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Climate Change and the Economic Balance of Public Health in Indonesia

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Abstract: *Developing countries like Indonesia have been facing huge challenges with climate change, especially in terms of maintaining a balance between economic growth and public health. Increasing infectious diseases, respiratory disorders, and economic losses are caused by climate change impacts such as rising temperatures, extreme rainfall, and natural disasters. The purpose of this research is to see how climate change affects public health and how it impacts the economic stability of the health sector in Indonesia. This research utilizes a qualitative-descriptive approach that uses secondary data from various sources. The research shows that economic losses due to climate change in the health sector reach trillions of rupiah every year, and the poor are the most affected. To maintain the balance between economic development and public health in the future, adaptation and mitigation strategies are essential.*

Keywords: *Climate change, Public Health, Health Economics*

Introduction

The global phenomenon known as climate change affects many aspects of human life, such as national economies and public health. One of the countries most vulnerable to the impacts of climate change is Indonesia, which is an archipelago with a lot of biodiversity and relies heavily on agriculture and marine waters. (World Bank, 2021).

Environmental conditions greatly affect public health. According to WHO (2022), increasing air temperatures, the spread of disease vectors, and deteriorating air and water quality are all factors that increase the burden of disease in communities. In addition to increasing morbidity and mortality, this places a greater burden on national health systems and results in significant economic losses.

This study aims to explore the linkages between climate change and the public health economic balance in Indonesia, and develop evidence-based recommendations for mitigation and adaptation policies.

Research Method

a. Climate Change Theory

Climate change is defined as long-term changes in temperature, precipitation, wind patterns, and other weather phenomena caused by human activities (IPCC, 2021). According to the greenhouse effect theory, the accumulation of gases such as

CO_2, CH_4, and N_2O in the atmosphere causes an increase in the Earth's temperature that disrupts the balance of ecosystems.

In Indonesia, an increase in global temperature triggers an increase in the intensity and frequency of disasters such as floods, droughts, forest fires, and shifts in climate zones that have a direct impact on public health through the spread of disease and a decrease in the quality of life (BMKG, 2023).

b. Health Economics Theory

Health economic theory highlights the relationship between economic resources and population health outcomes. One of the key principles is the concept of efficiency and distribution in the health care system. When climate change causes the burden of disease to increase, the cost of health care also increases, both in terms of individuals and countries.

This theory also emphasizes the importance of cost-effectiveness in climate-related public health interventions, such as early warning systems for infectious diseases or improved sanitation infrastructure. According to WHO (2022), every US$1 invested in climate adaptation in the health sector can save up to US$4 in long-term health costs.

c. Community Vulnerability and Resilience Theory

This theory explains that not all individuals or communities have the same capacity to deal with the impacts of climate change. Vulnerability includes exposure to risk, sensitivity to impact, and adaptive capacity. In the Indonesian context, the poor, elderly, women and children are the most vulnerable.

In contrast, resilience is the ability of a system or community to anticipate, absorb and recover from stresses or shocks due to climate change. Strategies to increase resilience include the provision of inclusive health services, climate health education, and strengthening social support systems (Adger, 2006).

This research used a descriptive qualitative approach with a literature study method. Data were collected from official government reports (Ministry of Health, MoEF, Bappenas), international organizations (WHO, World Bank, IPCC), and relevant scientific journals. Analysis was conducted thematically to identify linkages between climate change indicators and health and economic indicators in Indonesia.

Result and Discussion

Direct Health Impacts

a. Increase in average annual temperature in Indonesia by 0.3°C per decade since the 1980s (BMKG, 2023).
b. Increased cases of infectious diseases such as dengue hemorrhagic fever (DHF) and malaria, especially in eastern Indonesia (Indonesian Ministry of Health, 2022).
c. Increase in ARI and cardiovascular diseases due to forest fires and degraded air quality, especially in Kalimantan and Sumatra.

Health Sector Economic Losses

a. Economic losses due to climate-related disasters are estimated at IDR 100 trillion per year (Bappenas, 2021).
b. Medical costs and lost productivity due to diseases exacerbated by climate change amount to 1.5% of GDP (World Bank, 2021).

Vulnerable Groups

Low-income communities are most affected due to limited access to health services, crowded and unhealthy living environments.

Discussion

National economies and health systems face similar challenges due to climate change. Temperatures and weather instability are increasing, which lengthens disease seasons and expands the spread of disease vectors. The need for health services and post-disaster recovery increases, resulting in increased health costs. The absence of climate-resilient infrastructure, economic disparities, and unequal access to health services exacerbate these impacts. As a result, investments in green infrastructure, strengthening community-based health systems, and early warning systems are critical adaptation measures. Investments in climate change mitigation, such as reducing greenhouse gas emissions and reforestation, can also generate co-benefits for public health, such as improved air and water quality, and reduced disease risk.

Conclusion

Indonesia's public health is greatly affected by climate change, which indirectly affects the economic stability of the health sector. Climate-related diseases and disasters bring significant economic losses, especially for vulnerable groups. National development planning should integrate climate and health policies, and improve adaptation and mitigation capabilities through a multisectoral and evidence-based approach.

References

Adger, W. N. (2006). Vulnerability. Global Environmental Change, 16(3), 268–281.

Amegah, A. K., & Agyei-Mensah, S. (2021). Urban air pollution and health in the Global South. Environmental Research, 191, 110105.

Austin, S. E., Biesbroek, R., & Ford, J. D. (2020). Adapting health systems to climate change: A scoping review. Health Policy and Planning, 35(8), 1041–1057.

Badan Meteorologi Klimatologi dan Geofisika (BMKG). (2023). Laporan Perubahan Iklim Indonesia.

Bappenas. (2021). Kajian Risiko Iklim Nasional.

Bennett, C. M., Friel, S., & Ross, H. (2019). Global health and climate change: How to link public health and environmental sustainability. Public Health Research & Practice, 29(4), e2941921.

Bhatia, R., & Kumar, D. S. (2020). Climate change and public health: Emerging policy and legislative challenges. Indian Journal of Public Health, 64(4), 328–332.

Capstick, S., et al. (2021). Public understanding of climate change and health. Nature Climate Change, 11(6), 447–455.

Chersich, M. F., et al. (2020). Climate change and heat-related mortality in sub-Saharan Africa. Lancet Planetary Health, 4(5), e195–e202.

Ebi, K. L., & Hess, J. J. (2020). Health risks due to climate change: Inequity in causes and consequences. Health Affairs, 39(12), 2035–2042.

Frumkin, H., et al. (2021). Climate Change and Public Health: Emerging Challenges. Annual Review of Public Health, 42, 263–281.

Green, M. A., et al. (2022). Socioeconomic inequalities and climate resilience. Social Science & Medicine, 305, 115040.

Han, S., & Choi, J. (2021). Evaluating the economic burden of climate-sensitive diseases. Global Health Research and Policy, 6(1), 17.

IPCC. (2022). Sixth Assessment Report (AR6).

Kementerian Kesehatan Republik Indonesia. (2022). Profil Kesehatan Indonesia 2021.

WHO. (2022). Climate Change and Health. World Health Organization.

World Bank. (2021). Indonesia: Climate Risk Profile.