

Sophie Mathes

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Research Interests

Environmental Economics, Health Economics, Urban Economics, Applied Microeconomics

Education

- 2015-2020 Ph.D. Economics, Arizona State University (expected)
Committee chairs: Nicolai Kuminoff and Alvin Murphy
- 2012-2015 Coursework in Mathematics, Heidelberg University
- 2009-2012 B.S. Economics, University of Mannheim. Thesis advisor: Michèle Tertilt

Working Papers

The Dynamics of Residential Sorting and Health: Implications of Climate Change in the U.S.

(Job Market Paper)

This study combines the seminal ideas of Tiebout (1956) and Grossman (1972) to develop a new empirical framework for evaluating treatments that have spatially differentiated effects on health and environmental quality. Individuals are modeled as choosing a residential location based on their heterogeneous preferences for local public goods and their beliefs about how their location choices will affect the future evolution of their health. Thus, the choice of residential location constitutes a health investment, in addition to providing current and future consumption values of local public goods. To estimate the dynamic model of location choice, I employ a sample of 5.5 million seniors from 2001-2013. Seniors' preferences for public goods, private goods, and their rates of intertemporal substitution between health and consumption are allowed to vary flexibly with age and health. Results suggest that seniors' willingness-to-pay (WTP) for warmer winters is uniformly positive, while WTP to avoid warmer summers varies with age and health. Their average annual WTP to avoid future climate change in the U.S. predicted under a "business as usual" scenario for global carbon emissions ranges from \$962 for older, sicker groups who are more vulnerable to climate change's negative effects on health to -\$1,894 for younger, healthier groups, who value warmer winters and are relatively resilient and mobile.

The Illness-Poverty-Amenity Trap

(joint work with Nicolai Kuminoff and Jonathan Ketcham)

This study investigates the interaction between residential sorting and health among senior citizens in the United States. We extend Tiebout's (1956) sorting model to recognize that health may affect the rate at which retirees are willing to trade public and private goods. Local public goods such as air pollution and climate may also affect the rate at which health declines late in life. A single-crossing restriction on preferences implies that lower income seniors will choose to live in lower quality neighborhoods, become sicker sooner, and spend more on health care. We test these predictions using a 10% random panel sample of Medicare beneficiaries that includes more than 7 million seniors from 2001-2013. Regression analysis reveals that poorer seniors tend to live in neighborhoods that expose them to higher concentrations of fine particulate air pollution (PM_{2.5}); they are diagnosed with more chronic medical conditions; they spend more on health care; and they die sooner. We also find that medical spending and migration rates increase following health shocks that are associated with elevated PM_{2.5} exposures, such as cancers, hip fractures, strokes, heart attacks, and dementia. Finally, we observe that when lower-income seniors move, they tend to move to more polluted neighborhoods. Overall, our findings are suggestive of an "illness-poverty-amenity trap" in which sicker, poorer seniors are exposed to worse environmental conditions

that degrade their health, increase their medical spending, and induce them to move to neighborhoods that are less expensive and more polluted.

Work in Progress

Sorting for Life: New Evidence on the Value of a Statistical Life for Seniors

(joint work with Kelly Bishop, Nicolai Kuminoff, and Alvin Murphy)

Senior citizens are the main beneficiaries of many regulations targeting human health and environmental quality. For instance, 70% of monetary benefits that the Environmental Protection Agency attributes to its Clean Air Act regulations are based on reducing mortality among people over age 65. However, these benefit measures are calculated by multiplying the number of deaths avoided by the value of a statistical life (VSL) derived from wage hedonic studies of younger, healthier workers. A well-known caveat to such calculations is that life-cycle theory suggests the VSL will evolve with age and health. However, there is virtually no revealed preference evidence on this evolution after people exit the labor market. We address this knowledge gap by leveraging the fact that seniors may increase their life expectancies by paying to move to neighborhoods where residents tend to live longer, for example because of access to higher-quality health care, better environmental conditions, and more opportunities for social interaction. Based on this logic, we use a hedonic property value model to estimate the implicit cost of statistical life extension in the housing market and use these implicit-cost estimates to estimate the VSL for seniors. We assess the sensitivity of our estimates to different beliefs that seniors may have about how their residential location affects their longevity. Specifically, we compare VSL estimates based on the “naïve” belief that observed spatial differentials in average longevity reflect purely a causal relationship with the “sophisticated” belief that these spatial differentials in average longevity reflect both a causal relationship and a non-causal correlation created by spatial sorting on health in equilibrium.

Presentations

- 10/2019 ECN PhD Reunion Conference, W.P. Carey School of Business, Arizona State University
- 08/2019 Sloan Summer School in Environmental and Energy Economics, UC Berkeley, “egg timer” session
- 07/2019 Western Economic Association International, 94th Annual Meeting
- 06/2019 American Society of Health Economists, 8th Annual Conference
- 05/2019 Association of Environmental and Resource Economists, 2019 Summer Conference
- 09/2018 Seminar, Center for Environmental Economics and Sustainability Policy, Arizona State University
- 08/2018 Camp Resources XXV Conference, North Carolina State University

Honors and Awards

- 2019 Travel Grant, Graduate College, Arizona State University
- 2019 Travel Grant, Graduate and Professional Student Association, Arizona State University
- 2019 Performance Award, Department of Economics, Arizona State University
- 2018 Performance Award, Department of Economics, Arizona State University
- 2016 Graduate Teaching Assistant Award, Department of Economics, Arizona State University
- 2012 “Elisabeth Altmann-Gottheiner” Thesis Award, University of Mannheim

Memberships

Association of Environmental and Resource Economists, American Society of Health Economists, Urban Economics Association, American Economic Association

Research Experience

2018	Research Assistant to Kelly Bishop, Arizona State University
2017	Research Assistant to Alexander Bick, Arizona State University
2013	German Council of Economic Experts, Research Assistant
2012–13	Research Assistant to Michèle Tertilt, University of Mannheim
2011–12	Research Assistant to Thomas König, University of Mannheim
2009–10	Research Assistant to Markus Frölich, University of Mannheim

Teaching Experience

2019	Instructor, Intermediate Microeconomics (undergraduate level), Arizona State University. Mean evaluation score 6.7/7 on Likert scale.
2018	Teaching Assistant, Intermediate Microeconomics (undergraduate level), Arizona State University, Instructor Kelly Bishop
2017	Teaching Assistant, Business Statistics (undergraduate level), Arizona State University, Instructor Stephan Ruediger
2016	Teaching Assistant, Mathematics for Economists (graduate level), Arizona State University, Instructor Andreas Kleiner
2014	Teaching Assistant, Empirical Methods in Economics (undergraduate level), Heidelberg University, Instructor Melanie Arntz

Personal

Citizenship: German

Languages: German (Native), English (fluent), Spanish (fluent)

References

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