Journal of Interdisciplinary History, LI:4 (Spring, 2021), 533–564.

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Socioeconomic and Marital-Status Inequalities in Longevity: Adult Mortality in Transylvania, 1850–1914

1850–1914 This article investigates adult mortality in Transylvania between the middle of the nineteenth century and the outbreak of World War I. The information extracted from parish death registers in the newly constructed Historical Population Database of Transylvania (HPDT) allows for a methodology that can consider a wide range of factors, from civil and socioeconomic status to time period and residential locality. Research has discovered that the various ways in which mortality has evolved cannot be attributed to a simple, unifactorial cause; a series of social, economic, cultural, geographical and environmental variables always is important. The analytical models developed to explain mortality trends on this basis are encouraging.[1]

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 https://doi.org/10.1162/jinh_a_01627

1 Bolovan et al., "Historical Population Database of Transylvania: A Database Manual," *Studia Universitatis Babeş-Bolyai. Digitalia*, LXIV (2019), 9–85; Roger Schofield and David Reher, "The Decline of Mortality in Europe," in *idem* and Alain Bideau (eds.), *The Decline of Mortality in Europe* (New York, 1991), 1–17; Traian Rotariu, *Demografie şi sociologia populaţiei: Fenomene demografice* (Iaşi, 2003), 99-101.

Even though adult mortality has received less academic attention than infant mortality, the topic has never been completely neglected. Studies of adult mortality in the past mainly originated in countries situated in northwestern Europe—Belgium, the Netherlands, and Sweden—primarily involving variables such as gender, marital status, religious denomination, habitat, and socioeconomic status. As yet, only a few investigations have explored adult mortality in Eastern Europe; the construction of historical databases there is still in its incipient phase. Romanian researchers, however, have already taken the first steps toward bridging this gap by starting to access the individual-level data in the HPDT. The vast amount of information contained therein will enable further, and more comprehensive, studies of mortality, as well as other phenomena.[2]

2 Marco Breschi, Renzo Derosas, and Matteo Manfredini, "Mortality and Environment in Three Emilian, Tuscan, and Venetian Communities, 1800–1883," in Tommy Bengtsson et al. (eds.), *Life under Pressure: Mortality and Living Standards in Europe and Asia, 1700–1900* (Cambridge, Mass. 2004), 209–252; Sören Edvinsson, "Adult Mortality and Childhood Conditions: Long-Term Effects of Urban Life in 19th-Century Sweden," in Lars-Göran Tedebrand and Peter Sköld (eds.), *Nordic Demography in History and Present-Day Society* (Umeå, 2001), 247–268; Muriel Neven, "Mortality Differentials and the Peculiarities of Mortality in an Urban-Industrial Population: A Case Study of Tilleur, Belgium," *Continuity and Change*, XV (2000), 297–329; Frans van Poppel and Inez Joung, "Long-Term Trends in Marital Status Mortality Differences in the Netherlands 1850-1970," *Journal of Biosocial Science*, XXXIII (2001), 279–303; Sam Williner, "Gender and Mortality with Regard to Marital Status in 19th Century Sweden," in Tedebrand and Sköld (eds.), *Nordic Demography*, 233–246; Sören and Marie Lindkvist, "Wealth and Health in 19th Century Sweden: A Study of Social Differences in Adult Mortality in the Sundsvall Region," *Explorations in Economic History*, XLVIII (2011), 376–388; Bengtsson and Martin Dribe, "The Late Emergence of Socioeconomic Mortality Differentials: A Micro-Level Study of Adult Mortality in Southern Sweden 1815–1968," *Explorations in Economic History*, XLVIII (2011), 389–400; Niels Schenk and van Poppel "Social Class, Social Mobility and Mortality in the Netherlands, 1850–2004," *Explorations in Economic History*, XLVIII (2011), 401–417; Grażyna Liczbińska, "Diseases, Health Status, and Mortality in Urban and Rural Environments: The Case of Catholics and Lutherans in 19th-Century Greater Poland," *Anthropological Review*, LXXIII (2010), 21–36; *idem*, "Ecological Conditions vs. Religious Denomination: Mortality among Catholics and Lutherans in Nineteenth-Century Poznań," *Human Ecology*, XXXIX (2011), 795–806; Noël Bonneuil and Elena Fursa, "Learning Hygiene: Mortality Patterns by Religion in the Don Army Territory (Southern Russia), 1867–1916," *Journal of Interdisciplinary History*, XLVII (2017), 287–332; Hannaliis Jaadla, Allan Puur, and Kaja Rahu, "Socioeconomic and Cultural Differentials in Mortality in a Late 19th Century Urban Setting: A Linked Records Study from Tartu, Estonia, 1897–1900," *Demographic Research*, XXXVI (2017), 1–40; Georgiana Coroian, "Infant Mortality in Rural Transylvania: A Case Study on Four Parishes in the Second Half of the 19th Century," *Romanian Journal of Modern History*, VIII (2017), 5–18.

THE SOCIOECONOMICS OF TRANSYLVANIA, 1850 TO 1914 Transylvania, an important region in modern Romania, is home to an ethnically and religiously diverse range of settlers who coexist alongside native Romanians. The population of Transylania has historically consisted of Romanians, Hungarians, Germans, Jews, Slovaks, Serbs, Armenians, and Gypsies, encompassing seven religious denominations—Orthodox, Greek Catholic, Calvinist (Reformed), Roman Catholic, Lutheran, Mosaic, and Unitarian. The last census before the outbreak of World War I, conducted by Hungarian authorities in Budapest in 1910, found that Romanians comprised 55.3 percent of Transylvania's total population, despite economic, cultural, and social measures introduced to establish a Hungarian majority in the eastern region of the Austro-Hungarian Empire principally inhabited by Romanians, Slovaks, and Serbs. After World War I, however, Transylvania became part of the Romanian State.[3]

The period from 1850 to 1914 brought important changes to Transylvania, instigated largely by industrialization, even though modernization progressed at a slower pace there than in other regions of the former Habsburg Empire. Before the outbreak of World War I, only 12.4 percent of Transylvania's population lived and worked in cities; the corresponding figure was almost 25 percent in other parts of the former Austro-Hungarian Empire. Overall, socioeconomic realities highlighted the idiosyncratic agrarian–industrial profile of the province; many localities gradually embraced industrial development, slowly connecting to wider transport and communication networks, while other areas remained predominantly agrarian.

The period was marked by challenging economic crises, natural calamities, and epidemics (the most devastating being the cholera epidemics of 1872/3) that affected the demographic behavior of the Transylvanian population. Any analysis of adult mortality in northwestern Europe during this period generally involves two groups of variables—individual factors and broader contextual-structural factors.[4]

3 Bolovan, Holom, and Marius Eppel, "Ethnicity and Politics: Censuses in the Austro-Hungarian Empire (Case Study: Transylvania, 1869–1910)," *Romanian Journal of Population Studies*, X (2016), 149–150.

4 Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918: Contribuţii demografice* (Cluj-Napoca, 2000), 83; *idem* and Sorina Paula Bolovan, *Transylvania in the Modern Era: Demographic Aspects* (Cluj-Napoca, 2003), 35–37.

INEQUALITIES IN ADULT MORTALITY: INDIVIDUAL FACTORS

Marital Status Around 1900 in Western Europe, 6 to 20 percent of men aged forty-five to forty-nine were unmarried; the percentage of unmarried females ranged from 10 to 29 percent. In contrast, in Eastern Europe only 3 to 9 percent of men and 1 to 4 percent of women around the age of fifty were single. Despite the relatively high percentage of bachelors and spinsters in Western Europe, traditional society in European countries, as well as in the Transylvanian region, considered single status to be far from ideal. In rural Scandinavia, for example, unmarried people, regardless of their gender, were the subject of pity and ridicule not only in folklore and popular art but also in everyday life: the singleton had a lowly and humble position within the community. Similarly, in Transylvanian society, those who did not marry were viewed as "sinners, unhappy, dead in both the soul and the body."[5]

Above all, a common feature of the old demographic regime, roughly between 1850 and 1880, was the high mortality that affected family life, generating the dissolution of many marital unions. Transylvanian documents show that in 1882, the County of Lower Alba witnessed 1,755 marriages and 1,310 dissolutions due to the death of one of the partners. In Cluj County, the corresponding figures were 1,930 and 1,582, in Mureş-Turda, 1,728 and 1,315, and in Turda-Arieş, 1,370 and 1,029. Nonetheless, most people by far were married, and in some parts of Western Europe, society regarded marriage as a prerequisite for happiness, security, safety, social status, and certainly reproduction. In Transylvanian society, marriage provided individuals with a "place among people": Starting a family meant reaching the threshold of maturity and forging closer links with other families and the community at large. Beyond social implications, marriage also had inevitable effects on individual lives. Previous research has established that married people were less exposed to mortal danger, especially men. Women were not so fortunate; the inferior state that

5 John Hajnal, "European Marriage Patterns in Perspective," in David Victor Glass and David Edward Charles (eds.), *Population in History: Essays in Historical Demography* (London, 1965), 102–103; David Gaunt and Orvar Löfgren, "Remarriage in the Nordic Countries: The Cultural and Socio-Economic Background," in Jacques Dupâquier et al. (eds.), *Marriage and Remarriage in Populations of the Past* (New York, 1981), 49-60; Simeon Florea Marian, *Nunta la români: Studiu istorico-comparativ etnografic* (Bucureşti, 2000), 21.

traditional societies ascribed to them from birth persisted throughout their lives.[6]

Since boys carried the family name and guaranteed the patrimony, girls' treatment tended to reflect their lack of status, and because marriage entailed girls leaving the households of their upbringing, their departure could also mean a loss of labor and revenue. Placed initially under the authority of their father—and then their husband—women were responsible for preparing food, making clothes, taking care of young children and elderly relatives, and laboring in the fields, even during pregnancy and immediately after giving birth. The consequences of such sustained effort often led to a premature decline in bodily immunity, illness, and early death.[7]

The selection mechanism of the marital market disadvantaged those who suffered from physical disabilities, exhibited a precarious financial situation, or displayed unhealthy or indecorous behaviors. Men had to demonstrate the necessary economic means to establish a family. Women not only had to be attractive; they also had to be strong enough and capable enough to produce children and care for them, not to mention obedient and dutiful.[8]

Socioeconomic Status The mortality gradient for socioeconomic status has two putative components, constancy and divergence/convergence. Constancy, as developed by Link and Phelan, signifies the idea that the differences in mortality according to socioeconomic position remained almost unchanged over time because of the unyielding advantage enjoyed by the elite in the struggle for survival. In support, Link and Phelan cite the resources (money, power, prestige, and influence) always available to those at the pinnacle of society that

6 *Magyar Statistikai Évkonyv* (1886), I, 12–21; van Poppel and Joung, "Long-term Trends in Marital Status," 283–284; Sorina Paula Bolovan, *Familia în satul românesc din Transilvania: A doua jumătate a secolului al XIX-lea şi începutul secolului XX* (Cluj-Napoca, 1999), 75–76, 140; Williner, "Gender and Mortality," 233; van Poppel and Joung, "Long-Term Trends," 289; Edvinsson and Lindkvist, "Wealth and Health," 383; Holom, "Patriarchal Relationships in Romanian Rural Communities in Transylvania (Second Half of the 19th Century–Early 20th Century)," *Romanian Journal of Population Studies*, X (2016), 44–46.

7 Holom, "Patriarchal Relationships."

8 Van Poppel and Joung, "Long-Term Trends," 281; Williner, "Gender and Mortality," 233; Adriana Florica Muntean, "Condiţia femeii măritate în societatea tradiţională transilvăneană din a doua jumătate a secolului al XIX-lea," in Ghizela Cosma, Enikő Magyari-Vincze, and Ovidiu Pecican (eds.), *Prezenţe feminine: studii despre femei în România* (Cluj-Napoca, 2002), 160–162.

enable them to access better health care and thus reduce the risk of illness and early death.[9]

Divergence/convergence, proposed by Antonovsky, is based on the observation that people of different social backgrounds evinced no discernible differences in mortality until the middle of the seventeenth century; rich and poor alike suffered equally from the virulence of infectious diseases. Between the mid-seventeenth and mid-nineteenth century, however, inequalities between the different strata of society sharply increased as a result of industrialization, as reflected in the proliferation of diseases, living conditions, sanitation, and nutrition, all of which created and exacerbated mortality differences by social rank. After the middle of the nineteenth century, however, these socioeconomic inequalities began to fade, and the differences in mortality among classes have remained extremely low ever since.[10]

Empirical data for the nineteenth- to twentieth-century period do not support the constancy hypothesis, and studies of other eras demonstrate Antonovsky's hypothesis to be the stronger of the two, even though inequalities emerged at different times and affected only some regions during the twentieth century. Notwithstanding the lack of studies concerning differences in mortality by socioeconomic status in Transylvania, researchers have concluded that even a single village with an overwhelming agrarian profile could manifest extremely large discrepancies between wealthy peasants (with plenty of land, livestock, servants, money, and prestige) and agricultural laborers responsible for the care of many children, who relied on the breadline. Such disparities certainly affected the demographic behavior of individuals and influenced the incidence of mortality among different sections of the population.[11]

9 Bruce G. Link and John Christopher Phelan, "Understanding Sociodemographic Differences in Health: The Role of Fundamental Social Causes," *American Journal of Public Health* LXXXVI (1996), 471–473; Bengtsson and van Poppel, "Socioeconomic Inequalities in Death from Past to Present: An Introduction," *Explorations in Economic History*, XLVIII (2011), 346; Bengtsson and Dribe, "Late Emergence of Socioeconomic Mortality Differentials," 390; Jaals, Puur, and Rahu, "Socioeconomic and Cultural Differentials," 4.

10 Aaron Antonovsky, "Social Class, Life Expectancy and Overall Mortality," *Milbank Quarterly*, XLV (1967), 31-73; Bengtsson and van Poppel, "Socioeconomic Inequalities," 346; Bengtsson and Dribe, "Late Emergence of Socioeconomic Mortality Differentials," 390; Jaals, Puur and Rahu, "Socioeconomic and Cultural Differentials," 4–5.

11 Schenk and van Poppel, "Social Class," 409; Bengtsson and Dribe, "Late Emergence of Socioeconomic Mortality Differentials," 396; Simion Retegan, "Realităţi demografice ale satului românesc din nordul Transilvaniei la mijlocul secolului al XIX-lea," in Nicolae Edroiu, Aurel Răduţiu, and Pompiliu Teodor (eds.), *Civilizaţie medievală şi modernă românească: Studii istorice* (Cluj-Napoca, 1985), 172.

INEQUALITIES IN ADULT MORTALITY: CONTEXTUAL–STRUCTURAL FACTORS

Locality Residential locality—along with the environment and its associated conditions—had a major influence on the health of previous generations and on their likelihood of contracting certain diseases. Research shows conclusively that location was one of the most important factors influencing survival prospects. Peripheral or predominantly rural areas provided people with better protection against infectious diseases; cities and localities with commercial activity and good transportation links facilitated the spread of pathogenic agents due to migration and population congestion. The processes of industrialization in localities had an even greater effect on people's lives, threatening severe mortality from overpopulation, unsanitary working or living conditions, and poor hygiene because of a lack of proper wastewater disposal. Diseases such as cholera, typhus, and tuberculosis found conditions amenable to their rapid spread in industrial areas, thus generating a higher number of deaths among adult populations.[12]

Transylvania began to industrialize in the second half of the nineteenth century, accelerating the process after 1880. The advent of industry provided employment and daily sustenance for many people but at a cost. Testimonies of those working in the Transylvanian mining and metallurgical sector between 1848 and 1867 highlight the trials and tribulations of hard labor, the precariousness of the living conditions, and the inadequacy of the sanitation. A working day lasted as many as twelve hours, away from sunlight and in an atmosphere sometimes polluted by deadly gases, with debilitating consequences for the workers' physical strength and overall well-being. The health problems that miners and metallurgical workers endured included respiratory, rheumatic, digestive, skin, and connective-tissue disorders. Among the most common diseases afflicting miners were silicosis and ancylostomiasis, as well as toxic poisoning for those processing precious and nonferrous metals. Infectious diseases, such as

12 Edvinsson and Lindkvist, "Wealth and Health," 380; Liczbińska, "Diseases, Health Status, and Mortality," 30–31; Neven, "Mortality Differentials," 304, 303; Liczbińska, "Ecological Conditions vs. Religious Denomination," 803; William D. Johnston, "Tuberculosis," in Kenneth F. Kiple (ed.), *The Cambridge World History of Human Diseases* (New York, 1993), 1059; Steven L. Hoch, "Famine, Disease, and Mortality Patterns in the Parish of Borshevka, Russia, 1830–1912," *Population Studies: A Journal of Demography*, LII (1998), 361.

tuberculosis and typhus, appear to have been common as well, but cholera claimed a higher number of victims.[13]

Time Periods Economic and epidemic crises constrained individuals' chances of survival. Mortality escalated when production declined, prices rose, and disease erupted. Livi-Bacci showed that increases in the price of cereals between the sixteenth and early nineteenth century also led to higher mortality among the population of numerous European countries, followed, in most cases, by the outbreak of epidemics. Economic fluctuations and high prices frequently influenced mortality rates, particularly in poor areas; because badly nourished people had less immunity to infection, they typically struggled to fight even the mildest of diseases.[14]

In the mid-nineteenth century, the European continent suffered a series of epidemics, among the most harmful of which was cholera; their rapid spread throughout vast, densely populated areas, often turned them into pandemics. In the middle of the nineteenth century, a third cholera pandemic ravaged Europe, lasting from 1839 until 1855. The fourth cholera pandemic started in 1863 and ended c. 1874. The fifth occurred between 1881 and 1892 and the sixth between 1899 and 1923.[15]

The death rate due to cholera from 1847 to 1849 and in 1855 among the Lutherans who lived in the Zion of Bielitz (currently Bieslko-Biala, Poland) was 11.9 per 1,000; in nonepidemic years (from 1845 to 1846, 1850 to 1854, and 1856 to 1864), the mortality rate from cholera was 0.3 per 1,000. In Hamburg, the 1892 cholera mortality rate was 13.4 per 1,000 in the city and 2.1 per 1,000 in the nearby suburb of Altona, where the rate was lower because of the efficient water-filtering plant for the Elbe River. In Poznań, Poland, the 1866 cholera epidemic lasted from June 23 to November 8, causing 50.5 per 1,000 of all deaths recorded during that year. The succession of economic and health crises that Transylvania endured during the second half of the nineteenth century proved extremely

13 Robert Nagy, *Capitalul-forţă a transformării: rolul capitalului german în industrializarea Transilvaniei (1880–1918)* (Cluj-Napoca, 2011), 81–83; Ludovic Vajda, "Date privind condiţiile de muncă şi de trai ale minerilor din Transilvania între 1848-1867," *Studia Universitatis Babeş-Bolyai: Series Historia*, II (1969), 86–87.

14 Massimo Livi-Bacci (trans. Alina Vamanu), *Populaţia în istoria Europei* (Iaşi, 2003; orig. pub. in Italian 1998), 54–57; Bengtsson, "Living Standards and Economic Stress," in *idem* et al. (eds.), *Life under Pressure: Mortality and Living Standards in Europe and Asia, 1700–1900* (Cambridge, Mass., 2004), 37, 40–42; Breschi, Derosas, and Manfredini, "Mortality and Environment," 245.

15 Reinhard S. Speck, "Cholera," in Kiple (ed.), *Cambridge World History of Human Diseases*, 647.

destructive, especially between 1850 and 1880 when the region was still ensconced within the old demographic regime.[16]

In 1866, the cholera epidemic arrived in Transylvania after a prolonged, severe drought in the plains and northern areas between 1864 and 1866, resulting in famine and leaving many deaths in its wake. The eighth decade of the nineteenth century was especially detrimental to the Transylvanian population; the gross mortality rate escalated to 40.9 per 1,000 between 1871 and 1875, compared to a more modest 24.9 per 1,000 between 1856 and 1859. Transylvania was also hit by a financial and economic crisis in 1873 that greatly reduced the purchasing power of the population. Later, from 1874 to 1877, a shortage of crops led to an increase in the price of food staples with dire consequences for peasant health. The cholera epidemic of 1872/3 affected 57,551 people, 22,053 of whom lost their lives.[17]

Livi-Bacci argued that by the end of the nineteenth century, the European population gradually managed to leave behind the old demographic regime and to move toward a more stable system. The result was a steep decline in deaths from infectious epidemic diseases and a drop in the frequency of subsistence crises, ensuring better chances of long-term adult survival, even into old age. Similarly, after 1880, Transylvania entered a different phase of demographic evolution—impeded by only infrequent and isolated cases of mortality-inducing epidemics—benefiting from investments in industry, technology, hygiene, health, and social-protection systems to combat disease and death. In 1857, the proportion of the entire population older than 60 was 5.6 percent; by 1910, this figure had risen to 9 percent.[18]

In 1850, Transylvania was one of the most underdeveloped provinces in the Habsburg Empire. The few industries in operation used rudimentary techniques and only supplied products that met the needs of the local markets. Even though the sector underwent numerous positive changes—especially in siderurgy (iron and steel), mining, and food production—between 1867 and 1873, the economic crisis

16 Arkadiusz Wrębiak, "Cholera and Typhoid Fever in 19th-Century Bielitzer Zion," *Anthropological Review*, LXXIII (2010), 40; Asa Briggs, "Cholera and Society in the Nineteenth Century," *Past & Present*, 19 (1961), 87; Liczbińska, "Ecological Conditions," 802.

17 Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918*, 140–142, 145; Marin Iosif Balog, "Criza economică din 1873: Manifestarea şi percepţia ei în economia şi societatea transilvană," *Anuarul Institutului de Istorie George Barițiu din Cluj-Napoca, series Historica*, L (2011), 66.

18 Livi-Bacci, *Populaţia în istoria Europei*, 149–166; Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918*, 46–52, 223.

of 1873 set it back until the end of the 1880s. Between 1850 and 1880, Transylvania was still in the first phase of industrial development, only entering the second phase after a tranche of legislative measures supported industrial growth in 1881. Law 44 of 1881—described in the literature as the first law for supporting industry—stipulated that new factories (those manufacturing new products or deploying the latest technology) could enjoy fifteen years of tax exemption. Law 13 of 1890—the second law supporting industry—further guaranteed tax exemption and offered cash grants and equipment at the state's expense. Indeed, law 49 of 1899 and law 3 of 1907 were further measures introduced to bestow financial assistance upon businesses, the latter providing tax exemptions of thirty years in some cases for newly established companies.[19]

RESEARCH HYPOTHESES Material conditions were not the only determinants of the adults' chances of survival. Besides factors specific to individuals, wider temporal and spatial contexts in which people lived were also significant. Taking into consideration the results of earlier studies in the light of Transylvania's situation, we formulate the following hypotheses:

(1) A transition from the old demographic regime—hampered, as it was, by repeated, widespread epidemics and economic shortages—to a more stable demographic regime—marked by a decrease in the frequency of crises, an increase in industrial development, and an improvement in public sanitation—generated new, but also preserved old, factors that affected adult mortality.

(2) Place of residence mattered for adult mortality. Structural residential and local conditions, and their evolution over time, influenced adults' chances of survival.

(3) Individuals situated at the bottom of the social hierarchy became more exposed to the risk of early death; the changes in agriculture and the advent of industrialization limited the access of the less affluent to resources and impaired their living and working conditions.

19 Marin Iosif Balog, *Dilemele modernizării: Economie şi societate în Transilvania, 1850–1875* (Cluj-Napoca, 2007), 189–198, 201; Nagy, *Capitalul-forţă a transformării*, 81–83.

(4) Matrimonial market selection and marriage protection (especially for men) influenced chances of individual survival.

DATA, VARIABLES, AND METHODOLOGY

Data The main sources for the data extracted from the HPDT are parish registers containing vital details of baptisms, engagements, marriages, and burials. Since the process of linking individuals from different parish registers is still in the test phase, the present investigation consults only thirty-three parish death registers belonging to Greek Catholic, Orthodox, Roman Catholic, Calvinist (Reformed), and Jewish denominations, covering the years 1850 to 1914. The registers included data for seven settlements in four neighboring counties—Lower Alba, Mureş-Turda, Turda-Arieş, and Cluj—in the center of today's Romania. They yielded a working sample of 6,719 cases (deaths), as compiled by Transylvanian priests, though they had lapses in registration records for marital status and occupation, especially during the first thirty years after 1850.[20]

Variables The dependent variable for this research was age of death, which was either explicitly recorded in the parish registers or calculated from the recorded birth date and the date of death/burial. The independent variables, in relation to our research hypotheses, were locality and period and civil and socioeconomic status. Where and when someone lived, along with their marital status and occupation, were expected to generate differences in their chances of long-term survival.

Locality Type. The economic profile of the region, combined with its connection to market activity and available transportation, were the main criteria used to divide localities into two groups, open and peripheral. The open category—referring to localities' commercial and industrial characteristics—includes Ocna Mureş, Războieni, and Gurghiu; the peripheral category includes Caşva, Orşova, Hodac, and the isolated and mountainous Muntele Rece, all of which were predominantly agricultural. The status of fully

20 The record-linkage process was time-consuming and challenging, given the ethnic and denominational diversity of the Transylvanian population, the heterogeneity of information, and changes in the manner of registration over time. For a detailed discussion, see Angela Lumezeanu, "Insights into Designing and Building a Historical Population Database," *Romanian Journal of Population Studies,* XII (2019), 78–95.

urban is reserved for only eighteen localities in Transylvania during the period under investigation.[21]

Ocna Mureş, which functioned as a borough throughout the nineteenth century, began the construction of a rail connection to the station in Războieni, an important Transylvanian railroad hub, in 1872. Yet Ocna Mureş was primarily known for its long tradition of exploiting salt minerals. Large industrial investments after 1881 transformed it into the most modern salt mine in Transylvania. Its number of employees made it the second-largest salt mine in the Kingdom of Hungary. In 1896, a factory specializing in the production of calcined and crystallized soda opened there. After 1910, it added the production of caustic soda. Războieni's evolution into an open settlement, involving local and regional migration, started especially after the establishment of the Cluj–Războieni railway system and opening of the railway station in 1873. Between 1862 and 1918, Gurghiu became an important borough that attracted people from across the valley. It housed porcelain, cellulose, and alcohol factories, as well as several sawmills. Data from the 1910 census indicates that people in these open settings worked largely in the mines or in occupations related to the industrial, commercial, transportational, and public-service sectors. Conversely, those in peripheral localities earned their living, to a great extent, from farming (Table 1).[22]

Period. The construction of the period variable entailed dividing data into two timelines reflecting our intention to capture differences between Transylvania's old demographic regime (1850–1880) and its new and dynamic demographic and economic system (1881–1914). The beginning of second period carries the date of the Kingdom of Hungary's first important law promoting industrial development.

Marital Status. The four classifications of this variable are unmarried, married, previously married (widowed or divorced), and unspecified (the relevant information being absent from the registers).

Socioeconomic Status. Occupations reported in the death registers were encoded according to the Historical International Standard of Classification of Occupations (HISCO) and later assumed under the Social Power (SOCPO) scheme, albeit only men's occupations because

21 Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918*, 84.

22 See Holom, Oana Sorescu-Iudean, and Hărăguş, "Beyond the Visible Pattern: Historical Particularities, Development, and Age at First Marriage in Transylvania, 1850–1914," *History of the Family*, XXIII (2018), 340–341.

Table 1 The Occupational Profile of the Two Types of Localities according to 1910 Census Data

TYPE OF LOCALITY	DOMAIN	NUMBER	%
Open	Agriculture, gardening, forestry	628	19.6
	Other branches of the primary economy	22	0.7
	Mining, siderurgy	679	21.2
	Industry and handicrafts	819	25.6
	Trade, credit	123	3.8
	Transport	164	5.1
	Public service, freelancers	123	3.8
	Army	10	0.3
	Day laborers	11	0.3
	Servants	261	8.1
	Unknown occupations	364	11.4
	Total	3,204	100.0
Peripheral	Agriculture, gardening, forestry	2,144	83.8
	Other branches of the primary economy	144	5.6
	Mining, siderurgy	0	0.0
	Industry and handicrafts	90	3.5
	Trade, credit	22	0.9
	Transport	37	1.4
	Public service, freelancers	22	0.9
	Army	1	0.0
	Day laborers	19	0.7
	Servants	7 5	2.9
	Unknown occupations	5	0.2
	Total	2,559	100.0

SOURCE Traian Rotariu (ed.), *Recensământul din 1910: Transilvania: Populaţia după ocupaţii* (Cluj-Napoca, 2006).

the priests did not record women's reliably. We modified the SOCPO scheme slightly to move farmers from the middle class to a distinct category called *agricultors* because peasants, even those who owned land, did not have enough money or social capital to share the middle class with more well-to-do landowners. Moreover, peasants may not have enjoyed the same level of social prestige as that accorded to bureaucrats, tax collectors, or postal and telegraph officials.[23]

Because of the limited number of individuals assigned to the elite and middle-class categories—and to ensure similar levels of wealth

23 Marco M. H. van Leeuwen, Ineke Mass, and Andrew Miles, *HISCO: Historical International Standard Classification Of Occupations* (Leuven, 2002); Kees Mandemakers et al., *HSN Standardized, HISCOcoded and Classified Occupational Titles* (Amsterdam, 2018).

and social prestige within each group—we combined these classes into a single category named *upper/middle-class*. The resulting scheme comprises six categories: (1) upper/middle-class (executives performing general policy tasks, local businesspeople and supra-local businesspeople, highly skilled [nonmanual] people, members of the nobility, supervisors of skilled people, manual superskilled people, and nonmanual skilled people); (2) agricultors; (3) skilled workers (supervisors of semi- and unskilled workers and manual skilled workers); (4) semiskilled workers (including the locally oriented self-employed with access to minimal capital); (5) unskilled workers; and (6) unspecified. Occupation titles in the SOCPO scheme that fall into the upper/middle-class category herein are physician, notary, priest, noble, landowner, pharmacist, teacher, road supervisor, and postmaster. Peasant and wine grower are in the agricultor category; shoemaker, tailor, carpenter, and caporal correspond with skilled worker; soldier, salt-mine worker, and miller correspond with semiskilled worker; and day laborer, rail worker, shepherd, and beggar correspond with unskilled worker.

Table 2 shows the distribution of events (deaths) in our sample, according to the variables. For both men and women, around 60 percent of events were registered in open localities and around 50 percent occurred during both time periods. Socioeconomic status has a large number of missing values, and the unregistered cases account for 46.5 percent of men. We suspect that rural priests under-recorded occupations because of the overwhelming concentration of workers employed in the agriculturally based economy; they likely noted only the exceptions. Around half of the individuals whose deaths were registered in our sample were married; more than one-quarter of men had an unspecified marital status, probably because most of them were looking for work in open localities, leaving the compiler of the registers in the dark about their matrimonial situation.

Method We treat our data concerning age of death from a survival perspective, using Cox regressions for multivariate analysis. However, working with data on deaths, rather than with individual life-course histories, means that we do not have right-censored cases because all individuals experienced the event under investigation. Hence, in the multivariate analysis, we interpret the Cox regression coefficients as indicative of the risks of earlier death. A higher risk of dying earlier suggests increased mortality for a particular category in comparison with the reference. Focusing on adult mortality, we include in our analysis people who died after turning twenty-four,

Table 2 Distribution of Deaths by Locality, Time Period, Socioeconomic and Marital Status, and Gender, 1850–1914

MEN			WOMEN		
LOCALITY TYPE					
Open	2,053	60.7%	Open	1,927	57.8%
Peripheral	1,330	39.3%	Peripheral	1,409	42.2%
TIME PERIOD					
1850–1880	1,668	49.3%	1850–1880	1,575	47.2%
1881–1914	1,715	50.7%	1881–1914	1,761	52.8%
SOCIOECONOMIC STATUS					
Unskilled workers	332	9.8%			
Semiskilled workers	481	14.2%			
Skilled workers	167	4.9%			
Agricultors	628	18.6%			
upper/middle class	202	6.0%			
Unspecified	1,573	46.5%			
MARITAL STATUS					
Married	1,715	50.7%	Married	1,733	51.9%
Previously married	516	15.3%	Previously married	1,150	34.5%
Unmarried	263	7.8%	Unmarried	179	5.4%
Unspecified	889	26.3%	Unspecified	274	8.2%
Total	3,383	100.0%	Total	3,336	100.0%

SOURCE Historical Population Database of Transylvania (authors' calculation).

since this was considered the age of majority for both men and women under the civil law of Transylvania during that period. We performed the analysis separately for men and women and separately for the two time periods.[24]

Descriptive Results Table 3 shows the mean and median ages at death, according to categories of independent variables and the tests of equality of means among categories of each variable under scrutiny. Descriptive indicators show variation in the mean and median ages at death, for all independent variables and for both men and women. The exception is locality type in the case of women, which shows no difference in the mean or median ages at death between females in open and peripheral localities. Men in peripheral localities

24 Bolovan, Holom, et al. (eds.), *Legislaţia ecleziastică şi laică privind familia românească din Transilvania în a doua jumătate a secolului al XIX-lea* (Cluj-Napoca, 2009), 228–229.

Table 3 Mean and Median Ages at Death, by Locality, Time Period, Marital and Status, and Gender, 1850–1914

MEN							
VARIABLE	CATEGORIES	N	MEAN	STD. DEVIATION	MEDIAN	F	SIG.
LOCALITY TYPE	Open	2,053	52.81	16.20	52.0	73.076	.000
	Peripheral	1,330	57.89	17.91	60.0		
PERIOD	1850–1880	1,668	52.12	16.47	50.0	83.562	.000
	1881–1914	1,715	57.42	17.24	59.0		
SOCIOECONOMIC STATUS	Unskilled workers	332	54.02	15.29	54.0	13.776	.000
	Semiskilled workers	481	51.94	15.63	51.0		
	Skilled workers	167	53.94	16.72	53.0		
	Agricultors	628	59.55	16.55	60.0		
	Upper/middle class	202	52.72	15.70	52.0		
	Unspecified	1,573	54.31	17.90	54.0		
MARITAL STATUS	Married	1,715	54.56	15.92	54.0	236.648	.000
	Previously married	516	68.48	13.25	70.0		
	Unmarried	263	38.71	15.76	31.0		
	Unspecified	889	52.11	15.90	50.0		
TOTAL		3,383	54.80	17.07	55.0		

WOMEN							
VARIABLE	CATEGORIES	N	MEAN	STD. DEVIATION	MEDIAN	F	SIG.
LOCALITY TYPE	Open	1,927	54.53	17.58	56.0	0.086	.770
	Peripheral	1,409	54.72	18.70	56.0		
PERIOD	1850–1880	1,575	52.28	17.42	51.0	50.161	.000
	1881–1914	1,761	56.69	18.37	59.0		
MARITAL STATUS	Married	1,733	47.58	15.71	46.0	455.279	.000
	Previously married	1,150	67.90	13.15	69.0		
	Unmarried	179	43.22	18.36	38.0		
	Unspecified	274	50.67	17.67	48.0		
Total		3,336	54.61	18.06	56.0		

SOURCE Historical Population Database of Transylvania (authors' own calculation).

died later than men in open localities; agricultors lived the longest and semiskilled workers the shortest. Unmarried men died earliest. Men died much later during the second time period than during the first. Women's age at death was also much older during the second time period than during the first, and unmarried women died earliest.

One important feature of the descriptive results concerns the visible gradient in age at death between the two periods: Men and woman alike suffered the consequences of the various regional calamities in Transylvania, such as economic and financial crises, poor harvests, the rising price of cereals, and the cholera epidemics between 1850 and 1880. Between 1870 and 1873, Transylvania and the other localities under investigation suffered terribly from a continuous increase in the price of cereals, exacerbated by the outbreak of typhus and cholera epidemics in 1873. Between July 4 and November 27, 1873, a cholera epidemic emerged in the county of Lower Alba, which included Ocna Mureş, afflicting 2,829 of the 100,811 inhabitants, killing 1,270 of them. The heavy rains at the start of 1877 were followed by a drought, leading to a decline in agricultural production and causing cereal prices to remain exorbitant. Thus, in Aiud, the seat city of Lower Alba County, the average annual price of wheat in 1877 was 8.8 florins per hectoliter, compared to 5.1 florins per hectoliter in 1874. Potatoes were sold for 2.9 florins per hectoliter in 1877, compared to 2.1 florins per hectoliter in 1874.[25]

Male and female mortality recovered during the second period (1881–1914), reflecting the situation in Transylvania as a whole. Since the ninth decade, the region witnessed only local mortality crises that were not as severe as those previously endured. Besides, press articles from that period, even in Ocna Mureş, mention that the effect of the influenza epidemic in 1905 were relatively modest. In 1876, the introduction of law 14 on public hygiene, which rendered disease prevention and public health the responsibility of the state, heralded improvements in quality of life. Local authorities, subordinate to the Ministry of the Interior, ensured the sanctity of the law and instituted measures to secure its intent by constructing sewerage systems; draining swamps; cleaning streets, schools, and other establishments; evacuating houses with substandard sanitation; and compelling new

25 Holom, "Drama, Suffering and Sorrow: The Problems of the Eightieth Decade of the 19th Century in the Former County of Alba de Jos: Demographic Impact," *Romanian Journal of Population Studies*, III (2009), 99–104; *idem*, *Individ, familie, comunitate: Comportament demografic, relaţii familial interetnice şi interconfesionale în satele dintrecutul Albei (1850–1910)* (Cluj-Napoca, 2009), 49.

establishments to procure a sanitation license. The Ministries of Interior and Transport also took responsibility for the health and safety of railway and mining employees by hiring doctors, providing medical treatment, and ensuring hygienic transportation. For example, in 1904, the inhabitants of Ocna Mureş were "informed through the sound of drums to drink water of the Mureş only if boiled" because of an outbreak of typhus. The physician of the salt mine also declared the outbreak of a flu epidemic in 1905, urging the local population to take precautions to avoid catching a cold and having to deal with the associated complications.[26]

MULTIVARIATE RESULTS The tables below present the results of the Cox regression analyses, run separately for men and women and for the two time periods (1850–1880 and 1881–1914). The models were constructed in distinct stages: The first model contains only the type of locality; the subsequent models add socioeconomic status and marital status.

Men Research on other countries of Europe has already established that people living in isolated, less densely populated, and near-agrarian areas were insulated, to some extent, from infectious diseases. Likewise, between 1850 and 1880, in the regions investigated herein, men residing in open areas were more likely to die earlier than those in peripheral localities (Table 4).[27]

Introducing socioeconomic status to the model lowers the effect of locality type slightly, but it does not produce differentiation in ages of death per se. After adding marital status to the analysis, the effect of locality type becomes more pronounced. Unmarried men were almost three times more likely to die earlier than married men. As demonstrated in other cultural areas, the difference must be attributable to the protection from unhealthy behavior and the support network that marital union confers upon men. We must not forget, however, the selective effect of the marital market that disfavored those with health problems, those exhibiting socially undesirable

26 Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918*, 143; Oana Habor, *Incursiuni pe tărâmul medical transilvănean* (Cluj-Napoca, 2015), 43–50; *Marosujvár és Vidéke* (1904), 2; *ibid.* (1905), 3.

27 Jaadla, Puur, and Rahu, "Socioeconomic and Cultural Differentials," 17; Bonneuil and Fursa, "Learning Hygiene," 289; George Alter, Neven, and Michel Oris, "Mortality and Modernization in Sart and Surroundings, 1812–1900," in Bengtsson et al. (eds.), *Life under Pressure*, 181.

Table 4 Results of the Multivariate Analysis—Cox Regression Models for Men, 1850–1880

	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP (B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)
LOCALITY TYPE									
Open	1.403	***	[1.266; 1.555]	1.336	***	[1.191; 1.499]	1.518	***	[1.329; 1.733]
Peripheral (ref)	1			1			1		
SOCIO-ECONOMIC STATUS									
Unskilled workers (ref)				1			1		
Semiskilled workers				1.161		[0.951; 1.416]	1.128		[0.924; 1.376]
Skilled workers				0.971		[0.730; 1.292]	0.944		[0.710; 1.257]
Agricultors				0.910		[0.720; 1.151]	0.933		[0.738; 1.180]
Upper/middle class				1.053		[0.788; 1.407]	1.033		[0.773; 1.381]
Unspecified				0.970		[0.806; 1.166]	0.941		[0.781; 1.134]
MARITAL STATUS									
Married (ref)							1		
Previously married							0.541	***	[0.453; 0.647]
Unmarried							2.953	***	[2.406; 3.625]
Unspecified							0.838	***	[0.736; 0.955]

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

behaviors, and those of lowly socioeconomic status. This selection process was underscored with civil and church legislation in Transylvania during the second half of the nineteenth century. People without the means to provide a decent standard of living, with questionable morals (heavy drinkers et al.), with physical disabilities that impinged on marital duty (impotence, for example), with mental illnesses (epilepsy, dementia et al.), or with severe contagious illnesses were not permitted to marry.[28]

Previously married men had a lower risk of dying earlier than did their married peers. Of course, previously married persons tended to be older, on average, than currently married ones, but widowers (common in rural Transylvania) may also have benefited from the protective effect of living under the same roof as married sons/daughters. Locality type and marital status displayed similar effects in relation to the age of male death during the second period. The investments in new techniques and equipment for salt exploitation and the opening of a soda factory in 1896 resulted not only in a diversification of labor but also a differentiation in the ages of men at the time of death. Men working in agriculture, as well as semiskilled workers, were more likely to live longer than those employed as unskilled workers (Table 5).

The agricultors—*econom* in Romanian and *földműves* in Hungarian—were small landowners, apparently with good prospects for establishing a family and enjoying a prolonged life. Unskilled workers, however, endured a harsh existence, involving a daily search for work and requiring difficult and dangerous tasks when hired for railway work. Other geographical areas, such as in the Sundsvall region of Sweden, had a similar low mortality rate for farmers compared to that for unskilled workers. Semiskilled workers—composed mainly of Ocna Mureş salt miners—seemed to benefit from the measures that the authorities implemented after 1881 to afford them with, among other things, social protection, notably the subsidies granted to them for illness, accident, or retirement. In 1893, 410 of the approximately 700 miners in the Ocna Mureş salt mine were permanent employees entitled to such rights.[29]

28 Williner, "Gender and Mortality," 233; van Poppel and Joung, "Long-Term Trends," 289; Edvinsson and Lindkvist, "Wealth and Health," 383; Bolovan, Holom, et al. (eds.), *Legislaţia ecleziastică şi laică,* 123, 168, 360, 458, 512.

29 Holom, Sorescu-Iudean, and Hărăguş, "Beyond the Visible Pattern," 350; Edvinsson and Lindkvist, "Wealth and Health," 383.

Table 5 Results of the Multivariate Analysis—Cox Regression Models for Men, 1881–1914

	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)
LOCALITY TYPE									
Open	1.330	***	[1.208; 1.464]	1.255	***	[1.124; 1.403]	1.324	***	[1.184; 1.480]
Peripheral (ref)	1			1			1		
SOCIOECONOMIC STATUS									
Unskilled workers (ref)				1			1		
Semiskilled workers				0.829	*	[0.671; 1.023]	0.755	***	[0.612; 0.933]
Skilled workers				0.916		[0.716; 1.172]	0.845		[0.659; 1.082]
Agricultors				0.797	**	[0.669; 0.949]	0.816	**	[0.684; 0.974]
Upper/middle class				1.051		[0.840; 1.314]	0.984		[0.787; 1.231]
Unspecified				0.895		[0.761; 1.052]	0.896		[0.762; 1.054]
MARITAL STATUS									
Married (ref)							1		
Previously married							0.489	***	[0.433; 0.553]
Unmarried							2.141	***	[1.803; 2.541]
Unspecified							0.827	**	[0.689; 0.994]

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

Table 6 Results of the Multivariate Analysis—Cox Regression Models for Women, 1850–1880

	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)
LOCALITY TYPE						
Open	1.187	***	[1.071; 1.315]	1.432	***	[1.287; 1.593]
Peripheral (ref)	1			1		
MARITAL STATUS						
Married (ref)				1		
Previously married				0.434	***	[0.386; 0.489]
Unmarried				1.230		[0.941; 1.608]
Unspecified				0.812		[0.691; 0.955]

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

All the salt-mine workers in Ocna Mureş belonged to a professional association supported by the Treasury of the Mines, each contributing a percentage of their salary to its general fund—6 percent from permanent miners and 3 percent from temporarily employed miners. In the event of illness, the fund provided all members with medical treatment and hospitalization. Furthermore, the dependent family members of any miner incapacitated by disease had the right to a lump sum; permanent employees received a pension.[30]

Women In the first time period, the effect of locality type on age at death is particularly strong for men and weaker for women. Nonetheless, women in peripheral localities clearly benefited from longer lives, too, because of the health benefits that living in uncrowded dwellings and working in agrarian environments—at least some protection from the spread of disease—conferred (Table 6).

Marriage had a protective effect on the longevity of men but not of women: Unmarried women's survival rates did not differ from those of married ones. As with men, however, previously married women had a lower risk of dying earlier than did their married contemporaries. Again, widows, like widowers, may have felt the salutary effects of intergenerational co-residence. For instance, in 1868, women in the households of Vlăhiţa and Căpâlniţa—two villages in

30 *Erdély: Turistasági, fürdőügyi és néprajzi folyóirat* (1893), II, 166–179.

Table 7 Results of the Multivariate Analysis—Cox Regression Models for Women, 1881–1914

	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)
LOCALITY TYPE						
Open	0.966		[0.879; 1.061]	1.001		[0.910; 1.100]
Peripheral (ref)	1			1		
MARITAL STATUS						
Married (ref)				1		
Previously married				0.285	***	[0.255; 0.318]
Unmarried				1.008		[0.832; 1.220]
Unspecified				0.585	***	[0.471; 0.725]

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

the eastern part of Transylvania—found support by residing in the household of their married children. The second time period reveals a different picture for women, compared both with men and with the previous time span: The effect of locality type on age at death is no longer visible, and the effect of marital status is similar to that detected during the first time period (Table 7).[31]

Between 1850 and 1880, the women and men living in open localities were more susceptible to disease during epidemics; in the subsequent time period, this disparity was no longer discernible. Diseases became more geographically isolated, and the extent of their virulence declined as new public measures for prevention and control began to reduce environmental inequalities. The enduring inequalities for men across different localities stem from their involvement in economic activities. Numerous studies confirm the strong influence of place of residence on health and chances of survival. For this reason, we take a closer look at this important factor for both time periods and for both genders.[32]

31 Levente Pakot, "Households and Families in Rural Transylvania: A Case Study of Vlăhiţa and Căpâlniţa, 1868," *Romanian Journal of Population Studies*, VII (2013), 32–34.

32 For examples of studies that confirm the strong influence of place of residence on health and chances of survival, see Liczbińska, "Diseases, Health Status, and Mortality," 22; Bonneuil and Fursa, "Learning Hygiene," 289; Edvinsson and Lindkvist, "Wealth and Health," 384; William H. Hubbard, "The Urban Penalty: Towns and Mortality in Nineteenth-Century Norway," *Continuity and Change*, XV (2000), 331.

Men and Locality Type Table 8 shows that in open localities, the type of work produced differences in adult survival even during the early stages of industrialization. Men working in agriculture faced less harsh working conditions than unskilled workers employed in the railway and mining sectors.

For some peasants, the agrarian laws of 1854 signaled the dissolution of feudal landholding, a reorientation of the rural economy toward market productivity, and an opportunity to create a prosperous household. For others, working the land still remained an inadequate way of ensuring a decent living. Many peasants had to seek unskilled employment in industry or the railroad. Moreover, the slow development of the railway and mining sectors in Războieni and Ocna Mureş between 1850 and 1880 exposed employees to a high risk of accidents. Moreover, because day laborers constantly traveled in search of work, they were more susceptible to contracting serious diseases.[33]

While agricultors in open localities continued to live longer than unskilled workers, between 1881 and 1910, the major investment in industry and the well-being of workers during this period had a generally positive effect. The main beneficiaries were the semiskilled male workers in the Ocna Mureş salt mine. In contrast, unskilled workers in open localities—including wanderers and beggars in our data—continued to face a higher risk of early death. A news article from 1905 reports that beggars were numerous in Ocna Mureş. In spite of strategies enacted to help the needy, such as a charitable fund and permits issued for beggars, the daily struggles and harsh conditions that these people had to navigate undoubtedly increased their likelihood of premature death.[34]

Peripheral locations evince no socioeconomic differences in age at death during the early period. Men in the upper and middle classes—generally, rural teachers and priests—however, were more likely to live shorter lives than unskilled workers during the second period, primarily because their work forced them to interact closely with people who had infectious diseases like typhus, which continued to afflict people in the villages under study.

Unmarried men tended to have shorter lives than married men, especially during the first period, in open localities, when single men

33 Ioan Lumperdean, Rudolf Gräf, and Thomas Nägler, "Economie şi structuri sociale," in Ioan Aurel Pop, Nägler, and Magyari András (eds.), *Istoria Transilvaniei (de la 1711 până la 1918*) (Cluj-Napoca, 2008), 513.

34 *Erdély: Turistasági, fürdőügyi és néprajzi folyóirat,* II, 166–179; *Marosujvár és Vidéke* (1905), 1.

Table 8 Results of the Multivariate Analysis—Cox Regression Models for Men by Locality, 1850–1914

	MEN, 1850–1914			MEN, 1881–1914		
	EXP(B)	SIG.	95.0% CI FOR EXP(B)	EXP(B)	SIG.	95.0% CI FOR EXP(B)
OPEN LOCALITIES				OPEN LOCALITIES		
SOCIOECONOMIC STATUS				SOCIOECONOMIC STATUS		
Unskilled workers (ref)	1			Unskilled workers (ref)	1	
Semiskilled workers	1.113		[0.906; 1.366]	Semiskilled workers	0.746	**	[0.590; 0.943]
Skilled workers	0.930		[0.691; 1.253]	Skilled workers	0.862		[0.656; 1.133]
Agricultors	0.697	**	[0.520; 0.934]	Agricultors	0.683	***	[0.519; 0.899]
Upper/middle class	0.917		[0.663; 1.268]	Upper/middle class	0.905		[0.705; 1.162]
Unspecified	0.987		[0.812; 1.201]	Unspecified	0.905		[0.740; 1.108]
MARITAL STATUS				MARITAL STATUS			
Married (ref)	1			Married (ref)	1		
Previously married	0.537	***	[0.416; 0.691]	Previously married	0.457	***	[0.387; 0.540]
Unmarried	3.296	***	[2.402; 4.523]	Unmarried	1.945	***	[1.543; 2.452]
Unspecified	0.833	**	[0.718; 0.966]	Unspecified	0.999		[0.796; 1.255]

PERIPHERAL LOCALITIES				PERIPHERAL LOCALITIES			
SOCIOECONOMIC STATUS				SOCIOECONOMIC STATUS			
Unskilled workers (ref)	1			Unskilled workers (ref)	1		
Semiskilled workers	1.312		[0.541; 3.178]	Semiskilled workers	0.680		[0.344; 1.346]
Skilled workers	1.064		[0.361; 3.134]	Skilled workers	0.540		[0.258; 1.133]
Agricultors	1.421		[0.731; 2.765]	Agricultors	0.877		[0.668; 1.151]
Upper/middle class	1.738		[0.792; 3.812]	Upper/middle class	1.729	*	[0.979; 3.053]
Unspecified	0.968		[0.514; 1.823]	Unspecified	0.864		[0.652; 1.146]
Marital status				Marital status			
Married (ref)	1			Married (ref)	1		
Previously married	0.547	***	[0.425; 0.706]	Previously married	0.534	***	[0.447; 0.638]
Unmarried	2.730	***	[2.082; 3.580]	Unmarried	2.490	***	[1.919; 3.233]
Unspecified	0.912		[0.642; 1.296]	Unspecified	0.627	***	[0.458; 0.859]

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

were more than three times more likely to die early than men with wives. This situation is explained by the marital-market selection process that disqualified individuals with insufficient economic and social means. Between 1850 and 1880, a good number of the unmarried men in Ocna Mureş came from nearby localities. Since they had little or no land and lacked the agricultural inventory necessary for plot cultivation, they had to sell their labor to industry. Many of them died before acquiring the necessary resources to establish a family. During the second period, unmarried men in open localities continued to encounter a higher risk of early death, but to a lesser extent. The increased demand for new workers due to industrial investment and the creation of new factories, like the one in Ocna Mureş for calcined and crystalized soda production, compelled employers to raise salaries and improve working conditions, which afforded employees enhanced opportunities to start a family. Single men in peripheral localities during both periods remained vulnerable to early death, often unable to muster sufficient capital in an economy overwhelmingly dependent on agriculture to start a family (Table 1). Moreover, the traditionalism of rural society placed draconian restrictions on people regarded as "unfit for family life." [35]

The greater longevity of formerly married men in open localities may have something to do with their receipt of a retirement pension. A miner's monthly pension of 23 to 30 florins was sufficient to cover the expenses of a whole family and was a more than ample income for a single man. Many men in rural areas, however, secured their old age by transferring their position as head of household to one of their children in exchange for continued care and support.[36]

Women and Locality Type One noteworthy finding is that in peripheral localities between 1850 and 1880, unmarried women tended to die at a younger age than married ones—the only instance of marriage affording women a protection against fatality. This finding appears to be linked with the persistence of the traditional traits that determined spousal selection: beauty, physical condition, and moral uprightness decided a woman's worth in the marriage market, and hard work had a detrimental effect on women's health. As noted above, marital status, however, had no significant bearing

35 Nicolae Dobra, *Oraşul Ocna Mureş în documente, legende şi amintiri: monografie* (Cluj-Napoca, 2007), 171; *idem*, *Ocna Mureş: Monografie* (Alba Iulia, 1996), 65.

36 *Idem*, *Oraşul Ocna Mureş în documente, legende şi amintiri,* 140; Pakot, "Households and Families in Rural Transylvania," 34.

on women's chances of survival in open localities during both periods under analysis, nor in peripheral settings between 1881 and 1914. Only women previously married enjoyed the prospect of a longer life (Table 9).

The situation for women was a function of the prejudices inherent in a traditional patriarchal society that burdened women with more responsibilities but allowed them fewer rights than men. From early childhood, girls were saddled with domestic activities, not the least of which was the care of younger children—an obligation that became even more onerous after marriage, often accompanied by the difficulties of childbearing. Such factors probably explain why so many females died at a relatively young age.

The changeover from an old demographic regime encumbered by all manner of crises to a new era of greater population stability and rapid industrialization had important consequences for the survival prospects of Transylvanian men and women. The analysis of two time periods (1850–1880 and 1881–1914) confirmed our assumptions regarding the persistence of, or changes to, patterns in adult mortality. People in open localities were more prone to premature death than their counterparts in peripheral settings, although this advantage slowly began to wane during the second period. The main beneficiaries of the legislative measures on behalf of industry and the investments in technology, public sanitation, and health care during the second period were males (particularly unmarried men, men in agricultural occupations, and men employed as semiskilled workers). Although men farming the land typically performed less arduous and dangerous tasks—some of them even with enough land to eke out a decent living—semiskilled workers (most of them were miners) faced harsh working conditions, at least until a gradual amelioration from 1881 to 1914. Likewise, during the second period, single men benefited from the rapid pace of industrial and social investment, as well as by the diversification in the labor market, which enabled them to find work with greater ease.

The period from 1850 to 1880 saw no differences in longevity between the different social classes, but our hypothesis concerning the greater vulnerability of individuals situated at the bottom of the social hierarchy is valid for the later time span. Unskilled workers apparently did not reap the rewards of improvements in working and living conditions. Findings for both periods under observation

Table 9 Results of the Multivariate Analysis—Cox Regression Models for Women by Locality, 1850–1914

	WOMEN, 1850–1880				WOMEN, 1881–1914			
	EXP(B)	SIG.	95.0% CI FOR EXP(B)			EXP(B)	SIG.	95.0% CI FOR EXP(B)	
			LOWER	UPPER				LOWER	UPPER
	OPEN LOCALITIES					OPEN LOCALITIES			
Married (ref)	1				Married (ref)	1			
Previously married	0.370	***	[0.320; 0.428]		Previously married	0.269	***	[0.232; 0.312]	
Unmarried	0.984		[0.567; 1.709]		Unmarried	0.845		[0.650; 1.097]	
Unspecified	0.775	**	[0.639; 0.940]		Unspecified	0.556	***	[0.395; 0.784]	
	PERIPHERAL LOCALITIES					PERIPHERAL LOCALITIES			
Married (ref)	1				Married (ref)	1			
Previously married	0.560	***	[0.459; 0.682]		Previously married	0.297	***	[0.252; 0.349]	
Unmarried	1.393	**	[1.022; 1.899]		Unmarried	1.259		[0.950; 1.668]	
Unspecified	0.845		[0.625; 1.142]		Unspecified	0.610	***	[0.462; 0.805]	

*$p < 0.1$.
**$p < 0.05$.
***$p < 0.01$.
SOURCE Historical Population Database of Transylvania (authors' calculation).

confirm our hypothesis regarding the role of the marriage market in discarding men considered "unfit to establish or support a family." Men who married achieved a better chance of living longer. Life in a peripheral locality had its advantages for women between 1850 and 1880, but not during the second period. One consistent trend throughout both periods, however, was the absence of marriage's protective effect upon female longevity. In accordance with previous studies, the results of our analysis confirmed the great influence of residential location on the survival chances of adults. Yet, our work extends further by considering the influence of wider structural characteristics of locality and chronological socioeconomic change on longevity.[37]

Our research clearly confirms that the effects of reforms in the agricultural sector that promoted industrial development and the improvements in the living and working conditions of workers were particularly pronounced in open localities. The positive outcomes resulting from the legal dissolution of the feudal landholding regime in 1854 were clearly visible during the first period and continued their influence; during the second interval, significant improvements were also seen for semiskilled workers in open localities. Yet, these initiatives did not confer uniformly beneficial effects; unskilled men still risked early death, regardless of period.

The existence of mortality-related inequalities between the various social classes offers empirical confirmation of Antonovsky's hypothesis. People situated at the bottom of the social structure were clearly more vulnerable to disease and death, especially during the period of industrialization, when socioeconomic disparities were exacerbated by differential access to medical and social care. Single men continued to be more susceptible to an earlier death, although this risk diminished during the second period, when their opportunities for employment had improved.

Men in peripheral settings were not subject to any differences by class background, the only exception being members of the upper/middle category during the second period. Far from awarding them advantages regarding mortality, their elevated social standing actually subjected them to a greater risk of earlier death because of the contact with a variety of people that their occupations entailed, which in turn

37 Bengtsson and van Poppel, "Socioeconomic Inequalities in Death from Past to Present," 350; Edvinsson and Lindkvist, "Wealth and Health," 384.

increased their chances of contracting infectious diseases. Living in peripheral localities did not help unmarried men; they continued to be more vulnerable than men with wives. The agrarian character of the economy offered men fewer opportunities to find work, regardless of period. Life in open localities delivered positive changes and advantages for men but not for women. Marriage did not enhance women's health or chances of survival in either period. This situation was almost identical for women in peripheral localities, the first period excepted. Women were more susceptible to premature death in both periods. The improvement in Transylvanian men's chances of longevity matches what similar studies discovered in other areas of Europe. The transition to a more stable demographic regime enhanced all adults' prospects of living longer, regardless of their gender. By considering locality and time period together, the analysis highlights that during the first period, various crises and adverse situations strongly influenced the mortality of adults. During the second period, however, differences in adult mortality were attributable mainly to economic activities.

The extensive new data set, extracted from the HPDT, enabled a particularly nuanced investigation of adult mortality, bringing to light previously obscure, idiosyncratic socioeconomic realities and demographic behaviors in Transylvania. It also helps to plug some of the knowledge gaps concerning adult mortality in the Eastern European context and contribute to the literature about health-based inequalities in Europe between the second half of the nineteenth century and the outbreak of World War I. Any limitations in this research are related to the quality and the completeness of the data at hand. Even though we did not access linked data pertaining to individual life trajectories but focused only on data referring to deaths, this study manages to capture the various factors influencing adult mortality by taking into account contextual specificities relating to living and working conditions. The relevance of the findings ventures beyond the specific localities studied. In time, the HPDT data could be linked to other data sources to reveal more information about education, living conditions, nutrition, etc. and thus provide a more nuanced understanding of the vagaries of mortality.