The Johns Hopkins Biostatistics: Graduate Program

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Programs

- PhD
- ScM

Program Differentiation

- The ScM training is geared toward the development of the skills necessary to appropriately design studies and analyze data using existing statistical methods.
- The PhD training is geared toward the development of the skills necessary to appropriately design studies and analyze data using existing statistical methods *and* develop new statistical methods.

PhD Program: Coursework

- *Core:* 2 six term sequences in Statistical Methods and Statistical Theory
- *Additional Statistical Coursework:* Statistical Computing, Longitudinal Data Analysis, Survival Analysis, Multi-level Models, Causal Inference, Clinical Trials, Spatial Statistics, Bayesian Statistics, Decision Theory, Foundations, Advanced Topics ...
- *Extra-department Coursework:* Epidemiology, Introduction to Biomedical Sciences, Research Ethics, Public Health Perspectives
- *Scientific Minor*

PhD Program - Evaluations

- Written qualifying after 4 terms of coursework
- School-wide oral exam taken between 7th and 10th terms
- Thesis defense

PhD Program - Additional Features

- Rigor
- Working groups
- Apprenticeship model
- Research summers
- Seminars
- Collaborations
- Consulting center
- Jointly earn Master's degree in other areas (e.g., Bioinformatics)
- Hanging out
- Full tuition plus stipend/health insurance scholarships
- Excellent job prospects

PhD Program - Applications

What are we looking for?

- Quantitatively-oriented, scientifically-minded, self-motivated, intellectually curious individuals who are interested in public health research.
- Great references
- Strong essay
- Excellent GRE scores and academic performance
- Extra stuff (e.g., research experience)
- Coursework: Calculus, linear algebra, real analysis (not required, but a plus)

ScM Program: Coursework

- *Core:* 2 four term sequences in Statistical Methods and Statistical Theory
- *Additional Statistical Coursework:* Statistical Computing, Longitudinal Data Analysis, Survival Analysis, Multi-level Models, Causal Inference, Clinical Trials, Spatial Statistics, Bayesian Statistics, ...
- *Extra-department Coursework:* Epidemiology, Introduction to Biomedical Sciences, Research Ethics, Public Health Perspectives

ScM Program - Evaluations

- Written qualifying after 4 terms of coursework
- Thesis

ScM Program - Additional Features

- Rigor
- Working groups
- Apprenticeship model
- Research summers
- Seminars
- Collaborations
- Consulting center
- Hanging out
- Tuition Repayment program
- Excellent job prospects

ScM Program - Applications

What are we looking for?

- Quantitatively-oriented, scientifically-minded, self-motivated, intellectually curious individuals who are interested in public health research.
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- Coursework: Calculus, linear algebra

Statistics in Action

What proportion of individuals interested in biostatistics experimented with marijuana before finishing their second year of college?

I will assume that the individuals in this room are a representative sample from this cohort.

Sensitive Question

Roll an 8-sided die.

Random Digits: 1-8

6 6 4 3 4 1 4 5 7 5 7 4 8 8 3 7 7 6 4 5 7 3 7 8 4 7 1 8 2 3 6 1 2 6 2 8 6 2 4 3
1 7 1 8 8 3 3 2 3 3 6 3 3 4 2 4 8 7 2 2 7 6 4 1 2 4 2 2 5 2 3 7 6 4 1 8 6 1 8 5
5 5 4 7 7 6 2 7 7 8 2 4 5 4 8 4 5 5 6 8 4 2 6 5 6 4 6 5 3 8 7 8 2 5 4 6 7 4 5 7
4 3 1 7 8 5 4 2 3 7 5 5 8 2 3 4 8 7 3 5 7 2 7 2 2 2 8 5 3 2 4 2 3 8 6 5 8 8 2 8
3 1 2 7 5 5 1 4 5 7 6 8 2 4 2 4 2 7 7 1 8 8 2 5 8 8 3 5 7 4 2 8 4 3 8 3 5 3 7 3
7 5 1 8 6 4 5 8 7 8 1 5 2 3 2 8 5 3 3 5 5 8 2 7 6 1 4 3 8 2 3 8 5 1 2 8 6 4 3 6
3 5 2 1 4 1 3 6 5 8 3 4 7 5 2 4 6 8 5 1 2 8 1 5 2 8 4 6 6 4 6 6 4 3 7 6 2 5 4 3
2 7 6 1 5 5 7 6 5 3 3 7 2 5 1 4 6 1 2 4 7 8 5 1 8 5 4 8 3 8 7 1 3 6 5 3 6 5 2 6
1 8 5 7 7 5 4 8 1 8 7 4 8 5 5 1 4 8 5 7 6 5 3 3 4 3 6 2 1 4 8 1 6 4 4 3 1 1 3 6
3 2 2 6 2 6 4 6 3 8 5 3 4 4 1 8 6 5 5 2 1 4 3 5 6 2 3 1 2 1 3 8 8 1 8 8 1 1 7 1
1 2 2 4 4 5 7 7 5 8 5 5 6 1 7 6 5 4 2 1 4 2 6 7 8 7 4 2 2 6 6 2 5 7 3 4 4 5 8 3
8 5 2 5 5 5 7 8 3 7 6 1 6 4 6 7 2 2 3 5 7 1 7 1 8 5 7 2 6 8 7 7 3 5 3 6 8 6 8 3
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4 2 6 5 2 5 3 8 7 7 8 8 3 1 4 3 4 2 2 2 6 6 5 5 3 1 7 8 5 2 3 1 5 3 2 3 1 6 4 6
4 1 8 5 7 2 4 4 1 6 5 7 1 2 6 7 5 3 2 7 5 5 5 6 5 1 5 3 5 8 1 1 7 2 7 3 1 3 3 2
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7 1 7 6 8 7 5 2 2 1 3 3 5 1 2 7 7 7 7 8 4 5 1 4 3 7 6 7 3 8 7 7 4 3 3 6 3 7 1 3

Sensitive Question

- If rolled 1, then answer 'yes' regardless of the truth
- If rolled 2,3, then answer 'no' regardless of the truth.
- If rolled 4,5,6,7,8 then answer truthfully.

Sensitive Question

```
greenberg = function(x,n) {
    res = binom.exact(x,n)
    lower = (res$lower-0.125)/0.625
    upper = (res$upper-0.125)/0.625
    prop = (res$proportion-0.125)/0.625
    c(prop,lower,upper)
}
```