



Effectiveness of Integrated Information Systems in Reporting Public Health Data: Literature Study

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ABSTRACT

ARTICLE INFO

Article History

Received: 23-11-2025

Accepted: 12-12-2025

Keywords:

Integrated
Information
System, Health
Data Reporting,
Effectiveness

This study aims to analyze the effectiveness of implementing Integrated Information Systems, such as the Community Health Center Management Information System (SIMPUS) and the Health Information System (SIK), in improving public health data reporting in healthcare facilities, particularly community health centers. The method used was a literature review of various studies published between 2020 and 2025. The results of the review indicate that implementing health information systems has been proven to accelerate service processes, improve data accuracy, and facilitate reporting to relevant agencies.

However, implementation effectiveness is still influenced by human resources, technological infrastructure, internet network stability, and support from regional management and policies. Frequent obstacles include lack of operator training, technical system disruptions, and differences in readiness between regions. Therefore, increasing human resource capacity, strengthening infrastructure, and continuous system integration are key to achieving effective, accurate, and sustainable public health data reporting.

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Published by <https://ojs.ucp.ac.id>

INTRODUCTION

In today's information age, information is an object that must be quickly distributed and received by anyone who needs it. In addition, quality information (data that *valid* And *up-to-date*) is a key factor in effective decision-making that meets existing needs. The availability of health information is essential for implementing effective and efficient health efforts (Suary & Yunengsih, 2024).

Currently, the world of technology and information has experienced very rapid development, so to keep up with the progress and development of technology and information, we are required to follow existing developments (Rewah et al., 2020).

Health services are efforts in planning, implementing, evaluating, recording, and reporting, all of which are compiled into a system carried out by community health centers (Umar & Maksum, 2022). Patient satisfaction depends on the quality of services provided (Wiwiek Indriany Sary S et al., 2021). To improve the quality of health services, the government uses information technology (IT), based on the Decree of the Minister of Health of the Republic of Indonesia Number 128/MENKES/SK/II/2004 as stated in the article (Mawardi et al., 2020).

An information system is a part of an organization or company that functions to produce and provide information that can be accessed by one or more users. This system

works in an integrated manner. to collect, process, store, and disseminate information (Awal, 2023). A Health Information System (HIS) is a collection of integrated systems designed to manage data, information, indicators, procedures, technology, devices, and human resources. A HIS supports decision-making and action to achieve health goals (Arwananing Tyas & Nata Negara, 2022).

Information systems act as the main tool in managing. Data is transformed into useful information for decision-makers (Widiyanto et al., 2023). SIMPUS is a crucial structure that supports the decision-making process in Community Health Center management to achieve its service objectives (Ministry of Health of the Republic of Indonesia, 2004). By utilizing data from the Integrated Health Center Recording and Reporting System (SP2TP), SIMPUS is expected to improve the quality of Community Health Center management and support better service delivery (Handayani, 2020).

Another drawback of SIMPUS is data collection issues. Some districts or cities have yet to submit their Community Health Center data reports, the data entry format does not comply with provincial standards, data reports are often late, the data coverage is too broad, and the online SIMPUS system is slow. However, optimal implementation of SIMPUS can reduce the workload of staff and improve the quality of patient care. With the resulting efficiencies in time, effort, and costs, SIMPUS has the potential to increase the satisfaction of both service users and healthcare organizations (Suary & Yunengsih, 2024)).

Although SIMPUS was designed as a solution to address health management issues, its implementation in West Java still faces various technical and operational challenges. Issues such as late reporting, data inaccuracies, limited facilities and infrastructure, and a lack of technological understanding among staff have prevented the system from functioning optimally. If these challenges are not addressed promptly, they could degrade the quality of services at community health centers (*puskesmas*), hamper data driven decision making, and ultimately lower public satisfaction with healthcare services.

Therefore, a literature review is essential to assess the effectiveness of implementing an Integrated Information System in reporting public health data. Through a literature review approach, this research is expected to identify the extent to which the system improves the efficiency, accuracy, and quality of health data, while also identifying factors influencing its success or failure in field implementation.

METHOD

This study employs a literature review method as its scientific approach. The selection of articles was conducted based on predetermined inclusion criteria, namely articles published between 2020 and 2025 and those that have a direct relevance to the topic of SIMPUS. Articles that did not meet these criteria were excluded from the review. All journal sources used in this study were obtained through searches conducted exclusively on the Google Scholar database.

The search process involved identifying relevant literature by entering keywords related to SIMPUS and primary healthcare information systems. Titles and abstracts were screened to ensure alignment with the inclusion criteria, followed by full-text reading to assess eligibility. Only studies that explicitly addressed SIMPUS implementation, evaluation, or its administrative impact were included in the final analysis. The selected

articles were then synthesized using a descriptive narrative approach to identify key themes, patterns, and findings related to the role of SIMPUS in healthcare administration.

RESULT AND DISCUSSION

Table 1. Literature Review Results

Title	Author (Year)	Aim / Method	Key Findings
Implementation of the Community Health Center Management Information System (SIMPUS) in Improving Health Services at Beji Community Health Center, Tulungagung	(Cahyanti et al., 2025)	Method: Qualitative descriptive. Aim: Analyze SIMPUS implementation across service stages.	SIMPUS improves digitization, speeds service flow, reduces recording errors, supports data access, registration, queues, and medical records. Obstacles include network disruption and technical issues.
Implementation of Health Information Systems in Various Community Health Centers	(Tyas & Negara, 2022)	Method: Literature study. Aim: Evaluate effectiveness, efficiency, and transparency of SIK/SIMPUS implementation.	Effectiveness still low due to data inconsistency; efficiency limited by irregular maintenance; transparency improving but still needs development. Overall implementation remains suboptimal.
Implementation of Health Information Systems in Community Health Centers in Indonesia	(Hanafi et al., 2025)	Method: Literature review of Indonesian studies (2018–2024). Aim: Assess contributions and challenges of SIK implementation.	Health information systems improve data efficiency and service quality; challenges include limited HR capacity, inadequate infrastructure, and network issues. Recommends training, better integration, and infrastructure strengthening.
Implementation of the Community Health Center Management Information System (SIMPUS) at Lawang Gintung Health Center, Bogor	(Indah & Yunengsih, 2024)	Method: Qualitative descriptive; purposive sampling; interviews & observation. Aim: Examine SIMPUS use and obstacles.	SIMPUS improves administration but faces network issues, incomplete features, and limited staff competency. Recommends better training and infrastructure.
Evaluation of Health Information System Utilization for Program Accuracy and Planning in Indonesian Health Facilities	(Putri, 2025)	Method: Qualitative systematic literature review. Aim: Evaluate HIS role in planning and decision-making.	HIS improves data-driven planning and service efficiency; main barriers include low HR competency, limited system integration, and infrastructure gaps. Calls for capacity building and policy support.

Based on the results of a review of various relevant studies, the implementation of Integrated Information Systems or health information systems such as SIMPUS and SIK has an important role in increasing the effectiveness of reporting public health data in various health service facilities, especially at the Community Health Center level.

In general, the research results show that this information system is capable of speeding up the service process, increase data accuracy, and facilitate reporting to relevant agencies. However, the effectiveness of the system still depends on several key factors, including the quality of human resources, the availability of infrastructure, as well as network stability and management support.

Discussion

Effectiveness of Integrated Information Systems in Public Health Data Reporting

Based on a literature review, the implementation of Integrated Information Systems (SIMPUS, SIK) has been shown to positively contribute to public health data reporting, particularly at the community health center (Puskesmas) level. Several studies have found that these information systems can accelerate administrative service and reporting processes, reduce recording errors, and facilitate data delivery to health offices or relevant policymakers (Tyas & Negara, 2022).

However, actual effectiveness in the field is conditional, depending on supporting factors such as human resource quality, infrastructure availability (hardware and software), network connection stability, and managerial commitment to providing training and technical support. The reviewed studies consistently report obstacles in infrastructure and competency aspects that result in reporting delays, data inconsistencies, and system features that do not yet cover all service units (Suary & Yunengsih, 2024). Furthermore, information system effectiveness is also closely related to aspects of sustainability and technological adaptability at the regional level. Based on research (Hanafi et al., 2025), the success of HIS implementation in Indonesia still varies due to differences in infrastructure readiness between regions.

In addition to improving reporting efficiency and accuracy, the Integrated Information System also plays a crucial role in supporting evidence-based decision-making in the health sector. Through the digitization of public health data, community health centers (Puskesmas) and health offices can monitor disease trends, immunization coverage, and the need for drugs and medical devices in real time. This helps develop health programs that are more targeted and responsive to field dynamics. Research by (Putri, 2025) shows that the implementation of SIK and SIMRS encourages increased program planning accuracy and decision-making efficiency. However, this effectiveness is only achieved if the system is managed consistently and supported by national policies that prioritize cross-sector integration. This system can accelerate service processes, improve data accuracy, and simplify reporting to relevant agencies. Research by (Cahyanti et al., 2025) shows that SIMPUS helps digitize health information, accelerate services, and reduce errors in patient data recording. Furthermore, this system also facilitates coordination between units such as pharmacies, laboratories, and BPJS Kesehatan through horizontal integration, as well as reporting to health offices through vertical integration.

In areas with stable internet connections and strong local government support, health information systems have proven effective and provide tangible benefits to improving service quality. Conversely, in remote areas, limited facilities and operator competency remain major obstacles. Therefore, strategies for increasing human resource capacity, technology funding, and systems integration policies from the central government to the regions are needed to ensure more effective, accurate, and sustainable public health data reporting.

The main benefits of a health information system

A review of various studies shows that Health Information Systems (HIS), including SIMPUS (Community Health Center Management Information System), play a crucial role in improving the effectiveness of data management and the quality of healthcare services in various healthcare facilities. These systems offer significant benefits in accelerating service processes, improving data accuracy, and simplifying reporting to healthcare institutions.

Research (Putri, 2025) confirms that health information systems play a major role in supporting data-based decision making (*data-driven decision making*) in healthcare facilities. Through an integrated system, public health data can be processed in real time and used as a basis for program planning and health resource allocation. However, this study also found that low operator competency and network limitations remain barriers to achieving the full effectiveness of the information system.

In addition, (Tyas & Negara, 2022) through *literature review* concluded that the implementation of HIS in various regions in Indonesia has contributed to increased effectiveness, efficiency, and transparency in health data management. However, these benefits have not been optimal due to persistent challenges such as data inconsistency, lack of user training, and irregular system maintenance. This suggests that improving human resource capacity and infrastructure support are crucial for maximizing the benefits of information systems.

Another point was also made by (Amin et al., 2024). An integrated information system makes the service process faster and more structured. Patients don't have to wait long for registration or medication pick-up. Furthermore, doctors and medical personnel can easily access patients' medical histories, allowing them to provide more accurate diagnoses and treatments.

Factors Affecting the Effectiveness of Health Information Systems

Based on the results of various studies, the effectiveness of health information systems such as SIMPUS and SIK is greatly influenced by several main factors, namely the competence of human resources (HR), the availability of technological infrastructure, the stability of the internet network, and management support in system implementation. The quality and capability of HR are very important aspects, because the success of system implementation depends not only on the software, but also on the ability of officers to operate and utilize the system optimally. Research (Cahyanti et al., 2025) shows that although SIMPUS helps speed up services and improve administrative efficiency, limited understanding of technology among officers remains a major obstacle in system implementation in Community Health Centers.

One crucial factor affecting the effectiveness of health information systems is the limited competence of human resources (HR) in information technology. Many healthcare

workers lack adequate skills in operating SIMPUS, while the training programs provided are often general and not conducted continuously. However, managing information systems requires technical expertise and a sound understanding of health data management. This situation has resulted in suboptimal implementation of SIMPUS, as implementing personnel have not been fully able to utilize the system's features effectively. As a result, data recording and reporting processes at community health centers continue to face obstacles, thus the system's primary goal of supporting data-driven decision-making has not been fully achieved (Faris & Janitra, 2025).

In some cases, SIMPUS is only used to a limited extent or even not used at all due to frequent technical glitches. However, in the context of digital-based public services, a stable infrastructure is a key prerequisite for real-time and accurate recording, referral, and reporting (Adha et al., 2023).

ACKNOWLEDGMENT

The authors would like to express their gratitude to all supervisors, colleagues, and institutions who provided support, guidance, and valuable contributions that made this study possible.

CONCLUSION

Based on a literature review, the implementation of Integrated Information Systems such as SIMPUS and SIK has been shown to increase the effectiveness of public health data reporting, particularly at the community health center (Puskesmas) level. These systems help expedite services, improve data accuracy, and simplify reporting to relevant agencies. However, their effectiveness still depends on human resource readiness, infrastructure availability, network stability, and management support. Common challenges identified include limited operator training, system disruptions, and differences in readiness across regions.

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