Potential corruption in the stunting alleviation program: A cost-benefit analysis of local food-based feeding program

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Abstract: In poor rural areas, stunting threatens the health and nutrition of children aged five and under. Despite persistent efforts, Indonesia's stunting rate remains high. The primary objective of this study is to assess the effectiveness of programs designed to mitigate stunting. The e-PPGBM data analysis investigates whether there is a connection between potential corruption and the allocation of funds for a nutritional program in 2023. This study uses cost-benefit analysis to compare government program budgets with the potential benefits of taxable income as an indicator of potential state financial losses. The study's findings indicate that implementing local food-based feeding programs will have a favorable impact on state revenue. However, budget limitations on the program preclude interaction with the entire target group and the collection of substantially higher income tax, which might cost the state in the future. Furthermore, the study found the potential for financial losses for the state due to inaccurate aid recipient selection, which could cause the program to fall short of its intended results. From an academic perspective, this study advises health sector government officials to rely on data and evidence to meet program objectives without harming state budgets.

Keywords: Corruption; State Loss; Cost-Benefit Analysis; Stunting; Supplementary Feeding Program

Introduction

The perception that stunting is a common condition rather than solely a nutritional issue, especially among impoverished households in rural areas, contributes to Indonesia's high prevalence of stunting (Adriany & Tesar, 2023). Findings from a study by Haile and Headey (2023) refute this misconception, demonstrating a clear association between a 10% increase in milk supply and a 0,31-point decrease in stunting. Recognizing the potential to mitigate stunting by providing highly nutritious food, the Indonesian government allocated funds for supplementary feeding programs (Pemberian Makanan Tambahan, or PMT) in various districts and cities, particularly those with stunting rates exceeding the national average (Suratri et al., 2023). Unfortunately, improper targeting of aid recipients hampers the program from achieving its full potential. To address this issue, we conducted a study comparing the benefits of distributing the program budget to eligible recipients with the benefits of maintaining anti-corruption standards.

Learning from past experiences, Katong NTT (2022) reported inaccuracies in targeting program recipients in Nusa Tenggara Timur (East Nusa Tenggara, or NTT). The Indonesian Audit Board (Badan Pemeriksa Keuangan, or BPK) released Audit Report Number: 91.c/LHP/XIX.KUPANG/05/2021 on May 17, 2021, revealing inaccuracies in target selection for receiving aid, amounting to approximately US$3,03 million (PorosNttNews, 2022). Instances of abuse of authority, as evidenced by the selection of ineligible aid recipients, elucidate why, despite an expenditure of approximately US$10,7 million from 2019 to 2022 (Herin, 2022), the 2022 Indonesian Nutritional Status Study (Studi Status Gizi Indonesia, or SSGI) identifies NTT as having the highest stunting rate in the country (Namangdjabar et al., 2023). In addition to hindering the PMT program from achieving its intended results, such actions may lead to legal consequences. Individuals who deliberately include ineligible recipients on the assistance list may face criminal

penalties. Winarni (2023) classifies this behavior as an abuse of power, constituting elements of an offense or criminal conduct.

Regarding the potential for corruption through maladministration involving the abuse of excessive authority by deliberately including beneficiaries who do not meet the criteria in a program, such illicit behavior can lead to state financial losses (Tomu et al., 2023). This unlawful action is based on the premise that the government should not finance programs that, during their execution, result in the wastage of state funds (Hatta et al., 2020). Under Article 2 of "Law No. 20 of 2001 concerning Amendments to Law No. 31 of 1999 concerning the Eradication of Criminal Acts of Corruption," corruption is defined as acts that enrich oneself, another person, or a corporation, conducted unlawfully to the detriment of state finances or the national economy. Meanwhile, maladministration, as defined in "Law Number 37 of 2008 concerning the Ombudsman of the Republic of Indonesia," encompasses any illegal action that neglects the provision of public services, resulting in tangible or intangible harm to the community or individuals.

Unfortunately, many previous government programs in Indonesia were indicated as a waste of state finances, including the phenomenal Pre-Employment Card (Kartu Pra-Kerja) program initiated in early 2020 during the COVID-19 pandemic. The Indonesian Corruption Eradication Commission (Komisi Pemberantasan Korupsi, or KPK) recommended that President Joko "Jokowi" Widodo temporarily stop the Pra-Kerja program, which had entered wave 4, and start to evaluate its effectiveness (CNN Indonesia, 2020). This moratorium was carried out because there were signs that the program was ineffective and had the potential to cause state financial losses. Typically, programs that obtain resources through public procurement of goods and services, along with corrupt suppliers, have the potential to result in a waste of state money (Arulpragasam et al., 2011; Williams-Elegbe, 2018).

In the same context but with a different program, during the COVID-19 pandemic, the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana, or BNPB) and the Ministry of Social Affairs (Kementerian Sosial, or Kemensos) organized a social assistance program to help affected communities. However, the program did not achieve its optimal goals and had the potential to harm state finances due to inaccuracies in potential aid recipients (Latif & Pangestu, 2022). The study findings showed that the aid recipients were not from low-income families, such as village heads or wealthy farmers. This unexpected scenario may highlight the critical need to regularly update inadequate population databases to create accurate and trustworthy information that can be utilized to make decisions or policies.

Considering the PMT program's relevance, regardless of the potential for corruption in its execution, the central government, through the Ministry of Health (Kementerian Kesehatan, or Kemenkes), continues to support this initiative. In contrast to earlier iterations of the PMT program that included high-nutrition biscuits and milk in meals (Rokom, 2017), the 2023 program called Local Food-Based Supplemental Feeding Program, abbreviated as local PMT, emphasizes the use of locally sourced foods that are readily available in each district or city across Indonesia (Anggraini, 2023).

As a legal basis, the implementation of local PMT is governed by Minister of Health Regulation No. 42 of 2022, which outlines technical guidelines for utilizing non-physical special allocation funds (Dana Alokasi Khusus Non-Fisik, or DAK non-physic) in the health sector for the fiscal year 2023 (BPK, 2022). According to this guideline, 389 districts and cities were given budget allocations for local PMT. Combining the 2021 fiscal capacity index, the percentage of stunting prevalence based on the 2021 SSGI, and the 2021 Food Security Index yields these allocations. The allocation of the local PMT budget among distinct districts or cities is determined using the Formula 1.

$$I = 85\% \times P \times S \times 90 \text{ days} \times R \quad \text{.. 1)}$$

I   : Local PMT Budget Allocation
P   : Projected target population group (children under five/pregnant women)
S   : Percentage of stunting prevalence rate
R   : Cost per unit head. (If children under five =US$1,08, else pregnant women = US$1,40)

The budget allocation formula indicates that the supplemental feeding intervention was implemented continuously for 90 days. Interventions are conducted not only for vulnerable groups, such as children suffering from malnutrition and stunting, but also for pregnant women with chronic energy shortages (Ibu Hamil Kekurangan Energi Kronis, or Bumil KEK). There is also a disparity in the daily budget expenses per person between stunted or malnourished children and pregnant women, with pregnant women incurring an additional cost of US$0,33. The 85% coefficient represents the proportion of the entire budget allocation used for intervention. It is assumed that if the program can reach 85% of the target population, it will be considered to have achieved its objectives.

According to data from the Directorate General of Public Health, Ministry of Health, the total budget allocation for the local PMT program targeting stunted and malnourished children under five in 2023 amounts to approximately US$43,9 million. The non-physical special allocation fund (DAK non-physic) was then distributed across 389 districts and cities throughout Indonesia. The Health Service (Dinas Kesehatan, or Dinkes) in each regional government allocates the local PMT funding to all community health facilities (Pusat Kesehatan Masyarakat, or Puskesmas) within their administrative areas. The implementation of the local PMT program begins at the Puskesmas level, where the Commitment-Making Officer (Pejabat Pembuat Komitmen, or PPK) procures goods and services, selects vendors to provide food, and distributes the food to aid recipients.

Meanwhile, several previous studies have documented the effectiveness of supplemental feeding programs in reducing the prevalence of stunting (Phuka et al., 2008; Zhang et al., 2016). A recent study by Sufri et al. (2023) highlights the critical role of locally sourced food in ensuring the efficacy of the PMT program. The study emphasizes consistently providing such food during monthly Integrated Service Post (Pos Pelayanan Terpadu, or Posyandu) events and continuously for 90 days without interruptions. Furthermore, research conducted by Baye and Kennedy (2020) indicates that achieving a more equitable and effective reduction in stunting requires the synchronization of food programs. This synchronization is integral to the program's success, especially considering that the 2023 implementation of the local PMT in Indonesia relies on DAK non-physic funding from the central government, distributed to all regions in the country.

Regrettably, a duality exists in the reference indices that gauge stunting prevalence. The first index, the SSGI, is a collaborative survey between the Health Development Policy Agency (Badan Kebijakan Pembangunan Kesehatan, or Pusjak) of the Ministry of Health and the Central Statistics Agency (Badan Pusat Statistik, or BPS). Concurrently, the electronic Community-Based Nutrition Recording and Reporting Application (Elektronik-Pencatatan dan Pelaporan Gizi Berbasis Masyarakat, or e-PPBGM) is another measurement tool. SSGI data is collected through a survey targeting households with children under five. Unlike SSGI, Puskesmas nutrition officials collect e-PPGBM data using monthly weighing results from the Posyandu to compile data for the entire population. This method clarifies the choice of utilizing e-PPGBM data rather than SSGI data in this study. The decision is based on the fact that the e-PPGBM data provides actual information on stunted and malnourished children under five, as opposed to survey-derived data. Further, Jasmawati and Setiadi (2020) highlight the superiority of e-PPGBM due to its ability to analyze data at the individual level, allowing for cohort-based monthly analysis.

However, due to variations in measurement instruments, disparities in resultant prevalence indices are inevitable. Hapsara (2023) reports a decrease in stunting prevalence in Pringsewu Regency based on SSGI, illustrating disparities in outputs across two tools with distinct data collection methodologies, from 19% in 2021 to 16,2% in 2022. In contrast, the e-PPGBM-derived stunting prevalence index for 2022 is 5,5%. Similarly, Herawati et al. (2023) found significant differences between SSGI and e-PPGBM results in Cimahi Regency, with SSGI indicating 16,4% and e-PPGBM showing 9,7% for 2022. Any variations in data can lead to issues. As Garuolienė et al. (2016) emphasized, such data disparities may leave decision-makers without accurate, trustworthy, and robust information, hindering their ability to formulate effective strategies and enhance future actions.

Within the scope of state finance, multiple studies indicate that the significant frequency of stunting will result in future losses for the country (Hoddinott et al., 2013; Suryana & Azis, 2023). Meanwhile, according to the World Bank, the economic ramifications of nutritional deficiencies

amount to 2%–3% of GDP (Shekar, 2006). Recognizing the significance of budget allocation in tackling stunting to prevent potential state losses and economic consequences in the future, a study by Sulaeman and Ahmad (2022) recommended that the Indonesian government should increase health budget allocations based on analyzed data from 100 districts and 33 provinces. Additionally, Pearson et al. (2018) conducted a study in Bangladesh in 2018, using simulations to determine how the distribution of funds may be altered based on the available budget to achieve the most effective reduction in the incidence of stunting in different age groups of children under five years old.

In almost the same context, various studies have also started to examine the correlation between childhood stunting and workforce productivity as well as pay (McGovern et al., 2017; Galasso & Wagstaff, 2019; Ponce, 2018). Akseer et al. (2022) conducted a study analyzing health and labor economic models to examine the impact of childhood stunting on the workforce in 95 low- and middle-income countries (LMICs), representing about 90% of the total workforce. The study's findings indicated that childhood stunting leads to a minimum annual sales loss of US$135,4 billion for the private sector. Concurrently, several studies have also demonstrated that a decrease in stunting results in increased attainment in school, which is a robust predictor of future income (Gottlieb & Fogarty, 2003; Kyui, 2016). In other words, an increase in taxable income can translate into a corresponding rise in state revenue within a nation. Enhancing one's educational attainment and allocating substantial financial resources toward mitigating the prevalence of childhood stunting makes it possible to boost workers' wages (Postel-Vinay & Sahn, 2010). Initially, an individual may not be liable to pay income tax due to their income falling below the taxpayer's threshold. However, as their income increases, they become eligible for income tax.

Meanwhile, the Net Present Value (NPV) investment analysis technique has gained significant traction in healthcare (Kirigia et al., 2020; Thunström et al., 2020; Wolff et al., 2020). Examining the correlation between NPV and nutrition-sensitive intervention, Webb et al. (2021) utilized a microsimulation model in their research. This model combined time, individual-level nutrition, and policy parameters to estimate the health impact and cost-effectiveness of reducing stunting. The findings reveal that, under the assumption of 80% intervention coverage for the entire population, programs focused on enhancing nutritional quality can potentially extend the health quality of toddlers aged 0,16 and 3,20 years per child. The average cost-effectiveness ratio falls from US$9 to US$2000 per life year saved. Unfortunately, no study has investigated the linkage between intervention programs emphasizing nutritional improvement and the prospective income tax revenue derived from stunted children under five as they enter the workforce in the future.

Given the current knowledge gap with no previous research, this study investigates the optimal allocation of funds for nutrition improvement interventions in stunting programs, considering the potential influence of corruption. The focus is on supplementary feeding programs based on locally sourced food, covering many districts and cities in Indonesia. Moreover, a cost-benefit analysis has yet to be conducted for this program to ascertain the future advantages that the government obtains from taxable income generated during periods of productive employment. Furthermore, no prior study has examined the number of recipients of the stunting alleviation program and used cost-benefit analysis to determine the taxable money that the government cannot collect in the future based on these incorrect aid recipients. Therefore, assessing its effectiveness through cost-benefit analysis and the correlation of selecting potential aid recipients free from targeting errors, which has the potential for corruption, is a new aspect of this study.

This study will endeavor to examine several key questions, delineated as follows, in alignment with the study objectives:

Q1: What is the connection between the budget allocations for the local PMT program in 2023 and their influence on the increment of taxable income over the next several years in contributing to the Indonesian government's revenue?

Q2: Did the 2023 local PMT budget allocation adhere to fairness principles, ensuring comprehensive coverage of most children under five affected by stunting in a specific area with an accurate selection of aid recipients?

Q3: To what extent does the inability to collect income tax from eligible children under five who were mistakenly excluded from program assistance due to probable corruption, including misidentification of beneficiaries, pose a substantial financial risk to the country?

Q4: Is there an alternative strategy to maximize future taxable income advantages within the existing budget policy framework for the local PMT program?

While this study underscores the significance of generating taxable income for the country over an extended period by allocating a substantial budget to reduce stunting prevalence rates, it has limitations in enhancing the existing knowledge base. One of the limitations of this study is its sample size, which exclusively includes data on children with stunting and malnutrition from e-PPGBM from August 2022 to February 2023, excluding data on pregnant women in the analysis. Consequently, the findings may only fully represent some population groups. Furthermore, the study's conclusions are restricted to only specific districts and cities that receive DAK non-physic for local PMT. The Papua region is excluded from the dataset since most of Papua's districts and cities are in conflict zones, causing the e-PPGBM application to contain inaccurate data regarding stunted and malnourished children.

Methods

This study employs a quantitative approach and utilizes secondary data acquired from e-PPGBM spanning the period of August 2022 to February 2023. The main reason for using data from February and August is that these two months are weighing months (Darojat et al., 2023), during which the data compiled into the e-PPGBM application is significantly larger than other months (Rinawan et al., 2022). The data gathered included details on malnourished and stunted children from 513 districts and cities across all of Indonesia. Nutrition officials in each Puskesmas verified the information. Subsequently, this data was cross-referenced with information on districts and cities granted budget allocations from the local PMT for the fiscal year 2023. The intersectional data was further adjusted by excluding districts and cities within Papua Province and those that did not get non-physical DAK assistance. During the cleaning process, we collected data from 360 districts and cities. As a result, the budget allocated initially for 389 districts and cities dropped from around US$43,9 million to about US$42 million.

In the next step, the cleaned data underwent analysis using the net present value (NPV) calculation to see how well a program's budget is being used to reach its goals. According to Gallo (2014), NPV is a technique used to determine a project's or expenditure's return on investment (ROI). It involves evaluating the total expected financial gains from the investment and converting them into present-day currency. According to Zethraeus et al. (2003), one advantage of the NPV method is that it may overcome the interpretation and statistical issues associated with the incremental cost-effectiveness ratio.

In calculating NPV, it is essential to determine the total income of the working-age population. Based on findings from a 2019 survey by BPS, the productive age of the Indonesian population is defined as encompassing people aged 15 to 64 (Kominfo, 2021). This variable represents productive age in the NPV calculation. The productive years of life are calculated by subtracting the years in the age bracket of 64 from 15. The formula used in the calculation includes a discount rate of 4,5%, based on the loan facility's interest rate. As mentioned earlier, the rate was documented in the board of governors' meeting report of Bank Indonesia, which occurred between August 22 and August 23, 2022 (BI, 2022).

Regarding the average income of the working-age population, this study refers to a survey published by the BPS, cited in the study conducted by Negara and Ramayandi (2020). A BPS survey shows Indonesia's gross domestic product (GDP) is approximately US$7 trillion. This figure implies that the Indonesian population's per capita income (PCI) will be approximately US$1.760 per month or US$21.123 per year in 2045. Before arriving at the NPV formula, it is necessary to calculate the future value for each individual. For further details, the Formula 2 applied for calculating future value is as follows:

$$FV_{[r, t]} = Po \, (1 + r)^t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 2)$$

$FV_{[r, t]}$: Earnings throughout the working years

Po   : Total taxable income in 1 year
r   : Interest rate of the Lending Facility
t   : Years of life spent productively

Once we have calculated the income value throughout the working years, we must quantify the economic worth of a child contributing to the workforce until retirement age. The Formula 3 is used to calculate a child's economic value:

$$\textbf{FVA}_{\textbf{[r, t]}} = \frac{FV_{[r,t]} - [(1+r)^t - 1]}{r} \quad \text{... 3)}$$

$FVA_{[r, t]}$: Monetary worth until the child reaches retirement age
$FV_{[r, t]}$: Earnings throughout the working years
r   : Interest rate of the Lending Facility
t   : Years of life spent productively

Subsequently, we calculate the economic potential of a newborn using the present value Formula 4.

$$\textbf{PV}_{\textbf{(0)}} = \frac{FV_{[r,t]}}{(1+r)^t} \quad \text{... 4)}$$

$PV_{(0)}$: Potential economic development of a 0-year-old
$FVA_{[r, t]}$: Monetary worth until the child reaches retirement age
r   : Interest rate of the Lending Facility
t   : Years of life spent productively

To evaluate the viability of a program, we can calculate its net economic value by subtracting the operational expenses from its economic potential or by dividing these two variables to determine a cost-benefit ratio (CB ratio). A positive discrepancy or a CB ratio exceeding zero suggests the program's feasibility. Conversely, a negative discrepancy or a CB ratio below or equal to zero indicates the program's impracticality, prompting either a reassessment or a thorough evaluation if the program is already underway. The Formula 5 is shown as follows.

$$\textbf{CB ratio} = \frac{PV_{(0)}}{I} \quad \text{... 5)}$$

CB ratio: a ratio used in a cost-benefit analysis
$PV_{(0)}$: Potential economic development of a 0-year-old
I   : The total investment distributed to finance a program/project

In order to answer the study questions, it is essential to consider several additional variables that serve as corrective factors in the benefit calculation. These variables encompass the individual's number of productive years, the death ratio, and the income value subject to taxation. As previously mentioned, the productive age spans 49 years, from 15 to 64. However, according to Ekaptiningrum (2023), the average age of undergraduate students in Indonesia is approximately 22 years. Furthermore, according to Nasional (2023), individuals seeking employment must have at least one year of professional experience to effectively navigate the shift from the academic setting to the professional realm. Assuming the mean age of infants receiving local PMT assistance in 2023 was one year, these infants will reach the labor force at twenty-three in 2045. If we choose the year 2045 as the initial point of calculation, expanding the "t" variable to encompass an individual's maximum productive age of 64 years yields a "t" value of 42 years.

Another additional factor that serves as a correction is the death rate. According to the World Bank Open Data (2021), it was reported that the crude death rate (CDR) in Indonesia was 9,6 deaths per 1000 individuals or 0,96% in 2021. As a final corrective measure, Law No. 7 of 2021 concerning Harmonization of Tax Regulations has regulated non-taxable income (Penghasilan Tidak Kena Pajak, or PTKP) for individual taxpayers; the amount is US$3.520. According to this law, married taxpayers are entitled to an additional US$293, while each member of the taxpayer's family receives the same amount. Before calculating the PTKP value, the number of children in a family must be assumed. The average number of children per family in this study is obtained from the BPS (2023) report. As specified in this report, Indonesia's total fertility rate (TFR) falls within the range of two. Based on this condition, if a married couple has two children, the deductions for each person's taxable income will be US$3.520 and US$586, respectively.

The law also states that after deducting the value of non-taxable income from taxpayers, those with US$16.298 to US$32.597 will be subject to an income tax of 25%. This study bases all conversion rates on the official Bank Indonesia currency rate as of December 29, 2023, which is Rp15,338 for US$1.

Results and Discussion

Following the previously established formula, the cost-benefit calculation is carried out, considering the assumptions elucidated earlier that form the basis for the correction variable's value. Table 1 shows the calculation of the CB ratio by dividing the present value benefit (PV benefit) by the present value cost (PV cost).

Table 1. Cost-benefit ratio on local PMT

Tax	PV (0) taxed	Target Population	PV Benefit	PV Cost	CB Ratio
25%	$92.901	1.780.275	$163.801.473.939	$172.352.967	950

According to the data provided in Table 1 the state could acquire approximately US$163 billion over the next 42 years by applying a taxable income rate of 25% to the total income of each individual within the targeted population of stunted and malnourished children. This value is based on the target population of 1.780.175 children with a mortality rate of 0,96%. When comparing this estimated gain to the overall costs incurred by the state for funding the local PMT program for the entire target population, the CB ratio indicates a notably significant value of 950. The results of this analysis address the question posed in Q1, where the CB ratio of this program is substantially high. This high ratio suggests that implementing the local PMT program is highly beneficial, as it has the potential to significantly contribute to the state revenue and expenditure budget (Anggaran Pendapatan dan Belanja Negara, or APBN) through taxable income, commencing at the age of 23 in 2045 and continuing until the individual reaches 64 years old.

However, not all families with stunted and malnourished children received additional food support through the local PMT program due to financial limitations. Excluding Papua, the Indonesian government allocated approximately US$42 million to intervene and assist 434.330 children experiencing stunted development and malnutrition. Despite valid arguments, such as financial constraints, the government's policy implementation continues to demonstrate an element of inequity.

Table 2. Total budgetary excess

No.	Province	Children stunting and malnutrition (e-PPGBM)	Children budgeted for intervention	Ineligible recipients	Total budgetary excess (US$)
1.	Sumatera Utara	9.896	20.674	10.778	$1.043.452
2.	Sumatera Selatan	4.097	8.605	4.508	$436.437
3.	Riau	9.151	12.553	3.402	$329.344
4.	Sulawesi Utara	2.404	3.852	1.448	$140.159
5.	Kalimantan Tengah	1.248	2.252	1.004	$97.213
6.	Lampung	5.342	6.206	864	$83.646
7.	Jambi	3.266	4.037	771	$74.631
8.	Papua Barat	1.304	2.047	743	$71.919
9.	Sulawesi Tenggara	2.509	3.170	661	$64.012
10.	Maluku Utara	660	1.017	357	$34.606
11.	Kepulauan Bangka Belitung	782	1.139	357	$34.606
12.	Bengkulu	1.046	1.320	274	$26.554
13.	Aceh	300	552	252	$24.397
14.	Maluku	665	904	239	$23.138
15.	Jawa Timur	503	653	150	$14.557
		43.173	68.982	25.809	$2.498.671

Unfortunately, the government's constrained budget, which leads to unfairness, is not the sole source of potential issues with the local PMT program. Another issue this study highlights is the need for more accurate targeting of aid recipients. The study revealed that 25.809 records indi-

cated these recipients were ineligible to participate in the local PMT program. Consequently, out of the 434.330 children under five who received intervention through the supplementary food program, only approximately 408.521 were eligible beneficiaries. A comprehensive breakdown of the provinces that demonstrated indications of inaccuracies concerning assistance recipients is presented in Table 2. These figures include the number of aid recipients with inaccurate data and the total number of misallocated budgets.

Further examination of Table 2 reveals that among the 34 provinces of Indonesia, 15 provinces showed discrepancies in identifying beneficiaries. The calculation of beneficiaries involves subtracting the recorded number of stunted and malnourished children in the e-PPGBM database for each district and city from the count of children who receive program benefits. Meanwhile, determining program recipients entails dividing the total budget allocated to districts and cities in each province by $1,08 per child, multiplied by 90 days. Based on this analysis, it is evident that the country may lose approximately $2,49 million due to the possibility of erroneous targeting. This sum represents 5,94% of the government's overall budget for the regional PMT program, indicating a waste of state funds due to errors in determining program beneficiaries.

When delving deeper into the statistics and focusing on the districts and cities within each province, the results presented in Table 3 become apparent. This analysis entails sorting the ten districts and cities with the highest risk of ineligible program recipients from highest to lowest.

Table 3. Top ten districts with misallocated state funds

No.	District	Total Budget	Children budgeted for Intervention	Children Stunting and Malnutrition	Ineligible Recipients	Misallocated state funds	SSGI 2022
1.	Kab. Ogan Komering Ulu Timur	$251.132	2.594	624	1.970	$190.721	19,1%
2.	Kab. Serdang Bedagai	$297.892	3.077	1.159	1.918	$185.686	21,1%
3.	Kab. Labuhanbatu	$194.593	2.010	419	1.591	$154.029	23,9%
4.	Kab. Tapanuli Tengah	$223.443	2.308	858	1.450	$140.378	30,5%
5.	Kab. Asahan	$201.757	2.084	790	1.294	$125.275	15,3%
6.	Kab. Labuhanbatu Selatan	$166.347	1.718	597	1.121	$108.550	26,4%
7.	Kab. Kampar	$352.785	3.644	2.695	949	$91.875	14,5%
8.	Kab. Ogan Komering Ulu Selatan	$150.982	1.560	675	885	$85.634	19,4%
9.	Kab. Tapanuli Selatan	$119.247	1.232	375	857	$82.942	39,4%
10.	Kab. Rokan Hilir	$233.837	2.415	1.624	791	$76.614	14,7%
		$2.192.017	22.642	9.816	12.826	$1.241.705	

Table 3 reveals that among the top ten districts and cities, the six districts in North Sumatra Province had the most inaccurate targeting of local PMT program aid recipients. The remaining inaccuracies are distributed among two districts in Riau Province and two in South Sumatra Province, with Ogan Komering Ulu Timur having the highest budgetary excess. Each of the ten regions with the highest number of inaccurate targets is comprised of districts, all located on the island of Sumatra.

In addition, among the ten districts identified as recipients of misallocated aid programs, six districts exhibited stunting prevalence rates that exceeded the national average, which stands below 21,6%.[1] This observation highlights a governmental oversight in planning, wherein financial allocation was prioritized to areas with stunting rates significantly lower than the national average. These findings underscore the imperative of utilizing more accurate data in planning, verification, and validation processes to ensure alignment with the number of stunted and

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[1] A lower stunting prevalence index indicates a higher proportion of healthy toddlers to the number of stunted toddlers.

malnourished children under the age of five in each region. This alignment serves as the basis for prioritizing the provision of financial assistance.

By analysing the data presented in Tables 2 and 3, we can address the questions posed in Q2 and Q3 regarding the unfair distribution of the local PMT program budget across various areas and the possibility of financial losses for the state in budget allocation. The existence of areas designated to receive budget allocations surpasses the recorded population of stunted and malnourished children under five on e-PPGBM, demonstrating a distortion of the principle of fairness. In other words, it is hypothesized that surplus money will be allocated to children under five who fail to meet the specified criteria as designated recipients. As a result of assisting these non-targets, there is a potential state financial loss of 5,94% of the allocated budget. This circumstance not only hampers the local PMT program's ability to fulfil its goals effectively but also poses a risk of corruption in the form of financial losses for the state due to the inclusion of ineligible recipients among the program's target beneficiaries.

To explore a different approach to allocating budgets and answer the last research question in Q4, Table 4 compares two scenarios: first, the government's intervention with the whole target population, and second, the current policy according to budget distribution. In the calculations for the second scenario, it is essential to note that the number of mistargeted beneficiaries, totaling 25.809, was excluded from consideration due to the assumption that their inclusion would result in a financial loss for the state.

Table 4. Comparison on two different scenarios

Scenario	Target Population	PV Benefit	PV Cost
1	1.780.275	$163.801.473.939	$172.352.967
2	408.521	$37.587.643.445	$42.048.621
	Potential loss	-$126.213.830.493	

A cost-benefit analysis of the data in Table 4 reveals that, by only intervening with 408.521 stunted and malnourished children under the age of five, the government has the potential to earn around US$37,5 billion. Unfortunately, if there is no government intervention for the entire target population, the Indonesian government will experience a potential income tax revenue loss of US$126,2 billion. In other words, if the Indonesian government were to limit involvement to a mere 22,95% of the target population, it would be exposed to the possible loss of a significant amount of taxable revenue. These figures represent a potential reduction of 77% in the total income the government could have generated.

Conclusion

This study has examined the critical domain of optimizing the implementation of Special Allocation Funds in supplementary feeding to tackle the widespread issue of stunting in Indonesia. By conducting a thorough examination using cost-benefit analysis, our study emphasizes the importance of implementing supplemental nutrition programs that accurately utilize locally sourced foods to select eligible recipients. The analysis results also show significant benefits to potential future taxable income, thus validating the positive impact of this program.

However, this study also highlights the potential financial consequences of inaccuracies in selecting aid recipients. As a result of inaccuracy in selecting beneficiaries, the government might face massive financial losses in the future because of the failure to collect income taxes, mainly when only a segment of the intended population is subject to intervention. Moreover, the inefficient allocation of state money was noted when individuals who did not satisfy the specified qualifying requirements were selected as assistance beneficiaries. Corruption occurs when injustice arises in the process of selecting program recipients as a result of the misuse of power and maladministration. Before the program's continuation in the subsequent year, it is essential for all related stakeholders, particularly the central government, to evaluate success based on effectiveness in declining stunting prevalence, resource efficiency, and adherence to anti-corruption principles. In addition, it is vital to use e-PPGBM data as a reference database to select possible assistance beneficiaries while enhancing data accuracy. The Ombudsman, Indonesia's National Government Internal Auditor (Badan Pengawasan Keuangan dan Pembangunan, or BPKP), and

the KPK are all non-ministerial institutions that play a crucial role in improving the quality of program planning and implementation by making sure that rules and laws are followed. This effort is achieved through various means, such as conducting audits in areas suspected of non-compliance with eligibility criteria, overseen by the BPKP, or through anti-corruption assessments assisted or conducted by the Deputy for Prevention and Monitoring within the Corruption Eradication Commission. Consultation and audit operations may be initiated by thoroughly examining ten districts on Sumatra Island, where several assistance recipients failed to fulfill the requirements and were not recorded in the e-PPGBM application.

Given the gravity of the issue, this study serves as a compelling call to action for policymakers, urging them to establish evidence-based health sector policies that ensure optimal program outcomes while safeguarding state finances, particularly in light of Indonesia's current struggle with stunting. Concurrently, this study attempts to furnish insights and counsel for the formulation of forthcoming policies that more effectively and suitably tackle this concern, ultimately striving to enhance the welfare of children within the nation.

Analyzing the population of pregnant women experiencing chronic energy deficiency who also receive aid under the supplementary feeding program is a potential enhancement for future studies. This analysis serves a dual purpose; not only does it enable a comparison of the success among the target population of aid recipients with stunted and malnourished toddlers, but it also serves as a supplementary approach for determining whether the supplementary feeding program is attaining its optimal outcomes at the implementation level under the pregnant women with chronic energy deficiency population.

Furthermore, the stunting prevalence index for the year 2023 was not yet accessible when conducting this study. Therefore, it would be beneficial for a forthcoming study to investigate the impact of the correlation between the percentage reduction in stunting prevalence in 2023 and the budget assigned to the local PMT program.

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