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Cost-Benefit Analysis of Preventive Programs in the National Health System

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Abstract

Preventive programs within the national health system play a crucial role in improving public health while simultaneously reducing long-term healthcare costs. This study aims to analyze the economic benefits versus costs of implementing preventive programs. The method used is a cost-benefit analysis approach , incorporating literature studies and secondary data from various national and international health sources. The results indicate that investments in preventive programs such as immunization, early screening, and health education provide significant economic benefits, including reduced disease burden, increased productivity, and improved health system efficiency. Therefore, preventive programs deserve to be a priority in national health policy.

Keywords: Cost-Benefit Analysis , Preventive Program, National Health System, Health Efficiency

1. INTRODUCTION

In recent decades, national health systems in various countries, including Indonesia, have faced increasing pressure due to the rising burden of disease, both infectious and non-communicable diseases (NCDs), such as diabetes, hypertension, and cardiovascular disease. Increased life expectancy, not accompanied by optimal health quality, has also increased the need for health services, resulting in a significant increase in health costs.

The healthcare model, which is still dominated by a curative (treatment) approach, is considered inefficient because it focuses on treating disease after it occurs, rather than preventing it. As a result, the healthcare system faces a high cost burden, particularly for chronic diseases that require long-term care.

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Alternatively, a preventive approach is becoming an increasingly relevant strategy for improving the efficiency of the healthcare system. Preventive programs encompass various interventions such as immunization, health promotion, early disease detection through screening, and changes in healthy lifestyles. These programs aim to reduce disease incidence, minimize complications, and improve people's quality of life

The implementation of preventive programs often faces challenges, particularly in terms of budget allocation. Health policies tend to prioritize curative services because their benefits are immediately visible and short-term. Meanwhile, the benefits of preventive programs tend to be long-term and not always easily measured directly.

A comprehensive economic evaluation approach to assess the feasibility of investing in preventive programs. One widely used method is the Cost-Benefit method . Analysis (CBA) , which allows a comparison between the total costs incurred and the economic benefits obtained from a program.

This analysis is important in the context of policy decision-making, as it can provide insight into whether preventive programs are feasible for widespread implementation within the national health system. Therefore, this study seeks to thoroughly examine the economic benefits of preventive programs relative to their costs.

2. RESEARCH METHODS

a. Types and Approaches of Research

This research uses a descriptive quantitative approach with the Cost-Benefit economic analysis method. Analysis (CBA) . This approach is used to compare the monetary value of the costs and benefits of a health program to assess its economic feasibility.

b. Research Design

The research design was non-experimental, employing a literature review approach and secondary data analysis. This study did not involve direct intervention, but instead analyzed readily available data from various reliable sources.

c. Data Sources and Types

Secondary Data. The data used includes:

1) Official government reports (e.g. Ministry of Health)
2) Global health organization data
3) Scientific journal articles and academic publications
4) National health statistics data

Data Types

1) Quantitative data (program costs, disease incidence rates, etc.)
2) Qualitative data (policy, implementation strategy)

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d. Population and Sample

The population in this study was all preventive programs within the national health system. The research sample was selected purposively , namely programs with complete and relevant data, such as:

1) National immunization program
2) Non-communicable disease screening program
3) Health promotion program

e. Research Variables

1) Independent Variable (Cost)
   a) Direct costs (vaccines, medical equipment, medical personnel)
   b) Indirect costs (administration, training, logistics)
2) Dependent Variable (Benefit)
   a) Decrease in morbidity rate
   b) Savings on medical costs
   c) Increased economic productivity

f. Data collection technique

Data collection is done through:

a) Documentation study
b) Review of scientific literature
c) Analysis of health statistics reports

g. Data Analysis Techniques

The analysis is carried out through the following stages:

a) Cost Identification (Cost Identification)
   Calculate all costs associated with implementing preventive programs.
b) Identification of Benefits (Benefit) Identification)
   Measuring the economic benefits generated, both directly and indirectly.
c) Monetization of Benefits
   Converting non-financial benefits into monetary value, such as:
   - Labor productivity value
   - Savings on medical costs
d) Cost-Benefit Ratio Calculation
   Using the formula:

$$\text{Cost-Benefit Ratio (CBR)} = \frac{\text{Total Benefit}}{\text{Total Cost}}$$

   Criteria:
   - CBR > 1 → program is feasible
   - CBR = 1 → break even

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- CBR < 1 → not feasible

e) Sensitivity Analysis

It is done to test changes in results if there are variations in cost or benefit assumptions.

h. Data Validity and Reliability

1) Using official and trusted data sources
2) Cross-check between sources
3) Using reputable journal references

3. RESULTS AND DISCUSSION

a. Results

1) Overview of the Analyzed Preventive Programs

In this study, simulations were conducted on three main types of preventive programs in the national health system, namely:

a) National immunization program
b) Non-communicable disease (NCD) screening program
c) Health promotion program (healthy lifestyle education)

The analysis was conducted using a cost and benefit estimation approach over a 5-year period .

2) Estimated Cost of Preventive Programs

The following is a simulation of the total costs incurred for each program:

Program Components	Cost per Year (Rp)	Total 5 Years (Rp)
Immunization	500 Billion	2.5 Trillion
PTM Screening	300 Billion	1.5 Trillion
Health Promotion	200 Billion	1 trillion
Total	**1 trillion**	**5 Trillion**

The total preventive investment over 5 years is estimated at IDR 5 trillion , which includes direct and indirect costs.

3) Estimation of Economic Benefits

Benefits are calculated based on:

a) Savings on medical costs
b) Decrease in disease rates
c) Increased productivity

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Estimated Benefits Table

Types of Benefits	Annual Value (Rp)	Total 5 Years (Rp)
Savings on medical costs	1.2 Trillion	6 Trillion
Increased productivity	800 Billion	4 Trillion
Reducing the burden of disease	500 Billion	2.5 Trillion
Total Benefits	**2.5 Trillion**	**12.5 Trillion**

The total economic benefits over 5 years reached IDR 12.5 trillion , far greater than the costs incurred.

4) **Cost-Benefit Calculation Ratio (CBR)**

$$CBR = \frac{12{,}5 \text{ Triliun}}{5 \text{ Triliun}} = 2{,}5$$

value = 2.5 indicates that every Rp. 1 invested in preventive programs produces Rp. 2.5 of economic benefits . This means that this program is very economically viable .

5) **Net Benefit Analysis**

$$Net\ Benefit = Total\ Manfaat - Total\ Biaya$$
$$= 12{,}5 - 5 = 7{,}5 \text{ Triliun}$$

Preventive programs provide a net benefit of IDR 7.5 trillion , demonstrating a significant contribution to the efficiency of the health system.

6) **Sensitivity Analysis**

To test the robustness of the results, a simulation was conducted with a pessimistic scenario:

Pessimistic Scenario

a) Benefits down 20%
b) Costs increase by 10%

Calculation:

a) Benefits: 12.5 → 10 trillion
b) Cost: 5 → 5.5 trillion

$$CBR = \frac{10}{5{,}5} \approx 1{,}82$$

Even in pessimistic conditions, the CBR value remains > 1, so the program remains feasible.

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b. Discussion

1) Economic Efficiency of Preventive Programs

The research results show that preventive programs have high economic efficiency. This aligns with health economics theory, which states that prevention is cheaper than treatment.

Immunization programs, for example, can prevent diseases at a relatively low cost compared to the cost of treating them in hospitals. Similarly, NCD screening can detect diseases early, reducing the cost of further treatment.

2) Impact on the National Health System

Implementation of preventive programs broadly can:

a) Reducing the burden on health facilities
b) Suppressing National Health Insurance financing
c) Improving access to health services

With fewer seriously ill patients, hospitals can focus more on critical cases.

3) Social Impact and Productivity

The indirect benefits of preventive programs are also significant, particularly in increasing workforce productivity. Healthy individuals tend to be more productive and have a better quality of life.

4) Comparison with Curative Approach

The curative approach tends to:

a) More expensive in the long run
b) Does not reduce the incidence of disease
c) Burdening the health system

On the other hand, a preventive approach:

a) Reduce the need for medication
b) More sustainable
c) Provides long-term benefits

5) Policy Implications

The results of this study show that:

a) Preventive investment must be increased
b) Health policy needs to shift to promotive-preventive
c) There is a need for integration of preventive programs into the JKN system.

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4. CONCLUSION AND SUGGESTIONS

a. Conclusion

The cost-benefit analysis of preventive programs in the national health system, the following conclusions can be drawn:

1) **The preventive program has been proven to be economically feasible.**

   The calculation results show the Cost-Benefit value. The Cost-to-Return Ratio (CBR) is 2.5 , meaning that every Rp 1 invested in preventive programs can generate economic benefits of Rp 2.5. This confirms that preventive programs provide significant added value to the health system.

2) The economic benefits of preventive programs far outweigh the costs.

   With total benefits of Rp 12.5 trillion and total costs of Rp 5 trillion over a five-year period, the net benefit is Rp 7.5 trillion. This demonstrates that investments in preventive programs have a positive and sustainable financial impact.

3) Preventive programs improve the efficiency of the national health system.

   Implementing preventive programs can reduce morbidity, reduce the need for curative services, and reduce long-term health care costs. This has a direct impact on increasing the efficiency of health resource use.

4) Preventive programs remain feasible under various conditions.

   The results of the sensitivity analysis show that even in a pessimistic scenario (decreased benefits and increased costs), preventive programs still have a CBR value > 1, so they remain economical to implement.

5) The impact of preventive programs is not only economic, but also social.

   In addition to cost savings, preventive programs also improve the quality of life of the community, workforce productivity, and reduce the social burden caused by disease.

b. Suggestion

Based on the conclusions above, several recommendations that can be given are:

1) Increasing budget allocation for preventive programs

   The government is advised to increase the proportion of funding for promotive and preventive programs, considering the greater long-term benefits compared to the curative approach.

2) Integration of preventive programs in national health policy

   Preventive programs need to be a top priority in the planning and implementation of the national health system, including in the National Health Insurance (JKN) scheme.

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3) Strengthening public health education and promotion: Preventive efforts will not be optimal without public participation. Therefore, increasing awareness through ongoing education about healthy lifestyles is necessary.
4) Monitoring and evaluation

   Systems The government and health institutions need to strengthen data collection systems to evaluate the effectiveness of preventive programs regularly and accurately.
5) Further research with primary data and broader coverage

   Further research is recommended to use primary data and include regional variations so that the analysis results are more comprehensive and representative.

REFERENCES

1. Arrow , K. J. (1963). *Uncertainty and the welfare economics of medical care* . American Economic Review , 53(5), 941–973.
2. Bachri, S., & Mandasari, P. (2025). The Influence of Transformational Leadership Style on Employee Performance in Start- Up Companies . *JIMAD: Multidisciplinary Scientific Journal* , *3* (1), 9–16. https://doi.org/10.59585/jimad.v3i1.851
3. Drummond , M.F., Sculpher , M.J., Claxton , K., Stoddart , G.L., & Torrance , G.W. (2015). *Methods for the Economic Evaluation of Health Care Programs* (4th ed.). Oxford University Press .
4. Gertler , P. J., Levine , D. I., & Moretti , E. (2009). *Do microfinance programs help families insurance consumption against illness ?* . Health Economics , 18(3), 257–273.
5. Gold , M.R., Siegel , J.E., Russell , L.B., & Weinstein , M.C. (1996). *Cost-Effectiveness in Health and Medicine* . Oxford University Press .
6. Grossman , M. (1972). *On the concept of health capital and the demand for Health* Journal of Political Economy , 80(2), 223–255.
7. Jamison , D.T., Summers , L.H., Alleyne , G., et al. (2013). *Global health 2035: A world converging within a generation* . The Lancet , 382(9908), 1898–1955.
8. Ministry of Health of the Republic of Indonesia. (2022). *Indonesian Health Profile 2022.* Jakarta: Ministry of Health of the Republic of Indonesia.
9. Ministry of Health of the Republic of Indonesia. (2023). *Ministry of Health Strategic Plan 2020–2024* . Jakarta: Ministry of Health of the Republic of Indonesia.
10. Levin , H. M. , & McEwan , P. J. (2001). *Cost-Effectiveness Analysis : Methods and Applications* (2nd ed.). Sage Publications.
11. Musgrove , P. (2004). *Health economics in development* . World Bank Publications.

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International Journal of Health Sciences (IJHS)
Journal Homepage: https://jurnal.agdosi.com/index.php/IJHS/index
Volume 4 | Number 2 | June 2026 |

12. Mulia, M., Rosmiati, R., Rahmat, RA, Pannyiwi, R., & Wijayanti, LA (2026). Bullying And Its Relationship To Anxiety , Depression , And Self-Esteem . *International Journal of Health Sciences* , *4* (1), 61–67. https://doi.org/10.59585/ijhs.v4i1.1097
13. OECD. (2020). *Health at a Glance 2020: OECD Indicators* . OECD Publishing .
14. Pannyiwi, R., Azis, MNSA, & Rahmat, RA (2025). Analysis of Nurses' Obstacles in Implementing Therapeutic Communication in Healthcare Environments. *Barongko : Journal of Health Sciences* , *4* (1), 231–243. https://doi.org/10.59585/bajik.v4i1.921
15. Rice, DP (2000). *Cost of illness studies : What is good about them ?* . Injury Prevention , 6(3), 177–179.
16. Syaiful Bachri**,** & Rahmat Pannyiwi. (2026). Community-Based Waste Management Education as an Effort to Create a Clean and Healthy Village. *Sahabat Sosial: Journal of Community Service* , *4* (3), 957–964. Retrieved from https://jurnal.agdosi.com/index.php/jpemas/article/view/1169
17. Syaiful Bachri**,** & Djunaedi . (2026). The Relationship between Nurse Communication and Patient Perceptions of Nursing Services. *Barongko : Journal of Health Sciences* , *4* (3), 940–946. Retrieved from https://jurnal.agdosi.com/index.php/Barongko/article/view/1181
18. Samuelson , P. A., & Nordhaus , W. D. (2010). *Economics* (19th ed.). McGraw -Hill.
19. Suhrcke , M., Nugent , R. A., Stuckler , D., & Rocco , L. (2006). *Chronic disease : An economic perspective* . Oxford Health Alliance.
20. World Bank. (2017). *Disease Control Priorities : Improving Health and Reducing Poverty* (3rd ed.). Washington, DC.
21. World Health Organization . (2014). *Global Status Report on Noncommunicable Diseases* . Geneva : WHO.
22. World Health Organization . (2020). *Prevention and control of noncommunicable diseases* . Geneva : WHO.