

About the Republic of Moldova Data on Causes of Death

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General

In the 19th century, when Moldova (then called Bessarabia) was a province of the Russian Empire, deaths, births, baptisms, and marriages were registered by the church in special parish registers. The earliest church records in Moldova date back to 1810 (Corlăteanu-Granciuc, 2008). Between 1918 and 1940, Moldova belonged to Romania and gradually came to adopt the Romanian death registration system. When Moldova became the Moldavian Soviet Socialist Republic (MSSR) in 1940, the country adopted the Soviet death registration system. After Moldova gained its independence from the USSR in 1991, new rules were introduced. Independence was declared in 1990 by Transnistria, a region in the eastern part of the country with a population of around half a million (representing 14 percent of the total population). Although this claim was not recognized by Moldova or by any other country, Transnistria was offered “autonomous” status by Moldova. This offer was refused, and war broke out in 1992.

In Moldova, the national system of statistics is centralized. The National Bureau of Statistics (Biroul Național de Statistică), which was called the Central Statistical Administration (TCSU) during the Soviet period, is the main body responsible for the organization and dissemination of official statistics. Apart from the National Bureau of Statistics (NBS), three ministries and their subordinate institutions are involved in the collection and processing of death and birth certificates:

1. The Ministry of Justice, which oversees the Vital Statistics Office;
2. The Ministry of Information, Technology, and Communications, which supervises the Center for State Information Resources and in turn is in charge of the population registries, or “Registru”, as described below; and
3. The National Center for Health Management, which operates within the Ministry of Health and is responsible for cause-of-death statistics.

The annual population estimates are based on data from population censuses and vital and migration statistics. After World War II, four Soviet censuses were conducted in Moldova: on January 15, 1959; on January 15, 1970; on January 17, 1979; and on January 12, 1989. The first census after independence was conducted on October 5, 2004. For political reasons, this census did not cover Transnistria. The most recent Population and Housing Census was conducted in Moldova on May 12, 2014. Like the census of 2004, it did not cover Transnistria.

The Center for State Information Resources “Registru” (SE CSIR “Registru”), an agency that reports to the Ministry of Information Technology and Communication (MITC), is responsible for the maintenance of the State Population Register (SPR). Created in the mid-1990s, the SPR provides information on all Moldovan citizens, as well as on all foreign citizens and stateless individuals who reside in Moldova either permanently or temporarily. Moldovan citizens remain in the SPR even if they migrate permanently or temporarily to another country. Personal data in the SPR are linked by a personal identification number (IDNP). An IDNP is assigned to each individual upon his or her initial registration (that is, at birth or when identification papers are first issued to a native-born individual or to foreigners upon first entry), and it remains unchanged thereafter. An IDNP is removed from the SPR only in case of death or of permanent departure (in the case of foreigners).

The official annual population counts for Moldova are very questionable both for the Soviet period and after independence. In our study, we used the new population estimates produced especially for Moldova in accordance with the Human Mortality Database (HMD) Protocol (in collaboration with Dr. Dmitri Jdanov and Dr. Pavel Grigoriev). A detailed description of quality problems with population data is given in the section “Population data”.

The codification system for causes of death in Moldova during the Soviet period was the same as in the whole of the USSR. The Soviets used a special classification of causes of death (Soviet Classification, SC) based on the International Classification of Diseases and Causes of Death (ICD). After proclaiming independence in 1991, Moldova adopted the 9th revision of the ICD. During the period 1991-1995, two statistical institutions separately carried out codification of causes of death according to the last revision of the Soviet classification (NBS) and the 9th ICD revision (the National Centre for Health Management, NCHM). With the introduction of the 10th ICD revision in 1996, medical death certificates are codified only by the NCHM. We collected cause-of-death mortality statistics at the most detailed available level for the period 1965-2012. For the Soviet period, we used the statistical forms on causes of deaths (forms 5 and 5b) tabulated by the national statistical office based on death certificates. For the period of independence, we used the depersonalized individual death records database provided by the NCHM (see Section 6 “*Classifications in use and collected data*”).

Territorial coverage

Moldovan official vital and migration statistics have not covered the Transnistria region since 1997. The reconstructed cause-of-death series refer to Moldova with this territory included for the years before 1997 and without it thereafter.

Part I – Vital statistics and population censuses

1. Death count data

Coverage and completeness

Annual death counts for both the Soviet period and after independence refer to the *de facto* population (i.e., having occurred within the country).

There are serious problems concerning the registration of infant deaths in Moldova until the mid-1970s. The republican central statistical offices in the former USSR republics, including Moldova, annually conducted so-called *control checks* of the completeness of death and birth registration. The procedure for the control checks that the Soviets started after 1948 (Kharkova, 2006) was as follows. In urban regions, the individual death and birth records were collected at maternity hospitals, maternity units or hospitals; while in rural regions, they were retrieved from so-called house registers (*pohozeistvennaia kniga*). Then, these records were compared with the corresponding civil status acts made by ZAGS (*Zapis' aktov grazhdanskogo sostoiania*, Registry of Acts of Civil Status). In the Soviet system, ZAGS was the district administration office responsible for registration of births, deaths, marriages, divorces and other acts related to the legal status of family members (Andreev, Scherbov and Willekens, 1995). In Moldova, 10% of villages were selected randomly for one control check (TCSU of USSR, 1971).¹ Villages were selected according to special instructions from the TCSU in the USSR, and these could change from year to year. In rural areas, the completeness of death and birth registration was controlled for one calendar year, while in urban areas only for the last quarter of a year.

According to the results of one control check for urban areas conducted in Moldova in 1971 (TCSU of MSSR, 1972), 6% of births, 5.5% of deaths and 6.8% of infant deaths were not registered by ZAGS, while the under-registration of births and deaths (including infant deaths) in rural areas was even much lower (respectively, 0.2%, 0.3% and 2.6%). In this study, we show that the true degree of infant death under-registration in Moldova before the mid-1970s is by far much more severe than the situation depicted by these official control checks, especially in rural areas. Thus, according to our estimates (Penina, Meslé and Vallin, 2010), the percentage of unregistered infant deaths in Moldova in 1971 is 42% in rural areas and 33% in urban areas (see *Specific details: infant mortality* in this section). Certainly, the official correction coefficients can by no means be taken into account when adjusting infant mortality data for Moldova in the early period under study.

¹ A 10% sample was chosen in the following republics: Ukraine, Belarus, Lithuania, Moldova, Latvia, Estonia, and Russia (with a few exceptions for Russia). In other republics this proportion was increased to 20% (TCSU of USSR, 1971).

Vital statistics in Moldova for the period of independence are considered to be complete. According to the evaluation of the Health Information System in the Republic of Moldova, which was conducted by the Health Metrics Network in 2007 (Health Metrics Network, 2007), the coverage of vital registration regarding deaths is over 90%. Since 1997, annual death counts do not cover the Transnistria region.

Specific details: infant mortality

The problems related to the registration of infant mortality in Moldova in the past can be broadly divided into two major types. The most important one (in terms of its impact on the level of infant mortality) is the under-registration of infant deaths up to the mid-1970s. The second type regards the definition of a live birth.

At the beginning of the 1970s, an unexpected infant mortality increase occurred in all countries of the former USSR. Of all of the European countries in the former USSR, the rise was by far the largest in Moldova, where the infant mortality rate increased by 50% from one year to the next (from 24.5 per 1,000 in 1972 to 36.8 in 1973). Penina, Meslé and Vallin (2010) attribute this increase to improved registration of infant deaths, especially in rural areas. A more moderate rise in the number of infant deaths occurred during subsequent years (up to 1977). This increase very likely reflects not only a continuing improvement of infant death registration, but also a real deterioration of the health status of the population, especially in rural areas.

The infant mortality correction deals solely with the sudden improvement observed in 1973 while ignoring the more moderate death count increase in subsequent years. This correction is based on the assumption that a moderate rise after 1973 reflects not only a continuing improvement of infant death registration, but also a real deterioration of the health status of the population, especially in rural areas. However, since there are no obvious means to separate the impact of the artificial growth due to improved registration from the real health deterioration, a minimal adjustment option was chosen. Following these assumptions the infant mortality rate should be higher by 27% in 1945, 34% in 1955, 47% in 1965 and 50% in 1972 (Penina, Meslé and Vallin, 2010).

Correction coefficients computed separately for neonatal and post-neonatal components were applied to the corresponding reconstructed death time series for all causes (except ill-defined items) before 1973.

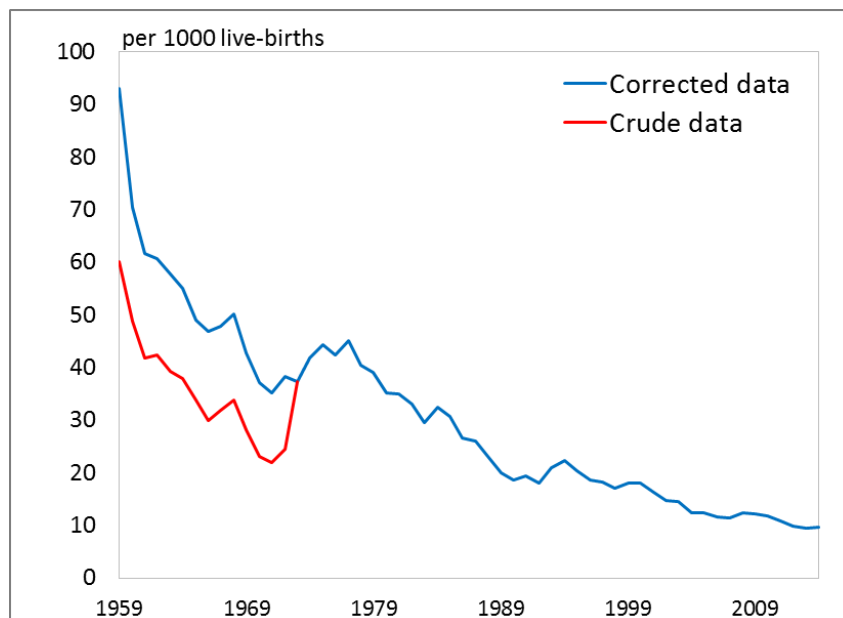


Figure 1. Infant mortality rate in Moldova before and after correction of years prior to 1973, both sexes, Moldova, 1959-2014

Source: National Bureau of Statistics of Moldova (published and unpublished data); Penina, Meslé, Vallin (2010). Comment corriger la sous-estimation de la mortalité infantile moldave? *Population-F*, 65 (3), 563-580.

The other problem is related to the definition of a live birth, which does not conform to the standard definition recommended by the World Health Organization (WHO). According to the Soviet definition, a birth is considered live and registered as such if the period of gestation was 28 weeks or longer, if the birth weight was 1,000 grams or higher, if the body length was 35 centimetres or longer, and if the newborn did not die within the first seven days of life. Research has shown that such a restrictive rule could cause an underestimation of up to 50% and 25%, respectively, in neonatal and infant mortality (Anderson and Silver, 1986 ; Velkoff and Miller, 1995).

In 1995, the Ministry of Health and the NBS issued a decree titled “On Shifting to WHO Standards for Live Births and Still Births” (Ministry of Health, NBS, 1995). According to the new definition, any infant with a birth weight of at least 500 grams and who breathed or showed any other sign of life is to be counted as a live birth. However, this definition has only been used by health facilities for their statistics and not by the vital registration offices, which have continued using the former Soviet definition. In 2008, a new definition of a live birth that is closer to the WHO definition was introduced in Moldova. According to this new definition, infants born after 22 weeks of gestation or weighing at least 500 grams should be registered as live births. The transition to the new definition resulted in a 20% increase in the early neonatal mortality rate. Given the experience of the Baltic countries, where the transition from the Soviet definition to the WHO definition resulted in a 50% increase in early neonatal mortality in the early 1990s (Estonian Medical Statistics Bureau, Latvian Medical Statistics Bureau, Lithuanian Statistics Bureau, 1993, as cited in Meslé et al., 1996), a fraction of early neonatal deaths in Moldova might still be under-registered.

Referring to the Baltic precedent, we therefore decided to increase early neonatal mortality by 50% for all years preceding 2008. For the years since 2010, we preferred not to correct infant mortality rates; while for 2008 and 2009 the infant mortality rates were interpolated assuming that over these two years the transition to a new live-birth definition was incomplete. The new estimates of early neonatal mortality for Moldova are very close to those registered on the basis of the medical documentation.

The adjustment coefficient linked to the live-birth definition was applied only to a specific number of perinatal conditions and congenital diseases for the 1965-2009 period².

Specific details: old-age mortality

Two separate problems can be identified with regard to the Soviet mortality statistics at older ages for the European countries of the former USSR, including Moldova. The first one refers to the inaccurate calculation of official population estimates at older ages. In this study, we use the population estimates produced especially for Moldova in accordance with the Human Mortality Database (HMD) Protocol. According to HMD, population counts for advanced ages (in the case of Moldova, the age threshold was 70 years) are calculated using the extinct cohort method, which for earlier years depends entirely on the death statistics and does not take into account potentially erroneous population counts at advanced ages. However, even after these population corrections, mortality rates at older ages remain suspiciously low in Moldova at the beginning of the period. Thus, in 1960, life expectancy at age 80 in Moldova compared to a Western country with a good death registration system (for example, Sweden) is about two years higher for both males and females. This is the second problem related to the inaccurate registration of death age known as age heaping of deaths. The misreporting of age at death is the main source of mortality underestimation at older ages in former Soviet countries, including Moldova.

In this study, we corrected the underestimated old age mortality rates for Moldova using Coale-Demeny model life tables (Coale, Demeny and Vaughan, 1983). As a key parameter to these models, we used our corrected infant mortality rates. The same approach was taken in the studies for Russia (Meslé et al., 1996) and Ukraine (Meslé and Vallin, 2003, 2012). If we had chosen middle-age mortality as a reference, it could have produced misleading results, since an abnormally high adult mortality rate (specifically among males) in these countries is a very specific feature of the mortality age pattern. Based on the average model of life expectancy at age 60, new age-specific rates over the age of 60 were computed and life tables were re-estimated for the period 1959-

² According to the short ICD10 list, the items subject to the second infant mortality correction are 178-190.

1968 for males and 1959-1970 for females. For females, we extended this correction to very old age groups (80 years and above) until 1977 because of the persisting difference between the model and the observed values. New mortality rates were multiplied by population counts (produced according to HMD Method Protocol) and new death counts were obtained. The “missing deaths”, i.e., the difference between the reported and estimated death counts at older ages, were redistributed proportionally among all reconstructed causes of death.

2. Population count data

Coverage and completeness

Census data

The censuses of 1970, 1979 and 1989 differentiate between *de jure* and *de facto* residents of Moldova. The 1959 census refers to the *de facto* population only.

As for the 2004 census, the NBS published official estimates of the *de jure* population only, though they also published the official number of residents who were temporarily away from the country, with a breakdown by sex, age and duration of absence.

During the Soviet period, the difference between the *de jure* population and the *de facto* population at the time of each census was not very large because of low international migration flows in and out of Moldova. By contrast, the difference is much larger for the period since independence. At the time of the 2004 census, the number of Moldovans who had been away for at least one year reached 130,306, or 3.9% of the total *de jure* population.

Migration statistics

The NBS disseminates international migration statistics provided by the SRP and the Bureau of Migration and Asylum (BMA), which is subordinate to the Ministry of Internal Affairs. Aggregated data on emigrants come from SRP, whereas BMA provides data on immigrants and repatriates. The NBS does not have access to individual migration records.

The definition of international migration used in Moldova does not conform to international standards. Migration statistics are based only on the information collected from special deregistration forms and from declarations of long-term emigration, neither of which are compulsory and thus, in many cases, are overlooked by the population. The NBS publishes data about “documented” or “permanent” emigrants. The availability of an emigration form for any emigrant (whether temporary or long-term) supposes that the individual has “deregistered” from his/her place of residence (Vremiş et al., 2012).

Data on emigrants are used by the NBS together with vital statistics records to produce annual population estimates. Moldovan citizens who live abroad but keep their (formal) permanent residence in the country are considered as temporary, even if they have not been back for over a year. As a result, such citizens are included in the Moldovan population while their deaths, if they die abroad, are not reflected in official vital statistics. This practice, along with the massive emigration of Moldovan citizens, especially in the early 1990s (Poalelungi, 2012), has resulted in an overestimation of the size of the Moldovan population, and, consequently, in a significant under-estimation of mortality.

However, appropriate adjustments of Moldovan population counts can be carried out using reliable international migration statistics. The Moldovan Integrated Automated System on “Migration and Asylum” (SIAMMA) combines several administrative databases or information systems managed by different institutions.³ Within this system, the Border Guard Service has been providing valuable information on state border crossing (entry into and exit from Moldova) since January 1st, 2005. Entry or exit of an individual is recorded together with his/her passport identification number. The Border Guard database is also a system component of the State

³ The Integrated Automated Information System on “Migration and Asylum” (SIAMMA) is operated by the Bureau of Migration and Asylum (Poulain et al., 2011)

Register of Population. At the moment, it is the only national source of administrative information that provides an estimate of the number of Moldovan emigrants and also follows the international definition. For political reasons, the Moldovan authorities are unable to control the state border between Transnistria and Ukraine. This is a major factor in the under-estimation of border crossing migration. It is also a potential source of double counts for entries and exits (Poulain et al., 2011). Unfortunately, no estimate of the completeness of border crossing data is available.

Annual population estimates

Annual population estimates prior to 1980 have not been published and are not available in Moldovan archives. For the years 1980 to 1988, annual population estimates published by the NBS were produced by the Central Statistical Office of the USSR, which were based on the results of the 1979 and 1989 censuses. Annual population estimates for the Soviet period refer to the *de jure* population.

For the period since independence, the NBS produces annual population counts by sex, age and region for the *de jure* population, and this is what has been used as the denominators for all official demographic indicators. This method creates a systematic bias, since deaths and births refer to the *de facto* population (i.e., occurred within the country), while population estimates also include long-term emigrants (Moldavian citizens living abroad), leading to an under-estimation of mortality and fertility rates. This issue has already been discussed in the *Migration statistics* section (see above).

Demographic rates are further under-estimated because of annual population estimates for the period since independence: the NBS did not replace its post-1989 census population estimates with the new inter-censal estimates after the results of the 2004 census became available. To this day, the NBS continues to publish annual estimates of the *de jure* population without taking into account the results of the 2004 census, while it appears that such figures over-estimate population counts (leading to the under-estimation of mortality and fertility rates) compared to those from the 2004 census.

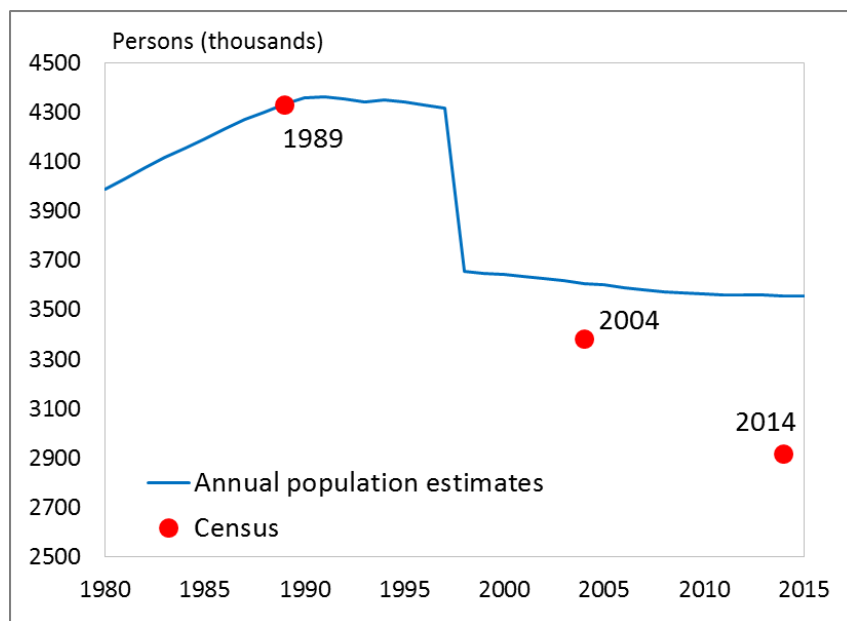


Figure 2. The official annual de jure population for 1980–2015 (as of January 1) and the de jure population according to the 2004 census and the preliminary results of the 2014 census; Moldova, both sexes

Source: National Bureau of Statistics of Moldova, www.statistica.md

Note: Since 1998, official population statistics do not include the Transnistria region

This situation may reflect NBS concerns about the completeness of the 2004 census. However, population numbers in the census are only 6% lower than estimates for the same year that are derived from the 1989 census and the series of birth and death count alone. Furthermore, the deficit is mostly concentrated in the young working ages (20-39 years old), i.e., those age groups where migration outflows are the most intensive. In the other age groups, the numbers are extremely close (Figure 3), which strongly suggests that the 6% discrepancy between the two sets of numbers is the direct result of an improper definition of international migrants (see *Population count data*). There is thus little reason to ignore such an important data source, which is the only population census conducted over the past twenty years. Further analyses will be conducted when the results of the (May) 2014 census become available.

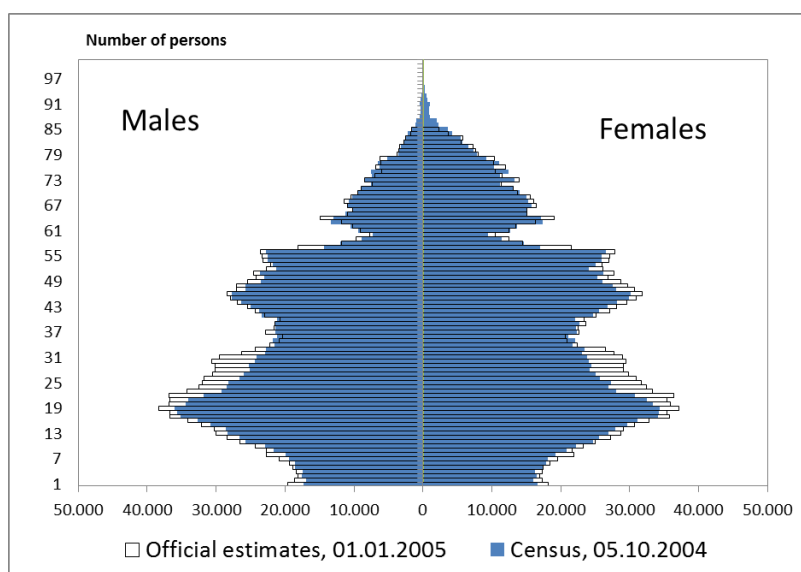


Figure 3. Age pyramid of the *de jure* population of Moldova, 2004 Census versus 2005 official population estimates

Source: National Bureau of Statistics of Moldova, www.statistica.md

Specific details

Population estimates were adjusted using data on border crossing migrants. The number of border-crossing migrants included in the statistics represents the number of Moldovan citizens who left the country in 2005 or after and who have been away for at least one year at a given time during the observation period. These data are available as of January 1st by sex, 5-year age group and the duration of absence from the country for all years from 2009.

Calculation of the territorial adjustment factors for 1997

Starting in 1997, vital statistics (birth and death counts) published by the NBS do not include those occurring in the Transnistria region. Similarly, population estimates published by the NBS do not include residents of the Transnistria region starting in 1998. Territorial adjustment factors thus had to be computed for 1997, using the demographic statistics available for the Transnistria region during this year, which followed the HMD methods protocol⁴.

Re-estimation of population data

Inter-censal annual population estimates for the 1970s were calculated using the standard HMD methodology (see the HMD Methods Protocol). Official population estimates were used for the years 1980-1988. An

⁴ See Appendix D of the HMD Methods Protocol (<http://www.mortality.org/Public/Docs/MethodsProtocol.pdf>) for information on territorial adjustments. Also note that the $Rb_{(t)}$ factor was computed for both sexes combined, as birth counts by sex were not available for Transnistria in 1997.

adaptation of the HMD Methods Protocol was implemented to estimate annual population counts for years 1989-2013.

As previously mentioned, official population estimates published by the NBS for the years after 1989 are problematic, mainly because they do not sufficiently take into account the large out-migration of this period. Consequently, instead of using official population numbers, population estimates were reconstructed using standard HMD methods.

First, data from the 2004 census were corrected to exclude Moldovans who had been out of the country for more than 12 months. Next, inter-censal population estimates were computed for the period 1989-2004. Then, population estimates for the year 2009 corrected for out-migration were used as the most recent reference to compute another series of inter-censal estimates for the period 2005-2008, accounting for the actual net migration rate for these years. The same method was used to compute post-censal population estimates for years 2010-2013.

Figure 4 shows the results of these calculations, comparing alternative population estimates with official annual population data for the period 1980-2014. The difference between the two series ranges from 1% at the beginning of the 1990s to more than 18% at the end of the period. The preliminary results of the 2014 census almost coincide with the alternative data for the same year (Penina Olga, Grigoriev Pavel and Jdanov Dmitrii, 2015).

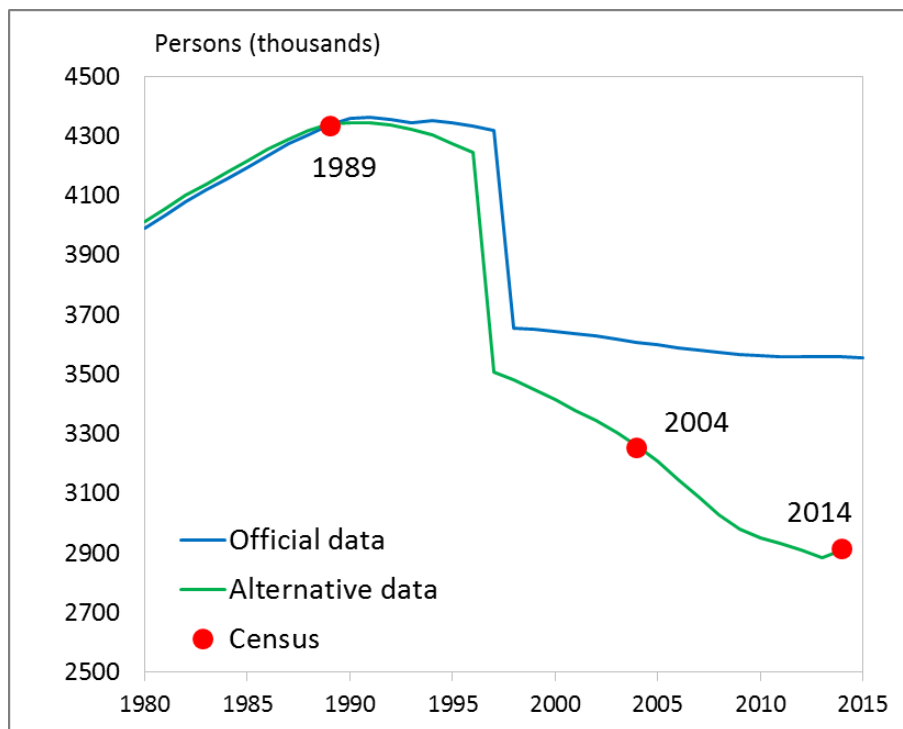


Figure 4. Population estimates for Moldova: official *de jure* (1980-2015) and alternative *de facto* (1980-2014), all ages, both sexes

Note: Since 1998, official population counts do not include the Transnistria region

Source: official *de jure* population data: National Bureau of Statistics of Moldova, www.statistica.md; alternative *de facto* population data: [Penina Olga, Grigoriev Pavel and Jdanov Dmitrii, 2015.](#)

3. Birth count data

Coverage and completeness

Annual birth counts for both the Soviet period and the period of independence refer to the *de facto* population (i.e., occurred within the country).

The medical *birth certificate* is prefilled with the identification number attributed by the Ministry of Information, Technology, and Communications (MITC). The medical birth certificate is composed of two parts: one part is given to the family to be presented at the regional civil registration office within three months, and the other (a notification) is sent to the civil registration office by the medical institution. The medical birth certificates have to be issued by one of 41 accredited medical institutions. Since 2009, births can be registered directly at the medical institution. If delivery takes place outside of these 41 medical institutions, the birth certificate is to be issued within 10 days of birth and after a medical examination of the mother and the child by a committee comprising three physicians.

The civil registration office sends the medical birth certificate to the NBS with an additional form that includes information related to thirty socio-demographic variables. When the birth is registered at the civil registration office by the family, who then brings in the part of the medical birth certificate issued by the medical institution or the committee, the information is compared with that of the notification that was received independently from the medical institution. If the information from both sources coincides, the birth is registered; if not, the civil registration office informs the police for further investigation. The civil registration office then transmits the information (from the notification received from a medical institution) to SRP within two days.

Specific details

Before the mid-1970s, the official number of births was under-estimated because of the specific process implemented after an early neonatal death, as described in the “*Death Count Data*” section.

Because of the use of the Soviet definition of a live-birth in the official Moldovan statistics up to 2008 and the implementation of a new, though still incomplete, definition starting in 2008, the number of births has been under-estimated until 2008 and possibly during subsequent years.

The input file includes the number of live births estimated after two corrections of the infant mortality rate for 1965-2009 (Penina, Meslé and Vallin, 2010).

Part II – Information on CoD collection

4. Death certificate

During the Soviet period

In the former Soviet Union, including Moldova, the coverage of mortality data by cause is considered incomplete until the late 1950s, since only doctors were empowered to certify a cause of death (Meslé et al., 1996). According to the 1959 census, only 78% of the Moldovan population was covered in rural areas because there was a considerable lack of doctors and the system could function properly only in urban areas. In 1958, the Health Ministry and the TCSU of the USSR issued a new directive, according to which the death certificate could also be issued by a medical assistant (*feldsher*) when there was no doctor present, but only in cases not requiring a forensic medical examination (violent death or suspicion of it, death of a child out of the medical unit, abortion performed out of the medical unit, and in some other cases). The death certificate issued by a doctor is referred to as medical certificate of death (*vrachebnoe svidetelstvo o smerti*), and the certificate issued by a *feldsher* is called a *feldsher* certificate of death (*feldsherskaya spravka o smerti*). In 1959, 15% of death certificates in rural areas were completed by *feldsher*. This proportion then steadily decreased in the 1960s and 1970s, falling to 5% or 6% in the mid-1980s (Meslé and Vallin, 2012).

As far as we know, the Ministry of Health and TCSU of the USSR issued three orders concerning the approval of the death certificate: in 1954 (Ministry of Health of USSR, 1954), 1966 (Ministry of Health of USSR, 1966) and

1984 (TCSU of USSR, 1984). Like in other countries, the Soviet type of death certificate distinguishes three levels of causes of death: the underlying cause (principal or primary), the immediate cause and contributory (associated or secondary) causes. The Moldovan central statistical office tabulates causes of death on the basis of the underlying cause.

A special form of death certificate for perinatal deaths (stillbirths from 28 weeks of gestation and deaths of children aged 0-6 days) was adopted in the USSR in September 1973 (Ministry of Health of USSR, 1973). It is called the perinatal death certificate (*svidetelstvo o perinatalnoi smerti*). Generally, a case of perinatal death was certified by a medical doctor, including in rural areas if there were at least two doctors. However, if in a rural area there was only one doctor or in the case of his/her absence, a *feldsher* or midwife who assisted a delivery or treated an ill child could certify a perinatal death. During the Soviet period, the perinatal death certificate issued in 1974 with the corresponding instructions was revised in 1984. At ZAGS, stillbirths were registered based on the perinatal death certificate, while deaths occurring within the first 6 days of birth were registered on the basis of a medical birth certificate and perinatal death certificate.⁵ The introduction of the perinatal death certificate in the territory of the whole of the USSR in 1974 was accompanied by an increase in infant mortality, which differed more or less according to the republic. In the case of Moldova, a significant rise in infant deaths occurred a year before, in 1973 (see section “*Death Count Data*”).

Three forms of the death certificate issued either by a medical doctor or a *feldsher* were distinguished by the Soviets: “final”, “preliminary” and “instead of preliminary”. The latter two forms were used when a case of death was not clear and some additional time was required for the final post-mortem diagnosis. The same three options existed for the perinatal death certificate.

Annex 1 provides copies of the medical death certificates adopted in 1966 and 1984, as well as the perinatal death certificate introduced in 1974 and revised in 1984.

After independence

After independence, the medical death certificate was revised in 1998 (Ministry of Health of Moldova, 1998) and 2004 (Ministry of Health of Moldova, Department of Statistics and Sociology and Department of Information Technology, 2004). A medical death certificate is issued only by a doctor.

A different certificate is used for all deaths occurring within 6 days of birth. It is called the “perinatal death certificate”, as it is also used to record stillbirths. The perinatal death certificate must be completed by a forensic pathologist.

The last revision of the medical death certificate is presented in Annex 1. Unfortunately, we could not have access to the order issued by the Ministry of Health in 1998 (this order was not published officially and it seems to be only for internal use within the Ministry of Health).

5. Cause of death coding

During the Soviet period

Until 1991, Moldovan population statistics were an integral part of the vital registration system established by the USSR. In the Soviet Union, the system for the civil registration of vital events was established after the 1917 Revolution as a result of transferring church registration functions to specially established district administration offices named ZAGS. Death had to be registered within three days of the event. After a death, the deceased’s relatives or some other person close to the deceased was required to obtain a medical death certificate from the responsible medical institution and take it to the ZAGS. In exchange, the relatives of the deceased received a civil death certificate that served as both a burial permit and a legal document for inheritance purposes. The ZAGS then sent the medical death certificate to the regional office of statistics.

⁵ Before the introduction of the perinatal death certificate in 1974, stillbirths were registered on the basis of a special stillbirth certificate (adopted in 1966), while early neonatal deaths were registered on the basis of a medical or *feldsher* death certificate.

In addition to a civil death certificate, ZAGS issued a record of death for administrative and statistical purposes. This form, called a civil status act (*akt grahdanskogo sostoiania*), consisted of two identical copies⁶. The first copy of a death record was kept at the ZAGS, while the second copy was regularly delivered to the district statistical office for data processing (together with a medical/*feldsher*/perinatal death certificate).

In Soviet Moldova, processing the death certificate and second copies of civil status forms was centralized, i.e., it was produced at the level of the Central Statistical Administration of MSSR.

The TCSU of MSSR annually tabulated different statistical forms based on the second copies of the civil status acts and death certificates in accordance with the instructions regularly elaborated by the TCSU of the USSR. With regard to mortality statistics by cause of death, the Moldovan national statistical office used death certificates to produce annual statistical forms about deaths by sex, age and cause. These were titled form 5. Any official publication of mortality data, notably by age and, above all, by cause of death, was ceased by the Soviet authorities from 1974. Some cause-of-death statistics had a special secret status. Thus, until 1988, certain items of the Soviet Classification (cholera, plague, suicide, homicide, occupational accidents) did not appear in the above-mentioned statistical form and were tabulated separately in a special table (statistical form 5b). In order to maintain correct totals for all causes in form 5, deaths from these hidden causes were included in item 159 "ill-defined causes". Above these hidden causes, death certificates issued by a medical doctor or *feldsher* were based on testimonial evidence and coded under this item as well.

In the former USSR, all the statistical forms were tabulated manually until the late 1980s; and it was only in 1988 when electronic data processing was introduced. This was also accompanied by changes in the names of statistical forms. Thus, statistical forms 5 and 5b were transformed into a single form, S-51; but form 4 (deaths by single year of age and sex) became titled S-42. The national statistical office of the MSSR produces the annual statistical forms on deaths by sex, age and cause for the whole of the republic and separately by regions (urban/rural). For rural areas, statistical forms 5 and 5b are also tabulated separately, based on medical/*feldsher*/both medical and *feldsher* death certificates.

After independence

After proclaiming independence in 1991, the essence of the system for registering death did not change much. However, the management of vital statistics underwent important changes, such as the establishment of the State Population Register (SPR) in the mid-1990s. The system of making two identical copies of a civil status act, which was introduced by the Soviets in the late 1920s, is still valid in independent Moldova. However, at present, these two copies of a civil status act are intended only for administrative purposes. For statistical purposes, the NBS adopted a series of statistical forms (*Buletin statistic*) in the late 1990s that are to be completed on the basis of records of births, deaths, marriages and divorces.⁷ These statistical forms correspond to vital records and include around 25 variables, including the IDNP.

At present, death certificates are processed as follows.⁸ A medical death certificate is issued by a certified physician after examination of the body. In some cases (a death at a hospital, a violent death or the suspicion of it), a forensic autopsy is compulsory. The medical death certificate, which is prefilled with a serial number provided by the MITC, includes the deceased's identification number and consists of two parts. One part of the document is given to the relative of the deceased or to whomever declared the death (a neighbour, or a physician from the medical institution in which the death occurred). This person must present it at the civil registration office within three days of occurrence, upon which they receive in exchange a certificate of the

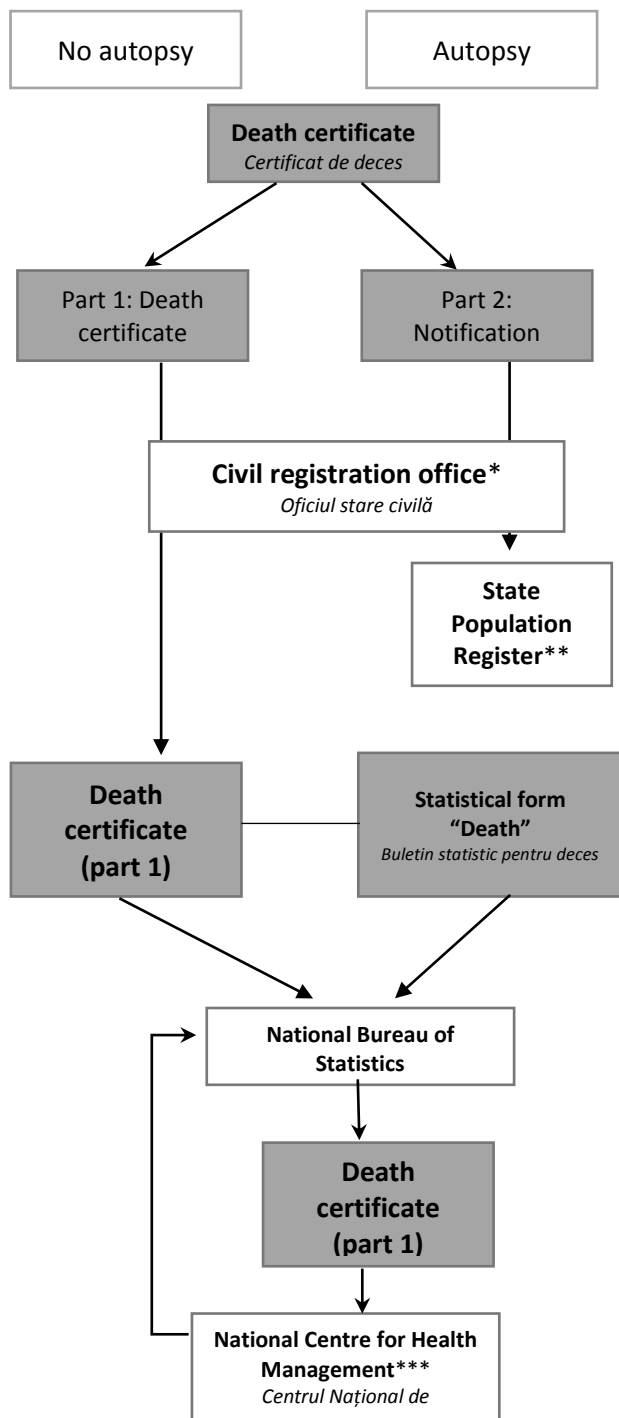
⁶ The procedure of making two identical copies of a civil status form was adopted by the Soviets in 1926 (Jones and Grupp, 1987).

⁷ Four vital registration forms were introduced in Moldova in 1997: one for births (#1), one for deaths (#3), one for marriages (#4), and one for divorces (#5). These forms were reproduced from those used in Romania, except for form #2 (for stillbirths), which is not used in Moldova.

⁸ According to Common Order # 132/47/50 (dated 29/04/2004) of the Ministry of Information Technology and Communications, the National Bureau of Statistics and the Ministry of Health regarding the issuance of death certificates.

death record. The other part of the medical death certificate (a notification) is sent on the 10th of each month to the civil registration office by the physician or medical institution who certified the death.

At the civil registration office, the medical death certificate presented by the person who has declared the death, and the notification received from the medical institution must match. If the information on both documents coincides, the death is registered. If not, the civil registration officer must inform local authorities (i.e., the police) for the case to be investigated. This procedure guarantees that all deaths are recorded at the civil registration office. The civil registration office sends the information about each “notification” to the MITC within two days and it is included in the State Register of Population. It also sends the medical death certificate with its associated statistical form (i.e., the death record) to the NBS. The statistical forms are completed with the information included on the medical death certificate, and they cover 17 socio-demographic variables – though not the cause of death, which is included only in the medical death certificate.



Medico-legal autopsy is required for certain conditions stipulated by law

Death certificate is prefilled with a serial number included into Population Register and completed by a doctor. Death certificate is composed of two parts: part 1 (death certificate) and part 2 (notification)

Both parts of the death certificate are transmitted to district civil registration office. Part 1 is transmitted by a relative of the deceased within 72 hours. Part 2 is transmitted by the medical institution each 10th day of month.

The civil registration office checks that the information on both parts of the death certificate coincide; if not, it must inform the police.

The "notification" is transmitted to the State Population Register

The civil registration office completes the death record on the basis of the death certificate. This form does not include the cause of death
The death certificate and the death record are both transmitted to the National Bureau of Statistics (NBS)

NBS manages the database of all death records. It is in charge of verifying and processing the statistical data.

NBS transmits the death certificate to the National Centre for Health Management (NCHM)

NCHM assigns a four-digit ICD-10 code to the cause of death (or to the multiple causes)

NCHM manages the database with all death certificates and sends aggregated cause-of-death statistics to NBS for official dissemination

*Ministry of Justice

**Ministry of Information Technology and Communications

***Ministry of Health

Figure 5. Circulation of medical death certificate in Moldova

The NBS forwards the medical death certificate to the NCHM, which is responsible for coding the causes of death according to the 10th revision of the International Classification of Diseases and Causes of Death, which has been in use since 1996. The NCHM manages a database which includes all medical death certificates, and it is

responsible for transmitting aggregated cause-of-death statistics to the NBS for publication and dissemination purposes. Figure 5 shows the circulation of medical death certificates in Moldova.

6. Classifications in use and collected data

6.1 Classification changes

After the foundation of the USSR, the Soviet classification was revised seven times: two times before and five times after the Second World War. Starting from 1965, the successive revisions of the Soviet classification were based on the ICD. The overview of the Soviet classifications from 1955 is given in Table 1. Annex 2 includes the lists of the Soviet classifications revised in 1965, 1970, 1981 and 1988 (for deaths from injury and poisoning).

Table 1. Classifications of causes of death used in Moldova during the Soviet period

Years	Title	Number of items/ ICD level	Age groups
1955-1964	1952 classification (Soviet classification of causes of death, 3 rd revision)	116	0, 1, 2, 3-4, 5-6, 7-13, 14-15, 16-17, 18-19, 20-24, 25-29, 30-39, 40-49, 50-59, 60-69, 70 and over
1965-1969	1965 classification (based on ICD-7)	210+13*	0, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29, ... 80-84, 85 and over
1970-1980	1970 classification (based on ICD-8)	185+10*	0, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29, ... 80-84, 85 and over
1981-1987	1981 classification (based on ICD-9)	185+10*	0, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29, ... 80-84, 85 and over
1988-1990	1981 classification, adapted for deaths from injury and poisoning in 1988 (based on ICD-9)	175+10*	0, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29, ... 80-84, 85 and over

* An additional number of items from external causes, according to the character of trauma

During the first five years of independence in 1991-1995, two statistical institutions produced mortality statistics independently by cause of death. The NBS continued to codify causes of death according to the 1981 revision of the Soviet classification adopted for deaths from injury and poisoning in 1988. At the same time, the National Centre for Health Management (NCHM), subordinate to the Ministry of Health, codified causes of death according to the 9th revision of the ICD. The medical death certificate was transmitted from the NBS to the NCHM. Since the adoption of the 10th revision of the ICD in 1996, the NCHM has been the only institution responsible for codifying causes of death (Ministry of Health of Moldova, 1995). This double codification of causes of death is, however, not a genuine case of double (“bridge”) coding practiced by certain countries for a few years after the adoption of a new classification (see Section 8).

Table 2. Classifications of causes of death used in Moldova after independence

Years	Title	Number of items/ ICD level	Age groups	Responsible institution
1991-1995	1981 classification, adapted for deaths from injury and poisoning (based on ICD-9)	175+10*	0, 1, 2, 3, 4, 5-9, 10-14, 15-19, 20-24, 25-29, ... 80-84, 85 and over	The National Bureau of Statistics of Moldova
1991-1995	ICD-9	4-digit level	Exact age	The National Centre for Health Management
Since 1996	ICD-10	4-digit level	Exact age	

*An additional number of items from external causes according to the character of trauma

6.2 Collected data

For the Soviet period (1965-1990) and 1991-1995, we used the original statistical forms on death counts by sex, age groups and causes of death under the Soviet classification (forms 5 and 5b for 1965-1987, and form S-51 for 1988-1995). These statistical forms were tabulated by the NBS on the basis of medical death certificates (manually before 1988).

For the period of independence (from 1991), we used the electronic database of medical death certificates provided by the NCHM, which includes the date of birth (day/month/year), the date of death (day/month/year), sex and the 4-digit ICD code of cause of death.

The distribution of death counts under the 1988 Soviet classification and ICD-9 in 1991 was used to compute *a priori* transition coefficients (see section 8).

6.3 Data sources

For the former USSR republics, including Moldova, mortality data by cause of death for the period 1959-1990 were collected, computerized and verified at L'Institut national d'études démographiques (INED, Paris) using the original manuscripts produced by the TCSU of the USSR. This tremendous work was possible thanks to the collaboration between the French and the Russian demographers in the early 1990s, when the Soviet archives earlier kept in secret for many decades became available to the researchers (Meslé et al., 1996). The 1965-1990 mortality data for Moldova were provided by the INED. Data missing for a few years were collected at the Moldovan National Archive and the NBS archive (form 5 and 5b for 1965; form 5b for 1971, 1977-79, 1980-87).

For the period 1991-1995, the cause-specific mortality data under the Soviet classification were collected at the NBS archive (form S-51). The depersonalized database of medical death certificates under ICD for the period 1991-2012 was provided by the NCHM.

From 1997, the data do not cover Transnistria. All the provided data have not been officially published.

6.4 Specific treatment of the raw data

For the Soviet period before 1988, we subtracted the total deaths by “hidden causes” according to statistical form 5b from item 159, “ill-defined causes”. For years 1986 and 1987, the total hidden causes of deaths from table 5b was subtracted from item 181, “Other accidents, excluding occupational”.

7. Specific transition documents

No documents related to the transition were produced by the statistical office. No double coding was used in the years of transition.

Part III – Reconstruction information

8. Reconstruction of coherent time series

For Moldova, based on the reconstruction method (Meslé and Vallin, 1996), we obtained the 1965-2012 cause-of-death time series by sex, 5-year age groups and a short ICD-10 list that covers 211 items (the Baltic list, see Annex 3). In total, we produced four transitions from one classification of causes of death to another classification:

1. From 1965 revision of SC to 1970 revision of SC
2. From 1970 revision of SC to 1981 revision of SC adapted for deaths from injury and poisoning in 1988 (or 1988 revision of SC)
3. From 1988 revision of SC to ICD-9
4. From ICD-9 to ICD-10

Tables 3-6 display the distribution of associations by type with the corresponding death counts in a year of transition to a new classification, i.e., in 1970, 1981, 1991 and 1996. For the transition from the 1988 revision of the Soviet classification to ICD-9, fundamental associations of items (FAI) were produced separately for three main age groups: before one year, 1-59 years and 60 years and over. Since the distribution of deaths according to the last revision of SC and ICD-9 is available for the period 1991-1995, FAIs were constructed for the year 1991. Annex 4-7 present the FAIs built for the successive four transitions.

Transition from the 1965 SC to the 1970 SC

Totally, 141 FAIs were built. The biggest part (70%) of FAIs are “simple” (type 1:1) and gather 26% of the total of 1970 deaths. Furthermore, 9 “splitting” (type 1:n) and 14 “merging” (type n:1) associations concern quite few deaths (5%). Finally, only 19 FAI are complex, but they concentrate the biggest part of the total number of deaths (69%).

Based on the established FAIs, the transition coefficients have been calculated for 210 items of the 1965 SC. For 20 items the transition coefficients had to be age-adjusted.

Table 3. Distribution of fundamental associations of items built between the 1965 SC and the 1970 SC by type and death counts

Association type	1970 Classification			
	Associations		Deaths (in 1970)	
	Number	Proportion, %	Number	Proportion, %
type 1:1	99	70	7014	26
type 1:n	9	6	1019	4
type n:1	14	10	162	1
type n:n	19	14	18399	69
Total	141	100	26594	100

Transition from the 1970 SC to the 1981 SC

Like for the previous transition, the proportion of associations defined as simple (type 1:1) is the biggest (84%) and covers a quarter of all the deaths in 1981. At the same time, the share of the items involved in complex exchange of items (type n:n) between the two classifications is quite small (13%) but covers 69% of total deaths. The new items resulted from splitting or merging of the old items occur even more rarely.

At this step of reconstruction, transition coefficients for 19 out of 185 items of the 1981 SC had to be adjusted by age.

Table 4. Distribution of fundamental associations of items built between the 1970 SC and the 1981 SC, by type and death counts

Type of associations	1981 Revision			
	Associations		Deaths (1981)	
	Number	Proportion, %	Number	Proportion, %
type 1:1	129	84	10265	25
type 1:n	6	4	1935	5
type n:1	6	4	466	1
type n:n	13	8	28810	69
Total	154	100	41476	100

Abolished definition of work accident in 1988

In 1988, an important amendment in relation to accidental causes of death was introduced into the 1981 classification. Under the 1981 classification, every accidental cause of death, with a few exceptions, includes two items referring to occupational and non-occupational accidents. In 1988, this division was abolished, and the

accidental causes of death with and without this specific distinction were united into a single item. As a result, 160-185 items referring to deaths from injury and poisoning were reclassified into 160-175 items. This amendment led us to produce a reclassification of accidental causes of death by simply merging the two items from the 1981 Classification into one new item for 1988

Transition from the 1988 SC to ICD-9

For the period 1991-1995, we had at our disposal mortality data codified under the two different classifications: the 1988 Soviet classification by the NBS and the ICD-9 by the NCHM. Figure 6 gives an example referring to two categories of renal diseases: *infections of kidneys* (item 130 under the 1988 SC and item 590 under ICD-9) and *other nephritis, nephrosis and nephrotic syndrome* (item 129 of 1988 SC and items 581-589 of ICD-9). In 1991, a transition year, the total of deaths for two causes was the same in terms of the both classifications. The next year, 1992, there is an abrupt rise in death counts from the item 129 under the 1988 SC accompanied by the symmetric drop in deaths from the item 130. Over the next years, this interchange of deaths between the items continued. At the same time, the curves for the corresponding ICD-9 items (dotted lines in Fig.6) represent smooth continuation of the crude time series under the Soviet classification. We found similar examples for many other causes of death. It seems that in 1992, the NBS introduced the new national rules regarding the codification of causes of death under the Soviet classification, which led to important disruptions in death time series. Thus, the parallel cause-of-death codification produced by the two Moldovan statistical institutions in 1991-1995 is not a genuine case of the “bridge coding” practiced by some countries. Nevertheless, the fundamental associations of items and transition coefficients were produced *a priori* for 1991 year (before the codification changes introduced by the NBS) separately for three age groups: under one year old, 1-59 years and 60 years and over.

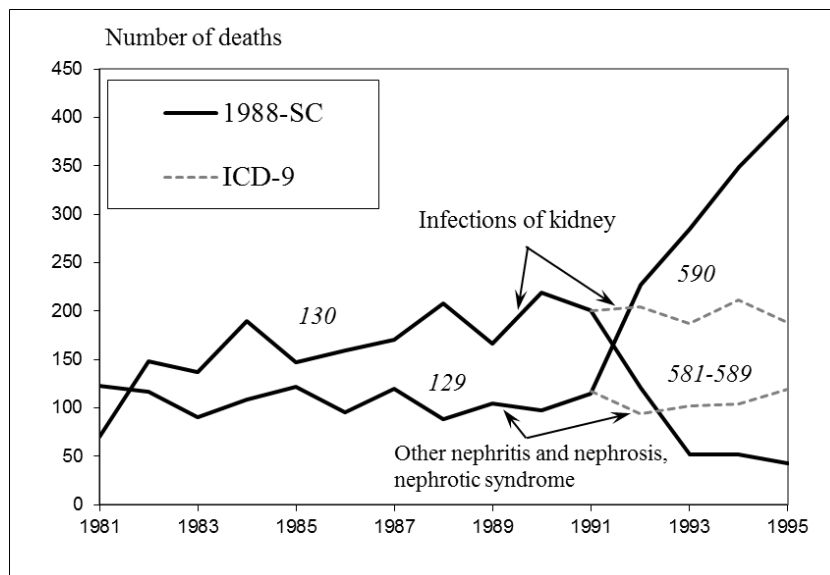


Figure 6. Trends in annual deaths from «infectious renal diseases» and «other nephritis and nephrosis, including nephrotic syndrome» codified under the 1988 SC and ICD-9

For the three age groups, the biggest part of deaths is concentrated in the complex associations (type n:n), varying from 70% for the age group under one year and 86% for the elderly.

Table 5. Distribution of fundamental associations of items built between the 1988 SC and ICD-9, by three age groups, type and death counts

Type of associations	Under 1 year				1-59 years				60 years and over			
	Associations		Deaths (in 1991)		Association		Deaths (in 1991)		Association		Deaths (in 1991)	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
type 1:1	113	80	353	25	87	71	2320	17	92	74	2152	7
type 1:n	16	11	75	5	11	9	478	3	15	12	1397	5

type n:1	3	2	0	0	1	1	347	3	1	1	630	2
type n:n	9	7	1012	70	24	19	10459	77	16	13	26317	86
Total	141	100	1441	100	123	100	13605	100	124	100	30497	100

Transition from ICD-9 to ICD-10

Like in all the previous stages of the reconstruction, most of the fundamental associations of items belong to a simple type (type 1:1), but the latter include 35% of the total deaths only. Twenty complex associations (type n:n), on the contrary, cover 64% of the total of deaths. The check of statistical continuity by three main age groups did not reveal any important disruptions in death time series, and the same transition coefficients were applied to all age groups.

Figure 7 displays a case referring to obstructive pulmonary diseases. In the transition year, standardized mortality rate for *bronchiectasis and other obstructive pulmonary diseases* (items 494-496 in ICD-9 and J44, J47 in ICD-10) suddenly increased, while for the rate for *chronic bronchitis and emphysema* (items 490-492 in ICD-9 and J40-J43 in ICD-10) decreased symmetrically. To counterbalance death counts in these time series, we merged them into a single association (Association #110).

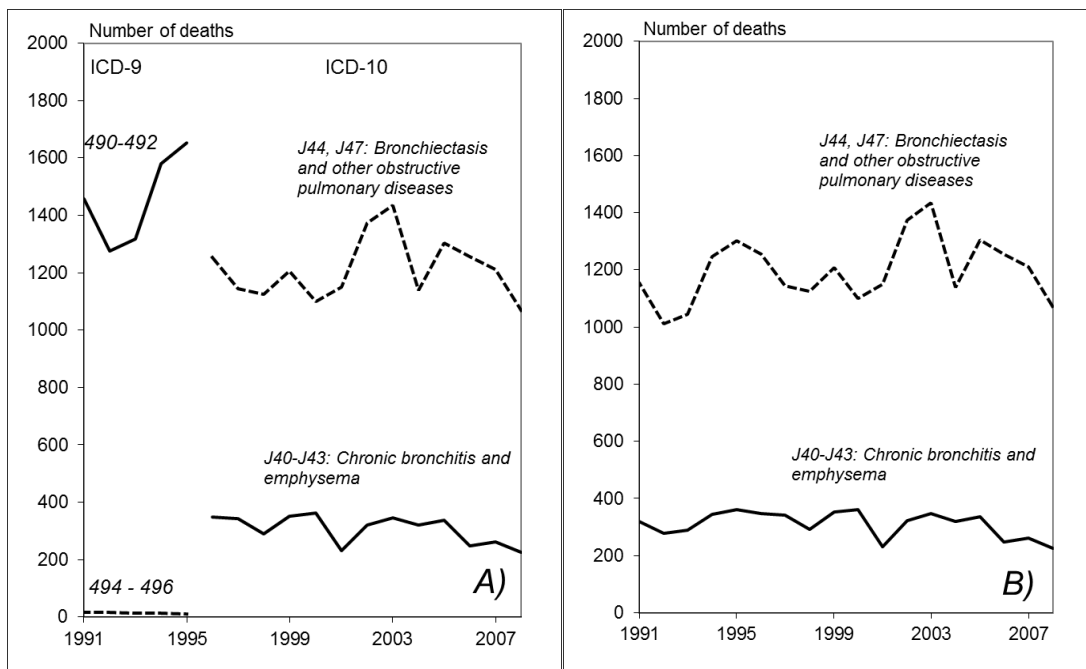


Figure 7. Annual trends in deaths for some obstructive pulmonary diseases recorded under ICD-9 and ICD-10: before (on the left) and after (on the right) reconstruction

Table 6. Distribution of fundamental associations of items built between ICD-9 and ICD-10, by type and death counts

Type of associations	ICD-10			
	Associations		Deaths (in 1996)	
	Number	Proportion, %	Number	Proportion, %
type 1:1	143	85	17568	35
type 1:n	2	1	424	1
type n:1	4	2	5	0
type n:n	20	12	32062	64
Total	169	100	50059	100

Transition coefficients calculated for each transition are given in Annex 8.

A posteriori corrections

This type of correction was produced after every transition from an old classification to a new one, i.e., in four steps. We made the first round of *a posteriori* corrections to the 1965-1980 time series classified under the 1970 classification, and the second one to the 1965-1990 time series classified under the 1988 classification. After the third transition from the 1988 Soviet classification to ICD-9, *a posteriori* coefficients of correction were applied to the 1965-1995 statistical series. Finally, the fourth round of this type of correction was produced after producing the 1965-2012 time series according to ICD-10. Tables 7-10 present *a posteriori* coefficients calculated at each step.

Figure 8 gives an example of *a posteriori* correction applied to the 1965-1980 death series reconstructed under the 1970 Soviet classification. The number of deaths classified under the item 85, *Chronic rheumatic heart diseases*, decreased abruptly in 1974 year, which was simultaneously accompanied by the symmetric increase in number of deaths attributed to the item 84, *Active rheumatism*. Quite clearly, this is the result of a change in coding practices. Indeed, in 1973, the TCSU of the USSR issued new instructions concerning the preparation of the annual cause-of-death statistical forms 5 and 5b (TCSU of USSR, 1973). According to these rules, it was recommended to pay a special attention to codification of the item 84 (*active rheumatism*) at age groups above 15 years old and to the item 85 (*chronic rheumatic heart diseases*) at age groups before 15 years old. This new instruction provoked an exchange of deaths between these two causes of death in 1974, which we tried to counterbalance by *a posteriori* correction: we transferred 30% of deaths attributed to the items 85 to the item 84 for the period 1965-1973 (Table 7).

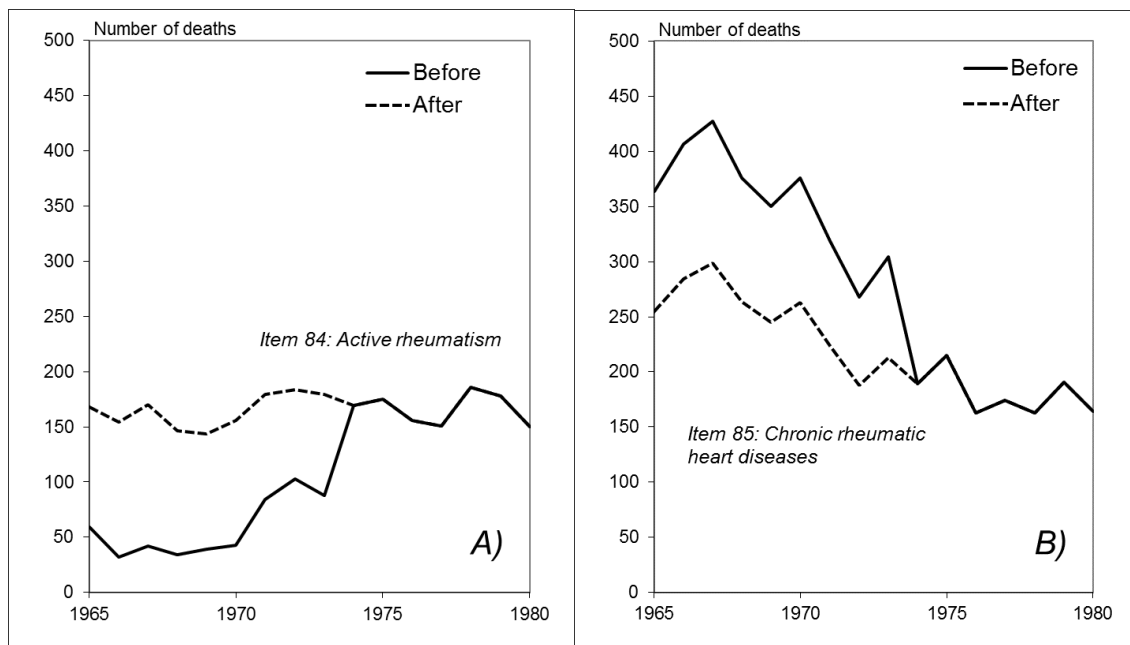


Figure 8. Annual trends in number of deaths classified under items 84 and 85 according to 1970 Soviet classification before and after *a posteriori* correction, age 1-59 years old, both sexes

Table 7. Percentage of deaths transferred *a posteriori* from one item in the 1970 SC to one or more other items

Item of entrance	Item of exit	Age	Proportion (%)												
			1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	
49	50	All ages	45	45	45	45	45	45	45	45					
64	55	All ages								85	85	85			
76	74	> 1 year	40												

61	57	> 1 year	20
76	78	> 1 year	20
121	123	> 1 year	85
122	123	> 1 year	40
125	101	1-59 years	25
125	101	> 60 years	3

Table 10. Percentage of deaths transferred *a posteriori* from one item in ICD-10 to one or more other items

Item of entrance	Item of exit	Age	Proportion (%)			
			1965-1996	1997	1998	1999-2000
115	111	> 60 years		25		
115	113	> 60 years	65	65	65	
117	116	> 60 years	50	50	50	50

9. Redistribution of ill-defined causes

In Moldova, like in other former Soviet republics, very few deaths were classified under senility as well as under other items dealing with unknown or ill-defined causes before the end of the 1980s. The situation has changed completely after 1989, when the Soviet Health Ministry headed by Evgeni Chazov, formerly leader of a cardiology unit, issued a new directive regarding the diagnosis of deaths from cardiovascular diseases among people above age 80 and diagnosis of sudden cardiac death at younger ages. The new instructions recommended that any death occurring after age 80 be registered as due to senility, unless the person's medical history or an autopsy report make it possible to diagnose a precise cause of death or mentioned death from injury, poisoning or another external cause (Meslé and Vallin, 2012).

As soon as the new directive came into force, the number of deaths attributed to the item *senility* (items 158 under the 1981 SC, 797 under ICD-9 and R54 under ICD-10) rose dramatically in Moldova. In 1993, senility deaths accounted for 12% of the total of deaths in males and 21% in females. At the same time, death counts from certain circulatory diseases, in particular, from *atherosclerotic cardiosclerosis* that accounted for the lion's share of deaths in the Soviet pattern of heart diseases mortality, was in a deep decline. After 1993, the number of deaths classified under senility started decreasing quickly, so that by the year 1997 it consisted 5% of the total of deaths and by the years 2000 it was 3%. Over the recent years, as before 1989, the number of deaths codified under this item is very small in Moldova.

The method of senility redistribution adopted for Moldova suggests using special coefficients for three different groups of circulatory system diseases (heart diseases, cerebrovascular diseases and other circulatory diseases).

The algorithm of computation of these coefficients is presented in Annex 10.

A posteriori coefficients, including redistribution coefficients for Senility deaths, are given in Annex 9.

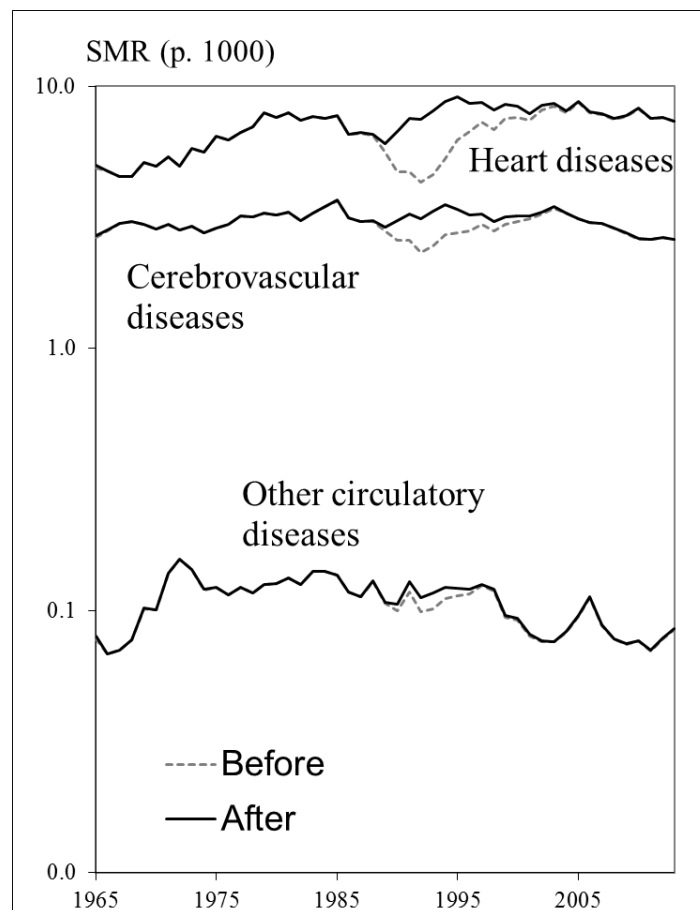


Figure 9. Annual trends in the standardized mortality rate for three groups of circulatory diseases in Moldova before and after redistribution of senility deaths, all ages, both sexes

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List of acronyms

BMA - Bureau of Migration and Asylum

FAI - fundamental associations of items

ICD – International Classification of Diseases and Causes of Death

IDNP - personal identification number

MITC - Ministry of Information Technology and Communication

NBS - National Bureau of Statistics

NCHM - National Centre for Health Management

SE CSIR - Center for State Information Resources

SPR - State Population Register

SC – Soviet classification

TCSU - Central Statistical Administration

ZAGS - *Zapis' aktov grazhdanskogo sostoiania*, Registry of Acts of Civil St

Annex

1. Medical and statistical documents (certificates)
2. Soviet classification of causes of death (1965, 1970, 1981 and 1988 revisions)
3. Detailed list of causes of death used in reconstructed series (ICD-10 Baltic list)
4. FAls between the 1965 SC and the 1970 SC
5. FAls between the 1970 SC and the 1981 SC and between the 1981 SC and the 1988 SC (for deaths from injury and poisoning)
6. FAls between the 1988 SC and ICD-9 (for three main ages groups)
7. FAls between ICD-9 and ICD-10
8. Transition coefficients
9. *A posteriori* coefficients
10. Calculation of distribution coefficients for deaths registered under the item Senility among diseases of the circulatory system