Poverty and Mental Illness: Causal Evidence

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Abstract: Why are the poor disproportionately affected by mental illness? Do economic policies improve psychological well-being? Can psychological interventions reduce poverty? We review the interdisciplinary evidence of the bi-directional causal relationship between poverty and mental health and the underlying mechanisms. Mental illness causes and exacerbates poverty; psychological interventions generate economic benefits. Similarly, poverty causes mental illness, and anti-poverty programs such as cash transfers improve mental health. Given this evidence, combining anti-poverty programs with an expansion of low-cost treatments for mental illness is a key policy priority for coming decades.

One Sentence Summary: We review the interdisciplinary evidence of the bi-directional causal relationship between poverty and mental health and its underlying mechanisms.

Structured Summary:

BACKGROUND: Depression and anxiety are the most common mental illnesses: 7% of the world's population suffer from them at any given time. Contrary to widely held preconceptions from the 20th century, they are not 'diseases of affluence'. At the individual level, their incidence is robustly correlated with poverty as well as lower income, consumption, and employment. Within a given location, the poor are typically 1.5 to 3 times more likely to suffer from depression or anxiety than the rich. This correlation reflects some combination of a causal effect of poverty on mental illness, a causal effect of mental illness on poverty, and the effect of shared risk factors that cause both poverty and mental illness.

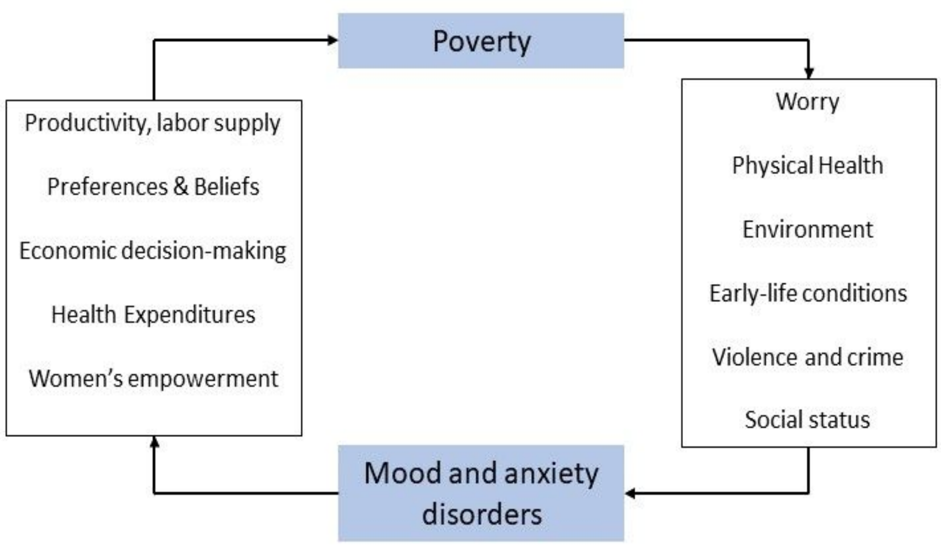
ADVANCES: Recent research has begun to untangle the causal relationships between poverty and mental illness using `natural experiments' and randomized-controlled trials. First, poverty has been shown to cause mental illness. Quasi-random negative shocks to income worsen mental health, and interventions to improve economic circumstances boost mental health. Randomized trials of cash transfers and broader anti-poverty programs have found reductions in depression, with effect sizes comparable to those of clinical treatments for depression. Researchers are beginning to isolate the underlying mechanisms. Volatile incomes and expenditures and the resulting worries and stress among the poor appear to play a role in causing mental illness. Providing insurance to the poor can thus lower depression. Poverty experienced in childhood and in utero also impacts child development in ways that make adult mental illness more likely. Limited causal evidence exists on other plausible mechanisms, such as worsened physical health and lower social status, increased social isolation, and greater exposure to violence and/or trauma.

Second, mental illness has been shown to cause poverty. Mental disorders prevent individuals from reaching their full earnings potential by reducing days worked. Treating depression and anxiety thus improves economic outcomes substantially. Correlational evidence suggests several potential mechanisms. Mental illness may directly reduce productivity. But it may also distort economic decisions such as labor supply, savings, and investment due to effects on economic preferences, beliefs, and behavioral biases. It may also hinder education and skill acquisition among adolescents and young adults, and increase the likelihood of catastrophic health expenditures through its frequent comorbidity with other health conditions.

OUTLOOK: The incidence of mental illness is unlikely to decrease without increased policy efforts. While richer individuals within a given location are less likely to be mentally ill, richer countries do not have lower overall rates of mental illness. Thus, aggregate economic growth alone is unlikely to reduce mental illness. Climate change is likely to worsen mental health, both directly through higher temperatures, and via reduced agricultural yields, more frequent

weather-related disasters, and an increased likelihood of violent conflict. Technological change and globalization will create large overall economic gains but also concentrated groups of losers whose mental health may consequently be compromised. The spread of social media and associated technologies may also harm mental health, especially among adolescents.

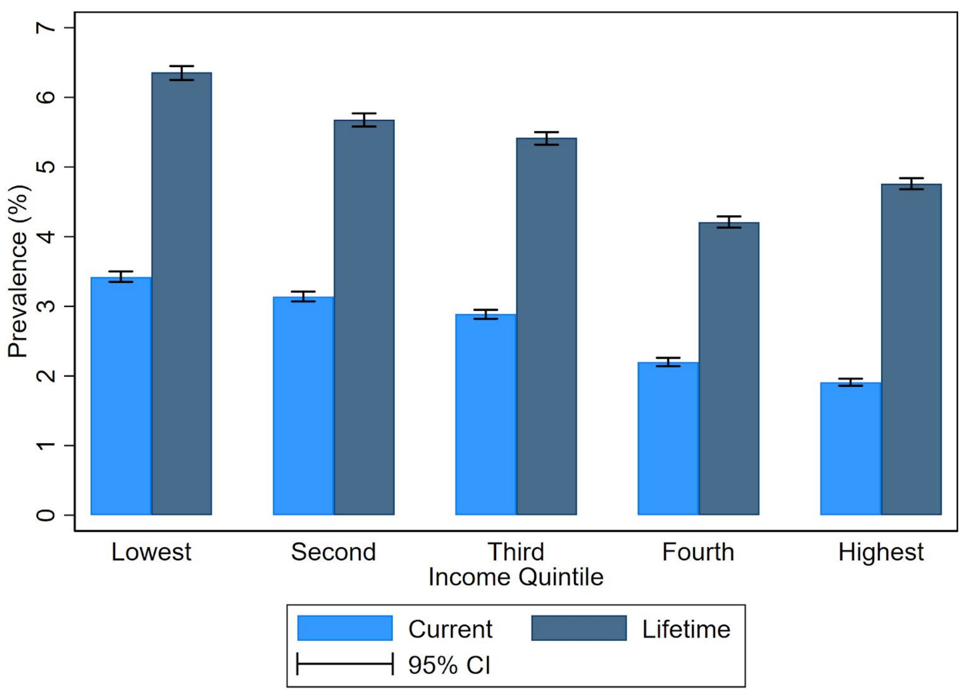
Given these challenges, policy action on mental health is vital, as is more interdisciplinary research on poverty and mental health. Evaluations of economic interventions should routinely measure mental health. Recently developed low-cost and highly-effective psychotherapy approaches may be a more cost-effective poverty alleviation strategy than 'conventional' economic approaches for the subset of the poor that suffers from mental illness. More research is needed to establish the optimal combination of mental health treatments with poverty alleviation programs. Combining interventions will be particularly important if mental illness affects economic productivity and decision-making. A key priority for research is testing for a mental health-based 'poverty trap', which would imply that one-time interventions have large long-run effects as gains in mental health and economic outcomes reinforce one another.



Main Text:

Depressive and anxiety disorders together affect over 7% of the world's population at any point in time (*1*). Contrary to widely-held preconceptions from the 20th century, these are not 'diseases of affluence' (*2*, *3*). In fact, within a given location, the poor are more likely to suffer than the rich. Rates of depression, anxiety, and suicide correlate negatively with income (*4*–*7*), household consumption (*7*), and employment (*5*, *8*). Those with the lowest incomes in a community suffer from depression, anxiety and other common mental disorders 1.5 to 3 times as often as those with the highest incomes (*5*). For instance, in India, 3.4% of those in the lowest income quintile in their state have suffered from depression in the past two weeks, compared to 1.9% of those in the highest quintile (Figure 1). Income and employment also correlate positively with broader measures of psychological well-being such as happiness and life satisfaction (*9*) and negatively with the prevalence of severe mental disorders such as schizophrenia (*10*).

Figure 1. Prevalence of Depression by Income Quintile in India



Notes: This graph shows the average percentage of people in each income quintile in India who have had depression (i) within the past two weeks ('current' prevalence) or (ii) at some point in their life ('lifetime' prevalence). Error bars show 95% confidence intervals. These numbers come from (*11*), who analyzed the Indian National Mental Health Survey, 2015-16.

Why are the poor disproportionately affected by mental illness? Do economic policies improve psychological well-being? Can psychological interventions reduce poverty? We review the interdisciplinary evidence for the bi-directional causal relationship between poverty and mental health and the underlying mechanisms. We argue that economic poverty worsens important dimensions of mental health, that mental illnesses cause and exacerbate poverty, and that given this evidence, combining anti-poverty programs with an expansion of low-cost treatments for mental illness is a key policy priority for coming decades.

Any attempt to understand this relationship must acknowledge the complexity and multi-dimensional nature of both mental health and poverty. Mental health has been defined broadly to describe “a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (*12*). Within this broad construct, economics has emphasized measures of ‘happiness’ or ‘well-being’, while biomedical fields focus on symptoms associated with anxiety and with mood disorders such as depression. Compared to the mere absence of disorders, well-being is a broader construct encompassing subjective satisfaction with life, including both the emotional experience of feeling good, and the perception of living a meaningful and good life (*13*). Yet the two are clearly related: depression and anxiety are strong determinants of happiness (*14*), and ultimately mental health and even mental disorders such as depression and anxiety exist along a continuum.

This article focuses on two important dimensions of mental health: mood and anxiety. Most of the causal evidence based on poverty and mental health examines low mood and anxiety, principally depressive and anxiety disorders. At times, we mention evidence on another mood disorder, bipolar disorder, and, given the continuous nature of mental health, complementary evidence on happiness and well-being. For the sake of brevity, the article uses the more general terms ‘mental health’ and ‘mental illness’ to refer to a person’s status along the dimensions of mood and anxiety specifically.

Like mental health, poverty is multidimensional. This article focuses on causal links between mental illness and the central ‘economic’ dimension of poverty -- consumption of goods and services -- including closely linked economic variables such as income and employment. Where appropriate, we touch upon other dimensions of poverty, including a lack of capabilities due to low education and physical health, as well as relative poverty and the associated low social status.

The correlation between poverty and mental illness reflects some combination of a causal effect of poverty on mental illness, a causal effect of mental illness on poverty, and the effect of shared risk factors that cause both poverty and mental illness. This article focuses on the first two causal pathways - i.e., the evidence for a bidirectional causal relationship. The possible presence of unobserved shared risk factors, however, makes untangling the causal relationships in each direction challenging.

Causal evidence comes from two main sources. Firstly, randomized-controlled trials (RCTs) of poverty alleviation programs and mental health treatments create variation in individuals' poverty and mental health status, respectively, that is uncorrelated by design with other observed or unobserved shared risk factors. Secondly, studies of 'natural experiments' identify naturally-occurring variation in economic circumstances or mental health that is argued to be 'as good as random' and therefore uncorrelated with other risk factors, conditional on some set of observables. Examples of natural experiments include lotteries, rainfall shocks that affect farmers' incomes, or the precise timing of approval of a new mental health treatment.

II. The Causal Impact of Poverty on Mental Ill-Health

We first review the evidence that economic circumstances causally affect mental health, focusing on natural experiments and RCTs. This evidence strongly supports a causal relationship. We then discuss the underlying mechanisms that may drive this causal effect and the evidence for each mechanism.

II.a. Evidence of a Causal Effect

Job loss and income declines often precede mental illness (*15*, *16*). Such correlations suggest a causal effect, but may still be confounded by third factors (such as a developing physical health condition) that cause both immediate loss of employment or income and have a slower-developing, delayed effect on mental health.

Natural experiments demonstrate more convincingly that loss of employment or income causally worsens mental health. For instance, lower agricultural output -- and therefore lower income for farmers -- due to rainfall shocks causes increased rates of depression and suicide in rural parts of Indonesia (*17*). Job losses due to plant closures are associated with higher subsequent antidepressant use and mental health-related hospitalization in Austria (*18*). US areas more exposed to trade liberalization with China saw reduced income and employment for some groups of workers and increased mortality through suicide among those same groups (*19*).

Large income or wealth increases induced by natural experiments have been found to improve mental health, although the evidence of causal effects is less clearly established. Native American tribes that opened casinos have seen substantial rises in income and reductions in anxiety relative to those that did not (*20*). Some studies have also found improved mental health among lottery winners compared to those who won less or played but did not win (*21*). However, these studies did not observe every variable that affects the chance of winning (e.g., number of lottery tickets bought), raising the possibility of bias if such variables correlate with risk factors for mental health. Research that controls for all such variables finds no short-run and a small longer-run effect of lottery winnings on mental health (*22*, *23*).

Perhaps the most compelling causal evidence that poverty causes mental illness comes from randomized-controlled trials (RCTs) that evaluate anti-poverty programs. Unlike the above studies, RCTs cannot be informative about the effects of negative shocks due to ethical considerations, but randomization by design greatly reduces the risk of bias. Cash transfers of \$400 to \$1,500 PPP in total to Kenyan households increased consumption and happiness, while reducing depression, stress and worries, four months after program completion (*24*). Scores on a depression scale fell by 0.12 standard deviations (SD); larger transfers caused substantially larger effects.

Randomized evaluations of other conditional and unconditional cash-transfer programs have produced similar results (*25*, *26*). For instance, a \$20 per month government cash-transfer program for households in Kenya reduced the likelihood of depression among vulnerable youth by 24 percent after four years of transfers (*27*). The effects identified in these recent studies are comparable to the effects of psychotherapy and pharmacological treatments on depression itself, although cash transfers are substantially more expensive (Lund et al., 2019).

Economic transfers and poverty-alleviation programs beyond cash transfers can also yield mental health benefits. A recent large-scale randomized evaluation of an ultra-poor graduation program in six countries -- which provides extremely poor participants with a mix of assets, intensive training, temporary cash support, and sometimes savings incentives and help accessing healthcare -- found increases in consumption and assets three years after the program's start. The program also improved an index of psychological well-being by 0.1 SD, driven by an increase in happiness and a decrease in mental distress (*28*). In some locations, where longer-run effects have been measured, the effects were even larger on both economic outcomes and mental health. In India, for example, an index of psychological well-being was 0.24 SD higher in the treatment group seven years after the completion of the program (*29*). Other programs with less comprehensive approaches found smaller or no effects on mental health (*30*, *31*).

In summary, across a wide range of populations and study designs, positive economic shocks to individuals improve mental health along the dimensions of mood and anxiety and negative economic shocks worsen it. This evidence is robust enough for us to conclude that poverty does indeed cause mental illness, but important shortcomings remain. With two exceptions (*23*, *29*), the above studies consider the consequences of relatively short-term variation in conditions, up to a few years at most. These studies therefore cannot capture causal effects which may take longer to emerge, and would only be observed through many years or decades of experiencing poverty. Ongoing long-run evaluations of cash-transfer programs are expected to provide such evidence (*32*).

II.b Mechanisms

Why does poverty cause mental illness? We discuss several plausible causal mechanisms and the existing evidence for each. More evidence is needed across the board, but the worries and uncertainty that come with living in poverty seem to be an important driver of the effect, as do the effects of poverty on childhood development and one's living environment. We have little causal evidence on other plausible channels, running through the worsening of physical health caused by poverty, increased exposure to violence or crime, and the effects of low relative social status and social isolation.

Worries and uncertainty. The poor face substantial uncertainty and income volatility, juggle complex financial portfolios, and have little access to formal insurance (*33*, *34*). Sustained long-run exposure to stress from managing this volatility may threaten mental health. In particular, the anticipation of economic shocks, not just their occurrence, may cause mental illness among the poor. In support of this mechanism, wealth shocks appear to have little or no effect on mental health in countries with generous and comprehensive systems of social insurance, such as Sweden (*22*, *23*).

Consistent with this hypothesis, a large-scale experiment randomizing health insurance to low-income individuals in Oregon found that receiving health insurance reduced rates of depression by about a quarter (*35*). This effect did not appear to be explained by increased mental health care or changes in physical health, and instead may reflect a sense of improved general well-being due to being insured. More evidence on the effect of insurance and social safety nets relative to the effect of higher *levels* of consumption on mental illness among the poor would be valuable.

Physical well-being. Poverty may worsen physical well-being, and this in turn may cause mental illness. Both steps in this causal chain are plausible. The robust income-health gradient in many settings (*36*) may reflect a causal relationship, as poverty exposes individuals to various adverse health factors (e.g. pollution, poor nutrition). The poor also experience physical pain more often, for instance, through occupations involving strenuous physical labor and inadequate access to medical care (*37*, *38*). In turn, physical illness plausibly strains mental health: physical ill-health often co-occurs with depressive and anxiety disorders (*39*). Acute or chronic health conditions and physical pain are financially costly, stressful, and emotionally draining.

To date, only limited causal evidence exists for this mechanism. Evidence on income causally affecting physical health is mixed (*40*). Many of the randomized interventions described in Section II.a had no detectable effect on physical health even as they reduced mental illness. However, physical well-being may well be a relevant mechanism over a longer time frame, which may not be captured by short-run studies.

Environmental factors. Those living in poverty are generally more exposed to environmental irritants such as pollution, temperature extremes, and challenging sleep environments (*41*). Many of these factors have been linked directly to mental illness. Days with extreme heat see higher rates of hospital admission of patients with mental disorders and increased rates of self-harm and suicide (*42–44*). Similarly, chronic sleep deprivation (*45*) can worsen psychiatric symptoms (*46*), though evidence on mood and anxiety specifically is lacking. Rising air pollution has also been associated with declines in mental health in China (*47*), though causal evidence is lacking.

Early-life conditions. Exposure to poverty early in life may have long-term effects on mental health. Such effects could be generated in utero, by exposing pregnant women to malnutrition or stress. Poverty may also disproportionately expose children to adverse shocks while their brains are highly plastic and thus profoundly impact brain development, cognitive ability, and mental health in adolescence and adulthood (*48*, *49*). For instance, the death of a mother's relative during pregnancy (as opposed to after childbirth) predicts depression and anxiety among her grown children later in life (*50*). Economic stresses around the time of birth can also have long-term mental health costs: in Ghana, a one-standard-deviation decrease in crop prices at an individual's time of birth was found to increase incidence of anxiety or depression in adulthood by 50%, with maternal nutrition, reinforcing childhood investments and adult economic outcomes the likely mechanisms of the effect (*51*). These results imply that cash-transfer and similar programs that provide financial support for households with pregnant women or young children may have high long-run mental health and economic returns.

Trauma, violence and crime. Living in poverty disproportionately exposes individuals to crime, including violent offenses (*52*). Within the household, women and children in poor households are disproportionately affected by intimate partner violence (*53*). The relationship between poverty and experiencing violence itself may be causal: cash transfers to households reduce intimate partner violence (*54*). Exposure to violence within the household predicts depression and other mental illnesses (*55*). Causal evidence on the effect of reductions in crime and violence on mental illness is needed to shed further light on this mechanism.

Social status, shame and isolation. *Relative* poverty -- consumption or income relative to others in one's society -- may play a role in the relationship between poverty and mental illness, as a consequence of social status and interpersonal comparisons. A recent natural experiment in

Norway found that when each citizen's income and wealth were unexpectedly made highly public, the poor became less happy (and the rich became happier) (*56*). While similar causal evidence is lacking for mental illness, it is plausible that the diminished social status resulting from poverty would have a similar effect on depression and anxiety. Relatedly, frequent marginalization of the poor in society may result in social isolation and loneliness (*57*). Loneliness and social isolation in turn are correlated with depression, which may reflect a causal relationship (Cacioppo et al. 2006).

III. The Causal Impact of Mental Ill-Health on Poverty

Just as poverty impedes mental health, mental illness worsens economic outcomes. We first review the causal evidence establishing this effect and then discuss the mechanisms through which mental illness may affect people's economic lives.

III.a. Evidence of a Causal Effect

Mental illness predicts worse labor market outcomes later in life. Following a diagnosis of depression, employment rates and earnings have been estimated to fall by anything up to 50 percentage points relative to the non-depressed (*58*, *59*). Evidence from natural experiments suggests a causal effect. A study in Denmark using the approval of effective treatment for bipolar disorder as a natural experiment found that it reduced the earnings penalty associated with bipolar illness by a third, from 38 to 26%, with the largest effects in the lower half of the earnings distribution (*60*).

Experimental evidence also supports a causal effect. A meta-analysis aggregating results across 36 RCTs in developing countries finds a positive average effect of various interventions to treat mental illness on labor supply (*61*). The average effect is sizable (0.23 SD) and similar across treatments for anxiety and depression. Pharmacological and psychological treatments have similar effects on labor supply (0.1 to 0.15 SD), while combining both types of treatments has even larger effects (0.34 SD). While these studies do not directly show that treating mental illness reduces poverty rates, higher labor supply and earnings naturally reduce the likelihood of living in poverty.

III.b Mechanisms

Mental illness may cause poverty through a range of plausible mechanisms. Limited causal evidence suggests that health expenditures and women's empowerment may play a role. Key mechanisms may include direct effects of mental illness on productivity and skill acquisition, and its effect on economic decision-making and so-called 'behavioral biases', although only correlational evidence exists at present, and these mechanisms remain important areas for future research.

Labor supply and productivity. Depression and anxiety often affect individuals in the prime of their economic lives (*62*). Mental illness may directly lower income by reducing economic productivity, ability or motivation to supply labor, and thus earnings. Depressed individuals may work fewer and shorter days and produce less per hour. Consistent with this, treating anxiety and depression reduces the number of days people report being ‘unable to work’ (*61*).

Mental illness may also impede skill acquisition and training efforts by workers. Depressed workers might be more easily discouraged during their job search, especially in the face of frequent rejections (*63*). Mentally ill workers also face discrimination in employment (*64*), which could lower wages and employment relative to equally productive mentally healthy workers. As described, substantial causal evidence exists that treating mental illnesses increases employment and income. However, there is little evidence on whether this happens through higher at-work productivity, greater job search intensity, reduced discrimination, or other mechanisms.

Health expenditures. Mental illness may deepen poverty through its impacts on health and health expenditures. The global poor usually pay most of their health costs out of pocket (*34*). 150 million people globally are estimated to have catastrophic health expenditures each year (defined as health care payments totalling more than 40 percent of a household’s non-subsistence expenditures) (*65*). Costs associated with treating mental illness rarely account for large shares of individuals’ budgets, in part because large fractions of individuals remain untreated. However, depression and anxiety frequently co-occur with other health conditions (*39*), and such comorbidity with depression is associated with substantially higher health expenditures for a range of health conditions (*66*, *67*). Indeed, treating depression was found to lower overall health care costs (*68*). Understanding the underlying reasons remains a topic for future research. For instance, treating depression may improve adherence with treatment regimes for the co-occurring health conditions, thus reducing ultimate costs.

Women’s empowerment. The burden of mental illness falls more heavily on women than men (*1*)**.** Improving mental health may therefore have important benefits for female empowerment, which in turn may reduce future poverty. A Cognitive Behavioral Therapy (CBT) intervention for depressed pregnant women in Pakistan lowered depression levels compared to a control group seven years after completion of the intervention (*69*) and increased measures of womens’ economic empowerment. In addition, treated women increased investments in children, which may reduce their children’s future poverty. Consistent with the hypothesis that psychological constraints prevent women from reaching their full earnings potential, a short-run psychological intervention increased women's labor supply several months after the completion of the trial (*70*).

Human capital accumulation. The onset of common mental disorders often coincides with secondary and tertiary education and the early stages of an adult's work career (*62*). Mental illness may therefore cause long-run economic hardship by reducing school and college completion rates, worsening early-career job placements, and hindering skill acquisition (*71*). This suggests the possibility of particularly high economic returns from improving mental health among adolescents and young adults. However, while childhood mental health is strongly associated with lower educational attainment, there is little evidence on whether this relationship is causal (*72*).

Poverty can influence cognitive function and decision-making by capturing attention and taxing mental bandwidth (*73*). The effects of mental illness could be along the same lines, but may be both broader and stronger. Mental ill-health may impact poverty by distorting economic decisions via impacts on individuals' preferences, beliefs, or decision-making processes. Such effects may impact welfare through changes in a variety of economic behaviors, such as labor supply decisions, savings and investment choices, consumption behavior, and the take-up of social programs.

Preferences. Mental illness may impact time, risk, or social preferences, i.e. how individuals make decisions between present and future payoffs, between risk and certainty of outcomes, and between payoffs for oneself versus others. For instance, depression may induce myopia, risk aversion, or an aversion to making active decisions. Existing studies have found mixed evidence on the correlation of depression with survey-measured time preferences, risk aversion in financial domains, and risky behavior in health domains (*74*, *75*). Causal evidence on how treating depression affects such outcomes using experimental measurement techniques remains lacking and is a topic for future research.

Beliefs. Beliefs about one's own and others' abilities, circumstances, and actions are central to economic decision-making. Mental illness may distort such beliefs in various ways. Depression is thought to be associated with systematically more negative beliefs about oneself and the external world (*76*, *77*). Correlational evidence suggests that depressed individuals show less optimism bias in how they change their beliefs, in contrast to healthy individuals (*78*). Providing causal evidence on how depression affects beliefs and how individuals form and update those beliefs, and the effect of treatments such as psychotherapy on such information processing, is another promising topic for future work.

Decision-making. Mental illness may also interfere with economic decision-making beyond its effects on preferences and beliefs. For instance, depressed individuals might be particularly susceptible to default options or may have difficulty selecting from large choice sets. Anxiety and depression involve changes in how attention is allocated, such as excessive rumination or worries about low-probability events (*79*). Limited attention is a frontier research topic in behavioral economics and has been argued to underlie many behavioral biases (*80*). Understanding how mental illnesses affect the stock and allocation of attention is a promising way to bridge scholarship in mental health with economics.

Effects like these may play a role in a key puzzle in development economics and growth: the apparent existence of numerous unexploited, high-return investments in developing economies (*81*). Traditional economic models imply that such high returns should not be available and left unexploited. Behavioral economics provides some explanations for this puzzle. For instance, factors such as present bias (discretely higher discounting of payoffs not in the present) and loss aversion (disliking losses in payoffs more than liking similar-sized gains) can help resolve some of the puzzles (*82*). We speculate that depression and anxiety reduce take-up of high-return investments; treating them may thus lead to improvements in economic well-being.

IV. Outlook

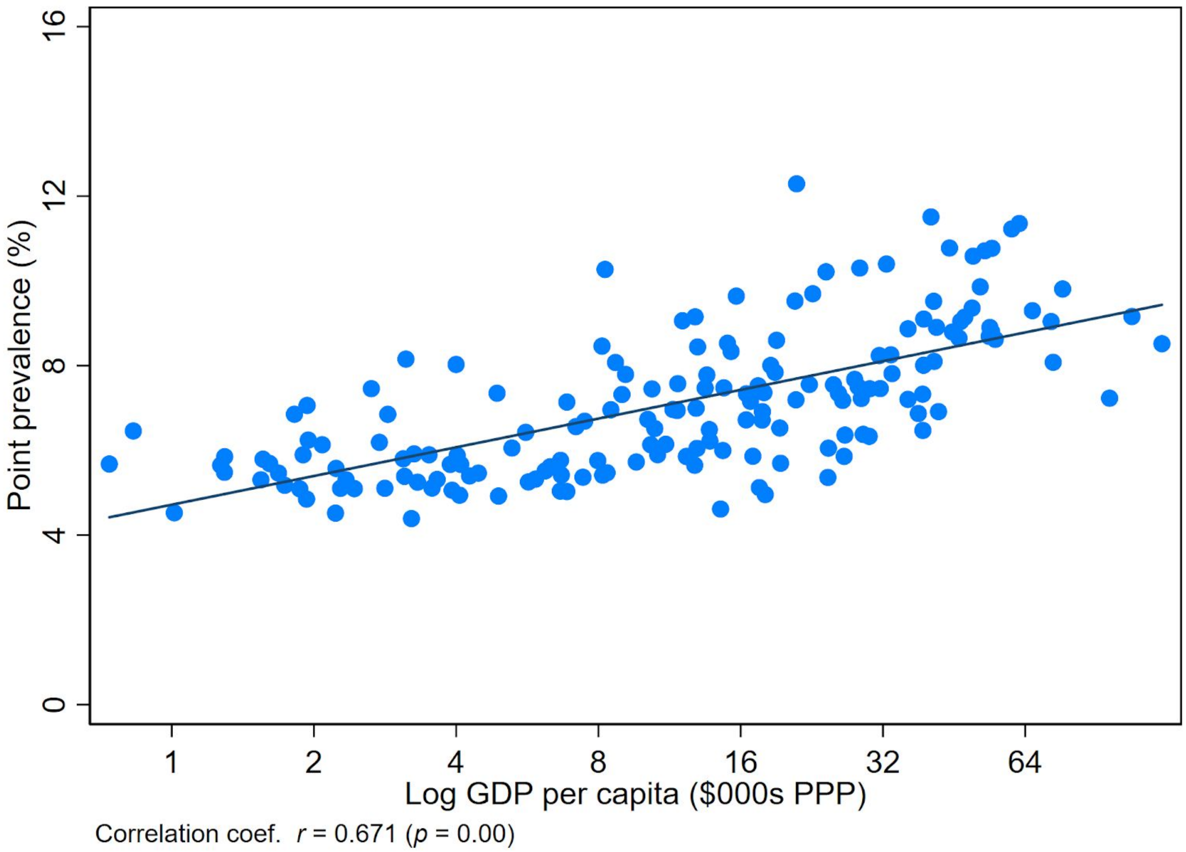
Having established the bidirectional causal relationship between poverty and mental health, we now discuss future developments and potential policy implications.

IV.a Future Developments and Challenges

Aggregate economic growth and other ongoing global trends are unlikely to improve mental health by themselves.

Aggregate economic conditions. As shown in section II, higher income causes better mental health at the individual level. Yet the prevalence of mental illness does not appear to decline as countries grow. In fact, mental illness is slightly *more* common in richer countries (*83*) (Figure 2), though some concerns remain about methodological differences in measurement across contexts (*84*). Risk factors discussed in section II such as inequality and relative income, or the stresses of urban environments for the poor, may worsen rather than improve as whole economies expand. For instance, within-country inequality has increased in many countries in recent decades, despite significant reductions in extreme poverty and global inequality (*85*). Therefore, even in the presence of aggregate economic growth, complacency about mental health is not warranted. Active efforts to combat mental illness are critical given that several emerging societal and global factors such as climate change pose threats to mental health, especially among the poor.

Figure 2. Prevalence of Common Mental Disorders by Country



Notes: This graph plots, for each country, the percentage of the population estimated to have a depressive or anxiety disorder at a given point in time against log GDP per capita of that country. Each scatter point represents one country. The line shown is an Ordinary Least Squares regression line of country prevalence rates on a constant and log GDP per capita. Prevalence rate data come from the *Global Burden of Disease Study*, 2017, accessible at: http://ghdx.healthdata.org/gbd-results-tool.
GDP per capita data are for 2017, measured in constant 2011 international $, and come from the World Bank's World Development Indicators dataset, accessible at: https://databank.worldbank.org/source/world-development-indicators/.

Climate change. The more frequent occurrence of extreme heat due to climate change can be expected to exacerbate mental illness (*44*, *86*). Similarly, the increased frequency of weather-related disasters such as floods and hurricanes poses a threat to mental health through higher exposure to trauma (*87*). Climate change also threatens mental health through its negative economic consequences, including increases in conflict and migration. These economic consequences are likely to be more pronounced in already-poor countries (*86*). High temperatures during the agricultural growing season have already caused an increase in suicides in agricultural regions in India (*88*). Finally, climate change is expected to lead to increased violence and political conflict over the next century (*89*). This combination of economic and political consequences of climate change may increase the flow of refugees and economic migrants, with concomitant challenges to mental health (*90*).

Technological change and globalization. For many of the world's poor, technological change and globalization provide great economic opportunities, as they are key engines of aggregate economic growth and thus ways to increase the overall economic pie. However, both phenomena produce both winners and losers. The costs to losers, especially low-wage workers in high- and middle-income countries who lose jobs due to trade or automation, can be long-lasting and substantial (*91*) As demonstrated in section II, job loss has significant mental health costs (*18*, *19*). Offering social insurance and welfare, skills training, and job transition programs including psychotherapies for workers exposed to the harmful effects of technological change and globalization will be important to protect mental health. While most economic research on these topics focuses on rich countries, there is an urgent need to understand the mental-health effects of these economic changes in poorer countries.

Digital technologies. The spread of mobile phones and the internet opens up new opportunities for poverty alleviation (*92*) and novel ways to deliver mental health care, as discussed below. However, some of these technologies may pose new threats to mental health. While much more causal evidence is needed, some studies have found that depression is correlated with internet addiction and with the intensity of use of social media among young adults and adolescents (*93*, *94*). Recent randomized interventions show that deactivating social media accounts for four weeks led to 0.1 SD reductions in depression and anxiety scores (*95*).

IV.b Implications for Research and Policy

Given these challenges, policy action on mental health is vital, as is more interdisciplinary research on poverty and mental health.

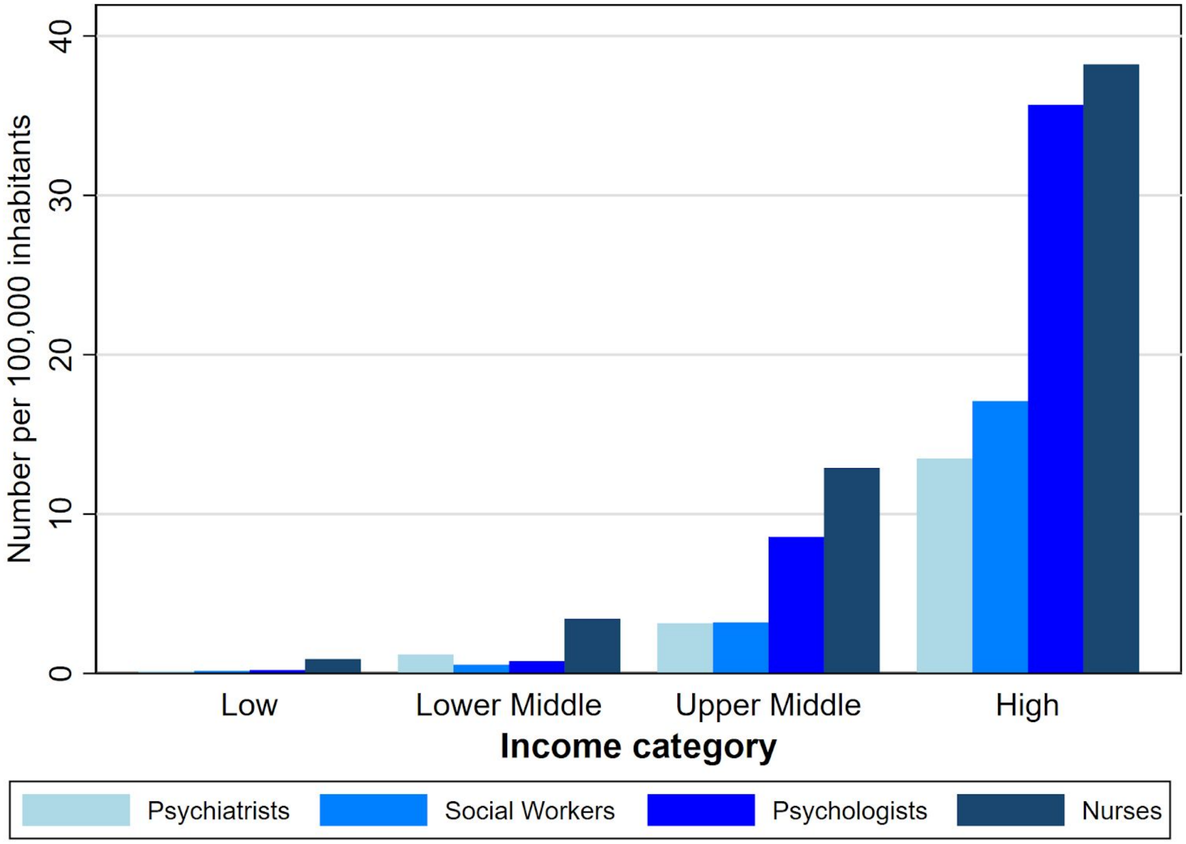
Interdisciplinary research. Since mental health and poverty are intimately linked, interdisciplinary collaborations between mental-health researchers and social scientists studying poverty are particularly valuable. Evaluations of economic interventions should carefully measure impacts on mental health using standard tools developed by psychiatrists (*96*). Such measurements are particularly needed for likely economically beneficial interventions that may increase risk or uncertainty and therefore entail adverse psychological effects, such as policies that increase exposure to market competition or conditionality of cash transfers. Similarly, evaluations of psychological interventions should embed the standard measurement tools from development and behavioral economics.

Policy tools. Based on the existing research, a mix of economic and mental-health tools is available to policymakers. On the economic side, recent work in development economics has shown the effectiveness of cash transfers and other anti-poverty programs, though the evidence on the long-run impacts of such interventions is still limited. On the mental health side, there is a strong economic case for investing in the mental health of the poor. The mental health interventions considered in (*61*) are an order of magnitude less expensive than many economic interventions. This suggests that, among the subset of the poor who are mentally ill, mental-health treatments could be the most cost-effective anti-poverty intervention.

Closing the massive existing treatment gaps for mental health is a key priority: in poor countries, the fraction of diagnosed individuals who do not receive treatment often exceeds 90 percent for depression and anxiety (*97–99*)(*100*), (*97–99*). Such treatment gaps likely result from a combination of poor supply and low demand for mental health services, thus warranting interventions that increase supply and stimulate demand.

Increasing supply. Resources for mental health care are extremely limited in low-income countries (Figure 3). As a result, the poor often lack access to basic mental health care (*101*). Cost-effective and scalable strategies for treating mental illness in low-resource settings now exist. A substantial evidence base from multiple countries shows that 'psychosocial' treatments such as structured talk therapy can be highly effective at low cost, including when delivered by non-specialist community health workers (*98*, *102*, *103*). The use of digital technology such as mobile phones or the internet to support care also shows promise, although more research is needed to establish its effectiveness (*13*).

Figure 3. Availability of Mental Health Workers across Countries



This graph plots the mean numbers of psychiatrists, social workers, psychologists and nurses working in the mental health sector (per 100,000 people) for countries in each of the four income categories used by the World Bank. Data on mental health workers comes from the WHO's Global Health Observatory, accessible at http://apps.who.int/gho/data/node.main.MHHR?lang=en, and is for the most recent year available (which ranges from 2013-2017). The World Bank's classification of countries into income categories is based on GNI per capita and can be found (along with a description of the methodology used to classify them) at https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups.

Stimulating demand. Even in settings with affordable and effective mental health services, many people do not seek or adhere to treatment (*104*). People often lack mental health literacy, i.e. basic information about mental health conditions and their risk factors, symptoms, and potential treatment options (*105*). Stigma and shame can further depress demand for mental health services. A priority for future work should be the development and evaluation of programs to bolster mental health literacy as well as to find ways to overcome stigma, e.g. by bundling mental health treatments with other unstigmatized services, or by considering novel remote technologies that are less prone to stigma. Finally, further research must examine how demand and supply might interact.

Optimal policy mix. The impacts of anti-poverty and psychological interventions when implemented by themselves are increasingly well understood. However, we know little about how to optimally combine, dose, sequence, and target the two types of interventions. Combining mental health interventions with conventional economic interventions may be optimal if the two types of interventions reinforce each other. Improved mental health may increase the economic returns of cash or asset transfers by improving decision-making and productivity. Similarly, psychotherapy might more effectively and durably improve mental health for individuals who also receive treatments to improve their economic circumstances.

Despite the wealth of evidence described above, we are still only beginning to understand the long-run effects of different interventions and policies targeting mental illness among the poor. Persistent impacts would point to the existence of a psychological poverty trap, i.e. the idea that some of the poor are ensnared in a vicious cycle of poverty and mental illness (*5*). The underlying idea is that poverty reinforces itself by interfering with people's ability to earn income and to accumulate wealth, in this case through causing poor mental health, which in turn hinders earnings. If these feedback effects are strong enough, a one-time intervention of sufficient magnitude could 'push' people into a state of permanently higher income and better mental health. While intuitive, the quantitative condition for poverty traps is fairly demanding: a steep relationship in both directions is required (*106*). Recent evidence from ultra-poor programs is consistent with the existence of poverty traps, but the underlying mechanisms are not well-understood (*29*, *107*). Mental health could play a key role. More interdisciplinary research is needed to understand the root causes and long-run solutions to poverty and mental health.

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