

Youth and Climate Change

Topic Map

Climate change is a threat to everyone. As the Intergovernmental Panel on Climate Change noted in its 2019 “IPCC Special Report on Global Warming of 1.5°C,” the changing climate is likely to increase the frequency and severity of extreme weather, lead to sea level rise that threatens coastal communities, contribute to species loss, expand risks from diseases such as malaria, and limit agricultural capacity.¹ Absent serious action, these effects will have serious negative consequences on the health, livelihoods, security and economic potential of people around the globe. These problems are especially serious for children and youth.² As the *Lancet* Countdown notes in its 2019 report, “a child born today will experience a world that is more than four degrees warmer than the pre-industrial average, with climate change impacting human health from infancy to adolescence to adulthood and old age.”³

Yet, beyond a handful of tentpole publications, such as the aforementioned *Lancet* Countdown’s report, there are few documents devoted solely to detailing the issues faced by young people. Moreover, there are few forums in which young people can regularly discuss their concerns and be treated as legitimate stakeholders. Though activist action has forced some legislative bodies to hold hearings with youth participation, institutional attempts to harness youth action around climate change have been few and far between. COP26, scheduled to be held in Glasgow, Scotland in November 2020, represents a unique opportunity to address these gaps. Organizers have both an opportunity to provide an agenda that represents youth concerns and provides a venue for youth to talk about their concerns.

This document aims to help organizations seize that opportunity and better understand youth concerns in their day-to-day business. At the direction of Data for Children Collaborative, with UNICEF, The Governance Lab (The GovLab) at New York University’s Tandon School of Engineering rapidly reviewed the topics associated with **children and climate change**. This work relied on desk research conducted with English language searches of publicly available journals, conference programmes, reports, and databases. It also relied on referrals from The GovLab’s research partners who work on issues pertaining to climate change’s impact on children.⁴ The rapid review did not encompass items with a poor online presence or issues which are not commonly discussed in relation to youth and climate change. Rapid reviews are in some ways limited in comparison to traditional systematic reviews undertaken over longer periods of time. Research has shown, however, that rapid reviews and systematic reviews generally result in similar findings.⁵

This document summarizes this work in the form of a **topic map**, a scan of the issues, questions, organizations, and experts that might be relevant for the Data for Children Collaborative.

¹ <https://www.ipcc.ch/sr15/chapter/spm/>

² In this piece, we define “children” and “youth” as all those people who are less than 18 years of age.

³ <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2819%2932596-6>

⁴ For information on our R-Search Methodology, see:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3144044

⁵ <https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-020-0528-9#Tab2>

Recognizing that the impacts and manifestations of climate change are complicated and interrelated, this document does not attempt to comprehensively taxonomize climate change issues. Rather, it presents common research areas for organizations interested in child well-being and seeks to clarify some of these interrelations. The topic map is arranged by mapping of:

- **Topic, Themes and Questions** representing the major issues in the discourse surrounding youth and climate change, as identified through a rapid scan of relevant literature, and notable or indicative research questions common within these topics that lend themselves to quantitative analysis;
- **Organizations** who conduct work related to these questions;
- **Experts** who are involved in or useful in answering these questions;
- **Publications** where research on these questions might be published;
- **Events** where practitioners might convene.

Throughout this mapping, we try to focus as much as possible on the challenges unique to children. However, it is important to note that many of the issues children face in the coming years—such as coastal erosion, increased likelihood of extreme weather—are the same challenges faced by adults. For these more generalized impacts of climate change, we seek to clarify how children are uniquely affected due to additional vulnerabilities and needs.

Box 1: Criteria for Topic Area Prioritization:

The topics, themes, and questions outlined in this document are intended to support decision-making regarding priority areas of investment around children and climate change. This overview captures relevant areas of inquiry driving research and programmatic work around the world. Informed by this topic map, The GovLab proposes to support the Data for Children Collaborative in homing in on topic areas for further study and investment. We propose the following criteria to determine which issues warrant initial prioritization:

1. **Desirability:** Would investment toward addressing the issue have the potential to transform our understanding of the topic and support impactful interventions?
2. **Novelty:** Is the area ripe for the generation of new insights or the refutation or extension of existing knowledge?
3. **Feasibility:** If the requisite resources are made available, could stakeholders make meaningful progress toward addressing the issue in the near term?
4. **Scalability:** Does the issue exist in varied contexts and therefore lend itself to the scaling and/or replication of effective solutions?

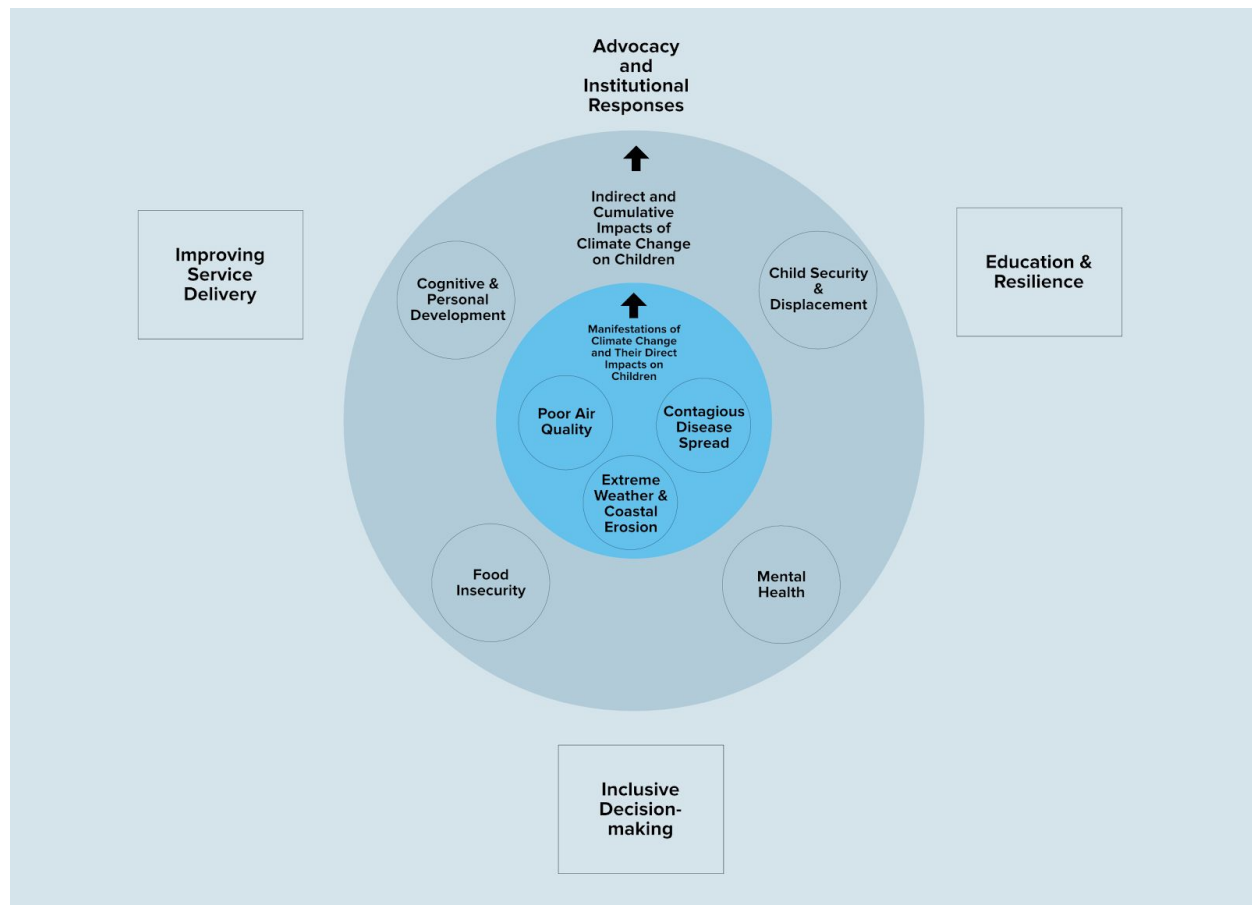
Once priorities are set, the Data for Children Collaborative can initiate the process of designing actionable questions to guide future investment, research, and practice (see Box 2 below), potentially leveraging [The 100 Questions Methodology](#).

Mapping Topics, Themes and Questions:

In organizing the topics relevant to a conversation about children and climate change, the researchers organized key topics into three parts:

- **Manifestations of Climate Change and Their Direct Impacts on Children**, referring to the immediate and direct environmental consequences of emissions and climate change on child well-being;

- **Indirect and Cumulative Impacts of Climate Change on Children**, referring to impacts on institutions, communities, families, and individuals arising from climate change’s environmental manifestations
- **Advocacy and Institutional Response**, referring to the role children can serve as change agents and how institutions might respond to that advocacy or a general awareness of child vulnerability.



Many of the issues within this framework are interconnected. This abstraction serves to organize a complex and interwoven collection of issues, and to help the reader consider the roots causes and follow-on effects of various phenomena. From this basis, the researchers then reviewed specific conference agendas, peer-reviewed publications, and other material (outlined in subsequent sections) to determine which common elements (“themes”) drive research and practice. These themes are followed by example research questions taken or inspired by work currently in the field.

Neither the themes nor the questions are meant to be comprehensive. The literature on the climate change challenges facing children and climate-related youth activism is relatively nascent and still developing. Consequently, the content here is indicative of research activity and suggests possible avenues for future data interventions.

Manifestations of Climate Change and Their Direct Impacts on Children

Climate change manifests in several ways. In this section we focus on three core environmental manifestations of climate change and outline associated themes and core research questions regarding how those manifestations directly impact children.

1. **Poor Air Quality:** Poor air quality impacts everyone. It is associated with seven million premature deaths,⁶ various illnesses,⁷ and a lowered quality of life.⁸ However, youth populations are among the most susceptible populations to air pollution's effects. Ultrafine particles and gases can damage vital organs such as the heart and lungs during crucial phases of development.⁹ As children have higher breathing rates and smaller body sizes, they absorb more air pollution than an adult in the same situation.¹⁰ These effects can accumulate over time, leaving today's youth and future children vulnerable to respiratory infections and other health conditions later in life. Faced with a world in which more than 90 percent of children breathe polluted air,¹¹ youth advocacy and research organizations have pushed for air to be protected and emissions to be cut.¹²
 - a. **Physical Development:** What are the impacts of air pollution on lung development, growth rate, and functioning?¹³
 - b. **Respiratory Diseases:** How does poor air quality impact the prevalence of various respiratory diseases, infections, and allergies among children?¹⁴
 - c. **Early Childhood Mortality:** How does exposure to air pollution impact fetal, infant, and child mortality?¹⁵

2. **Contagious Disease Spread:** In the early 2000s, the World Health Organization warned that "climate change will [...] affect infectious disease occurrence."¹⁶ In recent years, this warning appears to have been realized. As *The Lancet* reports, "nine of the ten most suitable years for the transmission of dengue fever on record [have] occur[ed] since 2000."¹⁷ The increased suitability and durability of diseases is a problem for child protection. Children and adolescents often have immune systems less capable of fighting disease and tend to be dependent on caregivers, leaving them vulnerable in the event of an outbreak. UNICEF reports that "[c]lose to 90 per cent of the burden of disease

⁶ <https://www.who.int/mediacentre/news/releases/2014/air-pollution/en/>

⁷ <https://www.ncbi.nlm.nih.gov/pubmed/28679072>

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<http://documents.worldbank.org/curated/en/781521473177013155/pdf/108141-REVISED-Cost-of-PollutionWebCORRECTEDfile.pdf>

⁹ <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2819%2932596-6>

¹⁰ <https://www.nytimes.com/2019/11/13/climate/climate-change-child-health.html>

¹¹ <https://unfccc.int/news/polluted-air-affects-more-than-90-of-children>

¹² <https://www.dallasnews.com/news/texas/2012/07/11/texas-judge-rules-atmosphere-air-is-public-trust/>

¹³ http://www.euro.who.int/_data/assets/pdf_file/0009/96750/E90767.pdf

¹⁴ <https://link.springer.com/article/10.1007/s11882-018-0777-7>

¹⁵ <http://jhr.uwpress.org/content/44/4/916.short>

¹⁶ <https://www.who.int/globalchange/climate/summary/en/index5.html>

¹⁷ <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2819%2932596-6>

attributable to climate change is borne by children under the age of 5.”¹⁸ Consequently, organizations have raised concern about the threat climate change-affected disease presents to children and have sought to build systems to address its effects.

- a. Physical Health and Development: How does infectious disease impact children’s nutrition level and physical growth?¹⁹
 - b. Disease Suitability and Durability: What types of infectious diseases will become more common among children in the next 50 years?²⁰ How will regional changes in climate affect the durability and suitability of diseases such as dengue and malaria?²¹
 - c. Child Resilience: Which factors (e.g. class, gender, enrollment in educational programs) affect child vulnerability to disease? What stressors could increase or decrease resilience to climate-sensitive disease?²²
 - d. Disease Burden: Which communities currently feel the greatest burden of climate-sensitive diseases? When, where, and how will this burden change following variations in climate?²³
3. **Extreme Weather and Coastal Erosion**: Visible consequences of climate change are the increased frequency and severity of certain extreme weather events as well as rising sea levels.²⁴ While floods, typhoons, heatwaves, and forest fires affect everyone, they are especially problematic for children and families. Youth can be physically vulnerable to injury and death. They can also suffer psychologically from trauma or from being cut off from basic services (e.g. education, sanitation, health care).
- a. Impacts on Physical Health: What are the most common physical manifestations of childhood exposure to extreme weather (e.g. stunted growth/height)?²⁵
 - b. Demographic Variation: Children in which demographic groups (e.g. age and socioeconomic status) see their short-term education outcomes most affected after exposure to extreme weather?²⁶ How do impacts differ along gender lines?²⁷
 - c. Drought and Water Stress: What effect does drought have on the emotional well-being of children?²⁸ Which factors influence the physical and psychological resilience of children in drought conditions?²⁹ Which croplands are most affected

¹⁸ Ibid

¹⁹ <https://academic.oup.com/aje/article-abstract/115/3/315/172952>

²⁰ <http://www.annals.edu.sg/pdf/47VolNo10Oct2018/V47N10p401.pdf>

²¹ <https://www.sciencedirect.com/science/article/abs/pii/S0031395507000193>

²² <https://www.sciencedirect.com/science/article/pii/S0031395507000193>

²³ <https://www.sciencedirect.com/science/article/pii/S0031395507000193>

²⁴ <https://www.carbonbrief.org/mapped-how-climate-change-affects-extreme-weather-around-the-world>

²⁵ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2487754

²⁶ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2704253

²⁷ <https://link.springer.com/article/10.1007/s00148-016-0628-6>

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https://onlinelibrary.wiley.com/doi/full/10.1111/j.1748-0361.2007.00113.x?casa_token=RhKPGmi3pOgAAAAA%3A8EyaG2pa2DIXPn33MHaZGUFaPEV1wEN5bJU3QW_NhHBLBdNFZ5Fx_INp2_iTnZhx0wxoyfl5kJ1Z314

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https://www.jstor.org/stable/10.7721/chilyoutenvi.18.1.0126?casa_token=meS17b7YCfgAAAAA:xEe53KEBvM

in water-stressed conditions?³⁰ Which serious health conditions do children face as a result of changing precipitation patterns?³¹

Indirect and Cumulative Impacts of Climate Change on Children

If gone unchecked, the environmental manifestations of climate change described above can initiate a cascading series of negative impacts on institutions, communities, families, and individuals. In this section we outline key second-order and cumulative impacts of climate change and identify relevant themes and research questions associated with each.

4. **Food Insecurity:** Various manifestations of climate change impact food production, as evidenced by the downward trends in global yield potential for all major crops since 1960 and the apparent global increase in undernourishment since 2014.³² Many children are likely to be impacted by malnutrition and undernutrition as a result, with serious, long-term consequences. Globally, 22.2 percent of children under the age of five suffer stunting due to chronic malnutrition.³³ 27 percent of children are underweight, with three quarters of these living in just ten countries.³⁴ Besides risk of death and disease, poor nutrition can lead to lifelong physical and cognitive impairment. As such, governments and advocacy groups have sought to reduce the chances of food insecurity driven by climate change.
 - a. **Malnutrition:** How does climate change's impact on crop yields impact instances of severe acute malnutrition, stunting, wasting among children?³⁵
 - b. **Dietary Diversity:** How does climate change impact the variety of foods available to children and the micro-nutritional value of their diets?³⁶
 - c. **Infant Nutrition:** Does climate-related food insecurity impact breastfeeding and infant nutrition rates?³⁷
 - d. **Disease:** How do climate-related food insecurity and water contamination affect incidence and severity of diarrheal diseases and other illnesses?³⁸
 - e. **Economic Impacts:** How does climate-related food insecurity affect families' economic security and contribute to high rates of child labor?³⁹

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³⁰ <https://www.sciencedirect.com/science/article/pii/S095965262030161X>

³¹ <https://www.sciencedirect.com/science/article/pii/S095965262030161X>

³² <https://www.thelancet.com/action/showPdf?pii=S0140-6736%2819%2932596-6>

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<https://www.unicef.org/press-releases/2018-global-nutrition-report-reveals-malnutrition-unacceptably-high-and-affects>

³⁴ https://www.unicef.org/media/media_33724.html

³⁵ <https://publichealthreviews.biomedcentral.com/articles/10.1186/s40985-016-0031-6>

³⁶ <https://www.sciencedirect.com/science/article/abs/pii/S2211912418300063>

³⁷ <https://onlinelibrary.wiley.com/doi/full/10.1111/mcn.12524>

³⁸ <https://www.sciencedirect.com/science/article/pii/S0048969715312419> ;

<https://www.mdpi.com/1660-4601/10/4/1202>

³⁹ <https://www.sciencedirect.com/science/article/abs/pii/S0277953617302277>

5. **Mental Health:** Youth populations are often psychologically vulnerable, with half of all mental health conditions appear by early adolescence.⁴⁰ Exacerbating this inherent risk are concerns about the various environmental manifestations of climate change and their impacts. Some activists have reported experiencing severe depression and anxiety as they became aware of environmental degradation.⁴¹ Beyond these anecdotes, some nascent research suggests that the environmental disruptions caused by climate change have a significant effect on the mental well-being of children and adults alike.⁴² To reduce the incidence serious mental health conditions as well as the incidence of suicide, organizations have stressed the need to look at the relationship between mental health and the manifestations of climate change.
- a. **Depression:** What is the impact of climate change on youth depression and mental health?⁴³
 - b. **Psychological Well-being:** How does climate change impact children's health, learning and psychosocial well-being?⁴⁴ How do psychological harms and stressors manifest in children after being affected by extreme weather events?^{45,46}
 - c. **Emotional Health and Wellbeing:** How does exposure to poor air quality impact children's emotional regulation capabilities and subsequently their mental health and development?⁴⁷
 - d. **Influence of Age:** How do children of different age brackets cope with climate change?⁴⁸
 - e. **Threatened Communities:** What is the impact on the well-being and psychological resilience of youth in vulnerable communities (e.g. Inuit youth,⁴⁹ youth in coastal areas,⁵⁰ lower-income countries⁵¹) affected by climate change?

⁴⁰ https://www.who.int/mental_health/maternal-child/child_adolescent/en/

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<https://www.independent.co.uk/life-style/greta-thunberg-depression-father-svante-radio-4-today-climate-protest-a9263936.html>

⁴² <https://ijmhs.biomedcentral.com/articles/10.1186/1752-4458-2-13>

⁴³ [https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196\(17\)30045-1.pdf](https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(17)30045-1.pdf)

⁴⁴ <https://journals.sagepub.com/doi/abs/10.1177/0956247808096125>

⁴⁵ <https://link.springer.com/article/10.1007/s11920-018-0896-9>

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https://www.jstor.org/stable/43755231?casa_token=Q28m-nvBzkkAAAAA:VsFSmCR516Clquygm4lkWtJwCa8vxXUyptfdGa44dzHxyz_qt7dAglldDEoesCd7GfV1QJuLc_LCU3cEpw4xBYf66S9dRI2yvU-Zz5JgvfsFG0dWOMQW&seq=1#metadata_info_tab_contents

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https://apha.confex.com/apha/2018/meetingapi.cgi/Paper/415685?filename=2018_Abstract415685.html&template=Word

⁴⁸ <https://www.sciencedirect.com/science/article/abs/pii/S0272494412000138>;

<https://eric.ed.gov/?id=EJ997146>

⁴⁹ <https://www.sciencedirect.com/science/article/pii/S0277953615300332>

⁵⁰ <https://www.cjcmh.com/doi/abs/10.7870/cjcmh-2007-0029>

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https://www.jstor.org/stable/10.7721/chilyoutenvi.18.1.0071?casa_token=2oTeseh4RK4AAAAA:z22u1aMlgxyESdgHTbmZUILDeBGHmFQSK5pYczUvSgBYj5rL6V5BLrLCQ-J453S8ICGTVk3E5vC9GqJNhPL4onQi53MpbQeaNv1qKaZR0K-Bm7e7RIZq#metadata_info_tab_contents

6. **Child Security and Displacement:** The environmental manifestations of climate change are also likely to spur child protection issues, either due to threats to their physical well-being (e.g. from drought or forced displacement) or due to the loss of their economic livelihood (e.g. loss of fish stock or agriculture). These changes are likely to be disruptive to the lives of children caught in their paths, who may suffer trauma, endure interrupted school schedules, or face other hardship.
- Refugee and Displaced Peoples:** Which regions and populations are likely to experience forced displacement resulting from climate change? How can institutions respond to the needs of children within those groups?⁵²
 - Violent Conflict and Human Security:** What is the relationship between sudden economic shocks (such as those caused by extreme weather or displacement) and the willingness of young people to join armed groups?⁵³
 - Welfare and Child Protection:** What will be the impact of climate change on the capacity of states (and particularly weak states) to provide services to vulnerable populations,⁵⁴ including victims of gender-based violence in particular?⁵⁵
 - Impacts of Displacement:** What are the experiences of children left-behind by parents who migrate?⁵⁶ What are the effects of parental migration on children's nutrition?⁵⁷ What are the effects of migration on children–parents relationships?⁵⁸
 - Social Ties:** How does a child's social capital change following climate-induced family migration?⁵⁹
7. **Cognitive and Personal Development:** The consequences of poor air quality, food insecurity, extreme weather, and other circumstances can have serious impacts on child development. Prenatal exposure to environmental contaminants has been suggested to be a risk factor for birth defects and impaired cognitive development.⁶⁰ Just as it can contribute to physical stunting, toxic stress and poor nutrition can also hinder brain

⁵² <https://ehp.niehs.nih.gov/doi/full/10.1289/ehp.1104375>

⁵³ <https://www.sciencedirect.com/science/article/pii/S0305750X03000093>

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<https://reader.elsevier.com/reader/sd/pii/S096262980700039X?token=C90F5CA303E41241B47B46CEA16F6AD155661BC0B67C2231E5C63B4A6CD020D1D44C3CBA1C23DA02FE08A0D7B0EFD299>

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https://academicworks.cuny.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1449&context=cc_pubs

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https://www.tandfonline.com/doi/full/10.1080/17441730600700556?casa_token=0o6CRYw8p7cAAAAA%3Ahi1x4045Po3QNxNZOJOyCSL27mORQnYfgdMaTTsqTjNI7GHEyXxZC5hExadCJAfRxb0D6AaPixPV0q

⁵⁷ <https://www.sciencedirect.com/science/article/abs/pii/S0306919210000916>

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https://psycnet.apa.org/record/2004-13080-001?casa_token=CWFcQeLLsg0AAAAA:q7F0uNmlgUGqtWif1MKgmunl1UL7VbDngWU8jOoBC6VHlrj1SxsYL89OOOrKTVb4TwNxoilQq6M_uJe00uGlucml

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https://www.jstor.org/stable/2096354?casa_token=93wElOwDtREAAAAA:Q5VK2tJo-4uD_FUqlCfP2F4Y45lSBOqYmCN-k9E7MuRvy7aEmgTWpTTxe1E2t6iP5dYIDMcvCkbi6hdoBRtpUmiVjdqpmPQvCndsOBd97qH2oaAa5L4E&seq=1#metadata_info_tab_contents

⁶⁰ <https://www.ncbi.nlm.nih.gov/pubmed/29699913>

development, especially in the early days of infancy and childhood.⁶¹ Inability to attend school due to disaster or family financial need can further limit child capacity. In short, this section focuses on the risks climate change poses from infancy through adolescence, spanning both the direct physical aspects (e.g. in limiting child diet) and in the societal aspects (e.g. limiting the ability of children to attend school).

- a. Physical and Cognitive Development: What are the immediate impacts of climate-related food insecurity on children’s emotional health and development?⁶²
- b. Schooling: What is the correlation between school absenteeism and the rate of infectious disease?⁶³ How does infectious disease affect children’s grades in school?⁶⁴ How does exposure to poor air quality affect children’s school absenteeism?⁶⁵
- c. Education Attainment: What are the impacts on primary and lower secondary school enrollment and educational attainment among children who have experienced extreme weather events?⁶⁶ How do those impacts on educational attainment differ across socioeconomic segments? How does infectious disease like malaria affect children’s educational attainment?⁶⁷ and education outcomes?⁶⁸
- d. Economic Security: How does exposure to extreme weather impact longer term familial economic security, household welfare, and poverty risks?⁶⁹ How does childhood exposure to climate-related pollutants impact their longer term economic prospects and other quality of life metrics?⁷⁰

Advocacy and Institutional Responses

Partly as a result of youth activism, renewed attention has been given to the effects climate change will play on children and youth. In this section, we outline conversations about how child attitudes are shifting as a result of climate change, how and what kinds of change children are advocating for, and the ways children’s input can be incorporated into institutions.

8. **Improving Service Delivery for Climate-Affected Populations**: Among the most basic functions that public institutions can fill is to deliver services that improve the welfare of the public. As children and youth populations are uniquely vulnerable to the effects of climate change and “face a future where their health and well-being will be increasingly impacted by the realities and dangers of a warmer world,” as *The Lancet* states,

⁶¹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4981537/>

⁶² <https://www.ingentaconnect.com/content/wk/dbp/2017/00000038/00000002/art00009>

⁶³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4114464/>

⁶⁴ <https://www.ajtmh.org/content/journals/10.4269/ajtmh.2003.69.582>

⁶⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2528642/>

⁶⁶ <https://link.springer.com/article/10.1007/s41885-017-0022-1>

⁶⁷ <https://www.ajtmh.org/content/journals/10.4269/ajtmh.2006.74.386>

⁶⁸ <https://www.sciencedirect.com/science/article/abs/pii/S0272775716303703>

⁶⁹ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3297323

⁷⁰ https://www.unicef.org/publications/files/Clear_the_Air_for_Children_Executive_summary_ENG.pdf

institutions will need to find ways to deliver child and youth services that target these issues in a more effective manner.⁷¹ Service delivery is an especially important way for institutions to address inequalities, responding to the needs of populations most affected and marginalized in climate discussions. The children in these groups—indigenous communities, women, minorities, and low-income individuals—tend to be uniquely harmed by environmentally exploitative practices.

- a. **Need Identification:** Within vulnerable communities, which technologies, systems, and techniques can best identify the children and families most in need of support to adapt to climate-related shocks?⁷² What special needs do children in post-disaster settings face and what policies are useful in filling those needs?⁷³
 - b. **Mental Health Care:** Which types of mental health services can best reach and respond to the needs of youth suffering from climate change-related depression and anxiety?⁷⁴
 - c. **Restorative Work:** What kinds of restorative projects (e.g. replanting, repairing damage from extreme weather) best allow child-led mobilization around environmental issues?⁷⁵
 - d. **Financial Needs:** Which financial policies are most successful at fostering adaptation among low-income families?⁷⁶
 - e. **Education:** How does school policy influence the rate of contagious disease among students?⁷⁷
 - f. **Conflict:** What policies (e.g. foreign aid, refugee support, or cash transfers) could best reduce the effects of climate change-related violence on children?⁷⁸
9. **Practicing Inclusive Decision-making:** Faced with threats that affect the lives of their members, many youth organizations have urged institutions to provide them with avenues to have their concerns heard and acted upon through policy. This desire for participation is reflected in testimony before legislative groups such as the US House Select Committee on the Climate Crisis.⁷⁹ The need to engage youth is also reflected in official documents and publications, including COP25's Declaration on Children, Youth, and Climate Change, which calls governments to “[e]nhance the meaningful participation of

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<https://reader.elsevier.com/reader/sd/pii/S0959378009000934?token=D1177AA665837F6C7252540B80998817622ABC7F63A98B97D0E42463E39DBE8ED1E6F9241955529493492609909B8FB6>

⁷³ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2033300

⁷⁴ [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(17\)30045-1/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(17)30045-1/fulltext)

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https://onlinelibrary.wiley.com/doi/full/10.1111/j.1099-0860.2010.00316.x?casa_token=WlAsZH2AKyAAAAAA%3AwC2-uwGW5rRuB15Vp2M4YbH3NEtxI2jFAQs7jpaiBm445lbVQ7mVabqaNPye_hak_dfKZNepa9TRLI

⁷⁶ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1646883

⁷⁷ <https://www.sciencedirect.com/science/article/pii/S019665531730041X?via%3Dihub>

⁷⁸ <https://www.jstor.org/stable/pdf/43755230.pdf>

⁷⁹

<https://climatecrisis.house.gov/committee-activity/hearings/generation-climate-young-leaders-urge-climate-action-now>

children and youth in climate change processes” as well as the creation of “mechanisms at the national level to ensure the effective participation of children and youth in decision making on climate change.”⁸⁰ In accordance with the Convention on the Rights of the Child, national, sub-national, and international organizations have explored how to allow youth to participate in the decision-making processes that impact them.⁸¹

- a. Advocacy Approaches: What concrete actions done by youth organizations (e.g. garbage collection, disaster response) best inform and persuade others (e.g. adults) of the value of child agency within a community?⁸² Are participatory video methods an effective way for youth to raise awareness of their situation and advocate to decision-makers?⁸³ What is the effect of social media content from youth activists on opinion, knowledge, and behavior?⁸⁴
- b. Factors Contributing to Success and Failure of Youth Advocacy: Which connections, skills, and opportunities are associated with successful youth leadership and activism on climate?⁸⁵ Which factors (e.g. negative adult attitudes, age segregation, denial of age differences) are most significant in undermining the ability of youth to affect change?⁸⁶
- c. Effects of Advocacy: What is the influence of environmental movement organization members on the attitudes and behavior of the general public?⁸⁷
- d. Institutional Mechanisms: Which institutionalized pathways (e.g. advisory committees, representation with full voting rights, youth forums, adult–youth partnerships, e-consultations⁸⁸) are most able to sustain youth civic engagement and participation and foster a sense of problem ownership?⁸⁹ Which mechanisms and approaches can institutions use to most effectively earn the trust of youth?⁹⁰
- e. Youth Empowerment: To what extent do youth have knowledge of and decision-making power in adaptation practices in different regions and contexts?⁹¹

⁸⁰ <https://www.voicesofyouth.org/campaign/cop25-join-declaration-children-youth-and-climate-action>

⁸¹ <https://www.unicef.org/child-rights-convention/convention-text>

⁸²

https://onlinelibrary.wiley.com/doi/full/10.1111/j.1099-0860.2010.00316.x?casa_token=WIAsZH2AKyAAAAAA%3AwC2-uiwGW5rRuB15Vp2M4YbH3NEtxI2jFAQs7jpaiBm445lbVQ7mVabqaNPye_hak_dfkZNepa9TRLI

⁸³ <https://www.tandfonline.com/doi/full/10.1080/14733285.2013.848599>

⁸⁴

<https://oxfordre.com/climatescience/view/10.1093/acrefore/9780190228620.001.0001/acrefore-9780190228620-e-369>

⁸⁵ <https://www.liebertpub.com/doi/abs/10.1089/eco.2009.0007>

⁸⁶ https://www.tandfonline.com/doi/pdf/10.1207/S1532480XADS0604_8

⁸⁷ http://userpage.fu-berlin.de/~ffu/akumwelt/bc2008/papers/bc2008_245_Tindall.pdf

⁸⁸

<https://www.oecd-ilibrary.org/docserver/9789264048874-39-en.pdf?expires=1585060032&id=id&accname=ocid177380&checksum=9B8B1C687B1D2BA367E32E6A63E99731>

⁸⁹ https://www.tandfonline.com/doi/pdf/10.1207/S1532480XADS0604_8

⁹⁰

https://www.researchgate.net/profile/Michael_Dorneich/publication/336864149_Inclusive_Decision-Making/links/5dceb406a6fdcc7e138316c7/Inclusive-Decision-Making.pdf

⁹¹ <https://cgspace.cgjar.org/handle/10568/88082>

- f. Long-Term Life Trajectories: What are the long-term life trajectories of young people engaged in climate activism and climate advocacy?⁹²
10. **Education and Resilience**: Youth are hugely affected by climate change physically, psychologically, and socially. Individuals may experience climate-related disasters that challenge them and their families in serious ways. Consequently, many institutions have sought to provide youth with the skills they need to be more resilient in their daily lives, teaching them how to respond to threats such as sea-level rise and encouraging them to take action to reduce climate impact.⁹³ These efforts can empower youth in their daily lives and spur greater participation in community resilience work.
- Learning Curricula: What types of curricula and teaching approaches to climate education are most effective in engaging students and leading to desired learning outcomes?⁹⁴ Does the incorporation of different fields into environmental education projects (e.g. community psychology)⁹⁵ affect youth perceptions of project quality?
 - Learning Techniques: Does field learning affect changes in youth knowledge, leadership, social awareness or commitment to civic action on issues pertaining to climate?⁹⁶
 - Factors Influencing Engagement: What factors (e.g. role models, values, perceptions of control) affect the development of pro-environmental attitudes and behaviors and what are their implications on environmental education?⁹⁷
 - Inclusion of Marginalized Groups: How can educators and international development practitioners best educate young girls and other excluded groups on climate risks to promote community resilience?⁹⁸
 - Educational Empowerment: Do youth exposed to climate education feel more empowered to address climate change later in life than youth who did not receive

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https://www.tandfonline.com/doi/full/10.1080/13504622.2015.1007337?casa_token=QSLiPbTdx1AAAAAA%3AYQvYwG5J1E4GLd3bClja5DIEqrrLIDvJ_Unt-w-1DDm0sUTHJ8f9mcgRrC7jFMPbshdfI_HxBRIbmw

⁹³ <https://www.nytimes.com/2019/12/02/well/family/climate-change-resilience-education.html>

⁹⁴ https://www.tandfonline.com/doi/pdf/10.1080/13504622.2017.1360842?needAccess=true;https://www.tandfonline.com/doi/full/10.1080/13504622.2015.1007337?casa_token=QSLiPbTdx1AAAAAA%3AYQvYwG5J1E4GLd3bClja5DIEqrrLIDvJ_Unt-w-1DDm0sUTHJ8f9mcgRrC7jFMPbshdfI_HxBRIbmw

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<https://scholars.wlu.ca/cgi/viewcontent.cgi?referer=https://scholar.google.com/&httpsredir=1&article=1000&context=cclra>

⁹⁶ <https://psycnet.apa.org/record/2013-04968-003>

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[https://www.degruyter.com/dg/viewarticle/j\\$002fjtes.2013.15.issue-1\\$002fjtes-2013-0002\\$002fjtes-2013-0002.xml](https://www.degruyter.com/dg/viewarticle/j$002fjtes.2013.15.issue-1$002fjtes-2013-0002$002fjtes-2013-0002.xml)

98

<http://documents.worldbank.org/curated/en/667701468177537886/The-costs-to-developing-countries-of-adapting-to-climate-change-new-methods-and-estimates-the-global-report-of-the-economics-of-adaptation-to-climate-change-study>

comparable education?⁹⁹ Which types of climate change education are most effective at changing student behavior and changing perceived efficacy of individual actions?¹⁰⁰

- f. **Education's Impact on Resilience:** Do public investments in climate change education and empowerment have an effect on the vulnerability of youth and other populations to climate-related shocks?¹⁰¹ Which educational programs are most successful in educating youth about climate change without fostering pessimism, fear, and anxiety about the future?¹⁰²

Box 2: Designing Actionable Questions

The above mapping of topics, themes, and questions seeks to reflect and organize the current fields of research and practice for children and climate change. Upon completion of the topic area prioritization process outlined in Box 1, Date for Children Collaborative and The GovLab could collaborate to design actionable questions that could be answered through investment in targeted data collaboration, leveraging our [100 Questions Methodology](#).

Through our work to facilitate data collaboratives in the public interest and create a new science of question design, The GovLab has identified four types of question that can help to guide impactful data use:

1. **Improving situational awareness:** Situational analysis questions ask how increased access to previously inaccessible information might enable stakeholders across sectors to better understand the trends and the geographic distribution of various phenomena. **For example:** What are today's eating patterns among teenagers in both developed and developing countries that will impact population health for the next generation?
2. **Cause-and-effect:** Cause-and-effect questions can help stakeholders better understand the key drivers and consequences of an observed situation. They aim to establish which variables can make a difference for a problem and whether any issues might be correlated. **For example:** What is the relationship between vehicular emissions in relation to children's asthma in local communities?
3. **Prediction:** These questions seek information to enable new predictive capabilities to allow stakeholders to assess future risks, needs, and opportunities. **For example:** Which regions are most likely to benefit from targeted vocational training or apprenticeship programs, and what types of industries are most relevant to those regions?

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https://www.tandfonline.com/doi/pdf/10.1080/03057260508560213?casa_token=wZiD3you5HEAAAAA:AJQdAA1Rt7Rc_haAiGNcHEOEFWwA4WuVUf_8TnwibvgoXnbUwVrOcrVYq8SY5V6EQAbuFAgyMwNdag

¹⁰⁰

https://www.tandfonline.com/doi/abs/10.1080/1350462032000126096?casa_token=uLak46FJVeMAAAAA:6FDGd2etYUpnptN9FCod5TV39x3CvlfzmmwM0I-gzuPsML0Qx6KWUiWFzKUoftd5ZMRJh6275tY-pg

¹⁰¹ https://www.jstor.org/stable/26269470?seq=1#metadata_info_tab_contents

¹⁰²

https://www.tandfonline.com/doi/pdf/10.1080/03057260508560213?casa_token=zrZv_cFLtQMAAAAA:QZs8z85EQDQP_cAZUSFsWWY2MKPTfkkKTqk2I6ENeBIMjAsJnzM4QtHpNbA9ivL6cM_UxYNZ_jeW0w

4. **Impact assessment:** Impact assessment questions try to determine which, whether, and how various inputs affect certain conditions. They can also seek insight into the obstacles hampering the achievement of certain objectives or the success of particular experiments. **For example:** What are the environmental effects created by the introduction of newly protected bike lanes in a city? How does that compare to the introduction of electric scooters?

Mapping Organizations

Given the research tasking, The GovLab searched for organizations that explicitly focused on: a.) climate change; and b.) the well-being of people under the age of 18. It collected a series of organizations found through web searches, referrals, conference programs, and other materials. Through conversations with staff, it focused this list down to 21 notable organizations for the Data for Children Collaborative. Organizations are listed in alphabetical order. They are further sub-divided by type for organizational purposes.

Advocacy Organizations

1. The [Arab Office for Youth and Environment](#) is a non-governmental organization based in Cairo, Egypt that seeks to raise awareness of environmental issues among youth populations in the Middle East and North Africa. It is accredited by the United Nations Environment Assembly.
2. The [Catholic Youth Network for Environmental Sustainability in Africa](#) is a Kenya-based action and advocacy group that engages young people to engage in responsible environmental stewardship and promote sustainable development.
3. [Green Hope Foundation](#) is a Canada-based, youth-led advocacy group that seeks to educate young people, adults, and decision makers about environmental protection policies. It is involved in on-the-ground action campaigns focused on the 17 Sustainable Development Goals.
4. [Jeunes Volontaires pour l'Environnement](#) (Young Volunteers for the Environment) is a Togo-based youth organization, accredited by the United Nations Environment Assembly, which seeks to empower young people to promote environmental protection in their homes, schools, and communities.
5. [Our Children's Trust](#) is a US nonprofit public interest law firm known for filing lawsuits on behalf of youth plaintiffs against governments. It argues that the failure to address climate change infringes upon the rights of its clients and seeks to use the courts to compel public action.

6. [Youth for Action](#) is an Indian advocacy organization that seeks to promote the status of women, children, and youth through sustainable development.

7. [Zero Hour](#) is a youth-led environmental advocacy organization that organizes young people around environmental issues and calls for action to address climate change. It operates primarily in the United States but has chapters in South America, Europe, Sub-Saharan Africa, South Asia, and East Asia and the Pacific.

Government and International Organizations

8. The [Healthy Environments for Children Alliance](#) is a global cooperative, facilitated by the World Health Organization and the United Nations Environment Programme to motivate action on environmental risks to child health. It engages in advocacy, serves as a knowledge platform, promotes action in different sectors and levels of government, supports countries and communities, and monitors progress on sustainability goals.

9. [Global Initiative on Advancing Children's Right to a Healthy Environment](#) is an organization launched with support from the Government of Slovenia and the United Nations Environmental Program to explore children's rights in the context of environmental harm and action. It focuses on empowering children, increasing awareness of child rights within an environmental policy context, convenes stakeholders, and looks for promising policy practices.

10. The [National Environmental Justice Advisory Council](#) is an independent body of the US Environmental Protection Agency that advises the agency's leadership on matters related to environmental justice.

11. [President's Task Force on Environmental Health Risks and Safety Risks to Children](#) is a US government body made up of representatives from the National Institute of Environmental Health Sciences, the Consumer Product Safety Commission, and the Centers for Disease Control and Prevention and other institutions to discuss how the federal government can protect future generations through environmental protection policy. It is supported by an interdepartmental staff.

12. The [United Nations Major Group for Children and Youth](#) is the formal, self-organized forum for individuals under the age of 30 to contribute to and engage with the UN policy process. It is UN General Assembly-mandated and its work includes issues related to climate change.

Universities and Research Organizations

13. The [American Academy of Pediatrics's Council on Environmental Health](#) is a US group of experts specializing in children's environmental health. It advises the academy's leadership on issues related to environmental health, supports legislative efforts to protect child well-being, and hosts educational initiatives.

14. [Children's Environments Research Group](#) is a network within the Graduate Center of the City University of New York that seeks to connect environmental research with organizations and programs involved in improving children's lives.

15. The [Columbia Center for Children's Environmental Health](#) is a community-based research organization based out of Columbia University that studies the health effects of prenatal and early natal exposure to pollutants. It combines methods and disciplines.

16. The [Harvard Center for Climate, Health, and the Global Environment](#) is a US organization within the Harvard School of Public Health that seeks to connect research on the public health aspects of climate change from faculty with action meant to improve public well-being.

17. The [International Society for Children's Health and the Environment](#) is a multidisciplinary research organization in the United States that hosts conversations on the scientific, policy analysis, educational, and clinical aspects of children's environmental health. Its mandate includes translating research into policy, catalyzing action to protect children from environmental hazards, enhancing surveillance of diseases, and promoting better service delivery.

18. The [Mid-Atlantic Center for Children's Health and the Environment](#) is a regional Pediatric Environmental Health Speciality Unit of the US Centers for Disease Control and Prevention that studies, treats, and educates on children's and reproductive environmental health. It serves residents in Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia.

Aid Organizations

19. [CARE's Climate Change and Resilience Platform](#) is a division of the humanitarian organization CARE (coordinated by CARE Netherlands) that seeks to incorporate climate change and resilience into humanitarian work, especially as that work pertains to women and girls and marginalized peoples.

20. The [Red Cross/Red Crescent Climate Centre](#) is a collaboration between the Netherlands Red Cross and the International Federation of the Red Cross that helps the Red Cross and Red Crescent Movement and its partners better respond to the impact of climate change as it cares for vulnerable populations.

Mapping Experts

Relying on the elements previously gathered, The GovLab further searched for professionals at think tanks, universities, international bodies, businesses, and other organizations outside

UNICEF who might possess relevant expertise. It identified several people working on issues related to children and climate change that could form the basis of an expert graph.

The biographies are taken directly from the expert's organizational page. The "focus" tags indicate the previously identified sub-topics on which the expert focuses. Experts are listed in alphabetical order.

1. [Jesse Anttila-Hughes](#), Associate Professor, University of San Francisco

- **Focus:** Poor Air Quality; Contagious Disease Spread; Promoting Education and Resilience
- **Biography:** "Professor Anttila-Hughes received his PhD in Sustainable Development from Columbia University. His research focuses on understanding the social impacts of environmental processes, particularly those influenced by environmental degradation and climate change. Professor Anttila-Hughes' current research areas include: public health impacts of the climate; behavioral responses to new information about environmental risks; and determinants of the spread of environmental attitudes and ideas."

2. [Aaron Bernstein](#), Interim Director of The Center for Climate, Health, and the Global Environment, T.H. Chan School of Public Health, Harvard University

- **Focus:** Contagious Disease Spread; Extreme Weather and Coastal Erosion; Mental Health
- **Biography:** Aaron Bernstein is the Interim Director of The Center for Climate, Health, and the Global Environment at the Harvard T.H. Chan School of Public Health (Harvard C-CHANGE), a pediatrician at Boston Children's Hospital, and an Assistant Professor of Pediatrics at Harvard Medical School. Dr. Bernstein focuses on the health impacts of the climate crisis on children's health and advancing solutions to address its causes to improve the health and wellbeing of children around the world. In 2019, Dr. Bernstein testified before Congress on the child health impacts of climate change, drawing from his personal experience as a pediatrician having to treat children with breathing difficulties, vector-borne diseases, and trauma from natural disasters.

3. [Prashant Bharadwaj](#), Associate Professor and Vice Chair of Graduate Studies, Yale University

- **Focus:** Child Security and Displacement; Service Delivery for Climate-Affected Populations
- **Biography:** "[He is] an Associate Professor in the Department of Economics at the University of California, San Diego. My research interests are in development and labor economics, focusing on the interactions between early childhood health, gender, and education. My research affiliations include BREAD, CEGA, CERP and the NBER. [Prashant is] currently a co-editor at Journal of Human Resources and an associate editor at the Journal of Development Economics."

4. [Janet Currie](#), Henry Putnam Professor of Economics and Public Affairs, Woodrow Wilson School. Co-Director, Center for Health and Wellbeing

- **Focus:** Mental Health; Improving Service Delivery for Climate-Affected Populations
- **Biography:** "Janet Currie is the Henry Putnam Professor of Economics and Public Affairs at Princeton University and the Co-director of Princeton's Center for Health and

Wellbeing. She also co-directs the Program on Families and Children at the National Bureau of Economic Research. She is the President of the American Society of Health Economics, has served as the Vice President of the American Economics Association, and is a member of the National Academy of Sciences, the National Academy of Medicine, and of the American Academy of Art and Sciences. [...] Currie is a pioneer in the economic analysis of child development. Her current research focuses on socioeconomic differences in health and access to health care, environmental threats to health, and the important role of mental health.”

5. [Olivier Deschenes](#), Professor of Economics, University of California Santa Barbara

- **Focus:** Food Insecurity
- **Biography:** “Olivier Deschenes is Professor of Economics at the University of California Santa Barbara [...] Deschenes' research focuses on measuring the costs and benefits of environmental policies. His current research focuses on the potential impacts of climate change on human health, agricultural productivity, and economic activity in the U.S. and around the world using historical data and data from Global Circulation Models. An important component of this research is to identify cost-effective and sustainable adaptation strategies to climate change. He also studies how “green policies” and the development of renewable energy affect labor markets. His research has appeared in leading journals, including the American Economic Review, the Journal of Political Economy, and Science.”

6. [Kristie L. Ebi](#), Professor, University of Washington

- **Focus:** Contagious Disease Spread; Food Insecurity; Extreme Weather and Coastal Erosion
- **Biography:** “Kristie L. Ebi is professor of environmental and occupational health and of global health at the University of Washington. She has been conducting research and practice on the health risks of climate variability and change for over 20 years. Her research focuses on the impacts of and adaptation to climate variability and change, including on extreme events, thermal stress, foodborne safety and security and vector-borne diseases. She focuses on understanding sources of vulnerability, estimating current and future health risks of climate change and designing adaptation policies and measures to reduce the risks of climate change in multi-stressor environments. She has supported multiple countries in Central America, Europe, Africa, Asia and the Pacific in assessing their vulnerability and implementing adaptation measures, in collaboration with WHO, UNDP, USAID and others. She also is co-chair with Tom Kram (PBL, The Netherlands) of the International Committee On New Integrated Climate Change Assessment Scenarios, facilitating development of new climate change scenarios.”

6. [Ben Groom](#), Professor of Environment and Development Economics, London School of Economics and Political Science

- **Focus:** Improving Service Delivery for Climate-Affected Populations
- **Biography:** “Ben Groom is Professor of Environment and Development Economics at the Department of Geography and Environment, London School of Economics and Political Science. He is also an associate of the Grantham Research Institute on Environment and

Climate Change. His research has focussed on the welfare analysis of public policies that have long-term welfare effects. In particular he has worked on the determinants of the social discount rate (SDR) and empirical measures of intergenerational and intra-generational fairness. Current projects include research on the impact of different positions on intergenerational fairness on climate change policy; devising new measures of economic performance that internalise and reflect aversion to income inequality; empirical measures of inequality aversion over environmental quality; and, the causes of deforestation and biodiversity loss, and the effectiveness of preventative policies. His work in these areas cover both developed and developing countries such as Indonesia, Bolivia and Ethiopia.”

7. [Bronwyn Hayward](#), Associate Dean of Postgraduate Research, University of Canterbury (New Zealand)

- **Focus:** Improving Service Delivery for Climate-Affected Populations; Practicing Inclusive Decision-making; Promoting Education and Resilience
- **Biography:** “Bronwyn is a Professor in the Department of Political Science and International Relations and Director of The Sustainable Citizenship and Civic Imagination Research group. Her research focuses on the intersection of sustainable development, youth, climate change and citizenship. Bronwyn is a Coordinating Lead Author for the Intergovernmental Panel on Climate Change AR6 report (cities & infrastructure) and was a lead author for the 2018 Special Report on 1.5 (Sustainable development & Poverty eradication). She is co-primary investigator with University of Surrey's ESRC funded CUSP: Centre for Understanding Sustainable Prosperity, she leads the CYCLES Children and Youth in Cities lifestyle Evaluation study in 7 world cities. She was an Erskine Fellow with University College, Oxford, UK 2017. Recent books are Sea Change: Climate politics and New Zealand (BWB, 2017) and Children, Citizenship and Environment (Routledge, 2012). She served on the International Social Sciences Council steering committee - Transformative Research, as a co-researcher with University of Oslo, Voices of the Future project, a lead author on UNEP's global survey of 18-35 year olds lifestyles and sustainability.”

8. [Brigitte Rudram](#), Technical Adviser, Red Cross/Red Crescent Climate Centre

- **Focus:** Child Security and Displacement; Practicing Inclusive Decision-making; Promoting Education and Resilience
- **Biography:** “Brigitte leads the development and implementation of the Climate Centre’s strategy for young people. Specializing in youth engagement with climate resilience, she promotes design and evaluation of participatory, gender-sensitive and inclusive approaches, and coordinates the piloting of the Y-Adapt curriculum in Guatemala, Haiti and Iran. First engaging with the Climate Centre in 2015, she evaluated serious games for youth-led climate action. Based in the Philippines during 2016–17, she supported participatory design of initiatives, from digital innovation for preparedness and response to local government climate change action planning. Brigitte has previously consulted on innovative approaches to resilience, and she established Nottingham University’s West

Africa Office, initiating knowledge-sharing collaborations across the region. She holds an MSc in climate change and development from the Institute of Development Studies at Sussex University and a BSc in geography from Nottingham University, both in the UK.”

9. [Perry E. Sheffield](#), Assistant Professor, Mount Sinai Institute for Exposomic Research and the Transdisciplinary Center on Early Environmental Exposures

- **Focus:** Poor Air Quality; Contagious Disease Spread; Extreme Weather and Coastal Erosion
- **Biography:** “Dr. Sheffield is co-Director of the New York State Children’s Environmental Health Center (NYSCEHC) —the first state-wide, publicly funded model for children’s environmental health clinical services in the United States. She also serves as Deputy Director of the Region 2 Pediatric Environmental Health Specialty Unit (PEHSU), a US Environmental Protection Agency and Centers for Disease Control and Prevention program that provides environmental health services to communities in New Jersey, New York, Puerto Rico, and the US Virgin Islands. Dr. Sheffield’s research focuses on threats and solutions related to climate change and human health, with a particular emphasis on vulnerable populations such as children and workers. She has authored or contributed to more than 40 peer-reviewed articles or chapters, primarily focused on extreme heat and air pollution. She has spoken internationally and nationally on her research and is an advocate for public policies that protect children’s health. She served as a co-author for the US Global Change Research Program 4th National Climate Assessment (2018).”

10. [Joy Shumake-Guillemot](#), Co-Chair of Global Heat Health Information Network (GHHN), World Health Organization/World Meteorological Organization Climate and Health Office

- **Focus:** Extreme Weather and Coastal Erosion; Service Delivery for Climate-Affected Populations; Promoting Education and Resilience
- **Biography:** “Dr. Joy Shumake-Guillemot “leads the WHO/WMO Climate and Health Joint Office in Geneva Switzerland. She is an environmental health scientist and public health practitioner who has worked with WHO, WMO, UNICEF and others to develop public health policy and programming for climate adaptation and risk management. She has extensive field experience in Africa, Asia, and Latin America supporting public health and humanitarian assistance programs. Her current work focuses on enabling WMO and WHO to work together to accelerate the availability, access and use of climate and weather information that can improve public health policy and practice. She is the founder and co-coordinator of the Global Heat Health Information Network; and plays a leading coordination role for the Health, Environment, and Climate Change Coalition (HECCC) between UN Environment, WHO, and WMO.”

11. [Nick Watts](#), Executive Director, The Lancet Countdown

- **Focus:** Poor Air Quality; Contagious Disease Spread
- **Biography:** Nick is the Executive Director of the Lancet Countdown: Tracking Progress on Health and Climate Change, an independent and multi-disciplinary research collaboration between academic centres around the world. It is based at University College London’s

Institute for Global Health, and is a continuation of the 2015 Lancet Commission on Health and Climate Change. The Countdown tracks and drives progress towards a world which is responding to climate change in a way that protects and promotes public health. Nick is a medical doctor having qualified from the University of Western Australia, and trained in population health (UWA) and public policy (University College London). He regularly consults with the World Health Organization's Dept. of Public Health, Environmental and Social Determinants of Health, where he provides technical expertise on a range of policy issues, and supports the WHO's engagement with the UN Framework Convention on Climate Change.

Mapping Publications

The GovLab consulted a database of peer-reviewed academic journals and other useful documents for resources that could contain useful resources for the study of children and climate change. By searching keywords—such as “child,” “youth,” “climate change,” and “environment”—and checking the scope of the journal, researchers found several publications worthy of highlighting. Publications are listed in alphabetical order.

1. The [Children, Youth and Environments](#) journal “disseminates knowledge and stimulates discussion in support of inclusive and sustainable environments for children and youth everywhere. [...] The CYE journal is a peer-reviewed, multi-disciplinary, online journal, highlighting the physical environments where children and youth live, learn, work and play. The journal values the capacity of children and young people to meaningfully participate in the processes that shape their lives, and publishes papers from distinct viewpoints, varied approaches, and diverse cultures and regions around the world.”
2. [Climate and Development](#) “is the first academic journal dedicated to the range of issues that arise when climate variability, climate change and climate policy are considered along with development needs, impacts and priorities. It makes complex analysis of climate and development issues accessible to a wide audience of researchers, policymakers and practitioners, and facilitates debate between the diverse constituencies active in these fields throughout the world.”
3. [Healthy Environments for Children Alliance listserv](#) “is an international mailing list [from the World Health Organization and UNEP] dedicated to promoting healthy environments for children. The list provides updates on the activities of the Healthy Environments for Children Alliance (HECA), advocacy tools and information resources, relevant meeting announcements, and reports on technical research and monitoring related to environmental risks to children's health.”
4. [International Journal of Climate Change Strategies and Management](#) “is an international forum that addresses the need for disseminating scholarly research, projects and other initiatives aimed to facilitate a better understanding of the subject matter of climate change. The journal publishes papers dealing with policy-making on climate change, and methodological approaches

to cope with the problems deriving from climate change. It disseminates experiences from projects and case studies where due consideration to environmental, economic, social and political aspects is given and especially the links and leverages that can be attained by this holistic approach. It regards climate change under the perspective of its wider implications: for economic growth, water and food security, and for people's survival – especially those living in the poorest communities in developing countries.”

5. [International Journal of Climate Change: Impacts and Responses](#) “seeks to create an interdisciplinary forum for discussion of evidence of climate change, its causes, its ecosystemic impacts, and its human impacts. The journal also explores technological, policy, strategic, and social responses to climate change.”

6. The [Journal of Environmental and Public Health](#) “is a peer-reviewed, Open Access journal that publishes original research articles, review articles, and clinical studies covering all population-wide health issues. The journal serves the public health community, including epidemiologists, clinicians, toxicologists, governmental agencies, policy makers, and NGOs. Articles on health issues relating to the natural and built environment are particularly welcome, including occupational medicine research and practice.”

7. [The Lancet Countdown](#) “is an international, multidisciplinary collaboration, dedicated to monitoring the evolving health profile of climate change, and providing an independent assessment of the delivery of commitments made by governments worldwide under the Paris Agreement.” Its 2019 report focused on the specific health challenges faced by children due to a changing climate.

8. [The Future of Children](#) journal “is a collaboration of the Woodrow Wilson School of Public and International Affairs at Princeton University and the Brookings Institution. Our mission is to translate the best social science research about children and youth into information that is useful to policymakers, practitioners, grant-makers, advocates, the media, and students of public policy. We publish one journal and policy brief each year, in addition to other projects. The policy topics we cover range widely – from education to health to families – with children as the unifying element. Our diverse senior editorial team represents two institutions and multiple disciplines.” It recently published a journal on [children and climate change](#).

9. [The Lancet Planetary Health](#) “is a gold open access journal that seeks to be the pre-eminent journal for enquiry into sustainable human civilisations in the Anthropocene. As such, we publish peer reviewed Research and Reviews as well as Comment and Reportage broadly encompassing sustainable development (the SDG’s) and global environmental change. We particularly favour work that contributes to our understanding of, and transition into, a safe and just space for humanity, respecting planetary boundaries and the social and economic foundations of a healthy life. We are interested in all important aspects of societal development and its interaction with the environment including the drivers of change, the implications of those changes for people and society, and practical policies and interventions for a healthier planetary future.”

10. [Weather and Climate Extremes](#) “provides academics, decision makers, international development agencies, nongovernmental organizations and civil society with publications on different aspects of research in weather and climate extremes, monitoring and early warning systems, assessment of vulnerability and impacts, developing and implementing intervention policies, effective risk management and adaptation practices to address local and regional needs and circumstances, engagement of local communities in the adoption of these practices to cope with extremes, and information and communication strategies. The journal encourages the submission of original research papers, comprehensive review articles, and short communications.”

Mapping Events

The GovLab researchers scanned research and programmatic conferences and events that might host useful conversations on children and climate change. It identified the following possible forums, listed in alphabetical order:

1. The [2020 Global Conference on Health and Climate Change](#) is an event organized by the World Health Organization and Global Climate Health Alliance in collaboration with the Glasgow Caledonian University’s Centre for Climate Justice during the COP26 climate change conference. It will focus on mobilizing health professionals around climate action.
2. The [Clinical Climate Change: Protecting Patients and Improving Health Outcomes in the Climate Crisis](#) is an annual conference hosted by New York’s Icahn School of Medicine at Mount Sinai focusing on the public health issues faced by individuals in a world of increased temperatures and extreme weather events.
3. The [Conference on Youth](#) is an annual international youth conference, with regional affiliate conferences on five continents, devoted to engaging organizations around climate change and environmental topics in anticipation of the annual UN Climate Change Conference.
4. The [European Climate Change Adaptation conference](#) is a biennial event organized by several projects funded under the European Union’s Horizon 2020 Research and Innovation Framework Programme. It brings together academics, government officials, businesses, and communities to discuss the challenges of climate change. The last conference included a call for action by youth.
5. The [Global Conference on Climate and Health](#) is a biennial conference hosted by the World Health Organization to bring together government officials, representatives of vulnerable communities, and technical experts to talk about the relationship between climate change and health.

6. The [Youth for Climate Action: Conference of Youth](#) is an annual conference hosted by the Children and Youth constituency to the United Nations Framework Convention on Climate Change meant to provide young people with a forum to discuss climate change and sustainability. It is hosted after the UN Climate Change Conference.
7. The [UN Youth Climate Summit](#) is an event hosted by the United Nations meant to give young climate leaders an opportunity to meaningfully engage with UN policymakers.

Addendum: Criteria for Area Prioritization

Manifestations of Climate Change

Poor Air Quality				
	Desirability	Novelty	Feasibility	Scalability
Physical Development				
Respiratory Diseases				
Early Childhood Mortality				
Emotional and Mental Health				

Contagious Disease Spread				
	Desirability	Novelty	Feasibility	Scalability
Physical Health and Development				
Disease Suitability and Durability				
Child Resilience				
Disease Burden				

Extreme Weather and Coastal Erosion				
	Desirability	Novelty	Feasibility	Scalability
Impacts on Physical Health				
Immediate Psychological Impacts				
Demographic Variation				
Drought and Water Stress				

Indirect and Cumulative Impacts of Climate Change on Children

Food Insecurity				
	Desirability	Novelty	Feasibility	Scalability
Agricultural Production				
Dietary Diversity				
Infant Nutrition				
Disease				
Economic Impacts				

Mental Health				
	Desirability	Novelty	Feasibility	Scalability
Depression				
Psychological Well-being				
Influence of Age				
Threatened Communities				

Child Security and Displacement				
	Desirability	Novelty	Feasibility	Scalability
Refugee and Displaced Peoples				
Violent Conflict and Human Security				
Welfare and Child Protection				
Impacts of Displacement				

Social Ties				
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Cognitive and Personal Development				
	Desirability	Novelty	Feasibility	Scalability
Physical and Cognitive Development				
Schooling				
Educational Attainment				
Economic Security				

Advocacy and Institutional Responses

Improving Service Delivery for Climate-Affected Populations				
	Desirability	Novelty	Feasibility	Scalability
Need Identification				
Mental Health				
Restorative Work				
Financial Needs				
Education				
Conflict				

Inclusive Decision-making				
	Desirability	Novelty	Feasibility	Scalability
Advocacy Approaches				
Factors				

Contributing to Success and Failure of Youth Advocacy				
Effects of Advocacy				
Institutional Mechanisms				
Youth Empowerment				
Long-Term Life Trajectories				

Education and Resilience				
	Desirability	Novelty	Feasibility	Scalability
Learning Curricula				
Learning Techniques				
Factors Influencing Engagement				
Inclusion of Marginalized Groups				
Educational Empowerment				
Education's Impact on Resilience				