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The first Russian nomenclature of diseases and diagnostics of causes of death in the XIX century: a particular case

Abstract. The purpose of this article is to analyze changes in the diagnosis of causes of death of the local population and to study the relationship of these changes with the development of medicine and unification of the definition of causes of death in Russia. The information base of the study is the registers of the two parishes in the Moscow County in the period from 1815 to 1918. The obtained results show a significant improvement in the diagnosing of causes of death in the second half of the XIX century, connected with the expansion of the network of medical institutions in the Moscow Province and the activity of the medical society in the development of the Russian nomenclature of diseases.

Keywords: causes of death, classification of diseases, zemstvo medicine, parish registers, historical demography

JEL Codes: J00, J11

Little is known about the evolution and features of mortality in pre-revolutionary Russia. Data on the number of births and deaths published since the end of the XVIII century by the Statistical Committee of the Ministry of Internal Affairs of the Russian Empire, as well as estimates of the population made on the basis

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of the of population registers, enables obtaining but a most general idea of the natural movement of the Orthodox population of European provinces.¹ This information, however, was of enormous strategic importance, showing that, due to natural population growth, Russia is an absolute “demographic leader” among the largest European countries. At the same time, these data showed that in the last decade of the XIX century in Russia there were signs of what will later be called demographic transition, or demographic revolution (Fig. 1).

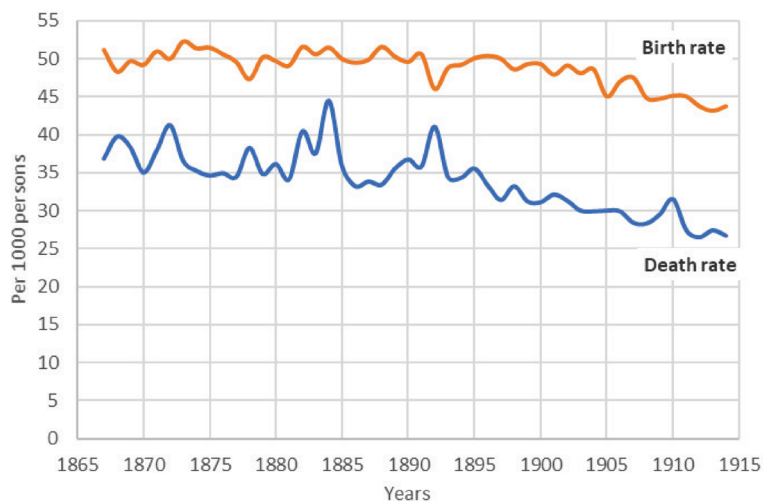


Figure 1. Estimation of the crude birth and death rates for European Russia from 1868 to 1914, made in 1934 by the Central Department of National Economic Accounting of the State Planning Committee (Gosplan) of the USSR .

Source: Russian State Archives F.4372, Op.32, D.139 L. 11, published at <http://istmat.info/node/51003> (date of reference December 10, 2018)

It should be borne in mind that in the XIX century demography, as a science in the modern sense, did not yet exist. Although the word “demography” appeared in 1857, the term was used mainly to summarize data relating to what was then called “moral statistics”, and today it should be called social statistics. Actually the domain of demographic analysis in the XVIII-XIX centuries was mortality,

¹ The data were summarized results of church registration of demographic events and for a long time included only information on births and deaths of the Orthodox population of 50 European provinces of the Russian Empire (without the Kingdom of Poland, Siberia, Caucasus and Central Asia). Data on the population of other confessions, also for 50 European provinces, were published by the Central Statistical Committee of the Russian Empire since 1867. So-called revision or enumeration lists (*revizskaya skazka*), which were lists of the taxed members of households, as well as individual and household (families) lists of representatives of privileged classes were, in fact, registers of the population in the Russian Empire.

the methodology of quantification of which was based on the construction of life tables, which, in fact, represented a probabilistic model of extinction of a hypothetical cohort. Building life tables was not a purely academic exercise. Since ancient times, these tables served as a basis for assessing risks and premiums in life insurance and determining capital for life pensions [Dupaquier, 1996].

In Russia, interest towards the construction of life tables increased after the abolition of serfdom, when along with industrialization and expansion of wage labor in large industrial enterprises, the need for the creation of insurance and pension funds arised. In this context, since the mid-XIX century, Russian statisticians and mathematicians repeatedly attempted to calculate life tables for the population of the European part of the Empire by means of various indirect methods on the basis of data on the distribution of deceased persons by sex and age. The works of V.Ya. Bunyakovsky [1865], K.A.Andreev [1871]; V.I. Bortkevich [1890], L. Besser & K. Ballod [1897], V.I. Grebenshchikov [1902], S.A. Novoselsky [1908, 1911, 1916] made a significant contribution to the development of the theory of mortality analysis, but specific calculation results were generally criticized and considered unreliable, since before the First All-Russian Population Census in 1897 there was no reference information on the population structure by sex and age. [Novoselsky, 1916: 52-97; Blum, Troitskaya, 1996]. The first complete life tables for the European part of the Russian Empire were calculated on the basis of the data of the First All-Russian Population Census in 1897 and published almost 20 years later, in 1916 [Novoselsky, 1916].

Such late, in comparison with countries like Sweden, France, England, Belgium, etc., construction of life tables in Russia was due not to lack of necessary information, but technical or technological limits in its processing. Indeed, in Russia throughout the XIX century there were data sources that enabled not only building modern-type life tables and estimating the dynamics of mortality indicators, but also indicating the causes of death. Although these sources were well known to the authors of that period, no one attempted to use them because statistical processing of their data was almost insurmountable at the time, difficulties mainly stemming from the lack of a state structure to centralize the collection and processing of information on the population. These sources, were, firstly, revision or enumeration lists (*revizskaya skazka*) — household lists of taxable population in the Russian Empire, containing records on the structure of households by sex, age and kin relations between its members. They also indicated the reasons for the absence of the individual at the time of the revision (*reviziya*), that is, verifying and completing the next list in order to determine the changes that occurred in the population since the previous enumeration. Death of an individual in the period between the two revisions, with indication of the year of the event, dominated among reasons for absence in the current revision. The main limitation of this source in estimating mortality was the lack of detailed information for women, for whom only age was indicated at the time

of the current revision. In addition, building accurate life tables according to the revisions data is possible not for all ages, but only for those that exceeded n years, where n equaled the length of the period between revisions. This deficiency does not play a significant role in adult mortality studies, since during the XIX century the intervals between revisions ranged from 5 to 18 years.

The second source of information on mortality of the Russian population were parish registers containing records on the dates of birth, marriage and death of parishioners not only by their main place of residence, but also by place where a demographic event took place.

By combining information from both sources, it is possible to build individual biographies that enable making rather accurate statistical estimates of age-specific death rates, birth and marriage rates, on the basis of which, in turn, it is possible to calculate basic integral indicators of demographic behaviour of the population [Avdeev et al., 2004; Blum, Troitskaia, 1996].

Until recently, both demographers and historians regarded the quality of information contained in Russian revision lists and parish registers and the possibility of their systematic statistical processing with great skepticism. The skepticism of demographers was due to the lack of experience in working with large amounts of individual data from historical sources; historians, more familiar with working with primary sources, did not always know how to effectively manage the valuable information in their hands.

In this article, we refer to one of the above-mentioned sources, namely parish registers, to study the causes of death — the evolution of diagnosing, sex and age differences in causes of death, the average age of the deceased from various causes — for one particular case, namely for the Vykhino estate of the Counts Sheremetyev in the period from 1815 to 1918. The purpose of the work, due to the limited number of observations, is not to construct life tables by cause of death; the analysis will be rather descriptive. We aim to trace changes in the registration of causes of death in parish registers and to link these changes with the development of medicine and the efforts of the medical community of Russia to unify the estimation of causes of death.

Data and object of study

The object of our research is the causes of death of the population of Vykhino estate of Moscow County, which belonged to the family of Counts Sheremetyev, the largest landowners in Russia since the middle of the XVIII century. The estate, which consisted of the Veshnyaki village and three nearby villages — Vykhino, Zhulebino and Vyazovka — was 10-12 km south-east of Moscow, on Bolshaya Kolomenskaya road. At the beginning of the XIX century, according to the VII revision list (1816) 1,042 persons lived in the estate [Central State Archives of

Moscow, fund 51], and 2,231 persons were recorded in the family list of the Vykhino volost in 1912 [Central State Archives of Moscow, fund 535].

The inhabitants of the estate were parishioners of two churches: most belonged to the parish of the Church of the Resurrection of Christ in the village of Veshnyaki, the smaller part belonged to the Church of the Origin of the Honest Timber of the Cross of the Lord in the village of Kuskovo. Almost 90% of all demographic events taking place in the patrimony were recorded at the Veshnyaki church.

Individual data on the inhabitants of the Vykhino estate (after the 1861 reform — Vykhinskaya *volost*), used in our study for the analysis of mortality by cause, were obtained from parish registers of both churches mentioned above. These documents are stored in the Central State Archive of Moscow in foundation 203 “Moscow Spiritual Consistory”.

Thus, the data set on which this study is based consists of parish registers of the Veshnyaki and Kuskovo churches during the period of 1815–1918 with minor gaps in the time series (in particular, data on deaths are not available for 1865–1871 and 1887–1888). The death records contain information on the name and surname of the deceased, as well as on the date, age and cause of death; out of 7,600 death records of the Vykhino estate within the study period (1815–1918), only approx. 2,000 concern the adults (aged 15 and over).

Assessment of data quality

The widespread (although unconfirmed) view of the poor quality of information in the above-mentioned sources was one of the main arguments for their disregard in the study of the history of the population of Russia. In this article, we put aside the question of the completeness of mortality accounting, that is, the registration of all deaths in each parish without exception. First, it is difficult to verify the completeness of the records without information on migration; secondly, the quality of the records of stillbirths and deaths before baptism, to which all statisticians of the period refer, cannot be verified. But the number of such cases was hardly significant. The death of an unbaptized newborn, was considered a great sin according to church canons, and persons at whose fault the rite was not performed in time, and the child died unbaptized, were punished by a three-year excommunication “with two hundred bows every day.” Therefore, any Orthodox (most often midwives) had the right to baptize unviable babies immediately after birth [Avdeev et al., 2010: 212–214] These babies, even if they died immediately after birth, were recorded in parish registers.

The fact that according to religious canons burial without funeral was practically impossible in the Orthodox population can also be considered an argument in favour of sufficiently complete registration of deaths of adults, at

least in the Vykhino estate. Even the records of the burial of suicides, to whom the church denied funeral ceremonies, were nevertheless entered in a parish register.¹

Long, almost centenary series of birth and death records allowed us to estimate an error in the indication of the age of death in parish registers, comparing the registered age of death with the exact age of death calculated on the basis of the date of birth and death of an individual. Calculation of the exact age of death was possible for 5,800 out of 7,600 inhabitants of the estate of both sexes (76% of our observations). The average deviation of the calculated age from the recorded in the parish registers was 0.57 ± 1.16 years, and 90% of deviations of the calculated age of death from the declared was in the interval of $[-1; 1]$ (Fig. 2). Significant deviations (10 years or more), which account for $\approx 0.2\%$ of the total number of observations, can be both registration errors (in the original document) and copying errors (from the original source of the data file). It should also be noted that the quality of data on the age of death deteriorates with the increase in the age of the deceased.

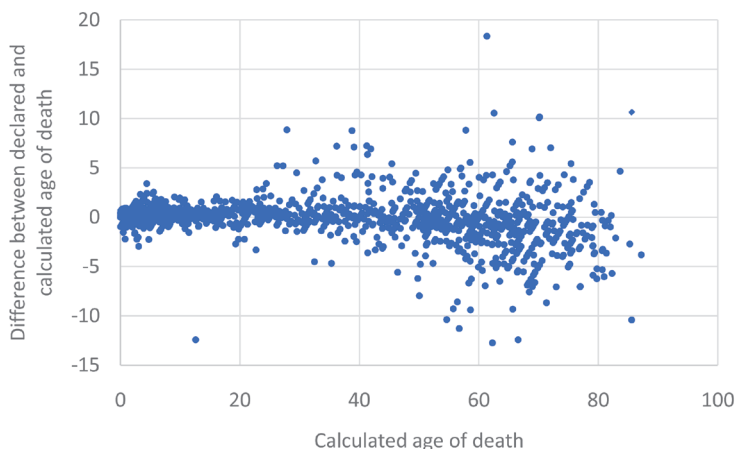


Fig. 2. Deviation of the declared age of death from the correct age calculated on the dates of birth and death, period 1815-1918

Source: authors' assessments

Accumulation of age of death at values that are multiples of 5 and 10, unavoidable for the sources of this period, was also observed in the Vykhino estate, especially in older ages (Fig. 3). Accumulation persists even if the observation period is divided into two intervals, suggesting that the quality of death registration improved in the second half of the XIX century.

¹ In the parish register of the Veshnyaki Church there is a record of a resident of the Vykhino estate, who committed suicide on April 20, 1872 (cause of death — suicide by hanging).

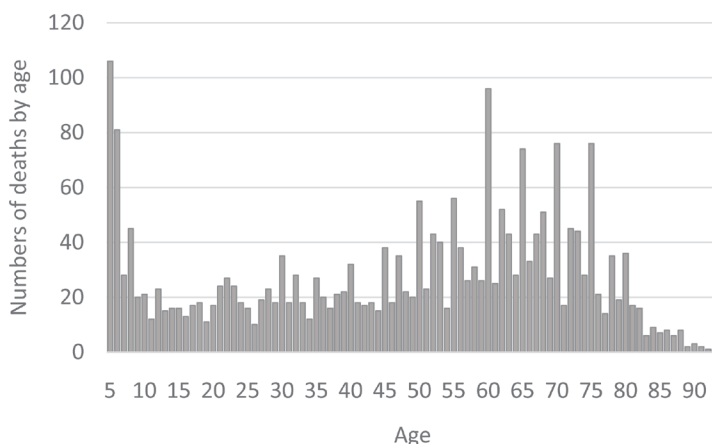


Fig. 3. Accumulation of declared age of death, for the period 1815-1918

Source: authors' assessments

Mortality of the population of Russia: general comments

The lack of information on the size and sex and age structure of the population, as well as the differences in methods and baseline data for the construction of life tables, make it impossible to assess the dynamics of the population's mortality in the Russian Empire throughout the XIX century. The first estimates of the crude death rates refer to the last third of the XIX — early XX century, that is, to the period when, after the creation of the Central Statistical Committee under the Ministry of Internal Affairs of the Russian Empire in 1863, the publication of vital data became more or less regular. S. Novoselsky did not doubt the decline in mortality in Russia starting from the 1890s, having supported his opinion with estimates, which he calls "approximate". He considered this positive trend largely due to the dynamics of child and adolescent mortality: between 1907-1908 the crude death rate in the age group under 15, decreased by 20% compared to 1896-1897. In adults, the trend was not so obvious: a decrease of 4- 8% in women in all ages except the oldest - 75 years and more, and an increase of 3-9% in almost all ages for men, and by 15% in the group of 75 years and older [Novoselsky, 1916: 183].

More recent estimates of the dynamics of total mortality in Russia during the second half of the XIX and early XX century, made in 1956 by A. Rashin on the basis of more complete and accurate data, confirm the conclusion of S. Novoselsky about the decrease in mortality in Russia which began at the end of the XIX century (Fig. 4). After significant fluctuations associated with the First World War and the Civil War, the figures return to pre-war trends. The data also

show a steady natural growth of the population by an average of 1.5% per year, faster in the second half of the period.

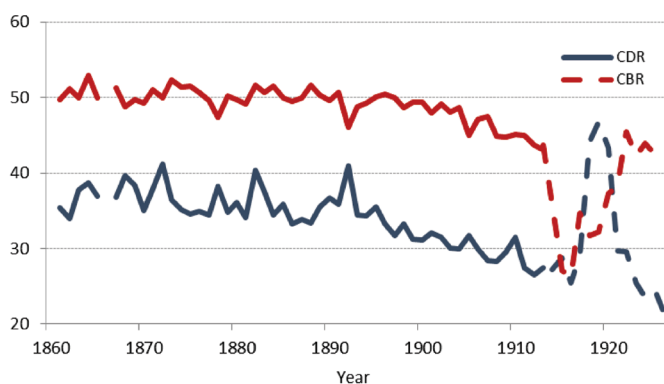


Fig. 4. Dynamics of crude birth and death rates in Russia, 1861-1926

Source: Rashin, 1956: 155-156

The small sample size, as well as the formal nature of revision campaigns (they recorded the legal population, which was not necessarily equal by number and structure to the de facto population) do not enable obtaining sustainable estimates of death rates, even crude rates, for the Vykhino estate. The death rate in the Moscow province during the second half of the XIX century, which was 20- 30% higher than the average for European Russia (Fig. 5) in the 1860-70s, can serve as a benchmark.

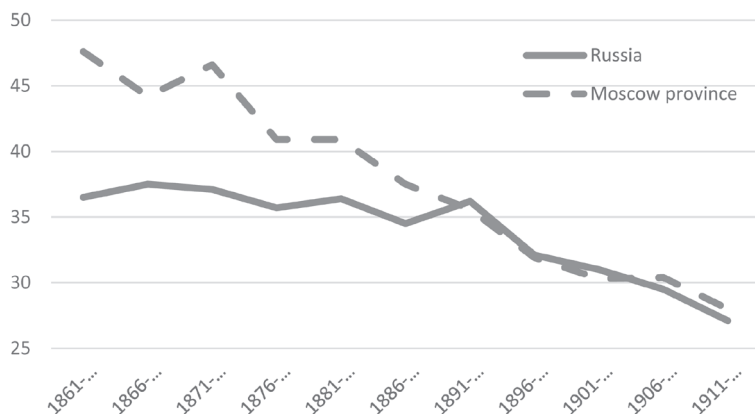


Fig. 5. Crude death rates (%), Russia and Moscow province, 1861-1913

Source: Rashin., 1956: 187

However, these estimates should be used with some caution: given the presence of a large city in the province (according to the 1897 census, Moscow had 1.04 million inhabitants, or 43 per cent of the total population of the province), a higher proportion of men in urban population and higher mortality rates of urban population [Novoselsky, 1911], we can assume that the mortality of the rural population of the Moscow province in the second half of the XIX century was closer to the average Russian values.

Positive changes in the death rates can be noted in the Vykhino estate by analyzing the dynamics of the registered maximum age of death (Fig. 6). This indicator showed a clear increase throughout the observation period, significant fluctuations in the first third of the period (not related, however, to the epidemics of “adult” diseases of the of the period — cholera of 1832–33 and 1848–49). For women, the maximum observed age of death increased slightly faster, but the difference was negligible: the slope in the regression equation is 0.10 (versus 0.08 for men). The mean age of death is also close: 53.9 (± 17.9) for men and 54.7 (± 18.9) for women.

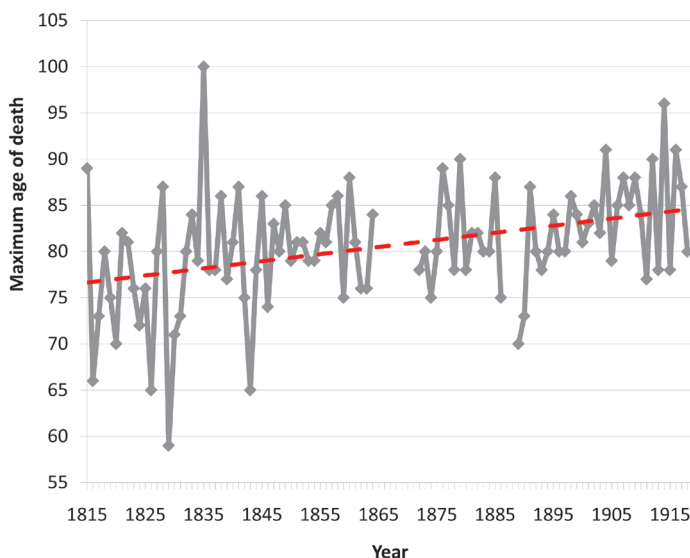


Fig. 6. Dynamics of the observed maximum age of death in the Vykhino estate, both sexes

Source: authors' assessments

Mortality by cause

Despite the fact that demography as an independent scientific discipline began with the analysis of mortality, in the historical populations mortality by cause is

not sufficiently studied, and publications on this topic are scarce. The reasons for this are most likely the absence of a generally accepted classification of diseases up to the end of the XIX century, as well as the apparent presence of priority areas in the study of mortality in pre-transition period, namely:

- 1) Child mortality, as it was abnormally high in Europe until the end of the XX century, and in Russia — until the 1930s [Avdeev, 2002; Corsini, Viazzo, 1993; Houdaille, 1980];
- 2) Mortality during epidemics, because they were a danger to society and because they were easiest to diagnose [Bordelais, Raulot, 1987; Hildesheimer, 1993; Alexander, 1980].

In addition, both of these types of mortality gave a sufficient number of observations, which greatly facilitated their study.

Even at the beginning of the XX century, S.A. Novoselsky wrote: “As for the immediate causes of high mortality in certain ages in Russia, any definite, numerically based judgment in this regard is extremely difficult, since statistics of causes of death in Russia for the rural population is almost completely absent. An exception is only contagious diseases, for which there are some, though little satisfactory, data based on the parish registers of the clergy” [Novoselsky, 1916: 158]. In Russia, registration of the deceased from infectious diseases was introduced in 1891-1892, according to parish registers. Previously, more or less attention had been paid to external mortality, perhaps because its registration had been much more orderly. All cases of violent death in pre-revolutionary Russia were necessarily investigated by the police; without their conclusion, burial was impossible, so it was often not done on the third day, as prescribed by Orthodox canons, but later. It is no coincidence that the only official publications devoted to mortality by cause in Russia were two statistical reports “Violent and sudden deaths in the Russian Empire”, published in 1894 and 1897 and relating to the periods of 1875-1887 and 1888-1893 respectively.

In Russia, studies of mortality in general and mortality by cause in particular were complicated by the insufficient level of development and organization of medicine. The emergence of a medical care system accessible to the population (primarily for peasants) can be attributed to 1864, when the introduction of the institute of county council doctors, serving peasants at the expense of the bodies of local self-government — the county councils (*zemstvo*). Before the introduction of the system of *zemstvo* medicine, the number of rural hospitals was very small, mostly owned by the Ministry of State Property and intended for the treatment of state peasants. As for the serfs, which were almost total population of the Vykhino estate studied here, according to famous Russian doctors, who were authors of the research on the development of Russian *zemstvo* medicine, “among former serfs there was no medical assistance at the time of the introduction of *zemstvo* institutions. It is true that before, very few landlords kept paramedics and, very rarely, doctors in hospitals, but immediately after emancipation all this was abolished” [Osipov et

al., 1899: 61]. Medical care in hospitals during the pre-reform period was paid for, and if a peasant could not pay for his treatment, the costs were borne by the community to which he belonged. There were frequent cases when an officer of justice accompanied by soldiers came to the village and demanded payment from the community for the treatment of a patient, even if he had already died. Peasants, from their part, did not have much confidence in official medicine and applied to doctors only in the most severe cases. Thus, since in the framework of zemstvo medicine treatment for peasants became free, the attitude to the doctors and treatment began to change gradually. Zemstvo hospitals, which were rather small, soon faced a shortage of beds for the sick, because “... *wishing to stay in the institution, the sick peasants began to indicate that they are the same zemstvo tax payers as well as those who lay on the beds, that if there is no free bed, they will be willing to lay on the floor, and if there is not enough lunch for them, they could eat their own food*” [Osipov et al., 1899: 77].

Peasants began to apply to hospitals more often, which gave doctors the opportunity to introduce an educational element in their activities, for example, telling patients about hygiene and disease prevention. The number of hospitals and beds in them has also increased steadily. If in the early 1860s in 13 counties of Moscow province there were 12 hospitals with 328 beds and 10 asylums for 133 beds (all of them were transferred under zemstvo administration in 1865–1868), in 1890 the province was divided into 52 medical stations with 50 medical institutions (excluding psychiatric ones) with 730 beds and 12 outpatient clinics (Fig. 7).

The number of doctors in zemstvo medical institutions increased from 24 in 1870 to 41 in 1880 and 68 in 1890; the number of auxiliary medical personnel (paramedics of both sexes, midwives, pharmacists with assistants) — up to 87, 114 and 155 respectively [Osipov et al., 1899: 62, 87, 90].



Fig. 7. Expansion of the network of medical institutions in the Moscow province in the second half of the XIX century

Source: Osipov et al., 1899: 88–89

Creation of the zemstvo system in Russia and, within its framework, zemstvo medicine, in addition to increasing the number of medical institutions, doctors and paramedical personnel, led to awareness of the need for zemstvo doctors' association on professional interests. Already in the early 1870s, a few years after the zemstvo reform, the first congresses of zemstvo doctors were held in the provinces. They became regular; we shall further tell about one of them, held in 1876 in the Moscow province, which was an important mark in the history of medical statistics of Russia. The "Pirogov Medical Society" established in 1883, united the best representatives of Russian zemstvo medicine, and at regular meetings of the society, better known as "Pirogov congresses", a wide variety of issues of organization of Russian medicine and medical statistics, social hygiene, sanitary and preventive activities, etc. were discussed. Later they were published in of the Journal of the Society. In addition, the Pirogov congresses served as a link between metropolitan and regional medicine.

In addition, for promotion of sanitary culture among the rural population, as well as for diagnosing causes of death, it was important that by the mid XIX century, i.e. by the time of the introduction of zemstvo management in Russia, in the vast majority of cases people with education no lower than seminary were appointed to the posts of parochial priests.¹ Churchmen were legally obliged to participate in anti-epidemic measures and campaigns to challenge vaccination in their parishes, were obligatory members of committees of public health and smallpox etc., prepared periodic reports from parish registers on those who died from contagious diseases, had the right, in certain cases, in the absence of a doctor, to record death, etc.

Training of priests for health-education activities in their parishes was mainly organized by the eparchial leadership. For example, at the end of the XIX century, in all eparchial educational institutions of the Tomsk province, "Bishop Makarius introduced, outside the program of the Synod, subjects directly influencing the formation of sanitary facilities and the health status of students: fundamentals of hygiene, medicine, vaccination and gymnastics" [Karavaeva, 2011: 17].

The first Russian nomenclature of diseases

In August 1876, Moscow hosted the First Congress of Zemstvo Doctors of Moscow Province. It discussed, among other issues, the need for a uniform classification of diseases and causes of death. In the materials of the congress, published as early as next year, it was noted that "*in the notes of diseases and the preparation of statements doctors have so far been guided by the government nomenclature, the*

¹ In the second half of the XIX century in the Russian system of spiritual education there were three types of educational institutions: spiritual schools (primary education), spiritual seminaries (secondary) and spiritual academies (higher education).

rubrics of which were rather uncertain, so it is impossible to do a detailed analysis of morbidity based on these data - it might be possible to make major mistakes in conclusions. This can explain the extraordinary diversity in the number of diics..." [First Governor's..., 1877: 60]. The development of nomenclature of diseases by Moscow doctors started a few years before the congress; this is indirectly indicated by the published materials of the IV Congress of Russian natural scientists and doctors (Kazan, 1873), which discussed the draft nomenclature of diseases developed by the Society of Russian Doctors in Moscow. The Kazan Congress, respecting the work of Moscow colleagues, considered, however, the project unsatisfactory and did not recommend to doctors to widely use the proposed nomenclature, explaining it with concerns "of constraining the scientific freedom of doctors" [Osipov et al., 1899: 135].

Nevertheless, the work of Moscow doctors under the guidance of E.A.Osipov in this direction continued, and in 1876 the draft nomenclature of diseases was published in the "Moscow Medical Newspaper" (№ 19, 15 May) and in the "Medical Bulletin" (№ 57, August 1), and soon after that represented at the First Congress of Zemstvo doctors of the Moscow province. After discussion by the participants of the congress and introduction of several proposed corrections, the "Draft nomenclature of diseases for zemstvo medical practice" was approved by the Congress and recommended for use by zemstvo doctors of the Moscow province, starting on December 1, 1876. In the following years, this classification was spread in other provinces of Zemstvo Russia under the name "Moscowian". The Nomenclature of Moscow Zemstvo of 1876 consisted of 5 classes and 274 rubrics. The expansion and revision of this nomenclature went on continuously, and the 1897 version included 415 rubrics divided into 10 classes.

At the same congress, the issue of advisability of developing a separate nomenclature of diseases intended for paramedics, i.e. junior medical staff, was discussed. With a clearly insufficient number of doctors, paramedics in rural areas were "an enforced by circumstances addition" to zemstvo medicine, and paramedics, under periodic doctors' supervision, almost always had to act independently in both the diagnosis and treatment of diseases; in this situation, the presence of a single nomenclature, designed specifically for paramedics, simplified and shortened, would have been useful. The Congress, however, rejected the proposal by deciding that "the paramedical nomenclature should be made available to doctors so that they could possess it in accordance with the information of their subordinate paramedics" [First Governor's..., 1877: 98-101]. The participants of the congress also noted that if the paramedical nomenclature should determine the amount of knowledge that the paramedic should have as an assistant doctor, it can become the basis of the program, according to which education in paramedical schools should be organized.

It would be interesting to study whether Russian doctors took into account the experience of European colleagues when creating the nomenclature of

diseases, because by that time — by the early 1870s — several classifications used in medical statistics of different countries were known. The most famous were the classifications of W. Farr and M. Espin, adopted in England and the Swiss canton of Geneva, respectively. It was Farr and Espin, by the decision of the International Statistical Congress (Brussels, 1853), who were entrusted with the elaboration of a uniform nomenclature of diseases with the prospect of its application in all countries. The experience of working together failed: Farr and Espin did not complete this work because they were guided by completely different principles in their classification of diseases [Fagot-Largeault, 1989: 92].

In the middle of 1890s the statistical organization of the Pirogov Society of Doctors called for coordination of sanitary and statistical research of zemstvos in Russia in order to create all-Russian nomenclatures of diseases and causes of death. In 1894 the V Congress of the Pyrogov Society of Russian Doctors charged P.I. Kurkin to head the Commission of the Society on the development of a new uniform nomenclature and classification of diseases. The work of this commission was publicly debated. Scientific medical societies, universities, medical congresses, the sanitary statistics bureau and individual specialists were involved in the creation of the nomenclature; the main foreign materials were used (the J. Bertillion, R. Virchow, English and Austrian nomenclatures). The report of the Commission (P.I. Dyakonov, S.S. Korsakov, P.I. Kurkin, I.V. Popov, V.D. Shervinsky) was presented to the VII Congress of Doctors (Kazan, 1899), at which this first all-Russian, so-called Pirogov nomenclature was approved for use over the next ten years (until the next revision). In respect to principles and content the Pirogov nomenclature, which contained 20 classes and 458 rubrics, relied upon the program of the Moscow zemstvo of 1876. However, it was more orderly and systematic, and also rich in details. The terminology used in this nomenclature was closer to the living language. It became a practice of Russian public sanitary-statistical institutions, but “in one significant point it failed to achieve the goal: due to the resistance of the government bodies, it was not used in official records” [The Great Medical..., 1981].

Diagnosis of causes of death in the XIX century: the case of the Vykhino estate

When analyzing the mortality of the population of the Vykhino estate by cause, the obvious impact of changes in the organization of rural healthcare on the diagnosis of causes of death should immediately be noted. By dividing the study period into two roughly equal parts — 1815-1861 and 1862-1918 — we find the following significant differences in the definition of causes of death:

- 1) In the first half of the period, for 25- 30% of all deaths the cause was either defined as “unknown” or not specified in the parish register at all. After 1861, the proportion of such deaths fell to 0.4 %;

- 2) In the first half of the XIX century some groups of causes were not or were almost not mentioned: diseases of the genitourinary system, neoplasms, geriatric exhaustion and senility. In the second half of the period in the column “Cause of death” in the parish registers, there are such professional diagnoses as tuberculosis meningitis, eclampsia of pregnant women, neoplasms with precise localization and etc.

Taking into account age differences, we will further evaluate the distribution of causes of death for three age groups: 0-4 years (5,226 deaths), 5-14 years (367 deaths) and 15 years and over (2,055 deaths)

Infant and child mortality

In the first half of the study period (1815-1861), for every third death between the ages of 0-4, the cause of death is unknown or not specified at all. Acute intestinal infections predominate in the structure of causes of death: cramps, colic pains, diarrhea (table 1).

Since 1862, 3,191 cases of death between the age of 0-4, recorded in the parish registers of the Vykhino estate have only 11 records in which the cause of death is not specified; there is an improvement in quality of parish registers keeping. In addition, the list of causes indicated in the death records has become much longer: it included slightly more than 20 causes in the first half of the period, and over 40 causes of death of children under 5 were recorded in parish registers after 1861.

Diarrhea and other gastrointestinal disorders, recorded in the parish registers as cramps, colic pains, diarrhea, remained the leading cause of death in both periods and for all ages. This is consistent with the data of other researchers [Hoch, 1998: 365; Shpenev, 2010: 83-85]; the peak of infant and child deaths from this cause occurred in the summer months [Avdeev et al., 2001: 44]. In the second half of the XIX — beginning of the XX century, the structure of causes of death changed, congenital weakness appeared on the second position in the list, and diseases of the respiratory organs (pneumonia, colds) on the third place. Infant infections accounted for almost 20% of all deaths between the ages of 0-4, as in the first half of the XIX century, but the list of infectious diseases was becoming more extensive: in it there were measles and diphtheria, which were absent from the parish registers of 1815-1861.

Table 1. Structure of causes of death of children aged 0-4, 1815-1918

A) period 1815-1861

Causes of death	Age of death (years)					Total deaths from this cause	
	0	1	2	3	4	Number	Share (%)
Diarrhea	47.7%	35.3%	38.0%	34.3%	25.0%	579	43.3%
Colic pains	26.2%	17.2%	12.4%	4.3%	6.8%	290	21.7%

The end of table 1A

Causes of death	Age of death (years)					Total deaths from this cause	
	0	1	2	3	4	Number	Share (%)
Smallpox	9.6%	19.9%	16.5%	28.6%	22.7%	179	13.4%
Cold	7.3%	12.2%	19.0%	21.4%	34.1%	144	10.8%
Measles	2.5%	8.6%	8.3%	1.4%	6.8%	55	4.1%
Whooping cough	2.8%	2.3%	0.8%	2.9%	0.0%	33	2.5%
Other	3.9%	4.5%	5.0%	7.1%	4.5%	57	4.3%
Total	100%	100%	100%	100%	100%	1337	100%

B) period 1862-1918

Causes of death	Age of death (years)					Total deaths from this cause	
	0	1	2	3	4	Number	Share (%)
Diarrhea	45.7%	33.7%	23.3%	21.3%	12.3%	1281	40.3%
Congenital weakness	17.7%	0.4%	0.0%	0.9%	0.0%	391	12.3%
Pneumonia	8.2%	13.5%	15.1%	8.3%	11.1%	309	9.7%
Cold	7.0%	11.6%	11.6%	9.3%	12.3%	267	8.4%
Scarlet fever	2.8%	11.8%	19.4%	21.3%	22.2%	214	6.7%
Colic pains, cramps	8.5%	3.2%	1.7%	0.0%	0.0%	208	6.5%
Measles	2.9%	7.4%	9.1%	13.9%	6.2%	146	4.6%
Whooping cough	2.6%	5.6%	8.6%	7.4%	16.0%	77	2.4%
Dysentery	2.1%	4.0%	1.7%	1.9%	1.2%	66	2.1%
Smallpox	1.5%	3.9%	1.7%	2.8%	4.9%	61	1.9%
Diphtheritis	0.9%	3.9%	3.4%	8.3%	3.7%	32	1.0%
Other	0.1%	1.1%	4.3%	4.6%	9.9%	130	4.1%
Total	100%	100%	100%	100%	100%	3182	100%

Source: authors' assessments

Child and adolescent mortality

The study of causes of death between the ages of 4 and 15 is complicated by the fact that the number of deaths at that age is small. Only 367 deaths in this age group were found in parish registers throughout the monitored period. Therefore, it is possible to distinguish neither by period or sex with such a number of observations;

in addition, for 42 deaths the cause is unknown or unspecified. We shall only note that the main causes of death in this are infectious diseases — scarlet fever, smallpox, diphtheria, measles (43% of the total number of deaths), respiratory diseases — pneumonia, colds (21%) and gastrointestinal disorders (16%).

Mortality of population aged 15 and over

In the adult population of the Vykhino estate throughout the XIX century, the main causes of death recorded in parish registers remain cardiovascular, infectious and respiratory diseases (Fig.8).



Fig. 8. Distribution of adult mortality in Vykhino estate by main groups of death causes, both sexes

Source: authors' assessments

Senility increased especially in the structure of causes of death in the second half of the study period. The average age of those who died from this cause in the Vykhino estate is 76 years of age; it is possible that this diagnosis was automatically made to all those who died in old age, especially if there was no obvious cause of death, and the diagnosis was made on the basis of verbal autopsy.

In the second half of the XIX century, in medical circles in the West, the meaning of the “senility” diagnosis was widely discussed (in the parish registers of the Vykhino estate it was referred to as “old age” or “geriatric exhaustion”). In his classification, W. Farr defines the cause of death from old age as “senility”, M. Espin - as “senile marasmus”. In J. Bertillon’s nomenclature of diseases, officially used in Paris at the end of the XIX century, “senility” appears in class XIII

“Old age” under rubric 141. But when Bertillon proposed the first revision of the international nomenclature of diseases identical to the Parisian one, the American statistician C.L. Wilbur expressed the following opinion about this cause of death: the diagnosis of “senile dementia” means, in fact, that there is no diagnosis; therefore, this cause should be classified as “unidentified”. Bertillon’s objections were that age exhaustion of the body was an acceptable cause of death and could not be attributed to unidentified; he considered it possible to formulate such a diagnosis starting from the age of 60 [Fagot-Largeault, 1989: 107].

We had to analyze the causes of death of adults by sex for the entire period due to the insufficient number of observations. There were no significant differences in mortality in men and women in the Vykhino estate in the XIX — early XX centuries. Men died more often from diseases of the respiratory system, external causes and diseases of the digestive system, women - from infections and senility (Fig. 9).

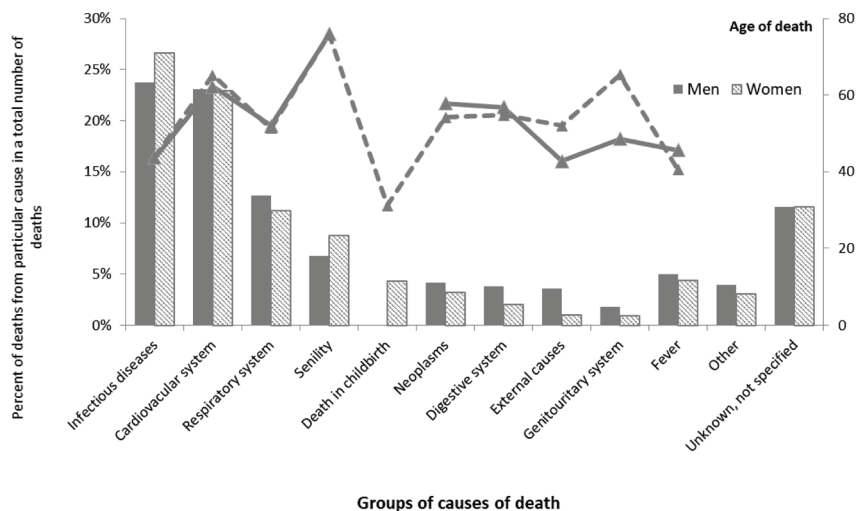


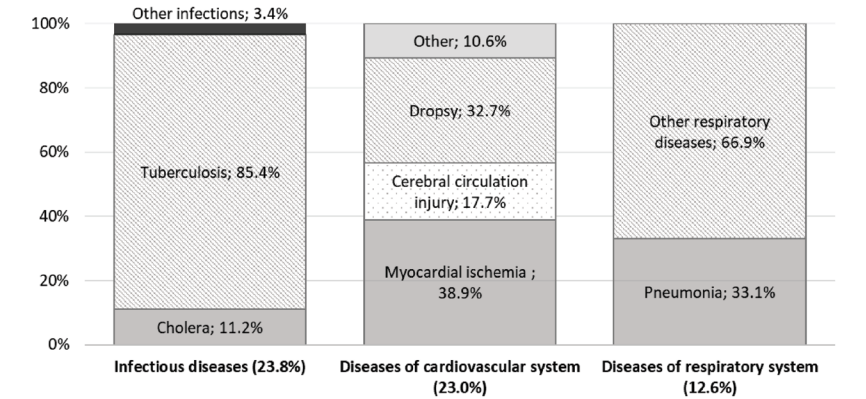
Figure 9. Difference in mortality from major causes by sex and average age of deaths from different causes groups

Source: authors’ assessments

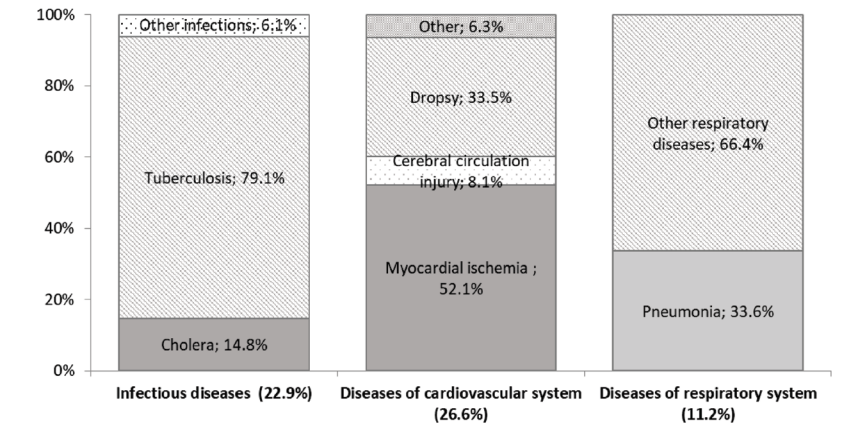
As for the average age of the deceased, men died earlier from external causes (42.8 years versus 52 in women) and urogenital diseases (48.6 and 65.3 years respectively), and later from fever and neoplasms. For the three main reasons, there was little difference in the average age of the deceased, although with the relatively small number of observations we had, it is difficult to draw reliable conclusions.

Detailed analysis of the three major causes of adult death

The structure of the three main classes of causes of death — from infectious, cardiovascular and respiratory diseases — in individual diseases was very similar for men and women (Fig. 10).



A) men (X axis shows the proportion of the causes of this group in the total number of deaths of men)



B) women (in the X axis, the proportion of the causes of this group in the total number of deaths of women is shown in parentheses)

Fig. 10. Detailed analysis of causes of death in the three groups of the most common causes, 1815-1918

Our estimates are somewhat conditional, especially in the analysis of causes of death from cardiovascular diseases: using the records of causes of death in the parish registers, it was necessary to make certain assumptions in order to

draw parallels with modern definitions of disease. Thus, it was assumed that shortness of breath is a symptom of ischemic heart disease, “stroke” or “paralysis” - a synonym of cerebral-vascular stroke, etc.

Conclusion

The results of the study presented in this article, once again confirm the richness of Russian sources on historical demography and the improvement of their quality throughout the XIX century. It is only regrettable that they are insufficiently used by demographers in studying the history of the population of Russia in those periods for which there are only local estimates of demographic indicators. The explanation for this is obvious: difficulties in collecting and processing information extracted from their primary sources; lack of institutional databases on historical demography similar to those in some countries of Western Europe and Northern America; not completely overcome distrust of the quality of sources.

Attention of Russian physicians and statisticians to research mortality, including deaths due to causes, in the XIX century is undeniable. This was largely facilitated by the development of zemstvo medicine, and attempts of the medical community to unify the diagnosis of diseases and causes of death occurred simultaneously with similar activity behalf their colleagues in the West. Study of the possible influence of W. Farr, M. Espin and J. Bertion's classifications of diseases on the nomenclature, created by Russian doctors in the framework of Pirogov congresses could be a further development of the study presented in this article. Identity of these classifications, at least in general terms, can give an idea of circulation of scientific ideas in Europe, about the availability of European scientific achievements for the Russian medical community.

As for the particular case described in this article, we see that in both child and adult mortality there were no differences between the sexes; gastrointestinal disorders in children and infections in all ages were the leading causes of death; in the adult population the average age of deaths from the main causes was relatively low. The proportion of deaths from circulatory diseases was high, but their diagnosis was rather inaccurate, and sometimes it is necessary to classify the causes of death by indirect factors.

Thus, descriptive analysis of mortality by cause in the Vykhino estate does not identify the signs of demographic transition, at least in this particular case.

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