Linking Health and Economic Prosperity

Literature Review

Author: Emma Connell

This literature review supported a study conducted by Wilder Research and the Federal Reserve Bank of Minneapolis as part of the Engaging Businesses for Health initiative, developed by the Robert Wood Johnson Foundation and AcademyHealth.

We focused our literature review on research regarding three topics:

- Health and economics
- Social determinants of health
- Policy and health

We did not attempt a completely exhaustive review. Rather, we completed a review that offers a glimpse at the literature that assesses the above relationships as of 2018. It serves as a starting point and baseline to ground hypotheses and analysis.

The connections between health and economics are nuanced, and the intertwined nature of how economic health and physical health interact with one another makes causality difficult to tease out. Research indicates that financial well-being, social context, and health mutually influence one another. Much of this research analyzes these connections at the level of the individual; more analysis at the aggregate level (be that the level of the county, MSA, state, etc.) can further shed light on the ways in which these facets of life interact.

OCTOBER 2019

Wilder Research
Information. Insight. Impact.

Health and economics

Improved economic standing leads to better health

A strong evidence base indicates the positive influence of economic well-being on health. This effect occurs at the individual and aggregate levels. While health is an individual measure, it is often aggregated to examine how different groups of people are faring generally. At the individual and aggregate level, economic well-being appears to significantly influence both physical and mental health.

Economic well-being and physical health reinforce one another

Poor financial well-being affects the availability of resources that bolster physical health. Turunen and Hiilamo (2014) found that falling behind on mortgage payments was associated with food insecurity and cost cutting on required prescription medication; additionally, credit card debt of $1,000 or more was a greater predictor of unhealthy weight-related behaviors than perceived stress or poor stress management.

Poor health can have a detrimental impact on a variety of indicators of work stability and satisfaction. Individuals who are obese or overweight are more likely to leave work on disability (Robroek et al., 2013), women and Hispanic men have been found to have lower wages as their BMI increases (Cawley, 2004), and suboptimal self-rated physical health is one of the best predictors of unemployment and prolonged unemployment (Virtanen, Janlert, & Hammarstrom, 2012). In fact, self-perceived poor health has even been found to be a greater predictor of an individual's exit from paid employment than were mental health problems or the presence of a chronic disease (Van Rijn, Robroek, Brouwer, & Burdorf, 2013).

The connections between health and economics at the individual level are clear: healthier people less often miss work, have higher wages, and are less likely to leave the workforce due to unemployment or disability. Furthermore, unemployed people have greater probability of participation in some risky health behaviors, including smoking and risky alcohol intake (Virtanen, Janlert, & Hammarstrom, 2012).

Economic well-being and mental health reinforce one another

The connections between financial insecurity and mental health are negative, consistent, and significant. Across studies, as individuals experience financial insecurity, they are more likely to suffer from deleterious mental health conditions. The added stress of falling behind on mortgage, loan, or other payments, for example, increases the likelihood of an individual suffering from major depression or generalized anxiety disorder (Turunen & Hiilamo, 2014).

In addition, worse mental health increases financial insecurity. Studies have found that depression and anxiety issues increase the number of days an individual is absent from work due to health problems (Zhang et al., 2016), and even unemployment (Van Rijn et al., 2013). This can lead to greater financial stress and concern.

Recessions improve physical health and harm mental health

Ruhm (1996) examined the impact of economic recession on mortality in his work, "Are Recessions Good for Your Health?" Ultimately, after examining employment and mortality data for the United States from 1972-1991, he asserts that they indeed have a positive relationship at the aggregate level. Specifically, a one percentage point increase in joblessness is associated with a 0.5% decrease in the total death rate in his models. This relationship was found for deaths related to poor health behaviors (such as drinking and driving) and illness (including heart disease, influenza, and pneumonia). However, this relationship was inverse for suicides—suicide rates increase during recessions.

When considering the theory behind these differences in mortality rates, Ruhm hypothesizes that in recessions individuals have more time to dedicate to healthy behaviors (like exercise, food preparation, and sleep) and have less to spend on unhealthy goods, like alcohol and cigarettes. Rolden, Van Bodegom, Van Den Hout, and Westendorp (2013) similarly state that during times of low unemployment smoking and obesity rates increase, physical activity decreases, and diets become less healthy as well.

Additionally, some low-income individuals may newly qualify for Medicaid, which decreases the cost of health care to the individual. Ruhm states that the connection between recessions and reduced rates of illness-related deaths is less straightforward than much of the literature base suggests. He suggests that individuals with full workloads might delay doctor visits due to time constraints, and that busy individuals might experience more stress, which would result in higher rates of illness. This stress is likely less severe than the stress held by the unemployed, which would explain the increase in suicides during recessions (Ruhm, 1996).

Rolden et al. (2013) had similar findings in their study of the relationship between GDP per capita and mortality rates for adults in developed countries from 1950-2008. They found that mortality rates increase in economic upswings and decrease in economic contractions, and that the effect was more pronounced for men. Rolden et al. hypothesized that social support and caregiving have an impact on mortality rates: as workloads increase, individuals have less time to dedicate to caregiving, which makes individuals, in particular older adults, more vulnerable.

Health impacts participation and productivity

The health of workers directly relates to their productivity. Weil states in his 2013 article "Health and Economic Growth," that healthier adults, both physically and mentally, can work more effectively, and healthier children can accrue greater amounts of human capital (namely, education) to improve productivity in the long run.

Birth outcomes are a helpful measure of health and nutrition in utero and are correlated with health outcomes throughout the lifetime (Weil, 2013). With this in mind, Behrman and Rosenzweig (2004) analyzed fraternal twins and found that lower-weight twins were likely to have shorter adult height, fewer years of schooling, and lower wages (even when controlling for schooling) than their larger twin sibling. Black, Devereux, and Salvanes (2007) found similar results. Bloom and Canning (2005) found that increased health (as measured by survival rates) has a positive effect on worker productivity: a one percentage point increase in countrywide adult survival rates increased labor productivity by about 2.8%.

Pronk et al. (2004) examined the impact of obesity, cardiorespiratory fitness, and physical activity on work outcomes. They found links between these measures of physical health and both absenteeism from work and productivity at work. Obesity was significantly related with increased days absent from work, and physical activity was significantly associated with quality of work performance and the amount of effort required to complete the work. Adams and Cowen (2004) found similar results when examining the effect of increased BMI on sick days taken; employees with higher BMI and blood pressure, those with diagnoses of diabetes, and those reporting higher levels of stress were found to take significantly more days of sick leave than their healthier peers.

There has been a decline in workforce participation among prime-age men for several decades; poor health appears to be a barrier to work for many of these men. Krueger (2017) notes the prevalence of pain among prime age men outside of the labor force – nearly half of these men report taking pain medication on a daily basis and, of these cases, nearly two-thirds take prescription pain medication. Forty percent of prime-age men outside of the labor force report that pain prevents them from accepting a job. Krueger notes that depressed labor force participation and the current opioid crisis are intertwined, as labor force participation has declined more in areas with relatively greater rates of opioid prescription use.

Case and Deaton reported in 2015 on rising mortality among white middle-aged Americans; these follow declines in self-reported physical and mental health, increasing reports of difficulty with daily living activities, and, similar to Krueger, increased reports of pain. The increase in mortality was particularly prominent for white Americans with the least education. While Case and Deaton note that these trends are not completely understood,

they point to the increase in opioid availability that began in the late 1990s as a cause; drug overdoses, as well as suicides, increased for this group, leading the authors to coin the term "deaths of despair."

Poor individual health reduces investments in human capital

Evidence suggests that individuals with earlier anticipated mortality do not make the same investments in education as their peers. Oster, Shoulson, and Dorsey (2013) examined the impact of an individual's expected mortality on investments in their own human capital. Specifically, they analyzed data on Americans at risk of Huntington's Disease and found that individuals do indeed make calculated decisions about investing in their own human capital within the context of anticipated longevity and health, reducing investments in the face of reduced longevity.

Worker health issues result in workforce productivity loss

Relationships between health and the economy exist at a macro level, as well. Several studies have examined the impact of illness and poor health behavior on workforce productivity. The American Productivity Audit delved into the question of how different health conditions can impact absenteeism and presenteeism, or reduced productivity while at work (Stewart, Ricci, Chee, & Morganstein, 2003). They found that presenteeism caused a greater share of lost productive time than did absenteeism, and that common health concerns like headaches, the common cold, seasonal allergies, gastrointestinal distress, and depressive symptoms were the most costly health conditions to the American workforce.

A 2016 examination of absenteeism at work in the Canadian labor force and the chronic conditions that led to decreased productivity due to absence found that back problems, mood disorders, and migraines accounted for the greatest aggregate productivity loss (Zhang et al., 2016). Back problems alone were estimated to have led to $621 million in productivity losses for the country as a whole over a three-month span. Beyond individual days of work missed, health issues also led to longer-term leave from work and unemployment (Robroek et al., 2013).

Studies have shown that smoking status affects worker productivity. Those who currently or formerly smoke, as compared to those who have never smoked, experience greater absenteeism and presenteeism (Bunn, Stave, Downs, Alvir, & Dirani, 2006). This is attributable to greater incidence of illness and time spent on smoking breaks. Other costs to employers include increased accidents and workers' compensation costs; early retirement for disability; and increased facility costs for ventilation systems, maintenance, and cleaning. Among women, incidence of diabetes has been found to not only decrease the probability that an individual will work, but to increase the likelihood of work

limitations and the number of days absent (Tunceli et al., 2005). Additionally, studies have shown that incidence of asthma increases work absenteeism; this increase is relatively small, at an additional 1.1 absent days and 2.2 short-term disability days in a year (Shenolikar, Song, Anderson, Chu, & Cantrell, 2011).

Community health impacts worker productivity

While the literature analyzing the connections between a community's health and worker productivity is an emerging field, some initial research has found evidence that better community health makes a positive impact on worker productivity. A 2018 study found that manufacturing employees living in counties with poor health outcomes had higher rates of absenteeism and tardiness (McHugh et al., 2018). Study authors found that the annual value of these lost wages ranged from $3,489 to over $1.3 million at different sites included in the study.

Social determinants of health

The World Health Organization defines social determinants of health (SDOH) as "the conditions in which people are born, grow, live, work and age." Social determinants of health include neighborhood, housing stability, household income and wealth, and educational attainment. This section describes the influence of these social determinants on individual and population health outcomes.

Neighborhood quality can influence health

The neighborhood in which one lives can have a sizable impact on health since it can determine a person's local access to fresh food, high quality public education, job opportunities, safe places to exercise, and transportation options.

A 2012 study, which examined the effects a neighborhood's built environment have on health outcomes, found that a neighborhood's walkability was related to lower levels of overweight and obese residents, and higher levels of physical activity (Sallis, Floyd, Rodriguex, & Saelens, 2012). The proximity of one's neighborhood to their workplace also had significance. Longer commute times were associated with decreases in the amount of time people spent on health-promoting activities, such as physical activity, sleep, and food preparation (Christian, 2012). Ewing, Meakins, Hamidi, and Nelson (2013) built upon these findings by examining the impact of residential sprawl on health outcomes. Study authors found that counties that are more compact had better health outcomes in terms of healthy body mass index, obesity, heart disease, high blood pressure, and diabetes rates.

Neighborhood safety can also impact a person's health. Neighborhood crime has been found to have detrimental health effects, especially for youth. One study, which examined the effects of crime rates on childhood asthma (Beck et al., 2016), found significant associations between high rates of neighborhood crime and increased childhood asthma rates. Study authors suggest that consistent exposure to violence in one's neighborhood could increase stress and physiologic inflammation in the body that increases the likelihood of developing asthma.

High quality, affordable housing is associated with better health

Cohen (2011) notes several ways that affordable housing can positively affect physical health. For example, it frees up resources for health-positive expenditures such as healthy food and doctor visits. Affordable housing options in higher income neighborhoods can also increase access to amenities that benefit health, such as fresh produce or local parks.

Well-constructed and well-managed housing can reduce the presence of allergens, neurotoxins, and other dangers such as mold or lead (Cohen, 2011). Vulnerable populations, including low-income adults and children, the sick, and the elderly, are more likely to live in poor quality housing that can cause or exacerbate health problems. Over time, poor housing quality can fuel poverty by gradually degrading health. This leads to increased health care costs and a decreased ability to go to school or work, or participate in other activities that promote upward social mobility (Bruner, 2009; Thomson, Thomas, Sellstrom, & Petticrew, 2009).

Affordable housing can also improve residents' mental health by reducing stress, including that which is caused by overcrowding, frequent moves, and financial insecurity. Access to affordable housing options can also benefit those attempting to flee domestic abuse at home, which has numerous mental and physical health benefits (Cohen, 2011).

The literature also demonstrates a positive relationship between homeownership and health outcomes. Finnigan (2014) found evidence which suggests that homeowners have a health advantage over those who rent, and that these benefits are greater for white homeowners than for homeowners of color.

Household income and wealth influence health

Household income and wealth are important factors in shaping a person's lived experience. Income and wealth increase a family's ability to make choices about where they want to live, what they want to do for work, what they want to do with their leisure time, etc. In short, financial security gives families more control over what they do with their lives.

Household income is also highly correlated with life expectancy in the United States. Chetty et al. (2016) examined the association between income and life expectancy and found that higher household income was associated with longer lifespans, and that inequality in life expectancy has increased over time. The differences in life expectancy for the top wealthiest 1% of Americans and the bottom poorest 1% of Americans is quite large: men in the richest one percent can expect to live 14.6 years longer than their poor counterparts, and women in the richest one percent can expect to live 10.1 years longer than their poor counterparts. Between 2001 and 2014, life expectancy for the top wealthiest 5% of Americans increased by 2.34 years for men and 2.91 years for women. During that same period, the poorest 5% of Americans saw much smaller gains: just 0.32 years for men and 0.04 years for women.

Hajat, Kaufman, Rose, Siddigi, and Thomas (2011) and Kennickell (2008) found similar results: wealthier individuals are healthier, and there are distinct differences for those with lower socioeconomic status. Wealth serves a different role than income when comparing the total impact of financial security on health outcomes (Hajat et al., 2011). While household income can be used to measure financial security, it only provides information about the flow of financial resources entering a household. The inclusion of wealth is useful because it provides insight into the resources available to a household in times of financial uncertainty or upheaval. It also serves as a repository from which to make investments, including things such as paying for college or buying a house (Rank, 2008).

Higher educational attainment is associated with better health

The literature demonstrates that individuals with higher educational attainment tend to have better health outcomes, including lower rates of diabetes and heart disease, and healthier behaviors, such as higher rates of exercise and lower rates of smoking (Gaskin et al., 2014; Kimmel, Bono, Barnes, & Woolf, 2015). Hayward, Hummer, and Sasson (2015) note that researchers have typically approached this connection by measuring the increased "health capital" available to those with higher levels of education, including: higher-paying jobs that offer health insurance, extensive networks and social relationships, and information about health care and healthy behaviors. Higher education levels are also associated with greater personal agency, including better communication and problem solving skills, which are critical in making healthy decisions throughout a person's life.

Racial inequities in health and economics are pervasive

People of color in the United States are more likely to have various chronic conditions, such as diabetes, obesity, heart disease, and cancer and have lower life expectancy than their white peers (Egede, 2006). This reflects historic and current discrimination and bias (Woolf & Braveman, 2011).

Disparities in income and wealth between whites and people of color are stark, and there is less opportunity for upward economic mobility for black communities (Chetty, Hendren, Jones, & Porter, 2018). Wage gaps between black and white workers are growing (Gould, 2019).

Social determinants' early influence on adulthood

Social determinants of health can have a strong impact on adult financial security. Studies show that poor living conditions can influence a person's current and future achievement, productivity, and health. All of these factors can affect a person's ability to support themself and their family through work.

Family resources influence economic well-being in adulthood

The connection between a child's household income and their future economic status as an adult is well documented. Availability of resources at a young age has a compounding effect. Access to better schools, afterschool activities, and other educational resources can lead to better standardized achievement test scores. These opportunity gaps tend to emerge early in childhood and continue to self-perpetuate. Eventually this can lead to decreased likelihood of high school graduation and, subsequently, decreased likelihood of college entry and completion (Holzer, Schanzenbach, Duncan, & Ludwig, 2007). Duncan, Ziol-Guest, and Kalial (2010) found that moderate gains in annual family income can improve children's future earnings. They found that a $3,000 annual increase in family income between a child's prenatal year and fifth birthday was associated with 19% higher earnings in adulthood. Most of that income gain was due to increased work hours since those adults were less likely to miss work due to health issues.

High quality education is associated with improved economic well-being in adulthood

The quality of education across the United States varies, and gaps in school quality between high- and low-income areas are pervasive (Jackson, Johnson, & Persico, 2015). Study authors examined the role of school spending increases and the long-term effects of those increases on students. Increases in school spending in the areas of instruction (including reduced student-to-teacher ratio, extended school year, and increased teacher and support staff salaries) resulted in better educational and economic outcomes for students across the life course. To illustrate, a 10% increase in per-pupil spending each year for all 12 years of public school was associated with 0.27 more years of education, a 3.7% decreased incidence of poverty, and 7.25% higher wages in adulthood. The effects were even greater for children from low-income families. Low-income students were 10% more likely to graduate high school, were six percent less likely to live in poverty, and had 13% higher wages as adults.

Neighborhood quality can influence adult economic well-being

Chetty and Hendren (2015) analyzed the wages of adults who had participated in the Federal Moving to Opportunity Program as children; their research demonstrated that neighborhood quality can have a strong impact on adult earnings.

Study authors found that each additional year a child was exposed to a high quality neighborhood environment resulted in better social and economic outcomes, including increased college attendance, higher earnings, and decreased likelihood of teen parenthood. They also found that the likelihood of upward economic mobility varies across metropolitan areas. For example, children born in Minneapolis have more economic mobility than children born in Detroit. Difference in opportunity exists within metropolitan areas as well. Children raised in the suburbs of Minneapolis experienced greater upward mobility than those raised in the central city. The data also revealed regional differences in upward mobility across the United States. Economic mobility was highest in Great Plains states and lowest in the Southeastern states. Chetty et al. note many correlated factors: increased income and racial segregation levels are associated with diminished opportunity for upward mobility, while increased school quality and stable family structure are associated with increased opportunity for upward mobility (Chetty, Hendren, Kline, & Saez, 2014).

Policy and health

Economic and social policies can affect health, both intentionally and unintentionally. For purposes of this study, we focused our literature review on policies that specifically sought to achieve health outcomes (such as smoking ordinances) and policies that offered "natural experiments" in which different jurisdictions put the same or similar policies into effect at different times (for example, minimum wage increases).

Minimum wage effects on health outcomes are mixed

In 2018, Leigh, Leigh, and Du conducted a comprehensive review of the literature on minimum wage effects on individual health and found several studies with evidence of a positive correlation between health outcomes and increases in the minimum wage, including: better mental health, better overall health, and lower smoking prevalence. The association between wage increases and lower smoking prevalence was particularly strong for female low-wage earners.

Wehby, Dave, and Kaestner (2018) found that increases in the minimum wage resulted in increased birth weights among babies born to lower-income women. Because low birth weights are correlated with a number of negative health conditions throughout the lifespan,

including greater risk of diabetes, hypertension, and heart disease, minimum wage increases can produce lasting and significant positive impacts on population health (Goldenberg & Culhane, 2007).

Evidence of the effects of wage increases on adult body mass index are mixed. Some studies have demonstrated increases, and others have found decreases (Horn, Maclean, & Strain, 2016). Other negative health behaviors observed as a result of wage increases include increased purchases of alcohol and tobacco products. In particular, when minimum wage increases lead to reduced work hours for employees (as a result of companies cutting hours), evidence suggests that employees often fill their additional leisure time with unhealthy, sedentary activities (Horn et al., 2016).

Smoke-free laws reduce smoking prevalence and improve health

A strong evidence base shows that smoke-free laws that prohibit smoking in public spaces reduce the prevalence of smoking and improve the health of workers and the general population. Improvements in health can be seen shortly after the implementation of the law (Centers for Disease Control and Prevention, n.d.).

A systematic review of the literature found that smoke-free laws and policies were associated with an increase in tobacco use cessation and a decrease in tobacco use prevalence (Hopkins et al., 2010). A 2009 study similarly found that smoke-free laws led to reduced cigarette consumption among smokers, increased successful smoking cessation, and decreased tobacco use among youth (International Agency for Research on Cancer, 2009).

A 2007 study found that a comprehensive smoke-free law in New York state led to an eight percent reduction in hospital admissions for heart attack in the year after the law took effect; this led to $56 million in hospital cost savings (Juster et al., 2007). A 2011 study of the effects of Arizona's comprehensive smoke-free law found that passage of the law was associated with reductions in hospital admissions for heart attacks, angina, stroke, and asthma (Herman & Walsh, 2011). A 2012 study of the effect of smoke-free laws across the country on Medicare beneficiaries similarly found reductions in hospital admission rates for heart attacks and for chronic obstructive pulmonary disease (Barr, Diez, Wang, Dominici, & Samet, 2012).

Increased spending on public health initiatives can improve health

Some evidence suggests that increases in public health and health care expenditures can improve a community's health. A recent study on the relationship between county health, county wealth, and county social services spending found that, overall, wealthier counties had better health. The authors examined which counties over-performed in their health

rankings based on wealth and found that those which dedicated a greater proportion of their total public spending on community health care and public health initiatives increased their odds of being an over-performer. Each percentage point of public spending allocated to community health care or public health interventions resulted in a 3.7% increase in the odds that a county would over-perform in its health rankings, even after controlling for community income and wealth (McCullough & Leider, 2017).

Mays and Smith (2011) similarly found that increases in spending among local public health agencies are associated with decreased rates of preventable death, including infant mortality and adult deaths due to cardiovascular disease, diabetes, and cancer. Communities with greater increases in public health expenditures saw greater reductions in mortality when controlling for community characteristics, such as demographics and socioeconomic status. The authors note, however, that spending alone is not enough to decrease mortality rates; this spending must lead to greater quality care for patients.

Place-based economic policies and programs can lead to improved health

Busso, Gregory, and Kline (2010) assessed the impact of the federal place-based Empowerment Zone program on different outcomes related to social determinants of health and financial stability for residents of areas where the program was implemented, which were higher-poverty neighborhoods within large metropolitan areas. The authors found that wages in Empowerment Zones increased, while rental housing costs remained steady, resulting in overall economic improvement for renter households.

Bibliography

Adams, T., & Cowen, V. (2004). Health risk factors and absenteeism among university employees. *American Journal of Health Studies, 19*(3).

Barr, C., Diez, D., Wang, Y., Dominici, F., & Samet, J. (2012). Comprehensive smoking bans and acute myocardial infarction among Medicare enrollees in 387 U.S. counties: 1998-2008. *American Journal of Epidemiology, 176*(7).

Beck, A., Huang, B., Ryan, P., Sandel, M., Chen, C., & Kahn, R. (2016). Areas with high rates of police-reported violent crime have higher rates of childhood asthma morbidity. *The Journal of Pediatrics, 173*, 175-182.

Behrman, J., & Rosenzweig, M. (2004). Returns to birthweight. *Review of Economics and Statistics, 86*(2), 586-601.

Black, S., Devereux, P., & Salvanes, K. (2007). From the cradle to the labor market? The effect of birth weight on adult outcomes. *The Quarterly Journal of Economics, 122*(1), 409-439.

Bloom, D., & Canning, D. (2005). *Health and economic growth: Reconciling the micro and macro evidence.* Retrieved from: https://www.anderson.ucla.edu/faculty_pages/romain.wacziarg/demogworkshop/Bloom%20and%20Canning.pdf

Bruner, C. (2009). *Connecting child health and school readiness*. Retrieved from IssueLab website: https://www.issuelab.org/resource/issue-brief-connecting-child-health-and-school-readiness.html

Bunn, W., Stave, G., Downs, K., Alvir, J., & Dirani, R. (2006). Effect of smoking status on productivity loss. *Journal of Occupational and Environmental Medicine, 48*(10).

Busso, M., Gregory, J., & Kline, P. (2010). *Assessing the incidence and efficiency of a prominent place based policy* (NBER working paper No. 160960). Retrieved from The National Bureau of Economic Research website: https://www.nber.org/papers/w16096

Case, A., & Deaton, A. (2015). Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century. *Proceedings of the National Academy of Sciences of the United States of America, 112*(49).

Cawley, J. (2004). The impact of obesity on wage. *The Journal of Human Resources, 39*(2).

Centers for Disease Control and Prevention. (n.d.). *Smokefree policies improve health*. Retrieved from: https://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/protection/improve_health/index.htm

Chetty, R., & Hendren, N. (2015). *The impacts of neighborhoods on intergenerational mobility: Childhood exposure effects and county-level estimates, executive summary*. Retrieved from: http://www.equality-of-opportunity.org/images/nbhds_exec_summary.pdf

Chetty, R., Hendren, N., Jones, M., & Porter, S. (2018). *Race and economic opportunity in the United States: An intergenerational perspective*. Retrieved from: https://scholar.harvard.edu/hendren/publications/race-and-economic-opportunity-united-states-intergenerational-perspective

Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014). *Where is the land of opportunity? The geography of intergenerational mobility in the United States*. Retrieved from: http://www.equality-of-opportunity.org/assets/documents/mobility_geo.pdf

Chetty, R., Stepner, M., Abraham, S., Lin, S., Scuderi, B., Turner, N., Bergeron, A., & Cutler, D. (2016). The association between income and life expectancy in the United States, 2001-2014. *JAMA, 315*(16), 1750-1766.

Christian, T. (2012). Trade-offs between commuting time and health-related activities. *Journal of Urban Health, 89*(5), 746-757.

Cohen, R. (2011). *The impacts of affordable housing on health: A research summary*. Retrieved from: https://www.enterprisecommunity.org/download?fid=8096&nid=4584

Duncan, G. J., Ziol-Guest, K. M., & Kalil, A. (2010). Early-childhood poverty and adult attainment, behavior, and health. *Child Development, 81*(1), 306-325.

Egede, L. (2006). Race, ethnicity, culture, and disparities in health care. *Journal of General Internal Medicine, 21*(6), 667-669.

Ewing, R., Meakins, G., Hamidi, S., & Nelson, A. (2013). Relationship between urban sprawl and physical activity, obesity, and morbidity – Update and refinement. *Health & Place, 26*, 118-126.

Finnigan, R. (2014). Racial and ethnic stratification in the relationship between homeownership and self-rated health. *Social Science & Medicine, 115*, 72-81.

Gaskin, D. J., Thorpe, R. J., Jr., McGinty, E. E., Bower, K., Rohde, C., Young, J. H., LaVeist, T. A., & Dubay, L. (2014). Disparities in diabetes: The nexus of race, poverty, and place. *American Journal of Public Health, 104*(11), 2147-2155.

Goldenberg, R. L., & Culhane, J. F. (2007). Low birth weight in the United States. *The American Journal of Clinical Nutrition, 85*(2).

Gould, E. (2019). *State of working America wages 2018*. Retrieved from Economic Policy Institute website: https://www.epi.org/publication/state-of-american-wages-2018/

Hajat, A., Kaufman, J. S., Rose, K. M., Siddigi, A., & Thomas, J. C. (2011). Long-term effects of wealth on mortality and self-rated health status. *American Journal of Epidemiology, 173*(2), 192-200.

Hayward, M. D., Hummer, R. A., & Sasson, I. (2015). Trends and group differences in the association between educational attainment and U.S. adult mortality: Implications for understanding education's causal influence. *Social Science & Medicine, 127*, 8-18.

Herman, P., & Walsh, M. (2011). Hospital admissions for acute myocardial infarction, angina, stroke, and asthma after implementation of Arizona's comprehensive statewide smoking ban. *American Journal of Public Health, 101*(3).

Holzer, H., Schanzenbach, D., Duncan, G., & Ludwig, J. (2007). *The economic costs of poverty in the United States: Subsequent effects of children growing up poor*. Retrieved from The Center for American Progress website: https://cdn.americanprogress.org/wp-content/uploads/issues/2007/01/pdf/poverty_report.pdf

Hopkins, D. P., Razi, S., Leeks, K. D., Kalra, G. P., Chattopadhyay, S. K., & Soler, R. E. (2010). Smokefree policies to reduce tobacco use: A systematic review. *American Journal of Preventive Medicine, 38*(2, Suppl.), S275-S289.

Horn, B., Maclean, J., & Strain, M. (2016). *Do minimum wage increases influence worker health?* (NBER working paper no. 22578). Retrieved from The National Bureau of Economic Research website: https://www.nber.org/papers/w22578

International Agency for Research on Cancer. (2009). *Evaluating the effectiveness of smoke-free policies*. Retrieved from: https://www.iarc.fr/wp-content/uploads/2018/07/handbook13-0.pdf

Jackson, C., Johnson, R., & Persico, C. (2015). *The effects of school spending on educational and economic outcomes: Evidence from school finance reforms* (NBER working paper no. 20847). Retrieved from The National Bureau of Economic Research website: https://www.nber.org/papers/w20847

Juster, H., Loomis, B., Hinman, T., Farrelly, M., Hyland, A., Bauer, U., & Birkhead, G. (2007). Declines in hospital admissions for acute myocardial infarction in New York state after implementation of a comprehensive smoking ban. *American Journal of Public Health, 97*(11).

Kennickell, A. B. (2008). What is the difference? Evidence on the distribution of wealth, health, life expectancy, and health insurance coverage. *Statistics in Medicine, 27*(20), 3927-3940.

Kimmel, A., Bono, R., Barnes, A., & Woolf, S. (2015). *Investments in education are investments in health: The Business perspective*. Retrieved from Center on Society and Health website: societyhealth.vcu.edu/media/society-health/pdf/EHI4BusinessBrief.pdf

Krueger, A. B. (2017). *Where have all the workers gone? An inquiry into the decline of the U.S. labor force participation rate*. Retrieved from Brookings website: https://www.brookings.edu/bpea-articles/where-have-all-the-workers-gone-an-inquiry-into-the-decline-of-the-u-s-labor-force-participation-rate/

Leigh, J., Leigh, W., & Du, J. (2018). *Minimum wages and public health: A literature review*. Retrieved from SSRN website: https://ssrn.com/abstract=3176217

Mays, G., & Smith, S. (2011). Evidence links increases in public health spending to declines in preventable deaths. *Health Affairs, 30*(11).

McCullough, J., & Leider, J. (2017). Associations between county wealth, health and social services spending, and health outcomes. *American Journal of Preventive Medicine, 53*(5).

McHugh, M., French, D., Farley, D., Maechling, C., Dunlop, D., & Holl, J. (2018). Community health and employee work performance in the American manufacturing environment. *Journal of Community Health.*

Oster, E., Shoulson, I., & Dorsey, E. (2013). Limited life expectancy, human capital, and health investments. *The American Economic Review, 103*(5), 1977-2002.

Pronk, N., Martinson, B., Kessler, R., Beck, A., Simon, G., & Wang, P. (2004). The association between work performance and physical activity, cardiorespiratory fitness, and obesity. *Journal of Occupational and Environmental Medicine, 46*(1).

Rank, M. (2008). *Asset building over the life course*. Retrieved from U.S. Department of Health & Human Services, Office of the Assistant Secretary for Planning and Evaluation website: https://aspe.hhs.gov/basic-report/asset-building-over-life-course

Robroek, S., Reeuwijk, K., Hillier, F., Bambra, C., Van Rijn, R., & Burdorf, A. (2013). The contribution of overweight, obesity, and lack of physical activity to exit from paid employment: A meta-analysis. *Scandinavian Journal of Work, Environment, and Health, 39*(3).

Rolden, H., Van Bodegom, D., Van Den Hout, W., & Westendorp, R. (2013). Old age mortality and macroeconomic cycles. *Journal of Epidemiology and Community Health, 2014*(68).

Ruhm, C. (1996). Are recessions good for your health? *The Quarterly Journal of Economics, 115*(2), 617-650.

Sallis, J., Floyd, M., Rodriguez, D., & Saelens, B. (2012). The role of built environments in physical activity, obesity, and CVD. *Circulation, 125*(5), 729-737.

Shenolikar, R., Song, X., Anderson, J., Chu, B., & Cantrell, R. (2011). Costs of asthma among U.S. working adults. *The American Journal of Managed Care, 17*(6).

Stewart, W., Ricci, J., Chee, E., & Morganstein, D. (2003). Lost productive work time costs from health conditions in the United States: Results from the American Productivity Audit. *Journal of Occupational and Environmental Medicine, 45*(12).

Thomson, H., Thomas, S., Sellstrom, E., & Petticrew, M. (2009). The health impacts of housing improvement: A systematic review of intervention studies from 1887 to 2007. *American Journal of Public Health, 99*(S3), S681-S692.

Tunceli, K., Bradley, C. J., Nerenz, D., Williams, L. K., Pladevall, M., & Lafata, J. E. (2005). The impact of diabetes on employment and work productivity. *Diabetes Care, 28*(11).

Turunen, E., & Hiilamo, H. (2014). Health effects of indebtedness: A systematic review. *BMC Public Health, 14*(489).

Van Rijn, R., Robroek, S., Brouwer, S., & Burdorf, A. (2013). Influence of poor health on exit from paid employment: A systematic review. *Occupational and Environmental Medicine, 2014*(71).

Virtanen, P., Janlert, U., & Hammarstrom, A. (2012). Health status and health behaviour as predictors of the occurrence of unemployment and prolonged unemployment. *Public Health, 127*(2013).

Wehby, G., Dave, D., & Kaestner, R. (2018). *Effects of the minimum wage on infant health* (NBER working paper no. 22373). Retrieved from The National Bureau of Economic Research website: https://www.nber.org/papers/w22373

Weil, D. (2013). Health and economic growth. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of Economic Growth: Vol. 2.* (pp. 623-682).

Woolf, S., & Braveman, P. (2011). Where health disparities begin: The role of social and economic determinants – And why current policies may make matters worse. *Health Affairs, 30*(10).

Zhang, W., McLeod, C. B., & Koehoorn, M. (2016). The relationship between chronic conditions and absenteeism and associated costs in Canada. *Scandinavian Journal of Work, Environment, and Health, 42*(5).

Acknowledgements

The author would like to thank Ela Rausch from the Federal Reserve Bank of Minneapolis and Paul Mattessich, Heather Loch, Amelia Barkley, Marilyn Conrad, and Jenny Bohlke from Wilder Research for their work on this report.

For more information

For more information about this report, contact Emma Connell at Wilder Research, 651-280-2717.

Author: Emma Connell

OCTOBER 2019