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A Proposal for Reclassifying Causes of Death in Transylvania (1850–1920): The HCDT System

Propozycja ponownej klasyfikacji przyczyn zgonów w Transylwanii (1850–1920). System HCDT

Abstract

Our research explores issues related to the process of classifying causes of death, using information from parish registers of burials included in the Historical Population Database of Transylvania (HPDT), and covering the period between 1850 and 1920. In the first phase, causes of death were subjected to several processes of standardization, English-language equivalence and accommodation according to the International Classification of Diseases,

Abstrakt

Nasze badania dotyczą zagadnień związanych z procesem klasyfikacji przyczyn zgonów i wykorzystują informacje z parafialnych ksiąg pochówków zgromadzone w Historycznej Bazie Danych Ludności Transylwanii (HPDT). Obejmują one okres od 1850 do 1920 r. W pierwszej fazie prac przyczyny zgonów zostały poddane kilku procesom standaryzacji, równoważności anglojęzycznej i dostosowaniu do Międzynarodowej Klasyfikacji Chorób

10th Revision (ICD-10), a system often used in the field of historical demography. At a later stage, we developed a classification scheme suitable for the Transylvanian population in the past. Consequently, the Historical Causes of Death in Transylvania (HCDT) system has a narrower taxonomy, comprising only eight chapters with several subgroups, which take into account the historical realities of Transylvania. Therefore, the HCDT system can be used as a research tool that meets the specific needs of historical demography and of the history of medicine, being also capable of providing pertinent answers to fundamental questions about historic mortality. The scheme proposed in our research could potentially be used for comparative analyses with other regions and historic populations.

Keywords

causes of death, parish registers, HPDT, classification, ICD-10, HCDT system

(Rewizja 10 – ICD-10), tj. systemu często stosowanego w obszarze badań demografii historycznej. Na późniejszym etapie opracowaliśmy schemat klasyfikacji odpowiedni dla minionych populacji Transylwanii. W konsekwencji system Historycznych Przyczyn Śmierci w Transylwanii (HCDT) ma mniej rozbudowaną taksonomię, składającą się tylko z ośmiu rozdziałów z kilkoma podgrupami, które uwzględniają realia historyczne Transylwanii. System HCDT może być wykorzystywany jako narzędzie badawcze, które spełnia specyficzne potrzeby demografii historycznej i historii medycyny; jest w stanie wspomóc udzielanie trafnych odpowiedzi na fundamentalne pytania dotyczące umieralności w przeszłości. Schemat zaproponowany w naszych badaniach może potencjalnie zostać wykorzystany do analiz porównawczych z innymi regionami i populacjami historycznymi.

Słowa kluczowe

przyczyny zgonów, księgi parafialne, HPDT, klasyfikacja, ICD-10, System HCDT

Introduction

In the field of historical population studies, cause-of-death analysis has a long tradition, with data on past populations being grouped into statistical series in order to observe large-scale developments in phenomena such as mortality patterns, epidemiological and health transition.¹ However, the processing of historical data for spatial and temporal comparisons and capturing demographic trends has been

¹ Abdel R. Omran, "The Epidemiological Transition: A Theory of the Epidemiology of Population Change," *Milbank Memorial Fund Quarterly* 49 (1971): 509–538; Monroe Lerner, *Modernization and Health: A Model of the Health Transition*, Paper presented at the American Public Health Association Conference (San Francisco, November 1973).

hindered, both in quantitative and qualitative terms. Some regions (as was the case in countries in Northern and Western Europe) have benefited from the availability of well-preserved collections of primary sources spanning more than two centuries.² On the other hand, countries in Eastern Europe have faced gaps in terms of the safekeeping of primary sources and, as such, experience difficulties in reconstructing continuous datasets. The situation is similar in Romania, but the first steps towards addressing these disparities have already been taken with the construction of the first database for the historical population of Transylvania—HPDT.³

There have also been significant differences between countries in terms of keeping civil records of mortality and the systematic collection of cause-of-death data (compiled since 1837 in the case of England and Wales, 1855 in Scotland, and 1864 in Ireland), while in South-eastern Europe this kind of information only became available after the First World War.⁴ In the eastern part of the Austro-Hungarian Empire (of which Transylvania was a component until 1918), efforts towards centralizing data only led to concrete results towards the end of the 19th century. In fact, until 1895, cause of death was recorded in parish registers, with the data subsequently transmitted by priests to the state authorities, who then compiled statistics, taking into account particular aspects, primarily relating to public health.

In this context, the first part of this paper gives a brief overview of the way in which causes of death were recorded and grouped, starting from the official regulations issued at the time. Because causes of death were registered in many instances by people with limited medical knowledge, who used popular terms or ambiguous expressions for symptoms, the next step in our approach was to standardize the causes of death and accommodate them within a system suitable for future analysis.⁵ As such, we employed the ICD-10 system, and subsequently,

² Martin Drìbe, and Luciana Quaranta, “The Scania Economic-Demographic Database (SEDD),” *Historical Life Course Studies* 9 (2020): 158–172; Annika Westberg, Elisabeth Engberg, and Sören Edvinsson, “A Unique Source for Innovative Longitudinal Research: The POPLINK Database,” *Historical Life Course Studies* 3 (2016): 20–31.

³ Ioan Bolovan et al., “Historical Population Database of Transylvania: A Database Manual,” *Studia Universitatis Babeş-Bolyai. Digitalia* 64 (2019), 1: 9–84; Angela Lumezeanu, “Insight into Designing and Building a Historical Population Database,” *Romanian Journal of Population Studies* 12 (2018), 2: 77–98.

⁴ Graziella Caselli, “National Differences in the Health Transition in Europe,” *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 29 (1996), 3: 107–125.

⁵ Recently, within the framework of the SHiP network, an initiative for creating a classification of historical causes of death has been launched. Initially restricted to deaths in European port cities, this project aims to expand internationally and to create a historical joint coding scheme, although for the moment the principles and good practices behind the system are not thoroughly explained and are available to scholars only in the form of an essay. See Angélique Janssens, “Constructing SHiP and an International Historical Coding System for Causes of Death,” *Historical Life Course Studies* 10 (2021), special issue 3: 64–70. For similar attempts addressing the historical realities of Spain and the Netherlands see: Ana-Maria Sáinz-Otero, Antonio-Jesús Marín-Paz, and José Almenera

because of the high number of ICD-10 codes assigned and aiming to obtain a measure that takes into account the historical realities of Transylvania, we developed a categorial classification for historical causes of death.

From Parish Registers to Official Statistics Regarding Causes of Death

Until 1895, parish registers served as official vital records, and in Transylvania they were the sole responsibility of priests. The state then took over the process of keeping civil status registers, with the religious ones remaining only for church use.⁶ Until this date, priests had been required to keep two copies, one of which was submitted to civil jurisdiction (under Law 23 of 1827).⁷ Changes in the way that data were communicated were regulated by government ordinances. Thus, for example, ordinance no. 5669 of 1854 stipulated that extracts from death registers should be sent to the relevant district tribunal by the end of every month.⁸

Initially, the registers were drawn up by the priest and data noted as a linear text, but after 1850 printed registers with rubrics became extensive, and occasionally took the form of protocols containing joint data on multiple types of events (baptisms, marriages, and burials). Printed death records had a separate heading entitled “Type of death”. Causes of death had been mentioned even earlier, albeit not in all registers and not in a consistent format. For example, in an 18th-century Roman Catholic register in Sibiu, causes of deaths began to be recorded regularly in the 1790s, often mentioning the length of individuals’ illness before their death,⁹ most likely in response to a governmental ordinance. This practice was maintained even after 1850, with some registers also recording (in the section dedicated to the cause of death) extra information about the duration of illness, e.g., “a bolit

Barrios, “The Classification of Causes of Historical Mortality (CCHM): A Proposal of the Study of Death Records,” *Plos one* 15 (2020), 4: e0231311; Judith H. Wolleswinkel-Van Den Bosch, Frans W. A. Van Poppel, and Johan P. Mackenbach, “Reclassifying Causes of Death to Study the Epidemiological Transition in the Netherlands, 1875–1992,” *European Journal of Population* 12 (1996): 327–361.

⁶ Diana Covaci, Daniela Deteșan, and Elena Crinela Holom, “Laic Laws Governing the Romanian Families in Transylvania in the Second Half of the 19th Century,” in: *Families in Europe between the 19th and the 21st Centuries: From the Traditional Model to Contemporary PACS*, eds. Antoinette Fauve-Chamoux and Ioan Bolovan, supplement of the *Romanian Journal of Population Studies* (Cluj-Napoca: Presa Universitară Clujeană, 2009), 584–585.

⁷ Liviu Moldovan, “Înregistrarea de către biserici a botezaților, cununațiilor și înmormântărilor în Țările Române în sec. XVIII–XIX,” in: *Populație și societate* vol. 3, ed. Ștefan Pascu (Cluj-Napoca: Editura Dacia, 1980), 137.

⁸ Arhivele Naționale, Direcția Județeană Cluj, Colecția Registre parohiale, Registrul 177/10, 1818–1887 (Ocna Dej).

⁹ Arhivele Naționale, Direcția Județeană Sibiu, Colecția Registre de stare civilă, Registrul 77, 1771–1809 (Sibiu).

3 zile” (“He was sick for three days.”); “nu a bolit mult” (“He had not been sick for long.”); “boală îndelungată” (“long illness”); and “hosszas sínlődés” (“long-term sickness”), etc.

During the 19th century several classifications of causes of death had been enforced by the Transylvanian authorities with the aim of controlling transmission of infectious diseases more effectively and preventing epidemics. The clergy were advised to differentiate between “natural” and “epidemic” diseases, while some of the headers of printed registers provided the official classification, and the priest had to tick the relevant category to identify the cause of death, as follows: death caused by disease (natural, epidemic, smallpox, or rabies) or due to violence (suicide, accident, or murder). In most cases, the head of the printed table did not contain this classification, but the priests were instructed to use it and the “natural” cause (“ordinară”/“ordinary”; “természetes”/“natural”) continued to be recorded in the section dedicated to causes of death until the end of the 19th century (figure 1).

Figure 1. Header of a register for deaths, Roman Catholic denomination, Ocna Dej parish

m o r t i s g e n u s						
m o r b u s				v i o l e n t i a		
communis	epidemicus	variolae	rabies canum	autochiria	infortunium	ab aliis occisus

Source: Arhivele Naționale Direcția Județeană Cluj, Colecția Registre parohiale, Registrul 177/11, 1857–1884 (Ocna Dej).

After the establishment of the Hungarian Central Office of Statistics in 1871, starting with the following year the institution published a yearbook entitled *Magyar Statisztikai Évkönyv* (MSE), which summarized demographic statistics and vital events information. In a chapter dedicated to natural population change, there was, additionally, a brief classification of the causes of death. In the introduction to the first issue of the series, the authors listed the difficulties of data collection, although the efforts of priests of all denominations and local authorities in providing the necessary data were also mentioned.¹⁰

¹⁰ *Magyar Statisztikai Évkönyv* (Budapest: Országos Magyar Statisztikai Hivatal, 1872).

Statistics on causes of death were divided into two main groups: natural and violent death. The first category included epidemics, cholera, and smallpox (with the latter two infectious diseases statistically analyzed in two separate columns), local diseases, and common (ordinary) diseases. A special column was assigned to mothers and newborns who had died due to childbirth complications.¹¹ The second category, that of violent deaths, had separate sections for suicide, drowning, accidental death, homicide, murder, death sentences, or unknown causes of violent death.¹²

Volumes of the MSE for the period 1874 to 1892 no longer included detailed evidence relating to causes of death but only data on epidemics, published regularly in the chapter dedicated to public health. Statistics on causes of death were resumed in 1893, when the first issue in the new series of the statistical yearbook appeared. In this first issue we find statistics for the period 1881–1887, where causes of death are divided into the same two categories: natural and unnatural. Twenty-three categories of natural causes were recorded: congenital weakness, cramps, child tuberculosis, pneumonia, tuberculosis, enterocolitis, dysentery, cholera, typhus, smallpox, scarlet fever, measles, diphtheria (twice, with two names), whooping cough, puerperal fever, apoplexy, old age, edema, anthrax, rabies, mental illness, and other natural causes. The second category included induced death, suicide, and accidents.¹³

A real change in the character of cause-of-death recording appears in the statistics for 1896, this being the first year in which a detailed account of deaths was made based on civil status registers kept by state officials and not by priests. Henceforward, a new categorization of causes of deaths established by forensic doctors, but also by non-medical death inspectors, was included. Deaths declared by doctors comprised a total of 154 causes, grouped into 22 categories, as follows: infectious diseases, diseases caused by parasites, malignant tumors, physiological diseases, nutrition-related diseases, diseases connected to physical development, diseases due to deficiencies of the nervous system, diseases associated with the sense organs, diseases of the circulatory system, respiratory diseases, diseases of the digestive system, diseases of the glands, urinary diseases, diseases of the genitals, birth-related diseases, diseases of the skeletal system, skin-related diseases, accidents, suicide, murder, unexplained violent deaths, and unidentified causes of death (with two subcategories: sudden death and other unknown diseases).¹⁴

¹¹ MSE (1872), 44–45.

¹² MSE (1872), 44–45.

¹³ MSE (1894), 63–69.

¹⁴ This system has similarities to that proposed by the French statistician and demographer Jacques Bertillon, which was the basis for the first international system of classification of causes of death, adopted by the International Statistical Institute in 1893. The first chapter covers infectious diseases, and a number of chapters are devoted to conditions related to the human anatomical system and organs. There are also similarities in terms of how violent deaths were recorded. Differences included, for example, the fact that “old age”, enclosed in the Bertillon classification, was not used in the statistics

Causes of death ascertained by authorized non-medical persons were also listed (29 in total), grouped as infectious diseases, other diseases, and violent deaths (the last category covering unknown causes).¹⁵ It should be noted that the category of non-medical personnel included mainly death inspectors who had to authorize the burial, but without being professionally qualified in terms of medical skills and knowledge since most of them were schoolteachers, tradesmen, or educated peasants who had had formal training under the supervision of a doctor, or had acquired on-the-job skills. As such, the medical roles of the death inspectors consisted chiefly in establishing the cause of death, distinguishing violent deaths from deaths due to epidemics, performing autopsy when necessary, and writing up their conclusions into reports. In fact, during the entire 19th and early 20th centuries, Transylvania lacked qualified forensic medical personnel and statistics from 1897 indicate that the vast majority of deaths were certified by death inspectors, whilst doctors established only 29.3% of all deaths, mainly in urban areas.¹⁶ The fact that causes of death could be identified by medical staff as well as by persons less qualified from a medical point of view reconfirms the mixture of tradition and modernity in the way causes of death were entered in parish registers. However, more professional and accurate methods of death registration emerged towards the end of the 19th century. This was stimulated by economic progress and improved access to healthcare, but throughout the period analyzed, cause-of-death data should still be interpreted with caution. It is evident that there were more accurate recordings of infectious diseases with epidemic potential, but there were also significant shortcomings in terms of identifying chronic non-infectious diseases, which the authorities and people in general continued to regard as vectors of ‘natural’ deaths.

For the period from 1901 to 1910, general statistics on causes of death in Transylvania can be extracted from the publications of the Central Office of Statistics in Hungary, which were published in the Romanian language in the series *Studia Censualia Transilvanica*: Volume 2 follows the same classification of causes of death as that used to record deaths in the statistical yearbook.¹⁷

of the Magyar Statistical Yearbook. The Magyar system has more sections, but the numbers of individual diseases roughly coincide. To conclude, the system used by the Magyar Office for Statistics is not significantly different from international systems used at the time, bar certain specific aspects. See: *The Bertillon Classification of Causes of Death; Recommended for the Use of Registrars of Vital Statistics (after the First Revision of Paris, 1900) by the American Public Health Association and by the Conference of State and Provincial Boards of Health of North America*, Michigan: Lansing, 1899.

¹⁵ MSÉ (1897), 88–89.

¹⁶ Marius Rotar, “Death Inspectors or the ‘Professionals’ of Death during the Late Nineteenth and Early Twentieth Century Transylvania,” *Mortality* 17 (2012): 240–255.

¹⁷ *Mișcarea naturală a populației între 1901–1910: Transilvania. Cauze de deces*, vol. 2, eds. Traian Rotariu (Cluj-Napoca: Presa Universitară Clujeană, 2005).

Data and Method

We used information extracted from 77 registers in the HPDT, belonging to various denominations from 25 localities, in seven counties (Alba, Cluj, Mureş, Sălaj, Harghita, Hunedoara, and Bistriţa-Năsăud).¹⁸ The data cover over 36,800 recorded deaths and the period between 1850 and 1920 (table 1). Among the included areas were mining localities (Ocna Mureş and Ocna Dej), villages with access to the railway network (Războieni Cetate), plain villages (Călăraşi), mountain villages (Muntele Rece), and premontane settlements (Caşva, Orşova, and Hodac). The profile of the settlements enclosed in the analysis is in consonance with the overall habitat and socioeconomic structures of Transylvania during the period, when more than 87% of the population lived in rural areas: despite growth in industrialization and urbanization, the socio-professional composition of the province remained a transitional (agro-industrial) one, with many inhabitants earning their existence from agriculture.¹⁹

Table 1. Data by parish register type

Register type	Denomination					Total
	Orthodox	Greek Catholic	Calvinist (Reformed)	Roman Catholic	Jewish	
Registers	12	35	16	11	3	77
Entries	8,433	16,461	7,479	4,071	397	36,841

Source: HPDT (authors' own calculations).

The data extracted from the HPDT were first processed for standardization, English-language equivalence and codification of death causes using the ICD-10 system. In several instances, the data provided by parish registers in Transylvania had a number of characteristics that made this approach challenging (difficulties generally faced by researchers seeking to analyze demographic phenomena recorded in historical populations). Further aspects will be detailed below. Subsequently, we developed a system that was a better fit for the information provided by parish registers. Thus, in the HPDT, a particular table dedicated to causes of death was created: this allocated two other codes, the ICD-10 code and the HCDT-system code, to each cause found in the parish registers of various denominations (figure 2).

¹⁸ These are the administrative-territorial units to which the localities currently belong. Before 1918, Transylvania had a different administrative organization.

¹⁹ Ioan Bolovan, *Transilvania între Revoluţia de la 1848 şi Unirea din 1918: Contribuţii demografice* (Cluj-Napoca: Centrul de Studii Transilvane: Fundaţia Culturală Română, 2000), 233–235.

Figure 2. Entry form for data on causes of death

Editing Death Cause record	
Death Cause	<input type="text" value="Au muritu in colera"/>
Standard Name	<input type="text" value="Holera"/>
English Standard Name	<input type="text" value="Cholera, unspecified"/>
ICD-10 Code	<input type="text" value="A00.9"/>
HCDT system	<input type="text" value="112"/>

Source: HPDT.

Reporting Causes of Death and the Process of Classification Using the ICD-10 System

Georgiana Coroian made an initial attempt to classify causes of death in Transylvania employing the ICD-10 scheme, but her approach was limited to three villages in the Mureş valley, belonging to the Reformed Calvinist denomination. Furthermore, the article dealt very expeditiously with assessing the most effective way of accommodating causes of death in the ICD-10 scheme.²⁰ Consequently, our intention was to remedy this through the present approach, which was applied to all death registers included in the HPDT, regardless of denomination. We employed the ICD-10 system because it has been used in other attempts at codifying historic causes of death.²¹

Living in a multiethnic, plurilingual, and multi-denominational area such as Transylvania has had repercussions in terms of communication and writing, with a series of Romanian words being largely influenced by the Hungarian language, including causes of death. Thus, the phrase “lovit de gută” (“hit by gout”) led us,

²⁰ Georgiana I. Coroian, “Application of ICD-10 on the Causes of Death from the Reformed-Calvinist Burial Parish Registers in the Mureş Valley, Transylvania,” *Philobiblon. Transylvanian Journal of Multidisciplinary Research in the Humanities* 24 (2019), 1: 127–141.

²¹ Malin Ericsson et al., “Life-course Socioeconomic Differences and Social Mobility in Preventable and Non-preventable Mortality: A Study of Swedish Twins,” *International Journal of Epidemiology* 48 (2019), 5: 1703; Irma T. Elo, Pekka Martikainen, and Mikko Myrskylä, “Socioeconomic Status across the Life Course and All-cause and Cause-specific Mortality in Finland,” *Social Science & Medicine* 119 (2014): 199; Enrico Debiasi and Martin Dribe, “SES Inequalities in Cause-specific Adult Mortality: A Study of the Long-term Trends Using Longitudinal Individual Data for Sweden (1813–2014),” *European Journal of Epidemiology* 35 (2020): 1045.

in the first instance, to thoughts of an aggressive episode of gout—an “attack of gout”. However, additional words added to this cause of death, such as “apoplexy (gout)”, were further confirmation that this cause of death had roots that needed to be searched for in the Hungarian language. “Hit by gout” did not mean death caused by an accumulation of uric acid in the joints, as we might have been tempted to believe upon an initial, literal, reading of the phrase case in Romanian. In these instances, we were dealing with “gutaütés”, which means apoplexy (stroke) in Hungarian. In most cases, the stroke involved a cerebrovascular accident (CVA), but there were also circumstances in which the sudden cessation of organ function referred to the heart or lungs. Thus, we concluded that “apoplexie de inimă” (“heart stroke”) and “guta de anima” (“gout of the heart”) meant an acute myocardial infarction and assigned the corresponding code in ICD-10. Furthermore, “lung stroke” was standardized as a pulmonary embolism, receiving code I26.9 in the ICD-10 classification system. The fact that many causes of death were established by people with limited medical knowledge led to the use of popular names for diseases, archaisms, and regionalisms. One concrete example is that of syphilis, which also appears in the registers as “sülly”, “sui”, “boală tainuitoare” (“secret disease”), “franțiu” (“French disease”) and “bubă rea” (“bad abscess”).

The weakness of newborns as a result of intrauterine injuries, genetic disorders, and congenital malformations was expressed in a multitude of ways by those compiling parish registers in Transylvania. Whether they referred to “debil din nascere” (“debility from birth”), “debila desvoltată” (“extensive debility”), “debilitas corporalis”, “slabă din naștere” (“weak from birth”), “debilitas nativitate”, “születési gyengeség” (“birth weakness”) or “gyermeki gyengeség” (“childhood weakness”), all these terms (expressed in Romanian, Latin, or Hungarian) were grouped generically as congenital weakness. We also included here the word “anemia”, which, translated literally, would express a quantitative and qualitative decrease in red blood cells and hemoglobin in the bloodstream. However, in the case of newborns, this refers to poor development and maturation during the gestation period.

Likewise, the term “old age” was expressed in Romanian, Latin, and Hungarian in a multitude of words and phrases, such as the following: “adancele bătranețe” (“advanced old age”), “ajunsa de batranete” (“ravaged by old age”), “de batranete” (“by old age”), “de slabiciunea batraneteloru” (“old-age weakness”), “debilitate de batranete” (“debility due to old age”), “senectus”, “morbus senilis”, “debilitas senilis”, “marasm senil”, “senectus”, “agggyengeség” (“old age”), “aggkor”, “aggkori végelgyengülés”, “vénség” and “végelgyengülés” (“debility due to old age”). Subsequently, in the standardization process, all these terms were collectively expressed as “age-related physical debility”, and the code R54 from the ICD-10 scheme was assigned.

In the case of some diseases, the manifold versions of recorded causes of death in parish registers are truly striking. Pulmonary tuberculosis, one of the most common diseases at the time,²² was identified in the HPDT data in 219 variants, differing in the language used but also in writing and spelling, and with question marks inserted due to the transcription difficulties faced by those who entered the data. We standardized all these forms using the English name of the disease, as this appears in the ICD-10 classification, under respiratory tuberculosis, unspecified.

Figure 3. Extract from the table of causes of death

	Death Cause	Standard Name	Standard English Name	ICD-10 Code	HCSD system
Show Edit Destroy	%infamarea inghititoare% ofica	Ofică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	??etica	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	bitesug sec	Ofică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	Boală de plămâni (trorobeteseg??)	Boală de plămâni	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	Boală la plămâni	Boală de plămâni	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	boala uscata	Boală uscată	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	bola de plamane	Boală de plămâni	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	bola de plamani	Boală de plămâni	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	Bola de plermoni	Boală de plămâni	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	Bôla uscata	Boală uscată	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	Bola uscata, ofica	Ofică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De boala uscata	Boală uscată	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De Hectica	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De heftica	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De heftica	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De heftice	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De Hectice	Hectică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De inadusale	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De inadusiale dăra morte fireasca	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De inadusiale au murit	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De inabusale de morbu de plamanu	Morb de plămâni, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De nădusale	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De nădusiale	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De năprasnă	Nădușeală, tuberculoză pulmonară	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De ofica	Ofică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De ofica altu mi?? fireasca	Ofică	Respiratory tuberculosis unspecified A16.9	121	
Show Edit Destroy	De ofitica	Ofică	Respiratory tuberculosis unspecified A16.9	121	

Source: HPDT.

A number of deaths occurred as a result of work in factories and mines. Thus, causes of death such as “omorât la baie” (“killed in the mine”), “mort în mină” (“dead in the mine”), “zdrobit în baie” (“crushed in the mine”), “periclitata in fodina subteranea”, “periclitatus in fodina salinari”, “fodina trucidatus” and “violenter ocassius in fodina” were subject to a standardization process and merged under the same ICD-10 code. Work in the railroad sector and the proximity of railway lines meant a greater possibility of accidents, and the parish registers mention deaths such as “omoritu prin linia ferata” (“killed on the railway line”), “zdrobită de tren” (“crushed by a train”) and “vasúti baleset” (“railway accident”).

²² By way of confirmation of the significant percentage of deaths where tuberculosis was a contributory factor, between 1910 and 1915 the Central Office of Statistics published a whole volume with data on mortality due to this disease: *A Magyar Szent Korona országainak 1901–1915. évi gümőkórhalálózása* (Budapest: Magyar Királyi Központi Statisztikai Hivatal, 1925).

Equally, the living environment, the geography of the place, and the proximity of rivers were predisposing factors for accidents, and compilers recorded deaths caused by drowning in various rivers: “innecat in apa Muresiului” (“drowned in the water of Mureş”), “innecatu in apa Gurghiului” (“drowned in the water of Gurghiu”) and “innecatu in apa la Déésiu” (“drowned in water at Déésiu”).

There were cases in which the cause of death had to be deduced from comments made by the person who made entries in the register. Mention of “megérett gyümölcs le hull a fáról” (“ripe fruits fall from the trees”) led us to assume that such a death was to do with aging, so this was standardized as age-related physical debility and was assigned the code R54 in the ICD-10 system. Likewise, in the case of the annotation “reggel halt meg az anyja karján” (“she died in the morning in her mother’s arms”), we assumed that this was congenital debility, a helpful element in this respect being the age of the infant in question, who was only 12 days old when she died. This is one of the cases in which the cause of death could not be identified and classified without additional information, such as the age of the deceased.

Towards the 20th century, the practice of registering causes of death became more specialized. A specific example is the way in which neoplasms were recorded. In many instances, the organ affected by a tumor was mentioned as in, for example, “carcinoma uterus” (“carcinoma of the uterus”), “cancer vulvae” (“vulvar cancer”), “tüdőlégdaganat” (“lung tumour”) or “cancer stomacali” (“stomach cancer”).

There were situations in which the column relating to the cause of death in the Transylvanian parish registers contained notes that referred to symptoms rather than to an obvious cause of death. Thus, “scurgere de sînge” (“bleeding”), “haemorrhagia universalis” and “vérmenés” were standardized as hemorrhages. Likewise, “ferbințială” (“warmth”), “febris” (“fever”), “láz” (“fever”) and “forroság” (“heat”) were grouped under the generic term “fever”. Both hemorrhage and fever received the corresponding codes in the ICD-10 classification, the system having a special chapter dedicated to symptoms, signs, and abnormal results of clinical and laboratory investigations not elsewhere classified.

In many instances, causes of death were extremely deficient in notations and had insufficient specific information, the etiology of these deaths remaining, in most cases, unknown. Thus, entries such as “moarte naturală” (“natural death”), “moarte firească” (“natural death”), “boală naturală” (“natural disease”), “boală firească” (“natural disease”), “boală ordinară” (“ordinary disease”), “mortis communis”, “morbus naturalis”, “súlyos betegség” (“serious illness”), “rövid betegség” (“short illness”), and “ismeretlen betegség” (“unknown disease”) were all accommodated under the group of ill-defined and unknown causes of mortality in the ICD-10 system.

The Historical Causes of Death in Transylvania (the HCDT System)²³

As per its title, the International Statistical Classification of Diseases and Related Health Problems (ICD) was designed to provide an easy way of obtaining statistics in fields related to morbidity, mortality, social security, and health, and to allow comparisons between different countries, regions, and geographical areas.

Designed primarily to pertain to contemporary medical realities, the ICD system has undergone numerous adjustments over time, having now reached version 11, which will replace the 10th version, currently in use, starting in 2022.²⁴

Most of the system codes have a specific and detailed form, but ICD-10 facilitates transposition of many aspects related to symptoms and vague or insufficiently defined conditions into an alphanumeric form. The ICD-10 system has therefore been used in numerous studies in the historical field.

The ICD-10 system consists of 21 main chapters, and most of the codes offer the possibility for the numerical transposition of well-defined and specified medical conditions, mainly relevant to contemporary realities. However, we found that for past realities the taxonomy of ICD-10 is too extensive and detailed, in contrast to the sparseness of the available historical data. The fact that 12 out of the 21 main chapters are devoted to the anatomical systems of the human body further exemplifies the extremely detailed structure of the ICD-10 scheme. If one intended to perform an analysis based on ICD-10 categories and subcategories, many data extracted from the historical sources would yield few results (or none at all).

Because ICD-10 was designed to address current needs and issues related to morbidity and mortality, it is not well suited for addressing some past realities, in particular ‘special categories’ such as the elderly.

In this context, the new classification system that we have introduced comprises a smaller number of categories and takes into account historical specificities, including and highlighting those entities that frequently appear in historical sources.

The Historical Causes of Death in Transylvania (HCDT) system considers mainly the classifications used by the authorities in 19th-century Transylvania, but also the demographic realities during the period. The system has 8 chapters. Three of them have subsections designed to facilitate specific research into aspects such as, for example, the evolution of the terminology used for the entries as medical services were modernized, types of infectious disease and their mode of transmission, the identification of the main causes of deaths, location-, gender-, or period-specific patterns, etc.).

²³ The causes of death in this classification scheme are sourced in the HPDT database. See note 3.

²⁴ Christian Lindmeier, *WHO Releases new International Classification of Diseases (ICD 11)*, accessed 15.10.2020, [https://www.who.int/news/item/18-06-2018-whoreleases-new-international-classification-of-diseases-\(icd-11\)](https://www.who.int/news/item/18-06-2018-whoreleases-new-international-classification-of-diseases-(icd-11)).

Because epidemics and infectious diseases have been ubiquitous realities (especially in the past), and the authorities required a clearer picture to combat these more effectively, the first category in the HCDT system comprises infectious and parasitic diseases (table 2). The chapter covers two main subgroups: 1. infectious diseases with a potential for turning into epidemics (e.g., airborne infectious diseases, diseases transmitted from water and food, vector- transmitted infectious diseases, other epidemic infectious diseases) and 2. infectious diseases with similar triggers, but without the risk of turning into epidemics. For example, smallpox received the code 111: the first digit represents the type of disease (infectious), the second digit identifies the character of the disease (epidemic), and the third digit indicates the mode of transmission (airborne).

Table 2. Historical Causes of Death in Transylvania (HCDT) System

<i>I Infectious diseases</i>		
1	2	3
11	Epidemic infectious diseases	
111	Airborne-transmitted epidemic infectious diseases	measles, influenza, smallpox, chickenpox, whooping cough, diphtheria, Spanish flu
112	Water- and food- transmitted epidemic infectious diseases	cholera, dysentery, typhus, malaria, diarrheal diseases
113	Vector-transmitted epidemic infectious diseases	exanthematic typhus
114	Other epidemic infectious diseases	morbus epidemicus
12	Non-epidemic infectious diseases	
121	Airborne non-epidemic infectious diseases	tuberculosis, pneumonia, common cold, sore throat
122	Water- and food- transmitted non-epidemic infectious diseases	diarrheal diseases
123	Vector-transmitted non-epidemic infectious diseases	rabies, scabies
124	Other non-epidemic infectious diseases	meningitis, encephalitis, anthrax, tetanus, syphilis
2	Chronic and acute non-infectious diseases	
21	Cardiovascular diseases	angina pectoris, pericarditis, endocarditis, carditis
22	Cerebrovascular diseases	stroke
23	Cancers and other tumors	stomach cancer, liver cancer, ovary cancer
24	Endocrine, metabolic, and nutritional diseases	diabetes, scurvy, starvation
25	Digestive system diseases	gastric ulcer, gastritis, jaundice
26	Nervous system diseases	paralysis
27	Respiratory system diseases	asthma, pulmonary embolism
28	Diseases of the urogenital system	nephritis, arena syndrome, disease of the uterus (unspecified)

1	2	3
29	Mental disorders	mental illness
210	Other chronic and acute non-infectious diseases	splenomegaly, teething syndrome, gout, arthritis
3	<i>Diseases originating in the perinatal period</i>	preterm newborn, stillbirth, congenital debility
4	<i>Diseases related to pregnancy and childbirth</i>	ectopic pregnancy, abortion, eclampsia, puerperal sepsis
5	<i>Old age-related diseases</i>	old age, senility
6	<i>Violent deaths</i>	
61	Accident	
611	Workplace accidents	crushed in mine
612	Drowning	aquis suffocatus
613	Burnings	ignition of clothing, scalding
614	Alcohol and substance abuse	alcohol abuse
615	Transport accidents	hit by railway train
616	Contact with animals	struck by horse, gored by bull, bitten by snake
617	Falls	fall from tree, unspecified falls
618	Struck by a falling object	struck by falling stone
62	Suicide	self-hanging, self-poisoning
63	Homicide	crime
64	Other violent deaths	fracture of spine, fracture of foot, amputation, neglect
7	<i>Symptoms, signs, and abnormal findings</i>	crying, colic, pain, bloating
8	<i>Ill-defined and unknown causes of mortality</i>	sudden death, illness (unspecified), found dead

Source: HPDT.

Parish registers also increasingly reported deaths due to chronic and non-infectious diseases, such cases becoming recurrent towards the 20th century. This trend in reporting was facilitated by the professionalization of those called to establish diagnoses and by the expansion of medical knowledge. Thus, the second category within the HCDT system was assigned to chronic and non-infectious diseases. The category proved useful for the study of phenomena occurring during the period in question, such as epidemiological transition. Entries to the sub-groups included in this chapter depended on the recurrence of diseases in the database we used: e.g., cardiovascular diseases, cerebrovascular diseases, cancers and other tumors, endocrine, metabolic, and nutritional diseases, digestive system diseases, nervous system diseases, respiratory system diseases, urogenital system diseases, mental disorders, other chronic and acute non-infectious diseases.

In the period under consideration here there was a high incidence of perinatal mortality and, understandably, the authorities were keen to obtain an accurate

picture of infant deaths and attempt to reduce them. The HCDT system includes a third category for this specific category of deaths.

The fourth category in the HCDT system includes deaths related to pregnancy, and childbirth: figures for maternal mortality levels provide clues about the quality of the health system and the degree of women's access to medical services.

In many instances, parish registers as well as the official statistics recorded deaths due to "old age", so we decided to include this entity in an independent category. Thus, chapter 5 in the HCDT system includes diseases caused by old age.

Very often, official classifications issued at the time paid special attention to fatalities caused by violence, so we considered it necessary to capture this aspect using the HCDT taxonomy. This was included in chapter 6 on violent deaths, divided into the following subgroups: accidents (workplace accidents, drowning, burnings, alcohol and substance abuse, transport accidents, contact with animals, falls, being hit by a falling object), suicide, homicide, and other violent deaths. A preliminary analysis of the causes of violent deaths in the HPDT database²⁵ made it clear that this category, and especially "accidents", needed further refinement and consequently we created 8 subgroups.

Parish registers often expressed cause of death in terms of the symptoms observed rather than as a result of a professional diagnosis. Therefore, we included such cases in chapter 7 of the HCDT, with entries such as symptoms, signs, and abnormal results.

In many cases, the parish registers had entries using unclear and vague terms, or even on deaths due to "unknown" causes, which we listed in the eighth chapter of the HCDT system.

The Utility of the Historical Causes of Death in Transylvania (HCDT) System

The application of the HCDT system can bring to light a nuanced picture of Transylvanian past realities in terms of epidemiology, health and living conditions, morbidity, and mortality. The eight chapters in the system can provide information on the nature of the main categories of deaths occurring in a given geographical area, over shorter or longer periods of time, depending on the research focus. Furthermore, the main categories of the system have been built taking into consideration the agenda and priorities of the authorities in the period under consideration.

²⁵ Elena Crinela Holom, Nicoleta Hegedűs, and Ioan Bolovan, "Quantitative Perspective on Violent Deaths in Transylvania between the Mid-19th Century and the End of the First World War: Tentative Findings," *Transylvanian Review* 30 (2021): 48–64.

The fact that the first two categories focus on infectious diseases, on the one hand, and on chronic and non-infectious diseases on the other, will help scholars determine the sections of the population most vulnerable to the threat of epidemics, and help them identify periods of manifestation as well as moments of recurrence, which are key to the study of epidemiological transition.

The next three categories of the system provide information about various groups such as newborns, women, and the elderly: analysis of these groups can yield invaluable data on living conditions, medicalization, and the provision of health and care services.

The sixth category provides information about individuals' livelihoods, various life events, as well as working and living conditions that had a negative impact. This type of data regarding deaths in Transylvania between 1850 and 1918 recently underwent scrutiny from a macro, mezzo, and micro perspective, the last level allowing for a more thorough analysis of the phenomenon. The results of the logistic regression model applied to the data extracted from the HPDT indicated that females in Transylvania were less likely to die because of a violent death. The data are similar for married, or previously married, persons. Likewise, individuals with a medium-to-high socioeconomic status were less likely to die violently compared to those situated on the lower level of the social ladder. People living in agricultural areas were more likely to die violently in the absence of investment in and modernization of work equipment, but also as a result of a higher incidence of burns, drowning, and falls.²⁶ The last two categories offer an insight into the medical expertise, and often the very thorough work, of those who made the entries in the registers.

The HCDT system is a helpful tool for extracting and manipulating data for future analysis. The HCDT system should support further comparative research towards a more nuanced picture of the many, and yet to be fully understood, aspects of mortality in Transylvania in the past.

Conclusions

The present study has explored and analyzed causes of death as recorded in parish death registers, which represent some of the main sources for historical demography. These data, as entered so far in the Historical Population Database of Transylvania, mainly cover the second half of the 19th century and the first two decades of the 20th century.

The difficulty encountered with the data in this study stems from the linguistic diversity of Transylvania and from the extremely varied ways in which causes

²⁶ Holom, Hegedüs, and Bolovan, "Quantitative Perspective."

of death were recorded. We therefore performed a number of operations of standardization and linguistic equivalence. Subsequently we coded causes of death by applying the ICD-10 scheme. However, due to the high number of categories and the complexity of the ICD-10 system, we constructed a specific cause-of-death classification scheme, taking into account the demographic realities of the Transylvanian past populations. Therefore, the HCDT system has been streamlined to only eight main chapters. Our preliminary findings on violent deaths in Transylvania indicate that the scheme is operational and can be used to address subjects related to mortality in both broader and specific, detailed, perspectives. The system is not definitive and remains open to further developments and extensions if its use exposes difficulties in the processing of data.

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A Proposal for Reclassifying Causes of Death in Transylvania (1850–1920): The HCDT System

Summary

Cause-of-death analysis has a long tradition in population studies, but in eastern European countries the study of mortality has been hindered by the quality of the sources preserved as well as by difficulties in reconstructing continuous datasets. The also applies to Romania. The first steps towards addressing these issues have already been taken with the construction of the first database for the historical population of Transylvania (HPDT). Using information from parish registers of burials included in the Historical Population Database of Transylvania (HPDT) between 1850 and 1920, we looked at several issues related to the process of classifying causes of death.

In the first phase, causes of death were subjected to processes of standardization, English-language equivalence and accommodation according to the International Classification of Diseases, 10th Revision (ICD-10), a system often used in the field of historical demography. As Transylvania is a multi-ethnic, plurilingual, and multi-denominational area, this has had repercussions in terms of communication and writing, including in the way of reporting of causes of death. Moreover, the fact that many causes of death were assessed and established by people with limited medical knowledge led to the use of popular names for diseases, archaisms, and regionalisms. Often the column listing causes of death in the Transylvanian parish registers contained notes that referred to symptoms rather than to an obvious cause of death. In many instances, the annotations on causes of death lacked sufficient or well specified information, and as a result the etiology remained largely unknown. As the 20th century approached, the practice of registering causes of death became more specialized.

In a second phase, due to the high number of categories and the complexity of the ICD-10 system, we proceeded to construct a specific cause-of-death classification scheme. Consequently, the Historical Causes of Death in Transylvania (HCDT) system has a narrower taxonomy, comprising only eight chapters with several subgroups fitting the classifications used by the authorities in 19th-century Transylvania, but also the demographic realities during the period. Nevertheless, the present form of the scheme is not definitive and remains open to further additions and extensions. Hopefully, it has the potential of becoming a research tool to be used in addressing subjects related to mortality from both a broader, and a specific, detailed perspective.

Propozycja ponownej klasyfikacji przyczyn zgonów w Transylwanii (1850–1920). System HCDT

Streszczenie

Analiza przyczyn zgonów ma długą tradycję w badaniach populacyjnych, ale w krajach wschodniej części Europy badanie umieralności było utrudnione ze względu na jakość zachowanych źródeł oraz trudności w rekonstrukcji ciągłych zbiorów danych. Dotyczy to również Rumunii. Pierwsze kroki w kierunku rozwiązania tych problemów zostały już podjęte, tworząc pierwszą bazę danych historycznej populacji Transylwanii (HPDT). Korzystając z informacji z parafialnych ksiąg pochówków zgromadzonych w Historycznej Bazie Ludności Transylwanii (HPDT) w latach 1850–1920, przyjrzeliliśmy się kilku zagadnieniom związanym z procesem klasyfikacji przyczyn zgonów.

W pierwszej fazie prac przyczyny zgonów poddano procesom standaryzacji, ekwiwalencji anglojęzycznej i dostosowaniu do Międzynarodowej Klasyfikacji Chorób (Rewizja 10 – ICD-10), tj. systemu często stosowanego w obszarze badań demografii historycznej. Ponieważ Transylwania jest obszarem wieloetnicznym, wielojęzycznym i wielowyznaniowym, miało to wpływ na komunikację i pisanie, w tym na sposób zgłaszania przyczyn śmierci. Co więcej, fakt, że wiele przyczyn śmierci zostało ustalonych przez osoby o ograniczonej wiedzy medycznej, doprowadził do używania popularnych nazw chorób, archaizmów i regionalizmów. Często kolumna zawierająca przyczyny zgonów w księgach parafialnych Siedmiogrodu zawierała wzmianki, które odnosiły się raczej do objawów niż do oczywistej przyczyny zgonu. W wielu wypadkach adnotacje dotyczące przyczyn śmierci nie zawierały wystarczających lub dobrze sprecyzowanych informacji, w wyniku czego etiologia pozostawała w dużej mierze nieznana. W miarę postępu w XX wieku praktyka rejestrowania przyczyn zgonów stawała się bardziej wyspecjalizowana.

W drugiej fazie prac, ze względu na dużą liczbę kategorii i złożoność systemu ICD-10, przystąpiliśmy do skonstruowania specyficznego schematu klasyfikacji przyczyn zgonu. W konsekwencji system Historycznych Przyczyn Zgonów w Transylwanii (HCDT) ma mniej rozbudowaną taksonomię, składającą się tylko z ośmiu rozdziałów z kilkoma podgrupami

pasującymi do klasyfikacji stosowanych przez władze w XIX-wiecznej Transylwanii, ale także dopasowaną do realiów demograficznych w tym okresie. Niemniej jednak obecna forma schematu nie jest ostateczna i pozostaje otwarta na dalsze uzupełnienia i rozszerzenia. Miejmy nadzieję, że ma on potencjał, by stać się narzędziem badawczym, które można wykorzystać w podejmowaniu tematów związanych z umieralnością zarówno w szerszej, jak i konkretnej, szczegółowej perspektywie.