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IMPLEMENTATION ANALYSIS OF STUNTING PREVENTION AND REDUCTION POLICIES USING THE HEALTH IN ALL POLICIES FRAMEWORK IN SAMARINDA CITY

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ABSTRACT

Stunting represents a complex public health challenge that leads to impaired physical growth and cognitive development among children. In Samarinda City, the prevalence of stunting remains high at 25.3%. To address this issue, the local government has implemented a range of preventive and control strategies through both sensitive and specific interventions integrated within regional programs and activities. This study examines the implementation of stunting prevention and control policies across sectors in Samarinda City using a qualitative case study design. Research participants were purposively selected based on their involvement and experience in stunting-related programs, resulting in 14 informants representing eight key agencies. Data analysis involved a systematic process of transcription, familiarization, coding, categorization, thematic identification, and synthesis of findings. To ensure research validity, the study applied triangulation across data sources, researchers, theories, and methodological approaches. The findings show that policymakers have initiated multisectoral collaboration by establishing the Stunting Reduction Acceleration Team. However, institutions still coordinate in a procedural and fragmented manner. Data managers continue to face challenges due to the unsynchronized nature of information systems, which hinders evidence-based planning. Despite these obstacles, policymakers have introduced adaptive innovations, such as local food supplementation programs, adolescent health education, and community-based initiatives, that reflect Samarinda's growing commitment to integrating health considerations into broader governance structures. These actions demonstrate emerging institutional learning and adaptive governance consistent with HiAP principles. In conclusion, policymakers in Samarinda City have advanced cross-sectoral collaboration and localized innovation in stunting prevention and reduction. However, weak data integration and institutional silos continue to limit progress. To realize the HiAP vision for equitable and sustainable health outcomes, it is essential to strengthen coordination mechanisms, establish a unified data system, and institutionalize shared accountability.

Kata Kunci:

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ABSTRAK

Stunting merupakan tantangan kesehatan masyarakat yang kompleks yang menyebabkan gangguan pertumbuhan fisik dan perkembangan kognitif pada anak-anak. Di Kota Samarinda, prevalensi stunting masih tinggi yaitu 25,3%. Untuk mengatasi masalah ini, pemerintah daerah telah menerapkan berbagai strategi pencegahan dan pengendalian melalui intervensi sensitif dan spesifik yang terintegrasi dalam program dan kegiatan daerah. Studi ini mengkaji implementasi kebijakan pencegahan dan penanggulangan stunting di seluruh sektor di Kota Samarinda, dengan menggunakan desain studi kasus kualitatif. Partisipan penelitian dipilih secara purposif berdasarkan keterlibatan dan pengalaman mereka dalam program terkait stunting, menghasilkan 14 informan yang mewakili delapan lembaga kunci. Analisis data melibatkan proses sistematis transkripsi, familiarisasi, pengkodean, kategorisasi, identifikasi tematik, dan sintesis temuan. Untuk memastikan validitas penelitian, studi ini menerapkan triangulasi lintas sumber data, peneliti, teori, dan pendekatan metodologis. Temuan menunjukkan bahwa para pembuat kebijakan telah memulai kolaborasi multisektoral dengan membentuk Tim Percepatan Penurunan Stunting. Namun, koordinasi antar lembaga masih bersifat prosedural dan terfragmentasi. Pengelola data terus menghadapi tantangan akibat sifat sistem informasi yang tidak sinkron, yang menghambat perencanaan berbasis bukti. Terlepas dari hambatan ini, para pembuat kebijakan telah memperkenalkan inovasi adaptif seperti program makanan tambahan lokal, edukasi kesehatan remaja, dan inisiatif berbasis masyarakat yang mencerminkan komitmen Samarinda yang semakin besar untuk

mengintegrasikan pertimbangan kesehatan ke dalam struktur tata kelola yang lebih luas. Tindakan-tindakan ini menunjukkan pembelajaran kelembagaan yang muncul dan tata kelola adaptif yang konsisten dengan prinsip-prinsip HiAP. Kesimpulannya, para pembuat kebijakan di Kota Samarinda telah memajukan kolaborasi lintas sektor dan inovasi lokal dalam pencegahan dan penanggulangan stunting. Namun, integrasi data yang lemah dan silo kelembagaan terus membatasi kemajuan. Untuk mewujudkan visi HiAP untuk hasil kesehatan yang adil dan berkelanjutan, penting untuk memperkuat mekanisme koordinasi, membangun sistem data terpadu, dan melembagakan akuntabilitas bersama.

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INTRODUCTION

Stunting in children has long-term implications for a country's human capital, including impaired physical growth, limited educational attainment, suboptimal cognitive and intellectual development, and reduced productivity. These conditions ultimately contribute to a long-term decline in national economic performance. Developing countries are particularly affected, accounting for approximately 90% of the world's stunted children (Galasso & Wagstaff, 2019). Evidence from a cross-national study involving 95 low- and middle-income countries indicates that stunting results in an estimated economic loss of US$135.4 billion to the private sector, equivalent to approximately 0.01% to 1.2% of total GDP, with the manufacturing, garment, and food industries being the most affected sectors (Akseer et al., 2022). In developing nations such as Indonesia, stunting prevalence has remained above 30% in recent years. According to the National Basic Health Research (Riset Kesehatan Dasar), the prevalence decreased from 37.2% in 2013 to 30.8% in 2018. Although this decline represents a positive trend following the sharp increase reported in 2013, it continues to pose a serious public health concern for the younger generation (Kemenkes RI, 2018).

Based on findings from the most recent Indonesian Nutrition Survey, the prevalence of stunting in Indonesia declined by 2.8% in 2022, decreasing from 24.4% in 2021 to 21.6% in 2022. Several provinces, namely South Sumatra, North Kalimantan, South Kalimantan, and Riau, demonstrated significant improvements, achieving reductions in stunting prevalence of less than 5% during the 2021–2022 period (Munira, 2023). However, the situation in East Kalimantan remains concerning, as the province continues to record a stunting prevalence higher than the national average of 23.8%. Within the province, Samarinda exhibits the second-highest prevalence rate, 25.3%, after Kutai Kartanegara (27.1%). Notably, Samarinda serves as the capital and administrative center of East Kalimantan Province, making it a strategic location for policy implementation and support for intervention programs.

Researchers generally categorize the underlying determinants of stunting into four main domains: family and household conditions; inadequate complementary feeding practices; suboptimal breastfeeding behaviour combined with recurrent infections; and broader socio-community influences encompassing political and economic factors, educational attainment, cultural norms, food systems, and environmental sanitation (Nirmalasari, 2020). A growing body of international literature has established that social, economic, and environmental determinants of health play a decisive role in explaining the persistence of stunting, particularly within low- and middle-income countries such as Indonesia (Siramaneerat et al., 2024; Vaivada et al., 2020). According to Li et al. (2020), socioeconomic conditions and parental nutritional status strongly influence stunting determinants. At the same time, inadequate sanitation and poor household environmental quality remain among the strongest predictors of impaired child growth.

Researchers observe that Samarinda City mirrors this global pattern, where stunting remains a persistent public health challenge. According to the Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in Samarinda was recorded at 25.3% in 2022, declining modestly to 20.3% in 2024. Although this reduction signals progress, the prevalence remains above the World Health Organization's acceptable threshold (< 20%) and the Indonesian national target of 14% (Amarullah et al., 2024). Moreover, substantial spatial disparities exist across sub-districts, with areas such as Palaran District reporting stunting prevalence exceeding 40%. These disparities highlight persistent inequities

in access to essential resources, including clean water, adequate sanitation, community health posts (Posyandu), and parental education.

Empirical evidence from East Kalimantan further indicates that household-level behaviours, environmental sanitation deficits, and limited participation in community health services constitute key contributing factors to child stunting (Yuliawati et al., 2024). Additionally, child-growth monitoring coverage through the e-PPGBM platform reached only 16.6% of its target in 2023, suggesting significant weaknesses in surveillance and reporting systems (Amarullah et al., 2024). Institutional fragmentation, inadequate intersectoral coordination, and weak policy advocacy remain systemic barriers to effective stunting prevention at the regional level (Herawati et al., 2025). Against this backdrop, the adoption of the Health in All Policies (HiAP) framework has emerged as both relevant and imperative. HiAP advocates integrating health considerations across all domains of public policy, including education, environment, housing, and infrastructure, to mitigate the unintended health consequences of decisions made outside the health sector (Green et al., 2021). Evidence from comparative analyses demonstrates that HiAP can strengthen the social determinants of health, foster institutional synergy, and enhance policy coherence in middle-income settings (Escher et al., 2024a).

At the subnational level, applying the HiAP framework in Samarinda City provides a strategic pathway for accelerating efforts to reduce stunting. Samarinda Mayoral Regulation No. 45 of 2023 on the Acceleration of Stunting Reduction underscores the importance of cross-sectoral convergence, data-driven governance, and inclusive participation of local communities and private actors. This framework requires collaborative engagement among key stakeholders—including the Health Office, Education Office, Community Empowerment Agency, and Housing and Settlement Office—to ensure the implementation of holistic and evidence-based policies. Consequently, HiAP serves not only as a policy instrument but also as an evaluative framework to assess the effectiveness of intersectoral coordination, program sustainability, and broader policy impacts on the social determinants of health. Through such an integrated approach, local governance in Samarinda can become more adaptive, inclusive, and equitable, thereby facilitating the sustainable achievement of national targets for reducing stunting. This study investigates how stakeholders evaluate the implementation of stunting prevention and reduction policies through the Health in All Policies (HiAP) framework in Samarinda City, thereby addressing critical gaps in intersectoral governance and policy effectiveness within local health initiatives.

METHOD

Type of Research

This study employed a qualitative case study design to analyze the implementation of stunting prevention and reduction policies in Samarinda City, examining them through the lens of the Health in All Policies (HiAP) framework. Researchers deemed the qualitative approach appropriate because it enabled an in-depth exploration of intersectoral dynamics, stakeholder experiences, and the governance mechanisms underlying health policy implementation. The primary objective was to understand how local actors interpreted, implemented, and negotiated policies related to stunting across various sectors.

Place and Time of Research

Between July and November 2024, the researcher conducted this study in Samarinda City, East Kalimantan Province. Samarinda was selected as the study site because it exhibits a stunting prevalence exceeding the national average, and Mayoral Regulation No. 45 of 2023, specifically designed to accelerate stunting reduction, was recently enforced there. This regulation emphasizes cross-sectoral collaboration and data-driven policy integration within the HiAP framework.

Population and Sample

Participants were recruited through purposive sampling to ensure the inclusion of individuals with direct experience and institutional knowledge of stunting prevention policies. The recruitment process began with formal correspondence sent to each targeted Agency, followed by personal confirmation of willingness to participate. The inclusion criteria were as follows:

1. Individuals holding a professional or managerial position in an institution directly involved in stunting prevention or policy implementatio.

2. A minimum of one year of experience in the relevant program or sector;
3. Willingness to participate voluntarily and share information based on their professional experiences.

A total of 14 informants representing eight local institutions participated in the study, including the Health Office, Social Service, Office of Population Control and Family Planning, Communication and Informatics Office, Ministry of Religious Affairs (Provincial Office), East Kalimantan Health Polytechnic, the Samarinda Stunting Prevention Task Force, and the Fisheries Agency. This multi-sector composition reflected a whole-of-government and whole-of-society approach consistent with the HiAP perspective.

Data Collection

The study received ethical approval from the Health Research Ethics Committee of Muhammadiyah Kalimantan Timur University. Before participation, each informant received an information sheet describing the study's objectives, procedures, benefits, potential risks, confidentiality assurance, and the right to withdraw at any stage without penalty. Researchers obtained written and verbal informed consent from all participants prior to data collection. Each informant explicitly granted permission for audio recording of the interviews. To safeguard privacy, pseudonyms were used and all identifying details were removed from transcripts and publications.

Researchers collected primary data through semi-structured in-depth interviews conducted either in person at participants' workplaces or online, depending on their availability and convenience. The interview guide, validated by two public health policy experts, covered key topics including understanding the HiAP framework, mechanisms of intersectoral coordination, implementation challenges, and strategies to sustain collaboration.

Interviews lasted 45–90 minutes and were conducted in Bahasa Indonesia by trained researchers familiar with qualitative inquiry. All interviews were audio-recorded (with consent) and later transcribed verbatim. To strengthen data triangulation, relevant documents—including policy regulations, program reports, and interdepartmental meeting minutes—were also reviewed and coded as secondary data sources.

Data Analysis and Processing

The data collected from the in-depth interviews were analyzed using thematic analysis supported by NVivo software. NVivo is a qualitative data analysis tool that facilitates the organization, coding, and interpretation of textual data, making it well suited for this study's qualitative approach. The analysis process began with data familiarization, during which the researcher transcribed the interview recordings and imported them into NVivo for processing. The researcher then coded the data by assigning labels to relevant sections of the text based on their relevance to the research questions. NVivo's coding tools enabled efficient tagging and organization of data into initial categories.

After initial coding, the researcher used NVivo to identify themes by grouping similar codes. NVivo's query functions helped identify patterns and relationships in the data that aligned with the study's objectives, particularly the implementation of stunting prevention policies and the integration of the Health in All Policies (HiAP) approach.

The key themes were refined and organized in NVivo into coherent categories that reflected significant factors influencing policy implementation. The researcher then interpreted these themes by examining their relationships to the research questions and their implications for policy and practice. NVivo's visualization tools were used to present identified themes and their interrelationships in a clear and accessible format. This thematic analysis enabled a comprehensive understanding of the data, highlighting both the successes and challenges in implementing stunting prevention policies in Samarinda City.

Data analysis employed a thematic analysis approach supported by NVivo 12 software to ensure analytical rigor and transparency. The process involved several stages:

1. Data familiarization through repeated reading of transcripts to understand context and nuance;
2. Initial coding by labeling meaningful text segments based on their relevance to the research questions.

3. Categorization of codes into broader conceptual clusters;
4. Identification of themes by synthesizing related categories into overarching concepts;
5. Subsequent interpretation and synthesis of emergent themes, linking them to the Health in All Policies (HiAP) framework and the local governance context.

Researchers iteratively applied a process of comparison and reflection until achieving thematic saturation, ensuring that no new insights emerged from the data.

To ensure credibility and trustworthiness, the study adopted Lincoln & Guba's (1985) four triangulation frameworks:

1. Source triangulation: comparing data across different informants and documentary evidence;
2. Investigator triangulation: cross-verification of coding and theme interpretation by two independent researchers;
3. Theoretical triangulation: aligning findings with established theories of collaborative governance and Health in All Policies;
4. Methodological triangulation: combining in-depth interviews with document analysis.

Additionally, researchers conducted member checking by sending interview summaries to selected participants for verification and clarification, thereby ensuring interpretive accuracy. An audit trail was maintained in NVivo to document the analytical process, enhancing transparency and replicability. All stages, from participant recruitment and informed consent to data analysis, were systematically documented in a dedicated research logbook. This detailed record enables other researchers to replicate the procedures in similar contexts, thereby strengthening the study's methodological transparency and reproducibility.

RESULT

Samarinda is a city experiencing rapid population growth. The latest population data for Samarinda City in 2023 indicates a population of 861,878. In 2024, the population of Samarinda City was 878,405, indicating a one-year population growth rate of 1.8%. Inter-island migration, urbanisation, and the relocation of the provincial capital in East Kalimantan contribute to this trend. Samarinda City currently has significant potential due to its demographic bonus, with 70–80% of its population in the productive age group (15–64 years). However, this demographic bonus also conceals the threat of nutritional problems within the community, which can disrupt productive regeneration by causing growth failure and reducing children's cognitive development, ultimately leading to stunting.

Stunting is undoubtedly a threat not only in Samarinda City but also in other urbanising areas in Indonesia. In 2022, the stunting rate in Samarinda City was 23.4%, decreasing slightly to 22.4% in 2023. The current stunting rate in Samarinda City remains higher than the national rate of 21.5%. This situation is serious to examine further because stunting reduction efforts involve various cross-sector partnerships, involving not only government institutions but also multiple non-governmental sectors.

An interesting aspect is that policymakers in Samarinda City have implemented a stunting prevention and management program through the Health in All Policies (HiAP) approach. This study aims to explore how policymakers in Samarinda City implement stunting prevention and management policies through a qualitative research approach. The research employed in-depth interviews with various cross-sectoral stakeholders who voluntarily participated and are members of the Samarinda City Stunting Prevention and Handling Team (TPPS).

Adaptif Policy and Program Effectiveness: From Technical to Adaptive

Policymakers in Samarinda City established a stunting management policy in 2012, long before the government issued Presidential Regulation No. 72 of 2021 aimed at accelerating stunting reduction. The Agency of Health emphasizes preventative efforts, especially during the First 1,000 Days of Life (HPK).

> " The Agency of Health has been tackling stunting since 2012. However, we cannot do it alone, as this is a cross-sectoral initiative." (Informant 7, Agency of Health, 2024)

" Stunting is the result. What we emphasize is prevention, because after the age of two, there is no more effective management other than mentoring." (Informant 7, Agency of Health, 2024)

The Agency of Health adapts its approach to community social conditions. They provide local food supplements tailored to locally available ingredients. Additionally, the Samarinda City Government has allocated financial assistance (Bankeu) specifically for the stunting program, supporting the sustainability of local policies.

" Through our stunting program, we not only provide local food supplements, tailored to 10 local menu variations to prevent community boredom, but also empower cadres and the community to take charge of their health and well-being." (Informant 7, Agency of Health, 2024)
" With the government allocating a dedicated Bankeu specifically for stunting, a substantial amount that will continue next year, we feel reassured about sustaining our efforts in the coming years." (Informant 7, Agency of Health, 2024)

Policymakers made early adjustments using a risk-based approach and introduced innovations such as locally sourced food supplements and diverse menu options. This approach reflects adaptive governance principles.

Cross-Sector Collaboration and Convergence: From Coordination to Action

Stunting reduction in Samarinda relies on cross-sectoral collaboration. The Agency of Population Control and Family Planning (DP2KB) coordinates family support and behavior change activities, supported by 969 cadres.

" We have 969 family support teams in 323 groups that have been working since 2021." (Informant 5, Agency of Population Control and Family Planning, 2024)

DP2KB has also established Youth Integrated Health Posts (Posyandu Remaja) and the Young Cadres Care for Stunting initiative, focusing on adolescent education on anemia prevention and early marriage risks.

" The key is adolescents. If adolescents are healthy, their marriage and pregnancy screening results will also be good." (Informant 10, Stunting Management and Prevention Task Force, 2024)

The Ministry of Religious Affairs plays a role through premarital education at the Office of Religious Affairs (KUA).

" We direct our stunting policy at premarital marriage. The Head of the KUA and counselors educate prospective brides and grooms about nutrition and physical readiness." (Informant 9a, Ministry of Religious Affairs, 2024)

The Social Service empowers low-income families and supports Posyandu programs.

" Posyandu is a social program, but we synergize it with health programs because the goals are the same." (Informant 2, Agency of Social, 2024)

Although each Agency contributes to stunting reduction, their efforts remain fragmented and lack synergy within a unified operational framework. Many agencies continue to follow their internal mandates rather than coordinate systematically.

" We in the social sector manage our own Integrated Health Post (Posyandu), but we do not always synchronize our reporting with the Health Agency." (Informant 2, Agency of Social, 2024)

" Different perspectives sometimes arise between agencies. Some focus on toddlers, others on pregnant women, even though they should be in the same cycle." (Informant 6, DP2KB, 2024)

Sectoral egos often lead agencies to run programs in parallel, creating overlap. Many actors still equate coordination with conducting "cross-sector meetings" rather than joint planning and resource sharing, contradicting HiAP principles.

Governance, Data, and Program Innovation: Between Accuracy and Synchronization

Governance in Samarinda's stunting program is characterized by transparency, data use, and innovation. DP2KB improved data validity by using Child NIK to prevent duplication.

" The same name can appear three times in the data. Now we use the child's NIK to prevent duplication." (Informant 10, Task Force, 2024)

However, data synchronization remains a significant challenge, with different systems (SIGIZI, eHDW, DTKS, SIMPUS, ePPGBM) producing inconsistent data.

" We often find different data between applications, even though the source is the same. A single health database should be usable across agencies." (Informant 5, DP2KB, 2024)
" Each office collects its own data, and in the end, we cannot meet at a common point." (Informant 5, DP2KB, 2024)

Innovative programs have also been introduced. The Ministry of Health launched Protein Capsules, recognized nationally for increasing children's height. DP2KB introduced "Etam Berbagi Tigu," distributing organic eggs to children at risk of stunting.

" The protein capsule innovation has successfully increased children's height and has become a good practice at the national level." (Informant 7, Agency of Health, 2024)
" Etam Berbagi Tigu' distributes organic eggs and targets toddlers at risk of stunting." (Informant 6, DP2KB, 2024)

Despite progress, stunting data management remains poorly integrated. There is still no interoperable system to ensure consistency across platforms. Academic contributions reflect a shift toward knowledge-based governance. The Health Agency also adapts its approach to community conditions—for example, providing local food supplements based on available ingredients.

Social, Nutritional, and Environmental Determinants: The Hidden Dimensions Behind the Numbers

Social, behavioral, and environmental factors strongly influence stunting outcomes. Informants acknowledged that while specific nutrition interventions have been effective, "the root of the problem lies in family behavior and social context."
DP2KB explained that the risk of stunting begins in adolescence, caused by anemia and lack of premarital education:

" If we do not treat anemia in adolescents, they may experience pregnancies that put their babies at risk of stunting." (Informant 5, DP2KB, 2024)

Education for adolescents and prospective brides continues to face challenges such as low participation and awareness:

" Many adolescents do not understand the importance of iron tablets. Some are embarrassed to take them because they think they are just medicine." (Informant 10, Task Force, 2024)

> " We have initiated nutrition education, but many prospective brides and grooms consider it just a formality." (Informant 9a, Ministry of Religious Affairs, 2024)

The Agency of Health noted behavioral issues, sanitation, and family eating patterns as major challenges:

> " Many families do not understand the importance of nutritious food. Sometimes children are only given rice and sweet tea because they think that is enough." (Informant 7, Agency of Health, 2024)
> " The home environment also has an impact. Many houses are cramped, poorly ventilated, and have dirty water sources." (Informant 7, Agency of Health, 2024)

Low-income families also struggle due to economic constraints:

> " Many families do not have refrigerators, so food spoils quickly. When aid runs out, they revert to old eating habits." (Informant 7, Agency of Health, 2024)

A nutritionist noted issues not only in food access but also in food preparation:

> "Many mothers do not know how to prepare nutritious food from local ingredients. We teach them how to make complementary foods from tempeh, eggs, and inexpensive vegetables so they can practice it at home." (Informant 1, Academic nutritionist, 2024)

Health students have been involved in community education:

> "We sent students to Rapak Dalam and Mangkupalas to train mothers in making complementary foods from local ingredients." (Informant 1, Academic nutritionist, 2024)

The Stunting Task Force emphasized that the health sector alone cannot address environmental and social factors.

> "If children live in poor sanitation conditions, they will still get sick even if we give them nutritious food. Cross-sectoral collaboration is essential to address this issue, as the health sector alone cannot resolve it (Informant 10, Stunting Management and Prevention Task Force, 2024).

Cross-informant analysis shows that stunting determinants in Samarinda are cyclical and multidimensional, from adolescence to pregnancy outcomes, household sanitation, parenting practices, and socioeconomic inequality. The knowledge–action gap remains evident: many families understand nutrition messages but cannot apply them due to structural, cultural, and economic constraints. Therefore, education alone is insufficient; interventions must integrate economic empowerment and social behavior change.

DISCUSSION

The implementation of stunting management policies in Samarinda demonstrates significant progress in local-level adaptation of national strategies but also reveals persisting governance and intersectoral barriers that limit their effectiveness. The findings highlight both structural and behavioral determinants, ranging from data fragmentation and weak cross-sector coordination to low community participation, that reflect broader challenges in translating Health in All Policies (HiAP) principles into actionable governance.

Cross-sectoral Governance and Health in All Policies

The research findings underscore that, despite the establishment of a cross-sectoral Stunting Task Force, coordination remains constrained by sectoral egos and fragmented data systems across key agencies, including the Agency of Health, DP2KB, and the Agency of Social Development. This fragmentation leads to inconsistent targeting and inefficient interventions. As one informant noted,

"Each office collects its own data, and in the end, we cannot meet at a common point." These statements align with the findings of Damayanti et al. (2021) and Imron et al. (2022), suggesting that institutional siloing and weak coordination mechanisms hinder collaborative governance in Indonesia's health sector. According to Alderwick et al. (2024), successful HiAP implementation requires an institutionalized coordination mechanism that explicitly defines roles, responsibilities, and data-sharing standards among agencies. In Samarinda, the absence of a unified data governance framework limits the ability to track interventions effectively. Strengthening policy coherence through legal instruments, such as mayoral regulations enforcing interdepartmental data synchronization, could enhance alignment with the HiAP mandate for health equity and shared accountability.

Implementing HiAP requires a fundamental shift from siloed policy execution to an integrated governance structure that aligns roles, responsibilities, and data-sharing standards across sectors. (Shankardass et al., 2018; Smits et al., 2023). Empirical findings indicate that, despite the presence of a multisectoral stunting Task Force, coordination remains largely procedural rather than institutionalized, limiting sustainable outcomes. The literature emphasizes that establishing an interdepartmental committee alone does not guarantee effective collaboration unless supported by formal mechanisms that integrate health considerations into planning, budgeting, monitoring, and evaluation cycles across non-health sectors (Tancred et al., 2024).

Alderwick et al. (2024) demonstrated through an integrated care system in England, designed to unite health, social care, and public health, that alignment between national policy, local planning, and resource allocation significantly supports health equity outcomes. These findings resonate with the situation in Samarinda, where informants described challenges arising from each Agency maintaining independent data systems and mandates, resulting in divergent target cohorts and duplicated efforts.

Smits et al. (2023) outline that achieving "balance" in cross-sectoral policy governance depends on three elements: (1) a formal institutional framework (e.g., a dedicated HiAP office, a legal mandate for data sharing), (2) a shared information system, and (3) a shared accountability mechanism whereby all sectors, not only health, are responsible for health-promoting outcomes. Their observation that agencies "still run their own programs" aligns with the concept of implementation asymmetry, which holds that while decentralized governance provides decision-making space, local capacities, systems, and incentives remain uneven.

Cross-sector collaboration also requires not only coordination but genuine policy integration, embedding health impact assessment (HIA) or health-informed analysis into non-health policymaking so that health becomes a valued element within policy design rather than an afterthought (Green et al., 2021). Although innovations such as adolescent Posyandu and cross-sector training show promise, they are not yet fully embedded into regulatory, budgetary, or performance frameworks across agencies. Consequently, governance remains peripheral rather than central to sectoral systems.

Furthermore, the literature demonstrates the crucial role of political leaders in shaping narrative framing. In their scoping review, Lilly et al. (2023) found that a city's acceptance of the HiAP approach depends on how political actors frame health and equity within the political agenda, how ministries interpret health determinants, and how effectively each sector mobilizes its capacities in that framework.

Data Integration and Evidence-based Planning

The lack of synchronized data across agencies emerged as a central barrier. Informants emphasized the need for a central data platform integrating health, social, and demographic indicators, noting that the current multiplicity of applications (e.g., Elsimil, SIGA, PHDP, ePPGBM) creates duplication rather than convergence. This mirrors findings by Victora et al. (2021) and McCrabb et al. (2020), who assert that data integration is fundamental for targeting interventions and evaluating program effectiveness. The situation in Samarinda illustrates how digital fragmentation mirrors institutional fragmentation, reflecting incomplete policy integration.

The uneven capacity among local actors to use data effectively reflects what Mahmood et al. (2024) describe as "implementation asymmetry" in decentralized health systems. Capacity-building in data literacy and interoperable systems (e.g., e-Posyandu) could help mitigate this gap, improving accountability and precision in identifying at-risk populations.

The challenges observed in Samarinda also illustrate global patterns of asymmetry: local governments often have a mandate but lack the technical ability to analyze and act on data. Windle et

al. (2025) documented a similar pattern in Australia, where abundant data existed but limited subnational analytical autonomy restricted evidence-based planning. This reflects the experience of Samarinda implementers, many of whom rely heavily on central directives before using available data.

International frameworks emphasize that data integration is not merely technical but a governance reform requiring shared standards, defined roles, and accountability. The OECD (2022) stressed that effective coordination requires institutionalized data management and cross-sector agreements on data use, privacy, and interoperability. Similarly, Amri (2022) argues that achieving HiAP at the city level requires integrating health-related information across all policy stages, supported by robust information-sharing infrastructure.

Building an integrated, interoperable data ecosystem would strengthen Samarinda's ability to align health, population, and social welfare data for comprehensive stunting surveillance and adaptive policymaking. Such a system should link Posyandu-level microdata with macro-planning instruments such as SIPD and SIKD, creating a continuous feedback loop between community indicators and local decision-making structures. Beyond improving monitoring efficiency, such integration would foster shared accountability, enabling each sector to view health outcomes as collective responsibilities consistent with HiAP principles.

Ultimately, the challenges of stunting data integration in Samarinda reflect a broader issue in decentralized systems: autonomy without capacity risks fragmentation. Addressing this requires technological and institutional reforms, standardized indicators, interoperable systems, and data literacy capacity-building. In line with Faridoon & Kechadi (2024), integrating these reforms into participatory governance models can transform siloed data into collective intelligence, driving equitable and sustainable stunting reduction policies.

Social, Nutritional, and Environmental Determinants

The findings reveal that stunting in Samarinda arises from complex interactions among social, nutritional, and environmental determinants that extend beyond dietary inadequacies. Informants described densely populated urban settlements with poor sanitation, unsafe drinking water, limited green space, and unmanaged waste—conditions that undermine child health and growth. These observations align with Akseer et al. (2020), who showed that improvements in WASH infrastructure significantly reduced child stunting across low- and middle-income countries. Similarly, Conway et al. (2020) found that declines in stunting in Nepal were driven not only by improved food access but also by advances in sanitation, maternal education, and health service utilization.

From both nutritional and social perspectives, maternal education, household income, and food security emerged as influential determinants. Local agencies observed that low-income families often rely on carbohydrate-heavy diets with low protein diversity, while gaps in breastfeeding and complementary feeding knowledge persist among young mothers. These findings mirror global evidence that nutritional diversity and maternal awareness strongly predict child outcomes. Olakunle (2024) found that maternal education and economic improvements accounted for more than 40% of stunting reduction in sub-Saharan Africa. Akseer et al. (2020) likewise emphasized that behavioral interventions are more effective when integrated with community support systems.

The intersection of environmental deprivation and socio-nutritional inequalities underscores the need for a HiAP approach. Fragmented implementation—where sanitation, food security, and social welfare remain institutionally separate—diminishes policy effectiveness. Integrating these sectors into a shared governance framework would enable cities to address root causes through coordinated infrastructure, education, and health initiatives. Conway et al. (2020) and Olakunle (2024) demonstrate that such integration facilitates sustainable reductions in stunting. For Samarinda, institutionalizing cross-sector accountability would help position child growth as a collective metric of success across urban development domains.

Policy Adaptation and Local Innovation

The findings indicate that Samarinda has actively localized national stunting directives through adaptive policy practices and community-based innovations. Informants described how local actors translated central guidelines into context-sensitive strategies, including locally tailored complementary feeding (MP-ASI), school-based nutrition campaigns, and mobilizing cadres to strengthen Posyandu

services. These adaptations emerged in response to structural barriers, including budget constraints, limited community engagement, and misalignment between national templates and local sociocultural realities. This aligns with Chapman et al. (2024), who found that culturally co-designed protocols in Indonesia and Senegal improved participation and implementation fidelity by embedding local values into national frameworks. Similarly, Escher et al. (2024) emphasized that nutrition policies grounded in local knowledge are more sustainable than top-down interventions.

Beyond cultural adaptation, Samarinda's governance system has demonstrated institutional learning through iterative policy experimentation—testing, refining, and scaling micro-level innovations. Informants cited rotating nutritious food distribution demonstrations, school-based education programs led by student activity units, and flexible volunteer task allocation as examples. These practices reflect principles of adaptive implementation, where policies evolve through continuous feedback. Sun et al. (2024) argue that adaptability, scalability, and sustainability (ASaS) are essential for long-term viability. Furthermore, Ramani-Chander et al. (2023) contend that embedding scale-up research into learning cycles enhances government ownership and institutionalization.

A key finding is Samarinda's emphasis on cost-effective innovation, leveraging community networks, students, and local food resources to optimize limited budgets. This aligns with global evidence supporting integrated, platform-based interventions. Walker et al. (2024) demonstrated that integrating preventive interventions into routine antenatal and child health services yielded greater cost-effectiveness and broader reach than vertical programs. Meanwhile, Madewell et al. (2024) noted that malnutrition accounts for nearly a third of under-five deaths in low-income countries, highlighting the urgency of multisectoral solutions addressing nutrition, infection, and social determinants simultaneously. In this context, policymakers in Samarinda exemplify HiAP principles by embedding innovations not as isolated experiments but as components of a coordinated, evidence-based governance system connecting health, education, and community development sectors. Institutionalizing these adaptive practices can transform short-term local experiments into long-term policy resilience and equitable health outcomes.

CONCLUSION AND SUGGESTION

An evaluation of stunting prevention and management policies in Samarinda City using the Health in All Policies (HiAP) framework shows that cross-sector collaboration is developing, yet still limited by institutional fragmentation. Coordination among the health, population, and social sectors remains suboptimal due to overlapping mandates, weak data integration, and unclear accountability mechanisms. However, adaptive capacity is emerging through local innovations such as community-based feeding programs, cadre empowerment, and health education initiatives. This reflects a shift from procedural coordination toward more responsive governance.

To enhance future HiAP implementation, an integrated multisector information platform and a dedicated secretariat are needed to coordinate cross-sector planning, budgeting, and evaluation. Strengthening the capacity of the Stunting Reduction Task Force—particularly in data literacy and collaborative leadership—is also essential. Future research may adopt mixed-method and comparative approaches across different regions, including the use of digital analytics and AI-based modeling to improve the effectiveness of stunting prevention strategies.

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