Modeling Antibiotic Resistance
Resources for the Future

• History
  – Nonpartisan, nonprofit think tank
  – Founded by Truman post-WWII
  – Natural resource economics

• Organization
  – Located in D.C.
  – ~50 fellows & visiting scholars
  – Research Assistants
  – Summer Interns

• Current Work
  – Energy and climate, human health, the natural world, regulating risks, transportation and urban land
Antibiotic Resistance

- **Antibiotics**
  - Bactericidal or bacteriostatic
  - Initially isolated from microorganisms
- **Penicillin**
  - 1928: Discovered by Fleming
  - 1930: First infection cured with penicillin
  - 1944: Mass production
- **Antibiotic Resistance**
  - Penicillin resistant Staph aureus observed in 1947
  - Resistance plasmids
South Swedish Pneumococcal Intervention Project

- *Streptococcus pneumoniae*
  - Infections
  - Carriage
  - Resistance
  - Vaccine
- Geographic variation in PRP
- SSPIP
  - Goals
  - Difficulty in evaluating
  - Data set
Modeling PRP in DCC

- Andersson et. al
  - 2005 paper
  - Stochastic, discrete model
  - Parameter estimates
  - Effect of SSPIP

- Modifications
  - Vaccination
  - Alcohol-based hand sanitizer use
  - Cost-effectiveness

- Specific difficulties
  - Questions about vaccination
  - Inability to verify code results
Antibiotic Resistance & Influenza

• How does an influenza epidemic change the profile of antibiotic resistance?
• Empirical data?
Reflections

• Working at RFF
  – Think tank
  – Washington, D.C.

• Post-graduate plans
  – Public health
  – Graduate study
  – Career goals
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