



ANALYZING BARRIERS AND STRATEGIES TO IMPROVE HEALTH SCREENING IMPLEMENTATION FOR ADULTS AND ELDERLY

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ABSTRACT

Non-communicable diseases (NCDs) such as hypertension, diabetes, and cardiovascular disease are major health problems in Indonesia, particularly among adults and the elderly. Health screening is essential for early detection, yet its implementation in primary health centers faces various challenges. This study aims to analyze barriers, supporting factors, and strategies to optimize health screening. This qualitative case study was conducted in five Puskesmas in Cilegon City, selected through purposive sampling. A total of 42 informants were involved, including Puskesmas heads, program managers, health workers, cadres, community members, and health office representatives. Data were collected using in-depth interviews, focus group discussions (FGDs), participatory observations, and document reviews. Data were analyzed thematically using Braun and Clarke's framework, guided by the theories of Policy Implementation and the Theory of Planned Behavior (TPB). The main barriers included limited human resources, inadequate facilities, fragmented reporting systems, and low community awareness. Supporting factors were leadership commitment, active cadres, outreach innovations, integration with other services, and cross-sectoral collaboration. Optimizing health screening requires strengthening reporting systems, improving human resource capacity, cross-sectoral advocacy, and community-based approaches. Policy support, application integration, training, and local-level.

Keywords: adults; elderly; health screening; non-communicable diseases; primary health care

How to cite (in APA style)

Damayanti, P., Pramudho, K., & Purnamasari, R. (2025). Analyzing Barriers and Strategies to Improve Health Screening Implementation for Adults and Elderly. *Indonesian Journal of Global Health Research*, 8(1), 359–368. <https://doi.org/10.37287/ijghr.v8i1.344>.

INTRODUCTION

Non-communicable diseases (NCDs), including hypertension, diabetes mellitus, and cardiovascular diseases, are the leading causes of morbidity and mortality worldwide. According to the World Health Organization (2023), NCDs account for more than 70% of global deaths, with a substantial burden borne by low- and middle-income countries. The growing prevalence of NCDs also poses significant economic and social challenges, straining national healthcare systems (Bloom et al., 2022). In Indonesia, the prevalence of NCDs has steadily increased over the past decade. The 2018 Basic Health Research (Riskesdas) reported a rising trend of hypertension and diabetes among adults (Kementerian Kesehatan RI, 2019). This escalation is associated with lifestyle changes, aging populations, and urbanization. Health screening is therefore recognized as a vital preventive strategy to detect risk factors early, initiate timely management, and reduce long-term complications. Recent evidence shows that community-based screening interventions significantly improve early diagnosis and reduce treatment costs in Southeast Asia (Nguyen et al., 2021).

To strengthen preventive services, the Indonesian Ministry of Health introduced the Integrated Primary Care (Integrasi Layanan Primer, ILP) policy, mandating Puskesmas to conduct life-course health screening (Kementerian Kesehatan RI, 2023; 2024). This policy framework aligns with the global call for stronger primary healthcare and underscores the central role of Puskesmas in delivering preventive services. Despite this regulatory support, implementation remains uneven. A national survey highlighted that community satisfaction with Posbindu PTM services was modest,

pointing to issues in accessibility, logistics, and human resources (Sari et al., 2022). Furthermore, an evaluation of hypertension screening revealed missed opportunities due to inadequate staff, limited logistics, and fragmented reporting systems (Yuliana & Sutrisno, 2024).

Behavioral barriers also remain a challenge. The Theory of Planned Behavior (Ajzen, 1991) emphasizes that attitudes, subjective norms, and perceived behavioral control shape individuals' intention to participate in preventive health services. In practice, low community awareness and reluctance to attend screenings demonstrate how psychosocial factors can undermine program success, even when services are available. At the local level, Cilegon City represents a unique industrial-urban setting, with 7.64% of its population aged 60 years and above and 66.21% in the productive age group. These demographics highlight the strategic importance of adult and elderly health screening. However, the 2024 coverage of adult health screening was only 78.8% and elderly screening 76.25%, both below the national targets (Dinas Kesehatan Kota Cilegon, 2024). Previous local studies confirmed that leadership commitment, cadre involvement, and cross-sectoral collaboration are critical determinants of program success (Setiawan & Pertiwi, 2019; Wulandari & Hasan, 2021). Nevertheless, there remains limited empirical analysis focusing specifically on adult and elderly NCD screening in Puskesmas, particularly within industrial-urban contexts like Cilegon City. Therefore, this study aims to analyze the barriers and supporting factors in the implementation of adult and elderly health screening at Puskesmas in Cilegon City and to formulate optimization strategies based on the Policy Implementation framework and the Theory of Planned Behavior.

METHOD

This study applied a qualitative case study design to explore barriers and strategies in the implementation of adult and elderly health screening at primary health centers (Puskesmas) in Cilegon City. A qualitative approach was selected to capture in-depth perspectives from various stakeholders and to understand contextual factors influencing program delivery. Informants will be selected according to research needs. A total of 42 informants were recruited through purposive sampling, which are divided into 3 types of informants, including: (1) key informants consisting of 5 heads of primary health centers and 2 person in charge of the TB program in Cilegon City. (2) The main informant as many as 10 people consisted of 5 people in charge of the Health Screening Program of the Puskesmas, and 5 health workers (nurses and midwives). (3) Supporting informants consisted of five people from each Puskesmas, including health cadres and community representatives.

The instruments of this study were semi-structured interview guides, focus group discussion (FGD) guides, observation checklists, and document review formats. The interview and FGD guides were developed based on the framework of policy implementation theory (Mazmanian & Sabatier, 1983) and the Theory of Planned Behavior (Ajzen, 1991), enabling the exploration of both structural and behavioral factors influencing the implementation of health screening. Interviews and FGDs explored structural and behavioral aspects of health screening implementation, while observations and document reviews provided contextual triangulation. Data were analyzed thematically using Braun and Clarke's (2006) six-phase framework. Coding and categorization were carried out manually to identify recurring patterns, which were then synthesized into major themes. Data credibility was maintained through triangulation of methods and sources, and member checking with selected participants. This study has received ethical approval from the Health Research Ethics Committee of Universitas Indonesia Maju (UIMA) with approval number 1510/Sket/Ka-Dept/RE/UIMA/V/2025.

RESULT

Based on interviews, FGDs, and observations across five Puskesmas in Cilegon City, thematic analysis identified five main themes: policy implementation, internal and external barriers, participation strategies, technology support, and adaptive evaluation.

Policy Implementation of Health Screening

Health screening policies were formulated with reference to national guidelines and local adaptations. Informants highlighted the importance of early detection for non-communicable diseases.

"...We conduct screening based on national guidelines, aimed at detecting diseases such as hypertension, diabetes, and cholesterol among adults and the elderly." (K.01)

"...health screening for adults and the elderly refers to Minister of Health Regulation No. 19 of 2024..." (K.04)

At the Puskesmas level, staff reported following SOPs and using applications such as *ePuskesmas* and *ASIK*, however, implementation was often adjusted to available resources. This indicates that while policies and SOPs exist, practical implementation varied according to resources at each Puskesmas:

"...We always follow the instructions from the Health Office and the SOPs that have been socialized." (U.02)

"...Screening is based on the latest technical guidelines and SOPs, but implementation depends on the availability of equipment and personnel." (K.04)

"...implemented with reference to national guidelines, with adjustments to local conditions..." (K.06)

Internal and External Barriers to Implementation

The implementation of adult and elderly health screening in Puskesmas across Cilegon City encountered various internal and external barriers that significantly influenced service delivery.

a. Human Resources and Workload

Based on the interviews, the implementation of health screening faced major internal challenges, particularly the limited number of health workers and the lengthy time required to conduct comprehensive screenings. Puskesmas staff often had to serve a large number of patients, while screening for the elderly required considerably more time due to the need for repeated explanations delivered carefully and patiently.

"...when patients are crowded, it is difficult to conduct screening because it takes a lot of time." (U.05)

"...limited human resources, heavy workload in Puskesmas..." (K.06)

b. Reporting and Recording Systems

One of the main problems identified in the implementation of screening was the lack of integration in recording and reporting systems. Health workers were required to manually input data into several different platforms, namely *ePuskesmas*, *ASIK*, *SatuSehat*, and Google Forms. This condition created inefficiencies in workflow and added to the administrative burden of frontline staff. Several health workers expressed complaints regarding this issue.

"...We must input into ePuskesmas, ASIK, and also Google Form... not connected, so it is double work." (U.08)

"...screening results must be input into several applications (no bridging yet), which takes time..." (K.06)

"...screening records and reports are not integrated." (K.04)

c. Facilities and Space

In addition to reporting systems, limitations in service facilities were also frequently reported by informants. Ideally, screening activities require a dedicated room to ensure patient comfort, as well as adequate equipment for physical examinations and digital recording. However, observations revealed that in several Puskesmas, screening rooms were combined with general examination rooms or other service areas, resulting in insufficient privacy for patients. Several informants mentioned inadequate space for screening:

"...The main problem is the examination room... the room is limited/narrow..." (K.07)

"...We only have one small room, not enough when patients are crowded and need privacy." (K.04)

d. Digital Devices and Connectivity

Digital device support in the implementation of screening was also considered insufficient, as reflected in the limited number of computers and the dependence on unstable internet connections. Observations in most Puskesmas visited indicated that no computers were specifically allocated for screening activities, and internet networks were often unstable during use.

"...Facilities do not support stable applications, the internet network is unstable..." (U.06)

"...Internet is unstable, recording is sometimes delayed..." (U.08)

e. Logistics and Equipment

Limited facilities and logistics also emerged as major obstacles in the implementation of screening. Several indicators, such as blood glucose and cholesterol examinations, required specific tools like glucometers and test strips, the availability of which was not always ensured. Shortages of medical supplies were reported:

"...main challenge is lack of facilities..." (U.08)

"...screening equipment is insufficient or not routinely available..." (K.04)

"...sometimes consumables are lacking (especially cholesterol strips)." (K.06)

f. Community Awareness and Attitudes

From the community focus group discussions, it was revealed that fear, rejection, and apathy toward health screening were common.

"...Some residents are afraid the results will be bad, so they are reluctant to join screening." (FGD.5)

"...Some feel healthy, so they think screening is unnecessary, though risks remain." (FGD.4)

g. Accessibility

Geographic location and road infrastructure also posed significant obstacles to community participation, particularly in areas with hilly terrain or damaged roads.

"...The road to the Puskesmas is damaged and uphill. When it rains, we cannot come here." (FGD.2)

Participation Strategies and Optimization

Based on the in-depth interviews, focus group discussions, and observations, several efforts were identified as strategies implemented by the Puskesmas to increase participation and optimize the implementation of health screening, namely:

a. Education and Socialization

One of the main strategies employed to increase community participation in health screening was the use of educational and socialization approaches conducted by health workers, community health cadres, and supported by cross-sectoral stakeholders. Education was delivered in various forms, ranging from counseling sessions at *Posyandu* and women's religious gatherings to neighborhood meetings (RT/RW), as well as through the use of social media platforms and WhatsApp groups.

"...providing education to the community, outreach screening activities in communities or institutions..." (K.06)

"...socialization across sectors, not only in Puskesmas but also in sub-centers and ILP Posyandu..." (K.03)

"...Screening is usually done during Posyandu... we check blood pressure and sugar..." (FGD.1)

"...Health staff often come to Posyandu, informing us about screening..." (FGD.2)

b. Outreach and Home Visits

To overcome mobility challenges, particularly among elderly groups, Puskesmas implemented outreach services and home visits. Screening activities were also conducted outside the Puskesmas building in strategic community locations to improve accessibility and coverage.

"...conducting sweeping or home visits for those who have not been screened..." (U.04)

"...providing screening outside the facility in strategic locations to ease access..." (K.04)

c. Integration with Routine Programs and Community Events

Screening was often integrated into existing health programs such as *Prolanis* and non-communicable disease (NCD) services, as well as routine community activities like social

assistance distribution, village meetings, and health promotion events. This approach reduced logistical burdens while expanding opportunities for community participation.

"...integrating screening with other Puskesmas programs..." (K.06)

"...screening can be done during Prolanis, PTM programs, and other activities..." (U.02)

"...screening during large cross-sectoral events..." (U.04)

d. Cross-sectoral Collaboration and Pentahelix

Collaboration across sectors was emphasized as a key factor in strengthening screening efforts. The involvement of local government agencies, private companies, educational institutions created additional support for resources and outreach. The active participation of community leaders, religious figures, and local organizations helped build trust and strengthen communication between health workers and residents. Health cadres played an essential role in motivating the community to attend screening activities.

"...we urge the private sector to support programs..." (K.01)

"...involving cadres, religious and community leaders for education and information..." (K.01)

"...screening with government offices and workplaces was welcomed by sectors..." (K.05)

The overall strategy reflected the *pentahelix* model, involving government, academia, the private sector, communities, and media. This collaborative framework ensured that health screening programs were not only supported by the health sector but also reinforced by broader social structures, creating stronger sustainability for implementation.

"...collaboration with the private sector through CSR programs or providing supplies..." (K.04)

"...working together to conduct screening in companies and workplaces..." (U.10)

"...community involvement through cadres, Posyandu, and local leaders..." (K.04)

"...socialization via social media, radio, and local media..." (K.01, K.02, FGD.3)

Technology Support but Limited Integration

The implementation of screening in Puskesmas across Cilegon City was supported by the use of technology, particularly applications such as *ePuskesmas*, *ASIK*, and other reporting platforms. These applications functioned to record screening results, monitor participant coverage, and generate reports. Health workers acknowledged the convenience of using these systems for data monitoring, although their implementation had not yet been fully optimized.

"...we use ePuskesmas and ASIK. In ASIK we input screening data, in ePuskesmas we see targets, and we can check who has not been screened..." (U.04)

"...Data are input into ASIK. For viewing targets, ePuskesmas is used. Reports are submitted via Google Form to the Health Office..." (U.10)

Although technology has been adopted, the fragmented reporting system remained a major challenge. Furthermore, unstable internet connections in several areas frequently disrupted the process of data entry.

"...We must input into ePuskesmas, ASIK, and Google Form. Not connected, so it is double work..." (U.08)

"...screening results must be input into several applications (no bridging yet), which takes time..." (K.06)

"...reporting systems are not integrated..." (K.04)

"...Internet is unstable, recording is sometimes delayed..." (U.08)

Several informants expressed the expectation that the technological systems used in screening should be more integrated, user-friendly, and directly accessible to the community.

"...If a screening reminder application could be implemented, it would be very useful..." (U.01)

"...Maybe self-screening through SMS could be added..." (U.02)

"...technology innovations such as SMS/WhatsApp reminders would greatly help improve coverage..." (U.08)

Monitoring, Evaluation, and Adaptive Improvement

Monitoring and evaluation are key aspects in ensuring the success of a health policy or program. In the case of screening, monitoring was routinely carried out by the Puskesmas through the collection of monthly reports to evaluate the effectiveness of screening implementation. These evaluations helped determine whether the objectives of the screening were achieved and whether improvements were needed. In addition to internal evaluations at the Puskesmas level, structured monitoring was also conducted by the Cilegon City Health Office. Puskesmas were required to submit monthly reports, and quarterly evaluations were carried out to assess the overall progress of the program. This structured monitoring system provided not only measurements of program outputs but also feedback to identify problems, formulate adaptive solutions, and improve implementation strategies. The results indicated that regular evaluations served as an important foundation for continuous improvement, ensuring that health screening activities could be aligned with local needs and resources. This adaptive approach allowed both the Puskesmas and the Health Office to refine strategies and strengthen the quality of screening services over time. *“...Every month Puskesmas evaluates screening achievements...”* (U.04)

“...from this evaluation we improve the screening program...” (K.04)

“...Monitoring is carried out every month, we collect reports from Puskesmas, evaluate the data, and provide feedback...” (K.01)

“...the Health Office continuously monitors the development of screening implementation...” (K.02)

“...evaluation results are used to find solutions, improve strategies...” (K.06)

This structured monitoring system supported continuous improvement and adaptation of the program to local needs.

DISCUSSION

This study provides an in-depth analysis of barriers, strategies, and opportunities in the implementation of health screening for adults and the elderly at primary health care centers in Cilegon City. Despite the availability of national policies and technical guidelines, the findings demonstrate that screening coverage remains suboptimal due to limited resources, fragmented systems, and behavioral challenges. These findings are consistent with other studies on health screening in primary care, indicating that effective implementation requires not only regulations but also adequate infrastructure, human resources, and community engagement (Baker & Johnson, 2023; Pramita & Purnama, 2023). One of the major barriers identified is the insufficiency of human resources and high workload among health workers. Similar to the findings of Fitzgerald and Abbott (2023), staff shortages and overlapping responsibilities have led to limited time allocated for screening activities. This condition reduces the quality and frequency of services, especially for elderly patients who generally require more time and detailed explanations. From the perspective of Mazmanian and Sabatier's policy implementation theory, this reflects a gap between policy design and local execution, where clear policy directives are present but insufficient resources and administrative burdens hinder their realization.

Technological challenges also emerged as significant issues in this study. The use of multiple applications—such as ePuskesmas, ASIK, and SatuSehat—has created data duplication and inefficiencies. This finding aligns with Perwita and Rahayu (2020) and Taufiq et al. (2021), who reported that although digital tools can enhance participation through reminders and monitoring, fragmented systems often hinder effectiveness. Integrative digital solutions have been shown to improve service efficiency, as demonstrated by Ng and Kong (2024), who highlighted that interoperable platforms in primary care facilitate better disease detection and patient follow-up. Community participation remains another critical challenge. Many adults and elderly expressed reluctance to undergo screening due to fear of negative results, low perceived risk, or the assumption of being healthy. These behavioral factors resonate with the Theory of Planned Behavior (TPB), which posits that attitudes, subjective norms, and perceived behavioral control

shape individuals' intentions and actions. In this study, negative attitudes (fear of diagnosis), weak social norms (low encouragement from family or peers), and low perceived control (limited mobility, transport barriers) all contributed to poor participation, echoing findings by Setiawan et al. (2022) and Burns & Caldwell (2020).

Accessibility also remains a structural constraint, particularly for elderly populations with mobility limitations. Yuliana and Sutrisno (2020) highlighted that transportation difficulties and physical impairments often prevent older adults from accessing screening services. This study similarly revealed that poor road infrastructure and lack of transportation assistance significantly reduced attendance, especially among the elderly living in remote areas. Despite these challenges, several adaptive strategies were identified in Cilegon. Health workers integrated screening with routine community events, including posyandu activities, religious gatherings, and social assistance distributions, which successfully increased participation. This approach is supported by Mansur and Sihombing (2022), who emphasized the effectiveness of community-based outreach in expanding coverage for non-communicable disease (NCD) screening. Additionally, cross-sectoral collaboration, particularly with local authorities and religious leaders, was effective in promoting awareness and strengthening collective norms. Such partnerships reflect the pentahelix model, where government, private sector, community, and academia work synergistically in promoting health (Cohen & Sharma, 2023). From a policy perspective, the findings of this study reinforce the importance of aligning local implementation with national initiatives. The recent Indonesian Ministry of Health regulation on primary care transformation emphasizes preventive and promotive services, including free basic health checks for all citizens starting in 2025. While such policies provide momentum, their success at the local level depends on the ability to translate policy into practice. As Mazmanian and Sabatier suggest, successful implementation requires not only clear policy direction but also adequate resources and strong stakeholder commitment.

Furthermore, continuous monitoring and evaluation were reported to be in place, with monthly reports from Puskesmas and quarterly reviews by the local health office. This practice reflects a commitment to adaptive improvement and is consistent with international recommendations emphasizing iterative feedback loops in implementation science (Ng & Kong, 2024; Sun & Zhao, 2021). However, without strong follow-up mechanisms and sufficient resources, these evaluations risk becoming procedural rather than transformative. Overall, the findings indicate that optimizing health screening requires a multipronged approach. Investment in workforce capacity, integration of digital health systems, community-based strategies, and cross-sectoral collaboration are crucial. When analyzed through the dual lens of policy implementation theory and TPB, it becomes clear that structural readiness and behavioral factors must be addressed simultaneously to achieve success. While challenges in human resources, technology, and participation remain, adaptive strategies in Cilegon demonstrate that locally tailored interventions can significantly improve coverage and effectiveness of adult and elderly health screening.

CONCLUSION

This study revealed that the implementation of adult and elderly health screening at primary health care centers in Cilegon City remains suboptimal despite the existence of comprehensive national policies and guidelines. Several barriers were identified, including insufficient human resources, fragmented digital systems, high workload, limited facilities, and low community participation due to negative attitudes and accessibility constraints. On the other hand, adaptive strategies—such as integrating screening into community events, strengthening cross-sectoral collaboration, and utilizing digital reminders—were found to enhance participation and coverage. Therefore, to improve screening implementation, local health authorities should focus on four priorities: (1) strengthening workforce capacity and workload distribution, (2) integrating digital health platforms to streamline reporting and reduce duplication, (3) enhancing community engagement through health education and involvement of local leaders, and (4) institutionalizing cross-sectoral

collaboration to ensure sustainability. By bridging structural readiness and behavioral motivation, health screening for adults and the elderly can become more accessible, acceptable, and impactful, ultimately contributing to the prevention of non-communicable diseases and the achievement of national health goals.

ACKNOWLEDGEMENTS

The author is grateful to the Cilegon city health office, all health centers in the city of Cilegon, academics, media and industry involved in this research. The researcher is grateful to the Institute for Research and Community Service of the University of Indonesia Maju.

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