From Macro-Statistics to Family Reconstitution Data. Causes of Death in Hungary (Sources and Databases — 19th and Early 20th Centuries)

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From Macro-Statistics to Family Reconstitution Data

Causes of Death in Hungary (Sources and Databases — 19th and Early 20th Centuries)

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ABSTRACT

This paper presents Hungarian sources that provide information on the causes of death at both individual and aggregate levels. It demonstrates how causes of death appeared in parish records from the early 19th century onwards, alongside denominational differences and legal prescriptions for recording them. The paper also outlines the process of increasing professionalism, from the mandatory recording of causes, and the involvement of coroners or physicians as death inspectors, to the introduction of civil registration, and the use of prescribed lists of illnesses and international classifications in the first half of the 20th century. The paper also discusses the completeness and reliability of parish records and civil registration, as well as the emergence of aggregate-level statistics, which influenced the content and accuracy of individual-level registration. It presents existing family reconstitution databases containing causes of death alongside digitised statistical publications, enabling a thorough analysis of the mortality transition.

Keywords: Mortality, Historical causes of death, Causes of death registration practice, Historical sources, Population history of Hungary

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1 INTRODUCTION: NATIONAL CONTEXT OF THE DEVELOPMENT OF CAUSE-OF-DEATH STATISTICS

The collection of statistical data has a long tradition in Europe. Since ancient times, both states and churches have carried out this task for various reasons. Until the 18th century, states primarily sought to collect data for military purposes and taxation, while churches aimed to gather information on their followers. Statistics consisted of population censuses, census-like lists of sub-populations, and the registration of major demographic events (births, deaths and marriages). From the 18th century onwards, the purpose of these efforts began to change. During a period when modern states were forming, state bureaucracies began to control areas such as demography, education and public health, which had not previously attracted their attention. Therefore, knowing the exact size of the population, the number of births, deaths and marriages, and their key characteristics, appeared to be important. This administrative and scientific interest coincided with similar efforts by the Roman Catholic and Protestant churches from the 16th century onwards. The churches aimed to control their populations by registering events such as baptisms, burials and marriages, and creating the lists of parishioners. In this way, church registers provided basic statistical information on demographic events and parish population size, which state bureaucracies used to compile various statistical summaries. While European states began organising modern population censuses carried out by administrative personnel generally in the course of the 19th century, statistics on population movement were mostly based on parish registers until civil registration was introduced. The development of public health policies and statistical sciences in the 19th century led to increasingly accurate and detailed death registrations. While the cause of death was generally recorded in parish registers in the course of the century, previously only serious epidemic outbreaks or extraordinary circumstances of death (such as accidents, murders or suicides) were noted. The introduction of civil registration and the professional medical examination of deaths meant that reliable cause-of-death records were kept from the second half of the 19th century onwards.[1]

The Hungarian Kingdom was a multi-ethnic and multi-denominational area that was part of the Habsburg Empire until 1918.[2] In the 19th century economic development and social transformation was considerable. After the abolition of feudal privileges and serfdom in 1848, economic development speeded up. Railways were built up and agricultural production and food industry became significant even in international comparison (Katus, 2010). As a consequence, a steady population growth took place, which was slowed down only by periodic mortality crises caused first of all by serious cholera epidemics between 1831 and 1873. High, pre-transitional mortality began to decrease noticeably only after 1873, the last country-wide cholera outbreak accompanied by economic crisis and famine in the poorer, mountainous regions of the country. Despite the disappearance of cholera, mortality remained high in European comparison, infectious diseases of the digestive and respiratory systems among infants and children on the one hand, and tuberculosis among adults were very frequent even in the first decades of 20th century. Infant mortality rate decreased from about 250 per thousand to 200 per thousand by 1900, while life expectancy at birth was under 30 years in the first half of the 19th century, and reached only 40 years by 1900 (Hablicsek, 1991; Őri & Spéder, 2020). Fertility decline also began in the 19th century but with considerable spatial differences. Family reconstitution studies proved the fact of birth control in some remote corners of the country as early as the beginning of the 19th century (Andorka, 1998). A considerable decrease in marital fertility can be seen after 1850, especially in the urban and industrial centers and among the elite groups of the rural society. Fertility decline proceeded well by 1900, married women born 1880–1900 gave birth to 4 then 3 children (Őri & Spéder, 2020).[3]

The practice of collecting statistical data in the Hungarian Kingdom was shaped by the traditions of various churches, including Roman and Greek Catholics, Protestants, Orthodox and Jews, as well as by the efforts and interests of the imperial administration. In institutional terms, the 1867

1 About the development of demographic statistics see: Cabourdin and Dupâquier (1995), Dupâquier (1997), Willigan and Lynch (1982).

2 After 1918, it became an independent but much smaller country. In this paper, when we refer to the Hungarian Kingdom or Hungary, we are always talking about the country's actual territory. Our findings and statements about historical sources and statistical publications must be interpreted in this way. Our family reconstitution database at the individual level refers to Hungary's recent territory, and cannot be regarded as representative of present-day Hungary.

3 See a more detailed insight in Őri and Pakot (2025, pp. 3–4).

Compromise between Austria and Hungary created a new situation by granting Hungary extensive internal autonomy and enabling the establishment of an independent statistical office between 1867 and 1871. Consequently, relative independence in data collection emerged in the last third of the 19th century, alongside the impact of Austrian influence and international statistical congresses.

The statistical sources suitable for demographic analysis in Hungary are very similar to those in other European countries. The registration of baptisms, marriages and burials in the parish registers was made compulsory for Roman Catholics by the Council of Trent in 1563, and the content of the registers was prescribed by the *Rituale Romanum* of Paul V in 1614. This became compulsory in Hungary in 1625. Apart from a few early examples from the 17th century, mostly in urban areas, the registration of baptisms, burials and marriages had become widespread by the second half of the 18th century in both Roman Catholic and Protestant communities. By contrast, registration became a general habit among Orthodox Christians and Jews in many cases in the 19th century (Faragó, 2011, pp. 10–11; Fügedi, 1980).[4]

There was no standardised format for maintaining parish registers throughout the kingdom. Although the content of the records remained relatively consistent, practices varied from diocese to diocese and from parish to parish. Initially, the content of the registers was not tabulated. However, from the mid-18th century onwards, data were increasingly recorded in tabular form. Pre-printed register pages were generally adopted from the 1860s onwards, though some parishes began using them much earlier. The language used in parish registers could change over time and between denominations, as different denominational groups mostly represented different ethnic groups. Thus, Roman Catholic registers were kept in Latin or Hungarian from the late 19th century, while Protestant ones were mostly kept in Hungarian (Calvinists) or in German and Slovak (Lutherans). Orthodox records were kept in Serbian or Romanian, and Jewish ones in Hungarian, German or Hebrew (Biszak et al., 2008, pp. 6–7).

2 THE DESCRIPTION OF SOURCES CONTAINING CAUSE-OF-DEATH DATA

2.1 PARISH REGISTERS

Before the end of the 19th century, parish registers were the only source of data on demographic events in Hungary. Until civil registration was introduced in 1895, clergymen were required to provide the secular authorities with information on such events, and all administrative statistical publications and analyses were based on parish register data (Kármán, 1985). Consequently, state efforts to obtain more information about demographic development could influence church registration, thereby improving its accuracy and enriching its content. Thus, state efforts to compile nationwide statistics and the demand to control and prevent communicable diseases in the 18th and 19th centuries led to increasingly detailed and generalised death-cause registration (Holom & Hegedűs, 2022).

Prior to 1895, parish registers contained basic information regarding the causes of death. Death registers were the least significant for the various churches, consequently they were the least reliable in the 18th century, in terms of both the completeness of registration and the accuracy of causes of death (Jároli, 1989, pp. 473–474). The registration of causes of death was not originally prescribed for local clergymen;[5] consequently, it appeared in parish books much later than death registrations commenced, mostly and systematically in the 19th century. As previously mentioned, the completeness of parish registers developed alongside the state's increasing demand for statistical data on demographic processes. As statistical summaries produced by local administrative authorities were based on parish records, the use of statistical tables had the potential to influence the content of the church records directly, as clergymen tried to fulfil their prescribed duties and provide the required data, or indirectly, through instructions from the church administration, which was obliged to assist state efforts in the 18th and 19th centuries (Őri, 2003, pp. 47 and 144).

4 In 1785, Emperor Joseph II granted Protestants the right to keep parish registers, although record-keeping had already begun in many places well before this date. Registration of the Jewish population in Hungary became universally mandatory in July 1851.

5 As for Roman Catholics, see the directions of the *Rituale Romanum (Titulus XII, cap. 4.: Forma describendi defunctos)* (https://www.liturgia.it/content/ritrom.pdf).

Thus, prior to the 19th century, death causes only appeared in parish registers if they were extraordinary, such as accidents or murders, or if they were of greater significance to the local community, church or state administration, such as serious epidemics or cases of suicide. The victims of the plague were carefully listed in some early death records; smallpox was also frequently recorded in the 18th and 19th centuries. Apart from its local significance, the demand for control of the plague's spread resulted in the production of detailed statistics on losses, thereby providing information on the development of the disease over time and space. Smallpox also constituted a grave public health concern, and the introduction of vaccination in the first half of the 19th century rendered smallpox mortality data of considerable significance. In addition, during the second half of the 18th century, the absolute monarchy initiated the collection of demographic data and endeavoured to establish a continuous population register (Durdik, 1973, pp. 227–228; Horska, 1998, pp. 441–442; Őri, 2003, pp. 29–30). This initiative was also implemented in Hungary in the 1770s and 1780s. As a contributing factor to the annual decline in population, the number of deaths was presented by some death causes listed separately.[6] Consequently, a number of parish death registers exhibit these causes of death in conjunction with the yearly summaries of deaths categorised as previously outlined. In 1784, Emperor Joseph II introduced a new state registration system primarily for military purposes. While lists of population loss (deaths and emigration) had to be kept up to date for census books, the previous categorisation of causes of death was omitted.

Despite the dissolution of this initiative in Hungary following 1790, the legal significance of parish registers was repeatedly emphasised during the 19th century, exerting a notable influence on the documentation of death causes. The 1827/XXIII law stipulated the mandatory preparation of copies, which were to be submitted to the civil county authorities on an annual basis. At the same time, preprinted tabulations or their hand-made copies with standardised content began to replace the previously used linear texts (Biszak et al., 2008, p. 7; Holom & Hegedűs, 2022, p. 10). The adoption of tabulations varied from parish to parish, but had become widespread by the middle of the 19th century, with the headings of the tables containing the causes of death. Once the cause of death column had been introduced, the practice of cause-of-death registration became standard. In general, causes of death appeared earlier in Protestant parish registers than in those of Roman Catholics, where this practice only became widespread in the second half of the 19th century (Benda, 2000, p. 131; György-Dávid, 2008, p. 187).[7]

A preliminary examination of a sample of parish registers from various regions across Hungary has revealed distinct patterns in the timing of cause of death recording among the three major Christian denominations. A comprehensive analysis of 22 parishes discloses substantial variations in the implementation of systematic cause of death registration across denominations (see Figure 1 and Table A1).

Among Roman Catholic parishes, death registration typically began in the early to mid-18th century, but recording the cause of death was introduced considerably later. Except for Újlak, a suburb of Buda (the right-coast part of modern Budapest) where death registration and recording of causes of death began simultaneously in 1711, the earliest examples of cause recording emerged in the late 18th century (Csepreg in 1788 and Bő in 1789).[8] The majority of Catholic parishes began systematic cause registration in the 1830s and 1850s, often alongside wider ecclesiastical reforms and state directives.

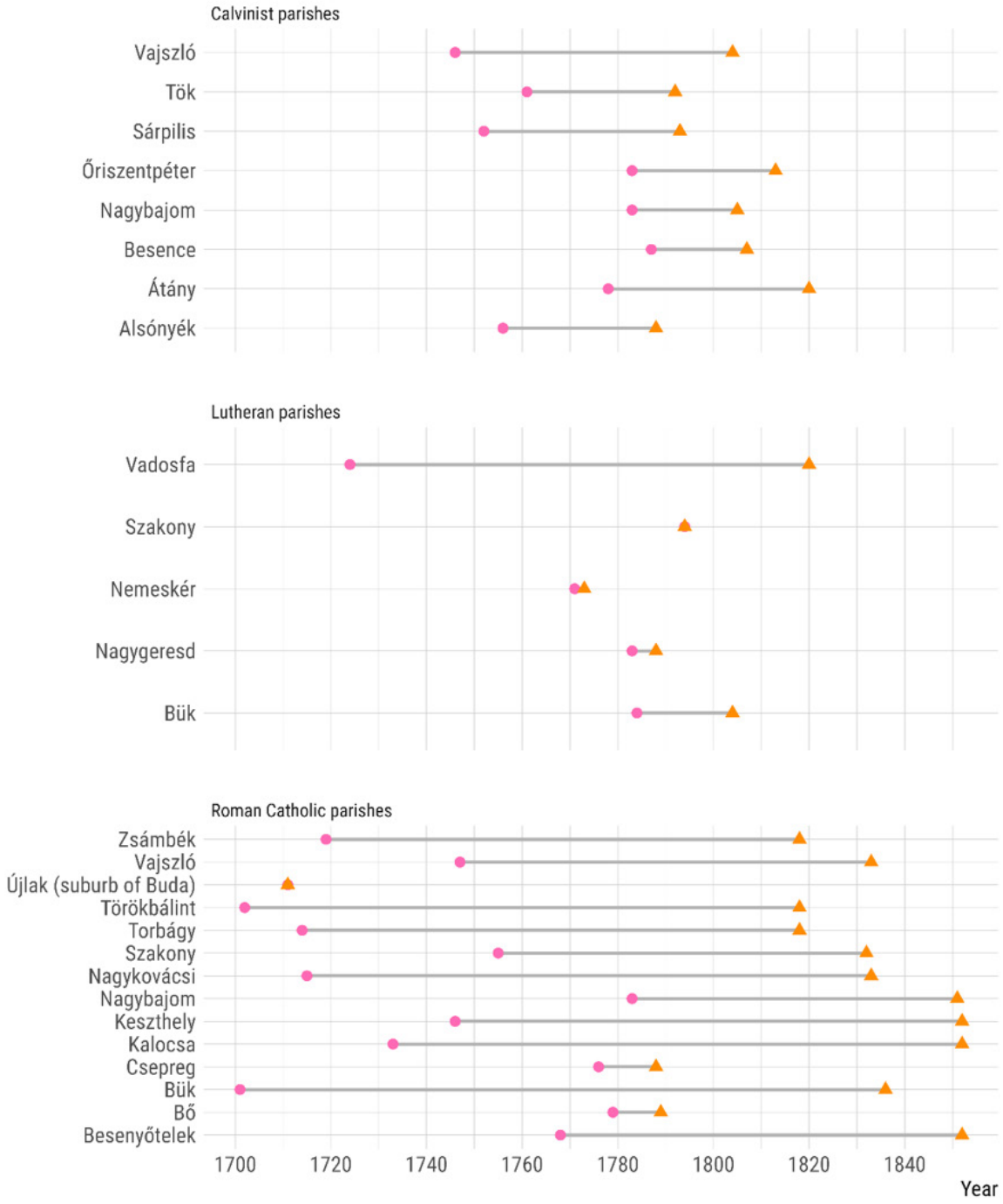
Lutheran parishes adopted cause of death recording much earlier. Their death registers typically began in the late 18th century and the recording of causes often commenced simultaneously or shortly thereafter. Notably, the Szakony Lutheran parish began recording causes of death as soon as they started recording deaths in 1794, and the Nemeskér parish introduced cause recording within two years of starting to record deaths.

6 The categories prescribed on the printed tabulations were as follows: those executed (*ultimo supplicio affecti*), those found dead (*inventi mortui*), those who died in accidents (*casu fortuito enecti*), and those who died at birth (*in partu enecti*). Clearly, state authorities were interested in perinatal mortality and accurate birth statistics, as well as in some types of external death causes and dubious cases (Őri, 2003, pp. 64–65).

7 For example, in the Diocese of Veszprém from the 1850s onwards. We would like to express our gratitude to Tibor Varga, the archivist at the Veszprém Archdiocesan Library and Archives, for his valuable contribution of information regarding the diocese's registration keeping practices.

8 The early registration of causes of death in Újlak was really exceptional. Apart from the urban nature of the settlement, this was probably due to the accurate work of the parish priests who established a local registration tradition.

Figure 1 *The beginnings of entries on the cause of death in the death registers of some Hungarian parishes, by denomination*



Note: A pink circle marks death register start, an orange triangle marks cause of death entries start.

Calvinist parishes demonstrated the earliest and most consistent adoption of cause-of-death recording. The practice was introduced in most parishes in the late 18th or early 19th century. Several Calvinist communities, including Sárpilis (1793) and Tök (1792), began systematically recording causes of death in the 1790s. These findings confirm that Protestant denominations generally preceded Roman Catholic parishes in implementing comprehensive cause of death registration. This reflects broader differences in administrative practices and ecclesiastical governance structures among Hungary's major religious communities.

As mentioned above, the recording of causes of death in parish registers often began at the same time as the introduction of tabulated forms with separate columns for illnesses that caused death. The use of these tabulated records with a separate section for the cause of death, sometimes began in 1828 when mandatory copies of records had to be prepared. However, the tabulation form was sometimes

much older, and the emergence of the cause of death as a separate category occurred much earlier. For example, in the Roman Catholic, urban parish of Újlak, a tabulated form with a separate column for causes of death had been used since the beginning of registration in 1711. In the Calvinist parish of Tök, close to Budapest, tabulations were adopted in 1789, with the cause of death column appearing in 1792. In the neighbouring Roman Catholic parish of Zsámbék, however, tabulations had been used since 1807, and the cause of death column appeared in 1818.

However, this did not ensure complete or accurate registration of causes of death, as these were often missing or recorded as "unknown". The completeness of the records also improved during the 19th century, becoming fully complete only after 1895 with the introduction of civil registration. Naturally, significant differences in completeness can be expected between regions and denominations, even within this period.

The main problem with the accuracy of cause-of-death registration was that it was originally determined by local clergymen, who were not medical professionals. They often based their findings on symptoms rather than specific diseases and used ambiguous terms or too general categories. For example, it was very difficult to differentiate between infectious diseases accompanied by rashes, or between respiratory or digestive diseases with very similar symptoms. Specific illnesses are also difficult to identify behind general terms such as "water disease" (some sort of oedema), "consumption", "weakness", "fever", or "old age".

An important change to the way death causes were recorded came with the 1876 law,[9] which made the involvement of official examiners compulsory. The law stipulated that "every deceased person must be examined by an officially appointed individual to determine whether death has occurred and, if so, whether it was violent or the result of a contagious epidemic." If the official death examiner found no signs of anything suspicious, he would set the time of burial and issue a death examination certificate. Based on this certificate, the local authorities would grant permission for burial and record the death in the civil register. In cases of suspected infectious disease or violent death, the coroner (death examiner) was required to report the case to the relevant state and police authorities (Hanák, 1998; Koltai, 2003). The legislation also obliged physicians and clergy to immediately report any epidemic outbreak in their settlements to the primary public health authorities (Section 80). This requirement facilitated the subsequent localisation of numerous epidemics and prevented their spread (Marton, 1959).

2.2 CIVIL REGISTRATION

State (civil) registration was introduced by Act XXXIII of 1894 and came into effect on 1 October 1895 (Magyarországi Rendeletek Tára, 1895). The initial state civil register format, introduced in 1895, used a prose structure in which information for each registry event was organised into sequential lines. This was replaced on 1 January 1907 by a more efficient columnar structure. A section on causes of death was naturally included in the content of the preprinted sheets, as required by the explanations linked to the text of the law. "For Paragraph 47, Section 6 contains the cause of death as an integral part of the death record because it provides public health statistics with invaluable information. In addition, considerations regarding the police also make its inclusion in the death record desirable."[10] In other words, cause-of-death statistics provide the government with the necessary information in order to prevent epidemic outbreaks, improve population health and reduce mortality. They also help the police to detect suspicious deaths caused by homicide or suicide.

The standardised classification system for causes of death was established by Appendix 9 of the 1895 Hungarian law introducing state civil registration (Magyar Rendeletek Tára, 1895, p. 791). This classification system contains 27 categories for qualified coroners (non-physicians), which systematically organise mortality data and reflect the medical knowledge and disease terminology of the late 19th century (see Table 1). These categories include infectious diseases such as cholera, typhoid and measles; infantile and childhood conditions such as congenital weakness, infantile diarrhoea and marasmus; respiratory ailments such as tuberculosis and pneumonia; and external causes of death such as suicide, homicide and accidents. Notably, the final three categories require a detailed explanation of the circumstances, indicating an emphasis on documenting violent or accidental deaths in particular. The

9 On public health: Act XIV, Section 110.

10 Explanation of the 1894 Law on Civil Status Records; https://net.jogtar.hu/ezer-ev-torveny?docid=89400033.TVI&searchUrl=/ezer-ev-torvenyei%3Fpagenum%3D44.

accompanying note emphasises that this classification system is mandatory for all personnel involved in death certification, ensuring standardised mortality reporting across the Hungarian Kingdom.

According to Section 7 of the 1895 Hungarian civil registration law, a hierarchical procedure for recording causes of death was established. When issuing a death certificate, a physician-coroner had to record the exact cause of death. If a qualified non-physician coroner or municipal official issued the certificate using a cause from the standardised classification, that cause had to be recorded. Where no certificate was presented, or where the cause was not listed or fell outside the standardised categories, the registrar was required to question the reporting party in order to determine the most appropriate cause from the official list. If no cause could be established through questioning, "cause unknown" had to be recorded. This system prioritised medical expertise while providing fallback procedures to ensure systematic death registration.

Table 1 *Prescribed causes of death for qualified coroners at the introduction of civil registration in Hungary, 1895*

N.	Cause of death in Hungarian	Cause of death translated to English
1	Veleszületett gyengeség	Congenital weakness
2	Görcsök	Convulsions
3	Gyermek-aszály	Marasmus (infantile atrophy)
4	Gyermekek hasmenése	Infantile diarrhoea
5	Ázsiai kolera	Asiatic cholera
6	Vérhas	Dysentery
7	Roncsoló toroklob (Diphteria). Torokgyík (Croup)	Diphtheria. Croup
8	Kanyaró (Veres himlő)	Measles
9	Szamárhurut	Whooping cough (Pertussis)
10	Vörheny (Skarlát)	Scarlet fever
11	Hólyagos himlő	Smallpox
12	Hasi hagymáz (Typhus)	Typhoid fever
13	Kiütéses hagymáz (Petecses)	Typhus (spotted fever)
14	Orbáncz	Erysipelas
15	Pokolvar	Anthrax
16	Gyermekágy	Puerperal fever (childbed fever)
17	Veszettség (Viziszony)	Rabies (hydrophobia)
18	Tüdőgümőkor (Tüdővész, hektika)	Pulmonary tuberculosis (consumption, phthisis)
19	Tüdőgyulladás (Mellhártyagyulladás)	Pneumonia (pleuritis)
20	Gutaütés	Stroke (apoplexy)
21	Vizibetegség	Dropsy (oedema)
22	Sérvek (Szakadás)	Hernia (rupture)
23	Elmebaj	Mental illness
24	Aggkori végkimerülés	Senile exhaustion
25	Öngyilkosság. Megnevezendő az öngyilkosság módja is, például öngyilkosság lövés, vízbeugrás, akasztás, mérgezés által stb.	Suicide. The method of suicide must also be specified, for example: suicide by shooting, drowning, hanging, poisoning, etc.
26	Gyilkosság. Megnevezendő annak módja is, például: lelövés, megfojtás, agyonütés stb.	Homicide. The method must also be specified, for example: shooting, strangulation, beating to death, etc.
27	Baleset. Megnevezendő annak módja is, például: vízbefúlás, mérgezés, lezuhanás, elgázoltatás, agyonnyomatás stb.	Accident. It must also be specified, for example: drowning, poisoning, falling, being run over, being crushed, etc.

When analysing the 27-category Hungarian mortality classification system, it is important to consider it within the context of late 19th-century medical knowledge and the practical requirements of the time. One notable aspect of this system is how it groups specific diseases, such as tuberculosis and measles, alongside symptoms and clinical conditions, including convulsions and senile exhaustion. The system's comprehensive approach reflects the legislators' intention to account for all possible causes of death. This explains why different categories appear alongside each other. The law's creators aimed to compile an exhaustive classification system covering the full spectrum of causes of death encountered in practice, ranging from infectious diseases and external causes (such as homicide and suicide) to socially defined categories such as "mental illness". This system was designed so that non-medically trained coroners and municipal officials in the country's most remote settlements could use it. The 27 categories were simple and easy to understand, enabling people with varying qualifications to record causes of death relatively uniformly. While physicians could naturally make more precise diagnoses, the purpose of state civil registration was to standardise the collection of statistical data rather than to provide accurate medical documentation.

The most important feature of the classification is that over half of all categories (15 out of 27) relate to infectious diseases. This overwhelming emphasis reflects the fact that infectious diseases were the leading cause of death in the late 19th century. The inclusion of major epidemic diseases such as cholera, typhoid fever, typhus and smallpox suggests that those responsible for the classification recognised the threat these diseases posed to public health and their potential to cause widespread devastation. This classification of diseases can be seen as a continuation of the 19th-century categorisation that appeared in statistical publications at an aggregate level, where the distinction between "natural" and "violent" diseases was the main focus, with communicable diseases playing a key role within the former. In this way, the categorisation reflected the morbidity and mortality conditions of the late 19th century, and, with regard to some significant illnesses, made the compilation of continuous time series possible.

The implementation of this standardised classification system increased accuracy and professionalism, and official instructions concerning causes of death had a growing impact on everyday registration practices. It is also important to note, however, that there were significant differences in the level of involvement of physicians and death examiners with no advanced medical training. A significant portion of death causes were determined by non-physician investigators and medical doctors played a pivotal role only in urban areas. While the involvement of physicians reached 90–100% in Budapest and other large cities, as well as in the county surrounding the capital, the national average was only 61.6% in 1900 (Népmozgalom, 1900–1902, 1905, p. 33; Népmozgalom, 1901–1910, 1913). Registration and the statistics based on it became more professional, consistent and reliable over time. This process continued in the first half of the 20th century, with medical doctors becoming increasingly involved. Calculated for the smaller, post-war territory of the country, the involvement rate of medical doctors increased to 69.5% in 1920 and to 88.3% in 1930 (Népmozgalom, 1926–1932, 1937, p. 24). The increasing significance of professional aspects and international standards such as the implementation of the International Classification of Diseases (ICD) from 1932 onwards led to further substantial advancements in cause-of-death statistics.

Table 2 *Categories of causes of death in Tök, Calvinist parish registers before 1896 and civil registers from 1896 onwards, those aged 55 and above*

	Before 1896		1896–1945	
	N	%	N	%
Airborne infectious diseases	355	37.0	59	9.1
Water-food borne infectious diseases	43	4.5	11	1.7
Other infectious diseases	29	3.0	9	1.4
Cardiovascular diseases	146	15.2	140	21.6
Cerebrovascular diseases	59	6.2	72	11.1
Malignant neoplasms	20	2.1	54	8.3
Old age	260	27.1	265	40.9
Other diseases	35	3.6	15	2.3
External causes	12	1.3	23	3.5
Total	959	100.0	648	100.0

Source: The parish registers and civil registers of the village of Tök, 1761–1945.

By comparing the causes of death recorded in parish and civil registers, we can see that the structure of causes began to change in the last decades of the 19th century, with more professional and unified causes being recorded. Both changes can be observed in the registers of the Calvinist village of Tök, near Budapest. To demonstrate this, we examined the deaths of people over 55, categorised using a simplified version of the 27 categories prescribed for coroners.[11] The distribution of deaths among people over the age of 55 in the village of Tök shows some signs of the developing mortality transition, with a decreasing proportion of deaths from infectious diseases and an increasing proportion from degenerative diseases (see Table 2). It also indicates that "old age" was not only a prevalent cause of death, but an increasingly prevalent one. "Old age" as a cause of death may indicate the inaccuracy and ignorance of coroners and physicians when determining the cause of death in this age group (Reid et al., 2015). In this specific Hungarian case, however, this may be due to the difficulty of diagnosis when multiple causes were present, which undoubtedly became more common in the first half of the 20th century. As for other causes of death, accuracy and professionalism improved with the introduction of civil registers and the involvement of official examiners. Before 1896, airborne infectious diseases caused most deaths, which were mostly recorded as tuberculosis under various names, such as "consumption", "weakness", "dry disease", etc. (in Hungarian *sinlődés*, *sorvadás*, *aszkór*, *száraz betegség*, *száraz nyavalya*, *hektika*). After 1895, tuberculosis accounted for a smaller proportion of deaths and was recorded under this name or its modern Hungarian equivalents (*tüdőgümőkór*, *tüdőbaj* or *tüdővész*). Other infectious diseases were also professionally recorded and could easily be identified, such as pneumonia, pleurisy and chronic bronchitis. Similarly, one third of cardiovascular diseases were recorded before 1896 as "water disease" or "swelling" (*vizibetegség*, *dagadás*, *dagadozás*), meaning oedema of some kind. While this undoubtedly refers to heart disease (cardiac failure) in most cases, it can also refer to diseases of the kidneys and respiratory system. After 1895, cases of death caused by water disease, suffocation or swelling disappeared, and more identifiable modern diseases were recorded. About half of these cases were ischaemic heart disease (in Hungarian *szívszélhűdés*).

2.3 AGGREGATE-LEVEL STATISTICAL PUBLICATIONS

As we have seen, the first attempts to introduce a continuous population register in the Habsburg Empire resulted in the compilation of basic cause of death statistics, but these were kept secret. By contrast, in the 19th century, statistical summaries at a provincial level, based on demographic data provided by local clergy, were regularly published in various publications (e.g. *Tafeln zur Statistik der Österreichischen Monarchie* and *Statistisches Jahrbuch der Österreichischen Monarchie*). Initially, stillbirths, deaths from sickness (e.g. epidemics and smallpox), and violent deaths were categorised separately.[12] Later, in the 1860s, *Tafeln* and *Statistisches Jahrbuch* published detailed death statistics by sex and age, including cause-of-death data by sex and province. In these statistics, deaths were classified as either natural or violent (Holom & Hegedűs, 2022, p. 11). The first category included separate sections for cholera, smallpox, other epidemics, childbirth (with mothers and children categorised separately) and local and general illnesses. Violent deaths were also categorised as follows: suicide, rabies, accidents, murder, execution and other.[13]

Following the establishment of an independent Hungarian statistical service after 1867, data collection based on parish records produced publications very similar to the Austrian ones (*Magyar Statisztikai Évkönyv*). Natural and violent deaths were categorised separately, and the same sub-groups could be found within these categories as in the Austrian publications. Although the clergy were required to provide regular and detailed categorisations of death cases, data on causes of death were not published between 1874 and 1892. Following this, detailed statistics were published for the period 1881–1892, categorised by cause of death and county, with 23 natural causes and 3 non-natural (external according to modern terminology) causes (see Table 3).[14] The Statistical Office also published more detailed data on infectious diseases.

11 We are planning to code the causes of death of the entire population using the system suggested by Reid et al. (2024). For now, however, we can use the codes from a previous study examining the mortality of the elderly.

12 See for instance https://viewer.onb.ac.at/10290F22.

13 See for instance https://viewer.onb.ac.at/10290ED1.

14 See https://digitalia.lib.pte.hu/www/free/magyar-statisztikai-evkonyv/1893/htm/068.htm.

Table 3 *Causes of death in the statistical publications for the period 1881–1892*

N.	Cause of death in Hungarian	Cause of death translated to English
	Természetes halálokok	*Natural causes of death*
1	Veleszületett gyengeség	Congenital weakness
2	Görcsök	Convulsions
3	Gyermek-aszály	Marasmus (infantile atrophy)
4	Tüdőlob	Pneumonia
5	Tüdőgümő, tüdővész, aszkór	Pulmonary tuberculosis
6	Bélhurut	Gastro-enteritis
7	Vérhas	Dysentery
8	Cholera	Cholera
9	Hagymáz	Typhus or typhoid fever
10	Himlő	Smallpox
11	Vörheny	Scarlet fever
12	Kanyaró	Measles
13	Roncsoló toroklob	Diphtheria
14	Torokgyík	Diphtheria (or croup)
15	Hökhurut	Bronchitis
16	Gyermekágyi láz	Puerperal fever (childbed fever)
17	Gutaütés	Stroke (apoplexy)
18	Aggkor	Old age, Senile exhaustion
19	Vízkór	Dropsy (oedema)
20	Fertőző pokolvar	Anthrax
21	Víziszony	Rabies (hydrophobia)
22	Elmebaj	Mental illness
23	Egyéb halálokok	Other causes of death
	Nem természetes halálokok	*Non-natural causes of death*
24	Erőszakos halál	Violent death
25	Öngyilkosság	Suicide
26	Balesetek	Accidents

From 1896 onwards, the publication of data was based on civil registers, resulting in a more detailed structure of cause-of-death statistics. Two categorisations were used: one for causes of death determined by qualified non-physician examiners and physicians, and one for causes determined solely by physicians. The latter was much more detailed than the former. The former followed the prescribed causes for non-physician examiners detailed in Table 1, with some modifications: there were two categories for diphtheria (one of them may indicate croup), and puerperal fever and death in childbirth were separated. The latter specified 168 distinct diseases, classified into 20 categories (see Table 4), which was very similar to the classification of the French demographer, Jacques Bertillon (Holom & Hegedűs, 2022, pp. 12–13). As both classification systems developed in parallel in the 1890s, it is difficult to talk about the direct impact of the Bertillon system; it is more a case of common sources. At the International Statistical Congresses in the previous decades, the classification of causes of death was discussed, and the suggestion of William Farr became widely known, among others. Farr's system differentiated between epidemic diseases, constitutional (general) diseases, diseases arranged by anatomical site, developmental diseases and violent diseases. Although Farr's system was never officially accepted, its principles appeared in Bertillon's classification system and formed the basis of

the subsequent International List of Causes of Death.[15] The Hungarian classification system reflects these principles and is related to the development of medical science and the collaboration of national statistical services from the late 19th century onwards.

Table 4 *Categories of causes of death determined by physicians in the Hungarian statistical publications from 1896 onwards*

I.	Infectious diseases (smallpox, chicken-pox, measles, scarlatina, typhus, influenza, diphtheria, diarrhoea, dysentery, malaria, different types of TBC, etc.)
II.	Parasitic diseases (worms and fungus infections)
III.	Malignant neoplasms
IV.	Constitutional diseases (e.g. gout and rickets)
V.	Nutritional diseases (e.g. scurvy, alcohol poisoning)
VI.	Developmental problems (premature birth, congenital weaknesses, malformations and deformations, teething, old-age exhaustion)
VII.	Diseases of the nervous system (meningitis, stroke, paralysis, epilepsy, etc.)
VIII.	Diseases of the sensory organs
IX.	Diseases of the circulatory system (different heart diseases)
X.	Diseases of the respiratory system (pneumonia, pleuritis, etc.)
XI.	Diseases of the digestive system (gastro-enteritis, gastric ulcer, ileus, peritonitis, cirrhosis of the liver, hernia, etc.)
XII.	Endocrine diseases
XIII.	Diseases of the urinary system
XIV.	Diseases of the genital system
XV.	Diseases related to pregnancy and childbirth
XVI.	Diseases of the musculosceletal system
XVII.	Diseases of the skin
XVIII.	Diseases and symptoms not elsewhere classified (exhaustion, fever, abscesses, inflammation)
XIX.	Violent deaths (suicide, murder, executions, uncertain origin)
XX.	Unknown (sudden death, non-classifiable)

3 DEVELOPMENT OF THE DATABASE

3.1 AGGREGATE STATISTICS

At an aggregate level, the statistical summaries published by the Hungarian Central Statistical Office are useful for demonstrating changes in mortality patterns and their spatial aspects since 1896. Although the change in the country's territory in 1918 makes tracking the decline in mortality difficult,[16] the Statistical Office has continued to publish cause-of-death data for the new country since 1920, with content becoming increasingly detailed over time. Basic data were published in printed form by administrative units (counties and towns), sex and broad age group (under and above the age of 7), while more detailed publications after 1920 (e.g. on causes of death among infants by parents'

15 See WHO: History of the development of the ICD (https://cdn.who.int/media/docs/default-source/classification/icd/historyoficd.pdf).

16 Although the results were published by county — both before and after 1918, the new borders divided some counties meaning that these counties with the same names referred to entirely different territorial units during the mid-war period.

occupational groups) are available at a national level. Volumes of *Magyar Statisztikai Évkönyv* and *Magyar Statisztikai Közlemények* are available online from 1885 onwards, including detailed cause-of-death statistics from 1896.[17] Until 1931, data publication was based on the classification shown in Table 3; thereafter, the actual International Classification of Diseases was used instead. From 1926 onwards, causes of death were also published by occupational group, albeit only at a national level.

Recently, data have also been published at a national level (Klinger, 1992). Digitised data on population movement, including causes of death, are also available. In addition, scanned versions of special volumes published by the Statistical Office containing cause-of-death data can be used. For example, one volume presents population movement data for the period 1901–1910, categorised by settlement. Causes of death are categorised according to the classification system for non-physician coroners, as shown in Table 1 (Népmozgalom, 1901–1910, 1913). A special volume on infant and child mortality published cause-of-death data at a national level by parents' occupational group for the period 1911–1915 (Gyermekhalandóság, 1921), while a publication on tuberculosis is also available for the period 1901–1915 (Gümőkórhalálozás, 1925).[18]

3.2 INDIVIDUAL LEVEL DATABASES

Databases containing individual-level cause-of-death data are based on parish registers and civil registration records from after 1895. Some of these records have been digitised and organised into family reconstitution databases by the authors of this paper, while others have been donated by individuals who have already completed the process of family reconstitution. The records that include causes of death originate from the western part of the country and cover the villages of Bük, Csepreg, Szakony and Nagygeresd, which have Roman Catholic and Lutheran populations. They also cover the Calvinist parish of Tök, which is located in the centre of the country. Data have been transcribed from the beginning of registration until 1945.[19] Registration of causes of death began in Csepreg in 1788, in Tök in 1792, in Szakony in 1832, and in Bük in 1836 (see Figure 1 and Table A1). Additionally, an urban sample is being compiled from the family reconstitution database of the Roman Catholic Újlak, suburb of Buda (Pest) for the period 1857–1873, for which three surviving population censuses aid the process of data linkage.

The database has been further enriched by the family reconstitution database of Őriszentpéter, which was compiled by Gábor Koltai (Koltai, 2003, 2004) and covers the period from 1783 to 1895. It contains cause of death data from 1813 onwards. The Kalocsa Roman Catholic Archdiocesan Archives have also created a database containing digitised data from the parish registers of Kalocsa and two neighbouring Roman Catholic parishes (Szakmár and Homokmégy) for the period 1733–1910. This database is also available to researchers, enabling them to examine cause of death data for the period 1852–1910.

Figure 2 illustrates the linguistic patterns of cause-of-death registration across settlements and denominational parishes. The timeline shows when systematic cause-of-death recording began in each parish, which may not have coincided with the commencement of general death registration. The Kalocsa database is an exception in that it is based exclusively on ecclesiastical records up to 1910. By contrast, the Újlak database currently only covers the period from 1857 to 1873.

The figure shows that the language used to record causes of death in Roman Catholic parishes underwent distinct changes over time. Registration was usually carried out in Hungarian between 1836 and 1852, with the use of Latin preceding and following this period. After this Hungarian was

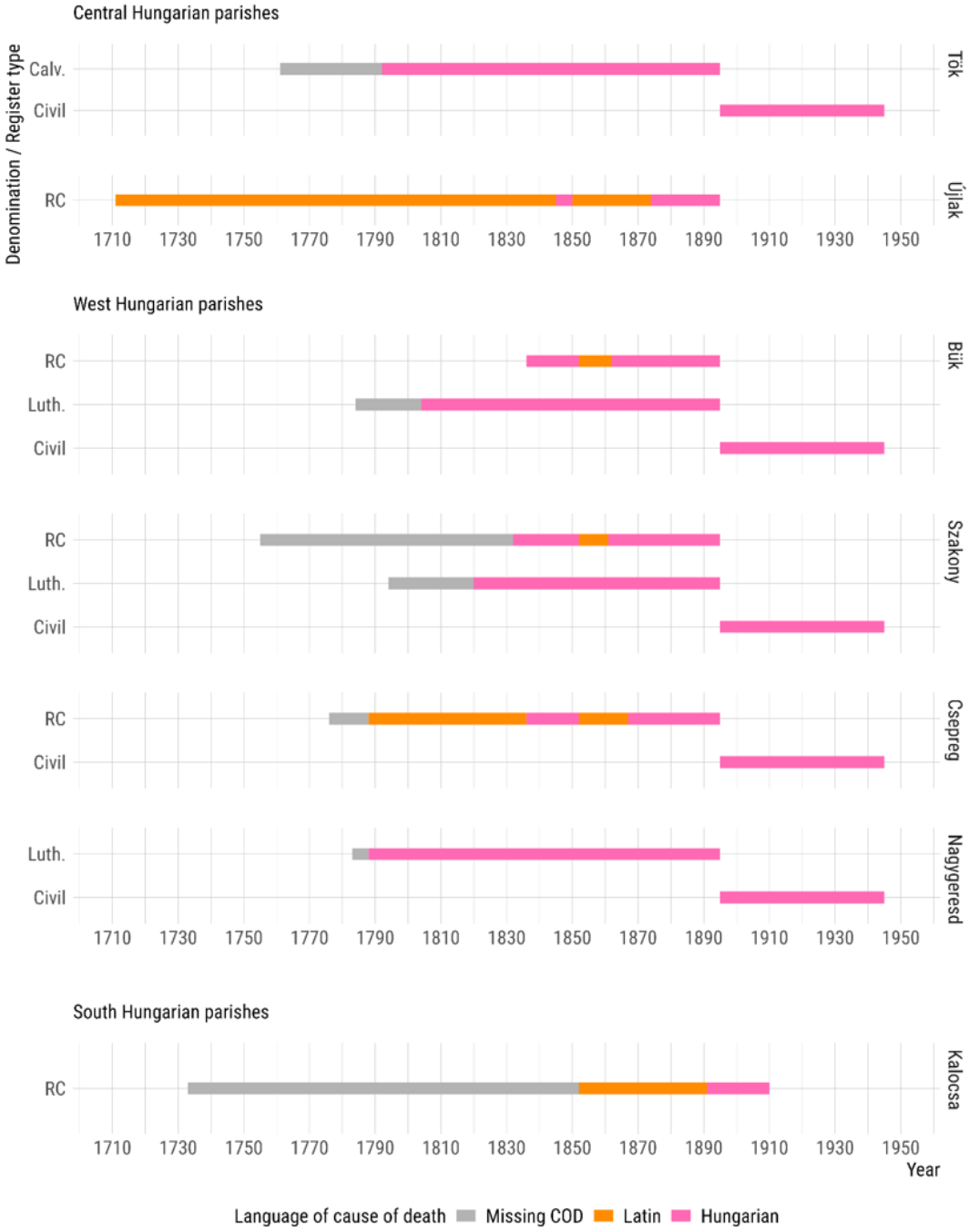
17 See for *Magyar Statisztikai Évkönyv (1885–1911):* https://digitalia.lib.pte.hu/www/free/magyar-statisztikai-evkonyv/index.html, and for the period 1905–1947: https://epa.oszk.hu/05200/05299#, for *Magyar Statisztikai Közlemények (1900–)*: https://www.kshkonyvtar.hu/article/56/258/magyar-statisztikai-koezlemenyek.

18 See https://www.kshkonyvtar.hu/article/56/258/magyar-statisztikai-koezlemenyek.

19 Levente Pakot has digitised data and performed record linkage regarding the western group of settlements, while Péter Őri has done the same for the settlements of Tök and Újlak. This work was supported by the projects referenced at Funding. More detailed descriptions of the databases and settlements can be found in Pakot and Őri (2015), Őri (2019, 2022, 2023a, 2023b) and Őri and Pakot (2025). It is important to note that the data from the period 1895–1945 originates from civil state registers, which are only available for scientific purposes to those in possession of special permission proving this. Publications must not contain data that could identify individuals (such as names).

reinstated.[20] Kalocsa, however, presents a notable deviation from this pattern, with Latin remaining the language of registration until 1891. This reflects its status as an archiepiscopal centre with distinct administrative practices. By contrast, Protestant denominations used Hungarian for all registrations, including causes of death, throughout the entire period. Consequently, recorded causes of death fall into two main linguistic categories: Latin and Hungarian, meaning at least two coded lists of causes of death must be created.

Figure 2 *Language of cause of death registration in selected Hungarian parishes (individual level cause-of-death database), 1711–1945*



Note: Line start marks the beginning of each death register.

20 Latin was the traditional language of the Roman Catholic Church, whereas Protestants mostly used Hungarian from the beginning. Latin was used not only in church life, but also remained the kingdom's official language until 1836, when Hungarian was also recognised as an official language. In 1844, Hungarian became the sole official language, a change reflected in Roman Catholic Church documents. Following the unsuccessful war for independence in 1849, the use of the Hungarian language declined, but it reappeared in official Roman Catholic documents, such as parish records, around 1867.

Table 5 *The completeness of cause-of-death records in the parish registers and civil registers of some selected settlements (individual level cause-of-death database)*

Settlement/ parish	Denomination/ register type	Period	Number of death records	Number of records with death cause	Per cent with death cause
Tök	Calvinist	Before 1800	349	74	21.2
		1800–1827	1,155	674	58.4
		1828–1849	1,005	913	90.8
		1850–1894	2,009	1,970	98.1
	Civil	1895–1945	1,391	1,390	99.9
Újlak	R.C.	1857–1873	3,743	3,703	99.0
Bük	Lutheran	1804–1895	1,922	1,439	74.9
	R.C.	1836–1895	2,368	1,488	62.8
	Civil	1895–1948	2,829	2,523	89.1
Szakony	Lutheran	1820–1895	1,010	883	87.4
	R.C.	1832–1895	1,160	359	30.9
	Civil	1895–1948	1,406	1,274	90.6
Csepreg	R.C.	1788–1895	6,786	4,271	62.9
	Civil	1895–1940	3,883	3,775	97.2
Őriszentpéter	Calvinist	1813–1895	1,471	1,374	93.4
Kalocsa	R.C.	1852–1910	33,114	32,515	98.2

Table 5 reveals clear denominational patterns in terms of the completeness of cause of death recording. Protestant parishes consistently outperformed Roman Catholic ones. Lutheran registers were 75–87% complete, while Calvinist registers reached 93% completeness in Őriszentpéter and above 90% completeness in Tök after 1828. Cause-of-death registration began in Tök in 1792 but was rare in the last decade of the 18th century and only became common after 1828. Following this, the registration of causes of death became widespread, and after 1850 it can be considered to be complete.

By contrast, Roman Catholic parishes showed greater variation, with rates ranging from 31% in Szakony to 63% in Bük and Csepreg. Rates reached almost 100% completeness in the capital's suburb of Újlak. This confirms earlier observations about Protestant churches' superior administrative practices.[21]

The introduction of civil registration in 1895 dramatically improved the collection of data across all settlements, with completeness rates consistently exceeding 89% and reaching 97% in Csepreg and 99% in Tök. This illustrates the effectiveness of standardised state procedures in ensuring the systematic documentation of mortality.

The Kalocsa and Újlak Roman Catholic registers are notable exceptions, achieving 98–99% completeness in the second half of the 19th century. This suggests that major ecclesiastical and urban centers maintained significantly higher administrative standards than ordinary parishes. This was probably due to greater oversight and more sophisticated bureaucratic procedures, which were typical of archiepiscopal jurisdictions and administrative centers.

21 The Hungarian historical demographic literature, however, emphasizes the under-registration practice of 18th-century Protestant death registers too. The core element of this critique is that the death registers are incomplete, partly due to the fact that two types of registers existed in Protestant burial practice: the minister's register, which contained burial data for wealthier farmers and their family members (excluding children) — these were funerals with sermons — and the teacher's register, which contained funerals with hymns for poorer people and children. The latter was kept at the school (Jároli, 1989, pp. 473–474).

CONCLUSION

Family reconstitution databases for Western and Central Hungary have been created since 2010. Initially, these databases were used to analyse fertility patterns before and during the demographic transition, paying particular attention to social and denominational differences, the impact of changing food prices, and changes over time (Pakot & Őri, 2015; Pakot, 2016; Őri, 2023b; Őri & Pakot, 2025). Some papers have also addressed changing marriage customs and the question of remarriage (Őri 2019, 2023a). Although the causes of death have not yet been coded, the impact of short-term economic crises on infant and child mortality has already been analysed (Őri & Pakot, 2025).

As the causes of death have been digitised, they are currently being coded using the coding system developed by Great Leap COST members (ICD10h).[22] Once completed, these databases, together with statistical summaries at an aggregate level, will enable the details of Hungary's mortality transition from the mid-19th century onwards to be reconstructed.[23] Family reconstitution data will also enable more detailed analyses. Multivariate statistical techniques, such as event history analysis, enable us to examine mortality by cause of death, sex, age and occupational group over time. These techniques can also reveal the impact of earlier life events on mortality, broken down by sex, age and occupation.[24] Therefore, this kind of data can reveal details about changes in mortality over time, and represent a significant step towards a better understanding of this important demographic process.

In a paper currently in preparation we focus on infant and child mortality, paying special attention to the impact of changing ambient temperatures. The social background of families, the absence or death of parents, and the changing role of infectious diseases in declining mortality will also be addressed. We also plan to analyse old-age mortality by cause of death in relation to socio-economic status and significant life events such as childbearing, widowhood and remarriage. More broadly, the impact of major epidemics such as cholera in the 19th century and influenza in the 20th century can be examined. This can be considered alongside the changing mortality patterns of various diseases during the epidemic transition, as well as the resulting mortality inequalities by sex, age, and social status in the second half of the 19th century and the first half of the 20th century.

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22 See Reid et al., 2024.

23 Although individual-level causes of death have not yet been coded, sources from historical Hungary were presented at the kick-off meeting of the "Great Leap" COST Action in May 2024 in Nijmegen. Some preliminary results of aggregate-level cause-of-death statistics relating to infants and children were also presented at the European Social Science History Conference in Leiden in March 2025.

24 A micro-analysis of infant and child mortality has been conducted based on the family reconstitution data of the villages Zsámbék and Tök, examining the effects of epidemic years on mortality and the long-term impacts of epidemic diseases on survivors. The results were presented at the IUSSP seminar, 'From Influenza to COVID: Continuity and Discontinuity in the Factors of Inequality' in November 2024 in Madrid.

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APPENDIX

Table A1 *The beginnings of entries on the cause of death in the death registers of some Hungarian parishes, by denomination*

Parish	Denomination	Year of beginning of death register	Year of beginning of cause of death entries
Bük	Roman Catholic	1701	1836
Szakony	Roman Catholic	1755	1832
Csepreg	Roman Catholic	1776	1788
Bő	Roman Catholic	1779	1789
Kalocsa	Roman Catholic	1733	1852
Vajszló	Roman Catholic	1747	1833
Nagykovácsi	Roman Catholic	1715	1833
Keszthely	Roman Catholic	1746	1852
Törökbálint	Roman Catholic	1702	1818
Torbágy	Roman Catholic	1714	1818
Újlak (suburb of Buda)	Roman Catholic	1711	1711
Zsámbék	Roman Catholic	1719	1818
Besenyőtelek	Roman Catholic	1768	1852
Nagybajom	Roman Catholic	1783	1851
Bük	Lutheran	1784	1804
Szakony	Lutheran	1794	1794
Nagygeresd	Lutheran	1783	1788
Vadosfa	Lutheran	1724	1820
Nemeskér	Lutheran	1771	1773
Őriszentpéter	Calvinist	1783	1813
Átány	Calvinist	1778	1820
Vajszló	Calvinist	1746	1804
Besence	Calvinist	1787	1807
Sárpilis	Calvinist	1752	1793
Alsónyék	Calvinist	1756	1788
Tök	Calvinist	1761	1792
Nagybajom	Calvinist	1783	1805