

## Research Statement

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The broad goal of my research is to reduce health and wealth inequalities in the society. In order to generate new knowledge to advance science and to aid policy makers, my research focuses on the interactions between health and wealth shocks, public policy, and family decisions. In the vast majority of my work, I use register data and exploit natural experiments in order to identify causal effects.

My research thus far has focused on three areas: (i) the effects of health policies on population health, (ii) the interactions between health shocks, public policy, and socio-economic outcomes, and (iii) the effects of housing wealth on individual well-being. In recent years, I have started working on a fourth area focused on causes and consequences of mental health disorders. I am currently leading several large research projects with members at varying levels of seniority. My projects include 26 participants from 22 different institutions in 6 countries (see Appendix Table 1). In the remainder of this section, I provide a detailed description of these projects.

### **The Effects of Health Policies on Population Health**

In most developed countries, the welfare state has an integral role in shaping health inequalities through public health policies, social policies (e.g. cash transfers) and healthcare services. Part of my work evaluates the impacts of health policies. While I always aim for scientific novelty first, I also have a desire to contribute to ongoing policy debates in the societies I reside. As such, my work has focused on the health effects of a variety of policies, such as health insurance provision and drug safety warnings in the United States, and organization of child delivery services in the Netherlands.

Focusing on former policies, I found that uninsured patients lead to reductions in the quality of hospital care provided to insured patients through increases in uncompensated care costs [2]. My work also documented that drug safety warnings may not only lead to reduced medication use but they can also reduce preventive care use more generally [4]. These papers highlight the difficulty of evaluating public policies in the presence of spillover effects and unintended

consequences. Concerning the organization of child delivery services, my research documented that hospital births (as opposed to home births) lead to substantial reductions in infant mortality among women classified to be low-risk, but that the effects are entirely driven by women residing in low-income neighbourhoods [5]. A follow-up paper also showed that access to a broad set of prenatal treatments provided by physicians (relative to midwife care only) significantly reduces short-term mortality of low-income newborns who are classified as low-risk [6]. These papers underscore the importance of understanding the heterogeneity in treatment effects across patient populations and caution against designing “one-size-fits-all” policies. The fact that medical interventions improved the health outcomes of low-income newborns even among low-risk women living in a developed country with a long history of risk selection suggests that even relatively sophisticated models of risk selection may fail to identify all high-risk individuals.

In ongoing work, “**An Economic Approach to Machine Learning in Health Policy**” (joint with Sendhil Mullainathan, Ziad Obermeyer, Suproteem Sarkar, and Mircea Trandafir) I expand on the difficulties in risk targeting by considering the effects of precision screening policies for cancer guided by algorithms. Using clinical and register data on breast cancer screenings in Denmark, we first show that complex machine learning models can predict cancer better than simpler models that use established risk factors. We then tackle the evaluation challenge: an algorithm that can predict cancer in a hold-out set only establishes predictability; it does not imply an algorithmic screening rule built on it would improve social welfare. Using a series of policy evaluation methods we show that targeting screening via algorithm could in fact lead to large health benefits. Moreover, we show the choice of prediction target is key -- not all models with high accuracy can be used to construct beneficial screening policies.

### **The Interactions Between Health Shocks, Public Policy, and Socio-Economic Outcomes**

Economists have long been interested in the relationship between health and labor market outcomes (Currie and Madrian 1999). In this research theme, I investigate the effects of health shocks on socio-economic outcomes, primarily focusing on children and women, and further ask whether medical innovations and social policies may mitigate the resulting negative consequences.

My former work in this area focused on early-life medical treatments for very low birth weight (VLBW) children and showed that treatment eligibility not only improves the socio-economic

outcomes of VLBW children themselves, but it substantially improves the academic achievement of their siblings by improving mothers' short-term mental health and through compensating parental behavior [8]. The key insight from this work is that the family unit plays an integral role in enhancing or muting the returns to medical innovations, which may have important consequences for health and socio-economic inequalities in society.

I have several ongoing works in this area. First, in a paper titled “**Germes in the Family: The Short- and Long-Term Consequences of Intra-Household Disease Spread**” (with Hui Ding, Maya Rossin-Slater, Hannes Schwandt), we focus on another aspect that highlights the importance of the family unit in the production of short-term health and long-run socioeconomic outcomes: virus transmission, with older children “bringing home” viruses to their younger siblings. We combine birth order variation with within-municipality variation in respiratory disease prevalence among preschool-aged children to identify differential long-term impacts of early-life respiratory illness between younger and older siblings. Our findings suggest that increased exposure to severe respiratory illness during infancy among second-born children translates into worse educational and labor market outcomes in the long-run.

In another project, “**Child Health, Parental Well-Being, and the Social Safety Net**” (with Achyuta Adhvaryu, Snaebjorn Gunnsteinsson, Teresa Molina, and Herdis Steingrimsdottir), we study the effects of a large health shock -- childhood cancer -- on parents' income, safety net transfers, and labor market decisions. We further exploit changes in the generosity of transfers to families for parents' labor market absence during their children's illnesses. We find that parental income declines substantially for 3-4 years following a child's cancer diagnosis. Fathers' incomes recover fully, but mothers' incomes remain 3% lower 12 years after diagnosis. We also show that transfers play a crucial role in smoothing income for these households and, importantly, do not generate work disincentive effects.

Two of my projects focus on the effects of medical innovations on female labor market outcomes. In one project, “**Labor Market Effects of Life-Saving Treatments: Evidence from Breast Cancer Patients**” (with William N. Evans, Mikkel Hasse Pedersen, and Mircea Trandafir), we examine the effects of adjuvant radiation therapy treatment on the labor market outcomes of breast cancer patients and find that treatments improve employment and income and reduce reliance on the safety net. In a second project, “**Menopause, Hormones and the Labour Market**” (with Cheti Nicoletti, Kjell G. Salvanes, Hans Henrik Sievertsen, and Emma

Tominey), we plan to study the impact of medical treatments targeting menopausal symptoms on women's labor market outcomes.

### **The Effects of Housing Wealth on Individual Well-Being**

Given the well-documented two-sided relationship between health and wealth, I also have a desire to understand how wealth affects individual well-being. The persistent growth in wealth inequality in the prior four decades has led to a heightened interest in understanding causes of wealth as well as the effects of wealth shocks on individuals' outcomes. Part of my research focuses on the effects of housing wealth shocks, which is the main source of wealth for all but the wealthiest households. My former research on this topic has examined the effects of wealth shocks on fertility and early-life health outcomes [7] as well as the intergenerational rank correlations in net wealth versus total housing wealth [9].

In ongoing work, "**The Intergenerational Transmission of Housing Wealth**" (with Mike Lovenheim and David Wasser), we want to understand whether the observed correlations in wealth across generations are caused by wealth itself or other factors. In order to do so, we examine the effect of housing wealth shocks during different childhood developmental stages (ages 0-6, 7-11, 12-17) on wealth accumulation at ages 29-32. Our results suggest that wealth changes during childhood are differentially passed on to children later in life based on the age at which the wealth change occurs. We find evidence of significant transmission from early and middle periods, with the shocks occurring early in life mainly affecting housing wealth formation while shocks experienced during the middle developmental stage impacting both housing and non-housing wealth formation. We provide suggestive evidence that these effects are likely due to changes in unobserved parental preferences and behavior that are passed on to children.

### **Causes and Consequences of Mental Health Disorders**

Mental health disorders affect 15% of children and adolescents globally and they are now the leading cause of childhood disability (Polanczyk et al. 2015). The prevalence of child mental health disorders is similarly high in Denmark. Dalsgaard et al. (2020) find that 15% of Danish children are diagnosed with a mental health disorder by age 15. Existing research documents correlations between child (or adolescent) mental health and various socioeconomic, hereditary, and environmental factors. Yet, evidence on the causal drivers of childhood mental health disorders remains scarce. There is also scarce causal evidence on the effects of

pharmaceutical treatment of mental health disorders among children and adolescents, despite ongoing concerns about over-diagnosis and treatment. In this large research project that I have been developing during the last few years, along with my team members, I will address three questions:

One of my recent publications assesses theories that autism spectrum disorder is heritable and transmitted through parental skills. In this descriptive work, we find that fathers' skills are linked to ASD in children [10]. In **“The Role of Nature and Nurture in the Intergenerational Transmission of Mental Health”** (with Sonia Bhalotra, Jakob Søgaaard, and Mircea Trandafir), I will use identification strategies based on international adoptees, children conceived via donors in IVF treatments, and children of twins to answer how nature and nurture interact to create the intergenerational correlation of mental health.

Two other subprojects will investigate possible causal drivers of child mental health. **“Sibling Disability and Child Mental Health”** (together with Janet Currie, Mette Gørtz and Jonas Hirani) will examine the effects of having a sibling with a somatic disability on the likelihood of developing a mental health disorder. We will address the concern that child disability is non-randomly distributed across families through a matching design as well as a within-family identification strategy that compares the first- and second-born siblings between families with 3+ children in which the third born is disabled and not. Preliminary results provide support of a detrimental mental health effect of exposure to a disabled sibling. **“The Oral Contraceptive Pill and Adolescents' Mental Health”** (with Ana Costa-Ramón and Ana Rodríguez-González) will study how primary care provider practice style, as measured by their tendency to prescribe oral contraceptives, affects the development of mental health disorders among adolescents. Preliminary results show that being assigned to a provider with a higher oral contraceptive prescribing tendency increases the chances of (early) pill initiation and worsens mental health outcomes.

Finally, my research will address whether pharmaceutical treatment of mental health disorders affect socio-economic outcomes of adolescents. Subproject **“Antidepressant Use and School Performance: Evidence from Danish Administrative Data”** (with Sonia Bhalotra and Mircea Trandafir) examines the effects of antidepressant use on 9<sup>th</sup> grade test scores of native Danes. Our findings point to significant gains from treatment, especially for math. The effects are particularly large among children from low socio-economic background. We will expand

our work (**subproject 5**) to study effects of treating mental illness among vulnerable youth, such as immigrants.