
SYLLABUS

Managing the health risks of climate change
GH/ENV H 418/518 (3 credits)
Lectures Mondays / Wednesdays 2:30 – 3:50pm
Room: CDH 125

Instructor:

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Office hours will be held after class or by appointment. Offices are at 4225 Roosevelt Way NE #100. Suite 2330. Telephone number: (206) 543-6342

Requirements: None. This is a broad course open to students without specific training in the areas of climate change, environmental sciences, and/or public health.

Course description

Climate change is causing injuries, illnesses, and deaths, with increases in global temperature projected to further increase morbidity and mortality from most climate-sensitive health outcomes if actions are not taken to rapidly increase adaptation and reduce greenhouse gas emissions. Of particular concern are heat-related morbidity and mortality and ozone-related mortality if emissions needed for ozone formation remain high. Urban heat islands often amplify the impacts of heatwaves in cities.

Risks for some vector-borne diseases, such as malaria and dengue fever, are projected to increase with warming from 1.5°C to 2°C, including potential shifts in their geographic range and changes in their seasonal distribution. Undernutrition is projected to increase with additional warming. Separately, increasing concentrations of carbon dioxide are expected to reduce the nutritional quality of significant cereal crops. Other potentially large risks are insufficiently quantified, such as the impacts of climate variability and change on a range of climate-sensitive health outcomes, such as diarrheal diseases, occupational heat stress, mental health, and migration and displacement. Vulnerable populations and regions will be differentially affected, with the potential to increase poverty and inequities.

Adaptation (adjustments in response to actual or expected climatic shifts) and mitigation (efforts to reduce to the likelihood of dangerous climate change by limiting greenhouse gas emissions) are the primary policy responses to address the health risks of climate change. Health adaptation can reduce the current and projected burdens of climate-sensitive health outcomes over the short term in many countries, but the extent to which it could do so past mid-century will depend on emission and development pathways. Under high emission scenarios, climate change will be rapid and extensive, leading to fundamental shifts in the burden of climate-sensitive health outcomes that will be challenging for many countries to manage. Unmanaged disease burdens could erode gains made in public health, economic development, and living standards worldwide. Sustainable development pathways could delay but not eliminate associated health burdens.

Students in this course will gain foundational knowledge in the health effects of climate change, methods for quantifying climate change health effects, adaptation needs and strategies, and health benefits of mitigation activities.

Overall learning objectives

Students will be able to:

- Identify the major health risks of climate variability and change, including the sources of vulnerability to those risks
- Analyze the methods and tools for assessing risks for specified populations domestically and in several international settings
- Enumerate key issues in implementing, monitoring, evaluating, learning from, and continuously updating, adaptation policies and programs
- Outline the health co-benefits of mitigation policies to reduce greenhouse gas emissions
- **Graduate student only** - Evaluate policy options to address the health risks of climate variability and change

Expectations of students

Students are expected to prepare for, attend, and participate in class discussions, demonstrate knowledge of assigned readings, and demonstrate teamwork/professionalism. Students are also expected to complete a group presentation and position paper and write one paper (individually) on a relevant topic chosen between the student and the instructors. (see Grades)

Required readings

Required readings will be posted on Canvas and will include:

- IPCC Summary for Policy Makers for the Special Report on Warming of 1.5°C (2018)
- USGCRP 2018 *4th US National Climate Assessment: Human Health chapter*
- Watts et al. 2019 *Lancet Countdown on Health and Climate Change*

Students also will be assigned readings from the recent literature.

Grades

Grading will be based on a group presentations and position paper (40%) and an independent project /paper (60%).

We will use the UW's grading guidelines, available at <http://depts.washington.edu/grading/practices/guidelines.html>.

Students will be asked to complete **one** of the following assignments:

Presentation / Position Paper 1 Political Context: Groups of students will develop a presentation and individual position paper (1,500 to 2,000 words excluding references) on an aspect of the national or international political context for managing the health risks of climate variability and change. Grading will be based on a clear statement of the issue(s) chosen, a description of the background and arguments to support a particular perspective, and the group's assessment of the validity and robustness of the chosen issue. The position copy of the presentation will be due **February 5th at noon (emailed to professor and TA)**.

The individual position paper will be due **February 12th by midnight** (submitted on Canvas).

Presentation / Position Paper 2 Communication: Groups of students will develop a presentation and individual position paper (1,500 to 2,000 words excluding references) on an aspect of communicating the health risks of climate change and options to manage these risks within the context of a local or national case study. Grading will be based on a clear statement of the case study chosen and why, a description of how the case study is an example of best practice or an example of where communication could improve understanding or action on managing the risks of climate change, and a discussion of specific approaches to improve communication, with an evaluation of their likely effectiveness. The presentation will be due **February 19th at noon (emailed to professor and TA)**. The individual position paper will be due **February 26th by midnight** (submitted on Canvas).

Presentations should include no more than 12 slides including slides for references. The slides should include a clear statement of the topic covered and learning objectives for the talk as well as a summary of the conclusions of the talk. All material and literature should be cited. Presentations can be solely lecture style or can incorporate short activities, discussions, and group work. Grading will be based on a clear statement of the issue(s) chosen, a description of the background and arguments to support a particular perspective, and the assessment of the validity and robustness of the chosen issue.

Students should plan to each spend equal time presenting material. Presentations will be graded based on the adherence to the stated guidelines, depth of engagement and comfort with the topic, quality of presentation including use of visuals, level of audience engagement, and presentation style including adherence to time limits. All students working in the team will receive the same grade for the presentation.

Project (undergraduate student only): Each student will develop an individual paper on some aspect of managing the health risks of climate variability and change. This can be a subject covered by the readings or some other aspect of climate change that is of particular interest. A one-paragraph summary of the topic for the individual project will be due **February 10th at noon**. The paper will be 5-10 double-spaced pages and contain a minimum of 5 references that are peer-reviewed, scholarly articles found in scientific journals. The paper will be due **March 11th at noon**. Please include your last name in the file name.

Project (graduate student only): Each student will develop an individual paper on some aspect of managing the health risks of climate variability and change. This can be a subject covered by the readings or some other aspect of climate change that is of particular interest. A one-paragraph summary of the topic for the individual project will be due **February 10th at noon**. The paper will be 10-15 double-spaced pages and contain a minimum of 10 references that are peer-reviewed, scholarly articles found in scientific journals. In addition to the added length and number of references, it is expected that this paper reflects a level of thought and analysis reflective of a graduate student. The student will give a short presentation (~10 minutes with time for questions) summarizing the case study for class discussion. The paper will be due **March 11th at noon**. Please include your last name in the file name.

UW Writing and Research Center. The Odegaard Writing & Research Center (OWRC) offers free, one-to-one, 45-minute tutoring sessions for undergraduate, graduate, and professional writers in all fields at the UW. We will work with writers on any writing or research project, as well as personal projects such as applications or personal statements. Our tutors and librarians collaborate with writers at any stage of the writing and research process, from brainstorming and identifying sources to drafting and making final revisions. For more information or to schedule an appointment, please see our website (<http://depts.washington.edu/owrc>), or come visit us in person on the first floor of Odegaard Undergraduate Library.

Microsoft Word. It is beneficial in this course for students to have access to Microsoft Word. The Microsoft Office suite is available for free to all UW students and can be downloaded from this online site (<https://itconnect.uw.edu/wares/uware/microsoft/microsoft-software-for-students/>). If you have additional questions, please contact the TA's.

UW Disability Statement

Access and Accommodations: Your experience in this class is important to us, and it is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you experience barriers based on a disability or temporary health condition, please seek a meeting with DRS to discuss and address them. If you have already established accommodations with DRS, please communicate your approved accommodations to your instructor at your earliest convenience so we can discuss your needs in this course.

Disability Resources for Students (DRS) offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (this can include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu

Academic Integrity Statement

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.

Religious accommodation statement

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy \(https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/\)](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form \(https://registrar.washington.edu/students/religious-accommodations-request/\)](https://registrar.washington.edu/students/religious-accommodations-request/)

Email policy

Emails received after 5 pm will be answered within 24 hours whenever possible, and not before 9 am the following morning.

Classroom climate

The UW School of Public Health seeks to ensure all students are fully included in each course. We strive to create an environment that reflects community and mutual caring. We encourage students with concerns about the classroom climate to talk to your instructor, your advisor, a member of the departmental or SPH Diversity Committee and/or the program director. vg@uw.edu is a resource for students with classroom climate concerns.

Course session schedule:

Class	Instructor	Topic	Assigned Readings
WEEK 1 Class 1 MON 1/6	Ebi	Introduction and overview	USGCRP <i>4th US National Climate Assessment: Human Health chapter</i> Watts et al. 2019 <i>Lancet Countdown</i>
WEEK 1 Class 2 WED 1/8	Ebi	Political context for climate science, process for international assessments, and progress toward mitigation goals	UNFCCC < https://unfccc.int/resource/docs/covnpkp/conveng.pdf > and the Paris Agreement < https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement >
WEEK 2 Class 3 MON 1/13	Bond	Weather, climate, climate variability, and climate change	IPCC AR5 SPM Working Group I USCRP <i>Executive Summary Climate Science Special Report</i>
WEEK 2 Class 4 WED 1/15	Ebi (remotely)	Framework for understanding and managing risks; vulnerability and adaptation assessments	Berry et al. 2018 (international) Ebi and Villalobos 2015 (guidance) Ebi et al. 2018 (indicators) Levison et al. 2018 (local)
WEEK 3 MON 1/20	<i>Martin Luther King Day</i>		
WEEK 3 Class 5 WED 1/22	Ebi	Health and risk communication	Jang_CC_Frames_Twitter 2014 Maibach_CCHH_UC_2015 Six Americas
WEEK 4 Class 6 MON 1/27	Morin	Infectious disease	Readings: TBD
WEEK 4 Class 7 WED 1/29	Ebi (panopto)	Health system adaptation to climate change	Bowen 2013 (governance adaptation) Ebi et al. 2016 (using climate information) Ebi 2017 (lessons learned) Hess & Ebi 2016 (heat early warning systems) Morin et al. 2018 (vectorborne disease early warning systems) WHO 2015 (climate-resilient health systems)

WEEK 5 Class 8 MON 2/3	Ebi	Methods for assessing current and projecting health risks of climate change	Ebi et al. 2018 (detection attribution) Ebi et al. 2018 (risks 1.5_2C) Xun et al. 2010 (methods) WHO 2014: Exec Summary, Ch. 1, Ch. 8
WEEK 5 Class 9 WED 2/5	Boyer	Student presentations on political context	PowerPoints or other media emailed to professor and TA by noon
WEEK 6 Class 10 MON 2/10	Ebi	Thermal extremes and their health impacts	Arbuthnott et al. 2016 Bunker et al. 2016 Gasparrini et al. 2015 Sanderson et al. 2017
WEEK 6 Class 11 WED 2/12	Ebi	Extreme weather and climate events and their health impacts / disaster risk management Political Context Papers Due	Bell et al. 2017 (overview) McGregor & Ebi 2018 (ENSO) Sampson et al. 2018 (floods) Schmitt et al. 2016 (economics) Yusa et al. 2015 (drought)
WEEK 7 WED 2/17	<i>President's Day</i>		
WEEK 7 Class 12 WED 2/19	Boyer	Presentations on communication	PowerPoints or other media emailed to professor and TA by noon
WEEK 8 Class 13 MON 2/24	Ebi	Food security	Lindgren et al. 2018 (sustainable food systems) Loladze 2014 (micronutrients) Springmann et al. 2018 (sustainable diets) Weyant et al. 2018 (nutritional quality) Wheeler & von Braun 2013 (food security) Zhao et al. 2017 (crop yields) Zhu et al. 2018 (nutritional quality rice)
WEEK 8 Class 14 WED 2/26	Ebi	Mitigation and health co-benefits Communication Papers Due	Chang et al. 2017 Quam et al. 2017 IPCC AR5 WGIII SPM

WEEK 9 Class 15 MON 3/2	Ebi	SDGs	<ul style="list-style-type: none"> • https://www.un.org/sustainabledevelopment/sustainable-development-goals/ • https://sustainabledevelopment.un.org
WEEK 9 Class 16 WED 3/4	Ebi	Student presentations of individual projects	
WEEK 10 Class 17 MON 3/9	Ebi	Student presentations of individual projects	
WEEK 10 Class 18 WED 3/11	Ebi	Course wrap-up / selected lecture	
		NO Final Exam	