

Applying math to social problems

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- Love for mathematics: fit with way of thinking / questioning
 - ▶ People told me I could get a mathematics PhD
 - ▶ I loved doing math: maybe I should get a mathematics PhD...
 - ▶ But what would I be happy doing from there?
- Careers *using* mathematics differ on many key dimensions:
 - ▶ Day-to-day emphasis: Teaching, research, practical problem-solving
 - ▶ Within research, variation in distance to social problems
 - ▶ Being given problems vs. choosing your own problems
 - ★ E.g. researching health insurance exchanges vs. running an exchange
 - ▶ Working independently vs. as part of a team
- For me, a career as an academic economist is perfect

Why don't we have a cure for cancer?

- Common characterization: Basic science is challenging
- Economic perspective: Potential role for market incentives
 - ▶ Available scientific opportunities may reflect past research investments
 - ▶ Potential role for government policies to impact medical innovation
 - ▶ Unique research opportunity for social scientists:
What inventions are we missing?

Example #1: Cancer drug development

American Economic Review 2015, 105(7): 2044–2085

<http://dx.doi.org/10.1257/aer.20131176>

Do Firms Underinvest in Long-Term Research? Evidence from Cancer Clinical Trials[†]

By ERIC BUDISH, BENJAMIN N. ROIN, AND HEIDI WILLIAMS*

Example #2: Patenting human genes

Intellectual Property Rights and Innovation: Evidence from the Human Genome

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[*Journal of Political Economy*, 2013, vol. 121, no. 1]

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American Economic Review 2019, 109(1): 203–236

<https://doi.org/10.1257/aer.20151398>

How Do Patents Affect Follow-On Innovation? Evidence from the Human Genome[†]

By BHAVEN SAMPAT AND HEIDI L. WILLIAMS*

Example #3: Who profits from patents?

The Quarterly Journal of Economics (2019), 1343–1404.

WHO PROFITS FROM PATENTS? RENT-SHARING AT INNOVATIVE FIRMS*

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NEVIANA PETKOVA
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OWEN ZIDAR

Thank you

