



# **Overview of the CDC Steven M. Teutsch Prevention Effectiveness (PE) Fellowship Infectious Disease Modeling Track**

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# CDC Steven M. Teutsch Prevention Effectiveness Fellowship

Mission: To establish a cadre of quantitative policy analysts at CDC whose work provides information for health policy decision-makers in CDC, Congress, and non-governmental entities regarding allocation and use of resources to maximize the impact of public health programs

Vision: Research, Policy, and Programmatic capacity developed to assure value-based public health

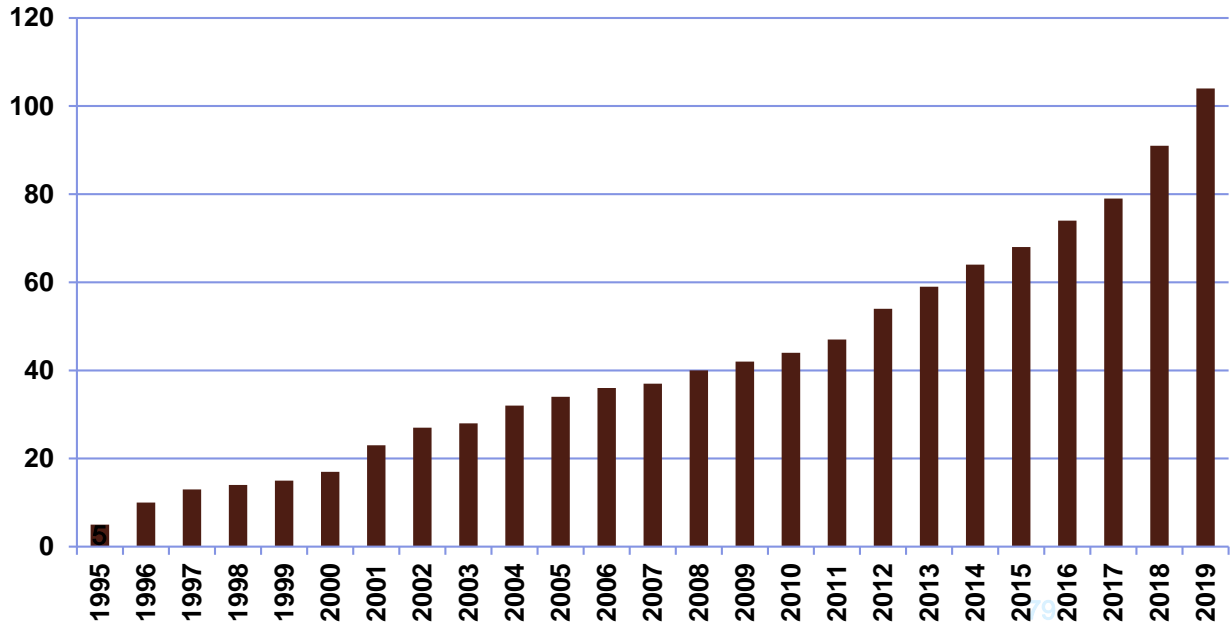


# PE Fellowship Basic Design

- 2-Year commitment
- Learning/Service model
- Performance requirements
- Supervisor and separate mentor guidance
- “Community of Practice” of decision scientists
- Competency-based curriculum
- Seminars and inquiry groups



# Growth of Economics and Decision Science Capacity at CDC Since 1995



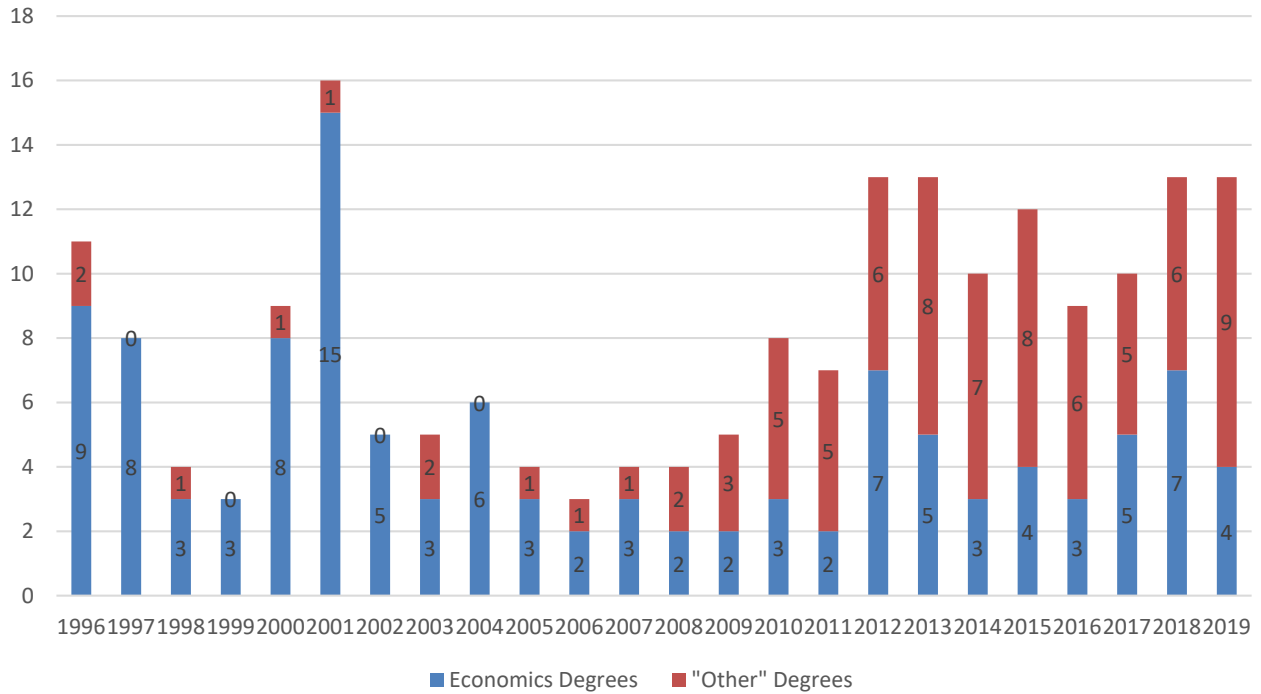
Growth in economics and decision sciences capacity at CDC due to the Prevention Effectiveness Fellowship

# PE Fellowship Alumni at CDC

- >90 PhD economists or decision scientists
- Most are alumni of PE Fellowship
  - 10 second year fellows
  - 12 first year fellows
  - 162 have completed 2-year fellowship since 1995 (by 2018)
  - 69 alumni employed at CDC in 2018
- Health Economics Research Group (HERG) ~300
- Very productive – 157 publications in 2017; ~3,900 peer-reviewed publications by alumni of the PE fellowship, 1995-2018
- 21 PhD “Modelers” engaged since 2010
- 98% of PEF graduates Agree/Strongly Agree with the statement “I would not be here at CDC now had I not gone through the PE Fellowship”

# PE Fellowship Classes by Year and Degree Type

PE Fellowship Classes by Year and Degree Type



# Modeling at CDC

- Describe transmission dynamics and provide insights about important natural history parameters
- Develop situational awareness tools, e.g. early warning systems, synthesis/interpretation of surveillance data, prioritization of surveillance strategies
- Generate planning assumptions and scenarios
- Produce short-term forecasts
- Inform detection, isolation, and quarantine strategies
- Inform the use of and assess the impact of pharmaceutical and nonpharmaceutical interventions
- Estimate resource needs

# PE Fellowship “Modeling Track”

- Modeling complex public health phenomena is increasingly important
- Need to engage quantitative scientists with the following backgrounds;
  - Mathematical and computational modeling
  - Statistics
  - Disease ecology
  - Operations research and industrial engineering
  - Data science, computer science, machine learning & deep learning
  - Quantitative epidemiology
  - Biomedical and health informatics



# Aims

- Train future modeling and analytic leaders in applied public health
- Provide opportunities for fellows to apply data analytics to inform public health decision making and policy development
- Enable growth of advanced analytical expertise across CDC
- Provide collaboration opportunities with other CDC fellows (e.g. EIS Officers)
- Facilitate long-lasting connections between CDC and the academic modeling community

# Desired Skills of Applicants

- Terminal degree in a mathematical or analytical field
- Desire to gain work experience in an applied public health setting
- Experience with modeling and advanced analytical approaches
  - Machine Learning
  - Bayesian analyses
  - Network, Agent-Based, & Simulation Modeling
- Proficiency with specialized software for analytics (e.g. R and Python)
- Experience working independently and leading projects
- Experience writing and publishing manuscripts
- Good communication and data visualization skills

# Potential Host Sites/Topics

- Fellows hosted in CDC programs and supervised by subject matter experts
- Host sites currently applying and projects will utilize the unique expertise of fellows, including inferring epidemiological characteristics, risk assessment, forecasting, and intervention planning and assessment
- Sites may include;
  - Healthcare-associated infections
  - Vector-Borne Diseases
  - Influenza
  - COVID-19
  - HIV/AIDS

# PE Curriculum

Domain	Courses
Population Health Science & Practice	<ul style="list-style-type: none"><li>▪ Introduction to the CDC / History of the CDC,</li><li>▪ Introduction to Population Health Science and Practice</li></ul>
Analytics & Assessment	<ul style="list-style-type: none"><li>▪ Introduction to Prevention Effectiveness Methods</li><li>▪ Prevention Effectiveness Research Methods</li><li>▪ Introduction to Cost Analysis I/II</li><li>▪ Introduction to Cost Effectiveness Analysis</li><li>▪ Introduction to Cost Utility Analysis</li><li>▪ Introduction to Regulatory Impact Analysis</li><li>▪ Introduction to Budget Impact Analysis</li><li>▪ Introduction to Health Impact Analysis</li><li>▪ Health Econometrics</li><li>▪ Advanced Decision Modeling and R</li><li>▪ Introduction to TreeAge Software</li><li>▪ Medical Expenditure Panel Survey (MEPS) Data</li><li>▪ MarketScan Data</li><li>▪ Individual Level Cost Effectiveness Analysis</li></ul>
Policy Evaluation & Communication	<ul style="list-style-type: none"><li>▪ Economics and Policy at CDC</li><li>▪ Writing a Policy Brief I/II/III</li></ul>
Interpersonal & Professional Communications	<ul style="list-style-type: none"><li>▪ Scientific Writing I/II</li><li>▪ Developing and Delivering Effective Presentations</li><li>▪ Networking for Success &amp; Getting a Job at CDC</li></ul>
Foundations of Leadership	<ul style="list-style-type: none"><li>▪ Introduction to Leadership for Prevention Effectiveness Fellows</li><li>▪ Fellowship Goal-Setting and Performance-Planning</li><li>▪ Accelerating Your Professional Development</li></ul>

# Modeling Track Performance Requirements

- Develop two manuscripts suitable for publication
- Develop and deliver two professional presentations (one of which must be peer reviewed)
- Develop and deliver two methods-based trainings
- Make substantial contributions to CDC models in terms of coding, updating inputs, calibration, and validation
- Attend required didactic trainings

# PE Fellowship Application Information

- Detailed eligibility information & required documents at:
  - <https://www.cdc.gov/pef/application.html>
- All applications need to be submitted online
- Application period for the 2021 class opens in September 2020
- Timeline:



Source: <https://www.cdc.gov/pef/application.html>

# Thank you!

## Questions?

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