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ABSTRACT

Poverty is strongly associated with worse health across countries and within countries across individuals. However, not all poor individuals suffer from poor health: the effects of poverty on health vary across place and time. In this review, we discuss the evidence documenting these patterns, and the reasons for the associations. We then provide an overview of what is known about policies that may improve the health of the poor. We focus primarily on the modern-day United States, but also discuss evidence from historical experiences and low- and middle-income countries. Throughout we discuss areas in need of future research.

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I-Introduction

A large literature has documented a strong, positive relationship between income and health. Preston (1975) was the first to observe that countries with greater GDP have higher life expectancies. The same is true within countries across individuals. For example, in the United States today, Chetty et al. (2016) estimate that the difference in life expectancy between the richest and poorest 1% of individuals is upwards of 10 years. Previous work (e.g. Deaton & Paxson 2004, Cutler et al. 2011) including Preston's, also shows that the relationship between income and health is not linear but concave: income appears to have a larger effect on health among the poor than among the rich.

In this review paper, we focus on the relationship between poverty – defined as having a low income (or low consumption) relative to a society's current standard – and health, rather than between income and health. The poor are the most disadvantaged group and thus it is of particular interest to understand the health consequences of their circumstances, and whether policy can ameliorate them. We start by documenting some key stylized facts that also underscore why it is important to focus on poverty. We next discuss why the relationship between income and health is not linear and the evidence on whether poverty causes health to decline. We then present alternative views on what drives the association between poverty and health. We finally turn to a discussion of why the relationship between poverty and health differs across time and place and end with a discussion on policy implications and directions for future research.

II-Stylized Facts

Poverty is broadly defined as having insufficient resources to guarantee basic needs such as food, clothing, and shelter. Although this definition appears straightforward, in practice, it is challenging to measure poverty, particularly across different times and places. The difficulties in doing so are many: to determine if someone is poor, one needs to assess their level of resources (typically using income), their level of need, and whether their resources are sufficient to meet those needs. However, because our perception of basic needs evolves across time and place, many define poverty in a relative sense, simply as being at the bottom of the income distribution. There are many measures of poverty available, each with its own advantages and disadvantages, as has been discussed in much greater detail elsewhere (e.g. Deaton 2016). We will ignore these important philosophical and measurement debates, because as we demonstrate next, the data clearly suggest that the relationship between health and income is stronger at the bottom of the income distribution, despite that fact that poverty lines are not always clear.

To illustrate this point, we use data from different sources to document two critical stylized facts that inform our review.

Stylized fact 1: Health improves with income, at a greater rate among the poor. Figure 1 shows the relationship between household income and four measures of health in the United States today: life expectancy at age 40, and the share of middle-age adults reporting that they are in good health, have a health difficulty, or experience depression. For all four measures and despite the fact they are measured very differently, we observe that health increases with income at the low end of the income distribution, but after a certain level of income the relationship is much flatter. Although

the level of income at which the relationship flattens out varies across figures, in all cases, the slope gets smaller at high levels of income. Thus, to a first order approximation, poverty, rather than income, is the most important predictor of health, no matter how one measures it.

Stylized fact 2: Poverty does not condemn individuals to poor health. In Figure 2a, we plot the relationship between county life expectancy and average household income in the United States for the 2001-2019 period. The figure shows that, although on average the poor are in worse health, there is a substantial amount of variation in the health of the poor, much larger than among the rich. As we show in Figure 2b, adjusting for differences in the cost of living across counties does not substantively affect these conclusions. Thus, no matter where they live, the rich appear to live equally long lives, but the location of the poor matters: it has a substantial impact on how long they live. Chetty et al. (2016) document similar patterns across cities of the United States. This evidence suggests that individual-level poverty is not destiny – other conditions in these locations or other characteristics of the population appear to greatly mediate the relationship between poverty and health.

III. Why are poverty and health related?

a. Conceptual issues: how is health produced and why does poverty matter more than income?

Money or the lack thereof does not directly affect health. It does so only indirectly by altering a person's social standing and by changing the ability of individuals to make purchases, move to healthier environments, and provide peace of mind. In reality, there is no simple relationship between income (or poverty) and health. As first characterized by Grossman's seminal (1972) model of health production, individuals may use their income to purchase health inputs and spend time on health-improving activities. Yet, the Grossman model makes ambiguous predictions about the relationship between income and health (it can be positive or negative), as it includes many possible mechanisms.

To illustrate the many factors at play and build intuition, we start by considering how income and health are related in the simplest model of population health presented by Lleras-Muney & Moreau (2022). In this model, individuals are endowed with an initial level of health H , which reflects parental health and genes, as well as *in utero* conditions, and is normally distributed in the population. Thereafter, health evolves at each age a as follows: $H_a = H_{a-1} - \delta a^\alpha + I + \varepsilon_a$. It can increase (decrease) if individuals receive positive (negative) health investments I ; it deteriorates with age at an increasing rate (given by the aging function δa^α); and finally it receives stochastic shocks ε_a , which are also assumed to be normal. Individuals die when their health falls below a certain threshold. This model, which ignores optimization, has been shown to provide an excellent description of the mortality of populations from birth to death in stationary environments.

If we assume that income can be transformed into a health investment (i.e. if there exists a function $I=I(\text{income})$ with $I'>0$), the model predicts that life expectancy rises with income. Even if the I function is linear, this model implies a non-linear relationship between income and health. When income increases, individuals that are close to the death threshold move away from the threshold, which has a large effect on life expectancy. But if individuals are far from the threshold, income

matters much less, at least in the short run. This provides at least one reason why poverty matters more than income for health: many of our health measures capture left tail events. Simulations, however, suggest that the steep relationship between health and income for low levels of income is not fully explained by this baseline model.

So, how could one modify the model to explain the steep relationship between income and health among the poor? One possibility is that the function I is concave, exhibiting decreasing returns to scale. This is intuitive and classically assumed in most economic models. But there is scant evidence to support this assumption because it is difficult to estimate the production function of health since health is not readily observable or captured by a single metric.

The model does not take optimization into account – it describes the evolution of health and mortality as a result of passively receiving resources and shocks. Using a model of health deficits, Dalgaard & Strulik (2014) find that if individuals use their income to make optimal health investments, then the resulting relationship between income and health is positive but not steeper at the bottom. So, allowing for optimization does not explain why income matters more for the poor.

Another possible reason why the relationship is so steep at the bottom is that the model omits other factors. It does not consider the possibility that income is itself a function of health (reverse causality) – a fact for which there is substantial evidence (as we discuss below) and which is included in the Grossman model. If individuals that are disabled or in bad health are unable to work and become or stay poor as a result, then it will appear like the relationship between income and health is stronger at the bottom of the income distribution.

A different possibility is that as wages increase, individuals will work more and devote less time to healthy activities like sleep or exercise – this is one reason why the Grossman model makes ambiguous predictions regarding the relationship between income and health. In addition, work itself may be detrimental to health – it may cause stress, expose individuals to environmental hazards, or cause aging through repetition. In fact, individuals may *choose* risky and unhealthy jobs to increase their incomes, as the theory of compensating differentials predicts (Rosen 1974). The rich could also use their increased income to purchase goods that are detrimental to health, such as alcohol. As Becker & Murphy (1988) point out, a rational individual may very well decide to consume harmful and even addictive goods, optimally trading off quantity for quality of life. These choices could make the relationship between income and health flatter at the top of the income distribution.

Finally, poverty could be correlated with a host of other factors that could cause the relationship to be steeper at the bottom of the distribution. The model ignores social and environmental influences on health and, in fact, is silent about how health and aging can be produced or modified. Grossman argues that more educated individuals will be more efficient producers of health. If the poor are also uneducated and thus less adept at producing health, then the relationship will be steeper at the bottom. It is also likely that both an individual's poverty level and the poverty level in their environment matter. Many detrimental social determinants of health, such as pollution levels and crime, are spatially clustered and correlated with local poverty rates.

The presence of other factors may also be important in explaining our stylized fact 2, which states that the association between poverty and health varies across place. If the effect of poverty on health is moderated or mediated by other factors, its ultimate impact can only be assessed if those other factors are observed as well. For example, if the main reason why poverty lowers health is that poor individuals have no access to health insurance, then there would be no association in a location with universal health insurance. In this case, an accurate model would include interactions between poverty and these other factors.

However simple, the model makes some important empirical predictions that are helpful to understand our empirical observations. In this model, the entire history of income determines health and mortality. The relationship between contemporary poverty and health may vary across populations/locations, in part, because individuals who are currently poor may have different histories of poverty. Relatedly, the model also implies that the effects of income (or other) shocks do not fully materialize in the short term. This is true whether the shocks are permanent (like living a life of poverty) or temporary (having a poverty spell). In fact, if income affects initial health, the annual rate of investment (I), or the depreciation rate δ , then the effects of a permanent decline in income (e.g. becoming poor) are very small at first, but rise over time. Thus, the model implies that there are both cumulative and delayed effects of negative shocks like poverty spells. The same is true in health deficit models, which also predict growing health gaps among adults because of early insults (Dalgaard et al. 2021). Empirically then the relationship between poverty and health will vary across individuals of different ages. This also suggests that short-term evaluations will tend to underestimate the full health consequences of poverty on lifetime health and mortality.

In short, the simplest model we can write predicts that income and health will be positively correlated, and that the effects of income on health operate with substantial lags, but not why the relationship is so steep at the bottom of the income distribution. In what follows, we discuss the empirical evidence on how poverty affects the determinants of health and the extent to which poverty has been shown to be causally related to health and mortality. We also review the evidence for reverse causality, and briefly discuss other factors determining both.

b. Poverty causes poor health

In this section, we review studies that analyze the impact of income, as well as the impact of health inputs that can be purchased with income, through the lens of poverty.

Basic goods such as nutrition, housing, and health care access, and healthy environments are of obvious importance for the production of good health. Yet, empirical evidence of causal impacts of such factors or of income (which can be used to purchase such goods) has been scant until recently. Many recent studies estimate long-term relationships, in line with the discussion above that it may take time for health inputs to materialize into improved health outcomes. In many studies, causal identification is obtained using quasi-experimental variation in welfare programs targeting impoverished populations, making these studies particularly relevant for the focus of this review. Few studies investigate the direct link between poverty and health. Instead, many studies examine the effects of providing health inputs to poor populations. We review them now from the womb until old age.

In-utero period. The largest and most established literature documenting causal impacts of poverty and basic goods on health consists of papers studying exposure during gestation. Both the relatively short exposure window of nine months and the possibility to directly link pregnancy conditions to birth outcomes allow for robust identification strategies and often highly powered analyses. While birth outcomes are known to have long-term impacts on health later in life, several studies in this literature also link in-utero conditions directly to health at older ages. (For a comprehensive review see Almond et al. 2018.)

Material resources and financial stability during the pregnancy period have been found to impact health at birth and later in life (e.g. Lindo 2011, Carlson 2015, Hoynes et al. 2015, Markowitz et al. 2017), suggesting that parental poverty has negative health consequences for the next generation. In terms of basic goods that are often lacking among poor populations, studies have found, among others, causal health impacts related to maternal nutrition (e.g. Almond & Mazumder 2011, Almond et al. 2011, Hoynes et al. 2016), maternal health care access (e.g. Currie & Gruber 1996), Miller & Wherry 2019), in-utero exposure to violence (e.g. Currie et al. 2022), and in-utero exposure to air and water pollution (e.g. Currie et al. 2014). While poor populations are typically more exposed to air pollution, the in-utero effects of a given pollution dose might actually be comparable among poorer and richer populations (Alexander & Schwandt 2022). The children of rich and educated however are often better able to shield their children from the negative effects of bad shocks (see review by Almond et al. 2018).

Childhood. Several of the health effects identified for in-utero conditions are also found for early childhood. Greater family income (e.g. Aizer et al. 2016, Braga et al. 2020), improved nutrition (e.g. Hoynes et al. 2016), and, in particular, better health care access (e.g. Wherry et al. 2018, Goodman-Bacon 2021) during childhood have all been shown to improve adult health among children growing in poverty. In some cases, health benefits are only observed years or decades after the initial exposure, emphasizing the importance of lags when measuring the health impact of poverty-related conditions during childhood. Compared to physical health, childhood mental health has been found to respond more quickly to detrimental factors such as exposure to violence (e.g. Heissel et al. 2018, Rossin-Slater et al. 2020), which the poor are particularly exposed to.

Adulthood. A broader set of studies analyzing the impact of material resources on adult health have found limited impacts. Studying macro-level income changes, Ruhm (2000), Snyder & Evans (2006), and Adda et al. (2009) do not find evidence of a positive relationship between income and contemporaneous health – in fact, they estimate negative relationships. But this might differ in the long run. Indeed, Schwandt & von Wachter (2023) show that it takes up to two decades before poverty onset in early adulthood impacts morbidity and mortality. Similarly, Sullivan & Von Wachter (2009) also find that the deleterious effects of job displacement on mortality are felt for at least 20 years.

Similar to patterns found for childhood exposures, mental health seems to respond more quickly to changes in material resources. Studying lottery winners, Lindahl (2005), Gardner & Oswald (2007), Apouey & Clark (2015), and Cesarini et al. (2016) find positive effects of winnings on mental health, but no consistent effects for physical health even among the poor, though they only follow the populations they study for limited amounts of time. Similarly, in the short-run, health insurance coverage improves mental wellbeing among the poor but has no detectable effect on

physical health measures (Finkelstein et al. 2012), though again health is not measured over a long period of time. The exception, however, appears to be adult mortality, for which a number of recent papers find immediate declines under expanded insurance coverage among the poor in the United States in the 2010s (Borgschulte & Vogler 2020, Miller et al. 2021, Wyse & Meyer 2023a). Generous health insurance has been shown to have more immediate benefits among those that are both poor and have chronic conditions (Newhouse 1993).

It is worth noting that some studies find short term *increases* in mortality associated with increases in income, partly because income allows individuals to consume unhealthy goods like alcohol, which can result in greater deaths (Evans & Moore 2011, 2012), and partly because income increases other activities like pollution and driving, which also lead to greater mortality (Finkelstein et al. 2024, Ruhm 2000). More generally, the consumption of alcohol, cigarettes, and other harmful goods is positively associated with income (income elasticities are positive, Gallet & List 2003; Nelson 2013), so income does not always appear protective of health. Income effects among adults might also be ambiguous because their income and work are closely linked, and some work is detrimental to health, as Case & Deaton (2003) show for manual occupations.

Retirement age. Morbidity and mortality increasingly accelerate with age. Thus, in old age, health becomes more responsive again to changes in resources and inputs. Studying retirees, Schwandt (2018) finds physical health and mortality responses to large wealth shocks over two-year periods that appear to be driven by psychological stress and mental health. Among elderly populations with poor baseline health, mortality responses to health insurance coverage and air pollution can even be observed within a matter of days (Card et al. 2009, Deryugina et al. 2019). Among poor near-elderly individuals, positive health insurance impacts on health are broadly observed even when not focusing on ill persons (Miller et al. 2021).

Historical evidence. The empirical evidence discussed thus far comes from high-income countries today. The historical evidence is more ambiguous, suggesting that, in the past, the relationship between income and health was not as significant as it is today (Cutler et al. 2006). On the one hand, as societies escaped poverty, their populations also grew taller and lived longer, suggesting that income improved nutrition and, ultimately, health (Fogel 1994). However, not all the evidence supports the existence of a strong association between income or poverty and health in the past, as noted by Deaton (2013). For example, in France, the relationship between regional income and life expectancy was, in fact, negative in the past and has turned positive only in recent times (Bonnet et al. 2023). This is partly due to the fact that incomes were greater in cities, where infectious diseases were also more prevalent before the creation of sewers and the provision of clean water (Haines 2001), and where crowding and poor housing conditions facilitated the spread of infectious disease (Ager et al. 2024). Manufacturing growth in cities was fueled by coal which led to considerable pollution and higher mortality in 19th century England and Wales (Beach & Hanlon 2018).

Recent work using individual data also shows that, in 19th century Sweden, men in prestigious well-remunerated occupations did not live longer than those in lower ranked low paid occupations until after WWII (e.g. Debiassi & Dribe 2020). Work looking at the lifespan of specific types of individuals with high socioeconomic status (SES), such as politicians, similarly suggests that the advantage of the better off emerged only in the 1950s, at least in several now high-income countries

(Clarke et al. 2022), though some work shows disparities between nobles and the general population in England arose earlier, around 1750 (Harris 2004).

These findings suggest an important role for knowledge and technological innovation in creating, or at least increasing, health gaps between the rich and the poor in recent times. Medical knowledge and innovation accelerated substantially in the 20th century allowing for the eradication of many common infectious diseases through sulfa drugs and antibiotics around the 1940s (Alsan et al. 2021, Jayachandran et al. 2010), and later extending longevity with new treatments most notably for cardiovascular conditions (Cutler 2005). The availability of a larger number of technologies made it possible for a wider gap to emerge between adopters and non-adopters of these innovations. In the United States and other settings where incomes and education are more important to access these technologies, this has likely resulted in greater life-expectancy gaps between the haves and the have-nots (Glied & Lleras-Muney 2008).

In summarizing this evidence, a few points are worth noting. First, most of this evidence does not directly show a causal link between poverty and health or mortality. It would be interesting to combine the existing evidence to assess how large the effect of poverty on health is, or to directly study the impacts of programs or events that move people in and out of poverty. Second, as noted in the theory section, the evidence suggests that contemporary inputs matter more at the beginning and the end of life. It is less clear why the relationships are more ambiguous among adults. Third, in the short run the evidence points strongly to a negative effect of poverty on mental health, and to a negative effect on the physical health of frail and poor populations like children and the elderly. However very few studies follow individuals from birth or early childhood to death, and so the literature likely underestimates the total effect of poverty on lifetime health and longevity. Fourth, many of the cited studies focus on “reduced form effects” of aggregate shocks (e.g. any study exploiting area-level shocks), abstracting away from the question of whether effects operate at the individual level and/or through the aggregation of individual-level exposures. However, health might not only be determined by an individual’s income and health inputs, but also by social and environmental factors that are the aggregate result of spatially clustered, individual-level poverty. Lastly, while many studies find the expected effects, several (particularly those focusing on adults and in the past) do not, again highlighting that there is heterogeneity in the effect of poverty on health, as suggested by stylized fact 2.

c. Poor health causes poverty

While there is clearly a strong relationship between poverty and health, the causal direction of this relationship can be difficult to determine. Poor health may lead to worse economic circumstances, and not the other way around. For example, serious health conditions or unanticipated health events can lead not only to high medical expenses, but also reduced work capacity, with potentially large negative effects on family income and savings.

Cutler et al. (2011) conclude, upon reviewing two decades of research, that the evidence for negative economic impacts of poor health in adulthood greatly exceed the evidence for causal effects of adult income on health. In Low and Middle Income Countries (LMICs), poor health lowers productivity and labor supply, as shown by interventions that provide treatments for sick individuals, e.g. for HIV (Habyarimana et al. 2010, Thirumurthy et al. 2008) or malaria (Dillon et

al. 2021, Fink & Masiye 2015). In agricultural societies, where most work is physical, this may not come as a surprise. But this is also true in high-income countries where most individuals work in the service sector, as we now discuss.

Recent research in the context of high-income countries brings further evidence that illness or injury experienced as an adult can have large economic consequences for individuals and their families. Newer papers focus on serious health events that are sudden in nature, such as hospitalizations, to plausibly identify the causal effect of an unanticipated health shock. They also use event study methods that allow the authors to trace out the longer-term effects on economic outcomes, in addition to examining immediate or shorter-term effects. Applying this approach with U.S. panel survey data, Dobkin and coauthors (2018) find evidence that nonelderly adults with health insurance who experience a hospital admission incur significant medical spending and suffer from even greater earnings losses. These substantial declines in employment and earnings persist for three years after admission. A modest increase in social insurance payments does not offset this earnings loss and, as a result, total household income decreases compared to the pre-admission average. These findings are consistent with other research documenting persistent earnings and income declines following the onset of a chronic disease or disability among U.S. working-age adults (e.g. Charles 2003, Smith 2004). These declines can grow over time and, as a result, a non-trivial share of households fall into poverty (Meyer & Mok 2019).

Another advance in this literature is the use of large-scale administrative record linkages to track changes in economic outcomes following adverse health events. These studies use objective measures of health and economic well-being that do not rely on self-reported information or survey response. Studies using administrative records from several non-U.S. countries confirm large permanent declines in employment and earnings following negative health shocks (e.g., Fadlon & Nielsen 2021; García-Gómez et al. 2013). However, the evidence shows smaller declines in post-transfer income following an acute hospitalization than that observed in the United States, indicating better insurance against income losses in these countries.

While administrative record linkages can be more difficult to execute in the United States setting, the earlier study mentioned by Dobkin and coauthors (2018) links credit report data to hospital records in California. For adults without health insurance, the authors document an abrupt increase in unpaid medical bills after a hospital admission, as well as an increase in consumer bankruptcy over the next four years.

The literature cited above focuses primarily on the economic effects of adverse health events among working age or retired adults; however, several recent papers find that child health shocks can also have significant and lasting effects on parental economic outcomes. Using administrative data linkages in different Nordic countries, these papers consistently document declines in maternal income that persist for several years following various shocks to child health, such as hospitalization, cancer diagnosis, or disability (e.g., Adhvaryu et al. 2023, Breivik & Costa-Ramón 2022, Eriksen et al. 2021). The decreases in maternal earnings are only partially made up by social insurance. Some of the papers also find a short-term reduction in fathers' earnings.

While the papers described above tend to focus on acute conditions or those with unanticipated onset for identification purposes, other health conditions, including mental health conditions, are

likely important determinants of economic outcomes. As evidence of this, Biasi et al. (2023) document that gaining access to lithium as a treatment for bipolar disorder in the 1970s in Denmark led to a large increase in labor force participation and earnings among people with this condition, particularly among those with less family wealth. This is consistent with a large number of RCTs finding positive labor supply effects from interventions treating mental illness (see Ridley et al. 2020). A handful of papers exploiting variation in treatment for physical health conditions have also documented positive economic effects in high-income countries (e.g., Bütikofer & Skira 2018, Daysal et al. 2024). Lastly, there is evidence that additional medical treatment for low birthweight infants leads to better early life health and educational outcomes (Almond et al. 2010; Bharadwaj et al. 2013; Chyn et al. 2021), which are likely important for their longer-term economic outcomes.

In addition to having direct impacts on individuals' ability to study and work, *anticipated* disease or early mortality has also been shown to lower incomes, consistent with the predictions of human capital models (Ben-Porath 1967). Individuals who expect to live longer acquire more education (Jayachandran & Lleras-Muney 2009; Oster et al. 2013), work more, and save at greater rates (Baranov et al. 2015, Baranov & Kohler 2018).

Finally, there is a very large body of work documenting the long-lasting negative effects of poor early life health on health and economic outcomes in adulthood in both high- and low-income countries (see Almond & Currie 2011, Almond et al. 2018). While not all these studies examine the incidence of poverty as a specific outcome measure, they show large negative effects on a wide range of outcomes related to economic self-sufficiency. These effects appear larger in low-income countries where individuals get sick more frequently, have lower ability to counter health shocks, and face multiple negative shocks at once (Currie & Vogl 2013).

Together, this evidence strongly indicates that poor health can have both immediate and long-lasting negative effects on economic outcomes for individuals and their families. This suggests that policies that improve health may also be effective at reducing poverty. It appears that this causal link is stronger in the United States and other settings with less generous social insurance, which could partly explain differences in the association between health and income across place (stylized fact #2).

Despite major advancements in this literature, there is a need for further evidence to better understand the reach and magnitude of the impact of health on income and poverty. Future research is needed to understand the causal effects of health conditions that are more progressive in nature, including many prevalent chronic and mental health conditions. In addition, future contributions to this literature will ideally be able to quantify the magnitude of this “reverse causality” channel in the overall association between income and health, as well as document its relative importance for individuals of different ages and in different contexts.

d. Other factors determine both poverty and health

A number of individual and environmental factors predict who is more likely to end up in poverty in the United States and around the world. Many of these factors also independently affect health and, thus, could bias the estimated relationship between poverty and health. We highlight a few factors that meet both conditions.

Among individual factors, low levels of educational attainment and racial and ethnic minority status are some of the most common correlates of poverty rates, across and within countries (Brady et al. 2017, Laird et al. 2018). Although research on the effect of education on health is inconclusive (see Galama et al. 2018), educational attainment is one of the strongest correlates of health behaviors, health, and mortality (e.g. Case & Deaton 2023). and could partly explain the association between poverty and health. For example, we observe that smoking rates are highest among the poor today, despite the high cost of cigarettes. However, education is linked to lower smoking rates and the poor are, on average, also less educated.

Racial and ethnic status (as well as immigration status) is another potentially important omitted factor, associated with both health outcomes and poverty status. These associations, and the underlying omitted factors, differ across racial-ethnic groups and have changed significantly over time.

The health and longevity of non-Hispanic Asian Americans and Hispanic Americans greatly exceeds that of the overall population, despite their relatively higher poverty rates. These groups include a high share of immigrants, often from lower-income countries, and they tend to be healthier. This selection effect might overshadow not only the negative health effects of lower incomes in those groups, but also the effects of exposure to racial-ethnic discrimination, which has been shown to worsen both economic and health outcomes (Lang & Spitzer 2020, Williams et al. 2019).

Black and Native Americans experience not only the highest rates of poverty but also the worst health outcomes among U.S. racial groups. They have endured a long history of racism and discrimination potentially explaining their poor health outcomes. Indeed, a large health disadvantage persisted in those groups even when income is accounted for (e.g. Schwandt et al. 2021, Kennedy-Moulton et al. 2023), though there have been strong improvements in health and life expectancy of Black Americans both in absolute terms and relative to their income levels (Schwandt et al. 2021). These patterns are in line with the idea that third factors such as discrimination can impact health through channels other than income and that changes in these factors can strongly impact overall health trends.

Other individual factors might also matter. Poverty is highly transmitted from one generation to the next, though this varies across and within countries. In the United States, the chances that a child born to a poor parent grows up to be poor themselves is about 34% (Chetty et al. 2014) suggesting genes may play a role. While genetic factors play a role in determining health, there is very limited causal evidence of the extent to which they also determine incomes. For example, alcoholism is partly genetically determined (Reilly et al. 2017) and causes early deaths (Zhao et al. 2023). The same genes may also cause poverty, though this has not been established. Some recent studies suggest that a few personality traits (such as numerical abilities), which influence investment behaviors, may be partly genetically determined (Barth et al. 2020). But it is not clear these genes also affect health. However, the *causal* effects of genes on either poverty or health have yet to be identified in the genomics literature. Even if genes are randomly assigned (e.g., differences between siblings), associations with later outcomes might not reflect a biological causal effect. For example, a gene that leads to a darker shading of the skin for one sibling could

be associated with lower productivity for this sibling simply because society might treat this sibling differently and not because of a true causal, biological effect on that sibling's productivity. Most importantly, with a few exceptions, it is now well understood that most genes interact with the environment to determine outcomes (Virolainen et al. 2023).

Social and environmental factors are indeed likely important drivers of the correlation between health and poverty. The Moving To Opportunity (MTO) experiment in several U.S. cities showed, for example, that poor families who moved out of high poverty neighborhoods experienced improvements in health, despite seeing no changes in incomes (e.g. Ludwig et al. 2012). Deryugina & Molitor (2020) tracked the mortality rates of Hurricane Katrina survivors who moved out of New Orleans – in general this population was quite poor and disadvantaged. They found that their mortality rates thereafter were lower than in New Orleans and moreover appeared to converge towards the mortality rates of the receiving places. These studies make it clear that the poverty status of the family alone does not determine health, but location also matters.

Common habits and cultures are likely important. For example, exercise is well understood to benefit health and cognition (and likely affects productivity and earnings), while heavy drinking is detrimental to both. Poor health habits are strongly correlated with poverty (e.g., Lynch et al. 1997) and persist across generations. They are also highly correlated across individuals living in a similar location (Christakis & Fowler 2008, Rosenquist et al. 2010) or belonging to the same social networks (Zhang & Centola 2019).

e. Why is poverty not always predictive of poor health?

As observed in our stylized facts and confirmed by the variety of findings in the literature, poverty does not always predict poor health outcomes – the health consequences of poverty vary substantially across places. Unfortunately, while we know that place of residence matters for health, the studies establishing this do not identify what characteristics of the locations matter. Understanding these factors might hold the key to reducing disparities.

The literature provides some suggestions regarding which environmental factors might matter most. When Chetty et al. (2016) examine correlates of area-level variation in life expectancy, they find that poor individuals fare the best in cities with highly educated populations, high incomes, and high levels of government spending. One possible explanation is that certain determinants of health are local public goods (e.g. air quality), which are available to both rich and poor residents in these areas. The authors also document lower rates of obesity and smoking, as well as higher exercise rates, among low-income individuals in lower mortality areas, which suggests local behaviors and norms matter. Supply-side factors likely matter too. For instance, the willingness of doctors to prescribe highly-addictive opioids or the availability of fentanyl, both of which vary significantly across areas, may contribute to overdose deaths, which are more prevalent among the poor (Finkelstein et al. 2021; Schnell 2024). Public policies may also be important -- we review the evidence on some government assistance programs in the next section. While none of these correlations necessarily reflects causal relationships, they provide some hypotheses for future investigations to try and better understand what characteristics of place matter for poor individuals.

In addition, a substantial literature in biology and epidemiology documents that social structures and support networks are important predictors of health outcomes. The seminal Whitehall studies show that individuals in lower occupational ranks generally have poorer health as a result (e.g., Marmot et al. 2013), though it is not clear these effects are causal (Case & Paxson 2011). But even if they are, animal studies suggest that the relationship between social rank and health is not invariant. It varies substantially depending on whether the animal society has low or high social mobility, or a tendency towards violence or cooperation. It also varies as a function of individual circumstance, such as the availability of social support networks (Sapolsky 2005). Recent studies among humans confirm the importance of social support for health: e.g., Rico-Urbe et al. (2018) document that loneliness predicts mortality. More generally, individual health is higher in communities with strong social bonds (Putnam 2000). Thus, it is possible that poor individuals may not suffer large consequences from poverty if they find themselves in supportive communities with strong social capital. Lastly, as noted above, different communities may have very different cultures that promote or do not promote good health habits.

Descriptive analyses, such as those in Figure 2, suggest that place likely matters more for poor individuals than for those with higher incomes. In support of this, Chyn & Shenhav (2024) find that mothers who move from below- to above-median birthweight locations in California have higher birthweight infants, with larger effects observed for mothers without a college education. Similarly, Currie & Moretti (2007) show that among sisters living in California, the birthweight of their children is higher for the sister living in a higher income zipcode. In addition, Deryugina & Molitor (2020) find significantly larger mortality reductions among low-income vs. higher-income individuals displaced by Hurricane Katrina.

Other evidence suggests there are important factors that can lessen the impact of poverty on health. The Black-White life expectancy gap narrowed by over 50% between 1990 and 2018 (Schwandt et al. 2021) at the same time that Black-White income gaps increased. Black-White gaps in poverty did fall in the 1990s but widened again in the 2000s while racial life expectancy gaps declined throughout this period. Although it is not clear what has caused these improvements in the longevity of Black Americans, this evidence suggests that social and environmental factors can ameliorate the negative impacts of poverty on health.

Future work is needed to understand the relative contributions of individual- and place-level factors in determining the health outcomes of poor individuals and how this may vary across contexts.

IV. Policy implications

We finish our review by discussing the potential for policy-driven solutions and policies that might most improve the health of the poor.

A first observation is that there are many historical examples of policies that do not explicitly target the poor, but have a disproportionate impact on them. For example the provision of sewers and clean water, as well as efforts to modernize hospitals, in the early 20th century disproportionately lowered infant mortality for Black Americans, one of the poorest populations at the time (Anderson et al. 2021, Hollingsworth et al. 2024, Troesken 2004). Recent work also shows that environmental

regulation has disproportionately benefited minorities in the United States who experienced the greatest levels of pollution in the past (Currie et al. 2023).

A second observation is that policies targeting the poor that are not explicitly health interventions can be effective at improving their health, a premise that is described sometimes as “social policy is health policy.” Courtin et al. (2020) conduct a meta-analysis of 38 randomized trials providing different types of programs to the poor. They report that “Early life, income, and health insurance interventions have the potential to improve health.” We discuss these now.

a. The effects of income transfers to the poor on health and mortality

Since there is some evidence that poverty causes poor health, a natural question is whether cash/income transfers to the poor are an effective policy tool to improve their health outcomes. Some work suggests they are. For example, recent evidence from randomized trials indicate that cash transfers improve mental health (depression, anxiety and happiness), though these effects appear small compared to the mental health impacts of multifaceted antipoverty programs (Ridley et al. 2020). A recent meta-analysis of RCTs in LMICs found that unconditional cash transfers improved the height of children, though not their weight (Crosta et al. 2024). Pooling data from many LMICs around the world since 2000, Richterman et al. (2023) find that cash transfers of all kinds lower the mortality of women and children under 5. On the other hand, evidence from three recent experiments providing cash assistance to low-income families in the United States find minimal evidence of short-run health improvements (e.g. Liebman et al. 2022, Miller et al. 2024, Sperber et al. 2023). These studies find evidence of changes in health inputs (such as medical care or food), so perhaps they will generate longer-term health benefits.

Recent work using natural experiments to examine longer-term effects of cash transfers to the poor indicate that they can be effective. Analyzing the effects of the first welfare program for the poor in the United States, the Mothers’ Pension program, Aizer et al. (2016) document that boys whose mothers applied for and received cash transfers in the early 20th century lived longer than boys whose mothers were denied. However, other studies, such as some analyzing the effects of cash assistance targeted on the basis of poverty and poor child health under the United States Supplemental Security Income program, do not always find health improvements (Guldi et al. 2022, Hawkins et al. 2024, Ko et al. 2020). Another study analyzing the long-term effects of a negative income tax experiment in the 1970s, which guaranteed a minimum annual income by providing transfers that decreased with earnings, also found no change in subsequent mortality (Price & Song 2018). But negative income tax programs are not equivalent to cash transfers - they strongly disincentivize work and do not increase family income substantially as a result, potentially explaining the absence of long-term health benefits.

In the United States, the most common anti-poverty program today is the Earned Income Tax Credit (EITC), which replaced negative income tax programs in the United States. This program transfers money back to poor families once a year when they file taxes, provided that they are working. The main advantage of this set up is that the EITC benefit formula is designed to encourage work, unlike its predecessor. Some evidence suggests the program improves health outcomes among children and adults (Evans & Garthwaite 2014, Hoynes et al. 2015). However, due to its benefit design, this program does not reach the poorest families, nor is it equivalent to a

continuous transfer of income (Aizer et al. 2024). Closely related to pure cash transfers are programs that provide quasi-income transfers, such as the Supplemental Nutrition Assistance Program and the Supplemental Program for Women, Infants, and Children. Studies have found that access to subsidized food through these types of programs improve maternal health and poor children's health over the short (e.g., Almond et al. 2011, Hoynes et al. 2011) and long run (e.g., Bailey et al. 2023, Hoynes et al. 2016).

b. The health effects of other policies targeting the poor.

Even if cash transfers improve health among the poor, other policies could be preferable either because they are more effective or because they cost less.

Education is seen by many as the most promising avenue for improving long-term economic and health outcomes of the poor. The two most well-known RCTs in the United States providing early childhood education to poor populations (the Abecedarian program and the Perry School Program) resulted in improved incomes and health in adulthood, at least among men (Campbell et al. 2014; Conti et al. 2016). However, these trials are small (about 100 individuals in each) and targeted populations that were disadvantaged in other dimensions (IQ, race). Evidence from Head Start – the largest early education program in the United States for poor populations – is, however, consistent with these findings (Carneiro & Ginja 2014; Cascio 2021). Overall, early education interventions appear to have the potential to improve health among the poor and lower disparities. It is worth noting, however, that these programs are comprehensive, providing food and improving access to health care, and thus are not purely “education.”

The association between formal years of schooling (education) and health is large and growing (see review by Lleras-Muney 2022). However, a large number of papers in rich and poor settings has investigated whether this effect is causal by leveraging policy changes, such as compulsory schooling laws, with mixed results. Some have concluded that the relationship is, therefore, not causal (Xue et al. 2021), while others have pointed out that the heterogeneity across studies suggests instead that the implementation context matters (Galama et al. 2018; Hamad et al. 2018). Thus, while there is consensus that education has large impact on earnings (e.g. Gunderson & Oreopolous 2020), there is less consensus on its effects on health, at least at the primary and secondary level. There is scant evidence regarding the impact of higher education. Recent work suggests causal improvements though it does not focus on the poor (Buckles et al. 2016; Heckman et al. 2018). Overall, much remains to be understood about when and how education can improve the poor's health prospects.

Programs to provide job training and other forms of skill acquisition early in adolescence and young adulthood, particularly among the poor, are also very common around the world and have been the subject of extensive scholarly study. Substantial debate exists about whether poor young adults benefit from these programs. Recent reviews conclude they do, but these economic benefits only materialize over the long run and are larger for more comprehensive programs (Card et al. 2018, Kluve et al. 2019). Importantly, a handful of studies find that these training programs have substantial health benefits, lowering mortality in the medium run (e.g., Gelber et al. 2016) and, ultimately, significantly improving the health and lifespan of participants over their lifetimes (Aizer et al. 2024), at least among poor youths in the United States.

Finally, a growing body of evidence demonstrates that improving access to health care for poor individuals can have large and lasting health benefits. For instance, Bailey & Goodman-Bacon (2015) document sizable and persistent declines in older adult mortality following the introduction of U.S. community health centers in the 1960s, which provide subsidized primary care to the poor. An expanded analysis by Kose et al. (forthcoming) finds significant improvements in infant health outcomes as well. Over a similar time period, Goodman-Bacon (2018) documents meaningful reductions in U.S. infant and child mortality resulting from the introduction of public health insurance under Medicaid. This is consistent with earlier work by Currie & Gruber (1996) finding mortality reductions under later expansions of the Medicaid program for pregnant women and children in the 1980s to 1990s. These benefits were concentrated among the poorest families that got access.

In recent years, there has been significant interest in better understanding the longer-term effects of childhood Medicaid. Using geographic or cohort-based variation in childhood exposure to the program, these papers find evidence of better self-reported health at adult ages, fewer chronic diseases and related hospitalizations, and lower mortality (e.g. Brown et al. 2020, Miller & Wherry 2019, Thompson 2017). While the cohorts affected by the 1980-1990s expansions are still young adults in these studies, Goodman-Bacon (2021) is able to trace out even longer-run effects of childhood Medicaid eligibility using the introduction of the program in 1965. He finds reductions in mortality and disability up to 50 years later, suggesting lasting health effects of early life Medicaid exposure.

Another recent development in this literature is the emergence of new experimental and quasi-experimental evidence documenting the health benefits of Medicaid for poor adults. Recent papers have documented mortality declines following state Medicaid expansions under the Affordable Care Act (Borgschulte & Vogler 2020), including two papers using newly-available administrative data linkages (Miller et al. 2021; Wyse & Meyer 2023b). A novel experimental study provides additional evidence of health improvement among uninsured U.S. adults gaining insurance coverage, which includes Medicaid (Goldin et al. 2021).

A separate literature has investigated the impacts of changes to the quality of health care available to the poor. Not only do poor individuals often have limited access to health care, but they often only access low quality care, even when health insurance is available to them. Several studies in LMICs suggest that improving access to quality health care for the poor can be effective at improving health, and this can be achieved by different means, such as improving monitoring and auditing, using price incentives, improving consumer information, and by increasing competition (Das & Do 2023).

Overall, this recent literature provides strong evidence that health interventions can improve the health of poor populations both in the short- and long-term. Whether education or other policies can deliver similar or better results is still outstanding.

- c. The devil is in the details: some observations on the uncertainty regarding policy

New research indicates that interventions proven to be effective in certain times or locations do not always replicate. For example, a randomized trial of the Nurse Family Partnership (NFP) program, which provides nurse home visits for new low-income mothers and their infants, conducted in South Carolina between 2016 and 2022 found that the intervention is not effective at reducing adverse birth outcomes (McConnell et al. 2022). This stands in contrast to evidence from older randomized trials of NFP in the 1970s and 1990s in Colorado, New York, and Tennessee, which showed better pregnancy and long-run outcomes for mothers and infants, particularly among high-risk subgroups (e.g., Kitzman et al. 2019; Olds et al. 1986). This program may have become ineffective over time for several reasons. Perhaps optimal nursing practices had already diffused by 2016, but were rarer in the 1970s. Relatedly, infant mortality fell dramatically from 1970 to 2016, which could result in smaller benefits. These health gains may have resulted from the greater availability of other programs such as Medicaid. Indeed, some recent work has shown childhood programs can be substitutes (Rossin-Slater & Wüst 2020). Thus, what exactly the poor gain access to, *relative to what they already have*, may be crucial to understand its impact.

Evidence from LMICs further illustrates this point. Work in the last decade has shown that conditional cash transfer programs, which transfer cash to poor families if their children attend school and visit doctors, universally increase health care utilization. These programs can improve the health of children (e.g., the Progresa program in Mexico, see Gertler 2004), but systematic reviews (e.g., Lagarde et al. 2007) have found that health benefits have not always materialized, so context likely matters.

The experience of LMICs with insurance provision in the last 20 years also provides some interesting lessons in this regard, as Das & Do (2023) discuss in their review. Like in the United States, these schemes protect individuals' finances and thus help smooth consumption. However, unlike the findings in the United States, the implementation of these public systems has not consistently shown significant benefits for health, with some countries showing benefits (e.g. China) and others not (e.g. Mexico). Das and Do point out that there is wide variability in how these systems have been implemented. They also suggest that the incentives for providers under each scheme have often worked against the objectives of the system (e.g., by incentivizing the provision of unnecessary care and raising prices), possibly explaining the lack of health effects. So supply side issues are also key to understanding program effect heterogeneity.

The evidence on prevention programs also suggests caution, as detailed in Dupas & Miguel's (2017) review. In LMICs, RCTs have shown that health interventions targeting preventive care can meaningfully improve both the health and economic conditions of the poor. For example, iron supplementation, nutrition supplementation, deworming, bed net provision, indoor pollution reduction and clean water provision are demonstrably effective; several studies looking at the historical experiences of now high-income countries show similar results. However, many questions remain: not all the evidence points to positive impacts. For example, while nutritional supplementation improved outcomes in Guatemala, it did not in Colombia, perhaps due to the Colombia's greater resources and social safety net. Another important issue is the question of complementarities: the provision of clean water may be ineffective in the absence of sewers, for example. So the existence of complementary policies matters.

The role of behavior and adoption remains important. (See review by Dupas 2011.) First, the benefits of interventions often depend on the subsequent behavior of participants. Many effective health products are either not universally adopted or not properly used, even when these innovations are cheap or provided for free, as is the case for example with vaccines or bed nets. Thus, while prices remain an important predictor of adoption, they are not the only barrier that the poor face in adopting health products. The evidence suggests that information campaigns are often ineffective and their success depends on how specific and relevant the information is, how it is delivered by whom and to whom, and the context in which it is received, e.g. whether participants can easily change their behavior because of access and social norms.

Trust in institutions is a particularly important barrier to care among the poor. Historical experiences of abuse have resulted in a substantial lack of trust among poor populations. This is illustrated by the case of the Black population in the United States: men who knew about the Tuskegee trials (in which white doctors prevented men with syphilis from obtaining lifesaving medical treatment so they could study the evolution of the disease) were much less likely to interact with the health care system (Alsan & Wanamaker 2018). There have been other such episodes around the world, where the poor in particular have suffered from medical abuses, including several instances of forced sterilizations (e.g. Pelras & Renk 2023), or coerced harmful medical interventions (e.g. Lowes & Montero 2021). These episodes led to lower vaccination rates and use of health care more generally today (Lowes & Montero 2021; Pelras & Renk 2023). Recent research suggests that increasing the number of providers that come from local communities and share racial and ethnic similarities with their patients can improve the level of trust and health care utilization among the poor (Alsan et al. 2019).

A related theme that emerges from these findings, and findings from evaluations in the United States and other contexts, is that comprehensive programs that deliver information, subsidies, and provide assistance in other ways, and that target communities rather than just individuals, are much more effective than simple interventions alone. This is because the poor face many barriers to improving their health and the effect of ameliorating only one is often small. Many of these barriers are economic, but many others are not, highlighting the importance of psychological and social factors. Unfortunately, comprehensive interventions also tend to be much more expensive.

Overall, more evidence is needed to understand when, where, for whom and for what outcomes, health interventions targeting the poor are effective. Importantly, without trust in the government, health policy interventions are unlikely to succeed.

VI. Conclusions and Directions for Future Work

We conclude with a few observations and directions for future research. There is very little evidence on the causal relationship between poverty and health – most evidence relates lack of specific inputs, such as food or health insurance, and health. A full accounting of the extent to which poverty affects health, and why income at the bottom of the distribution appears to have a larger impact on health than at the top of distribution is needed. While we speculated on the reasons for the non-linear relationship between income and health, we do not know of any empirical evidence on this question.

Today, there is substantial evidence of reverse causality, where poor health affects income, even in high income settings. However, we are yet to understand how much of the association between income or poverty and health is due to this mechanism. There are no papers attempting to fully quantify this contribution. It would be important to decompose the overall association between health and income and quantify which share of the association can be attributed to causal effects, reverse causal effects, and omitted factors.

Another direction for future research is to better understand why poverty is not always predictive of poor health. The importance of psychological factors such as resilience, which other disciplines have emphasized, are not well understood. The causal role of social factors, in particular the role of rank and inequality in generating stress, and the role of social support in determining health are also poorly established. This line of investigation might prove most fruitful, as it could provide the key to understanding which policies might be most effective in improving the health of poor populations.

While a number of papers document that certain public policies have significant health impacts, we do not know which policies are most cost effective, or which populations are most likely to benefit from them. Existing work, in fact, shows very important heterogeneity in effects across interventions targeted to the poor. Efforts to compare the health effects of different policies are needed, as are efforts to further understand why the same policies have different effects on different populations.

Finally, there is insufficient work on the long-term effects of anti-poverty policies. A number of randomized controlled experiments around the world are being conducted to understand the impact of cash transfers on health, due to the renewed interest in providing Universal Basic Incomes to all in the face of technical innovation. These studies will provide invaluable evidence going forward on the health effects of transfers to the poor and, to the extent that these are extended to the rich, they will allow investigation of the non-linear effects of income, as well as investigation of how these effects vary by age, and over the short and the long run.

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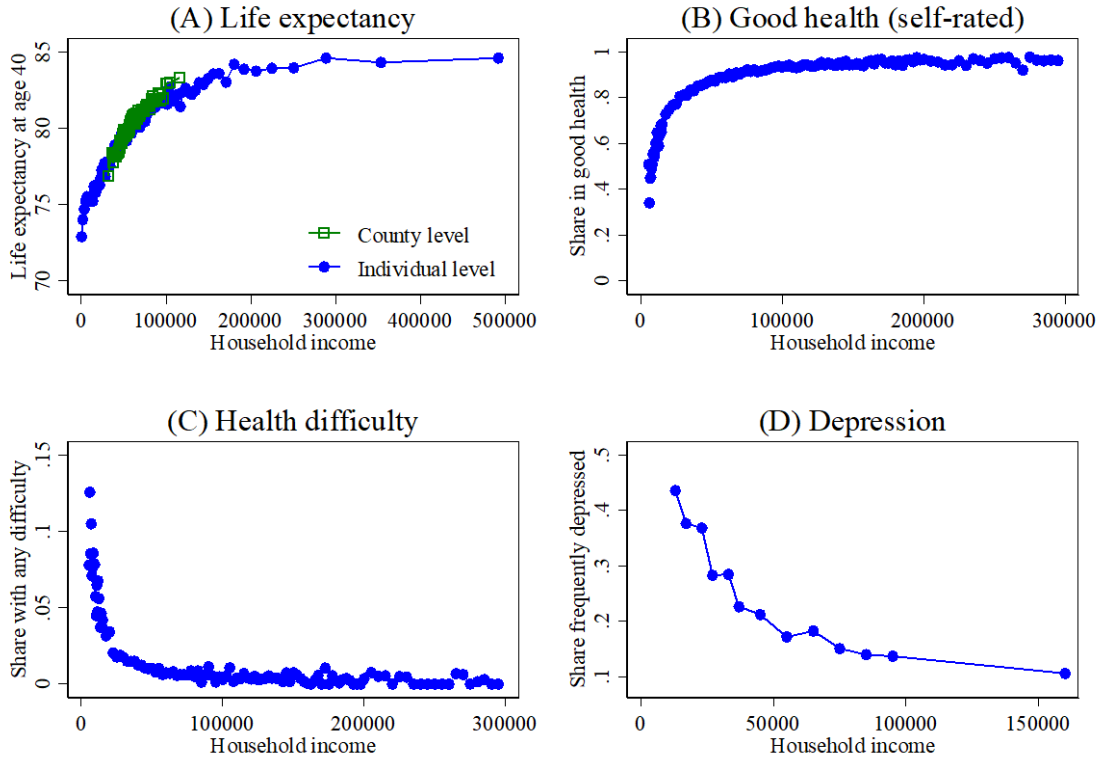
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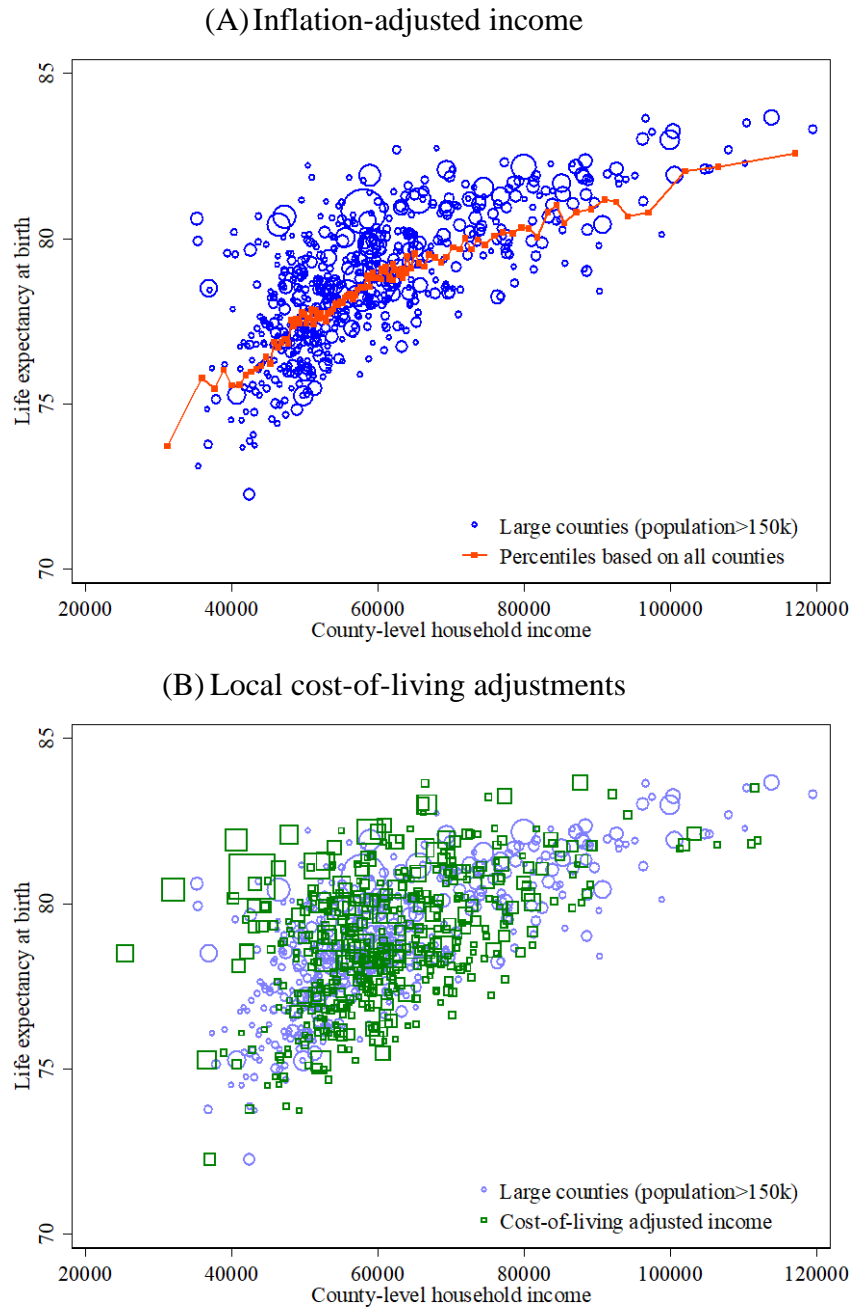
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Figure 1: Household income and health in the United States today



Notes: (A) plots life expectancy at age 40 of Americans between 2001 and 2014 grouped by their individual-level income (blue dots) and the median income in their county of residence (green squares) against household income in each group, respectively. The life expectancy data based on individual-level income data come from [Chetty et al. \(2016\)](#), while the county-level data are based on [Currie & Schwandt \(2016a\)](#). (B) and (C) show the share of respondents with good, very good, or excellent self-reported health and with at least one (of a total of six) health difficulties, respectively, across approximately 100 inflation-adjusted income bins in the Current Population Survey from 1996 to 2023 and 1996 to 2023, respectively. (D) shows the share of respondents feeling depressed daily, weekly, or monthly in the National Health Interview Survey from 2010 to 2022. Samples restricted to age 50-54 in (B)-(D) so that age remains largely constant across income groups.

Figure 2: Life expectancy and household income across counties



Notes: Authors' own calculations. (A) blue circles show life expectancy at birth between 2001 and 2019 plotted against median household income in 2014 for large U.S. counties (population above 150,000). The red connected dots show life expectancy and median income for the same time periods across all U.S. counties ranked by income and divided into 100 groups such that each group contains approximately the same population (see [Currie & Schwandt \(2016\)](#) for details). Income is U.S.-inflation adjusted. (B) blue circles as in (A); green squares show the same counties as the blue circles but with the county income adjusted for local cost of living. Mortality data from 2001-2019 NCHS; income data from 2014 ACS; cost-of-living data based on the 2010 ACCRA composite cost of living index for 325 urbanized areas.