

First-Year Impact of Indonesia's Free Health Screening Program on Drug Planning and Utilization in Kediri, Indonesia

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ABSTRACT

The implementation of Indonesia's Free Health Screening Program has increased healthcare utilization and may alter drug demand in primary healthcare settings. This study aimed to evaluate the alignment between drug planning and actual utilization and to assess its implications for drug management efficiency. This study employed a retrospective comparative study with a before–after design using drug consumption data from 2023 (pre-program) actual utilization data from 2025 (post-program), along with the 2025 drug requirement plan. Planning accuracy was defined as ratio actual drug utilization to planned quantities. Deviation between planned and actual utilization was calculated as a percentage to identify under-planning (<100%) and over-planning (>100%). Trend analysis was performed to assess changes in drug consumption patterns following program implementation. The conformity of drugs with the National Formulary was high (88.93–91.89%). However, planning accuracy was suboptimal, with over-planning (50%) and under-planning (38%) dominating, overall item conformity at 81.51%. Increased service utilization significantly influenced changes in drug consumption patterns that were not captured by historical-based planning. Drug planning systems based solely on historical consumption are insufficient in the context of large-scale health programs. More adaptive planning models incorporating real-time data and service utilization trends are required to improve drug management efficiency.

Keywords : Drug management, drug planning accuracy, primary health center, Indonesia's Free Health Screening Program, health service utilization.

INTRODUCTION

Primary health care serves as a fundamental component of the health system, playing a crucial role in improving public health status through integrated promotive, preventive, curative, and rehabilitative approaches. In Indonesia, primary health care is delivered by both public and private sectors, with Primary Health Centers functioning as government-owned facilities that hold a strategic role in providing comprehensive and continuous health services (Kementerian Kesehatan RI, 2024). Pharmaceutical services, as an integral part of the health care system, play an essential role in ensuring the availability of safe, effective, and affordable medicines for the community (Cholilah et al., 2021).

The Indonesian government has prioritized human resource development through improvements in health quality as part of the national development agenda under “the Astacita” framework. This policy emphasizes three main programs: free health screening, tuberculosis control, and the development of hospitals in remote areas (Presiden Republik Indonesia, 2025). The Indonesia's Free Health Screening Program is a strategic initiative aimed at enhancing early disease detection through life-cycle-based screening while expanding access to health services for the population (Kementerian Kesehatan RI, 2025;

Kementerian Keuangan RI, 2025).

The implementation of free health program has been shown to increase the utilization of health services at Primary Health Centers. A study conducted in Belu Regency reported improvements in service coverage and patient satisfaction following the implementation of a free health program, although challenges related to accessibility and service quality remained (Asa *et al.*, 2024). In addition, the program and community education initiatives have been shown to enhance health awareness and participation in regular health check-ups (Sulistiyawati *et al.*, 2025). Furthermore, the success of Indonesia's Free Health Screening Program is strongly influenced by community participation, with social support identified as a more significant determinant compared to individual knowledge and attitudes (Sinaga *et al.*, 2026).

The increased utilization of health services resulting from Indonesia's Free Health Screening Program implementation directly contributes to a rise in the demand for pharmacological therapy. Early detection of non-communicable diseases such as hypertension, diabetes mellitus, and dyslipidemia leads to a rapid increase in medicine needs, thereby potentially altering drug consumption patterns in Primary Health Centers (Kementerian Kesehatan RI, 2025). This condition necessitates a drug management system that is adaptive and responsive to changing health service demands.

Drug management in Primary Health Centers consists of a systematic cycle that includes planning, procurement, storage, distribution, and rational use of medicines. All stages must be implemented in an integrated manner to ensure the availability of the right medicines in terms of type, quantity, time, and quality (Kementerian Kesehatan RI, 2016). Ineffective drug management may lead to imbalances between drug availability and actual needs, ultimately affecting the quality of health services (Anisah *et al.*, 2023).

Previous studies have indicated that drug management in Primary Health Centers still faces several challenges, particularly in planning and control processes. Drug planning accuracy remains low and often does not reflect actual needs, as evidenced by high occurrences of overstock and stock-out (Cholilah *et al.*, 2021). Such conditions may result in budget inefficiencies and disrupt the continuity of health services (Suryagama *et al.*, 2019).

Evaluation of drug management is conducted using indicators that reflect the efficiency and effectiveness of the pharmaceutical logistics system, including planning accuracy, alignment with disease patterns, drug availability levels, Inventory Turn Over Ratio (ITOR), and stock conditions (Satibi *et al.*, 2019). Evidence suggests that conformity of medicines with the National Formulary remains suboptimal, accompanied by excessive stock, unused medicines, and low ITOR values, indicating inefficiencies in drug management (Hananto *et al.*, 2024).

Drug requirement planning in Primary Health Centers is generally based on a consumption-based approach (drug needs plans are prepared 1 year before use using drug usage data from the previous year), which has inherent limitations in accommodating dynamic changes in demand resulting from large-scale health policy interventions. Planning systems that are not supported by accurate data and integrated information systems tend to produce inaccurate estimations of drug needs (Fitriah *et al.*, 2022). This limitation becomes more critical in the context of sudden increases in service utilization, where discrepancies between planned and actual drug demand may lead to both overstock and stock-outs. Such inefficiencies not only affect drug availability but also have broader implications for service quality and financial efficiency, including the risk of expired or unused medicines (Rosita *et al.*, 2024).

Health budget efficiency policies play a crucial role in drug management at Primary

Health Centers. The government emphasizes effective, efficient, and targeted budget utilization in the 2025 State Budget to improve public spending quality and address fiscal constraints (Kementerian Keuangan RI, 2025). Accordingly, public health expenditure must be managed optimally to enhance access to health services and reduce social inequalities (Puspitasari, 2024).

The first year of the Indonesia's Free Health Screening Program represents a critical phase for assessing the adaptability of drug management systems to policy changes. Drug planning conducted prior to program implementation may fail to capture the surge in demand resulting from large-scale disease detection. Although previous studies have examined drug management in Primary Health Centers, these have largely been conducted under routine service conditions and do not account for the impact of large-scale health policy interventions. To date, no studies have specifically evaluated the accuracy of drug planning within the context of a large-scale national health screening program in Indonesia, where sudden increases in service utilization may substantially alter drug demand patterns. This gap is important, as inaccurate planning under such conditions may lead to inefficiencies, including overstock, stock-outs, and suboptimal budget allocation.

This study provides empirical evidence on the impact of a large-scale national health program on drug planning and utilization at the primary healthcare level using a before–after approach. By comparing pre-program and post-program conditions, this study contributes to understanding the limitations of consumption-based planning systems and highlights the need for more adaptive and data-driven drug management strategies in the context of dynamic health policy interventions.

This study aims to evaluate the alignment between drug planning and actual utilization in Primary Health Centers during the implementation of the Indonesia's Free Health Screening Program and to analyze its implications for the efficiency of drug management at the regional level.

METHODS

This study employed a retrospective comparative study with a before–after design to evaluate the alignment between drug requirement planning and actual utilization before (2023) and after (2025) the implementation of Indonesia's Free Health Screening Program. The retrospective approach was applied because the 2025 Drug Requirement Plan was developed in 2024 based on drug consumption data from 2023, enabling a comparison between historical-based planning and actual utilization following program implementation.

This study was conducted at “Puskesmas Kota Wilayah Utara”, a Primary Health Center located in Kediri City, East Java, Indonesia. The analysis included drug consumption data from 2023 as the pre-program baseline, the 2025 Drug Requirement Plan as the planning reference, and drug utilization data from 2025 as the post-program condition.

The study population included all drug items listed in the 2025 Drug Requirement Plan, totaling 156 items, using a total sampling technique. The study utilized secondary data obtained from official Primary Health Center documents, including the 2025 Drug Requirement Plan, drug usage reports, and requisition forms for 2023 and 2025, as well as supporting data on drug stock and distribution.

The primary variable in this study was drug planning accuracy, defined as the ratio of actual drug utilization to planned quantities. Planning accuracy was expressed as a percentage, where a value of 100% indicates complete alignment between planned and actual utilization. Values below 100% indicate under-planning, while values above 100% indicate over-planning. These categories were used to describe deviations between planned

and actual utilization and do not imply optimal performance, as both under-planning and over-planning reflect inefficiencies in drug management.

To strengthen quantitative analysis, the deviation between planned and actual drug utilization was calculated using the following formula:

$$\text{Deviation (\%)} = (\text{Actual utilization} - \text{Planned quantity}) / \text{Planned quantity} \times 100\%$$

In addition, trend analysis was performed by comparing drug consumption patterns between 2023 and 2025 to assess changes associated with the implementation of the program. Supporting variables included drug types and quantities, as well as drug management indicators such as stock-outs, overstock, and Inventory Turn Over Ratio (ITOR).

Data analysis was conducted using descriptive quantitative and comparative approaches to assess the level of alignment between planning and utilization and to identify changes in drug demand patterns. Given the aggregated nature of drug-level data, the analysis focused on descriptive quantitative measures rather than inferential statistical testing. The findings were interpreted contextually by considering the influence of the program on drug demand dynamics and drug management efficiency at the Primary Health Center.

RESULTS

To provide a comprehensive assessment, this study presents two analytical perspectives: (1) planning accuracy based on the ratio between planned and actual drug quantities, and (2) conformity of drug items between planning and actual utilization.

The analysis results showed that the level of conformity of drugs with the National Formulary at Puskesmas Kota Wilayah Utara in 2025 was categorized as good, ranging from 88.93% to 91.89% each month. The highest value was observed in December at 91.89%, while the lowest occurred in January at 88.93%. Overall, there was an increasing trend in conformity during the second semester compared to the first. This high level of conformity indicates that drug selection has followed national standards as mandated in pharmaceutical services at primary health centers facilities (Kementerian Kesehatan RI, 2016). However, the observed fluctuations suggest that consistency in the implementation of the National Formulary has not been fully achieved and may be influenced by dynamic service demands, including changes in disease patterns resulting from the implementation of the Indonesia’s Free Health Screening Program.

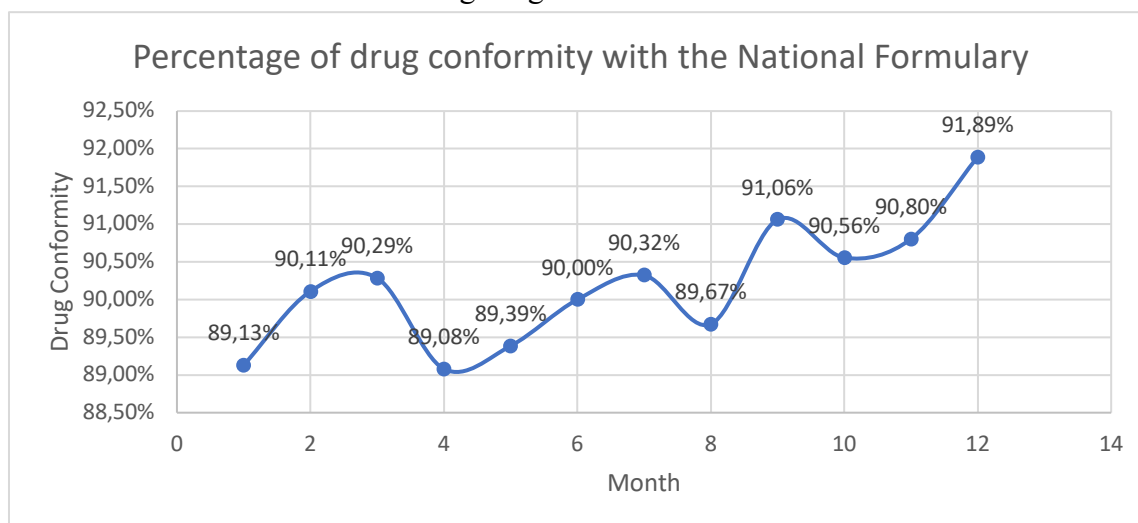


Figure 1. Percentage of drug conformity with the National Formulary

The relatively high conformity of drugs with the National Formulary indicates that drug selection in Primary Health Centers has adhered to national pharmaceutical service standards. This finding aligns with the requirement that drug use in primary health centers facilities must follow the National Formulary to ensure rational therapy and cost efficiency (Kementerian Kesehatan RI, 2016). This result is also consistent with previous studies showing that conformity of drug items with the National Formulary in Primary Health Centers can exceed 90%, although other indicators of drug management may not be optimal (Anisah *et al.*, 2023). Therefore, the drug selection process can be considered adequate; however, it does not necessarily reflect overall efficiency in the drug management system.

DISCUSSION

Data from the implementation of the Indonesia's Free Health Screening Program showed a very high participation rate, with a total attendance of 14,288 individuals or 99.73% of registered participants. This high participation rate reflects the success of the program in improving access to and utilization of primary health care services. This finding is consistent with previous studies indicating that free health programs significantly increase health service utilization (Asa *et al.*, 2024). Increased utilization directly impacts the demand for health services, including pharmacological therapy. This explains the shift in drug consumption patterns that cannot be fully predicted using historical-based planning approaches.

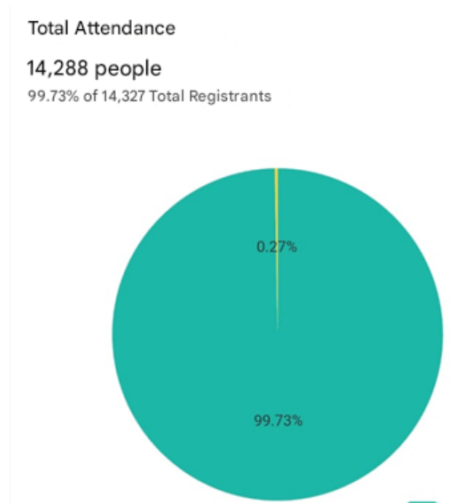


Figure 2. Coverage of visits in the Indonesia's Free Health Screening Program in 2025

The analysis of planning accuracy showed a substantial mismatch between planned and actual drug utilization. A total of 50% of drug items were categorized as over-planning (>100%), while 38% were categorized as under-planning (<100%), and none of the items achieved exact alignment (100%). This indicates that the planning system was unable to accurately estimate actual drug needs.

From a quantitative perspective, the deviation analysis revealed considerable discrepancies between planned and actual utilization, reflecting the limited responsiveness of consumption-based planning systems to changes in service demand. The dominance of over-planning suggests potential budget inefficiency due to excessive procurement, while under-planning may lead to stock-outs that disrupt service delivery. These findings are consistent with the limitations of consumption-based drug planning approaches, which are less adaptive to dynamic changes in healthcare demand (Satibi *et al.*, 2019).

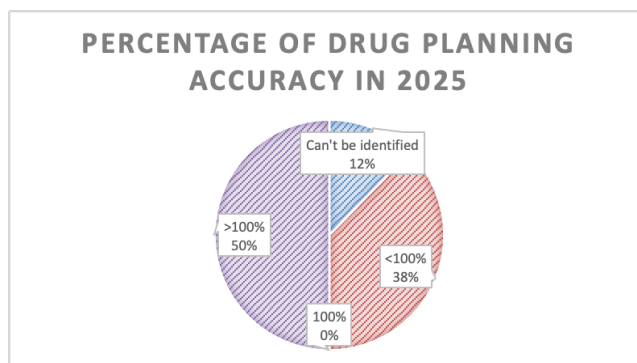


Figure 3. Percentage of drug planning accuracy in 2025

To provide a more comprehensive assessment, the conformity of drug items between planning and actual utilization was also analyzed. The results showed that only 2% of drug items achieved exact conformity (100%), while 46% were categorized as under-planning and 30% as over-planning. Additionally, 19% of items could not be identified due to limitations in data recording. The overall conformity level was 81.51%, indicating a gap between planned and utilized drug items, including cases where drugs were planned but not requested during procurement.

The occurrence of overstock and understock identified in this study represents a common issue in drug management systems within health facilities. Excess drug availability can lead to budget waste and increase the risk of drug damage or expiration, while shortages may hinder patient care (Suryagama *et al.*, 2019). Other studies have also demonstrated that inefficiencies in drug management can disrupt overall health service delivery, both clinically and economically (Fitriah *et al.*, 2022). Therefore, achieving a balance between planned and actual needs is essential to ensure the effectiveness of the pharmaceutical logistics system.

The implementation of the Indonesia’s Free Health Screening Program has been proven to increase health service utilization and subsequently raise the demand for medicines. The Indonesia’s Free Health Screening Programs are known to enhance access to health services and promote early detection of diseases, particularly non-communicable diseases (Sulistiyawati *et al.*, 2025). This increase in case detection directly leads to a rapid rise in pharmacological therapy demand, resulting in changes in drug consumption patterns that cannot be accurately predicted using historical data. This condition explains why consumption-based planning becomes less relevant in the context of large-scale policy implementation.

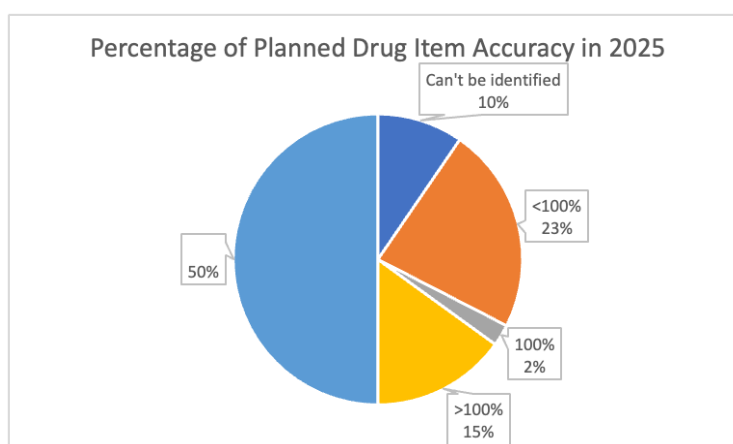


Figure 4. Percentage of planned drug item accuracy in 2025

The limitation of consumption-based planning methods (drug planning was planned one year before which used the data of drugs consumption two years before) is a key factor contributing to the mismatch between planning and utilization. This approach does not consider changes in disease epidemiology or health program interventions that significantly alter drug demand. Previous studies have shown that drug management systems not supported by accurate data and integrated information systems tend to produce inefficient planning (Fitriah *et al.*, 2022). Therefore, a more adaptive planning approach is required, integrating morbidity data and service utilization trends.

From an efficiency perspective, the percentage of expired drugs was relatively low at 0.05% of the total inventory value of Rp1,840,817,606.55. This indicates that stock management is generally effective in preventing losses due to expiration. However, a low expiration rate does not necessarily reflect overall system efficiency, as mismatches between planning and utilization may still lead to inefficiencies such as overstock and improper budget allocation.

Studies indicate that although certain indicators such as drug storage may perform well, other indicators such as dead stock and mismatched demand remain problematic (Rosita *et al.*, 2024). This suggests that drug management efficiency must be evaluated comprehensively rather than based on a single indicator.

Drug availability analysis showed that most drug items were within the safe stock category (10–12 months) at 54%, while the remaining items were distributed across shorter stock durations, including 0–3 months (16%), 4–6 months (15%), and 7–9 months (15%). This distribution indicates that, overall, stock management was relatively stable.

However, the presence of drug items in the low stock category (<3 months) suggests a potential risk of stock-outs, particularly under conditions of increased demand following the implementation of Indonesia's Free Health Screening Program. This finding indicates that although stock levels appear adequate in general, the planning and distribution system may not be sufficiently responsive to dynamic changes in service utilization, leading to imbalances in drug availability across different items.

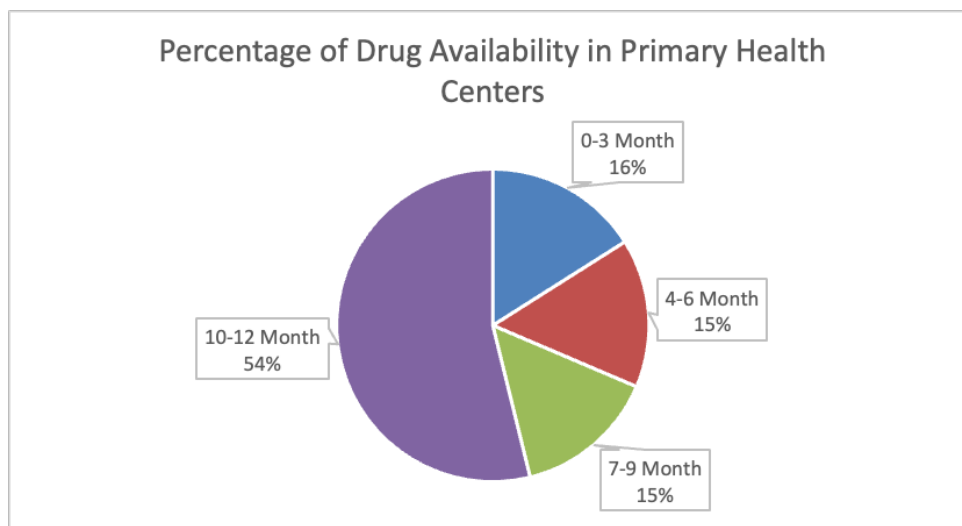


Figure 5. Percentage of Drug Availability in Primary Health Centers

Overall, the findings indicate that the implementation of the Free Health Screening Program has a significant impact on drug management systems in the Primary Health

Centers, particularly in the planning stage. High community participation leads to increased drug demand that cannot be fully anticipated by historical-based planning systems. This results in a mismatch between planning and utilization, affecting both budget efficiency and pharmaceutical service performance. These findings highlight the need for a more adaptive drug planning system based on real-time data and integrated with ongoing health programs, in line with the demand for efficient health budget management (Kementerian Keuangan RI, 2025).

CONCLUSION

The implementation of the Indonesia's Free Health Screening Program significantly increased health service utilization and altered drug demand patterns that were not captured by historical-based planning. Although conformity with the National Formulary was high, drug planning accuracy remained suboptimal, with dominant over-planning and under-planning conditions.

These findings indicate that consumption-based planning alone is insufficient in the context of large-scale health interventions. Policymakers are recommended to: (1) integrate real-time service utilization and morbidity data into drug planning systems, (2) develop hybrid planning models combining consumption and epidemiological approaches, and (3) strengthen pharmaceutical information systems to improve data accuracy and responsiveness.

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Hanie Kusuma Wardhani *et al* (First-Year Impact of Indonesia's Free Health Screening Program on Drug Planning and Utilization in Kediri, Indonesia)

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