ABSTRACT

Asthma currently accounts for around 9 million office visits and around 1.9 million visits to emergency departments each year, and is the leading cause of child disability in the US. Asthma has a known socio-economic gradient, striking poor children with greater frequency than wealthier children. Racial differences in asthma prevalence and morbidity seem to persist after attempts to control for socioeconomic status and access to care. The observed disparities have led researchers to question whether differences may be due to environmental, physiological, or genetic variations.

This paper analyzes the effects that the physical and socioeconomic neighborhood environment in which an individual grows up has on asthma prevalence and morbidity. We exploit a unique feature of the Panel Study of Income Dynamics (PSID) to examine effects of neighborhood factors. Specifically, the initial PSID sample in 1968 was highly clustered, allowing us to compare the similarity of asthma prevalence between siblings who grew up together, versus unrelated individuals who grew up in the same neighborhood. We use correlations between neighboring children’s subsequent incidence of asthma to bound the proportion of inequality in risk of asthma that can be attributed to disparities in neighborhood background. Because the PSID sampled neighboring children and all children within 1968 family members, and followed them into adulthood, we use sibling correlations of asthma prevalence and correlations between unrelated neighbors to assess the relative importance of neighborhood versus family background factors. We assess the extent to which asthma prevalence is correlated among neighboring children above and beyond the correlation that exists because of similar family backgrounds.

The PSID is the only survey that contains information on adult health, initial age of onset of health conditions, and the neighborhood in which the person grew up, along with the same information on that individual’s siblings and childhood neighbors. In addition, the PSID over-sampled minority and low-income families, which generated sufficient medium-high poverty neighborhoods to enable us to test for nonlinear neighborhood effects. For example, neighborhood problems such as lead paint or pollution may have significant impacts on health only when they achieve some threshold of incidence. Or certain families, perhaps low-income or single parent families, may be less able to buffer the negative effects of low quality neighborhoods.

We investigate to what extent observable family background and childhood neighborhood-level characteristics explain the observed sibling and neighbor correlations. We examine an extensive set of family and neighborhood background factors including birth weight, parent history of asthma, configuration of the family unit and patterns of care giving, self-reports of neighborhood and housing quality collected in
the PSID. Measures of the extent of air pollution are merged on from data from the National Aerometric Database for 1970 to 2001 at the zip code level. We also examine differential impacts of neighborhood effects by race/ethnicity, socioeconomic status, and family structure. We analyze data covering 1968-2001. We highlight disparities in the prevalence of asthma across neighborhood characteristics and investigate to what extent neighborhood effects contribute to racial inequality in this health condition.

1 These measures include self-reports of whether there exist plumbing problems, housing structural problems, cockroach or rat problems, insulation problems, neighborhood cleanliness problems, overcrowding, noise, or traffic problems.

2 The data includes information on the following air pollutants: Carbon Monoxide (CO); Nitrogen Dioxide (NO2); Sulfur Dioxide (SO2); Ozone (O3); Particulate Matter (PM10 and PM2.5); Lead (Pb).