

---

## **PUBLIC HEALTH INFORMATION STANDARD DATA QUALITY AND GOVERNANCE**

**Paramita**

Sekolah Teknik Industri dan Sistem, Universitas Telkom Bandung, Indonesia

[pramita@student.telkomuniversity.ac.id](mailto:pramita@student.telkomuniversity.ac.id)

---

### **ABSTRACT**

Many public health organizations face data quality challenges due to the complexity of the structure of clinical data systems, the massive growth in the volume of clinical data, and the need for more standardization between clinical systems in terms of naming and modelling. Data quality is an integral part of data governance, ensuring that data management is fit for purpose. It refers to the overall utility of a data set and its ability to be processed and analyzed quickly for other uses. This study uses a qualitative research method which is a principled research method that focuses on the description and understanding of the observed social phenomena. Moreover, the results of the study were obtained in the form of Standards for Data Quality according to the American Health Information Management Association (AHIMA) and the European Health Data Space (EHDS). In addition, there is also a discussion on privacy, security, and compliance. As well as obtaining a data governance framework for the health industry and good health industry governance. The conclusions from this study indicate that the quality of data and governance data in governance in the health industry is essential to ensure the achievement of effective and efficient health services and can be relied upon in decision-making.

**Keywords:** data quality, data governance, public health, health data.

---

Corresponding Author: Paramita

E-mail: [pramita@student.telkomuniversity.ac.id](mailto:pramita@student.telkomuniversity.ac.id)



### **INTRODUCTION**

Many public health organizations face data quality challenges due to the complexity of clinical system data structures, massive growth in clinical data volume, and the need for more standardization between clinical systems in terms of naming and modelling. Undoubtedly, poor data quality has a tremendous impact on the efficiency and effectiveness of public health organizations at both operational and strategic levels. All data problems are associated with a need for more effective governance. Data governance programs help public health organizations to determine the root causes of data quality problems and identify the best solutions that address all dimensions of the problem. Many disparate data sources within public health organizations are growing in volume yearly, making controlling vital patient data an unattainable goal. Understanding that data can lead to better public health decisions, ultimately leading to better business, transforms organizations into a new era of consuming patient data rather than producing it. Thus, effective data management requires attention to data quality to help organizations carry out suitable and quality data management.

#### **Data Quality**

Data quality is integral to data governance, ensuring that data organization is fit for purpose. It refers to the overall utility of a data set and its ability to be quickly processed and analyzed for

---

other uses. Data can be considered high quality if it is fit to serve a purpose in a particular context, for example, in operations, decision-making, and planning. Although this definition of data quality seems straightforward, many other definitions differ regarding qualitative or quantitative approaches to defining data quality. Data quality is essential in adequately measuring and analyzing science, technology, and innovation. This allows proper monitoring of research efficiency, productivity, and even strategic decision-making (Vancauwenbergh, 2019).

Data quality is synonymous with information quality. Data quality refers to the accuracy of the data set and its ability to analyze and create actionable insights for other users. People, processes, and technology are crucial elements for achieving high-quality data. All companies and organizations that deal with data need to define and follow a rigorous data quality approach to provide solid solutions to improve data quality and integrity. Such an approach should involve managing the lifecycle for data creation, transformation, and transmission to ensure that the resulting information meets the needs of all data consumers in the organization (Informatics, 2019).

### **Public Health Industry**

The Public health industry is health services for conditions of complete physical, mental and social well-being (Hee Lee & Yoon, 2021). The public health industry was not just the absence of disease or infirmity but health service provider institutions that are carried out by professional medical personnel organized to provide complete health services and good medical infrastructure (Dash et al., 2019).

### **Characteristics of Data Quality by The American Health Information Management Association (AHIMA)**

Data quality characteristics published by The American Health Information Management Association (AHIMA) can be the basis for setting data quality standards because these characteristics represent general dimensions of health data that should always be present. There are four domain areas according to AHIMA (Karen A. Wager, Frances W. Lee, 2021):

- a. Application: The place where the data comes from to be stored.
- b. Collection: The processes by which data elements are accumulated.
- c. Warehousing: The processes and systems used to archive data and data journals.
- d. Analysis: The process of translating data into information used for an application.

### **Characteristic of Data Quality by European Health Data Space (EHDS)**

Data quality is defined as fitness for purpose for user needs about health research, policy-making, and regulation and that the data reflect reality. The emphasis on data quality ensures that data is fit for decision-making, supporting health research and population health (European Commission, 2022). There are two main dimensions in identifying data quality according to EHDS (Hendolin, 2021):

- a. Institutional level: Dimensions of data quality at the institutional or institutional level.
- b. Data source level: The data quality dimension resides at the source level.

### **Data Governance in Public Health Industry**

The public health industry establishes data governance rules to ensure compliance with internal privacy and security policies and comply with externally regulated regulations, such as the Health Insurance Portability and Accountability Act (HIPAA) and the Privacy Act. The role of data governance here is to transform compliance with internal hospital policies and external regulations

---

from manual audits to automated, real-time checks and change-driven business processes that can instantly assess and manage risk.

For data governance to help organizations and public health systems, organizations/industries must do the following:

- a. Defining, agreeing, and communicating data strategies, policies, standards, architectures, procedures, and metrics is critical in emerging new models of care where 'trust' is a crucial element for working collaboratively.
- b. Enable compliance with data policies, standards, architectures, and procedures-have a shared taxonomy and ensure compliance.
- c. Use a consistent framework to help organizations sponsor, track, and oversee the delivery of data management projects and services in increasingly complex environments.
- d. Manage and resolve data-related issues-ensure users that the data they use is accurate.
- e. Provides a single system of records for data that needs to be consistent across platforms (e.g., customer, product, location) – supporting standardization in reporting and data protection measures.
- f. Create accountability and role connectivity, vertically and horizontally-improve organizational/system decision-making.
- g. Promote understanding of the value of data assets-sustain momentum in a data-driven digital economy.
- h. Facilitating the increasingly crucial digital conversation between patients and public health professionals about care in the face of new regulations.

## **METHOD**

This study used qualitative research methods. This principled research method focuses on describing and understanding the observed social phenomena. This method aims to find the characteristics and phenomena that fall into one category. Then the writer looks for the close relationship between the flow of symptoms that have different/similar characteristics that are found. Furthermore, the authors classify based on the nature of the symptoms that are classified to become a theory (Ahyar et al., 2020). Qualitative methods can also be used to understand human or social phenomena that can be described in complex and comprehensive words, provide detailed information from informants, and are conducted scientifically. This method aims to understand a context by leading to a detailed and in-depth description of a condition in a natural context about what happened in the field of study (Fadli, 2021).

## **RESULTS AND DISCUSSION**

### **The Standard of Data Quality according to AHIMA and EHDS**

The table below sets out the dimensions deemed most important at the data source level and how they might be defined. It was noted that the list closely resembles how quality is measured at cancer registries and other health information systems internationally. At the level of the institution, it was considered appropriate to revisit the matters of regulation (European Commission, 2022)

**Table 1. Standard Data Quality of American Health Information Management Association**

Characteristic	Definition
Accuracy	Data must be correct; a valid value is an accurate value. Name typography errors are an example of data inaccuracy.
Accessibility	Data that is only available when decision-makers need it is useful.
Comprehensiveness	All data needed for specific purposes must exist and be available to users. Data will only be helpful if it has complete.
Consistency	Quality data must be consistent. Using an abbreviation with two different meanings is an excellent example of how a lack of consistency can cause problems.
Currency	Many types of health data become obsolete after a certain period. The results of recognizing a patient's diagnosis are often different from recording a diagnosis at discharge. Therefore, the data must be up-to-date or updated.
Definition	Precise definitions of data elements must be provided so that current and future data users know what the data means. One way to provide precise data definitions is to use data dictionaries.
Granularity	Data granularity is usually referred to as data atomicity. Each data element is "atomic" because it cannot be broken down into more minor elements. Therefore, attributes and data values are clearly defined at the right level.
Precision	Precision is often related to numerical data. Precision indicates how close to an actual size, weight, or measurement standard is. Some health data must be exact. As such, drug doses should not be rounded to the nearest gram when drugs are dosed in milligrams.
Relevancy	Data must be relevant to the purpose for which it is stored. Storage is very accurate; data about favourite colours and hair types can be filled in promptly. Thus, the data collected must be relevant to the patient's treatment goals.
Timeliness	Timeliness is an essential dimension in the quality of various types of health data. For example, lab values for critical examinations must be made available to public health providers on time.

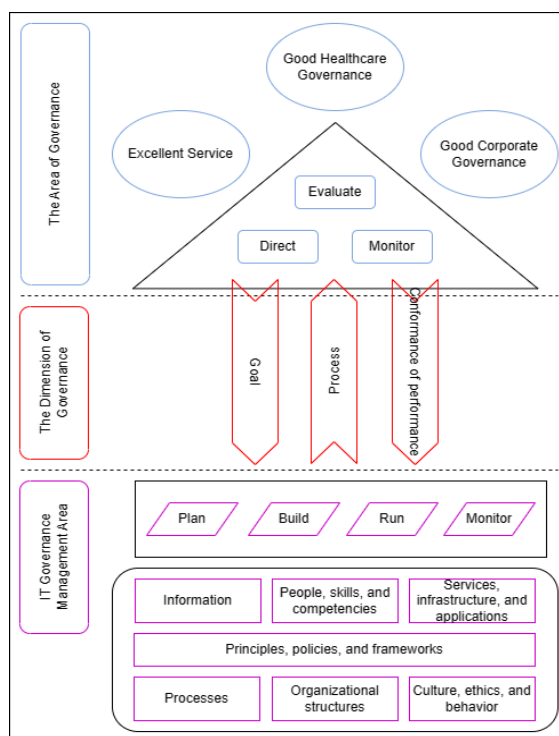
**Table 2. Data Quality by European Health Data Space**

Characteristic	Definition
Reliability	How closely does this data reflect what was designed to measure, and is it consistent over time?
Relevance	An aspect of data quality that determines if the data used or generated is relevant for migration into the system.
Timeliness	Data is collected within a reasonable timeframe and collected/reported on an agreed date, for example, closer to the decision maker's decision time.
Coherence	Data is consistent over time and across data holders and can be aggregated and compared with other data sources.
Coverage	The degree to which the data adequately covers the population/events (i.e. representative).
Completeness	How complete is the data variable?
Collection	Collecting data for business decision-making, strategic planning, research, and other purposes.
Publication	Documentation of data after data collection and analysis.
Delivery	Clear data processing procedures so as not to hinder meaningful reuse.

### Data Governance Framework for the Public Health Industry

Frameworks are used to develop desktop- or website-based applications (Ward, 2017). Using a framework will make it easier for users to create applications or websites (Pace et al., 2019). The public health industry needs a framework that can handle all hospital's needs to provide excellent service to the community. There are several kinds of frameworks (Sekhon et al., 2017). One of them

is the ISO 38500 framework. ISO 38500 framework can be developed as a proposed IT Governance model for the public health industry, which helps carry out the vision and mission of the health industry. This framework also uses Cobit 5 as an enabler as a guide in the monitor, run, plan and build process; COBIT 5 framework is described seven categories of enablers (Nugroho, 2017).



**Figure 2. IT Governance Model in the Public Health Industry**

The COBIT 5 framework enablers:

- a. Principles, policies, and frameworks are used to guide the day-to-day management of the hospital
- b. Processes are used to describe various activities in the health industry to achieve overall common goals
- c. Organizational structures are entities whose job is to make decisions
- d. Culture, ethics, and behaviour are used as benchmarks for successful governance
- e. Information is a source of information generated and used in the health industry.
- f. Services, infrastructure, and applications are used to process information and technology services in the health industry.
- g. People, skills, and competencies are used to carry out existing activities in the health industry also and adequately participate in decision-making.

**Good Public health Industry Governance**

To create good health governance, roles above and below are needed to adequately regulate the various policies and regulations stipulated in implementing health services (Pyone et al., 2017). Complexity and challenges in the health system require appropriate procedures in implementing health services to increase focus on creating good health governance (Gostin et al., 2020). The following are components of good health industry governance (Jafari et al., 2019):

**Table 3. Components Of Good Health Industry Governance**

<b>Component</b>	<b>Description</b>
Participation	The agreement of various stakeholders in this matter plays a significant role in creating good industrial health governance. In this case, the participation of the Ministry of Health will play a role in forming various policies, regulations, laws, and decision-making that will support good industrial health.
Transparency	Transparency, in this case, is easy access to information on various available health service platforms and the creation of sustainable information technology.
Rule of Law	A straightforward rule of law is the paramount supremacy in good governance, including in the health system, such as obtaining justice for all groups of recipients of health services.
Consensus orientation	Context orientation is the role of all government stakeholders working together to assist the community in overcoming various unrevealed health problems; this is related to the social, political, and economic context.
Accountability	Accountability is the commitment of the Ministry of Health to provide good quality services, rule of law, and provide health services for the community in order to create a fair treatment for the whole community.
Efficiency and effectiveness	Efficiency and effectiveness in providing health services with the support of various information technologies in order to create efficient and effective health services.
Responsiveness	Establish an effective justice system and provide guidelines for good industrial health to create responsiveness to society and monitor patient rights.
Equity	Increase understanding with citizens and stakeholders in health services to improve service quality.
Health Orientation	The orientation of health, in this case, is that the government is expected to focus on expanding health services, establishing a good lifestyle in society, preventing disease, and increasing public health services.
Decentralization	In this case, decentralization is delegating health authority and maintaining managerial control to various provinces and remote areas.

Good Public Health Industry Governance in the health industry is the cornerstone of good governance (WHO, 2018). Public health governance will protect and improve public health services by integrating and coordinating various relevant stakeholders and establishing reforms to improve people's good lives (Phelan et al., 2020). Public health governance requires multiple policies that provide synergy to deliver health services that are right on target. The role of government, society, and various sectors is crucial for developing good governance (Wenham & Eccleston-Turner, 2022).

## **CONCLUSION**

Good health company governance is essential to ensure the quality of data available to a health organization or company. Health data is essential in determining strategic or operational decisions for health companies. To ensure high data quality, corporate governance in public health must comply with several principles, such as transparency, accountability, and responsiveness. In addition, health companies must also have an excellent system to manage and store health data and ensure the security of this data. Data quality in the health industry refers to data accuracy, truth, completeness, and reliability in health-related decision-making processes. High-quality data in the health industry ensures effective and efficient health services. It is crucial to pay attention to data quality aspects in the health industry governance to achieve high-quality data that can be relied upon in decision-making.

## REFERENCES

- Ahyar, H., Maret, U. S., Andriani, H., Sukmana, D. J., Mada, U. G., Hardani, S.Pd., M. S., Nur Hikmatul Auliya, G. C. B., Helmina Andriani, M. S., Fardani, R. A., Ustiawaty, J., Utami, E. F., Sukmana, D. J., & Istiqomah, R. R. (2020). *Buku Metode Penelitian Kualitatif & Kuantitatif* (Issue March).
- Dash, S., Shakyawar, S. K., Sharma, M., & Kaushik, S. (2019). Big data in healthcare: management, analysis and prospects. *Journal of Big Data*, 6(1). <https://doi.org/10.1186/s40537-019-0217-0>
- European Commission. (2022). *European Health Data Space Factsheet*. 101035467.
- Fadli, M. R. (2021). Memahami desain metode penelitian kualitatif. *Humanika, Kajian Ilmiah Mata Kuliah Umum*, 21(1), 33–54.
- Gostin, L. O., Moon, S., & Meier, B. M. (2020). Reimagining global health governance in the age of COVID-19. *American Journal of Public Health*, 110(11), 1615–1619. <https://doi.org/10.2105/AJPH.2020.305933>
- Hee Lee, D., & Yoon, S. N. (2021). Application of artificial intelligence-based technologies in the healthcare industry: Opportunities and challenges. *International Journal of Environmental Research and Public Health*, 18(1), 1–18. <https://doi.org/10.3390/ijerph18010271>
- Hendolin, M. (2021). *Health Data Space : From*. 27(2), 15–17.
- Informatics, D.-G. for. (2019). *Data quality management*.
- Jafari, F., Hajinabi, K., Jahangiri, K., & Riahi, L. (2019). International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies Good Governance In The Health System : *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*, 10(8), 1127–1141. <https://doi.org/10.14456/ITJEMAST.2019.107>
- Karen A. Wager, Frances W. Lee, J. P. G. (2021). *Health Care Information Systems: A Practical Approach for Health Care Management*. John Wiley & Sons, Inc.
- Nugroho, H. (2017). Proposed IT Governance at Hospital Based on COBIT 5 Framework. *IJAIT (International Journal of Applied Information Technology)*, 1(02), 52–58. <https://doi.org/10.25124/ijait.v1i02.875>
- Pace, P., Aloj, G., Gravina, R., Caliciuri, G., Fortino, G., & Liotta, A. (2019). An Edge-Based Architecture to Support Efficient Applications for Healthcare Industry 4.0. *IEEE Transactions on Industrial Informatics*, 15(1), 481–489. <https://doi.org/10.1109/TII.2018.2843169>
- Phelan, A. L., Katz, R., & Gostin, L. O. (2020). The Novel Coronavirus Originating in Wuhan, China: Challenges for Global Health Governance. *JAMA - Journal of the American Medical Association*, 323(8), 709–710. <https://doi.org/10.1001/jama.2020.1097>
- Pyone, T., Smith, H., & Van Den Broek, N. (2017). Frameworks to assess health systems governance: A systematic review. *Health Policy and Planning*, 32(5), 710–722. <https://doi.org/10.1093/heapol/czx007>
- Sekhon, M., Cartwright, M., & Francis, J. J. (2017). Acceptability of healthcare interventions: An overview of reviews and development of a theoretical framework. *BMC Health Services Research*, 17(1), 1–13. <https://doi.org/10.1186/s12913-017-2031-8>
- Vancauwenbergh, S. (2019). Data Quality Management. *Scientometrics Recent Advances*, 1–15. <https://doi.org/10.5772/intechopen.86819>
- Ward, V. (2017). Why, whose, what and how? A framework for knowledge mobilizers. *Evidence and Policy*, 13(3), 477–497. <https://doi.org/10.1332/174426416X14634763278725>
- Wenham, C., & Eccleston-Turner, M. (2022). Monkeypox as a PHEIC: Implications for global health governance. *The Lancet*, 400(10369), pp. 2169–2171. [https://doi.org/10.1016/s0140-6736\(22\)01437-4](https://doi.org/10.1016/s0140-6736(22)01437-4)
- WHO. (2018). Multisectoral and intersectoral action for improved health and well-being for all: mapping of the WHO European Region. Governance for a sustainable future: improving health and well-being for all. (No. WHO/EURO: 2018-2667-42423-58849). *World Health Organization*
-

*Regional Office for Europe, 1–100.*



© 2023 by the authors. Submitted for possible open-access publication under the terms and conditions of the Creative Commons Attribution (CC BY SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).