



INDONESIA

CLIMATE CHANGE AND HEALTH SYSTEM RESPONSE

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The main objective of the study was to gather evidence on climate change and its impacts on health in South Asia (SA), South-East Asia (SEA), and the Pacific Islands (PI). The study was conducted in collaboration with esteemed partner—Asia Disaster Preparedness Centre (ADPC).

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INTRODUCTION

Over the last few decades, Indonesia has achieved substantial progress in major population health indices such as life expectancy and infant mortality, as well as significant improvements in overall health. However, climate change is posing a grave threat to all the progress in the health sector that the country has achieved so far.

Indonesia is highly vulnerable to the effects of climate change, including rising temperatures, changes in precipitation patterns, and sea-level rise, which affects water quality and contributes to the **spread of waterborne diseases** [1] such as, diarrhoea, cholera, and typhoid fever [2]. Changing temperature and precipitation patterns also alter the patterns of **vector borne diseases** through impacts on their transmission including dengue and malaria [3]. In 2021, there were an estimated 800,000 cases of malaria [4] and 600,000 documented instances of dengue fever [5].

Rising temperatures are increasing the threat of **extreme heat** for public health in the country. Climate model projections indicate that Indonesia is one of the most vulnerable countries to extreme heatwaves [6]. Regardless of the emissions pathway, the frequency of heatwave events in Indonesia will increase significantly by the 2080s through the end of the century. Specifically, under the RCP6.0 pathway, it is around 71%, and under the RCP8.5 pathway, it is around 96% [7].

In addition, **air pollution** is another climate change related challenge that public health systems in Indonesia are facing. Indonesia is the

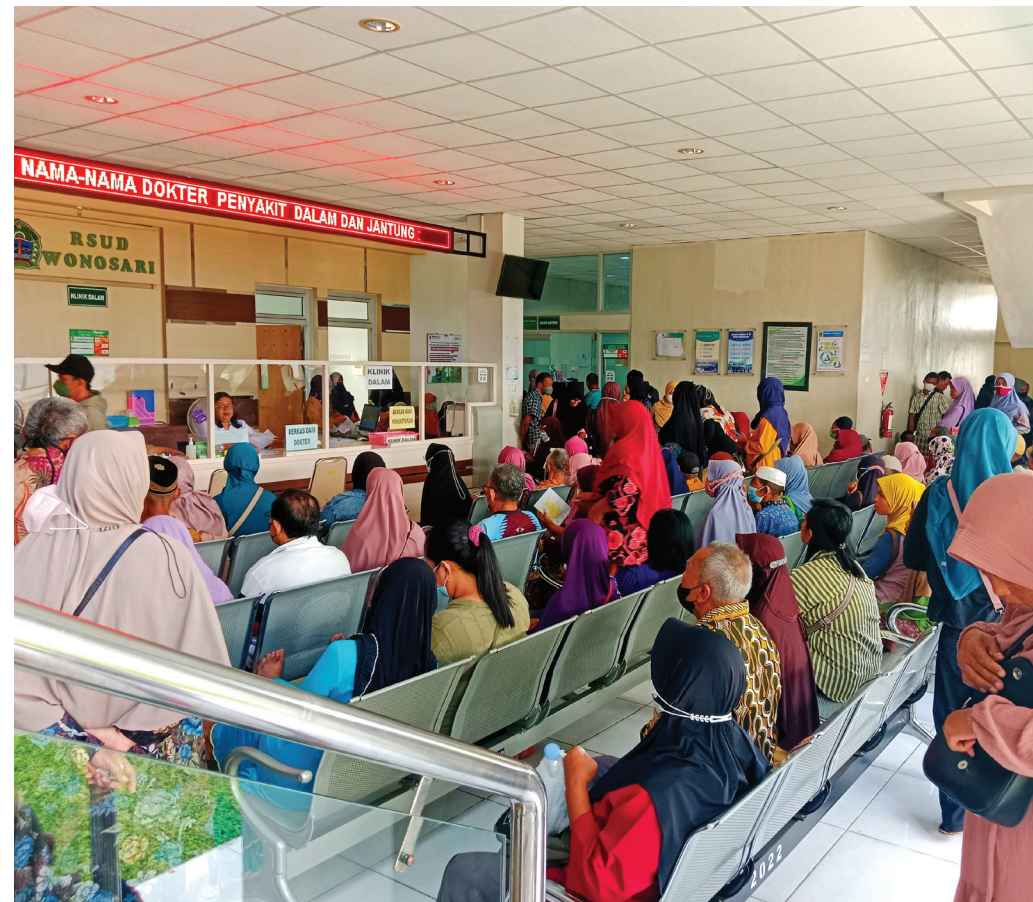
World's 12th most polluted country, with air pollution reducing an average resident's life by 2 years. Outdoor air pollution is estimated to cause over 7,000 adverse health outcomes in children, over 10,000 deaths, and 505,000 hospitalisations every year in Jakarta [8].

Indonesia is also affected by a diverse range of extreme events which are being rendered more frequent and destructive by climate change [9]. Flooding and coastal inundation are common in the country as a result of storms, landslides, and cyclones which in addition to direct and indirect material damage, have important mental health impacts, still understudied. Over 400,000 people were left homeless and displaced by floods in Jakarta in 2007, which damaged 80 districts and destroyed 70,000 dwellings [10].

This policy brief throws insights on climate change implications on human health, challenges associated and country priorities with regards to these risks, their health systems response and perspectives to build resilience in the health sector. The opportunities and recommendations hereby mentioned are the outcome of a desk review and stakeholder consultation with officials, civil society, and multilateral representatives. The findings indicate a mix of knowledge available in the public domain as well as information sought locally.

CHALLENGES

- **Uneven access to health services:** Limited access to medical services and treatment is a big challenge for Indonesia's health system response to climate change [11]. This uneven access results in differential health outcomes [12]. With limited availability and access to healthcare services, there is often accumulation of patients in certain hospitals. A&E departments (accident and emergency) in these hospitals are hence often crowded and in case of natural disasters or increasing demand caused by climate change-induced diseases this causes delayed response resulting in high mortality and morbidity due to climate related illnesses. In addition, most of the hospitals are concentrated in urban areas[13]; hence people residing in rural areas are often deprived of medical assistance in case of climate related health risks and emergencies.
- **Limited access to WASH services:** As stated in the Sustainable Development Goals 6.1 and 6.2, access to water, sanitation, and hygiene remains a global public health concern and weaken the health systems. More than 25 million citizens in Indonesia are yet to be open defecation-free (ODF) [12]. Together with poor hygiene practices, open defecation contributes to child mortality, undernutrition and stunting, and can potentially affect cognitive development. A quarter of all children under five in Indonesia suffer from diarrhoea, which is the leading cause of child mortality in the country. With climate change, the rising temperatures and unpredictable weather patterns threaten the sustained access to



clean water sources including endangering the WASH services in the health care sector itself. This will further amplify the health risks arising from climate change, creating more challenges for effective health system response in the country.

- **Evidence and Data Gaps:** Globally studies suggest that climate change and associated increases in climate variability are creating new health risks, exacerbating the existing health disparities and weakening the health systems. However, such evidence is



lacking in most developing nations including Indonesia partly due to limited research on this subject and partly due to availability and accessibility of the data required. Without such evidence, the country cannot frame informed policies to address climate change related public health risks.

- **Lack of Sufficient Budget for Health:** Indonesia spends relatively little on health (3% of GDP, 2020), compared to the average of upper middle-income countries (7% of GDP, 2020). Country's health system financing hence needs reforms. The recent Law on Health (Law No. 17/2023), passed in August 2023, abolished the obligatory health spending under national (5 percent) and local (10 percent) budgets mandated in 2009 under the Law on Health (Law No. 36/2009). This will have potential negative impact on health equity [14].
- **Limited Facilities and Resources:** Insufficient health budget leads to insufficient facilities and workforce required for public health services. Indonesia has a low number of beds compared to other countries in ASEAN and OECD. Physicians per 1,000 people in Indonesia were 0.6228 in 2020, which is way below the global average of 1.6. The existing patient referral system in Indonesia is weak, and the country's healthcare system has limited capacity to deliver essential health services especially under emergencies as evident from COVID 19 pandemic [15].
- **Decentralisation of Health:** Decentralization has affected the capacity of the central Ministry of Health to maintain integration and alignment across the different levels of the health system. In addition, a fuzzy boundary regarding the responsibilities between different departments and organisations weakens the health system responses to climate risks.



- **Weak Surveillance Systems:** Weak surveillance systems for climate sensitive diseases in particular results in evidence gaps, lack of information and knowledge for planning as well as monitoring and evaluation of interventions. One of the main causes of weak surveillance systems is lack of infrastructure as well as challenges of availability and accessibility to technology.
- **Human Resources for Health (HRH):** The HRH in Indonesia is inadequate and mal-distributed for effective planning and management of an efficient health system response to climate change. Moreover, the existing workforce does not possess sufficient skill mix desired for such a response.

GOOD PRACTICES

RSUP DR SARDJITO HOSPITAL

- In 2021, the hospital installed a WHO and UNDP-funded autoclave. Autoclaves are steam-based waste treatment technology for treating infectious waste and disinfect waste ready for recycling. This has reduced the energy consumption of the hospital in comparison to previous use of incinerators. It has also helped prevent the health risk from toxic pollutants released due to burning of the waste.
- The hospital has been running a successful Reuse-Reduce-Recycle (3R) programme.
 - » Hospital established a partnership with Koperasi (co-operative) and a third party to implement the 3R programme through Waste Bank
 - » During 2016-2021, the hospital recycled 8-15% of 900 kg of medical waste each day and 35-62% of 9,606 kg of domestic waste every month through the Waste Bank.
 - » Organic waste composed further added to the hospital's efficiency.
 - » This enabled RSUP Dr Sardjito Hospital to save around US\$ 24 000 in 2022.



HEALTH SYSTEM RESPONSE

Indonesia has put in place a variety of policy initiatives that, if implemented effectively and in accordance with regional conditions, can contribute to adaptation and mitigation co-benefits for climate change [16].

Some of the prominent **adaptation policy initiatives** in Indonesia include the Roadmap Nationally Determined Contribution (NDC) on Adaptation, Updated NDC, Climate Resilience Development, Long-Term Strategy on Low Carbon and Climate Resilience (LTS-LCCR) 2050, and National Action Plan on Climate Change Adaptation 2013-2025.

With continuous efforts, over the years, Indonesia has been able to bring down the dengue incidence rates [16] and mortality. In 2020, country reached the national control target indicator (<1%) as well as the control target of the World Health Organization (WHO). Similarly, malaria cases in Indonesia have decreased considerably between 2015 and 2021, and it is estimated that 75% of Indonesia's population now live in malaria-free communities [17]. Indonesia aims to eliminate malaria by 2030. Recent success was achieved in partnership with the WHO and through a decentralized and coordinated approach adapted to local needs. Jakarta developed a mechanism, the **Sistem Surveilans Vektor (SILANTOR)**, which has enabled monthly surveillance of the mosquito vectors of malaria and held workshops to build capacity at the community level [18].

The Government of Indonesia introduced the **Jaminan Kesehatan Nasional (JKN) or the National Health Insurance Program** in 2014, which has been able to bring down the incidence of catastrophic health spending for the citizens. However, extension of JKN is crucial to equitable access to services against risks posed by climate change [19]. In 2022, eight years after its introduction, JKN coverage reached 80% of the population [20]. In 2020, health spending as a percentage of GDP in Indonesia increased to 3.4% from 2.9% in 2019. High out-of-pocket (OOP) spending and limited insurance coverage for informal workers and rural dwellers are currently a priority of the government.



RECOMMENDATIONS

- **Bottom-Up Approach:** As regional inequalities in healthcare access, contributes towards increased vulnerability to climate change, a greater emphasis should be directed towards participatory and inclusive local solutions. Hence, there is a need for building greater local capacities.
- A clear boundary between the obligations of the federal, provincial, and district/municipality governments does not exist, resulting in complex the distribution of tasks and responsibilities in the health sector [21], with centre holding the control of strategic elements.
- In addition, traditional knowledge systems could be explored in form of nature based solutions. For instance, using indigenous plants to control mosquito population, or making provision of traditional fish ponds from malaria control, and restoring wetlands to provide habitat for natural predators of vectors can prevent spread of VBDs in the area.
- **Awareness:** Increase awareness and capacities with regards to community-based disaster risk reduction, include integration of health education in schools for better health care and management.
- **Promote Research:** In order to address the evidence gaps, more research needs to be conducted in the field of climate change and public health in Indonesia including the health systems responses. This needs more funding, improved data collection, its availability and accessibility, as well as increased translation of the findings into actionable suggestions. Emphasis is needed on understanding the impact air pollution on health, climate change impacts on food and nutrition, mental health impacts of extremes.
- **Improved Early Warning Systems:** Early warning systems aid in communication of information about impending risks to vulnerable people before the actual occurrence of a hazard event strengthening climate resilience of the group/s and/or system/s. The robust early warning systems are an important pillar of a resilient health system. Indonesia's National Action Plan on Climate Change Adaptation (2013-2025) recognizes the importance of effective early warning systems against infectious diseases, extreme events, heatwaves, air pollution, and other climate threats. These systems should further be expanding to other sectors (such as agriculture to ensure food and nutritional security and safeguard the livelihoods of farmers) and should have improved spatial coverage to help people in vulnerable areas in minimising their exposure to climate change related hazards.
- **Enhanced Surveillance and Environmental Monitoring:** Improved surveillance systems and environmental monitoring for climate sensitive diseases is important for efficient data collection that can further facilitate planning for addressing climate change risks to public health. In addition, the surveillance helps address the data gaps, promotes research and supports informed policy and decision making that is based on knowledge that is country specific and not



the global findings. This data also enables monitoring and evaluation of the interventions implemented.

- **Technology Support:** There is a need for supporting development and promotion of digital health technologies in Indonesia such as telemedicine. Technology support in terms of improved internet availability and accessibility is required for supporting digital health as well as strengthening the surveillance systems. The technology is hence expected to facilitate easy access to healthcare for the people of Indonesia.
- **Capacity Building:** Building capacities in terms of infrastructure as well as skilled workforce is extremely crucial for Indonesia to develop an effective health system response to climate change risks in the country. This would require sufficient funding to support infrastructural capacities as well as to improve medical curriculum, and support training and capacity building of human resource in health sector in terms of climate preparedness. Hence, government needs to improve healthcare personnel across the country through improving their numbers, quality and distribution (Economist Intelligence Unit, 2010). There is scope to expand the insurance coverage to the poor and the marginalised groups.
- **Understanding Differential Vulnerabilities** – Certain sections of the Indonesian society have weaker capacities to cope and adapt to health risks of climate change. This increased vulnerability of certain groups is due to related to their gender (women), age (children and elderly), socio-economic status (poor with limited access to health and basic services such as clean water, electricity, clean fuel) as well as their ethnicity (indigenous communities and geography). There is hence need for periodic vulnerability assessments to understand the urgency areas and groups that need support. Regular vulnerability assessments would help the Indonesian government in prioritising their finances and resources for developing strong and effective health response.

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