

Yale Climate Change and Health Initiative Annual Report

August 1, 2016 to July 31, 2017

Executive Summary

During Year 2 (August 1, 2016 – July 31, 2017) of the Overlook International Foundation grant to support the Climate Change and Health Initiative (CCHI) at Yale School of Public Health (YSPH), we have implemented all the activities described in the grant proposal; become known nationally as a locus for climate change and health at Yale; established goals for the next three years; and planned a full set of activities for Year 3.

In summary, our Year 2 accomplishments include:

- the addition of two senior scientists, Dr. Yawei Zhang and Dr. Michelle Bell, to our Executive Committee
- affiliation with the Global Consortium on Climate and Health Education, the Planetary Health Alliance, and the US Climate and Health Alliance
- a globally-recognized climate change leader in residence
- recruitment of our second pre-doctoral fellow (matriculating in Year 3)
- teaching of the course “Climate Change and Public Health”
- teaching of a case study entitled “The role of nuclear power in climate change mitigation in Connecticut” in the environmental health sciences core course
- three funded summer internships
- teaching of the “Practicum in Climate Change, Sustainability, and Public Health,” including a Leadership Development Workshop
- acceptance of two abstracts stemming from the practicum course for the November 2017 American Public Health Association Annual Meeting
- establishment of a CCHI Student Associates program that provides a venue for students across the university to discuss ideas in an interdisciplinary environment, learn from experts in the field, and grow together to ultimately perform research or implement interventions on pressing topics related to climate change and health
- two prominent climate change and health researchers for our speaker series
- our second pilot research grant

Furthermore, CCHI continues to receive strong support from the administration as evidenced by:

- an ongoing financial commitment to our pre-doctoral fellow
- a Sustainability Committee that guided the school’s the YSPH departmental paper competition and development of a 2017-2025 Sustainability Action Plan
- receipt by Dr. Dubrow and Ms. Heidi Richard of the Faculty & Staff Collaboration Award from the Yale Office of Sustainability
- funding of a student proposal, with Dr. Dubrow as faculty advisor, for a student team to work with the YSPH Sustainability Committee to minimize waste at YSPH catered events
- conduct of two workshops for students on “Climate justice: greenhouse gas emissions reduction in developing countries” that resulted in a YSPH contribution of \$15,000 to Cool Effect projects
- a departmental competition that resulted in a 29% reduction in paper use at YSPH
- a new faculty line funded by the Dean to attract a national leader in climate change and health research

I. CCHI Structure and Administration

A. Executive Committee

The Executive Committee acts as CCHI's governing body. The Executive Committee meets quarterly and has interim communication via email as needed. For 2016-17, we added Dr. Yawei Zhang and Dr. Michelle Bell to the Executive Committee. Dr. Durland Fish, Professor Emeritus of Epidemiology (Microbial Diseases), who served on the Executive Committee in 2015-16, now serves as a Senior Consultant. The following is the Executive Committee's current membership:

- **Dr. Robert Dubrow**, Faculty Director of CCHI, Professor of Epidemiology (Environmental Health)
- **Dr. Martin Klein**, Executive Director of CCHI, Senior Advisor, YSPH Dean's Office
- **Dr. Albert Ko**, Chair of Department of Epidemiology of Microbial Diseases, Professor of Epidemiology (Microbial Diseases)
- **Dr. Vasilis Vasiliou**, Chair of Department of Environmental Health Sciences, Professor of Epidemiology (Environmental Health)
- **Dr. Yawei Zhang**, Associate Professor of Epidemiology (Environmental Health), Section Chief of Surgical Outcomes and Epidemiology, Department of Surgery, School of Medicine
- **Dr. Michelle Bell**, Mary E. Pinchot Professor of Environmental Health, School of Forestry & Environmental Studies

B. Affiliated Faculty

We have 28 [Affiliated Faculty](#), 19 with primary appointments at YSPH and nine with primary appointments in other schools or departments.

C. CCHI Website

We continue to maintain a [CCHI website](#) within the YSPH website.

D. Student assistants

Emma Ryan, a Yale College senior in the joint BA-MPH program, served as the CCHI Research Assistant. Her duties included maintaining and updating the CCHI website and calendar; helping to organize and publicize CCHI events; identifying summer internship opportunities; conducting research on topics and organizations; acting as an advocate and representative of the program to student groups; and supporting the work of the faculty director and executive director as needed.

Arsalan Marsani, a first-year MPH student, helped support the work of the Sustainability Committee.

Kathleen Clark, a rising senior from Northwestern University, served as a summer intern (paid by Northwestern) to help develop the public health practice program (see IV.B).

E. Affiliations

CCHI has affiliated with the following organizations:

- [Global Consortium on Climate and Health Education](#)
- [Planetary Health Alliance](#)
- [US Climate and Health Alliance](#)

II. Program accomplishments

A. Leadership

1. Dean's Fund for Climate Change and Health

The Dean's Fund for Climate Change and Health supported the CCHI Student Associates program (see II.B.6); attendance of CCHI Executive Director, Dr. Martin Klein, at the Workshop on Weather, Climate and Health sponsored by the National Center for Atmospheric Research, Centers for Disease Control and Prevention, and University of Colorado School of Public Health from July 17 to 20, 2017 in Boulder, CO; and attendance of Charlotte Lawrence, a student in Dr. Dubrow's Spring 2017 term practicum course, at the American Public Health Association Annual Meeting, November 4-8, 2017 to present the results of her student team project in a Roundtable sponsored by the Health Administration Section (see.II.B.5).

2. Climate Change Leader in Residence

Our second "Climate Change Leader in Residence" was Dr. Kristie Ebi, who visited Yale April 4-6, 2017. Dr. Ebi is Professor of Global Health and Environmental and Occupational Health Sciences and Director of the Center for Health & the Global Environment at the University of Washington. Dr. Ebi is one of the pioneers in research on climate change and health. She conducts research on the impacts of climate change on extreme events, thermal stress, foodborne safety and security, water-borne diseases, and vector-borne diseases. She also focuses on understanding sources of vulnerability and designing adaptation policies and measures to reduce the risks of climate change. Dr. Ebi was Executive Director of the Intergovernmental Panel on Climate Change (IPCC) Working Group II Technical Support Unit during 2009 – 2012, and was a coordinating lead author or lead author for assessments of the health effects of climate change for two US national assessments, the IPCC Fourth Assessment Report, the Millennium Ecosystem Assessment, and the International Assessment of Agricultural Science and Technology for Development. Her activities as a Climate Change Leader in residence included:

- a public talk at YSPH: "Lessons learned on health adaptation to climate change in low- and middle-income countries"
- a public talk at the School of Forestry & Environmental Studies: "Health co-benefits of climate change mitigation policies and technologies"
- a College Tea at Branford College: "Climate justice and health equity"
- dinner with CCHI Student Associates
- meetings with faculty and students at Yale Nursing School
- various individual and group meetings with faculty and students

See Appendix II.A.2 for Dr. Ebi's complete itinerary and event fliers.

3. Climate Change and Health Leadership Development Workshop

In our grant proposal, we included a weekend workshop on leadership, strategy development, and policy implementation for a select group of Yale students from across the University. As described in the 2015-16 Annual Report, we decided to link the workshop to a new course entitled “EPH 555b, Practicum in Climate Change, Sustainability, and Public Health.” We describe the workshop, held in November 2016, in section II.B.5 in conjunction with our description of the course.

B. Education

1. Climate Change and Health Pre-Doctoral Fellowships

Our first pre-doctoral fellow, Alyssa Parpia, matriculated into the YSPH doctoral program in the Department of Epidemiology of Microbial Diseases in September 2016 and successfully completed her first year. She is interested in quantifying the impact of climate change on water-borne disease outbreaks and spread in Southeast Asia and East Africa. She also seeks to study diarrheal diseases in climate refugee populations and to evaluate the impact of public health and sanitation infrastructure interventions in reducing diarrheal disease risk.

To recruit our second fellow, we advertised the fellowship again during the fall of 2016 and received 49 applications. Sappho Gilbert, our top choice, accepted our offer. She has experience conducting research on mental health and wellness practices in Inuit communities in Nunavut, Canada and aims to focus her dissertation research on the effects of climate change on the health of indigenous Arctic communities. Ms. Gilbert will matriculate in September 2017. See Appendix II.B.1 for Ms. Gilbert’s curriculum vitae and a flier about the fellowship.

2. Graduate Course on Climate Change and Health

Dr. Dubrow prepared a new course, “CDE 547a, Climate Change and Public Health” and taught it in the Fall 2016 term. The following is the course description (see Appendix II.B.2 for course syllabus):

This course takes an interdisciplinary approach to examining relationships between climate change and public health. After placing climate change in the context of the Anthropocene, planetary boundaries, and planetary health and exploring the fundamentals of climate change science, the course covers impacts of climate change on public health, including heat waves, occupational heat stress, tropospheric ozone, wildfires, aeroallergens, vector-borne, foodborne, and waterborne diseases, water scarcity, food insecurity, migration, violent conflict, natural disasters, and health co-benefits of climate change mitigation. The course integrates climate justice issues and adaptation strategies into the discussion of specific topics. The course is reading-intensive, and makes ample use of case studies. There is a focus on critical reading of the literature and identifying research gaps and needs. This course should be of interest to students across Yale School of Public Health and the University.

Thirteen students took the course, which received a rating of 4.1 (out of 5) according to the student course evaluations.

3. Climate Change and Health Case Study

Case studies are powerful tools to examine real world problems from multiple perspectives. They allow students to explore the complexities of an issue, understand the motivations of individuals and organizations, and determine the factors that can lead to success or failure.

We developed a web-based case study, entitled "[The role of nuclear power in climate change mitigation in Connecticut](#)," in collaboration with Dr. Jaan Elias, Director of Case Study Research, Yale School of Management. Katherine Bagley, an environmental journalist currently with Yale Environment 360 and formerly with Inside Climate News, served as our case writer. In the Fall 2016 term we taught the case study in the environmental health sciences MPH core course, "EHS 510a, Principles of Environmental Health." We used two class sessions to teach the case study. In the first session, Dr. Dubrow presented an overview of climate change and health. During the second session, we held three simultaneous debates in which teams of students argued for or against nuclear power having a role to play in climate change mitigation in Connecticut. See Appendix II.B.3 for the case study assignment.

4. Summer Internships on Climate Change and Health

All MPH students are required to complete a 10-12 week full-time summer internship. The internship enables students to participate in real world public health projects and research and provides an opportunity for students to clarify their professional goals and to evaluate their career options. We provided funding for three summer internships:

- **Angela Lee:** Fish byproducts and iron availability at the Agricultural University of Athens (Preceptor: Dr. Debbie Humphries, Clinical Instructor in Epidemiology, Department of Epidemiology of Microbial Diseases) (co-funded by YSPH)
- **Elizabeth Moore:** Internship at the Public Health Institute's Center for Climate Change & Health (Preceptor: Dr. Robert Dubrow, Professor of Epidemiology, Department of Environmental Health Sciences)
- **Katherine Wolf:** Unconventional oil and gas disposal wells in the United States: an environmental justice impact analysis (Preceptor: Dr. Nicole Deziel, Assistant Professor of Epidemiology, Department of Environmental Health Sciences) (co-funded by the Stolwijk Fellowship)

5. Practicum in Climate Change, Sustainability, and Public Health

In the Spring 2017 term, Dr. Dubrow taught a new course entitled "EPH 555b, Practicum in Climate Change, Sustainability, and Public Health." The following is the course description:

This course is one of the options available to students to fulfill the practice requirement for the MPH degree. In this course, interdisciplinary student teams carry out applied research or practice projects in the area of climate change, sustainability, and public health. Each team works with a sponsoring organization (e.g., unit within Yale, local health department, state agency, community organization, other non-governmental organization). As a prerequisite for enrollment, this unique Spring Term course requires participation in the Fall Term Climate Change, Sustainability, and Public Health Leadership Development Workshop, a partnership between the Climate Change and Health Initiative, the Global Health Leadership Institute, and the Office of Sustainability. In September, students apply to join a team, and in November the selected students participate in this weekend workshop that provides training on leadership, strategic problem solving, and policy/applied research implementation. Teams use these skills to further conceptualize and plan their projects. These established student teams then

implement their projects in this Spring Term course, which affords the opportunity to apply concepts and competencies learned in the workshop and in the classroom to this important area of climate change, sustainability, and public health. This course should be of interest to students across Yale School of Public Health and the University.

We issued a request for applications to enroll in the course in September 2016. We received 22 applications and accepted 17 students into the course, each to be part of a student team working on one of the following four projects:

Project	Organization
<u>Reducing automobile use for short workday trips by Yale employees</u>	Yale Office of Sustainability
<u>Developing a healthy, sustainable, and tasty pizza for Yale events</u>	Being Well at Yale
<u>Bacterial contamination in Long Island Sound: improving beach closure policy and assessing the effects of climate change</u>	East Shore District Health Department (East Haven, Branford, North Branford)
<u>Carbon footprint impact of reduction in unnecessary medical testing in a hospital clinic</u>	Yale-New Haven Hospital, Department of Anesthesiology, Pre-operative Admission Testing Clinic

We held the Leadership Development Workshop on Friday, November 4 and Saturday, November 5, 2016. Workshop attendees included the students and the sponsoring organization preceptors. The keynote address, entitled “Never doubt what a small group of committed people can accomplish,” was delivered by Dr. Elizabeth Bradley, Brady-Johnson Professor of Grand Strategy and Director, Global Health Leadership Institute. On Saturday, we had an all-day working session facilitated by Heather Fosburgh, Program Manager, Yale Global Health Leadership Institute, in which the student teams applied “the 8 steps of strategic problem solving” to their projects. The workshop culminated in a presentation by each team.

Fifteen students took the course, which received a rating of 4.2 (out of 5) according to the student course evaluations. Dr. Dubrow will be giving an oral presentation about the course at the American Public Health Association Annual Meeting, November 4-8, 2017 in a session entitled “Climate change in public health education and public health practice.” In addition, Charlotte Lawrence, a member of the student team that conducted the project entitled “Carbon footprint impact of reduction in unnecessary medical testing in a hospital clinic,” will present the results of the project in a Roundtable sponsored by the Health Administration Section and entitled “Hot topics for health administrators.”

See Appendix II.B.5 for the request for applications to enroll in the course, the course application, the Leadership Development Workshop agenda, the list of Leadership Development Workshop attendees, and the course syllabus.

6. CCHI Student Associates

The CCHI Student Associates program provides a venue for students across the university to discuss ideas in an interdisciplinary environment, learn from experts in the field, and grow together to ultimately perform research or implement interventions on pressing topics related to climate change and health. Alyssa Parpia, the CCHI Pre-Doctoral Fellow, served as the program coordinator. In September 2016, we issued a request for applications. We received 31

applications and admitted [17 students](#) as CCHI Student Associates. These students were from the Schools of Public Health, Forestry and Environmental Studies, Medicine, Nursing, and Divinity, and Yale College. The Students Associates organized seminars with [Dr. Miraj Desai](#), Associate Research Scientist, Department of Psychiatry, Yale School of Medicine; [Dr. Jeffrey Shaman](#), Associate Professor, Department of Environmental Health Sciences, Columbia Mailman School of Public Health; [Dr. Theodore Andreadis](#), Director of the Connecticut Agricultural Experimental Station and Clinical Professor of Epidemiology, Department of Epidemiology of Microbial Diseases, YSPH; and [Tiokasin Ghosthorse](#), a Native American activist. The students also attended special CCHI-Student-Associates-only discussion sessions with CCHI speakers (Drs. Semenza and McCormick [see II.C.1]), as well as a dinner with Dr. Ebi. See Appendix II.B.6 for request for student applications and application form.

C. Research

1. Speaker Series on Climate Change and Health

In the Fall 2016 term, we hosted Dr. Jan Semenza, Head of the Scientific Assessment Section at the European Centre for Disease Prevention and Control, who gave a talk about “Climate change and other drivers of infectious disease threat events in Europe.”

In the Spring 2017 term, we hosted Dr. Sabrina McCormick, Associate Professor, Department of Environmental and Occupational Health, Milken Institute School of Public Health at George Washington University, who spoke about “Climate change in the court system: a new role for public health.”

See Appendix II.C.1 for the speakers’ itineraries and the event fliers.

2. Climate Change and Health Pilot Research Grant

The purpose of this annual \$25,000 award is to catalyze climate change and health research among our faculty. The expectation is that the pilot project will allow faculty to gather preliminary data necessary to apply for much larger federal or foundation grants. The 2016 award went to co-Principal Investigators Dr. Virginia Pitzer, Assistant Professor, Department of Epidemiology of Microbial Diseases; Dr. Daniel Weinberger, Assistant Professor, Department of Epidemiology of Microbial Diseases; and Dr. William Boos, Associate Professor, Department of Geology and Geophysics, for a project entitled “Consequences of climate change for risk of enteric infections: investigating links between hydrology and water-borne disease.” This pilot project has resulted in one manuscript in press and three manuscripts in preparation:

Metcalf CJE, Walter KS, Wesolowski A, Buckee CO, Shevliakova E, Tatem AJ, Boos WR, Weinberger DM, Pitzer VE (2017). Identifying climatic drivers of infectious disease dynamics: recent advances and challenges ahead. *Proc Biol Sci.* (in press)

Saad NJ, Lynch VD, Antillón M, Yang C, Crump JA, Pitzer VE. Seasonal dynamics of typhoid and paratyphoid fever. (in prep)

Lynch VD, Saad NJ, Pitzer VE. Influence of climatic factors on enteric fever: a systematic review. (in prep)

Saad NJ, Weinberger DM, Karkey A, Baker S, Boos WR, Pitzer VE. The impact of rainfall on enteric fever: a time series and mechanistic modelling approach. (in prep)

For the 2017 award, we had a two-stage application process. First, we received four letters of intent. These letters were reviewed by the Executive Committee, which chose two for submission of full applications. A review committee composed of faculty with no conflicts of interest then reviewed the full applications and chose the project entitled “Effects of extreme

climate events on environmental reservoirs and dispersion of Legionella,” submitted by Dr. Daniel Weinberger, Assistant Professor, Department of Epidemiology of Microbial Diseases.

See Appendix II.C.2 for Dr. Pitzer’s final report, the 2017 Request for Applications, and the successful 2017 application.

III. YSPH Commitment

A. Pre-Doctoral Fellowships

As committed, YSPH paid half the tuition and the full health insurance for our Climate Change and Health Pre-Doctoral Fellow, Ms. Parpia.

B. Sustainability Committee

In 2015, YSPH established a Sustainability Committee, co-chaired by Dr. Dubrow and Heidi Richard (Administrative Director, Office of the Dean). The Committee has the following mission: the YSPH Sustainability Committee guides the School’s efforts to implement its ongoing Sustainability Action Plan, which includes the areas of energy and greenhouse gas emissions; natural and built environment; materials management; food and well-being; and sustainability leadership and capacity building; The Committee’s efforts at greenhouse gas reduction will be guided by both the Sustainability Action Plan and the school-wide Climate Change and Health Initiative. The Committee collaborates with YSPH faculty, students and staff and the Yale Office of Sustainability to achieve its goals.

The membership of the Committee for the 2016-17 academic year was:

- Dr. Robert Dubrow, Professor of Epidemiology (co-chair)
- Heidi Richard (Administrative Director, Office of the Dean) (co-chair)
- Dr. Peter Krause, Senior Research Scientist in Epidemiology
- Dr. Brian Weiss, Research Scientist in Epidemiology
- Frank Grosso, Associate Dean for Student Affairs
- Elizabeth Eocaci-Tucker, Senior Administrative Assistant
- Katie Owers, PhD student
- Lyndsay Gavin, second-year MPH student
- Arsalan Marsani, first-year MPH student

During the 2016-17 academic year, the committee focused its work on the YSPH departmental paper competition (see III.E below) and development of a 2017-2025 Sustainability Action Plan in coordination with the new [Yale Sustainability Plan 2025](#).

In April 2017, Dr. Dubrow and Ms. Richard received the [Faculty & Staff Collaboration Award](#) from the Yale Office of Sustainability “for their work connecting sustainability to the operations and scholarship of the Yale School of Public Health. Professor Dubrow spearheaded the Yale Climate Change & Health Initiative, which provides a comprehensive educational program that addresses climate change and its implications on public health. Richard has been a Sustainability Leader since 2008 helping to develop the School’s sustainability plans, and making steady progress in moving the School in the direction of sustainability.”

Finally, the Yale Office of Sustainability issued a request for proposals from students to fund innovation and hands-on scholarship addressing information needs and solutions in support of the objectives described in Yale University’s ambitious Yale Sustainability Plan 2025.

Sheridan Finnie, an MPH student, submitted a proposal entitled “Minimal disposal practices for catered events,” with Dr. Dubrow as her faculty advisor. The proposal, which aims to minimize waste at YSPH catered events by converting from disposable to reusable dishware, silverware, and cups, was funded for \$17,322. Ms. Finnie and her student team will work with Dr. Dubrow and the YSPH Sustainability Committee to implement the proposal during the 2017-18 academic year.

See Appendix III.B for Sustainability Committee meeting agendas; the draft YSPH Sustainability Action Plan; the Yale Office of Sustainability request for proposals; and Sheridan Finnie’s successful proposal.

C. Sustainability Session During MPH Student Orientation Week

During the MPH student orientation week, Dr. Dubrow led a one-hour session on climate change and health, as well as sustainability at Yale and YSPH.

D. Greenhouse Gas Reduction Program for Students and Partnership with Cool Effect

On April 7, 2017 (at YSPH) and April 25, 2017 (at the School of Forestry & Environmental Studies), Dr. Dubrow conducted workshops for students on “Climate justice: greenhouse gas emissions reduction in developing countries.” The following was the workshop learning objective: Completion of this one-hour workshop will enable students to evaluate strengths and weaknesses of greenhouse gas emissions reduction projects in developing countries from a climate justice perspective at an introductory level. The workshops considered from a climate justice perspective the various potential co-benefits of emissions reduction projects that can be supported by individuals through purchase of carbon credits. We then applied this perspective to three specific projects listed on the website of Cool Effect: a wind power project in Costa Rica; a cook stove project in Uganda; and a biogas project in Vietnam. Finally, each student cast a vote for the project he or she deemed to be most worthy from a climate justice perspective, and Yale School of Public Health donated a total of \$15,000 to these projects in proportion to the results of the voting. Out of 31 votes, the Uganda project received 14 votes, the Vietnam project received 13 votes, and the Costa Rica project received 4 votes.

See Appendix III.D for a fuller description of the workshop and for the fliers publicizing the workshops.

E. YSPH Departmental Competition

YSPH committed to sponsoring a greenhouse gas reduction competition among YSPH departments. The Sustainability Committee decided that our first competition would focus on reduction in paper use. Paper represents the fourth largest industrial source of greenhouse gas emissions. Furthermore, more than 40% of the global industrial wood harvest is used to make paper. The paper competition was held from October 2016 to March 2017. Paper use was tracked through codes used for printers/photocopiers and comparisons were made for each department between the contest period (October 2016 to March 2017) and the baseline period (October 2015 to March 2016). The Sustainability Committee produced and distributed educational materials about how to go paperless, as well as how to use less paper (such as printing two-sided). The following are the results of the competition:

Paper Use (Sheets) During the Contest and Baseline Periods, by Department

Rank	Department	Sheets of Paper		% Change
		Baseline Period	Contest Period	
1	Epidemiology of Microbial Diseases	30,584	18,848	-38%
2	Environmental Health Sciences	15,282	9,947	-35%
3	Administration	65,421	44,556	-32%
4	Chronic Disease Epidemiology	71,732	49,697	-31%
5	Biostatistics	85,635	60,227	-30%
6	Health Policy & Management	54,351	46,693	-14%
	Grand Total	323,004	229,967	-29%

Thus, according to these data, YSPH as a whole achieved a 29% reduction in paper use. The tracking of paper use posed some challenges, but we were able to perform an independent validation of this substantial YSPH-wide reduction in paper use by comparing paper purchases during the contest period (844 reams) and baseline period (1,494 reams), observing a 44% reduction. Unfortunately, we could not use departmental paper purchases as a proxy for departmental paper use because several departments share printers and paper. The Department of Epidemiology of Microbial Diseases won the competition and was awarded \$5,000 to support education or research initiatives on climate change within the department.

See Appendix III.E for materials used to publicize the paper competition.

IV. Major Year 3 Goals

A. Faculty Recruitment

Dr. Sten Vermund, who started his tenure as Dean of Public Health in February 2017, has approved a national search for a faculty position in the field of climate change and health at the level of Assistant, Associate, or Full Professor. The successful candidate will serve as a core faculty member of CCHI. See Appendix IV.A for the faculty search advertisement.

B. Public Health Practice

It is critical to ensure that high-quality public health science plays a central role in advancing efforts to address climate change. We aim to create a program that utilizes public health science to support legislative, litigative, regulatory, executive, community, and other efforts to mitigate or adapt to climate change and to achieve climate justice. We will seek funding for a master's or doctoral level program manager who will develop and help supervise student projects carried out in practicum courses each semester and by summer interns during the summer. The program manager also will supervise a student rapid response team to address public information needs in a timely manner; conduct outreach and networking to identify appropriate partners; implement mechanisms for efficiently involving interested faculty; and develop best-practices.

C. On-line Certificate Program in Climate Change and Public Health

The recognition of climate change as one of the leading public health challenges of this century has been relatively recent, such that most practicing public health professionals did not receive education about climate change and health during their training. A certificate program in climate change and public health would fill this gap. During Year 3 we will begin to design and implement this certificate program.

D. Conference on Environmental Sustainability in Clinical Care

Dr. Jodi Sherman, a CCHI Affiliated Faculty, has applied for funding for this conference, which will be held April 6-8, 2018. The healthcare industry is a leading emitter of greenhouse gases and other pollutants. The premise of this conference is that reducing waste in healthcare results in improved patient safety (e.g., reduced unnecessary medical tests that often lead to false positive results and further invasive procedures) and in improved community health (through reduced emission of greenhouse gases and other pollutants). The conference will take place at Yale but is being organized in conjunction with a major collaborator at NYU, and will be presented as a conference sponsored by Yale Schools of Medicine and Public Health, NYU School of Medicine, and NYU Robert F. Wagner Graduate School of Public Service. Dr. Nick Watts, Executive Director of the Lancet Countdown: Tracking Progress on Health and Climate Change and Director of the UK Health Alliance on Climate Change, will be the keynote speaker at the conference and will also serve as the 2018 CCHI Climate Change Leader in Residence.

To achieve these goals, CCHI seeks to diversify and grow its funding streams, moving beyond a single grant to a model that includes individual gifts, government and foundation grants, and University support. Achievement of our goals, combined with success to date, will position YSPH to be a locus for research, education, and practice at Yale and beyond and to attract the best students and faculty.