



How Big Data Can Lead to Safer Drugs and Vaccines

Remember Vioxx? The painkiller helped many but increased the risk of heart attacks in others. It was withdrawn from the market in 2004, nearly five years after it was introduced.

Although it takes years of extensive testing for new drugs and medical products to reach the market, negative side effects may not become apparent even then.

“Until you can observe populations of an enormous size, you really can’t know everything there is to know about the rare adverse effects,” says Jennifer Nelson, MS 1994, PhD 1999 Biostatistics, and affiliate associate professor of Biostatistics at the University of Washington School of Public Health.

Nelson is part of a growing group of researchers transforming the way we monitor medical products for safety. She uses big data—in this case, millions of electronic health records sitting in the databases of large health insurers or health providers.

“Big health-care data holds great promise,” says Nelson, who is based at Group Health Research Institute, where she is senior investigator and director of biostatistics. “There’s big data in the numbers of people, and there’s also big data in the amount of information per person.”

Researchers drill into big data to predict everything from the outcome of the Super Bowl to which online ads consumers are likely to click. In public health and medical research, big data is helping unlock the secrets of our

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Photo: Jon Sharpe



Photo: Courtesy of Sangsoon Woo

Sangsoon Woo, MS 2007, PhD 2010

Biostatistics Alumni In Demand at Innovative Firms

“Seattle’s a great place for big data and science in general,” says Patrick Heagerty, professor and chair of the School’s Department of Biostatistics, which tied with Harvard for the honor of top biostatistics program, according to *US News & World Report’s* graduate school rankings. “It’s really a great time for biostatistics and quantitative research.”

Several graduate students have interned at Google, Heagerty says, while one recent alumna, Rui Zhang, PhD 2014 Biostatistics, works as a research scientist at Amazon. She conducts A/B testing, comparing different Web pages among audiences to see which performs better.

“It’s the business world’s equivalent of randomized testing,” Heagerty says. “She’s applying core-discipline public health skills to local big data companies.”

Sangsoon Woo, MS 2007, PhD 2010 Biostatistics, recently joined Seattle-based Axio Research,

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Big Data

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Photo: Jeff Hodson

Jennifer Nelson, MS 1994, PhD 1999

genomes and leading to personalized medical treatment.

Electronic health records have been around for decades, but only recently have more researchers started to recognize their potential for improving public health. It is now possible to access millions of records collected by insurers and health care providers such as Group Health Cooperative.

Regulatory agencies such as the FDA have typically had to wait until enough alarming cases emerge from doctors and their patients. It's a passive reporting process that doesn't capture everything.

Today, in a pilot project, researchers are proactively monitoring the safety of drugs and other medical products in "real time," Nelson says. It's faster and more cost-effective than recruiting participants for a randomized clinical trial or conducting a traditional observational study.

"It's the modern version of public health surveillance—using modern data-sharing mechanisms. They're measuring millions of lives and trying to keep track of adverse events," says Patrick Heagerty, professor and chair of the School's top-ranked department of Biostatistics.

Adverse events are essentially bad reactions. For vaccines, they can include pain, itching, swelling, or fever and in rare cases, seizures, Nelson says. For drugs—especially for cardiovascular disease—they include elevated risk of heart attack or kidney and liver problems.

Nelson is involved in two major monitoring projects. One is the FDA's Mini-Sentinel program, a pilot project set up in 2007 to build a nationwide "rapid-response surveillance system" for drugs and other medical products. It includes data from 17 partners, including Group Health, and more than 100 million patients.

Nelson is also part of the Centers for Disease Control and Prevention's Vaccine Safety Datalink, which uses

information on vaccines and medical illnesses collected at doctor's offices and hospitals in six health care systems across the country. Information is updated weekly.

Nelson and Heagerty say big data offers great potential but also many challenges. For instance, electronic medical records capture data for clinical care and billing, "but that doesn't cover all the things you might want to measure for medical research or public health research," Heagerty says. "It's not always complete."

The data needs to be augmented to address certain research questions, he adds, such as what actually happens to patients after they are treated.

"Maybe we need mobile data collection, where they can use text messages to send us their pain and ability to function every day," says Heagerty. "I think there will be innovation in adding to the electronic medical records."

Biostatisticians are key in designing these studies and in analyzing the data. Nelson collaborates with faculty on these issues, mentors students, and has taught at the department's Summer Institute in Statistics for Clinical Research.

"We want to expose junior researchers to this field because it's going places," Nelson says. "My goal is to help create those opportunities and create even stronger ties between the UW and Group Health. Getting from big data to meaningful evidence is not easy. And that's why it's fun. We're going to be employed for a long time doing this."

Biostatistics Alumni in Demand at Innovative Firms

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where she works as a statistical geneticist. The company was founded by several Biostatistics faculty members.

Woo does a wide range of planning and data analysis for her clients—pharmaceutical companies producing heaps of genetic data. "We identify the target genes," Woo says. "They develop the medicine to cure diseases."

"It's a good field," Woo says. "People are looking for biostatisticians. Even Microsoft has a genomics study team."

Heagerty says the department is continually updating

its curriculum to reflect trends in big data and data science.

"We're developing a new pathway in data science, a new core sequence—a data science course, a machine learning course, and a bioinformatics course are part of it," he says. "I think our students need to know more about the data that's out there, such as procedure and diagnostic codes in electronic health records. They're already seeing genomics data in some classes and how to access and work with it."

SPH Making an Impact

Vaccinating Children in Northeast India

For her capstone project, Marina Furtado, MPH 2014 Health Services, set up an immunization program at a remote orphanage in the foothills of the Himalayas in northeast India. Many of the Jhamtse Gatsal school's 90 children were not immunized. Marina traveled far and wide to find vaccines, and went door-to-door in nearby towns to find a refrigerator to keep them cold. An emergency room physician, she also provided medical care—one day resuscitating an 8-year-old boy who nearly died from eating poison berries.

Collecting Data on the Homeless

The Community-Oriented Public Health Practice program led the One Night Count of the homeless in Fremont this year. Team members included grad students April Wilson, Sigolène Ortega, Anastasia Mallillin, Nalani Yoko, and faculty member Ian Painter, along with staff from the Recovery Café, David Uhl and Teresa Perillo. This one-night count showed a 21 percent increase from last year in King County. Meanwhile, public health major Emily Kohring volunteered to survey homeless people at the Compass Housing Alliance Hygiene Center as part of the related Everyone Counts Project. "This project is especially important because institutions like Virginia Mason will go on to use our data to garner funds for homeless services for the entire year," said Emily.

Training the Trainers in Beijing

In Beijing, Abigail Halperin, director of the Tobacco Studies Program, and research assistant Nick Fradkin trained smoking cessation counselors and public health program managers to provide increased access to treatment for tobacco dependence. Halperin and Fradkin were part of a six-person team from the International Quitline Institute (IQI) that conducted a training program developed with the World Health Organization. Forty-five trainees from 15 Chinese provinces took part in the event, co-hosted by the China CDC. About half the group will put their newfound skills to work as counselors for China's public health hotline, while the other half will apply their learnings in other agencies working to decrease tobacco use in their communities. Halperin co-founded the IQI in 2010.

Strengthening Regional Food Supplies

Four nutrition grad students spent a summer investigating and then reporting on the way Washington state produces,



Photo: Marina Furtado

In India, nurses immunize children at an orphanage through a program set up by Marina Furtado, MPH 2014

processes, distributes, and consumes food: Jamie Bachaus, Katherine Getts, Jessica Jew, and Kidan Araya (Geography). They interviewed stakeholders, conducted a literature review, and facilitated breakout meetings with members of the Washington State Food Systems Roundtable. The Roundtable is an interagency work group hoping to generate a 25-year vision to strengthen regional food supplies and increase access to healthy foods. The students were mentored by Health Services faculty member Jennifer Otten, a member of the Roundtable. The students co-authored a report and presented their findings in Wenatchee last fall.

New Domestic Programs for START

The Strategic Analysis, Research & Training Program (START) has expanded to become a center in the department of Global Health and to provide research and analysis to domestic-focused agencies. One of the first domestic projects was based on a request from King County, which sought research as it prepares to ask voters to fund more early childhood programs. Graduate student and research assistant Anne Althaus studied other prevention-type initiatives across the country to assess factors that led to their successful passage. START began in 2011 as a faculty and student effort to provide analysis to the Bill & Melinda Gates Foundation. More than two dozen graduate students have completed more than 75 different projects on global issues from TB and pneumonia to the scale-up of oral rehydration salts.

THANK YOU

FOR SUPPORTING OUR SCHOOL

Gifts from generous donors and alumni to the School of Public Health are transforming the lives and research of our students and faculty. We are profoundly grateful to our donors for their continued support of our teaching, research, and service. Thank you!

Our students will graduate to become public health leaders and global researchers. They will solve real-world problems—tracking and stopping the spread of infectious disease, developing innovative ways to improve maternal and child health, ensuring health and safety as the global environment changes, and communicating critical health information effectively to diverse communities.

With state support of higher education diminishing, SPH friends and alumni are essential to catalyzing our research, alleviating student debt, and maintaining critical academic programs.

As you think about your philanthropy this year, please consider giving to:

The Public Health Undergraduate Student Assistance Fund: Supports our undergraduate students, including their tuition, research, fees, and travel.

The School of Public Health Endowed Fellowship: Provides assistance to our graduate students.

The Public Health Excellence Fund: Provides essential support for ongoing work and programs. The fund helps us meet emerging needs and opportunities as they arise.

For a complete list of our 2014 donors, please see the School website: sph.washington.edu/giving. Again, thank you.

—Dean Howard Frumkin, MD, DrPH

An Endowed Professorship Made Possible By Many Donations



Photo: Jeff Hodson

King Holmes

More than 125 colleagues and friends of King Holmes, founding chair of the department of Global Health, have contributed above \$500,000 to establish an endowed professorship in his name. The intent is to recruit and retain distinguished Global Health faculty who are committed to research and teaching in the field of sexually transmitted diseases (STDs) and AIDS.

Dr. Holmes is a key international figure in developing the field of STD research, public health policy, and clinical care. His pioneering work has led to effective treatment and prevention for millions of people.

Says Dr. Holmes, “When (Global Health professors) Sheila Lukehart and Judy Wasserheit invited me to breakfast in 2006, I thought maybe they had another good idea for a new STD research project. Turned out they did have a great idea. Eight years later, we actually have an Endowed Professorship for STD and AIDS, thanks to the many individuals who contributed.

“I am humbled and very grateful to all of them. We don’t live forever, and I feel very fortunate to be able to observe how this professorship will have a real impact on future STD and HIV research at the UW.”

A Climate Ride to Raise Funds for SPH

Join avid bicyclists Howard Frumkin, Dean of the School; Dean’s Council member Ron Sher; and others on Climate Ride’s California North Coast Ride May 17–21. The team is UWSPH Healthy Planet – Healthy People.

Funds raised by the team will benefit the UW Collaboration for Health and the Global Environment (CHANGE). Under the leadership of Professor Kristie Ebi, this new center focuses on understanding the risks of global environmental change.

To ride, the registration fee is \$100, and each rider is expected to raise a minimum of \$2,800. Or, if you do not wish to ride, you can donate to a rider on team UWSPH Healthy Planet – Healthy People.

To learn more and/or donate, go to www.climateride.org/events/california-coast.



Photo: Courtesy of Howard Frumkin

THANK YOU

FOR SUPPORTING OUR STUDENTS

These SPH scholarships and fellowships are made possible by generous donations from friends and alumni. If you are interested in learning more and/or contributing, please contact Megan Ingram, mkingram@uw.edu.

Grayston-Day Fellowship



Kim Kummer (MPH student, Epidemiology) hopes to improve the health of her fellow natives in the Makah Tribe in Washington state. Before grad school, she helped carry out a community health assessment that included more than 400 interviews. She is now analyzing the data. “I am extremely grateful for the Grayston-Day Fellowship because it has allowed me to afford this graduate program and build my capacity as a young native professional,” she says.



Married with a two-year-old daughter, **Frank Angelo** (PhD student, Health Services) says the Grayston-Day Fellowship allows him to focus on his studies and his family, instead of working 20 hours a week as a research assistant. “It makes it so people like me can do this kind of work,” says Angelo. The Bellevue native spent six years working with mentally ill homeless adults at an outpatient psychiatry clinic in Seattle’s Belltown neighborhood.

SPH Endowed Fellowship



Michael Arndt (PhD candidate, Epidemiology) didn’t have to take out loans this year to study. “The SPH Endowed Fellowship enabled me to focus my attention more completely on the research and accelerated my program,” he says. Arndt is studying the interaction between infectious intestinal disease and childhood growth in Bangladesh. He hopes his research can, among other things, help target certain pathogens for vaccine research.



For her practicum, **Aradhana Thapa** (MPH student, Global Health) evaluated a management training program. For her thesis, she studied use of family planning contraception after abortion. The Nepal native was able to concentrate on these

projects without worrying about how to fund them, thanks to the Endowed Fellowship and other funding. “I hope to pay forward this act of kindness to other students in need in the future,” Thapa says.

SPH Magnuson Scholarship



Christine Khosropour, a fourth-year PhD student (Epidemiology), seeks to better understand sexual behavior strategies that could prevent HIV transmission among men who have sex with men. Although her primary work is funded by a grant, winning the School’s Magnuson Scholarship has allowed her to explore other research questions. She’s helping conduct one of the first studies of its kind in the country on Truvada, an antiretroviral therapy recently approved for use as a prophylaxis.

Rattlinggourd Award



Kyle Durrant, a descendant of the Yakama and Klamath tribes, graduated in August 2014 with a bachelor’s degree in public health. “I want to see someday that the Indian population doesn’t suffer from all of these horrible diseases,” says Durrant, who now works for the Urban Health Institute, a division of the Seattle Indian Health Board. The Rattlinggourd award allowed him to move near campus during his final quarter and avoid a daily commute from his family home in Buckley, more than 50 miles away. “It gave me a lot more time to focus on my studies,” he says.

Remak Scholarship



Without the Remak Scholarship, **William Tinashe Msemburi** (PhD student, Global Health Metrics) might not be here at all to pursue his studies. “Cost of living in Seattle is significantly higher than in South Africa, where I was working before I came here,” he says. “I would not have had sufficient funds for the move.” With his PhD training, Msemburi hopes to conduct a burden of disease study for his native Zimbabwe while helping improve data quality and use in Eastern and South Africa—“which in turn I hope will feed into improved response by policy-makers and improved health for African people.”

New Faculty



Cristian Baeza, *Professor, Global Health; Director, IHME, Health Systems Solutions*

Dr. Baeza has worked extensively on health care financing and health systems, advising in more than 30 countries and institutions in Latin America, Asia, Eastern Europe, the Mideast, and Africa.



Marco Carone, *Assistant Professor, Biostatistics*

Dr. Carone mitigates the risk of misleading scientific conclusions driven by incorrect statistical models. Much of his substantive work is in neurology, with an emphasis on dementia and aging.



James Condon, *Senior Lecturer, Health Services*

Dr. Condon's research interests include student outcomes, health care disparities, health care finance, and adoption of electronic health records by primary care physicians.



Julia Yue Cui, *Assistant Professor, Environmental and Occupational Health Sciences*

Dr. Cui's research includes the effects of developmental exposure to environmental chemicals, and how the gut microbiome modulates the development of genes involved in drug metabolism and obesity.



Alison Drake, *Acting Assistant Professor, Global Health*

Dr. Drake's research interests include HIV-1 prevention among women and adolescents, mother-to-child HIV-1 transmission, adolescent reproductive health, and family planning.



Amanda Fretts, *Assistant Professor, Epidemiology*

Dr. Fretts does observational and interventional research aimed at improving the cardio-metabolic health of American Indians.



Romel Mackelprang, *Acting Instructor, Global Health*

Dr. Mackelprang combines epidemiological methods with analyses of high-dimensional biological data. The goal is to identify factors influencing human susceptibility to infectious diseases.



Lucy Perrone, *Acting Assistant Professor, Global Health*

Dr. Perrone specializes in infectious disease diagnosis, surveillance, and response; building laboratory capacity in resource-limited countries; and improving human resources for health.



Nancy Puttkammer, *Acting Assistant Professor, Global Health*

Dr. Puttkammer's interests are in strengthening health information systems and promoting data use to improve health programs in resource-limited settings. With I-TECH, she works with informatics projects in Haiti and Kenya.



Justin Robertson, *Acting Assistant Professor, Health Services*

Dr. Robertson focuses on applying and developing econometric methods to better understand heterogeneity. Among his research interests are health economics, patient-centered outcomes, and comparative effectiveness.



Jeanne Sears, *Research Associate Professor, Health Services*

Dr. Sears specializes in occupational health services research, and in program and policy evaluation.

A New Center for Health and the Global Environment

Kristie Ebi (Professor, Global Health and Environmental and Occupational Health Sciences) will be developing research and environmental programs in global environmental change and human health, one of the six emerging challenges identified in our School's Strategic Plan 2012–2020.

She is one of the world's leading authorities on climate change and health, with a special focus on using complex models to project human impacts, and on planning and implementing adaptation efforts. She has studied a range of ways climate change affects health, including extreme weather events, heat waves, food safety and security, and vector-borne diseases.

Dr. Ebi is developing the new Collaboration for Health and the Global Environment (CHANGE). It will focus on innovative approaches to understanding and managing the risks of global environmental change.



Photo: Jeff Hodson

Kristie Ebi

Alumni



Mary T. Bassett 2015 Distinguished Alumna

Mary Bassett

Mary Travis Bassett, MPH 1985 Health Services, has been named the 2015 Distinguished Alumna, the highest award given by the School.

In addition, Dr. Bassett was chosen as the 2015 Gloyd lecturer. The Stephen Stewart Gloyd Endowed Lecture recognizes Stephen Gloyd, a long-time, current faculty member in Global Health and Health Services. Her topic was “Public Health as Social Justice: Lessons from Harlem to Harare.”

With more than 30 years of experience in public health abroad and in the US dedicated to advancing health equity, Dr. Bassett was appointed Commissioner of the New York City Department of Health and Mental Hygiene in January 2014.

Says Gloyd, “Mary is one of the few people I know who has lived her whole life aligned with her principles of justice and equity. She really walks her talk. She is a role model for all of us.”

Her time at the School “began some of the best teaching and learning that I have experienced,” Dr. Bassett says. “Noel Weiss, a superbly gifted teacher, taught me epidemiology. With fellow student Nancy Krieger, I began pursuit of an enduring interest in the relationship between race and health. Steve Gloyd and I became a travelling duo, giving a talk about apartheid and health. It’s not often you get the space to think along with people who help you think better. I got this for two years at the University of Washington and it has served me well.”

First All-SPH Alumni Reunion April 17

Come connect with friends and celebrate the 45th anniversary of the School! Alumni from every department are invited to an All-School Alumni Reunion on Friday, April 17. It will be a unique opportunity to catch up with old friends and faculty.

Keynote speaker will be Ron Sims, former King County Executive, former Deputy Secretary of HUD, and current chair of the SPH Dean’s Council. He will talk about the impact of SPH in the past and on public health challenges going forward.

Tickets are \$25 and include food, drinks, festivities, and parking. Location is Club Husky in the renovated Husky Stadium. To register and pay, please go to sph.uw.edu/reunion/.

Alumni Updates

Sonora Rae Stampfly, Public Health major, Global Health Minor 2014, began Peace Corps service in Tanzania in early February. (The UW produced the most Peace Corps volunteers for 2015 with 72 alumni currently in service.)

Gena Barnabee, MPH 2014 Global Health, was featured in an NPR story about her work in Timor-Leste. She worked with Health Alliance International to evaluate a new mobile health program there for pregnant women and new mothers.

Roxana Chen, PhD 2014 Health Services, was featured in *The Seattle Times* for her dissertation work on menu calorie counts. She works at Public Health – King County & Seattle and is an affiliate professor of Health Services in SPH.

Nicole Van Abel, PhD 2014 Environmental and Occupational Hygiene, is now in a medicine postdoctoral fellowship at the University of Pretoria, South Africa.

Jade Fairbanks, BA 2013 Public Health major, spent a year in Burkina Faso with the Peace Corps. She won approval for a Peace Corps grant to buy and install solar panels with batteries for a labor and delivery clinic there.

Katerie Chapman, MHA 2001, was recently promoted to senior vice president and hospital administrator at Virginia Mason in Seattle.

Ulrike Luderer, MPH 1998 Occupational Medicine, has been reappointed by California Governor Jerry Brown to the Developmental and Reproductive Toxicant Identification Committee, where she has served since 2012. She has been a faculty member at UC-Irvine in Occupational and Environmental Medicine since 1999.

Elliott Fisher, MD, MPH 1985 Health Services, was quoted in *The New York Times* on policy surrounding elderly patient over-testing and imaging in connection with financial Medicare abuse. He is director of The Dartmouth Institute for Health Policy & Clinical Practice.



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A Sampling of SPH Accolades for Leadership, Excellence, Service

Noah Simon (Biostat) made *Forbes'* 30 Under 30 list in science for his work on algorithms to understand Crohn's disease, rheumatoid arthritis, and various cancers. He also won an NIH Director's Early Independence Award.

Ashley Bobman (PH major, Nutrition minor) received the UW Sophomore President's Medal for maintaining the highest academic standing of her class, her interdisciplinary work, and the breadth and depth of her extracurricular activities.

Lorelei Walker (Public Health Genetics) created an animated video on epigenetics that was featured in the NIEHS monthly newsletter, *Partnerships for Environmental Public Health*.

PhD student **Clara Dominguez-Islas** (Biostat) won an oral presentation award at the annual Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) conference. The SPH Diversity Committee awarded her a travel scholarship for the event.

Heather Fowler (DEOHS) received the School's 2015 Martin Luther King Jr. Community Service Award.

Grad student **Erika Keim** (DEOHS) won a Graduate School Boeing International Fellowship to research and teach in Ecuador during winter quarter 2015.

Jeff Duchin (Epi) was appointed interim local health

officer for Public Health - Seattle & King County.

David Fleming (Epi) has been named vice president for Public Health Impact at PATH, where he will lead programs for reproductive health, noncommunicable diseases, malaria control, and more.

Ken Stuart (GH), founder of Seattle BioMed, was named a Global Health Pioneer and winner of the 2014 Award for Impact by the Washington Global Health Alliance.

David Grossman (HServ) was appointed vice chair of the US Preventive Services Task Force, the agency that makes evidence-based recommendations on services such as health screenings.

Doug Conrad (HServ) and **Tao Sheng Kwan-Gett** (HServ) will lead an evaluation of the state's Healthier Washington project, which was recently awarded a four-year \$65 million grant from the federal Centers for Medicare and Medicaid. Among its strategic areas are paying for value over volume in health care.

Ariel Hart (COPHP) received the WA State Public Health Association's Exceptional Student Award, which recognizes leadership and commitment to public health.

Jack Thompson (HServ) was elected president of the Washington State Public Health Association.

CEO of Gates Foundation Will Be This Year's SPH Graduation Speaker

The School of Public Health will welcome Sue Desmond-Hellmann as its graduation speaker on June 10.

Since 2014, Dr. Desmond-Hellmann has served as CEO of the Bill & Melinda Gates Foundation. Previously she was Chancellor of the University of California at San Francisco

and for 14 years worked at Genentech, where she became its President of Product Development.

Her career has been shaped by her commitment to medicine, public health, and education. She is the first physician and research scientist to lead the Foundation.