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Literature Review on the Effect of Physical and Mental Health on Financial Well-Being

By *Isaac Swensen* and *Carly Urban*

Abstract: Adverse health conditions have the potential to financially cripple American households. This report reviews the large literature that considers the ways in which health—both physical and mental—impacts household finances. The review largely includes studies conducted with U.S. populations, and it spans many academic disciplines: economics, public health, law, medicine, psychology, public policy, and sociology.

The overwhelming finding is that deteriorating health, new health conditions, and even health shocks—such as injuries—negatively impact the financial health of households. First, unanticipated out-of-pocket health costs reduce or deplete the household savings, sometimes forcing household members to forego necessary consumption. Sometimes, this reduced consumption could directly harm their health (e.g., by skipping prescriptions), providing a direct feedback loop into the relationship between health and finances. Second, declining health or new health conditions often force people out of the labor market for an extended period. This reduces household earnings and either forces other household members to work more to compensate for the earnings loss or further harms the household balance sheet. The effects of mental health conditions are often more detrimental than the onset of severe physical health conditions.

The detrimental effects of health conditions on household finances are generally largest for those with the fewest protections in place: those with fewer assets, those without insurance coverage, and those with less education. However, the labor market consequences are sometimes largest for the highest earners.

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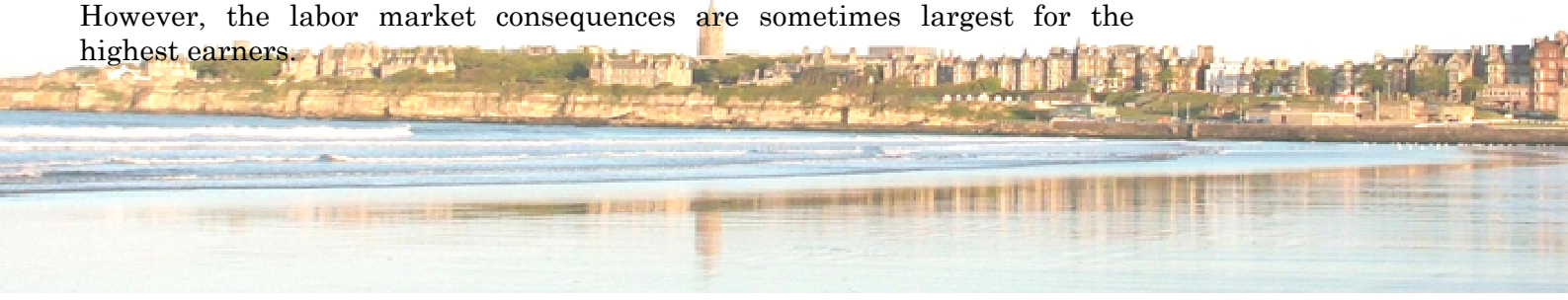

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Literature review on the effect of physical and mental health on financial well-being[1]

Isaac Swensen
Associate Professor, Montana State University

Carly Urban
Professor, Montana State University
Research Fellow at the Institute for Labor Economics (IZA)
Associate Director of Training, Center for Financial Security (University of Wisconsin-Madison)

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Executive Summary

Adverse health conditions have the potential to financially cripple American households. This report reviews the large literature that considers the ways in which health—both physical and mental—impacts household finances. The review largely includes studies conducted with U.S. populations, and it spans many academic disciplines: economics, public health, law, medicine, psychology, public policy, and sociology.

The overwhelming finding is that deteriorating health, new health conditions, and even health shocks—such as injuries—negatively impact the financial health of households. First, unanticipated out-of-pocket health costs reduce or deplete the household savings, sometimes forcing household members to forego necessary consumption. Sometimes, this reduced consumption could directly harm their health (e.g., by skipping prescriptions), providing a direct feedback loop into the relationship between health and finances. Second, declining health or new health conditions often force people out of the labor market for an extended period. This reduces household earnings and either forces other household members to work more to compensate for the earnings loss or further harms the household balance sheet. The effects of mental health conditions are often more detrimental than the onset of severe physical health conditions.

The detrimental effects of health conditions on household finances are generally largest for those with the fewest protections in place: those with fewer assets, those without insurance coverage, and those with less education. However, the labor market consequences are sometimes largest for the highest earners.

Existing policies can, directly or indirectly, blunt the effects of health on finances. Comprehensive health insurance, specifically for the chronically ill, those with high-cost conditions, and those covered under Medicaid, generates the greatest benefits for overall financial health. Paid sick leave and subsidized caregiving limit the effects of work interruptions when someone in the household falls ill. Promising existing policies that do not require change to federal programs include pausing loan obligations, financial literacy, and pairing healthcare choice with cost information.

An emerging literature explores how direct interventions in the U.S. healthcare system, such as increasing cost transparency and offering financial education to providers and patients, can mitigate the compounding financial burden of health conditions on households. While still in its infancy, we discuss the limited findings in this area and offer several suggestions for promising avenues of inquiry.

Our review leads with studies that determine the causal effects of changing health on finances, though it also includes correlational work, descriptive studies, and qualitative research. Further, we include a section that describes specific health conditions and how those contribute to financial health in different ways. We conclude with policy recommendations using cross-country contexts and the findings from the research we reviewed paired with reports and policy proposals from think tanks and non-profits.

I. Introduction

Healthcare debt is common among households in the United States. A recent Kaiser Family Foundation survey showed that four in ten adults currently have medical or dental debt (Lopes et al. 2022). Of those with healthcare debt, 63 percent had to cut back in spending on a basic necessity and 48 percent said they used up all their savings in order to pay down that debt (Lopes et al. 2022). These statistics are corroborated across other studies. Looking specifically at medical debt, the fraction of the overall adult population with medical debt drops to 23 percent in a 2018 sample (CFPB 2020), though this varies dramatically by age, as is shown in Figure 1. The Federal Reserve Board's Survey of Household Economic Decisionmaking (SHED) annual survey showed that in 2021, 20 percent of adults experienced an unexpected medical expense in the last year, with the median amounts between $1,000 and $2,000 (Federal Reserve Board 2022). Even among adults over age 65, who are guaranteed healthcare coverage through Medicare, 4.5 million—or one in ten—had medical debt in 2018 (CFPB 2020).

Having a health emergency is challenging in itself, but the financial toll of that emergency can strain one's finances to the point where a household then cuts back on purchases that could aid in recovery. The SHED data show that individuals regularly forego medical treatment due to cost: 40 percent of uninsured households skipped medical treatment because they couldn't afford it, whereas 22 percent of insured households skipped medical treatment for the same reason (Federal Reserve Board 2022). Foregoing treatment—especially after a decline in health or a new illness presents—can not only harm one's physical and mental health but also have detrimental long-run financial implications. For example, skipping medication could result in a larger health problem that causes immediate and more expensive care that could then financially ruin a household.

Medical debt is also complicated. Indeed, the United States Consumer Financial Protection Bureau (CFPB) reported that attempts to collect debt not actually owed was the most common medical debt complaint reported by individuals to the agency, and these complaints have increased over time (CFPB 2022a). Of all third-party debt collection tradelines, medical debt accounted for 58 percent (CFPB 2022a). Thus, the widespread prevalence of medical debt and confusion among credit bureaus regarding how and when to include it on reports can increase financial harm associated with out-of-pocket medical expenses.

FIGURE 1

Percent of adults with medical debt by age group

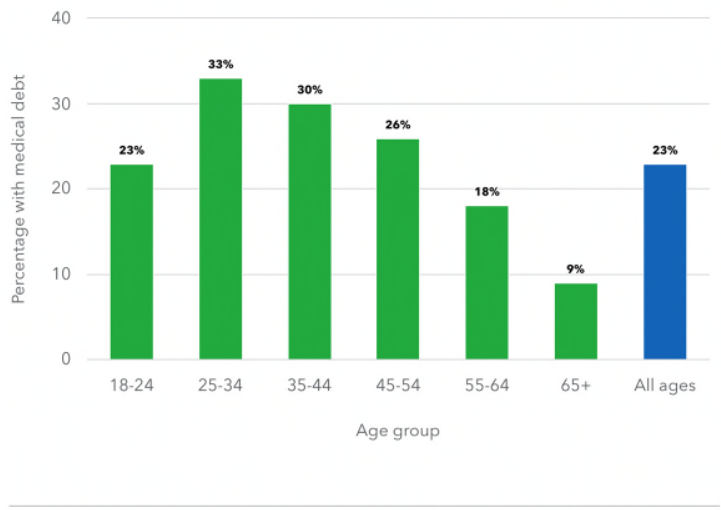

Figure 1: CFPB Report Figure 1, uses data from the 2018 National Financial Capability Study

This report reviews the literature on the effects of physical and mental health on financial well-being. Documenting the relationship between health and financial well-being is challenging since they continuously affect one another. It is hard to determine if health is harming household finances or if finances are simultaneously harming health. We take the bulk of our evidence from research reporting causal effects of health on finances using the somewhat randomness of the timing of a health shock. We then review literature that documents correlations and qualitative work. In all, our review contains research from the fields of economics, public health, law, medicine, psychology, public policy, and sociology. We discuss 60 papers across these literatures. As healthcare and safety net structures vary drastically across countries, our primary areas of interest are studies that consider the United States. However, we do discuss international studies and the country-specific context to better gauge the types of policies that may reduce the impact of a sudden change in health to a household's financial situation.

We find overwhelmingly that new health conditions, hospitalizations, and declining health are extremely financially costly. This comes from both out-of-pocket expenditures for the specific health problem and a reduced ability to work. These effects materialize even for insured populations, though they are slightly less prevalent for those on Medicare and receiving Social Security Retirement Income. The financial consequences of declining health are particularly prevalent for the uninsured, those with fewer assets, and those with less education. At times, those earning more actually experience greater hardship since their income declines by more after the onset of a health condition.

The literature linking mental health to financial well-being is relatively small and less conclusive than the literature analyzing physical ailments. However, our review of studies that link mental

health to financial well-being also suggests that mental health leads to costly adverse consequences, perhaps even more costly than effects of physical health ailments. Overall, a wide variety of psychological stressors and mental health diagnoses are shown to affect employment, earnings, labor market participation, work hours, absenteeism, foreclosures, and other financial pressures. These effects are often long lasting and may be particularly detrimental for emerging adults, women, and the less educated. Rough calculations suggest that mitigation of mental health issues could have significant financial benefits for both households and the U.S. economy, largely through an impact on labor markets.

Our results have important implications for U.S. policy responses, which we detail in Section V. First, access to comprehensive health insurance vastly reduces the impact of health conditions on financial health by reducing out-of-pocket costs. One option would be to provide automatic public coverage for high-cost, long-term diseases. Another option would be to universally automate enrollment in Medicaid for eligible individuals. Second, reducing the impact of earnings loss through required paid sick leave and extended caregiving options may vastly improve household finances of those struck with a medical ailment. Third, pauses in recurring loan obligations due to health shocks could help people to stay in their homes. Fourth, wellness programs and financial literacy could help those in the U.S. navigate the complexity of the healthcare market. Fifth, clinical trials suggest that mental health treatment may yield important dividends for those struggling with depression in maintaining work.

Finally, Section VI includes a discussion of a nascent literature examining recent efforts of partnerships between healthcare providers and non-profits to improve the financial health of those in poor physical health. While limited in its ability to discuss effectiveness, some of these partnerships may be the most promising avenue to improve the financial well-being of those suffering from deteriorating health without large-scale changes to the current healthcare system.

II. Methods

Research consistently lays out three clear pathways through which a decline in physical health directly impacts financial well-being. First, a new health shock can generate large out-of-pocket expenses, even when the individual is insured. This health shock is then directly a financial shock that can harm the individual or household for an extended period. Second, declining health can remove an individual from the labor market for an extended period. Third, a new diagnosis may require changes to daily life that are expensive. For example, declining health can require caregiving responsibilities that either reduce household income or draw down on savings. Moreover, one could also think of these pathways in the context of a positive health shock created by sudden improvements in health related due to policy changes.

In any of these cases, physical and financial health remain interrelated after an initial health shock. Consider an individual who experienced and survived a heart attack. Out-of-pocket expenses from the emergency visit are likely to strain the individual's finances. When the person should be spending more money on healthier food options, he may feel the need to simultaneously cut back on food spending to make ends meet. This could then exacerbate his heart problem and harm his health further. Another example is that individuals feeling financially strained due to a health shock may feel like they should work *more* during recovery to cover

medical bills when their body would benefit from rest. The concept that the financial burden interferes with treatment is sometimes referred to as financial toxicity.

A. How Do Researchers Tease Out Causal Effects?

While potential pathways are easy to consider conceptually, determining the effects of health on financial health is challenging. This is because it is hard to tell if the financial problem preceded the health problem (Turunen and Hiilamo 2014) or vice versa. Indeed, a large literature considers the effects of finances on health. In fact, Adams et al. (2003, 42) wrote an entire paper on the health-wealth nexus that stated "conclusions on the health to wealth link should be interpreted with caution" and found much more evidence on the wealth to health analyses. If physical and financial health are so interrelated, which one comes first? *Reverse causality* is one concern in many studies considering the relationship between physical health and financial health. A second concern is that a third characteristic is affecting people's physical and financial health simultaneously. For example, people who highly discount the future—meaning they value their present more than their future—may simultaneously engage in risky behaviors, like smoking, that harm health AND costly financial behaviors, like payday borrowing. If this person then declares bankruptcy and develops lung cancer, it may look like cancer caused bankruptcy, when it is actually the individual's preferences that developed both conditions.

The gold standard for navigating these types of biases is to randomize the independent variable of interest—in this case physical health. In medical studies, randomized controlled trials (RCTs) are commonly used to determine the effectiveness of a drug. By giving a randomly assigned treatment group the actual experimental drug and a control group a placebo drug, the researcher can compare health outcomes across the two groups to see if the drug is effective. In theory, the researcher could then compare financial outcomes across the two groups as well to see if the improvements in health translated to improved financial health. However, no research to the best of our knowledge has been able to use these data. This is likely because access to the private information is restricted and required to be linked to the most important, direct outcome variables.

The gold standard should be considered for future research, but it currently doesn't exist as an option in studies.[2] Instead, researchers do the next best option. They use "natural experiments" to determine what happens after there is a shock to health. This method allows researchers to tease out causal effects, though they are specific to one setting (e.g., hospitalization) or health shock (e.g., car accident-related injuries) and cannot be generalized to all settings. While useful to study worsening health within a person over time, this method does not allow researchers to determine the effects of long-standing diseases.

Though natural experiments provide a good source of variation to estimate causal effects, some research provides pre- and post-comparisons that look at individual financial health before and after health changes. Other studies rely upon correlational or descriptive results, noting the potential pitfalls described above: that it could actually be financial health affecting health or a third factor affecting both. Another group of studies completes qualitative work, such as focus groups or structured interviews, to understand the ways health affects financial health.

[2] The exceptions are RCTs considering the effect of various mental health treatments on worker outcomes.

If determining how physical health affects financial health seems challenging, determining how mental health affects financial health is substantially more difficult. Natural experiments are harder to uncover when it comes to mental health since there are rarely "shocks" to mental health. Instead, mental health is associated with varied views on underlying mechanisms, prevailing multiple diagnoses (Hawthorn and Wengerd 2019), and individuals suffering with mental illness for years before having an appropriate diagnosis and treatment strategy (Peterson 2019). Thus, this research is newer, much more likely to be correlational, and is ripe for additional research.

B. Measuring Financial Health

Beyond the challenges researchers face in determining causal effects, measuring financial health is hard. Outcomes that are easier to measure are observable in administrative data, such as labor earnings, household income, labor force participation, medical debt, out-of-pocket expenses, credit scores, bankruptcy, and consumption. These outcomes have a few benefits: they are not susceptible to recall bias, where people may remember things as better or worse than they actually were; they are less likely to suffer from measurement error, where people inaccurately report the outcome in a way that is correlated with their health change; and they are easy to translate across study.

These observable measures also have downsides. Is participating in the labor force after a health shock a good thing? While it may be good for short-term finances, it may also be bad for health, which potentially harms long-term finances. Even an increase in bankruptcy may be a good thing if it allows an individual do discharge all debt and start fresh. Policymakers designed bankruptcy to be a protective measure in the event that individual financial burdens became excessive; therefore, declaring bankruptcy may be optimal to improve both finances and health for some.

The CFPB created a new scale of financial well-being intended to measure how well people are keeping up with their day-to-day and month-to-month finances, and also how well positioned they are to meet their own unique financial goals for the future (CFPB 2015). This financial well-being scale is independent of income and is well suited to determine how within-person changes are reflected by health changes. This measure was constructed in 2016 and, unfortunately, very few studies have adopted it as an outcome.

Throughout this report, we discuss the relationships between physical and mental health and financial health using a variety of measures, including:

- Labor force measures (e.g., participation, earnings, unemployment)
- Debt-related measures (e.g., medical debt, mortgage debt, borrowing, delinquency, bankruptcy)
- Consumption (e.g., out-of-pocket medical expenses, access to credit, food expenditures)
- Subjective financial well-being measures (e.g., self-reports of perceived financial security, financial strain, ability to meet financial obligations, and perceived financial futures)

C. How We Search

To search for papers, we took the following approach. First, we started with a broad-sweeping systematic search of the economics, law, medical, public health, public policy, and sociology literatures. This included academic journal databases, such as EconLit, PubMed, Web of Science, and Google Scholar. Searching "health and financial well-being," "health and finances," and "health and employment" resulted in an excessive number of papers. We then checked for publications from major think tanks and professional organizations, such as the Urban Institute, the Financial Health Network, the Filene Institute, the National Credit Union Foundation, the FINRA Investor Education Foundation, the Aspen Institute, and other similar organizations. We narrowed down studies to focus on those in the U.S.; we only included international studies when they had clear causal interpretations and explained the healthcare and policy context in a way that allowed for comparison with the U.S. context. We put more weight on published papers than working papers, though we do include some working papers that appear in an official working paper outlet, such as the National Bureau of Economic Research (NBER) working paper series.

Since our initial search turned up an excessive number of papers, we sought out seminal papers across disciplines. We found at least one very important paper linking health and finances in each discipline, based on citation counts. For these papers, we looked at the papers cited within that work, and we also reverse-cited the paper to be sure we were not missing any key articles. This allowed us to identify more studies relevant to our review.

We put additional weight on studies that had causal interpretations. We recognize that estimating causal effects is not as common in some disciplines, and we therefore included studies using other methods—such as specific surveys and qualitative work—particularly in non-economics fields. In the medical literature, it is common to study one specific health condition, though most of those results are not causal. We devote a section of the physical health review to specific health conditions, though the bulk of the papers we discuss speak to health changes at large across a variety of conditions.

III. Physical Health and Financial Health

We begin the review of the relationship between physical and financial health with studies that consider changes to overall health (Section A). Within this section, we start with studies that provide causal evidence. As discussed in Section II, this means there was some type of health shock that struck someone out of the blue—or as close to as randomly as possible. After reviewing causal studies, we turn to correlational studies and qualitative work. Section B reviews the relationship between very specific health conditions (e.g., thyroid cancer) and financial outcomes. Section C discusses research that is predominantly causal in nature but in an international context.

A. Overall Health, Declining Health, and Health Shocks

Dobkin et al. (2018) is likely the most influential in the literature studying the effects of physical health on financial outcomes. It has 368 cites despite being published for only four years, and these cites span economics, public health, law, medicine, sociology, and psychology. The paper's

import comes from: (1) the convincing natural experiment strategy and (2) the number of questions it can answer using well-constructed administrative data paired with hospital records and, as a complement, survey data.

The paper uses an event study approach, where they show that the timing of a hospitalization is somewhat random for most people. This means, for a given person, something happens where they become hospitalized at a point in time that was unexpected. This unexpected hospitalization—referred to as a health shock—is often linked to a decline in health. First, they link hospital records, credit reports, and hospital admissions in California. Their primary sample is 380,000 insured adults between the ages of 25 and 64 who were hospitalized between 2003 and 2007, though they also report results for adults 65 or older at the time they were admitted to the hospital. The authors restricted the data to exclude pregnancy-related admissions and also removed adults who had prior hospital admissions for several years before what one could think of as the health shock hospitalization.

The authors then use a second method that relies upon survey data from the Health and Retirement Study (HRS). Their data span 1992-2012 and capture 2,700 insured adults who were hospitalized between ages 50 and 59. They use these survey data to consider how a hospitalization between survey waves impacted household economic situations in a subsequent wave of the survey. The survey data bring in data that do not exist in administrative data: income, labor force participation, and other individual-level characteristics.

The paper documents a clear and immediate effect of hospitalization on collections. Four years after admission, total collection balances increase by an average of $302. While most of this increase comes from medical collections, there is a slight increase in non-medical collections, which the authors note could come from misclassifications on the credit report. Figure 2 shows the medical collections results from Dobkin et al. (2018) that they show in their Figure 3. Medical collections are virtually zero before hospitalization. After hospitalization, the presence of medical collections and balances both increase.

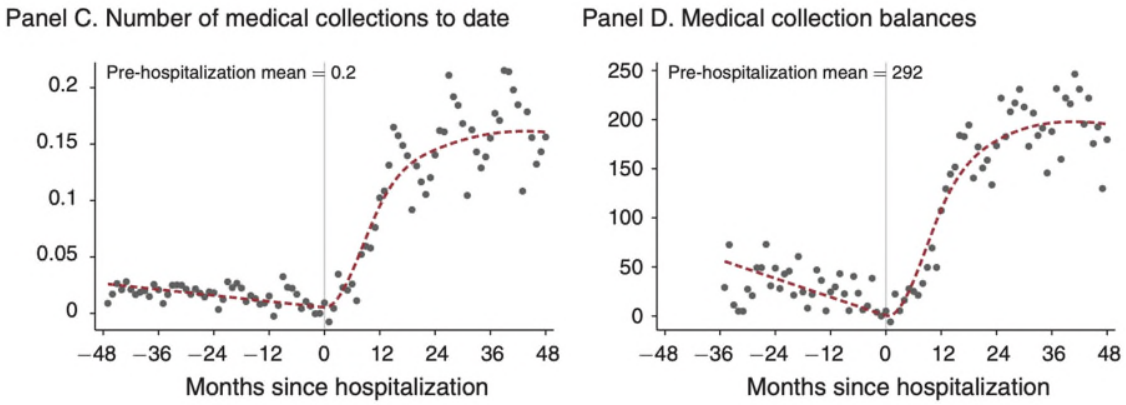

Figure 1: Dobkin et al. (2018) Figure 3 "Impact of Hospitalization on Collections for the Non-Elderly Insured (Ages 25 to 64)"

The paper is most cited for one finding: four years after hospitalization, a hospital admission increases the rate of bankruptcy by 33 percent (or 0.4 percentage points).

Hospital admissions also decrease access to credit. Using HRS data, The authors show that this is likely related to a decrease in income, where they document a 19 percent decrease in annual income post-hospitalization. Four years post-hospitalization, credit limits declined by $2,215, credit scores declined by 1.8 points (or 0.2 percent), a decline in credit card balances—a proxy for consumption—of $1,208 (or 10 percent), and auto loan balances fall by $507 (or 7 percent). The drop in credit limits—and subsequent reductions in loan balances—are consistent with one-half of the decline one would expect from an unemployment spell.

The prior results represent the effects of hospitalization on *insured* non-elderly adults. The authors then extend the work to focus on elderly populations (65+) and non-elderly uninsured adults. The takeaways are fascinating:

- Hospital stays are longer for those 65 or older (who are all insured via Medicare), but there are no real effects of hospitalization on bankruptcy, credit access, or income. Financial consequences are less of a concern for older populations experiencing hospitalization. This is likely because even if older adults retire due to the hospitalization, they have a means of supplementing that income with Social Security.

- For the uninsured non-elderly, hospitalization dramatically increases collection balances ($6,199 vs. $302 for the insured non-elderly) and bankruptcy (1.4 vs 0.4 percentage points for the insured non-elderly). However, the effects on credit access are relatively similar for the uninsured non-elderly as the insured elderly.

In additional tests, the authors seek to determine *for whom* effects are largest. Here are some of the highlights:

- The effects are larger for those on private insurance than those on Medicaid. They speculate that this is because those on Medicaid are already less likely to be working (and therefore earning less), so they have less consumption to compensate for if they stop working post-hospitalization.

- The effects are larger for conditions that appear to be chronic, which tend to have higher list charges.

- The effects are similar across the type of hospital (public, private, non-profit).

- The effects are similar across the five most common admissions reasons.

Other work has built upon that of Dobkin et al. (2018) directly. First, Arrieta and Li (2022) study the effects of emergency department visits—as opposed to just hospitalizations—on household employment. Hospitalizations are arguably less likely to be unanticipated than an emergency room visit, and hospitalizations tend to result in greater expenses. This makes emergency room visits more of an “unexpected shock” for a family. Arrieta and Li use data from the Medical Expenditure Panel Survey (MEPS), and their final sample consists of 281,000 individuals distributed across 128,261 families, where 23 percent of individuals visited the emergency

department at least once over the sample period (1996-2017). Like Dobkin and coauthors, they remove all visits related to pregnancy, and their main sample includes those 25-65 years of age.

Their first finding relates to employment of the person who had the health emergency. After a visit to the emergency department, the person is 2.3 percent less likely to work and earns 9.2 percent less for up to 18 months after the hospital visit. In addition to own effects, the emergency room visit also changes employment of the spouse. Emergency room visits increase employment of female family members by 1.5 percent but do not significantly change male family member employment. The emergency room visit also increases female family member earnings by about six percent and increases in the years following the visit, which compensates for some of the decreased earnings of the person with the health shock.

When Arrieta and Li break down their results by hospitalization—instead of just emergency room visits—to more closely match Dobkin et al. (2018), the results match: hospitalization declines income by 25 percent. Going beyond the Dobkin et al. (2018) results, Arrieta and Li then show that after hospitalizations, family members are 132 percent more likely to engage in caregiving for subsequent years. After a hospitalization, female family members do not see an increase in income.

Figure 3 comes from Arrieta and Li (2022) (also their Figure 3). In it, they show the effects of an emergency room visit on a female family member's income and caregiving responsibilities. Household member injury increases caregiving responsibility the least but increases the female family member's income by the most. At the other end of the spectrum, hospitalization increases the likelihood of caregiving by the most and does not change the female household member's income.

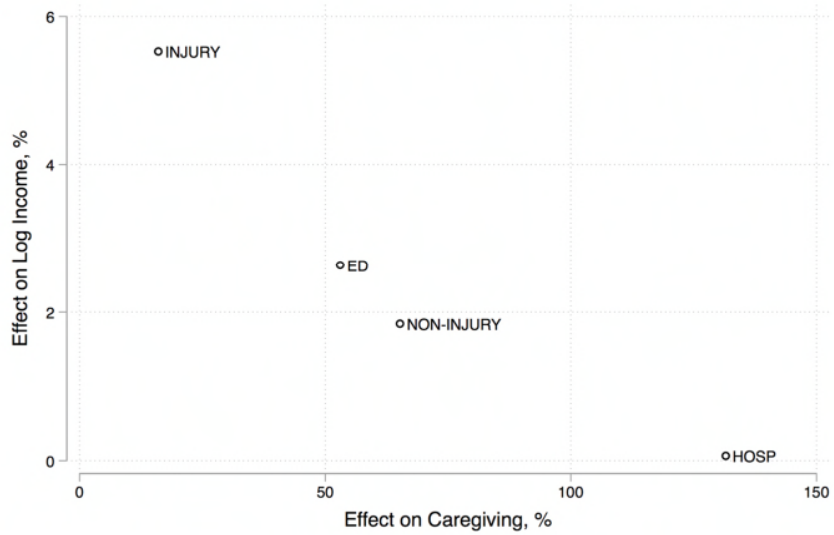

Figure 2: Arrieta and Li (2022) Figure 3 "Female Family Member's Income and Caregiving Responses by Medical Condition"

Arrieta and Li are not the only authors to look at overall household effects of an emergency room visit. Bergquist and de Vaan (2022) consider the effects of an emergency admission on household finances in a unique way: do households change their spending on healthcare for the rest of the family in the remainder of the year? Using data from 2010-2015 from Massachusetts' All-Payer Claims Database, they design a sample of patients with emergency admissions that result in a stay between five and 90 days. Using the unexpected hospital admission as an unanticipated event just like in Dobkin et al. (2018), the authors look at family members' subsequent health care spending after the household shock. Their results report a 6.4 percent decrease in health care spending and utilization in the year following the hospitalization for both children and adults in the household. The reduction came largely from fewer visits to primary care physicians, fewer referrals to specialists, and fewer preventive services. Taken together with the previously discussed studies, this finding from Bergquist and de Vaan (2022) suggests that financial shocks due to unexpected health shocks result in cost trimming that may lead to more health concerns for household members in the future. This reiterates the importance of considering policies to stop the feedback loop of health and financial distress.

Schaller and Eck (2021) again use the HRS, but they study how hospitalization, disability onset, and a switch to poor health affect intergenerational financial transfers and caregiving. With a sample of adults 50-85 years of age from 1993-2014, the authors restrict the data to only include respondents with at least one child over the age of 18. Hospitalization decreases the likelihood of making a parent-to-child transfer in the period of and the period after hospitalization, though hospitalization does not increase the likelihood of having a transfer from the adult child to the parent. The authors then find that disability onset and the onset of poor health for elderly parents lead to child-to-parent financial transfers. The onset of poor health increases the likelihood of receiving a transfer from an adult child by 37 percent. These health events do not reduce parent-to-child transfers.

Pollack et al. (2011) also studied health care utilization, but as an antecedent to mortgage foreclosure in Philadelphia County from 2005-2008. The authors rely upon administrative data on all foreclosures from RealtyTrac paired with administrative data from the University of Pennsylvania Hospital System (UPHS). They build a sample of 404 individuals who experienced foreclosure and had a primary care physician in the UPHS. The authors matched each of these individuals to up to five control individuals (for a total of 2,020 control individuals) who did not experience foreclosure, lived in the same ZIP code as those foreclosed upon, and had a primary care provider within the UPHS. Using individuals in the UPHS is important, as all healthcare-related data come from the UPHS records. While not a perfect natural experiment as there is no clear unexpected shock, the authors see what health conditions and expenditures existed in the two years prior to foreclosure for those who did and did not experience foreclosure.

Pollack and colleagues find that those in foreclosure were less likely to have had a primary care visit in the six months immediately prior to the receipt of the notice, compared to the no foreclosure group. This is likely due to strained finances and a desire to cut back on spending.

In the two years that preceded the foreclosure notice, individuals who received a foreclosure notice were more likely to visit the emergency department than those who did not receive a foreclosure notice. Taken together with the results of Dobkin et al. (2018) and Arrieta and Li

(2022), this suggests that emergency department visits often precede financial distress, which could lead households to lose their homes. Losing a family home could then put more physical stress on the person who is already struggling with their health, exacerbating health problems.

While the previously discussed four papers consider an emergency department visit or hospital admission shock, a second strand of papers consider how someone's overall health changes over time and how that change in health affects financial outcomes. This literature considers how new or additional health conditions, chronic conditions, and health limitations change the financial health of the household over time. These methods often compare the same person before and after the additional (or new) condition with other people who never had a new or worsening condition over the same time period.

Babiarz et al. (2013) is one of the first in this literature that studies how an adverse health event affects unsecured debt. Using data on 15,204 unique households that contain household heads over 50 years of age in the HRS from 1998-2010, the authors treat the onset of an adverse health condition as a semi-random event that is unrelated to the timing of a financial decline. The authors consider the following adverse health conditions: high blood pressure, diabetes, cancer, lung disease, heart problems, strokes, arthritis, or psychological problems. They categorize cancer, lung disease, heart problems, and strokes as "new severe health conditions." They focus on unsecured debt, which largely includes credit card debt. Their research shows that at the onset of an adverse health event, the likelihood of having unsecured debt increases by 10 percent and the amount of unsecured debt rises by 11 percent. The effects are driven by households with fewer financial assets. Wealthier households do not see a similar increase in unsecured debt after an adverse health shock, though wealthier individuals experiencing new severe health conditions having effects on unsecured debt use for at least ten years. The effects are also larger for the uninsured and those who are covered by only Medicare than those who were covered by multiple insurance plans.

Consistent with the previously described work, the effects of the health adversity on use of unsecured debt comes from two channels: higher medical-related expenses and disruptions to income due to the health event.

Houle and Keene (2014) similarly study within person changes in health limitations and chronic conditions to see how these health changes affect mortgage default and foreclosure. Using data from the National Longitudinal Study of Youth 1979 (NLSY79), their sample spans 2,004 individuals over 50 years of age who owned a home between 2007 and 2010. The survey asks about health limitations (yes or no), and they separately consider the following chronic conditions: cardiovascular disease and heart failure, lung disease, stroke, cancer, diabetes, hypertension, arthritis, asthma, joint pain, and osteoporosis. The survey asks respondents about these conditions closest to their 40^{th} (1998 or 2000) and 50^{th} birthdays (2008 or 2010), which allows the authors to document changes in health.

Houle and Keene find that respondents whose health worsened over the ten-year period had 1.7 times the risk of mortgage default than those who did not see their health worsen. Those with more chronic conditions at age 50 than at age 40 had nearly twice the likelihood of default than those did not experience an increase in chronic conditions. The increased default rates translate

into higher foreclosure rates. The effects of worsened health on default and foreclosure rates are explained, at least in part, by a decrease in income. These findings are consistent with Pollack et al. (2011), though Houle and Keane document an overall trend in health as opposed to an abrupt shock.

Finkelstein et al. (2013) study changes in the number of chronic diseases an older individual experiences, but they consider how much people who become less health *enjoy* their consumption. Using the HRS, they show that increases in the number of chronic diseases decrease how much enjoyment comes from consumption relative to the last unit consumed from someone with no chronic diseases. This result suggests that it is not just additional debt or financial stress burdening a person who becomes less healthy that is important, but the inability to enjoy consumption is also a problem associated with worsening health.

Two additional papers use causal methods, though instead of looking at individual-level changes, they consider the effects of aggregate health shocks on financial outcomes.

First, Kotschy (2021) shows that health improvements—measured by improvements in population-level cardiovascular disease for the white U.S. population—boost aggregate incomes. Specifically, when life expectancy increases by 1 percent, income increases by 1.7 percent. These effects largely operate through an improvement in labor force participation and education.

Second, Houle et al. (2015) look at 83 cities from 2004-2012 and document influenza outbreaks using Google trends searches. They then see how these increases in local influenza prevalence translate to credit card and mortgage delinquency rates. Their findings suggest that the effects are indistinguishable from zero for 30- and 60-day defaults, but flu outbreaks increase 90-day defaults. They interpret this as health shocks particularly harming borrowers who were already struggling.

Correlations, Qualitative Work

In comparison to high-quality causal work that documents the effects of health shocks on financial health outcomes, other work is more descriptive in nature. This is a mixture of correlational work, descriptive surveys, and qualitative work studying the relationship between health and finances. While we are cautious to overinterpret this work since correlational evidence can often be misinterpreted as causal, we think it is important to corroborate the findings from more rigorous evidence with additional studies in different settings.

Two papers, though not causal, help to understand very long-term effects of declining health conditions on financial outcomes. Poterba et al. (2017) link poor health and wealth accumulation in the HRS from 1994-2010 for the cohort that was 51-61 years old in 1992. Their findings suggest that the financial costs associated with long-term poor health could have cumulative wealth effects from not just out-of-pocket medical costs and lost earnings that previous papers document, but also from lifestyle modifications that require continued expenses and reduced savings. They use data from 1994 to compare people who had similar assets but diverged in health later in the sample period. By 2010, people in the top third of the health distribution (i.e.,

the healthiest) accumulated at least 50 percent (or $200,000) more assets than people in the bottom third of the health distribution—the least healthy—even though they had the same amount of assets in 1994. There are two factors driving the wedge between those more and less healthy: earned income and annuity income. While not causal, these results point to the long-term financial cost of poor health.

Bartel and Taubman (1979) compare earnings among twins, where one has a diagnosed health condition and the other does not. At the time of observation (in 1973), the respondents were about 50 years of age. They find significant negative earnings effects among those diagnosed with heart disease, psychoses/neuroses, arthritis, and bronchitis, emphysema, and asthma. The decreased earnings are estimated to be between 20 and 30 percent, with long-run psychoses/neuroses having the largest earnings penalties.

Two papers help to understand the context for the prior causal studies described. While these studies corroborate the evidence of the causal studies with simpler methods and sometimes new contexts, it is important to remember that: (1) the health condition could be causing the financial distress or vice versa and (2) a third event could be causing both financial distress and the health condition.

Becker et al. (2022) descriptively study the relationship between debt and chronic disease using provider data linked to credit report data for over 2 million adults in Michigan from 2019-2021. The authors compare medical debt in collections among adults diagnosed with a combination of seven to thirteen chronic conditions (cancer, congestive heart failure, chronic kidney disease, dementia, depression and anxiety, diabetes, hypertension, ischemic heart disease, liver disease, chronic obstructive pulmonary disease and asthma, serious mental illness, stroke, and substance use disorders) to those with none. Of those with 7-13 chronic conditions, 32 percent had medical debt in collections compared to 7.6 percent for those with none. Rates of nonmedical debt in collections were higher for those with more chronic conditions (24 percent vs. 7.2 percent), as were the likelihood of being delinquent on any account (43 percent vs. 14 percent), the likelihood of having a low credit score (47 percent vs. 17 percent), and recent bankruptcy rates (1.7 percent vs. 0.4 percent). These results descriptively corroborate the causal evidence shown in the previous section.

Richard et al. (2018) look at the relationship between chronic health conditions and out-of-pocket spending as well as the relationship between chronic health conditions and medical debt. Data come from the 2013 Panel Study of Income Dynamics (PSID) and a sample of 3,882 households between 18 and 64 years of age. The authors define chronic conditions as the following: high blood pressure, heart disease, diabetes, asthma, lung disease, cancer, schizophrenia, bipolar disorder, stroke, heart attack, and arthritis. They find that households with one to three chronic conditions or four or more chronic conditions had a substantially higher likelihood of having any out-of-pocket costs, as well as having any medical debt when compared to those with no chronic conditions. These results parallel those of the previously described papers, showing a correlation between the two outcomes.

The focus of Richard et al, (2018) on medical debt is in line with a large literature that points to medical debt generated by health problems as a prime reason for financial distress in the U.S. We

next highlight the findings in this area of inquiry, where a large literature that points to medical debt generated by health problems as a prime reason for financial distress in the U.S.

Bielenberg et al. (2020) built a sample of 60 individuals in Seattle who have experienced homelessness. They found that those with chronic conditions were more likely to have longer spells of homelessness. About 30 percent of the sample pointed to medical debt at least in part for their housing situation.

Himmelstein et al. (2005) surveyed 1,771 personal bankruptcy filers, and they followed up with 931 interviews. In their survey, roughly 50 percent of debtors blamed medical causes for their bankruptcy. Similar to other studies, the authors' interviews led them to conclude: "Illness begot financial problems both directly - due to medical costs - and through lost income" (Himmelstein et al. 2005, 7).

Himmelstein et al. (2011) did follow-up work in Massachusetts to see if the healthcare reform that improved insurance coverage similarly changed the fraction of people who experienced bankruptcy due to medical reasons. They find that 52.9 percent of bankruptcies in the state were due—at least in part—to medical bills in 2009 (post-reform) compared to 59.3 percent in 2007 (pre-reform). Himmelstein et al. (2019) did a similar exercise pre- and post- expansion of the Affordable Care Act (ACA). Within a sample of filers, 65.5 percent reported that medical costs were a contributor just before the ACA took effect, and 67.5 percent reported that medical costs were a contributor just after the ACA took effect. Taken together, they suggest that insurance access alone does not eliminate medical debt in the U.S.

Cutshaw et al. (2016) looked at 90 households undergoing foreclosure in Maricopa County, Arizona, between 2013 and 2014. Their survey results are consistent with interviews and surveys in other areas: 57 percent of respondents said medical debt or another medical cause for their foreclosure. Consistent with Babiarz et al. (2013), 54 percent took on new debt to pay medical bills. Even though 57 percent of their sample had a chronic condition, about 50 percent reported skipping or delaying a needed medical visit. Nearly half (46 percent) of respondents then reported that their foreclosures worsened their health, highlighting the feedback loop between finances and health.

Robertson et al. (2008) similarly surveyed 2,000 homeowners on the brink of foreclosure in California, Florida, Illinois, and New Jersey. Of the respondents, 49 percent mentioned that their foreclosure was caused by a medical problem, such as illness or injury (32 percent), medical bills (23 percent), lost work due to a medical problem (27 percent), or caring for a sick family member (14 percent). The authors go on to say that many homeowners were hit with multiple shocks at the same time, including medical bills, a few weeks of missed work, and either a divorce or rising interest rate.

Keene et al. (2014) take this work on struggling homeowners and health shocks a step further to see if the relationship between health and mortgage strain is particularly problematic for African American homeowners. The authors use a qualitative approach where they conduct 28 semi-structured interviews in a northeastern town among African American homeowners experiencing mortgage strain or foreclosure. These interviews took place between 2012 and 2013. Three

important themes emerged. First, health limited individuals' ability to work due to excessive pain. Second, these homeowners started to spend more on healthcare. Third, they felt like they had nowhere to turn, as there were limited personal or public safety nets available for homeowners with financial strain. While the first two themes coincide with the findings from previously discussed papers, the sentiments from the third theme suggest that medical costs can put severe strain on homeowners, and there were no currently available safety nets to address that strain.

Wiltshire et al. (2016) further consider medical debt among African American individuals when compared with white individuals. Using 24,937 respondents from the Health Tracking Household, they show that from 2007 to 2010, there was a slight increase in the fraction of people reporting they struggled to pay medical debt (18.3 percent to 19.8 percent). Over the same time period, this same percentage decreased among African American respondents—but only for those in poor or fair health. The authors conclude that this vulnerable group was most likely to forego or ration critical care. The same is not true among white respondents. These results suggest that the feedback loop of health and finances may be more pronounced for some groups than others.

B. Very Specific Health Shocks

While the papers previously described consider overall health or are agnostic about specific conditions, many papers—some causal and some correlational—study only one very specific physical health condition. We describe these papers here.

Several studies consider cancer diagnoses specifically as one of the largest shocks to financial health.

Gupta et al. (2015) use cancer diagnoses as an unanticipated health shock in a natural experiment to determine the causal effect of the diagnosis on finances using administrative data in Washington state from 1996 through 2009. Their results show that even among those with public or private insurance, delinquency rates on debt increase, foreclosures increase, and bankruptcy increases in the five years after diagnosis. Follow up work in Gupta et al. (2018) shows that having home equity to draw upon allows cancer patients to afford the recommended treatment, and they live longer as a result. The tie between finances and health again is a multi-directional constant feedback loop.

Mongelli et al. (2020) shows that thyroid cancer survivors report financial difficulties 43 percent of the time, and these difficulties are then associated with anxiety and depression. Uppal et al. (2022) further describe the research on the financial burden of thyroid cancer, finding that it has a higher degree of financial burden on patients and survivors than other cancer types.

McDougall et al. (2020) use the New Mexico Tumor Registry to study the changes in financial well-being before and after diagnosis for individuals with stage I-III breast, colorectal, and prostate cancer. They use the CFPB's financial well-being scale to show that financial well-being

fell by five points from the year before to the year after diagnosis. A five-point decline is large given the stability of this measure within person over time (Angrisani et al. 2020), and this is greater than the effect of job loss on the same scale (Burke et al. 2020).

Two studies considered the effects of respiratory disease on later financial stress.

Khandelwal et al. (2018) consider a very specific population: individuals over 18 who were on a ventilator for over 48 hours and successfully extubated before being discharged from the ICU. Using surveys within 2 weeks of returning home and follow-ups three and six months later, they show that financial stress was high at all survey points in time. However, financial stress was highest among patients at six months (42.5 percent reported being financially stressed) and highest among family members at three months (48.5 percent reported being financially stressed).

Kamdar et al. (2017) study 922 survivors of acute respiratory distress syndrome. Half of previously employed survivors returned to work after hospital discharge, and 68 percent returned within 12 months. In the year after discharge, 71 percent of survivors experienced lost earnings and experienced a 14 percent decline in private health insurance, which shifted them to Medicare or Medicaid.

Several studies consider injuries, as opposed to disease.

Morrison et al. (2013) consider non-fatal car accidents to be an unanticipated shock to health. Using administrative data from hospitals in Utah, linked to bankruptcy and car crash data, the authors show there is no effect of the health shock on bankruptcy. They do acknowledge that the lack of effect could be because they find people involved in non-fatal crashes tend to be less healthy in general. Thus, they are cautious in interpreting their results are causal. The lack of effect could also be because nearly every driver in Utah is fully insured against car crashes.

Hollingworth et al. (2007) study bankruptcy following brain or spinal cord injuries. When comparing rates within the same person before and after the injury, they find that bankruptcy increases by 33 percent. The increases were the highest among younger populations, those with some blood alcohol content at the time of injury, and those on Medicaid.

Scott et al. (2022) look at Blue Cross Blue Shield (BCBS) claims in Michigan from 2018-2021 linked to credit reports for those aged 18-64 to study those hospitalized for traumatic injury. They then build a comparison group of similar individuals based on demographic characteristics. Those with injury were 23 percent more likely to have medical debt in collections, 70 percent higher medical debt amounts in collections, and double the bankruptcy rate when compared to the comparison group. There was no difference across the two groups in non-medical debt or credit scores.

O'Hara et al. (2021) study orthopedic fractures from 2003-2014 among 9,997 fracture patients and 34,570 patients who had not yet had surgery for an eventual fracture but will have it at some point. For example, a patient who will have an injury and surgery in 2013 can be a control patient for one who is having their surgery in 2008. After surgery, individual earnings declined

by an average of $16,847 annually in the five years following surgery, and annual household income declined by $5,259. Social Security benefits—including Supplemental Security Income, Disability Income, and Retirement Income increased by $206 per year. The most income was lost by those in the top three earnings quartiles—the highest earners.

A final study considers Alzheimer's disease and related dementias (ADRD), which are often associated with cognitive decline in the years prior to diagnosis. Nicholas et al. (2021) used a sample of 81,364 Medicare beneficiaries living in single-person households from 1999-2018 linked to consumer credit reports. They showed that those diagnosed with ADRD were 0.4 percentage points more likely to miss a payment on a credit account as early as six years prior to diagnosis compared to beneficiaries without ADRD diagnoses. ADRD beneficiaries were 0.38 percentage points more likely to have subprime credit scores 2.5 years before diagnosis than beneficiaries without ADRD. After diagnosis, those with ADRD were more likely to miss payments and more likely to have subprime credit scores than those without ADRD. These differences were most common among ADRD patients in lower-education areas. The authors found that these same patterns did not exist in other medical conditions, such as glaucoma and hip fractures.

C. International Contexts

While not always relevant to the U.S. healthcare system and safety net, many studies document the causal effects of health shocks on household finances in other countries. These results can tell us a lot about which types of policies mitigate the effects of health shocks on different outcomes.

Mommaerts et al. (2020) replicate the HRS component of Dobkin et al. (2018) both in the U.S. and also internationally. This helps to gauge the difference in leave policies, where the U.S. is the only country in the sample to not legally require paid sick leave for workers undergoing a 50-day hospitalization. At the tail ends, Luxembourg and Norway provided 50 days of paid sick leave at 100 percent replacement rates while Switzerland provided 15 days at 100 percent replacement rates.

The authors use longitudinal data from the U.S., China, and 13 countries across Europe for older workers (ages 50-59) six and 24 months after hospitalizations. The authors find similar patterns to Dobkin et al. (2018) in the U.S., and they contrast these with findings from the other regions. The cross-country patterns suggest that more generosity of social protections (health systems, social security programs, labor market regulations) are associated with mitigated effects of hospital admissions on household finances. For example, in northern and southern Europe—where universal healthcare systems are paired with strong labor protections that provide generous sick leave—the effects of hospitalization on out-of-pocket spending and household earnings are smaller and not statistically different from zero, despite a decline in the likelihood of working.

Beckmannshagen and Konig (2022) look at the effects of two different types of shocks—sick days (temporary) and hospitalizations (longer-term)—on employment and earnings in Germany from 1993-2018. Before jumping into the results, the context is important. In Germany, employees cannot legally be dismissed for health reasons, and employees are entitled to

employer-paid sick leave with a 100 percent replacement rate for up to six weeks. After that period, additional sickness benefits exist through the public health insurance system, covering approximately 70 percent of income for up to 78 weeks. After that, individuals not able to return to work for at least three hours per day are granted a reduced capacity pension. Health insurance is required for all Germans, making it unlikely that they have to pay out-of-pocket medical expenses, as in the U.S. Thus, in Germany, workers with a health shock are unlikely to have lingering medical expenses, but their employment and earnings could be affected.

The authors find that those who have a persistent health shock—especially those over 50 years of age—saw a 25-percentage point drop in income after experiencing the health shock. The effect is smaller for younger individuals (10 percentage points). Shorter shocks—measured by sick days—result in a smaller reduction in employment (5 percentage points). Partner income does not change after either type of shock. Long-run health shocks reduce earnings by 6,500 euros per year for three years, though household net income is one-fourth the size of the earnings reduction. This suggests that social insurance makes up for some of the decline in labor market earnings. This context allows us to understand the effects of sickness or hospitalization on earnings when strong protections exist and healthcare expenses are virtually non-existent.

In Italy, Torrini et al. (2022) study the effects of short- and long-term hospitalization on health care expenditures for 50–70-year-olds from 2008-2017. The Italian system is unique in that patients do not pay for hospital care for acute cases or with physician referrals, and the chronically ill, HIV-positive individuals, and pregnant women do not pay for care. However, patients contribute to the cost of pharmaceuticals and outpatient services, with some exceptions.

The authors find that after hospitalizations, four-year hospital-related expenditures are approximately 13,500 euros. This cost is largely due to readmittance, pharmaceutical costs, and inpatient care. The cost estimates are driven by cardiovascular disease and cancer, and the effects are largest for chronic and disabled inpatients. The authors' financial conclusion is that to reduce these costs, policies need to provide integrated and transitional care that will reduce avoidable readmissions.

Two studies consider the effects of hospitalizations and severe conditions on household finances in the Netherlands, where social systems are such that disability and unemployment insurance are generous and healthcare is universal. First, Bonekamp and Wouterse (2022) study six severe conditions for those over 65 from 2006-2017. They do not find an effect on wealth for any of the conditions three years later. They do find some evidence that a lethal health shock results in a spending down of wealth through consumption. Second, García-Gómez et al. (2013) find that hospitalized individuals in the Netherlands decrease own-employment as well as family members' employment. The disability insurance system gives hospitalized individuals the ability to maintain a higher income level while being unemployed, which allows household members to leave the labor market to care for a sick family member. Taken together, the system in the Netherlands allows individuals suffering a long-term health shock to focus on getting well without damaging their household finances.

Fallesen and Campos (2020) study 424 concussion patients ages 20-59 in Denmark from 2003-2017, where healthcare is government provided and welfare protections are strong. They find

that a concussion reduced average annual salaries by four percent—a very small reduction compared to other conditions and other countries studied. This is likely due to the generosity of disability insurance. Those without high school degrees suffered the largest declines, and the effects come from exiting the workforce.

IV. Mental Health and Financial Health

We turn next to a review of the relationship between mental health and financial health. As discussed previously, determining how mental health affects financial health is substantially more difficult given the complex interaction of social, psychological, and biological factors that give rise to mental illness (WHO 2021).[3] Moreover, the onset of mental illness is typically not a sudden change or a health shock that researchers can use as a natural experiment to uncover causal effects. As such, when considered relative to the existing evidence on physical health, this research is newer, much more likely to be correlational, and needs additional insight into underlying causal effects. The exceptions are studies which utilize experimental treatment interventions to improve mental health and consider subsequent effects on worker outcomes related to financial well-being.

Within this section, we start with studies that consider the broad effects of mental health on financial outcomes using approaches that attempt to uncover causal evidence or at least employ an estimation strategy that rules out some confounding variables.[4] While the latter should be interpreted with caution, the limited existing causal evidence necessitates a careful consideration of the existing correlational evidence. We also briefly review the existing research that is purely correlational or qualitative.

We then review the existing evidence that comes from specific mental health treatment interventions and how they relate to worker outcomes. In this area, some researchers are able to employ the gold standard using RCTs to uncover causal effects that are particularly relevant for the design of optimal policy.

A. Overall Mental Health and Mental Health Shocks

There are several papers that attempt to employ research designs that rule out confounding issues and report causal effects in this space. We lead with a review of this evidence while noting that it is not without limitations given the inherent difficulty of unpacking the effects of mental health that we discussed previously.

Bogan et al. (2021) explore the effect of psychological distress and mental health diagnoses on self-employment decisions. They argue that self-employment in the form of unincorporated business ownership is more likely to be associated with those individuals that face difficultly

[3] Note that several previous studies, including four that consider mental health disorders in their chronic conditions list above, do not separate out each condition.

[4] Within this area of study, psychologists use specific terminology to separate circumstances when mental health has a causal effect on outcomes, when the reverse is true, and when there are bi-directional ongoing causal relationships. Our focus on uncovering evidence for causal effects of mental health on financial health is often termed “social causation” within this literature.

maintaining wage-and-salary employment. To support this, they show that these types of business owners—inclusive of both men and women—are more likely to suffer from moderate psychological distress and long-term mental illness. The results suggest that episodes of mental illness and psychological distress push individuals into a type of self-employment that is associated with lower average earnings.

Also looking broadly at psychiatric disorders on labor market outcomes, Banerjee et al. (2017) use a continuous measure of mental illness developed by Jöreskog and Goldberger (1975). They use an approach that, under certain statistical assumptions, allows them to isolate the effect of mental health on labor market outcomes using rich data that includes detailed information on the statistical properties, risk factors, and correlates of mental disorders. Their results suggest that mental illness adversely affects employment, labor force participation, and the number of weeks worked (i.e., it increases work absenteeism). Using U.S. labor force statistics, they estimate that the annual improvements in mental health among those diagnosed in the U.S. would lead to 3.5 million individuals gaining employment, and that the costs of workplace absenteeism would fall by $21.6 billion (2002 dollars).

Acknowledging the limited ability to account for key variables, several papers use mental health onset or diagnosis as a health shock to estimate effects on financial outcomes. For instance, Bartel and Taubman (1979)—discussed in the physical health section—also focus on mental health diagnoses. Adding to this earlier work showing larger negative effects on earnings from mental relatively to physical health shocks, Bartel and Taubman (1986) explore this link further to show that broad categories of mental illness are correlated with long-lasting and large effects on earnings, among other pervasive effects on family outcomes. They argue that a causal link is likely for diagnoses related to “psychosis” which offers a more plausible unanticipated health shock relative to other mental illnesses related to neurosis.

Babiarz and Yilmazer (2017) similarly focus on both physical and mental health. They estimate the impact of physical and mental illness on consumption behaviors and financial stability. Similar to research in the physical health space, the authors use adverse health events to compare the effects of physical and mental illnesses. They are careful to note that this approach cannot be described as causal, particularly with regard to mental health where the onset of mental health illness is less likely to be a new condition than an unanticipated physical health shock. With that caveat aside, the authors find important evidence that mental health shocks result in much larger decreases in household income relative to physical health shocks. This can be seen in the following figure which compares average earnings before and after mild and severe physical health shocks, as well as psychological health shocks. While those with eventually identified psychological illness had lower earnings before the diagnosis, their average incomes fall by slightly more than those with a severe health shock.

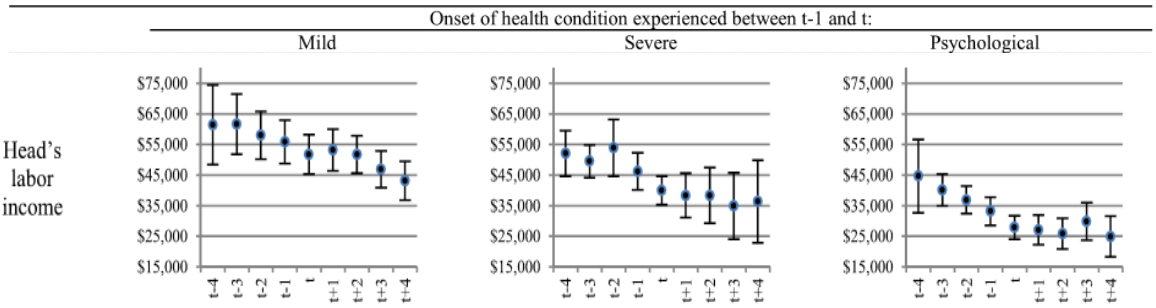

Figure 4: Babiarz and Yilmazer (2017) Figure 1, "Means and 95% confidence intervals for household head's labor income"

They also find that average household consumption falls more in periods following a psychological illness relative to a physical health shock. Particularly important for policy, the researchers show that while the social safety net does mitigate the effects for physical health shocks, it does not provide the same protection for the effects of psychological illness. They conclude that "improving the financial safety net against psychological health misfortunes should be the target of public policy" (Babiarz and Yilmazer 2017, 1756).

Though purely correlational, Mojtabai et al. (2015) explore data from a two-wave survey where individuals that were employed, unemployed, or a student were again interviewed ten years later with a focus on how a wide variety of mental disorders correlate with odds of subsequent employment. Based on their projections, these disorders were associated with 1.7–3.2 million adults being unemployed in the U.S. population at follow up.[5]

To our knowledge, there are no credible attempts to uncover causal effects of specific mental health ailments on financial well-being. Using an event study approach, Whooley et al. (2002) follow 2,334 employed adults ages 18 to 30 and compare those with and without depressive symptoms. They found that working young adults with depressive symptoms experienced higher rates of subsequent unemployment and lower family income.

Correlations, Qualitative Work

In work that is more descriptive in nature, researchers model general trends and cross-sectional comparisons, often using surveys that rely on self-reports and otherwise limited data sources. Again, we are cautious to overinterpret this work since correlational evidence can often be misinterpreted as causal, but also recognize the paucity of research in this area.

For instance, Pollack and Lynch (2009) use descriptive evidence to show that nearly 40 percent of their sample of 250 people that filed for foreclosure in the Philadelphia region met the criteria for major depression. While this may be indicative of an important underlying relationship between financial stability and depression, more work needs to be done to establish a credible link.

[5] The disorders included internalizing fear disorders (panic, phobias), anxiety/misery disorders (major depression, generalized anxiety disorder, post-traumatic stress disorder), externalizing disorders (conduct disorder, alcohol and illicit drug abuse-dependence), and bipolar disorder.

Hamilton et al. (1993) highlight the inherent problem of reverse causality and the dynamics of the relationship between mental health and financial stability. They compare workers in closing and non-closing General Motors plants and show that the plant closing is related to depression, but also that symptoms of depression are related to subsequent employment outcomes. This also highlights the possibility that difficult financial situations give rise to depression, which subsequently affects future employment outcomes and financial situations.

Cao et al. (2021) use survey data to highlight a positive association between depressive symptoms and financial stress that is apparent throughout ages 18 to 29. While acknowledging that their descriptive approach does not address alternative explanations, the authors argue that the estimates are consistent with the interpretation that depressive symptoms lead to differences in financial pressures, which adds support to the notion that improvements in emerging adults' mental health can affect financial well-being. This area of study ties to a recent literature that considers the correlates of student financial behaviors and well-being, though not specifically focused on the health to finances link (Bartholomae and Fox, 2021). Understanding the link between mental health and financial stability for emerging adults is an important area for future inquiry.

Another area of importance for future research relates to existing correlations suggesting that the consequences of poor mental health are particularly detrimental for low-income groups. For instance, Gupta and Huston (2009) highlight the inherent difficulty with identifying causal effects as they summarize the existing evidence linking depressive symptoms and economic outcomes of low-income women. While they conclude that the only causal relationship identified in this area points to income leading to a reduction in depressive symptoms, they also highlight many associations found in the literature relating psychological distress, earnings, employment stability, income, and job characteristics, and advocate for targeted policies such as treatment and workplace policies to help mitigate the potential links among particularly susceptible groups.

Also focusing on women, Dooley and Prause (2002) replicate prior studies by first showing an association between welfare status and depressive symptoms. They go on to argue that the correlations they find using data from the National Longitudinal Survey of Youth are a result of both depression leading to welfare and welfare leading to depression among women. Again, this highlights the prevalence of mental health and financial well-being correlations in lower-income populations, but also reaffirms that correlational designs do not account for key variables that could clarify the direction of causation.

B. International Contexts

In a recent and influential working paper, Biasi et al. (2021) use individual-level registry data from Denmark to show that depression, schizophrenia, and bipolar disorder are associated with a career earnings penalty ranging from 34-74 percent. They then estimate the causal effects of treatment for bipolar disorder by leveraging the introduction of lithium as a maintenance treatment approach in 1976. Their findings suggest that access to treatment eliminates a third of the earnings penalty associated with bipolar disorder and reduces the possibility of low or no earnings. This is likely the best evidence supporting the notion that access to mental health treatment can substantially mitigate the financial penalties associated with mental illness.

Importantly, Denmark is a country with universal healthcare, which introduces complexity when extrapolating to a U.S. context. With that said, the authors conclude that "In countries where access to mental health care treatment is costly, such as the United States, the distributional impact of mental health—and the potential benefits of expanding access to treatment—is likely to be greater" (Biazi et al. 2021, 30).

In another paper in an international context, Salakangas (2021a) uses Finnish data to consider the timing of first psychiatric admission to estimate the effect of treatment on labor market outcomes. Similar to diagnosis timing, the results show a downward trend even before the timing of the first admission. This finding again suggests that the link between mental health and labor performance predates admission and emphasizes that the mechanisms and causes underlying the link between mental health and financial outcomes are incredibly complex and not well understood. Of course, stark differences exist between the approach to mental health and access to mental healthcare in the U.S. and Finland, though perhaps most notable are the wider availability of mental health services and lower financial barriers to access mental health treatment in Finland.[6]

Using a 50-year follow-up period, Salakangas (2021b) uses the same data and similar methodology to show that a history of psychiatric admission is associated with a 41 percent relative decline in earnings and negative effects on employment. He finds that an earlier onset of admissions is even worse for those with mental illness, which suggests there may be an economic rationale for early interventions. With the richness of the data, he is able to look at various disorders to compare siblings within households as well as twins. While not ruling out the important biases discussed in his prior work, these comparisons add credibility to the analysis, particularly since the various methods all point to a consistent pattern of deficit—meaning the reduction in earnings, income, or employment due to the disorder. Figure 5 documents this pattern by plotting the various disorders and comparisons groups used in their estimation.

[6] See Mental Health Atlas 2020 Country Profile: Finland (who.int).

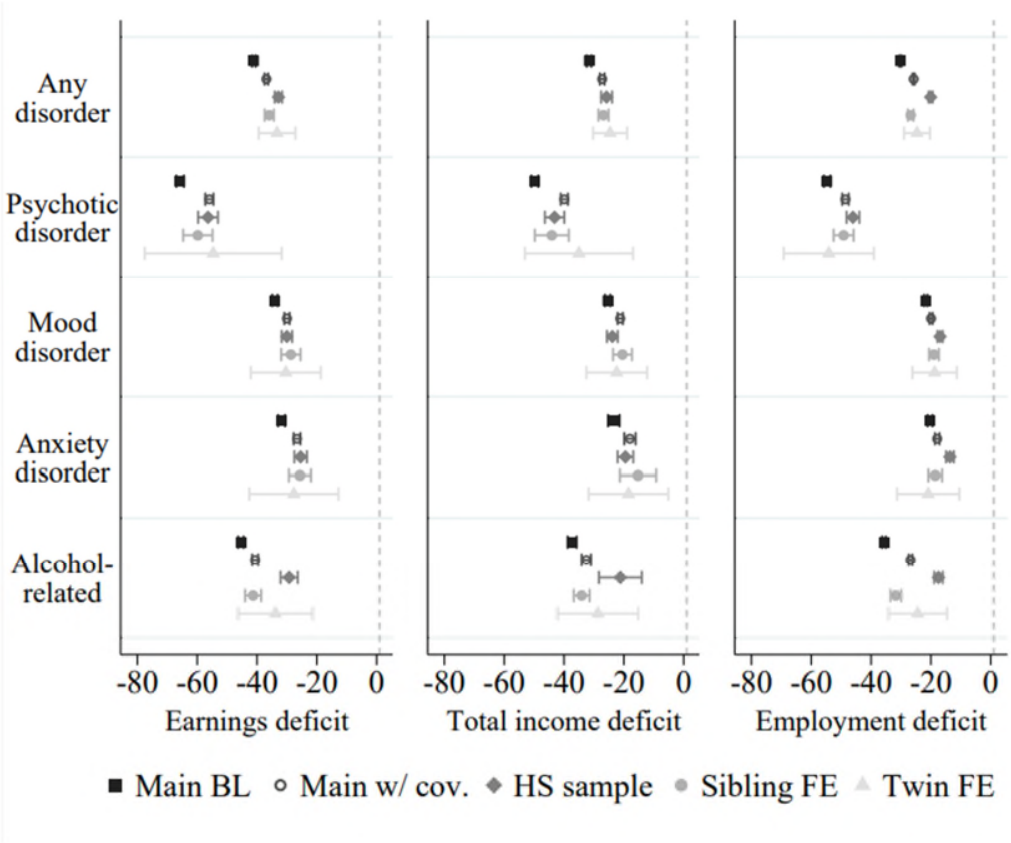

Figure 3: Salakangas (2021b) Figure 4. "Psychiatric admission history and the deficit in lifetime labor market performance"

Salmela-Aro et al. (2008) interviewed 297 Finnish university students seven times over a ten-year period and created three distinct depressive symptom groups to consider correlations with outcomes. Relevant to our focus, those students that were identified as a high-depressive trajectory earned less than comparison groups.

Using unique administrative data from Norway, Mastekaasa (1996) follows 2,100 people over time to show that people with psychological distress are much more likely to be laid off than otherwise observably similar workers, and that once laid off the same people have a lower probability of re-employment. Though these panel data avoid cross-sectional comparisons, they still do not offer conclusive evidence that rule out other factors correlated with mental health that may cause the layoff and effects on the probability of re-employment.

C. Mental Health Treatment

While many treatment approaches offer promising avenues to improve mental health, there has been little attention to financial well-being. There is one exception: a large literature focuses on mitigating the effects of depression and anxiety on workplace outcomes. Much of the work in this area uses randomized controlled trials to estimate causal effects of various mental health treatment interventions on mental health. This improvement in mental health is then a factor in improving financial wellness. One problem with this literature is that the analyses often rely on small sample sizes and focused treatment interventions that offer limited extrapolation to

alternative settings and populations. With that said, this is a critical area of inquiry due to the fact that depression and anxiety disorders are the leading cause of absence and work incapacitation in most developed countries (Joyce et al., 2016). Thus, we review meta-analyses that synthesize this research and draw upon larger sample sizes, though largely the evidence remains mixed and begs for larger-scale studies.

Timbie et al. (2005) conduct a meta-analysis of four randomized trials that focus on depressive disorders. They conclude that the existing evidence shows increased labor output and labor force participation following interventions that reduced depression, but the improvements to labor supply were small relative to standard benchmarks used in the social sciences.

A similar more-recent meta-analysis by Joyce et al. (2016) includes 20 moderate or high-quality studies that consider interventions to prevent, treat, or rehabilitate workers diagnosed with depression and/or anxiety. They conclude that the existing evidence demonstrates the efficacy of various treatment interventions in improving symptoms, but only certain interventions (such as cognitive behavioral therapy-based stress management, enhancing employee control, and promoting physical activity) are effective at improving occupational outcomes such as absenteeism and productivity.

Finally, Nieuwenhuijsen et al. (2020) conduct a review of 45 studies that consider the effect of workplace changes and clinical treatment on workplace outcomes in the U.S. and internationally. Treatment programs included medications like anti-depressants, psychological interventions, improved doctor care, and other programs such as exercise and diet. The authors find that some of these interventions may help people with depression return to work and take fewer days off. They do not find conclusive evidence of long-run improvements in workplace outcomes for any of the interventions, though they acknowledge that not many studies consider the fact that several treatment programs exist for many people. The authors conclude that more evidence is needed.

V. Policies that Limit the Effect of Physical Health or Mental Health on Financial Health

How do we reduce the financial impact of a health shock? Taken together, the research in the U.S. shows that many health shocks affect the ability to work, savings, and debt. Thus, we consider policies that will either (1) reduce the financial burden of being admitted to the hospital or treating a health condition or (2) would reduce the impact of not being able to work at the same level as before the health change occurred. Finally, since a large literature (Turunen and Hiilamo 2014) shows that wealth improves health, once health begins to deteriorate it is important to ensure that a certain level of financial well-being is maintained in order to not deteriorate health further.

We draw upon research on specific policy interventions as well as proposals from think tanks and thought leaders that parallel our learnings from the research. We also draw upon the international context to compare the U.S. to other healthcare and safety net settings. However, we acknowledge that since the entire system is different across countries, it is hard to assess how one specific change may or may not generalize to other settings.

Health Insurance

An obvious starting point to reduce out-of-pocket medical costs is to affordably increase health insurance access and coverage. In countries like the Netherlands with universal healthcare, declining health does not affect wealth or earnings (Bonekamp and Wouterse 2022; García-Gómez et al. 2013).

While a body of research finds that health insurance itself does not improve physical health (Finkelstein et al. 2018), some research has more promising findings. Miller et al. (2021) show that access to Medicaid among those ages 55 to 64 reduced mortality rates by 9.4 percent. There is also some evidence of mental health improvements with access to health insurance. Tipirneni et al. (2020) further show that Medicaid expansions were effective at improving job-related outcomes among enrollees with behavioral health diagnoses. McMorrow et al. (2017) further find that access to Medicaid reduced psychological distress for low-income parents. Regardless of health effects, a larger body of research shows that health insurance does substantially reduce the effect of a health shock on household finances (Allen et al. 2017; Gross and Notowidigdo 2011; Hu et al. 2018; Mazumder and Miller 2016).

Another option would be for the government to expand coverage for extreme health shocks that are likely to bankrupt individuals. This policy is similar to additional assistance in Italy for specific conditions (Torrini et al. 2022). Currently, the U.S. has an allowance for patients with end-stage renal disease that requires a regular course of dialysis or a kidney transplant to access Medicare right away.[7]

If the most vulnerable people struggle the most with enrolling in public benefits due to administrative burdens (Herd and Moynihan 2019), one policy option that could increase coverage is auto-enrollment in Medicaid. We know the converse is true: removing automatic enrollment for low-income individuals harms coverage (Shepard and Wagner 2022).

Other Financial Interventions Relevant for Health Shocks

A lesser-known policy response is called "required financial assistance," which essentially relies upon the non-profit status of some hospitals to force them to provide free or reduced-cost medical treatment to low-income people facing emergencies. A CFPB report describes Required Financial Assistance as "a form of community benefit involving medical care that is provided for free, or at a discount, to patients who cannot afford to pay. Nonprofit hospitals are required by federal law and some state laws to meet a community benefit standard to maintain significant tax and other financial benefits afforded by their nonprofit status. This standard is met in part by the provision of financial assistance to those who are not able to pay" (Singer et al. 2022).

A recent paper shows that financial assistance increases detection of health conditions by allowing for additional tests that would otherwise not have been conducted, as well as increased access to prescription drugs to combat these ailments (Adams et al. 2021). By looking at the timing of the assistance, the authors find that the effects are most concentrated in the months

[7] For more details on this policy, see this link: https://www.medicare.gov/basics/end-stage-renal-disease

immediately following the assistance and utilization does not continue to increase in the long run. This could suggest that the lower-cost medical care did improve health through short-term improvements in diagnoses and healthcare utilization without bankrupting those with ailments. However, it could be that the health benefits of the required financial assistance are short-lived, causing individuals to either cut costs at the expense of their health or spend more on their health at the expense of their finances.

While some credit unions now offer products to help consolidate medical debt at low interest rates, this is more of a bandaid than a solution.

According to a CFPB report (2022a), the most common medical debt complaints to the agency discuss attempts to collect debt that the individual says is not owed. Navigating medical debt is challenging in itself. For example, what will out-of-pocket-costs be? Beyond that, having medical debt and collections recorded differently than expected makes matters even more challenging. Two recent policies may improve this challenge. First, the No Surprises Act will protect patients from unexpected medical bills. Second, as part of the National Consumer Assistance Plan, medical debt fewer than 180 days behind will no longer factor into credit scores both contemporaneously and retrospectively (CFPB 2022b).

Financial Literacy and Wellness Programs

Since the U.S. healthcare system is complicated, having the knowledge and wherewithal to navigate the system should not be assumed. The Urban Institute finds that financial knowledge is correlated with medical debt, and that better understanding how to address medical debt could help financial health when you get sick (Braga et al. 2017).

Given the high costs of depression and anxiety disorders on worker productivity discussed in Section IV Part C, it is important to point out that financial well-being programs that include mental and physical health components are becoming a common feature in most large workplaces across the U.S. The Employee Benefit Research Institute (EBRI) conducts an annual Financial Wellbeing Employer Survey of large employers. Their survey results show that employers are anticipating expanding their budgets for these programs going forward, and that 84 percent of programs use financial well-being benefits to improve mental health and emotional well-being. The effects of these programs on health and subsequent worker outcomes will be an important area of inquiry going forward (Copeland 2022).

Disability Insurance and Sick Leave

In other countries with more generous disability insurance, health shocks have a much smaller impact on household finances. In the Netherlands, where disability insurance is much more generous, households do not see a reduction in income after adverse health conditions, allowing household members to be caregivers García-Gómez et al. (2013). Even in the U.S., Deshpande, Gross, and Su (2021) show that a disability allowance substantially reduces the likelihood of adverse financial events. The District of Columbia and 34 additional states automatically enroll Supplemental Security Income (SSI) recipients in Medicaid. Expanding this to all states could help with access to insurance.

The U.S. is the only developed country that does not legally require employers to provide sick days for employees. Allowing individuals to take time off when ill could improve their long-run health, as well as their finances. This is particularly important since Houle et al. (2015) find that flu outbreaks are most likely to affect those who are already struggling financially, likely because sick days are not an option for those employees. Robertson et al. (2008) proposed staying mortgage foreclosures during medical crises to give borrowers more time to bounce back from a health shock.

In other countries, it is often unlawful to fire people for any reason that related to health, and though the U.S. provides unemployment insurance (UI) to those who are terminated, the number of weeks covered by UI in most states does not allow for a continuous transition to either SSI or Social Security Disability Insurance (SSDI) benefits due to their burdensome applications.

Pairing Health Care Services with Access to Social Services

According to Dr. Bechara Choucair, the CEO of Kaiser Permanente, "Financial insecurity is the next great health crisis" (Financial Health Network 2022). In a podcast with the Financial Health Network, he discusses the interrelated nature of financial situations and health (Financial Health Network 2022). For example, without access to safe housing and consistent, healthy food, it is challenging to maintain one's physical health. His solutions are novel. He suggests pairing physical and mental health visits with questions about access to basic needs. Then he suggests linking these individuals without access to food, housing, childcare, or early education for children to services that exist in their local community that could help them access these necessities. For example, someone without access to consistent food may be eligible for SNAP benefits unknowingly. If doctors screened for nutritional needs, they may be able to link patients to people who could help them apply for SNAP. Fulfilling these basic needs in one place could improve access to the safety net when administrative burdens exist (Herd and Moynihan 2019).

VI. New Research Explorations in Policy Evaluation

A newer field of study examines how additional policy levers can work within the existing healthcare system in the U.S. to blunt the effect of declining physical or mental health on financial health. While funders are just beginning to support causal evaluations in this space, early results from pilot programs provide suggestive evidence of what non-profits, healthcare professionals, and institutional partnerships can do to improve the financial wellbeing of those in poor health.

One area of study offering initial evidence focuses on financial toxicity among cancer patients, where an individual's financial health often simultaneously determines their course of treatment, potential for survival, and future financial situation. Carrera et al. (2018) review studies in this space and offer several important insights. Based on surveys of oncologists and other clinicians, Carrera and coauthors encourage the development of generic drugs, physician recommendation of generic drugs, and an increased transparency in discussing treatment costs. They identify a list of treatment options that can minimize financial toxicity of cancer patients. For example, switching from oral therapies with high copays to intravenous therapies with little or no copays

reduces out-of-pocket costs without compromising care. Direct conversations between patients and physicians about cost, however, are more challenging. They discuss prior studies showing that a campaign aimed at increasing physician awareness of low-value care was not effective, showing that physicians found it difficult to talk to patients about avoiding low-value services.

Carrera et al. (2018) pull from the literature a recommendation that is consistent with Dr. Chouchair's idea: make "financial health" a routine part of clinical assessment. This strategy can help address the reluctance of physicians to discuss personal finances with patients and can facilitate the matching of patients to appropriate financial assistance and treatment options. This reduces the likelihood that patients will forego medical services due to expenses, giving them the greatest likelihood of improving their health. The set of questions they recommend is in Table 1.

Table 1: Questions Patients with Cancer May Want to Ask about Treatment Costs, Table 3 from Carerra et al. (2018)

- I'm worried about how much cancer treatment is going to cost me. Can we talk about it?
- Will my health insurance pay for this treatment? How much will I have to pay myself?
- I know this will be expensive. Where can I get an idea of the total cost of the treatment we've talked about?
- If I can't afford this treatment, are there others that might cost less but will work as well?
- Is there any way I can get help to pay for this treatment?
- Does my health insurance company need to preapprove or precertify any part of the treatment before I start?
- Where will I get treatment—in the hospital, your office, a clinic, or at home?

[a]Adapted from: American Cancer Society, 2017.[71]

Other work has piloted providing financial counseling for cancer patients. Kircher et al. (2019) developed a financial counseling intervention to provide more information about out-of-pocket costs. Fewer than half of those offered a meeting with a financial counselor took that meeting, but of those who were offered a phone call, 98 percent talked with a counselor. While the out-of-pocket estimation tool used by the financial counselor was able to provide an approximate cost, it could not be fully individualized because detailed information on the insurance plan could not be obtained. Through qualitative follow-up interviews, the researchers found that the counseling led to one patient obtaining financial assistance consisting of a payment plan and charity care for prescription drugs. Ultimately, the results suggested that patients found consultation helpful but did not feel better about their finances after the intervention. This research highlights that even with a lot of information, financial counselors cannot provide precise details about medical costs. Financial counselors may be best suited to help those who may be eligible for financial assistance in seeking out resources.

Other research shows that radiation patients who used a financial counselor had a lower financial difficulty score than those who did not, though they did not randomize who received financial counselors (Farrugia et al. 2021). This means that those who chose to work with a financial counselor may have been healthier or in less financial distress to start with. Haynes et al. (2011) show that for rural women with chronic illnesses, a randomized financial education program improved financial literacy. However, they do not expand their outcomes to financial behaviors and are unable to say if this translates to greater physical, mental, or financial health. Speaking more broadly to this area of inquiry and the potential challenges of these types of programs, (Weinert et al. 2008) find that retention in programs for the chronically ill is a persistent hurdle. This is likely because improving financial capability while unhealthy remains a struggle.

A more effective strategy could be to provide financial education or financial counselors to caregivers. Two studies support this strategy. Watabayashi et al. (2020) study a financial education and counseling program for both the caregiver and the patient, along with $11,000 in financial assistance. Though they cannot attribute this to the program with certainty, financial distress did not increase at the follow-up period over a year after treatment began. The program they studied leveraged partnerships with three non-profits: Consumer Education and Training Services, Patient Advocate Foundation, and Family Reach. Together, these non-profit partners provided both the financial assistance and the intervention. Worley et al. (1991) highlight the potential benefits of providing counseling for caregivers. They study the effects of financial counseling for parents of children with chronic illness. Parents randomly allocated to recieve financial counseling were more likely to establish records, use a budget, obtain low-cost life insurance, and use tax deductions appropriately. Overall, three-fourths of parents in the treatment group reported that the counseling had benefited or would benefit their lives going forward.

While financial education is a more common intervention, Nguyen et al. (2022) highlight the difficulty associated with improving health insurance literacy. Although this is a pilot study prior to the actual experiment, the preliminary findings showed that 44 percent of patients and 31 percent of caregivers have low health insurance literacy. More specifically, calculating out-of-pocket costs for out-of-network services was particularly challenging: fewer than 10 percent of patients and no caregivers answered these questions correctly. The authors point to the potential for health insurance literacy education or additional transparency to improve knowledge of costs.

Much of this past and ongoing work directly or indirectly speaks to what patients think will improve their financial health. For instance, Aviki et al. (2022) survey patients with gynecological cancer while in waiting rooms. Their top three preferences for interventions to reduce financial toxicity were access to transportation vouchers, understanding treatment costs up-front, and minimizing wait times. Adding further suggestive evidence, Ragavan et al. (2022) use a survey and qualitative methods to show that comprehensive financial resources were stated to be the most helpful resource in interviews with parents of pediatric cancer patients.

With this area of study being relatively limited in scope and newly emerging, there are important outstanding questions for researchers. We list some below, and we encourage future researchers to fill these gaps with experimental and quasi-experimental studies.

- How do debt consolidation programs provided by credit unions improve the financial well-being of those who have declining health?
- Are special considerations required for financial counseling when considering new mental health diagnoses? If so, can financial coaching be paired with therapy in order to strike a delicate balance between financial stress and mental health?
- Does more knowledge about out-of-pocket costs improve financial health for those who experience other less severe diagnoses (e.g., outside of cancer)?
- Can working with a financial counselor help those with new health conditions to generate a new and more realistic budget for future health-related expenses and a lower household income?

VII. Conclusions

Overall, this review documents the financial hardship experienced following the decline of one's physical health. The repercussions in the U.S. context include higher bankruptcy rates, worse credit outcomes, lower subjective financial well-being, and homes lost through foreclosure. These outcomes are more pronounced for the most vulnerable: those already behind on payments at the time a new health condition arises, those with lower levels of education, and the uninsured. The primary two mechanisms through which a physical health shock harms finances are out-of-pocket costs and reduced earnings due to a health-induced exit from the workforce.

The findings are not unique to physical health, and the current research suggests that those with psychological illnesses face even greater detriments to financial health. Mental illness reduces the capacity to work and reduces earnings by more than severe physical ailments. Research does find that an improvement in mental health improves workplace outcomes—such as participating in the labor market and holding employment—though these effects remain small and research has not yet seen how improvements in mental health translate to other financial outcomes.

Future research should consider focusing more on how an improvement in mental health can improve or change financial health. Further, some of the current research on physical health could benefit from strategies in the mental health space. For example, experiments that test the efficacy of a new prescription could track financial conditions across the treatment and control groups to see if improved health also improves one's finances.

Taken together in the U.S. context, our research summary suggests that policy interventions that focus on improving mental health at early ages, provide predictable and lower-cost medical care, and support households through gaps in labor market earnings due to unforeseen illness could greatly reduce the financial impact of health shocks.

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