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**CHILD CARE AND HUMAN
DEVELOPMENT: INSIGHTS FROM
JEWISH HISTORY IN CENTRAL AND
EASTERN EUROPE, 1500–1930**

Zvi Eckstein, Maristella Botticini and Anat Vaturi

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Abstract

Economists growingly highlight the fundamental role that human capital formation, institutions, cultural transmission, and religious norms may each distinctively play in shaping health, knowledge, and wealth. We contribute to this debate by studying one of the most remarkable instances in which religious norms and child care practices had a major impact on demographic and economic patterns: the history of the Jews in central and eastern Europe from 1500 to 1930. After documenting that the Jewish population in Poland Lithuania increased at a strikingly high annual rate of 1.37 percent during this period, we investigate the engines of this exceptional growth. We show that while Jewish and non-Jewish birth rates were about the same, infant and child mortality among Jews was much lower and account for the main difference (70 percent) in Jewish versus non-Jewish natural population growth. Our contribution stems from documenting that Jewish families routinely adopted childcare practices that recent medical research has shown as enhancing infants' and children's well-being. These practices, deeply rooted in Talmudic rulings, account for the lower infant and child mortality among Jews, and in turn, for the higher Jewish population growth rate in eastern and central Europe between 1500 and 1930. The key insight of our work is that once Judaism became a "literate religion," infant and child care, as well as enhancing offspring's cognitive skills, became focal activities of Jewish households.

JEL Classification: J11, J13, N33

Keywords: Child care; Eastern Europe, infant mortality, Jewish history, population growth, religious norms

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**CHILD CARE AND HUMAN DEVELOPMENT:
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Abstract

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INTRODUCTION

Economists growingly highlight the important role that human capital formation, institutions, cultural transmission, and religious norms may each distinctively play in shaping human development along the fundamental dimensions of health, knowledge, and wealth. More specifically, in recent years economists have been studying the role of nature (i.e., intergenerational transmission of genes) versus nurture (i.e., intergenerational transmission of cultural values and parental investment in children's cognitive skills and education) in affecting demographic patterns (e.g., health, life expectancy) and economic outcomes (e.g., educational attainment, occupational choice, labor outcomes, income and wealth levels and inequality) over the long run. Our paper contributes to this debate through the lens of a remarkable historical laboratory—the economic history of the Jewish people in central and eastern Europe from 1500 to 1930. As is well known, these regions in the early modern and modern times became the center of Jewish life and Judaism and, in turn, contributed to Jewish economic prosperity and intellectual achievements all over the world up to these days.

In our study we keep the geographic territories of Germany-Austria and Poland-Lithuania as constant as possible throughout the period and we divide the period under consideration into two sub-periods: (i) 1500–1800, which marks approximately the beginning and the end of the Polish-Lithuanian Commonwealth; (ii) 1800–1930, during which political borders changed a lot, the Industrial Revolution reached its full-fledged stage, and large-scale migrations of Jews out of central and eastern Europe occurred (Maps 1 and 2).

Figure 1 concisely summarizes the key population data we collected for this study. The total populations in Germany-Austria and Poland-Lithuania grew at almost a constant rate of about 0.43 percent from 1500 to 1930. In contrast, the Jewish population growth rate was much higher in both regions and even more so in Poland-Lithuania, where it was 1.37 percent for the entire period and exceptionally high relative to any other population at that time.¹

[FIGURE 1]

Circa 1500, there were only 10 to 15 thousand Jews in Poland-Lithuania—less than 2 percent of world Jewry and only 0.13 percent of the total population in Poland-Lithuania. During the 12th to the 15th century most Jews arrived to Poland-Lithuania from Germany-Austria. The Jews in Poland-Lithuania and Germany-Austria shared the same religious, educational, and cultural background. In 1880, there were 4.7 million Jews in the former Poland-Lithuania, who accounted for about 61 percent of world Jewry (7.6 million) and over 15 percent of the total population in Poland-Lithuania. Circa 1500, there were only 40,000 Jews in Germany-Austria and, by 1880, their number had reached 760,000 (1.35 percent of the total population in the area).

The rapid and spectacular growth of the Jewish population in Poland-Lithuania in the early modern and modern periods has attracted a lot of interest in the past and, recently, has generated a heated debate following the argument by Sand (2009) that the Jews in Poland-Lithuania may have originated from the descendants of the Khazars (living in the areas around the Caspian Sea) converted to Judaism during the 8th century and arriving to Poland from the East. There is vast historical literature that disproves this hypothesis and in this paper we will show that even if possible, the movement westward of Jews into Poland-Lithuania cannot be compared in scale to the migration of Jews from Germany-Austria eastward into Poland-Lithuania.

We investigate the main engines for this exceptional Jewish population growth. Our main argument is that the exceptional growth of the Jewish population in Poland-Lithuania in the early modern and modern periods can be explained by (i) comparatively lower infant and child death rates among Jews, and (ii) Jewish migration from Germany-Austria. More specifically, based on existing demographic data we collected from a variety of sources, we show that the comparatively lower infant and child mortality rates among Jews account for the main difference (about 70 percent). The key insight and main contribution of our work is that once Judaism became a “literate religion” (Botticini and Eckstein 2005, 2007, 2012) whose core norm required parents to invest in their children's education, infant and child care as well as enhancing offspring's cognitive skills became focal activities of Jewish households. The basic idea is as follows: because Jewish parents could not know in advance which of their infants had higher endowments of cognitive skills and

¹ The natural growth rate is defined as births minus natural deaths, thus not including death caused by wars and population growth from immigration.

physical strength (which affected children's survival), they put a lot of care and effort to improve the health and survival of all their newborn children --- thus generating comparatively lower infant and child mortality rates.

We then present an extensive summary and discussion of infant and childcare among Jews and non-Jews based on a critical assessment of historical evidence related to religious norms and practices. We analyze these religious/social norms and practices in light of modern medical knowledge. Whenever possible, halachic norms are complemented with historical and contextual arguments. Despite the risk implicit in generalizing, the problematic nature of the sources, and the question of whether religious norms determined everyday practice, we do our best in describing general trends and show that childcare practices, which were already adopted in earlier periods by the Jews, are now known by medical knowledge to be particularly effective in lowering infant mortality. For example, the Talmud requires 24 months of breastfeeding, allows the use of contraception to enable the long breastfeeding, recommends the use of one source of breast milk, and advises mothers to breastfeed their infants immediately following the birth of the child. These and other rules that were strengthened during the medieval and early modern periods were usually not common among the Christian communities neither in Germany-Austria, Poland-Lithuania and the rest of Europe, nor in the United States where a vast Jewish migration from Europe occurred later.

The paper is organized as follows. Section 1 relates our work to the relevant strands of literature in economics. Section 2 summarizes the key trends in Jewish and total populations from 1500 to 1930. Section 3 provides data on birth and death rates, clearly distinguishing between infant and child mortality rates vs adult death rates. Section 4 compares infant and child care norms and practices of Jews and non-Jews from the Talmudic era up to the modern period. Section 5 summarizes our main findings and provides directions for future research.

1. Contributions to the Literature

Our analysis of the economic consequences of the distinctive Jewish parental investment in infant and child care delivers novel insights to the recent research agenda in economics and psychology that studies the development of cognitive and non-cognitive skills, and, more broadly human development. Much of the existing literature in economics on parental investment in children's human capital in very early ages is directly related to Heckman (2006) hypothesis on the decreasing rates of return to investment in education by age. Kautz, Heckman et al (2014) have recently provided a survey of this literature including a review of contributions from other disciplines (e.g., psychology).² These works have as their fundamental pillar the hypothesis that cognitive and non-cognitive skills development is a dynamic process, which begins very early in life. The foundations for adult success are then laid down early in life, with quality parenting through nourishment, stimulation, attachment, encouragement, and support becoming the true engines of child advantage, and not the traditional measures of income and wealth commonly used in policy discussions. Along these lines, recent research by Falk and Fosse (2016) presents evidence showing that breastfeeding duration is a valid measure of the quality of early childhood environment. In a sample of preschool children and young adults, they find that longer breastfeeding duration is associated with higher levels of patience and altruism as well as lower willingness to take risk, and the observed pattern persists into adulthood. Importantly, the results are not purely driven by nutritional effects of breastfeeding. Altogether, their findings indicate that early childhood environment as measured by breastfeeding duration systematically and persistently affects preference formation.

Our contribution to this research agenda stems from providing unique and long-term (five centuries) evidence on the link between infant and early child care among different populations and the subsequent cognitive-enhanced demographic and economic impact. More specifically, we provide a comparative analysis on social and religious norms related to infant and early child care between Jews and non-Jews over a long period of time (from the Talmudic era [circa 3rd to 6th centuries] to modern times). We then show that Jewish religious norms and best practices of taking care of infants and young children coincide with

² Within this literature, most relevant for our work are Wolpin (1997), Cunha, Heckman and Schennach (2010), and Cunha, Elo and Culhane (2013).

those that nowadays medical knowledge recognizes as crucial in reducing infant and child mortality and to stimulate and nurture higher cognitive and non-cognitive achievements.

Our work presents novel findings also for the research agenda that studies the pivotal role of cultural transmission and institutions in shaping economic opportunities and outcomes.³ More broadly, we contribute to the research agenda on long-run economic growth. Economists increasingly highlight the important role of lower infant mortality for population growth and the demographic transition in the early stages of high growth of per-capita income mainly in the 19th century.⁴ Independently, most economic growth theories and empirical research have focused on the accumulation of human capital.⁵ The novel contribution of our study stems from using the laboratory of Jewish history between 1500 and 1930 to investigate the key insights of these fundamental contributions to the literature on long-run economic growth. In particular, we show that the unique trajectory of the Jewish people from 1500 to 1930 resulted from the unique interplay of Jewish distinctive investment in infant and child care and the specific legal systems of property rights in productive assets and institutions regulating the access to occupations and sectors.

A third strand of literature to which we contribute is the economics of religion. Social scientists have always been fascinated by the study of religion and by the influence religious values and norms may have on human behavior. In the past two decades, economists have become increasingly intrigued by the nexus between religion and economic outcomes.⁶ Our study contributes to this growing literature by linking the key features of Judaism to the unique demographic and economic traits that have shaped the history of the Jews in the early modern and modern periods in the areas (central and eastern Europe) that formed the center of Judaism and Jewish life.

Finally, our work contributes to the economic history literature in a global perspective. In fact, if someone spins a historical globe dating 1492, he or she would find a Jewish community in almost every city in the Iberian Peninsula, central Europe, Italy, and the Ottoman Empire. If someone does the same for every century from 1492 until today, he or she would discover that the locations in which the Jews have dwelled, and their distribution in urban centers, have dramatically expanded and changed across these five centuries. Thus, the understanding of the changes in Jewish population growth, migration, and occupational distribution inevitably requires the study of the economic and demographic history of almost any location in the world. As such, in addition to its intrinsic interest, the study of the history of the Jewish people from 1500 to 1930 enables a deeper understanding of the economic history of all the societies that the Jews encountered in their worldwide Diaspora. We have illustrated this unique feature of Jewish history in Botticini and Eckstein (2005; 2007; 2012) for the period from 70 to 1492. For the period between 1500 and 1930, which we cover in this paper, this distinctive mark becomes even more significant. As such, our work shades new light on some striking patterns in Jewish economic and demographic history at a pivotal period, during which the geographical discoveries in the New World, the growing urbanization prior to the Industrial Revolution and, later, the impressive industrialization during the modern era completely transformed the subsequent centuries in human history until today.

In Botticini and Eckstein (2005; 2007; 2012), using the tools of economic analysis applied to history, we showed that the unique norm within Judaism (established during the first century CE) imposing fathers to educate their sons at a very early age had a profound and long-lasting impact on Jewish economic and demographic history in the subsequent 15 centuries. In a nutshell, the enforcement of that religious norm in a rural world of almost universal illiteracy endowed the Jews with a comparatively higher human capital, which later helped them select into skilled and profitable occupations in the locations (e.g., the Muslim Empire during the 8th-12th centuries, and western Europe during the Commercial Revolution in the early Middle Ages), in which urbanization and the expansion of trade increased the demand for literate people. On

³ E.g., North (1990); Mokyr (1990), (2002), (2009); Glaeser, La Porta, Lopez-de-Silanes, and Shleifer (2004); Fernández, Fogli, and Olivetti (2004); Greif (2006); Acemoglu, Johnson, and Robinson (2002); Bisin and Verdier (2001); Doepke and Zilibotti (2008, 2017); Mokyr and Voth (2010); Tabellini (2010); Alesina, Giuliano, and Nunn (2013); Spolaore and Wacziarg (2013).

⁴ E.g., Eckstein, Mira, and Wolpin (1999); Galor and Moav (2002).

⁵ E.g., Lucas (1988); Romer (1990); Barro and Lee (2015).

⁶ This literature is rapidly growing. A recent survey by Iyer (2016) offers a more comprehensive review of this literature than the one we can present here. The most recent and most closely related works relevant for our paper are Becker and Woessmann (2009), McCleary (2011), Voigtländer and Voth (2012), Anderson, Johnson, and Koyama (2015), Cantoni (2015), Grosfeld, Sakalli, and Zhuravskaya (2017), and Becker and Pascali (2018).

the other hand, a proportion of Jewish farmers in the agrarian subsistence economies of the first millennium could not afford the religious norm of learning to read with no economic returns and they made the choice of converting. This novel way of studying Jewish history through the lens of economic theory enabled us to challenge and uproot several commonly-held views regarding some remarkable patterns in Jewish occupational distribution and demography.

Parental investment in children's education, though, is only one, although a major, component in children's overall well-being. Infant and child care includes many other equally important aspects such as breastfeeding, wet-nursing, nutrition, hygiene, medical care, transmitting values, motivation, and nurturing in general, which in turn may affect infant and child mortality rates, morbidity, cognitive and non-cognitive abilities, and subsequent child and adult development. In our earlier work, we did not study these crucial aspects, mainly because of the lack of high-quality data on some key variables. In this new paper, we take a huge leap and show that, since early times, Jews had also a distinctive way of taking care of their infants and children with regards to these other fundamental dimensions pertaining to breastfeeding, nutrition, hygiene, medical care, and nurturing in a broader sense. In turn, lower infant and child mortality became the "lever" of the spectacular Jewish population growth in early modern times, whereas their earlier investment in infant and child care coupled with the investment in children's education became the "lever" of their economic prosperity.

2. Jewish and Total Populations in Poland-Lithuania and Germany-Austria, 1500-1930

To understand Jewish population dynamics in central and eastern Europe in the early modern and modern times, it is first important to know the origins of German and Polish Jewry *prior* to the 16th century.

2.1 *The Origins of German and Polish Jewry, 800-1500*

The Jewish communities in Germany circa 1500 were the descendants of Jewish immigrants from Italy and southern France settling in German locations during the reigns of Charlemagne (771–814) and Louis the Pious (814–40). In 1238 Jews lived in about 90 towns and villages, whereas by 1348 there were already more than 1,000 Jewish communities in Germany. The first half of the 14th century (until the Black Death) marks the high point of Jewish settlement in medieval Germany, with a geographical dispersion not seen again until the 19th century.⁷

The dominance of professions related to trade and commerce among the early Jewish immigrants led them to settle in new towns and urban centers. The main occupations of German Jewry from the second half of the 10th century onward included shop keeping, local trade, long-distance commerce, toll collection, minting, and money changing. In addition, the Jews could and did own land, which they cultivated as orchards and vineyards by means of Christian tenants and agricultural laborers. Many German Jews also became heavily engaged in lending money at interest.⁸ As in other locations in Europe, the settlement of Jews in medieval Germany was regulated by local privileges, which stated their legal status and the type of economic activities in which they could engage.⁹ Throughout the Middle Ages, Jewish scholars in Germany continued to develop *halacha* (Jewish law).¹⁰

With the increase in anti-Jewish incidents, growing taxation by the authorities, followed by repeated episodes of temporary expulsion, Germany ceased to be a destination for Jewish immigration at some point, and in fact there began a net outflow of Jews. Although there was never a total expulsion of Jews from Germany, some Jews migrated first to Italy and, later, eastward to Bohemia, Silesia, and Poland. A large number of emigrants joined the German colonization movement whose destination were Polish cities (see

⁷ Toch (2005, 2008, 2011b, 2012, 2018), Abulafia (2011), Botticini and Eckstein (2012, chapter 7, pp. 186–190).

⁸ Baron (1952, vol. 4, chapters 20 and 22), Toch (2000a, 2000b, 2003, 2005, 2008, 2010, 2011a, 2012), Ben-Sasson et al. (2007).

⁹ Parkes (1934, 1938); Marcus (1938); Stow (1992, p. 101); Pakter (1988); Linder (1997); Teller (2010, pp. 112–13). Examples include the charters of Trier (919), Magdeburg (965, 973, 979), Speyer (1084, 1090), Worms (1074, 1090, 1157), Ratisbon (1182, 1216, 1230), and Vienna (1238). For the text of the charter to the Jews in Vienna, see Botticini and Eckstein (2012, Chapter 8, Annex, pp. 244–47).

¹⁰ Stow (1992, p. 90, 172–73), Grossman (1975, pp. 177–78).

below). Later, the massacres concomitant with, and in the aftermath of, the Black Death of 1348–1349, destroyed most of the German Jewish communities, led to accelerated migration eastward, and brought to Poland Jewish emigrants together with their religious, cultural, and social values and traditions. This laid the foundation for the rise of the large and prominent Ashkenazi Jewish communities in Poland in subsequent centuries.¹¹

During the first decades of the Polish kingdom in the 11th century, some small Jewish colonies were established to serve the needs of itinerant Jewish traders. In the mid–12th century, following the rise of towns, the Polish kingdom became attractive to both German and Ashkenazi Jewish immigrants. The Jews, like others, were attracted mainly by the burgeoning economic opportunities. The first permanent communities, though small, were probably established in the 12th century by wealthy Jews who worked for the Polish kings as minters, bankers, and commercial agents. From the second half of the 13th century onward, Ashkenazi immigrants, who were part of the large-scale migration from German-speaking lands eastward, established organized communities modeled on the Ashkenazi Diaspora.¹²

There is ample evidence of the Ashkenazi roots of Polish Jewry. Both Diasporas had a common core of religious practice called *Minhag Ashkenaz*. They had similar burial practices, as it can be seen from a comparison between the oldest remaining Jewish tombstones in Poland and the typical late medieval Ashkenazi sepulchral forms. The new communities accepted the Ashkenazi rabbinic authority and consulted often with Ashkenazi rabbis via *responsa*. Both early settlers and early settlements had German-sounding names, and both Diasporas spoke a common medieval Judeo-German dialect, an early form of the evolving Yiddish language.¹³

In 1264, the Jews received their first charter of privileges, the Statute of Kalisz, which granted the Jews freedom of worship, trade, and travel, exempted them from city and church courts, and placed them under the jurisdiction of the ruler or his representative, who would benefit from Jewish contributions to the treasury. Unlike in the German empire where Jews held the status of serfs of the treasury, the Polish charter established the Jews as an urban group, gave them rights parallel to other urban newcomers, and integrated them within the economic and social life of Polish towns. As minters, bankers, moneylenders, merchants, tax farmers and toll collectors, lessees of royal salt mines, administrators, and royal creditors, Jews began to play a prominent role in the royal and national economies. In 1453, King Casimir the Jagiellon granted the Jews of Poland a detailed charter that strengthened their physical security, religious freedom, and economic rights, and formally recognized the structure of Jewish autonomy. Although the charter was canceled in 1454 due to the opposition of the nobility, it was reconfirmed later by the early modern kings of the Polish-Lithuanian Commonwealth.¹⁴

By 1500, the Jewish community in Poland-Lithuania numbered between 10,000 and 15,000 individuals dwelling in about 100 small communities. The Jews paid the poll tax to the Polish kingdom and were free to travel, change residence, swear and sue in court, bear arms, and own homes and businesses; in principle, they were allowed to deal in any commodity and could sell retail as well as wholesale. They enjoyed a status parallel to that of the burgher estate, and their occupational structure developed according to the economic and political changes in Polish cities.¹⁵ Polish Jews at this time lived in mostly urban communities and while their self-government combined Jewish tradition with Polish influences, they became religious ethnic corporations recognized by law and protected by the monarchy and later by the nobility.¹⁶ The community (*kehila*) had a board (*kahal*), which usually consisted of affluent merchants connected to the developing rabbinic elite. The board imposed taxes and collected them and maintained a synagogue, ritual bath house (*mikveh*), cemetery, and a Jewish court of law.

Although the Polish Church advocated an inferior status, physical segregation, and various other restrictions on the Jews, it was never able to impose them. The strongest opposition to Jewish economic

¹¹ Baron (1952, vol. 4, chapter 22), Toch (2005, 2011b, 2012), Ruderman (2010, p. 30), Zaremska (2011, p. 116).

¹² Rosman (1990, p. 36), Weinryb, (1972, p. 27); Bell, (2008, p. 55); *Atlas* (2010, p. 32), Zaremska (2011, p.116).

¹³ Bartal (2005, p. 16); Ruderman (2010, pp. 30–31); Wodzinski (2010). Sources from the 14th and 15th centuries mention places with names using the middle-high-German diminutive suffix *lin*, while series of appellations mention names with the Germanic element *man*. For more details, see Beider (2001, pp. 184–198; table and map pp. 212–213).

¹⁴ Teller (2010, pp. 114–116), Zaremska (2011, p. 133).

¹⁵ Horn (1974), Rosman, (1990, p. 37), Lukowski (1991, p. 78), Guldon (2000).

¹⁶ Ruderman (2010, p. 86).

activities came from the Christian guild merchants and craftsmen. The increase in Jewish retail trade and crafts met with complaints, accusations, municipal restrictions, and sometimes street violence. The conflicting interests were often resolved through the king's intervention or by means of agreements known as "pacts" between the Jewish community and the Christian municipality, which prescribed the limits of Jewish economic activity in the city. In this context of power struggles between royalty and nobility and between royal privileges and municipal pacts, the Polish Jewish community began to grow and expand eastward.

What about the Khazarian Origin of Jews in Central-Eastern Europe? There is evidence that Jews lived in a small area of eastern Europe located at the north end of the Black Sea. Around the 7th century, the Khazarian kingdom expanded and its Jewish subjects reached the Caspian Sea. The Khazarian Jews settled in the cities, but there is no evidence of a large Jewish community in the kingdom at that time. With the destruction of the Khazarian kingdom in 965–969, the Jewish settlements near the Caspian Sea ceased to exist; Jews partly mixed with the non-Jewish population, and partly escaped or migrated to neighboring areas including eastern Europe and especially Kiev.¹⁷

It has not been decisively proven that the Kievan community had Khazarian roots and, furthermore, the hypothesis that the Khazars converted to Judaism has been based on only a few unreliable written sources. Even if the Khazars did convert to Judaism and later migrated to the area known as the Kievan Rus, no evidence of a separate community that maintained its own traditions has been found. In contrast, other non-Ashkenazi Jewish groups, such as Karaites and the Sephardic Jews, did preserve their religious practices and culture for centuries within the Jewish communities of eastern Europe.¹⁸

Furthermore, even if a large Jewish community with Khazarian origins did exist at the beginning of the 11th century, it was most likely destroyed together with the rest of Kiev during the Mongol siege in 1240.¹⁹ The Jews returned to Kiev and lived under Tatar-Mongol rule (1240–1320). With the annexation of the city by the principality of Lithuania (1320), the Jews were granted rights that ensured their safety and their property. During the reign of Witold (1392–1430), the Jews of Lithuania were granted privileges. At the end of the 14th century, Karaite Jews from the Crimean community settled in Troki and other Lithuanian towns. In the Tatar raid on Kiev in 1482, many Jews were taken captive, and the Karaite community moved to Łuck. Karaite communal institutions were formed in Lithuania in the 15th century under the influence of the Karaite center in Constantinople. In 1495, the Jews of Lithuania were expelled by Alexander Jagiellon and most of them moved back to the Crimea region.²⁰

To sum up, there is no evidence of a large non-Ashkenazi Jewish migration to Poland from the East. There is some possibility, though no concrete evidence, of a minor Jewish migration to Poland-Lithuania following the Mongol invasions during the 13th century. Some migration westward, as well as the presence of non-Ashkenazi Jews in small settlements on the eastern Polish frontier during the 15th century, cannot be

¹⁷ Dubnow (2000, vol. 1, pp. 1–6), Halpern (1968). For evidence of the Jewish presence in Kiev, see Kulik (2010, vol. 1, pp. 189–213), Meir (2010). Kiev was centrally located on a commercial crossroad and thus it must have attracted Jewish settlers from the Byzantine Empire, the Crimea, Persia, and the Caucasus. In his famous travel itinerary during the late 12th century, the Jewish traveler Benjamin of Tudela mentioned Kiev as a great city. The oldest written document that mentions Jews in Kiev is the so-called "Kievan Letter" from ca. 930. Ashkenazi scholars mentioned rabbis from Rus, such as Rabbi Moses of Kiev who was one of the pupils of the *tosafist* Jacob Tam (d. 1170). Although sources are scarce, it is probable that this medieval non-Ashkenazi community included both Rabbinic and Karaite Jews. Benjamin of Tudela (1840, p. 164). For more information on the Kievan Letter, see Golb and Pritsak (1982). *Sefer ha-Yashar le-Rabbenu Tam* (1811, pp. 52a, 522). Zaremska tends to rule out the existence of the Karaite community (2011, p. 77).

¹⁸ For an analysis of Arabic sources, see Gil (2011). For an analysis of all literary and non-literary sources, see Stampfer (2013). No material evidence has been found for the conversion of the Khazars to Judaism or for the existence of a sizeable Jewish community in the kingdom. Since the late 18th century, the hypothesis of the Khazars' conversion to Karaite Judaism has attracted interest, but has never been decisively proven. For a concise examination of this theory and its history, see Shapira (2007), Toch (2018) and the references therein.

¹⁹ Rosenthal (1906, p. 488). While it is known that some of refugees from the Jewish community, mostly Karaites, migrated to the Crimean Peninsula and established Karaite settlements, we have no evidence of substantial migration to the West that had a demographic impact. On the contrary, there was probably an eastward migration from Poland in response to the policy of Russian Prince Daniil Romanovich (1259) and his son, who invited Germans, Jews, Poles, and other foreigners to settle in Kiev to economically revive the city.

²⁰ Slutsky et al. (2007), Akhiezer (2010).

dismissed either. Nonetheless, these movements were insignificant and random and left no genetic or linguistic traces. Hence, Jewish migrations westward cannot be compared with the Jewish migration from German lands eastward. It was these immigrants who set the foundation for the subsequent spectacular demographic growth of the Jewish community in central and eastern Europe---a community which continued the Ashkenazi traditions.²¹

2.2 Jewish and Total Populations in Germany-Austria, 1500-1930

How did the Jewish communities in central and eastern Europe demographically develop in the four and a half centuries from 1500 to 1930? Which were the key patterns and trends in comparison with the local non-Jewish populations?

First, we split this vast geographical area into Germany-Austria and Poland-Lithuania. Second, we divide the period under consideration into two sub-periods: (i) 1500 to 1800, which roughly covers the three centuries before Jewish emancipation, the partitions of the Polish-Lithuanian Commonwealth, and the Industrial Revolution---three centuries during which Poland-Lithuania became the center and home for the majority of world Jewry; and (ii) 1800 to 1930, during which demographic data is even more abundant but many political changes occurring in that period make the definitions of the political borders quite problematic.

The population estimates are based on existing secondary sources, most of which calculated the Jewish population based on the number of Jews who were members of an established community and subject to community taxation rules until the end of the 18th century. Meanwhile, during the 19th century almost all population data is based on national censuses.

Table 1 presents our estimates of Jewish and total populations in Germany-Austria from 1500 to 1750. Historians' most recent estimates indicate that in 1500, there were approximately 40,000 Jews (or perhaps somewhat less) within a total population of 16 million in Germany-Austria. By the end of the 16th century, the Jewish population slightly shrank, and the Jews constituted a mere 0.2 percent of the total population. Consistent with the view of most historians, we maintain that the main explanation for this reduction is the immigration of Jews from Germany-Austria to Poland-Lithuania.²²

[TABLE 1 HERE]

It is interesting and surprising that by the end of the Thirty Years War, between 1600 and 1650 the Jewish population in Germany-Austria increased by more than 50 percent, whereas the total population reduced by about 15 percent. According to various estimates, war-related deaths account for 15–20 percent reduction in the total population. The Jewish population of Germany-Austria was less affected by the war partly because there was some migration of Jews from Poland-Lithuania to Germany-Austria in the wake of the Khmelnsky Uprising in 1648.²³

The key fact emerging from Table 1 is that the Jewish population of Germany-Austria was stagnant during the 16th century, whereas it grew by more than by 1 percent per year during the 17th century, mainly during the second half. While the total population collapsed during the Thirty Years War in the mid-17th century, the Jewish population remained stable. During the first half of the 18th century, it experienced a moderate growth rate of 0.3 percent per year, which is below the growth rate of the non-Jewish population. However, by the mid-18th century the Jewish population amounted to 0.5 percent of the total population---twice what it had been in 1500.

²¹ Rosman (1991, p. 32). See also Elhaik (2013) and his critics in Stampfer (2014). There are at least 12 DNA studies which disprove the Khazar theory. See, for example, Costa et al. (2013)'s study of Ashkenazi DNA found no significant evidence of Khazar influence. For a discussion of the lack of Turkic linguistic influence see Kulik (2014, pp. 105–143).

²² The estimate provided by Guggenheim (1989, pp. 130–131) is based on *Germania Judaica* III, particularly the first and second volumes which contain demographic information for over 1,000 Jewish communities. The total is based on Rabe (1989). See also Friedman (1983, p. 34).

²³ See Whaley (2012, vol. 1, p. 633) for a summary and review of these estimates. He mentions that the different estimates depend on the geographical focus of the demographic studies, i.e. whether the focus is on the German borders of 1871–1914 (the Second Reich) or on those of the early Reich. Schormann's estimate (fn. 26) refers to the early Reich. More information is also provided in Battenberg (2001, pp. 32–33).

Regarding the period between 1800 and 1930, Europe's geopolitical maps underwent major changes during the last thirty years of the 18th century, as well as in 1815 following the Congress of Vienna (see Appendix A).²⁴ In 1871, the German states were united to form the German Empire or the Second Reich, also known as the Kaiserreich, which lasted until 1918.

Table 2 presents the Jewish and total populations of Germany for the period 1800–1930 within the borders of 1934, that is, after the restoration of the Polish state. The estimates include areas of Germany that were parts of Germany-Austria for the earlier period and exclude areas of Germany that were not part of Germany-Austria during the period from 1500 to 1800 approximately. Meanwhile, Table 3 shows the Jewish and total populations of Austria, including Bohemia and Moravia. In the subsequent discussion, we consider jointly Tables 2 and 3 for the analysis of the total population in the entire Germany-Austria area.

[TABLE 2 HERE]

[TABLE 3 HERE]

The starting point in both Tables 2 and 3 is the year 1816, when the borders became more stable and the calculations can be based on the population censuses of the 19th century. Based on multiple sources described in Appendix A, we estimate the number of Jews in Prussia and the other German states in 1816 to be about 214,000 and the total population about 21.989 million.²⁵ In 1871, the Second Reich conducted the first imperial census and the population numbers are more accurate; interestingly, they fit the pattern of change and the levels of the earlier estimates. Until 1880, the Jewish population grew at a slightly higher rate than the total population and increased from about 1 to 1.09 percent of the total population. From 1880, the Jewish population growth rate was significantly lower than the one of the total population, and by 1933, their share amounted to only 0.76 percent of the total population, whose numbers are based on the census of 1933.²⁶

Starting from the census of 1880 following the introduction of universal conscription, the population figures for both the Jewish and total populations become more reliable. In 1830, the Jews in Austria amounted to almost 1 percent of the total population---as many as in Germany. From that time onwards, Jewish population growth rate in Austria until the end of the 19th century was much higher than that of the Jews in Germany, and also much higher than the total population growth rate; remarkably, the Jews in Austria amounted to 2.3 percent of the total population.

In 1934, there were 191,408 Jews in the territory of Austria which had become smaller following the defeat in WWI, out of a total population of 6,759,062.²⁷ According to the 1930 census data, in the former Austrian regions, which were now part of the new state of Czechoslovakia, there were 76,301 Jews out of a total population of 7,109,376 in Bohemia and 41,250 Jews out of a total population of 3,565,010 in Moravia and part of Silesia.²⁸ Overall, there was a significant reduction in the Jewish population in Austria during the period after WWI.

2.3 Jewish and Total Populations in Poland-Lithuania, 1500-1930

We divide the demographic history of Poland-Lithuania into two periods: 1500–1764 and 1764–1930. With regard to the first period, the year 1500 marks the first attempts by historians to estimate the size of the Jewish population in Poland, whereas the first Jewish census in Poland-Lithuania was carried out in 1764–1765. The second period begins after the Jewish census and the partitions of Poland-Lithuania (1772–

²⁴ Appendix A is available at: http://www1.idc.ac.il/Faculty/Eckstein/jewish_history_1500.html

²⁵ In the calculations we subtract the provinces of Posen and West Prussia.

²⁶ We exclude Galicia that was annexed from Poland, since it is included in the figures for Poland. Apart from Galicia, which accounted for 70–80 percent of Austrian Jewry, the regions of Moravia and Bohemia also had significant Jewish populations. Until 1850, general censuses were conducted by the military in Austria and the data from these censuses is not always reliable.

²⁷ *American Jewish Year Book* (1935, vol. 37, p. 360, table 8).

²⁸ Vobecka (2013, p. 47, table 4.1; p. 219).

1795) between Prussia, Russia, and Austria, and ends with the outbreak of World War II, well after the establishment of the Second Republic of Poland in 1918.

By around 1500, the Jewish population in Poland amounted to 10–15 thousand. A number of leading historians including Rosman (1991, p. 40) propose this estimate after a careful analysis of tax collection data. The year 1648 marks the beginning of a decade of wars, including the Khmelnytsky Uprising, which caused serious damage to the Polish economy, reduced its population, and resulted---among other things---in a temporary interruption of the rapid growth of the Jewish population in Poland.

Table 4 provides estimates of the Jewish and total populations of the geographic region of Poland-Lithuania as defined above. Comparing the existing studies, we propose an estimate of 10 to 15 thousand for the number of Jews in Poland-Lithuania circa 1500, whereas the estimate for total population based on recent studies amounts to 7,500,000 people.²⁹

[TABLE 4 HERE]

In the two and a half centuries between 1500 and 1764, the Jewish population of Poland-Lithuania grew extremely fast---amounting to about 0.13 and 5.36 percent of the total population in 1500 and 1764, respectively. The highest growth occurred at the beginning of the 16th century with the documented migration of Jews from Germany. It is interesting to note that during the period of the wars between 1648 and 1660, the Jewish population decreased by 1 percent annually, but the total population decreased by 2 percent annually.³⁰ At the end of the first period in which we have split our analysis, the special Jewish census of 1764–1765 provides the most important milestone for estimating the Jewish population of Old Poland, amounting to 750,000 people.³¹

When considering the subsequent period (1764–1930), one of the most significant geo-political events affecting Poland-Lithuania and the populations residing in this vast area were three partitions occurring in 1772, 1793, and 1795. As an outcome of the Congress of Vienna, the former Jewish population of Poland-Lithuania was now belonging to other countries as follows: (i) the provinces of Posen and West Prussia were subject to Prussia; (ii) Galicia was under Austrian rule; (iii) the Pale of Settlement were regions within the Russian Empire where Jews were permitted to continue to reside; and, (iv) Congress Poland was

²⁹ The figures for 1500 are based on the estimates of Weinryb (1972), Stampfer (1997), and Kupovetsky (2010), who mainly relied on fiscal registers that mention the existing Jewish communities. The earliest of these registers is the Coronation tax register of 1507, which lists 54 communities: 29 in Great Poland, 10 in Mazovia, 10 in Red Russ, and 5 in Lesser Poland (Horn 1974, pp.11–15). A number of scholars have complemented the information in these registers. For example, Schiper (1932) and Baron (1976, p. 207) estimated the Jewish population circa 1500 to be about 30,000. Among other studies, Samsonowicz (1989, p. 36) reported 89 communities (excluding Silesia) and estimated the Jewish population of Poland at 4,500. Guldon (2000) presented the longest list which consisted of 106 Jewish settlements established in Poland before 1507. However, since many of those communities were only temporary, his list is not a reliable basis for calculating the Jewish population. For a critique of Guldon's list, see, for example, Zaremska (2011, pp. 241–242). In contrast to Schiper and Baron, Weinryb (1972, pp. 309–311) provided a much lower estimate of 6,000–8,800 Jews in the Kingdom of Poland and an unknown number in Lithuania and estimated a total number of 10,000 Jews. Stampfer (1997, pp. 263–267) supports Weinryb's figure.

³⁰ Contrary to the significant Jewish population decline reported by contemporary chroniclers as a result of Khmelnytsky Uprising (over 100,000 killed and hundreds of communities destroyed), Stampfer (2003, pp. 218–222) shows that the number of Jewish casualties was in fact much lower, most likely in the range of 18,000–20,000. Kupovetsky (2010, table 1) agrees with Stampfer's assessment of the losses and estimates that 163,000 Jews were living in Poland-Lithuania after the period of the wars in 1660.

³¹ Using this census as a starting point, Mahler (1958, chapter 1, and pp. 45–46) made two major corrections. First, he added 6.35 percent to the Jewish population figures to account for children under the age of one who were not included in the census itself. Second, he also augmented the total figures by a factor of 20 percent to compensate for the underreporting due to tax evasion. While the original 1764 census data reported a Jewish population of 587,658 people (430,009 in Poland and 157,649 in Lithuania), with Mahler's corrections this figure increases to 750,000. Stampfer (1985) supported Mahler's argument pointing out that the data including Mahler's corrections correspond well to the data and the annual Jewish population growth rate during the 19th century. Further support to Mahler's corrections comes from Kalik (2009) study on the Jewish poll tax lists. After examining the newly discovered tax lists for Crown Poland for the period 1717–1764, Kalik estimated a difference of 21.28 percent between actual and potential tax, which is close to the correction factor suggested by Mahler and corroborated by Stampfer.

subject to the Russian Empire, but was not formally part of the Pale of Settlement even though Jews were residing there. Table 5 presents the estimates of the Jewish and total populations of Poland-Lithuania consisting of the four aforementioned areas after the partitions based on the existing historical and demographic studies.

[TABLE 5 HERE]

The Jewish population in the Pale of Settlement (including the Kingdom of Poland) amounted to 811,000 people in 1800. In addition, there were 9,000 Jews in other parts of Russia outside of the Pale, 201,277 Jews in Galicia (in 1803) and 45,000 Jews in Posen in 1800 (see Appendix A). The second column shows two numbers for the total population until 1897: “old total population” and “new total population.” The former figure includes only those territories that were part of pre-partition Poland.³² Remarkably, the Jewish population growth rate exceeded the total population growth rate until 1880 when the Great Migration to the United States started. At that time, the share of the Jews over the total population in the “old” Polish-Lithuanian territories reached 15.4 percent, which was the highest share of Jews in eastern Europe ever. After 1880 and until 1930, the total population growth rate exceeded the Jewish population growth rate, but it was not as high as the Jewish population growth rate prior to the Great Migration period.

Population data for 1897 is based, among other sources, on the most comprehensive survey of the Russian territories implemented in that year. This survey is a milestone for demographic research in general, as well as for the economic and social history of the Jews in the 19th century. From this survey (and from other sources) the Jewish population in the Pale and in the Kingdom of Poland in 1897 amounted to 4,899,327 people. This figure is the outcome of our estimation method that is explained in detail in Appendix A. Finally, the figures for 1925 and 1939 are based on this same methodology but different sources - including relatively new more reliable censuses.

2.4 *Summary of the Key Demographic Trends*

Based on the estimates presented above, a number of conclusions emerge from the analysis of the Jewish and total populations of Germany-Austria and Poland-Lithuania. Figure 2 presents the log values of the population figures appearing in Tables 1 and 4 and uses the calculated growth rate between each pair of observations to provide the log estimates in between. The dashed lines represent the calculated constant rate of growth for the entire period. The average annual growth rates appear on the right-hand side of the graph.

[FIGURE 2 HERE]

The following conclusions emerge for the period between 1500 and 1800:

- (i) The total populations of Germany-Austria and Poland-Lithuania grew at similar natural rates of 0.18 percent and 0.23 percent, respectively. The ratio of the total population of Poland-Lithuania to that of Germany-Austria remained relatively constant (about 0.55) throughout the period. The Thirty Years War in Germany-Austria and the wars of 1648–1660 in Poland-Lithuania had a significant negative impact on the total population growth rate over those 300 years; adjusting for the negative impact of these wars, the natural total population growth rate was about 0.3–0.4 percent.
- (ii) The Jewish population of Poland-Lithuania grew at the exceptionally high rate of about 1.36 percent annually, while the Jewish population of Germany-Austria grew by only 0.66 percent per year. Yet, both Jewish communities grew much faster than the corresponding total populations.
- (iii) Circa 1500, the ratio of the Jewish population of Poland-Lithuania to that in Germany-Austria was 0.25. By the end of that century, however, the Jewish population in Poland-Lithuania was twice as large as that in Germany-Austria and, by 1650, three times as large.
- (iv) During the Thirty Years War, the total population of Germany-Austria declined dramatically, whereas the number of Jews remained almost constant. During the period of the wars in 1648–1660,

³² Rashin (1956, pp. 44–45, table 10). The provinces included in the “old total” are Vilna, Vitebsk, Grodno, Kovno, Minsk, Mogilev, Podolia, Volhynia, and Kiev. We also add Courland which had been subject to Poland-Lithuania prior to the partitions.

the total population in Poland-Lithuania declined at twice the rate of the Jewish population dwelling there.

- (v) If birth, death, and conversion rates were identical between the Jewish populations in Germany-Austria and Poland-Lithuania, then net migration from Germany-Austria to Poland-Lithuania must have continued throughout the period and at a particularly high rate in the 16th century. There are various references to Jewish migration from Germany-Austria to Poland-Lithuania until 1648, but the much higher Jewish population growth rate in Poland-Lithuania than in Germany-Austria continued from 1660 to 1760 (Kupovetsky 2010). This potentially reflects a small yet continued flow of immigration of Jews from Germany-Austria to Poland-Lithuania.
- (vi) Under assumption (v) above, it is possible to argue that the annual natural Jewish population growth rate from 1500 to 1800 was 1 percent and the average net immigration rate from Germany-Austria to Poland-Lithuania was 0.35–0.37 percent. Hence, the average Jewish population growth rate in Poland-Lithuania was 1.35–1.37 percent and in Germany-Austria was 0.63–0.65 percent. Yet, the widening difference in levels of Jewish population in the late 18th century implies that the natural Jewish population growth rate in Poland-Lithuania at that time was potentially slightly above 1 percent.

Figure 3 summarizes Jewish and total population growth rates in Germany-Austria (including most of the “old” Reich) and the “old” Poland-Lithuania between 1800 and 1930 based on the figures in Tables 2, 3, and 5. The observations are calculated as explained in Figure 2.

[FIGURE 3 HERE]

The following conclusions emerge:

- (i) The Jewish population of Poland-Lithuania grew at an almost average rate of 1.35 percent until 1880, when growth slowed and later became negative at the beginning of the 20th century. The change in 1880 was mainly the outcome of the Great Migration of Jews from Poland-Lithuania to the West and, in particular, to the United States. The low Jewish population growth rate after 1900 indicates both a reduced natural growth rate and immigration away from Germany-Austria and Poland-Lithuania.
- (ii) The Jewish population in Germany-Austria grew at a rate of somewhat more than 1 percent, which was close to that of the Jewish population in Poland-Lithuania.
- (iii) The total population of Poland-Lithuania grew at a rate of less than 1 percent prior to 1900 and, subsequently, at a rate above 1 percent. The total population of Germany-Austria grew at a rate of about 1 percent until the beginning of the 20th century, whereas subsequently this growth rate slowed down.
- (iv) The share of the Jewish population over the total population in Poland-Lithuania, which amounted to about 6 percent in 1800, reached a stunning peak of 15.4 percent in 1880, and then fell to just above 7 percent by 1930. In contrast, Jews in Germany-Austria constituted about 0.6 percent of the total population in 1800, about 1.3 percent by 1880 (and above 2 percent in Austria alone), and less than 1 percent by 1930.
- (v) The year 1880 was clearly a turning point when the Jews of eastern Europe began migrating to the West and, primarily, to the United States. However, migration to western European countries had begun even earlier following the Napoleonic wars and Jewish Emancipation in the western and central European countries.

3. Jewish and Non-Jewish Birth and Death Rates, 1500-1930

After documenting (i) the higher Jewish population growth rate relative to the non-Jewish population in Poland-Lithuania and Germany-Austria from 1500 to 1880 and (ii) the continuously increasing proportion of the Jews over the total population in these regions despite the Great Migration from central and eastern

Europe to the West in the 19th century, we address the fundamental question of which were the factors behind these striking Jewish demographic patterns in the early modern and modern times.³³

As well known, population growth rate is determined by the difference between birth and death rates, as well as by immigration and religious conversion rates.³⁴ Unfortunately, there are scant reliable data on births, deaths, immigration, and conversion for both Jews and non-Jews in Germany-Austria and Poland-Lithuania prior to the 19th century. Yet, leading scholars have painstakingly searched for data to document as most accurately as possible the exceptional Jewish population growth in Poland-Lithuania in this period. Based on anecdotal evidence and population growth rates, Ruppin (1940, p.76) proposed the following estimates for birth/death rates among “world Jewry” (per 1000 people):

1650–1750	45/40
1750–1800	40/30
1800–1850	40/25
1850–1900	35/20

These Jewish natural population growth rates are consistent with our observation on Jewish population growth rates of about 1.4 percent in Poland-Lithuania between 1750 and 1900.

For the period between 1500 and 1764, Weinryb (1972, pp. 319–320) proposed a Jewish birth rate for Poland-Lithuania of 55–60 and a death rate of less than 40, which yields a natural rate of increase of 1.5–2 percent.³⁵ These birth rates seem to be above natural birth rates reported in most studies on European countries in the same period, which are typically in the range of 40–35 per 1000. DellaPergola (1983, pp. 58–59, fig. 3) estimated Jewish birth and death rates in Poland-Lithuania using data from Galicia. According to his estimates, there were 40 deaths and 50 births per 1000 during the period 1650–1750. Jewish death rates then began to decline, reaching about 13–15 per 1000 in the 1920s, whereas Jewish birth rates began to decline circa 1870 reaching about 20 per 1000 in the 1920s. Based on these figures, DellaPergola (1997, p. 5; p. 14, fig. 4) maintained that the demographic transition started much earlier (about 70–100 years earlier) among Jews than among non-Jews. In a recent study, Vobecka (2013) has advanced the same argument for the Jews in Bohemia.

Acknowledging this range of estimates regarding birth and death rates, to evaluate the natural population growth rates of Jews and non-Jews for the period 1500–1930, we follow the insights of the demographic transition literature on northern, central, and eastern Europe in which industrialization began in the late 19th century and divide the period into four stages.³⁶

Stage 1

It is the Malthusian period before the demographic transition in which birth and death rates were constant, and already modest population growth rates were further reduced due to epidemic cycles and wars. For

³³ An exhaustive list of primary and secondary sources we surveyed to collect data on birth and death rates is provided in Appendix B.

³⁴ During the 19th century, Jewish migration rate out of Europe was higher than for non-Jews (see Kuznets [1975, pp. 39–51, tables I to V]), which reinforces the argument regarding the difference in birth and death rates between Jews and non-Jews.

³⁵ Weinryb (1972, pp. 319–320). Weinryb based his estimates of the death rate on data collected by Wettstein from the *pinkas* of the Jewish burial society in Cracow for the period 1543–1790. The data are problematic since they do not include the deaths of children up to the age of thirteen or fourteen. However, Weinryb was able to locate data on deaths, including the deaths of children, in the *kehilla*'s records for the end of the 18th century. The number of deaths was twice that registered in the Jewish burial society records. During the period 1543–1590, the average number of deaths was 37–38 per 1000 excluding children. Doubling this number to account for children, Weinryb obtained 74–76 deaths. Thus, the total number of Jews in 1578 was 2,080 (Weinryb, 1972, p. 320). Dividing 2,080 by 74–76 yields 36 deaths (about 40) per 1000. Weinryb's estimate of the birth rate at 55 to 60 per 1000 is not based on data from Poland-Lithuania but rather on the situation in underdeveloped countries in Asia, Africa and the Middle East, which in his view are comparable to the situation in Poland-Lithuania during the early modern times.

³⁶ See Coale (1987) and the references therein cited for the development of the demographic transition literature and Vobecka (2013)'s discussion of the stages.

Germany-Austria this period ended in about 1800, whereas in Poland-Lithuania it continued for few additional decades.

Stage 2

It is the early demographic transition period which began just before the Industrial Revolution and was characterized by the same constant birth rates as before, but declining death rates. For Germany-Austria and Poland-Lithuania, this period ended in about 1870.

The modern demographic transition period is split into two stages until 1930:

Stage 3

From about 1870 to 1910 it is the main period of transition to modernity during which fertility rates declined, mortality rates further declined, and population growth rates increased.

Stage 4

Stage 4 from about 1911 to 1930 is the period in which relatively low and stable birth and death rates typical of modern industrial societies emerged.

The main underlying assumption of the demographic transition literature is that during stage 1, almost all eastern European countries, including Poland-Lithuania and Germany-Austria, were at the so-called “Malthusian equilibrium”, in which the natural population growth rate, i.e. the rate in a “normal environment,” was less than 0.5. The term “normal environment” refers to a historical context in which population growth is not affected by severe epidemics or wars. From Figure 2 one can see that prior to 1800, population growth rates in both Germany-Austria and Poland-Lithuania were about 0.2 percent and the differences with respect to the natural population growth rate are mainly due to the wars of the 17th century, as well as to repeated bouts of local epidemics.

3.1. Birth and Death Rates

We begin our analysis by first presenting and discussing birth and death rates for Jews and non-Jews. As already mentioned, it is challenging to find these data for many locations. For Poland-Lithuania, Table 6 presents the best evidence we could collect for a comprehensive comparison of birth and death rates for Jews and non-Jews in Galicia at the end of the 18th century and in Posen at the beginning of the 19th century (see Appendix B for details).³⁷

[TABLE 6 HERE]

The data from Galicia is representative of the whole region since Galician average birth and death rates for both Jews and non-Jews are comparable to those of a “normal environment” in Poland-Lithuania during stage 1 of the demographic transition. Although this was a period of political partitions in which large parts of the original Polish-Lithuanian Commonwealth were divided up among its neighbors, the socio-economic conditions of the Jewish communities remained unchanged throughout most of the period---with Jews living mainly in urban centers. Moreover, medical knowledge and the socioeconomic relations between Jews and non-Jews remained basically unchanged until the second half of the 19th century. The main exceptions were the periods of the Thirty Years War in Germany and the wars in Poland-Lithuania during the mid-17th century.

The main conclusion to be drawn from Table 6 is that Jews and non-Jews had almost the same birth rate of about 35(+/- 3) per 1000, whereas the average death rates were 20.3 and 25.6 for the Jewish and total populations, respectively. It should be noted that these birth and death rate estimates for the Jewish population are much lower than those proposed by Ruppin, Weinryb, and DellaPergola. However, the rate of Jewish population growth of about 1.5 percent is somewhat above to what we found for Jews in Poland-

³⁷ See appendix B at: http://www1.idc.ac.il/Faculty/Eckstein/jewish_history_1500.html

Lithuania over that period as shown in Figures 2 and 3. For the total population, the 1 percent growth rate is higher than the overall numbers we found for Germany-Austria and Poland-Lithuania prior to 1800. Yet, these figures are consistent with other estimates of average birth and death rates prior to the demographic transition from Germany and Sweden as reported in the main existing sources.³⁸ The most well-known case documented in Eckstein, Schultz, and Wolpin (1984, table 1) is that of pre-industrial Sweden from 1759 to 1869, where the average birth rate was 32.5 per 1000 inhabitants, the infant death rate was 189 per 1000 births, and the non-infant death rate was 19.7 per 1000 inhabitants. Consequently, the total death rate was 24.5 per 1000.

For pre-industrial (before 1870) Germany-Austria, Table 7 presents birth and death rates.³⁹ The figures for Germany are very close to those of Sweden prior to 1870. Hence, the figures we report earlier for Poland-Lithuania are within the statistical confidence intervals of the rates for Sweden and other regions.

[TABLE 7 HERE]

From Tables 6 and 7 we conclude that at the end of the 18th century, the average Jewish and non-Jewish population natural growth rates were 1.6 percent and 1 percent, respectively. The latter figure is somewhat higher than the Swedish rate of 0.8 percent but is nonetheless within the confidence interval.⁴⁰

Considering stage 3 of the demographic transition (the period 1870–1910), it is well-known that it was characterized by a decline in both birth and death rates, resulting in a substantial increase in population growth rates. This major demographic change occurred in parallel with the process of industrialization and increased urbanization and immigration both within Europe and from Europe to the Americas. For old Poland-Lithuania, we use the data available for Galicia and European Russia. Table 8 indicates that Jewish and total population's birth rates were somewhat higher than those shown in Table 6, whereas death rates were lower for both populations, thus generating higher natural population growth rates, particularly for the total population. Thus, during the period of early industrialization, eastern European locations had entered stage 3 of the demographic transition. Jews had a somewhat higher population growth rate than the total population, but the difference is small. This pattern is consistent with the one depicted in Figure 3 that does not consider Jewish migration from Poland-Lithuania to the West.

[TABLE 8 HERE]

For Germany-Austria, during stage 3 of the demographic transition the data in Table 8 shows lower birth and death rates for both the Jewish and the total populations. Thus, the rate of population growth in Prussia, Hesse, and Bohemia was about 0.7 percent for the Jewish population and 1.3 percent for the total population. The explanation for this divergent pattern lies in the fact that while the death rate among Jews was much lower than among non-Jews, the Jewish birth rate had declined significantly. This pattern is consistent with DellaPergola (1997)'s argument that in Germany, the demographic transition occurred earlier in the Jewish population than in the total population. Indeed, Table 8 shows that there was a significant drop in Jewish birth rates at the beginning of the 20th century in all three regions, which rapidly lowered Jewish population growth rate to less than 1 percent. In contrast, the total population experienced higher birth rates (close to 35 per 1000) whereas its death rates dropped, as one would expect in stage 2 of the demographic transition. As a result, total population growth rate remained higher than 1 percent.

During stage 4, which began around 1910, modern medicine became more available and industrialization reached its peak in eastern and central Europe following WWI. As Table 9 illustrates, for

³⁸ See the most recent graphs (including data for Germany after 1820) in https://ourworldindata.org/wp-content/uploads/2013/05/ourworldindata_demographic-transition-5-countries.png

³⁹ Vobecka (2013) reconstructed Jewish birth rates during 1793–1849 based on population growth rates and reported death rates. Based on his estimates, average Jewish birth and death rates are 32.99 and 23.48, respectively, giving a 0.95 natural Jewish population growth rate. For total population, Fialová, Pavlík and Vereš (1990) estimate average birth and death rates at 41 and 32.14 during 1800–1850, i.e. a 0.88 natural growth rate. The difference in the average natural increase is negligible, but the pattern of lower Jewish fertility and mortality rates is clear.

⁴⁰ The standard deviation of the net growth rate is about 7.4–7.6, which is suggestive of very large fluctuations in birth and death rates across time and locations.

Jews living in Poland one observes a decline in the birth rate to about 29 per 1000 and a decline in the death rate to about 14 per 1000. As a result, the rate of natural increase for Jews was about 1.4 percent --- almost equal to what it had been during the late 18th century. For both the total population and the Jews in Poland, the end of WWI marked the beginning of stage 4 of the demographic transition, during which birth rates declined less than death rates and the rate of natural increase reached 1.6 percent.

[TABLE 9 HERE]

With regards to Germany-Austria, Table 9 indicates that Jewish birth and death rates in Prussia were very close to those of both Jews and the total population during the modern period. However, Jewish birth rates were somewhat less than 15 per 1000 and deaths were somewhat more than 13 per 1000, such that Jewish population growth was slightly positive (0.13 percent). For the total population, the birth rate of 26 per 1000 was higher than the Jewish one, whereas death rates were similar. Hence, the rate of natural increase for non-Jews was above 1 percent. For Hessen and Bohemia, the shift was similar and the rate of natural increase for Jews became negative.

To sum up, the key observation regarding Jewish and non-Jewish birth and total death rates over this period is that in both Poland-Lithuania and Germany-Austria until WWI, Jewish birth rates were similar to those of the total population, but death rates were lower. Natural growth rates among Jews were higher and close to 1.5 percent on average until the Great Migration period of 1880. The fundamental question is then: what were the reasons for the lower Jewish death rates?

3.2 Infant and Child Mortality Rates

The view that lower infant mortality in the early modern and modern periods is the main explanation for the high rate of natural increase among the Jews of Poland-Lithuania is commonly accepted among historians and demographers.⁴¹ Baron (1976, vol. 16, pp. 203–204) estimated that infant and child mortality was much lower among the Jews than among the general population. This, in addition to lower adult mortality, led to an increase in the proportion of Jews in the population of Poland-Lithuania.

DellaPergola (1993, pp. 5–13) attributes the Jewish population increase that began in the late 18th century to early improvements in morbidity and mortality levels. According to the demographic transition model he proposes in his study, the Jews experienced the demographic transition earlier than the rest of the population---and this, in turn, resulted in lower child mortality. Derosas (2003, p. 11) prefaces his study of child mortality among Jews in Venice with the comment that Jews were known for lower mortality rates already in the late 18th century. He cites Toaldo (1787), who discovered that “only” one-fifth of Jewish newborns died in the first year of life. Also Schmeltz (1971), one of the leading scholars on this topic, relied on the explanation based on the demographic transition as the main driver for the reduction in Jewish mortality rates. The data he collected from both primary and secondary sources exhibits overwhelmingly lower Jewish infant and early child mortality rates.⁴²

The data we present here support the historians’ arguments and to the best of our knowledge, present the most up-to-date picture of infant mortality among Jews and non-Jews in eastern and central Europe in the early modern and modern periods. Again, we analyze the data according to the four stages of the demographic transition outlined above. We aggregate the data for Poland-Lithuania and Germany-Austria in view of the similarity between the two regions and the lack of extensive data on each location separately. This enables us to calculate the impact of lower infant mortality among Jews on their rate of natural population growth rate prior to and during the 19th century.

Civil registers recording births, marriages, and deaths were not common in most European countries prior to the 19th century. However, some demographic data is available from registers maintained by religious institutions. It has been estimated that in early modern western Europe, as many as a quarter of all babies died within the first year and another quarter before they reached adulthood. According to Zemon-Davis (1995, p. 12, 225 ft.23), between one-third and one-half of children born in Europe in the 17th century did not reach the age of 10. In early modern England, infant mortality rate was around 150-200 per 1000 live

⁴¹ See Hundert (2004, p. 24) for a review of the relevant literature.

⁴² Schmeltz (1971, pp. 13–14; 15–25, table 1; pp. 28–33, table 3).

births (Wear 1995, p. 215). In London, deaths exceeded births and its population would have decreased if not for migration from the countryside. In 1764, 49 percent of all recorded live births in London ended in death by the age of two and 65 percent by the age of five (Matthews-Grieco 1991, p. 39). As for continental Europe, France before 1750 had over 200 infant deaths per 1000, Denmark in the period 1645–1699 206 per 1000, and Geneva in the period 1580–1739 296 per 1000 (Lawrence 1995, p. 216). According to Wyczański (1991, p. 24), in Europe, 20–30 percent of the babies died in the first year of their lives, 75 percent reached the age of 15, and only 50 percent reached adulthood. Of course, the death rate varied across regions and over time. In general, the urban population was at higher risk than the rural population.

In comparison to western Europe, there are even fewer sources of data available on infant mortality in early modern Poland-Lithuania. According to the examined death registers and graves, most of deaths involved children in the age group defined as infants (under the age of one). Infant mortality was clearly very high, and the figures are likely to be even higher since many of the deaths among children, especially newborns, were not recorded. The typical Polish family in the early modern period had 4 to 5 children. An average married couple had 9 live births, but only 4 children reached adulthood. According to Tyszkiewicz (1981, 1983), more boys were born (105 boys for 100 girls), but more boys died in their infancy. Families with many children were more common in the countryside, especially among country gentry and well-off peasants. In urban areas the average family had 2 to 3 children. In the early modern period, the conditions in the Polish countryside deteriorated and child mortality rates increased. Although more children were born, fewer survived. During the 16th to 18th centuries, the average Polish family dwelling in a noble estate had 3.6 to 4.2 children. The earliest census that provides reliable data on infant mortality in early modern Poland was carried out in 1777. According to the census data and other available data for this period, it is estimated that infant mortality in Poland during the 17th and 18th centuries was about 350 per 1000. Child mortality up to the age of 15 was 550, and up to adulthood was 650 per 1000.⁴³

Unfortunately, there is little data on infant and child mortality prior to the 19th century that can facilitate a comparison between Jews and non-Jews for the entire Poland-Lithuania area. One of the best sources of data is for the province of Posen, which was part of the Polish-Lithuanian Commonwealth until the partitions. In 1793, Posen came under the control of Prussia and its birth and death rates continued at levels that resemble those which we maintain are characteristic of stages 1 and 2 of the demographic transition. Looking at the data for the province of Posen between 1819 and 1863, Table 10 presents some striking findings: Jewish infant and child mortality per 1000 live births was much lower than that of the total population. In fact, it was 27 percent lower for infants up to the age of one and 20 percent lower for children aged one to five. Jewish child mortality was significantly lower for all ages and, on average, from birth to 5 years old it was 23 percent lower.

[TABLE 10 HERE]

Similarly striking, for the province of Posen and for other areas prior to 1870, Table 11 shows infant mortality rates of 150 and 223 per 1000 births for the Jewish and the total populations, respectively. Therefore, according to this data Jewish infant mortality prior to 1870 was lower by about 73 per 1000 live births---that is, 33 percent lower---than the mortality in the total population. If we take the commonly held view that prior to the demographic transition, the live birth rate was about 35 per 1000 (see Table 6), then the lower infant (age 0 to 1) death rate is equivalent to saying that the birth rate was higher by 7.3 percent, or an additional 2.5 births per 1000.

[TABLE 11 HERE]

In other words, the lower Jewish infant death rate would account for half of the difference in the natural population growth rate between the Jews and the total population. If we take the survival rate to age 5 from Table 11, we obtain a number of surviving children higher by 9 percent, which accounts for 70 percent

⁴³ Data for this entire paragraph comes from Furtak (1937, p. 43), Koczerska (1975, p. 122), Gieyszterowa (1979, p. 169), Tyszkiewicz (1981, pp. 189–190; 1983, p. 172), Bartnicka (1992, p. 41), and Salmon-Mack (2012, p. 93). For more information on sources, see Żołędź-Strzelczyk (2010).

of the higher rate of Jewish natural population growth that we estimate to be prior to 1870 at about 0.45 percent (see Table 6).

Interestingly, lower infant mortality among Jews is traceable also in a single city with extant data, such as Torun in the 19th century (Zielińska 2012). There, the rate of infants among all Jewish deaths was 19.1–28 percent until the 1880s. Per 1000 live births, Jewish child mortality rate was between 48.8 to 126.8 in the period between 1871 and 1914. Among different Catholic parishes the average was around 113 infant deaths per 1000 live births between 1790 and 1800, rose to 290–330 deaths per 1000 live births in the period of urban development between 1861 and 1870, and decreased to 144–192 in different parishes in the first decades of the 20th century.

As for stages 3 and 4 of the demographic transition, Tables 12 and 13 show that Jewish infant mortality rates were again significantly lower than for non-Jews and the percentage difference was even higher than in the earlier periods. In eastern European regions prior to 1920, the rates are similar to those of stage 1 of the demographic transition. It is also worth noting that infant death rates decrease earlier in Germany-Austria than in other regions.

[TABLE 12 HERE]

[TABLE 13 HERE]

More recently, Condran and Kramarow (1991) and Condran and Preston (1994) have presented the most up-to-date demographic analysis of child mortality among Jews in comparison to the total population up to 1920, when modern medical services became widely available. Condran and Kramarow's main contribution is their analysis of the 1910 U.S. census, which sheds light on the massive wave of immigration to the United States in the late 19th and early 20th centuries and provides individual and household-level information on the respondents. They define ethnic group using census information on mother tongue or place of birth, or a combination of the two.⁴⁴ Their goal was to identify the covariate of child mortality and behavior of Jewish households relative to other ethnic groups. They focused on the cities with the largest Jewish populations: New York, Chicago, and Philadelphia. The data indicate that the rate of child mortality among Jewish immigrants was higher than that of native-born whites but *lower* than that of other immigrants, such as Italians and Poles.

The dependent variable in their regression is an index of child mortality developed by Trussell and Preston (1982), whereas the covariates are several independent variables that are meant to capture the main hypotheses suggested by demographers to explain infant mortality. The control variables include the following: ethnic group dummies, length of residence, naturalization, ability to speak English, husband's occupation, home ownership, husband's employment, mother's literacy and labor force status, and overall fertility. Although most of the covariates have the right sign and many are significant, the multivariate regression analysis is unable to eliminate the Jewish mortality advantage. That is, the dummies for Jews and Jewish East Europeans have large and significant negative coefficients of -0.35 and -0.27, respectively (native-born white is the default group). Thus, their results indicate that Jews had 27–35 percent lower child mortality conditional on behavioral variables and other indicators. In addition, it should be emphasized that only for Jews does the infant mortality decrease with number of years since immigration. Furthermore, for all ethnic groups the fact that the mother works increases infant mortality, yet for Jews it had no significant impact. Finally, Condran and Kramarow (1991, pp. 251-253) claim that “the data do not support the notion that scientific medicine was an important determinant of low Jewish mortality. The explanation for their low mortality rate in the early twentieth century should reflect the fact that the Jews had mortality advantages in Europe well before the turn of the century and in Eastern Europe at mid-nineteenth century that were certainly unrelated to medical advances or their earlier adoption by Jews.”

Subsequently, Condran and Preston (1994) study the behavioral aspects of infant and child mortality. To this end, they compare the data on French-Canadians and Jews using the data from the 1910–1917 census. The rates of infant mortality were found to be 173.3 per 1000 for French-Canadians and 53.5 per

⁴⁴ Their sample includes all Jewish immigrants who reported Yiddish as their mother tongue. Poles, like Jews, were identified exclusively by their mother tongue. Italians, in contrast, were those born in Italy and whose mother tongue was Italian while the Irish were identified as those born in Ireland, regardless of their mother tongue.

1000 for Jews.⁴⁵ The most striking evidence they found was the difference in the prevalence of breastfeeding and whether mothers stayed at home before and after birth.

Quite strikingly, the data we presented in this section on Jewish infant and child mortality rates in eastern and central Europe in the early modern and modern periods are similar to the ones presented by Condran and Kramarow, as well as to some data for the United States and Europe, and in particular New York, Amsterdam, London, Rome, and Florence prior to 1910.⁴⁶ According to their results, Jews in all locations had infant mortality rates that were lower by between 20 and 60 percent---similarly to what we presented in Tables 9, 10, 11, 12, and 13 for Germany-Austria and Poland-Lithuania during the early modern and modern periods. During the period 1885–1889, infant death rate per 1000 in the United States was 81 for Jews and 167 for the general population. These figures are similar to those for Frankfurt (Appendix A).

These findings beg the question of ~~which were~~ the underlying driving forces behind this significant differential between Jewish and non-Jewish infant and child mortality rates in the early modern and modern periods. Was it “nature” (that is, genetic factors) or “nurture” (that is, cultural values, religious norms, and social customs)?

4. Child Care Among Jews and Non-Jews in Historical Perspective

The comparatively lower infant mortality rate among Jews documented above has received much attention among demographers and historians (e.g., Schmeltz 1971, p. 37; Hundert 1986, p. 19; and Zielińska 2012, p. 217). They maintained that childcare practices and other factors that influenced the environment in which Jewish infants and young children were born and raised, accounted for the lower Jewish infant and child mortality rates. According to Condran and Preston (1994, pp. 176–178), the studies of the Jewish and non-Jewish populations in the United States during the period 1900–1930 indicate that three main factors likely determined lower infant and child mortality rates among Jews: (i) a higher level of parental devotion manifesting itself in mothers staying at home rather than working, continuous breastfeeding for longer duration, low rates of desertion by fathers, and smaller percentage of single mothers; (ii) a higher level of food hygiene due to the practice of frequent hand-washing and cleaner food at the table; and (iii) higher access and acceptance of medical knowledge.

These comparatively lower rates raise numerous questions. The most important one pertains to the historical roots of the unique behavior patterns among Jewish immigrants in the US prior to the accumulation of medical knowledge in the late 19th century and the first half of the 20th century. In particular, we will focus on the practice of breastfeeding since among historical demographers there is consensus that breastfeeding is a key factor in determining infant mortality (Quandt 1995, p. 131; Løkke 2002, p. 128). Our main hypothesis is that social and cultural norms that were shaped by religion were pivotal in influencing the way Jews and non-Jews took care of their infants and children. Hence, we examine the main religious norms and known practices related to, and indicating the importance of, early childcare among Jews from the biblical and Talmudic periods to early modern and modern times. While avoiding generalizations and distinguishing between descriptive and prescriptive sources, we use various available sources to discuss childcare rules and practices related to childbirth, postnatal care, breastfeeding, contraception, marriage and remarriage.

4.1 Child Care Norms in Biblical and Talmudic Sources

The ideal of fulfilling a child’s basic physical, emotional, spiritual, social, and intellectual needs is deeply rooted in Judaism. This is evident already from the biblical references to the importance of childrearing, motherly love, and a father's responsibility. The Bible imposed a commandment to procreate on men and suggested that the fruitfulness of a family is proof of God’s blessing. It prescribed special care for a newborn, and emphasized the importance of breastfeeding and its priority over all other domestic duties of a woman. Following the theological concept that all God’s creations had purpose, the Bible related to the female breast as having been created for breastfeeding. It viewed milk-producing breasts as a blessing and

⁴⁵ Condran and Preston (1994, p. 175, table 8.1).

⁴⁶ Condran and Kramarow (1991, pp. 225–227, table 1).

dry breast (and a miscarrying womb) as the greatest curse. Consequently, if a woman could not nurse her baby, the Bible allowed for the employment of a wet nurse to fulfill the infant's nutritional needs and prescribed to treat her with respect.⁴⁷

During the first five centuries of the first millennium, the Talmudic literature followed in the footsteps of the biblical approach. It praised procreation and discussed a child's needs, legal status, rights, and health. It stated that a man who did not marry and had no children was committing a sin of omission and could be considered dead.⁴⁸ The Talmudic tradition of 'the sanctity of life' led to a closer watch over children, whereas its emphasis on father's duty to educate his son created a greater awareness of the parent-child relationship (Ta-Shma 1991, pp. 265–266).

Although the specific term "child welfare" was probably not used until the time of the Geonim in the last two centuries of the first millennium, the idea itself seems present in the Talmudic rulings regarding children.⁴⁹ For example, the Talmud allows a desecration of Sabbath if the care of a newborn or a nursing lying-in mother demands it. Furthermore, Talmudic discussions of childcare, divorce, breastfeeding, remarriage, education, or child custody suggest a notion that child's welfare was above the interests of the father and mother (Shochatman 1977, p. 290).

While elaborating on the mandatory care to be provided to infants (e.g., Shabbat 147b), the Talmud lists three major principles in nurturing their development, as reflected in the advice given by a nanny of Abaye (one of the Amoraim sages during the fourth century):

The care and development of the infant requires first that he be bathed and anointed with oil, later, when he grows older, that he be given eggs and dairy products; and when he grows older still, that he be given the freedom to play with toys (Mishnah Yoma 78).

That is, personal hygiene, proper nutrition, and developmental play were set at the core of infant and child care among Jews since early times.

Following the Bible, the Jewish sages and rabbis whose debates and rulings produced the Jewish law code (*halacha*), also elaborated about breastfeeding and emphasized its importance as the best possible source of nourishment in infancy. To ensure mother's commitment, the Mishna granted the nursing mother some special privileges, and made breastfeeding one of a woman's duties to her husband. The Talmud expressed the most positive attitude towards breastfeeding and stated that it was natural for a woman to nurse her child (Eidelman 2006, p. 39). It discussed the qualities of breast milk, patterns of breastfeeding, and the status of the breastfeeding mother. For example, the Babylonian Talmud ruled that the work obligations of the nursing mother should be reduced to preserve the quantity and quality of milk, and stated that mother's diet should not include foods that might affect her milk. The Jerusalem Talmud prescribed that a baby must nurse every hour of the day, and at night it should nurse from the breast of his/her mother until the morning. Furthermore, the Tosefta prescribed that the nursing woman should not be allowed to do other jobs, to get engaged or to get married, since the baby has a right to nurse all day.⁵⁰

One of the most discussed aspects of breastfeeding during the Talmudic period was the period of nursing. While Rabbi Joshua spoke about a long duration, even up to five years, and Hillel's disciples ruled for 18 months, the Talmud in general prescribed that a baby should nurse for 24 months. Although the sages acknowledged that a completely healthy child could be weaned before, they stated that weaning children before they reached two years might cause a risk to their health.⁵¹

⁴⁷ The biblical passages prescribing such norms are: Deut. 11:18; Proverbs 1:8; Genesis 49:25, 1:28, 9:7, 49–22; Ezekiel 16:4; Numbers 11:12; Samuel 1: 12–17, 21–23; Hosea 9–14; Exodus 2: 7,9; Psalms 127:3. All quotes from the Bible are taken from the King James Version. See also Feldman (1917, p. 180).

⁴⁸ Talmudic saying based on the lament of barren Rachel in Genesis 30:1. See Schenker (2011, p. 343). According to Beit Shamai, a man was obligated to have a minimum of two sons. Beit Hillel ruled that the minimum was one son and one daughter. Mishnah Yevamot 6,6.

⁴⁹ Mature newborn: one with fully developed nails and hair. Mishnah Yevamot 80b; Sabbath 129a, 129b.

⁵⁰ See Preuss (1993, p. 405). The relevant passages are: Kethuboth 60b, JT Berachot 3a, 9, 14d, Kethuboth 5:5, 9, and Nidah 2, 4; Sotah 4:3.

⁵¹ BT Kethuboth 60a, 60b; JT Niddah 1, 49b; Berachoth 10a, Yomah 75a, Yevamot 75a. R. Eliezer R. Joshua said: [He might be breast fed] even for four or five years. If however, he ceased after the twenty-four months and started again he

Child's best interest was also the driving force behind halachic rulings ensuring the provision of breast milk for every baby. The school of Hillel ruled that if the mother refused to nurse the infant, she could be forced to do so, and a husband could compel his wife to nurse the baby. Moreover, it recommended that if a woman was ill, had died, or her status prevented her from nursing, then a wet nurse was to be hired. The nurse herself must be given abundant food and could not nurse more than one child. Rulings in the Tosefta permitted heathen wet nurses to be employed. It was customary to give the child to a wet-nurse in the parents' own house, and the Mishna further required that a heathen wet-nurse would nurse the baby in the domain of the baby's father to minimize the risk that the baby could be hurt.⁵²

Childcare---understood as the provision of best nutrition and care---played a central role also in the halachic rulings concerning procreation and contraception. In general, Jewish religious laws expressed the idea that nursing and caring for a baby was more important than the commandment to procreate for men and a new pregnancy. Breastfeeding, including the provision of breast milk and care for its quality and quantity, was so important that it became one of the three cases in which the use of mechanical prevention of pregnancy was permitted:⁵³

Three [categories of] women may use an absorbent in their marital intercourse. A minor, a pregnant woman and a nursing woman. [...] A pregnant woman because [otherwise] she might cause her fetus to degenerate into a sandal. A nursing woman, because [otherwise] she might have to wean her child prematurely and this would result in his death (Yevamot 12b).

The rabbis understood that while a new pregnancy would reduce the quality and quantity of the mother's milk, it could cause premature weaning and thus endanger the baby. They were probably aware of the fact that lactation only reduced the possibility of a new pregnancy (especially during the first three months), but did not eliminate it, and hence allowed mechanical contraception during lactation to preserve the mother's ability to nurse. Although it was not stated explicitly, by fostering a prolonged period of breastfeeding and supporting it with contraception, the rabbis had created a mechanism of spacing between children and thus contributed to each child's welfare. Nowadays, medical knowledge recognizes that there is a connection between long birth intervals and low infant mortality.⁵⁴

Child's best interest seems fundamental also in halachic rulings regarding remarriage. The halacha feared that a newly married woman would devote more attention to the new husband than to the baby, thus causing harm to his or her development. The rabbis also worried that the stepfather might not provide for the sustenance of the child. Hence, the halacha prohibited a nursing mother from remarrying until the baby reached the age of 18 or 24 months. This prohibition was also relevant in the case of pregnant or nursing widows.⁵⁵

Similarly, child's welfare was crucial in halachic laws regarding a replacement of breastfeeding mother or wet nurse. The argument was that an infant who was already used to breastfeeding from the mother ("knows her"), should not be given to a wet nurse because of "the danger to the baby." It is not clearly stated whether the danger was due to the change of milk, the risk that the baby might refuse to suck from a woman he or she was not used to, or the separation from the mother and her care. The age when infants could recognize their mothers by smell and taste and might refuse to be nursed by other women was

is to be regarded as sucking an abominable thing (unkosher insect). A breastfeeding period of three years is mentioned in the book of Maccabees. See Second Maccabees 7:27.

⁵² See Feldman (1917, p. 178) and Preuss (1993, p. 408). The relevant passages are: Kethuboth 59b, 60b, Yevamot 42a, b; Tosefta, Niddah 2:4, 5. Orphan babies were often nursed by neighborhood women in turn or were fed with milk and eggs, which were considered the second-best source of nutrition for infants.

⁵³ "Absorbent" translates the Jewish word *Moch*---a female barrier contraceptive device, usually made of hackled wool or flax. Although breastfeeding was known to have a contraceptive effect, the risk of pregnancy was recognized.

⁵⁴ See Lithell (1981) on the connection between a long birth interval and low infant mortality. Modern research into the causes of the rapid decline in infant mortality in England and Wales during the period 1861–1921 showed that the decline in fertility increased intervals between successive births, which in turn helped to reduce infant mortality (see, for example, Woods, Watterson, and Woodward (1989)). With regards to parental responsibility, see, for example, Kidushim 30b and Dorff (2012, p. 33).

⁵⁵ See also Zimmerman (1999, p. 54).

set at fifty days after birth. Furthermore, the idea of remaining with one wet-nurse was reinforced by the ruling that if a baby was nursed by another woman, then he/she cannot be given back to the mother, and by forcing a divorcee to continue nursing if the baby already “knows her.”⁵⁶

In addition to ruling on early childcare, the scholars and rabbis of the Talmud also acknowledged that childhood was a distinct and dynamic phase in human life. Parents or the community were considered responsible not only to provide children with food, clothing, and protection, but also with education suitable to their age and cognitive development (Botticini and Eckstein 2005, 2012).⁵⁷

To sum up, in many laws resulting from the debates and rulings in the Talmud, children’s welfare seemed more important than the mother’s. Moreover, in addition to ruling on children’s nutrition, the halacha had also provisions to ensure the child’s emotional and cognitive development in different stages of childhood. Finally, children’s education was considered of paramount importance to nurture and transmit values according to which Jewish children were expected to live and to grow into adulthood.⁵⁸

4.2 Child Care Norms and Practices during the Middle Ages

In general, Jewish scholars and rabbis in the Middle Ages continued to elaborate on the approaches to childcare as prescribed in the Bible and the Talmudic literature. On the one hand, the commandment to procreate was regarded as a central religious obligation of a man, and one was considered pious if had children. On the other hand, the birth of a child and childcare were seen as essential to a woman’s life. The sources reveal that although men were not present during the actual act of delivery and they related to the issues of pregnancy and labor indirectly in discussions of various *halakhot*, they did know a lot about pregnancy and the process of childbirth. In their remarks regarding early childcare, the concern for the infant remained a central issue.⁵⁹

Among the Jewish communities living in western and central Europe during the Middle Ages, pregnancy was generally viewed as a dangerous period. Thus, a pregnant woman was expected to undergo a number of checks by a midwife, and to care for the fetus’ needs already after she felt first movements in her womb. Facilitating the birth of a child justified the desecration of Sabbath. Immediately after the birth, the umbilical cord was ligatured and cut, and the baby was bathed, rubbed with salt, and wrapped in swaddling clothes. A mother and her baby were usually taken care of by other women during the first few days after labor. The birth of a child was an important family and communal event. The birth of a boy was celebrated during the ceremony of circumcision which due to its importance was carried out in a specially-prepared synagogue.^{60, 61}

As for breastfeeding, medieval Jewish scholars maintained that breast milk remained crucial to a child’s survival. They also accepted the halachic ruling of 24 months as the minimal period of breastfeeding, and it seems that this ruling was observed at least when mothers nursed their own children. In some unusual cases, children were nursed for even longer, until the age of four or five, and some were weaned early and given food prepared especially for them. The 24-month rule was prescribed for both boys and girls, although in practice there might have been differences. Furthermore, a special care for a nursing mother was extended during the twelfth century by one of the most famous scholars in Judaism, rabbi Moshe ben Maimon (Rambam), who ruled that: “As long as a woman is nursing a child, her husband must add wine and other things to her maintenance that are beneficial for her milk.”⁶²

⁵⁶ The relevant passages are: Yevamot 42a, b, Kethuboth 59b, 60a; Tosefta, Niddah 2, 4, Kethuboth 5:5. See Shochetman (1977, p. 291).

⁵⁷ Shabbat 152, 119; Kethuboth 49; Sukkah 42; Shabbat 121. See Ariès (1962) and Kraemer (1989, pp. 70–71).

⁵⁸ Sukkah 42; Shabbat 121.

⁵⁹ Baumgarten (2005, pp. 42–52, 69, 73).

⁶⁰ Not much is known about the profession of midwife or their training in those days. A midwife, also called ‘a wise woman’, was the most important assistant during the pregnancy and labor. They did not have formal training. From the descriptions regarding midwives, the profession seemed to be important and respected. In medieval Jewish Europe, employing Christian nurses as midwives was a common practice (Baumgarten 2013, p. 120).

⁶¹ Rashi, Genesis 49, 25; Levin (1987, pp. 3–38); Baumgarten (1999, p. 67; 2005, p. 85, p. 86 fn. 227, pp. 97, 98, 156); Feldman (1917, p. 176); Sabbath 66b, Rashi; Many books have been written describing the ritual (Baumgarten 2005, pp. 97–98).

⁶² Baumgarten (2007, p. 128; 2013, p. 126); Rambam, Ishus 21:11. In Christian society, girls were probably weaned six

Rabbis in the Middle Ages continued the Talmudic policy regarding the hiring of wet nurses. They ruled that a wet nurse should be brought to a mother's home, and despite some exceptions this was the prevailing practice. One of the major disagreements among Jewish scholars regarded the employment of a non-Jewish wet nurse. Their rulings varied, probably depending on time and place, but the majority emphasized the need to supervise Christian wet-nurses to ensure the physical and emotional wellbeing of the baby and limit his or her exposure to non-kosher diet or gentile traditions. Despite medieval sources frequently mention wet nurses and provide a lot of details regarding the terms of their employment, it is not possible to assess to what extent medieval Jewish families hired non-Jewish wet nurses.⁶³

When discussing wet nursing, Jewish scholars expressed deep concern for the baby's health and welfare and applied the Talmudic view that a change of a milk source might endanger a baby and thus parents should avoid changing wet nurses. Consequently, the prevailing practice was that if a wet nurse was hired, her contract was for a prolonged period during which she had to avoid pregnancy. An unmarried wet nurse had to swear that she would not marry and a married wet nurse had to swear that she would not get pregnant. Again, wet nurses were allowed to breastfeed only one baby at a time.⁶⁴

The problem arising from a new pregnancy and the changes of a milk source was relevant also in the discussions of contraception. While Jewish scholars usually dismissed the possibility of abstention during the breastfeeding period, some argued that nursing women must use some form of contraception to prevent an additional pregnancy to protect the life of the infant. One of the towering scholars in medieval Europe, Rabbenu Tam (twelfth century), stated that "a nursing woman must use some form of contraception, to ensure the life of her living child, who was dependent on her for his/her nourishment." Consequently, contraception was allowed within the frame of a family, but it is not possible to assess how widespread was this practice. When used, it helped to establish a birth interval, which in turn likely reduced the rate of infant mortality.⁶⁵

In medieval Ashkenaz, many of Jewish early childcare practices were quite similar to those of the local Christian population. For example, breastfeeding was part of Christian norms and the period of nursing was similar in Jewish and Christian families. Moreover, the Catholic Church exempted nursing women from fasting on Lent probably to secure their lactation abilities and to protect the infant. Still, it seems that Jewish scholars discussed early childcare more frequently and minutely than contemporary Christian laws, which mentioned breastfeeding mostly when discussing its contraceptive effects leading to disapproval of non-procreative sexual intercourse with a nursing woman.⁶⁶ As in Jewish early childcare, Christian norms described a new pregnancy as 'corrupting and poisonous' to breast milk and thus dangerous to the breastfeeding infant. Yet, in contrast to the contraceptive measures allowed by Jewish rabbis, the Church generally recommended sexual abstinence or placing the child with a wet nurse, so that the husband would not seek out another woman. Of course, in practice, beside common employment of wet-nurses, Christian women and men did use various contraceptive methods.⁶⁷

Church legal codes mentioned the care of pregnant mothers differently than it was in the Jewish sources. For example, the idea of reducing a pregnant woman's workload was not codified. Today it is known that pregnant women from peasant families, who continue with a heavy work load, are at risk of giving birth to an underweight baby, who has a low chance of survival during the first month. In fact, a low birth weight resulting from the mother's malnutrition or heavy work during pregnancy (especially in the field during the summer) was an important factor in high infant mortality rates.⁶⁸

In his famous book published in 1962, *Centuries of Childhood*, Ariès maintained that during the Middle Ages childhood was not recognized as a distinct phase in human life. Only with the development of

months earlier than boys (Matthews Grieco 1991, pp. 45–47). Sages' rulings may suggest that (i) either it was important to keep to the 24-month period or (ii) that the sages were trying to eliminate the practice of favoring boys.

⁶³ Baumgarten (2007, pp. 133, 139–142); Preuss (1993, p. 408); Goldin (2004, p. 29–30).

⁶⁴ For examples from medieval responsa see Baumgarten (2007, pp. 129–130).

⁶⁵ Baumgarten (2007, pp. 145, 147). See the discussion above on contraception in biblical and Talmudic sources.

⁶⁶ Salmon-Mack (2012, p. 191), Benedictow (1989, p. 246), Brundage (1988, p. 182). The contraceptive powers of lactation were not fully understood. For example, it was not known that frequent breastfeeding is necessary to prolong the contraceptive effect of breastfeeding (Lunn et al. 1980; Konner and Worthman 1980).

⁶⁷ Brundage (1988, pp. 182, 18), Wiesner, (2000, p. 85). Jacquart and Thomasset (1988, p. 72); Crawford (1981, p. 52). Lee (1995–1996, p. 47).

⁶⁸ Lithell (1981, p. 184).

the modern concept of a family emphasizing parental love, childhood emerged as a distinct phase in human life. Also, according to Ariès, the medieval civilization in Europe had no idea of education, and parents facing high infant and child mortality rates tended to view their surviving offspring as little adults. Only with the decrease in child's mortality in the 19th century, the affection and interest in children increased, and standardized schooling fostered the production of childhood culture. Subsequently, scholars have criticized some of Ariès' most famous arguments and have shown that, in contrast to his view, there was a concept of childhood in the Middle Ages. While some scholars have shown that the concept of childhood was different from the modern one, other scholars have pointed at some similarities in medieval and contemporary parental treatment of their children. In comparison with Jewish sources, in medieval Christian Europe there was special treatment for children, especially in infant stage, but it was not as structured and child-oriented as in Jewish laws and practice, which promoted the well-being of a child and valued childhood for its own sake.⁶⁹

4.3 Child Care Norms and Practices during the Early Modern Period

Information on norms regulating childcare and breastfeeding in the early modern Jewish communities of central and eastern Europe comes from halachic books, such as the legal code *Shulchan Aruch* and Moses Isserles' gloss to this legal code known as the *Mappah*, as well as from *responsa* and *sifrei musar*. In the discussions regarding marriage patterns, breastfeeding, mother's privileges or divorce, those sources generally continued the Biblical and Talmudic rulings and practices concerning childcare while accommodating them to the eastern European social and economic environment.⁷⁰

In its discussion of remarriage, the legal code *Shulchan Aruch* followed the halachic law known as *meyaneket chavero* and ruled that a widow cannot remarry within 24 months from the birth of her child even if she gave the child to a wet nurse (and even if the wet nurse committed to a period of two years) or weaned it earlier. However, while recognizing that a child brought up in a two-parent household has a better life outcome than one brought up by a widow, it suggested some ways to help women to remarry.⁷¹

The same legal code also continued to advocate breastfeeding as the best source of nutrition. It ruled that 24 months is the minimum period of breastfeeding, whereas five years is the maximum. Furthermore, it reaffirmed the Talmudic principle called "knowing her" according to which a child of nursing age who "knows his or her mother" is not to be given to another woman, since the trauma of separation might harm the child. Additionally, it adhered to the rulings of the Talmudic literature and to Rambam's aforementioned ruling, and advocated special care for nursing mothers as a source of breast milk. Also, when discussing divorce, the *Shulchan Aruch* emphasized the child's best interest:⁷²

A divorcee is not provided food, even if she is breastfeeding her child, but he gives her, in addition to her hire, things that the child will need, [such as] clothes and food and drinks and ointment and things like that, but a pregnant [divorcee] gets nothing.

How did Jewish and non-Jewish norms and practices compare in the early modern period when it comes to infant and child care? We compare them in light of modern medical knowledge. We consider five factors that we maintain contributed to the relatively lower infant and child mortality rates among Jews: (i) postnatal isolation and "in-home" wet nurse, (ii) remaining with one source of breast milk, (iii) first feeding, (iv) weaning, and (v) family support (*kest*) and some marriage patterns.

⁶⁹ Ariès (1962, especially p. 411), Wilson (1980), Cunningham (1995), Orme (1995; 2001, especially p. 274), Kanarfogel (1985); Ta-Shma (1991), Goldin (1989, 2004).

⁷⁰ Yosef Karo's *Shulchan Aruch* was first published in 1563 and printed in Venice in 1565. The majority of its editions include the *Mappah*, and the term *Shulchan Aruch* has come to denote the compilation of both texts, with Karo usually referred to as the *mechaber* ("author") and Isserles as the *Rema*.

⁷¹ A widow or a divorcee must wait 90 days before she remarries so that she makes sure she is not pregnant. (*Shulchan Aruch*, Even Ha-Ezer, 13). Regarding a man, *Shulchan Aruch* advised that one should remarry to continue to procreate and ensure the survival of at least one son and one daughter (*Shulchan Aruch*, *Hilkhot Pirya Urviya* 1:5). Regarding the ways to help widows remarry see *Shulchan Aruch*, Even HaEzer 13.

⁷² For the discussion in this paragraph and the quotes below see *Shulchan Aruch*, Even HaEzer 143:8; 82:5; 80:11; 80:12. *Shulchan Aruch*, Yore Deah 81:7. For a discussion of the duration of breastfeeding, see also Steinberg (2003).

(i) *Postnatal Isolation and In-Home Wet Nurses*

Modern medical science shows that non-exposure to an unfamiliar environment preserves infant's immunity and contributes to his or her healthy development. For the first weeks after birth, newborns are protected by antibodies they received through placenta (IgG). Those antibodies are conditioned by the environment the mother lives in and are responsive only to the microorganisms to which she has been exposed.⁷³ Thus, the trans-placental immunity protects the baby from familiar germs, especially some viral infections, but it is not sufficient to fight unknown germs to which the baby is exposed with a change of environment.

Consequently, in addition to other side effects, moving babies from their mothers' environment, for example to a wet nurse's house, may endanger them with infections en route and by exposing them to new surroundings.⁷⁴ Although it is impossible to estimate how many infants died due to their immune systems being attacked by a change in the environment in which they lived and how many died simply of negligence, based on current medical knowledge one can speculate that a community which observed postnatal isolation and preferred to employ "in-home" wet nurses had a lower rate of infant mortality than a society used to send their babies to a new environment right after birth.

Jews. In Jewish society in Poland-Lithuania, the described-above halachic positive approach to breastfeeding was generally accepted, whereas giving birth and childcare remained the central elements of a woman's life and her primary religious purpose. During the vulnerable postnatal period, the new mother and the newborn were usually well taken care of, and when possible, they stayed home for four weeks until the ceremony of Shabbat Yeziat ha-Yoledet. However, when a mother died, when she could not or refused to breastfeed herself, or sometimes when the mother was a widow and wanted to remarry or had to plan in advance her next pregnancy, a wet nurse was hired. Since finding a Jewish wet nurse was rather difficult, the legal code Shulchan Aruch allowed the baby to be breastfed by a gentile woman, but simultaneously added a strict rule to bring a wet nurse to the mother's home for supervision. Consequently, the Jews preferred to employ in-home wet nurses and tried to avoid sending their babies to a wet nurse's house, which was a more common practice among Christians.⁷⁵

Although there are no statistical data on gentile wet nurses employed in Jewish houses in Poland-Lithuania, the fact that the practice prompted a harsh opposition from both the Catholic Church and the Polish authorities, suggests that it was quite common. This practice continued despite the Church's repetitive attempts to impose fines on Jews hiring Christian wet nurses, indicating that Jewish parents considered wet nursing an important way of securing the best nutrition for their infants. Furthermore, the recognition of the Jewish authorities for the practice in face of the laws and prohibitions issued by the Polish Parliament and the king, suggests that the practice was viewed as necessary to continue. Hence, in the light of modern medicine, it seems that the halachic rule and the consequent practice not only protected babies from

⁷³ Matthews-Grieco (1991, p. 43). See also Chandra (1978).

⁷⁴ A study of 15th-century Florence showed that the mortality of children sent out to nurse by their families hovered around 17.9%. Matthews-Grieco (1991, p. 42).

⁷⁵ For example, the popular behavior manual *Brantspiegel* (1596, chapter 35), promoted a positive image of a woman who prays to become a mother and to breastfeed, and stated that a woman who gives birth, nurses her babies and provides for all their needs follows the way of the Creator and deserves of eternal life. See also Chovav (2009, p.154, 164); Fisher (2005, pp. 199–212). During this time, the mother was usually visited by other women from her family or neighborhood, who often brought her presents, helped with household chores and ate with her. Even if a woman got up from bed earlier, she and the baby were usually waited upon by other women during the first few days after labor (Baumgarten 2005, pp. 86, 156). The postnatal rituals and isolation period are known from the late medieval German communities, but they were attested in early modern Polish sources as well (Baumgarten 2007, p. 105; 2008); Chovav 2009, p. 171). The mother was absent during the ceremony of circumcision (Chovav, 2009, pp. 176–177). In Christian society, the attitude towards remarriage was rather ambivalent, and hiring a wet nurse was not related to the subject. Moreover, according to Wiesner (2000, p. 91), the law in the early modern period might also make remarriage of a widow less attractive by stipulating that a widow could lose all rights over her children through remarriage, including the right to see them. Jewish women were permitted to nurse only their own baby on Sabbath (Kalik 2010). According to Baumgarten (2005, p. 184), also in medieval times Jewish mothers did not send their babies to a wet nurse's home so as to be able to supervise the nursing.

negligence but incidentally also reduced the exposure of the infant to pathogens en route and to germs of a new environment. Thus, it might have contributed along other factors to comparatively lower infant mortality rates among Jews in Poland-Lithuania.⁷⁶

Christians. In early modern Christian Europe, a mother who could produce her own milk, was expected to breastfeed. However, while lactation was perceived as hindering new pregnancy and the Church continued to condemn non-procreative intercourse and contraception, many middle and upper-class women sent their babies to wet nurses and thus could avoid abstinence. In the 15th century, Konrad Bitschin complained that in his times, more and more mothers did not want to nurse their babies and gave them to wet nurses to satisfy their sexual drive. Sending babies for nursing offered a solution not only to devote Christians or in the obvious case of a mother's death, but also to those who wanted to guarantee the economic strength of the family with as many children as possible and to wives of merchants and artisans who wished to return to work for economic reasons. Hiring an "in-home" wet nurse was usually practiced by the rich families that often abandoned maternal breastfeeding for the sake of shortening birth intervals and increasing fertility rates. Urban families typically sent their infants to wet nurse in rural households living in the countryside.⁷⁷

Wet nursing was most common in France, where its popularity continued until the late 19th century. There, most of the babies were sent to the wet nurse's house and their mortality rates reached 70–80 percent depending on the region. High mortality rates occurred among infants also in early modern England, where it was common to send babies from the large cities to the nearby villages. In 18th-century north Germany (e.g. Hamburg), where infants were usually breastfed by their mothers, high mortality rates were common for foundlings who were sent away to wet nurses. In Poland, the sources before 1750, such as pedagogical treatises and herbaria, usually advised mothers to breastfeed their babies (Mikolaj Rej, 1956, p. 32):

Ladies mothers, especially those of good families [aristocrats] would make good, if they nursed and bring up their kids by themselves.

They also recommended using a wet nurse in case of problems but did not advise to bring her home.⁷⁸ Although it is impossible to estimate the popularity of wet-nursing among Christian families in the early modern period, the information preserved in contemporary sources shows that burghers in pre-modern Polish cities hired wet nurses much less than in France. Examples also suggest that those who could hire a wet nurse were usually from noble or rich burgher households and, in contrast to France, they usually brought her home to live with them and function as a nanny. The upper classes also observed the postnatal isolation and ended it with a celebrated visit to the church called 'churching'.⁷⁹ In contrast, hiring a wet nurse or isolating the mother and the newborn were not common among poor rural households, which constituted the majority of the Polish-Lithuanian population. For women in the countryside it was popular to nurse foundlings sent to

⁷⁶ The Church fought against the Jewish employment of wet nurses precisely because they had to be brought to, and often lodge in Jewish homes. Lipski (1737, pp. 73–77). Müller (1978, pp. 111–115) mentions that Jews hired wet nurses despite Church prohibitions. The relevant primary sources are: *Volumina legum* II, 51 (Sejm 1565); *Volumina legum* III 309, V, 585–586 (Sejm 1678); *Volumina legum* VIII 50 (Sejm 1775). For royal legislation, see Dubnow (1925, no. 512, p. 121). *Statut Krakowskiej Gminy Żydowskiej* par. 91:75. For the related resolutions of the Council of Lithuania see Dubnow (1925, no. 145, p. 35). For the related resolutions of the Council of Four Lands see Halperin (1945, pp. 483–487). Relevant information can also be found in Fildes (1986, p. 200), Salmon-Mack (2012, p. 189).

⁷⁷ Other views of breastfeeding as physically debilitating or dangerous for the mother were rarely expressed (Matthews-Grieco (1991, p. 17; Wiesner (2000, p. 87). Despite church rulings, different contraceptive methods were used. Still the extent of the practice during early modern period is unknown (Arnold 1980, pp. 151–152). Demographers have estimated that, on average, one out of ten births entailed maternal death (Flandrin 1976, ch. 10). For more information on maternal death rates among Christians, see Keeble (1994, p. 169), Matthews-Grieco (1991, p. 34), and Wiesner (2000, p. 87).

⁷⁸ Only in the nursing houses for foundlings infant mortality was higher. For more information on wet nursing in France see Sussman (1982). In the south Germany, e.g. Bavaria region, the babies were weaned at birth and fed with pap (Knodel and Van de Walle (1967), Rej (1956, p. 32), Dembińska (1980, p. 485).

⁷⁹ Kuklo (2009, p. 330), Żołędź-Strzelczyk (2002, p. 114). In the post-Tridentine period, baptism was usually carried out within a few days after birth. If not, it could be celebrated together with 'churching' (Hemperek 1982).

them by urban households or to leave their babies with other mothers in the family or village and to go in search for employment as wet nurses.⁸⁰

(ii) *Remaining with the Same Source of Breast Milk*

Modern research has found evidence linking an increase in infant mortality to the switching of wet nurses. For example, examining the cases of infants sent to wet nurses from a sample of wealthy Florentine families in the early 15th century, Herlihy and Klapisch-Zuber (1985, pp. 136–148) discovered that the number of deaths was directly related to the switching of wet nurses. The frequent deaths of infants following the replacement of the wet nurse suggest that this practice posed a serious threat to infant welfare.⁸¹ Hence, one can argue that maintaining the same wet nurse would increase a child's chances of survival.

Jews. As mentioned above, the legal code Shulchan Aruch reinforced the Talmudic opposition to switching the woman nursing a baby “if [it] knew her.” To avoid a change of milk source or abrupt weaning resulting from a new pregnancy, Jewish women in early modern Poland-Lithuania were allowed to use contraceptive measures. Furthermore, hiring of a wet nurse was permitted before the baby “knows its mother” and came with the commitment for a prolonged period of employment in which the employee was prohibited from getting pregnant. Accordingly, rich families which employed wet nurses to help the new mothers be ready for the next pregnancy, or women who attempted to get permission for remarriage, tended to hire single women for a long period even before the birth of their children in order that the infant would “know” his or her wet nurse before he/she got used to the mother. Although the *halacha* did not specify the kind of dangers posed to the child when changing wet nurses, its application limited such practice and, therefore, might have contributed to the lower infant mortality among Jews in Poland-Lithuania.⁸²

Christians. In early modern Europe, though switching wet nurses was known to affect a child's willingness to nurse, there was no religious law forbidding this change. On the contrary, in some cases a change of nursing woman was recommended, e.g., during the menstruation. Due to the belief that breast milk was a transformed menstrual blood and that any loss of blood alters or even “poisons” a woman's breast milk, children were often taken from the breast if their wet nurse menstruated. Consequently, many Christian children had two, three, four and even more wet nurses in their early years. In Poland, even in the late 18th century the physician Weichardt wrote that a wet nurse should not breastfeed during her menstrual period because “babies that nursed during that time often got sick.” He recommended that a replacement wet nurse should be found for that short period, or the baby should be given whey (which is the liquid remaining after milk has been curdled and strained; also known as milk serum or milk permeate) with eggs, which we know was often too heavy for the immature digestive system of the baby.⁸³ A change of the wet nurse was recommended also in case of pregnancy. This was due to the belief that the needs of a developing fetus changed the quality of the breast milk. Also, when the wet nurse got sick or when the infant became sick, a wet nurse was replaced because of the probable corruption of her breast milk.⁸⁴

(iii) *First Feeding*

According to modern medical knowledge, an infant is born with a passive immunity resulting from the IgG antibodies which are small enough to cross the placenta barrier and thus help to protect the fetus (and later the newborn) from microorganisms and some viruses familiar to the mother's body. To develop his or her own immune system, a newborn needs among others a boost of IgA antibodies, which can be found in the “first milk” produced by the breast already at the end of pregnancy and known as colostrum. Concentrated and easy to digest colostrum has as much as 20 to 40 mg/ml of IgA antibodies and contains a

⁸⁰ Hrdy (1992) shows the mortality rate among the biological infants of wet nurses to be quite high.

⁸¹ Baumgarten (2007, p. 127) and Klapisch-Zuber (1985, pp. 144–145).

⁸² Salmon-Mack (2012, pp. 95, 97).

⁸³ Weichardt (1782, pp. 48–51), Żołędź-Strzelczyk (2002, p. 118).

⁸⁴ Salomon-Mack (2010, p. 190), Weichardt (1782, pp. 48–51).

range of antimicrobial factors as well as factors that may impact the immune system, e.g., the iron-binding antimicrobial protein lactoferrin, antibacterial enzyme lactoperoxidase, and lysozyme. Moreover, colostrum contains leukocytes and growth factors that may affect neonatal intestinal development, and provides a source of energy which may impact IgG absorption in the newborn, and stimulate effective immune response.⁸⁵

Although very important, the benefits of yellowish, thick, and sticky milk were unknown until the modern times, and for thousands of years in various cultures “a mistrust of colostrums” deprived many infants of important immunities and exposed many mothers to the risk of mastitis also known as milk fever.⁸⁶ In the light of modern medical knowledge we know that before the invention of advanced formula, a newborn nursed with colostrum, which usually lasts for the first two to four days after birth, had a better chance of survival than an infant left hungry or fed in other ways. Consequently, breastfeeding with colostrum could be one of the important factors contributing to lower infant mortality.

Jews. Postpartum period was recognized as a vulnerable time for both the infant and the mother and thus special attention was directed to their diet and hygiene. New mothers were generally advised to observe a proper diet and avoid physical movement, as well as breastfeed their babies. Already in the Talmud we can find examples of putting a newborn on the mother’s breast, sometimes even before the cord was cut. According to Baumgarten (2005, p. 200), although it is not possible to ascertain when Jewish mothers in Ashkenaz started to breastfeed their offspring, they did not follow the recommendation to abstain from nursing the infant for the first eight days after birth which sporadically appeared in Sephardic sources. According to Chovav (2009, p. 171), Jewish mothers in Poland-Lithuania were advised not to breastfeed only for the first ten hours, during which the newborn was probably given a kind of purge to expel a meconium. It is known that already in Talmudic times newborns were given the so-called children’s herbs (*asube januka*) to make them vomit and clean their mouths in preparation for breastfeeding. Hence, Jewish newborns who were immediately nursed by their mothers in the first two to four days after birth did benefit from the colostrum.⁸⁷

Christians. In medieval and early modern Europe, the opinion of the ancient Greek physician Soranus was commonly accepted. He wrote that after birth the baby should be nursed by a wet nurse and not by the mother for at least 20 days, because “mother’s milk [...] is heavy, cheesy, hard to digest, [...] it comes from a sick and disturbed body.” Moreover, Soranus stated that the first food should be given to the baby only after two days from birth and in-between recommended warm honey since, in his opinion, it was the best way for cleaning the digestive system and caused neither gas nor constipation. Only afterwards the baby can be given milk.⁸⁸

According to the first important pediatric publication by Metlinger in the mid-fifteenth century, the mother’s milk was not good for the infant during the first two weeks after labor; moreover, after the baby received honey as a laxative he/she should be wet nursed. As a result of such medical advice and the belief that the milk should be liquid, most infants in early modern western Europe were taken away from their mothers for hours or even days to be washed, swaddled, and fed by other women while their mothers rested. Also, mothers were usually not allowed to feed their newborns until the colostrum had changed color (three to four days) or even until they had been ritually cleansed (about 40 days after birth) (Matthews-Grieco 1991, pp. 24–30). This long delay in first nursing deprived the newborns of the benefits of colostrum and thus seriously hindered the development of babies’ immune systems. It also put the mother at risk of milk

⁸⁵ Hurley and Theil (2011). For more information on immunological qualities of colostrum and breast milk, see WHO (1990, pp. 31–32).

⁸⁶ Matthews-Grieco (1991, p. 52).

⁸⁷ Chovav (2009, p. 171), Zibadi, Watson and Preedy (2013, p. 135). For types of purges commonly in use for newborns between 1500 and 1800 see Koletzko, Fleischer Michaelsen, and Hernell (2002, p. 5, table 1). See also Talmud Bavli, Sabbath 123a.

⁸⁸ The writings of the Greek physician Soranus of Ephesus (2nd century CE) determined European Christian medical opinion concerning women’s diseases, pregnancy, and infant care for nearly 1,500 years (Wickes 1953, p. 154; Lachs 1902, pp. 78–8; Żołędź-Strzelczyk 2002, pp. 119–120).

fever, exposed the baby to unclean feeding instruments, and often caused the loss of the newborn's sucking instinct.⁸⁹

Turning the attention to central and eastern Europe, in the early 18th century, German physician Etmuller was the first to object the prevailing practice and to recommend, though unsuccessfully, placing babies on their mother's breast during the colostrum period.⁹⁰ The real change in the attitude towards colostrum occurred *only* in the modern period. In Old Poland, it was also widely believed that colostrum was impure and harmful to the baby. Consequently, breastfeeding usually started a few days after birth. For the first few days, the newborns were usually given honey instead of mother's milk. In the 16th century, the authors of the popular Polish herbals, Hieronim Spiczyński and Marcin Siennik, taught that "on the day the baby was born, it should not be given mother's milk, but rather only someone else's milk." The reason for it was that at that time, women, especially those doing nothing, have colostrum i.e. siara or other impure, thick stuff which is very unhealthy to the baby. Only by the end of the 18th century, a few lonely voices advised nursing with colostrum, not so much for its nutritional value but to cause the vomiting of meconium.⁹¹

Mother's breast should be served right after some rest after the pain, i.e. two hours after the delivery. Mother's milk because it is still very liquid and whey-like, is the best medicine to expel the meconium and cause bowel movements in the baby.

(iv) Weaning

Today World Health Organization and UNICEF recommend exclusive breastfeeding for 6 months followed by breastfeeding combined with complementary foods until the age of two. Introduction of complementary food in the first four months of life is not recommended as it harms the infant.

In light of modern medical knowledge and research in developing countries, which points to the benefits of prolonged, regular, and frequent breastfeeding, it has been established that not only continued but also intense breastfeeding was also the best source of nutrition for the infant in the past. It increased an infant's chances of survival and proper development, and lowered the risk of intestinal infections and gastric illness, which in the past centuries often ended in infant death. Furthermore, modern medicine shows that intense and exclusive (or almost exclusive) breastfeeding strengthens the contraceptive powers of lactation and thus may help to establish longer birth intervals. Birth spacing, in turn, is known to have a positive impact on child mortality rates.⁹²

Jews. As we documented above, Jewish religion rules and social norms recommended prolonged and intense breastfeeding. If a widow or divorcee stopped breastfeeding earlier than the prescribed 24 months, it was usually viewed as suspicious and possibly related to mother's desire to remarry. Hence, unmarried (either because widow or divorcee) mothers with means usually preferred to hire a wet nurse in advance and avoid both sudden weaning and suspicions related to it. Despite the rule of nursing for 24 months, married women sometimes weaned a child earlier, usually around the age of 18 months. In such cases, special food was prepared for the weaned baby.

Christians. In early modern Europe, breastfeeding was generally recommended until the age of two, but other foods were usually introduced much earlier. While in the 16th century solid foods were served to a baby around 7–9 months of age, later it was reduced to the age of 2–4 months. The earlier a baby was given solid foods, the more it was exposed to contaminated food and risk of diseases, such as diarrhea, scurvy, rickets, and others. The first solid foods were usually a pap (flour or bread soaked in water or milk sometimes mixed with an egg) or panada (cereals cooked in broth).

In Old Poland, babies were usually breastfed until the age of one. Additionally, already before weaning they were served mixtures such as mush of bread cooked in milk with sugar and egg, or bread

⁸⁹ Bartolomeo Metlinger (born after 1440) published the book *Ein Regiman der jungen Kinder* in 1473. See also Matthews-Grieco (1991, p.30).

⁹⁰ Wickes (1953, pp.332–340). *Etmuller Abridged* was published around 1703 and translated into English in 1712.

⁹¹ Zołądz-Strzelczyk (2002, pp. 119, 120), Musiał-Morsztyn et al. (2014, p. 62), Dykcjonarz (1788, p. 67).

⁹² Hanson and Winberg (1972), Berens and Labbok (2015).

mashed in milk, goat milk with water, and various kinds of barley. Such food was usually given through a linen cloth babies could suck on or from a cow horn. In villages, babies were often given also some pre-masticated food. In 1534, the known Polish physician Falimirz advised that a baby should be given pieces of bread with sugar so that it could get used to regular food. According to physician Weichardt's complaints, babies in 18th-century Poland were pre-maturely exposed to other foods and weaned.⁹³

Polish mothers were advised to breastfeed less frequently. Falimirz, recommended to breastfeed babies only 2–3 times a day and not for too long, so that the baby would not get full. Weichardt claimed that the child should be fed only when hungry and not every time he or she cried. In his opinion, a wet nurse should get the baby used to eating at specific times. Regarding weaning, Weichardt stated that it should be gradual and its time "should not be determined ahead, because one child is weaker than the other and hence needs permission to suck longer the wet-nurse's breast."⁹⁴

(v) *Family Support and Marriage Patterns*

Historically, kin members have been the major source of economic support and insurance against negative shocks. Studies on the influence of grandparents on child mortality in historic population have shown that matrilineal grandparents were usually more ready to assist young couples and that the survival itself of the maternal grandmothers contributed to decrease infant mortality risks. In general, despite its importance, historically familial support was voluntary. Yet, in Jewish eastern European culture the matrilineal parental support to young couples was institutionalized and this turned into one of the factors that might have contributed to the comparatively lower infant mortality rates among the Jews in Poland-Lithuania already during the early modern period.⁹⁵

Jews. The Jewish pattern in eastern Europe, dating from at least the 17th century, was for young couples to establish their first household in the home of the wife's family. *Kest* is a Yiddish term used for a period of family support to young couples after marriage, during which the groom – preferably "the scholar, the diligent, promising yeshivah student" – lived with the bride's family and pursued Torah study, whereas the bride usually received training in the family business, as preparation for becoming a worker or a partner in it, or learnt a craft or a trade, or helped with some agricultural work. *Kest* often lasted up to three years and involved grandparents' help with new children. According to Goldberg (1997), as many as 25 percent of Jews could afford this arrangement. In some cases, the prenuptial agreements, which included the dowry, also included *kest*, which could be lengthened to attract the best suitor. The groom became a member of an extended family which usually included three generations under one roof.

Because of the *kest* system, maternal grandparents played a dominant role in the lives of their grandchildren. This Jewish model of marriage and family support was praised in the past as reflecting the best of what the institution of marriage had to offer. According to Hundert (2004, p. 24), the practice of *kest* was one of the reasons for the lower child mortality among the Jews.⁹⁶

An important notion that originated from Hasidei Ashkenaz and was reinterpreted by eastern European Jews according to their own frame of reference, was "that the acts of children affect the heavenly status of parents." They believed that a child's good deeds are credited to the parents in this life or in the afterlife. Furthermore, a child's misdeeds cause suffering to the parents: "that is all nothing comparing to the discomfort and suffering that one has in the next world because of unsuccessful children." Jewish fathers invested in rising pious sons, since the actions done by a son after his father's death were believed to constitute an atonement for the soul of the father.⁹⁷ Moreover, the parents were credited in the afterlife if

⁹³ Musiał-Morsztyn, Bogdał and Królak-Olejnik (2014, p. 62), Żołędź-Strzelczyk (2002, pp. 119, 143). Falimirz was a known Polish physician and author of the popular work *On Herbs and Their Potency* (1534, p. 37).

⁹⁴ Weichardt (1782, p. 69); Żołędź-Strzelczyk (2002, pp. 119-121). At this frequency, the contraceptive effect of lactation is reduced and many breastfeeding women got pregnant.

⁹⁵ Kemkes-Grottenthaler (2005, p. 219), Voland and Beise (2002), Hareven (1994).

⁹⁶ Eliach (1998, chapter 5), Goldberg (1999, p. 173).

⁹⁷ Fram (2006, p. 51). In the modern period, this attitude developed into the idea that among Jews, 'a child's obligation to his parents is discharged by acting toward his own children, when he is grown, as his parents acted toward him' Benedict (1948, p. 348). See also Slonik (1577, no. 102) and Horowitz (1701, for 3b) as quoted in Fram (2006, pp. 52, 53, respectively).

their children were good parents to the next generation. Thus, Polish-Jewish parents invested in their children and tended to support them after marriage and in their investment in the grandchildren as well.

Already in medieval Ashkenaz, marriage was viewed as a socioeconomic covenant between the parents of each side, who were also responsible for matchmaking, and the creation of “a material basis for the young couple.” Among Polish Jews, the religious ideal was early marriage, especially among the elite, although it is not known whether such early marriages were the general rule. It was difficult to meet the “necessary qualifications” for marriage, which meant the creation of a new economic unit, which would slowly become independent. The age of 16 was considered a proper age for a girl to marry and 18 for a boy. In general, most Jews married at a relatively young age (late teens) for a variety of reasons: to enable young men to fulfill the commandment of procreation, to channel sexuality to legitimate outlets, and to offset low life expectancy and high infant mortality rates.⁹⁸

Remarriage was a common phenomenon among the Jews. Marriage was an ideal state for a man and a legitimate framework for sexual activity. Thus, although for women a third marriage was forbidden, there was no prohibition of remarriage for a man. In terms of infant mortality, it should be emphasized that remarriage not only contributed to higher birth rates but also reduced extramarital sexual activity and, hence, reduced the number of children born out of wedlock, who had a lower chance of survival than legitimate offspring. Furthermore, the life expectancy of children who lived with only one parent was lower than that of children who lived with two. Thus, it can be assumed that a society emphasizing the need to remarry, like the Jewish communities in central and eastern Europe, might have a lower infant mortality than a society with an ambivalent attitude towards remarriage, like the Polish Christian society, in which the average marriage in pre-industrial towns lasted 10 to 15 years.⁹⁹

Polish Christians. According to Augustyniak (2008, p. 309), in the early modern period most of the rural households in Poland were so-called “open families,” which were characterized by early marriage (18 for a boy and 14–16 for a girl), and in which the couple lived with the parents after marriage. In urban areas, wealthy families were usually limited to just parents and unmarried children. There was no defined institution of *kest* in Polish Christian society. According to Bogucka (2004, p. 35), among the middle and lower classes the average age of marriage was relatively high, probably over 20 for men. In the case of women, the age of marriage may have been significantly lower, probably between 15 and 20. Social historians claim that noble women married before the age of 20, and daughters of wealthy magnates got married earlier than gentry’s girls. Often, there was a considerable age difference between the bride and groom. Families were patriarchal and marriage was a sacrament.¹⁰⁰

By the end of the 18th century, the average age at first marriage in Poland was 25–29 for a man and 20–24 for a woman.¹⁰¹ During the period 1740–1799, men in Warsaw were nearly 29 years old when they first got married, similarly to the situation in western Europe. However, women in Warsaw got married at the age of 22–23, which was much younger than in western Europe. In central Poland, the average family was relatively small, typically consisting of parents with children and sometimes a member of the older generation or a cousin. According to Hundert (1989, p. 85), this practice was different among the Jews who tended unlike their neighbors to live in multifamily dwellings.

4.4 Child Care Norms and Practices during the Modern Period

In general, the positive attitude towards childcare remained one of the pillars of Jewish life in eastern Europe also during the modern period. A survey of the *responsa* dating that time reveals that the above-

⁹⁸ Katz (1959, p. 7), Goldberg (1999, p. 174), Baumgarten (2005, p. 53). In Polish historiography, the common view is that Jews got married earlier than Poles: the average groom was 17 years old and the average bride was 16 years old (Kuklo 2009, p. 283). In Kraków around 1595, one had to be at least 20 years old (married or not) before conducting business independently (Dubnow 1925, no 32, year 1623). Poor girls were considered ready for domestic service at the age of 12 and for marriage at the age of 15 (Dubnow 1925, no. 128, p. 32 year 1628). See also Freeze (2010). Some research show that in smaller communities in 18th century the average age of marriage was 20–24 (Goldberg 1997, p. 23).

⁹⁹ Kuklo (1990), Kamecka and Kuklo (2003). In the 17th century, it was only 10 years (Waszak 1954, p. 285).

¹⁰⁰ Koczarska (1975, p. 32), Wolski (2005, p. 304), Kuklo (2009, p. 283).

¹⁰¹ Kuklo (2009, pp. 278–279).

described Talmudic rule known as *meyaneket chavro* was still very much discussed and people found it difficult to obey it. In many cases sent to rabbis to obtain their opinions and rulings, women asked for permission to marry the man they were already engaged to or a couple asked for permission to live together in violation of the ruling in the Shulchan Aruch. It is worth mentioning that the fact that many couples requested permission to stay together means that there were rabbis who allowed them to marry in the first place.¹⁰²

One of the reasons for the tendency toward leniency on *meyaneket chavero* appears to be the shortening of the breastfeeding period in the surrounding society. There were rabbis who recognized that the breastfeeding period had gotten shorter, but nonetheless insisted that people comply with the ruling of *meyaneket chavero*. For example, *Hatam Sofer* argued that the rule must be obeyed because there were still children who needed 24 months of breastfeeding and the rule protects them.¹⁰³ Furthermore, 19th-century rabbis explained that the ruling should continue to be obeyed because its intention is to guarantee that the infant, and not a new husband, will enjoy his/her mother's full attention and thus goes beyond merely breastfeeding.

By the end of the 18th century, there were clear differences between Jewish marital patterns in the German-speaking lands and in the Polish-Lithuanian Commonwealth. Western groom and bride were older than young couples in eastern Europe, where pre-mature marriage became more and more popular among the elite. In most of the documented cases of early marriage among the elite, the young couple lived with the maternal parents who provided financial support while the groom continued Talmud study in the yeshiva (academy of higher learning). In 19th-century eastern Europe, remarriage was a common phenomenon among Jews and constituted one of the characteristics of Jews as a population group: "Jews married younger, remarried more often and lived longer than members of other groups." In the mid-19th century, almost all Jewish adults were married, but a high percentage of them were married not for the first time.¹⁰⁴

Between 1867 and 1910, in comparison to other population groups, Jews had the highest percentage of marriages involving at least one remarrying partner, as well as marriages between widows and widowers. Religious legislation encouraged widows to remarry. Although the rulings of the Shulchan Aruch prohibiting a widow to marry a third time were generally obeyed, the *responsa* reveal that modern rabbis tended to look for ways to permit it. One of their motivations for permitting such marriages was to ensure the care of orphans based on rabbis' unquestioned assumption that fatherless children are endangered. It can thus be assumed that in case of widows, the practice of remarriage contributed to the welfare of otherwise fatherless children and to lower child mortality. During the 19th century the practice of early marriage was abandoned. In the second part of the century there was a general rise in the age of marriage among Jews.¹⁰⁵ Jewish marital age and remarriage patterns became similar to those in Christian society. Jewish widowers became less inclined to choose a widow as a mate, although Jewish widows continued to marry widowers rather than bachelors. On the other hand, Christian widowers were inclined to choose previously unmarried women for a second marriage.

In modern western Europe, one of the most significant discoveries in childcare was that colostrum is actually beneficial to the baby. Although already in 1719 Pierre Dionis recommended colostrum as more nutritious than regular breast milk, the attitude of mothers to breastfeeding after labor changed only in the mid-18th century following the observation of Hunter (1750) – that feeding babies after labor reduces the risk of milk fever – and the publication of Cadogan's 'Essay Upon Nursing and Management of Children.' The change and simultaneous return to maternal breastfeeding among the middle and upper classes were probably among the factors that contributed to the decrease in child mortality after 1750. However, only by the end of the 19th century it was understood that colostrum could equip the infant with some immunity and prepare it for more substantial nourishment.¹⁰⁶

¹⁰² Anzi (2015, pp. 4, 6).

¹⁰³ According to DeMause (1974, p. 34), while at the beginning of the 17th century it was 24 months, in the 18th and 19th centuries the nursing period lasted usually only 15 months. L. See also Chatam Sofer, *Even HaEzer* 1: 34 (Freshburg, 1857).

¹⁰⁴ Stampfer (1988, pp. 98, 104; 2010, pp. 9–21).

¹⁰⁵ Stampfer (1988, pp. 87, 104, 105; 2010, pp. 21, 23).

¹⁰⁶ Matthew-Grieco (1991, p. 47). Paul Ehrlich (1854 – 1915) was probably the first to discover that mother's milk passes immunity in 1892.

In Poland, the question of whether the baby should be nursed by his mother during the first 24 hours appeared in 18th-century treatises, but the attitudes changed only gradually first among doctors, later among midwives and finally among women themselves. By the end of the 18th century, the physician Weichardt still claimed that during the first 24 hours a newborn baby should not be given any food except for sugar with manna (semolina) or syrup with manna. Dykcjonarz (1788) advised that if the baby had no problems during the delivery, he/she should be given a bit of mother's milk (after the mother has rested for about two hours) to cause vomiting of meconium. However, if the newborn seemed weak it should be given a few drops of sweetened and warm wine. Furthermore, Dykcjonarz suggested that mothers should not breastfeed their babies during the milk fever and instead newborns should be fed with fresh goat milk mixed with water.¹⁰⁷

In 1867, Śniadecki was the first to recommend nursing with colostrum because it "has lactating advantages and helps to expel meconium." Only at the end of the 19th and beginning of the 20th century new publications described the first milk as having more proteins, fat and leucocytes than regular human milk, and Polish doctors agreed that the newborn should be breastfed within 4–8 hours after delivery. Together with the decrease in the number of still birth and progress in medical knowledge, the feeding with colostrum contributed to the population growth in Poland-Lithuania. In Poznan, for example, between 1870 and 1910 average intelligentsia family had 3,8 children, craftsman's family had 4,1 children while simple workers had 4,7. In the second half of the 19th century the number of women who died during the delivery decreased gradually. During the 19th century marriage and family became more institutionalized. For example, Prussian law of 1873 set the minimum marriage age for men at 21 and women at 16. In Poznan the average groom was 25–29 years old, while his bride was 20–29 and usually three years younger than him. With industrialization and urbanization, Polish women gained chances of professional work and became more independent within the family.¹⁰⁸

There are not many comparative studies on Polish and Jewish childcare. One of the important studies to confirm the differences in general attitude towards childcare was carried by Benedict (1949), who examined the practice of swaddling in Poland and Ukraine in the early 20th century. Benedict claimed that the Jewish idea of swaddling is to provide the baby with warmth and comfort rather than to "harden it" (which was the attitude in Poland and Russia). His research shows that Jewish babies were usually swaddled on a soft pillow and in most areas the bindings were wrapped relatively loosely around the baby and his little featherbed. In strongest contrast to the experience of the Gentile child, swaddling is part of the child's induction into the closest kind of physical intimacy.¹⁰⁹ Benedict juxtaposes the Jewish approach towards swaddling with the general Polish, Ukrainian and Russian attitudes according to which (i) the baby is fragile and needs the support provided by the bindings, and (ii) swaddling should be used to harden baby's legs. Furthermore, he emphasizes that the Poles also believed that swaddling prevents the baby from touching the dirty and shameful parts of its body, while Russian mothers swaddled the baby to prevent it from hurting itself.

4.5 Summary and Discussion

Modern medical knowledge regarding the impact of childcare on infant mortality and child well-being has changed dramatically from the late 19th century till today. Only at the beginning of the 20th century medical knowledge became widely accepted and the practices of breastfeeding changed. Nursing with colostrum as well as intense and exclusive breastfeeding became most common.

Our analysis of primary and secondary sources shows that Jewish childcare norms based on religious rules from the Talmudic period and developed throughout the Middle Ages and early modern period, were much closer to modern medical knowledge than those of contemporary Christian society. Jewish religious norms stated that infants' and children's well-being should be at the center of the family; consequently, Talmudic debates and rulings prescribed norms and recommended practices for taking care of infants and children. What is *striking* is that centuries later, these norms and practices have been scientifically confirmed

¹⁰⁷ Weichardt (1782, p. 316). In 15th century, Konrad Bitschin advised that a baby be fed with human milk, preferably the mother's, rather than wine, which testifies to the persistence of this problematic practice. See also Żołędź-Strzelczyk (2002, pp.110, 124) and Dembińska (1980, p. 487).

¹⁰⁸ Śniadecki (1867, p. 57), Michałowicz (1920), Kramsztyk (1896), Żyromski (2000, pp. 175, 183).

¹⁰⁹ Benedict (1949, p. 347).

by contemporary medical knowledge to be clearly beneficial for the physical growth and the development of cognitive and non-cognitive skills of children.

The key insight from our earlier work (Botticini and Eckstein 2005, 2007, 2012) and our current research is that when children's education became the main religious norm among Jews during the Talmudic period, Jews also began developing a unique body of norms and practices related to infant and child care, and followed them throughout the subsequent centuries up to today. The unexpected demographic outcome of this radical change in religious norms was that centuries later, the Jews in central and eastern Europe had much lower infant and child mortality rates in comparison to the local non-Jewish population. This in turn was the engine for the spectacular Jewish population growth during the early modern and modern periods in what had become the economic, cultural, and religious center of Jewish world, that is, central and eastern Europe.

5. Concluding Remarks and Future Research

In this paper we document the exceptionally high Jewish population growth rate (almost 1.4%) in Poland-Lithuania from 1500 to 1880. Later, it declined due to migration to western Europe and the Americas. The total population of Poland-Lithuania grew at much lower rates and reached that of the Jews only after 1880. We also provide evidence that the Jewish population in Germany-Austria before 1800 grew at more than twice the rate of the total population, though at a much lower rate than the Jewish population in Poland-Lithuania. The main evidence presented indicates that until the early 19th century, the difference in the rates of growth between the Jewish populations in Poland-Lithuania and Germany-Austria was due to migration to the East. It seems reasonable to assume that the natural growth rates of Jews in Poland-Lithuania and Germany-Austria were about the same due to similar religious and social norms of raising children and general economic conditions; hence, most of the difference was likely due to migration and conversion until 1880.

We also document the much lower infant and child mortality rates among Jews than the local populations. The difference accounts for more than half of the difference in the rates of population growth between the two groups. Since socioeconomic and demographic characteristics cannot fully explain the differences in infant mortality between Jews and non-Jews, we examine religious norms and practices, as well as lifestyle differences. In light of contemporary medical knowledge, Jewish religious norms along with breastfeeding and childcare practices generated a unique demographic pattern for the Jews---lower infant and child mortality rates, which in turn brought a huge Jewish population growth in central and eastern Europe during the early modern and modern period. These rules were deeply rooted in Judaism throughout the ages and were standard practice for Ashkenazi Jews in Poland-Lithuania and Germany-Austria.

One of the puzzling questions that emerge from the analysis is why the Jewish community grew so rapidly in Poland-Lithuania but not in Germany-Austria. Future research should focus on this puzzle. A possible explanation is related to differences in property rights between Germany-Austria and Poland-Lithuania and the role of the Jews in the Polish manorial economy. While Germany-Austria abandoned feudalism prior to 1500, in Poland-Lithuania a unique feudal system ('secondary feudalism') developed during the 16th century in which nobles (*szlachta*) had full property rights and a monopoly on the means of production, as well as the legal and military authority to protect their property. The Jews in Poland-Lithuania became part of the manorial system. They were successful as leaseholders and operators of noble properties and monopolies and their demographic growth in Poland-Lithuania was not limited by the feudal system. Our next research project will study this fascinating topic in depth.

To sum up, understanding the engines of human development and the mechanisms for achieving health, knowledge, and wealth is a central issue in economic research. Our work contributes to this fundamental issue by showing, through the unique lens of Jewish history from 1500 to 1930, how the interplay between the distinctive Jewish parental investment in child care and heterogeneity in institutional settings played a pivotal role in shaping the remarkable trajectory of the Jews in terms of demographic growth, economic prosperity, and intellectual achievements. It can thus offer previously unexplored insights and lessons for current debates on how to make a society prosper and grow.

Appendix A: Sources and Methodology for Section 2

Available at: ww1.idc.ac.il/Faculty/Eckstein/jewish_history_1500.html

Appendix B: Sources and Methodology for Section 3

Available at: ww1.idc.ac.il/Faculty/Eckstein/jewish_history_1500.html



Map 1: Borders of Germany-Austria and Poland-Lithuania in 1650.



Map 2: Borders of Germany-Austria and Poland-Lithuania in 1850.

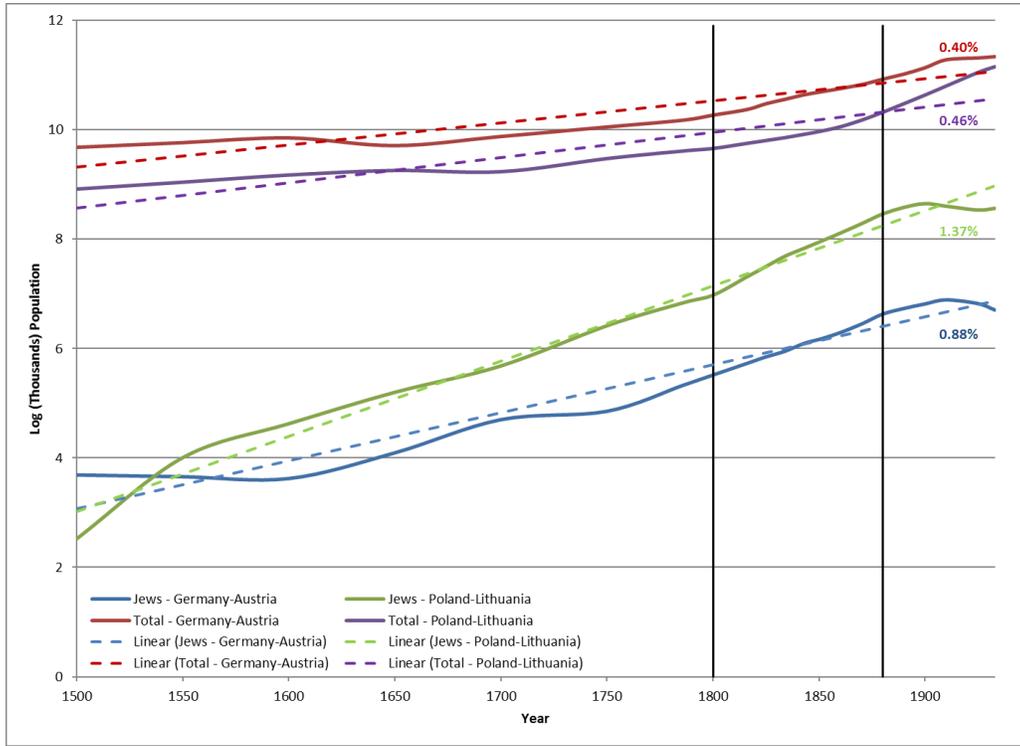


Figure 1: Jewish and Total Populations in Germany-Austria and Poland-Lithuania, 1500 to 1930 (logs)

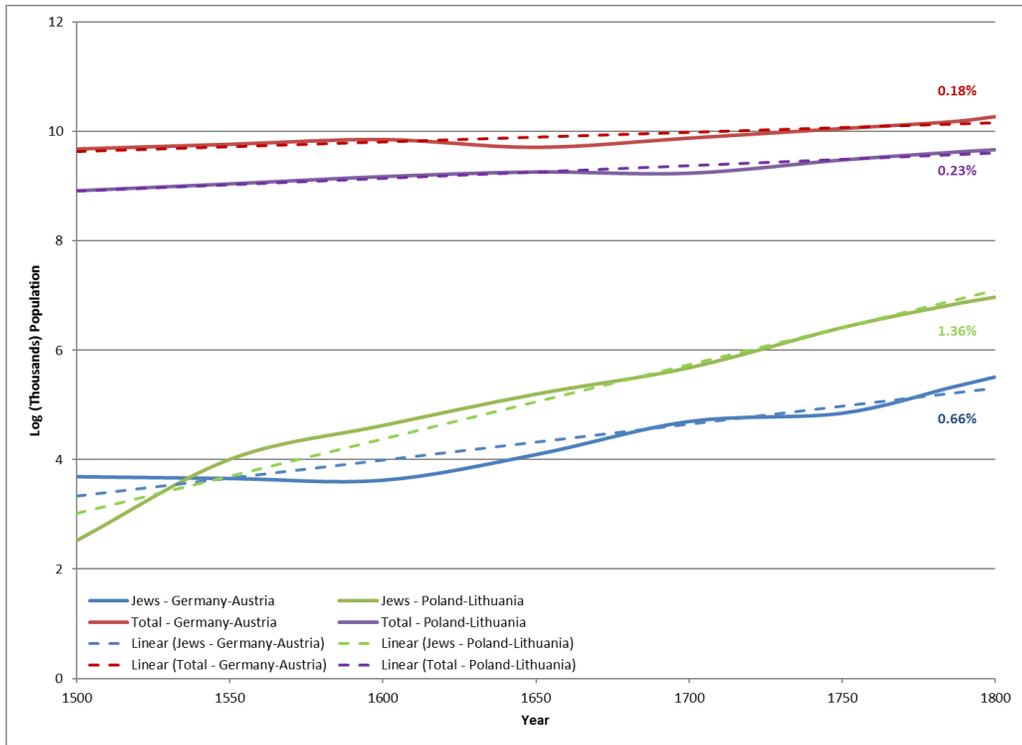


Figure 2: Jewish and Total Populations in Germany-Austria and Poland-Lithuania, 1500 to 1800 (logs)

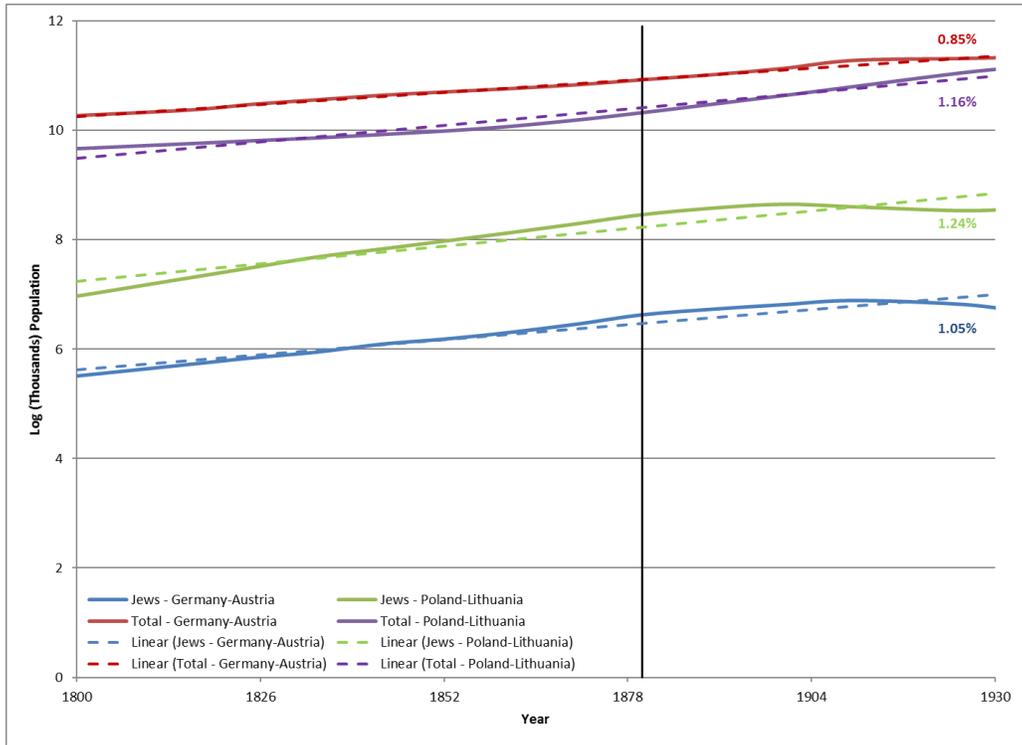


Figure 3: Jewish and Total Populations in Germany-Austria and Poland-Lithuania, 1800 to 1930 (logs)

Table 1: Jewish and Total Populations in Germany-Austria, 1500–1750

Years	Jewish Population (thousands)	Total Population (thousands)	Share of Jewish over Total Population (%)	Annual Growth Rate of Jewish Population (%)	Annual Growth Rate of Total Population (%)
1500	40	16,000	0.25	---	---
1600	35–40	18,000–20,000	0.20	0.00	0.11–0.22
1650	60	16,000–17,000	0.35	0.81	-0.23 – -0.32
1700	110	19,000–20,000	0.55	1.21	0.34
1750	128	26,265 ^a	0.49	0.30	0.32–0.38

Sources: **1500** Jews: Guggenheim (1989, pp. 130–131); Toch (2003 (1), p. 13); Total: Rabe (1989, p. 27); Whaley (2012 vol. 1, p. 50); **1600** Jews & Total: Battenberg (2001, p.10); **1650** Jews: Battenberg (2001, p. 33); Bell (2008, p. 48); Total: Schormann (2001, p.269); Whaley (2012, vol. 1 p. 633); **1700** Jews: Israel (1985, p. 170); Battenberg (1990, part 2, pp. 1–2); see also Battenberg (2001, pp. 32 ff); Total: Battenberg (2001, pp. 32 ff); **1750** Jews: Israel (1985, p. 303); Thon (1908, p. 5 for the year 1776); Hartmann (1995, p. 348 for the year 1796). Total: Kolb (1875, p. 36 for the year 1786); Hartmann (1995, p. 348 for the year 1796).

^a In 1786.

Table 2: Jewish and Total Populations in Germany, 1816–1933

Years	Jewish Population (thousands)	Total Population (thousands)	Share of Jewish over Total Population (%)	Annual Growth Rate of Jewish Population (%)	Annual Growth Rate of Total Population (%)
1816	214	21,989	0.97	---	---
1825	245	24,804	0.99	1.50	1.34
1834	270	27,064	1.00	1.08	0.97
1843	309	29,748	1.04	1.50	1.05
1852	329	31,693	1.04	0.70	0.70
1861	353	33,652	1.05	0.78	0.67
1871	383	36,323	1.05	0.82	0.76
1880	437	40,218	1.09	1.50	1.13
1890	467	44,639	1.04	0.67	1.04
1900	497	50,626	0.98	0.62	1.26
1910	539	58,451	0.92	0.81	1.44
1925	564	63,181	0.90	0.30	0.52
1933	503	66,022	0.76	-1.43	0.55

Sources: Blau (1950, p. 276, table 54); Bennathan (1932, p. 95, table 5).

Note: For the borders of Germany see Appendix A.

Table 3: Jewish and Total Populations in Austria, 1785–1934

Years	Jewish Population (thousands)	Total Population (thousands)	Share of Jewish over Total Population (%)	Annual Growth Rate of Jewish Population (%)	Annual Growth Rate of Total Population (%)
1785	70	7,724	0.90	---	---
1830	106	11,065	0.96	0.92	0.80
1857	172	13,006	1.32	1.79	0.60
1869	246	14,128	1.74	2.98	0.69
1880	319	15,180	2.10	2.36	0.65
1890	371	16,144	2.30	1.51	0.62
1900	413	17,587	2.35	1.07	0.86
1910	442	20,546	2.15	0.68	1.55
1934	308	17,433	1.77		

Sources: 1785–1900: Thon (1908, pp. 5–6, 8 table 1); 1910 Jews: Haas (1912, p. 149); Total: *Österreichische Statistik*, Neue Folge (1910–1915, vol 1 (1), p. 36); 1934: *American Jewish Year Book* (Vol. 37 (1935–1936), p.360, table 8); Vobecka (2013, for Bohemia, p. 47, table 4.1; for Moravia p. 219).

Note: For the borders of Austria see Appendix A. In this table Austria includes the Austrian Republic (the country after WWI), Bohemia, Moravia, and Silesia (part of Czechoslovakia).

Table 4: Jewish and Total Populations in Poland-Lithuania, 1500–1764

Years	Jewish Population (thousands)	Total Population (thousands)	Share of Jewish over Total Population (%)	Annual Growth Rate of Jewish Population (%)	Annual Growth Rate of Total Population (%)
1500 ^a	10–15	7,500	0.13	---	---
1550	55	8,500 ^b	0.65	2.6–3.4	0.11–0.22
1648	185	11,000	1.68	1.24	0.26
1660	163	8,000–9,000	1.81–2.03	-1.05	-2.0
1764 ^c	750	14,000	5.36	1.5	0.4–0.5

Sources: Jews: Weinryb (1972 p. 320); Stampfer (1997, pp. 263–267). Kupovetsky, YIVO (2010, October 12); Total: 1500, 1648, 1772 Gieysztorowa (1968, table 1, n.p.); (1981, p. 430, table 1); Jezierski & Leszczyńska (2003, p. 41, table 2.1); 1550: Łukasiewicz et al. (2014, p.49, table 2); 1660: based on Kuklo (2009, p. 212).

^a The date of 1500 is approximate. The estimates available are for the end of the 15th century.

^b The figure refers to the second half of the 16th century.

^c 1764/1765.

Table 5: Jewish and Total Populations in Poland-Lithuania, 1800–1939

Year	Jewish Population (thousands)		Total Population (thousands)		Share of Jewish over Total Population (%) ^c	Annual Growth Rate of Jewish Population (%)	Annual Growth Rate of Total Population (%)
	Former Poland Lithuania + Pale of Settlement ^a	Russian Empire outside Pale of Settlement	“Old” (Pre- partitioned Poland)	“New” (Pre- partitioned Poland + Pale of Settlement) ^b			
1800	1,066	9	15,751	19,735	6.77	1.00	0.33
1834	2,176	27	19,198	24,784	11.33	2.09	0.58
1850	2,811	41	21,402	27,740	13.13	1.60	0.68
1865	3,599	---	24,527	32,324	14.67	1.54	0.91
1880	4,702	155	30,520	40,710	15.41	1.78	1.46
1897	5,764	315	39,799	53,106	14.48	1.20	1.56
1926		5,037		64,305	7.83	-0.46	0.66
1939		5,377		75,715	7.10	0.50	1.26

Sources: **1800** Jews: SJE (1994 vol. 7 col. 385, table 7); Rosenfeld (1914, p. 140); Kupovetsky (2010, table 3); Silbergleit (1930, p. 7, table 5; pp. 18–19, table 9); Total: Rashin (1956, pp. 28–29, table 10); Gieysztorowa (1968, table 2); Zamorski (1989, p.45, table 1, p.46, table 2); *Jahrbuch für die amtliche Statistik des Preussischen Staates* (1883, p. 74, table 4). **1834**, SJE (1994 vol. 7 col. 385, table 7); Himka (1999, p. 26, table 1); Silbergleit (1930, pp. 18–19, table 9); Kemlein (1997, p. 58, table 2); Total: Rashin (1956, pp. 28–29, table 10); Guesnet (1998 p. 31 table 1); Zamorski (1989, p.45, table 1, p.46, table 2); *Jahrbuch für die amtliche Statistik des preussischen Staates*, (1883 p. 74, table 4). **1850** Jews: SJE (vol. 7, col. 385, table 7); Himka (1999, p. 26, table 1); Kemlein (1997, p. 58, table 2); Silbergleit (1930, pp. 18–19, table 9); Total: Rashin (1956, pp. 28–29, table 10); Gieysztorowa (1968, table 2); Zamorski (1989, p.45, table 1); *Jahrbuch für die amtliche Statistik des preussischen Staates*, (1883 p. 74, table 4). **1865** Jews: SJE (vol. 7, cols. 385, table 7); Rosenfeld (1914, p. 142); Kemlein (1997, p. 58, table 2); Silbergleit (1930, pp. 18–19, table 9); Total: Rashin (1956, pp. 44–45, table 19); Guesnet (1998 p. 31 table 1); Zamorski (1989, p. 69, table 12A); *Jahrbuch für die amtliche Statistik des preussischen Staates*, (1883 p. 76, table 4); **1880** SJE (vol. 7, cols. 382–90, table 7); Zamorski (1989, p. 69, table 12A); Silbergleit (1930, pp. 18–19, table 9); Total: Rashin (1956, pp. 44–45, table 19); Guesnet (1998, p. 31 table 1); Zamorski (1989, p.45, table 1); *Jahrbuch für die amtliche Statistik des preussischen Staates*, (1883 p. 76, table 4); **1897** Jews: SJE (vol. 7, cols. 382–90, table 7); Zamorski (1989, p. 69, table 12A); Silbergleit (1930, pp. 18–19, table 9); Total: Rashin (1956, pp. 44–45, table 19); Guesnet (1998, p. 31 table 1); Zamorski (1989, p. 69, table 12A); *Jahrbuch für die amtliche Statistik des preussischen Staates*, p. 76, table 4. **1925** Linfield (1931, vol.33, pp. 283, 315); Eberhardt (2003, p. 40, table 2.14); Jezierski (2003, p.357, table 84). **1939** Tolts (YIVO 12 October 2010 table 1); Linfield (1941, vol. 43, p.668); Lorimer (1946, pp. 241–242 table 22A).

^a These figures refer to the number of Jews in the territories of the former Poland-Lithuania as well as in the “non-Polish” areas of the Pale of Settlement.

^b These figures refer to the total population in pre-partitioned Poland as well as in the “non-Polish” areas of the Pale of Settlement.

^c The share of Jews over the total population is calculated using the figures in the column “old” for the total population.

Table 6: Births, Deaths, and Natural Increase (per 1000) for the Jewish and Total Populations in Poland-Lithuania (Galicia and Posen), 1777–1873

Years	Place	Births		Deaths		Natural Increase	
		Jewish Population	Total Population	Jewish Population	Total Population	Jewish Population	Total Population
1777–1800	Galicia ^a	36.5	35.4	20.2	25.4	16.5	10.0
1824–1873	Posen	35.3	41.1	22.2	30.0	13.1	11.1
Average		35.9	38.25	21.2	27.7	14.8	10.55

Sources: Budzyński (1993, vol. 1, p.108. table 7); Bergmann (1883, p. 136).

^a Data from 9 cities.

Table 7: Births, Deaths, and Natural Increase (per 1000) for the Jewish and Total Populations in Pre-Industrial Germany-Austria, prior to 1870

Years	Place	Births		Deaths		Natural Increase	
		Jewish Population	Total Population	Jewish Population	Total Population	Jewish Population	Total Population
1822–1864	Prussia	35.3	39.8	20–25	29.3	14.85	10.5
1863–1869	Hessen	29.5	34.5	18	24.5	11.5	10.0
1869	Bohemia	29.5	37.2	16.80	27.6	12.7	9.6
Average		31.4	37.2	18.35	27.1	13.0	10.0

Sources: For Prussia 1822–1864, Lestschinsky (1926, p. 26, table VIII). The calculation for Prussia in 1840–1864 is also based on Silbergleit (1930, pp.14–15, table 8). For Hesse, see Schmelz (1996, p. 108, table 3.1, p.112, table 3.5). For Bohemia, see Vobecka (2013, p.92, table 7.5; p.105, table 8.4).

Table 8: Births, Deaths, and Natural Increase (per 1000) for the Jewish and Total Populations in Poland-Lithuania and Germany-Austria, 1870–1910

Years	Place	Births		Deaths		Natural Increase	
		Jewish Population	Total Population	Jewish Population	Total Population	Jewish Population	Total Population
1882–1910	Galicia	39.80	44.30	21.50	29.20	18.3	15.10
1896–1904	E* Russia	35.15	49.40	17.15	31.65	18.0	17.75
1876–1910	Prussia	23.25	36.45	15.40	21.65	7.8	14.80
1870–1909	Hesse	23.90	33.10	16.00	20.90	7.9	12.30
1880–1910	Bohemia	20.00	34.35	15.35	23.90	4.65	10.45

Sources: For Galicia, European Russia, and Prussia see Kuznets (1975, pp. 63–64, table 6). For Hesse, see Schmelz (1996, p. 108, table 3.1, p. 112, table 3.5). For Bohemia, see Vobecka (2013, p. 92, table 7.5; p. 105, table 8.4).

Note: E* Russia = European Russia.

Table 9: Births, Deaths, and Natural Increase (per 1000) for the Jewish and Total Populations in Poland-Lithuania and Germany-Austria, 1911–1930

Years	Place	Births		Deaths		Natural Increase	
		Jewish Pop	Total Pop	Jewish Pop	Total Pop	Jewish Pop	Total Pop
1921–1930	Poland	28.8	33.5	14.3	17.60	14.5	15.9
1911–1925	Prussia	14.7	26.0	13.4	14.50	1.3	11.5
1914–1932	Hesse	11.0	18.5	15.5	13.25	-2.5	5.25
1926–1930	Bohemia	8.2	18.7	14.9	14.30	-6.7	4.4

Sources: For Jews in Poland, we use Marcus (1983, p. 173, table 25). For the total population in Poland, see GUS (2003, p.361, table 90 (355)). For Prussia, we use Kuznets (1975, pp. 63–64, table 6); for Bohemia, we use Vobecka (2013, p.92, table 7.5; p.105; table 8.4); and for Hessen, we use Schmelz (1996, p. 108, table 3.1, p.112, table 3.5).

Table 10: Infant and Child Mortality Rates per 1000 Live Births Among Jews and non-Jews in the Province of Posen, 1819–1863

Age at Death	Infant and Child Mortality Rates per 1000 Live Births		
	Jewish Population	Total Population	Percentage Difference
Just before or at birth	24	29	-17
From birth to 1 year old	146	200	-27
Total until 1 year old	170	229	-26
1–3 years old	91	107	-15
3–5 years old	33	47	-30
Total 1–5 years old	124	154	-20
Total from birth to 5 years old	294	383	-23

Source: The calculations are based on von Bergmann’s data (1883, p. 158 and Appendix F after p. 260).

Table 11: Infant Mortality Rates per 1,000 Live Births Among Jews and non-Jews in Poland-Lithuania and Germany-Austria, 1819–1870

Years	Location	Infant Mortality Rates per 1000 Live Births		
		Jewish Population	Total Population	Percentage Difference
1819–1863	Posen	170	229	-26
1867–1869	European Russia	154	272	-43
1851	Bohemia	162	257	-37
1851	Moravia	163	226	-28
1822–1840	Prussia	129	174	-26
1819–1870	East Prussia	136	208 ^a	-35
1819–1870	Westphalia	96	140 ^a	-31
1857–1870	Baden	186.5	275	-32
1827–1856	Magdeburg	135	225	-40
---	Average	160	221	-28

Sources: For Posen see von Bergmann’s data (1883, p. 158 and Appendix F after p. 260). For the total population in Russia between 1867 and 1869, see Mitchell (2003, p. 122, table A7). For the rest of the data, see Schmelz (1971, pp.15–25, table 3). Wherever Schmelz provided data for two denominations (i.e. Catholics and Protestants), their average is calculated.

^a The figure refers to the non-Jewish population.

Table 12: Infant Mortality Rates per 1,000 Live Births Among Jews and non-Jews in Poland-Lithuania and Germany-Austria, 1870–1910

Years	Location	Infant Mortality Rates per 1000 Live Births		Percentage Difference
		Jewish Population	Total Population	
1870–1904 ^a	European Russia	133	265.0	-50
1878	Bavaria	152	296.0	-49
1871–1873	Baden	182	277.5	-34
---	Average	155.6	279.5	-44

Sources: For the total population of Russia between 1870 and 1894, see Mitchell (2003, p. 122, table A7). For the rest of the data, see Schmelz (1971, pp. 15–25, table 1).

^a The data refers to the years 1870–1897 and 1900–1904.

Table 13: Infant Mortality Rates per 1,000 Live Births Among Jews and non-Jews in Poland-Lithuania and Germany-Austria, 1911–1930

Years	Location	Infant Mortality Rates per 1000 Live Births		Percentage Difference
		Jewish Population	Total Population	
1926	Soviet Union	57	174	-67
1926–1930	Poland	64	160 ^a	-60
1927–1930	Lithuania	36	158	-77
1926–1930	Latvia	43	93	-54
1921–1929	Carpatho-Russia	109	181	-40
1921–1929	Bohemia	58	168	-66
1921–1929	Moravia	69	168	-59
1920–1929	Hessen	49	83	-41
1925–1929	Bavaria	42	124	-66
---	Average	58.5	145.4	-60

Source: Schmelz (1971, pp. 15–25, table 1).

^a The figure refers to the non-Jewish population.

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