffered in harsh years. However, the situation for these vulnerable groups improved at the end of the nineteenth century in parallel with increasing real wages, heights and life expectancy (Bengtsson & Dribe 2005; Lee & Campbell 2005).

While the studies based on longitudinal micro-level data have provided new insights on living standards across socio-economic groups and over time, they are nevertheless based on data for a relatively small number of parishes or possibly a region. Even though we find similarities, for example between workers in areas of eastern Belgium and southern Sweden, and between farmers in north-eastern China and mid-Japan, which make it likely that our results are not context-specific, we still would like to widen our coverage to ensure the accuracy of our findings.

This is why we have turned our interest to cross-sectional data once again, data that have recently become widely digitized. Can we employ our new concept of standard of living to such data? At first, it seems impossible, since the new concept is based on both instant and delayed responses to changing environments, particularly changes in food prices. However, cross-sectional data typically contain information on the entire population at their year of birth and in the case of surveys sometimes also on past deaths, in addition to information on family structure, occupations, etc. Therefore, unpacking the information by calendar year in cross-sectional datasets will make the use of the new concept of living standard possible. It will most certainly enable the analysis of the effects of food prices on fertility, and sometimes also their effects on marriages and deaths. This approach has great potential: not only by widening the coverage of previous studies based on longitudinal individual level data, but also in its own right, and not only for historical data but also for contemporary data, in particular for developing countries.

References

- Bengtsson, T. (2004). Living standards and economic stress. In: Bengtsson, T., Campbell, C., Lee, J. *et al.* *Life under pressure: Mortality and living standards in Europe and Asia, 1700-1900* (27-59). Cambridge, Massachusetts: MIT Press.
- Bengtsson, T. & Dribe, M. (2005). New evidence on the standard of living in Sweden during the eighteenth and nineteenth centuries: long-term development of the demographic response to short-term economic stress. In: Allen, R. C., Bengtsson, T. & Dribe, M. (Eds.). *Living standards in the past: new perspectives on well-being in Asia and Europe* (341-372). Oxford: Oxford University Press.
- Floud, R., Fogel, R. W., Harris, B. & Hong, S. C. (2011). *The changing body: health, nutrition and human development in the Western World since 1700*. Cambridge: Cambridge University Press.
- Lee, J. Z. & Campbell, C. (2005). Living standards in Liaoning, 1749-1909: evidence from demographic outcomes. In Allen, R. C., Bengtsson, T. & Dribe, M. (Eds.). *Living standards in the past: new perspectives on well-being in Asia and Europe* (427-460). Oxford: Oxford University Press.
- Lee, R. D. (1990). The demographic response to economic crisis in historical and contemporary populations. *Population Bulletin of the United Nations*, 29, 1-15.
DOI: <http://www.popline.org/node/374367>

Biography

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Did you say infanticide?

Isabelle Séguy

Many historical demographers have looked at the question of infanticide, seeking to quantify the phenomenon and to determine its impact on population dynamics. Some works focused on a comparative approach between animals and humans, adopting a strictly behaviourist analysis (Hausfater & Blaffer Hrdy 1984); or explained the variation of infanticide (and foundlings) by economic difficulties or moral and social control (Jackson 2002). More recently, Prudhomme (2012) explored the psychological and legal aspects, while Sandin (2013) examined popular culture and state and church attitudes toward infanticide.

Infanticide is an ancient practice, as old as humankind itself, and still exists today. However, before it can be measured in historical populations, the framework for qualifying certain acts as infanticide must first be established. Under its legal definition in France infanticide is the murder, premeditated or otherwise, of a newborn infant who was born alive and, according to some case law decisions, viable. This simple definition is difficult to implement in law (and in fact the term infanticide as such has disappeared from the penal vocabulary since 1994). First, it implies that there was an intention to kill. Second, it requires proof that the child was indeed born alive and viable; and third, it calls for agreement on the definition of the term 'newborn' (generally a child less than three days old). These three conditions mean that prosecutions for infanticide are rare, and convictions even more so.

It also means that legal sources alone do not provide an adequate measure for the quantification of the phenomenon. It is probable that these sources cannot be used at all for social analysis, since the legislation in force over many centuries only ever targeted a single category of person: that of unmarried mothers. The social, political and religious context of the period under study is the second factor that calls for caution, as it may affect the amount of cases of infant deaths registered as cases of infanticide. From the very start of the early modern period, the church and the state sought to stamp out infanticide, a practice which deprived the former of worshippers and the latter of subjects (especially soldiers). French legislation, like that of its neighbours, regularly denounced the infanticides committed by unmarried or widowed mothers, from the edict of Henri III (1556) to the *Code d'instruction criminelle* of 1808. At the same time, it overlooked those cases carried out by established couples, provided that the newborn was christened or its birth registered. This legislative bias has produced a distorted image of the nature, frequency and perpetrators of infanticide.

The obligatory reporting of pregnancies was intended to protect single women from accusations of infanticide in the event of miscarriage or stillbirth. Given the high levels of perinatal mortality in pre-industrial populations, this was a useful precaution. This third point is a question of demography, as much as of medicine or childcare. Chances of survival were dictated as much by the circumstances of the pregnancy and the childbirth as by the care given to the newborn. The precarious living conditions and the inexperience of unmarried mothers, often isolated young servant girls who were shunned by

their peers, inevitably led to higher-than-average (natural) perinatal mortality among this group. But, under the law, all deaths of newborns in this population category were systematically presumed to be cases of infanticide. The creation of institutions to aid and support ‘fallen’ women helped to reduce infanticide in towns and cities, but without lessening the excess mortality of their children or eradicating the practice altogether.

The fragility of newborn infants is both biological and social, and this period of uncertainty with regard to their fate is marked, in all societies, by a waiting time between a child’s birth and his or her presentation to the community. In early modern France, this period traditionally lasted for around a week, before being shortened to three days, and then to a few hours after birth under pressure from the Catholic Church. The aim of this reduction in the waiting period was to save as many souls as possible. The provision of a waiting period before registering christenings and, more recently, births in the civil records introduced a period of limbo, during which a child who was born alive but died before registration was considered as a stillbirth. In other words, there was a period of three days during which the newborn child of a married couple could die, of natural causes or otherwise, without any risk of prosecution for the parents. All chrisoms, all infants presented lifeless to the registrar, did not necessarily die from complications of childbirth or congenital malformations, but may well have died simply from a lack of care (for example, because the ligature of the umbilical cord was performed incorrectly or not at all, or due to the use of cold or dirty water, exposure to the elements, lack of food or warmth, etc.). In this context, an early christening was a life-threatening event for infants barely out of their mother’s womb, who were often taken to the baptismal font in all weathers. The initial formulation of ‘child now lifeless’ in the records of the public registry suggests that the legislators were well aware of this high-risk period.

The technique of passive infanticide has been highlighted by historical demographers. It should be seen in relation to the severe disabilities liable to affect a non-negligible share of newborns; for example, following the long and difficult deliveries of their primiparous mothers. These were children who medical practitioners were unable to treat and who would have become an impossible long-term burden for their family. Nor was the phenomenon of passive infanticide unrelated to the growing concern – the obsession, even – of populations and of the Catholic authorities to ensure the spiritual survival of newborns at any cost, sometimes at the expense of their earthly survival. In the Late Middle Ages, and throughout the early modern period, the death of infants, whether natural or ‘assisted’, was socially and religiously accepted.

These popular beliefs bring us to the fourth point for consideration; that of the ideal family. This is not a moral question, but a simple financial calculation: how many – and which – children should one raise to ensure the survival of the family name and estate? The question of the number of mouths to feed and their cost was not only a matter of concern for the poorest families at times of scarcity, when infant mortality often rose sharply (a phenomenon generally interpreted in terms of the lesser physiological resistance of the youngest children). It was a constant concern among all families, and the purpose of many traditional rituals was none other than to test the physiological resistance of the newborn.

A non-natural selection process occurred therefore between birth and registration that was rarely questioned. Not even by demographers, who long believed that the natural sex ratio at birth was around 105 boys per 100 girls. Yet such a figure already implies a preference for boys, in terms of attention or registration; there is no need to raise the threshold (to 107, for example) before suspecting the infanticide – whether active or passive – of young girls. Indeed, from a strictly biological viewpoint (excluding certain specific health or environmental contexts), the chances of

having a boy or a girl are equal (Brian & Jaisson 2007).

Of course, not all newborns needed help to shed their mortal coil. And those who were assisted along the way often remain invisible to historical demographers. Duly registered by the church or the civil registrar, they became a statistic and are included in calculations of births, fertility and deaths. It is not the least of paradoxes that the visible object is sometimes no more than a decoy, while the true victims remain hidden from view. But that object is – notwithstanding the occasional court cases – both unstable and elusive: health and medical factors, and the weight of Ancien Régime demography form its boundaries; economic, patrimonial and societal factors define its contours; religious and political contexts dictate the degree of condemnation attached to it. Infanticide forms part of a set of beliefs, behaviour and rituals that give it meaning and essence. In the early modern period it was tolerated by the state, by the church and by society as a whole – on the condition that morality remained intact and that the soul of the newborn was saved.

Although a truly individual behaviour, infanticide was embedded in the collective unconscious of pre-industrial populations (i.e. populations without effective medical assistance), based on the belief that a newborn's life was poised on a knife-edge. The biological fragility of newborns offered broad scope for doubt about their vital status (a child must be born alive for infanticide to be committed) and the true causes of their death. Moreover, the nutritional and psychological condition of women during pregnancy (refusal to accept a child and the denial of pregnancy have always existed) had a decisive impact on children's chances of survival, and deserves closer analysis.

Moral or penal crime? Psycho-social problem? A simple method for controlling the size or quality of a population? The question of infanticide appears infinitely more complex. Following its legal definition, the phenomenon of 'infanticide' should not be confused with that of foundlings, abortion or passive infanticide, on the grounds that, for demographers, the result is the same: a number of births are missing, which impacts the whole population in the short, medium and long term.

Further research could focus on the four points I have mentioned to introduce new themes in historical demography. For example, the question of infanticide could be linked to mothers' diet, as the biological (and psychological) frailty of the mothers and their babies is affected by the sanitary context in which they live, especially during periods of food scarcity and during severe famines, which regularly occurred during modern times. Moreover, we ought to highlight how cycles of infanticide penalization, severe or more tolerant, may be closely intertwined with cycles in the authorities' preoccupations with population. For example, is it the case that the stronger the impression of depopulation (or of an unsatisfied need for more people), the more attention the authorities tended to pay to these lost births, and the more severe the penalization of infanticide? Furthermore, indirect measures of infanticide – as we have no official statistics – could also reveal more about popular culture and mentalities than what we are able to see through civil and religious laws, although it deserves to be emphasized that the jurisprudence seems to reflect popular opinion more than the rigor of the authorities.

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References

- Brian, E. & Jaisson, M. (2007). *The descent of human sex ratio at birth: a dialogue between mathematics, biology and sociology*. Dordrecht: Springer.
- Hausfater, G. & Blaffer Hrdy, S. (Eds.) (1984). *Infanticide: comparative and evolutionary perspectives*. New York: Aldine.
- Jackson, M. (Ed.) (2002). *Infanticide: historical perspectives on child murder and concealment, 1550-2000*. Aldershot: Ashgate.
- Prud'Homme, V. (2012). *Infanticide: une actualisation conjugale de problématiques singulières: problématique de mort d'enfants: analyse du parcours de vie des femmes*. Doctoral thesis in Psychology at the University of Rennes 2. (<https://tel.archives-ouvertes.fr/tel-00663342>)
- Sandin, B. (2013). Infanticide, abortion, children and childhood in Sweden, 1000-1980. In: Fass, P. S. (Ed.). *The Routledge history of childhood in the Western world*. London, New York: Routledge (The Routledge histories)

Biography

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The silence on male fertility in historical populations

Hilde L. Sommereth

Historical research on fertility has paid little attention to men, preferring instead to focus heavily on the history of women's childbearing behaviour. In this gendered context, most parts of Western Europe experienced a fertility decline in the late nineteenth century. A number of books and articles have been written on this subject, emphasizing either changing economic, social and cultural environments as the main structural or diffusion effects, or a complex mix of them all. But why is it that men are neglected as research objects?

One answer is related to biology. Women have their 'fertile window', their nine months of pregnancy and breastfeeding, which, if practiced, provides a natural delay in a woman's return to fertility. Later, there follows the menopause. In sum, the biological life course of women has the advantage of providing accurate measurements, which are a keystone of demography. Consequently, for decades women's fertility patterns have been reconstructed, with a strong emphasis on their spacing and/or stopping behaviour.

The reproductive span of men is less clearly defined. Biologically, a man can offer his sperm whenever he wants. Like women, his infertility increases with age. However, in contrast to women, men can continue to father children well into old age. As a result, his behaviour does not have the distinct life cycle characteristics of his female counterpart. For this reason, shifting fertility trends have usually been ascribed to changes in female behaviour, while male fertility behaviour has been regarded as more or less constant. But was it really constant? In the following paragraphs, I will dwell on two aspects of reproductive behaviour (or the lack of thereof) that may be worth studying in a gendered historical context, with special attention for male behaviour: childlessness (or the postponement of the first child) and multi-partner fertility.

Studies of contemporary societies suggest that men do have their own independent fertility history. Firstly, it should be noted that more men than women remain childless, either voluntarily or involuntarily (Lappegård *et al.* 2011). Interestingly, childlessness among men is most pronounced among those with low education, which is in stark contrast to the positive relationship between educational level and childlessness among women. This is in line with economic theories suggesting that a man with higher earning power (education) is potentially more able to support a family and therefore more attractive as a partner and as a father to a future child (Lappegård *et al.* 2011).

Some studies have specifically addressed the occurrence and prevalence of childlessness in historical populations (for example, Rowland 2007; Van Bavel and Kok 2010). A remarkable similarity is found across Europe, with a peak in childlessness rates for the 1880-1910 birth cohorts, followed by a drop during the first fifty years of the twentieth century (Rowland 2007). The U-shape has been explained in terms of economic evolution. Involuntary childlessness dominated in pre-industrialized societies, while increasing voluntary childlessness is associated with the effects of economic development and modernization: unstable marriages; higher union dissolution rates;

postponement of childbearing; changes in norms and values with a greater emphasis on individualization; social changes in female labour market patterns; and the pill. Recently, several scholars have challenged these more or less mutually exclusive 'states' by acknowledging huge spatial variations, moving on from there to consider the joint effects of economic stress, trends in marriage and family formation as a complex and continuously shifting phenomenon (Rowland 2007; Van Bavel and Kok 2010). However, none of these studies address possible changes in behaviour among men. Interestingly, in their study of childlessness within marriage during the inter-war period, Van Bavel and Kok (2010) found several indications that more or less deliberate childlessness related to a modern lifestyle (for example, to safeguard a career) existed before the so-called second demographic transition. Generally, the shift from 'traditional' to 'modern' reproductive behaviour has been explained in terms of the liberation of women, and the changed power relationships and negotiation positions that this created. But how did this cultural change affect male fertility? Did men act as obedient servants or did they leave independent imprints of behaviour not yet known to us?

Secondly, we know from contemporary studies that multi-partner fertility has been on the increase, especially among men (Lappegård *et al.* 2011; Lappegård and Rønsen 2013). Contrary to the correlation between childlessness and education described above, the propensity to have children with more than one woman does not show any effect of educational background. A suggested explanation is the phenomenon of the 'recirculation' of 'slightly used' men, in that women deliberately select men on the basis of their proven qualities (for example, having fathered a child and provided for it within a relationship), rather than on the basis of educational level.

In pre-industrial times, when young adult mortality was still relatively high, remarriage was an option when a spouse died (Van Poppel 1995 and Matthijs 2003, who both discuss the extent to which this was an identifiable characteristic of the Western European marriage pattern). This could potentially result in different fertility trajectories for men and women. The propensity for remarriage was greater among widowed men than among widows. At the same time, the age gaps between the spouses were generally wider compared to couples who married for the first time. For example, Van Poppel (1995) found that both widowed men and widowed women, if remarrying, usually preferred their new spouse to be young and childless or, at most, to have young children. In terms of fertility, these findings are intriguing. On the one hand, we have widowers who preferred young and childless women, and on the other hand we have widows who preferred young and childless men. Neither of these scenarios would have affected a woman's fertility behaviour substantially. The second scenario, however, could potentially have affected men's reproductive behaviour. When young men married widows, many of their brides must have been past the age of menopause. Therefore, men were more affected than women by this form of successive monogamy, since in these cases a man's reproductive cycle would not start until his second marriage. A delayed age of paternity also meant that a man still had relatively young children at home when he eventually reached old age, thus affecting the family organization and composition. Knowing that the succession of landed property usually followed the male line, I would argue that age of paternity should be investigated more thoroughly.

With increased access to individual life history datasets covering large time series across different geographical locations, the longitudinal analysis of men's reproductive behaviour should now be addressed more seriously. Increased life expectancy, together with low fertility, has resulted in an increasingly higher proportion of ageing people in the population, which poses significant challenges for the welfare system. The Nordic welfare system (I assume this is true for other countries as well) relies on a system of institutional care combined with informal care for the elderly members of society, the latter usually being provided by adult children. Consequently, there is a historical

continuity at play, in the sense that childlessness makes people vulnerable. In view of the content of this text, it should not come as a surprise to learn that men are especially vulnerable. The current discourse in the social sciences and in the media suggests that the gendered fertility pattern of today is a mirror of our modern individualized society, where women own the narratives of a changed fertility regime. But is this really the case? This is where historical demographers should step in.

References

- Lappegard, T. & Rønsen, M. (2013). Socio-economic differences in multi-partner fertility among Norwegian men. *Demography*, 50(3), 1135-1153.
DOI: <http://dx.doi.org/10.1007/s13524-012-0165-1>
- Lappegard, T., Rønsen, M. & Skrede, K. (2011). Fatherhood and fertility. *Fathering: A journal of theory, research and practice about men as fathers*, 9(1), 103-120.
DOI: <http://dx.doi.org/10.3149/fth.0901.103>
- Matthijs, K. (2003). Frequency, timing and intensity of remarriage in 19th century Flanders. *The History of the Family*, 8(1), 135-162.
DOI: [http://dx.doi.org/10.1016/S1081-602X\(03\)00010-1](http://dx.doi.org/10.1016/S1081-602X(03)00010-1)
- Rowland, D. T. (2007). Historical trends in childlessness. *Journal of Family Issues*, 28(10), 1311-1337.
DOI: <http://dx.doi.org/10.1177/0192513x07303823>
- Van Bavel, J. & Kok, J. (2010). Pioneers of the modern lifestyle? Childless couples in the early twentieth-century Netherlands. *Social Science History*, 34(1), 47-72.
DOI: <http://dx.doi.org/10.1017/S0145553200014073>
- Van Poppel, F. (1995). Widows, widowers and remarriage in nineteenth-century Netherlands. *Population Studies*, 49(3), 421-441.
DOI: <http://www.jstor.org/stable/2175256>

Biography

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Crop prices and demographic outcomes – A critical re-evaluation of the proxy

Kai Willführ & Charlotte Störmer

Correlations between crop price changes and demographic outcomes have been found to be absent or weak in many populations of eighteenth-century Europe. In this contribution, we argue that this apparent lack of relevance of crop prices for child mortality and fertility should not lead us to abandon this economic approach to demographic trends, which might be due to the flawed measurement of this proxy.

The development of average annual or average monthly crop prices over time is a topic that has attracted considerable interest among historical economists and demographers, and has provided the basis for investigations into the association between changes in crop prices and demographic parameters, such as child mortality and fertility (for a well-known project on this topic see, for example, Bengtsson *et al.* 2004). Because landless labourers living in past centuries spent a substantial share of their wages on food, it is usually assumed that historical crop prices reflected the cost of food (and are therefore an important indicator of living costs in general) for both landless agricultural and factory workers. Consequently, moderate changes in crop prices may be expected to have had observable effects on fertility and on child and adult mortality. This association has been confirmed for periods in which major changes in economic conditions – for example, remarkable changes in crop prices – occurred. But it is more difficult to detect in historical populations in eighteenth-century Europe (Amialchuk & Dimitrova 2012; Willführ & Störmer 2015).

We raise three concerns regarding the current common use of crop prices as proxies for food costs and overall living costs, and argue that improved measurement of the proxies for cost of living will help disentangling the complex relationship between the economy and demography.

First, if we assume that there was a direct relationship between high prices for the predominant crops (often rye and wheat) and food prices in general, and if we further infer that there was a proportional increase in the amount of money people spent on crops, we ignore the substitution effect. If rye or wheat was expensive due to a poor harvest, at least some share of rye or wheat consumption would have most likely been replaced by the consumption of other crops such as oats, which were used mainly as horse feed under normal economic conditions. Although this implies that people changed their dietary habits, a substitution of this kind would have reduced costs and mitigated nutritional deficiencies.

Second, the link between crop prices in trans-regional trade centres and the prices of local food (for example, bread prices in the local bakery) is not satisfactorily understood. Crop prices in trans-regional markets might not have followed the same dynamics as prices in local markets or in food exchanges in local subsistence communities, if the crop failure was localized. Because local prices and wages depended on the local labour supply, which itself depended on local fertility and

migration, some studies of fertility have focused on trans-regional crop prices to avoid problems of endogeneity. However, given the long time-lag and the compensating effect of labour migration, we argue that studies of fertility should use local price indices, since these indices more closely reflect local food and living expenses than the trading prices of a trans-regional market. This issue is, of course, related to the level of market integration, which differs over time and between places, but is not yet taken into account in the discussion of the contradictory findings with regard to the impact of food prices on life histories.

Third, historical demographers widely ignore that there are two kinds of possible consequences of insufficient food supply on demographic outcomes: on the one hand, behavioural or cultural effects, such as the postponement of marriage due to economic reasons; on the other hand, physiological effects, such as reduced or delayed fertility due to amenorrhea. We want to stress here that the importance of the physiological effects of high food prices should always be taken into account. As is the case among people living in developing countries today, in historic populations the consequences of having an unbalanced diet (malnutrition) were also more pronounced than the consequences of suffering from caloric deficiencies (undernutrition). Many studies of the physiological effects of nutrition suggest that even moderate malnutrition has a bigger impact on fertility than undernutrition. Crop prices might be good proxies for actual food expenses, but these prices mainly reflect caloric supply (in other words, undernutrition), while telling us little about the sources of those calories. As a result, the physiological impact on fertility of price increases for one or two crops might be relatively small (especially during minor food shortages) in contrast to increased prices for animal source food (like butter, eggs and bacon). In light of these considerations, we believe it would be useful to include the prices of other essential food stuffs, since this information could make it easier to disentangle the effects of malnutrition and undernutrition, which have a different impact on fecundity and the immune function.

The three points of criticism outlined above are worth taking into account in future research. We believe that these methodological limitations help to explain why correlations between crop price changes and demographic outcomes have been found to be absent or weak in many populations of eighteenth-century Europe. Incorporating the above mentioned considerations might help us to gain a better understanding of this complex relationship.

References

- Amialchuk, A. & Dimitrova, E. (2012). Detecting the evolution of deliberate fertility control before the demographic transition in Germany. *Demographic Research*, 27(19), 507-542.
DOI: <http://dx.doi.org/10.4054/DemRes.2012.27.19>
- Bengtsson, T., Campbell, C., Lee, J. *et al.* (2004). *Life under pressure. Mortality and living standards in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Willführ, K. & Störmer, C. (2015). Social strata differentials in reproductive behaviour among agricultural families in the Krummhörn region (East Frisia, 1720-1874). *Historical Life Course Studies*, 2, 58-85.
DOI: <http://hdl.handle.net/10622/23526343-2015-0006?locatt=view.master>

Biographies

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Chapter 9

Stand together, engage, and reach out

Cooperation is not a sentiment – it is an economic necessity

Charles Steinmetz

Six papers discuss collaborative research practices, data sharing, citizen science, and the impact of research findings on daily life.

Data sharing in historical demography

Steven Ruggles

When I began studying historical demography in the mid-1970s, very little public use data existed. Historical demographers collected their own data. Many did family reconstitutions, while others collected information from listings of a census or *status animarum*. Almost all studies focused on a particular community. Computerized data processing was still a novelty for historians.

I went to graduate school at the University of Pennsylvania in 1978, so that I could participate in the Philadelphia Social History Project (PSHP), which was then the largest historical data collection project in the world. PSHP was gathering a wide variety of data. The core of the collection was the population censuses of Philadelphia, but the project was linking in data from business directories, the census of manufactures, the Quaker and Abolitionist census of African-Americans, and a host of other sources.

After my first semester of graduate school, I asked the Principal Investigator of PSHP for access to the data, so that I could write my first-year research paper. He asked me to explain my hypothesis. I did so, and he informed me that my hypothesis was incorrect and denied me access to the data. I then went to Michael Katz (who later became my PhD advisor), and asked if I could use the data that he and others had collected from Erie County, New York for the period 1850-1915. Katz also asked me for my hypothesis, and he also felt I was wrong. But he let me use his data, so that I could find out for myself (in the end, it turned out that I was right after all; see Ruggles 1987).

Using the Erie County data proved to be a challenge. Although Katz and his assistants were actively using parts of the data for a new book (Katz, Doucet & Stern 1982), it took some months for them to locate tapes that had all the variables for the whole population. The codebooks were irregular, since the data had been keypunched by multiple investigators over many years. Most of the codebooks consisted of a faded photocopy of a photocopy of a typescript, with critical details handwritten in the margin. Much of the information needed to use the data was not written down at all, but instead was handed down from research assistant to research assistant through oral tradition.

In the autumn of 1979, Samuel Preston joined the Penn faculty. I heard rumours that Preston had new historical data, so I scheduled an appointment to see him. I walked out of his office with a nine-track tape of the brand-new 1900 Public Use Sample, a 1-in-750 sample of the U.S. census of population, comprising 100,438 individuals and 27,069 households. I got the data for free, with no vetting of my hypotheses.

When I started to use the 1900 Public Use Sample it was a revelation. There was professionally-prepared documentation comprising 206 pages. The first 70 pages described the history of the project, the source materials, enumerator instructions, sample design, error control procedures, and the methods used for coding geographic variables, family relationships and occupations. The rest of the document was a machine-processable codebook, with structured metadata describing variable names, column locations, codes, value labels and frequency distributions for every variable. There

was a wide array of constructed variables to simplify use, from size of place to number of family members to institution type. Even more remarkable, the data actually matched the codebook: there were no stray values and every code was documented. The data were a joy to work with, and became the centrepiece of my dissertation.

Data sharing has become more and more widespread across the social sciences. Increasingly, funding agencies around the world are requiring investigators to share data created with public support. Borgman (2012) gives four rationales for data sharing: (1) to reproduce or to verify research; (2) to make the results of publicly funded research available to the public; (3) to enable others to ask new questions of extant data; and (4) to advance the state of research and innovation. I will add two further rationales to this list. First, data sharing is good for the data and the metadata. When investigators know that their data is going to be subject to public scrutiny, they are more careful from the outset, more likely to fully document their procedures, and more likely to fix their mistakes. Second, data sharing is good for data creators. Making data is a creative scholarly activity, and data creators who share with others get plenty of credit. When your data are widely used, you make a lot of friends, and those friends often serve on grant review panels.

Historical demography has a poor record of data sharing. The data underlying the vast majority of studies published over the past three decades remain private. In many cases, the data are lost forever, because of the physical deterioration of storage media and because of the attrition of the human capital needed to locate and interpret the original files. Ironically, the PSHP data are an exception; thanks to the ongoing efforts of George Alter and others, much of the PSHP data have recently been recovered and are freely available through the Inter-university Consortium for Political and Social Research.

The European Historical Population Samples Network (EHPS-net) was established in 2011 to advance data sharing in historical demography. The project proposed to create a repository through which datasets could be freely disseminated. In addition, the project proposed to convert datasets to a new standardized format – the Intermediate Data Structure – that would improve the potential for cross-national comparative studies. To date, progress has been slow; at this writing, the project has not yet begun to disseminate data. If EHPS-net eventually does succeed in opening easy access to longitudinal historical datasets, it will be a major achievement.

There are other bright spots. The Mosaic Project led by Szoltyzek and Gruber (2015) and their collaborators has made dozens of previously proprietary historical datasets freely available for download. The North Atlantic Population Project (Ruggles *et al.* 2011) provides free access to a growing collection of complete census enumerations of ten North Atlantic countries. The China Multi-Generational Panel Dataset (Dong *et al.* 2015) releases all data to the research community as soon as it is ready for analysis. Over the past decade, the largest long-running demographic data collection projects – including the BALSAC Population Database, the Programme de Recherche en Démographie Historique in Montréal, the Demographic Database in Umeå, the Scanian Economic Demographic Database, and the Historical Sample of the Netherlands – have taken important steps to simplify data access, although there is still more to be done.

Despite this progress, the great majority of research in historical demography still uses proprietary data. Perusing the programme of the first meeting of the European Society of Historical Demography, it looks like only about one in five papers used accessible data. For the rest, replication or reinterpretation is impossible. This is not acceptable. There is no legitimate scientific rationale for withholding the evidence used to conduct research.

In the academic world, standards are established through peer review, so that we are all complicit

in tolerating data hoarding. When evaluating a grant or an article or a conference paper proposal, I believe that the historical demography community should simply reject works based on data that are inaccessible to other scholars, unless there is a clear commitment to make the data available within a reasonable period.

References

- Borgman, C. L. (2012). The conundrum of sharing research data. *Journal of the Association for Information Science and Technology*, 63, 1059-1078.
DOI: <http://dx.doi.org/10.1002/asi.22634>
- Dong, H., Campbell, C., Kurosu, S., Yang, W. S. & Lee, J.Z. (2015). New sources for comparative social science: historical population panel data from East Asia. *Demography*, 52, 1061-1088.
DOI: <http://dx.doi.org/10.1007/s13524-015-0397-y>
- Katz, M. B., Doucet, M. J., & Stern, M. J. (1982). *The social organization of early industrial capitalism*. Cambridge, Mass: Harvard University Press.
- Ruggles, S. (1987). *Prolonged Connections. The rise of the extended family in nineteenth-century England and America*. Madison, WI: University of Wisconsin Press.
- Ruggles, S., Roberts, E., Sarkar, S. & Sobek, M. (2011). The North Atlantic population project: progress and prospects. *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 44, 1-6.
DOI: <http://dx.doi.org/10.1080/01615440.2010.515377>
- Szoltyzek, M. & Gruber, S. (2015). Mosaic: recovering surviving census records and reconstructing the familial history of Europe. *The History of the Family*, 21 (1), 38-60.
DOI: <http://dx.doi.org/10.1080/1081602X.2015.1006655>

Biography

Steven Ruggles is a Professor of History and Population Studies at the University of Minnesota and Director of the Minnesota Population Center, which initiated and maintains the Integrated Public Use Microdata Series (IPUMS), as well as the North Atlantic Population Project (NAPP). IPUMS includes harmonized census data for the United States from 1790 to the present day and for 81 other countries from 1960 to the present day, a total of over a billion person records. NAPP provides complete count census data from the eighteenth to the early twentieth century for a number of American and European countries around the Atlantic.

A plea for more collaboration in the field of historical demography

Siegfried Gruber

My vision for the future of historical demography is that we should collaborate even more than we currently do. I see the development of historical demography as a path towards ever increasing collaboration. Many historical demographers have been trained as historians and thus were formed in a tradition of working as individuals and not as teams. On the other hand, joint research is the norm in demography (see Hin (2013) for a comparison of collaboration in ancient history and demography). We might therefore expect the level of collaboration in research and publications among historical demographers to be somewhere in-between that of historians and demographers.

No exact figures are known, but a comparison of the papers of the *Family and Demography* network at the European Social Science History Conferences in 2004 and 2016 shows an increase in joint paper presentations from 24.6% to 36.8%. Papers by single authors are still a majority with the *Family and Demography* network, but the proportion of joint papers has been steadily increasing during the past twelve years. Yet it seems that especially for the analyses of small geographic areas researchers still tend to work on their own.

Why, other than out of convention, do so many historical demographers perform their research in this solitary way? What might their motivations be and what benefits do they expect to gain? Some of the most frequently heard reasons are:

- I am the expert for this place/region/topic. Nobody could help me sufficiently.
- Nobody can meet my high standards in transcribing/coding/analyzing.
- I have collaborated with other people before, but it turned out that I did most of the work, while the others only gave ‘good advice’ about what I should do for them. They were only interested in getting credits for their CV or publication list.
- It is hard to coordinate a team of researchers, especially if most of them are convinced that they should be the head of the team. Why should I waste my time in trying to coordinate them, when nobody wants to listen anyway?
- Single authorship counts more than joint authorship.
- When I work alone, nobody can ever use my valuable data as long as I am active.

Of course, some of these reasons may be exaggerations and prejudices: the bold phrasing here is meant to reveal in an explicit way what prevents so many of us from performing joint research. Most scholars (including myself) have some kind of reservation against being exploited in collaborative efforts – whether they are research projects, publications or conference papers. It is part of human nature to be cautious, but we should be aware that globalization and the progress in communication techniques will challenge the way we have undertaken research until now.

What are the lessons that we as historical demographers could learn from research about

collaboration in demography and other fields? Can we use the experiences gained in such joint efforts to foster successful collaboration in our own field?

The top four benefits of collaboration mentioned by 195 university professors in a survey cited by Hin (2013) are increased knowledge; higher scientific quality of research output; the establishment of contacts and connections for future work; and the generation of new ideas. Her comparison of collaboration between ancient historians and demographers revealed that demographers collaborate more often with researchers of different ages and/or academic rank. Academic disciplines with a culture of collaboration tend obviously to employ more heterogeneous research teams than academic disciplines without such a culture. A major advantage of these multi-discipline groups is that there is no competition within the collaboration (McDaniels 2008). Hin advises ancient historians to create interdisciplinary platforms that are longer-lasting and more intensive than conferences; to create databases and promote data sharing; to recognize the role of leadership in fostering research collaboration; and, finally, to create incentives for collaboration.

In historical demography, collaboration in research projects is already well established among a subgroup of researchers, and we have taken our first steps from working as individuals to becoming scholars who are accustomed to collaboration at different levels, in different fields of historical demography, and with scholars of other academic disciplines. This may hopefully serve as an example for other historical demographers, not only to participate in collaborative efforts with each other, but also for collaboration in other areas of academia.

So far, we have been very good at realizing that the building of large data infrastructures is not possible without collaboration. No single person would have been able to create IPUMS, NAPP, Mosaic or the other large databases of their kind. The emergence of such large data-infrastructure projects has facilitated the access to microdata for research significantly, and has generated hundreds of publications every year. Teachers or students can now easily use such data without the need to invest huge amounts of time in data collection and coding. As a result, they can become acquainted with the use of microdata during their education.

What we now need is to work jointly to facilitate the geographic spread of such collaborative data-infrastructure efforts across a wider range of areas. Networks like the European Historical Population Samples Network can, by definition, only be collaborative efforts.

Another area in which more collaboration is needed to promote the future success of our field is that of summer schools and/or other training courses in historical demography. Through international collaboration on this front, expertise in different topics and methods can be spread, whilst at the same time sharing the teaching burden. By setting an example and a norm of collaboration for students participating in such courses, they will at an early stage in their careers become accustomed to scholarly and international collaboration in the field of historical demography. This will enhance collaborative efforts in the coming generations.

We have a lot to gain from intensifying our collaborative efforts. Collaboration in writing articles, books or conference papers gains from the input of the different expertise of the persons involved in matters as diverse as data, research topics, or methods. This can help to share the workload, but also, more importantly, to provide insights from new angles and widen our horizons. Such collaboration will be especially useful in countries where historical demography does not yet have a well-established institutional basis. A collaboration of several historical demographers will be more successful in creating such a basis than several scholars working independently and perhaps even competing with each other.

I think we are already on the right track. All we now need to do is go further along it!

References

- Hin, S. (2013). Interdisciplinary research collaboration as the future of ancient history? Insights from spying on demographers. *MPIDR Working Paper WP 2013-002*. Rostock: Max Planck Institute for Demographic Research.
DOI: <http://www.demogr.mpg.de/papers/working/wp-2013-002.pdf>
- McDaniels, M. (2008). *Intergenerational research collaborations at research-oriented liberal arts colleges: an ecological approach to faculty development*. PhD dissertation, Michigan State University.

Biography

Siegfried Gruber earned his doctoral degree at the University of Graz, where he is still affiliated to the Department of History. His main research interests are the spatial variation of European household patterns and patriarchal structures (especially in South-Eastern Europe), and urban households during the period of industrialization.

Large-scale collaboration and comparison in historical demography: reflections on the Eurasia Project

Cameron Campbell

In 1994, more than twenty years ago, Tommy Bengtsson and Akira Hayami organized the first meetings of what became the Eurasia Project (EAP) in Lund, Sweden and Kyoto, Japan. They brought together researchers working with population register databases from Europe and Asia, with the goal of developing a plan for collaboration and comparison. We introduced ourselves, our interests, and our data and methods to each other. At these discussions and at additional meetings immediately afterwards, teams working with Chinese, Japanese, Belgian, Swedish and Italian data committed themselves to the project; we identified the interaction between economic conditions, family organization and demographic behaviour as a theme. We also settled on a goal of producing at least three volumes, one each on mortality, fertility and marriage. In 2014, 20 years after our initial meetings, we finally published the third volume on marriage under the leadership of Christer Lundh and Satomi Kurosu (Lundh *et al.* 2014).

Here I want to offer a personal reflection on this collaboration, focusing on why I think we were able to collaborate successfully for two decades, not only to produce the three flagship volumes from MIT Press (Bengtsson *et al.* 2004; Tsuya *et al.* 2010; Lundh *et al.* 2014), but also numerous additional related conference volumes, special issues of journals, and papers. Among historical and perhaps even contemporary comparative quantitative social science projects, the effort was unusual for its combination of duration, scale, scope, productivity and organization. On these dimensions, only the longstanding and highly productive ‘Life at the Extremes’ comparison of family organization and demography in historical Taiwan and the Netherlands is comparable. I can think of no other historical comparative project that has lasted as long, had so many participants, has been so ambitious in terms of its scope, has been so productive, and has been organized like the EAP. I think, or at least hope, that there are some lessons to be learnt from our experience for other efforts.

Many features of the intellectual agenda, data and methods of the EAP combine to make it unique, but since the introductory chapters in the flagship volumes discuss these aspects in considerable detail, I will only mention them briefly here. The EAP is notable for its application of event-history techniques to longitudinal, individual-level data from population registers for comparison. Previous international historical demographic comparisons, such as the Princeton Fertility Project, relied on aggregated data. To the extent other comparisons made use of individual-level data, these tended to be cross-sectional. A more important distinguishing feature of the EAP, however, was the effort to standardize the calculations. Through a process I discuss below, we developed specifications for calculations that every team could carry out, and we focused our comparison on the results of these standardized calculations. This helped to ensure that comparisons were meaningful.

But the real key to the success of the EAP was our approach to organization, not our data and

methods. I believe the principles that we evolved at our earliest meetings were crucial to our success. One of the most important principles was that we emphasized consensus in our process for setting our intellectual agenda and for choosing our methods and models. This had a cost, in that making plans required repeated meetings, during which we learned more about each other's interests and data, and gradually iterated towards a decision. It ensured, however, that when we did finally make a plan for a calculation, it was one that everyone had a stake in and could carry out with their own data.

Obviously, while some members of the project were certainly more influential than others in these discussions, it was only because they were more persuasive and were more successful in making their cases.

The reliance on consensus was an outgrowth of another distinctive feature of our collaboration: it was decentralized. Each of the five country teams was responsible for managing its own affairs, including securing research funding to support its contributions to the project; managing the entry and cleaning of its data; performing calculations; and recruiting new members. Even though we did select a committee from among ourselves to serve as series editors, their primary role was to recruit lead authors for the volumes after the themes of the volumes had been set by broader deliberations. The volume lead authors were in turn responsible for recruiting authors for each of the chapters and writing introductory and concluding chapters once project participants reached a consensus on the outline of the volume. Because series editors and volume lead authors did not control funding, data or personnel, they had to rely solely on persuasion to move the work forward. We never had a single source of funding for the project as a whole. While a dedicated source of funding that all teams could draw on would certainly have had some benefits, and perhaps might have yielded results more quickly at the outset, it would have meant that whoever controlled those funds would have had the power to set the intellectual agenda, which would likely have eroded the role played by consensus. I doubt that the commitment and engagement that carried the project for twenty years would have survived as long under a more centralized approach.

Decentralization required us to develop a protocol that maximized opportunities for everyone who made contributions to sooner or later be recognized with lead co-authorship, either on a volume or in a chapter. Volume and chapter lead authors were recruited not only for their enthusiasm and expertise, but also with an eye towards equity and balance. Comparative chapters that made use of calculations according to project specifications identified the team members responsible for those calculations as collaborators, following the listing of the lead authors. Such measures helped to ensure that team members who took the time to contribute calculations from their data, in response to the needs of a volume or a chapter authored by others, would in turn have something with their name on it.

All of this would, of course, have been for naught, had it not been for the energy and perseverance of all the participants. We were extraordinarily fortunate in that from the outset we were lucky to have committed collaborators on every team who helped to move the project forward, even at times when progress appeared to be slow or non-existent, and sometimes at the cost of advancing other projects. Especially in the early years when we were still learning about the strengths and limitations of each other's data, it was not uncommon to ask teams to redo calculations repeatedly over several months, while we finalized specifications. Additionally, volume or chapter lead authors were often struck by inspiration even after we thought we were done, and asked for additional calculations to help make a point. Of course, it was not all work. Especially memorable to me are the numerous fabulous meals we had at outstanding restaurants in East Asia, North America and Europe, in the company of collaborators. Along the way, many friendships developed, leading to new and more focused collaborations on topics growing out of the EAP.

Our experience suggests that even as remarkable new datasets and methodologies create exciting opportunities for ever more ambitious collaboration and comparison, ‘human factors’ will continue to be important, in the sense that special attention early on to defining protocols for collaboration can make the difference between success or failure for a large-scale, long-term comparison project. Our experience was by no means without challenges and there are some things that in retrospect I think we might have considered doing differently. But overall it seems that early on we managed to hit upon a set of principles for making decisions collectively, for coordinating analysis and for sharing credit that allowed us to keep going for two decades, three flagship volumes and numerous side projects. This was not an accident: in the early days we spent as much time talking about how we would organize our work and share credit as we did talking about our data and our methods. Other approaches might very well work better for other projects or configurations of participants, but the larger point remains that in organizing a collaboration as ambitious as ours was, protocols for sharing responsibility and rewards are as important as remarkable data and cutting-edge methods.

Opportunities now abound for larger, even more ambitious comparative research projects in the spirit of the Eurasia Project. Data like those used in the Eurasia Project may be used in the comparative study of demographic and social outcomes other than mortality, fertility and marriage. Some of these, notably socio-economic and geographic mobility, are central concerns of social science more broadly, and offer possibilities for historical demography to contribute to ongoing debates in other disciplines. Historical population register datasets that follow families for three or more generations may be used in comparative studies of multi-generational demographic and social processes. Since almost all contemporary data is of limited generational depth, this is an area where there is an opportunity for a large comparative historical study to make a unique contribution. Finally, as datasets accumulate, there is increasing potential for detailed comparisons within Europe and Asia, moving beyond the broad comparison of East and West that was the goal of the Eurasia Project. In particular, advanced methods applied to expanded datasets make it possible to account for the role of regional and local factors in shaping patterns of demographic behaviour in a more refined and systematic fashion than was possible in the Eurasia Project.

Such efforts will require an approach to comparison very different from the one adopted in the Eurasia Project. In particular, to approach any of the topics listed above, it will almost certainly be necessary to harmonize and pool available data into a single dataset. In the Eurasia Project, each dataset was analyzed separately according to an agreed-upon standard and comparisons were based on examination of these separate results. This approach was expedient and, given various constraints, probably unavoidable, but it was not ideal. For more ambitious comparisons in which local and regional characteristics are explicitly incorporated into a model, participants will have to develop protocols for sharing data among themselves to produce an integrated dataset. When collaborators in a comparison using an integrated dataset divide up responsibility, they will have to do so by parcelling out topics, not regions.

References

- Bengtsson, T., Campbell, C., Lee, J. *et al.* (2004). *Life under pressure: mortality and living standards in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.
- Lundh, C., Kurosu, S. *et al.* (2014). *Similarity in difference: marriage in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.

Tsuya, N.O., Feng, W., Alter, G., Lee, J. *et al.* (2010). *Prudence and pressure: reproduction and human agency in Europe and Asia, 1700-1900*. Cambridge, Massachusetts: MIT Press.

Biography

Cameron Campbell is a Professor in the Division of Social Science at the Hong Kong University of Science and Technology. His research focuses on family, inequality, and demography in historical China and in comparative perspective.

The importance of historical demographic methods in longevity studies

Michel Poulain

Extreme longevity and more specifically centenarians have always attracted plenty of interest from the researchers of various disciplines, including gerontology and demography, but also from the general public. Age inaccuracy was often observed in past populations and is still commonly observed today in populations without efficient civil registration. The validation of the ages of alleged centenarians is essential for scientific research investigating longevity traits in demography, genetics, epidemiology, psychology and medicine. Any centenarians' study that does not include a strict validation of age will lose its significance and this is particularly true for early centenarians for whom age validation is a crucial matter. Young *et al.* 2010 have shown that inaccurate reporting of age may be significant; tends to increase with age; is more often observed in illiterate populations; and is more common among males than among females. Strict rules of age validation are not systematically applied and extraordinary cases of people with ages allegedly above 120 years often appear in the media. Demographers have become increasingly concerned with the accuracy of longevity claims, given the unprecedented rise in very old people in developed countries (Maier *et al.* 2010). More careful checks on individual longevity have been conducted within the framework of the development of the International Database on Longevity (see Supercentenarians under weblinks).

In the January 1973 issue of the National Geographic magazine, the physician Alexander Leaf gave a detailed account of his journeys to countries of purportedly long-living people: the Hunzas from Pakistan, the Abkhazians from the Soviet Union, and Ecuadorians from Vilcabamba. According to Leaf, there were ten times more centenarians in these countries than in most Western countries and he pointed out that each of these populations were characterized by poor sanitation, infectious diseases, high infant mortality, illiteracy and a lack of modern medical care, making the inhabitants' extreme longevity even more extraordinary. However, some years later age exaggeration was proved to be predominant in Vilcabamba, with a large number of the oldest-olds tending to increase their age in order to improve their social status or to promote local tourism. More in-depth investigations resulted in a systematic invalidation of all the above-mentioned allegedly long-living populations, since most claims of extreme age appeared to be undocumented or exaggerated.

In 1999, following the findings presented by Gianni Pes showing extreme male longevity in Sardinia, a strong scepticism pushed demographers to assess the validity of the alleged ages of the oldest-olds in Sardinia. Evidently, historical demographers are the best armed to apply such strict validation methods. I was a volunteer for this mission to Sardinia and in his paper published in *Science* Koenig (2001) considered me to be a '*crack historical demographer*' (sic). The ages of Sardinian centenarians were thoroughly proven to be correct, except that of Damiana Sette, who died at age of just 107 years and not at 110: she was mistaken for her elder sister, who died at the age of

two, just before Damiana was born (Maier *et al.* 2010). Age validations on Sardinia were based on the investigation of parish registers, civil registers and population registers from the last two centuries. Given the marginal annotations on death found in the birth register, both birth and death records were linked to confirm the exact age at death without doubt. The age validation also considered the family composition and additional individual information on education, military obligations, participation in elections and profession.

While this validation of individual longevity was supposed to be a final step, it actually turned out to be the starting point for a different research direction, focused on investigating population longevity. As a part of the validation process, the places of birth of all centenarians were mapped and, surprisingly, the spatial distribution of Sardinian centenarians according to their place of birth was far from random. The Extreme Longevity Index (ELI) – that is, the probability of becoming a centenarian among newborns in a given place – was estimated by setting the number of centenarians against the number of newborns in the same place a century earlier. The spatial distribution of ELI obtained by using a spatial Gaussian smoothing method allowed us to identify an area in the mountainous part of Sardinia with a significantly higher level of population longevity. This area was called the *blue zone*, as I used a blue pen to mark the area on the map (Poulain *et al.* 2004). The concept of a *longevity blue zone* (BZ) has since been defined as an area in which the population is characterized by a significantly higher level of longevity compared with neighbouring regions, provided that the exceptional longevity of people in this population has been fully validated. In practice, people living in a BZ share the same lifestyle, genetic make-up and environment, which facilitates the search for longevity determinants. The concept of BZ has been extended and popularized in collaboration with Dan Buettner, a journalist writing for National Geographic (see Bluezones under weblinks). Other BZs have so far been identified in Okinawa (Japan), on the Nicoya peninsula (Costa Rica) and on the island of Ikaria (Greece). In all three of these areas, longevity expeditions have been organized with the support of National Geographic to survey the oldest-olds and to investigate their characteristics. New opportunities to compare the characteristics of the four BZ populations raise hope that we can advance our understanding of the determinants of longevity (Poulain *et al.* 2013).

What we learnt by observing the population in each BZ is currently being disseminated across several local communities of the US. The BZ Community Project aims to improve the health and well-being of the local populations by changing their physical and human environment in order to stimulate healthy behaviour (see BZ Community Project under weblinks). Amazingly, the traditional tasks of historical demographers, including family reconstitution and age validation, have become a catalyst for a crucial and intensive public health policy that targets healthy ageing.

By investigating longevity, historical demographers are able to link the past and the present in an innovative way, unravelling the ‘secrets’ of centenarians who were born more than one century ago and have cumulated a wide variety of experiences, ranging from the impact of world wars and several economic crises to the positive benefits of the Golden Sixties. In this manner we, as historical demographers, can provide important contributions to the knowledge on population ageing and its consequences for our post-modern societies. Moreover, it is clear that the search for longevity determinants cannot be limited to a single discipline – whether it is genetics, medicine, epidemiology, nutrition, psychology, anthropology or gerontology. The search for longevity and healthy ageing determinants is, by necessity, a multidisciplinary one. Historical demographers, who were the first to be involved in the age validation of the oldest-olds, could become the leaders of such multidisciplinary investigations, where mutual understanding and frank cooperation are the key

words... It is an objective still to be achieved!

References

- Koenig, R. (2001). Sardinia's mysterious male Methuselahs. *Science*, 291(5511), 2074-2076.
DOI: <http://dx.doi.org/10.1126/science.291.5511.2074>
- Maier, H., Gampe, J., Jeune, B., Robine, J. M. & Vaupel, J. (Eds.) (2010). *Supercentenarians. Demographic Research Monographs*. Berlin-Heidelberg: Springer-Verlag.
- Poulain, M., Pes, G. M., Grasland, C., Carru, C., Ferrucci, L., Baggio, G., Franceschi, C. & Deiana, L. (2004). Identification of a geographic area characterized by extreme longevity in the Sardinia Island: the AKEA study. *Experimental Gerontology*, 39, 1423-1429.
DOI: <http://dx.doi.org/10.1016/j.exger.2004.06.016>
- Poulain, M., Herm, A. & Pes, G. M. (2013). The Blue Zones: areas of exceptional longevity around the world. *Determinants of Unusual and Differential Longevity*. Vienna: Yearbook of Population Research, 11: 87-108.
- Young, R. D., Desjardins, B., McLaughlin, K., Poulain, M. & Perls, T.T. (2010). Typologies of extreme longevity myths. *Current Gerontology and Geriatrics Research*. 2010 (2010).
DOI: <http://dx.doi.org/10.1155/2010/423087>

Weblinks

Bluezones: www.bluezones.com
Supercentenarians: www.supercentenarians.org
BZ Community Project: <https://communities.bluezonesproject.com>

Biography

Michel Poulain obtained a degree in astrophysics before he became interested in history and turned to historical demography. In 1969, he started a project of family reconstitution in a Belgian village and used computers for the first time, strongly supported by Etienne Hélin. He subsequently pursued a PhD in demography and continued his scientific career within the Belgian Research Foundation. He returned to historical demography to investigate extreme longevity in Sardinia and other long-living populations.

Crowdsourcing convict life courses, or the value of volunteers in the age of digital data

Rebecca Kippen & Janet McCalman

Volunteers have long been a mainstay of data collection for historical demography, providing countless hours of intellectual labour in transcribing, tabulating and linking data from hand-written historical documents. In the mid-twentieth century, Henry in France (Rosental 2003) and Wrigley and Schofield (1989) in England recruited hundreds of local amateur historians to copy and code information from parish registers for their respective groundbreaking projects. The vast majority of this early volunteer work was carried out in archives or parish churches, using the original registers. In contemporary examples, source documents are digitized and available online, so that anyone with internet access and the ability to read old handwriting can participate (see, for example, the Danish Demographic Database under weblinks). Advances in technology mean that transcribers no longer necessarily have to work from original sources and be subject to “many hours of cramped work in a chilly vestry” (Wrigley & Schofield 1989) or similar.

This contribution outlines our experience in working with volunteers on the historical-demographic *Founders and Survivors Ships Project*. We hope that these brief thoughts may prove useful to others considering a similar undertaking. The *Ships Project* is part of the larger long-term *Founders and Survivors (FAS)* study (Bradley *et al.* 2010; McCalman *et al.* 2015), which is building a longitudinal multi-record dataset on Tasmanian convicts and immigrants and their descendants. The aim of the *Ships Project* is to trace the characteristics and life courses of all individual convicts who arrived on selected convict ships to the British island colony of Van Diemen’s Land (now the Australian state of Tasmania). We use the resultant data to investigate the correlates of family formation, longevity and other behaviours and life outcomes, taking into account three key life stages of the convict cohorts: before, during and after sentence. At the conclusion of data collection in 2015, project volunteers had traced almost 25,000 of the 70,000 or so men, women and children transported to Tasmania from 1803 to 1853. We estimate the value of their donated labour at more than four million Australian dollars.

From the genesis of the *Ships Project* we knew it would take tens of thousands of person-hours to trace and link relevant records, and to transcribe and code data. The required tasks could not be automated, for several reasons. First, the universe of potential databases for tracing individual convicts was not defined. Tasmanian convicts were highly mobile after transportation, with many leaving the island for other Australasian colonies or to return to their homeland or to migrate to other parts of the world. Many migrated multiple times. We wanted to trace the convicts (and their life events) wherever they went, which meant detective work across sources around the world. Second, optical character recognition (OCR) has not yet progressed to the point where software can read crabbed copperplate in different hands, faded inks, and sometimes written sideways, upside-down or

overwritten. This still requires human eyes and interpretation. Third, coding of complex information extracted from textual – usually handwritten – data also needed human judgment.

The time required for *Ships* data collection was clearly outside the capacity of our small research team and limited research budget, but was well suited to crowdsourcing, with volunteer historians donating their time and expertise, and making use of new digital technologies. We began recruitment in 2009 with newspaper articles, radio interviews, presentations to genealogical societies and articles in genealogical society newsletters. These described the project, emphasized the importance of volunteers and invited those interested in participating to register on the *FAS* website (see weblinks), where further information was provided. Initially, several hundred members of the public registered their interest, with almost 60 becoming highly skilled long-term volunteers on the *Ships Project*. (Some other registrants undertook different tasks within *FAS*.) The *Ships* volunteers were mainly retirees who had researched their own family histories, or who otherwise had a longstanding interest in convict or Australian history, and who wished to contribute to building a public history of Australia's ordinary people.

To standardize data collection, each volunteer was allocated a spreadsheet for each of 'their' convict ships. We organized data collection by ship, so that volunteers had a coherent cohort to work on and could feel a sense of accomplishment on completion. Each ship carried between 50 and 370 convicts. Spreadsheets had fixed pre-specified data columns (54 in total) with convict surname and first name pre-filled in columns A and B. Other columns to be completed called for data to be transcribed or coded from online imaged convict records (held by the Tasmanian Archives and Heritage Office) with information on, for example, crime, occupation, birthplace, birth family, place of conviction, age at arrival, height, behaviour and punishment under sentence, and year and type of emancipation. A further set of columns necessitated a hunt for data outside the convict system through online sources that could have originated anywhere around the world. These data included marriages, births, child deaths, emigrations, later crimes, and the year, cause and place of death. These scraps of life course history were found in birth, death and marriage registers, census returns, institutional records, online historical newspapers, and a myriad of other public sources around the world. Occupations, birthplaces, ages, names of parents, and other variables helped to confirm identities. Paid checkers verified results. We used Google Docs to manage online data entry, checking, correcting and cleaning. The process for completing a spreadsheet was described in a training manual with step-by-step instructions, accompanied by screen-capture images. We also held face-to-face training workshops, and some volunteers chose to work together on a ship.

It was important that the volunteers knew that they were a valued part of the research team. Regular half-day research workshops, to which all volunteers were invited, featured research presentations, discussion groups, coaching sessions and great catering. The thrice-yearly online illustrated magazine for the broader *FAS* project, *Chainletter*, was a venue for articles written by the project volunteers about their research, in addition to being used to recruit further volunteers, update on progress and report research results.

The *Founders and Survivors Ships Project* would not have been possible before the internet and the boom in indexed historical records now accessible online. However, technology cannot (as yet) do everything; the project would also not have been possible without the painstaking research of dozens of expert volunteers, who spent tens of thousands of hours tracing the elusive life courses of 25,000 Australian convicts. Genealogy has become one of the modern world's great private pursuits and pleasures, where once it was the preserve of those with privileged lineage. This means there are literally millions of people around the world connected to the internet, who have the skills and

historical imagination to become partners in major research projects. If they are retired, lonely or bored, they have much time to give, as long as researchers show their appreciation in terms of support, involvement and entertainment. It must be a reciprocal gift relationship. They are research partners, not assistants or servants. And their expertise and passion can be harnessed to make very large projects possible as never before. We are indeed fortunate.

References

- Bradley, J., Kippen, R., Maxwell-Stewart, H., McCalman, J. & Silcot, S. (2010). The Founders and Survivors Project. *History of the Family*, 15, 467-477.
DOI: <http://dx.doi.org/10.1016/j.hisfam.2010.08.002>
- McCalman, J., Smith, L., Silcot, S. & Kippen, R. (2015). Building a life course dataset from Australian convict records. Founders and survivors: Australian life courses in historical context, 1803-1920. In: Bloothoof, G., Christen, P., Mandemakers, C. A. & Schraagen, M. P. (Eds.), *Population Reconstruction* (285-298). Heidelberg: Springer.
DOI: http://dx.doi.org/10.1007/978-3-319-19884-2_14
- Rosental, P. A. (2003). The novelty of an old genre: Louis Henry and the founding of historical demography. *Population (English Edition)*, 58, 97-129.
DOI: <http://www.jstor.org/stable/3246646>
- Wrigley, E. A. & Schofield, R. S. (1989). *The Population History of England, 1541-1871: A Reconstitution*. Cambridge: Cambridge University Press.

Weblinks

- Danish Demographic Database: <http://ddd.dda.dk>
Founders and Survivors (FAS): www.foundersandsurvivors.org

Biographies

Rebecca Kippen is Associate Professor of Demography in the School of Rural Health at Monash University. Her research interests include Australian historical demography, life course analysis, modelling population futures and demographic aspects of health and mortality in regional Australia.

Janet McCalman is a widely published social historian who is a professor in the School of Population and Global Health at the University of Melbourne. Her research interests are the health of historical populations in their social, economic and political context.

Engaging citizen scientists to expand the data infrastructure for historical demography

Evan Roberts

Social scientists and demographers studying the contemporary world are grappling now with the challenge that humans are generating vast quantities of organically generated ‘big data’ at the same time as response rates to representative social science surveys are declining. These coincident trends have created a credibility gap and an analysis gap. The credibility gap emerges from our scepticism about what can be learned from selective, observational data. The analysis gap emerges as data accumulates faster than it can be analyzed. Historical demographers have a more modest and achievable challenge: to create a database of all surviving records systematically describing human populations.

While our colleagues interested in contemporary populations face ever-growing amounts of data, the information collected about past populations is finite. Some records remain undiscovered, particularly those residing in local archives, but no more records of past populations will be created. Given the inherent risks from fire, flood and forgetfulness to manuscript records, we may be more likely to lose data yet to be digitized than discover new sources.

In the past 40 years historical demographers have made rapid progress at developing complete databases of past populations. In the 1970s and 1980s we were able to build samples of population registries and censuses: research that inspired my choice of career. Now, in 2016, we have completely transcribed enumerations of entire censuses of Britain, Canada, Denmark, Iceland, Norway, Sweden and the United States from the eighteenth to the mid-twentieth century. We have collaboratively made our data increasingly compatible and publicly available. This is a significant achievement, and the potential to trace people across time, to study small populations, and to refine our measures of local social context are yet to be fully realized.

But even in these countries, indeed in every country that has collected records of the population, there are sources yet to be digitized, yet to be transcribed, yet to be organized into a dataset. We know what these sources are. They are local censuses, agricultural and other economic censuses, church, military, welfare, hospital, land and tax records. In some countries, including France, Germany and parts of South America, we know that manuscripts of national censuses – our most valuable source – are extant in the archives.

Genealogists – commercial and amateur – led the transcription of many of the largest historical demography datasets we currently have. The size of these datasets was beyond what governments or foundations would fund, and well beyond what we can achieve with the collaboration of students, let alone our own labour. The collaboration with genealogists has been a productive one, and should continue. But the moment is here, the technology is here, for demographers to lead the way towards a complete transcription of historical population sources. Population data since the 1960s has largely

been born-digital and we should work to ensure the survival of and access to the demographic records of recent history. Ensuring survival and access is a mission of preservation.

Historical demographers must also set lofty goals for creation. In the next 40 years of historical demography we should complete the transcription of all pre-1960 population data sources. To do so, we must engage the public in our science and enlist their help. We cannot transcribe the material ourselves or with our students; we must enlist a crowd of citizen scientists. We can use tools made available for citizen science at the Zooniverse (see weblinks). Since 2007 the tools developed by Zooniverse have transformed the creation of large-scale data in fields as diverse as radio astronomy, wildlife biology and papyrology. For example, enlisting the crowd in transcribing papyri has made it possible to anticipate that the *Oxyrhynchus papyri* could be transcribed in 20 years. Before enlisting citizen scientists, it would have taken thousands of years. We now have the technology for crowd-sourcing transcription of handwritten sources in the form of an open-source software package, called Scribe (see weblinks).

Given an organized collection of images of documents and a structured map of where data elements are found on the images, Scribe will produce a database of multiple transcriptions of each data element. We are then presented with the traditional challenges of assembling demographic data: ensuring related people are grouped together, cleaning implausible values and assigning numeric codes to qualitative variables for ease of analysis.

We should not underestimate the one particular challenge of many demographic sources. Handwriting can be hard to read and the consequences of minor errors can be severe. While I would be happy to be proven wrong, it seems unlikely that accurate machine transcription of handwritten sources will be achieved soon. Human handwriting is variable, and mistakes can have a series impact on data accuracy. Mistaking a 3 for a 9 turns a 30 year old into a 90 year old. Several transcriptions of each field will be needed to minimize the random error inherent in asking lightly trained citizens to read old handwriting.

Multiple transcriptions for each field in the whole dataset are uncommon in the social sciences, and require researchers to develop methods for resolving differences in the transcriptions. We cannot assume that any one transcription is the correct entry. We need to efficiently synthesize the multiple transcriptions into a coherent representation of the original data, so that we have a single value for the age of a given person at a given time. If two of three transcriptions agree a person is 30 and a third says 90, perhaps we should take 30. But what of a situation where all three transcriptions are quite different? We cannot check the work of all our citizen scientist collaborators and return to the original sources. But we can work out acceptable rules for taking the most plausible values and for optimizing the trade-off of cost and error rates. These are familiar challenges in creating social science data.

Having emphasized the challenges of transcription and a consensus algorithm, let me close with some of the advantages and possibilities that emphasize instead the feasibility of this vision. Our work is made substantially easier by the regularity of much of the material within a given set of sources. The same census forms, for example, were used throughout the country. For any given source we can set up a fixed form to capture data. We are not asking citizen scientists to impose structure on free-form data.

It will be up to historical demographers in particular countries and regions to collaborate and decide what are the priorities in their country. The crowd can help, but we cannot waste our time and their time on duplicated efforts or the least important sources. Once we have priorities and a crowd, we must then digitize the material by scanning or photographing it, which is purely a challenge of organization and disc space. With enough images digitized, we move on to transcription. Scribe

automatically ensures that multiple people transcribe each image, to protect against widespread malevolence or incompetence in the crowd. Our final dataset will be like the data we currently use: rows and columns of names, ages, occupations and family relationships. Each row, each column, moves us closer to the goal of completely describing past populations. The past decade has shown us the power of complete datasets for understanding small groups, for tracing lives across time, and for measuring social context on a small scale. Extending the reach of this data to more times and more places is a big goal, and one that will keep historical demography relevant to the present trend of big data in demography.

Weblinks

Zooniverse: www.zooniverse.org

Scribe: <https://github.com/zooniverse/scribeAPI/wiki>

Biography

Evan Roberts is an Assistant Professor of Population Studies and Sociology at the University of Minnesota. His research interests in the United States and New Zealand include women's work and long-term changes in health and mortality. He is a leader of the 'Measuring the ANZACs' project to crowdsource the transcription of First World War personnel records for all 125,000 New Zealand soldiers in the war.

Chapter 10

Keep building

Get the facts first and then you can distort them as much as you please

Mark Twain

What can we do in terms of research policy and infrastructure to make better use of the data we have, and gain access to data not yet digitized or otherwise inaccessible to the scholarly community? Five data-experts provide their view.

Population data advocacy matters: a view from Canada and New Zealand

Lisa Dillon & Evan Roberts

Two decades ago, researcher access to large-scale historical and contemporary population microdata was a cutting-edge prospect. In the context of Canada, 1996 marked the launch of the Canadian Data Liberation Initiative, a collaboration between Statistics Canada and Canada's universities to foster the dissemination and use of Statistics Canada data. Historians and historical demographers, who had developed a variety of smaller, often regional and/or sample datasets since the 1960s, began to create infrastructures to share these data online and promote broader use. Today, large-scale population data has proliferated to the extent that there are specialist initiatives to integrate and disseminate international microdata in cross-sectional and longitudinal form (IPUMS and IDS, see web links). While the challenges before 2000 were how to access population microdata and how to train generations of new researchers to use them, the challenge today is to protect the very principle of data creation, data access and evidence-based policy-making – principles we now see cannot be taken for granted. A striking example was the summary transformation in 2010 of Canada's obligatory long-form census into the voluntary National Household Survey.

Canada's obligatory long-form census was finally resurrected on 15 November 2015 as the first policy decision of Justin Trudeau's new Liberal government. The substantial and broad-based constituency that emerged to defend Canada's obligatory census was a heartening manifestation of social science investment in this essential data resource. Demands to keep the obligatory census were evident across the political spectrum and included at least 488 organizations. Among them were 44 city councils; chambers of commerce; the Canadian Medical Association; the Canadian Bar Association; various academic associations; and newspaper editors (see Datalibre under weblinks). This support, coupled with evidence of the compromised quality of the 2011 long-form data, led the Liberal and NDP parties to signal a return to the obligatory census within their 2015 federal election platforms. That it took a sweeping change in government to finally restore the obligatory long-form census demonstrates the dependence of Canada's statistical practices on top-level political commitment.

With Canada's long-form census restored, new debates revolve around the need to revise the 1971 Statistics Act to formalize Statistics Canada's right to act at arm's length from all governments. The Canadian research community is now realizing the extent of damage done to government data collection during the Harper era: between 2006 and 2015, 539 data products were terminated, including 50 surveys (among them several important longitudinal surveys) and 191 publications, with no explanation and no cost-savings in the majority of cases (see Canada under weblinks). Other victims of the data slash-and-burn include Environment Canada reports, the federal Aboriginal Canada portal and the elimination of ministry libraries. The Conservative government also muzzled

federal scientists from discussing research and, in the course of rendering government documents digital-only, undertook a sweeping dump of web-based content deemed ROT: “redundant, outdated, and trivial”. A Maclean’s report stated that “the federal government’s ‘austerity’ program, which resulted in staff cuts and library closures (16 libraries since 2012) – as well as arbitrary changes to policy, when it comes to data – has led to a systematic erosion of government records far deeper than most realize, with the data and data-gathering capability we do have severely compromised as a result” (see Kingston under weblinks).

New Zealand, like Canada, inherited from Britain a tradition of high quality government data collection, and New Zealand and Britain’s statistical offices have been in regular contact about official statistics since the nineteenth century. Researchers have enjoyed liberalized microdata access in New Zealand over the past twenty years. However, substantial barriers to data access exist compared to peer countries abroad. Small samples of key surveys and of the 2001 and 2013 censuses can now be used by external researchers. But a several-week application process makes it difficult to use New Zealand microdata during a three-month university semester. By comparison, students and scholars in the United States can immediately download similar sets of anonymized microdata from the IPUMS website (see IPUMS under weblinks) without any application, while Canadian students and scholars can easily access public-use microdata census files online via the Data Liberation Initiative. Research using census microdata in New Zealand has expanded significantly from fewer than ten projects in 2011 to around 30 in 2015. The majority of the research is being performed by faculties, professional research organizations and government departments. The social science capacity building and hypothesis generation that comes from having undergraduates and early-stage graduate students exploring data is not yet visible in New Zealand. Formal barriers to data access have been removed, but substantive and practical ones remain.

New Zealand’s statistical microdata also exist in a state of intellectual isolation. While the country is geographically distant from the world, data is portable and shareable. However, impediments to the integration of New Zealand data with complementary international data has led to its omission from international social science research. In theory, international researchers can access New Zealand data, but a formal application process and the relegation of data harmonization to researchers makes the cost of adding New Zealand to a comparative study higher than it needs to be.

The contrasting experiences of New Zealand and Canada reveal both the vulnerability and the potential of research data, as well as the importance of data advocacy. What does this have to do with historical demography? Historical demographers have a long-standing tradition in creating and using population data, both historical and contemporary, and are well positioned to promote a vibrant data culture. They have been key players in the push to make public-use microdata files available, to adapt a wide range of interdisciplinary methodologies to exploit population data, and to offer institutionalized structures to train new researchers. More specifically, the historical demography community has invested in record linkage methodologies (including but not limited to family reconstitution) to create biographical data and has found ways to negotiate access to more recent life course data while preserving confidentiality. One of the most important tasks of historical demographers in data advocacy is establishing the critical importance of life course analysis, notably the influence of childhood and midlife conditions on later-life outcomes; as such, they can provide the empirical justification for investing in contemporary longitudinal surveys. They can also demonstrate the intimate link between data selection and research results, a link that should in turn influence data design. Historical demographers confront important questions of observation control and selection effects. They do so, first, by creating historical population data that begin with a broad random

sample of the population or with a complete-count dataset, and by thereafter pursuing record linkage forward. Second, they carefully analyze the population subgroups that remain under observation and those that fall out of observation. Selection effects are more difficult to address in retrospective or cross-sectional surveys, which capture subjects only in adulthood and which establish early-life information via retrospective questions beset by recall problems. Historical demographers are thus among the best defenders of the value of prospective longitudinal surveys. Furthermore, historical demographers can demonstrate the long-term antecedents of global contemporary issues, such as social inequality, refugee migrations and environmental effects. Finally, historical demographers can mobilize international comparisons and monitor international best practices that help to defend data sources. For example, pointing out the frequency with which particular census questions are collected in different countries, such as the number of rooms in a dwelling, helps to counter claims that these questions are irrelevant or intrusive.

In conclusion, advocacy matters. Canadian social scientists were able to minimize the damage of the cancellation of the long-term census in 2010 and, in the long run, the missing 2011 census may turn out to be just a blip in Canada's long-term statistical series. New Zealand social scientists have gained significantly easier access to microdata compared to the situation just a decade ago. Historical demographers have an important role to play in the community of social scientists advocating for data access, data collection and data preservation. In both countries ongoing direct connections have been important channels for advocacy. Historical demographers and statistical agencies interact at social science conferences, and in parliamentary and public service meetings. Graduates with experience in historical demography now working at statistical agencies have also played a key role in advocating for data preservation and access. Bringing a historical sensibility to the conversation is important, as many of our peer social scientists are not immediately or passionately interested in the survival of microdata from the 1990s or the 1980s. Yet late twentieth-century data are important resources for future historical demographers, just as much as the manuscript censuses and registers that historical demographers traditionally work with. Contrasting the experience of two Commonwealth countries also reveals the importance of international action. New Zealand's recent data access liberalization was a direct result of the demonstrated success of microdata access in peer countries. The restoration of Canada's census was not only important for Canadian social scientists and citizens; it was also important for comparative research in which Canada is often a key contrasting case. While advocates from the historical demography community may not win every battle, in the long run translating our expertise in data access, in database construction and in historical demographic analysis into a strong defense of data development and preservation will provide a key contribution to these debates.

References

- Sheikh, M. A. (2013). Good government and statistics Canada: the need for true independence. *Academic Matters: OCUFA's journal of higher education*, May 2013.
<http://www.academicmatters.ca/2013/05/good-government-and-statistics-canada-the-need-for-true-independence/>

Weblinks

Datalibre: <http://datalibre.ca/census-watch/>

Canada, House of Commons, "Order/Address of the House of Commons, by Mr. Stewart" December 8, 2015 (Tabled January 25, 2016)
<<http://ipolitics.ca/wp-content/uploads/2016/01/Stats-Can-order-paper-question.pdf>>

IDS: <http://www.ehps-net.eu/content/ids>

Kingston, A., 'Vanishing Canada: Why we're all losers in Ottawa's war on data', *Macleans*:

<http://www.macleans.ca/news/canada/vanishing-canada-why-were-all-losers-in-ottawas-war-on-data/>

Minnesota Population Center, 'Integrated Public Use Microdata Series International' (IPUMS):

<https://international.ipums.org/international/>

Biographies

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The East, the West and the future of demographic data

Gunnar Thorvaldsen

The history of census-like population lists is longer in the East than in the West. Just compare the quite accurate Chinese Han dynasty census from 2 CE with the heterogeneous descriptions of property in the Domesday Book a millennium later. Allegedly, the Chinese enumerations may be linked to the Mongols, who extended their enumerations for taxation purposes to Russian territory in the thirteenth century. Russia continued this census-like tradition, and the first census-like lists seen by West Europeans after the end of the Roman Empire were probably Russian in origin. In the early sixteenth century, the German ambassador in St. Petersburg, Baron von Herberstein, was already reporting that censuses were taken biannually. In other words, the inspiration for the first modern European censuses came from the East, since a similar continuity of the ancient Roman censuses is unknown. Moving on a few centuries, our Belgian hosts can be proud of the fact that, based on his censuses from 1829 onwards, Adolphe Quetelet spread the practice of nominative census taking first to Great Britain in 1841, next to the United States in 1850 and then even further afield during subsequent decades, when he organized several international statistical conferences. In the present day, largely due to the decadal constitutional requirement and the efforts of the Minnesota Population Centre, the US has the longest series of computerized census microdata in the world (1850-2011), with only the burnt 1890 census as the missing link in the chain. The Minnesota Population Centre has also extended its census work to include encoded versions of mainly nineteenth-century censuses for the countries around the North Atlantic in the NAPP project, while their IPUMS International project covers post-Second World War censuses from no fewer than 82 countries.

What is an exception in the West is the rule in the East. Nearly all census manuscripts from the first Russian imperial census of 1897 and the Soviet censuses from 1920 onwards were destroyed in order to save archival space. Even the 1937 census aggregates were destroyed for political reasons, though this is an extreme case. The preserved exceptions are a few local 1897 questionnaires; the computerized versions for the most recent decades; and significant parts of the 1926-27 Polar census – the most comprehensive census ever taken, with details about the economy and qualitative descriptions of the northern ethnic peoples. The archival situation is better for tax lists and church records. Most regional archives hold *revizkie skazkie* (tax revisions) from the 1720s to the 1850s, some of them with census-like individual level data about entire households. Covering the same period, as well as the later period from the 1850s until the revolution in 1917, the archives also contain church registers that give vital information about the baptized, the married and the buried for a significant number of parishes. Most localities are represented, and from the end of the nineteenth century there are even records for religious minorities. This practice stopped after the Revolution, but paradoxically the new atheist rulers preserved the church registers, while destroying the secular censuses. Few of the ministerial records in Eastern Europe and beyond have been transcribed for computer analysis, but fortunately new samples are now being brought forward in the Urals and in

Transylvania.

A small group of countries in-between the East and the West have archived historic population registers and/or a combination of censuses and church registers. Sweden, Finland, Belgium and the Netherlands are fortunate to have complimentary, ready-made population registers from the eighteenth or early nineteenth century onwards. Three Swedish databases contain longitudinal population registers for five Swedish regions, including the capital city of Stockholm for between 1876 and 1928. These databases offer details on migration, educational levels, etc. that are seldom found in historical records. Their richness makes digitization resource-demanding – if the current methodology does not develop further, they will not be able to cover Sweden as a whole in this or even the next century. The Historical Sample of the Netherlands contains longitudinal data following a representative group of 78,000 individuals during the period 1812 to 1922. Sample densities that vary between 0.25 and 0.75% over the period provide researchers with nationally significant data. Similar Swedish results will – strictly speaking – only be valid for the regions where data are available, but contain a richer variety of variables, and for two regions even cover the entire twentieth century. To compensate for selectivity, the Swedish censuses from 1860 to 1930 are being transcribed and made available with national coverage.

Unlike Sweden and Finland, the Danish Kingdom with Iceland and Norway only exceptionally kept catechismal church records, with their annually updated information on households. Instead, in Iceland the church records and censuses from the eighteenth century onwards have been linked with other written sources and oral traditions in the *deCode* database, in which families can be followed through the centuries, some even back to the thirteenth century. In Norway, a consortium supported by the Research Council is building a countrywide population register from 1801 to 1964, when the current Central Population Register took over. In Denmark, similar plans have been made for the twentieth century.

In a parallel development, eighteen European countries used register data to take a census in 2011, either in isolation or in combination with data from questionnaires. The purpose of this undertaking is to create census aggregates, although nominative lists are also being constructed. This means that in the future researchers can also have access to (anonymized) census-like microdata, albeit extracted from registries rather than from questionnaires. The advent of population registers signifies the end of the historical difference between nations focusing on censuses and those focusing on vital register data. As the drive to combine these data types by constructing fully comprehensive population registers grows stronger, it will bring forth new source materials that are more suited to follow over time population segments that are increasingly geographically mobile, both nationally and internationally. Since these registers will produce censuses more economically and lend themselves to a number of other administrative purposes, it is likely that funding for the construction of population registers will be available in a growing number of countries.

Unfortunately, less public funding will be allotted to the transcription, encoding and linking of historical source materials. Even so, commercial companies catering for genealogists will provide historians with additional transcriptions in exchange for our existing transcriptions and our proofreading and encoding. In addition, computer techniques for the (semi-)automatic transcription of handwriting are maturing and will first automatically generate simple numeric fields, such as birth year and gender, before moving on at a later stage of development to variables such as names and occupations. Inconsistencies between the automated and the commercial transcriptions will help us during quality control. In cases where vital registers with lists of births, marriages, deaths and migrants are available, it should be possible to fill in the changes occurring in families and

households between subsequent censuses. This will make it increasingly realistic to (re)construct censuses for any point in time, also for the past. An example could be the 1940-1941 censuses, which were never carried out in Europe. Cooperation with genealogists will also be valuable when it comes to record linkage, if they can update the historical population register with additional information on their own ancestry. A wiki-type web interface in beta for this purpose is already used in Norway as part of the effort to build the country's population register from 1801 to 1930.

The snakes in the grass of this virtual data paradise are the legal issues. Of course, it is perfectly understandable that current information about identifiable individuals must only be used for statistical purposes. What is not acceptable is that individual level data are blocked for research purposes, even when they are properly anonymized and de-identified. Data collected for public organizations should not be monopolized in-house by statistical agencies that subsequently charge external users. After a reasonable period, such as the 72-year rule in the US, the nominative versions of the datasets should be released, with the exception of especially sensitive variables such as illnesses or causes of death. The fact that protests against the 2011 round of censuses in Europe were much rarer than the protests against the censuses in the 1980s gives hope that social media has instilled more openness about personal affairs, also when it comes to historical demographic data. We may perhaps even start to ask when we shall finally see the building of central population registers in countries that currently lack them, such as France, Germany and the US.

Biography

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Reconciling the macro and micro approaches in historical demography. A European population database

Paulo Teodoro de Matos

In future, it will be necessary for historians, demographers and other social scientists to join forces to develop new ways of processing demographic information about Europe's past. The proposal presented here is based on two central ideas. Firstly, the proliferation of demographic studies in recent decades has made it virtually impossible to recover information in order to carry out demographic syntheses. Consequently, the academic community would benefit considerably from the creation of a European database for the registration of demographic series (overall population per decade and vital statistics) for every political-administrative unit, ranging from the parish/village to dioceses/counties/districts. Secondly, and complementary to the first proposal, researchers and funding agencies should promote the territorial coverage of European areas that have not yet been studied, based on representative samples.

During the 1990s, Portuguese and Spanish researchers became very interested in 'excess mortality' and measured 'mortality crises' in different rural and urban regions of the Iberian Peninsula. During that same period, historians and demographers were keen to analyze the family configurations of the past (following, in most cases, the Laslett/Hammel classification), in particular the development of household formation and family cycle in relation to both economic constraints and inheritance patterns. Concurrent with these trends, there was a proliferation of studies at the local level, which primarily used the classical techniques of family reconstruction (to simplify matters, we will use the term 'micro analysis'), as well as studies covering larger territories with the help of annual surveys of population movements and (sometimes) broader populations trends (aggregative methods). These two lines of research have persisted in Europe, albeit with certain degrees of variation. Several researchers have published local and regional demographic monographs that combine a broad range of sources and methodologies. However, increasingly these studies are becoming an exception. Without wishing to belittle these excellent monographs, which are more focused on the reconstruction of families or on the elaboration of demographic profiles based on surveys, what we have witnessed is essentially a 'divorce' between on the one hand demographic analyses based on record linkage, and on the other hand those that use aggregate records and/or proto-statistical surveys and censuses.

Intense specialization in the field of historical demography has, at times, made us forget the need for a wider perspective on the demographic vectors of societies: their structures and behaviour. Although studies based on family reconstruction often provide a thorough insight into fecundity and mortality, they do not always include information about structures. But without structural indicators, it is virtually impossible to compare the demographic dynamics of different societies. Aggregate indicators – such as population size, social composition, age classes and broad age groups (0-14, 15-64, 65+), the average annual growth rate, crude rates of birth and death, etc. – require the use of

sources such as surveys, population tables, ecclesiastical lists of confession (*libri status animarum*), etc.

A European Population Database

A great deal can be done to increase the comparability of our research results, and thereby maximize their value. In this context, it would be highly beneficial to create a European Population Database in the form of a collaborative platform for the aggregation of European historical demographic data. Such a database should be designed by a group of experts and hosted by a network of research clusters with experience in large-scale historical databases. Each individual contribution would follow a specific query and be validated by the database administrator.

Social scientists are in a position to pursue this goal, which is in line with the laborious efforts of demographers like Michael Flinn, Vicente Perez Moreda, David Reher and Jean-Claude Chesnais to produce large-scale demographic syntheses. Despite very ambitious projects of national and regional scale, such as the Historical Sample of the Netherlands (HSN), the Dansk Demografisk Database, the Swedish Historical Population Statistics project and the historical database of the Transylvanian population, to mention only a few, there is still a significant knowledge gap about the demographic past for huge areas of Europe.

In an era dominated by information technology and in a continent blessed with such an abundance of parish records, we can do far more – and do it better. Conditions are right for historians and demographers to create a collaborative database to register (at least!) the annual series of births, baptisms and deaths, as well as the decennial volume of populations at a local, regional and national level. Just as the Mosaic project collects information on European family structures, the European Population Database – using a standardized form for data collection – would have an enormous potential through its gathering together of masses of raw information on a hitherto unseen scale. New insights into Europe's countless demographic regimes and the complex 'demographic transition' process would inevitably emerge.

Sampling European demographic trends in past times

However, by simply aggregating individual contributions, the European Population Database will not provide enough information to reconstruct the major trends of Europe's demographic past. The population data that we possess for various European regions is still fragmentary, because there are vast areas in Europe about which little or nothing is known. This fact has seriously undermined the attempts that have been made so far to summarize demographic regimes. Based on the information available in the European Population Database – bolstered by researchers who will see it as an opportunity to share their work – a group of specialists will need to evaluate which territories are most deficient in terms of coverage. Another team will make an assessment of the available sources (particularly of parish records), while a third group of experts in demography and statistics will be responsible for preparing a significant cluster. The minimum set of indicators should consist of population growth, population composition, broad age groups, and crudes rates of birth, marriage and

death. A major commitment to this project could support a more detailed analysis of fertility (total fertility rate) and mortality (infant mortality rate).

Of course, this an ambitious proposal, both because of the significant amount of collaborative work that is implied and the high financial and organizational investment involved. But viewed from a different perspective – the unique insights already provided by demography into our societies – this is an investment with unquestionable returns.

Biography

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Bridging the gap between historical demography and computing: tools for computer-assisted transcription and the analysis of demographic sources

Joana Maria Pujadas-Mora, Alicia Fornés, Josep Lladós & Anna Cabré

The construction of large-scale databases in the field of historical demography has proliferated in recent decades as a result of the development of information technology and the specific financing of research projects. Indeed, it is said that we are in the midst of a Big Data Revolution (Ruggles 2012). However, data building is still a time-consuming process, mainly due to manual data entry and the lack of digital copies of the original sources.

Massive digitization of historical sources has become customary nowadays. As a result, digital copies can now be accessed on-line, but generally through platforms that only offer visualization functionalities. Knowledge becomes dematerialized as information is extracted, organized semantically into large databases, stored and valorised. Another advantage of this trend is that it offers possibilities to standardize the data as part of the process, which eases subsequent or future nominative record-linkage. There is an emerging trend in the development of web-based crowdsourcing platforms that allows people to type in data online, thus splitting this task among large numbers of transcribers.

The advances in the field of computer vision, and in particular in the sub-field of document image analysis and recognition, make the automation of some tasks feasible. During the last decade, scholars in the humanities and computer scientists have, to their mutual benefit, started to work together in the emerging discipline of Digital Humanities. Computational algorithms and services arising from this research activity are gaining relevance, as they start to be integrated into crowdsourcing platforms as assisting tools for scholars and transcribers at large. We can identify two major categories of tools; namely, tools for recognition and tools facilitating the understanding of image contents.

Since sources are usually manuscripts, handwriting recognition techniques (Romero *et al.* 2013) are at the heart of the first category. Handwritten text-recognition consists in automatically transcribing the content of an image into a text; in other words, to convert an image (in pixels) into its textual representation (typically ASCII), which can be later managed using a text-processing application. For this purpose, most existing technologies consist of an optical model (such as hidden Markov-models or neural networks) for modelling the appearance of the characters. These are integrated with dictionaries and language models for lexical, syntactical and structural validation.

A particular scenario of handwriting recognition is called *word spotting* (Mas *et al.* 2016). There are situations where the recognition of images is very difficult and/ or suffers from a high error rate. This occurs when images are ‘noisy’, due to the physical degradation of a document, or the use of old

scripts and languages, or the compilation of the document by multiple writers, etc. In such cases, the strategy of word spotting proposes a holistic approach in which words are treated as visual patterns. Instead of splitting the input into small units (letters, graphemes, etc.), words are recognized on the basis of their shape, using some visual features. Word spotting can be used to directly retrieve the pages where a given query appears; in the transcription process; to find links between registers; or to cluster named entities that frequently reappear.

However, a single literal transcription of the documents is useless for the purpose of analysis (for example, to generate genealogies with these data, to establish individual and family life spans, and to spatially locate family networks). To understand a document, we need to be able to semantically analyze and categorize its content. It does not suffice to merely recognize a word; we also need to be able to tag it as being a name, an occupation, a date, etc. A key concept in the activity of document understanding is the use of contextual knowledge. Document sources are highly heterogeneous. Generally used tools for document recognition (for example, line or word segmentation, writer identification, word recognition or word spotting) are not generic enough to perform well on different types of documents from different periods that are written in different scripts on different topics. This is why we need to use contextual knowledge. Two categories of contextual knowledge can be defined. The first is intrinsic contextual knowledge, which refers to contextual information that can be derived from the document itself. Such information may concern the relationships between and the frequency of use of terms in the document; for example, the presence of one term increases the probability of another one. The second type of contextual knowledge is extrinsic and concerns the correlation and cross-linkage between data on separate pages or in different sources, as well as the knowledge provided by an expert (for example, the socio-economic or temporal context in which the document was written). The use of contextual knowledge allows us to adapt recognition and interpretation tasks to the domain of the processed documents.

We have implemented the architecture described above in historical demographic settings (see Figure 1). In particular, we have constructed the Barcelona Historical Marriage Database in the context of the EU-ERC Advanced Grant project ‘Five Centuries of Marriages’. Currently, we are constructing databases on the basis of census records, such as the 19 censuses held between 1828 and 1955 in the Catalan town of Sant Feliu de Llobregat. In all our research projects, both past and present, researchers from both historical demography and computer vision are brought together to share their insights. All the projects have also included a crowdsourcing task (see Thorvaldsen *et al.* 2015 for more information). More than 200 transcribers, some of them volunteers, participated in the projects. They not only helped with the crowdsource-based transcription, but were early adopters of the services arising from the research. Their valuable feedback helps our interdisciplinary research team to solve new research challenges. The implementation of handwriting recognition and word spotting techniques can identify frequent words, thereby speeding up the transcription made by users (they only need to type once some of the names that occur very frequently).

At the most sophisticated level of automatization, we take advantage of the extrinsic and intrinsic contextual knowledge offered by the documentation to automate processes. For example, the censuses from Sant Feliu de Llobregat were recorded in intervals of just a few years and the information on individuals in each household was quite stable from one point in time to the next. This seeming redundancy of information is used to assist the transcription. The redundant information is transferred from the census already transcribed to the next one – a process that is facilitated by automated searches for family member names that correspond to the same household record, using word spotting procedures.

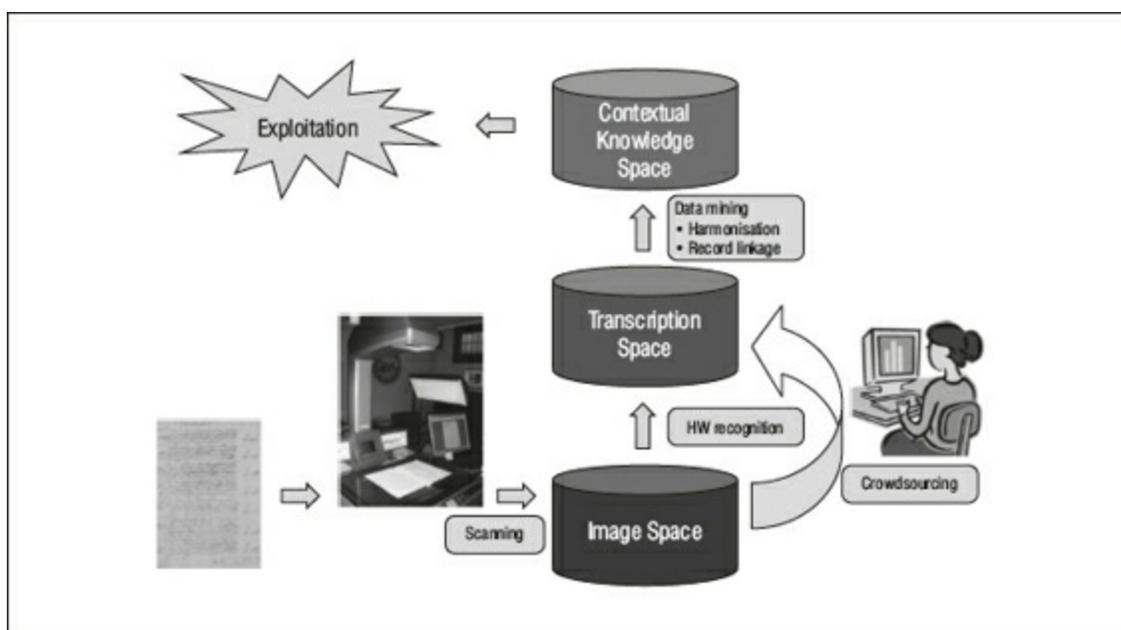


Figure 1. Technical architecture

The semi-automatization of data entry and the definition of standard formats for demographic databases, such as the Intermediate Data Structure (IDS) proposed by Mandemakers and others (see Alter & Mandemakers 2014), lead us to envision the creation of a kind of ‘social network’ of the past, similar to the way that people today are connected to each other through Facebook and other platforms. The use of artificial intelligence techniques permits analyses of their habits, their preferences and their social behaviour. We could achieve the same for historical populations by applying similar data analysis strategies to demographic data extracted from historical sources. Three key factors will be required to achieve this goal. First, the massive processing of scanned sources. Automatic reading software, adapted to different writers, languages and scripts, will be essential. Second, we need interoperable databases. This means more than standard formats and connectors across different platforms. The architectures underlying the database systems must also be flexible and dynamic enough to adapt themselves to the increases in and the enrichment of the data they contain. Third, the interpretation of the data contained in the databases will require that they be integrated with knowledge provided by people. This knowledge is the so-called ‘natural archives’, maintained by humans as memories of their societies.

Against this optimistic scenario, it should be remembered that fully automatic reading systems, which can operate on any source, are not a realistic expectation. Human intervention will always be needed. But this raises another challenge: how to place the user in the transcription loop in an efficient and effective way. From past experience of crowdsourcing the transcription process (Fornés *et al.* 2014), we can conclude that humans tend to introduce errors. Moreover, the transcription task tends to become tedious for the people involved. Redundancy in the transcription of some critical sources is necessary. However, this redundancy should be designed in a smart way; for example, with human and machine transcribers working in parallel. It also is vital, according to us, that the transcription activity is integrated into engaging platforms. Gamesourcing is an emerging paradigm that is worth considering.

In conclusion, in the mid-term future citizens of many countries will be able to navigate through networks of knowledge constructed from large-scale and cross-community demographic databases. This will generate new services for the interpretation of the past, not only for scholars but also for wider groups of the public. The incorporation of powerful image recognition tools will be at the heart

of data entry software. It will provide the computational power for semi-automatically processing large document collections, creating databases in a faster and more effective way. At the same time, interdisciplinary and cooperative work is needed to drive the construction of these databases. This interdisciplinarity should consist of a symbiosis between historical demography and computer science. In this mutually beneficial relationship, the demographers provide the historical, social and linguistic knowledge that allows the computer scientists to design algorithms adapted to the document sources.

References

- Alter, G. & Mandemakers, K. (2014). The Intermediate Data Structure (IDS) for longitudinal historical microdata, version 4. *Historical Life Course Studies*, 1, 1-26.
DOI: <http://hdl.handle.net/10622/23526343-2014-0001?locatt=view:master>
- Fornés, A., Lladós, J., Mas, J., Pujadas-Mora, J. M. & Cabré, A. (2014). A bimodal crowdsourcing platform for demographic historical manuscripts. In the Digital Access to Textual Cultural Heritage Conference (DATeCH), pp. 103-108. Online publication, see <http://dl.acm.org/citation.cfm?id=2595199>.
- Mas, J., Fornés, A. & Lladós, J. (2016). An interactive transcription system of census records using word-spotting based information transfer. *Conference presentation* at the 12th IAPR International Workshop on Document Analysis Systems (DAS).
- Romero, V., Fornés, A., Serrano, N., Sánchez, J. A., Toselli, A.H., Frinken, V., Vidal, E. & Lladós, J. (2013). The ESPOSALLES database: an ancient marriage license corpus for offline handwriting recognition, *Pattern Recognition*, 46 (6), 1658-1669.
DOI: <http://dx.doi.org/10.1016/j.patcog.2012.11.024>
- Ruggles, S. (2012). The future of historical family demography. *Annual Review of Sociology*, 38, 423-441.
DOI: <http://dx.doi.org/10.1146/annurev-soc-071811-145533>
- Thorvaldsen, G., Pujadas-Mora, J. M., Andersen, T., Eikvil, L., Lladós, J., Fornés, A. & Cabré, A. (2015). A tale of two transcriptions. *Historical Life Course Studies*, 2, 1-19.
DOI: <http://hdl.handle.net/10622/23526343-2015-0001?locatt=view:master>

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Historical population databases and the Intermediate Data Structure, 1980-2050

Kees Mandemakers

Datasets with historical demographical data were limited around 1980. But up in the North, a number of scientists with a ‘cool’ mind had already started ambitious databases with longitudinal data (Umea, Chicoutimi). Thirty-five years later, there has been an enormous expansion of datasets with historical population data of this kind.

In the 1990s, IPUMS (*Integrated Public Use Microdata Series Project*) started building systematic structured samples of the American census from 1850 onwards, which had already been further expanded before the turn of the millennium with the advent of two other major projects: a) The North Atlantic Population Project, with 100% population coverage for the USA, the UK and other Anglo-Saxon countries, and b) the start of IPUMS International, which rescues census data from all over the world. Taken together, all the IPUMS projects will number over 2 billion personal records by 2018 (see weblinks and Ruggles 2014). In Europe, the MOSAIC Project was started some ten years later. It collects census data from all over Europe and now includes almost 1 million persons (see weblinks).

IPUMS and MOSAIC are collections of static data, which refer to the moment of census-taking. From 1980 onwards, datasets with dynamic longitudinal data have grown enormously in all directions. Currently, there are now about 40 to 50 serious databases with longitudinal data worldwide, of which 30 are systematically described on the website of the European Historical Population Samples network (see weblinks). Until now, no-one has made the effort to count the number of persons in all these datasets, but a rough calculation suggests that the total must be at least 20 million. In addition to this, there are a lot of small-scale datasets that were mostly built by individual researchers. Their expansion generally halted when the researcher lost his or her interest in the subject.

What will the situation be like in 2050? For the Netherlands, given the enormous flow of activity in indexing by genealogists and archivists over the last decade, it is expected that all genealogical sources will be scanned and indexed – at least the information needed for identification. I expect the same development for most of the countries in northwestern Europe, the USA and Canada. The UK has already made the complete censuses of 1850-1910 available for scientific research. Their next step will be the inclusion of church registers and the linking of all person appearances (Schürer2007). We may call such a database semi-longitudinal, since it links different points in time without following persons day by day. There is no doubt that by 2050 IPUMS will have expanded its 100% count for 1850, 1880 and 1940 to all the censuses between 1850 and 1960, and will have linked them as well. The existing longitudinal databases will have expanded in many different directions: covering longer periods; covering more and larger regions; linking with modern

population registrations; and creating long family trees.

During the last ten years, we have seen the introduction and development of the so-called Intermediate Data Structure (IDS). This is an open data structure that provides a technical solution for disseminating data from historical population databases in a harmonized way (Alter, Mandemakers & Gutmann 2009; Alter & Mandemakers 2014). Figure 1 shows the various stages of the processing of person data. Each database uses several sources that differ in detail, but overall are more or less the same in terms of their basic structure. By converting these data into a common data structure, it becomes possible to use generic software for building datasets for analysis – so-called extraction software. The IDS presupposes that important integrating tasks, such as standardizing, dating and linking persons, will be performed by the database owners or creators themselves, since they have the best knowledge of their own sources. Of course, they can learn from each other and adopt techniques from other databases.

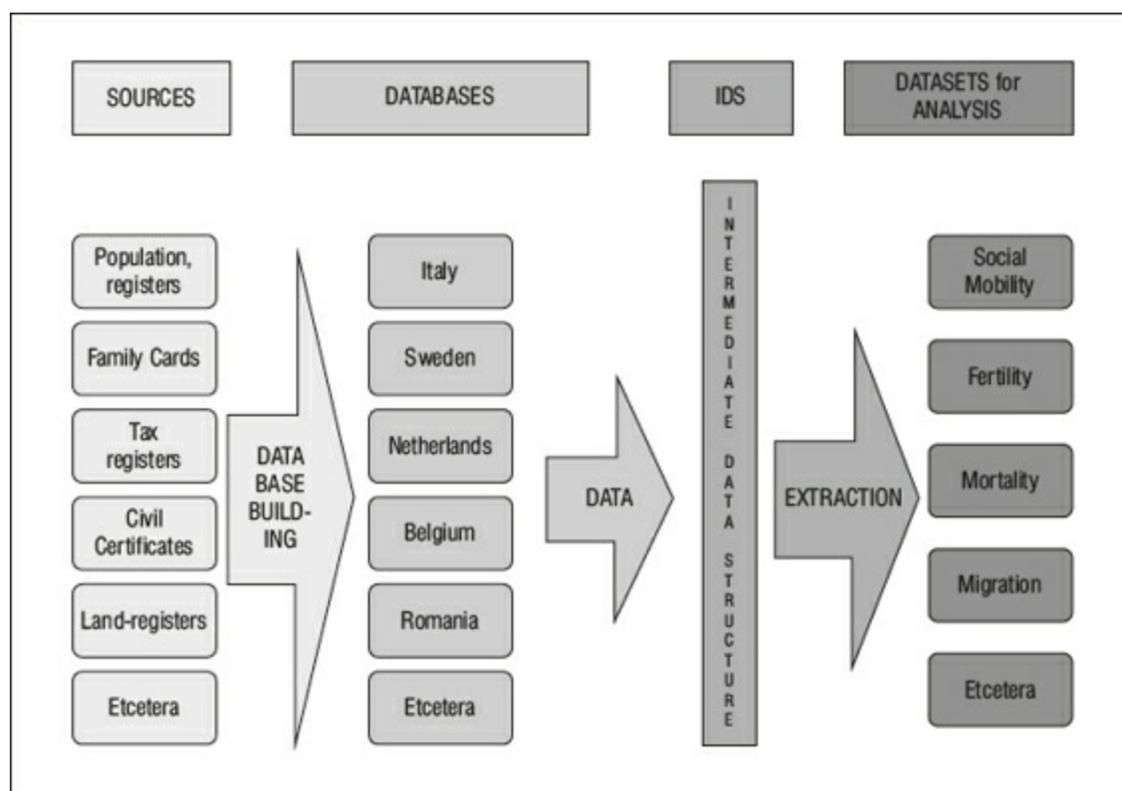


Figure 1. From source to harmonized datasets for analysis via the IDS structure

Since its official introduction in 2009, the IDS has been adopted by more than ten databases, including some very large ones, like DDB Umea. The production of software has taken off as well, both for small and bigger extraction components (a.o. Quaranta 2015). As historical demographers, we can therefore be very satisfied, especially when we realize that most of the work has been (and is being) done on a voluntary basis by professionals, who all adhere to the idea of a single collective data structure. In this sense, the demographic world has fully entered the ‘open access’ movement.

What are the challenges for the IDS during the next ten to fifteen years? I can see three key issues: a) outreach, b) maintaining standardization and c) integration.

Outreach is hampered by an old problem: lack of education. Historical demographers with a humanities background do not always have the skills to work with these big datasets. Teaching in statistics, database handling, etc. is very poor in most history faculties, especially at the bachelor level. This situation will not improve easily, since many history students are not fond of these more

technical subjects. In the very first article on IDS, Alter *et al.* (2009) suggested a three-step structure to overcome this problem: 1) courses on methodology; 2) easy data files; and 3) extraction software. The EHPS network has started to take up these issues by organizing a summer school system and by organizing the process of building and disseminating extraction software. In comparison, the second remedy – the construction of easy data files – is lagging behind, but this is only a question of time. However, maintaining the current network is highly dependent on the willingness of scholars to organize courses and to develop software. Another solution for the ‘skill’ problem is greater interdisciplinary cooperation, since only a few scientists are able to cover all the necessary aspects of research (theory, statistics and data handling).

Maintaining standardization and preventing ‘dialectization’ of the IDS is another continuing challenge. There is a risk of databases choosing new values or variables without consulting the community, which can lead to different variables and values for the same content. The solution here is to continue the already existing authority that decides on the IDS system. As far as software is concerned, there is the risk that all kinds of languages and packages will be used, which are not very durable or are too expensive for non-Western countries. For the moment, the best solution is to make a resolute choice for the open software community R when developing programmes.

The integration of all kinds of datasets will become an important issue; not the technical integration as such, which is realized by the IPUMS and IDS systems, but the integration of different data from the same realm. Historical demographers are interested in the micro world of specific villages and cities, simply because they need more variables for their analyses than can be offered by the big databases. However, this poses an enormous problem: that of generalization. Here, large datasets may offer firm ground for the selection of persons and data. This is where I see a future for a Historical Person Identifier or HPI, which will make the linkage of these multiple sources easier and more secure. The kernel of such a system is a register that contains the identifying information of persons (and their HPI number), comparable to the modern national population administration in continental Europe, but limited to deceased persons only. This HPI register will constitute the authoritative national reference source on historical persons. The users will be institutes with data collections, archives, individual researchers or research groups, and the genealogical community. The HPI can only be successfully introduced if the HPI register is grounded in a central, stable and transparent institutional setting.

To conclude, I see a bright future for our kinds of datasets, with more and more researchers other than historians using these data for many different types of research, including epigenetics, societal change (migration, mobility) and demography. It is important that historical demographers should keep up with these developments. At the same time, the existing historical databases need to integrate systems like the IDS, standard person identifiers and modern registrations into their data.

References

- Alter, G., Mandemakers, K. & Gutmann, M. (2009). Defining and distributing longitudinal historical data in a general way through an intermediate structure. *Historical Social Research*, 34(3), 78-114.
DOI: <http://www.jstor.org/stable/20762377>
- Alter, G. & Mandemakers, K. (2014). The Intermediate Data Structure (IDS) for longitudinal historical microdata, version 4. *Historical Life Course Studies*, 1, 1-26.
DOI: <http://hdl.handle.net/10622/23526343-2014-0001?locatt=view:master>
- Quaranta, L. (2015). Using the Intermediate Data Structure (IDS) to construct files for statistical analysis. *Historical Life Course*

Studies, 2, 86-107.

DOI: <http://hdl.handle.net/10622/23526343-2015-0007?locatt=view:master>

Ruggles, S. (2014). Big microdata for population research. *Demography*, 51(1), 287-297.

DOI: <http://dx.doi.org/10.1007/s13524-013-0240-2>

Schürer, K. (2007). Creating a national and representative individual and household sample for Great Britain 1850-1901 – the Victorian Panel Study (VPS). *Historical Social Research*, 32(2), 211-331.

DOI: <http://www.jstor.org/stable/20762213>

Weblinks

EHPS: <http://www.ehps-net.eu>

IPUMS: <https://www.ipums.org>

MOSAIC: <http://www.censusmosaic.org>

Biography

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Chapter 11

Where to go?

The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the mysteries of eternity, of life, of the marvellous structure of reality. It is enough if one tries merely to comprehend a little of this mystery every day. Never lose a holy curiosity

Albert Einstein

This final chapter sends you home with seven reflections on the mission of historical demography and its future.

Challenges and prospects of historical demography

Noriko O. Tsuya

If we view historical demography as a sub-field of demography, its presence in the international community of demographers seems to have been diminishing in recent years. For example, at the 27th IUSSP International Population Conference held in August 2013 in Busan, South Korea, there were only three out of 268 regular sessions (1.1%) that were devoted to historical demography. At two of these three historical demography sessions, I presented papers. Judging from the small audience attending them, I could not help feeling that the attention paid to historical demography has become somewhat limited in recent years.

Similarly, when browsing through the program of the 2015 PAA annual meeting in San Diego, there were only four out of 239 regular sessions (1.7%) that I could identify as being focused entirely on historical populations. Admittedly, it is often difficult to draw the line between what is “historical” and what is not, and there are other sessions (seven to be exact, checking the titles and the outlines of the papers) that seemed to include one or two historical contributions. Nonetheless, at the risk of overgeneralization, the overall picture emerging from the last IUSSP conference and the recent PAA meetings is one of a shrinking presence of historical demography as a sub-field of mainstream demography.

This recent trend poses a clear contrast to the period from the 1960s to the 1980s, a period during which, I think, historical demography was – both technically and substantively – an integral part of demography. Historical demography contributed to the field by offering data that were invaluable to the development of various formal demographic techniques, such as the model life tables (Coale & Demeny 1966), the I-indices of fertility (Coale 1969), and the model fertility schedules (Coale & Trussell 1974).

In my view, the theoretical importance of historical demography was (and still is) closely tied to the contributions it makes to the understanding of demographic transition, as exemplified by the European Fertility Project. Examining changes in childbearing behaviour from the late eighteenth to the mid-twentieth centuries for over 1,200 areas in Europe, the project produced eight books – all authored or co-authored by leading demographers – as well as a number of journal articles and book chapters (for a summary of the major findings of the project, see Coale & Watkins 1986). However, once the European Fertility Project was completed and its leading demographers moved away from historical studies, historical demography seems to have begun losing its central status in demography. This descent seems to have been facilitated further by the proliferation of multivariate analysis techniques, which were in large part made possible by innovations in computer technologies and by the widespread availability of large-scale micro-level survey data.

What can we do to reverse the adverse tide that historical demography seems to be facing? Historical demographic studies are often based on a small number of non-random observations, which tends to lead to statistically unstable and unreliable results. This limitation is prone to diminish

the empirical generalizability of their findings. To overcome this shortcoming, the first step that needs to be taken is to increase the size of data by drawing comparable records from different communities covering similar or overlapping years, and/or by pooling records from the same communities covering different points in time.

Historical demographic studies are also sometimes based solely on data drawn from the registration of events, such as parish registers. But to accurately estimate the probability of the occurrence of a given event, we also need to have information about the “population at risk” of experiencing that event. This means that we need to obtain records not only of individuals who experienced the event in question, but also those of all individuals living in the communities/areas to which such registers belong. By linking information of demographic events to persons who are at risk of experiencing them, we can then estimate the likelihood of specific demographic phenomena, as well as the age and gender patterns of demographic behaviour.

Furthermore, if we can link all existing records of individuals living in a community, using annual population or household registers that cover a long period of time with only a small number of years missing, to which information about demographic events can be merged, as in the case of some north-eastern Japanese villages in the eighteenth and nineteenth centuries (e.g. Tsuya & Kurosu 2004), we can construct an ultimate longitudinal dataset delineating actual life courses of individuals and their households.

Better yet, if information on the socio-economic conditions prevailing in the communities or areas in which those individuals and households reside can be added to the dataset, we can conduct multivariate and multi-level analyses that can account for the dynamic mechanisms of demographic behavioural change. Hopefully, the results of such analyses would have important implications for the study of contemporary populations.

Compared with the large-scale sample survey data often used by contemporary population studies, the construction and analysis of historical demographic data tends to be painstakingly tedious and labour-intensive, often requiring the long-term collaboration of different researchers. Yet if we can bring such challenging endeavours to a successful conclusion, the potential rewards could be significant.

A multivariate and multi-dimensional analysis of historical demographic processes covering a long period of time is likely to contribute to the furthering of our knowledge about contemporary societies, as we to know where we came from in order to see where we are going.

References

- Coale, A. J. (1969). The decline of fertility in Europe from the French Revolution to World War II. In Behrman, S. J. & Corsa, L. (Eds.), *Fertility and family planning: A world view* (3-24). Ann Arbor: University of Michigan Press.
- Coale, A. J. & Demeny, P. (1966). *Regional life tables and stable populations*. New York: Academic Press.
- Coale, A. J. & Trussell, T. J. (1974). Model fertility schedules: variations in the age structure of childbearing in human populations. *Population Index*, 40, 185-258.
DOI: <http://dx.doi.org/10.2307/2733910>
- Coale, A. J. & Watkins, S. C. (Eds.) (1986). *The decline of fertility in Europe*. Princeton: Princeton University Press.
- Tsuya, N. O. & Kurosu, S. (2004). Mortality and households in two Ou villages, 1716-1870. In: Bengtsson, T., Campbell, C., Lee, J., *et al.*, *Life under pressure: Mortality and living standards in Europe and Asia, 1700-1900*, 253-292. Cambridge, Mass.: MIT Press.

Biography

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Shedding the blinkers: innovative perspectives for historical demography

David S. Reher

The heyday of historical demography on the stage of the social sciences and humanities undoubtedly came during the second half of the twentieth century, in particular between the mid-1950s and the mid-1980s. This great leap forward by the discipline was based on new methods of analysis, on the discovery of the myriad uses of – often local – data, and on some wonderfully innovative ideas. This particular mix of innovations made the discipline the toast of the social and historical sciences of the day, with groundbreaking work in historical demography read widely both by social scientists and by historians. This rise to prominence had certain characteristics that are worth remembering. Perhaps the most important of these was that much of the success was couched in terms of an on-going dialogue between the past and the present. Methods and concepts were transferred from the social sciences to historical demography, while history interacted with the present via ideas, areas where theories could be tested, and an urgent need of the social sciences to make use of long-term historical perspectives. It was a marriage made in heaven, mutually beneficial for everyone involved. This golden age of historical demography was also one of pioneering, larger-than-life researchers, who gave real meaning to the on-going dialogue between the worlds of yesterday and today. The work of great scholars from both the historical and the social sciences, like Louis Henry, Peter Laslett, E. A. Wrigley, Roger Schofield, Ronald Lee, Ansley Coale or John Hajnal, was central to this rise to prominence of the discipline. While certainly not the only stars in the firmament during this period, their key role is undisputed.

Generational change is always perilous, especially when the older generation is particularly brilliant. Historical demography, like many of the social sciences, has not been an exception. In the aftermath of this golden age, the trajectory of the discipline has left much to be desired. It is difficult to deny that its scientific ‘clout’ was much lower in, say, 2000 than it had been a few short decades earlier. The number of practitioners of the discipline, especially the younger ones, has declined; research in the field no longer attracts the type of interest among historians or among social scientists that it did in the past; and I suspect that historical demographers are less inclined to follow the lead of the social sciences than they once were. A substantial part of this change has been caused by general changes in society and by trends in sister disciplines. This notwithstanding, it is also true that much of the decline was brought on by the intrinsic development of the discipline itself. A part of the problem is that many researchers seemed to prefer working in the shadow of past greatness, rather than moving in new directions with innovative research subjects, new ideas and different methodologies. This is not to say that there have been no innovative research efforts during recent decades, especially in light of important publications related to migration history, the history of health, reproduction dynamics, family history and other associated topics. None of these efforts, however, have reached

the prominence of the earlier pioneering efforts in the field. Currently, a return to the heyday of the past is quite simply unthinkable.

This current period is one of consolidation, rather than of greatness. Everywhere there are initiatives underway that offer the promise of rejuvenation for our discipline. Some of these are more promising than others, but all deserve mention. Unquestionably, the biggest news from this and other related fields is the veritable explosion of data now available to researchers. Unlike the initial period of historical demography, this multiplication of data does not result so much from the indefatigable work of individual researchers as it does from existing data sources that have been placed into readily usable databases, thanks in large measure to the seemingly unstoppable multiplication of the importance of computing. The variety of data in these datasets is enormous. Without doubt, microdata form the major part of the available data, though for the twentieth century there are a number of very important datasets based on national level statistics. While it is difficult to argue that this is not very good news indeed, because it minimizes the onus of data collection, it shifts the burden of quality to the ideas and methods of analysis applied by researchers and to their ability to derive a real story from large masses of information at their disposal. It has taken us from an age where data collection and processing was a major part of a researcher's task to a new era where it is a comparatively minor one. It also means that research tends to be constrained in an important way by the existence of 'big data', which limits our ability to address issues that may lie beyond the types of data to be found in these massive datasets.

Related to this, much of the research based on these new datasets makes use of fairly sophisticated multivariate analytical techniques, a trend that also characterizes research in many sister disciplines. This sophistication has both positive and negative implications. On the positive side, it brings us more closely in touch with the social sciences and gives our discipline a 'scientific' veneer. On the negative side, it means that research themes are defined in ever more restricted ways, and that we run the risk of knowing more and more about less and less. Ultimately, fairly sophisticated multivariate statistical techniques, especially in the absence of big ideas, may be of limited use in the discipline. What's more, these techniques have helped isolate historical demography almost entirely from the humanities, one of the two original growth areas of the field. In the final analysis, if our research is no longer read by either social scientists or by historians, the future cannot be considered very bright.

A more important challenge is the need to generate research around big, relevant ideas. Without these ideas, historical demography will end up having little or nothing to contribute to the contemporary world. Big data and small ideas are not going to lead to resurrection and renewal of the discipline. It is worth remembering that most of the pivotal contributions to our understanding of populations in the past have been general in nature; exciting ideas coupled with relatively low levels of statistical sophistication. It is unquestionable that the era of modern population growth that began two centuries ago poses enormous challenges for contemporary society. The cornerstone of this process is the demographic transition and how it developed in different world regions. The end point is the sustainability of massive human populations and, ultimately, the process of ageing and eventual population decline. Does historical demography have anything to contribute to our understanding of this process? I believe that it does, mostly because historians tend to understand long-term processes of change far better than social scientists.

For historical demographers to participate in these debates, they must first lose their fear of dealing with the twentieth century and contemporary society. It is worth mentioning that, to date, the vast majority of work on the demographic transition has been penned by demographers and economists, not by historical demographers. Has this key process in world population history been

completely researched? No, it has not, and there are many perspectives where historical demographers have a strategic advantage. Much the same holds true for the major fertility cycles of the twentieth century, and in particular for the baby boom and the subsequent baby bust. Does a historical perspective have something to add to existing debates? Again, I believe that it does, especially if historians make use of the traditional strengths of the discipline: microdata when available; perspectives on the importance of time and changes over time; and a grasp of the big picture.

Similar challenges can be identified for migration patterns (how past and present patterns are linked and how the role of migration differs over time); family systems (how non-European family systems compare to the European ones we know so well, and the implications this has for the way societies function and the way they may be able to intervene in the management of the approaching tidal wave of ageing); the modernization of mortality (similarities and dissimilarities in the way the health transition took place in the developing and the developed worlds); the links between population and economic growth (including, perhaps, a rediscovery of Malthus and Boserup when discussing the links between population, resources and technological change during the twenty-first century); the role of values for demographic behaviour (including their relative importance for behaviour, past and present); and, linked to the ageing issue, the importance of changes in age structures in societies throughout the centuries, up to and including our own. Last but not least, are we ready to produce a global history of reproduction during, say, the twentieth century? If so, wouldn't it be best if this task was undertaken by a historical demographer?

These issues of enormous interest for the contemporary world can also be a source of renewal for historical demography with regard to the way it deals with the past. Current concerns have always been the main source for new perspectives on the past and there is no reason why historical demography should be any different. Rethinking the issues of the past can – and must – be done. In this way, the field will finally be in a position to play a relevant role for the way we understand both the past and the present. It could well be the dawn of a new era.

Biography

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Which future for historical demography?

Josef Ehmer

Historical demography has become a well-established field of research. The question is, therefore, not whether it has a future, but which one: does it have a future as an academic niche, or as an intellectually inspiring discipline which is attractive to scholars throughout the humanities and social sciences, and to a broader public beyond academia. The result depends, in my view, on the will and the ability of historical demographers to transform four strongly interrelated tensions into productive relationships, which I want to discuss in the following reflections. None of them are new. They rely on discussions conducted throughout the last forty years. However, when thinking about the future, it might be useful to remember them.

Demography or history?

Historical demography should improve its efforts to become an accepted and essential approach both in demography and historiography. In temporal terms, this means the inclusion of all historical periods, including the present, and paying particular attention to long-term trends. In its formation phase, historical demography concentrated on early modern Europe, understood as an exemplary ‘pre-transition’ developmental phase. It paid less attention to the ‘transition’ itself and hardly any to ‘post-transition’ dynamics – if we use, for this purpose, the terminology of the ‘theory of demographic transition’. Historical demographers should get rid of this tradition and call transition theory in its entirety into question. They will probably not be able to compete with demographers when it comes to statistical skills, the handling of ‘big data’ or the global perspective, but they should look for inspiration from current demography and they should offer, in turn, reflective and empirically sound long-term perspectives.

At the same time, historical demographers should try to integrate their research more closely into the various attempts towards formulating a ‘history of society’, by taking the full historical context more seriously. This requires, first of all, ongoing theoretical reflections about the relations between human reproduction and all other dimensions of social and cultural life. So far, the most elaborated and influential concepts for integrating demography into general history have had an economic bias within a Malthusian theoretical framework. These approaches have many merits, but they are not enough, and they are too strongly tied to pre-industrial and early industrial modes of production.

Social science history or anthropological and cultural

demography?

Any attempt to bridge demography and history has serious methodological consequences. A major one concerns the trend in demography towards a highly formalized quantifying social science. Quantification has been one of the greatest strengths of historical demography, but its frequent restriction to statistical analysis is also one of its greatest weaknesses – and a barrier against historiography. Quantification is an excellent and indispensable tool for the description of historical trends and for the statistical proof of relations between various quantifiable dimensions of reproductive behaviour. Moreover, population statistics have the potential for empirically valid comparisons across time and space, including global comparisons. However, their explanatory power is weak. Quantification has the potential to show very clearly what happened, but less ability to explain why it happened. Quantification has an enormous heuristic value, as its results usually raise a wide range of new questions. Many of these questions, however, cannot be answered within the quantitative universe.

Since the 1970s, the quantitative mainstream has been accompanied or explicitly challenged by a rather modest ‘cultural turn’; by ‘anthropological demography’ or ‘cultural demography’. The proponents of these approaches were interested in the complexity of human agency, and in the cultural and mental structures that framed demographic behaviour. They used qualitative sources that promised access to discourses, as well as to individual and group meanings of demographic attitudes and practices. The problem I want to stress here is the insufficient communication between quantitative and qualitative approaches in historical demography. Bringing them together or at least nearer to each other seems to be anything but easy: their research interests, their conceptualization of demographic behaviour and their means of analysis all seem too different. Nevertheless, I am convinced that historical demography cannot avoid this task, if it wants to contribute to a full understanding of demographic behaviour in the past and the present, and if it wants to proceed towards an intellectually inspiring future.

Macro or micro?

As is well known, the formational phase of historical demography, particularly in France, had a pronounced focus on regional history. Since then, demographic questions have been more or less indispensable elements of local or regional ‘micro-studies’. However, the development of historical demography into a separate discipline led to a kind of emancipation from its regional traditions. The analyses of local church registers became building blocks for the construction of national population histories or even ‘European demographic systems’. This was an advance, no doubt, but it entailed an enormous loss: the integration of the reproductive behaviour of social groups into their full historical context, including the worlds of work, social stratification, normative systems and the like, is easier – or perhaps in the first place only even possible – on a micro-level. Cultural demography is not at all restricted to the micro-level – for instance, when it concerns discourses or religious systems. However, the most convincing combinations of quantitative and qualitative demographic research that have so far been produced are, in my opinion, local studies. A problem is, however, that the period covered by almost all of these studies ends at some point in the late nineteenth or early twentieth

century. One of the major challenges of historical demography will be to strengthen transnational and, hopefully, global perspectives, as well as to carry on the fruitful traditions of village and regional studies, and to extend them right up to the present day.

Population history or the history of fertility and mortality?

What I have observed throughout the last two or three decades in both demography and historical demography is an increasing differentiation and specialization into the various dimensions of human reproduction. The long process that gradually formed, from the seventeenth century onwards, a new coherent academic discipline – population studies or sciences – seems to have come to an end and has been replaced by fertility and mortality studies – in much the same way that migration studies and migration history are now only marginally related to demography. In a positive interpretation of this recent trend, one might welcome it as a process of emancipation for demography from the social, cultural and scientific construction of ‘population’. Surely, a complete separation is hardly imaginable. The construct of ‘population’ retains its relevance as a factor of social and economic change. There is still strong academic and political interest in the rise, decline and composition of ‘populations’. A lot of statistical effort is spent worldwide on global and national population forecasting. Population discourses, scientific thinking and politics are still important elements of state building, of nation building, and – since the mid-twentieth century – of global developmental programmes, and they are still widely used arguments in the political arena. Therefore, they must keep their place on the historiographical agenda.

However, my feeling is that the intellectual attractiveness of ‘population’ is exhausted. When it relates to the understanding and explanation of reproductive behaviour, concentration on its single elements seems to be more fruitful. Both fertility and mortality are much more strongly related to various dimensions of economic, social and cultural life than to each other. The split-up of demography might stimulate the integration of its traditional elements into broad socio-economic and cultural perspectives. Again, the task is to find a productive balance between ‘population history’ in all its various dimensions and reasoned scepticism regarding the construct of ‘population’.

To sum up: the four questions which structure my reflections were organised around an ‘or’. But it has become clear, as I hope, that what I want to advocate is an ‘and’. The future of historical demography that I hope for is to be found in the multidisciplinary *within* and *beyond* this discipline. Multidisciplinary not only requires huge research programmes or actual co-operation. Its very hub, for each of us, is simply an awareness of and a curiosity about what others are doing.

Biography

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Towards a sustainable future for historical demography

Sangkuk Lee

Present landscape and challenges for historical demography

A series of foreboding signs for the future of historical demography have surfaced in recent years. First, the number of researchers in the field is decreasing and changes in the impact factor index point to the declining status of our academic journals. In addition, the emergence of young innovative researchers who spearhead historical demography has become a rare occurrence, thereby eroding the pool of published research theses from which to quote.

Second, the topics addressed in existing research often prove limited in scope. Detailed research on isolated classic themes in historical demography abounds – fertility, mortality, migration and marriage are increasingly revisited. On the other hand, research that illuminates demographic processes and events in a holistic manner, which ought to be the ultimate aspiration for researchers in the field, remains sporadic.

Third, efforts to uncover new data sources have stalled. The wide range of data unearthed and shared from various parts of the world has hitherto driven the growth of historical demography. However, tapping novel data sources to complement the old datasets is becoming harder to achieve.

Last but not least, innovative research applying new research methodologies has been scarce. Western Europe has traditionally steered the research effort in historical demography and continues to improve and refine its existing models, while Asia, led by China and Japan, has adopted the Western methodology to build models comparable to the Western ones. Even though attempts to establish a customized Asian historical demographic model have been observed in recent years, they have yet gained traction.

Korea on the periphery of historical demographic research

While the less than sanguine future prospects for historical demography may sound the alarm-bell for regions and countries with a longstanding research tradition in the field, they present a new set of challenges for nations like Korea, with a relatively short record of historical demographic research. It was only around the year 2000 that historical demography gained a foothold in our country. Before then, demographic research largely consisted of endeavours concentrated on the tracking of demographic changes based on macro-datasets, which often suffered from a lack of credibility and a limited amount of data. During these early years, research relied on historical data, such as the *Annals of the Joseon Dynasty*, household statistics produced by the government and the census data collected

by the Japanese imperialist regime (1919-1945) after 1925. Although these data shed light on overall demographic trends, researchers working with them could not avoid criticism for failing to acknowledge the data's limited nature and for making liberal inferences from the information that was available. The statistics from the *Annals of the Joseon Dynasty* are essentially a record generated by the tax authorities of the Joseon Dynasty (1392-1910), while the post-1925 censuses were an incomplete source that did not capture population information on the preceding period.

Against this backdrop, several historical demographers noted the availability of genealogies and registers that contained personal information related to demographic events. They applied methodologies such as family reconstruction, at the same time investigating these documents to collect family or household-oriented data. Researchers then began to create an electronic file of the *Danseong Household Registers*, which were considered to be the most reliable source, and thereby paved the way for historical demography to flourish in Korea. The most pronounced feature of the *Danseong Household Registers* and other Joseon Dynasty's register data is the three-tiered (High-Middle-Low) system of individual occupational status. Such stratification is in sharp contrast with the data from other regions and countries, such as the register from the Province of Liaoning in north-eastern China, which covers just a single population group. The household registers therefore lend themselves well to further study in social mobility and inequality.

Genealogies constitute another important historical demographic source available in Korea. Korea has one of the most extensive troves of genealogies, and the practice of recording family genealogies remains intact. The *Andong Gwon-ssi Seongwhabo*, the oldest extant genealogy in the country, has been published about nine times from its first printing in 1476 until 2002. Genealogies can be utilized to reconstruct family histories and facilitate the accumulation of long-term time series data across diverse regions. Some historical demographers have relied on household registers and genealogies to study various demographic phenomena, including birth, marriage and death.

Nevertheless, doubts about the quality of these data have led sceptics to question the value of the research outcomes produced by historical demographers in Korea. One constraint of the genealogies is that they are incomplete. This fact is often taken for granted, without consideration of its implications. One is hard-pressed not to conclude that 'imperfect' statistical results derived from 'incomplete' datasets will inevitably be deemed 'inadequate'. Another problem is that researchers working with these data, who are historians by training, experience difficulty in embracing new statistical research methods that are more refined than making extrapolations to fill in the gaps of incomplete data.

Future of historical demography with new challenges

Nevertheless, the rising trend in research that underscores 'historicity' in historical demography sends a positive signal. The field has traditionally been saturated with statistical analyses and research methods taken from the social sciences. There has been a tendency to extract samples from populations without a clearly defined scope. Furthermore, rather than treating the compatibility of a dataset with stated research goals as the decisive factor in research undertakings, most research initiatives have been set up with the aim of avoiding the need to work with incomplete data, preferring instead to work only with high quality data. In this way, the data itself often became the research subject. What remained at the end was statistical analysis bereft of the historicity embodied

in data. Therefore, as we critically take stock of historical demography's past, a new challenge confronts us as we seek to move forward: to restore the historicity of data eclipsed by the prevailing quantitative, statistical research methods of the social sciences.

This new challenge could be tackled by collaborating with various disciplines instead of insisting that 'history' alone carry its weight. Interdisciplinary research can extend the scope of the research data, allow historical demographers to formulate research methodologies optimally tailored to the specificity of the data, and, moreover, facilitate intuitive understanding of the outcome of analyses by means of visualization. With the aim of addressing the current limitations of the field, the National Research Foundation of Korea has sponsored interdisciplinary research to resolve the issue of incomplete data and to bring history back into historical demography. With a brief introduction to this research, I would like to share a methodology that can contribute to the future progress of historical demography.

As mentioned earlier, the Korean registers and genealogies that included information on different social classes provide a glimpse of social mobility in the past, and have proven amenable to organization in time series. The wide use of these data sources laid the foundation for historical demography in Korea. However, the purpose-driven nature of these documents, which were created by national authorities and families, necessitated discretion and a cautious approach on the part of the researchers. As a measure to supplement and check these data, a research method to reconstruct family histories by aggregating registers and genealogies compiled in the same region and time period was suggested. Taking this suggestion a step further, we are currently collecting information on individuals from historical documents, including the *Annals of the Joseon Dynasty*, to enrich the overall dataset on individuals and families.

Moreover, researchers from linguistics and computer sciences have developed an ontological method that identifies historical figures from the vast tomes of historical data through data-mining. They uncover the configurations of life and death, making up for the lack of information on marital relations (since marriage networks are absent from the registers). Similarly, data-miners and statistical researchers are tailoring the Semi-Supervised Learning (SSL) method used in machine learning research to enhance the effort to collect relevant data. The longitudinal data accrued is then analyzed via network methodology in order to tease out the diverse demographic relations among individuals and families. Finally, the outcome is crystallized in a wide array of visual representations.

As much as our ultimate aims as historical demographers are to reinstate 'historicity' and to resolve the issue of 'incomplete data' in historical demographic research, we must recognize that these are also two laborious, formidable tasks. Even so, progressing towards the realization of these goals is a critical challenge we need to face, if we wish to secure the future of historical demography. Furthermore, we must also consider the best way to develop customized research methods that take into account the variety of data found in different regions and countries, which can be used in conjunction with universal research methodologies in the field. This is crucial, since mankind's historical trajectories in various localities are often divergent, despite their apparent similarities.

Biography

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Reach out to bring in rejuvenation: on the need to populate historical demography

Lotta Vikström

This book seeks to inspire the next generation of historical demographers. As such, it is a call for strategy and action of the utmost importance to future developments. However, the core aims of conducting historical demographic research, or defining precisely what this involves, are not uniformly articulated. This reflects historical demography's interdisciplinary background and may be viewed as an advantage in allowing for a multi-faceted approach. Yet any strategy and action can usually benefit from having the actual goals clearly in focus.

At stake is how this small and mixed field, as I will call it, can continue to gain interest from both senior and junior scholars to obtain the rejuvenation it needs. It was initially established by, and has ever since lived off, the recruitment of researchers from other disciplines. To survive and advance, the field must keep directing its interest towards these other disciplines and the different questions they address. Historical demographers must also make their research and their results attractive to them. But how can this be achieved? The box below sums up my suggestions for future rejuvenation and raises two questions for further debate, which I will address in the remainder of this text.

SUGGESTIONS FOR THE FUTURE REJUVENATION OF HISTORICAL DEMOGRAPHY

- Historical demographers should continue to utilize the recent development of advanced statistical methods to establish robust results and conclusions about past populations.
- However, they must discuss even more the historical significance of their result and the impact this has on current knowledge on the past.
- They should try harder to explain to non-specialists the methods by which their results are obtained, instead of seeking to impress specialists within the field.
- They must be even more open-minded to joint work with scholars from other disciplines and show interest in their theoretical and methodological skills, in order to jointly solve research issues.

These actions would strengthen both the historical dimensions and the questions/outcomes of historical demography. This would also increase external interest for the field and encourage cross-disciplinary work. More so than directing the focus towards methodological issues and advancement, it will provide new resources and safeguard rejuvenation. Methodological advances would later arise as a result of this rejuvenation.

TWO QUESTIONS WHOSE ANSWERS MAY ADD TO (OR IMPEDE?) REJUVENATION

1. What is historical demography? Should it be more clearly defined? If so, why - or why not?
2. What are the purposes of conducting historical demographic research? Why is it needed and by whom?

There is no straightforward answer to the question “what is historical demography?” Since its establishment, the field has incorporated a variety of scholars from different disciplines (for example, history, economic history, demography, sociology and statistics), of whom a majority employ

quantitative methods on past population registers to find solutions to the questions they are investigating. Basically, two analytical approaches dominate the field. First, there is a focus on demographic outcomes that result from societal transformations, with the aim to identify the mechanisms that have generated these outcomes; for example, the decline in mortality or fertility across time and space. Such studies treat a demographic phenomenon as the *dependent variable* that needs to be explained. Attention is paid equally to endogenous factors in the demographic structure of the population (such as age distributions and possible cohort effects) and to exogenous factors in society (such as economic transformations and technological innovations), both of which could shape demographic patterns. Second, there are studies that treat demography itself as the *independent variable*. According to this approach, population composition and shifts in this composition determine socio-economic and political changes in society, which may in turn influence future developments. The immense emigration of Europeans overseas serves as one historical example that has structured societies and populations on both sides of the Atlantic.

Beyond these two approaches, there is a third type of analysis that may lack full recognition within the field, since this approach primarily views demographic patterns or behaviour as expressions of other phenomena in society, while the demographic outcome *per se* is of secondary concern. Even so, population registers continue to be the main source to answer questions and the methods used echo those employed in historical demography. Analyses representing this approach have increased our understanding of the openness in past societies by quantifying social mobility from occupations in registers. Research on the socio-spatial origin of spouses and the age gap between them has indicated whether love played a part in people's partner choices, or if it was more a match made by parents and motivated by economic concerns. Based on population records, studies of illegitimacy, the parental sex preferences for offspring and the analysis of women's work and demographic change have all contributed to our knowledge about gendered relationships across time and in terms of power.

All three approaches increasingly use inferential statistics and multivariate models. They have become the preferred tools, thanks to the growing access to digitized data on populations, allied to the technical developments (computers, software, etc.) that make this possible. This is beneficial to the field and has promoted an interest for it among statisticians, sociologists and economists. However, many practitioners of historical demography have become less concerned with history and more with employing correct demographic methods, or with finding the best statistical model-fit. This focus tends to chase other scholars away, primarily those in the humanities. Without neglecting the importance of choosing adequate methods or of advancing them, this trend worries a historian like myself. It may even endanger the field's fruitful mix of scholars from different disciplines. Demographic data and methods should aid the research and understanding of history, which, in my opinion, is the ultimate task of historical demography. I view the third type of approach as the key to maintaining the historical dimension and strengthening the field by engaging scholars who are more concerned with the historical significance of their results than with their statistical relevance or the reliability of their statistical models. How is the field to survive and expand, if we are obsessed by methodological issues or if we are perceived as such among colleagues?

There is yet another reason why historical demographers must look for wider applications for their abilities and make themselves more readily available to take on new tasks for others. Society at large and the major funding bodies are both calling for cross-disciplinary projects to tackle the societal challenges of today (for example, Horizon 2020, National Research Councils, etc.). External funding assists the creation of innovative research, also in historical demography, but it has become more difficult to find funding as a discipline in isolation. Cross-disciplinary collaboration is a means to

make the field flourish by joining forces with scholars to answer new questions that require demographic data and methods to be investigated more completely. I know from personal experience that joining forces with others helps to promote topical research that requires historical demographers – along with many other specialists – to solve the issue in question. One recent area of investigation that has involved historical demographers focuses on sub-groups in past populations, such as indigenous people, or, as in my case, disabled persons (funded by the European Research Council with Consolidator Grant, DISLIFE-647125, Liveable Disabilities in 2015). Uncovering the demographic experiences of these often disadvantaged sub-groups may add little to core issues in historical demography, but it brings to the forefront long ignored individuals who still lack recognition in society. Identifying how their life courses developed from the past to the present advances our understanding of how opportunity structures operate across different regimes (for example, attitudes, norms, labor, partner markets and survival) to help or hinder the participation of individuals in social life and society. Such a reorientation of research stimulates inter-sectional analyses across disciplines and exemplifies how historical demography can help to solve current societal issues.

It would, moreover, stimulate rejuvenation from below. Reaching out has to start with the students, who potentially form the next generation of researchers. However, few students in the social sciences and humanities find any immediate interest in historical demography, as it takes time to appreciate the type of quantitative studies it involves. As a result of this, and because historical demography is seldom a subject on the core curriculum, we face a tough pedagogical task – not only to convince students about the advantages inherent in historical demographic analysis, but also to access them by persuading professors of adjacent disciplines that it is worthwhile integrating historical demography into their teaching. Extending the use of historical demographic research would facilitate this task by generating more and wider interest for our field.

So where do we go from here? To answer this question, historical demographers must meet and interact more frequently, not only to discuss research methods and results, but also to debate the development of the field itself. This book and the recent establishment of the European Society of Historical Demographers provide two platforms to make this possible.

Biography

Lotta Vikström (1971) is Professor of History at the Centre for Demographic and Ageing Research (CEDAR) at Umeå University, Sweden, where she also acted as deputy dean for the Faculty of Arts in 2011-15. She makes use of demographic data and methods to gain knowledge on gendered and socio-economic issues among vulnerable layers of historical populations. Her current Consolidator Grant project, 'DISLIFE Liveable Disabilities: Life courses and opportunity structures across time', has received funding (2015) from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (Grant Agreement No. 647125).

Demography – where the future might take us

Peter Teibenbacher

Introduction

Demography is a socio-economic science. Basically, it deals with personal and societal decision-making regarding fertility, mortality, nuptiality, family and household structures, and migration. These decisions depend on the respective living conditions of individuals and societies, and are driven by the desire to survive and to prosper. Living conditions are mostly shaped by environmental circumstances, modes of production, rules of inheritance, manorialism and other forms of social dependencies. Social norms and individual decisions were meant to comply with different economic systems in order to guarantee survival. Human beings, in the end, face the same or similar challenges all over the world. When investigating these challenges, we often find very different solutions – and not seldom inexplicably so – at different times and in different regions. Analytically, this implies that we should use a combination of anthropological and historical perspectives to study demographic experiences. In the following contribution, I will discuss three concrete directions in which I would like to see the field move. All of these express my personal opinion that, as historical demographers, we should adopt more holistic approaches that study human demographic experiences across time and space, engaging both with the past and the present.

Europe meets Africa

As far as (historical) demographic research is concerned, Africa, and especially sub-Saharan Africa, is a blank spot on the map. This situation is wholly unacceptable. Now that historical demographers have compared Europe and Asia – for example, in the ‘Life at the Extremes’ project – we should use our experience to shift the focus to Africa. This does not mean that we should forget other regions, like India or Spanish America. Even so, I would prefer Africa, because it is often called the ‘lost’ or ‘forgotten’ continent. Despite the scarcity of readily available sources and data – for instance, the parish books, vital statistics, censuses, registers and others documentation that demographers like to have at their disposal – we should nonetheless seek to find a way to talk meaningfully about Africa, and about black Africa in particular. From anthropologists and ethnologists we know that the area has been, and still is, characterized by very different demographic regimes. Might these differences be a continuation of older traditions or have they been introduced more recently, during the colonial period? Or do they result from a combination of both old and newer divergences?

In the different regions of sub-Saharan Africa, we can find polygamy as well as strongly restrictive

monogamy; matrilineal as well as patrilineal regimes. This diversity permits us to discuss in more detail the great variety of solutions to guarantee survival, depending on the natural and social environments of the region concerned. Obviously, there is not just a single time-invariant way to deal with fertility, reproduction or nuptiality in sub-Saharan Africa. For example, we might assume that polygamy was originally a means of survival that arose as a way to guarantee reproduction, but that over time it was transformed into male empowerment and supremacy.

In striving towards a better understanding of Africa's historical demographic past, we ought to join forces with local researchers in the continent. Their empirical and theoretical knowledge is indispensable, even though the scarcity of data obliges them to use alternative scientific approaches that differ from the ones usually employed by Western historical demographers (see the *Journal of Pan African Studies* 5.4). In particular when dealing with tribal societies and/or polygamy, we cannot expect to be successful if we seek to apply 'European' or 'Asian' concepts or patterns of marriage and the family.

Demography meets the public

In my view of the future, historical demography should also go public. We should engage with the popular world by presenting our work in the media, online or on TV, in ways that are attractive to the ordinary man or woman in the street; for example, through the use of written and spoken texts, pictures and maps. We should not be too shy to talk in terms of general statements and overall results, even if this implies that we have to sacrifice some of the details. In so doing, we should aim to use modern didactic methods suitable for larger audiences (see Inquiry Based Learning under weblinks). Our research and presentations should try to engage with the daily life experiences of people, and seek to address their concerns.

History meets the present – and even the future

Historical demography should also meet with the present: which commonalities and divergences can we find between pre-modern, modern and post-modern times? What are the challenging and burning questions of today, and can we find historical equivalents? These topics might include intercultural issues like mixed marriages or migration; inclusion and exclusion; inequality and social gaps; the purpose of high and low fertility; issues relating to genetics; and so on.

Historical demography needs to think about the future as well. Therefore, we should seek greater interdisciplinary cooperation with other areas of research, like medicine, anthropology, biology and sociology. Since we deal with humans in history, we should be very careful with statements such as: "This was completely new" or "Nobody has ever shown that kind of behaviour before". In order to avoid such oversimplifications, we should think in terms of the concepts of similarity and contingency rather than in terms of linearity and causality.

As an example of how we need to be careful with statements and concepts, let us look briefly at the issue of illegitimacy. Currently, there is a great deal of attention for 'post-modern' illegitimacy (cf. Klüsener 2015). Pre-modern illegitimacy is similar to post-modern illegitimacy, but it is not the

same. In order to analyse and to compare illegitimacy as a social issue over time, it is insufficient to use the same terms for all its various appearances, depicting it simply as non-marital fertility. The theory of fertility transition – basically defined as the decision to have fewer children in marriage – is not really applicable to illegitimacy. While in pre-modern times there was a low chance of marriage due to restrictions and strong structural hindrances, largely caused by a lack of sufficient income to marry and establish an own household, modern times are generally marked by greater opportunities for marriage, in particular as a result of greater opportunities to earn money. In our ongoing post-modern times, however, we are living in a society where there are higher chances to stay formally non-married, with people living in socially acceptable or even officially registered forms of cohabitation. The decline in non-marital fertility during modern times was not the result of a decision by women to have fewer non-marital births. Instead, it happened because of the increased chances to marry later in life (cf. the debate on courtship models in Van Bavel 2007), which contrasts with the often life-long imposition of lone motherhood faced by women in pre-modern times. It is often said that in comparison with pre-modern illegitimacy, there has been a switch in post-modern times from lone motherhood to illegitimate births in cohabitation (cf. European Fertility Datasheet 2015) and to pre-marital fertility. In former times, lone motherhood was prevalent, and mother and child were exposed to economic and social risks. Nowadays, even lone mothers receive government support and cohabitation is a deliberate and socially accepted alternative. However, for earlier times we have to assume that cohabitation was often the result of socially restricted opportunities to marry. Consequently, we should seek to find indications of cohabitation and pre-marital ‘illegitimacy’, in order to distinguish them from real single motherhood in pre-modern times.

It is true that things are different now, but in many respects it is only the proportions that are changing: we can also find cohabitation in the past and lone motherhood in modern and post-modern times. We should therefore try to differentiate, for instance, between lone motherhood and pre-marital fertility in cohabitation, instead of talking about ‘illegitimacy’ as an undifferentiated umbrella term (cf. Berghammer 2009). We should not reduce our analysis to a single indicator like the illegitimacy ratio, which – as a share of all births – is much more strongly influenced by the striking decline in marital fertility over the last four decades than by the increase in non-marital fertility since the 1970s, which in any case for the most part cannot be attributed to genuinely lone mothers.

References

- Berghammer, C. (2009). Uneheliche Geburten – eine vergleichende Analyse von neun europäischen Ländern. In: Buber-Ennser, I. & Neuwirth, N. (Eds.). *Familienentwicklung in Österreich. Erste Ergebnisse des “Generations and Gender Survey (GGS)” 2008/09*. Vienna, 14.
- European Fertility Datasheet* (2015). Edited by the Centre for Demography and Global Human Capital & the Vienna Institute of Demography.
- Klüsener, S. (2015). Spatial variation in non-marital fertility across Europe in the twentieth and twenty-first centuries: recent trends, persistence of the past, and potential future pathways. *The History of the Family*, 20 (4), 593-628.
DOI: <http://dx.doi.org/10.1080/1081602X.2015.1099112>
- Van Bavel, J. (2007). The decline of illegitimacy and the control of marital fertility during the demographic transition. Testing the innovation-diffusion hypothesis using cohort fertility data from a Belgian town, 1850-1910. *Historical Social Research*, 32 (2), 42-67.
DOI: <http://www.jstor.org/stable/20762206>

Weblinks

Inquiry Based Learning: <http://www.whatisib.com/a-transdisciplinary-approach.html>

Biography

Peter Teibenbacher (1954) is Associate Professor at the Department for Economic, Social and Business History of the Karl-Franzens University in Graz. He is President of the Austrian branch of the Association for History and Computing (AHC) and, since 2015, Vice-President of the International Commission for Historical Demography (ICHHD). His research interests are regional economic and social history and demography.

A six-pack of big ideas for historical demography

Ken R. Smith, Heidi A. Hanson & Geraldine P. Mineau

In many ways, historical demographers have much to offer and, as a discipline, we have undersold our value to the larger academic community. Our team at the University of Utah, which has been studying historical demography for decades, largely on the basis of the Utah Population Database, has raised several novel approaches to the study of historical demography that we think might be a solid foundation for guiding the next generation of demographers. Here we offer a six-pack of BIG ideas.

Big Genealogies

Increasingly, genealogies and data based on family reconstitution focus on specific geographic areas. This means that those that leave the area under study are often lost to observation and we are required to focus primarily on those who stay. As the number of genealogies that are not geographically restricted grows, it becomes possible to consider how individuals and families in one country are related to individuals and families in another country. Such genealogies may be connected through the growing number of genealogies that our own group has facilitated, but certainly also with the help of others, including the Church of Jesus Christ of Latter-day Saints, Ancestry.com and FamilySearch. They create an amazing opportunity to look at differences in demographic behaviour between those who stay in their country of origin and those who migrate elsewhere, and their respective descendants.

The Big Experiments

Historical demography has as one of its key advantages its ability to capture the demographic behaviour of many individuals over many years, and during distinctive historical periods. Our incredible ability to capture these data is advantageous for the study of what we would call the Big Experiments. By experiments, we are referring to natural experiments caused by Mother Nature, as well as experiments created by governments and policymakers. Accordingly, historical demographers are well positioned to take very long views of the role of important man-made experiments or public policies, such as the one-child rule in China; the effects of the National Health Service or of Medicare in the UK and the United States, respectively; the role of vaccinations in affecting survival rates; and policies affecting immigration. Evaluations of the effects of natural experiments could include global assessments at an unprecedented level of detail, such as the effect of the 1918 flu

pandemic, world wars and economic upheavals, such as the Great Depression and the Great Recession. If we know how these shifts in history create changes in the demographic structure of societies, historical demographers are in a unique position to be able to construct simulations of what the demographic reality would be if these shocks had not happened.

Big Environment

A new direction that historical demographers could take would be to better integrate our approaches with those of geographers, geologists and environmental scientists, so that we have better and more comprehensive objective measures of the environment, and particularly of aspects of the environment that affect demographic outcomes. Large national databases that hold precipitation and temperature data, and changes in agricultural practices and pesticide use have been used to a degree in historical demography but these could be expanded in new ways to great benefit. An approach that holds great promise is the use of dendrology (the study of tree rings, which provide data on past precipitation and drought). In addition, measures of lake levels and river flow would be great sources of information that can be used to study how the environment affects demographic responses and *vice versa*. A related opportunity, but one which seems to be undersubscribed, relates to collections and museums that hold bio-specimens, such as teeth, human hair and animals. These sources provide information about the environment at the time these individuals lived, and therefore represent data on the larger living conditions at that time.

Big Photography

Historical demographers often use photographs as illustrations of the living conditions of people from a particular time. Often, however, these photographs are not well integrated into our research. We should take the opportunity to make a more concerted effort to catalogue, digitize and make more accessible photographs of key periods in time that could be connected to data that historical demographers typically use. These photographs may provide key supplemental information about the populations we study, since they are objective and offer novel views of the lives of people in the past that are simply not available from the data used by historical demographers

Big Curriculum

As we contemplate the future of historical demography, we should certainly be thinking and dreaming about new ways of ‘doing’ historical demography, but also about how to train the next generation of historical demographers. What might this training entail? As we seek to grow the volume, scope and reach of our data, the next generations will need to know about the latest in so-called big data analytics and should therefore have systematic training in constructing and managing databases, and the statistical computing that these new data will require. We also believe that the curriculum should

include a better integration of evolutionary thinking, since many of our outcomes (mortality, fertility, migration, and residential living arrangements) are affected by the forces of evolution. And, as we alluded to previously, historical demographers can and should be taught the tools of micro-simulation. Doing so enables them to study the patterns that underlie demographic change, and also to consider what those changes might have looked like under a range of conditions and public policies, as well as health-related environmental shocks.

Big Genetics

The advances in the human genome project and the declining costs of obtaining whole genomic sequences on large samples of individuals now make it reasonable to consider connecting these genomic data to historical demographic data. If this can be done on a reasonably large scale, and during the coming decades this does not seem too remote a possibility, then the collaboration between historical demographers and genetics holds great promise. Some advances that could be made include assessments of paternity, the interaction between environment and genes, and the way in which certain genetic variants may be more common in sub-sets of the population that left a country in comparison with sub-populations of the same country that remained in place. This could certainly lead to a better understanding of how some populations have genetic variants that place them at greater risk of certain diseases, while others seem to be protected from those same diseases.

Biographies

Ken R. Smith is Distinguished Professor of Family Studies and Population Science at the University of Utah and Director of the Utah Population Database, which links genealogical, medical, environmental and demographic data. His research interests in biodemography include exceptional human longevity, the impact of inter-generational and early life circumstances on later life health, and the effects of kinship, family networks and neighbourhoods on human health.

Heidi A. Hanson is Assistant Professor of Family and Preventive Medicine at the University of Utah. Her training and experience is in the fields of biodemography, sociology, statistics, familial patterns of disease, geographic information systems (GIS) and life course epidemiology. Her research aims to promote healthy ageing and longevity by understanding the genetic and environmental determinants of health throughout the life course. Geraldine P. Mineau is Research Professor Emeritus of the Department of Oncological Sciences at the University of Utah and Founding Director of the Pedigree and Population Resource. Dr. Mineau has conducted and collaborated on research that includes family demography, bio-demography and family genetics. Her research has addressed questions about the identification of familial clustering of disease or health outcomes.

This volume aims to provide inspiration for the future of historical demography. Prominent scholars were invited to reflect critically on where the discipline of historical demography stands now, to reproach us for what we have missed, to indicate key trends in research we must engage with, and to stimulate us to link our future work to other disciplines. Authors were asked to write a provocative pamphlet for the future and to think outside the normal academic boxes. Here the authors present 60 provoking ideas.

Koen Matthijs is full professor of Sociology and Demography at the University of Leuven (Belgium). He is head of the research group Family and Population Studies, in which he unifies historical demographic research on long-term, sociodemographic trends with contemporary sociological studies on current family structures and processes. He published widely on marriage, divorce and family forms. He is editor-in-chief of *Historical Life Course Studies* and a member of the Royal Flemish Academy of Belgium for Science and the Arts.

Saskia Hin is a researcher at the Family and Population Studies research group, University of Leuven (Belgium). She published on demographic phenomena in the Greco-Roman world. Currently, she studies the impact of World War I on marriage behaviour. She is interested in how quality of life and demographic patterns are affected by diverging contexts, and in how humans respond to these.

Jan Kok holds the Chair of Economic, Social and Demographic History at Radboud University Nijmegen (The Netherlands). His research revolves around historical life courses, mostly derived from the Historical Sample of the Netherlands. He is particularly interested in pre- and extramarital sexuality, migration, family formation, and households. He is also (co-)editor-in-chief of *The History of the Family. An International Quarterly*.

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