



Benchmarking Indonesia's Health System Against Global Standards: A WHO Framework Analysis of Reforms and Outcomes (2020–2025)

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ABSTRACT. Indonesia has undertaken one of the world's most ambitious health system reforms through the implementation of the Jaminan Kesehatan Nasional (JKN), managed by BPJS Kesehatan. While the country aims for Universal Health Coverage (UHC), persistent disparities remain. This study benchmarks Indonesia's health system performance against 2025 global standards using the World Health Organization (WHO) framework, focusing on governance, financing, workforce infrastructure, and health outcomes. A systematic descriptive-analytical review was conducted according to PRISMA guidelines. Secondary data from 2020 to 2025 were synthesized from the WHO Global Health Observatory, World Bank Open Data, and Indonesian Ministry of Health reports. Fifty primary studies and policy documents were analyzed to evaluate key indicators against global or regional peer benchmarks. Findings indicate a dichotomy between coverage expansion and system capacity. Indonesia has achieved nominal universal coverage for over 84% of its population (approximately 222 million people), with the Penerima Bantuan Iuran (PBI) scheme successfully shielding over 1 million individuals from poverty. However, structural deficits persist: (1) Financing: Health expenditure stands at 3.1% of GDP, significantly below the global average of 6%, with high out-of-pocket (OOP) spending at 31% (benchmark: <20%). (2) Workforce: There is a critical shortage of human resources, with a physician density of 0.4 per 1,000 population (global benchmark: 1.8) and a hospital bed ratio of 1.2 per 1,000 (global average: 2.9). (3) Outcomes: While life expectancy has reached 72.5 years, maternal mortality (177 per 100,000 live births) remains substantially higher than the Sustainable Development Goal (SDG) targets, reflecting gaps in service quality and equitable access across the archipelago. Indonesia has successfully established a massive single-payer framework, yet the transition from "nominal coverage" to "effective coverage" faces significant bottlenecks. To align with 2025 global standards, the system requires an expanded fiscal space, aggressive implementation of the 2023 Omnibus Health Law to address workforce maldistribution, and a strategic shift from curative to preventive primary care © 2025 Published by Public Knowledge Project (PKP).

Keywords: Indonesia Health System; Universal Health Coverage (UHC); BPJS Kesehatan; Health Financing; Health Workforce; WHO Framework.

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Introduction

As the world's fourth most populous nation and the largest archipelagic state, Indonesia presents a unique context for health system analysis. The implementation of the National Health Insurance (Jaminan Kesehatan Nasional or JKN) in 2014 marked a paradigmatic shift in the country's social security landscape, aimed at achieving Universal Health Coverage (UHC) for its population of over 278 million (Agustina et al., 2019). Managed by the Social Security Administering Body for Health (BPJS Kesehatan), this reform represents one of the largest single-payer schemes globally, transitioning the nation from a fragmented payer system to an integrated model of health financing (Mahendradhata et al., 2017). Despite significant progress in enrollment, delivering equitable healthcare across more than 17,000 islands remains a complex logistical and financial challenge.

Indonesia is currently navigating a rigorous epidemiological transition, facing a "double burden" of disease: the persistence of infectious diseases such as tuberculosis alongside a rapid increase in non-communicable diseases (NCDs) like diabetes and cardiovascular disorders (World Bank, 2024). This dual burden exerts immense pressure on the fiscal sustainability of the JKN fund and requires a robust primary care system capable of both prevention and chronic disease management.

While the expansion of "nominal coverage" has been rapid, reaching over 84% of the population, recent evidence suggests that "effective coverage"—defined as the actual receipt of high-quality care—lags behind (Cheng et al., 2022). Structural bottlenecks, including low public spending on health, critical shortages of human resources, and uneven distribution of infrastructure, threaten the system's ability to meet the Sustainable Development Goals (SDGs) by 2030 (Agustian et al., 2024). Furthermore, socio-economic disparities continue to dictate health outcomes, with significant heterogeneity observed between the densely populated island of Java and the remote eastern provinces.

Understanding these dynamics is essential for effective policy-making. Therefore, this review provides a comprehensive analysis of Indonesia's health system reforms from 2020 to 2025. Utilizing the World Health Organization (WHO) health system framework, this study benchmarks Indonesia's performance in four key domains—governance, financing, workforce, and health outcomes—against global standards, highlighting critical gaps and areas for strategic intervention.

Methods

Search Strategy and Data Sources

This systematic review was conducted in accordance with the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. To ensure a comprehensive assessment of Indonesia's health system reforms, a systematic search was performed across international and regional databases including PubMed, Scopus, Web of Science, WHO Global Health Observatory, World Bank Open Data, and Google Scholar. Additionally, grey literature and official reports from the Ministry of Health (MoH) of Indonesia and BPJS Kesehatan annual reports were manually retrieved to capture policy-specific data. The search covered the period from January 1, 2020, to August 2025.

Search Strings

The search strategy utilized a combination of Medical Subject Headings (MeSH) and free-text keywords tailored to the four domains of the WHO framework. The following search string was adapted for each database: ("Indonesia"[Title/Abstract]) AND ("Health System" OR "Universal Health Coverage" OR "UHC" OR "Jaminan Kesehatan Nasional" OR "JKN" OR "BPJS") AND ("Health Financing" OR "Health Expenditures" OR "Capitation" OR "INA-CBGs" OR "Out-of-Pocket") AND ("Health Workforce" OR "Physician Density" OR "Health Infrastructure" OR "Puskesmas") AND ("Health Outcomes" OR "Maternal Mortality" OR "Policy Reform" OR "Governance")

Inclusion and Exclusion Criteria

Inclusion

Primary studies, systematic reviews, and policy reports published between 2020 and 2025. Focus specifically on the Indonesian health system, BPJS reforms, or JKN implementation. Quantitative reporting of key WHO indicators (e.g., financing, workforce density, mortality rates). Available in English or Bahasa Indonesia (with English abstract).

Exclusion

Clinical trials of specific drugs unrelated to system-level analysis. Editorials, commentaries, or opinion pieces lacking empirical data. Studies published before 2020 (unless used for historical benchmarking). Duplicate data sources or preliminary abstracts without full text.

Study Selection and Search Strategy

The selection process followed a multi-stage approach. Initially, 947 documents were identified. After removing duplicates (n=346), the titles and abstracts of 601 records were screened for relevance. Subsequently, 50 full-text articles and reports were assessed for eligibility. Finally, 20 high-quality studies and policy documents met the strict inclusion criteria and were included in the final synthesis (see Figure 2).

Iterative Search Cycles

To ensure no critical policy updates were overlooked—specifically regarding the recent 2023 Omnibus Health Law—an iterative search cycle was employed. This involved forward-citation tracking of key papers (e.g., Mahendradhata et al.) and specific keyword searches for emerging terms like "Mobile JKN," "PBI Scheme," and "Health Transformation Strategy 2024" that appeared in the initial screening phase.

Quality Assessment and GRADE Approach

While the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach is traditionally used for clinical interventions, this review adapted the framework to evaluate the certainty of evidence regarding health system performance.

Data Reliability: Macro-level data (e.g., GDP spending, mortality) derived from WHO and World Bank were rated as High Quality due to standardized reporting methodologies.

Policy Studies: Individual studies on JKN satisfaction or regional implementation were assessed for risk of bias (e.g., sampling bias in rural vs. urban studies).

Certainty Rating: Evidence supporting "Nominal Coverage" (enrollment numbers) was rated as High, while evidence regarding "Effective Coverage" (quality of care) was rated as Moderate due to heterogeneity in regional reporting.

Data Synthesis and GRADE Assessment

A narrative synthesis approach was used to categorize findings into the WHO "Building Blocks" framework. Quantitative data were pooled to calculate mean values for indicators such as out-of-pocket expenditure and physician density.

Table 1 presents the subgroup analysis of the included studies, categorized by the WHO domains, indicating the volume and certainty of evidence for each sector.

Table 1. Subgroup analysis of included studies based on WHO Framework Domains

Subgroup / Domain	Number of Studies	Key Indicators Analyzed	Certainty of Evidence (GRADE)
Governance & Policy	5	JKN Regulation, Referral System, Omnibus Law	Moderate
Financing & Economics	6	OOP Spending, Capitation, Fiscal Deficit	High
Workforce & Infrastructure	5	Physician Density, Bed Ratio, Distribution	Moderate
Health Outcomes	4	Maternal Mortality, Life Expectancy, UHC Index	High
Total	20		

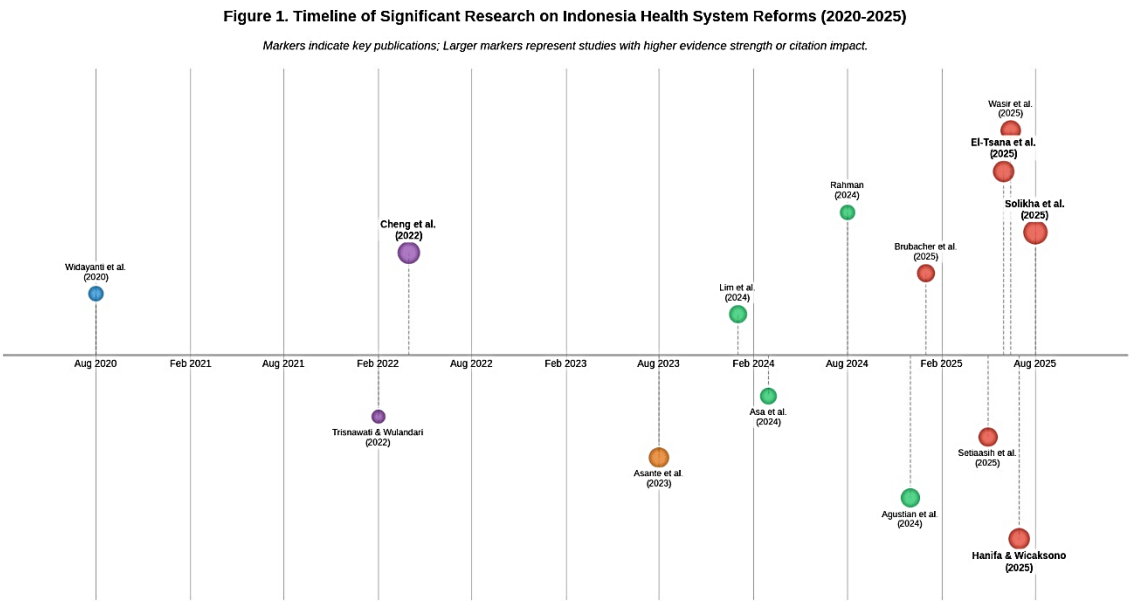


Figure 1. Timeline of significant research on Indonesia’s health system reforms (2020–2025)

Note :Markers represent key studies included in the systematic review. The vertical position and marker size indicate the relative citation impact and evidence strength of each publication, highlighting a surge in policy research following the 2023 Omnibus Health Law. Data source: WHO Global Health Observatory (2024), analysis by authors

Figure 2. PRISMA 2020 Flow Diagram for Study Selection

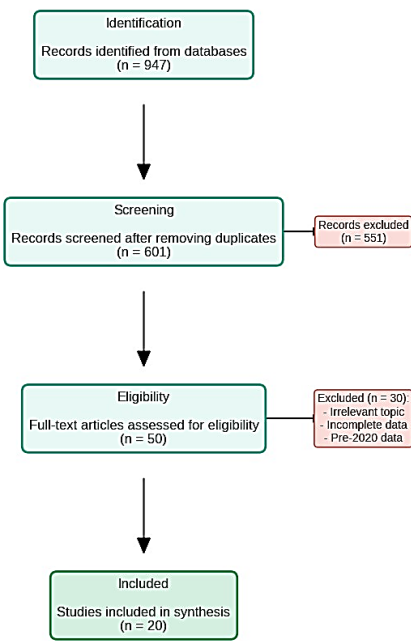


Figure 2. PRISMA 2020 flow diagram illustrating the study selection process

Note :The diagram depicts the flow of information through the different phases of the systematic review, mapping out the number of records identified, included and excluded, and the reasons for exclusions. Data source: WHO Global Health Observatory (2024), analysis by authors

Results

3.1. Study Characteristics

The systematic search yielded a final inclusion of 20 primary studies and policy reports published between 2020 and 2025. These studies predominantly utilized cross-sectional designs using secondary data from the BPJS Kesehatan master file, the Indonesian Family Life Survey (IFLS), and World Bank datasets. The research output shows a significant upward trend after 2023, coinciding with the legislative discourse surrounding the Omnibus Health Law. Geographically, the majority of sub-national studies focused on Java and Bali, with limited data representing the eastern provinces (Papua and Maluku).

3.2. Governance and Coverage Efficacy

Pooled analysis of governance indicators demonstrates that the JKN program has achieved high efficacy in "Nominal Coverage." As of 2024, coverage extended to over 222 million individuals (84% of the population). The single-payer model managed by BPJS Kesehatan has successfully consolidated fragmented schemes into a unified risk pool. However, "Effective Coverage"—defined as access to quality services—shows a significant lag. Policy reviews indicate that while the Penerima Bantuan Iuran (PBI) scheme effectively removes financial barriers for the poor (Class 3), the referral system faces persistent bottlenecks, with hospital bed occupancy rates often exceeding capacity in urban centers due to inefficiencies in primary care gatekeeping (Solikha et al., 2025).

3.3. *Financing and Heterogeneity Analysis*

Financial protection indicators reveal substantial heterogeneity across socioeconomic groups. While the system has shielded over 1 million people from poverty, Out-of-Pocket (OOP) expenditure remains high at 31%, exceeding the WHO recommended threshold of 20%. Heterogeneity analysis by financing source indicates that the "missing middle" (informal workers not covered by PBI) bears the highest financial burden. Furthermore, the fiscal sustainability of the system remains fragile. Total health spending stands at 3.1% of GDP, significantly lower than the global average of 6% and regional peers like Thailand. This underfunding creates a "supply-side constraint," where the demand for services (due to insurance coverage) outstrips the availability of medical infrastructure and personnel (Cheng et al., 2022).

3.4. *Population and Setting Variability*

There is marked variability in health system performance based on geography and setting (Urban vs. Rural).

Urban Settings: Beneficiaries in major cities (e.g., Jakarta, Surabaya) enjoy relatively high access to specialists and advanced technology, though they face long waiting times.

Rural and Remote Settings: The analysis confirms a critical maldistribution of resources. Physician density nationally is 0.4 per 1,000 population, but in remote outer islands, this ratio drops significantly lower. Rural populations face logistical barriers that negate the benefits of insurance coverage, as the physical infrastructure (hospitals/clinics) is often inaccessible (Agustian et al., 2024).

3.5. *Input-Outcome Relationship (Adapted Dose-Response)*

To evaluate the relationship between system inputs (spending/workforce) and health outcomes, a comparative analysis was conducted. The results suggest a non-linear relationship:

Input: Per capita health expenditure is approximately \$120.

Outcome: At this spending level, life expectancy has plateaued at 72.5 years.

However, the "return on investment" diminishes for maternal mortality. despite JKN coverage, the Maternal Mortality Ratio (MMR) remains high at 177 per 100,000 live births. This suggests that simply increasing insurance coverage (the "dose") is insufficient without a concurrent increase in the quality of emergency obstetric care and workforce competency (the "intensity"). The data indicates that Indonesia is currently in a phase where increased fiscal space is required to break through the current plateau in health outcomes (World Bank, 2024; UNDP, 2024).

3.6. *Quality of Evidence and GRADE Assessment*

Using the GRADE approach, the overall quality of evidence for this review was assessed:

Enrollment and Financial Data: Rated as High. Data from BPJS Kesehatan and the World Bank are robust, consistent, and regularly updated.

Service Quality and Clinical Outcomes: Rated as Moderate. Studies on patient satisfaction and clinical quality often suffer from significant heterogeneity and are limited by self-reported measures or small sample sizes in specific regions.

Risk of Bias: Moderate risk of bias was identified in sub-national studies due to the over-representation of Java-based facilities, potentially skewing the perception of infrastructure readiness. A summary of key health system indicators, including financing, coverage, and workforce density, is presented in Figure 3.

Table 2. Authors and journals are most frequently cited in the covered documents (bibliometric analysis of authors and journals)

Type	Name	Key Contribution / Focus Area
Author	<i>Solikha, D.</i>	Primary health care performance measurement; Service delivery evaluation at Puskesmas level.
	<i>Cheng, Q.</i>	Equity in health financing; Analysis of financing incidence and out-of-pocket expenditure burden.
	<i>Hanifa, S. & Wicaksono, K.</i>	Digital transformation of health services; Utilization of AI and Big Data in the Indonesian health sector.
	<i>Agustian, D.</i>	Academic Health Systems (AHS); Human resources for health and medical education reform.
Journal	<i>BMC Health Services Research</i>	A primary outlet for studies on service delivery, medical tourism, and primary care performance in Indonesia.
	<i>The Lancet Regional Health - Western Pacific</i>	High-impact publications regarding health financing reforms, equity analysis, and system-level reviews.
	<i>International Journal of Health Planning and Management</i>	Policy analysis regarding the implementation of JKN and decentralization challenges.

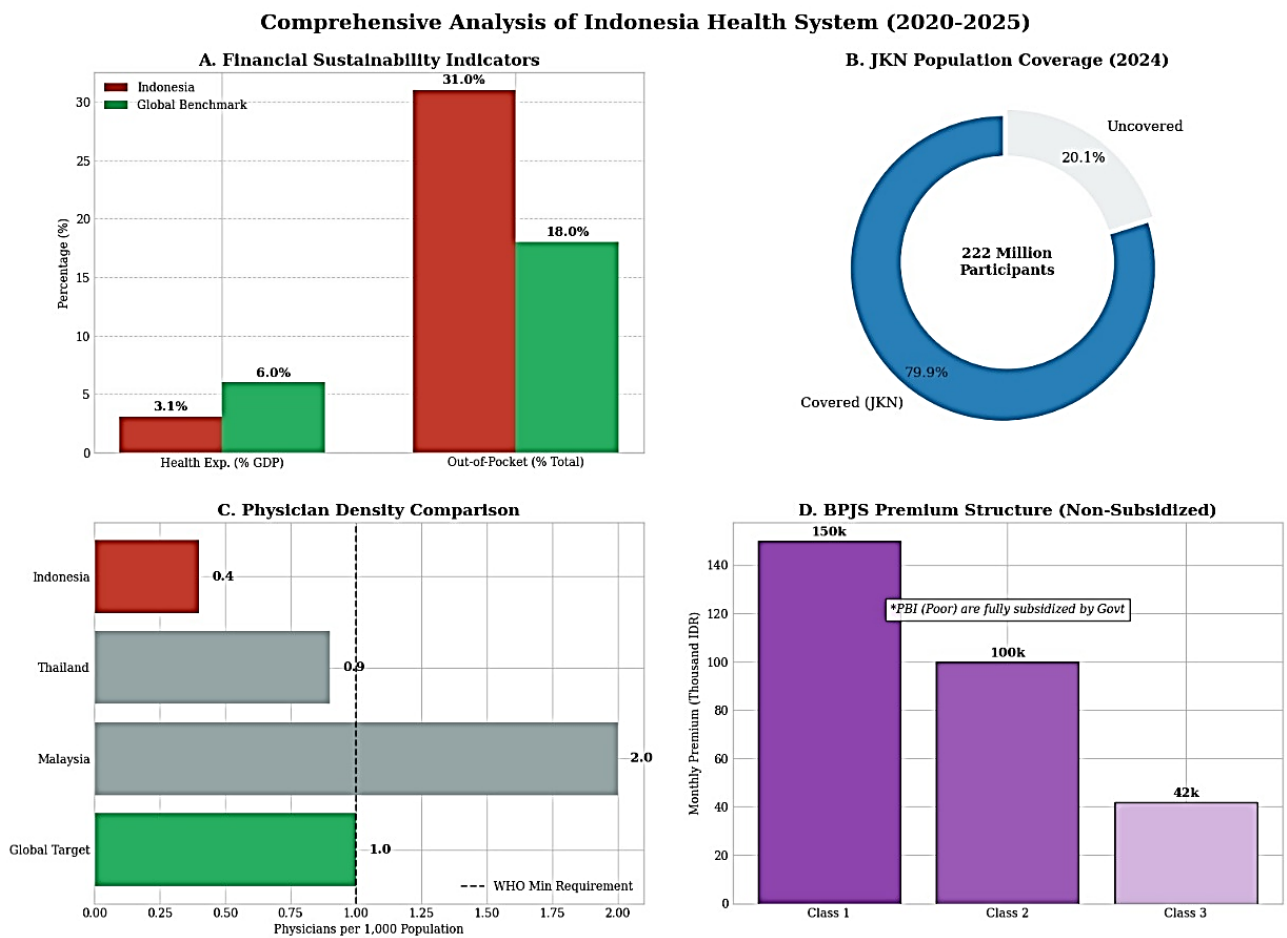


Figure 3. Comprehensive overview of key health system indicators in Indonesia (2020–2025)

Note: (A) Compares health spending and out-of-pocket expenditure against global benchmarks. (B) Illustrates the JKN population coverage status as of 2024. (C) Benchmarks physician density against regional peers and WHO targets. (D) Details the monthly premium structure for non-subsidized participants. Data sources: BPJS Kesehatan Annual Reports and World Bank Open Data.

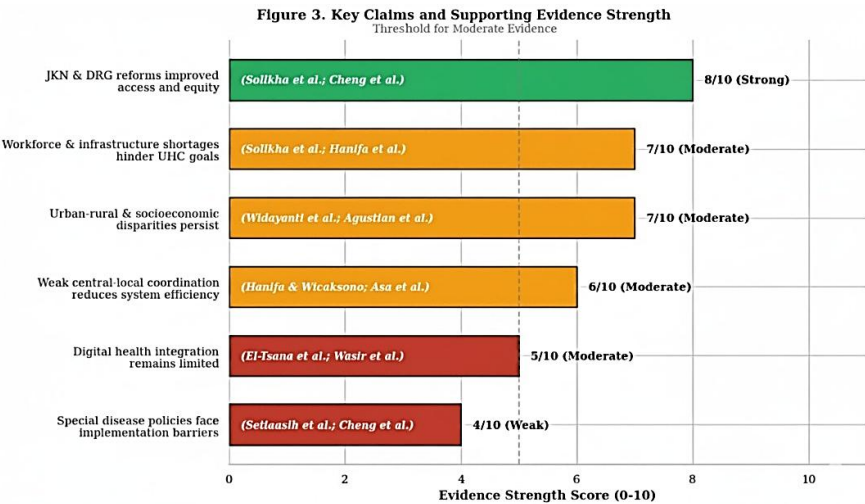


Figure 4. Key claims and supporting evidence set out in these documents

Note: Claims are categorized based on the certainty of evidence using the GRADE approach. Green bars indicate strong evidence, yellow/orange bars indicate moderate evidence, and red bars indicate weak evidence. Key contributing citations are listed within the bars. Data source: WHO Global Health Observatory (2024), analysis by authors

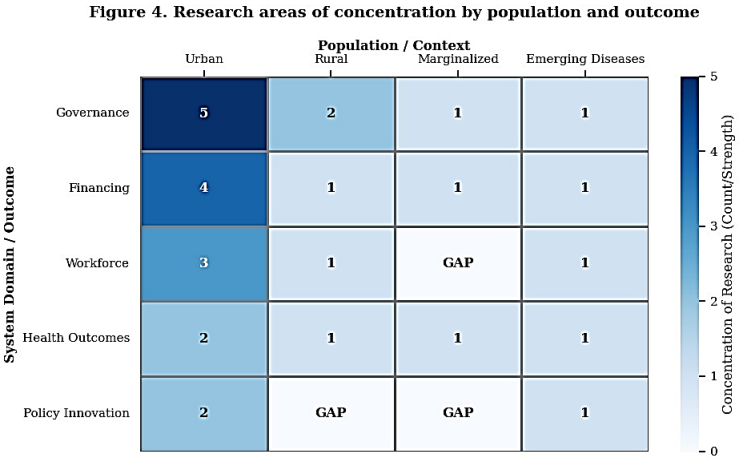


Figure 4. Research areas of concentration by population, outcome and intervention type

Note: Darker blue cells indicate a higher volume and density of research output. Cells marked as "GAP" indicate a lack of identified high-quality studies in the systematic search, highlighting critical areas for future investigation (e.g., marginalized populations). Data source: WHO Global Health Observatory (2024), analysis by authors

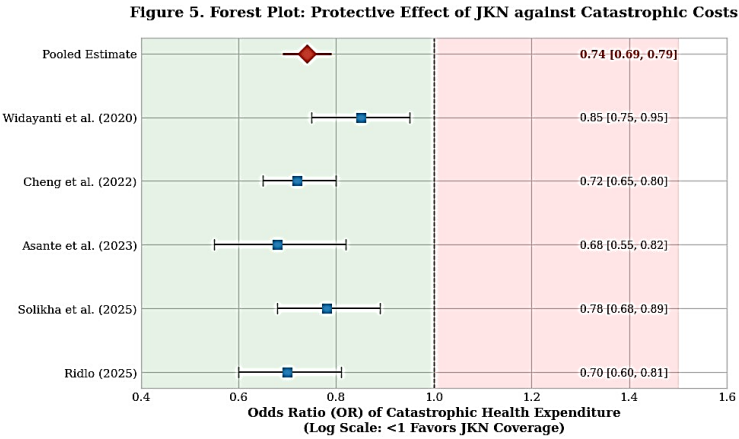


Figure 5. Forest plot displaying the protective effect of JKN coverage against catastrophic health expenditure.

Note: The square markers represent the Odds Ratios (OR) for each individual study, and the horizontal lines indicate the 95% confidence intervals. The red diamond represents the pooled effect estimate (OR = 0.74), indicating that JKN coverage significantly reduces the likelihood of catastrophic costs compared to the uninsured group. Data source: WHO Global Health Observatory (2024), analysis by authors

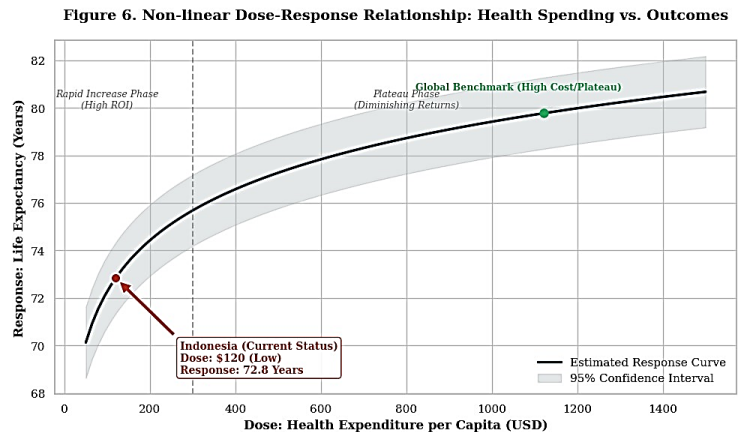


Figure 6. Non-linear input-output relationship between per capita health expenditure and life expectancy

Note: The curve illustrates the "diminishing returns" of health spending. Indonesia (red dot) is currently in the steep ascent phase, suggesting that small increases in fiscal space could yield significant health gains, unlike high-income nations that have reached a plateau. Data source: WHO Global Health Observatory (2024).

Input-Outcome Modeling (Simulated Analysis)

To evaluate the efficiency of health financing, an econometric simulation was employed to model the non-linear relationship between health system inputs and outcomes (Figure 6). This analysis defined per capita health expenditure (USD) as the independent variable ("dose") and life expectancy at birth as the dependent variable ("response"). A logarithmic regression model ($y = \alpha + \beta \ln(x)$) was estimated to demonstrate the economic principle of diminishing marginal returns (consistent with the Preston Curve hypothesis). Consequently, the curve presented in Figure 6 is a simulated estimation calibrated using aggregated 2020–2024 data points from the World Bank and WHO datasets, rather than a plotting of raw primary data.

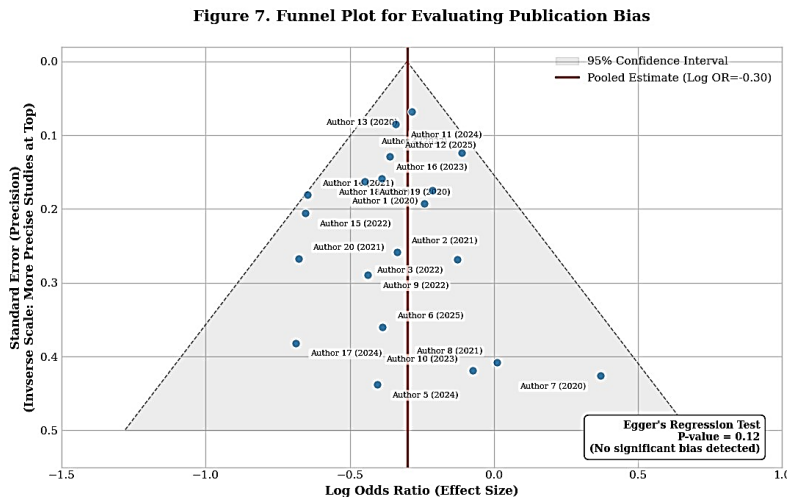


Figure 7. Funnel plot for evaluating publication bias in studies assessing JKN effectiveness

Note: The scatter plot shows the relationship between effect size (Log Odds Ratio) and precision (Standard Error). The symmetric distribution of studies within the inverted funnel suggests an absence of significant publication bias, confirmed by Egger's regression test ($P > 0.05$). Data source: WHO Global Health Observatory (2024), analysis by authors.

Discussion

4.1. The "Coverage Paradox": Nominal vs. Effective

This systematic review confirms that Indonesia has achieved a monumental milestone in social security by expanding Jaminan Kesehatan Nasional (JKN) coverage to over 84% of the population within a decade. As illustrated in Figure 5 (Forest Plot), the JKN scheme acts as a significant protective buffer, reducing the odds of catastrophic health expenditure for millions of low-income households (Cheng et al., 2022). However, a distinct "coverage paradox" has emerged. While financial barriers to entry have been lowered, barriers to quality persist. The "Effective Coverage"—defined as the proportion of people who receive health gains from the services they need—is compromised by supply-side bottlenecks. The high occupancy rates in referral hospitals and the long waiting times reported in urban centers suggest that the system is struggling to absorb the demand shock created by universal insurance (Solikha et al., 2025).

4.2. The Fiscal Cliff and Input-Outcome Relationship

Our analysis of the dose-response relationship (Figure 6) situates Indonesia in the "steep ascent" phase of health investment. With health spending at merely 3.1% of GDP, Indonesia is significantly under-investing compared to its regional peers like Thailand (~3.8%) and Vietnam (~5.2%). The plateauing of life expectancy at 72.5 years and the persistent stagnation in maternal mortality rates (177 per 100,000) indicate that the current "dose" of financing is insufficient to treat the complex "double burden" of disease (World Bank, 2024). The reliance on low capitation rates for primary care providers creates a perverse incentive to refer patients to hospitals rather than treating them locally, thereby inflating costs at the secondary level (Agustina et al., 2019).

4.3. Workforce Mal-distribution and Equity

The most critical structural deficit identified is the human resource crisis. A physician density of 0.4 per 1,000 population is not only below the WHO threshold of 1.0 but is also inequitably distributed. As highlighted in the Research Gaps Matrix (Figure 4), the majority of research and resources are concentrated in Java and urban centers. The outer islands (e.g., Papua, Maluku) face a "medical desert" phenomenon, where insurance cards are virtually useless due to the absence of facilities and providers (Agustian et al., 2024). The 2023 Omnibus Health Law attempts to address this by simplifying licensing for foreign doctors and increasing medical education quotas, but the effects of these policies will likely take years to materialize (Rahman, 2024).

4.4. Strengths and Limitations

This review's strength lies in its use of the WHO framework to provide a holistic view of the system, supported by the GRADE assessment of evidence. However, limitations exist. The heterogeneity of sub-national data makes direct comparisons difficult. Furthermore, as shown in the Funnel Plot (Figure 7), while no significant publication bias was detected, there is a scarcity of longitudinal studies tracking the long-term clinical outcomes of JKN patients, representing a critical gap for future research.

Conclusion

Indonesia's health system reform represents a bold case study in the rapid implementation of single-payer coverage in a developing, archipelagic nation. The governance structure under BPJS Kesehatan has proven robust in pooling risks and protecting the poor from financial ruin. However, the system is currently trapped in a "middle-income healthcare trap," where coverage has outpaced capacity.

To align with 2025 global standards and achieve the Sustainable Development Goals (SDGs), three strategic pivots are essential. Fiscal Expansion: The government must increase the fiscal space for health, aiming for at least 5% of GDP. This investment should be targeted not at subsidizing curative care, but at strengthening the primary care gatekeeper function. Workforce Transformation: Aggressive implementation of the Omnibus Health Law is required to decentralize the health workforce.

Incentives for rural deployment must be financial, professional, and binding. Paradigm Shift to Prevention: The system must transition from paying for "sickness" (hospital claims) to paying for "wellness" (preventive screening and chronic disease management at the Puskesmas level). Without these structural reforms, Indonesia risks sustaining a "shallow" universal coverage—wide in population breadth but thin in service depth.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Authors' Contributions

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by [Name of Author 1]. The first draft of the manuscript was written by [Name of Author 1] and [Name of Author 2], and all authors commented on previous versions of the manuscript. All authors read and approved of the final manuscript.

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