

# The Epidemiologic Transition Reflected in the Parish Burial Registers in Three Communities from Mureş Valley

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## Abstract

*Abdel. R. Omran studied the mortality patterns with regards to causes of deaths, different stages of infectious and degenerative diseases and developed the epidemiologic theory. He formulates stages of the linear declining trend of infectious diseases leading to a decline in mortality, and an increase in degenerative diseases. The present study tries to identify the characteristics of the epidemiologic transition in some communities from Mureş Valley between 1859 and 1930. The sources consist of parish burial registers for the Reformed-Calvinist communities which offer information about the date of death, age, gender, and, most importantly, the main diseases which led to death for each individual recorded. The analysis focuses on the main causes of death, gender and age-group distribution of mortality and the seasonal variation of the illnesses. The fundamental aspects of the epidemiologic transition found in these communities are the declining of the impact of infectious diseases, especially tuberculosis; infant mortality decline and that of the children under 5 years of age.*

**Keywords:** *Transylvania, epidemiologic transition, cause of death, mortality, infectious diseases*

In the European continent infectious diseases still devastated the lives of people in the second half of the 19<sup>th</sup> century. There are variations between different parts of the continent, in the more developed countries the new discoveries in medicine and the social and economic developments led to a decrease of the impact of the infectious diseases, but the pattern of decline in the Eastern countries was visible at a much later time. Furthermore, in this period cardiovascular, digestive and respiratory illnesses started to be recorded more often as causes of death. In Prussia, Germany, Austro-Hungary the infectious diseases continue to be the main cause of death until the beginning of the 20th century.<sup>1</sup> Tuberculosis still has a high relevance in these areas, followed by diphtheria, cholera, smallpox (especially in the Austro-Hungarian Empire), and influenza epidemics.<sup>2</sup> In certain parts of Poland

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<sup>1</sup> Andrew Davidson, *Geographical Pathology: an inquiry into the geographical distribution of infective and climatic diseases* (Edinburgh & London: Young J. Pentland, 1892), 67-100. Forgotten Books.

<sup>2</sup> Davidson, *Geographical Pathology*, 74-100.

scarlet fever and smallpox were the main causes of death, but after 1870 the pattern of infectious diseases is declining and the number of deaths caused by degenerative and man-made diseases rise.<sup>3</sup>

The official civil records from Transylvania between 1901 and 1910<sup>4</sup> give information about the major diseases which led to death in the whole region, and on the community level. Among the infectious disease tuberculosis had the higher impact, followed by scarlet fever and diphtheria. Studies based on parish registers from some communities in Transylvania illustrate the same diseases, tuberculosis, pox<sup>5</sup> and diphtheria, as the major causes of death, but also mentions diseases related to the respiratory system.<sup>6</sup> Unfortunately, both of the sources reveal a problem in the registration of causes of death, the fact that many deaths were recorded as ‘ordinary’ or ‘natural death’, and some vague names are used such as ‘weakness’ which hide other illness.

### **Epidemiologic theory**

In 1971 Abdel R. Omran formulated the epidemiologic transition theory as an addition to the demographic transition theory regarding the changes in mortality. There are five propositions at the basis of this theory. The first proposition states that mortality is a fundamental factor in population dynamic. The second argument, the most famous one, says that the transition occurred from a high impact of the infectious diseases to a high impact of degenerative and man-made diseases regarding morbidity and mortality. Omran distinguishes three stages of the transition. The first stage is one of pestilence and famine, mortality has very high levels and the life expectancy is low. The main causes of death are the infectious diseases. The second stage is one of receding epidemics and of the impact of infectious diseases which resulted in the declining of mortality. This stage has two phases. In the early phase the impact of infectious diseases is reduced but the mortality still remains at a high levels. Tuberculosis and the childhood specific infections remain the main causes. In the late phase, the impact of infectious disease decline even more, mortality levels are lower, life expectancy increases and infant mortality drops under 150 deaths in 1000 births. This is the time when the last epidemics of cholera occur, the prevalence of tuberculosis and childhood infectious

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<sup>3</sup> Grażyna Liczbińska, *Lutherans in the Poznań province. Biological dynamics of the Lutheran population in the 19th and early 20th centuries* (Hamburg: Verlag Dr. Kovač, 2015), 76-88.

<sup>4</sup> Traian Rotariu, *Mișcarea naturală a populației între 1901-1910 Transilvania. Vol II. Cauze de deces* (Cluj-Napoca: Presa Universitară Clujeană, 2005), 8-11.

<sup>5</sup> Ioan Bolovan, *Transilvania între Revoluția de la 1848 și unirea din 1918. Contribuții demografice* (Cluj-Napoca: Centrul de Studii Transilvane, 2000), 157; Alina Ioana Șuta, “Aspecte privind evoluția demografică a orașului Câmpia Turzii (jud. Cluj) între anii 1855-1900”, in *Transilvania în secolele XIX-XX. Studii de demografie istorică*, ed. Sorina Paula Bolovan, Ioan Bolovan, Corneliu Pădurean (Cluj-Napoca: Presa Universitară Clujeană, 2005), 190.

<sup>6</sup> Șuta, “Aspecte privind evoluția demografică a orașului Câmpia Turzii (jud. Cluj) între anii 1855-1900”, 189.

disease decline and the impact of the diseases specific to the circulatory diseases grow. The last stage is that of degenerative and man made diseases (violence and war) when mortality reaches a minimum and life expectancy rises to over 50 years.<sup>7</sup>

The third arguments states that the most profound changes in health will occur among children and women. Although in every age group the declining in mortality will be visible the most noticeable decline will be among children between 1 and 4 years of age. The next argument is that the changes in the mortality and diseases patterns which form the basis of this theory are associated with the demographic transition and the social-economic changes.<sup>8</sup>

The last argument explains how, because of the various patterns, there are three models of the theory. The classic model (western), the accelerated model and the contemporary model (late). In the first model, the classic one, the shift from one stage to another takes place in time and because of the social and economic development; the medical development occurred later and had only a second impact. In this model are included countries for the western part of Europe. The accelerated model refers to Japan, where a new modernization is observed starting with the beginning of the 20<sup>th</sup> century, and the levels of mortality decline especially because the sanitary and medical innovations. The contemporary model is applied to the countries currently developing and the transition is not over yet. Mortality levels had a major drop after World War II and the international medical assistance led to the growth of population. Mostly countries from Latin America, Africa and Asia fit this model.<sup>9</sup>

In 1983 Abdel Omran published an up-date, as he calls it, to the epidemiologic theory where he made some clarifications and used more data in order to point different aspects. One thing he clarifies is the differences between western countries and the eastern ones. He admits that in countries from East Europe the declining of mortality is more visible in the 20<sup>th</sup> century.<sup>10</sup> Also, that these countries were still in the receding phase of infectious diseases in the 20<sup>th</sup> century.<sup>11</sup> In addition to the third proposition of a declining in mortality first noticeable among children he states that there will also be a rise in mortality in people over 50 years old. Another

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<sup>7</sup> Abdel. R. Omran, "The Epidemiologic Transition: A theory of the Epidemiology of Population Change," *The Milbank Memorial Fund Quarterly* 49, no. 4 (October, 1971), 511-516, <http://www.jstor.org/stable/3349375>.

<sup>8</sup> Omran, "The Epidemiologic Transition: A theory of the Epidemiology of Population Change," 521-526.

<sup>9</sup> Omran, "The Epidemiologic Transition: A theory of the Epidemiology of Population Change," 533-536.

<sup>10</sup> Abdel R. Omran, "The Epidemiologic Transition Theory. A Preliminary Update," *Journal of Tropical Pediatrics*, 29, (December, 1983), 306, <https://academic.oup.com/tropej>.

<sup>11</sup> Omran, "The Epidemiologic Transition Theory. A Preliminary Update," 307.

thing he supplemented was another intermediated stage of receding pandemics in the second part of the 19<sup>th</sup> century.<sup>12</sup>

There were some critiques to Omran's epidemiologic theory such as the fact that the socio economic environment had a big impact and people the poorer regions experienced much later the third phase of the transition than their wealthier counterparts. Another different view is that this theory oversimplifies the mortality patterns and do not fit perfectly into historical periods or in some regions.<sup>13</sup> Also one must bear in mind that in some cases the infectious and the chronic diseases are related or affect one another. Another point of view is that the time of infectious epidemic diseases is not over, nowadays we are confronted with new infectious diseases.<sup>14</sup> George Alter and J. C. Riley consider that the theory is incomplete in some aspects. It assumes that mortality pattern reflects morbidity pattern, which is not necessarily true, and that it does not try to find how mortality influences the fertility and migration patterns.<sup>15</sup>

The analysis on epidemiologic transition specific in different countries can be troublesome. The main causes of death are linked to the changes in the economic, medical developments and to modernization in general. For example, in Netherlands early stage of the second phase is visible between 1875 and 1900 when the impact of typhoid fever, scarlet fever and chickenpox declined. Other infectious diseases such as tuberculosis, whooping cough, diphtheria and other respiratory diseases had a slow decline at the end of the 19<sup>th</sup> century and at the beginning of the 20<sup>th</sup> century. Regarding the degenerative disease a slow increase as causes of death was visible after 1915, and after World War II they also started to decline. As a result, the second stage of Omran's theory can be observed until the middle of the 20<sup>th</sup> century and after this time it is difficult to trace because of the rapid advances in medicine.<sup>16</sup> In Poznan province (Poland) the impact of the degenerative diseases as cause of death increased since 1880, and the impact of the infectious diseases declined slowly until the 20<sup>th</sup> century when this decline accelerated.<sup>17</sup> The problem in Germany is that the degenerative disease did not start to be recorded until 1982 when an official statistic was made in the entire state. As a result the decrease of tuberculosis is noticeable but the starting point cannot be seen; after World War I

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<sup>12</sup> Omran, "The Epidemiologic Transition Theory. A Preliminary Update," 311.

<sup>13</sup> Robert E. McKeown, "The Epidemiologic Transition: Changing Patterns of Mortality and Population Dynamics," *American Journal of Lifestyle Medicine* 3, suppl 1 (July-August 2009), 24.

<sup>14</sup> McKeown, "The Epidemiologic Transition: Changing Patterns of Mortality and Population Dynamics," 25.

<sup>15</sup> James C. Riley, George Alter, "The Epidemiologic Transition and Morbidity," *Annales de démographie historique* (1989), 202.

<sup>16</sup> Judith H. Wolleswinkle-van den Bosh, et. al. "Cause-Specific Mortality Trends in the Netherlands, 1875-1992: A Formal Analysis of the Epidemiologic Transition," *International Journal of Epidemiology* 26, no. 4 (September, 1997).

<sup>17</sup> Grażyna Liczbińska, *Lutherans in the Poznań Province. Biological Dynamics of the Lutheran Population in the 19<sup>th</sup> and early 20<sup>th</sup> Centuries* (Hamburg: Verlag Dr. Kovač, 2015), 86-87.

the descending is more visible. The number of deaths cause by heart related problems increased, but cancer is the disease that started to have a bigger impact starting with the 20<sup>th</sup> century.<sup>18</sup>

The main purpose of this article is to observe some characteristics of the epidemiologic transition present in communities from Transylvania. The focus will be on the patterns of certain infectious diseases and of disease of the circulatory and nervous systems over a time span of 70 years (1859-1930) in order to observe in which stage of the epidemiologic transition is noticeable. Albeit the sample is small certain mortality patterns are visible. The causes of death are classified according to *International statistical Classification of Diseases and Related Health Problems*, tenth revision (ICD-10).<sup>19</sup> Different aspects of mortality are analyzed, the epidemics present, sex and age differences, and seasonal variation of the causes of deaths. We propose to validate the methods used in order to observe the epidemiologic patterns in this area, and to raise interest for other studies, more profound to be conducted thus aligning to the research made by other European researchers.

### Sources and methodology

In order to study the main causes of death in Mureş Valley three communities were chosen Războieni-Cetate, Noşlac și Mirăslău. The sources consist of the parish burial registers for the Reformed- Calvinist denomination. The total number of deaths is 1837 and the period of study is between 1859 and 1930.

*Tabel 1. The three vilages under observation and the number of death between 1859 and 1930*

Village	Numer of deaths between 1859-1930
Războieni-Cetate	331
Noşlac	730
Mirăslău	776
Total	1837

The method used is a descriptive one. The burial parish registers offer information about the total number of deaths, sex, age, date of death and burial and the causes of death for every individual. The reason why only the parish burial

<sup>18</sup> Hallie Kintner, "Recording the Epidemiologic Transition in Germany, 1816-1934," *Journal of the History and Allied Sciences* 54, no. 2 (April, 1999), 167-168, <http://jhmas.oxfordjournals.org/>.

<sup>19</sup> For more information about ICD-10 see Izabela Georgiana Coroian, "Application of ICD-10 on Causes of Death from Burial Parish Registers from Transylvania," *PHILOBIBLON. Transylvanian Journal of Multidisciplinary Research in the Humanities* XXIV, no. 1 (2019), 127-141.

registers for the Reformed-Calvinist denomination was used is because in these sources the causes of death are more complete. The parish burial registers for the Greek-catholic, Catholic and Orthodox communities also present in these villages recorded only the violent deaths (murder, accidents, suicides) and most of the people who died because of illnesses were recorded as 'natural deaths' regardless of the age of the deceased. In the parish registers of Reformed-Calvinist denomination such case of 'ordinary death' were recorded but only in a few cases.

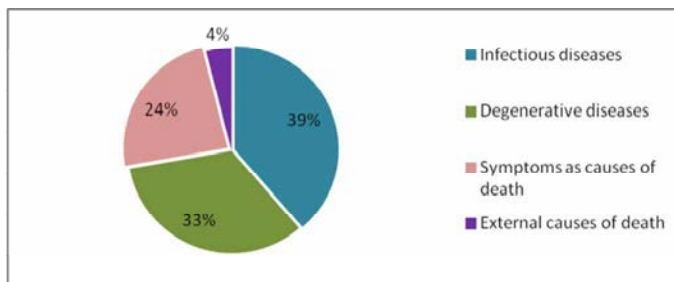
Analyzing this information, we can establish at a community level the years with a high death toll and with lower ones, in which age group and season the highest number of deaths were recorded and the illness behind, also if some small epidemics were present. All the information gathered was subjected to a standardization process and based on the age of the deceases certain age groups were formed. A special attention was given to the causes of death in the standardization process because some diseases appeared under different names or variation of names, and they were coded and classified according to ICD-10. The tools used for the analysis were Microsoft Excel and SPSS.

### **The prevalence of the main causes of death**

The parish burial registers record the main causes of death for the population in these Reformed-Calvinist communities from the Mureş Valley and it is unmistakable that infectious diseases were the most responsible, but degenerative diseases were recorded as well. The same problem of ill-define causes exists as well but in smaller numbers, clearly defined diseases were recorded in 72% of the total number of deaths, out of which 39% were infectious diseases. Unfortunately, many symptoms were recorded as causes of death, symptoms belonging to a multitude of diseases, and cannot be integrated into a disease or another. In this category 'debility' and 'old age' were included. About 24% of the total number of deaths was due to symptoms. Another 4% of the total number of death was external causes, meaning accidents, murders and suicides.

In the following, the clearly define diseases are analyzed, organized by the system they belong to, with emphasis on the infectious and degenerative diseases with higher impact.

*Graphic 1. Main categories of causes of death recorded in these parishes 1859-1930*



As can be seen from *Graphic 1* the infectious diseases had the highest toll, 39% of the total deaths. In this category tuberculosis had the highest impact, 40% of all deaths due to infectious diseases, and was present every year. Towards the end of the study period the impact diminished, until 1900 on average 5 people died every year because of it, but after 1900 the average was of 3 death every year.

The pox<sup>20</sup> had the most impressive decline. Before 1900 on average 3 children died every year, but after the beginning of the 20<sup>th</sup> century only one child died from pox every year on average. Diphtheria was the infectious diseases with the second highest impact in Transylvania according to the official statistics from 1901-1910. It also had a high impact in our communities, 86 people died because of this disease. Between 1873 and 1876, 1894 and 1897 there was a small epidemic of this disease in Transylvania and these communities were affected as well, the number of people who died was above average. In the second half of the 19<sup>th</sup> century the average number of deaths was 2. Between 1859 and 1900 73 people died because of diphtheria, and between 1901 and 1920 only 13 people died because of it, after this year there are no more deaths related to diphtheria recorded in the parish registers. Typhus had a similar trend, between 1859 and 1900 37 people died because of this disease and only 16 in the first part of the 20<sup>th</sup> century, typhus disappearing as cause of death after 1924. Whooping cough also was responsible for a high number of deaths in the second part of the 19<sup>th</sup> century, in total 42 people died because of it, but in the first 30 years of the 20<sup>th</sup> century the numbers were substantially reduced.

Since infant mortality was very high, illnesses in the perinatal period have also a high frequency, 12% of all deaths. In this category, both of the causes of death recorded are vague and probably hide different diseases and problems. By problems I am referring to lack of care of the pregnant women and of the new born because for 192 children the cause of death recorded was 'congenital debility' and 24 children died because of premature birth. Strangely, there were no cases of infants who were born dead.

Disease of the respiratory system had also a high impact, especially pneumonia and influenza. From the total of deaths due to respiratory disease, pneumonia had a 63% and influenza 30%. Other diseases of the respiratory system recorded are pulmonary emphysema, 4 cases, chronic laryngitis, bronchitis, and chronic pulmonary diseases but in very small numbers.

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<sup>20</sup> In Romanian pox is called "vărsat". Many Romanian scientists claim that this actually represents smallpox, but I found instances when in the same village there was an epidemic of chickenpox or scarlet fever in one burial parish register from one denomination and in another only pox was registered, as a result I am not exactly convinced that some denominational communities was confronted only with chicken pox and others only with smallpox even though they lived in the same village. At least in the second half of the 19<sup>th</sup> century people did not distinguish between these diseases. This is the reason I choose to maintain the term pox and not, in order to present the situation more accurately than to speculate the predominance of a specific disease.

In the category of circulatory system diseases, the highest impact had the stroke, 53.93% and heart attack 32.58%. Other diseases were sclerosis, hemorrhoids and other cardiopathies but under 4 cases. Illnesses of the digestive system recorded in the burial parish registers were gastroenteritis, with the highest frequency 24.48%, gastritis, gastric ulcer, peritonitis and abdominal hernia. Starting with the year 1890 diseases of the bones and the muscular tissue were recorded as causes of death for 8 people, mostly atrophy of the muscular tissue and of the spine, but these too can be as a result of other illness unspecified. 17 women died as complications of child births, but the recordings are vague; 5 women died at childbirth, 4 because of hydrops due to labor, 5 in labor pain and 4 because of puerperal fever.

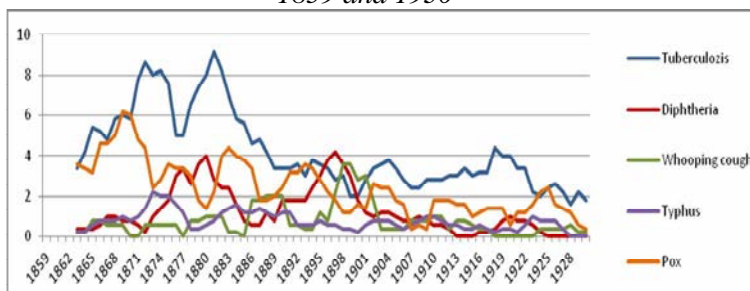
In the symptoms category the highest frequency is 'debility' or 'old age', 38,44% of this category. Hydrops is the second most common symptom as cause of death, 15,56%, and 11,89% is the percentage for the cases of 'natural' or 'ordinary' deaths. Other common symptoms which can be attributed to different illness are fever, haemorrhage, convulsions and weakness.

External causes of death is formed of all cases of accidents, suicides, murders, and 12 men died in the war, either on the battle ground or as prisoners.

With reference to the epidemiologic transition a decrease of the infectious disease is unmistakable, as pointed out in the graphic below. The most pronounced decline occurred in the cases of tuberculosis and pox because these two diseases had the highest impact, but the decline is also visible in the case of diphtheria, a disease which was no longer recorded as cause of death towards the end of the observation period. Whooping cough was responsible for the increase in the number of deaths at the end of the 19<sup>th</sup> century, but in the next century the number of deaths due to this infectious disease declined, only 13 deaths were recorded.

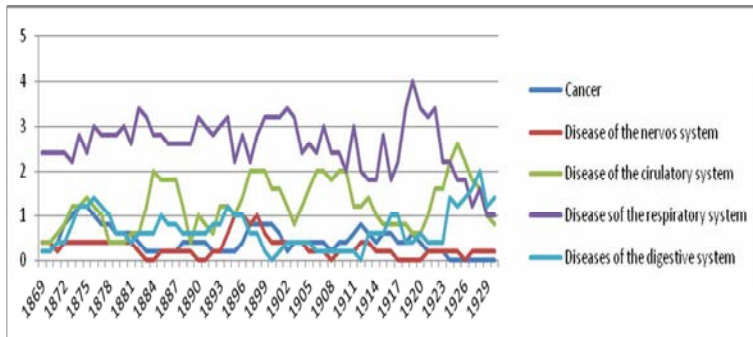
Even though the decline in infectious diseases is visible, an increase in the numbers of deaths due to degenerative diseases is not visible yet, but one must bear in mind the fact that mortality was on a declining path in this region. On average 5 deaths per years were due to degenerative diseases for the whole period under study. Indeed, towards the observation period deaths because of these diseases were recorded every year.

*Graphic 2. Changes in the infectious diseases – five-year averages between 1859 and 1930*





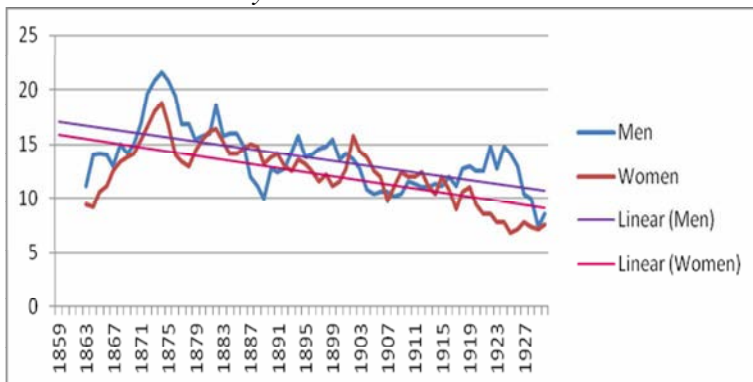
*Graphic 3. Changes in the degenerative diseases – five-year averages between 1859 and 1930*



The same pattern of decline is visible in the case of symptoms recorded as causes of death. The most visible decline is in the case of weakness and hydrops recorded as causes of death, the numbers decreasing in the 20<sup>th</sup> century. For hydrops, for example, the annual average number of deaths is 1.14 in the second half of the 19<sup>th</sup> century and 0.66 in the first half of the next century. The number of deaths classified as ‘unknown’, ‘ordinary’ or ‘natural’ decrease as well, at the beginning of the 20<sup>th</sup> century only 4 deaths were classified as such, the last two at the end of World War I.

The next part of the analysis consists in observing the gender distribution of the causes of death. As it was mentioned before, in these communities there is a clear pattern of a higher number of deaths among men, specifically, 52,7% from the total number of deaths. There is clear pattern of declining mortality in both genders, but as *Graphic 4* shows the decline is more accentuated among women towards the end of the observation period.

*Graphic 4. Five-year average on gender distribution of mortality and the tendency line between 1859 and 1900*



*Graphic 5* depicts the main causes of death where the difference between genders was noticeable. In the case of infectious diseases, overall, the differences

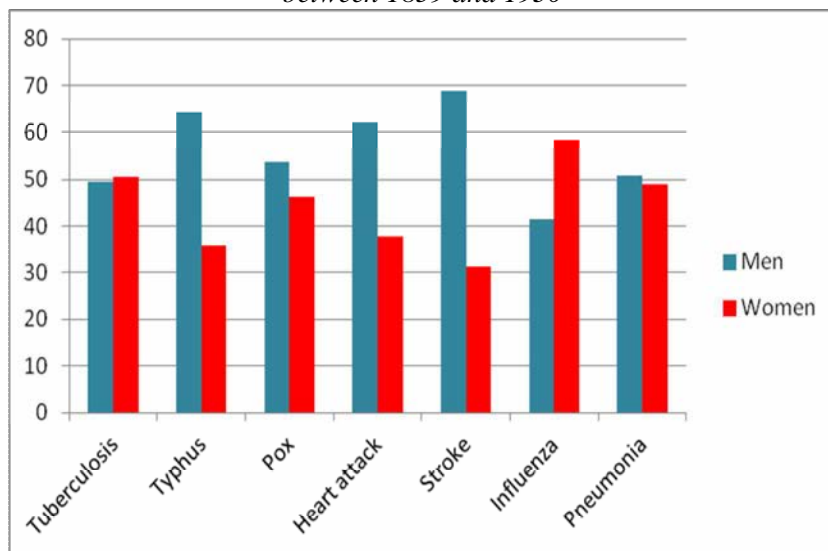
between men and women are very small, from the total of death from infectious diseases 52% were men and 48% were women. Observing in more detail, typhus had a higher prevalence among men, from the total of 53 people who died of this disease, 34 were men and 19 women. From the total number of people who died because of pox 53.84% were men and 46.15% women. Tuberculosis was more prominent among women, 50.53% of the total death from tuberculosis were women and 49.46% were men. The differences between genders are very small regarding deaths due to the other infectious diseases.

Illnesses of the circulatory system had a higher prevalence among men. The highest differences between the genders can be seen especially in case of deaths caused by stroke where over 68% of the deaths were among men. Similar is the case for deaths due to heart attack where the percentage of men is slightly over 62%.

At a first view over the diseases of the respiratory system the situation is almost even, but specific on diseases one can see that influenza had a higher impact on women, but the situation is reversed in the case of pneumonia. From the total number of deaths due to influenza 58,49% were women and 41,5% were men. In the case of the second diseases mentioned 51% were men and 49% were women.

Significant differences cannot be observed in other diseases between men and women, not even in the case of symptoms, but one must also consider the fact that the population sample is pretty small. Only in the case of infants who died because of congenital debility 100 infants were boys and 92 were girls, but infant mortality wholly was slightly higher for boys.

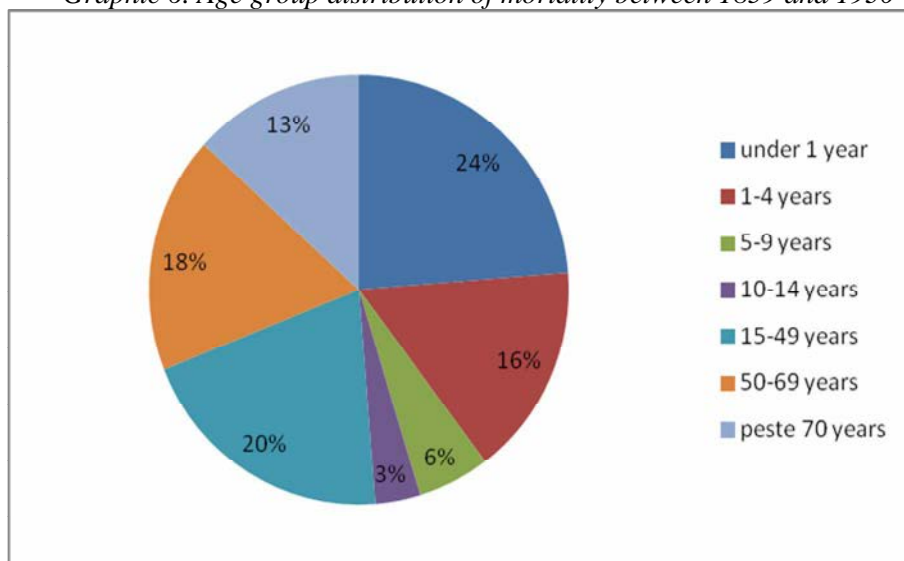
*Graphic 5. Highest differences in cause of death between men and women between 1859 and 1930*



The third argument of the epidemiologic transition states that the first changes in the infectious disease patterns are among women and children. In this respect the focus is on observing if mortality among women declined. As it was said before mortality declined in the second half of the 19<sup>th</sup> century, and the number of deaths due to infectious diseases also declined. In addition, mortality among men was higher. Considering this, a clear decline in the number of deaths among women is only slightly visible, more apparent after the end of the World War I so we can say that the third argument of the theory begins to apply here. As can be seen in *Graphic 5* the number of deaths among women declined but this has multiple explanations. Because the male population was higher so was the number of deaths, every year more men died. Analyzing the causes of death, there are few diseases that had a clear prevalence among women. The number of deaths among women declined with regards to every disease towards 1930, but the same was the case for every individual because of the pattern of decline in mortality.

Analyzing the age group differences in mortality it must be said from the beginning that the highest number of deaths were among children. Infant mortality represents 24% from the total number of deaths, and mortality of children with ages between 1 and 4 years represents 16%. As it was said before for infants the most frequent cause of death is ‘congenital debility’, 42.43%, and for people over 60 years it is ‘old age weakness’.

*Graphic 6. Age group distribution of mortality between 1859 and 1930*



At every age the infectious diseases had a high impact comparing with the other diseases, yet the highest impact was among children between 1 and 4 years of age. Diphtheria affected children mostly, 80,23% were children between 1 and 9 years

of age. There were recorded 55 deaths because of whooping cough and 53 of them were children under 5 years. Obviously the pox epidemic affected mostly children, about 50% of them died before their first birthday and 33% were children with ages between 1 and 4 years.

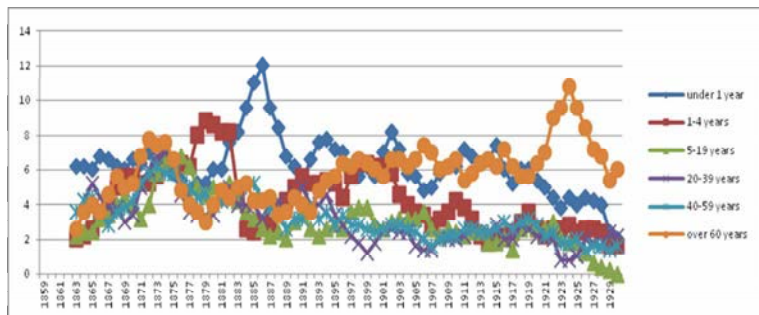
Tuberculosis affected especially people over 20 years, 73.30% of all deaths due to this illness was among people with ages between 20 and 69 years, but deaths due to tuberculosis were recorded in all the age groups. Likewise, typhus was responsible for the death of people in all age groups but affected the adult population in higher proportion; the highest number of deaths was recorded in the 20-19 age group.

Out of all the cases of death because of influenza 54.34% were among infants. Regarding pneumonia, 26% of all deaths were recorded among people with ages from 40 to 59 years and 23% among children under 5 years. From the total number of deaths because of diseases of the digestive system, 13% were infants and 53% were adults with ages varying between 30 and 69 years. Out of 28 deaths due to different types of cancer, 22 were people between 20 and 69 years.

Stroke and heart attack had a higher frequency in the population between 50 and 79 years.

With reference to the third argument of the epidemiologic transition, it is noticeable that the number of deaths among the children dropped very much. A decline in mortality is visible in almost all age groups up until 60 years of age, after this group the number of deaths increased. The most pronounce decline in mortality can be seen in the 1-4 years age group. At the end of the 19<sup>th</sup> century 5 children in this age group died on average every year, and after 1901 this average decline to 3 children. In the case of infant mortality the annual average between 1859 and 1901 was 7 infants and in the first half of the 20<sup>th</sup> century it decline to 5 infants. Although, since there is present a tendency of declining mortality, it is safe to assume that the part of the argument which refers to a drop in the deaths of children applies in our geographical area. Infant mortality and that of the children in general decline mainly because of the reduction of the impact of infectious diseases.

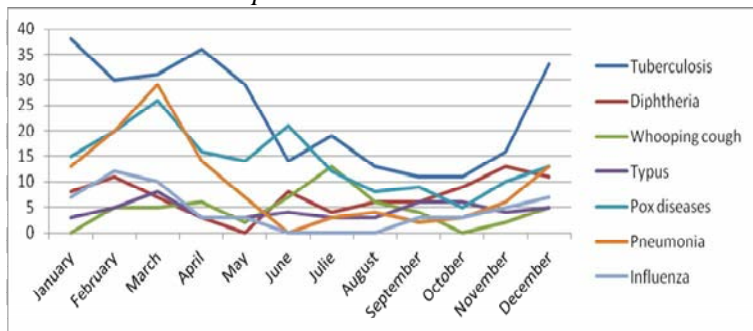
*Graphic 7. Five-year average on age group annual distribution of mortality between 1859 and 1930*



With regards to the seasonal movement of mortality and causes of death, the highest number of deaths in these communities were recorded in winter and spring seasons. As it is expected, diseases of the respiratory system, pneumonia and influenza, had a high prevalence in the winter and spring months, but also some infectious diseases. For both diseases the highest number of deaths were recorded in March.

Deaths caused by tuberculosis are recorded all year long, with predilection in the first 5 months of the year and in December. Diphtheria also had a higher impact between November and February. The pox diseases were present all year long with a high prevalence in the spring, the toll being recorded in March, but a high number of deaths was registered in the summer months with a toll in June. Whooping cough has a clear pattern of virulence in the summer months.

*Graphic 8. Monthly distribution of the main causes of death with a clear seasonal pattern between 1859 and 1930*



Degenerative disease recorded in the burial parish registers of these communities do not have a clear seasonal pattern. The main reason for this is because of the small numbers of deaths caused by them. The highest numbers of deaths were recorded in the spring and winter months following the seasonal pattern of mortality present in Transylvania.

## Conclusions

Summing up the information presented in relation to the epidemiologic transition it is safe to assume that these communities are in the second stage of the epidemiologic transition, namely the stage in which infectious diseases decline and the impact degenerative diseases increases. As it was mentioned before this stage has two phases, early and late phase. Of course the distinction between these two is not absolute. Observing the mortality characteristics presented and the causes of death we would suggest that these communities are in the early phase. Until World War I infectious diseases still have an immense impact, being the primarily causes of deaths. Towards the end of the period under observation this impact declined and some infectious diseases are not recorded as causes of death anymore. Two

characteristics of the late phase are identified, namely the downturn of the impact of tuberculosis, even though it still has a high predominance, and in this time the last cholera epidemic was present (1873), but disappears completely towards 1930. Nonetheless, the number of deaths due to degenerative diseases remains constant, only a few cases are recorded annually.

The most visible decline in mortality is among children under 5 years of age. This proves that the third argument of the epidemiologic transition is true in these communities as well, the factors behind this decline being the decrease of the infectious diseases.

As Abdel Omran stated in his complement article, in the non-western countries the impact of infectious disease started to diminish in the 20<sup>th</sup> century which is visible in these communities.<sup>21</sup> Another statement that mortality raises among people over 50 years of age<sup>22</sup>, is true for these communities as well.

At the end of the 19<sup>th</sup> century the main causes of death in the three communities from Mureș Valley, Noșlac, Războieni-Cetate și Mirăslău, were infectious diseases, 40% of deaths being caused by tuberculosis, but pox, whooping cough typhus and diphtheria were recorded as well. Eventhough some of these diseases decreased in impact towards the end of the observational period, the degenerative diseases were recorded with the same frequency during the entire period. Mortality levels are continuing dropping, only during the World War I the number of deaths increased in some years, afterwards the decline is more obvious. This pattern is visible in all age groups, but the most noticeable decline in mortality can be seen among infants and children under 5 years old. After the age of 60 years the number of deaths increased slightly, but this was mostly because people got to live longer. After World War I mortality declined in this region because of the social and economic improvements, but mainly because of the medical development, in the 20th century effective treatments were discovered.

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<sup>21</sup> Omran, "The Epidemiologic Transition Theory. A Preliminary Update," 307.

<sup>22</sup> Omran, "The Epidemiologic Transition Theory. A Preliminary Update," 311.