



The Robert Wood Johnson Health & Society Scholars Program at Columbia University is a joint initiative of the Institute for Social and Economic Research and Policy (ISERP) and the Mailman School of Public Health (MSPH).

Short Courses, Tools for the Long Term

When Columbia University was selected as one of the six sites for the Robert Wood Johnson Health & Society Scholars Program, part of our mission was to build skills relevant to population health research. Since its inception, the Columbia program has sponsored more than a dozen short courses in methodology that are open to postdoctoral scholars and faculty affiliates of the program as well as to researchers in the wider Columbia community. These courses provide a shared technical toolkit to build a collaborative framework for population health research across the social and health sciences.

This fall, the program hosted a short course on qualitative research methods with former Health & Society Scholar Stefan Timmermans (now at UCLA), and a course on theoretical epidemiology with Jamie Robins (Harvard School of Public Health). Over the span of two days, Timmermans offered an historical overview of qualitative research, its underlying epistemological principles, and the strengths and limitations of various forms of the methodology. The course included a hands-on component; participants conducted practice interviews and analyzed qualitative data in preparation for the second day of the course. These sessions complemented a module on ethnographic methods taught by sociologist Jack Katz (UCLA) last year.

Robins' course, by contrast, focused on a long-standing problem in statistical analysis—drawing causal inferences from observational studies. Problems of causal inference appear throughout the field of population health. For example, much research in population health seeks to identify the “social determinants” of health, articulate the relationship between social and biological processes in causing a given health outcome, and model the relationship between “distal” and “proximal” causes. Moreover, health researchers are often asked to identify interventions and articulate the policy implications of their work, which requires that they produce narratives of the relationships between causes and outcomes that render causal factors subject to deliberate intervention.

During his visit in October, Robins investigated this topic in depth, with particular emphasis on ways to analyze the causal effects of time-varying exposures. He addressed epidemiologic concepts such as confounding, comparability, overall effects, direct effects, intermediate variables, and selection bias in the context of a counterfactual causal model.

Robins' course is one in a suite of workshops on statistical methods, which have been a mainstay of the program. More recently, Columbia H&SS offered a course that addressed causal estimation through the use of another technique—propensity score matching. “The vast majority of public policy research focuses on causal questions,” explains instructor Jennifer Hill (SIPA). “Researchers want to know what the impact would be on participants if we changed an existing policy or implemented a new policy. At the same time, most researchers are forced to rely on observational data that is not well suited to answering causal questions. If we want to know the impact of participating in Program A versus Program B and have collected data on people in both situations, simple comparisons of the people across programs generally will not lead to estimates of the causal effect of Program A relative to

Program B because the people in each programs may differ from each other in other important ways. In this situation, the study is said to suffer from selection bias.”

Propensity score matching, according to Hill, offers one solution. Unlike many competing techniques, propensity score matching has the advantage of being “intuitively straightforward and relatively easy to implement.” While propensity score matching does assume that the researcher has measured all important covariates, it does not rely on many of the strong parametric and structural assumptions necessary for the validity of some competing techniques.

Another popular course this year was Bayesian data analysis, taught by Andrew Gelman (Columbia University). Participants brought their laptops to the course and learned to work with Bugs, a program developed by Gelman and colleagues, which includes routines for conducting Bayesian analyses. Gelman, the co-author of *Bayesian Data Analysis* (Chapman and Hall, 2003), explored applications of this approach in social science and public health.

This year’s last short course, on multi-level modeling, will be taught by Ana Diez-Roux (University of Michigan). Multi-level analysis allows the simultaneous investigation of the effects of factors defined at multiple levels on individual-level outcomes. This short course will review the rationale for multi-level analysis in public health, the fundamentals of the statistical approach and its difference with other regression approaches, and the basics of fitting different types of multi-level models with SAS.

A course on social network analysis methods given by James Moody (Ohio State) was a particular favorite among scholars last year. Two Cohort 2 scholars, Mike Emch and Sara Shostak, have started to use the methodology in their current research. According to Sara Shostak, “Social Network Analysis, with Jim Moody, was something of a conversion experience for me. Incorporating the methods I learned in that short course, even at a very simple level, has contributed significantly to my research on how people in families affected by epilepsy think—and talk—about risk, inheritance, and genetics.”

The short courses have been a popular feature of Columbia’s Health & Society Scholars Program. The courses typically “sell out” within hours of when they are posted, and have begun to attract Scholars from other Health & Society Scholars sites as well as Columbia faculty, researchers, and students. In previous years, course topics have included network analysis, GIS and spatial statistics, content analysis, multiple imputation, and optimal matching and other methods for analysis of sequential data. We value our role in building capacity for population health research and hope you will join us for a course in the future.