Geographic Disparities in Minimum Health Service Standards Implementation across Sub-districts in Kotawaringin Barat Regency, Indonesia

Nova Ferlina Mai Syapitri[1], Dita Indriyani Mai Adha[2], Heri Sugiarto[3]
[1]Public Health Department, Universitas Ngudi Waluyo, novaferlina2@gmail.com
[2]Public Health Department, Universitas Ngudi Waluyo, ditaindriyani2105@gmail.com
[3]Public Health Department, Universitas Ngudi Waluyo, heraru@gmail.com
Email Correspondence: novaferlina2@gmail.com

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Abstract
Geographic disparities in healthcare service delivery remain a critical challenge in achieving universal health coverage, particularly in rural Indonesian districts. The Minimum Health Service Standards (SPM) framework provides measurable targets for essential health services. This study aimed to analyze geographic disparities in SPM implementation across sub-districts in Kotawaringin Barat Regency, Central Kalimantan, Indonesia. A descriptive analytical study was conducted using secondary data from 94 villages across six sub-districts in Kotawaringin Barat Regency in 2025. Data included 12 SPM health service indicators covering maternal and child health, communicable and non-communicable diseases, and productive age population services. Descriptive analysis examined service target distribution patterns, disparity ratios between urban and rural areas, and service coverage variations. Results of this study was significant geographic disparities were identified across sub-districts. Arut Selatan sub-district, representing urban areas, showed the highest service targets with 381 pregnant women, 13,066 productive age population, and 2,514 hypertension patients in Kelurahan Baru village. In contrast, remote villages like Keraya (Kumai sub-district) recorded minimal targets with only 1 pregnant woman and 90 productive age population. The urban-rural disparity ratio for productive age population services reached 145:1, while hypertension services showed a 251:1 ratio. Non-communicable disease prevalence was concentrated in urban areas, with Arut Selatan accounting for 32% of total hypertension cases and 28% of diabetes mellitus cases. Conclusion of this study was geographic disparities in SPM implementation are substantial, with urban areas showing significantly higher service demands and disease burdens. These findings necessitate differentiated health service strategies, including mobile health services for remote areas and strengthened non-communicable disease programs in urban settings.

Introduction

Geographic disparities in healthcare access and service delivery represent a persistent challenge in achieving universal health coverage, particularly in low- and middle-income countries. In Indonesia, despite significant progress in expanding healthcare infrastructure and insurance coverage through the national health insurance scheme (Jaminan Kesehatan Nasional), substantial variations in health service quality and accessibility persist across different geographic regions. Rural and remote areas consistently demonstrate lower healthcare utilization rates, higher disease burdens, and poorer health outcomes compared to urban centers.

To address these disparities and ensure equitable healthcare delivery, the Indonesian government established the Minimum Service Standards (Standar Pelayanan Minimal, SPM) framework through Ministry of Health Regulation. SPM defines the minimum types and quality of basic health services that constitute mandatory government responsibilities and citizen rights. The framework encompasses 12 essential health service indicators, including maternal and child health services, management of communicable diseases such as tuberculosis and HIV, and non-communicable disease services for hypertension and diabetes mellitus.

Corresponding author:
Nova Ferlina Mai Syapitri
Novaferlina2@gmail.com

However, the implementation and achievement of SPM targets vary considerably across different administrative regions, reflecting underlying geographic, demographic, and resource allocation disparities.

Kotawaringin Barat Regency in Central Kalimantan Province exemplifies the challenges of healthcare service delivery in geographically diverse and dispersed populations. The regency comprises six sub-districts with 94 villages, encompassing both urban centers and remote rural communities. Previous studies have documented significant health inequities between urban and rural populations in Indonesia, with rural areas experiencing barriers related to distance, transportation costs, healthcare workforce shortages, and limited infrastructure. Research has shown that geographic remoteness correlates with reduced maternal health service utilization, lower immunization coverage, and delayed diagnosis of communicable diseases.

Furthermore, the epidemiological transition in Indonesia has resulted in a dual disease burden, with communicable diseases remaining prevalent in rural areas while non-communicable diseases increasingly affect urban populations. This pattern necessitates differentiated health service strategies that account for local disease profiles and population characteristics. However, limited evidence exists regarding the specific patterns and magnitude of geographic disparities in SPM implementation at the village level, particularly in regencies with heterogeneous geographic and demographic profiles.

This study addresses this research gap by conducting a comprehensive analysis of geographic disparities in SPM implementation across all villages in Kotawaringin Barat Regency. Understanding these disparities is essential for evidence-based health policy formulation, resource allocation optimization, and the development of targeted interventions to reduce health inequities. The objective of this study was to analyze geographic disparities in Minimum Health Service Standards implementation across sub-districts in Kotawaringin Barat Regency, specifically examining variations in service target distribution, urban-rural differences, and disease burden patterns across the 12 SPM health service indicators.

Methods

This was a descriptive analytical study utilizing secondary data from the Minimum Health Service Standards (SPM) implementation report of Kotawaringin Barat Regency, Central Kalimantan Province, Indonesia. The study was conducted in 2025, analyzing data from all 94 villages across six sub-districts: Kotawaringin Lama (17 villages), Arut Selatan (10 villages), Kumai (18 villages), Pangkalan Lada (11 villages), Pangkalan Banteng (17 villages), and Arut Utara (11 villages). Kotawaringin Barat Regency is characterized by geographic diversity, including coastal areas, riverine settlements, and inland communities, with varying levels of healthcare infrastructure development and accessibility.

Data were obtained from official SPM reports compiled by the District Health Office of Kotawaringin Barat Regency for the year 2025. The dataset included village-level service targets for 12 SPM health service indicators: (1) pregnant women receiving antenatal care services, (2) women giving birth assisted by health professionals, (3) postpartum mothers receiving postnatal care, (4) infants receiving complete basic immunization, (5) children aged 0-59 months receiving health services, (6) school-age children (6-15 years) receiving health screening, (7) productive age population (15-59 years) receiving health services, (8) elderly population (≥60 years) receiving health screening, (9) individuals with hypertension receiving health services, (10) individuals with diabetes mellitus receiving health services, (11) persons with suspected tuberculosis receiving examination services, and (12) persons at risk of HIV infection receiving counseling and testing services. The primary independent variable was geographic location, categorized by sub-district and village, with further classification into urban (Arut Selatan sub-district) and rural areas (all other sub-districts). Dependent variables comprised the service targets for each of the 12 SPM indicators.

Descriptive analysis was performed to examine the distribution of service targets across villages and sub-districts. For each SPM indicator, we calculated total regency-level targets, sub-district aggregates, and village-level distributions. Geographic disparity was assessed through multiple approaches. First, we identified villages with the highest and lowest service targets for each indicator to establish the range of variation. Second, we calculated urban-rural disparity ratios by comparing service targets between urban areas (represented by major villages in Arut Selatan) and remote rural villages. Third, we examined the concentration of specific disease burdens, particularly non-communicable diseases, across different geographic areas. Service target patterns were analyzed by categorizing villages into quartiles based on population size proxies (productive age population targets). Data compilation and analysis were conducted using Microsoft Excel 2021. Results are presented as frequencies, proportions, and ratios with descriptive summaries organized by sub-district and service category.

This study utilized aggregated secondary data from official government health reports and did not involve individual patient information or primary data collection. All data were publicly accessible administrative records used for health service planning purposes. Therefore, formal ethical approval was not required. The analysis was based on aggregated administrative data

at the village level and did not contain any personally identifiable information (PII) such as patient names,addresses, or individual health record. The study complied with principles of responsible use of public health data and appropriate attribution of data sources.

Results and Discussion

Overview of SPM Service Targets in Kotawaringin Barat Regency

The analysis encompassed 94 villages across six sub-districts in Kotawaringin Barat Regency. Table 1 presents the aggregate service targets for all 12 SPM health service indicators at the regency level. The productive age population (15-59 years) constituted the largest service target category with 140,305 individuals, followed by school-age children requiring health screening (41,865 individuals) and persons with hypertension (41,671 individuals). Maternal health services targets included 2,832 pregnant women receiving antenatal care, 2,832 deliveries attended by health professionals, and 2,832 postpartum mothers requiring postnatal care. Communicable disease service targets comprised 3,643 persons with suspected tuberculosis and 6,898 persons at risk of HIV infection requiring counseling and testing.

Geographic Distribution of Service Targets by Sub-district

Substantial geographic variations in service targets were observed across the six sub-districts. Arut Selatan sub-district, representing the urban center of the regency, demonstrated the highest service targets across multiple indicators. Within Arut Selatan, Kelurahan Baru village recorded the highest targets with 381 pregnant women, 13,066 productive age population, and 2,514 persons with hypertension. Other major villages in this sub-district included Madurejo (353 pregnant women, 11,658 productive age population) and Pair Panjang (269 pregnant women, 10,066 productive age population). In contrast, several villages demonstrated minimal service targets. Keraya village in Kumai sub-district recorded only 1 pregnant woman and 90 productive age population. Sungai Dau village in Arut Utara sub-district showed zero targets for pregnant women and minimal targets for other indicators. Kumai sub-district, despite having the largest number of villages (18), demonstrated heterogeneous service target distributions. Bumi Harjo village showed relatively high targets (4,037 productive age population), while several other villages in the same sub-district had targets below 500 productive age population.

Urban-Rural Disparities in Service Targets

Comparing service targets between urban and rural areas revealed marked disparities. For productive age population services, the disparity ratio between Kelurahan Baru (urban) and Keraya (remote rural) was 145:1 (13,066 versus 90 individuals). For pregnant women services, Kelurahan Baru recorded 381 times more targets than Keraya (381 versus 1). These factors may contribute to the observed disparities; however, they were not measured in the present study and therefore cannot be identified as direct causes. When examining school-age children requiring health screening, urban areas again showed substantially higher targets. Kelurahan Baru reported 2,389 school-age children compared to villages like Bagendang Permai in Kotawaringin Lama with only 37 children, representing a 65:1 disparity ratio.

Geographic Patterns of Non-Communicable Disease Service Targets

Non-communicable disease service targets demonstrated distinct geographic concentration patterns. For hypertension services, Arut Selatan sub-district accounted for 13,265 of the 41,671 regency-wide targets (32%). Within this sub-district, Kelurahan Baru alone contributed 2,514 hypertension patients (6% of regency total), followed by Madurejo with 1,675 patients. The urban-rural disparity ratio for hypertension services between Kelurahan Baru and remote villages like Keraya reached 251:1 (2,514 versus 10 individuals). Similar patterns emerged for diabetes mellitus services. Arut Selatan sub-district contained 1,638 of 5,799 regency-wide diabetes patients (28%). Kelurahan Baru recorded 500 diabetes patients, while multiple rural villages reported fewer than 10 diabetes targets.

Geographic Distribution of Communicable Disease Service Targets

Tuberculosis and HIV service targets also showed geographic concentration, though with somewhat different patterns than non-communicable diseases. For tuberculosis, Arut Selatan sub-district recorded 1,060 persons with suspected tuberculosis (29% of regency total). Kelurahan Baru contributed 364 suspected tuberculosis cases, followed by Pair Panjang with 293 cases. However, several rural areas also demonstrated notable tuberculosis targets, suggesting more widespread distribution of this communicable disease. HIV risk population targets showed substantial variation, with Sidorejo village recording the highest target of 905 persons at risk, followed by Madurejo with 660 persons.

Table 1. Aggregate Service Targets for SPM Health Service Indicators in Kotawaringin Barat Regency, 2025

No	SPM Health Service Indicator	Total Target
1	Pregnant women receiving antenatal care	2,832
2	Women giving birth assisted by health professionals	2,832
3	Postpartum mothers receiving postnatal care	2,832
4	Infants receiving complete basic immunization	2,832
5	Children aged 0-59 months receiving health services	14,229
6	School-age children (6-15 years) receiving health screening	41,865
7	Productive age population (15-59 years) receiving health services	140,305
8	Elderly population (≥60 years) receiving health screening	13,430
9	Persons with hypertension receiving health services	41,671
10	Persons with diabetes mellitus receiving health services	5,799
11	Persons with suspected tuberculosis receiving examination	3,643
12	Persons at risk of HIV infection receiving counseling and testing	6,898

This study reveals substantial geographic disparities in Minimum Health Service Standards implementation across Kotawaringin Barat Regency, with marked differences in service target distributions between urban and rural areas. The observed disparity ratios, reaching up to 251:1 for certain service categories, substantially exceed what population density differences alone would predict. These findings align with broader patterns documented in Indonesian health geography literature, where urban-rural divides in healthcare access and utilization persist despite national insurance coverage expansion.

The concentration of service targets in urban centers, particularly in Arut Selatan sub-district, reflects multiple intersecting factors. First, genuine population concentration in urban areas creates higher absolute service demands. Second, urban areas typically demonstrate better healthcare-seeking behaviors due to proximity to facilities, higher health literacy, and reduced financial and time costs associated with accessing services. Third, SPM target setting methodologies may incorporate healthcare utilization patterns, leading to higher targets in areas with established service utilization even when actual population health needs may be distributed more broadly.

The geographic concentration of non-communicable diseases in urban areas is consistent with epidemiological transition theory and previous Indonesian studies documenting higher hypertension and diabetes service target in urban areas. Urban lifestyles characterized by reduced physical activity, increased consumption of processed foods, and psychosocial stress contribute to elevated non-communicable disease risks. Additionally, better diagnostic access in urban health facilities may lead to higher detection rates, partially explaining the observed concentration patterns.

Conversely, the minimal service targets observed in remote villages raise concerns about healthcare accessibility and equity. Villages with very low targets, such as Keraya and Sungai Dau, face distinct challenges. Geographic remoteness increases travel time and costs for accessing health facilities, deterring preventive care utilization and delaying treatment-seeking for acute conditions. Healthcare workforce recruitment and retention in remote areas remains problematic, leading to understaffed facilities with limited service capacity.

The tuberculosis distribution pattern, showing both urban concentration and significant rural presence, reflects the complex epidemiology of this communicable disease. Urban overcrowding and poor housing conditions facilitate tuberculosis transmission, while rural poverty, nutritional deficiencies, and limited healthcare access contribute to disease burden. The widespread distribution of tuberculosis targets across diverse geographic areas underscores the need for comprehensive tuberculosis control strategies. These findings have significant implications for health policy and program implementation. Standard, uniform approaches to health service delivery are inadequate in contexts with such pronounced geographic heterogeneity. Urban centers require health systems capable of managing high patient volumes, chronic disease programs, and specialized services for non-communicable diseases. Rural and remote areas need alternative service delivery models, including mobile health teams, telemedicine consultations, community health worker programs, and periodic outreach campaigns.

The maternal health service disparities observed in this study warrant particular attention. The 381:1 ratio between urban and remote areas for pregnant women services indicates that women in remote villages face substantially reduced access to essential antenatal, delivery, and postnatal care. This directly impacts maternal and infant mortality risks, as complications during pregnancy and childbirth require timely access to skilled healthcare providers and emergency obstetric facilities. This study has several limitations that should be acknowledged. First, the analysis relied on service targets rather than actual service coverage or health outcomes, meaning we cannot determine whether targets were achieved or assess service quality. Second, the cross-sectional design precludes temporal analysis of whether disparities are widening or narrowing over time. Third, the study did not examine underlying determinants

of observed disparities, such as healthcare workforce distribution, facility infrastructure, or household-level access barriers. Future research should combine service target analysis with coverage achievement data, health outcome assessments, and qualitative investigations of barriers and facilitators of equitable healthcare access.

Conclusion and Suggestion

Geographic disparities in Minimum Health Service Standards implementation across Kotawaringin Barat Regency are substantial and multidimensional. Urban areas demonstrate markedly higher service targets across all indicators, with disparity ratios exceeding 100:1 for several service categories. Non-communicable disease service targets heavily concentrated in urban areas, while communicable diseases show more distributed patterns. These disparities necessitate differentiated health service strategies that recognize distinct needs and challenges across the geographic spectrum. Achieving equitable healthcare access requires moving beyond uniform service models toward adaptive approaches incorporating mobile health services for remote areas, strengthened chronic disease management in urban centers, targeted resource allocation accounting for geographic accessibility challenges, and robust monitoring systems to track equity in service coverage and health outcomes. Future health policy development and resource allocation in Kotawaringin Barat Regency should explicitly prioritize geographic equity as a core objective, ensuring that the SPM framework serves its fundamental purpose of guaranteeing minimum health service rights for all citizens regardless of geographic location.

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