Historical Life Courses and Family Reconstitutions. The Scientific Impact of the Antwerp COR*-Database

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Historical Life Courses and Family Reconstitutions

The Scientific Impact of the Antwerp COR*-Database

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ABSTRACT

The Antwerp COR*-database is a longitudinal micro-level database, which covers all entries from individuals whose last names started with the letters COR (and individuals who shared at some moment in time a household with a COR*-person) from the population registers and the vital registration of births, marriages and deaths for the 19th- and early-20th-century Antwerp district in Flanders, the northern Dutch-speaking part of Belgium. As such the database allows the reconstruction of historical life courses and families, and the analysis of key demographic characteristics and developments regarding marriage, fertility, migration, social mobility, health, mortality and longevity, as well as their interplay within and across households, families and generations. After a short description of the source material and the construction of the database, a review of the literature based on the database is presented in order to provide the reader with an encompassing overview of the research that has been carried out with this database and the knowledge and insights it has generated since its first release in 2010. The article ends with a discussion of potential pathways for future research, including new topics, and future extension of the database through citizen science projects.

Keywords: Antwerp COR*-Database, Longitudinal data, Life courses, Family reconstitution, Population registers, Civil registry

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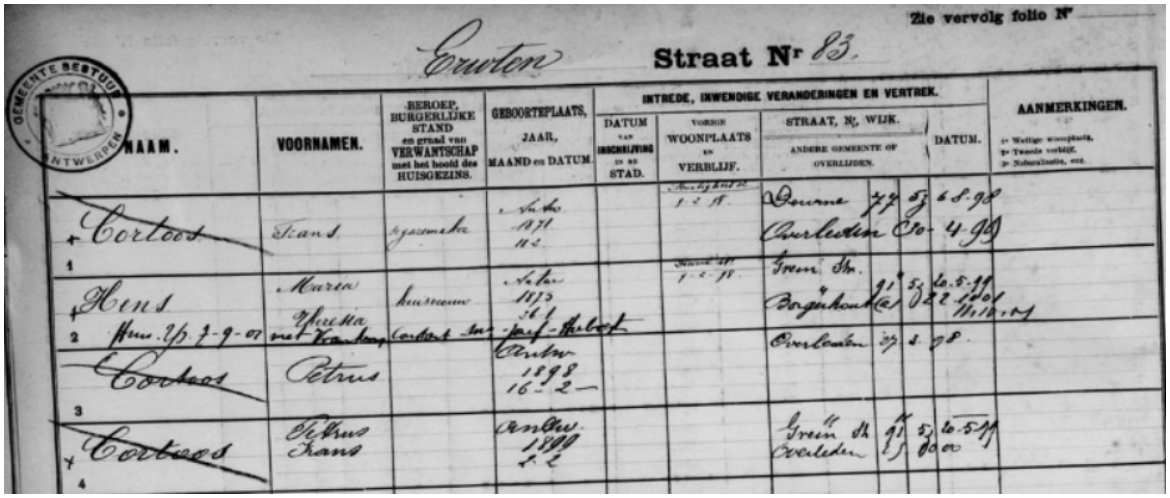
1 INTRODUCTION

Thanks to the efforts of Adolphe Quetelet, the newly-independent Kingdom of Belgium developed in the 1840s a population administration, which would set an example for many other European countries. The Central Committee for Statistics — under the leadership of Quetelet himself — started in 1846 a population register at the municipality level with a nation-wide coverage. Census sheets were copied down in new books, covering cross-sectional data by household. Each double page referred to one address, and each line of the population register consisted of one individual, with the head of the household on top — usually a man —, followed by the spouse, children and other household members, including kin — e.g., resident siblings of the head of the household and/or his wife — and non-kin, for instance, lodgers and domestic servants. For each individual, core characteristics were entered, including the relation to the head of the household (spouse, child, brother, sister, etc.), sex, birth date, birth place, marital status and occupation. So far the register was not more than a copy of the census. However, in the decade to come — until a new census was taken — all mutations in the household were meticulously registered: the birth of children, the death and in- and out-migration of family members, as well as changes in marital status. Since all life course events were dated in this way, the population register was a living document that kept track of a number of demographic changes at the individual and the household level. Together with the civil registry that had been installed in the 1790s under Napoleon, the population registers offered the Belgian authorities a superb administrative tool for monitoring its population (Gutmann & Van de Walle, 1978; Oris & Ritschard, 2014).

Figure 1 *Example of a population register from Antwerp city — 1890–1900*



Source: Scan from FelixArchief — https://felixarchief.antwerpen.be/archievenoverzicht/87729

Notwithstanding the very rich data sources, historical demographers in Belgium — and elsewhere in Europe — relied until far into the 20th century almost exclusively on aggregate statistics — mostly from censuses and demographic yearbooks — or they applied family reconstruction on birth and marriage certificates, as outlined by Michel Fleury and Louis Henry (1956), neglecting the rich individual level data provided by the population registers. It was only after Myron Gutmann and Etienne van de Walle (1978) published their article "New Sources for Social and Demographic History: The Belgian Population Registers" that an interest arose in the use of these superb data sources. Especially George Alter's (1988) "Family and the Female Life Course, the Women of Verviers", which showed the power of the population registers by applying event history analysis to marriage and fertility data, caused a paradigm shift in the field. The applied methodology, which Alter described carefully, was superior to the family reconstructions, as it was able to deal with incomplete life courses — i.e., censoring — by taking the time at risk into account, and avoided biases resulting from the neglect of families with incomplete information, often due to migration (Alter, 2020; Ruggles, 1999).

Alter's monograph marked the start of an increasing number of historical demographic studies based on individual level data from Belgian population registers and vital registers. Studies appeared on marriage, fertility, migration, mortality, and social mobility, as well as their relationships (e.g., Alter & Oris, 2005; Neven, 2003; Oris, 1996). These studies mainly focused on Wallonia — the southern French-speaking part of Belgium, a region that experienced early industrialization and urbanization —, thereby largely neglecting Flanders, the northern, Dutch-speaking part of the country.

2 THE CREATION AND DEVELOPMENT OF THE ANTWERP COR*-DATABASE

Inspired by the above mentioned studies on Wallonia, the development of the Historical Sample of the Netherlands (Mandemakers & Kok, 2020), as well as the construction of Swedish historical demographic databases at Umeå University (Engberg & Edvinsson, 2020; Westberg, Engberg, & Edvinsson, 2016) and Lund University (Bengtsson & Dribe, 2021; Dribe & Quaranta, 2020), the idea arose to build a high quality historical demographic database on Flanders. Under the lead of Koen Matthijs, who had acquired extensive experience on the collection and analysis of vital registration data (Matthijs, 2002, 2003a), members of the research group Family and Population Studies (FaPOS) of the KU Leuven, started a pilot project on the city of Antwerp in order to test whether the envisioned data collection procedure was feasible (Matthijs & Moreels, 2010; Van Baelen, 2007).

As it was unrealistic to collect the socio-demographic information on all individuals and families who lived in Antwerp city and beyond during the second half of the 19th and early 20th century, it was necessary to select an efficient sampling strategy. Following the data collection principle of the French TRA-Project (Bourdieu, Kesztenbaum, & Postel-Vinay, 2014), a letter sample was chosen. In practice, all entries from birth, marriage and death certificates, as well as from the population registers of individuals whose family names started with the letters "COR" (e.g., Cordon, Cornelissen, Coremans, Corlui, Cornet) were collected, stored, cleaned and linked. Last names with this letter combination were chosen as investigations by the KU Leuven Department of Linguistics showed that individuals with these last names were equally distributed over Flanders and representative of the Flemish population in terms of a number of socio-demographic indicators, including SES and migration status (Moreels & Matthijs, 2011; Van Baelen, 2007). The latter was especially important since Antwerp turned into the fastest growing and most populous city in Belgium, as a result of large-scale in-migration in the course of the 19th century (Kruithof, 1964; Winter, 2009). Equally important was the fact that COR* family names were not linguistically exclusive, making sure that immigrant families from various countries were included. More than 7% of the individuals in the database is indeed of foreign descent, with a majority of immigrants from the neighboring Netherlands, Germany and France, but the database contains also individuals who were born in faraway countries, such as Australia, Egypt, Japan, the United States and Russia.

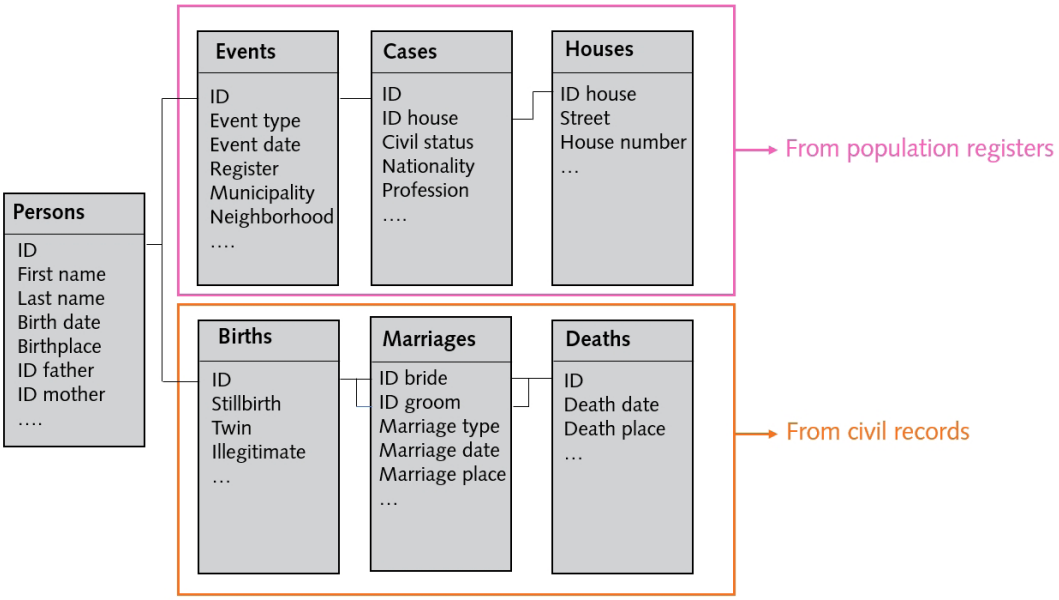
Working with a letter sample had several advantages. First, it simplified the data collection and therefore increased the reliability and quality of the data, as data collectors only had to search for individuals based on their last name instead of a whole list of criteria. Second, the reconstruction of life courses and families was facilitated by selecting people based on their family name, as it made sure that throughout the whole research area and period pieces of information from the same families and individuals were selected. Third, this sampling strategy made it easier to deal with lost and incomplete information, which was imperative in the highly mobile urban society of Antwerp, in which people moved frequently within and across municipalities, and not all migrations might have been properly registered. Instead of following the lives of individuals through time and space, which would have meant that data collectors would have to follow individuals from one municipality register to the next over time, sometimes being confronted with "dead ends", all data entries on research persons were collected following the "vacuum cleaning method": all pieces were collected independently by multiple data collectors. The life courses were later reconstructed by putting all pieces together by way of record linkage (Matthijs & Moreels, 2010; Van Baelen, 2007).

The Antwerp COR*-database covers data from 1846 — the year when the first nation-wide population registers were issued — until 1920, the end of the 1910 register. The end point was pragmatically chosen as later population registers at the time of the data collection were not yet accessible due to privacy regulations.[1] The pilot project on the city of Antwerp turned out to be successful and therefore it was decided to enlarge the area of data collection to Antwerp's suburbs and the rural municipalities of the larger Antwerp district. This resulted in the 2010 release of the Antwerp COR*-database, which forms the basis of most historical-demographic studies on the 19th- and early-20th-century Antwerp district.[2]

1 Note that there are recent developments in Belgium privacy law, shortening the individual privacy protection from 100 years (birth certificates) to 75 years (marriage certificates) and 50 years (death certificates).

2 For an extensive description of the construction and composition of the Antwerp COR*-database, see Matthijs and Moreels (2010) and Van Baelen (2007).

Figure 2 *The structure of the 2010 release of the Antwerp COR*-database*



An important advantage of the database is that it allows not only to track family members residing within the household, but also those residing outside the household, a feature that is usually lacking in databases that consist of intergenerational historical life course data based on a random sample from the population under study (Van Baelen & Matthijs, 2007).

In the context of EU Horizon 2020 Marie Sklodowska-Curie project "Methodologies and data mining techniques for the analysis of Big Data based on Longitudinal Population and Epidemiological Registers" (LONGPOP, MSCA-ITN 676060), the COR*-database was transformed into the Intermediate Database Structure (IDS; Alter & Mandemakers, 2014), after a systematic evaluation of the original methodologies for the address-based reconstruction of households based on a set of criteria, and the detailed geocoding of the historical database. This resulted in the 2020 IDS-release of the COR*-database, a release that offers plenty of opportunities for comparative analysis (Jenkinson, Anguita, Paiva, Matsuo, & Matthijs, 2020).

3 LITERATURE REVIEW

Since the release of the Antwerp COR*-database in 2010 (Centre of Sociological Research, research group Family and Population Studies, KU Leuven, 2010) various empirical studies have been conducted on the data. In this section we summarize the most important findings, by situating and discussing them in the context of the broader historiographical debates. The focus will be on articles, chapters and working papers, but we also report findings from PhD theses and a couple of bachelor papers and master theses. This review is organized thematically. We start with partner choice and (re)marriage, subsequently we deal with fertility and bridal pregnancies, out of wedlock fertility and extra-pair-paternity, morbidity and mortality, migration and social inclusion, and social stratification and social mobility.

3.1 MARRIAGE AND PARTNER CHOICE

In the 19th and early-20th century marriage was a key transition in the life course, marking the entry into adulthood. Usually it was coupled with a move from the family of orientation to the family of procreation (Puschmann, 2020a). Western Europe was characterized by the so-called European Marriage pattern of late and non-universal marriage. Couples were only expected to get married once they were financially independent and had the means to set up their own household (Hajnal, 1965,1982).

Katherine Lynch (1991) found an urban variant of this pattern, marked by even higher ages at marriage and larger shares of singles than in the Western European countryside. Sarah Moreels and Koen Matthijs (2011) observed the urban variant of the European marriage pattern also for the city of Antwerp. Moreover, they found differences with other Flemish cities. Whereas in the industrializing textile cities of Aalst and Ghent, ages at marriages started to decrease from the middle of the 19th century on — signaling the granulation of the Western European marriage pattern — ages at first marriage in the port city of Antwerp increased until about 1890. This was to a large degree explained by heavy urban in-migration. Further research confirmed that both internal and international migrants in Antwerp — as well as in other major European port cities — were less likely to marry and did so at significantly higher ages than the native urban population. The highest ages at first marriage and the highest likelihood to remain single were found among the international migrants (Puschmann, Grönberg, Schumacher, & Matthijs, 2014a; Puschmann, Van den Driessche, Grönberg, Van de Putte, & Matthijs, 2015; Puschmann, Van den Driessche, Matthijs, & Van de Putte, 2012; Puschmann, Van den Driessche, Matthijs, Van de Putte, 2016a; Schumacher, Matthijs, & Moreels 2013). These results suggest that migrants had a hard time in becoming part of urban mainstream society, a finding to which we return in the section on migration and social inclusion.

Next to rural-urban residence and migration status, social status also played a role in the access to marriage, in the sense that the higher classes married later than the lower ones, suggesting that there was more at stake for the elite when it came to marriage partner choice (Moreels & Matthijs, 2011), but it might have been also a result of a longer period of education and training (Caron, Neyrinck, Dillon, Matthijs, 2017). Last but not least, for the elite women it might have been simply more difficult to find a spouse with an equal (or higher) social status, as the group of elite men was relatively small, while these men were due to their power and wealth attractive to women from all social layers, and marrying downwards was often less of an issue for men than for women. Another group with relatively high marriage ages were the sons of farmers, which has been interpreted by Marianne Caron et al. (2017) as a sign of land saturation. Due to strong population growth and innovations in agriculture, everywhere in Europe it became indeed increasingly difficult for young men and women to obtain their own farm or to find work as agricultural laborers, resulting in significant out-migration (Mönkediek, Kok, & Mandemakers, 2016).

Marianne Caron et al. (2017) also found evidence that sibship composition played a role in getting access to the marriage market. In this regard, siblings could act as competitors, but they could also improve each other's chances of finding a partner and getting married. Moreover they also influenced the timing of marriage. It was found that having older siblings extended individuals' waiting time until marriage, while having younger siblings shortened that time. The negative effect of having older siblings became stronger at higher ages. Next, gender effects were found in the sense that for both women and men a recent marriage of a sibling of the same sex delayed marriage, while for marriages of siblings of the opposite sex an acceleration effect was found. While the first result was interpreted in terms of resource dilution, i.e., the parental resources were temporarily exhausted, the latter might point at the positive influence of the extension of the social network through a brother-in-law or a sister-in-law. The total number of siblings did not influence the age at marriage.

Marriage dates can also be used as an indicator of broader social changes. Marriage seasonality can, for example, be used as a proxy for secularization as marriages during Lent and Advent were "forbidden" or discouraged by the Catholic Church. Hideko Matsuo and Koen Matthijs (2018) assessed the extent and evolution of church control through the development of Lent and Advent marriages. They also examined this for fertility by studying whether conceptions occurred during the religious "closed periods", as sex was also forbidden during these religious spells, especially during Lent. Their study showed declining compliances of religious rules on marriage and to some extent on conception, indicating a secularization trend. Different underlying mechanisms existed: marriages were more influenced by social control than conceptions, and the higher the birth order, the lower the level of compliance. Socio-economic, cultural and demographic variables in the COR*-database allowed to examine who was more, or less likely to adhere to church rules. For marriage, non-compliances were largely observed among urban citizens and older brides, which increased in later periods (early 20th century). Compliance, by contrast, was found mainly among elite bridegrooms. For conceptions, non-compliance was found among literate women, while again compliance with the church rules was found among elite bridegrooms.

3.2 FERTILITY DECLINE

In the course of the 19th century the fertility transition took off in Western Europe. Scholars agree that fertility decline during the first demographic transition was realized through "traditional" techniques: the calendar method and coitus interruptus. These were not particularly safe for individuals and couples, but highly effective on the macro-level. It is also clear that the decline of mortality, and in particular infant and child mortality, was an important contributor to fertility decline (Haines, 1998), because it led ceteris paribus to an increase in average family size, creating a first incentive to limit the number of live births. Next, there were economic motives to limit the number of offspring. As a result of bans on child labor and the introduction of compulsory schooling, children started to contribute only much later in life to the family income, while at the same time raising them became more expensive. Consequently, the opportunity costs of children increased, turning around intergenerational wealth flows, through which it became rational to limit fertility (Caldwell, 1976, 2005). Moreover, as children demanded ever increasing investments in human capital, it became logical to invest in child quality instead of quantity (Becker, 1960; Spolaore & Wacziarg, 2021). However, there were also cultural and religious factors that prevented couples from actually practicing birth control, when this had become economically rational and feasible (Engelen, 1997). In that sense, to practice birth control couples had to be "ready, willing and able", as Ansley Coale (1973) concluded.

While the complex interplay of economic motivations and cultural and religious impediments — that has been studied extensively within the European Fertility Project (see Coale & Watkins, 1986) — explains an important part of the complex history of fertility decline, it has become also clear that this is not the complete story. After all, one would expect that countries that industrialized first were also the first to see their fertility decline. The simple fact that the fertility transition started in France and not in England, shows that the complex puzzle is not yet solved. Over the years, historical demographers have therefore considered other factors and mechanisms, including the role of family systems (e.g., Rotering, 2020) and diffusion mechanisms (i.e., the idea of "communicating communities", see Szreter, 1996). While studies have increased our insights, the historical debate on the fertility decline continues, mainly because the striking geographic and social differences in the onset and progress of the fertility seem not to be explainable by one encompassing theory.

All these complexities in the debate on fertility decline are also observable in Belgium. Belgium was the first country on the European continent to industrialize and it was also one of the forerunners in the fertility decline (Lesthaeghe, 2015). However, if one zooms in, it turns out that there were major geographic and social differences in the timing and pace of fertility decline. In the industrial zones of Wallonia, the decline took off earlier and fertility levels remained below those of Flanders in the course of the 19th and early 20th century. Fertility was also higher among Flemish couples that had similar income and educational levels as French-speaking couples. For the city of Leuven e.g., evidence was found that parity-dependent stopping behavior of Flemish laboring class couples was influenced on the neighborhood level by the presence of francophone couples and couples from the upper classes. These groups adopted fertility control earlier on than Flemish laboring couples. This suggests that diffusion effects played a role in the Belgian fertility decline (Van Bavel, 2004).

Hideko Matsuo and Koen Matthijs (2016) examined the interplay of socio-economic and cultural factors in fertility limitation behavior during the demographic transition, by studying this through the age at which the last child was born. Based on Kaplan-Meier analyses and hazard models, their analysis confirmed that the age at last childbearing declined mainly among the birth cohort of 1860–1888 in comparison to earlier cohorts (1800–1839 and 1840–1859). They identified substantial inter- and intra-cohort differences, driven by cultural and life course factors, such as literacy status, spousal age gaps, witness characteristics, birth seasonality, marital and childbearing ages and birth histories.

Diffusion effects were found as well. Sarah Moreels and Matthijs Vandezande (2012) investigated parity-specific stopping behavior of 747 couples from the city of Antwerp and categorized them into native, migrant and mixed couples. Generally speaking, native couples were the first to practice birth control. Interestingly, migrants who moved as children to Antwerp adopted the stopping behavior of the urban population of Antwerp, whereas immigrants who moved as adults to the city resembled the behavior of the population of origin. The analysis of the mixed couples showed that the origin of the wife was more decisive than that of the husband, suggesting that — at least in this context — women took the lead when it came to the adoption of fertility control.

Reto Schumacher et al. (2013) studied family formation trajectories of migrants and natives in Antwerp and Geneva from a life course perspective, using sequence analysis. They found for Antwerp important differences in the reproductive careers of short- and long-distance migrants, the former being highly traditional (i.e., long childbearing periods, little or no signs of stopping behavior, and a high average number of children ever born), while the latter were forerunners in the fertility transition (i.e., short childbearing periods, signs of stopping, and a lower number of children). Interestingly, for 19th century Geneva, the differences in the reproductive careers of native and migrant women were smaller. This might be related to the type of migrants that those cities attracted. Geneva received mainly skilled migrants, while Antwerp received mainly unskilled laborers (due to its port function), and this applied especially to the short-distance migrants.

3.3 BRIDAL PREGNANCIES, OUT-OF-WEDLOCK FERTILITY AND EXTRA-PAIR PATERNITY

While couples were expected to wait with having sex until they were married and to remain faithful to their marriage partner, deviations from those norms did occur. In European pre-industrial societies it was not uncommon for couples to have sex in anticipation of marriage. In fact, there were all kinds of local practices in which unmarried couples had sex in peer-controlled settings. In case the young woman involved got pregnant, the mating partner would voluntarily or under pressure of the parents and/or others, marry her (Kok, Bras & Rotering, 2016). However, from the latter half of the 18th century on, there was a significant increase in the number of out-of-wedlock births in Western European societies, which peaked in the course of the 19th century, before declining by the end of the 19th century, although the timing varied across regions (Kok, 2005; Matthijs, 2001). The phenomenon was mainly, but not exclusively, observed in urban areas under the laboring classes.

Various explanations have been put forward to explain the rise and decline in extra-marital fertility. Edward Shorter (1971, 1973) suggested that it signified an early sexual revolution among laboring class women, resulting from the liberating effect of earning wages in industry. Peter Laslett (1980) claimed that out-of-wedlock fertility increased within so-called "bastardy-prone sub-societies", in which out-of-wedlock fertility was no deviation from the norms and in which women often gave birth to multiple children out of wedlock. However, most studies point to the role of uncertainty — among both women and men — and vulnerability that increased among young women in the wake of industrialization, rural-to-urban migration and large scale urbanization. The lack of a social network, job insecurity, and relatively low wages all weakened the bargaining power of young women vis-à-vis men. At the same time, illegitimacy might have been both a cause and a consequence of vulnerability (Schumacher, Ryczkowska, & Perroux, 2007).

Against this background, Sophie Vries (2019) studied in her bachelor thesis bridal pregnancies and illegitimate births in the Antwerp district. She observed that — in line with the expectations based on other studies — both phenomena increased in the course of the 19th century and declined again in the beginning of the 20th century. She systematically compared the life courses of (1) women who conceived all children within wedlock, (2) women who experienced a bridal pregnancy, and (3) women who gave birth to one or more illegitimate children. The analysis showed that the life course of women with illegitimate children differed much more from women who conceived all children within marriage, than those of women who experienced a bridal pregnancy. The results made assumable that — in line with the research of Reto Schumacher et al. (2007) — out-of-wedlock fertility was mainly a result of vulnerability. The transition from a regional textile center into a port city led to lower incomes, less job stability, and a substantial decline in job opportunities for females which made them more vulnerable, resulting in a rise in illegitimate births. While out-of-wedlock fertility was mainly caused by vulnerability, it did not necessarily make the women even more vulnerable, since many of the women who gave birth to illegitimate children would ultimately marry. An exception to this were the group of international migrant women, as they often gave birth to multiple children out of wedlock, while their likelihoods of remaining single were much higher than among the natives and internal migrant women.

The debate about out-of-wedlock fertility also raised questions about how faithful couples were to each other (Puschmann, 2020b). Thanks to cooperation between historical demographers and geneticists some light has been shed on biological kinship ties in the past, using historical demographic and genealogical data in combination with DNA information. By comparing Y-chromosomal DNA of contemporary individuals who have the same legal ancestor, it can be determined whether in previous generations women had children with men who were not the legal fathers, as the non-recombining part of Y-chromosome is transmitted unchanged from fathers to sons (Larmuseau, 2021; Larmuseau et al., 2017).

Making use of the Antwerp COR*-database and other historical demographic and genealogical data, Maarten Larmuseau et al. (2013) found that in Flanders extra-pair paternity was rare in the past. Linking historical demographic data with contemporary genealogical data — allowing generational linkage and by doing so, covering multidisciplinary fields — was one of the important contributions COR*data has made in this respect. Extra pair paternity rates were around 1–2% per generation, much lower than previous studies had suggested. Further research (Larmuseau, 2021; Larmuseau, Matthijs, & Wenseleers, 2016a, 2016b) found that extra-pair paternity rates had been especially low among farmers and peasants. However, extra-pair paternity rates were considerably higher among the laboring classes in urban areas (+/- 6% per generation). Moreover, it was found that in the course of the 19th century, more or less parallel to the rise of extra-marital fertility, extra-pair paternity rates had increased significantly (Larmuseau, 2021; Larmuseau et al., 2016a). This proves that it was not only more difficult in this period for women in cities to meet and stay with the partner but also that a small, significant part cuckolded their partners.

3.4 HEALTH AND MORTALITY

During the 19th century important improvements in health took place, thanks to, amongst others, sanitary measures, improved nutrition, and advancements in medical knowledge and practice. As a result, mortality declined and life expectancy at birth and at later ages increased systematically. These changes are part of the so-called epidemiological transition: the shift from a mortality regime in which infectious diseases were the main causes of death towards a regime in which chronic, degenerative diseases, cancer and cardiovascular diseases prevail (Omran, 1971). In Belgium this transition was unfolding during the 19th and early 20th century, but far from complete by the end of the COR*-research period. We observe for the period 1840–1920 a lot of epidemic outbreaks — e.g., cholera, measles and smallpox (Donrovich, Puschmann, & Matthijs, 2018; Donrovich, Puschmann, Matthijs, & Neyrinck, 2013) — and although in Belgium life expectancy at birth increased from 40 years in 1840 to 50 years by the start of World War I, the improvement was far from linear (Devos, 2006; Eggerickx, Sanderson, & Vandeschrick, 2020).

The research on health and mortality on the basis of the Antwerp COR*-database has been concentrated on three topics: the clustering and intergenerational transfer of infant mortality, the impact of early life conditions on later life mortality (i.e., post-reproductive life expectancy), and differences in mortality risks between migrants and natives, the so-called healthy migrant effect.

In both contemporary and historical societies, deaths among infants are not spread randomly over the population. In high mortality regimes, certain families pay a high infant death toll, while others face only a limited number of deaths. This phenomenon has become known as infant mortality clustering (Das Gupta, 1990) and has received ample attention in the field of historical demography. Mattijs Vandezande (2012) was the first to explore this phenomenon using the Antwerp COR*-database and devoted his PhD thesis to it. He approached infant mortality clustering from an individual (micro), family (meso) and population (macro) perspective. He found that high infant mortality risks were transferred from one generation to the next, both through the paternal and the maternal line, although the effects found for the maternal line were stronger. As it turned out, girls who lost a considerable share of their siblings in infancy had up to twice the risk of losing an infant as mothers, compared to mothers who had no siblings dying in infancy (Vandezande & Matthijs, 2013). Follow-up research by Robyn Donrovich et al. (2018) confirmed that women whose mothers lost three or more infants had a 77% higher risk of experiencing infant deaths among their own offspring, compared to women whose mothers lost no infants. Comparable results were found elsewhere in Europe (Quaranta et al., 2017).

Measuring infant mortality clustering in families and its intergenerational transfer is one thing, explaining it is another. Both nature, "faulty genes", and nurture explanations, "faulty parents", as well as a combination of both have been proposed (Edvinsson & Janssens, 2012; Janssens, Messelink, & Need, 2010). The research by Mattijs Vandezande (2012) pointed especially in the direction of the socialization hypothesis, stating that both health-threatening as well as health-promoting attitudes and behaviors of parents are "transmitted" from one generation to the other. Robyn Donrovich et al. (2018), by contrast, linked their results to life history theory, as they observed that mothers with the highest risk of infant mortality were more likely to bear their children at a young age, out-of-wedlock and raise them without a partner. Their limited life experience and lack of a helping hand and resources created a risky environment for their children. Offspring that survived in such circumstances followed faster and riskier reproductive strategies, creating similar risk factors among their offspring (Pink, Willführ, Voland, & Puschmann, 2020).

Infant and childhood conditions were not only important for the health and survival chances of offspring, they also had an important impact on ego's later life mortality risks (Bengtsson & Lindström, 2000; Quaranta, 2013). Donrovich, Puschmann and Matthijs (2014) investigated the impact of sibling composition (i.e., sib size and sex) and birth order on later life mortality risks in the district of Antwerp. Moreover, they investigated whether geographic proximity of siblings later in life influenced mortality risks after the age of 50. The event history models showed that sibling competition in early life profoundly impacted later life outcomes. Having older brothers was found to have had a negative effect for males' as well as females' later life survival chances. Women who had no older brothers were almost always better off. Widows were, however, an exception, as for them it was beneficial to have older brothers in later life. The same applies to widowers who had older sisters. Apparently, sibling competition gave way to solidarity and mutual support for siblings of the opposite sex in times of crisis. It is interesting to see that such mutual support was not found for men and women who remained single for life. Remaining unmarried and having a lot of siblings was especially detrimental for the survival chances of women in later life.

Another branch of COR*-research focused on differences in survival chances (above age 30+ years) between migrants and natives. Puschmann, Donrovich, Grönberg, Dekeyser, and Matthijs (2016b) found strong evidence for a so-called "healthy migrant" effect in Antwerp, as well as in the port cities of Rotterdam and Stockholm. This is explained in terms of selection effects: only the healthiest people move, and the healthiest people move over the longest distances. The living environment was also important: migrants who grew up in the countryside, had lower mortality risks compared to natives and urban migrants. However, in the later period, when the urban penalty had turned into an urban premium, the opposite was observed: rural-to-urban migrants now faced higher mortality risks. Moreover, rural-to-urban migrants in Antwerp had higher mortality risks in times when Antwerp was hit by epidemics, probably as these migrants had not been exposed to these infectious diseases in early life and consequently lacked immunity (Alter & Oris, 2005). In a follow-up paper on Rotterdam, it was tested whether the healthy migrant effect was not caused by selective return migration of the sick and elderly, the so-called salmon bias hypothesis. The results showed that the healthy migrant effect was real, and that the most mobile migrants had the lowest mortality risks (Puschmann, Donrovich, & Matthijs, 2017).

3.5 MIGRATION AND SOCIAL INCLUSION

Inspired by contemporary debates on migration and social inclusion, historians of migration have studied how mobile and adaptable individuals and societies were in the past (Lucassen, 2005). Apparently, migration has always been typical for human societies, and this was also the case for 19th and early 20th-century Western societies (Hoerder, 2002). As a result of mortality decline, Europe's population grew at an unprecedented speed, while at the same time, due to innovations, less labor was needed in agriculture. Consequently, a substantial and growing part of the European population left the countryside. Increasing numbers of individuals tried their luck in other continents, especially the United States. The largest population movement was from the countryside to a nearby city, where newcomers found work in the growing industry and service sector (Moch, 2003). The urban share of Europe's population increased from about 12% in 1800 to 44% in 1910 (Clark, 2013). During this period, Antwerp turned into the largest and fastest growing city of Belgium and it became one of Europe's major ports.

Sociologists and historians have debated intensively on the extent to which urban newcomers in the 19th and early 20th century became integrated in the city. Scholars of the Chicago School of Sociology (Park, 1928; Thomas & Znaniecki, 1918) and their later followers (Handlin, 1973) argued, mostly on the basis of qualitative sources, that all migrants, but especially those who originated from the countryside, faced a very hard time to get integrated in the city. Rural-to-urban migrants lacked schooling, skills and the necessary social networks which prevented them from thriving in the new urban environment. They soon became marginalized and ended up in ghettos and poor suburbs. In their struggle for survival, a significant part grabbed the bottle, committed crime or prostituted themselves. While most of the initial work was done on American cities, Chicago in particular, European researchers reached similar conclusions on cities like Rotterdam (Bouman & Bouman, 1955) or Paris (Chevalier, 1973). Later researchers (Moch, 1983; Sewell, 1985) studied the topic with more quantitative data and came to other, sometimes even opposite conclusions: they claimed that urban newcomers were the most dynamic and enterprising city dwellers, who possessed plenty of human capital and moved into well-integrated social networks. Moreover, as the majority of them moved over short distances, they could

maintain connections with the home front. Migrants did well as they were positively selected from the population of origin: they brought the right baggage with them to the city to become successful urban dwellers. Lucassen (2004) has tried to reconcile the opposite views, by arguing that the gloomy picture applied to leavers, while the successful migrants stayed and left their traces in the quantitative source material (i.e., the registries).

Against this background Paul Puschmann (2015) studied in his PhD-thesis processes of social inclusion and exclusion among internal and international migration in Antwerp, Rotterdam and Stockholm, in the period 1850–1930. Next to the Antwerp COR*-database, the research was based on the Historical Sample of the Netherlands and the Stockholm Historical Database. Puschmann focused on various subtopics — marriage opportunities, family formation, assortative mating, career mobility and adult mortality — in order to study to what degree migrants got access to the marriage market, other social groups, reproduction, and the labor market, and to determine whether social exclusion gave rise to certain adverse health effects in later life. By comparing three different port cities, it could be established whether or not the historical context played an important role in processes of social inclusion and exclusion.

The results regarding marriage opportunities and family formation showed that migrants had less access to marriage and reproduction compared to the native population. Migrants who originated from the vicinity of the city and arrived at younger ages, had the highest chances to get married and start a family. Generally speaking, economic capital did not increase the likelihood of getting access to the marriage market. It became clear that access to marriage was easier in Antwerp and Rotterdam, compared to Stockholm (Puschmann, 2015; Puschmann et al., 2014a; Puschmann, Van den Driessche, Grönberg, Van de Putte, & Matthijs, 2014b).

The results on partner choice learn that migrants were treated as outsiders and that this was not due to a lack of economic capital or skills, but was mainly related to ethnic and cultural characteristics. Migrants who originated from the city's hinterland and had moved early on in their life, had the highest likelihood of marrying a native partner and becoming fully part of the urban mainstream. It also became clear that migrants from smaller groups had more difficulty in getting married, but if they did, they were more likely to do so with native partners, probably because the in-group options were scarce (Puschmann et al., 2016a).

In terms of labor market inclusion, migrants also faced a hard time. Male migrants were over-represented among the lower positions, and often were not able to close the gap with the native population. However, there were differences. In general, international migrants performed better than internal migrants, and often even occupied higher positions than natives, while internal migrants were found, especially in the beginning of their career, on the lower positions. However, in Rotterdam, domestic migrants closed the gap in the course of their career, in Antwerp they even overtook natives over the life course, while in Stockholm the gap was large and even widened, showing again that social inclusion in Stockholm was more difficult, especially compared to Antwerp (Puschmann, 2015).

While on average migrants had lower mortality risks in later life than natives — the healthy migrant effect — a deeper analysis made clear that migrants paid a high price for moving to the city, as their mortality advantage decreased the longer they lived in the city. Moreover, certain sub-groups actually experienced excess mortality, sometimes due to negative selection effects, but also due to heavy and unhealthy jobs.

3.6 SOCIAL STRATIFICATION AND SOCIAL MOBILITY

One of the main hypotheses regarding social structure and social mobility is that societies will become meritocratic as a result of modernization, i.e., industrialization, urbanization and increased geographic mobility (Treiman, 1970). Status ascription will give way to status achievement, signaling a decrease of the (direct) influence of parents and the family on the social status and mobility chances of the children, while the importance of human capital — education, training, and skills — will increase. At the same time, overall social mobility is believed to have increased. While this hypothesis has been influential in stratification research, the evidence is mixed: some studies find little evidence for a real (relative) shift in social mobility, while others confirm that processes of modernization transformed patterns of social mobility. Wiebke Schulz, Ineke Maas and Marco van Leeuwen (2015) found, for instance, that during the latter half of the 19th and the early 20th century the association between the occupations of fathers and sons decreased in the Netherlands. Other studies find mixed results.

Richard Zijdeman (2009) found no overall effect of industrialization on social mobility in the Dutch province of Zeeland. He did, however, find an increase in social mobility in areas that experienced an expansion of the transport network.

Against this background, Cornelia Vandenberghe (2020a) studied intergenerational mobility in Antwerp in the period 1830–1913, by comparing HISCAM-scores of fathers and sons. She found evidence that Antwerp became increasingly meritocratic and that social mobility increased towards the end of the period. Overall, the likelihood of sons having a higher social status than their fathers increased over time, while the elasticity of intergenerational social mobility decreased during the study period. In line with the results of Paul Puschmann (2015), she found that migrants were more upwardly mobile than natives and that literacy increased the chances of intergenerational upward mobility among males, while at the same time the literacy of their female spouses also had an effect, suggesting that education of women (as measured by literacy status) was important for the career of their husbands.

Van Bavel, Moreels, Van de Putte, and Matthijs (2011) investigated the relationship between parent's fertility control and intergenerational social mobility of children in the city of Antwerp. Following the quality-quantity trade-off and the resource dilution hypothesis, they investigated whether the application of birth control by the parents would increase the likelihood of children to climb the social ladder. They found evidence that the children of couples that did not apply fertility control, were more likely to end at the lower ranks of the social ladder. Also, they found that fertility control limited the likelihood of children to experience downward mobility, especially among the middle classes. However, fertility limitation did not play an instrumental role to accelerate upward mobility among the offspring.

Sarah Moreels (2010) worked on female careers. Together with others, she developed GENCLASS, a historical class scheme adapted for women's occupations. GENCLASS is based on both the social power of the woman and that of her husband. This was necessary as until then, researchers had almost exclusively focused on career mobility of men, due to the under-registration of female occupations. Especially among married women, often the following occupational entries are found: "housewife" or "without occupation". Moreels also applied GENCLASS in order to study the social mobility of fertile women (ages 15 through 49) in the city of Antwerp in the period 1846–1906. She found that the social status of the majority of the studied women during family formation remained stable. This result is corroborated by the finding that parity did not predict the social status of women.

The last study we discuss is the master thesis by Cornelia Vandenberghe (2020b) on female labor market participation in Antwerp and Brussels. She compared both cities in order to determine whether the demand for female labor had an impact on their labor market participation. She found that in Brussels, where there was larger demand for female laborers in the textile industry and manufacturing, female labor market participation was not notably higher than in Antwerp, where the labor market was dominated by physically demanding jobs. Female labor market participation was rather determined by supply-side factors: unmarried women were much more likely to work than married women, higher class women were also less likely to work than laboring class women, and before marriage, migrant women were more likely to work than native women, while the reverse was found during marriage.

4 PATHWAYS FOR FUTURE RESEARCH

4.1 NEW POSSIBLE TOPICS

The Antwerp COR*-database is relatively young (first release: 2010). As the literature review has shown, quite a number of studies have been conducted based on the analysis of the database over the past years, but this is only a fraction of what is possible. There are plenty of options for further research in all domains outlined above, but also beyond, for instance with regard to social and geographical mobility, historical family dynamics, and segregation versus inclusion. One could look into settlement patterns of migrants and natives. Did migrants mingle with natives in the housing market or did they live in segregated city parts? What were the driving forces of settlement patterns? Were individuals with port-related occupations, such as dock workers and sailors, mostly found in the neighborhoods of the port? Did individuals move into richer neighborhoods if they climbed up the social ladder? And did residential patterns influence health and survival chances? These and related questions can be studied using GIS techniques.

So far no studies on the database have looked into remarriages. Usually men remarry more often and at a faster rate (Matthijs, 2003b), but was this also the case in a port city like Antwerp with an excess number of young males, resulting from strong male in-migration? Did the skewed sex ratio translate into a stronger bargaining power of women in the marriage market and if so, how did that manifest itself? Did women remain less often single than elsewhere? Did they more often marry upward? Were women with illegitimate children more likely to remarry? And did potential female advantages disappear when in the beginning of the 20th century the sex balance became more equal? Since the context — skewed sex-ratio's — is essential in this type of exploration, a comparative IDS-project including multiple cities such as Antwerp, Rotterdam and Stockholm (Puschmann, 2015) with varying sex-ratio's seems more promising than an individual case study.

Sex-differences in mortality are another topic to further explore. Isabelle Devos (2000) showed that towards the end of the 19th and the early 20th century certain groups of girls experienced excess mortality, notwithstanding the fact that females enjoy biologically pre-determined survival advantages for all age groups. Patterns of excess female mortality have also been observed for other European countries in the same time period or even later (Weigl, 2016). Various hypotheses have been put forward to explain these excess mortality rates, ranging from females having less access to food, vaccinations and medical care to particular gender-based working and living conditions. On the basis of the COR*-database, it can be explored which females were at an increased risk of mortality and which factors were associated with it. One could look, for example, at household composition, birth order, social status, age differences of the parents, literacy status of the parents, and living conditions.

Other topics that could be explored using the COR*-database are (changes in) naming practices (i.e., after whom were children named), residential patterns of mothers with illegitimate children (e.g., did they cluster in certain parts of the city?), and legitimizations of illegitimate children (which children had a higher likelihood of being recognized?). Also one could dig into the life courses of (known) fathers of illegitimate children. How did their life course differ from the life course of fathers who had exclusively legitimate children? Promising are studies that will look into the influence of kin inside and outside the household on fertility and survival of offspring (e.g., grandmother hypothesis; Watkins, 2021), migration and mobility.

4.2 EXTENSIONS OF THE DATABASE

There are two ways of extending the database: (1) by plugging in data from other source types, and (2) by increasing the scope of the current source types (e.g., population registers and vital registration records), either through time or through space.

4.2.1 PLUGGING IN DATA FROM OTHER SOURCE TYPES

It can be of great added value, next to the existing demographic and socio-economic data from the population registers and vital registration, to include data from other sources. Currently the COR*-database is already being enriched with genetic markers in the context of a postdoc project by Sofie Claerhout, funded by Research Foundation Flanders.[3] More specifically, currently-living COR*-males in Flanders and the Netherlands are being sequenced on the non-recombining part of the Y-chromosome. The DNA-data that will be obtained in this way is being linked through the family tree of the sampled individuals to their ancestors in the Antwerp COR*-database. This will shed new light on long-debated nature-nurture issues relating to surnames, family formation, migration and mortality.

Likewise, projects by third parties can lead to extensions of the COR*-database. The IMMIBEL project "Outcast or Embraced? Clusters of Foreign Immigrants in Belgium, c. 1840–1890" led to the creation of a database with the surviving index cards of immigrants from the Public Safety Office (Sécurité Publique) as well as a database with all mariners (both Belgian and foreigners) based on the Seamen's registry of voyages.[4] By plugging the data on COR*-persons and their partners into the COR*-database, new analyses can be performed related to, amongst others, work and mobility patterns of immigrants.

The citizen-science project S.O.S Antwerp "Sociale ongelijkheid in sterfte" [Social Inequality in Death], aims to create a database of the causes of death of all individuals that died between 1820 and 1946 in

3 https://researchportal.be/en/project/genetics-behind-historical-socio-demography-flanders-revealed-human-y-chromosome

4 https://www.belspo.be/belspo/brain-be/projects/IMMIBEL_en.pdf

Antwerp.[5] If the cause of death of COR*-individuals are linked to the Antwerp COR*-database, this will open up research possibilities that might shed new light on the clustering and intergenerational transfer of infant and child mortality as well as the healthy migrant effect. One can investigate whether clusters of infant and child deaths can be attributed to the same causes of death, and what causes lower death rates among migrants. This can increase our insights into the drivers of mortality dynamics and differences.

New projects can be launched to collect other materials on COR*-persons. Promising sources are conscription records, notarial deeds (e.g., prenuptial agreements, wills and property transfers), tax and rent registers. Research opportunities are, for instance, the impact of heights on life course trajectories, health and mortality and the relation of income and wealth levels with e.g., partner selection, the timing of marriage, patterns of career mobility, and health and well-being.

4.2.2 VERTICAL AND HORIZONTAL EXTENSIONS

Currently, a limitation of the database is its relatively small size. Although there are observations on more than 30,000 individuals, the whole is limited in time and space. Life course data are censored by the end of the observation period (1920) and the area of observation (the district of Antwerp). For 5,971 research persons we only observe a single demographic event in the population registers and we can only link 2,459 death certificates to the 7,222 birth certificates in the database. This means that for only 35% of the individuals for which we have a birth certificate, a complete life course can be studied. That is less than 10% of all individuals in the database. For many research questions this is no problem, as event history techniques can deal well with incomplete data. However, for research questions that require a long time window the numbers soon get smaller. This is especially true if we want to include multiple generations. Robyn Donrovich et al. (2018) ended up with only 1,445 infants in their study on the intergenerational transfer of infant mortality.

Extending the data to later periods would be most interesting, but is hampered due to privacy laws. Going back in time would be possible, but it would require also a change of source type, using parish records, since population registers started not before 1846 and the civil registration not before the 1790's. While this would not lead to a similar information density as from 1846 onwards, the addition of baptism, marriage and burial records, could lead to a valuable extension of multiple generations of COR*-individuals. This will open up new venues for research on intergenerational issues, related to marriage, fertility and mortality, but also on, for instance, naming practices, as individuals were often named after godfathers and -mothers.

Next to vertical extension in terms of time, horizontal extensions in terms of space are possible. In principle the database could be extended over the rest of Flanders or even the whole of Belgium. While this seemed until recently a "mission impossible", given the amount of time and resources it would require, new opportunities have arisen thanks to large-scale citizen science projects, as well as advances in handwritten text recognition, as successful examples from Norway and Spain have shown (e.g., Pedersen et al., 2022; Pujades-Mora et al., 2022; Thorvaldsen et al., 2015). In principle it would be possible to launch a platform and to call on volunteers — genealogists, students, retirees — to gather all entries from COR*-persons from the population registers and vital registration records from all Belgian municipalities, provided the data collection, entry and processing are guided by data and record linkage specialists. In practice, important steps have been taken already, as the marriage certificates of Flemish Brabant and Brussels of the 19th and early 20th century haven been collected in the context of the crowdsourcing project DEMOGEN, coordinated by the Belgian State Archive and KU Leuven (Matthijs, Put, & Trio, 2019). An even larger data collection has taken place for the province of West Flanders, also in the context of a citizen-science project (Aelvoet, Matsuo, Matthijs, & Buyst, 2016). By adding data on COR*-persons from these datasets, we will be able to add a large number of new research persons, but also to complete missing life course information of existing research persons who moved from or to Antwerp at some point in time during their life.

In sum, if we overlook all the possibilities for new research on the existing database and the opportunities that might arise from future extension of the database, it seems that we are only at the beginning of a long and exciting research journey through the demographic past of Flanders and Belgium.

5 https://sosantwerpen.be/

REFERENCES

Aelvoet, A., Matsuo, H., Matthijs, K., & Buyst, E. (2016). *Linking individual historical demographic data: Province of West Flanders, Belgium.* (CeSO Working Paper, WOG/HD/2016-1). Leuven: CeSO. Retrieved from https://lirias.kuleuven.be/retrieve/610466

Alter, G. (1988). *Family and the female life course. The women of Verviers, Belgium, 1849–1880*. Madison: The University of Wisconsin Press.

Alter, G. (2020). The evolution of models in historical demography. *Journal of Interdisciplinary History, 50*(3), 325–362. doi: 10.1162/jinh_a_01445

Alter, G., & Mandemakers, K. (2014). The Intermediate Data Structure (IDS) for longitudinal historical microdata, version 4. *Historical Life Course Studies, 1*, 1–26. doi: 10.51964/hlcs9290

Alter, G., & Oris, M. (2005). Childhood conditions, migration, and mortality: Migrants and natives in 19th-century cities. *Social Biology, 52*(3–4), 178–191. doi: 10.1080/19485565.2005.9989108

Becker, G. S. (1960). An economic analysis of fertility. In G. Becker (Ed.), *Demographic and economic change in developed countries* (pp. 209–231). Princeton: Princeton University Press.

Bengtsson, T., & Dribe, M. (2021). The long road to health and prosperity, Southern Sweden, 1765-2015. Research contributions from the Scanian Economic-Demographic Database (SEDD). *Historical Life Course Studies, 11*, 74–96. doi: 10.51964/hlcs10941

Bengtsson, T., & Lindström, M. (2000). Childhood misery and disease in later life: The effects on mortality in old age of hazards experienced in early life, Southern Sweden, 1760–1894. *Population Studies, 54*(3), 263–277. doi: 10.1080/713779096

Bouman, P. J., & Bouman, W. H. (1955). *De groei van de grote werkstad: Een studie over de bevolking van Rotterdam*. Assen: Van Gorcum.

Bourdieu, J., Kesztenbaum, L., Postel-Vinay, G. (2014). *L'enquête TRA, histoire d'un outil, outil pour l'histoire.* Paris, INED: Classiques de l'économie et de la population.

Caldwell, J. C. (1976). Toward a restatement of demographic transition theory. *Population and Development Review, 2*(3–4), 321–366. doi: 10.2307/1971615

Caldwell, J. C. (2005). On net intergenerational wealth flows: An update. *Population and Development Review, 31*(4), 721–740. doi: 10.1111/j.1728-4457.2005.00095.x

Caron, M., Neyrinck, W., Dillon, L. Y., Matthijs, K. (2017). Sibling influence on access to marriage: A comparative study of Québec and Flanders, 1842–1912. *Journal of Family History: Studies in Family, Kinship and Demography, 42*(3), 271–307. doi: 10.1177/0363199017713540

Chevalier, L. (1973). *Laboring classes and dangerous classes in Paris during the first half of the nineteenth century*. New York: Fertig.

Clark, P. (2013). Introduction. In P. Clark (Ed.), *The Oxford handbook of cities in world history* (pp. 1–30). Oxford: Oxford University Press.

Coale, A. J., (1973). 'The demographic transition reconsidered'. In International Union for the Scientific Study of Population (IUSSP) (Ed.*), Proceedings of the International Population Conference 1973* (Vol. 1) (pp. 53–73). Liège: Editions Ordina.

Coale, A. J., & Watkins, S. C. (1986). *The decline of fertility in Europe. The revised proceedings of a conference on the Princeton European Fertility Project.* New Jersey: Princeton University Press.

Centre of Sociological Research, research group Family and Population Studies, KU Leuven. (2010). COR*-database. Data Set Release 2010.08.

Das Gupta, M. (1990). Death clustering, mothers' education and the determinants of child mortality in rural Punjab, India. *Population Studies, 44*(3), 489–505. doi: 10.1080/0032472031000144866

Devos, I. (2000). Te jong om te sterven. De levenskansen van meisjes in België omstreeks 1900, *Tijdschrift voor Sociale Geschiedenis, 26*(1), 55–75.

Devos, I. (2006). *Allemaal beestjes. Mortaliteit en morbiditeit in Vlaanderen, 18de–20ste eeuw.* Gent: Academia Press.

Donrovich, R., Puschmann, P., & Matthijs, K. (2014). Rivalry, solidarity, and longevity among siblings: A life course approach to the impact of sibship composition and birth order on later life mortality risk, Antwerp (1846–1920). *Demographic Research, 31*(38), 1167–1198. doi: 10.4054/DemRes.2014.31.38

Donrovich, R., Puschmann, P., & Matthijs, K. (2018). Mortality clustering in the family. Fast life history trajectories and the intergenerational transfer of infant death in late 19th- and early 20th-century Antwerp, Belgium. *Historical Life Course Studies*, 7, 47–68. doi: 10.51964/hlcs9285

Donrovich, R. N., Puschmann, P., Matthijs, K., & Neyrinck, W. (2013). Broers en zussen: Rivalen voor het leven? Het effect van het hebben van broers en zussen en van geboorterang op de sterftekans van vijftigplussers (arrondissement Antwerpen, 1846–1910). In K. Matthijs, P. Puschmann, A. Janssens & H. Bras (Eds.), *Gender in/en historische demografie. Jaarboek historische demografie 2013* (pp. 103–130). Leuven: Acco.

Dribe, M., & Quaranta, L. (2020). The Scanian Economic-Demographic Database (SEDD). *Historical Life Course Studies, 9*, 158–172. doi: 10.51964/hlcs9302

Edvinsson, S., & Janssens, A. (2012). Clustering of deaths in families: Infant and child mortality in historical perspective. *Biodemography and Social Biology, 58*(2), 75–86. doi: 10.1080/19485565.2012.738575

Eggerickx, T., Sanderson, J.-P., & Vandeschrick, C. (2020). Mortality in Belgium from the nineteenth century to today. Variations according to age, sex, and social and spatial contexts. *Revue Quetelet 8*(2), 7–59. doi: 10.14428/rqj2020.08.02.01

Engberg, E., & Edvinsson, S. (2020). A database for the future. Major contributions from thirty-seven years of database development and research at the Demographic DataBase. *Historical Life Course Studies, 9*, 173–196. doi: 10.51964/hlcs9305

Engelen, T. (1997). The fertility decline in the Dutch province of Limburg, 1880–1960: On understanding historical actors in a constrained environment. *The History of the Family, 2*(4), 405–424. doi: 10.1016/S1081-602X(97)90023-3

Fleury, M., & Henry, L. (1956). Des registres paroissiaux à l'histoire de la population: Manuel de dépouillement et d'exploitation de l'état-civil ancien. *Population, 11*(1), 142–144. Retrieved from https://www.persee.fr/doc/pop_0032-4663_1956_num_11_1_4739

Gutmann, M., & Van de Walle, E. (1978). New sources for social and demographic history: The Belgian population registers. *Social Science History, 2*(2), 121–143. doi: 10.1017/S0145553200022367

Haines, M. (1998). The relationship between infant and child mortality and fertility: Some historical and contemporary evidence for the United States. In M. Montgomery & B. Cohen (Eds.), *From death to birth. Mortality decline and reproductive change* (pp. 227–253). Washington: National Academy Press. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK233807/#top

Hajnal, J. (1965). European marriage patterns in perspective. In D. V. Glass & D. E. C. Eversley (Eds.). *Population in history. Essays in historical demography* (pp. 101–143). New Brunswick (U.S.A.): Aldine Transaction.

Hajnal, J. (1982). Two kinds of preindustrial household formation system. *Population and Development Review, 8*(3), 449–494. doi: 10.2307/1972376

Handlin, O. (1973). *The epic story of the great migrations that made the American people*. Boston: Little Brown.

Hoerder, D. (2002). *Cultures in contact: World migrations in the second millennium.* Durham & London: Duke University Press.

Janssens, A., Messelink, M., & Need, A. (2010). Faulty genes or faulty parents? Gender, family and survival in early and late childhood in the Netherlands, 1860–1900. *The History of the Family, 15*(1), 91–108. doi: 10.1016/j.hisfam.2010.01.005

Jenkinson, S., Anguita, F., Paiva, D., Matsuo, H., & Matthijs, K. (2020). The 2020 IDS-release of the Antwerp COR*-database. Evaluation, development and transformation of a pre-existing database. *Historical Life Course Studies, 9*, 197–217. doi: 10.51964/hlcs9301

Kok, J. (2005). Passion, reason, and human weakness. The European marriage pattern and the control of adolescent sexuality. In T. Engelen & A. Wolf (Eds.), *Marriage and the family in Eurasia. Perspectives on the Hajnal hypothesis* (pp. 343–367). Amsterdam: Aksant.

Kok, J., Bras, H., & Rotering, P. (2016). Courtship and bridal pregnancy in the Netherlands, 1870–1950. *Annales de Démographie Historique, 132*(2), 165–192. doi: 10.3917/adh.132.0165

Kruithof, J. (1964). De demografische ontwikkeling in de XIXde eeuw. In Genootschap voor Antwerpse Geschiedenis (Ed.), *Bouwstoffen voor de geschiedenis van Antwerpen in de XIXde eeuw* (pp. 508–543). Antwerpen: Algemene Drukkerijen LLoyd Anversois.

Larmuseau, M. H. D. (2021). De mateloze interesse in de negentiende eeuw. In J. Van Bavel, D. De Coninck, P. Puschmann & B. Van De Putte (Eds.), *Neurotic doubt and sacred curiosity. Essays in honour of Koen Matthijs/Neurotische twijfelzucht en heilige verwondering. Huldeboek voor Koen Matthijs* (pp. 141–149). Leuven: Centre for Sociological Research, Faculty of Social Sciences, KU Leuven. Retrieved from https://www.researchgate.net/publication/355318848_Neurotic_doubt_and_sacred_curiosity_Essays_in_honour_of_Koen_Matthijs

Larmuseau, M. H. D., Claerhout, S., Gruyters, L., Nivelle, K., Vandenbosch, M., Peeters, A., van den Berg, P., Wenseleers, T., & Decorte, R. (2017). Genetic-genealogy approach reveals low rate of extra-pair paternity in historical Dutch populations. *American Journal of Human Biology, 29*(6). doi: 10.1002/ajhb.23046

Larmuseau, M. H. D., Matthijs, K., & Wenseleers, T. (2016a). Long-term trends in human extra-pair paternity: Increased infidelity or adaptive strategy? A reply to Harris. *Trends in Ecology & Evolution, 31*(9), 663–665. doi: 10.1016/j.tree.2016.06.012

Larmuseau, M. H. D., Matthijs, K., & Wenseleers, T. (2016b). Cuckolded fathers rare in human populations. *Trends in Ecology & Evolution, 31*(5), 327–329. doi: 10.1016/j.tree.2016.03.004

Larmuseau, M. H. D., Vanoverbeke, J., Van Geystelen, A., Defraene, G., Vanderheyden, N., Matthys, K., Wenseleers, T., & Decorte, R. (2013). Low historical rates of cuckoldry in a Western European human population traced by Y-chromosome and genealogical data. *Proceedings of the Royal Society B — Biological Sciences, 280*(1772). doi: 10.1098/rspb.2013.2400

Laslett, P. (1980). The bastardy-prone sub-society. In P. Laslett, K. Oosterveen & R. Smith (Eds.), *Bastardy and its comparative history: Studies in the history of illegitimacy and marital nonconformism in Britain, France, Germany, Sweden, North America, Jamaica and Japan* (pp. 217–246). London: Edward Arnold.

Lesthaeghe, R. J. (2015). *The decline of Belgian fertility, 1800–1970*. Princeton: Princeton University Press. doi: 10.1515/9781400870035

Lucassen, L. (2004). De selectiviteit van blijvers. Een reconstructie van de sociale positie van Duitse migranten in Rotterdam (1870–1885). *Tijdschrift voor sociale en economische geschiedenis, 1*(2), 92–115. doi: 10.18352/tseg.826

Lucassen, L. (2005). *The immigrant threat: The integration of old and new migrants in Western Europe since 1850*. Urbana & Chicago: University of Illinois Press.

Lynch, K. A. (1991). The European marriage pattern in the cities: Variations on a theme by Hajnal. *Journal of Family History, 16*(1), 79–96. doi: 10.1177/036319909101600106

Mandemakers, K., & Kok, J. (2020). Dutch Lives. The Historical Sample of the Netherlands (1987–): Development and research. *Historical Life Course Studies, 9*, 69–113. doi: 10.51964/hlcs9298

Matsuo, H., & Matthijs, K. (2016). Women's age at last childbearing and its determinants: A case study of Antwerp (Flanders, Belgium) on the basis of the multi-source COR* historical sample. *The History of the Family, 21*(2), 175–194. doi: 10.1080/1081602X.2015.1090326

Matsuo, H., & Matthijs, K. (2018). The role of secularisation on marriage and conception seasonality patterns: A study of Antwerp (Flanders, Belgium) in the second half of the 19th and the early 20th century. *Journal of Family History, 43*(4), 335–356. doi: 10.1177/0363199018798745

Matthijs, K. (2001). *De mateloze negentiende eeuw: Bevolking, huwelijk, gezin en sociale verandering*. Leuven: Universitaire Pers Leuven.

Matthijs, K. (2002). Mimetic appetite for marriage in nineteenth-century Flanders: Gender disadvantage as an incentive for social change. *Journal of Family History, 27*(2), 101–127. doi: 10.1177/036319900202700203

Matthijs, K. (2003a). Demographic and sociological indicators of privatisation of marriage in the 19th century in Flanders. *European Journal of Population/Revue européenne de Démographie, 19*(4), 375–412. doi: 10.1023/A:1026361006200

Matthijs, K. (2003b). Frequency, timing and intensity of remarriage in 19th century Flanders. *The History of the Family*, *8*(1), 135–162. doi: 10.1016/S1081-602X(03)00010-1

Matthijs, K., & Moreels, S. (2010). The Antwerp COR*-database: A unique Flemish source for historical-demographic research. *The History of the Family, 15*(1), 109–115. doi: 10.1016/j.hisfam.2010.01.002

Matthijs, K., Put, E., & Trio, P. (2019). Demogen: Crowdsourcing, geneaologie en historisch-demografisch onderzoek in het Rijksarchief. *Science Connection, 60*, 46–48. Retrieved from https://kuleuven.limo.libis.be/discovery/fulldisplay?docid=lirias2815380&context=SearchWebhook&vid=32KUL_KUL:Lirias&search_scope=lirias_profile&tab=LIRIAS&adaptor=SearchWebhook&lang=en

Moch, L. P. (1983). *Paths to the city: Regional migration in nineteenth-century France*. Beverly Hills: Sage Publications.

Moch, L. P. (2003). *Moving Europeans: Migration in Western Europe since 1650.* Bloomington & Indianapolis: Indiana University Press.

Mönkediek, B., Kok, J., & Mandemakers, K. (2016). The impact of family setting and local opportunities on leaving home and migration destinations of rural youth, the Netherlands 1860–1940. *Historical Life Course Studies, 3*, 43–65. doi: 10.51964/hlcs9353

Moreels, S. (2010). Classifying historical occupational titles of women in a social class scheme. The career mobility of fertile women living in Antwerp during 1846–1906. *Belgisch Tijdschrift voor Nieuwste Geschiedenis, 1–2*, 143–175. Retrieved from https://www.journalbelgianhistory.be/nl/journal/belgisch-tijdschrift-voor-nieuwste-geschiedenis-2010-1-2/classifying-historical-occupational

Moreels, S., & Matthijs, K. (2011). Marrying in the city in times of rapid urbanization. *Journal of Family History, 36*(1), 72–92. doi: 10.1177/0363199010390615

Moreels, S., & Vandezande, M. (2012). Migration and reproduction in transitional times. Stopping behaviour of immigrants and natives in the Belgian city of Antwerp (1810–1925). *Historical Social Research/Historische Sozialforschung, 37*(3), 321–350. doi: 10.12759/hsr.37.2012.3.321-350

Neven, M. (2003). Individus et familles: Les dynamiques d'une société rural. Le Pays de Herve dans la seconde moitié du XIXe siècle. Geneva: Droz. doi: 10.4000/books.pulg.5432

Omran, A. R. (1971). The epidemiologic transition: A theory of the epidemiology of population change. *Milbank Memorial Fund Quarterly, 49*(4), 509–538. doi: 10.1111/j.1468-0009.2005.00398.x

Oris, M. (1996). Fertility and migration in the heart of the industrial revolution. *The History of the Family, 1*(2), 169–182. doi: 10.1016/s1081-602x(96)90005-6

Oris, M., & Ritschard, G. (2014). Sequence analysis and transition to adulthood: An exploration of the access to reproduction in nineteenth-century East Belgium. In P. Blanchard, F. Bühlmann & J.-A. Gauthier (Eds.), *Advances in sequence analysis: Theory, method, applications* (Vol. 2) (pp. 151–167). Cham: Springer. doi: 10.1007/978-3-319-04969-4_8

Park, R. E. (1928). Human migration and the marginal man. *The American Journal of Sociology, 33*(6), 881–893. Retrieved from http://www.jstor.org/stable/2765982

Pedersen, B.-R., Holsbø, E., Andersen, T., Shvetsov, N., Ravn, J., Sommerseth, H. L., & Bongo, L. A. (2022). Lessons learned developing and using a machine learning model to automatically transcribe 2.3 million handwritten occupation codes. *Historical Life Course Studies, 12*, 1–17. doi: 10.51964/hlcs11331

Pink, K. E., Willführ, K. P., Voland, E., & Puschmann, P. (2020). Effects of individual mortality experience on out-of-wedlock fertility in eighteenth- and nineteenth-century Krummhörn, Germany. *Human Nature, 31*, 141–154. doi: 10.1007/s12110-020-09368-3

Pujadas-Mora, J. M., Fornés, A., Ramos Terrades, O., Lladós, J., Chen, J., Valls-Fígols, M., & Cabré, A. (2022). The Barcelona Historical Marriage Database and the Baix Llobregat Demographic Database. From algorithms for handwriting recognition to individual-level demographic and socioeconomic data. *Historical Life Course Studies, 12*, 78–111. doi: 10.51964/hlcs11971

Puschmann, P. (2015). *Social inclusion and exclusion of urban in-migrants in Northwestern European port cities. Antwerp, Rotterdam & Stockholm ca. 1850–1930*. (PhD thesis, KU Leuven). Retrieved from https://www.researchgate.net/publication/287106072_Social_Inclusion_and_Exclusion_of_Urban_In-Migrants_in_Northwestern_European_Port_Cities_Antwerp_Rotterdam_Stockholm_ca_1850-1930

Puschmann, P. (2020a). Introduction. In P. Puschmann (Ed.), *A cultural history of marriage in the age of empires* (pp. 1–16). London & New York: Bloomsbury Academic.

Puschmann, P. (2020b). Love, sex and sexuality: Balancing economic considerations, sociocultural expectations, and personal desires. In P. Puschmann (Ed.), *A cultural history of marriage in the age of empires* (pp. 117–138). London & New York: Bloomsbury Academic.

Puschmann, P., Donrovich, R., Grönberg, P.-O., Dekeyser, G., & Matthijs, K. (2016b). Disfavored in life, favored in death? Later-life mortality differences (ages 30+) between migrants and natives in Antwerp, Rotterdam and Stockholm, 1850–1930. *Historical Social Research/Historische Sozialforschung, 41*(4), 257–290. doi: 10.12759/hsr.41.2016.4.257-290

Puschmann, P., Donrovich, R., & Matthijs, K. (2017). Salmon bias or red herring? Comparing adult mortality risks between natives and internal migrants: Stayers, returnees and movers in Rotterdam, the Netherlands, 1850–1940. *Human Nature, 28*, 481–499. doi: 10.1007/s12110-017-9303-1

Puschmann, P., Grönberg, P.-O., Schumacher, R., & Matthijs, K. (2014a). Access to marriage and reproduction among migrants in Antwerp and Stockholm. A longitudinal approach to processes of social inclusion and exclusion, 1846–1926. *The History of the Family, 19*(1), 29–52. doi: 10.1080/1081602X.2013.796889

Puschmann, P., Van den Driessche, N., Grönberg, P.-O., Van de Putte, B., & Matthijs, K. (2014b). Migratie en sociale in- en uitsluiting in Noordwest-Europese havensteden. Partnerkeuze en huwelijk onder migranten in Antwerpen, Rotterdam en Stockholm, 1850–1930. In I. Devos, K. Matthijs & B. Van de Putte (Eds.), *Kwestbare groepen in/en historische demografie* (pp. 115–153). Leuven: Acco. doi: 10.13140/2.1.1799.3288

Puschmann, P., Van den Driessche, N., Grönberg, P.-O., Van de Putte, B., & Matthijs, K. (2015). From outsiders to insiders? Partner choice and marriage among internal migrants in Antwerp, Rotterdam & Stockholm, 1850–1930. *Historical Social Research/Historische Sozialforschung, 40*(2), 319–358. doi: 10.12759/hsr.40.2015.2.319-358

Puschmann, P., Van den Driessche, N., Matthijs, K., & Van de Putte, B. (2012). Marginalisatie en huwelijkssluiting onder migranten. Het acculturatieproces van migranten in de havenstad Antwerpen vanuit levensloopperspectief (1846–1920). In K. Matthijs, J. Kok & H. Bras (Eds.), *Leren van historische levenslopen: Historisch-demografisch onderzoek in Vlaanderen en Nederland* (pp. 145–180). Leuven/The Hague: Acco. Retrieved from https://lirias.kuleuven.be/retrieve/206487

Puschmann, P., Van den Driessche, N., Matthijs, K., & Van de Putte, B. (2016a). Paths of acculturation and social inclusion. Migration, marriage opportunities and assortative mating by geographic origin in Antwerp, 1846–1920. *Journal of Migration History, 2*(1), 177–207. doi: 10.1163/23519924-00201007

Quaranta, L. (2013). Scarred for life. How conditions in early life affect socioeconomic status, reproduction and mortality in Southern Sweden, 1813–1968 (Doctoral dissertation, Lund University). Lund: Media-Tryck. Retrieved from https://lup.lub.lu.se/search/ws/files/3026458/3737380.pdf

Quaranta, L. Broström, G., van Dijk, I. Donrovich, R., Edvinsson, S. Engberg, E., Mandemakers, K., Puschmann, P., Matthijs, K, & Sommerseth, H. (2017). Intergenerational transfers of infant mortality in historical contexts: A comparative study of five European populations. Paper presented at the SSHA Conference, Chicago.

Rotering, P. P. P. (2020). *Family influences on fertility in Europe, 1850–1920* (PhD thesis, Wageningen University). doi: 10.18174/517335

Ruggles, S. (1999). The limitations of English family reconstitution: English population history from family reconstitution 1580–1837. *Continuity and Change, 14*(1), 105–130. doi: 10.1017/s0268416099003288

Schulz, W., Maas, I., & van Leeuwen, M. H. D. (2015). Occupational career attainment during modernization. A study of Dutch men in 841 municipalities between 1865 and 1928. *Acta Sociologica, 58*(1), 5–24. doi: 10.1177/0001699314565795

Schumacher, R., Matthijs, K., & Moreels, S. (2013). Migration and reproduction in an urbanizing context. Family life courses in 19th century Antwerp and Geneva. *Revue Quetelet, 1*(1), 51–72. doi: 10.14428/rqj2013.01.01.03

Schumacher, R., Ryczkowska, G., & Perroux, O. (2007). Unwed mothers in the city. Illegitimate fertility in 19th-century Geneva. *The History of the Family, 12*(3), 189–202. doi: 10.1016/j.hisfam.2007.10.002

Sewell, W. H. (1985). *Structure and mobility: The men and women of Marseille, 1820–1870.* Cambridge, London & New York: Cambridge University Press.

Shorter, E. (1971). Illegitimacy, sexual revolution, and social change in modern Europe. *The Journal of Interdisciplinary History, 2*, 237–272.

Shorter, E. (1973). Female emancipation, birth control, and fertility in European history. *The American Historical Review, 78*, 605–640.

Spolaore, E., & Wacziarg, R. (2021). Fertility and modernity. *The Economic Journal, 132*, 796–833. doi: 10.1093/ej/ueab066

Szreter, S. (1996). *Fertility, class & gender in Britain, 1860–1940.* Cambridge, New York: Cambridge University Press.

Thomas, W. I., & Znaniecki, F. (1918). *The Polish peasant in Europe and America: Monograph of an immigrant group*. Chicago: Chicago University Press.

Thorvaldsen, G., Pujadas-Mora, J. M., Andersen, T., Eikvil, L., Lladós, J., Fornés, A., & Cabré, A. (2015). A tale of two transcriptions. Machine-assisted transcription of historical sources. *Historical Life Course Studies, 2*, 1–19. doi: 10.51964/hlcs9355

Treiman, D. J. (1970). Industrialization and social stratification. *Social Inquiry, 40*(2), 207–234. doi: 10.1111/j.1475-682X.1970.tb01009.x

Van Baelen, H. (2007). *Constructie van een historisch–demografisch longitudinale database. Methodologie van de Demographica Flandria Selecta*. Leuven: Centrum voor Sociologisch Onderzoek.

Van Baelen, H., & Matthijs, K. (2007). Comparing two methods to reconstruct the kin network outside the household with nineteenth-century Antwerp data. *Journal of Family History, 32*(2), 149–160. doi: 10.1177/0363199006298064

Van Bavel, J. (2004). Diffusion effects in the European fertility transition: Historical evidence from within a Belgian town (1846–1910). *European Journal of Population, 20*, 63–85. doi: 10.1023/B:EUJP.0000014572.66520.0d

Van Bavel, J., Moreels, S., Van de Putte, B., & Matthijs, K. (2011). Family size and intergenerational social mobility during the fertility transition: Evidence of resource dilution from the city of Antwerp in nineteenth century Belgium. *Demographic Research, 24*(14), 313–344. doi: 10.4054/DemRes.2011.24.14

Vandenberghe, C. (2020a). *Like father, like son? Industrialization and intergenerational social mobility: evidence from Antwerp, 1830–1913 (*Research paper). London: London School of Economics.

Vandenberghe, C. (2020b). *Supply or demand? An evaluation of the determinants of Belgian female labour force participation during industrialization: Antwerp and Brussels in the early twentieth century (*Master thesis). London School of Economics, London.

Vandezande, M. (2012). *Born to die. Death clustering and the intergenerational transmission of infant mortality, the Antwerp district, 1846–1905* (PhD thesis, KU Leuven). Retrieved from https://lirias.kuleuven.be/retrieve/206174

Vandezande, M., & Matthijs, K. (2013). Inherited dimensions of infant mortality. Detecting signs of disproportionate mortality risks in successive generations. *The History of the Family, 18*(2), 169–186. doi: 10.1080/1081602X.2012.755131

Vries, S. H. (2019). *Ongehuwde moeders en voorechtelijke verwekkingen in het arrondissement Antwerpen, 1812–1920* (Bachelor thesis, Radboud University Nijmegen). Retrieved from https://theses.ubn.ru.nl/bitstream/handle/123456789/10471/Vries%2c_S.H._1.pdf?sequence=1

Watkins, A. (2021). Reevaluating the grandmother hypothesis. *History and Philosophy of the Life Sciences, 43*(103). doi: 10.1007/s40656-021-00455-x

Weigl, A. (2016). The drifting apart of gender-specific life expectancies in Europe 1850–2010. Some introductory remarks. In M. Dinges & A. Weigl (Eds.), *Gender-specific life expectancy in Europe 1850–2010* (pp. 7–15). Stuttgart: Franz Steiner Verlag. Retrieved from file:////ia/IISG$/home/MarjaK/Downloads/MedGG_Beiheft_58-1.pdf

Westberg, A., Engberg, E., & Edvinsson, S. (2016). A unique source for innovative longitudinal research: The POPLINK Database. *Historical Life Course Studies, 3*, 20–31. doi: 10.51964/hlcs9351

Winter, A. (2009). *Migrants and urban change. Newcomers to Antwerp, 1760–1860.* London: Pickering & Chatto.

Zijdeman, R. L. (2009). Like my father before me: Intergenerational occupational status transfer during industrialization. *Continuity and Change, 24*(3), 455–486. doi: 10.1017/S0268416009990166