

# Yale Center on Climate Change and Health

## Annual Report Summary

### Year 6: July 1, 2020 to June 30, 2021

*The Yale Center on Climate Change and Health is led by Dr. Robert Dubrow, Faculty Director, and Dr. Martin Klein, Executive Director, in collaboration with YCCCCH staff and faculty, Advisory Committee, 35 affiliated faculty members from across the University, and with the support of Student Associates.*

## YCCCCH Structure and Administration

- **University Center:** The Yale Center on Climate Change and Health (YCCCCH) is a provost-approved university center, with a four-year [strategic plan](#) (2020-2024).
- **YCCCCH Core Team:** Robert Dubrow (Faculty Director); Martin Klein (Executive Director), Kai Chen (Director of Research), Laura Bozzi (Director of Programs), Jodi Sherman (Director of Program on Healthcare Environmental Sustainability), Mauro Diaz-Hernandez (Program Administrator).
- **Assistant or Associate Professor in Climate Change and Health:** In June 2021, we received approval to recruit through an international search an Assistant or Associate Professor in Climate Change and Health to serve as the YCCCCH Director of Education and a core YCCCCH faculty member.
- **Advisory Board:** The YCCCCH [Advisory Board](#) includes students, faculty from other universities, and representatives from government and non-profit organizations.
- **Affiliated Faculty:** As of June 2021, we had 35 [Affiliated Faculty](#), 25 with primary appointments at YSPH and 10 with primary appointments in other schools or departments.
- **Communications:** We maintain a [YCCCCH website](#) within the YSPH website. We also have an active Twitter account (@cchyale). We have worked closely with the YSPH Communications Office to produce news articles highlighting YCCCCH efforts. In July 2020, we launched the publication of a monthly newsletter that reaches approximately 1,300 recipients.

## Program Accomplishments

### Research

- **Core Research Program:** The core research program is led by Dr. Kai Chen, the YCCCCH Director of Research. Through this program, we are building a vibrant community of doctoral students, postdoctoral researchers, and collaborating faculty who apply multidisciplinary approaches – including climate and air pollution sciences, exposure assessment, mathematical and statistical modeling, and environmental epidemiology – to investigate a) interactive effects on human health of ambient temperature, air pollution, extreme weather events, demographic factors, and social determinants; b) future climate change impacts as determined by modeling of alternative scenarios; c) health co-benefits of climate change mitigation and adaptation measures and related policies; d) effects of mitigation and adaptation policies on reducing disparities in environmental exposures and their adverse health effects; and e) adaptation strategies, especially to extreme heat. The program aims to produce policy-relevant knowledge that can be used to advance climate change mitigation and adaptation in a manner that promotes health and protects vulnerable populations. During the 2020-21 academic year, the core research program included Dr. Chen, Dr. Dubrow, Dr. Pin Wang (postdoctoral researcher), five doctoral students, one visiting doctoral student, one master's student, and one undergraduate student.
- **Research grant awards:** YCCCCH core faculty were awarded a number of research grants: (1) [Effect of air pollution reductions on mortality during the COVID-19 lockdown: a natural experiment study](#). PI: Kai Chen.

Funder: Health Effects Institute. Two-year award: \$499,101. (2) [Associations between extreme precipitation, floods, or drought and childhood diarrhea in low- and middle-income countries](#). PI: Kai Chen. Funder: Reckitt Global Hygiene Institute. Two-year award: \$300,000. (3) *Ethane cracker plants in the United States: emissions and community vulnerability*. PI: Dr. Nicole Deziel. Funder: High Tide Foundation. One-year award: \$100,000

- **Yuet Mei Chin Innovation Fund for Junior Faculty:** The donor has committed \$1,000,000 for this endowed fund over a five-year period, with the first payment made in 2021. The expendable income from the fund will be used to provide pilot grants to junior faculty in YSPH for projects involving climate change and health.
- **Support for a postdoctoral associate:** YCCCH received a \$63,851 private donation to support a postdoctoral associate to work with Drs. Chen and Dubrow.
- **Lancet Countdown: Tracking Progress on Health and Climate Change:** The [Lancet Countdown](#) is an international collaboration that produces an annual report, published in *The Lancet*, that tracks indicators of global progress (or lack of progress) on climate change and health. Yale, represented by YCCCH, has been a member of the collaboration since 2018. Drs. Dubrow and Sherman were among the co-authors of the 2020 report, contributing indicators on (1) mitigation in the healthcare sector and (2) air conditioning: benefits and harms. Drs. Sherman and Bozzi served as reviewers for the ancillary [2020 Lancet Countdown on Health and Climate Change Policy Brief for the United States of America](#).
- **Planned virtual “Conference on Climate Change and Health in Small Island Developing States: Focus on the Caribbean” (October 5-8, 2021):** Although the Caribbean islands have made negligible contributions to the world’s greenhouse gas emissions, they are among the most vulnerable countries/territories in the world to the adverse effects of climate change, posing monumental public health challenges. Consequently, and because the Caribbean is in our “backyard,” YCCCH has made the Caribbean our top global priority, with this conference being our first significant activity. YCCCH has served as a lead organizer for the conference, which is being organized in partnership with more than 25 international, U.S., and Caribbean organizations.

#### Yale Program on Healthcare Environmental Sustainability

- The [Yale Program on Healthcare Environmental Sustainability](#) (Y-PHES), led by Dr. Jodi Sherman, is housed within YCCCH. The health sector is a leading emitter of greenhouse gas and non-greenhouse gas pollution. Y-PHES seeks to improve the environmental performance of the healthcare sector by a) quantifying its environmental impacts to aid decision-making and b) designing and testing interventions to reduce unnecessary resource consumption, waste, and greenhouse gas emissions. The program is a partnership among the Schools of Public Health, Nursing, and Medicine, working in close collaboration with Yale-New Haven Health System. Y-PHES hosted the following virtual events in 2020-1:
  - [Mitigation in the Healthcare Sector](#) in collaboration with the Lancet Countdown
  - [Clinical Sustainability: Environmental Stewardship at the Bedside](#) (part of the CleanMed Virtual Series)
  - [Covid 19, Climate Change and Supply Chain Resiliency](#) in collaboration with the Nordic Center for Sustainable Healthcare
  - [Care Without Carbon: The Road to Sustainability in US Health Care](#): The Inaugural Yale University Sustainability in Health Care Symposium was offered in partnership with the Yale Center for Business and the Environment, University College London Energy Institute, the Lancet Countdown, the Northeastern University College of Engineering, and the Nordic Center for Sustainable Healthcare.

## Education

### Education & Training for Yale Students

- **Climate Change and Health Concentration for MPH Students:** 2020-21 was the inaugural year of YCCCH's [Climate Change and Health Concentration](#) for MPH students. Concentrations are cross-departmental programs, with specific requirements, that are open to all MPH students, regardless of department. In December 2020, three MPH students from the Class of 2022 were accepted to join the concentration.
- **EHS 547: [Climate Change and Public Health](#):** This course is the foundational climate change and public health course offered at YSPH. It was developed and taught by Dr. Dubrow.
- **EHS 560: [Methods in Climate Change and Health Research](#):** Dr. Chen offered this course for the first time in Fall 2020. The course is an important component of both the Climate Change and Health MPH Concentration and the doctoral course sequence for students working with Drs. Chen and Dubrow.
- **EPH 555, [Clinic in Climate Justice, Climate Policy, Law, and Public Health](#):** This course, an innovative collaboration between YSPH, Yale School of the Environment, and Vermont Law School, includes students from both Yale and Vermont Law School. In the course, interdisciplinary student teams carry out applied projects that incorporate elements of climate justice, climate policy, and/or law with public health, in collaboration with a partner organization. The Northern New England Rural Transportation and Climate Justice team produced a [project brief](#), which was shared with regional stakeholders. YCCCH received a three-year grant for \$189,700 from the *SNF Fund for the Integration of Theory and Practice* to support the clinic.
- **EPH 570 and 571: Seminar in Climate Change and Health:** During the 2020-21 academic year, we expanded our speaker series into a not-for-credit seminar course meeting four times each semester. The seminar is a required course for students in the Climate Change and Health Concentration, as well as open to the public.
- **[YCCCH Student Associates](#):** Student Associates serve one-year terms as ambassadors for YCCCH while engaging with a diverse community of like-minded students. Associates gain broad exposure to issues of climate change and health through small, seminar-style discussions with field experts whom they help to select. Associates also participate in additional programming such as workshops and skill-based training, film screenings, and student-led presentations/discussions. Finally, Student Associates are paired with experts in the field through our Mentorship Program. For the 2020-21 academic year, we had 26 Student Associates representing the Schools of Public Health, the Environment, Medicine, Divinity, and Engineering; the Jackson Institute for Global Affairs; and Yale College.
- **Summer Internships in Climate Change and Health:** YCCCH further expanded its summer internship program to meet the significant interest in the field of climate change and health. The 2021 program was open to MPH students, YCCCH Student Associates, and for the first time, undergraduate students in the Environmental Studies major. Through a two-step process, eligible students applied to be matched with one of the summer internship projects, and then the selected students applied for funding from sources including – but not limited to – YCCCH. This revised process allowed us to continue building connections with key partner organizations and to expand our reach by leveraging other Yale funds to support the students. We placed students with the CT Institute for Resilience and Climate Adaptation (Groton, CT), East Shore District Health Department (Branford, CT), EarthMedic & EarthNurse (Trinidad and Tobago), Montana Health Professionals for a Healthy Climate, WE ACT for Environmental Justice (New York, NY), Eastern Caribbean Health Outcome Research Network (New Haven/ Atlanta), Save the Sound (New Haven, CT), California Department of Public Health, the Governor's Council on Climate Change (Hartford, CT), New Haven City Plan Department, the University of Maryland School of Public Health, Dejusticia (Bogota, Colombia), and YCCCH.
- **Climate Change and Health Pre-Doctoral Fellowships:** Alyssa Parpia completed her fifth year; her dissertation advisor is Dr. Alison Galvani. Sappho Gilbert, who completed her fourth year, was awarded a two-year pre-doctoral fellowship from the National Institute of Environmental Health Sciences for a dissertation entitled "Socio-environmental determinants of grocery sales and community nutrition in transition in Nunavut,

Canada.” Her dissertation advisor is Dr. Dubrow. Lingzhi Chu (funded by the China Scholarship Council [CSC]) completed her third year with dissertation advisor Dr. Dubrow; her dissertation prospectus, “Ambient temperature, humidity, air pollution and renal disease risk,” was approved with distinction. In addition, she was awarded a Dan David Prize Scholarship. Yiqun Ma (funded by the CSC) completed her second year, and Chengyi Lin (funded by YSPH) completed her first year; Dr. Chen is the advisor for both students.

### Continuing Education

- **Online Certificate Program in Climate Change and Health:** YCCCCH has continued to offer the well-regarded online [Climate Change and Health Certificate](#) program for working professionals. This 18-week program consists of three consecutive six-week courses: *Introduction to Climate Change and Health*, *Climate Adaptation for Human Health*, and *Communicating Climate Change and Health*. We offered the program in September 2020 (84 students representing 16 countries) and in February 2021 (77 students representing 10 countries). In student evaluations, 99% would recommend the certificate program to others and 92% rated the program as excellent or very good. In 2020-21, YCCCCH received a net income of \$234,007 from the certificate program to support YCCCCH activities.
- **Coursera Specialization:** We continue to offer the three-course [Coursera Specialization, Climate Change and Health: From Science to Action](#). Coursera is an online course platform with a large, global reach. The Specialization is an abridged version of the online certificate program.

### Public Health Practice

#### Policy Impact Unit: Focus on Connecticut

- **Climate Change and Health in Connecticut: 2020 Report:** In Fall 2020, YCCCCH launched its Policy Impact Unit, which leverages YCCCCH research and public health practice projects to inform climate policy. The initial focus of the unit, which is led by Dr. Laura Bozzi, YCCCCH Director of Programs, is on [Connecticut climate mitigation and adaptation policies](#). In September 2020, we issued [Climate Change and Health in Connecticut: 2020 Report \(2020 Report\)](#), a first-of-its-kind comprehensive report on climate change and health in Connecticut. The report tracks 19 indicators across four domains – temperature, extreme events, infectious diseases, and air quality.
- **Dissemination & Media:** The *2020 Report* was distributed to state legislators, local health officials, agency directors, advocates, and other decision-makers. The report received substantial television, print, and radio media attention, including from the [Connecticut Mirror](#), [Danbury News Times](#), [WTNH \(TV news\)](#), [WNPR \(radio\)](#), and [Yale Daily News](#). As a result of our active engagement in state climate policy activities, the report is cited in the Connecticut Governor’s Council on Climate Change (GC3) Adaptation Plan. Dr. Bozzi also led development of the GC3’s extreme heat adaptation recommendations.
- **Climate Change & Health Issue Briefs:** YCCCCH authored issue briefs that align with the *2020 Report’s* four domains, summarizing the key findings and extending them to include policy recommendations, including Issue briefs on [Extreme heat in Connecticut](#) and [The air quality health benefits of climate action in Connecticut](#). We also published a brief entitled [Natural gas policy and health in Connecticut](#), which resulted from an MPH thesis. Two more issue briefs – on extreme events and vector-borne diseases – are planned for 2021-2. We received a \$10,560 gift from The Patrick and Catherine Weldon Donaghue Medical Research Foundation to support the design, printing, and distribution of the *2020 Report* and the policy briefs.

### Outreach

- YCCCCH faculty and staff engaged in public speaking events and media appearances to educate about climate change and health and propel policy action: keynote address at the Connecticut Commission on Women, Children, Seniors, Equity & Opportunity-sponsored [Climate Change Summit](#); lecture during [Yale Climate Day](#);

speaking event during Earth Day Initiative & March for Science NYC's [Earth Day 2021 virtual event](#); an interview with [Yale Climate Connections](#) in a piece entitled, [COVID recovery packages should include climate solutions](#); and the inaugural presentation in the Yale Alumni Academy's [Climate Change Conversations](#) series.

### Advocacy Training for Climate Action

- YCCCH's annual advocacy training for climate action took place virtually throughout February 2021. Sessions addressed: (1) the role of citizen science and incorporating voices and knowledge from community members' lived experiences into science and advocacy; (2) stakeholder analysis and leveraging connections to create curriculum changes; (3) crafting and communicating a message in ways that motivate action; (4) fact finding and using data to support messaging; and (5) writing effective op-ed pieces in local and national media outlets.

### YSPH Sustainability Committee

- The committee is guided by a [YSPH Sustainability Action Plan](#), developed in 2018 in coordination with the [Yale Sustainability Plan 2025](#). During the 2020-21 academic year, all classes were taught virtually and all faculty and staff worked from home due to the COVID-19 pandemic. This virtual environment posed challenges for advancing sustainability within the YSPH physical space, but we were able to pivot and held successful virtual "coffee hours" on [Electric vehicles: taking charge of vehicle choices](#), [Transitioning to plant-forward food](#), [Priorities for climate change legislation in Connecticut](#), and [Composting basics](#).

## Major Year 7 Goals

Year 7 will focus on implementing the second year of our four-year strategic plan. Highlights include:

- **Recruitment of a new core faculty member to serve as YCCCH Director of Education.** We aim to conduct an international search, with the aim of recruiting the Director of Education, with a start date of January 1, 2022.
- **Conference on Climate Change and Health in Small Island Developing States: Focus on the Caribbean, October 5-8, 2021.** YCCCH has identified the Caribbean as its top global priority. This conference, for which YCCCH has served as a lead organizer, represents our first major activity. We are organizing the conference in partnership with more than 25 international, U.S., and Caribbean organizations.
- **Climate Change and Health Concentration for MPH Students.** We aim to enroll at least 10 students from the Class of 2023 into the concentration.
- **Expansion of core research program team.** We aim to add a postdoctoral associate, a predoctoral fellow, and a visiting scientist to our research team.
- **Policy Impact Unit: Focus on Connecticut.** We aim to publish policy briefs on extreme events and vector-borne diseases.
- **Fundraising.** We aim to secure at least two major new grants or donations, and to actively support efforts associated with the university's capital campaign.