IJMR E-ISSN: 3109-9777
INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEACH

EMPOWERING VILLAGE GOVERNMENTS THROUGH PARTICIPATORY TRAINING MANAGEMENT CYCLE: IMPLEMENTATION OF THE SIK ELHAN HEALTH INFORMATION SYSTEM IN TOMOHON CITY

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E-ISSN : 3109-9777		
Received: April 2026	Accepted: April 2026	Published: April 2026

Abstract:

Health data management at the village level in Tomohon City faces significant challenges, including limited human resource capacity, non-integrated systems, and manual data collection that hinders the planning of priority health programs. This Community Service Program (PKM) aims to address these issues by establishing an information system and building the capacity of village officials, with the primary outcome being the creation of a sustainable Village Health Information System (SIK ELHAN). Methods: The study employed a participatory Training Management Cycle approach, consisting of four stages: (1) Training Needs Assessment to identify partner requirements; (2) Training Design to develop training programs and system architecture; (3) Training Delivery involving hands-on training, tutorials, and direct mentoring; and (4) Training Evaluation using Key Performance Indicators (KPIs) to measure effectiveness and impact. This methodology actively engaged partners throughout all stages. Results: The program successfully developed and implemented SIK ELHAN, a web-based system enabling structured and real-time recording and reporting of community health data. Thirty village officials and healthcare workers were trained, with 85% of participants demonstrating independent system operation capability. Evaluation results showed a 70% increase in participant understanding based on pre-test and post-test comparisons. The Village Government demonstrated strong commitment to sustainability by appointing dedicated administrators for SIK ELHAN management, supported by a 90% partner satisfaction rate. The participatory Training Management Cycle approach proved effective not only in providing the technical solution of SIK ELHAN but also in empowering partners through capacity building. This program successfully established a robust foundation for digital transformation of health data management at the village level, which is expected to support more effective data-driven health program planning and monitoring in Tomohon City.

Keywords: *training management cycle, health information system, community empowerment, digital transformation*

INTRODUCTION

Improving the quality of healthcare services at the sub-district level is a crucial component of the national healthcare system (*World Health Organization* /WHO 2018). The Sub-district Health Information Data System (SDIK) plays a key role in providing accurate and real-time data for more effective health program planning (World Bank 2019). However, many sub-districts still face challenges in managing health data due to limited infrastructure, human

resources, and a lack of information system integration (Ministry of Health Indonesia 2020; Setiawan et al. 2021). Therefore, community service activities related to SDIK are crucial for improving the efficiency and effectiveness of healthcare services at the local level.

According to *the World Health Organization* (WHO), a good health information system must be able to systematically collect, manage, and analyze health data to support evidence-based decision-making (WHO 2020). SDIK in sub-districts can help monitor public health conditions, detect diseases early, and optimize health resources (BPS Indonesia 2021). Implementation of this system also supports the achievement of the *Sustainable Development Goals* (SDGs), particularly in increasing access to quality and equitable health services (*United Nations* /UN 2021).

One of the main challenges faced is the limited capacity of healthcare workers to operate health information systems (Aisyah et al. 2024). Therefore, training and mentoring through community service activities are a strategic solution to improve digital literacy among healthcare workers in sub-districts (Surayani et al. 2020). Furthermore, community involvement in data collection and reporting is also a crucial aspect in improving data quality and the effectiveness of health interventions (Ministry of Health of the Republic of Indonesia 2021).

With this community service, it is hoped that the health information system at the village level will be more integrated and contribute to better health policy planning. Furthermore, strengthening the SDIK will increase government responsiveness to public health issues, such as disease outbreaks, stunting, and maternal-child health. Therefore, sound SDIK implementation can serve as a foundation for more informed, evidence-based decision-making in the public health system.

The results of observations on partners identified several problems, namely:

1. There is no public health data available in every sub-district in Tomohon City.
2. There is no health information system in every sub-district in Tomohon City.

Therefore, this community service activity is designed to implement "training activities on village health information systems." This program aims to create a system that can increase government responsiveness to public health issues, such as disease outbreaks, stunting, and maternal-child health. The objectives of this activity are:

IMPLEMENTATION METHOD

The Community Partnership Program (PKM) aims to address the challenges faced by its partners, namely the Village Governments in Tomohon City, North Sulawesi, by strengthening their capacity in health data management. The primary method adopted is a participatory ***Training*** **Management Cycle ,** in which partners are actively involved in every stage. This cycle consists of four main stages: needs assessment, design, implementation,

and evaluation.

1. *Training Needs* Assessment

This stage serves as the foundation for all activities. The proposal team conducts initial communication and coordination with the Village Government to discuss various aspects, from the background of the importance of health information systems, identifying specific partner needs, to the objectives and scope of the activities. A participatory approach is implemented by actively involving partners in this assessment process. The outcome of this stage is a mutually agreed-upon solution that truly reflects the partners' needs. The formal agreement for PKM implementation is represented by the Village Head.

2. Activity Design (*Training Design*)

Based on the assessment results, the proposal team developed a detailed activity plan to achieve the established output targets. This plan included the type of activity, methods, schedule, location, resource persons, participants, and the readiness of materials and logistics. Partners were again actively involved in this planning stage by providing ideas, suggestions, and input. The target participants were sub-district government officials who would later have the knowledge to operate the health information system.

3. Implementation (*Deliver Training*)

Once the design is approved, the team executes the activities as agreed. The team leader ensures all operations run according to plan. Implementation is carried out using different methods, tailored to the target output, including:

a. Identification/Survey: for initial mapping of potential People with Disabilities (ODD).
b. Campaign & Outreach: for outreach and training using broadcast materials.
c. Tutorial/Demonstration: for creating a health information system.
d. Writing Guide: for compiling scientific articles.

Partner contributions at this stage include preparing training venues and mobilizing participants through official invitation letters.

4. Evaluation (*Training Evaluation*)

Evaluations are conducted at the end of the program to measure success and provide guidance for improvement. The team uses simple Key Performance Indicators (KPIs), such as the number of potential people with disabilities (ODD) identified, the number of participants trained, and the number of participants able to create information systems. Evaluation steps include identifying gaps, facilitating program sustainability by partners, follow-up visits, and impact surveys with participants.

Application of the Method in the Development of a Health Information System (SIK ELHAN) In practice, this method is realized in the development of a Village Health Information System (SIK ELHAN). The process begins with problem analysis and the collection of public health data at the village level. Based on the identified problems, a website-based system is designed to record and report health data. After the website is completed, training is conducted for field officers (Head of Neighborhood and his Deputy) covering data collection

techniques and the use of the SIK ELHAN application. The final success of the activity is measured by the existence and functioning of SIK ELHAN in each partner village.

Thus, this research method emphasizes a structured and collaborative cycle approach, ensuring that the solutions offered (SIK ELHAN) are not only on target but also sustainable because they are born from and implemented with partners.

RESULTS AND DISCUSSION

1. Results of *the Training Needs Assessment* Stage

Based on participatory discussions and coordination with partner sub-district governments in Tomohon City, the community service team succeeded in identifying the root of the problem, namely:

- **a.** Limited Human Resource Capacity: Health workers and village officials experience difficulties in operating the existing health information system.
- **b.** Unintegrated Systems: Public health data is still managed manually and is scattered, making effective program planning difficult.
- **c.** Urgent Need: There is an urgency to have a simple, real-time system that can be operated by village-level personnel to support priority programs such as stunting management and epidemic prevention.

2. Results of the Activity Design Stage (*Training Design*)

Based on the assessment results, the team designed activities with the primary output of establishing a Village Health Information Data System (SDIK), named "SIK ELHAN." The activity plan agreed upon with partners includes:

a. Target Participants: Attended by village officials and health workers from all partner villages.
b. Training Material: Specially designed to cover data collection techniques, use of the ELHAN SIK application, and basic data interpretation for decision making.
c. Method: Combination of counseling, tutorials, and hands *-on practice*.
d. Partner Contribution: The Village Government actively prepared the location, mobilized participants, and provided input in preparing the materials.

3. Results of the Implementation Phase (Deliver Training)

The training and mentoring activities were successfully implemented on August 18-20, 2025 with the following achievements:

a. Training Runs Effectively: 30 participants from village officials and health workers were successfully trained. Participants demonstrated enthusiasm and active engagement during both theory and practical sessions.
b. Implementation of the ELHAN SIK System: The ELHAN SIK website-based information system has been successfully developed

and implemented in all partner villages. This system enables structured, *real-time* recording and reporting of public health data (such as data on toddlers, pregnant women, and disease cases).

c. Human Resource Capacity Building: Through tutorial and demonstration methods, 85% of training participants were declared to have passed the practical evaluation and were able to operate SIK ELHAN to input data, generate simple reports, and perform basic analysis.
d. Availability of Supporting Materials: Training materials, SIK ELHAN user guide modules, and ready-to-use software have been produced.

4. Results of the Evaluation Stage (*Training Evaluation*)

Evaluation is carried out to measure the success and impact of activities based on the established *Key Performance Indicators (KPIs):*

a. Output Quantity:
   1) The construction of 1 SIK ELHAN system unit which is accessed by all partner sub-districts.
   2) 30 health workers and village officials were trained.
b. Output Quality:
   1) The post-test results showed a 70% increase in participants' understanding compared to the pre-test.
   2) 100% of partner sub-districts have initial health data (*initial baseline*) inputted into the system.
c. Impact and Sustainability
   1) The Village Government stated its commitment to continue using SIK ELHAN and has appointed a special admin to manage the system.
   2) 90% satisfaction rate , with the majority of participants feeling more confident in managing health data.
d. Example of ELHAN SIK results regarding the quality of life of the elderly in Tomohon City

   SIKESDA Website City Tomohon is a digital platform designed to monitor and present data on the quality of life of older adults in Tomohon City. The goal is to provide accurate and efficient information to support improving the well-being of older adults in the region.

Figure 1. Initial display of the Village Information System

(Source : https://sikesdakotatomohon.durablesites.com/unpublished)

Structure Page And Feature Home Page (Home) presents an introduction to the purpose and importance of monitoring the quality of life of the elderly. Quality of Life Statistics : Displays visual data such as graphs and diagrams regarding various aspects of seniors' lives, including physical health, psychological health, cognitive status, and social support.

Figure 2. Display of quality of life categories for the elderly

Influencing Factors : Explains factors that influence the quality of life of the elderly, such as physical and mental health, social support, and cognitive status.

Data Per Ward : Provide information amount elderly in 25 sub-district in City Tomohon based on data Practice Study Field Faculty of Public Health Unsrat 2024.

Figure 1. Opening of Activities in the Tomohon City Government Hall with the Tomohon City Government

Figure 2. Participants in the trainee training at FKM Unsrat students

Figure 3. Implementation of training by FKM Unsrat students in Woloan Village

Figure 4. Implementation of Community Service in Talete Village

The results of this Community Service (PKM) program consistently demonstrate the effectiveness of the participatory Training Management Cycle approach. This success is due to the alignment of the applied methodology with the principles of digital health transformation advocated by global health organizations and the latest research findings.

1. The Success of Participatory Approaches in Assessment and Design

Accurate identification of root causes during the assessment phase—human resource limitations, unintegrated systems, and urgent needs—was key to partners' acceptance of the solution. This participatory approach aligns with the findings of Karsan et al. (2024) who emphasized the importance of "inclusive dynamic facilitation" to ensure the adoption of health information systems (HIS) by end-users. By involving partners from the outset, the design of the ELHAN HIS system and its training materials could be tailored to the operational context of the village, thus avoiding the resistance often encountered in top-down system implementations. Partners' active contributions in site preparation and participant mobilization, as seen at this stage, were significant drivers, as also identified in evaluations of HIS implementation across multiple contexts (Aisyah, 2025).

2. Effectiveness of Hands-on Training Method and System Implementation

The 85% success rate of participants in operating the ELHAN SIK demonstrates the effectiveness of the combined method of counseling, tutorials, and hands-on practice. This strategy adopts principles successfully applied in SIPETER workshops, where real-life case simulations and hands-on practice have been shown to improve healthcare workers' skills in using digital applications (Santosa et al., 2025). Furthermore, this reflects the findings of Karsan et al. (2024) on the importance of "practical activities for knowledge retention." The training, which was not only theoretical but also allowed participants to directly interact with the system in real-world scenarios (data input, report generation), has built their confidence, as reflected in the 90% satisfaction rate in the survey.

3. Achieving Digital Transformation at the Primary Level

The successful development and implementation of the ELHAN Health Information System (HIS) in all partner villages is a strategic step in optimizing the routine health information system at the most basic level. This aligns with the WHO roadmap (2024) which emphasizes strengthening primary data capacity as the foundation of the national health information system. By transforming data management from manual and scattered to structured and real-time, the ELHAN Health Information System (HIS) contributes to global efforts to create reliable health data for planning and monitoring priority programs, such as stunting management. The ELHAN Health Information System (HIS) feature, which can display statistical and per-district data, as seen in the elderly quality of life module, is a concrete example of utilizing HIS for data-driven decision-making, as recommended in a systematic review of HIS (Aisyah et al. 2024).

4. Impact of Sustainability and Institutional Commitment

The Village Government's commitment to continuing the use of SIK ELHAN and the appointment of a dedicated administrator are critical indicators of sustainability. This step demonstrates that the proposed solution has been adopted as part of the village's work system, not just a one-time project. This principle aligns with the proposal for Health Information Technology as a Learning Health System, where the system is designed to continuously learn and adapt based on data and feedback, requiring institutional commitment to ongoing training and development (Astuti et al. 2020). The appointment of a dedicated administrator is also a strategy to address the challenges of information system implementation, which are often hampered by human resource rotation and lack of ownership, as identified in the analysis of SIMPUS implementation challenges (Aisyah et al. 2024).

Recommendation

Based on the discussion above, several recommendations are proposed to ensure the sustainability and scalability of SIK ELHAN:

1. Development of Continuous Training Modules: It is recommended to develop scheduled follow-up and *refresher training modules, adopting the "Learning Health System" model*. These modules could include more in-depth data analysis and system troubleshooting , as implemented in the SIPETER workshop (Santosa et al., 2025).
2. Data Expansion and Integration: To support regional priority programs, the ELHAN SIK needs to be expanded by adding specific modules, such as more detailed nutrition monitoring modules for toddlers and pregnant women. This aligns with the WHO strategy to strengthen routine data collection and analysis (WHO, 2024).
3. Policy Advocacy and Scalability: The Tomohon City Government should be encouraged to adopt SIK ELHAN as a standard platform for all sub-districts. This will standardize data, facilitate consolidation, and support more integrated health development planning at the city level, addressing

the challenges of information system fragmentation as identified (Aisyah 2025).

4. Building a Technical Support Network: Establishing a technical support forum or group (for example, through an instant messaging app) that connects village administrators with a team of experts. This strategy has proven effective in maintaining system continuity by providing rapid *troubleshooting* and knowledge sharing among users (Karsan et al., 2024).

CONCLUSION

Based on the implementation of the activities, it can be concluded that the participatory Training Management Cycle approach successfully addressed partner issues. This success was marked by the establishment of the Village Health Information System (SIK ELHAN), which transformed data management from manual to digital, the training of 30 village officials with an 85% success rate, and the achievement of institutional commitment to program sustainability. Overall, this activity not only provided technical solutions but also empowered partners, thus creating a strong foundation for data-driven health program planning and monitoring at the village level.

Suggestion

Based on the results and discussions of PKM activities, here are three main suggestions to ensure sustainability and further development:

1. Sustainable Capacity Building for Partners
   It is recommended to develop a refresher training program *and* regular mentoring for SIK ELHAN administrators in each sub-district. This program should focus on basic data analysis and technical troubleshooting *to* ensure partners' independence in managing and utilizing the system in the long term.
2. Policy Advocacy and Data Integration at the City Level
   Advocacy is needed for the Tomohon City Government to adopt SIK ELHAN as a standard health information system platform for all sub-districts. This policy will create data integration, facilitate integrated monitoring, and support more evidence-based and effective city health development planning.
3. Feature Development and Technical Support Network
   The ELHAN SIK needs to be developed by adding specific modules, such as stunting monitoring and immunization, to make it more relevant to regional priority programs. In parallel, a technical support network (for example, via a messaging app group) should be established that connects all village administrators with a team of experts to facilitate questions and answers and quickly share solutions.

Thank-You Note

The author would like to thank the Institute for Research and Community Service (LPPM) of Sam Ratulangi University, Manado, for providing financial support for this community service. He also thanked all government officials in Tomohon City, including the Mayor, Deputy Mayor, and Assistant Mayors, as well as all the trainers and participants who participated in this activity.

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