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**MORTALITY EVOLUTION IN VALEA MUREȘULUI
BETWEEN 1850-1918**

Summary

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Mortality as a demographic phenomenon is influenced by a number of factors such as climate, food, medical system, value system, behavior, etc. On the European continent, there is a decreasing trend in mortality, especially in the second half of the 19th century.

In all European countries there is a pattern in which infant mortality has the highest values and male excess mortality is observed in this age group. The differences by sex are reversed in the adult population, more women died, especially during the reproduction age. In the Balkan area, the number of deaths among men was higher than that of women in the first age groups, and in the adult population there is a slight female excess mortality, but the differences are small. Another feature of this pattern is the decrease in the impact of infectious diseases in the second half of the 19th century, which is a direct cause of the decline in mortality during this period.

In Transylvania in the second half of the 19th century the economic, political and social changes had consequences for demographic events such as birth, marriage and death. Studying the latter provides some information about people's daily lives and the problems they have faced, such as the deaths of many children before the age of 5, the more pronounced danger of respiratory diseases with the start of agricultural work, as well as various epidemics of infectious diseases that have affected entire communities.

The pattern of mortality in Transylvania is similar to the one found at European level. The common characteristics found in the villages of Transylvania are a high number of deaths among children, infant mortality has the highest percentages, there is a male excess mortality, most deaths occurred in the spring and winter months, and infectious diseases were the main causes of death.

The purpose of this work is that by analyzing the characteristics of the mortality phenomenon we observe certain patterns of it in the Transylvanian countryside. The sample

consists of 14 villages, 29 confessional communities and 24,972 individuals. The geographical area studied consists of several localities located in the Mureș Valley, namely the Ocna Mureș fair and the surrounding villages: Războieni-Cetate, Decea, Lunca Mureșului, Gura Arieșului, Călărași, Cisteiul de Mureș, Ciunga (Uioara de Jos), Mirăslău, Micoșlaca, Uioara de Sus, Noșlac, Vereșmort and Vințu de Sus. The analysis was made on four denominations, namely Orthodox, Greek Catholic, Reformed Calvin, and Roman Catholic. The study period covers the second half of the 19th century and the beginning of the next one, i.e. death events were observed between 1850 and 1918. For the last chapter in which I observed the effects of the First World War, the period studied extends to 1930. The main sources used for this work are the parish registers of civil status kept at the National Archives. Most of the 14 villages are ethnically and confessional mixed.

All communities in the Mureș Valley have suffered as a result of the epidemics that have affected Transylvania. There are two important aspects observed in the analysis of the annual evolution of mortality. The first aspect is that mortality is on a downward trend in this geographical area, at the same time as the pattern observed at the level of other European countries in the second half of the 19th century and the beginning of the following century. The second aspect is that the impact of infectious diseases are traceable, in several communities in the same year the number of deaths has increased, seeing how the whole area has been affected by major events, especially epidemics. Of course, these are epidemics that have affected more geographical areas, even other countries in Europe. In several communities the number of deaths has increased significantly over years when certain epidemics have been present such as 1873, when the cholera epidemic peaked throughout Eastern, Southeast and Central Europe. Thus, in this year we see an increase in the number of deaths in almost all the communities studied, the most affected being Ocna-Mureș, Cisteiul de Mureș and Micoșlaca. The eighth decade is one in which several diphtheria epidemics have affected the Austro-Hungarian Empire, which is also reflected in the our communities. In several localities the number of deaths in 1872 increased, în Vereșmort, Micoșlaca, Decea and Mirăslău, and among the diseases recorded were diphtheria, tuberculosis and pneumonia. Several deaths from the pox are recorded this year in the Reform Calvin parish register in Vințu de Sus. Also, in the years 1877-1878 was present another epidemic of diphtheria and whooping cough reflected in the causes of deaths in Războieni-Cetate, Călărași, Noșlac and Mirăslău. In the Greek Catholic parish of Noșlac there were recorded a higher number of deaths in 1876 and the main

cause was diphtheria, being the only recorded disease. And in the last decade the number of deaths has increased due to infectious diseases in almost every community. The impact of Russian influence in 1889 and 1890 was traced in the burial registers by the increased number of deaths due to influenza and its complications. This impact is more evident in the Războieni-Cetate and Mirăslău, in the last locality mentioned there were recorded several deaths due to pneumonia in 1890. In 1898 the death toll increased to maximum levels in Ciunga and Cisteiul de Mureș, and regarding the causes of death in Ciunga it is noted that several deaths this year were from whooping cough.

The distribution of mortality by sex shows a male excess mortality at the sample level, similar to the pattern found in Transylvania. In all communities there were years when the number of men who died was much higher than the number of women, but also years in which the distribution of mortality is reversed. The reasons why in some years the number of men who have died is almost double that of women cannot be established since the infectious diseases present do not have a prevalence for one gender or another.

For example, in Călărași, in 1877 and 1878, when an epidemic of diphtheria was present, the number of men who died is higher, but in the Gura Arieșului and Războieni-Cetate, more women died during this period. In Lunca Mureșului there were several deaths among women in 1890, but in Noșlac this year there was the maximum number of men who died, and in Mirăslău the number of deceased men was higher. In Vințu de Sus in 1882 the number of women who died was double that of men, and in Decea in all three parishes the number of women was higher than that of men this year. Of course, with male excess mortality observed, there were almost annual deaths among men.

With regard to the distribution of sex and age groups, a pattern of male excess mortality in infant mortality is very clear. At the level of the whole sample it is observed that this male excess mortality is present among children, after which the number of women who have died is higher in adulthood. After 50 years, the number of men is increasing again, and after 70 years the situation has reversed again.

Individually in villages are some differences. In almost every village the number of boys was higher than that of girl among infants. This is also maintained in the following age group in the villages of Lunca Mureșului, Gura Arieșului, Războieni-Cetate, Vințu de Sus, Ocna Mureș,

Ciunga, Micoșlaca and Mirăslău. In the villages of Călărași, Vereșmort, Noșlac, Uioara de Sus, Decea the number of girls who died was higher.

Among adults, mainly in the age group of 15-49 years, there is a pattern of female excess mortality observed in Călărași, Lunca Mureșului, Uioara de Sus, Micoșlaca and Mirăslău. But in Gura Arieșului, Vereșmort, Vințu de Sus, Noșlac, Ocna Mureș, Ciunga and Decea the death toll was higher among men. In the next age group, the number of men who died is higher, with the exception of the villages of Cisteiul de Mureș and Micoșlaca. Among people over 70 years of age, female excess mortality is observed, only in Ciunga the situation is reversed. Interesting is the pattern observed in Ciunga. The data for this village reveals that almost in all age groups the number of men who died was higher, except for the age group 5-9 years and over 70 years.

In terms of the distribution of mortality by age group, a high mortality pattern among children is observed, the highest percentage is in infant mortality. Of the total number of deaths over 50% represents the death of children under 10 years of age, almost half of whom were children who died before the age of one. In the case of these children, the analyses are carried out in two other age segments because the reasons for their death are divided into two extended categories. Causes of deaths in neonatal infant mortality, children who died in the first month of life are endogenous causes, related to the mother's condition, care during pregnancy and conditions of birth. Postneonatal infant mortality also has causes related to the environment, living conditions, care for the newborn, as well as specific infant diseases. From the entire sample, almost half of the total number of infant deaths were children who died in the first month of life. Of these, more than 30% died in the first week after birth. The second highest percentage category is that of children between 1 and 4 years of age, i.e. 20%. The fewest deaths were recorded in the age groups of adolescents, namely 10-14 years and 15-19 years, respectively. Among the adult population the number of deaths increases again, but the next age group with the highest share is 60-69 years, 8% of the total number of deaths.

This pattern is observed at the level of each community in the sample, i.e. the death of children under 10 years of age is more than 50%. In almost all villages infant mortality has the highest percentage, with the highest values in Războieni-Cetate and Vereșmort, i.e. 27% and 26% of the total number of deaths in these villages. The second age group, 1-4 years old has the second highest percentage in almost all communities. Lunca Mureșului and Gura Arieșului were faced with the highest percentages in the second age group. In the first village mentioned the percentage

of children between 1 and 4 years of age is 25% and the infant mortality rate is 23%. In Gura Arieşului, infant mortality has the lowest sample values in this age group, i.e. 19% of the total number of deaths, and 21% represents the number of children in the second age group. In all the communities under observation, more than 40% of infant mortality are children who died in the first month. In Gura Arieşului, Vereşmort and Uioara de Sus most children died in the first month of life, the percentage of neonatal infant mortality being over 51%.

In all the villages in the sample, the number of deaths in the following age groups decreases, only in the adult population increasing again. In the age groups 50-59 years and 60-69 years increase the number of deaths reaching the third highest percentage, but it is a maximum of 10%.

In the villages of the Mureş Valley most deaths occurred in the spring and winter months. Tracking the number of deaths on months overall the most deaths occurred in March, but individually on the villages the maximum number of deaths are reached in other months of spring. In Lunca Mureşului and Vereşmort the most deaths were recorded in February, and in Ciunga and Micoşlaca in April. In Gura Arieşului and Războieni-Cetate the maximum number was recorded in December although a high number of deaths were recorded in the spring months. The seasonal death movement by gender is similar, for both sexes the highest number of deaths were recorded in the spring and winter months, and in the summer and autumn months the number of deaths decreased. For both men and women, the highest number of deaths were recorded in March, and the fewest in June.

Analyzing the seasonal movement of mortality in correlation with the distribution by age group, the same pattern of the increased number of deaths is observed in the spring and winter months. In the first two age groups, children under one year and between 1 and 4 years of age, the age groups in which the most deaths occurred, the peak was reached in March and the minimum in November. And among the other age groups the number of deaths was higher in the spring and winter months. There are obviously some differences in the villages in the months in which the most deaths occurred, but these differences are quite small. The fewest deaths were recorded in all the communities under observation in the summer and autumn months.

In the second half of the 19th century the main causes of death are infectious diseases, both in other European countries and in Transylvania. This is also true for villages in the Mureş Valley, the majority presence of these diseases being reflected in the parish burial registers. For this chapter a smaller sample was used, only parish registers that recorded the disease that led to

death on a regular basis, the analysis was done on 14 different confessional communities, and the total number of deaths is 10,494.

Causes of deaths have been classified and organized according to the *International Statistical Classification of Diseases and Health Related Problems*, 10th revision in order to test the applicability of this classification to parish registers in our space. This classification is already used in other world-wide demography studies.

To provide another novelty to the work, in this part we have tracked the patterns of certain infectious diseases, but also of diseases specific to the circulatory and nervous system to observe in which stage of epidemiological transition are these communities in Transylvania. Following analyses of the villages in this geographical area, the characteristics of the second stage of epidemiological theory are observed, i.e. the stage in which the impact of infectious diseases decreases and the impact of degenerative diseases gradually increases. Until the First World War, the number of deaths remained high and infectious diseases continue to have a big impact, and are also the leading causes of death. Towards the end of the observation period the impact of epidemic diseases is lower, some diseases have disappeared from these parish registers. The most noticeable is the decline in the number of deaths of children under 5 years of age during the study period. This demonstrates that the third argument of epidemiological theory also applies in these communities, the levels of mortality among children are the first one to decline the main reason is the decrease in the impact of infectious diseases.

The infectious diseases affected the population in all its structures by age and sex. There was male excess mortality recorded in this area, as previously explained, as a result this is a reason why the number of deaths among men were higher. The infectious disease did not have a high prevalence among a gender or another, but in the case of diphtheria and pox, more deaths occurred among men. Tuberculosis is the only disease which affected the female population more, from the total number of death due to tuberculosis 52% were women. In terms of age structure, tuberculosis and typhus were predominant in the adult population, of the total number of deaths caused by the first disease mentioned about 21% occurred in the 20-29 age group. People in this age group were also affected by cholera, but this disease also attacked children under 10 years of age. Pox was predominant among children, both under one year and in the 1-4 age group. Similarly, epidemics of diphtheria, whooping cough and dysentery predominantly caused the death of children under 10 years of age.

The second category of diseases that have affected these communities are those specific to the respiratory system, with deaths from influenza and pneumonia being recorded annually, and more than 50% of cases were men. Even Spanish flu was recorded as a cause of death in 1918, particularly in November and December. The diseases of the respiratory system had a high prevalence among children under 1 years of age and children between 1 and 4 years of age, and in the adult population more affected were people between 50 and 59 years of age.

After 1870 the record of degenerative diseases increased, and new disease appeared in the parish registers for the first time. A prime example is cancer, the most common being stomach cancer, but other types such as cancer of the uterus, liver or laryngeal are recorded towards the end of the century. Although their number is quite low, most deaths due to different types of cancer occurred among the adult population, and over in over 50% of cases were women. Deaths from meningitis and encephalitis were prevalent among male individuals. In the case of meningitis, 46.66% of the total deaths were children under 10 years of age, and of the total deaths caused by encephalitis, 20.99% occurred among children in 5 and 9 years.

Diseases specific to the circulatory system recorded in the parish burial registers were predominant for people over 40 years of age, and the gender difference is quite large. Almost 60% of all deaths due to stroke occurred among men, and also deaths due to heart attack were predominant among men at 64%. In the category of diseases specific to the digestive system gastritis and gastroenteritis are the diseases most commonly recorded as causes of death. Regarding the gender structure of people who died of the first disease mentioned there are no differences between the two genders, only in the case of deaths due to gastroenteritis 53% were men. The number of men who died was higher than that of women for other diseases in this low-frequency category. The most affected by diseases of the digestive system were children, 74% of the total number of deaths were children between the ages of 1 and 4, and gastroenteritis caused the most deaths among children under one year of age.

Of the total number of deaths 12% represents the percentage of children under 1 year of age who died from conditions originating in the perinatal period. In this category many names are vague, i.e. in 62% of cases congenital debility was recorded and 23% premature births. Similarly, among people over 70 the predominant cause of death is old age or weakness of old age. Clearly under these names, as well as others in the category of symptoms recorded as causes of death, other diseases are hidden.

As we have presented in the part dedicated to the seasonal distribution of mortality, most deaths were recorded in the spring and winter months, and at the opposite pole are the summer and autumn months. The reason is that the main diseases recorded had a high prevalence during the period when temperatures are low. For example, tuberculosis was prevalent in the first months of the year. In addition to respiratory diseases that were prevalent in the spring and winter months, the same monthly distribution is also in the case of outbreaks of pox and typhus. Whooping cough was more virulent in the spring and summer months.

Diseases affecting the digestive system, both infectious, like diarrhea and dysentery, as well as non-infectious ones, gastritis and gastroenteritis, were present especially in the summer, most deaths caused by these diseases occurred in July. For other degenerative diseases there is not a clear seasonal pattern.

The last part is dedicated to the impact of the World War I on the localities in the sample. The observation period is 1890-1930, divided into three subperiods for better observation of the effects of war on this demographic event.

The annual evolution in the number of deaths between 1890 and 1930 shows that mortality levels are decreasing, following the European pattern. The period of the World War I disrupted this trend, with extreme values of the number of deaths on the home front, which shows us that the war has had great consequences in the lives of the inhabitants even in small towns that were not theater of war. In the first year of the global conflagration, the annual number of deaths remained within the parameters of the previous years, but in 1915 a record number of deaths were recorded. In the next two years, the number of deaths fell so that in 1917 the mortality level was below the average of the previous period. 1918 was the second year with a maximum number of deaths between 1890 and 1930. After 1919, the downward trend in mortality has increased.

Across the entire Transylvanian province, there is a pattern of high mortality among men, a pattern that is also found at our sample throughout the observed period. In the first time segment, the number of men accounts for 50,5% of all deaths. Although, during the war the situation was expected to reverse due to the mobilization of men in military service, the same pattern of a higher death toll among men remained and differences are more pronounced, with the percentage of men who died reaching 51,3%. In the post-1919 period the gender gap is further growing, with the percentage of men being 57,3%, but as I also mentioned at the beginning it was only after the end of the war the fate of some men was discovered, some of them were found dead or were declared

dead on the battlefield and were recorded in the parish record of the post-war burial. Although in few cases it is clearly stated that they have died on the front, there may be many more cases, or cases of men who have returned home sick and only the illness which led to the death has been recorded, not to mention that it was acquired during the war.

The consequences can also be seen in the distribution of mortality by age group and in the seasonal movement. Since the second half of the 19th century the levels of child mortality and of children under 5 years of age have been the highest in the communities under observation. Of the total number of pre-war deaths there is 27% of infant mortality and 21% of children between the ages of 1 and 4. The third high percentage of deaths was in the age group 60-69 years. During World War I, the number of children born decreased significantly, thus also affected infant mortality, which was clearly lower than in the previous period, but remained high in relation to the total number of deaths in the five years of war. The highest percentage recorded during this period is in the 1-4-year-old age group, 17,6%. After the war, the percentage of infant mortality has returned to the pre-war level, about 28% of the total number of deaths between 1919 and 1930. By contrast, the death rate for children aged between 1 and 4 has fallen from 21% to 16% since the first world war. It is interesting that in the whole sample, a male excess mortality is observed among children under one year of age, both in the pre-war period and in the post-war period, only during the war was the number of girls who died more than the boys.

Visible effects were also seen in the seasonal movement of mortality. In the pre-war period, most deaths occurred in the winter and spring season, but between 1914 and 1919 in the autumn was the season of the most deaths, with a maximum reached in November. In the post-war period monthly fluctuations are decreasing, most deaths are recorded in the spring and winter months, and the autumn has become again the season with the lowest recorded deaths. With regards to the predominant diseases that led to deaths, epidemics and infectious diseases were the main cause of death in the second half of the 19th century in the under observation. During the First World War, the number of deaths from infectious epidemic diseases has increased, mainly due to the social, economic and health problems faced by the populations of these villages. Thus, in 1915 and 1916, an outbreak of pox hit these communities contributing to the increase in the number of deaths in these years. In 1918 Spanish influenza was explicitly recorded in the parish records as the cause of death, but in addition the number of deaths from respiratory diseases, such as tuberculosis and pneumonia, increased. Between 1919 and 1930, there were no severe epidemics of infectious

diseases and their pre-war downward trend continued. The most visible is the decrease in the impact of tuberculosis, with only 23 deaths occurring over the last period. Also, during this period, three deaths were recorded due to whooping cough and just as many as due to diphtheria.

By analyzing the mortality in this geographical area, we have tried to give an overview of an inevitable demographic phenomenon at a time when there have been many changes in political, social, cultural, economic and health terms. In the second half of the 19th century and the beginning of the 20th century there were made world-wide medical findings that spread throughout all areas, including Transylvania. There were also changes in behavior and attitudes, and the social and economic development that have influenced the population during this period. Even the first World War has had consequences for the population left at home, which is also seen in this geographical area. All these changes must be analyzed in correlation with each other and an indication of development is also visible in the evolution of the mortality trend in this area in the second half of the 19th and the beginning of the next century.

Parish burial registers provide a longitudinal image of small communities, sometimes with true family tragedies, and analysis of several sources of the same kind in an area presents a longitudinal image of a single community in a larger geographical area. These sources should therefore be harnessed to create an image of a community in the smallest detail.

In addition, the aim of the work is also to align mortality research in historical demography with European research by analyzing the characteristics of Abdel Omran's epidemiological theory, characteristics already found in other countries on the 19th and early 20th century population. Another practice found in other mortality studies is to classify causes of death according to an international classification in order to make it possible to analyze these causes in the future from several geographical areas. That is why in analyzing death-causing diseases we have tried to apply the *International Statistical Classification of Diseases and Health Related Problems*, 10th revision, the application of this classification being possible to some extent on the sources at the end of the 19th century.

Key word: mortality, historical demography, Transylvania, gender distribution, age groups, mortality seasonality, causes of death, World War I, parish registers, epidemiological transition, ICD-10.