

Systemic Barriers to Preventing Fraud in National Health Insurance (JKN) Claims: Perspectives from Regional Hospitals and BPJS Kesehatan

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Abstract

Health insurance claims within Indonesia's National Health Insurance (JKN) scheme are highly vulnerable to fraudulent practices, which may jeopardize the sustainability of the program. Fraud prevention is therefore a critical component of accountable claim management. This study aims to analyze the challenges in implementing the JKN fraud prevention system in hospitals based on existing regulations and current practices. This research adopts a qualitative approach using a case study design. The study was conducted at the BPJS Health office and a hospital located in East Java, Indonesia. Data were collected through document review and in-depth interviews with four informants: one BPJS Health officer, two members of the anti-fraud team, and one member of the hospital's claim verification team. The data were processed through reduction, presentation, and conclusion drawing. The findings were presented using interview quotations and visual illustrations generated with NVivo 15. The findings reveal that the JKN fraud prevention system in hospitals still faces major challenges, including limited understanding of fraud concepts, minimal utilization of claim detection applications, and inadequate internal audits. The data indicate five groups of outpatient services and five groups of inpatient services based on INA-CBG classifications with the highest fraud potential during the 2022–2024 period. A word cloud visualization highlighted keywords such as "verification," "application," "procedure," and "regulation" as core issues in fraud prevention. Although an anti-fraud team has been established, its implementation remains suboptimal in preventing fraud within JKN claims. The implementation of the JKN fraud prevention system encounters multidimensional challenges, particularly concerning regulatory frameworks, technological support, and human resource competencies. Strengthening digital systems, harmonizing regulations, and providing technical training are essential to enhance monitoring mechanisms and early detection of fraud in JKN claims.

Keywords: National Health Insurance; JKN; Claim Fraud; Claim Audit; Anti-Fraud System; Claim Verification.

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INTRODUCTION

Health insurance claims under Indonesia's National Health Insurance (JKN) scheme refer to the process by which healthcare facilities submit reimbursement requests to BPJS Health for the medical services provided to insured patients. This financing mechanism plays a crucial role in ensuring the operational sustainability of the JKN program [1]. The Social Security Administering Agency for Health (BPJS Health) is a public institution established by the Indonesian government to manage and implement the national health insurance system for all citizens across socio-economic levels [2].

One of the major challenges in the implementation of JKN is the potential occurrence of fraud. In the context of healthcare services, fraud is defined as a deliberate act aimed at obtaining unlawful financial gain through the submission of claims that do not reflect actual medical services and procedures [3]. Within the JKN system, fraudulent practices may be perpetrated by various actors including participants, healthcare providers, BPJS Health officers, and even suppliers of medicines or medical equipment motivated by financial benefits obtained in violation of regulatory provisions [4].

Importantly, the issue of health insurance fraud is not exclusive to developing countries; it also persists in developed nations. Several countries in the Asia-Pacific region such as Singapore, Malaysia, Thailand, the Philippines, Vietnam, Japan, Hong Kong, South Korea, Taiwan, and Indonesia have acknowledged the presence of fraudulent indicators within their national health insurance systems. Empirical data across these countries suggest that perpetrators of hospital-based fraud may include medical professionals, administrative staff, and other healthcare service providers [5].

The Indonesian government, as stipulated in the Regulation of the Minister of Health of the Republic of Indonesia Number 16 of 2019, has classified several common forms of fraud that occur in hospitals. These fraudulent practices include excessive diagnosis coding (upcoding), duplication of claims from other patients (cloning), submission of fictitious claims (phantom billing), inflated billing for medications and medical devices, unbundling of service episodes, self-referrals, repeated billing, and extension of inpatient care without clinical indication. Furthermore, Glynn (2022) identified ten prevalent types of fraud in healthcare systems, such as submitting claims for services that were never provided, manipulating the timing and location of services, falsifying provider identities, and prescribing unnecessary drugs [6]. Ineffective prevention of such fraudulent activities may threaten the sustainability of the JKN program. Therefore, Ministerial Regulation Number 16 of 2019 mandates that every Advanced Referral Health Facility (FKRTL) establish a fraud prevention system consisting of internal policies, technical guidelines, anti-fraud culture development, formation of anti-fraud teams, and strengthened internal monitoring mechanisms. In addition, external oversight by BPJS Health is expected to function optimally. Ineffective internal supervision by hospital

management and inadequate external supervision by BPJS Health have the potential to facilitate fraud occurrences [7].

The problem of fraud within the JKN program warrants further investigation, particularly in the context of implementing fraud prevention policies within healthcare facilities. This study was conducted to examine the challenges in preventing JKN-related fraud in hospitals based on existing regulatory frameworks. The focus of the study encompasses the regulations and fraud prevention systems that have been implemented, as well as the obstacles encountered during their execution.

Interview findings with a claims officer at one of the BPJS Health branch offices in East Java, Indonesia, on February 18, 2025, revealed the presence of claims indicating potential fraud during the 2022–2024 period. The information obtained also revealed that the current JKN fraud prevention system in the region remains in its early developmental stage and has not yet demonstrated full effectiveness. Based on this context, the present study aims to analyze the challenges in preventing JKN-related fraud at one BPJS Health branch office and one regional hospital in East Java, Indonesia, with the expectation of providing strategic insights to strengthen the fraud prevention and monitoring system for JKN claims in hospitals.

METHOD

This study employed a qualitative approach with a case study design to explore in depth the challenges of fraud prevention in National Health Insurance (JKN) claims within hospital settings. According to Sugiyono, the qualitative approach is often referred to as a naturalistic method because it is conducted in natural conditions. It is called qualitative because the data collected and analyzed are descriptive and narrative rather than numerical [8]. This design enabled the exploration of multiple perspectives from actors directly involved in detecting, preventing, and implementing JKN fraud prevention policies.

Purposive sampling was used to select key informants who possessed relevant experience and authority in processes related to JKN fraud prevention. The inclusion criteria specified individuals professionally involved in claim verification, fraud prevention, and audit procedures related to JKN claims. Informants were required to have a minimum of one year of active involvement in JKN claims, either at BPJS Health or within hospital anti-fraud teams. A total of four informants were selected: one BPJS Health officer responsible for JKN claim verification, two members of the hospital's anti-fraud team, and one hospital claim verifier directly involved in the submission of JKN claims.

The research sites were determined using purposive sampling. One BPJS Health branch office with recorded indications of fraudulent claims during the 2022–2024 period was selected, along with one hospital that had already established an anti-fraud team. The study was conducted between May and July 2025 at the BPJS Health branch office and a regional hospital located in East Java Province, Indonesia.

Data were collected using a structured interview guide and a document review checklist. The interview guide was developed based on the main components of the JKN fraud prevention policy outlined in the Regulation of the Minister of Health (PERMENKES) Number 16 of 2019 concerning the prevention and management of fraud in the implementation of the National Health Insurance program. This regulation provides guidelines for preventing JKN-related fraud in healthcare facilities, including hospitals and BPJS Health offices.

The guide consisted of open-ended questions designed to elicit in-depth responses from participants directly involved in JKN claim verification and fraud prevention efforts. To ensure clarity and relevance, the interview guide was validated by an academic expert and a practitioner involved in JKN claim verification. These experts evaluated the alignment of the questions with the study objectives, particularly regarding systemic and operational challenges in fraud prevention. Revisions were made based on their feedback to enhance content coverage and linguistic clarity. A document review checklist was also employed to support and validate the interview findings. The combination of guided interviews and document examination provided a comprehensive basis for triangulating results and strengthening data validity.

Data were obtained through interviews and document collection. In-depth structured interviews were conducted using the validated interview guide. The required documents included BPJS Health reports indicating potential fraudulent indications in JKN claims, JKN claim submission procedures, decrees (SK) of hospital JKN anti-fraud teams, regulations related to JKN fraud prevention systems, JKN claim guidelines, audit reports of JKN claims, and documentation of capacity-building activities for anti-fraud teams through training and/or seminars.

According to Miles and Huberman, the interactive model of data analysis consists of three main components: data reduction, data display, and conclusion drawing or verification. These three elements are integral to the qualitative analysis process because their reciprocal relationships must be continuously linked and compared to determine the direction and content of the final conclusions [9]. Data reduction enables the researcher to obtain a clearer overview of the findings and facilitates further tracing of relevant information whenever needed. Once the data are reduced, the next stage involves data presentation. In this study, data were presented in the form of interview quotations, visualizations generated using NVivo 15, and tables. The final stage consisted of drawing conclusions and formulating recommendations.

Data collection is the process of gathering information that enables researchers to draw conclusions and formulate strategic steps. Data were presented systematically in descriptive and narrative form based on the findings that emerged from the data reduction process. All data collected from the field both through in-depth interviews and document review were then organized to provide a comprehensive picture of potential fraud

in JKN claims, the existing JKN fraud prevention system, and its implementation challenges.

In this study, data reduction was carried out by selecting and simplifying relevant information obtained from interviews, observations, and document reviews related to the implementation of JKN fraud prevention efforts in hospitals. This process aimed to focus on key issues, particularly the challenges encountered by hospitals and BPJS Health in preventing potential fraud within health service claims. Information that was not directly related to the research focus such as general opinions outside the context of JKN policies or claims was eliminated to ensure a sharper and more targeted analysis. The retained data consisted of findings that highlighted systemic constraints, including limitations in fraud detection technology. This reduction process enabled the development of a more focused and structured narrative on these challenges, ultimately yielding academically and practically justifiable conclusions.

The data were presented systematically and coherently to illustrate the findings and allow researchers to identify problem patterns and draw relevant conclusions. Interview results were displayed both as direct quotations and as visual representations generated using NVivo 15. Document review results related to potential JKN fraud claims were presented in tables and diagrams for clearer interpretation.

Using NVivo 15, interview data were analyzed and coded based on predetermined themes as well as emergent inductive themes from the field. These codes were categorized into several groups. Visualizations such as Node-Case Models, word clouds, and matrix coding queries were used to clarify inter-category relationships and reinforce data interpretation. This approach not only facilitated researchers in understanding the challenges of JKN fraud prevention but also supported a transparent, in-depth, and structured thematic analysis process.

This research received ethical approval from the Health Research Ethics Committee under reference number 035/E-KEPK/STIKES/BHM/I/2025. Prior to data collection, all participants were clearly informed about the objectives and procedures of the study and were asked to provide their consent through an informed consent form.

RESULTS AND DISCUSSION

The findings of this study are presented graphically to clarify the relationship between the main themes and the parties involved in the JKN fraud prevention process. The visualization in Figure 1 shows the NVivo qualitative analysis Project Map. This Project Map illustrates the relationship between the elements being examined and the informants, namely: the Claims Verifier, BPJS Health, and two Hospital Anti-Fraud Teams (Anti-Fraud Team 1 and Anti-Fraud Team 2).

Six elements were identified from the data coding process, including: Challenges in Preventing JKN Fraud, Regulations Related to JKN Fraud Prevention, JKN Claim Verification, JKN Claim Audit, Fraud

Coding Requests and the Formation of JKN Anti-Fraud Teams, and Indicators of JKN Fraud.

Figure 1 shows that all informants provided perspectives on almost all of the topics examined. This strengthens the validity of the research findings by combining the perspectives of both the payer (BPJS Health) and the service providers (hospitals).

1. Challenges in Preventing JKN Fraud

Fraud prevention within Indonesia's National Health Insurance (JKN) program still faces multiple challenges. Based on interviews with informants from BPJS Health and the hospitals, it was found that the main obstacles include limited understanding among healthcare facility staff regarding the concept of fraud prevention, as well as the insufficient use of applications capable of effectively detecting fraudulent claims in hospitals. The following are excerpts from the interviews with several informants:

“The challenge is that the JKN fraud prevention program is not yet widely recognized, and the understanding of the concept of JKN fraud is still at an early stage. However, awareness is gradually improving.” (R1)

“It is difficult to determine which claims fall into the category of JKN fraud because there are many regulations related to specific diseases and cases, and the applications used are not yet efficient in assisting the officers.” (R2)

2. JKN Claim Verification

The claim verification process within the National Health Insurance (JKN) system in Indonesia is conducted in a comprehensive and stepwise manner to ensure data accuracy, document completeness, and compliance with relevant standards and regulations. Based on interviews visualized through NVivo 15 in Appendix 2, as well as a document review of claim flowcharts, claim document standards, and Minutes of Agreement on INA-CBGs claims, the following components were identified as key characteristics of the JKN claim verification process: Verification is carried out in several stages. Each submitted claim is assessed for completeness and compliance with administrative, medical coding, and clinical aspects in accordance with the INA-CBGs agreement guidelines. Initial processing at the hospital level begins with manual document checks conducted by medical records staff and hospital claim officers. After internal verification, the claims are submitted to BPJS Health for further processing. Compliance with regulations and policies is ensured through adherence to the INA-CBGs Minutes of Agreement and the National Guidelines for Medical Services (PNPK). If inconsistencies are found, BPJS Health verifiers may request additional supporting data and may return or reject claims that do not meet the requirements. BPJS Health also utilizes several verification applications to support the claim validation process.

3. Regulations for Preventing JKN Fraud

Fraud prevention within the National Health Insurance (JKN) program in Indonesia is grounded in a structured and comprehensive regulatory framework. Interviews with informants from BPJS Health and hospitals revealed that the implementation of JKN fraud prevention systems refers to several official regulations established by the government. These findings were further reinforced by document reviews related to the policies and regulatory guidelines used in practical implementation. The interview results from BPJS Health staff and hospital JKN anti-fraud teams are as follows:

“Fraud prevention regulations within the JKN program are based on Minister of Health Regulation Number 16 of 2019, the National Guidelines for Medical Services (PNPK), as well as other regulations such as Presidential Regulations (Perpres), Government Regulations (PP) related to the matter, and internal policies of BPJS Health formulated in accordance with these regulations.” (R1)

“The main legal foundation that serves as the core regulatory framework for JKN fraud prevention is Minister of Health Regulation No. 16 of 2019. In addition, the Minutes of Agreement related to INA-CBGs claims also serve as one of the references in the claim process.” (R3)

These interview findings provide evidence that numerous regulations, provisions, and guidelines have been issued to support the prevention of fraud within the JKN system.

4. JKN Claim Audit

Claim auditing plays a strategic role in ensuring the integrity of claim management in the National Health Insurance (JKN) program and serves as a crucial component of the fraud prevention mechanism. Figure 3 in the appendix presents the interview data related to JKN claim audits. The claim audit is an integral part of the JKN fraud prevention system as stipulated in the Minister of Health Regulation Number 16 of 2019 concerning Fraud Prevention in the National Health Insurance (JKN) program.

Based on the interviews, several mechanisms and practices were identified regarding the implementation of claim audits: (1) Audit Responsibility and Oversight Claim audits are primarily conducted by BPJS Health as the managing body of the JKN program. This institution is responsible for evaluating submitted claims to ensure compliance with medical standards, diagnosis and procedure codes, and administrative requirements. Most informants stated that BPJS Health usually conducts audits, particularly when discrepancies or potential fraud are detected in JKN claims. Hospital anti-fraud teams have not yet conducted any claim audits. (2) Timing and Scope of Audits Audits are initiated after claims are returned or questioned by BPJS Health. Audits take place at various times. Post-payment audits are conducted one month after claims are settled. The AAK audit is conducted at least twice a year. In addition, external audits by bodies such as SPI, BPK, and BPKP may be carried out every two to three years, and the audit timeframe may be extended

for up to 12 years. (3) Types of Audit and Stakeholders Involved JKN claim audits are categorized as follows: Internal audits are conducted directly by BPJS Health. Medical audits are carried out by medical professionals. External audits are conducted by independent bodies such as the Internal Supervisory Unit (SPI BPJS), the Audit Board of Indonesia (BPK), and the Financial and Development Supervisory Agency (BPKP). Mediation Audit: The Quality and Cost Control Team (TKMKB) often acts as an impartial body to resolve disputes related to discrepancies between hospital claims and BPJS Health assessments.

5. Fraud Detection Applications and Formation of Anti-Fraud Teams

The implementation of JKN fraud prevention policies is reflected through various efforts already applied within healthcare facilities. Figure 4 in the appendix illustrates that fraud prevention policies have been implemented through the establishment of JKN anti-fraud teams and the utilization of fraud detection applications. The interview findings were supported by document analysis, including the official Decree on the establishment of the JKN anti-fraud team and certificates of JKN fraud prevention training.

Based on interviews and document review, the following findings were identified: (1) Formation of Anti-Fraud Teams An Anti-Fraud Team has been established as part of the JKN fraud prevention system. Minister of Health Regulation No. 16 of 2019 on JKN Fraud Prevention mandates the formation of Anti-Fraud Teams in healthcare institutions, particularly hospitals. These teams typically consist of medical record officers, physicians, and case mix officers. Each member is required to sign an Integrity Pact in accordance with JKN claim submission regulations. The prevention of JKN fraud in hospitals has been carried out by the Anti-Fraud Team through assigned responsibilities to detect and prevent fraudulent practices. (2) Coordination at the Primary Healthcare Level (FKTP) Fraud prevention at the FKTP level is conducted through coordination with local Health Offices and supervisory teams at the district/city level. BPJS Health also operates several JKN fraud detection systems, including fraud prevention through the Whistleblowing System (WBS) and biometric verification for patients. Previously, fingerprint recognition was used, and it is currently being developed into facial recognition technology. (3) Fraud Prevention Training in Hospitals Hospitals have participated in training sessions on JKN fraud prevention. These trainings were attended by Anti-Fraud Team members and hospital claim officers, with the primary objective of enhancing the technical competence of healthcare personnel involved in fraud prevention and JKN claim management.

6. JKN Fraud Indicators

Based on the visualization in Figure 5, the indicators of JKN fraud are categorized into two major groups: 1) Regulatory Framework Fraud indicators used in the JKN system are primarily derived from Minister of Health Regulation No. 16 of 2019, which outlines potential types of fraud such as: Upcoding: unjustified alteration of diagnosis or procedure codes, Claims submitted by ineligible or unauthorized participants,

Unwarranted extension of hospitalization duration. Inconsistencies in medical service duration or treatment not aligned with clinical protocols and the National Guidelines for Medical Services (PNPK) This regulatory framework serves as a reference for hospitals and BPJS Health to understand and identify potential types of JKN fraud. 2) Discrepancies in Claim Documents. Fraud indicators also arise from inconsistencies found in claim documents related to administrative aspects, clinical documentation, and medical coding contained in the INA-CBGs claim agreement.

7. Potential Fraud in JKN Claims

Table 1 presents data obtained from one of the BPJS Health branch offices regarding JKN claims that potentially indicate fraud within outpatient services for the period 2022 to 2024. Five case groups based on INA-CBGs (Indonesia Case Base Groups) in outpatient services were identified as having the highest rankings in terms of both case volume and total cost.

The highest category was Q-5-44-0, classified as “Other mild chronic diseases,” with a total of 2,798,745 claims and IDR 581,196,391,274 in expenditures. This was followed by M-3-16-0, or “Physical therapy and musculoskeletal procedures,” which recorded 365,351 cases with IDR 45,871,012,600 in total costs.

Additionally, N-3-15-0, or “Dialysis procedures,” ranked third with 292,039 cases and a total claim cost of IDR 240,695,618,095. The Z-3-27-0 category, which includes “Wound care,” registered 251,431 cases with IDR 48,874,855,700 in total expenses. Finally, H-3-12-0, or “Other eye procedures,” included 194,972 cases with a total cost of IDR 45,658,426,100.

The lack of specificity in these categories creates the potential for invalid or inappropriate claims that do not accurately reflect the actual medical procedures performed.

Table 1. Most Frequent INA-CBGs Outpatient Cases 2022–2024

Code	INA-CBGs Name	Total Cost (IDR)	Total Cases
Q-5-44-0	Other minor chronic diseases	581,196,391,274	2,798,745
M-3-16-0	Physical therapy and minor musculoskeletal procedures	45,871,012,600	365,351
N-3-15-0	Dialysis procedures	240,695,618,095	292,039
Z-3-27-0	Wound care	48,874,855,700	251,431
H-3-12-0	Other eye-related procedures	45,658,426,100	194,972

Table 2. Most Frequent INA-CBGs Inpatient Cases 2022–2024

Code	INA-CBGs Name	Total Cost (IDR)	Total Cases
O-6-10-1	Minor cesarean surgical procedures	183,908,760,200	33,600
A-4-13-1	Mild non-bacterial infections	67,897,542,520	33,321
K-4-17-1	Abdominal pain and other gastroenteritis (mild)	36,842,032,752	21,092
E-4-10-1	Diabetes and nutritional/metabolic disorders (mild)	44,166,513,206	11,557
K-4-18-1	Other gastrointestinal system diagnoses (mild)	16,077,909,148	10,967

Table 2 presents data sourced from BPJS Health reports, identifying the five inpatient INA-CBGs care categories with potential JKN fraud during the period 2022–2024. The category O-6-10-1, or “Minor cesarean surgery,” ranked first with 33,600 cases and a total cost of IDR 183,908,760,200. This was followed by A-4-13-1, or “Mild non-bacterial infections,” with 33,321 cases and a total cost of IDR 67,897,542,520. The third ranking category was K-4-17-1, or “Abdominal pain and other gastroenteritis (mild),” which recorded 21,092 cases with IDR 36,842,032,752 in total expenditures. Next, E-4-10-1, or “Mild diabetes and nutritional/metabolic disorders,” reported 11,557 cases with a total cost of IDR 44,166,513,206. Finally, K-4-18-1, or “Other mild gastrointestinal system diagnoses,” recorded 10,967 cases with IDR 16,077,909,148 in total costs.

Figure 6 below displays the results of a word frequency analysis using NVivo 15 software with the “Word Frequency with Synonyms” feature. This visualization was used to identify the most frequently appearing terms in informants’ narratives during in-depth interviews on Systemic Barriers in Fraud Prevention for National Health Insurance (JKN) Claims. Terms such as “fraud,” “verification,” “claim,” “procedure,” and “compliance” emerged as dominant keywords. These results indicate that the primary concerns of informants centered on the claim verification process, regulatory compliance, and fraud prevention mechanisms that are currently not functioning optimally. The word association mapping also revealed strong thematic relationships particularly between “verifier,” “compliance,” and “application” highlighting the critical role of technological support in identifying non-compliant claims.

The implementation of fraud prevention measures within Indonesia’s National Health Insurance (JKN) program demonstrates a multi-faceted approach grounded in regulatory frameworks, operational procedures, and institutional capacity. This study outlines five major thematic domains that collectively illustrate both progress and challenges in reducing fraudulent claims within JKN: claim verification, legal foundations, utilization of applications and the role of anti-fraud teams, indicators of fraudulent claims, and JKN claim auditing.

1. Challenges in Preventing Fraud in the JKN System

The findings of this study reveal that efforts to prevent fraud within the JKN system face complex challenges, including regulatory barriers, technological limitations, and human resource readiness. These findings reinforce the argument that large-scale health financing systems such as JKN require not only a strong policy framework but also adaptive infrastructure and competent human resources to effectively address potential fraud.

First, the lack of efficient supporting applications in several hospitals to assist in fraud detection emerges as one of the major issues. Artificial Intelligence (AI) significantly enhances real-time fraud detection capabilities and is more capable of adapting to evolving fraud patterns compared to traditional rule-based systems [10]. Previous studies also

identified gaps in the understanding of fraud definitions among hospital staff, limited training for claim officers, and the absence of integrated digital tools to support early detection mechanisms [11]. Strengthening digital systems is therefore a strategic step to minimize fraud in JKN, particularly considering the high volume of claims, which are often difficult to verify manually.

Second, the large number of guidelines governing claims for each diagnosis poses a substantial challenge in the verification process. Regulatory harmonization is necessary to establish a more transparent and fair claims process.

Third, the limited understanding of fraud within the JKN framework indicates that the program is still in the early stages of developing a strong compliance culture. Regulations, policies, technology, and human resources form an inseparable framework that serves as the backbone of the JKN fraud prevention system. JKN requires more adaptive regulations, enhanced digital systems, and improved capacity among healthcare personnel to ensure their ability to identify, prevent, and report fraud effectively.

2. JKN Claim Verification

The verification of JKN claims is a process that involves the manual examination of administrative completeness, the accuracy of medical coding, and compliance with regulatory standards such as the National Guidelines for Medical Services (PNPK) and the Minutes of Agreement for INA-CBGs (Indonesian Case-Based Groups) claims. Analyses of health insurance claim decisions in Indonesia emphasize the importance of accurate claim verification in preventing fraud within the National Health Insurance (JKN) system. BPJS Health offices have utilized applications for JKN claim verification, whereas hospitals mostly still perform verification manually. The systematic utilization of health insurance claim databases can provide valuable insights for detecting fraudulent claims [12]. Hospitals can develop new Standard Operating Procedures (SOPs) to review claim submissions, determine accurate diagnosis and procedure codes, and verify the completeness of medical record documentation [13]. Variations in claim coding have been proven to result in significant reimbursement errors [14]. Meanwhile, in the United States, the use of machine learning and predictive analytics has proven effective in reducing insurance fraud [15]. These findings underscore the need for applications that support claim verification in hospitals to enhance the capacity of verification officers.

3. Regulations for Preventing JKN Fraud

The Regulation of the Minister of Health Number 16 of 2019 concerning the Prevention and Handling of Fraud and the Imposition of Administrative Sanctions for Fraud in the Implementation of the National Health Insurance Program serves as the legal foundation for fraud prevention within the JKN system in Indonesia. In addition, several diagnostic claim guidelines, including the National Guidelines for Medical Services (PNPK) and the INA-CBGs Minutes of Agreement, are used as

references in the claims process. Understanding and implementing these regulations is essential for healthcare workers.

In the context of policy implementation, Mathar et al. (2023) found that delays in BPJS inpatient claim processing were not solely caused by administrative discrepancies but were also influenced by weak control over verification and validation systems at the healthcare facility level [16]. Purwandari et al. highlighted that the effectiveness of fraud prevention systems is determined not only by the presence of regulations but also by legal awareness and the capacity of healthcare providers to correctly implement established procedures [17]. Furthermore, weak internal controls and low adherence to claim guidelines remain major vulnerabilities that enable fraud, emphasizing the need for stricter data-based verification mechanisms [18]. High workloads, insufficient training, and administrative pressures are also contributing factors to fraudulent practices, directly affecting the accuracy of claim processing and the financial sustainability of the JKN system [19].

Although Ministerial Regulation No. 16 of 2019 serves as the legal basis for fraud prevention within JKN, its existence has not yet been fully matched by optimal understanding and implementation at the level of healthcare facilities. Therefore, fraud prevention efforts must be accompanied by the development of a work culture that prioritizes integrity, transparency, and accountability. Internal campaigns promoting professional ethics and compliance with policies should become an integral component of risk management strategies in every healthcare institution.

4. JKN Claim Auditing

Claim auditing plays a crucial role in ensuring good governance and financial integrity in the implementation of Indonesia's National Health Insurance (JKN) program. The findings of this study reveal several existing mechanisms and highlight the complexity and challenges of the audit process. These findings align with and can be compared to claim audit practices in other countries, as reflected in relevant international literature.

This study indicates that the primary responsibility for claim auditing lies with BPJS Health, the governing body of the JKN program. JKN claim audits are largely retrospective, including post-payment evaluations conducted one month after reimbursement, as well as audits that may be performed up to one year after a claim is submitted. This approach is consistent with post-payment review systems commonly used in insurance-based healthcare systems worldwide.

JKN claim audits are categorized into internal audits, external audits, and mediation audits. However, manual audit methods have proven to be less effective due to resource limitations [20]. This supports the dual role of audit as both a regulatory mechanism and an educational tool. The layered audit structure within the JKN system represents a relatively strong yet evolving framework.

Enhancing audit methodologies and strengthening inter-agency coordination are essential for improving the effectiveness of the system.

Literature suggests that the integration of data mining and predictive analytics can accelerate fraud detection, as demonstrated in the Medicaid system in the United States [15]. According to Widjajadi (2023), post-claim verification and audits serve as preventative measures against fraud. Without continuous monitoring and evaluation, there is a risk of fraud that could threaten the relationship between BPJS Health and healthcare facilities in the future [19].

The advancement of digital auditing technologies and the adoption of technological innovation within the JKN system may serve as strategic steps to improve audit efficiency, strengthen public trust in national health financing, increase the capacity and competence of claim auditors, and enable periodic evaluations of the effectiveness of the layered audit structure.

5. JKN Fraud Detection Applications and Formation of Anti-Fraud Teams

Hospitals and primary healthcare facilities in Indonesia have begun implementing fraud prevention policies through the establishment of JKN Anti-Fraud Teams, consisting of claim officers, medical record staff, physicians, and nurses. The signing of an Integrity Pact by all involved staff demonstrates a commitment to ethical conduct. This approach aligns with global best practices that emphasize organizational ethics and internal accountability [23].

Training for coders and medical personnel on the accuracy of medical coding procedures is also a critical factor in reducing fraudulent practices within the JKN system [24]. The JKN system will benefit significantly from continuous professional development, particularly in areas related to fraud detection, medical coding accuracy, and technological fluency among healthcare personnel.

6. Indicators of JKN Fraud

The main indicators of fraud identified in this study include discrepancies between diagnosis and procedure codes, unjustified hospital admissions, upcoding, and claims submitted by ineligible participants. In the context of the U.S. Medicare program, it is estimated that upcoding results in a financial loss of approximately USD 11 billion [25]. Advanced fraud detection and analytical software, such as SAS and IBM Watson, have been successfully implemented [15]. Within the JKN fraud prevention framework, similar analytical and detection tools may be adapted and further developed to align with the specific indicators of fraudulent JKN claims.

7. Potential Fraud in JKN Claims

Based on the review of BPJS Health data, five INA-CBG groups were identified as having the highest potential for fraud within outpatient services during the 2022–2024 period. These findings are consistent with the literature, which indicates that claim-based financing systems particularly prospective payment schemes such as INA-CBGs are vulnerable to manipulative practices, as tariff settings represent one of the main incentives for fraudulent behavior among healthcare facilities [26]. The group Q-5-44-0, classified as “Other minor chronic diseases,”

ranked first with 2.79 million claims and a total cost of IDR 581.2 billion, suggesting that broad and general diagnostic categories may facilitate fraudulent practices. This aligns with the findings of José Villegas-Ortega et al. (2021), who demonstrated that chronic medical conditions are a contributing factor to increased fraud propensity [27].

Furthermore, M-3-16-0, which includes therapeutic procedures and minor musculoskeletal treatments, exhibits a high risk of overutilization due to its repetitive nature and dependency on clinical evaluation. This is supported by the findings of the Corruption Eradication Commission (KPK) in 2024, which revealed a case of phantom billing in physiotherapy services across three private hospitals. Out of 4,341 claims, only 1,071 were supported by medical records, while the remaining 3,269 claims (approximately 75%) were allegedly fictitious, with a potential financial loss of IDR 501.27 million [28]. These findings confirm that physiotherapy services are highly vulnerable to administrative fraud, emphasizing the need for enhanced medical record-based verification systems and risk-based auditing mechanisms.

The category N-3-15-0 (Dialysis Procedures) ranked third in total costs, amounting to IDR 240,695,618,095. Dialysis is a long-term and routine treatment, making it susceptible to cumulative fraud through fictitious documentation or duplicate claims. Fourth is Z-3-27-0 (Wound Care), which indicates risks related to misclassification or manipulation of diagnostic and procedural codes, as variations in wound type are not always accurately reflected in the claim coding process. Lastly, H-3-12-0 (Other Eye Procedures) recorded a total cost of IDR 45,658,426,100, also suggesting potential loopholes for fraudulent claims.

A study by Mitriza and Akbar (2019) in Indonesian hospitals revealed that a major trigger of potential fraud is the difference in interpretation between auditors and treating physicians regarding diagnosis [29]. This aligns with findings from Feride Hayırsever Baştürk et al. (2020), which showed that health insurance fraud in Turkey was often committed by deliberately presenting misleading information to insurers, resulting in payments for services that were not covered by the policy [30]. The prevalence of non-specific diagnostic labels such as “Other physiotherapy” in JKN claims reflects similar concerns in other countries, where vague clinical descriptions have been exploited for fraudulent claims.

A study within Taiwan’s National Health Insurance system applied data mining techniques to detect fraudulent reporting by healthcare providers, particularly in outpatient diabetes services. The research demonstrated the effectiveness of algorithms such as logistic regression, artificial neural networks, and classification trees, with the classification tree model achieving an accuracy rate of 99% [31]. Therefore, these findings highlight the importance of early fraud detection mechanisms, which should be implemented through the integration of big data analytics, enhanced capacity of medical verifiers, and the optimization of electronic medical records as a primary validation tool. Without adequate technological support and transparent governance, the JKN system will

continue to be at risk of financial leakage due to undetected fraudulent practices.

A document review was also conducted on BPJS Health data regarding suspicious inpatient claims during the 2022–2024 period. Five JKN case groups at severity level 1 indicating mild or minimal conditions were identified as having fraud potential. The INA-CBGs code O-6-10-1 (Minor cesarean section surgery) ranked highest in both case volume (33,600 cases) and total cost (IDR 183,908,760,200). Cesarean procedures emerged as the most prominent category with potential fraud exposure in JKN. A study on upcoding practices in INA-CBGs-based inpatient claims across six general hospitals in West Sumatra found that the highest incidence of upcoding occurred in CMG O (maternity group) at 2.8%, followed by CMG W (female reproductive system group) at 1.7% [32].

The diagnostic code A-4-13-1, or “Mild non-bacterial infection,” ranked second with 33,321 cases and a total cost of IDR 67,897,542,520. The category K-4-17-1, or “Other mild abdominal pain and gastroenteritis,” ranked third with 21,092 cases and IDR 36,842,032,752 in total expenditures. In the diagnosis-based case mix inpatient claim system, upcoding practices are possible. The U.S. Centers for Medicare & Medicaid Services (CMS) estimated that total improper Medicare payments under the case mix-based Prospective Payment System (PPS) for acute inpatient care (both short-term and long-term) reached USD 4.8 billion (5.2%) [33].

The fourth category, E-4-10-1, or “Mild diabetes mellitus and nutritional/metabolic disorders,” recorded 11,557 cases with IDR 44,166,513,206 in total costs. Finally, K-4-18-1, or “Other mild gastrointestinal diagnoses,” recorded 10,967 cases with IDR 16,077,909,148. This category reveals a weakness in diagnostic classification, as the use of the term “other” indicates ambiguity in medical documentation and may allow room for inappropriate claim submissions.

From the above analysis, it is evident that most inpatient INA-CBG groups with fraud potential consist of diagnoses that are mild, generic, and subjectively interpreted. Such characteristics are highly prone to various forms of deviations, including: overclaiming (submitting claims that exceed the actual services provided), claims without medical justification, and upcoding or miscoding, where diagnosis or procedure codes are upgraded to higher severity levels to obtain higher reimbursement. These findings highlight the need to strengthen medical verification procedures and enforce standardized clinical pathways.

The results of this study have direct implications for the financial sustainability of the JKN system. If not properly controlled, fraudulent practices may increase expenditure without improving quality of care. Therefore, several strategies must be prioritized, including: strengthening regulations and claim auditing, implementing early-warning systems for potential fraudulent claims, digitalizing medical audits using artificial intelligence (AI), enhancing the capacity of JKN anti-fraud teams, claim

verifiers, and JKN claim auditors, as well as utilizing big data analytics to map claim patterns and develop detection applications for potential fraud in JKN claims. Without adequate technological support and transparent governance, the JKN system will continue to be at risk of financial leakage. This aligns with the findings of Mathar et al., (2024) who concluded that hospitals require a specifically designed misconduct prevention system to detect irregularities in JKN claims, strengthen accountability, and reduce the likelihood of fraud occurring at the operational level [13].

Furthermore, this study emphasizes that current efforts to prevent fraud in the JKN system remain reactive rather than proactive. Fraud detection often only begins after claims are submitted. The findings also indicate that successful fraud prevention is determined not only by the existence of policies but also by the synergy between regulatory strength, technological integration, and the competency of human resources involved in JKN fraud prevention.

The analysis using the Word Frequency with Synonyms feature in NVivo 15 revealed that terms such as “fraud,” “verification,” “claim,” “procedure,” and “compliance” were among the most frequently mentioned keywords in informants’ narratives. This demonstrates that the main focus of informants centered on claim verification processes, regulatory compliance, and the current fraud prevention mechanisms which are not yet functioning optimally.

The high frequency of the terms “fraud” and “verification” further suggests that the greatest challenge in fraud prevention lies in the uncertainty of detecting and managing problematic claims. This reinforces earlier findings that verification processes still rely heavily on manual systems in many hospitals, while digital tools have yet to be fully utilized (11). The visualizations also showed a strong association between verifiers, compliance, and applications, indicating that: The role of verifiers is crucial in identifying problematic claims; The level of compliance with regulations depends heavily on the staff’s understanding of established procedures; and Technological support, such as claim verification applications, is essential to detect claims that do not meet required standards.

This study makes an important contribution by identifying systemic challenges in preventing fraudulent claims within Indonesia’s National Health Insurance (JKN) system, particularly at the hospital level and within local BPJS Health offices. The qualitative approach through in-depth interviews and document reviews enabled a contextual understanding of regulatory, technological, and human resource constraints. However, several methodological limitations must be acknowledged.

First, the number of informants was limited ($n = 4$) and sourced from only one hospital and one BPJS Health office. Although thematic saturation was achieved, the diversity of perspectives from other regions or different healthcare facility levels is not fully represented, which may restrict the generalizability of the findings. Administrative challenges in

obtaining research permission from healthcare institutions, particularly hospitals, resulted in a smaller pool of informants than intended, even though additional respondents from collaborating hospitals within the same region should ideally have been included.

Second, the absence of a comparative control group for instance, hospitals with a well-integrated anti-fraud system limits the ability to attribute the observed challenges solely to systemic deficiencies. This constraint reduces the study's capacity to draw exclusive conclusions regarding institutional weaknesses.

Future research should adopt comparative and longitudinal designs, such as comparing hospitals that have implemented digital anti-fraud systems with those that have not, to establish stronger causal evidence on the effectiveness of interventions. A longitudinal approach is also essential to evaluate the long-term impact of fraud prevention policies and mechanisms.

To enhance representativeness and generalizability, future studies should increase respondent diversity by involving participants from various levels of healthcare facilities such as primary care centers (Puskesmas), type C, B, and A hospitals and from different geographical regions. Case-based or realistic simulation evaluation methods are also recommended to practically assess decision-makers' abilities in managing potentially fraudulent claims.

On the technological front, integration of advanced detection tools is critical. The development and testing of digital applications such as machine learning-based or rule-based systems linked to SIMRS and BPJS Health platforms may strengthen early detection of anomalous claims. Regarding human resource development, the exploration of innovative training models, such as interactive simulations, adaptive online learning, and performance-based incentives, is necessary to align training with participants' digital literacy levels and improve its effectiveness.

Lastly, future research should empirically evaluate the effectiveness of anti-fraud policies in relation to healthcare outcomes such as quality improvement, cost-efficiency, and stakeholder trust in the JKN system. By incorporating these approaches, subsequent studies may provide a more comprehensive foundation for establishing an effective, adaptive, and sustainable anti-fraud system in Indonesia.

CONCLUSION

This study concludes that fraud prevention efforts within Indonesia's National Health Insurance (JKN) system continue to face significant multidimensional challenges, particularly at the hospital level and within BPJS Health branch offices. Although a strong regulatory framework—such as the Minister of Health Regulation No. 16 of 2019 has been established, its implementation remains suboptimal due to limited understanding of fraud concepts among healthcare personnel, inadequate technological infrastructure, and insufficient capacity of verifiers and anti-fraud teams to detect problematic claims. The findings

also show that the majority of potentially fraudulent claims originate from mild and generic diagnostic categories in both outpatient and inpatient services, which are more difficult to verify clinically and administratively. Moreover, claim verification in hospitals is still predominantly conducted manually, leading to delays and inconsistencies in decision-making. These findings underscore the need to shift from a reactive post-claim approach to a proactive early detection system supported by technology. Strengthening digital infrastructure, enhancing technical training, fostering a culture of integrity, and improving institutional governance are essential steps to build an effective anti-fraud framework. Synergy between regulatory enforcement, technological innovation, and human resource capacity development is crucial to ensure financial sustainability of the JKN scheme and promote transparency and accountability in national healthcare service delivery. By adopting these strategies, the JKN system can evolve into a more resilient and trustworthy financing mechanism that better safeguards public health resources and maintains the credibility of universal health coverage in Indonesia.

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APPENDIX: FIGURES







