Gabriela de Carvalho
Achim Schmid
in collaboration with
Alexander Polte
Lorraine Frisina Doetter
Sebastian Haunss
Heinz Rothgang

Global Historical Healthcare Systems Dataset (G2HSet):
Technical report
and codebook
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GLOBAL HISTORICAL HEALTHCARE SYSTEMS DATASET (G2HSET): TECHNICAL REPORT AND CODEBOOK

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INDEX

1. INTRODUCTION ................................................................. 4
2. KEY DEFINITIONS AND OPERATIONALISATIONS ................. 4
2.1 Healthcare systems ......................................................... 5
2.2 Healthcare systems under public responsibility .................. 5
2.3 Introduction of a healthcare system under public responsibility 6
3. DATA .................................................................................. 7
3.1 Descriptive analysis of the dataset ........................................ 7
3.2 Unit of analysis and period of observation ......................... 8
3.3 Country coverage .............................................................. 8
3.4 Sources ............................................................................. 12
4. PRACTICAL PROCEDURE .................................................. 12
5. INDICATORS ....................................................................... 14
5.1 Regulation ......................................................................... 14
5.2 Financing .......................................................................... 16
5.3 Service Provision .............................................................. 17
6. CASES WITHOUT A HEALTHCARE SYSTEM ................. 18
6.1 Central African Republic ................................................ 19
6.2 Somalia ............................................................................ 19
7. REFERENCES ....................................................................... 21
8. APPENDIX I: SOURCES BY COUNTRY ............................... 24

ABOUT THE AUTHORS

Gabriela de Carvalho: CRC 1342, University of Bremen, decarvalho@uni-bremen.de
Achim Schmid: SOCIUM, University of Bremen, aschmid@uni-bremen.de
1. INTRODUCTION

Various attempts have been made to collect historical and global data on healthcare (systems). Existing datasets often contain information on specific types of healthcare schemes, such as social insurance, e.g., Social Security Programs Throughout the World (USSSA, 2019; Cutler & Johnson, 2004), particular dimensions of healthcare systems, e.g., Healthcare Cost and Utilization Project (AHRQ, 2022), healthcare coverage legislation (Feigl & Ding 2013), and/or public health programmes, e.g., National Centre for Health Statistics, (CDC, 2022). However, to our knowledge, a dataset that captures both the timing and the ways in which states take on responsibility for the health(care) of their citizens through the establishment of a healthcare system (for a detailed definition, see section 2)—not just specific schemes and single policies—is still lacking.

The G2HS dataset is unique in its efforts to gather historical data on a global scale about when and how states started to create integrated systems of entitlement to medical treatment and prevention for their citizens. In taking responsibility for the financing, provision, and/or regulation of healthcare, states become accountable for people’s lives, which represents a significant phenomenon in the development of social policy throughout time (de Carvalho et al., 2021). The main goal of this dataset is to provide data to describe and portray healthcare systems at their inception, identifying when systems begin and revealing the main characteristics of systems at introduction in terms of financing, service provision, and regulation of arrangements.

The present technical report and codebook describes and documents the data collection process, the indicators, and the key concepts represented and contained in the G2HS dataset. First, we present the main definitions used to guide our data collection Following this, we describe the data collection process, outlining the coverage of the data, cases, and sources. A particular focus is given to the distinction between independent countries, colonies/occupied countries, semi-sovereign countries, and countries part of larger empires/confederations. Next, we detail the practical procedure for collecting information. We then display, define, and give examples of the indicators/variables contained in the dataset. The sixth section discusses the cases that emerged as exceptions: countries with no healthcare systems as of June 2022. Finally, Appendix I lists all the sources used to create the dataset by country.

The G2HS dataset has been developed in the project “Global Developments in Health Care Systems and Long-term Care as a New Social Risk” of the Collaborative Research Centre 1342 (CRC 1342), “Global Dynamics of Social Policy”, at the University of Bremen, Germany. The project was funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – Project number 374666841 – SFB 1342. The dataset is stored in the Global Welfare State Information System (WeSIS), a web-based interactive database on social protection established by the CRC 1342.

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2. KEY DEFINITIONS AND OPERATIONALISATIONS

This section clarifies how the G2HS dataset conceptualises healthcare systems, healthcare under public responsibility, and the point of introduction of healthcare systems under public responsibility1. It also details how the healthcare system introduction is operationalised.

1 Definitions provided in this section follow, adapt, and expand the concepts outlined and discussed in de Carvalho & Fischer (2020).
2.1 Healthcare systems

Numerous definitions of healthcare systems in existing scholarship reflect the interest, choices, and scope of the respective research (Frisina Doetter et al., 2021). Conceptualisations of the term often emphasise two main aspects of healthcare systems, stating that the phenomenon comprises (1) the sum of all the organisations, activities, resources, and peoples that are involved in promoting, preventing, and maintaining the health of individuals (e.g., Roemer, 1991; Bazzoli et al., 1999; WHO, 2007; Freeman & Frisina, 2010; Simon, 2017), and (2) the functions that a healthcare system arrangement needs to perform; that is, health service delivery, the funding of this services, and the regulation of all the actors involved in healthcare – i.e. beneficiaries, healthcare providers, and financing agents (e.g., Field, 1973; Frenk & Londono, 1997; Roemer, 1991; Wendt et al., 2009; Freeman & Frisina, 2010; Quadagno, 2010; Simon, 2017).

For comparative purposes and to further specify our research object, we call attention to the ‘formal’ aspect of the system. Although in many countries, especially in the Global South (see, for instance, Montenegro & Stephens, 2006; Sieverding & Beyeler, 2016), healthcare is the responsibility of ‘informal’ providers, that is, practitioners without scientific training (Bloom et al., 2011; Green & Colucci, 2020; Lall et al., 2018), we are interested in formal healthcare arrangements that take the form of systems defined by legal acts and/or regulations. Further, we aim to emphasise the boundaries of the healthcare system vis-à-vis its environment (Luhmann & Baecker, 2002), analysing healthcare arrangements as a singular and specific branch of social protection separate from other policy fields, such as employment injury benefits.

Building on the previously cited earlier work, we combine the two perspectives by which healthcare systems are mostly defined and stress the formal component of said arrangements, to conceptualise a healthcare system as:

A healthcare system is the sum of all formal arrangements concerning financing, regulation and provision of qualified health services within a society dealing specifically with healthcare as an area of social protection (de Carvalho & Fischer, 2020, p. 12).

2.2 Healthcare systems under public responsibility

As previously mentioned, our data focuses on the role that states play in the introduction of healthcare systems. Therefore, our conceptual framework accounts for the responsibility of states in said arrangements, coining them as a healthcare system under public responsibility:

A healthcare system under public responsibility is a system in which a substantial state involvement in financing, service provision, and/or regulation of healthcare occurs (de Carvalho & Fischer, 2020, p. 13).

According to this definition, countries in which the state is not involved in at least one of the three functional dimensions of healthcare do not have a healthcare system under public responsibility. For practical reasons, we focus on national or central-level state intervention only, as local and/or regional variation is not of interest in our research. Having said this, the involvement of the central/national state in at least one of the dimensions of healthcare is a necessary condition for the existence of a system under public responsibility. This condition does not exclude other types of actors, such as private for- and not-for-profit or societal actors, from also having a role in healthcare systems alongside the state.
2.3 Introduction of a healthcare system under public responsibility

Building on our definition, we define the introduction point of a healthcare system under public responsibility as the first national/central state intervention in at least one of the dimensions of healthcare. To create a healthcare system, such an intervention needs to be more than just one healthcare policy or programme. Following system theory thinking (e.g., Rajabalinejad et al., 2020), the classification as a ‘system’ also requires that its elements are to some degree integrated. Finally, establishing a healthcare system entails more than building hospitals or paying doctors. A healthcare system under public responsibility needs to create legal entitlements to healthcare services for defined population groups (or the whole population) (de Carvalho & Fischer, 2020). Accounting for these conditions, we thus generally define that:

A healthcare system under public responsibility is introduced when (a) the first public healthcare initiative is established by a national legislative body, (b) the elements of the healthcare system are integrated, and (c) entitlements to healthcare benefits are enacted. The first point in time in which the three necessary conditions are fulfilled is considered the beginning of the healthcare system under public responsibility.

Operationalisation of the introduction of a healthcare system under public responsibility follows a five-step approach. The first step accounts for the state responsibility element of our definition; therefore, healthcare systems must be introduced by national public initiative. We mostly focus on legislative acts, such as laws, decrees, and ordinances. However, in cases where we could not identify relevant legislation but for which consensus among experts exists about the introduction of a healthcare system, we followed these experts’ judgment. The second step deals with the integration of the system, which is measured through the existence of a(n) (set of) institution(s) that is(are) explicitly responsible for healthcare. Third, the national public initiative must grant access to medical services on general terms in case of sickness, not only related to work accidents or work-related diseases. Fourth, the population group(s) that can potentially receive the benefits must be defined. Finally, the identified national public initiative must be verified at the first of its kind that addresses the integration into a system and demarcation of entitlement to healthcare.

Table 1. Operationalisation criteria

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Operationalisation criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public responsibility</td>
<td>Introduced by national public initiative</td>
</tr>
<tr>
<td>System integration</td>
<td>Existence of an institution or set of institutions explicitly responsible for healthcare</td>
</tr>
<tr>
<td>Medical care</td>
<td>Access to medical services is granted</td>
</tr>
<tr>
<td>Entitlement</td>
<td>Definition of the population group for which is possible to receive benefits</td>
</tr>
<tr>
<td>Temporal criterion</td>
<td>First public initiative established by national body</td>
</tr>
</tbody>
</table>


It is important to note that the introduction of a healthcare system at some point in time does not necessarily mean that a functioning arrangement is still in place today. A necessary condition for the presence of a healthcare system under public responsibility is state capacity, that is, the existence of a functioning government/state. Failed states or the temporary collapse of domestic regulations due to war or natural disasters, for instance, may destroy state structures and, accordingly, healthcare systems. For example,

2 For instance, there is an agreement in the secondary literature that the Mongolian healthcare system started in 1922, when the state took responsibility for delivering, financing, and regulating health services, based on the Semashko model (e.g., Bashkuev & Ratmanov, 2020; Gunsentsoodol et al., 2006; Tsiaajav et al., 2013; World Bank et al., 2007; Yiengprugsawan et al., 2021). Although no legislation has been found or cited in the scholarship, we identify 1922 as the beginning of the Mongolian healthcare system.
the revolution of 1978 in Afghanistan dismantled the social health insurance established for public employees in the country in 1955 (Health Policy Project, 2015).

## 3. Data

Data for this dataset was collected between February 2019 and November 2021, with an update in June 2022 by the research team of the A04 project. This section provides detailed information on these data. In what follows, we first provide a brief descriptive analysis of the dataset. Subsequently, we discuss and justify the unit of analysis and temporal coverage of our dataset, describe our country sample, and provide details on how we dealt with former colonies, semi-sovereign countries, and countries that were part of a larger empire/confederation. Then, we describe the sources used to gather information and outlined the practical procedure for data collection.

### 3.1 Descriptive analysis of the dataset

The country sample on healthcare system introductions includes all existing independent countries with a population of more than 500,000 inhabitants as of 2017, resulting in a universe of 167 cases (see Annex 1). For each country, the dataset provides the year of introduction of a healthcare system under public responsibility. Out of the 167 countries, all but two have introduced such a healthcare system (see Section 6 for details on the exceptional cases). The first healthcare system was introduced in 1883 in Germany; the most recent system so far was introduced in 2011 in Togo. Figure 1 plots the sequence of healthcare system introductions on a world map. It reveals that many of the earlier systems were introduced in European countries while the most recent developments have been predominantly in African countries.

![Figure 1. Temporal sequence of healthcare system introductions](image)

Note: Geographical distribution of healthcare system beginnings from 1880 to 2020 in 20-year intervals. Dark red indicates an earlier introduction. Source: Own presentation.

3 Besides the permanent researchers of the A04 project, we particularly thank the student assistants and interns involved in our data collection efforts (in alphabetical order): Alexander Paar, Antonio Basilicata, Charlotte Grupp, Janina Clasen, Katharina Scherf, Louisa Freytag, Mai Mohamed Abdou Mahmoud, and Ojirmyrat Gandymov.
In addition to the year of introduction, the dataset also provides information on the type of healthcare system at introduction (see Frisina Doetter et al., 2021 and Section 5 for details). Of the 165 identified healthcare systems under public responsibility, 111 were state-regulated at the time of introduction and 54 were regulated by societal actors. Five types of actors were identified as being responsible for financing of healthcare systems at their introduction: state (72 countries), societal actors (80 countries), global actors (nine countries), private individual actors (four countries). Service provision was comparably more varied. The provision of healthcare services was the responsibility of the state in 86 countries, private actors in 26 countries, and societal actors in 14 countries. In the remaining 38 cases, service provision was either shared in some constellation across state, societal, private and/or global actors, or provision was not attributable to any dominant actors. Figure 2 shows the distribution of healthcare system types among the 165 countries identified at their system’s point of introduction.

Figure 2. Healthcare system features at introduction

<table>
<thead>
<tr>
<th>Healthcare System Types</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State</strong> (70)</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Private, individual</td>
<td></td>
</tr>
<tr>
<td>Societal (28)</td>
<td></td>
</tr>
<tr>
<td>Global (9)</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Societal</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Private, individual</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Societal</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Private, individual</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Societal</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Private, individual</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td></td>
</tr>
<tr>
<td>Societal</td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td></td>
</tr>
<tr>
<td>Private, individual</td>
<td></td>
</tr>
</tbody>
</table>

Note: An X denotes systems for which it was not possible to ascertain a dominant actor type in the provision dimension. The numbers in brackets relate to the respective sum of countries. Source: Own presentation.

3.2 Unit of analysis and period of observation

In line with the definition of healthcare systems under public responsibility, which focuses on legislation and initiatives established at the national level, the nation-state is our unit of analysis. To identify introduction dates, we cover the time period from 1880, representing the origin of the modern welfare state in Germany (Stolleis, 2013), to 2022. Since the borders of states have changed over the course of the long observation period, we also looked for legislation in the states preceding the currently existing sample of states. This is further detailed in subsection 3.3.1-3.3.3.

3.3 Country coverage

Generally, we focus on healthcare systems implemented in sovereign states. Our definition of independence follows the Correlates of War project (see CoW State System Membership List Codebook
In summary, countries that possess legal, military, economic, or political powers to exercise a degree of sovereignty are classified as independent. Entities not falling into this category are dealt with according to the following rules.

3.3.1 Colonies

In the case of former colonies, we do not consider regulations of colonial administrations to identify the emergence of a healthcare system. Our data collection, therefore, starts at the point of independence on the grounds that colonies: (a) were never fully integrated and/or part of the colonising state, and/or (b) were under external rule, so any potential healthcare system created before independence was established by a foreign state and not by a national, self-governing institution.

3.3.2 Semi-sovereign countries

Even though we generally focused on fully independent countries, we set the introduction date before political independence was achieved if a healthcare system under public responsibility was established by a semi-sovereign country or a country which lost full independence due to a temporary occupation. The necessary condition for this category is that the public initiative was enacted by a national, self-governing institution and not by an external power. This refers to the cases of Bulgaria, Eritrea, Qatar, North Korea, and Papua New Guinea. In the following, we justify the introduction date of each case.

Bulgaria (independence 1908, first HCS: 1888)

Until mid-1879, the territory that was to become Bulgaria was ruled by the Provisional Russian Administration. During this time, “Temporary Rules for the Organization of the Health Administration in Bulgaria” were implemented, stipulating free access to basic medical care organised at the municipal level (Dimova, 2021; Balabanova, 2001). After the Russian-Turkish wars of 1877-78, Bulgaria achieved autonomy within the Ottoman Empire under the treaty of Berlin. In June 1879, the Principality of Bulgaria was established and the Tarnovo Constitution was adopted under the rule of Prince Alexander I Battenberg. While the successive ruler Ferdinand of Saxe-Coburg-Gotha did not proclaim full independence of the then Kingdom of Bulgaria until 1908, sovereign legislation based on the Tarnovo Constitution of 1879 had been adopted before this independence date. The first healthcare law “submitted and considered under the constitutional order in the National Assembly” was the Sanitary Law in 1888 (Dimova, 2021; Dimova et al., 2018). In addition to public health measures and a reorganisation of the healthcare administration, it stipulated free hospital care, limited outpatient care, and public funds for the healthcare of poor people. Therefore, we identify it as the beginning of a healthcare system under public responsibility.


Eritrea’s healthcare system was developed during the armed struggle with Ethiopia, which took place from 1961 to 1991 (Connell, 2001; Findlay, 1989). During this period, not all Eritrean territory was free. However, secondary scholarship observes notable efforts in healthcare during the war by the Eritrean People’s Liberation Front (EPLF) (Findlay, 1989; Jones, 1991; Sabo & Kibirige, 1989), an armed organisation that fought for Eritrean independence (Connell, 2001). The literature states that in 1981, the EPLF introduced the Eritrean Public Health Programme (EPHP) under the stewardship of a Health Department (Findlay, 1989). The EPHP comprised a comprehensive primary healthcare system focused on healthcare services for women and children. It promoted breastfeeding, family planning, immunisation, nutrition programmes, health education, and a wide range of therapeutic services (Findlay, 1989; Jones, 1991; Sabo & Kibirige, 1989). By the end of the 1980s, the EPLF had developed a comprehensive health service that treated 1.6 million patients per year. In agreement with the literature, we identified
1981 as the introduction date due to the fact that the EPLF became a de facto parallel state, which ruled free regions and implemented social programmes involving education, medical care, and food production (Findlay, 1989).

Qatar (independence: 1971, first HCS: 1965)

Between 1916 and 1971, Qatar was a British Protectorate. The British-installed Al-Thani dynasty ruled Qatar as an absolutist monarchy (Goodman, 2015). The treaties establishing the British Protectorate of Qatar promised military protection at the cost of losing sovereignty in external affairs. The Qatari rulers had, however, autonomy with respect to most domestic policies and, as a result of the oil production since the 1950s, increasing resources for social policies. In 1965, the Decree Law 6/1965 Organizing Medical Treatment within the state stipulated free medical care for all Qataris, as well as employees and their family members residing in Qatar. This law complies with our definition of healthcare system beginnings. It represents an autonomous decision of the national rulers despite the restrictions with respect to external affairs, which ended only with the declaration of independence in 1971.

North Korea (independence: 1948, first HCS: 1946)

The introduction of a healthcare system in North Korea is consistently dated to the implementation of a health insurance scheme in 1946 (e.g., Kichae & Hyejin, 2018; Soh, 2016; Sung-Eun Cho, 2019; Armstrong, 2003; Hyung Shik, 1992). The Labour and Social Insurance Law, to which the cited literature refers, entitled civil servants and workers in the manufacturing industry to free healthcare in public facilities. At this time, North Korea was still occupied by the Soviet Union. The declaration of independence followed in 1948—almost two years after the establishment of the healthcare system. In consistence with the literature, we identify the system as beginning in 1946 since a national institution, the Provisional People’s Committee of North Korea, adopted the Labour and Social Insurance Law, and laid the foundation for the further development of the healthcare system within a socialist regime (Kichae & Hyejin, 2018).


Australia had control of Papua New Guinea from 1906 to 1975 (CoW, 2022). In 1972, Papua New Guinea, although still territory of Australia at the time, marked the start of their journey toward independence with a legal national election (Newbrander, 1987). The country became self-governing the following year and achieved full independence in September 1975 (CoW, 2022; Newbrander, 1987). Throughout the process leading up to independence in 1975, the self-governing territory of Papua New Guinea introduced its first national healthcare system legislation, the National Health Plan 1974-1978, in 1973. This is regarded as the introduction of a healthcare system under public responsibility by the secondary scholarship and policy field experts:

“At independence health was regarded as an important issue, and the 1974 National Health Plan focused on expanding the provision of health services to rural areas and thus achieving more or less universal access” (Connell, 1997, p. 283)

“In 1973, as Papua New Guinea, then a territory of Australia, prepared for independence, it recognised the important role of the people’s health in the overall scheme of development (…) a five-year National Health Plan for 1974-1978 was developed to set out the priorities and strategies for developing the new nation’s healthcare system” (Newbrander, 1987, p. 228).

Even though Papua New Guinea only achieved full independence in 1975, we consider the introduction date of the healthcare system under public responsibility in the country to be 1973, in line with the
secondary literature, because the National Health Plan was developed by an autonomous, elected, and self-governing body.

3.3.3 COUNTRIES THAT WERE PART OF A LARGER EMPIRE/CONFEDERATION

Our investigation into healthcare system introductions includes 167 independent countries as of 2017. Yet, over the long observation period of about 140 years, the number of existing, independent countries varied, particularly as larger empires or confederations disintegrated after the world wars and the collapse of the Soviet Union. Examining only the new healthcare initiatives to be implemented in the nations that originate from former empires would neglect the potential existence of earlier healthcare systems on the territories of these nations. In these cases, the evolution of healthcare systems has to be considered as reforms or even the continuity of inherited systems. Thus, if a country in our sample was part of an independent predecessor in the form of an empire or confederation, we refer to this predecessor in our data for healthcare system introduction and examine earlier systems implemented in the respective territory. For instance, several of today’s independent countries were a part of the Russian Empire and the Soviet Union earlier in our period of observation. These countries are Armenia, Azerbaijan, Belarus, Estonia, Georgia, Moldova, Kazakhstan, Kirgizstan, Latvia, Lithuania, Tajikistan, Turkmenistan, Uzbekistan, and Ukraine. Moreover, Finland was an autonomous Grand Duchy within the Russian Empire until 1917. For these countries, their healthcare system introduction point should not exclude the history of their involvement of the Russian Empire/Soviet Union. The following paragraph explains how each of their healthcare system introductions were defined.

Early approaches to provide public health and medical care in the Russian Empire were taken on the regional level. National legislation concerning the so-called Zemstvo district medicine since the mid-19th century was vague and did not stipulate entitlements to healthcare (Krug, 1976). The first national legislation establishing entitlements to healthcare can be identified with the social insurance legislation in 1912 (Goudima & Rybalko, 1996). However, as specified in the social insurance law of 1912 (Nolken, 1914), the insurance scheme was only valid and executed in the European and Caucasian parts of the Russian Empire (i.e., referring to the current countries Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, Russia, and Ukraine). Therefore, we identify 1912 as the year of healthcare system introduction in those countries. For the Central Asian countries, the development of the Soviet Semashko system in the early 1920s, and the adoption of the regulations with the constitution of the Soviet Union in 1924, is the decisive development of a healthcare system referred to as healthcare system beginning in these countries (Ibraimova et al., 2011). Admittedly, this approach differs from the procedures used for former colonies, where we ignore regulations taken by the colonial administration. This is rooted in the reasoning that our data collection of healthcare system beginnings is interested in regulations taken by self-governing national institutions.

The table below shows all the countries that pertained to this group of cases.

<table>
<thead>
<tr>
<th>Predecessor country</th>
<th>Introduction Date</th>
<th>Current independent states</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austrian Empire</td>
<td>1888</td>
<td>Austria, Bosnia and Herzegovina, Croatia, Czech Republic, Slovenia</td>
</tr>
<tr>
<td>Hungary</td>
<td>1891</td>
<td>Hungary, Slovakia</td>
</tr>
<tr>
<td>Russian Empire</td>
<td>1912</td>
<td>Armenia, Azerbaijan, Belarus, Estonia, Georgia, Latvia, Lithuania, Moldova, Russia, Ukraine</td>
</tr>
<tr>
<td>Sudan</td>
<td>1975</td>
<td>Sudan, South Sudan</td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>1922</td>
<td>Kosovo, Montenegro, North Macedonia, Serbia</td>
</tr>
<tr>
<td>USSR</td>
<td>1924</td>
<td>Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan</td>
</tr>
<tr>
<td>United Arab Republic</td>
<td>1959</td>
<td>Egypt, Syria</td>
</tr>
</tbody>
</table>

Source: Own presentation.
3.4 Sources

To create the G2HS dataset, we relied on two types of sources: Domestic legal acts and secondary literature. We used national legislation, such as laws, decrees, ordinances, and presidential executive orders as raw data whenever possible. These texts were mainly retrieved from domestic governmental websites, like Ministries of Health, House of Parliament, and Congress. However, legal databases were also consulted, such as the International Labour Organisation Legislative Series and the NATLEX (Database of national labour, social security, and related human rights legislation).

We relied on secondary literature if national legislation was not identified and/or found. This includes, but is not limited to:

» Academic work written by country experts;
» Reports from governmental sources, such as Health Ministries, Statistical Offices, Social Development Ministries, Budget Plans;
» Reports from international organisations (e.g. World Health Organisation, World Bank, Pan-American Health Organisation, European Observatory on Health Systems) and development banks (e.g. Inter-American Development Bank, Asia Development Bank);
» Reports from foundations, associations, and education institutes, such as medical associations, non-governmental organisations, think tanks, and research projects.

The secondary literature was identified using scientific databases, such as PubMed, Scopus, Sociological Abstract, Web of Science, Google Scholar, and international organisations’ repositories. Even though we also conducted unstructured searches, we used the following search terms: “healthcare system” OR “health care system”, “healthcare policy” OR “health care policy”, “healthcare legislation/law/act” AND “introduction”, “creation”, “development”, “establishment”, “history of” AND analysed country. Scholarship cited in the identified literature was also consulted.

4. Practical Procedure

In terms of the practical procedure to identify healthcare systems introduction dates, our period of observation starts in 1880, with the creation of the modern welfare state in Germany (Jopp, 2013). Generally, in the case of former colonies/occupied countries, the analysed period begins after political independence has been achieved according to the Correlates of War dataset (CoW, 2022). Exceptions are related to the implementation of healthcare systems under public responsibility by self-autonomous governments in semi-sovereign countries (see section 3.3.2). In the case of countries that used to be part of a larger empire/confederation, the introduction date refers to the predecessor countries (see section 3.3.3).

We relied firstly on the judgement of experts, particularly agreement in the extant literature, on whether and when a healthcare system was introduced to map all the potential introduction points. These dates were extracted and assessed based on the information collected through legal acts and secondary literature to evaluate whether they match our criteria for system introduction (as seen in Table 1). Therefore, we applied a seven-step procedure. We first considered the judgement of experts on when a healthcare system in a particular country was introduced to identify potential starting dates. Second, we checked the status of the country (i.e., independent, colonised/occupied, part of an empire/confederation) at the time of the potential introduction date. If the country was independent or part of a larger entity, we tested the conditions for healthcare system beginnings (steps 4-7). If colonised/occupied, we

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4 The practical procedure described in this section is based on and adapted from de Carvalho & Fischer (2020).
verified whether a national, self-governing institution executed the potential introduction of a healthcare system (3). If this was the case, we again examined whether the system introduced meets the conditions for a healthcare system under public responsibility: the introduction by a national public initiative (4), the definition of an institution, or a set of institutions responsible for healthcare (5), the entitlement to medical care in case of sickness (6), and the definition of the population group covered by the system (7). Finally, the first date at which all necessary conditions are fulfilled is taken as the introduction date. The practical procedure is displayed in Figure 3.

**Figure 3.** Procedure for the identification of healthcare system beginnings

![Procedure diagram](image)

Source: Own presentation.

Table 3 exemplifies our procedure, using the case of Cuba. The secondary literature points to two potential introduction dates, 1909 and 1961. Following the above reasoning, we concluded to take 1961 as the introduction date.

**Table 3.** Healthcare system under public responsibility introduction: Practical procedure

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Potential Introduction Date I: 1909</th>
<th>Potential Introduction Date II: 1961</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expert judgement on system introduction</td>
<td>Liebowitz, 1969</td>
<td>Watzkin, 1983; Delgado García, 1998; Sixto, 2002; Stusser, 2017</td>
</tr>
<tr>
<td>Is the country independent or part of a larger empire/confederation at this point?</td>
<td>Yes (CoW, 2022)</td>
<td>Yes (CoW, 2022)</td>
</tr>
<tr>
<td>Has it been introduced through national public initiative?</td>
<td>Yes (Decree No. 78)</td>
<td>Yes [Law No. 959]</td>
</tr>
<tr>
<td>Is there an institution, or set of institutions, responsible for healthcare?</td>
<td>Yes (Secretaría de Sanidad y Beneficiencia)</td>
<td>Yes (Ministry of Health)</td>
</tr>
<tr>
<td>Are health services entitlements granted?</td>
<td>No</td>
<td>Yes, primary and secondary care [Law No. 959]</td>
</tr>
<tr>
<td>Do entitlements define the population group of beneficiaries?</td>
<td>No</td>
<td>Yes [residents of the country]</td>
</tr>
<tr>
<td>Is this the earliest date that meets the above criteria?</td>
<td>N/A</td>
<td>Yes</td>
</tr>
<tr>
<td>Is this the beginning of the system?</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Own presentation.
After identifying the introduction date of the healthcare system under public responsibility, we then proceeded to collect data on the characteristics of the arrangement that was created (see section 5 for a complete overview of the included features). In order to do so, we first prioritised the information provided in the national public initiative that established the system. If the required information was not stated in the document, we then assessed the secondary literature using the types of sources discussed in the previous subsection.

5. Indicators

In this section, we present the variables included in the G2HS Dataset, including the technical variable names used in WeSIS, information on the type of variable, attributes, and definitions. The variables can be grouped into three dimensions: the regulation dimension, the financing dimension, and the service provision dimension. These dimensions have been used to describe healthcare systems and are fundamental to the classification of healthcare systems (Wendt et al., 2009; Frisina Doetter et al., 2021). All variables refer to the point of introduction of the healthcare system under public responsibility. Information concerning the date of introduction is subsumed under regulation.

5.1 Regulation

- Variable label: Healthcare system existence
  » Technical variable name: health_HC_regulation_Existence
  This binary variable indicates whether a country has established a healthcare system under public responsibility at some point during the observation period. The indicator represents a dummy variable for the years of healthcare system existence. It takes the value “1” = “Yes” for the year of introduction of a healthcare system under public responsibility and each year after this date. For all other years, the indicator is set to “0” = “No”. A healthcare system under public responsibility is introduced with (a) the first national legislation, (b) enactment of entitlements to healthcare benefits, and (c) the integration of elements of the healthcare system (e.g., through the definition of institutional responsibilities for financing, service provision, and regulation, cf. earlier sections of this paper). Currently, the variable does not yet reflect the possibility of terminating a healthcare system e.g., by abolishing the respective regulation or the loss of state capacity due to events such as wars or natural disasters which lead to the collapse of healthcare regulations. When ongoing research reveals periods of healthcare system abolishment, the variable will be set to “0” for the respective years.

- Variable label: Year of healthcare system introduction
  » Technical variable name: health_HC_regulation_IntroBinary
  This binary variable indicates the year of healthcare system introduction. The indicator takes the value 1 = “Yes” for the year of introduction of a healthcare system under public responsibility. For all other years, the indicator is set to 0 = “No”.

- Variable label: Date of healthcare system introduction
  » Technical variable name: health_HC_regulation_IntroDateJure
  This variable indicates the date of the adoption of the legislative act introducing a healthcare system under public responsibility. As a rule, the date is provided in the format YYYY.MM.DD. If the exact date is unknown, DD is set to the last date of the month. If the exact month is unknown, the month is set to “12”.
» Variable label: Name of the legal act introducing the healthcare system
» Technical variable name: health_HC_regulationIntroLaw
This string-variable specifies the name and, where available and applicable, the number of the legal act introducing a healthcare system under public responsibility.

» Variable label: Content of the legislation introducing the healthcare system
» Technical variable name: health_HC_regulationIntroLawContent
This string-variable includes a brief description of the contents of legislation introducing a healthcare system under public responsibility. It describes, e.g., the major policy goals, the population groups entitled to healthcare benefits, information on the scope of benefits, and financing.

» Variable label: Population groups entitled to healthcare at introduction
» Technical variable name: health_HC_regulationIntroEntitlement
This string-variable describes the features of the healthcare system at the point of introduction. The variable lists the groups of people entitled to healthcare benefits.

» Variable label.: Entitlement at introduction based on
  » Citizenship
  » Occupation
  » Means-testing
  » Ethnicity
  » Residence
  » Other
» Technical variable names:
  » health_HC_regulationIntroEntitleCitizen
  » health_HC_regulationIntroEntitleOccupation
  » health_HC_regulationIntroEntitleCitizenMT
  » health_HC_regulationIntroEntitleCitizenEthnicity
  » health_HC_regulationIntroEntitleCitizenResidence
  » health_HC_regulationIntroEntitleOther
The listed variables are binary variables which indicate the principle on which entitlements to healthcare benefits are based. The variable takes either the value “1” = “Yes” or “0” = “No”. For example, “entitlements based on citizenship” refers to regulations where the status as a citizen is the main condition to be entitled to healthcare benefits. “Entitlements based on occupation” refers to regulations that link healthcare entitlements to occupational status, e.g., health insurance for workers.

» Variable label: Healthcare system type at introduction
» Technical variable name: health_HC_regulation_hcstype
This string-variable describes the features of the healthcare system at the point of introduction. The variable indicates the dominant actor type in the regulation, financing, and service provision dimensions of the healthcare system. It relates to the variables “Main actor type responsible for financing at introduction”, “Main actor type responsible for service provision at introduction”, and Main actor type responsible for regulation at introduction.” Actor types comprise state, societal, private, and global actors. In the financing dimension, we differentiate between private collective actors (i.e., private health insurance) and private individual actors (direct payments by individuals and households). For a detailed discussion of the healthcare system typology, actor types, and classification, see Frisina Doetter et al. (2021).

» Variable label: Healthcare system type at introduction, numerical code
» Technical variable name: health_HC_regulation_hcstypeCode
This multinomial variable describes the features of the healthcare system at the point of introduction. The variable is a numerical expression of the variable “healthcare systems at introduction” (health_HC_
The variable is a three-digit number composed of the variables “Main actor type responsible for regulation at introduction”, “Main actor type responsible for financing at introduction”, and “Main actor type providing health services at introduction” described below. The first digit represents the regulation dimension. It can take values 1 (state actors), 2 (societal actors), 3 (private actors), 5 (global actors), or 0 (unknown, no dominant actor identified). The second digit represents the financing dimension. It can take values 1 (state actors), 2 (societal actors), 3 (private, individual actors), 4 (private, collective actors), 5 (global actors), or 0 (unknown, no dominant actor identified). The third digit represents the service provision dimension. It can take values 1 (state actors), 2 (societal actors), 3 (private actors), 5 (global actors), or 0 (unknown, no dominant actor identified). Hence, code 111 would represent a system with state actors dominating all dimensions. Code 123 would indicate a system with state regulation, contribution financing, and private actor provision.

5.2 Financing

This multinomial variable indicates the dominant actor type in the financing dimension of the healthcare system. It can take the values 1, 2, 3, 4, 5, or 0. It is based on the actor types and system of financing as defined in respective legislations and, where available, the size of financing shares attributed to the respective actor type. The variable is coded according to the dominant actor type responsible for healthcare financing of the healthcare system under public responsibility at introduction. Dominance is
either defined by the definition of major financing actors in the legislation or, if available, by the relative majority of healthcare financing attributable to the respective actor type. Actor types are state, societal, private collective, private individual, and global actors. State actors refer to government agencies and the general government budget at different territorial levels (value label = 1). Societal actors refer to mandatory financing schemes organised by non-governmental organisations with autonomous budgets (2). Private individual actors refer to healthcare financing by individuals and households (3). Private collective actors refer to voluntary financing schemes organised by private actors (4). Global actors refer to healthcare financing by non-resident institutions, international organisations, international NGOs, or foreign states (5). (0) indicates inconclusive or missing information.

- Variable label: Financing of the healthcare system at introduction
- Technical variable name: health_HC_financing_IntroDescription

This string variable describes the features of the healthcare system at the point of introduction. It describes the system of financing as defined in the respective legislation. The description includes information such as the sources of financing and, where applicable, the level of contribution rates or insurance premiums.

- Variable labels: Healthcare system financed through
  - taxation at introduction
  - contributions at introduction
  - out-of-pocket payments at introduction
  - private insurance schemes at introduction
  - global actors at introduction
- Technical variable names:
  - health_HC_financing_IntroTax
  - health_HC_financing_IntroCont
  - health_HC_financing_IntroOOP
  - health_HC_financing_IntroPriv
  - health_HC_financing_IntroGlobal

The listed variables are binary, indicating the main financing schemes for the healthcare system. The variables take the value “1” = “Yes” if the respective legislation and system description define the respective financing schemes as a substantial source of financing. Taxation refers to general government revenue. This may also include government revenue from trading commodities or government debt. Taxation is characterised as revenue that does not establish entitlements to healthcare, although it might be earmarked for health spending. It may include revenue at federal, regional or local level of government. Contributions are characterised as mandatory prepayments to (social) health insurance establishing entitlements to healthcare benefits. I.e., contributions may refer to a certain rate of income or wages and flat rate payments and incur varying amounts of redistribution. Typically, contributions are collected by insurance funds provided with financial autonomy and are separate from the national budget. Out-of-pocket payments (OOP) are characterised as payments for healthcare goods and services at the point of service delivery. OOP include direct payments to providers for medical care, co-payments, and co-insurance. Private insurance payments/premiums are characterised as prepayments to voluntary health insurance, which establish entitlements to healthcare goods and services. Financing by global actors includes non-domestic sources of healthcare financing by international organisations, international non-governmental organisations, or foreign countries.

5.3 Service Provision

- Variable label: Health services provision at introduction
- Technical variable name: health_HC_provision_IntroActorsDescrip
This string-variable describes the setup of healthcare provision, the main locus of care (e.g. hospitals, outpatient healthcare centres, outpatient physician practice), and the status of service providers (e.g. public, private non-profit/societal, private, or global actors).

» Variable label: Main actor type providing services at introduction
» Technical variable name: health_HC_provision_IntraActorCode

This multinomial variable indicates the dominant actor type in the provision dimension of the healthcare system. It is based on the actor types as defined in respective legislations and, where available, the share of healthcare providers attributed to the respective actor type (state, societal, private, or global actor). The variable is coded according to the dominant actor type responsible for healthcare provision as it was organised at the introduction of a healthcare system under public responsibility. The dominance of providers is either based on information provided in the legislation (e.g., sickness funds have to contract non-profit providers of medical care; or services are only provided in publicly owned hospitals, etc.) or, if available, by the relative majority of health providers attributable to the respective actor type. Actor types are state, societal, private, and global actors. State actors refer to healthcare facilities owned by government agencies at different territorial levels (value label = 1). Societal actors refer to healthcare facilities owned by private non-profit organisations (2). Private actors refer to healthcare facilities owned by private for-profit providers or voluntary financing schemes organised by private actors (3). Global actors refer to healthcare facilities owned by non-resident institutions, international organisations, international NGOs, or foreign states (4). Where available, relative majority in the hospital sector is determined by the share of hospital beds attributable to provider types. Relative majority in the outpatient sector is determined by the share of physicians attributable to provider types. Inpatient and outpatient sectors are weighted according to the share of health expenditure the sectors consume. (0) indicates inconclusive or missing information.

6. Cases without a Healthcare System

As discussed in section two, our research and, therefore, the constructed database deal with healthcare systems under public responsibility, namely healthcare arrangements in which the central state has substantial involvement in at least one of the dimensions of healthcare – financing, service provision, and regulation. As of June 2022, two countries were considered as having no healthcare system in place: Central African Republic and Somalia. It is important to note that this does not mean there is no healthcare arrangement in place. Theoretically, countries may have well-functioning, purely private or societal schemes where the state does not play any substantial role. Further, it does not even mean that there is no government involvement in the healthcare system, as local governments might have taken this role, or the central government could take responsibility without any form of institutionalised backing. What we can establish is that, as of June 2022, there was no institutionalised, in the form of formal rules, involvement of the central state in any of the healthcare system dimensions of regulation, financing, and service provision.

To assert that these two countries do not have healthcare systems under public responsibility in place, we followed the first step of our practical procedure, that is, analysing the secondary literature to map any potential healthcare system introduction date. In these two cases, the scholarship cited below affirms the non-existence of any public healthcare system. After this first step, we searched for potential public national initiatives in government sources, like the Ministries of Health, House of Parliament, and Congress, without success.

The following subsections show excerpts of the scholarship that address (the lack of) healthcare systems in the aforementioned cases.
6.1 Central African Republic

“Health provision is almost exclusively local, with a health landscape resembling an archipelago of disconnected deliverers, some islands taller than others. In CAR, as in many other countries, the familiar pyramid of connected layers of increasing service complexity described by policy documents is, in fact, absent (...) The absence of the state as uniforming agent has compounded physical and financial inaccessibility, to preclude the development of an inter-connected health system, leaving a constellation of atypical facilities delivering a fragmented service.” (Beesley, 2013, p. 3)

“The Central African Republic’s health system has always been very weak; in many parts of the country, to all intents and purposes, it does not exist.” (Médecins Sans Frontières, 2011, p. 11)

“The Central African Republic (CAR) is in the midst of a perpetual—and largely overlooked—health crisis. While the country contends with what amounts to a continuous state of medical emergency, the situation has not generated a response big enough to meet the basic health needs for most of the population. (Green, 2012, p. 964)

The Central African Republic (CAR) is still considered a fragile state, and the health situation has not recently improved (Kuehne & Roberts, 2021). In the past, there were attempts to implement health insurance which might have qualified as a healthcare system under public responsibility. Thus, the United States Social Security Association’s (USSSA) publication “Social Security Around the World” mentions Decree No. 70-64 of September 30, 1970, referring to a health insurance scheme in the CAR. However, the USSSA also states that the scheme has never been implemented, and there is no reference in the literature to such a health insurance scheme or its shape. Furthermore, we examined the social security codes (Law No. 06.035 of December 28, 2006, and related decrees and laws) referred to by USSSA. Yet, despite using the term “health insurance”, the social security code only includes medical care related to work accidents and work-related diseases, which does not qualify as a healthcare system under public responsibility as we define it.

6.2 Somalia

Even though secondary literature on the Somali healthcare system is still incipient, there is a general agreement that Somalia does not have a system under public responsibility in place. Global actors such as the United Nations, the WHO Regional Office for the Eastern Mediterranean (EMRO), and the Danish Immigration services point to the non-existence of healthcare system under public responsibility due to a lack of state capacity and resources. This is also supported by scholars who added that poverty and the civil war resulted in a state incapable of answering health needs (e.g. Qayad, 2008).

“(…) in spite of progress made, indicators for state stability, including the capacity to build a functional health care system, remain poor. This also affects the Federal Ministry of Health which was described as being in a ‘chronic emergency situation’ by an interviewed consultant from the ministry” (Danish Immigration Service, 2020, p. 14).
“In the absence of strong national governance, healthcare services are being offered by multiple actors including local authorities, private for-profit entrepreneurs, international development partners and international NGOs. According to findings from a qualitative study in Mogadishu, the private sector has become the dominant healthcare provider, an observation which was shared by UNFPA” (Danish Immigration Service, 2020, p. 14).

“(…) hazard settlement, poverty and a weak economy, and poor governance created an unbearable burden of health problems that overwhelmed the nation’s staggering health care system and its coping mechanisms. These problems stifled the health care system and contributed to the poor health status of the Somali people. The Ministry of Health (MOH) never developed a care health care services package nor gauged the extent of resources and infrastructure needed to deliver them. It could have saved wasted resources and eased its management burden if sound leadership had been practiced. As a result of poor leadership, the needs of the health care system and its effective operation were mis conceptualised (…)” (Qayad, 2008, p. 191).

“The Somali health system was already in disarray at the time of Siad Barre, with wide inequalities in access to health services between Mogadishu and the rest of the country. According to the policy adopted at the time, health and education were free of charge. The capacity of transforming policies into action was, however, limited, and so were the resources, largely provided by the international assistance (94% of the health budget in 1989). As a result, an indigenous, coherent health system never took off. No sector-wide adoption of the PHC approach took place in those years.” (EMRO, 2006, p. 34).

“There is only one government hospital in the capital, Mogadishu, and people often have to seek health care services at a private health facility and pay out of their own pocket very high amounts for their own treatment. Only a few people can afford these services, thereby leading to high child and maternal mortality.” (United Nations, 2022, no pagination)
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3. Algeria
4. Angola

5. Argentina

6. Armenia
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7. Australia


8. Austria


9. Azerbaijan


10. Bahrain

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11. Bangladesh


12. Belarus


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13. Belgium


14. Benin


15. Bhutan


16. Bolivia


17. Bosnia and Herzegovina


18. Botswana


19. Brazil


20. Bulgaria


21. Burkina Faso

22. Burundi

23. Cambodia

24. Cameroon

25. Canada


26. Cape Verde


27. Central African Republic


28. Chad


29. Chile
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32. Comoros

33. Congo

34. Costa Rica

35. Croatia


36. Cuba


37. Cyprus


38. Czech Republic


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87. Lesotho


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95. **Mali**


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97. **Mauritius**


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99. Moldova
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[54]


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129. Senegal


130. Serbia


131. Sierra Leone


132. Singapore

133. Slovakia

134. Slovenia

135. Solomon Islands


136. Somalia


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149. Tanzania


150. Thailand


151. Togo


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166. Zambia

167. Zimbabwe