

Personal Health Big Data and Its Uses in Mongolia

P Ganchimeg¹, T Saruul^{2*} and P Ankhtuya¹

¹National Academy of Governance, Mongolia

²First Central Hospital of Mongolia, Bone Marrow Transplantation and Hematology Center, Mongolia

ABSTRACT

The Law on Personal Information Protection states that Health Information: refers to information about an individual's physical and mental health, health care and services received. While the world is taking measures to reduce the spread and complications of non- communicable diseases, and to increase life expectancy, when new or resurgent infectious diseases are increasing, and during social disasters and using real-time information on population diseases and health rational. Therefore, the study of the storage and use of personal health bigdata became the basis of the research work.

Objectives: The purpose of the research work is to study the storage of big data of personal health and its use.

Methods: The process and use of personal health big data was researched based on medical history forms and NCD guidelines. It takes time and budget to carry out the research in all specialized central hospitals. For the personal health big data and use of medical records of the first central hospital and National Center for Maternal and Child Health, which provided the most inpatient treatment services since in 2014-2021 was studied using MS-Excel program.

*Corresponding author

T Saruul, First Central Hospital of Mongolia, Bone Marrow Transplantation and Hematology Center, Mongolia.

Received: January 14, 2026; **Accepted:** January 19, 2026; **Published:** January 28, 2026

Keywords: Big Data, Medical History Storage

Literature Review

One major source of big data in the health sector is the medical information of hospital patients. From the moment a patient registers at a health facility, their medical history archived in both the institution's records and the individual's medical chart. This history documented according to standardized forms intended for statistical analysis and reporting in the health sector.

In Mongolia, the first standard format for recording medical history was approved in 1998. Since then, patient records have been maintained both in paper and electronic formats, depending on the institution and time. This research aimed to study and evaluate the content, collection, storage, and usage of a specific type of data-namely, inpatient medical histories- at the two major hospitals mentioned above. The study classified the process of generating personal health data in Mongolia into two stages:

Paper-Based Stage

Initially, all patient data was recorded on paper. Analysis of secondary data stored in archives reveals the following findings.

Before 1999	From January 2013 to 2020	After January 1, 2020
According to Order No. 481 of the Minister of Health of the People's Republic of Mongolia (PRM) in 1970, the "Medical History" was maintained. Additionally, based on Order No. 221 of the Minister of Health and Social Welfare in 1982, the "Preoperative and Postoperative Condition History" and the "Anesthesia Record" were recorded. Furthermore, under Order No. 321/418 issued in 1971 by the Minister of Finance and the Minister of Health and Social Welfare, the "Medication Sheet Used by Patient" was kept in a standardized form.	All healthcare organizations followed Order No. 450 issued on November 11, 2013, by the Minister of Health, which approved the unified template for the "Health Registration and Reporting Form." Based on this, the initial stage included 131 standard templates. Among them: 74 templates were used in inpatient services, 37 in outpatient clinics and family health centers, and 33 in soum (rural) healthcare facilities. According to this order, patient medical histories were archived and stored in paper format for 50 years.	According to Order A/611 of the Minister of Health, dated December 30, 2019, medical records were maintained using standardized reporting templates required for collecting national health indicators and statistics. This system standardized the forms and registration records for essential public health data across all healthcare facilities.

Figure 1: Origin of Paper-Based Medical History Forms

Before the implementation of the "E-Governance" program in Mongolia, the H-info software for compiling health statistics was introduced in 1992. While developed countries already used advanced hospital information systems, implementing those directly in Mongolia posed practical and financial challenges due to high costs and differences in service operations. Hence, the need arose to develop a low-cost, user- friendly, and locally appropriate system. Data privacy and national security concerns also warranted a locally developed system instead of relying on foreign providers. As a result, 27 projects were implemented between 1992 and 2012. An assessment by a task force formed under Government Resolution No. 139 (dated September 20, 2013) concluded that many of these projects were ineffective and redundant.

One of the key goals of these projects was to digitize health data. The World Bank- funded “E-Health 2” project launched in 2021 aimed to introduce a unified data exchange platform for healthcare institutions. However, this project was ultimately unsuccessful and discontinued [1-8].

Electronic Stage

With the digitization of patient data, electronic records have now replaced paper ones in many cases. The research analyzed data stored electronically and presented the following findings:

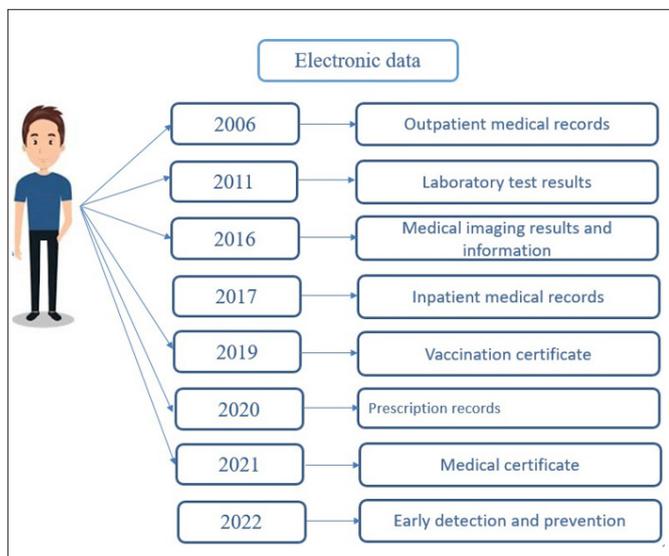


Figure 2: Data Stored in Electronic Format

Patient medical records in Mongolia regulated under orders from the Ministry of Health. Storage duration varies by record type:

- **Birth History:** 20 years
- **Immunization Records:** 5 years
- **Diagnostic Results:** 5 years
- **Inpatient History:** 50 years
- **Outpatient Records:** 5 years
- **Rehabilitation Records:** 5 years
- **Mortality Records:** 20 years

Results

The medical history of an individual served by a health institution is maintained according to the Minister of Health and related orders, and includes birth history-20 years, immunization history 5 years, diagnostic test results 5 years, inpatient history 50 years, outpatient history 5 years, rehabilitation treatment history is kept for 5 years and death history for 20 years. The inpatient history since 1986 in the first central hospital of the stored in an area of 127 m². And the inpatient history since 1988 in the national Center for Maternal and Child Health of the stored in an area of 280m². Between 2014 and 2016, the First Central Hospital of the spent an average of 14 million MNT to purchase the necessary forms to these records. But the National Center for Maternal and Child Health spent an average of 15 million MNT between 2014 and 2019. Medical records stored in this way are used by researchers in their research and by law enforcement [9].

Conclusion

It is important to use bigdata of personal health rather than numerical data of the disease to determine the causes of NCDs and identify the primary risk factors that caused the disease,

to reduce further treatment, complications, mortality, and spread. And important for evidence- based decision-making in healthcare management.

References

1. Amir Gandomi MH (2014) Beyond the hype: big data concepts, methods, and analytics. International journal of information management 5.
2. Bahl S (2015) Brief on ICD Trend: Big Data. Asian and Pacific Training Centre Information and Communication Technology for Development 26.
3. Creswell JP (2003) Advanced mixed methods research design. In: A Tashakkori & C Teddlie (Eds.), Handbook on mixed methods in the behavioral and social sciences 209: 240.
4. Dash S (2019) Big data in healthcare: management, analysis and future prospects. Journal of Big Data 24.
5. Field A (2009) Discovering statistics using spss (3rd). Dubai: Oriental Press 69.
6. Foundation T (2014) Evidence-Based Policymaking: A guide for effective government 35-38.
7. Grazia Dicuonzo GG (2022) Towards the Use of Big Data in Healthcare: A Literature Review. MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations 265-278.
8. Lungo JH (2003) Data flows in health information system. Norway: master thesis. University of Oslo 25.
9. Kieran Walshe, Thomas G Rundall (2006) Evidence-based Management: From Theory to Practice in Health Care. California at Berkerley 39.

Copyright: ©2026 T Saruul. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.