

## Ethical Considerations in Climate Health for Small Island Developing States

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Climate change is undoubtedly one of the greatest problems faced by Small Islands Developing States (SIDS).<sup>1</sup> It has profound health consequences for residents. For that reason, governments, development organizations, civil society organizations and individuals are pursuing public health interventions that help SIDS to adapt to and mitigate against the health effects of climate change. For example, in St. Vincent and the Grenadines there is a climate change and health initiative that is part of the broader EU/CARIFORUM Strengthening Climate Resilient Health Systems Project that is being implemented in the Caribbean region.<sup>2</sup> This project, coordinated by the Pan American Health Organization (PAHO) seeks to enhance climate resilience in healthcare across the Caribbean. In St. Vincent and the Grenadines, it includes efforts to retrofit healthcare facilities as “Smart” health centers. These centers are designed to withstand natural disasters and mitigate environmental impacts, featuring energy-efficient systems, reinforced structures, and sustainable water management. This adaptation strengthens healthcare infrastructure, making it more resilient to the effects of climate change and thus being able to provide ongoing health services and minimizing disruptions due to natural disasters.

Several public health ethics frameworks exist to guide ethics deliberation in the implementation of public health interventions. However, despite these frameworks being excellent tools in the application of ethics for traditional public health interventions such as disease outbreaks and risk factor reduction, they are insufficient in addressing issues related to climate change and health especially for resource limited settings such as SIDS.

Kass (2001) presents a framework designed to help public health professionals assess the moral implications of policies and interventions.<sup>3</sup> The framework emphasizes balancing public health goals with respect for individual rights and societal values. Kass suggests six ethical criteria: identifying the public health objective, evaluating the effective-

ness of proposed actions, assessing burdens on individuals and groups, considering alternative methods, evaluating potential harms and benefits, and ensuring transparency and community involvement. This framework promotes responsible, equitable public health practices that minimize harm while addressing population health needs.

Although this framework has become an influential tool in creating ethically sound public health policies, it is less applicable to climate change and health. Firstly, climate change and health interventions are generally not considered to be traditional public health interventions such as an immunization campaign, a mandatory seat belt policy or a campaign to increase physical activity. The Kass public health ethics framework, like similar frameworks, tends to focus on disease outbreaks, the implementation of screening programs or the implementation of control measures to reduce disease risk factors or exposure.<sup>4</sup>

The approach needed for climate change and health is different in several, crucial ways. Existing public health frameworks are structured in a way that presents public health institutions as the major players and leaders in the implementation of interventions, thereby de-emphasizing the role of other potential players. In contrast, climate health interventions for SIDS require an all of community approach, and various actors—individuals, communities and countries—need to intervene at different levels.

Furthermore, public health ethics frameworks assume the availability of sufficient resources, while SIDS face varying challenges and vulnerabilities and have limited resources. SIDS also have certain advantages and opportunities for addressing climate change that are not captured in these public health frameworks. SIDS’ advantages include tight kinship networks, a strong sense of identity and community, creativity for sustainable livelihoods, and local knowledge and experience of dealing with environmental and social changes throughout history.<sup>5</sup>

This paper presents four key considerations that should

be applied by all stakeholders including donor organizations, governments, multilateral organizations, civil society organizations and public health implementers before and during the implementation of public health policies and actions ed at responding to climate change and health in SIDS.

The first consideration suggests that climate health interventions should be linked to national adaptation and mitigation goals and that these interventions support reducing mortality and morbidity in the context of climate change. Most countries do have National Adaptation Plans so it will be beneficial to link any proposed interventions to these plans.

The second consideration places strong emphasis on ensuring that those communities and individuals who are most affected by climate change are the primary beneficiaries of these interventions. The impact of climate change affects individuals and communities differently. Therefore, the primary beneficiaries of public health climate interventions should be individuals and communities most vulnerable to, or directly impacted by, climate change—especially those who are disproportionately affected by environmental health issues.

Third, the response to climate change and health should not be left up to governments and public health authorities but that everyone, no matter how small, can intervene at some stage in the response. I present an intervention responsibility matrix to support the identification and inclusion of all actors—domestic and global—in the response.

Finally, the fourth consideration emphasizes the importance of sustainability. It supports community participation and ownership and argues that interventions must have a sustainability component. The impact of climate change on health is long lasting and individuals and communities must be supported as much as possible to promote healthier lives despite the ongoing climate turmoil.

When these four considerations are used to supplement existing public health frameworks such as the Kass framework, it strengthens ethical deliberations on climate change, especially in SIDS.

### **Ethics Considerations in Climate Health for SIDS**

As SIDS increase response to climate change and move to strengthen health systems through the implementation of various public health interventions, these interventions must be applied in an ethical manner ensuring that they support mitigation and adaptation to climate change and that they reduce morbidity and mortality. The four considerations in this paper highlight important areas for deliberation that, when applied by themselves or in addition to already existing public health ethics frameworks, provide a strong foundation for the application of ethics in climate health, especially in the context of resource limited settings such as that of SIDS. Examples are drawn from successful cases in the Caribbean region as best practices that can be

replicated across other Caribbean countries or in other SIDS regions. The considerations are framed as simple questions that provoke in-depth analysis through the application of ethical principles and values.

### **Considerations:**

1. *How will the intervention help in reducing mortality and morbidity through climate change adaptation or mitigation?*
2. *Who are the primary beneficiaries of these interventions?*
3. *What intervention responsibilities can be applied to different actors?*
4. *How can these interventions be sustainable?*

### **First Consideration: How will the intervention reduce mortality and morbidity through climate change adaptation or mitigation?**

There is significant emphasis now on strengthening health systems especially in developing countries to be able to cope with the challenges of climate change. Climate change may increase the burden of already existing problems such as vector, food and waterborne diseases. It may also create new problems such as mental health related issues. Health systems may be forced to look at new and innovative approaches to address these challenges. Even for existing problems, the burden from climate change may be exponentially increased, demanding a change from the traditional way that we typically respond. Any public health intervention or response must support health systems adaptation to climate change while at the same time aim to improve lives and livelihoods and reducing morbidity and mortality.

Kass's first question is: what are the public health goals of the proposed program? This is an important starting point. However, from a climate and health perspective, the goal will be supporting climate change adaptation and reducing mortality and morbidity associated with climate change. National adaptation plans or indicators can help to make this question more concrete. Many countries do have national adaptation plans and have aspirational indicator targets in support of overall climate change adaptation. In some cases, these are laid out by sectors such as education, agriculture and health. Donor organizations, multilateral organizations, governments, and public health practitioners should deliberate on the question of how an intervention reduces climate-related morbidity and mortality in the planning phases of any proposed intervention. This will support effective planning and organization ensuring that they do not lose sight of the principal of the intervention. In looking at this through the traditional public health lens, the will be in the context of reducing disease burden and death. However, in the context of climate change and health there is a dual of reducing morbidity and mortality and at the same time sup-

porting climate change adaptation and/or mitigation.

As an example of how an explicit focus on both goals can help, consider a project from the Caribbean region where the Pan American Health Organization (PAHO) is supporting the Smart Hospital Initiative across several countries.<sup>6</sup> This initiative has been successfully implemented and tested in over seventy sites in seven countries across the region. It focuses on improving hospitals' resilience, strengthening structural and operational aspects, and providing green technologies. The initiative has three major pillars that include building safe facilities that are resistant to multi-hazards, having green environmentally friendly facilities and being sustainable through a reduction in operational cost and reduced service disruptions following disasters. It has allowed health systems to ensure the continuity of services and minimal disruption during and after major disasters. For example, facilities in St. Vincent and the Grenadines continued to provide vital services during and after the La Soufriere volcano eruption of 2001, facilities in Belize provided services during hurricane Lisa in 2001, and facilities in the British Virgin Islands continued to provide services during and after Category five Hurricanes in 2017.<sup>7</sup>

This initiative is closely aligned with helping countries to achieve the Sustainable Development Goals (SDGs),<sup>7</sup> particularly those focused on health, energy, infrastructure, and climate action. By enhancing the resilience and functionality of healthcare facilities, the project directly supports SDG 3 (Good Health and Well-Being) by ensuring that hospitals can continue to provide essential services during and after disasters. It also contributes to SDG 7 (Affordable and Clean Energy) through the integration of energy-efficient technologies and renewable energy sources, reducing the carbon footprint of healthcare facilities. Additionally, the project supports SDG 9 (Industry, Innovation, and Infrastructure) by building resilient healthcare infrastructure, and SDG 13 (Climate Action) by preparing hospitals to withstand and respond to the challenges posed by climate change.

Moreover, in relation to the Lancet Countdown on Climate Change,<sup>8</sup> the PAHO Smart Hospital Project embodies key adaptation and mitigation strategies that are essential in addressing the health impacts of climate change. The Lancet Countdown highlights the urgent need to strengthen health systems to cope with the increasing frequency and severity of climate-related events. The Smart Hospital Project addresses this by retrofitting health facilities to be more resilient to disasters, ensuring they remain operational during emergencies. This aligns with the Countdown's emphasis on health system resilience and underscores the critical role of sustainable and climate-adaptive healthcare infrastructure in safeguarding public health.

Additionally, these interventions fit into most National Climate Change Adaptation Plans that address minimizing the negative impact of climate change on human health. They do not only support climate change adaptation or mit-

igation, but they also provide essential health services thereby reducing the impact on health.

### ***Second Consideration: Who are the primary beneficiaries of these interventions?***

None of us are immune from the health impacts of climate change. However, we experience its impact differently. Our geographic location and socioeconomic status can determine how climate change impacts us. SIDS are disproportionately impacted by climate change. Issues such as rising sea levels, increased frequency and intensity of storms and severe droughts are just some examples that SIDS confront regularly, and these issues all have implications on human health. Even within small countries, the impact of climate change is experienced differently as you go from one location to the other. For example, low-lying coastal communities are at greater risk of experiencing sea level rise that can expose them to more frequent and severe flooding and can result in damages to infrastructure, houses and developments, resulting in the displacement of these communities. In the context of climate change, vulnerability has a different look. It is not just poverty or ill health, but those that are vulnerable because of their locations, such as coastline communities or those on riverbanks who are susceptible to rising sea levels or other climate shocks.

Public health interventions should therefore be implemented according to level of impact and needs, especially where scarce resources are to be used. Kass's framework emphasizes the need to implement a program "fairly," which includes warnings about unequal distributions of risks and benefits across programs and the need to have data to justify this. It also states that the social consequences must be considered if a community is allotted resources unequally, and these consequences must be balanced against the benefits to that community or others. Finally, Kass' call to fairness emphasizes the importance of serving the most vulnerable.

In the context of climate change and health in SIDS, however, it is helpful to supplement this call to fairness with an awareness of different sources of vulnerability. In typical public health projects, vulnerability is due to a lack of social power, economic resources, or ill health. But climate change adds another category of vulnerability: those that are impacted directly by climate change and those that are disproportionately affected by environmental health issues due to climate change. We should therefore supplement Kass' framework by emphasizing the need to identify and benefit such vulnerable populations.

Decision makers should map out the beneficiaries prior to the implementation of any climate change and health interventions. This can be simply organized into primary beneficiaries—those who will benefit directly and secondary beneficiaries—those who may not benefit directly but will accrue some benefits from the implementation of the activities. The primary beneficiaries of public health climate

interventions should be the communities most vulnerable to the impacts of climate change—those that are impacted directly and those that are disproportionately affected by environmental health issues. For example, in the Caribbean context, many of these communities are located on coastal areas and are vulnerable to a rise in sea levels and coastal erosion resulting in internal displacement. These often include low-income communities, communities of color, indigenous communities, and other marginalized groups. Prioritizing these communities ensures that public health interventions address existing inequalities and promote environmental justice.

An example of a successful project that prioritized those vulnerable to the effects of climate change is the EU/CARIFORUM Climate Change and Health Project that supported vulnerable and marginalized groups in seventeen countries across the Caribbean region by strengthening climate-resilient health systems.<sup>9</sup> The project supported improving access to healthcare by strengthening health systems for vulnerable populations who may face barriers such as distance, cost, or lack of infrastructure. Countries like Guyana and Suriname have implemented this project in the remote hinterland regions with a focus on reaching indigenous communities as the primary beneficiaries. These groups are disadvantaged by any framework, but they are especially vulnerable to the impact of climate change and face significant barriers to accessing health services, which makes them the appropriate beneficiaries of health funding. Initiatives under this project also supported communities in decision-making processes related to climate change and health and ensured that the needs and perspectives of vulnerable groups were considered.

Addressing the needs of the most vulnerable in the context of climate change and health is an ethical imperative that underscores our commitment to justice and equity. These individuals and communities often bear the brunt of climate-related health impacts, such as increased disease burden, food and water insecurity, and displacement, despite contributing the least to the problem. By prioritizing their needs, we acknowledge the disproportionate risks they face and strive to mitigate these inequities. Ensuring their access to healthcare, resources, and support systems is not only a moral duty but also essential for fostering resilience and sustainability.

### ***Third Consideration: What intervention responsibilities can be applied at all levels?***

There have been many debates about who should compensate countries for damages and losses that result from climate change. This includes not only physical damage but the broad impact of climate change on various aspects of the economy including health. Similarly, while countries are expected to put in place adaptation and mitigation interventions as a matter of urgency, questions linger about how

these interventions should be financed and sustained. Some argue that the largest emitters of greenhouse gases should be held responsible and should provide some levels of compensation for the smallest emitters such as Small Islands Developing States.

Attributing blame and holding some countries responsible may never work. Additionally, quantifying risks levels for compensation and attaching a monetary value to losses, especially to health-related impact, may be problematic. When blame is attributed, no one wants to admit guilt.

Dale Jamieson (2015) proposes the notion of intervention responsibility and applies it to climate change. He identifies four families of agents: individual people, nations and other jurisdictions, international organizations and regimes, and firms.<sup>10</sup> Each family of agents (and each agent) could intervene in climate change and health response in some respects but not in others. This supplementary framework applies this notion to climate change and health because, in public health interventions, the participation of individuals and the community is critical for them to be successful.

Current public health ethical frameworks do not address the roles and the obligations of all stakeholders. Many of these frameworks focus on how public health authorities can implement interventions in an ethical manner. They typically use a top-down approach attributing action and responsibility mostly to governments and public health authorities or institutions. Climate change and health is of great importance to SIDS and so governments and public health authorities may not have all the resources needed to implement initiatives. It is therefore important to engage with as many stakeholders as possible not only to pool resources but also to get their support. The application of intervention responsibility as presented by Jamieson allows us to examine each group carefully to explore their roles, obligations, capacity, and power in climate change response. It also allows us to ensure that we do not overlook any groups and that groups are attributed actions that they are well positioned to perform.

Donor organizations, multilateral organizations, governments, civil society organizations, public health practitioners and all stakeholders involved in all aspects of climate change and public health interventions are encouraged to map out the four families of agents at play. They should examine their roles, responsibilities and obligations and what actions they can take part in to play a positive role in the climate health initiatives. The mapping matrix shown in Figure 1 can support this process at the practical level.

Consider the example of the Caribbean Disaster Risk Management Project that was implemented in the Caribbean region from 2008 to 2022 to demonstrate how intervention responsibility can be applied, and how the matrix can be used. The project was funded by the Government of Canada with over seven million dollars and focused on improving the ability of the Caribbean region to prepare for, and re-



spond to, natural disasters such as hurricanes and floods, to reduce their impact on people's lives and livelihood.<sup>11</sup> The project provided support to regional organizations, national governments, and local communities. It supported the implementation of the disaster risk management framework adopted by the member states of the Caribbean Community (CARICOM). The project also supported the Canada-Caribbean Disaster Risk Management Fund, which assists communities in adapting to the impacts of climate change and increases their resilience to extreme weather events. The Fund assisted non-governmental organizations, community groups, and government agencies undertaking small-scale projects at the community level.

By examining the role of each agent or group, we see that through donor contribution from the Government of Canada, developing countries of the Caribbean are benefiting from these bilateral government relationships to support climate change and health systems. Instead of attributing blame and waiting on climate compensation from developed nations, we should continue to advocate for climate change mitigation and adaptation initiatives to be included in bilateral country support and technical cooperation activities.

International organizations such as the Caribbean Disaster Management Agency (CDEMA), the Pan American Health Organization (PAHO) and the CARICOM Secretariat participated in the project by developing, implementing, and monitoring disaster risk management framework adopted by the member states. Furthermore, they have supported capacity building around climate change and health related topics.

Individuals, on the other hand, continue to play a critical role in disaster risk management (DRM) by taking proactive steps to reduce their vulnerability and increase their resilience to disasters. Being aware of the types of disasters that can occur in their area and understanding the associated risks can help individuals make informed decisions to reduce their vulnerability. Individuals can also take steps to prepare themselves and their families for disasters, such as creating a family emergency plan, assembling an emergency kit, and staying informed about local emergency protocols. Simple interventions such as ensuring that one has adequate amount of medication for chronic disease care can go a long way in ensuring good disease control in the event of health service disruption. Following early warning messages and taking appropriate actions, such as evacuating to safer areas or seeking shelter, can save lives and reduce the impact of disasters. Also, engaging with neighbors and local community organizations can help build a sense of community resilience, solidarity and facilitate collective responses to disasters.

While Jamieson's intervention responsibility to firms focused on reducing emission and looked at firms principally as emitters, in developing countries contexts such as the SIDS of the Caribbean, firms are generally not major emitters in

the global context because of their small size compared to firms in larger countries. However, at the national level, they may be emitting more greenhouse gases, producing more waste, and are major users of energy. They can range from manufacturing plants to large scale farms. Despite not being comparable to firms in larger countries, they can still play a crucial role in supporting the response to climate change and its impact on health due to their significant impact on the environment and economy. They can reduce their carbon footprint by implementing energy-efficient practices, using renewable energy sources, and optimizing their supply chains to reduce emissions. They can invest in sustainable technologies and practices, such as green building design, sustainable agriculture, and circular economy models, to reduce environmental impact. They also have the power to engage with stakeholders, including employees, customers, and communities, to raise awareness about climate change issues and collaborate on solutions and advocate for policies that support climate action, such as carbon pricing, renewable energy incentives, and sustainable transportation infrastructure. They also do have a social responsibility to contribute to the well-being of communities and society through environmental and social measures (see figure 1).

Using the intervention responsibility approach supports solidarity, shared responsibility and can promote greater engagement, including community and individual participation. Program planners are encouraged to map these out in the early stages of planning public health and climate change interventions to promote engagement and participation.

#### ***Fourth Consideration: Are the interventions sustainable?***

Public health interventions that are ed at supporting health systems resilience and climate mitigation and adaptation should be sustainable for the countries and communities that they are intended to benefit. The issue of sustainability beyond the project period is very important especially in the context of SIDS that benefit significantly from initiatives that are supported by donor funding and development aid. Quite often interventions in the form of projects are started in developing countries but they are not sustained after the active project cycle has ended and funding is no longer available. So, development projects must consider how they will be sustained after the funding runs out.

One example of how a project can anticipate sustainability is the Water Sector Resilience Nexus for Sustainability in Barbados (WSRN S-Barbados). This Project exemplifies a sustainable climate change and health initiative in the Caribbean. It focuses on enhancing water sector resilience to climate impacts through rainwater harvesting systems, promoting water-saving technologies, improving water quality, and strengthening infrastructure. The project also emphasizes capacity building and public awareness on water conservation. By ensuring reliable access to clean water, it reduces waterborne diseases, supports agriculture, and im-

**Fig.1: Mapping Matrix for Intervention Responsibilities**

Families of Agents	Some examples of roles, responsibilities, obligations and actions in responding to climate change and public health	Application to the Caribbean Disaster Risk Management Project
Individual people	<ul style="list-style-type: none"> <li>• Advocate about the importance of addressing climate change and its health impacts.</li> <li>• Raise awareness in the community about the links between climate change and health and why the community should support and participate in the initiatives.</li> <li>• Mobilize local efforts and initiatives to mitigate climate change effects.</li> <li>• Civil Society Organizations (CSOs) can support implementation at the grassroots level.</li> <li>• Reduce carbon footprint by making lifestyle choices that minimize greenhouse gas emissions.</li> <li>• Take steps to protect yourself and your family from climate-related health risks.</li> </ul>	Local communities supported the implementation of the activities by supporting community mobilization and participation.
Nations and other jurisdictions	<ul style="list-style-type: none"> <li>• Work with other countries, international organizations, and stakeholders to address climate change globally.</li> <li>• Support countries with the relevant financing to implement projects.</li> <li>• Honor commitments made under international climate agreements, such as the Paris Agreement.</li> <li>• Set an example for other nations and regions by adopting and encouraging ambitious climate and health initiatives.</li> </ul>	<p>The Government of Canada provided the funding for the project.</p> <p>The Governments in the participating countries supported the implementation of the project.</p>
International organizations and regimes	<ul style="list-style-type: none"> <li>• Encourage and support collaboration among countries, regions, and sectors to address climate and health challenges.</li> <li>• Support the development of frameworks and policies to address climate change and health.</li> <li>• Provide Technical Assistance like training, and capacity-building to countries, especially developing nations, to enhance their ability to respond to climate and health issues.</li> <li>• Support monitoring and reporting to track progress on climate and health initiatives and provide transparent reporting to inform policy and decision-making.</li> <li>• Ensure that global climate and health actions are inclusive and address the needs of the most vulnerable populations.</li> </ul>	<p>Regional organizations such as the Caribbean Community (CARICOM), the Caribbean Disaster Emergency Management Agency (CDEMA) participated in the implementation of the project and supported countries in implementation.</p> <p>International Organizations such as PAHO/WHO provided technical assistance to countries to build capacity to support the implementation of the project.</p> <p>The Canada Caribbean Risk Management (CCDRM) Fund provided support to national and regional voluntary agencies and community groups as well as governmental agencies to undertake small-scale projects at the community level to enhance disaster risk management and disaster risk reduction.</p>

Firms	<ul style="list-style-type: none"> <li>• Develop and implement innovative solutions to reduce emissions and improve health.</li> <li>• Set an example for industry standards in sustainability and corporate responsibility.</li> <li>• Promote policies and practices that support climate action and public health.</li> <li>• Minimize the firm's carbon footprint and environmental impact through sustainable practices.</li> <li>• Protect the health and safety of employees, especially in the face of climate-related risks.</li> </ul>	<p>Developing and implementing business continuity plans to ensure operations can continue during and after a disaster to continue to provide services to communities.</p> <p>Provided disaster preparedness and response training for employees.</p> <p>Partnered with local communities and governments to support disaster preparedness initiatives.</p> <p>Promoted sustainable practices to reduce environmental impact and contribute to long-term resilience.</p>
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proves public health outcomes. This integrated approach fosters environmental, economic, and social sustainability, demonstrating a model for climate-resilient health solutions in the region. Additional community participation along with government commitment has been instrumental in sustaining this project.

It is very crucial that capacity is built at the community level to ensure community participation and ownership. In addition, governments should invest in these interventions to support their sustainability. Implementing partners should ensure that interventions are designed and implemented in a way that maximizes their long-term impact and benefits for the communities they are intended to serve, while also respecting the environment and local cultures. The impact of climate change will continue for years to come and so any meaningful and impactful intervention must be sustainable.

## Conclusion

SIDS continue to be impacted disproportionately by climate change. The impact of climate change on health is far reaching. Actions to accelerate and increase interventions to mitigate and adapt to climate change are urgently needed. In the coming years, more and more public health interventions will be implemented in developing countries to support building resilient and sustainable health systems. These interventions must be implemented in an ethical manner.

Several public health ethics frameworks do exist to support ethical deliberation. However, these frameworks do not focus on climate change. Climate change is a critical issue for SIDS, so it requires more in depth and explicit scrutiny. In addition to the already existing ethics frameworks, the application of these additional considerations can strengthen the ethical analysis of public health and climate change initiatives.

These considerations are critical to ensuring that public health interventions not only effectively mitigate and adapt to climate change impacts but also promote equity and justice. The four key considerations outlined—linking interventions to adaptation and mitigation, prioritizing the most vulnerable beneficiaries, engaging all levels of society

in response efforts, and ensuring sustainability—provide a robust supplementary framework for ethically sound and impactful climate health initiatives. These considerations emphasize the need for tailored approaches that reflect the unique vulnerabilities and strengths of SIDS, advocating for interventions that are both inclusive and sustainable.

The application of these ethical considerations requires a multifaceted approach involving diverse stakeholders, from local communities to international organizations. By prioritizing the needs of those most affected by climate change, such as low-income coastal communities, and ensuring their active participation in intervention planning and execution, public health initiatives can better address existing inequities. Moreover, the concept of intervention responsibility encourages shared accountability and collaboration among individuals, governments, firms, and international bodies, fostering a holistic response to climate health challenges in SIDS.

Finally, ensuring that interventions are designed with sustainability in mind, and supported by continuous capacity building and local ownership, is crucial for enduring benefits. As climate change continues to pose significant threats to SIDS, ethically-guided and sustainable public health strategies are imperative for building resilient health systems and improving the well-being of vulnerable populations.

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