

PhD in Public Health Sciences

Concentrations

PhD Concentrations

School of Public Health PhD students develop an individualized area of interest through coursework and mentored training opportunities that culminate in an empirical dissertation demonstrating mastery of a specific field of public health sciences. All students enter under the Generalist Concentration through which they choose from a wide variety of courses that align with their individual area of interest, with the option to declare one of our more structured concentrations, which provide a framework for interested students to develop competencies in subfields of expertise. Successful concentrators earn a PhD in Public Health Sciences with a specialization in their chosen area. Upon graduation, completion of the concentration is noted on the student's academic transcript and may be listed on their CV. Currently, the School of Public Health offers the following concentrations: 1) Generalist; 2) Dissemination and Implementation Sciences (D&I); and 3) Systems Science for Health Equity (SS4HE).

Administrative Oversight

Each PhD concentration is overseen by at least one primary instructional faculty (PIF). The PIFs coordinate with the PhD Program Director to ensure students meet all concentration and program requirements. The PIFs also work to ensure that cutting-edge training opportunities in the subfield are accessible to students. This includes developing and monitoring course offerings and facilitating potential mentorship matches between students and faculty. In the case of the Generalist Concentration, the PhD Program Director serves as the PIF, and students build both formal and informal mentoring relationships with faculty members who have similar research interests and areas of expertise.

Process and Timeline

Students complete PhD and concentration coursework during the first two years of the program. They also fulfill all other PhD requirements, including mentored training opportunities. Students are typically supervised by and complete a Qualifying Exam with faculty experts in the subfield. Students work with their faculty advisor, the PIF, and the Program Director to ensure interest alignment and eligibility. Students initially declare a concentration of interest in Workday during their first year, but they do not formally apply for their chosen concentration until after successfully completing their dissertation proposal. Course requirements will be considered as part of the concentration application, and students will be expected to complete concentration coursework, independent study, or other mentored research training opportunities that include or are equivalent to at least nine full hours of academic work per week for 15 weeks for each 3 units of credit.

Generalist PhD Concentration

Rationale and Competencies

The Generalist Concentration allows students to choose to focus on a research interest of their own, selecting coursework and working with faculty members who can support their interests. Students selecting this track will be prepared to meet the following competencies:

- Design and conduct independent research in a specialized focus area within public health and demonstrate mastery of that area.
- Understand and apply a range of study designs, research methods, and approaches to data management and analysis commonly used in public health and in the specialized focus area.
- Evaluate scientific literature in public health and the specialized focus area critically but fairly and identify gaps that need to be addressed.

Generalist Concentration Requirements

Coursework

Students complete coursework and mentored training aligned with their specialized focus area. Coursework should be selected to expose students to the emerging conceptual, methodological, and ethical issues around their focus area. Students select a minimum of 9 credits of courses from graduate offerings. Students also complete course requirements for the PhD degree, which provide ample opportunities to supplement the Generalist Concentration coursework with highly relevant methods courses in mixed methods, multilevel modeling, system sciences, and so on.

Mentored Research

Concentrators identify faculty mentors whose scholarship aligns with their specialized area of focus. Together, the student and their faculty mentor(s) develop and execute research that culminates in a dissertation that contributes to the literature on the focus area.

Primary Instructional Faculty

The PhD Director, Patrick Fowler (pjfowler@wustl.edu), is the initial point of contact for generalist concentrators. Students build a network of additional faculty mentors through activities such as coursework, research and teaching practicum opportunities, and attending talks and seminars to build out their support system and committees.

Courses

Note: The following list of courses is meant to provide examples of the work undertaken by students in this concentration; it is not an exhaustive list.

Code	Title	Units
BSDC 8003	Foundations of Data Analysis	3
BSDC 8004	Foundations of Data Management	3
BSDC 8005	Applied Linear Regression Analysis	3
BSDC 8006	Generalized Linear Models	3
BSDC 8008	Structural Equation Modeling	3
BSDC 8010	Multilevel and Longitudinal Modeling	3
BSDC 8011	Propensity Score Analysis	3
BSDC 8018	Designing for Dissemination, Implementation & Sustainability: How to Maximize Impact & Equity	3
BSDC 8023	Introduction to Agent-Based Modeling	3
BSDC 8024	Introduction to Dissemination & Implementation Science	3
BSDC 8025	Survival Analysis	3
BSDC 8026	Developing and Evaluating Implementation Strategies in Health and Social Services	3
CLNV 5230	Introduction to Dissemination and Implementation Science	3
CLNV 5240	Implementation Science: Measures, Metric and Methods	3
CLNV 5420	Designing for Dissemination, Implementation & Sustainability: How to Maximize Impact and Equity	3
PHEL 6003	Translating Epidemiology Into Policy	3
PHEL 6005	Applied Machine Learning Using Health Data	3
PHEL 6009	Applied Deep Learning Using Health Data	3
PHEL 6010	Systems Thinking in Health	3
PHS 5160	Dissemination and Implementation Science	3
SWPM 6074	Community Based System Dynamics	3
SWPM 6077	System Dynamics Modeling for Strategic Design	3

Dissemination and Implementation Sciences PhD Concentration

Rationale and Competencies

Much of the health burden is preventable, yet there remains a large gap between the evidence known to promote health and application in community and clinical settings. Over nearly two decades, dissemination and implementation (D&I) research has emerged to shorten the translation gap. The D&I PhD concentration is uniquely positioned to build capacity in D&I research. It builds on extensive experience in the following areas: 1) training researchers

in D&I methods; 2) conducting D&I research studies; and 3) building strategic partnerships with other researchers and partners to further D&I science. It aims to prepare next-generation public health scholars for the following D&I competencies:

- Describe the objectives of D&I research for promoting health and addressing health equity.
- Critically evaluate D&I theories, models, and frameworks.
- Assess the need for and process of adapting and tailoring interventions and D&I research strategies.
- Design studies that incorporate innovative and emerging methods and measures in D&I research.
- Describe the importance of and methods for incorporating the perspectives of different partners (e.g., patients/families, practitioners, policy makers) in D&I.

D&I Concentration Requirements

Coursework

Students complete coursework and mentored training opportunities in D&I. Coursework aims to expose students to the emerging conceptual, methodological, and ethical issues in D&I research. All students take a 3-credit introductory course in D&I and select two courses (6 credits) from a list of pre-approved offerings. Students who have already completed graduate-level introductory courses in D&I take three domain-related courses. Concentrators also complete course requirements for the PhD degree, which provide ample opportunities to supplement the D&I Concentration coursework with highly relevant methods courses in mixed methods, multilevel modeling, system sciences, and so on. Students also may complete one course through an individually designed independent study with faculty experts in D&I.

Mentored Research

Concentrators identify faculty mentors whose scholarship involves D&I sciences. Typically, these faculty members will supervise the completion of the Qualifying Exam. After finishing D&I and other required doctoral coursework and milestones, students conduct dissertation research in the field under the mentorship of faculty working in the area. Students are encouraged to participate in the various D&I training opportunities offered through the School of Public Health and the university, such as those found on the Dissemination and Implementation Research website. In addition, the Institute of Clinical and Translational Sciences' D&I Research Core affords students opportunities to receive and offer consultation and research support as research assistants.

Primary Instructional Faculty

A team of faculty across Schools coordinate to support D&I concentrators. Feel free to reach out with questions and suggestions. Faculty include the following:

- Maura Kepper (kepper@wustl.edu)
- Byron Powell (bjpowell@wustl.edu)
- Elvin Geng (elvin.geng@wustl.edu)
- Patrick Fowler (pjfowler@wustl.edu)

Courses

Concentrators must take one 3-credit introductory course:

Code	Title	Units
CLNV 5230	Introduction to Dissemination and Implementation Science	3
or PHS 5160	Dissemination and Implementation Science	

Concentrators then choose a minimum of 6 credits from the following courses:

Code	Title	Units
BSDC 8018	Designing for Dissemination, Implementation & Sustainability: How to Maximize Impact & Equity	3
BSDC 8026	Developing and Evaluating Implementation Strategies in Health and Social Services	3
CLNV 5420	Designing for Dissemination, Implementation & Sustainability: How to Maximize Impact and Equity	3
PHL 6003	Translating Epidemiology Into Policy	3

Systems Science for Health Equity PhD Concentration

Rationale and Competencies

Systems science is the study of complex systems. The theories and methods of systems science are applied in almost every discipline, including genetics, biology, engineering, sociology, political science, public health, and more. In the past few years, systems science and analysis have developed rapidly as an interdisciplinary approach to exploring and solving important scientific problems. The Systems Science for Health Equity (SS4HE) PhD Concentration is uniquely positioned to build capacity in systems science through a public health lens. It builds on Washington University's extensive experience in training researchers in systems thinking and methods, conducting systems science research, and building strategic partnerships with other researchers and partners to further systems science. It offers a unique opportunity for doctoral students to engage in and embed transdisciplinary work in complex systems thinking and methods within their Public Health Sciences PhD program, and it aims to prepare next-generation public health scholars for the following systems science competencies:

- Understand how organizational, community, and healthcare systems contribute to public health as complex systems.
- Apply core systems science principles — such as complexity, feedback, emergence dynamics, evolution, endogeneity, social structures, and interactivity — to public health research and intervention design.
- Describe how systems thinking and systems science methods contribute to core research activities of description, prediction, explanation, and causal inference.
- Design studies incorporating systems science tools, such as agent-based modeling, system dynamics modeling, network analysis, group model building, and so on.
- Engage diverse partners in systems science research to ensure equitable public health processes and outcomes.

SS4HE Concentration Requirements

Coursework

Students complete concentration coursework with other PhD requirements during their first two years of the program. Concentrators complete one introductory course in systems science and select at least two additional SS4HE doctoral courses from the options presented below. Students who have already completed introductory courses prior to joining the doctoral program may take another of the SS4HE courses listed below. Students may also complete one course through an individually designed independent study with faculty experts in systems science.

Mentored Research

Students identify faculty mentors whose scholarship involves systems science. Typically, these faculty members will supervise the completion of the qualifying exam. After finishing the required doctoral coursework and milestones, students conduct dissertation research in systems science under the mentorship of faculty working in the area. Students are also encouraged to take advantage of training opportunities across the university, such as the quarterly meetings of the Systems Science Interest Group; the annual Systems Sciences for Social Impact Summer Training Institute; and mentored research opportunities through relevant WashU centers such as the Center for Public Health Systems Science, the Center on Social Dynamics and Policy, the Social System Design Lab, the Center for Mental Health Services Research, and the Center for Advancing Health Services, Policy, and Economic Research.

Primary Instructional Faculty

A team of faculty coordinate to support SS4HE concentrators. Feel free to reach out with questions and suggestions. Faculty include the following:



- Ellis Ballard (eballard@wustl.edu)
- Patrick Fowler (pjfowler@wustl.edu)
- Ross Hammond (rhammond@wustl.edu)
- Douglas Luke (dluke@wustl.edu)

Courses

Concentrators must take one 3-credit introductory course, unless they have already completed an introductory course during a prior graduate degree:

Code	Title	Units
PHL 6010	Systems Thinking in Health	3

Concentrators then choose a minimum of 6 credits from the following courses:

Code	Title	Units
BSDC 8023	Introduction to Agent-Based Modeling	3
PHDC 8007	Social Network Analysis	3
SWPM 6074	Community Based System Dynamics	3
SWPM 6077	System Dynamics Modeling for Strategic Design	3