

Division of Biostatistics

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Biostatistics at SPH

The Division of Biostatistics advances SPH as a research powerhouse and tackles some of public health's most persistent problems.

Highlights:

- Among the top 5-7 biostatistics programs (out of 40+ in the U.S.)
- #3 research portfolio at the U of M (\$40+ million in grants, nearly 50% of the SPH research budget)
- Top 20 NIH investigator in U.S., consistently (Jim Neaton)
- Coordinating Centers for Biometric Research (CCBR), the organizing and implementation engine behind some of the world's largest and highest impact HIV trials.
- Nobel Prize in Physiology/Medicine (Edward Lewis, MS '39)

Biostatistics at SPH

Public health problems recently addressed:

- What brain regions are most active/suppressed in individuals with clinical depression?
- Which combinations of genes put you at highest risk for heart disease?
- Would reducing the nicotine content of cigarettes reduce nicotine exposure and dependence?
- How do we allocate a limited supply of organs for transplant in the fairest way possible?

Biostatistics at SPH

We lead in two distinct ways:

1. The study and innovation of biostatistical methods
2. Clinical trial design and management

Breakthroughs in Biostatistical Methods

- **Bayesian analysis**
- **Causal inference for dynamic treatment regimes:** discover the best treatment strategy for every patient
- **High-dimensional data:** drawing conclusions from big data (so we don't drown in data)

Breakthroughs in Clinical Trials

(NOTE: we design, manage, *and* analyze these trials)

- Largest HIV/AIDS treatment trials in the world
- Ebola vaccine, treatments, and survivor studies
- More efficient designs for Phase I cancer chemotherapy trials

Emerging Areas of Influence

- **IMAGING:** Designing ways to better understand brain function through advanced imaging, often in partnership with prominent Center for Magnetic Resonance Research (CMRR)
- **GENOMICS:** Developing methods to find gene combinations that change disease risk
- **MOBILE HEALTH:** Developing smartphone applications to collect data on individual health habits and behaviors to drive public health advances
- **BIG DATA:** Discovering ways to mine large-scale electronic health records to predict risks, such as for heart attack and stroke

Partnerships

We are frequently called on as consultants by corporations, colleges, and governments.

Corporate

- Health Partners: electronic health records data
- Boston Scientific: 50% of student position
- Medtronic: Susan Wei supported 20% to do methods work toward med device development
- AbbVie pharmaceutical: historical data borrowing to reduce sample size of trials

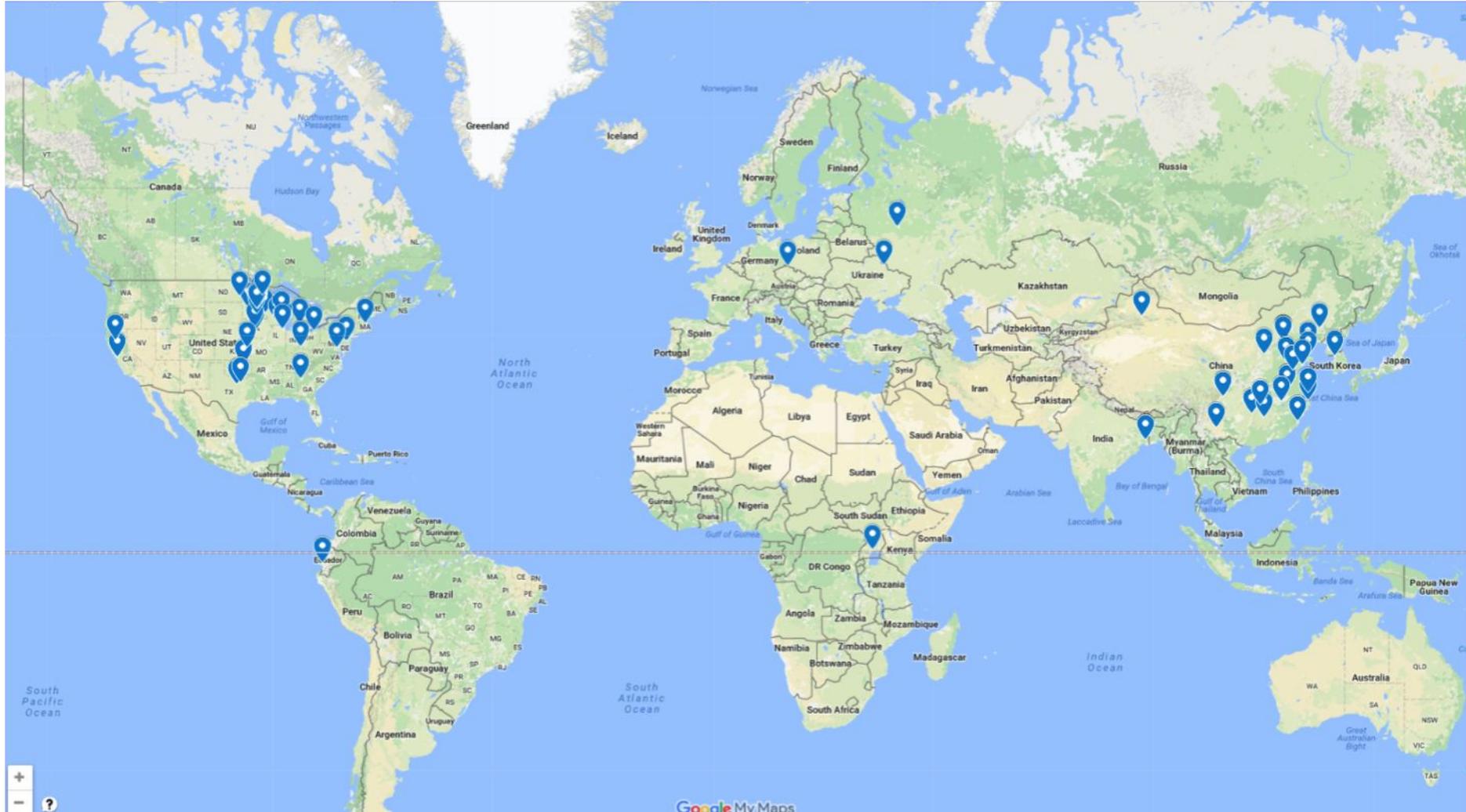
UMN partnerships

- Other SPH divisions
- UMN Medical School
- Cancer Center
- Humphrey, Carlson, and College of Science & Engineering (big data)

Biostatistics Students

- 75 students (40 PhD, 35 MS/MPH)
- Fall 2017 admissions
 - MS/MPH: 143 applicants, 127 admitted (89%), 15 matriculated (goal: 25), avg. GPA (admitted) 3.62
 - PhD: 148 applicants, 37 admitted (25%), 15 matriculated, avg. GPA (admitted) 3.87
- PhD students are fully funded and guaranteed 5 years support through RAs, TAs, training grants, and school scholarships
- All MS/MPH students receive at least 25% financial support in second year

Where students come from



Teaching Innovations

- Biostatistical consulting course to gain practical experience
- Biostatistics literacy course for general audiences to understand statistics in scientific papers
- Key partner in developing The Islands, a free, online, virtual human population used to simulate studies
- Faculty and teaching staff winners of Charles N. Hewitt Creative Teaching Award; Leonard M. Schuman Award for Excellence in Teaching; and Award for Excellence in Advising

Student Engagement & Support

- **Summer Institute in Biostatistics**

6-week NIH-funded summer program on UMN campus for U.S. undergrads interested in a career in Biostatistics. All expenses paid (travel, food, lodging, entertainment)

- **Statistics in the Community**

SPH biostats students and UMN statistics students provide free statistical consulting services to local non-profit, governmental, and community-service organizations.

Student Employment Prospects

Placement of recent graduates:

- Virtually all students have jobs lined up prior to graduation
- Academic: Harvard, Johns Hopkins, MD Anderson Cancer Center, Memorial Sloan Kettering Cancer Center, U of Maryland, U of Michigan, U of California Santa Cruz, U of Colorado, Ohio State, U of Nevada Reno, Florida state
- Industry: Genentech, Novartis, Amgen, Medtronic, Boston Scientific, Eli Lilly, AbbVie