

CLIMATE AND HEALTH APPROACH

Addressing Climate Impacts on the Health of Women, Children and Adolescents

OVERVIEW

The purpose of this Global Financing Facility (GFF) Climate and Health Approach paper is to integrate the climate and health agenda into the [GFF Strategy 2021–2025](#), providing direction for current GFF operations to address the impacts of climate change on women, children and adolescents and provide early inputs for the next strategy period. The strategic directions and recommendations included in this paper have been developed in consultation with the climate and health technical advisory group (TAG).

ACTION REQUESTED

GFF Investors Group members are requested to endorse the integration of the approaches in this paper into the current GFF strategy, to provide direction for ongoing GFF operations and help inform development of the GFF's next strategy period.

CONTEXT AND OBJECTIVES

The rapidly accelerating climate crisis has worsened health outcomes and poses a growing threat to human health, including for GFF's target populations of women, children and adolescents in low- and lower-middle-income countries (LICs and LMICs).¹ Improving their health and well-being is central to achieving universal health coverage (UHC) and the sustainable development goals (SDGs), yet climate change is stalling, and in many cases reversing, progress. Thus, the GFF has an imperative to address the climate and health nexus in pursuit of its overarching goal to ensure all women, children and adolescents can access the quality, affordable essential health care they need to survive and thrive.

Drawing from prior analyses, inputs from the TAG, and key informant interviews conducted with the World Bank, partners and other stakeholders, this paper seeks to:

- **Synthesize available global evidence and insights** to identify specific areas to prioritize in addressing climate and health impacts on women, children and adolescents;
- **Define the GFF's value-add** in supporting partner countries and World Bank task teams to address climate and health impacts on women, children and adolescents in GFF partner countries;
- **Promote GFF coherence, synergy, and alignment with major global climate and health initiatives** and partnerships, including, for example, the Alliance for Transformative Action on Climate Change and Health Initiative (ATACH), the WHO/UNFPA/UNICEF call to action, the Development Bank Working Group for Climate-Health Finance, the Joint Learning Network as well as civil society organizations (CSOs) and youth representatives.

IMPACT OF THE CLIMATE CRISIS ON HEALTH AND NUTRITION FOR WOMEN, CHILDREN AND ADOLESCENTS

The most vulnerable groups in low-resource settings—including women, children and adolescents in GFF partner countries—are bearing the disproportionate burden of climate change. Rapidly evolving climate change is increasingly jeopardizing global health and human survival and requires accelerated action across sectors.² The [State of the Global Climate Report](#) concluded 2023 was the hottest year on record, and temperatures in 2024 are likely to surpass that record.³ Extreme weather and chronic heat are now experienced across all habitable continents, coupled with the onset of extreme weather events. Looking ahead, all regions of the world are expected to face greater climate hazards, resulting in a growing burden of heat-related illnesses and deaths. A review of existing literature underscores the fact that the disproportionate climate change impacts on health outcomes for lower-income women, children and adolescents are shaped by their relative physiological vulnerabilities and by persistent social, economic, environmental and gender disparities.⁴

¹ Romanella et al. 2023.

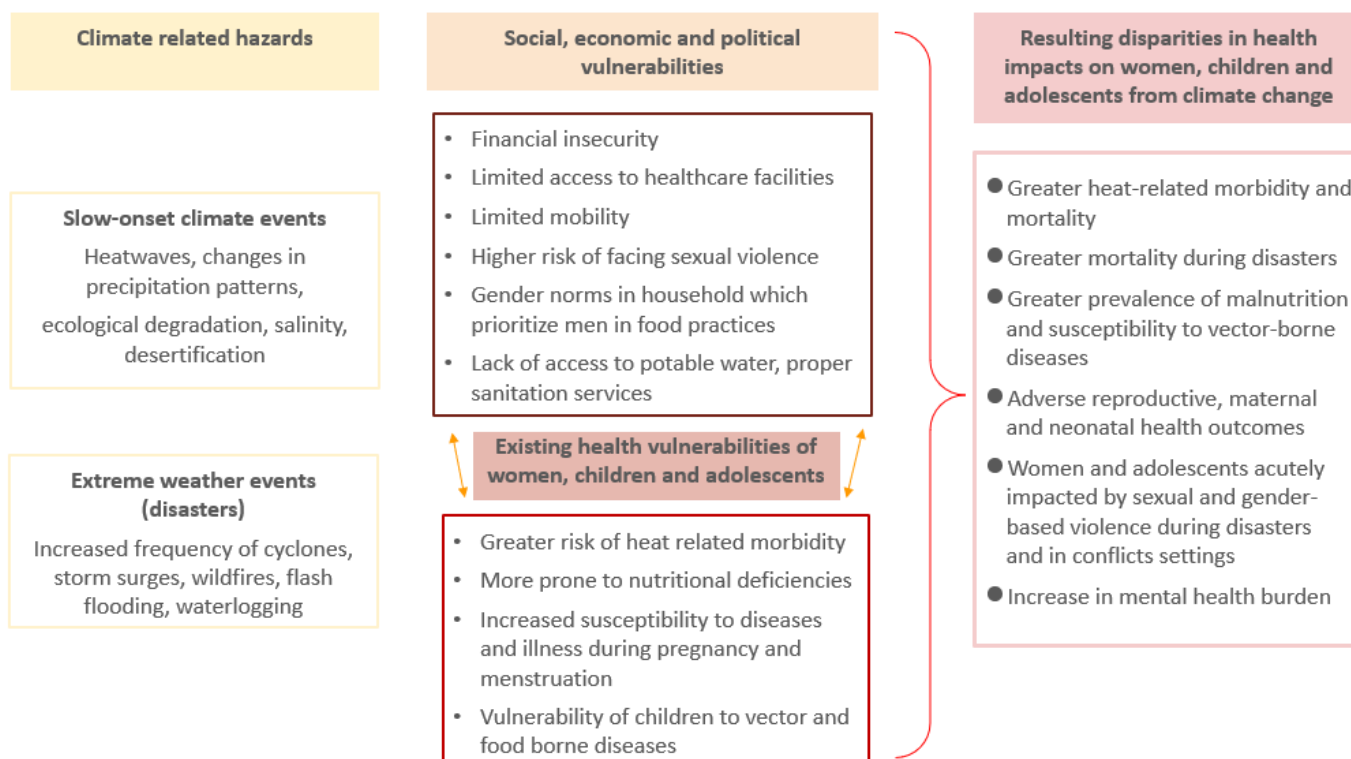
² Romanello et al. 2023; IPCC 2023; WMO 2023.

³ WMO 2023; Carbon Brief 2024.

⁴ Sigun and Gibbons 2024; Gibbons 2014.

Despite the growing recognition of the links between climate change and worsening outcomes for reproductive, maternal, newborn, child, and adolescent health and nutrition (RNMCAH-N), there are limited examples to date of research, programs, and policies designed to address these issues in low and middle-income countries.⁵ A 2021 World Health Organization (WHO) assessment found that while health is prioritized in national adaptation plans, none of these specifically address reproductive, maternal, adolescent or neonatal health needs.⁶ However, a more recent review by the United Nations Population Fund (UNFPA) notes that 38 countries—out of the 119 reviewed—address sexual and reproductive health and rights (SRHR) in their national climate policies. Additionally, only 23 countries mention maternal and newborn health, and just 15 countries acknowledge the issue of gender-based violence.⁷

Figure 1. Climate change impacts on reproductive, maternal, newborn, child, adolescent health



Source: Adapted from the framework published in the *Climate change and women’s health: Impacts and policy directions*⁸ and the WHO *Operational Framework for building climate resilient health systems*⁹, revised to include health risks of women, children, and adolescents—and the resulting gendered disparities.

⁵ Burns and Mutunga 2024.

⁶ WHO 2021.

⁷ UNFPA and QMUL 2023.

⁸ Sorensen et al. 2018

⁹ WHO 2023.

From all GFF countries included in the evidence review, major health vulnerabilities affecting women, adolescents and children across regions can be summarized as follows:

Women. There is compelling evidence that extreme heat and changing climate and precipitation patterns are harming maternal health.¹⁰ Increased hot days and reduced precipitation have been found to correlate with lower birth weights in Sub-Saharan Africa.¹¹ In East Africa, droughts and water scarcity worsen pregnancy outcomes due to food insecurity.¹² Pregnant women face twice the risk of death from severe malaria and a higher likelihood of severe anemia,¹³ while women in coastal areas with higher salinity face increased risks of preeclampsia, gestational hypertension and miscarriages.¹⁴ Exposure to extreme heat also increases the risk of preterm births and stillbirths,¹⁵ indicating that women most at risk are likely those who lack social and economic safety nets to adapt and protect themselves in extreme environments.

Furthermore, a review of 83 studies found that climate change-related factors like flooding, extreme temperatures, and bushfires are linked to increased gender-based violence among women and adolescent girls.¹⁶ Women from lower socioeconomic backgrounds in lower-income countries are particularly affected. Additionally, menstrual health and hygiene suffer due to limited access to supplies during floods and cyclones, and heat and drought reduce water sources for women's hygiene.¹⁷ Studies in South Asian contexts are showing that disruptions in food production and availability—along with reduced access to nutritious food sources as a result of biodiversity loss—is resulting in heightening nutritional deficiencies, particularly among women from poorer socioeconomic backgrounds and ethnic minorities.¹⁸

The rise in extreme events (floods/cyclones) as well as chronic weather events (droughts, salinity) are leading to women and adolescent girls facing increased risks of intimate partner violence, gender-based violence, HIV, and other sexually transmitted diseases.¹⁹ For adolescents, the risk is greater as climate change exacerbates conflict, food insecurity and economic crisis across the Global South—where they are more vulnerable to forced sex and early child marriage.²⁰ In addition, extreme weather events, such as floods, storms, and cyclones, negatively impact mental health and well-being, with women and adolescents at higher risk.²¹ Women's responsibilities for domestic work, caring for farmland, and primary caregiving often confine them to their homes, leaving them isolated and unprepared to cope with the impact of natural disasters.²²

Adolescents. Evidence shows that climate change affects all aspects of adolescent well-being as they suffer from unique impacts, such as eco-anxiety and solastalgia,²³ school attendance, education and skills for employment, adolescent's agency and teenage pregnancy.²⁴ As a result of increased frequency of extreme weather and greater population displacement due to climate-related events, sexual and

¹⁰ Kadio et al. 2024; Linh Tran et al. 2024; Rahman et al. 2016.

¹¹ Grace et al. 2015.

¹² Part et al. 2024; Lusambili 2024.

¹³ Doumbia et al. 2022.

¹⁴ Hossain 2020; Tiwari et al. 2022; Khan et al. 2014.

¹⁵ Bonell et al. 2023; McElroy et al. 2022; Chersich et al. 2020.

¹⁶ Logie et al. 2024.

¹⁷ Llorente-Marrón 2021; Lusambili 2024.

¹⁸ Yadav and Lal 2018; Dewan 2019.

¹⁹ Population Council and Women Deliver 2023; Ma et al. 2022; van Nieuwenhuizen et al. 2021; Logie et al. 2024.

²⁰ Alston et al. 2014; Logie et al. 2021.

²¹ Lawrence et al. 2021; Qin et al. 2024; Ma et al. 2022; van Nieuwenhuizen et al. 2021; Population Council and Women Deliver 2023; Husaini & Davies 2022; Population Council and Women Deliver 2023.

²² Awiti 2022.

²³ Distress that is produced by environmental change impacting on people while they are directly connected to their home environment (Albrecht et al. 2007).

²⁴ McGushin et al. 2022.

reproductive health outcomes for adolescents are very poor, also jeopardizing SRHR overall. Besides, as climate change exacerbates conflict, food insecurity and economic crisis—especially across the Global South—adolescent girls are more vulnerable to forced sex and early child marriage.²⁵ Studies have also documented a high prevalence of anemia, stunting and severe thinness in recent years in adolescent girls' health.²⁶ Moreover, climate change and climate events can shift the age of menarche, by disrupting food availability or increasing the release of toxins and pollutants.²⁷

The impact on adolescent mental health is also very high as studies state that emotional traumas, such as post-traumatic stress disorders, are likely to be with them throughout their whole lives, affecting their cognitive development.²⁸

Newborn and children's health. According to WHO, environmental factors contribute to nearly one-third (27 percent) of child deaths.²⁹ Recent evidence notes that the negative impacts of climate change on children (including infants and neonatal) primarily included an increase in preterm births, asthma, respiratory illnesses, diarrheal diseases, and vector-borne diseases, increase in malnutrition and stunted growth, disruptions to responsive caregiving and family functioning, as well as increase in post-traumatic stress and other mental health disorders, low birth weight and premature mortality in children under five.³⁰ Yet, despite being highly vulnerable, children receive minimal attention in most climate change initiatives, with only 2.4 percent of major climate funds allocated to child-focused projects.³¹

Besides, a significant amount of air pollution comes from climate change related droughts, wildfires and dust storms that are set to increase.³² Therefore, air pollution and climate change have similar underlying drivers – often, the impacts of one will exacerbate the other. For example, air pollution and high temperature exposure likely have a synergetic effect on the risk of preterm birth.³³ Some studies have also found positive associations between air pollution levels, influenced by wildfires, and the risk of children developing metabolic disorders such as diabetes and hypertension.³⁴

The [Lancet Countdown 2023](#) warns of increased malnutrition and stunting in children due to altered agriculture, droughts, and heat.³⁵ Rising temperatures in Africa are reversing gains in reducing heat-related child mortality.³⁶ Infants in low-income areas face heightened risk of mortality due to inadequate housing and cooling access.³⁷ Extreme and chronic weather events also expose children to toxins, causing acute poisoning and other long-term health issues.³⁸ Poor air quality affects maternal and neonatal health, growth restrictions, and congenital defects.³⁹

²⁵ Alston et al. 2014; Logie et al. 2021.

²⁶ Mridha et al. 2019.

²⁷ Canelón and Boland 2020.

²⁸ Ma, Moore, and Cleary 2022.

²⁹ Coll-Seck et al. 2019.

³⁰ Tiwari et al. 2022; Proulx et al. 2024; WHO 2016; Murray et al. 2013; Doumbia et al. 2022.

³¹ UNICEF 2023.

³² Hutchinson, Justine A., et al. 2018.

³³ Wang, Q., et al. 2020.

³⁴ Gheissari, Roya, et al. 2022.

³⁵ Romanello et al. 2023.

³⁶ Kovats and Natukunda 2024.

³⁷ Nakstad et al. 2022; Bonell et al. 2023.

³⁸ Abdilllah et al. 2023; Hellden et al. 2021.

³⁹ Haryanto 2018; Khakimov 2019.

Delivery of essential health services. Climate change also poses increasing barriers to health care access for women, children, and adolescents.⁴⁰ The barriers stem from both infrastructural and socioeconomic challenges. Climate-induced natural disasters often disrupt health care infrastructure, leading to shortages of essential supplies, medicines, and health care workers, including community health workers.⁴¹ For example, Typhoon Haiyan in the Philippines severely damaged health care centers, delaying external medical assistance and forcing pregnant women to travel long distances for necessary care.⁴² Disruption to local roads and transportation systems exacerbates the challenge of access to health care, particularly in areas like Bangladesh's low-lying "haor" regions, which are prone to floods and storms.⁴³

Climate-induced disasters also disrupt routine health care services, such as immunizations for children and antenatal care for women, as populations are forced to migrate.⁴⁴ Moreover, economic barriers further limit access to health care, especially for low-income communities vulnerable to climate-related loss and damage.⁴⁵ Household health expenses were found to decrease significantly during and after climate-related disasters in regions such as Latin America, exacerbating health care access challenges.⁴⁶

Women's and adolescents' agency. Women, children and adolescents are constrained by more limited knowledge and decision-making power related to climate change and its health impacts. Women often lack the necessary training to cope with natural disasters, as warning information is typically shared among men, leaving women less prepared for survival.⁴⁷ Moreover, men have greater access to educational opportunities around climate change, providing them with more knowledge and skills to adapt. Both adults and youth in African countries express inadequate knowledge of climate change, its impacts, and adaptation strategies, highlighting a need for more information.⁴⁸ In salinity-affected coastal areas of Bangladesh, women's lack of awareness led to harmful practices such as washing clothes in saline water, often result in health issues, including skin irritations and bleeding in genitals, which contributes to domestic violence, divorce, and abandonment.

Furthermore, women in climate-vulnerable communities face disproportionate burdens due to socioeconomic inequalities, limited decision-making power, and reduced income-generating capacity, all of which impact their access to health care services.⁴⁹ Limited access to education, employment and economic decision-making exacerbates the vulnerability of women and adolescent girls in low-resource settings.⁵⁰ These factors collectively contribute to the perpetuation of health disparities for women.

On the other hand, both women, children and adolescents can act as agents of change to take forward the climate agenda.⁵¹ As adolescents stand at risk of being disproportionately affected by climate change, they are concerned and motivated to contribute to climate efforts.⁵² Proactive young people around the globe are striving to make a difference through social media campaigns, civic engagement initiatives, and protests.⁵³ Similarly, it is crucial to tap into women's knowledge of adaptation and mitigation, as they tend to be more local and contextual compared to men's, which tend to be large-scale and impersonal.⁵⁴

⁴⁰ Nahian et al. 2023.

⁴¹ Ashraf et al. 2023; Shah et al. 2018.

⁴² Sato et al. 2016.

⁴³ Lusambili et al. 2024; Haque et al. 2016.

⁴⁴ Ashraf et al. 2023; McMichael et al. 2012.

⁴⁵ Harayanto 2018.

⁴⁶ Langer et al. 2015.

⁴⁷ Charbit 2018; Awiti 2022.

⁴⁸ Population Council and Women Deliver 2023; Nigatu et al. 2014; Kidanu et al. 2009.

⁴⁹ Awiti 2022; Preet et al. 2010.

⁵⁰ Devonald et al. 2022.

⁵¹ Bandura and Cherry 2020; Thomaes et al. 2023.

⁵² Corner et al. 2015.

⁵³ Thomaes et al. 2023.

⁵⁴ Charbit 2018.

Climate-induced migration and sexual health. Migration triggered by extreme weather events often exacerbates poverty and fragility, and leads to increased transactional sex and sexual exploitation.⁵⁵

Displaced populations, facing limited access to sexual and reproductive health (SRH) services, poverty, and sociocultural disparities, experience worse sexual and reproductive health outcomes and rights.⁵⁶ Women and adolescent girls in these situations often lose their social support networks, making them more vulnerable to gender-based violence, both during displacement and within their homes.⁵⁷ Conflict-related disruptions, structural inequities, and relational factors multiply these risks, increasing exposure to HIV and sexually transmitted infections (STIs) while also limiting access to testing.⁵⁸ Refugee populations face barriers to HIV testing due to various factors, including, for example, high transportation costs, overcrowded living conditions, low literacy, and social stigma.⁵⁹ Displacement has significant health implications for children—in addition to exposing them to direct health issues, it also leads to lower immunization rates among children in climate migrant or refugee populations.⁶⁰

Self-care practices. Women’s and girls’ self-care practices are also being negatively impacted by climate change. In Cameroon, school children self-manage symptoms of heat exhaustion, with girls being more vulnerable due to clothing and grooming differences.⁶¹ High temperatures adversely affect pregnant women's health, leading to complications such as hypertension and skin infections, impacting their ability to care for themselves and their children.⁶² In Burkina Faso, breastfeeding duration decreases due to heat-related discomfort and maternal dehydration, necessitating supplementary fluids.⁶³

Mental health and well-being. The increase in climate-induced disasters is also contributing to a rise in severe mental health issues, including heightened anxiety, depression, and post-traumatic stress disorder, with adolescents and children showing increased aggression.⁶⁴ Indirect exposure to climate change, such as perceiving its impacts, can also cause mental distress, leading to phenomena such as "climate anxiety," particularly among young people.⁶⁵ Despite these challenges, mental health often receives inadequate attention compared to immediate priorities after disasters, such as treating physical injuries and addressing economic losses.⁶⁶

IMPACT OF CLIMATE CHANGE EVENTS ON HEALTH SYSTEMS AND HEALTH SERVICE DELIVERY

⁵⁵ Weine and Kashuba 2012.

⁵⁶ Logie et al. 2024.

⁵⁷ Devonald et al. 2022; Logie et al. 2024.

⁵⁸ Logie et al. 2021; Llorente-Marrón 2021.

⁵⁹ Logie et al. 2024.

⁶⁰ Devlin and Gray 2020.

⁶¹ Dapi et al. 2010.

⁶² Kadio et al. 2024.

⁶³ Part et al. 2024

⁶⁴ Futterman et al. 2021; van Nieuwenhuizen et al. 2021.

⁶⁵ Ma et al. 2022.

⁶⁶ Nigatu et al. 2014.

Health care infrastructure and patient care. Climate change-induced weather events are further straining health care infrastructure and patient care in already fragile health systems. Research shows a 27 percent increase in health care facility damage since the 1990s, mainly due to coastal flooding.⁶⁷ For instance, heavy monsoon rains in Bangladesh damaged numerous health facilities, disrupting essential services, and causing distress to patients.⁶⁸ Similarly, Cyclone Idai severely affected health facilities in Mozambique, highlighting the vulnerability of health care infrastructure to extreme weather events.⁶⁹

Health workers. Climate change also poses significant challenges to health workforce deployment and retention. Health workers—70 percent of which are women—experience reduced productivity during heatwaves and other health emergencies, including difficulties in reaching their workplaces during floods.⁷⁰ Prolonged emergencies lead to mental health issues among health workers, while slow-onset events like heatwaves strain health care services, resulting in increased demand and higher health care costs.⁷¹ Supply chain disruptions also occur, causing shortages in medical supplies.⁷²

Health system resilience. Building climate-resilient health systems is essential for protecting women, children adolescents and other vulnerable groups from the adverse effects of climate change.

The WHO operational framework for strengthening climate resilient health systems provides essential guidance on prioritizing key components of health system building blocks.⁷³ However, a holistic and systemic approach is needed to build a climate-resilient health system owing to its complex adaptive nature.⁷⁴ This is crucial for maintaining essential services during and after climate events, particularly for vulnerable populations. Strengthening maternal and child health services, utilizing mobile health units, and implementing climate-resilient infrastructure are essential strategies.⁷⁵ Additionally, training the health workforce to manage climate-sensitive health conditions and implementing surveillance systems for early disease detection are vital.⁷⁶ There is a need for leadership and strategic planning to address the complex and long-term nature of climate risks, with the necessity to collaborate between diverse stakeholders and include cross-sectoral planning to ensure coherent policies.⁷⁷ In terms of financing, there is a need to expand funding to account for costs of health care due to climate-sensitive disease. This calls for innovative models to finance preventive intersectoral approaches, including leveraging climate-change-specific funding streams.⁷⁸

Nonetheless, health system resilience is crucial in addressing the impacts of climate change on health, particularly for women, adolescents and children. Achieving this requires both climate friendly and climate-resilient infrastructure as well as robust service provision, thus ensuring the workforce is skilled and adequately supported to deliver uninterrupted health care during climate emergencies.

⁶⁷ XDI 2023.

⁶⁸ Debu 2022.

⁶⁹ WHO 2019.

⁷⁰ Wilter et al. 2023.

⁷¹ Campbell et al. 2021; Sapari et al. 2023.

⁷² Minh et al. 2014; Lindvall et al. 2020.

⁷³ Health system building blocks include financing, leadership and governance, health workforce, health information systems, essential medical products and technologies, and service delivery (WHO 2022).

⁷⁴ Mosadeghrad 2023.

⁷⁵ Zurynski et al. 2024.

⁷⁶ Lokotola 2023.

⁷⁷ WHO 2023.

⁷⁸ WHO 2023.

CLIMATE AND HEALTH ACTIVITIES IN GFF PARTNER COUNTRIES

Prioritization of Climate and Health. Human vulnerability to climate change is a growing concern for GFF partner countries. Currently, nearly one-third of GFF countries are listed among the 20 most climate-vulnerable countries globally. Following the devastating 2022 floods,⁷⁹ every project that the World Bank finances is now mandated to incorporate climate mitigation and adaptation measures, which has led to heightened attention among project teams. Eighteen out of 21 countries surveyed reported that climate and health is a priority area in national plans and strategies for health adaptation or mitigation for climate change.⁸⁰ Countries including Bangladesh, Kenya, Rwanda, Malawi, Zimbabwe, Indonesia, and Zambia have integrated climate as a priority for RMNCAH-N initiatives and in their GFF investment cases, and most of these have GFF-cofinanced World Bank projects either in the pipeline or currently being implemented. In Zimbabwe, for example, the GFF is cofinancing a World Bank project to procure solar-powered tricycles to access remote health facilities. In Bangladesh, support from the GFF is helping strengthen maternal and child health care services and enabling primary health care workers to detect and treat climate-change induced health conditions.

Among the 18 countries prioritizing climate and health, government leadership is cited as a key focus area, followed by financing, advocacy, technical assistance, and evidence with varying durations of engagement. Two-thirds of these countries have dedicated funding for climate and health initiatives. For instance, Pakistan has allocated US\$70 million within its Natural Disaster and Risk Management Fund for climate and health efforts, while Zambia's Health National Adaptation Plan covers components such as common diseases affecting vulnerable groups and continuity of services during disasters. Fifteen out of the 18 countries also reported receiving technical assistance and support from international development partners to integrate climate change into their health policies and frameworks.

Adaptation and mitigation efforts. However, country commitments to climate and health vary widely. Twelve countries (Bangladesh, Kenya, Vietnam, Tanzania, Rwanda, Mali, Malawi, Zimbabwe, Liberia, Pakistan, Indonesia, and Zambia) have prioritized both adaptation and mitigation strategies for climate change in their national policies and strategies, while two countries (Guinea and Madagascar) have only incorporated adaptation strategies for climate change, and seven countries (Nigeria, Central African Republic, Ghana, Sierra Leone, Niger, Côte d'Ivoire, and Mauritania) do not have adaptation or mitigation strategies for climate change in their national policies. Integration of climate into health has been more prominent for short-term projects focusing on primary health care services.

GFF'S VALUE-ADD TO THE CLIMATE AND HEALTH AGENDA

Focus on women, children, and adolescents. The GFF has a leadership role to play to ensure that the health needs of women, children and adolescents are prioritized in climate and health initiatives. The survey data from the 21 countries show that currently 10 GFF partner countries are integrating some RMNCAH-N focus into their national climate and health strategies. For example, Kenya has integrated a focus on provisioning for nutrition to prevent stunting in children and anemia among pregnant women into broader climate adaptation plans, focusing on interventions in maternal and newborn health services. Similarly, Bangladesh has prioritized RMNCAH-N in its Health Population and Nutrition Sector Development Program, which includes climate adaptation components to strengthen health service delivery. Across countries where climate and health initiatives are taking off, the focus on women, children and adolescents predominantly lies on addressing maternal health impacts, safeguarding immunization

⁷⁹ In Pakistan, Malawi, Brazil, South Africa, Sudan and South Sudan, Nigeria, Bangladesh, Philippines and Australia.

⁸⁰ A survey form was sent out to the GFF country focal points; we received responses from 21 of 36 countries.

rates against disruption from extreme or chronic weather, and ensuring “climate-proofed” service provisioning for nutrition among children and pregnant women.

Alignment with international initiatives and partnerships. The GFF’s strategic framework and model make it well placed to support partner countries experiencing climate and health vulnerabilities. The GFF has a range of tools, including technical assistance and innovative programming support mechanisms such as: results-based modalities and financing; policy reforms; catalyzing stronger alignment and coordination among stakeholders and country priorities; capacity development; and monitoring, evaluation, and learning mechanisms. By integrating climate change into its current strategic framework, the GFF can align with international initiatives arising from the Paris Climate Agreement and the Conference of Parties (COP), including the [Declaration on Climate and Health](#) endorsed at COP28 in Dubai. Financial commitments made through these frameworks to tackle the climate–health crisis emphasize the imperative for collective action. Initiatives such as ATACH, the WHO/UNFPA/UNICEF call to action, and the Joint Learning Network converge on addressing climate and health challenges through various interventions.

Similarly, the UNFPA-UNICEF-WHO call to action and the Partnership for Maternal, Newborn & Child Health (PMNCH) are strongly aligned with the GFF’s focus on RMNCAH-N.⁸¹ These initiatives emphasize the vulnerability of women, children and adolescents to climate crises, stressing the need for heightened action in safeguarding their health and well-being. The GFF’s strategic positioning enables it to strengthen the nexus between health, climate and gender agendas and prioritize investments in women’s, children’s, and adolescent health by accelerating climate policies and financing programs tailored to their needs, bolstering resilience against upcoming climate challenges.

Complement and leverage World Bank climate and health efforts. The GFF’s unique relationship with the World Bank provides an opportunity to influence—and benefit from—larger World Bank initiatives on climate change and health⁸² as well as leverage cross-sectoral skills and partnerships to incentivize a stronger focus on women’s, children’s and adolescent health in health systems. The GFF approach aligns with the World Bank’s [Climate and Health Program](#), particularly in establishing fair, efficient, and sustainable financing mechanisms for health, nutrition and population outcomes. The GFF approach to integrating climate change also aligns with the broader objectives of the World Bank’s [Climate Change Action Plan \(CCAP 2021–2025\)](#), empowering countries to integrate climate considerations into national health strategies and plans, prioritize mitigation and adaptation opportunities, and mobilize climate finance to achieve tangible results in resilience and health outcomes.⁸³ The CCAP commits to increase financing for adaptation and resilience and incorporate climate risks and opportunities across policy planning and implementation phases.⁸⁴ The GFF’s focus on RMNCAH-N complements the World Bank’s broader efforts to support climate hot-spot countries, promote resilience, and provide financial protection against climate shocks and disasters. The GFF will also align with the [Guiding principles for financing climate and health solutions](#)—launched at COP28 and endorsed by the World Bank⁸⁵—in a sustainable and coordinated manner.

PRIORITY GFF ACTION AREAS ON CLIMATE AND HEALTH

⁸¹ UNFPA, UNICEF and WHO 2023; PMNCH 2023.

⁸² World Bank 2017.

⁸³ World Bank 2021.

⁸⁴ World Bank 2019.

⁸⁵ The World Bank, with other development banks, also launched [Development Banks’ Joint Roadmap for Climate-Health Finance and Action](#) on June 12, 2024. This roadmap will aim to maximize investments in climate and health through shared tools, financing, and thought leadership for integrating and scaling international investment at the intersection of climate and health. The GFF will align and work with the Development Bank Working Group for Climate-Health Finance.

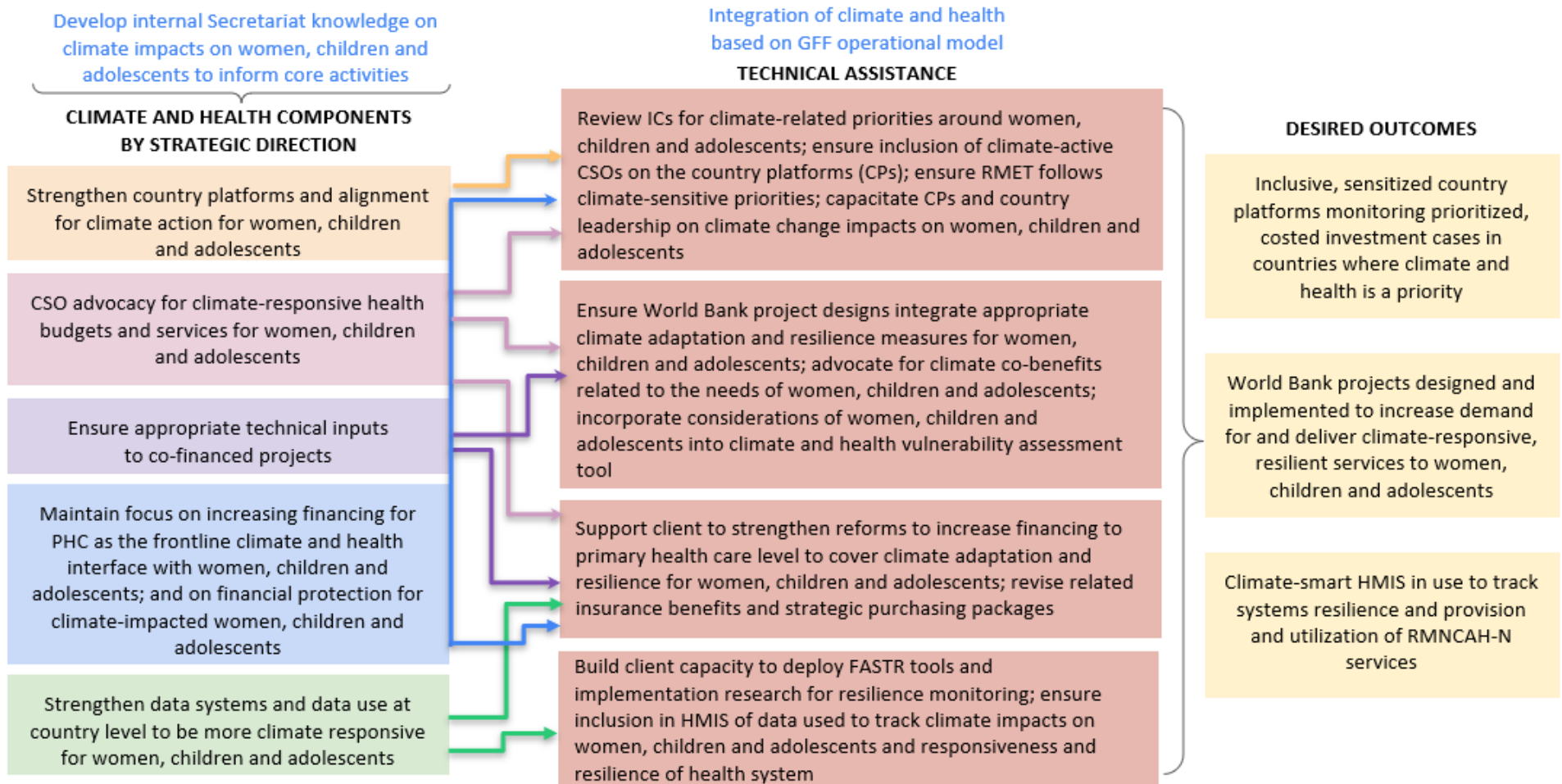
Based on the evidence and through the process with the TAG, four key focus areas emerged for GFF:

- **Integrate consideration of climate change factors into all aspects of GFF investment case development, costing, and review in countries for which health adaptation to climate change is a priority.**
- **Prioritize and institutionalize consideration of women, children and adolescents in World Bank -supported climate and health efforts, tools and measures, leveraging the GFF's position within the World Bank.**
- **Incorporate climate sensitivity and responsiveness in the GFF's data generation, monitoring, and results systems to build a robust global evidence base for prioritizing climate change impacts on RMNCAH-N, and determine value addition.**
- **Align with GFF partner initiatives to prioritize climate actions within RMNCAH-N programs by bringing together international partners, donors, CSOs and youth representatives with national leadership to ensure buy-in for prioritizing women, children and adolescents by design in health adaptation and mitigation initiatives for climate change.**

An equity lens will be mainstreamed into the GFF's work on climate and health.

Consistent with the GFF's logic model, and building on existing activities, the following framework shown in figure 2 highlights targeted activities and entry points for the GFF to integrate climate change into its current strategy and operations:

Figure 2. Logic Model for Integration of Climate and Health for Women, Children and Adolescents into the GFF Strategy 2021–2025



The following is a mapping of the proposed GFF priority actions and activities on climate and health against the five strategic directions in the current GFF Strategy 2021–2025.

Strategic Direction 1: Bolster country leadership and partner alignment behind prioritized investments in health for women, adolescents and children.

- **Review investments cases for climate-related priorities around women, children and adolescents.** For countries where climate change is a priority, the GFF can provide technical assistance to ensure contextualized climate impacts on women, children and adolescents and equity are flagged in the investment cases; reforms targeting health systems resilience are articulated; and the related measurable indicators to track progress are included.
- **Build knowledge in country platforms and country leadership** to understand the specific impacts of climate change on women, children and adolescents. A specific pathway to build cross-sectoral knowledge sharing between country leaderships, and initiate willingness to consider RMNCAH-N could be followed through facilitating the development of “climate champions” within national leadership.
- **Ensure alignment of partners,** and catalyze multisectoral collaborations among national leadership (ministries) through leveraging World Bank relationships in order to increase buy-in to promote the consideration of climate-sensitive actions affecting women, children and adolescents.
- **Facilitate multistakeholder platforms that bring together cross-sectoral collaborations beyond the health sector.** The GFF can also consider using catalytic funding to expand its engagement with other sector ministries and stakeholders, to facilitate the inclusion of women, children and adolescents in national-level climate and health initiatives and advance equity.

Strategic Direction 2: Prioritize efforts to advance equity, voice, and gender equality.

- **Include CSOs and relevant private sector and academic groups on country platforms** to keep the focus on climate change impacts and actions for women, children and adolescents.
- **Ensure the inclusion of CSOs** that focus on climate responsiveness and resilience within CSO country platforms, prioritizing women’s and youth-led organizations. This will facilitate the inclusion of gender vulnerability to climate change impacts and address gendered dimensions of climate responsiveness in community-led accountability for service delivery and quality of care.
- **Build the capacity of existing CSO platforms** to advocate and raise awareness, aiming to incorporate RMNCAH-N considerations. This advocacy effort will aim to encourage government and national bodies to prioritize and institutionalize a focus on RMNCAH-N in their national climate action plans and ensure climate impacts on women, children and adolescents feature in national health sector plans.
- **Leverage GFF reach to national leadership to catalyze an enabling environment for CSOs,** who will then develop capacity and leverage tangible financing for climate and health initiatives through an RMNCAH-N lens.

Strategic Direction 3: Protect and promote high-quality, essential health services by reimagining service delivery.

- **Support partner countries to develop social and behavior change campaigns** to raise awareness of climate risks to health service availability for and health impacts on women, children and adolescents.
- **Review country climate-risk management protocols** for emergencies and disasters to ensure responsiveness of the health system to the needs of women, children and adolescents.
- **Provide technical assistance to World Bank task teams and partner countries to develop projects** that aim to develop resilient health systems that are responsive to the specific needs of women, children and adolescents during climate events and as a result so climate change. This can include changes in supply chain management (for instance, prepositioning contraceptive supplies and vaccines); bolstering of human resource skills and knowledge (to identify and treat climate related morbidities in women, children and adolescents); and informing climate-smart infrastructure (for example, solarization to power vaccine cold chain).
- **Provide technical assistance to develop public-private partnerships (PPP)** to deliver scaled climate-sensitive, climate-resilient health services for women, children and adolescents especially during severe climate events (such as mobile services during climate events or mobile phone company collaboration to provide self-care messages during climate events). The [World Bank Group PPP gender toolkit](#) can be used to assess potential PPPs at the intersection of health, climate and gender.
- **Work with the World Bank to revise the Climate Health and Vulnerability Assessment (CHVA) tool** to ensure inclusion of specific measurement of the vulnerability of women, children and adolescents.

Strategic Direction 4: Build more resilient, equitable, and sustainable health financing systems.

- **Tapping into the convening power of the Bank to facilitate relationships with ministries of environment and finance** and leverage the IDA (international development association) to fund/provide loans to country partners for prioritizing RMNCAH-N in their national health plans/strategies for climate change.
- **Supporting innovative financing mechanisms** in partner countries that address health vulnerabilities of women, adolescents and children arising from climate change.
- **Work with the World Bank to ensure that climate considerations and costs specific to women, children and adolescents are incorporated into reforms aimed at increasing domestic resources for primary health care** as well as into health insurance benefits packages and strategic purchasing schemes. This can include increasing cost inputs for RMNCAH-N services; as well as for climate adaptation of health systems.
- **Provide technical assistance to partner countries to develop points on specific climate vulnerabilities of women, children and adolescents** when advocating to ministries of finance for additional budget for ministries of health, or to countries where climate and health is a priority and their health national adaptation plans (HNAPs) are being drafted or revised.
- Also provide technical assistance to partner countries to **leverage the evolving number of multilateral climate funds which are increasingly prioritizing gender equity and health**, and align their domestic funding to support in bettering women, children and adolescent health outcomes as part of addressing health adaptation or recognizing climate change induced losses and damages.
- Play a crucial role in **supporting climate-vulnerable communities access funding and mobilizing resources for implementing climate- and gender-responsive strategies** to improve women, children and adolescent health outcomes.
- **Consider** on a case-by-case basis **tracking financing for climate and health in Resource Mapping and Expenditure Tracking (RMET) exercises**, when possible.

Strategic Direction 5: Sustain a focus on results.

- **Incorporate climate-related RMNCAH-N outcomes in the Frequent Assessments and Health System Tools for Resilience (FASTR) tool** and advocate its inclusion (at least partially) within each partner country's health management information system (HMIS) to facilitate on-demand analysis and identification of climate-induced health condition hotspots.
- **Enable routine monitoring of essential health service utilization and rapidly respond to emerging health priorities.**
- **Provide technical assistance to build and undertake health facility and household surveys under FASTR to track protracted effects of climate change on RMNCAH-N outcomes.** Such processes could be set up in countries already identified as climate-vulnerable as well as in countries where strengthening health systems is prioritized by partner governments.
- **Collaborate with the World Bank to understand climate shocks and thresholds, and discuss the potential development of early warning systems in countries prone to frequent climate events.**
- **With the World Bank, conduct qualitative deep dives to understand exemplar countries able to protect women, children and adolescents during climate events,** to facilitate sharing of best practices and strategies for climate resilience with other partner countries.
- **Provide technical assistance to countries to conduct implementation research** to improve responsiveness of health system to women, children and adolescents in times of climate crisis.
- **Coordinate with partner organizations to avoid duplication of efforts and ensure complementary data generation strategies,** thereby ensuring comprehensive coverage and maximizing the utility of available resources.

NEXT STEPS

The significant impacts on climate change on women's, children's, and adolescent health and on primary health care services pose a growing risk to countries and the GFF's ability to deliver on its core mandate to improve health outcomes for women, children and adolescents. To avoid duplication, the GFF will build on and complement existing work, both within the World Bank and elsewhere. The World Bank's Health, Nutrition and Population (HNP) Global Practice and Climate Group can provide the GFF with most of the necessary frameworks, tools, and convening capacity to drive more technical and financial resources for climate and health. Thus, the GFF Secretariat can focus on integrating a targeted climate and health approach into its current strategy that (1) addresses the specific needs and considerations of women, children, and adolescents, and (2) leverages its country-led operating model. However, integrating climate and health actions into the GFF's work will require some adjustments to the GFF's current operational set and capacity to deliver.

Here are some specific activities the GFF Secretariat will undertake to advance this work over the next 18 months:

- **Upskill technical and country-facing GFF staff** to ensure a minimum solid foundation of understanding of climate change and its specific impacts on the health of women, children and adolescents, with a particular focus on RMNCAH-N outcomes. The World Bank's forthcoming climate and health flagship course will be an important resource. This training will help GFF Secretariat staff and country focal points better engage with partners on climate and health in project preparation and implementation efforts.
- **Ensure that GFF Secretariat staff can access relevant climate and health expertise** to review and strengthen GFF investment cases, country engagement summaries, and cofinanced project documents to appropriately account for climate-related content.
- **In collaboration with the World Bank's Health, Nutrition, Population Global Practice and Climate Group** to ensure that new tools, methods, and standards that might apply to World Bank operations take into account the climate impacts on the health of women, children, and adolescents.
- **Collaborate with the Joint Learning Network's new pillar on climate and health** to integrate activities specific to women, children and adolescents, facilitating cross-country knowledge exchange and capacity building.
- **Develop technical partnership with partner organizations**, starting with IG members, who are already working on climate and health actions.
- **Participate in major climate and health global fora and within relevant partnerships to advocate for a strong focus on women, children and adolescents, and strengthen the nexus between climate, health and gender equity.** As noted earlier, these may include ATACH, COP28 and other relevant platforms.
- **Work with the World Bank to ensure climate and health vulnerability assessments are conducted in at least 20 GFF partner countries**, using a revised World Bank methodology to identify vulnerabilities specific to women, children and adolescents.
- **Work with the GFF Results team to develop a monitoring and accountability plan** to ensure effective and timely implementation of the Climate and Health approach outlined in this paper.

REFERENCES

- Abdillah, A., R. A. Buchari, I. Widianingsih, and H. Nurasa. 2023. "Climate change governance for urban resilience for Indonesia: A systematic literature review." *Cogent Social Sciences* 9 (1). <https://doi.org/10.1080/23311886.2023.2235170>
- Ahmed, S. 2019. "A Gender-Sensitive Policy Framework for Disaster Management in Bangladesh." PhD Thesis, Victoria University. In *VU Research Repository*. Melbourne Australia. <https://vuir.vu.edu.au/39483/>
- Akachi, Yoko, Donna Goodman, and David Parker. 2009. "Global Climate Change and Child Health: A review of pathways, impacts and measures to improve the evidence base." Innocenti Discussion Paper No. IDP 2009-03. Florence: UNICEF Innocenti Research Centre. https://www.unicef-irc.org/publications/pdf/idp_2009_03.pdf
- Albrecht, G., Sartore, G-M., Connor, L., Higginbotham, N., Freeman, S., Kelly, B., Stain, H., Tonna, A., Pollard, G. 2007. "Solastalgia: the distress caused by environmental change". *Australas Psychiatry*. <https://doi.org/10.1080/10398560701701288>
- Ashraf, M., S. Shahzad, P. Sequeria, A. Bashir, and S. K. Azmat. 2024. "Understanding Challenges Women Face in Flood-Affected Areas to Access Sexual and Reproductive Health Services: A Rapid Assessment from a Disaster-Torn Pakistan." *BioMed Research International* 2024: 1–13. <https://doi.org/10.1155/2024/1113634>
- Awiti, A. O. 2022. "Climate Change and Gender in Africa: A Review of Impact and Gender-Responsive Solutions." *Frontiers in Climate* 4. <https://doi.org/10.3389/fclim.2022.895950>
- Bandura, A., and L. Cherry. 2020. "Enlisting the power of youth for climate change." *American Psychologist* 75 (7): 945–51. <https://doi.org/10.1037/amp0000512>
- Bonell, A., C. Part, U. Okomo, R. Cole, S., Hajat, S. Kovats, A. N. Sferruzzi-Perri, and J. E. Hirst. 2023. "An expert review of environmental heat exposure and stillbirth in the face of climate change: Clinical implications and priority issues." *BJOG*. <https://doi.org/10.1111/1471-0528.17622>
- Burns, P. A., and C. Mutunga. 2024. "Addressing the Impact of Climate Change on Sexual and Reproductive Health Among Adolescent Girls and Young Women in Low- and Middle-Income Countries." *Global Health: Science and Practice* 12 (1). <https://doi.org/10.9745/GHSP-D-23-00374>
- Campbell, S. L., T. Remenyi, G. J. Williamson, D. Rollins, C. J. White, and F. H. Johnston. 2021. "Ambulance dispatches and heatwaves in Tasmania, Australia: A case-crossover analysis." *Environmental Research* 202: 111655. <https://doi.org/10.1016/j.envres.2021.111655>
- Canelón, S. P., and M. R. Boland. 2020. "A Systematic Literature Review of Factors Affecting the Timing of Menarche: The Potential for Climate Change to Impact Women's Health." *Int J Environ Res Public Health* 17 (5): 1703. <https://doi.org/10.3390/ijerph17051703>
- Charbit, Y. 2018. "Women as actors in addressing climate change." In *International Handbooks of Population*. 317–328. https://doi.org/10.1007/978-94-024-1290-1_21

- Chersich, M. F., M. D. Pham, A. Areal, M. M. Haghghi, A. Manyuchi, C. P. Swift, and S. Hajat. 2020. "Associations between high temperatures in pregnancy and risk of preterm birth, low birth weight, and stillbirths: Systematic review and meta-analysis." *BMJ* 371. <https://doi.org/10.1136/bmj.m3811>
- Coll-Seck, A., H. Clark, R. Bahl, S. Peterson, A. Costello, and T. Lucas. 2019. "Framing an agenda for children thriving in the SDG era: A WHO-UNICEF-Lancet Commission on Child Health and Wellbeing." *Lancet* 393 (10167): 109–12. [https://doi.org/10.1016/S0140-6736\(18\)32821-6](https://doi.org/10.1016/S0140-6736(18)32821-6)
- COP28. 2024. "UAE Declaration on Climate And Health." <https://www.cop28.com/en/cop28-uae-declaration-on-climate-and-health>
- Corner, A., O. Roberts, S. Chiari, S. Völler, E. S. Mayrhuber, S. Mandl, and K. Monson. 2015. "How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators." *WIREs Clim Change* 6: 523–34. <https://doi.org/10.1002/wcc.353>
- Dapi, L. N., J. Rocklöv, G. Nguetack-Tsague, E. Tetanye, and T. Kjellstrom. 2010. "Heat impact on schoolchildren in Cameroon, Africa: Potential health threat from climate change." *Global Health Action* 3 (1): 5610. <https://doi.org/10.3402/gha.v3i0.5610>
- Debu, D. 2022. "Healthcare in crisis as floods damage 24 Sylhet hospitals." *The Business Standard*, June 26, 2022. <https://www.tbsnews.net/bangladesh/healthcare-crisis-floods-damage-24-sylhet-hospitals-447706>
- Devlin, M. K., and M. A. Grey. 2019. "Climate Change Refugees and Public Health Implications." In *Good Health and Well-Being*, edited by W. Leal Filho, T. Wall, U. Azeiteiro, A. Azul, L. Brandli, and P. Özuyar. Encyclopedia of the UN Sustainable Development Goals. Springer, Cham. https://doi.org/10.1007/978-3-319-69627-0_72-1
- Devonald, M., N. Jones, A. Iyasu Gebru, and W. Yadete. 2024. "Rethinking climate change through a gender and adolescent lens in Ethiopia." *Climate and Development* 16 (3): 176–86. <https://doi.org/10.1080/17565529.2022.2032568>
- Dewan, C. 2019. "Impure Foods: Entanglements of Soil, Food, and Human Health in Bangladesh." *Gastronomica* 19 (1): 99–102. <https://www.jstor.org/stable/26854579>
- Doumbia, M., J. T. Coulibaly, D. K. Silué, G. Cissé, J.-A. N'Dione, B. Koné. 2023. "Effects of Climate Variability on Malaria Transmission in Southern Côte d'Ivoire, West Africa." *International Journal of Environmental Research and Public Health* 20 (23): Article 23. <https://doi.org/10.3390/ijerph20237102>
- Futterman, I. D., H. Grace, S. Weingarten, A. Borjian, and C. A. Clare. 2023.. "Maternal anxiety, depression and posttraumatic stress disorder (PTSD) after natural disasters: A systematic review." *Journal of Maternal-Fetal & Neonatal Medicine* 36 (1). <https://doi.org/10.1080/14767058.2023.2199345>
- Gheissari, Roya, et al., 'Health Outcomes in Children Associated with Prenatal and Early Life Exposures to Air Pollution: A narrative review', *Toxics*, vol. 10, no. 8, August 2022.
- Gibbons, E. D. 2014. "Climate change, children's rights, and the pursuit of intergenerational climate justice." *Health & Hum. Rts. J.* 16 (19). <https://www.hhrjournal.org/wp-content/uploads/sites/2469/2014/06/Gibbons1.pdf>

- Grace, K., F. Davenport, H. Hanson, C. Funk, and S. Shukla. 2015. "Linking climate change and health outcomes: Examining the relationship between temperature, precipitation and birth weight in Africa." *Global Environmental Change* 35: 125–137. <https://doi.org/10.1016/j.gloenvcha.2015.06.010>
- Haque, M. A., S. K. Dash, and M. a. B. Chowdhury. 2016. "Maternal health care seeking behavior: The case of Haor (wetland) in Bangladesh." *BMC Public Health* 16 (1). <https://doi.org/10.1186/s12889-016-3296-2>
- Haryanto, B. 2018. "Climate Change and Urban Air Pollution Health Impacts in Indonesia." In *Climate Change and Air Pollution: The Impact on Human Health in Developed and Developing Countries*, edited by R. Akhtar & C. Palagiano, 215–39. Springer International Publishing. https://doi.org/10.1007/978-3-319-61346-8_14
- Hausfather, Z. 2024. "State of the climate: 2024 off to a record-warm start." Carbon Brief, April 23, 2024. <https://www.carbonbrief.org/state-of-the-climate-2024-off-to-a-record-warm-start/>
- Helldén, D., C. Andersson, M. Nilsson, K. L. Ebi, P. Friberg, and T. Alfvén. 2021. "Climate change and child health: A scoping review and an expanded conceptual framework." *The Lancet Planetary Health* 5 (3). [https://doi.org/10.1016/s2542-5196\(20\)30274-6](https://doi.org/10.1016/s2542-5196(20)30274-6)
- Hossain, S. 2020. "Salinity and Miscarriage: Is There a Link? Impact of Climate Change in Coastal Areas of Bangladesh—A Systematic Review." *European Journal of Environment and Public Health* 4 (1): em0036. <https://doi.org/10.29333/ejeph/6291>
- Husaini, S., and S. E. Davies. 2022. « Case Report: Another Burden to Bear—The Impacts of Climate Change on Access to Sexual and Reproductive Health Rights and Services in Bangladesh." *Frontiers in Climate* 4. <https://doi.org/10.3389/fclim.2022.875515>
- Hutchinson, Justine A., et al., 'The San Diego 2007 Wildfires and Medi-Cal Emergency Department Presentations, Inpatient Hospitalizations, and Outpatient Visits: An observational study of smoke exposure periods and a bidirectional case-crossover analysis', *PLoS Medicine*, vol. 15, July 2018, e1002601.
- Kadio, K., V. Filippi, M. Congo, F. Scorgie, N. Roos, A. Lusambili, B. Nakstad, S. Kovats, and S. Kouanda. 2024. "Extreme heat, pregnancy and women's well-being in Burkina Faso: An ethnographical study." *BMJ Global Health* 8(Suppl 3): e014230. <https://doi.org/10.1136/bmjgh-2023-014230>
- Khakimov, P. 2019. "Climate change in Afghanistan, Kyrgyzstan, and Tajikistan: Trends and adaptation Policies conducive to innovation." *Social Science Research Network*. <https://doi.org/10.2139/ssrn.3806243>
- Khan, A. E., P. F. D. Scheelbeek, A. B. Shilpi, Q. Chan, S. K. Mojumder, A. Rahman, A. Haines, and P. Vineis. 2014. "Salinity in Drinking Water and the Risk of (Pre)Eclampsia and Gestational Hypertension in Coastal Bangladesh: A Case-Control Study." *PLOS ONE* 9 (9): e108715. <https://doi.org/10.1371/journal.pone.0108715>
- Kidanu, A., K. Rovin, and K. Hardee-Cleveland. 2009. "Linking population, fertility and family planning with adaptation to climate change: Views from Ethiopia," 36. Washington, DC: Population Action International.

https://cetesb.sp.gov.br/proclima/wpcontent/uploads/sites/36/2014/05/kidanu_rovin_hardee_linkin_g_population.pdf

Kitota, A. 2023. *Uncovering the Medical Implications from Maxims of Prophet Muhammad (S.A.W) on General Hygiene, Health and Diseases: A Case of infectious Diseases*. 296–313.

Kovats, A., and M. Natukunda. 2024. “Climate Change and Child Health.” ENBEL Policy Brief 8. https://assets-global.website-files.com/6233557710220c5f2eafdabe/65b8ba2c279e920696b4fca4_ENBELPolicybrief_childhealth.pdf

Langer, A., A. Meleis, F. M. Knaul, R. Atun, M. Aran, H. Arreola-Ornelas, Z. A. Bhutta, A. Binagwaho, R. Bonita, J. M. Caglia, M. Claeson, J. Davies, F. A. Donnay, J. M. Gausman, C. Glickman, A. D. Kearns, T. Kendall, R. Lozano, N. Seboni, and J. Frenk. 2015. “Women and Health: The Key for Sustainable Development.” *Lancet* 386 (9999): 1165–1210. [https://doi.org/10.1016/S0140-6736\(15\)60497-4](https://doi.org/10.1016/S0140-6736(15)60497-4)

Lawrance, E. L., R. Thompson, J. N. L. Vay, L. Page, and N. Jennings, N. 2022. “The Impact of Climate Change on Mental Health and Emotional Wellbeing: A Narrative Review of Current Evidence, and its Implications.” *International Review of Psychiatry* 34 (5): 443–98. <https://doi.org/10.1080/09540261.2022.2128725>

Lindvall, K., J. Kinsman, A. Abraha, A. Dalmar, M. F. Abdullahi, H. Godefay, L. Lerenten Thomas, M. O. Mohamoud, B. K. Mohamud, J. Musumba, and B. Schumann. 2020. “Health Status and Health Care Needs of Drought-Related Migrants in the Horn of Africa—A Qualitative Investigation.” *International Journal of Environmental Research and Public Health* 17 (16): Article 16. <https://doi.org/10.3390/ijerph17165917>

Llorente-Marrón, M., Y. Fontanil-Gómez, M. Díaz-Fernández, and P. Solís García. 2021. “Disasters, Gender, and HIV Infection: The Impact of the 2010 Haiti Earthquake.” *International Journal of Environmental Research and Public Health* 18 (13): Article 13. <https://doi.org/10.3390/ijerph18137198>

Logie, C. H., D. Toccalino, A. C. Reed, K. Malama, P. A. Newman, S. Weiser, and A. Adedimeji. 2021. “Exploring linkages between climate change and sexual health: a scoping review protocol.” *BMJ open* 11 (10): e054720.

Logie, C. H., D. Toccalino, F. MacKenzie, A. Hasham, M. Narasimhan, H. Donkers, N. Lorimer, and K. Malama. 2024. « Associations between climate change-related factors and sexual health: A scoping review.” *Global Public Health* 19 (1): 2299718. <https://doi.org/10.1080/17441692.2023.2299718>

Lokotola, C. L., R. Mash, K. Naidoo, V. Mubangizi, N. Mofolo, and P. N. Schwerdtle. 2023. “Climate change and primary health care in Africa: A scoping review.” *The Journal of Climate Change and Health* 11: 100229. <https://doi.org/10.1016/j.joclim.2023.100229>

Lusambili, A., S. Kovats, B. Nakstad, V. Filippi, P. Khaemba, N. Roos, C. Part, S. Luchters, M. Chersich, J. Hess, K. Kadio, and F. Scorgie. 2024. “Too hot to thrive: A qualitative inquiry of community perspectives on the effect of high ambient temperature on postpartum women and neonates in Kilifi, Kenya.” *BMC Pediatrics* 24 (1): 36. <https://doi.org/10.1186/s12887-023-04517-w>

Ma, T., J. Moore, and A. Cleary. 2022. “Climate change impacts on the mental health and wellbeing of young people: a scoping review of risk and protective factors.” *Social Science & Medicine* 301 (114888). <https://doi.org/10.1016/j.socscimed.2022.114888>

- McElroy, S., S. Ilango, A. Dimitrova, A. Gershunov, and T. Benmarhnia. 2022. "Extreme heat, preterm birth, and stillbirth: A global analysis across 14 lower-middle income countries." *Environment International* 158 (106902).
- McGushin, A., G. Gasparri, V. Graef, C. Ngendahayo, S. Timilsina, F. Bustreo, and A. Costello. 2022. "Adolescent wellbeing and climate crisis: adolescents are responding, what about health professionals?" *BMJ* 2022: 379. <https://doi.org/10.1136/bmj-2022-071690>
- McMichael, C., J. Barnett, and A. J. McMichael. 2012. "An ill wind? climate change, migration, and health." *Environmental Health Perspectives* 120 (5): 646–654. <https://doi.org/10.1289/ehp.1104375>
- Meiro-Lorenzo, M., T. Bouley, G. Kleiman, P. L. Osewe, R. Tamer, S. Samah, M. Richard, and H. Wang. 2017. "Climate Change and Health Approach and Action Plan [English]." Investing in Climate Change and Health Series. Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/421451495428198858/Climate-change-and-health-approach-and-action-plan>
- Minh, H., N. S. Pocock, N. Chaiyakunapruk, C. Chhorvann, H. A. Duc, P. Hanvoravongchai, J. Lim, D. E. Lucero-Priso III, N. Ng, N. Phaholyothin, A. Phonvisay, K. M. Soe, and V. Sychareun. 2014. "Progress toward universal health coverage in ASEAN." *Global Health Action* 7 (1): 25856. <https://doi.org/10.3402/gha.v7.25856>
- Mosadeghrad, A.M., P. Isfahani, L. Eslambolchi, and others. 2023. "Strategies to strengthen a climate-resilient health system: A scoping review." *Global Health* 19 (62). <https://doi.org/10.1186/s12992-023-00965-2>
- Moyo, E., L. G. Nhari, P. Moyo, G. Murewanhema, and T. Dzinamarira. 2023. "Health effects of climate change in Africa: A call for an improved implementation of prevention measures." *Eco-Environment & Health* 2 (2): 74–78. <https://doi.org/10.1016/j.eehl.2023.04.004>
- Murray, N. E. A., M.B. Quam, and A. Wilder-Smith. 2013. "Epidemiology of dengue: Past, present and future prospects." *Clinical Epidemiology* 299. <https://doi.org/10.2147/clep.s34440>
- Nahian, M. A., T. Ahmad, I. Jahan, N. Chakraborty, Q. Nahar, and P. K. Streatfield. 2023. "Air pollution and pregnancy outcomes in Dhaka, Bangladesh." *The Journal of Climate Change and Health* 9: 100187. <https://doi.org/10.1016/j.joclim.2022.100187>
- Nakstad, B., V. Filippi, A. Lusambili, N. Roos, F. Scorgie, M. F. Chersich, S. Luchters, and S. Kovats. 2022. "How climate change may threaten progress in neonatal health in the African region." *Neonatology* 119 (5): 644–51. <https://doi.org/10.1159/000525573>
- Nigatu, A. S., B. O. Asamoah, and H. Kloos. 2014. "Knowledge and perceptions about the health impact of climate change among health sciences students in Ethiopia: A cross-sectional study." *BMC Public Health* 14 (1). <https://doi.org/10.1186/1471-2458-14-587>
- Part, C., V. Filippi, J. A. Cresswell, R. Ganaba, S. Hajat, B. Nakstad, N. Roos, K. Kadio, M. Chersich, A. Lusambili, S. Kouanda, and S. Kovats. 2022. "How do high ambient temperatures affect infant feeding practices? A prospective cohort study of postpartum women in Bobo-Dioulasso, Burkina Faso." *BMJ Open* 12 (10): e061297. <https://doi.org/10.1136/bmjopen-2022-061297>

- Population Council, and Women Deliver. 2023. "The health effects of climate change: Experiences of young people in Bangladesh, Guatemala and Nigeria." Population Council and Women Deliver. <https://doi.org/10.31899/sbsr2023.1048>
- Preet, R., M. Nilsson, B. Schumann, and B. Evengård. 2010. "The gender perspective in climate change and global health." *Global Health Action/Global Health Action: Supplement 3* (1): 5720. <https://doi.org/10.3402/gha.v3i0.5720>
- PMNCH. 2023. *Prioritizing Women's, Children's and Adolescents' Health in the Climate Crisis*. <https://pmnch.who.int/resources/publications/m/item/prioritizing-women-s-children-s-and-adolescents-health-in-the-climate-crisis>
- Proulx, K., B. Daelmans, V. Baltag, and P. Banati. 2024. "Climate change impacts on child and adolescent health and well-being: A narrative review." *Journal of Global Health* 14. <https://doi.org/10.7189/jogh.14.04061>
- Sidun, N. M., and J. L. Gibbons. 2024. "Women, girls, and climate change: Human rights, vulnerabilities, and opportunities." *Int J Psychol* 59: 257–66. <https://doi.org/10.1002/ijop.12942>
- WHO-UNICEF-UNFPA. 2023. "Protecting maternal, newborn and child health from the impacts of climate change—A call to action." WHO Department of Sexual and Reproductive Health & Department of Maternal, Newborn, Child and Adolescent Health and Ageing. <https://www.unfpa.org/resources/protecting-maternal-newborn-and-child-health-impacts-climate-change-unfpa-unicef-who-call>
- Qin, Z., Q. Wu, C. Bi, Y. Deng, and Q. Hu. 2024. "The relationship between climate change anxiety and pro-environmental behavior in adolescents: The mediating role of future self-continuity and the moderating role of green self-efficacy." *BMC Psychology* 12 (1). <https://doi.org/10.1186/s40359-024-01746-1>
- Rahman, J., S. H. M. Fakhruddin, A. K. M. F. Rahman, and M. A. Halim. 2016. "Environmental Heat Stress Among Young Working Women: A Pilot Study." *Annals of Global Health* 82 (5): 760–767. <https://doi.org/10.1016/j.aogh.2016.07.007>
- Remme, M., A. Vassall, G. Fernando, and D. E. Bloom. 2020. "Investing in the health of girls and women: A best buy for sustainable development." *BMJ* 369: m1175. <https://doi.org/10.1136/bmj.m1175>
- Romanello, M., A. McGushin, C. Di Napoli, P. Drummond, N. Hughes, L. Jamart, and A. Haines. 2023. "The 2023 report of the Lancet Countdown on health and climate change: The imperative for a health-centred response in a world facing irreversible harms." *Lancet* 402 (10419): 2346-2394. [https://doi.org/10.1016/S0140-6736\(23\)01859-7](https://doi.org/10.1016/S0140-6736(23)01859-7)
- Sapari, H., M. I. Selamat, M. R. Isa, R. Ismail, and W. R. W. Mahiyuddin. 2023. "The Impact of Heat Waves on Health Care Services in Low- or Middle-Income Countries: Protocol for a Systematic Review." *JMIR Research Protocols* 12(1): e44702. <https://doi.org/10.2196/44702>
- Sato, M., Y. Nakamura, F. Atogami, R. Horiguchi, R. Tamaki, T. Yoshizawa, and H. Oshitani. 2016. "Immediate Needs and Concerns among Pregnant Women During and after Typhoon Haiyan (Yolanda)." *PLoS Currents*. <https://doi.org/10.1371/currents.dis.29e4c0c810db47d7fd8d0d1fb782892c>

- Shah, A. A., J. Ye, M. Abid, J. Khan, S. M. Amir. 2018. "Flood hazards: household vulnerability and resilience in disaster-prone districts of Khyber Pakhtunkhwa province, Pakistan." *Natural Hazards* 93 (1): 147–165. <https://doi.org/10.1007/s11069-018-3293-0>
- IPCC (Intergovernmental Panel on Climate Change). 2023. *Sixth Assessment Report*. IPCC. <https://www.ipcc.ch/assessment-report/ar6/>
- Sorensen, C., V. Murray, J. Lemery, and J. Balbus. 2018. "Climate change and women's health: Impacts and policy directions." *PLOS Medicine* 15 (7): e1002603. <https://doi.org/10.1371/journal.pmed.1002603>
- Lenzen, Manfred, Arunima Malik, Mengyu Li, Jacob Fry, Helga Weisz, Peter-Paul Pichler, Leonardo Suveges Moreira Chaves, Anthony Capon, and David Pencheon. 2020. "The environmental footprint of health care: A global assessment." *Lancet Planetary Health* 4 (7): e271-e279. [https://doi.org/10.1016/S2542-5196\(20\)30121-2](https://doi.org/10.1016/S2542-5196(20)30121-2)
- UNFCCC. "The Paris Agreement." <https://unfccc.int/process-and-meetings/the-paris-agreement>
- Thomaes, S., S. Grapsas, J. van de Wetering, J. Spitzer, and A. Poorthuis. 2023. "Green teens: Understanding and promoting adolescents' sustainable engagement." *One Earth* <https://doi.org/10.1016/j.oneear.2023.02.006>
- Tiwari, I., M. Tilstra, S. M. Campbell, C. C. Nielsen, S. Hodgins, A. R. Osornio Vargas, K. Whitfield, B. P. Sapkota, and S. S. Yamamoto. 2022. "Climate change impacts on the health of South Asian children and women subpopulations—A scoping review." *Heliyon* 8 (10): e10811. <https://doi.org/10.1016/j.heliyon.2022.e10811>
- Ashraf, Mariam, Sara Shahzad, Pamela Sequeria, Anam Bashir, and Syed Khurram Azmat. 2024. "Understanding Challenges Women Face in Flood-Affected Areas to Access Sexual and Reproductive Health Services: A Rapid Assessment from a Disaster-Torn Pakistan." *Biomed Research International*. <https://doi.org/10.1155/2024/1113634>
- UNFPA (United Nations Population Fund) and Queen Mary University of London. 2023. *Taking stock: sexual and reproductive and health and rights in climate commitments—A global review*. New York: UNFPA.
- van Nieuwenhuizen, A., K. Hudson, X. Chen, and A. R. Hwong. 2021. "The Effects of Climate Change on Child and Adolescent Mental Health: Clinical Considerations." *Current Psychiatry Reports* 23 (12): 88. <https://doi.org/10.1007/s11920-021-01296-y>
- Wang, Q., et al., 'Independent and Combined Effects of Heatwaves and PM2.5 on Preterm Birth in Guangzhou, China: A Survival Analysis', *Environmental Health Perspectives*, vol. 128, art. 17006, 2020.
- Witter, S., S. Thomas, S. M. Topp, E. Barasa, M. Chopra, D. Cobos, K. Blanchet, G. Teddy, R. Atun, and A. Ager. 2023. "Health system resilience: A critical review and reconceptualisation." *Lancet Global Health* 11 (9): e1454–e1458. [https://doi.org/10.1016/S2214-109X\(23\)00279-6/](https://doi.org/10.1016/S2214-109X(23)00279-6/)
- WHO (World Health Organization). 2016. *World health statistics 2016: Monitoring health for the SDGs, sustainable development goals*. <https://www.who.int/publications-detail-redirect/9789241565264>
- WHO (World Health Organization). 2019. "Restoring essential health services after Cyclone Idai in Mozambique." July 05, 2019. <https://www.afro.who.int/news/restoring-essential-health-services-after-cyclone-idai-mozambique>

- WHO (World Health Organization). 2021. *Review of Health in National Adaptation Plans*. Geneva: World Health Organization. <https://www.who.int/publications-detail-redirect/9789240023604>
- WHO (World Health Organization). 2023. *Operational Framework for building climate resilient health systems*. <https://www.who.int/publications/i/item/9789241565073>
- World Bank. 2020. *Reference Guide on Adaptation Co-Benefits. World Bank Group Climate Change*. <https://thedocs.worldbank.org/en/doc/6f438059fcd67d697592f0dd3e2ed151-0090012021/original/1-Reference-Guide-on-Adaptation-Co-Benefits.pdf>
- World Bank. 2021. *Climate Change and Action Plan 2021–2025: Supporting Green, Resilient and Inclusive Development*. Washington, DC: World Bank Group. <https://documents1.worldbank.org/curated/en/705731624380363785/pdf/World-Bank-Group-Climate-Change-Action-Plan-2021-2025-Supporting-Green-Resilient-and-Inclusive-Development.pdf>
- World Meteorological Organization. 2024. “State of the Global Climate 2023.” <https://library.wmo.int/records/item/68835-state-of-the-global-climate-2023>
- XDI. 2023. *2023 XDI Global Hospital Infrastructure Physical Climate Risk Report*. <https://xdi.systems/news/2023-xdi-global-hospital-infrastructure-physical-climate-risk-report>
- Yadav, S., and R. Lal. 2018. “Vulnerability of women to climate change in arid and semi-arid regions: The case of India and South Asia.” *Journal of Arid Environments* 149: 4–17. <https://doi.org/10.1016/j.jaridenv.2017.08.001>
- Zurynski, Y., G. Fisher, S. Wijekulasuriya, E. Leask, P. N. A. Dharmayani, L. A. Ellis, C. L. Smith, and J. Braithwaite. 2024. “Bolstering health systems to cope with the impacts of climate change events: A review of the evidence on workforce planning, upskilling, and capacity building.” *The International Journal of Health Planning and Management* 39(3): 781–805. <https://doi.org/10.1002/hpm.3769>