

The Health Implications of Reduced Food Stamp Eligibility

A RAPID-CYCLE BACKGROUND REPORT
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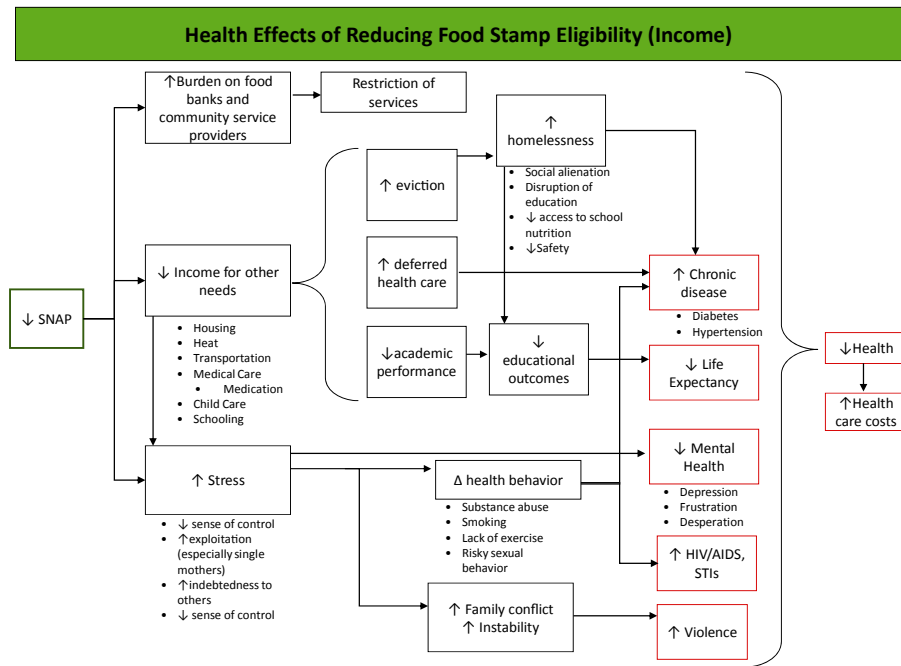
INTRODUCTION

Policymakers are increasingly recognizing the need to consider the health implications of policies outside the health sector, such as how housing affects lung disease, how land use and the design of the urban environment affect obesity rates, and the long-term benefits of education for health and health-care costs. The Farm Bill offers an excellent example of the intersection between agricultural policy and health. In particular, decisions about eligibility for the Supplemental Nutrition Assistance Program (SNAP) could affect health through multiple pathways.

To help lawmakers consider the potential outcomes of different proposals under consideration by the Senate, the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts, commissioned the research organization Mathematica Policy Research to model the potential economic consequences and commissioned a supplemental analysis by our institution, the VCU Center on Society and Health, to discuss the potential health implications. This rapid-cycle background report has been prepared quickly to help lawmakers consider bills that are under current deliberation.^a

What are the potential connections between food stamps and health?

At first glance, the potential health implications of reduced food stamp eligibility seem obvious: Low-income households with less SNAP support might be more likely to alter their grocery shopping habits in deleterious ways; for example, they may eat less expensive, calorie-dense foods, such as starches and fast foods, which promote obesity. Even worse, they might find it more difficult to purchase enough groceries to feed their families, contributing to food insecurity and increasing the risk of malnutrition,



^a The VCU Center on Society and Health, chartered in 2007 and formerly called the VCU Center on Human Needs, is an academic research center that conducts objective, nonpartisan research on the health implications of social factors outside the clinic. Details about the Center can be found at www.humanneeds.vcu.edu. The authors acknowledge the assistance of Robert E. Johnson, Ph.D. (Senior Biostatistician) and Chunfeng Ren, M.P.H. in calculating the projected impact of the policy on deaths, diabetes, and medical care costs for diabetes and of Amber Haley, M.P.H. (Research Epidemiologist), Albert R. Walker, III, Th.M. (Community-Academic Liaison), and the Engaging Richmond Community Research Team for developing the analytic model of potential health effects of the policy. This report was made possible through support from the Health Impact Project, a collaboration of the Robert Wood Johnson Foundation and The Pew Charitable Trusts (Contract No. 25998). The views expressed are those of the authors and do not necessarily reflect the views of the Health Impact Project, The Pew Charitable Trusts, or the Robert Wood Johnson Foundation.

especially for vulnerable household members such as infants and children, the elderly, or people with chronic illnesses.^{1,2} The literature about these health effects does not provide a clear picture, however.^{3,4,5,6,7,8}

But the potential connections between food stamps and health go far beyond the obvious links to nutrition and food security. Regardless of how SNAP policy affects food purchasing behavior or eating habits, having to spend more on food means that low-income families have less money available for other important expenses necessary for good health.^{9,10} The effect on family budgets is not trivial: the Mathematica analysis predicts that SNAP income could be reduced substantially under S.3240 and H.R.6083, bills proposed by the 112th Congress. A large reduction in SNAP income could force beneficiaries who receive lower amounts and those who lose SNAP eligibility to choose between groceries and the costs of stable housing to avoid homelessness; heating, electricity, and other utilities; and transportation to work, school, or doctors' appointments. People facing financial stresses are more likely to postpone or forgo medical care because they cannot afford health insurance premiums, deductibles, copayments, and medical supplies.¹¹ Patients with chronic diseases are less likely to refill prescriptions.

The predictable net result is that patients with less disposable income will give less priority to their health and are more likely to develop preventable complications that demand more intensive (and more costly) acute medical care, emergency department visits, diagnostic testing, and hospitalizations. The stress and psychological pressures when parents and children struggle with economic hardship may have their own health consequences, such as depression, unhealthy behaviors (e.g., smoking, physical inactivity, substance abuse), and family discord and violence—each of which affects health outcomes and costs.^{12,13} Set against a backdrop of spiraling health care costs that are already posing a crisis for entitlement spending, budget deficits, and the bottom line for major corporations, an unfavorable effect of SNAP policy on health care costs is a disturbing concern.

It is easy to imagine the immediate health and economic consequences of not taking medications or visiting the doctor as a result of SNAP policy, but it is also important to consider other effects, both short- and long-term, on children in particular. Infants and children in families affected by such policies can suffer consequences that manifest not only in childhood but also years later as adults. Inadequate nutrition for healthy growth and development and household economic instability that interferes with health care can set the stage for unhealthy behaviors and the chronic diseases of older adulthood. Economic hardship can influence health through many different pathways, which are discussed below.¹⁴

HOW DOES INCOME AFFECT HEALTH?

Appreciating the link between SNAP legislation and health outcomes rests on the large body of scientific evidence that has documented the many ways in which income can affect physical health, not only in the short-term but also across a person's entire lifespan. Although evidence has been accumulating for more than a century, the past two decades have brought an explosion of relevant scientific knowledge that now sheds new light on previously unrecognized relationships between income and health.

Clearly, income itself does not directly cause good or bad health. It is what money can—or cannot—buy that has potential health consequences.

The health impact of losing economic resources, from money to food stamps, depends on a person's circumstances: For example, the health effects of a given income level are likely to vary with the local cost of living and with other resources available through public programs like SNAP or through family, friends, or neighbors. The health impact of income also varies with how much accumulated wealth or savings a person can fall

back on in times of need. At the same level of income, African Americans and Latinos have far less wealth than whites. For example, data available from the U.S. Census Bureau indicate that the wealthiest households in the lowest income quintile was on average 400 times greater if the head of household was white rather than black. Racial/ethnic differences in wealth are seen at all income levels; even among high-income households, whites were three to nine times wealthier than blacks.^{15,16}

The next few pages discuss multiple ways in which a loss of income might “get under the skin” to produce physical effects on the body, including some of the physiologic mechanisms that are thought to be involved.^b The evidence tells us that the pervasive relationships between income and health are based not just on how economic resources can affect access to medical care, but also on how these resources permit some of us to live in safer homes and neighborhoods, buy healthier food, have more leisure time for physical activity, and experience less stress on a chronic basis from having inadequate resources to make ends meet.¹⁷ Early childhood seems to be a period of life in which exposure to chronic economic hardship exacts a particularly heavy toll. In many cases, these health effects may not show up for decades, but the damage is occurring relentlessly over time, whether or not we can see immediate effects. A large body of knowledge in biology has accumulated that explains how poverty can affect health, and how chronic poverty in childhood can take its long-term toll on health in adulthood.^{18,19,20,21}

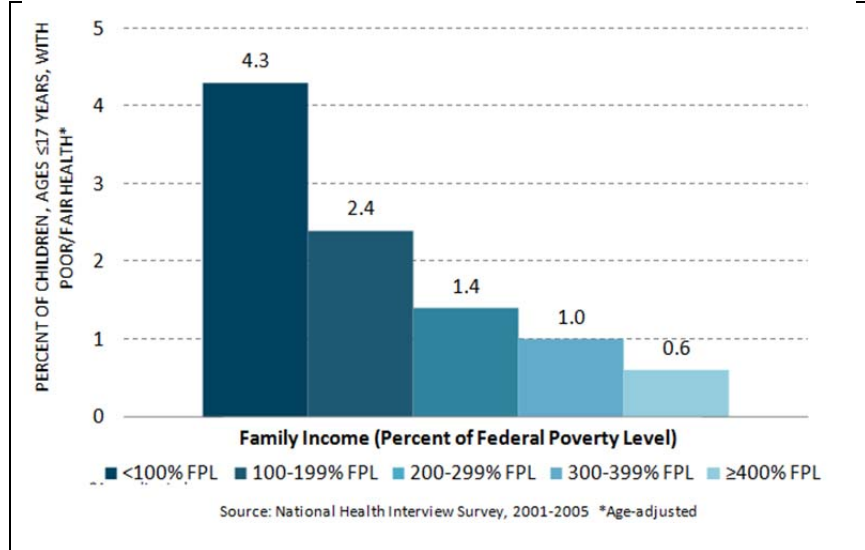


Figure 1. As family income rises, children’s health improves. Even middle-class children (in families with incomes 3 to 4 times the poverty level) have worse health than children in higher-income families

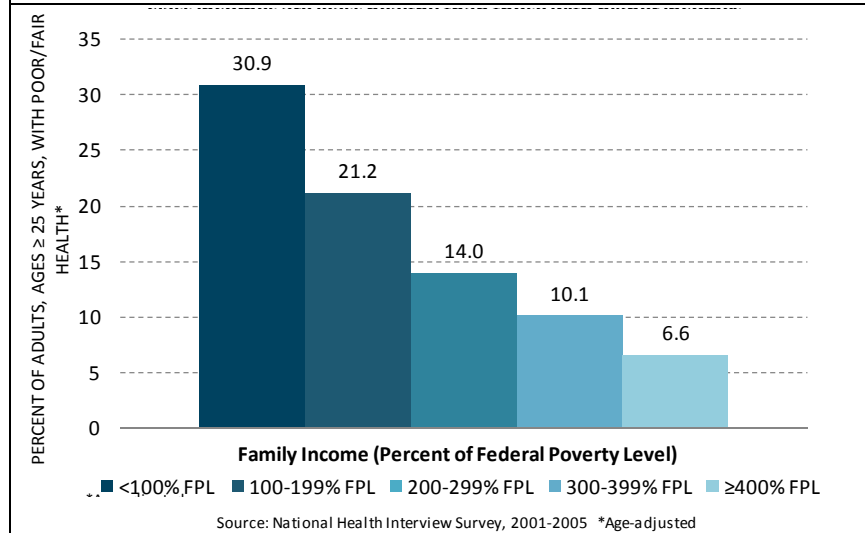


Figure 2. Higher income, healthier adults. Even adults with middle-class incomes are less healthy than those with higher incomes.

^b A later section discusses controversies about the relationship between income and health. Not all experts agree on all aspects of the relationship between income and health, but the links and interpretations stated here are supported by a large collection of solid scientific literature from respected sources.

RESEARCH HAS REPEATEDLY SHOWN THAT IN MOST CASES, FROM BIRTH ON, HIGHER INCOME IS ACCOMPANIED BY BETTER HEALTH AND LONGER LIFE

A large body of research has documented the links between income and a wide array of health indicators across the life span, beginning even before birth.²² Figures 1-4, taken from work by Braveman et al., provide graphic examples of a pattern seen repeatedly for many health outcomes throughout life: a stepwise gradient in which health incrementally improves as income rises.^{22,23,24} While those at the bottom of the economic ladder typically experience the worst health, even middle-class individuals are less healthy than those who are more affluent.^c Adults without a high school education or equivalent are three times as likely to die before age 65 as those with a college education. Although health insurance and education play some role in explaining these links, research has shown that the gaps in health according to income persist even after accounting for insurance and/or education, and even, in some studies, for health-related behaviors like smoking, drinking, and dietary habits.^{22,23,24,23}

The links between income and health are seen very early in life: Rates of low birth weight, which is strongly associated not only with infant mortality but also with child development and chronic disease in

adulthood, are highest among infants born to low-income mothers.^{24,25} Figure 1 shows that children in poor families are about seven times as likely to be in poor or fair health as children in families with incomes at or above 400% of the federal poverty level (FPL).**Error! Bookmark not defined.** Lower-income children experience higher rates of asthma, heart conditions, hearing problems, digestive disorders, and elevated blood lead levels, which can lead to neurological damage.^{26,27}

Lower income is also associated with shorter and sicker lives among adults. As Figures 2 and 3 show, poor adults are almost five times as likely to report being in poor or fair health as adults with family incomes at or above 400% of the FPL,²⁸ and they are more than three times as likely to have activity limitations due to chronic illness.^d

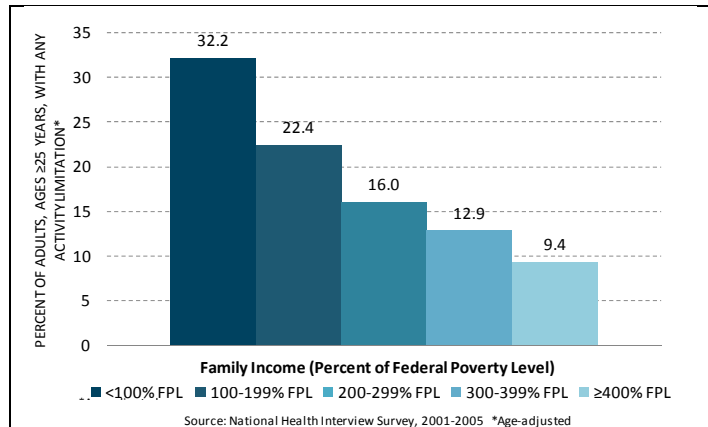


Figure 3. Higher income, less activity limitation due to chronic illness among adults

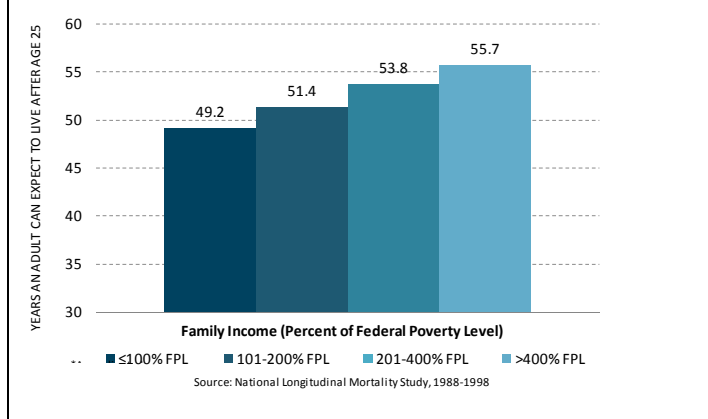


Figure 4. Higher income, longer life

^c The stepwise patterns linking income and wealth with health do not necessarily follow a straight line; for example, increases in income are linked with greater health improvements at the lower end of the income scale, and increases in income may not necessarily correspond to better health among those at the very highest end of the income scale (Backlund, Sorlie et al. 1996, Subramanian and Kawachi 2006, Braveman, Cubbin et al. 2010, Dowd, Albright et al. 2011).

^d Self-reported health is widely used and has been considered a roughly reliable indicator of major differences in health as determined by medical examination.

Figure 4 shows that among adults at age 25, those in the highest-income group can expect to live more than six years longer than their poor counterparts; similar disparities by income are seen for both men and women and across racial/ethnic groups (not shown).^{24,26,28} Examination of scores of additional indicators of health, health risks, and health-related behaviors reveals similar stepwise gradient patterns, with health incrementally improving as income rises.^{23,24,26f}

Table A lists examples of child and adult health indicators that have been associated with income. It has been observed that the shape of the income-health relationship itself tends to support the conclusion that income actually is a cause of good or bad health.**Error! Bookmark not defined.** The pattern suggests the “dose-response relationship” observed in drug research, in which incrementally higher doses are linked with stronger effects, which is viewed as supportive evidence that an observed effect is causally related to the drug being tested. Another criterion for making a causal inference is whether it is plausible based on current knowledge of biology; the next section summarizes the pathways through which income could affect health.

TABLE A. SOME HEALTH OUTCOMES AND RISK FACTORS LINKED WITH INCOME

CHILDREN

Health outcomes

- Infant mortality, low birth weight, and premature birth
- Overall health status reported by parents
- Asthma
- Lead poisoning
- Heart conditions
- Hearing problems
- Digestive problems

Health risk factors

- Obesity
- Nutritional quality of diet
- Sedentary behavior of adolescents

ADULTS

Health outcomes

- Life expectancy (mortality)
- Heart disease
- Diabetes
- Stroke
- Chronic disease that limits normal activities
- Functional status of the elderly
- Severe psychological distress
- Overall self-reported health

Health risk factors

- Smoking
- Obesity

Sources: (Pamuk, Makuc et al. 1998, Braveman, Cubbin et al. 2010, Braveman, P., S. Egerter and R. Mockenhaupt (In press). *Health is More than Health Care: Social Factors Such as Education Powerfully Shape Health and Health Disparities. Health and Education in Early Childhood: Predictors, Interventions, and Policies*. A. J. Reynolds, J. A. Temple, A. Rolnick and H. C. R. Collaborative. Cambridge, Cambridge University Press.

Not everyone agrees that income influences health. Some economists believe that the strong, repeated links observed between income and health are explained by health influencing income (income loss associated with poor health), rather than income influencing health. While health can shape a person’s prospects for schooling²⁹ and/or employment, multiple experts have concluded, based on evidence, that this does not explain the strength of the observed relationships between income and health. Many experts have concluded that, despite controversies, the weight of evidence overall supports a causal role for income in a wide range of health outcomes, particularly for low-income individuals.^{30,31,32,33, 34,35,36,37,38} Although there is solid evidence that income affects many health outcomes and groups of people, it may not affect all outcomes, all groups, or all settings;³⁰ for example, the health effects of income are stronger

^e Not surprisingly, the income-health gradient generally has appeared less striking among the elderly (Deaton and Paxson 1998), probably because retirement usually brings a loss of income. Despite this, Minkler and colleagues found striking gradients in functional status among the elderly aged 65 to 85 years old, all of whom presumably had Medicare, even after taking into account education and race (which would have partly controlled for wealth).

^f A clear-cut gradient pattern is not seen for every health indicator; for example, it is not observed consistently among people who are overweight or have diabetes, and it is less clear among some groups, particularly Latinos (Braveman, Cubbin et al. (2010)). But these are the exceptions that prove the rule.

among low-income persons³⁷ when low income is chronic rather than temporary³⁶ and among children. Controversies about the income-health relationship are discussed further in Appendix B.

HOW DOES INCOME INFLUENCE HEALTH?^g

As noted above, a reduction in SNAP benefits might affect health significantly by leaving families with less income to devote to other household needs. This loss can reduce access to goods and services that protect and promote health, and the resulting financial pressures can induce stress, which is itself harmful to health when experienced on a chronic basis.

- **Reduced income limits access to health-promoting goods and services.** Economic resources can influence health through so-called “material” pathways, that is, by providing access to health-promoting goods and services. As noted earlier, higher income and greater wealth make it easier to pay for medical insurance premiums, deductibles, copayments, and medicines, which can be particularly important once a person becomes ill. Greater economic resources can also enhance access to the kinds of health-promoting conditions—such as renting or buying housing that is free of lead, cockroaches, dust mites, and mold; properly heating one’s home; staying physically active; and obtaining stable housing in health-promoting neighborhoods—that help prevent illness in the first place.^{22,34}

- **Among low-income persons, reduced income is stressful.** Households already struggling to make ends meet, when faced with the need to spend more money on food, will have less available for other family needs such as housing, heating, child and elder care, and transportation to work. These households may experience increased anxiety and distress about food insecurity, unstable housing, or outright homelessness. Low-income pregnant women are more likely to suffer divorce or separation (presumably because such stresses can produce family conflict and instability), having to move because of difficulty paying the rent or mortgage, or domestic violence. They are also more likely to experience food insecurity and to have trouble paying their bills.³⁹ Low-income people have fewer options for housing and thus are more likely to experience neighborhood violence or disorder, noise, residential crowding, and environmental pollution.^{40,41,42} The effects of chronic stress are thought to be particularly toxic,^{18,43} along with the effects of facing multiple stressors.^{44,45} Chronic stress during early childhood appears to have enduring adverse health effects.^{19,20,21,24} Chronic financial hardship can take its toll on family and social relationships, parenting, self-esteem, and other factors that have been shown to exert direct and indirect influences on health.⁴⁶

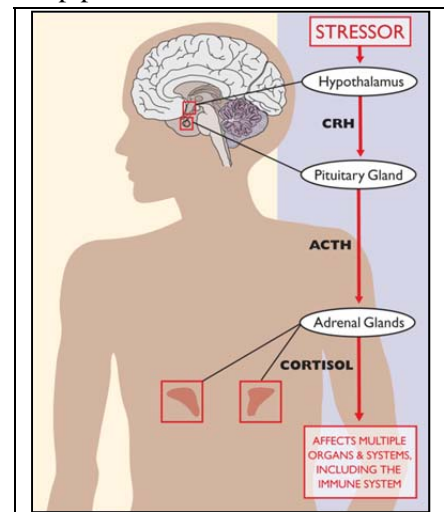


FIGURE 5: How stress damages health: an example

(Egerter, Braveman et al. 2011)

- **Chronic stress can damage health.** Major scientific advances over the past two decades have helped explain how chronic stress can literally “get under the skin” to damage health.^{18,47,48,49,50,51,52} As shown in Figure 5, stressful experiences—such as those associated with economic hardship^{39,44,45} that might come from reduced SNAP benefits—can trigger a cascade of physiologic responses beginning in the brain and resulting in the release of hormones (such as cortisol and adrenaline) from the adrenal

^g This section drew heavily from: Braveman, P., S. Egerter and C. Barclay (2011). *Issue Brief Series: Exploring the Social Determinants of Health: Income, Wealth and Health*. Princeton, Robert Wood Johnson Foundation.

glands along with other substances that cause inflammation. Prolonged exposure to these substances, particularly with repeated or prolonged stresses over time, can damage immune defenses and vital organs including the heart.⁴³ This chain of events can result in more rapid onset and progression of chronic illnesses, including heart disease.⁴⁸ The bodily wear and tear associated with chronic stress may accelerate aging.^{53,54,55} Stress has been shown to be related to the physiologic changes that accompany aging, including shortening of telomeres, the ends of chromosomes.⁵⁶ Increasing evidence indicates that the accumulated strain from trying to cope with daily challenges (e.g., having inadequate financial resources for decent housing, heating, food, child care, transportation or medical care) may over time lead to far more physiological damage than a single stressful event, even if that event is dramatic.⁵⁵ Evidence shows that prolonged and/or severe stress in early childhood can disrupt vital body systems, resulting in continued damage to organs even when an individual’s circumstances are no longer so stressful in adulthood.

HOW SNAP LEGISLATION MIGHT AFFECT CHILDREN—AND THEIR HEALTH AS ADULTS

Considerable evidence indicates that young children can be profoundly affected by the conditions they experience in households contending with economic disadvantage. As noted earlier, babies born to low-income women are more likely to be born too small (low birth weight) or too early (premature birth), which in turn are powerful risk factors not only for infant mortality, but also for serious cognitive, behavioral, and physical problems in childhood. Low birth weight is associated with serious chronic diseases in adulthood—including heart disease, hypertension, and diabetes.^{24,57,58,59} Because of limited housing options for low-income families, low-income children are more likely to be exposed to hazardous conditions in their homes and neighborhoods. For example, lead poisoning due to unsafe lead levels in inadequate housing can result in irreversible neurologic damage.⁶⁰ Children in low-income families are less likely to have nutritious diets,⁶¹ with potential serious long-term health effects.^{62,63,64,65} Low-income children are more likely to be obese,⁶⁶ increasing their risks of obesity and related chronic illness as adults.⁶⁷

Economic hardship during childhood can shape health later in life in other ways as well (Table B). Parents with limited economic resources face greater obstacles to creating healthy home environments and modeling healthy behaviors for their children.^{22,68} In addition to its direct effects on health, economic disadvantage—especially in the first five years of life—affects health indirectly by having strong effects on education.^{18,19,20,21} Economic disadvantage is strongly linked with poor cognitive development and lack of school readiness.^{69,70,71} Parents struggling to make ends meet are less able to provide their children with cognitive stimulation, enriching experiences and materials, or help with homework;^{44,47,65,69} this in turn has implications for academic achievement, educational attainment, and future employment opportunities and earnings.

Poverty condemns children to limited life chances,⁷² which in turn shape health. One study found that, compared with children in families earning near the median family income (between \$35,000 and \$49,999 at that time), children growing up in families earning less than \$15,000 per year were more than 12 times less likely to graduate

TABLE B. THE HEALTH AND ECONOMIC CONSEQUENCES OF ECONOMIC HARDSHIP IN CHILDHOOD:

Consequences seen in childhood:

- Poorer cognitive, emotional, social, and physical development
- Lower readiness for school and poorer performance in school
- Inferior diet
- Obesity
- Poorer child health

Consequences not seen until adulthood:

- Lower educational attainment and thus greater adult poverty, unemployment, economic insecurity, and lower productivity,
- Inability to create healthy circumstances for children
- Chronic disease, including heart disease and diabetes
- High costs for medical care

from high school.⁷⁰ Fewer than one in six children born to parents in the lowest income quintile attains the U.S. median household income by middle age.⁷³

Thus, exposing children to the economic disadvantages related to reduced SNAP benefits could not only affect their health in childhood, but may also have consequences that first manifest when they are adults. Children’s experiences of economic hardship also can diminish their chances for economic security and being productive members of the workforce as adults, which in turn can adversely affect their health in later adulthood. Apart from the effects on families and society that result from poor school performance—from problem behaviors to unemployment and poverty—the resulting impact on their health as adults will introduce a public health and economic burden for the next generation because of greater needs for medical care and lost workforce productivity. Compelling research indicates that this effect on adult health is enduring; it persists even when economic circumstances in adulthood are taken into account.^{24,52,70,74,75,76,77}

Early childhood is a critical period of development, during which exposure to stress –e.g., due to economic hardship-- can have particularly powerful and lasting effects (Braveman and Barclay 2009).

In addition, both health and economic disadvantage compound over a person’s lifetime and amplify the obstacles to good health. These obstacles in turn are transmitted across generations, as disadvantaged children become adults with limited economic resources and poorer health who are less able to provide health-promoting environments for their own children. Evidence from randomized controlled trials and natural experiments indicate that income assistance programs have a positive effective on physical health, mobility limitations, birth weight, and depression.^{78,79,80,81,82} Cutting SNAP benefits is likely to deepen the poverty of many families in the United States, and push many more into poverty, with serious health and economic consequences that will be felt by the nation for generations to come. Because blacks and Latinos have the highest rates of poverty and low-income as well as the least wealth at a given income level, the potential health impact of SNAP cutbacks can be expected to fall most heavily on them.

THE ECONOMIC IMPLICATIONS OF INCREASING THE COSTS OF HEALTH CARE

Although the proposed SNAP legislation is intended to reduce discretionary spending, the above concerns raise the question of whether the adverse health consequences produced by the legislation might increase the costs of health care and offset some or all of the savings. According to the April 26, 2012 Congressional Budget Office (CBO) report to Senator Stabenow and the July 26, 2012 CBO report on H.R.6083, the projected savings in 2013-2022 from S.3240 and H.R.6083 were \$4.49 billion and \$16.1 billion, respectively.^{83,84}

What if the increased medical spending resulting from these bills offsets these savings? The proposed legislation has the potential to cause a large proportion of SNAP recipients to enter poverty, falling below the FPL. Given the strength of the connection between poverty and health, even a seemingly small increase in the poverty rate in the United States could increase disease burden and—due to the high costs of health care—offset the projected savings sought by the budget cuts.

We developed a scaled logistic regression model that tracks the relationship between household income and three health measures—(a) death rates, (b) the prevalence of diabetes, and (c) the costs of diabetes care—based on publicly available statistics from national, state, and county data sources.^h Diabetes was

^h The regression model was developed for the County Health Calculator (countyhealthcalculator.org), a project funded by the Robert Wood Johnson Foundation to help the public and policymakers gain a greater appreciation of the important health implications of education and income. The tool allows the user to choose a county, state, or the

chosen as an example of the many chronic diseases that affect health and medical spending in the United States and that occur with much higher prevalence among low-income vulnerable populations, such as SNAP recipients. We emphasize that diabetes is just one example and the total impact on health and spending must be pooled across the totality of health conditions to obtain a full estimation of the economic consequences of increasing socioeconomic disadvantage.

The Appendix lists the changes in these outcomes that would be expected nationally, and in each of the 50 states, if the poverty rate was increased by small proportions: 0.10%, 0.25%, 0.50%, and 1.00%. The financial implications for the United States (Table C) show that, apart from increasing death rates and the prevalence of diabetes by substantial proportions, the incremental increase in medical spending for *one disease alone*—diabetes—could range from \$268 million to \$2.95 billion per year, the latter exceeding the projected savings from even the more aggressive House bill (\$1.47 billion per year in 2013-2017, \$1.73 billion per year in 2018-2022). The more modest savings sought by the Senate bill would be offset by an even smaller increase in the U.S. poverty rate (0.25%). The *total* impact on medical spending would be considerably higher than the values shown here for diabetes.

TABLE C. SAVINGS FROM PROPOSED LEGISLATION AND PROJECTED SPENDING INCREASES FOR DIABETES					
		Annual Increases in Medical Care Costs for Diabetes, Given an Increase in Poverty			
	Annual savings per CBO projections	0.10% increase in poverty	0.25% increase in poverty	0.50% increase in poverty	1.00% increase in poverty
S.3240	\$0.35 billion (2013-17) \$0.55 billion (2018-22)	\$0.27 billion	\$0.72 billion	\$1.47 billion	\$2.95 billion
H.R.6083	\$1.47 billion (2013-17) \$1.73 billion (2018-2022)				

These are estimated effects at the broad population level in the United States; the impact will vary at the local level. To illustrate this variation, in Table D we show the variation in projected impact for 11 legislative districts and counties.

nation and to examine the effect on avertable deaths, new cases of diabetes, and the costs of medical care for diabetes that would be expected with higher levels of education or income.

TABLE D. PROJECTED IMPACT OF INCREASED POVERTY RATES IN 11 DISTRICTS AND COUNTIES												
Increase in Poverty Rate	Excess deaths (all causes, per year)				New cases of diabetes (per year)				Medical care costs for new cases of diabetes (per year, millions of dollars)			
	0.10%	0.25%	0.50%	1.0%	0.10%	0.25%	0.50%	1.0%	0.10%	0.25%	0.50%	1.0%
Iowa, 5 th District	13	27	50	94	144	295	542	1022	0.7	1.6	2.9	5.5
Minnesota, 7 th District	6	21	47	97	75	278	613	1270	0.4	1.5	3.2	6.5
North Carolina, 7 th District	9	30	65	135	99	348	760	1572	0.6	2.2	4.8	9.9
Ohio, 8 th District	11	36	79	162	144	491	1064	2188	0.9	3.3	7.2	14.8
Oklahoma, 3 rd District	10	29	60	120	116	322	661	1326	0.7	2.0	4.2	8.4
Virginia, 6 th District	9	24	50	98	120	320	646	1274	0.6	1.6	3.3	6.5
California, 12 th District	13	32	65	131	135	350	708	1418	1.0	2.5	5.0	10.0
Kentucky, Jefferson County	12	27	52	101	113	262	508	994	0.7	1.7	3.3	6.4
Michigan, Clare County	1	1	2	4	4	11	21	41	0.0†	0.1	0.2	0.3
Mississippi, Hinds County	2	6	12	24	23	58	117	233	0.2	0.4	0.7	1.4
Nevada, Clark County	25	93	205	426	307	1150	2540	5263	2.4	9.3	20.5	42.5

Notes: Calculations for House districts were derived by aggregating results for constituent counties. Some House districts include specific cities but not the surrounding counties. For example, Tulsa (but not Tulsa County) is included in the 3rd District of Oklahoma. For ease of calculation our projections include surrounding counties. † = less than \$50,000 in costs. These districts and counties were selected as areas relevant to the leadership and ranking members of the U.S. House of Representatives, the House Agriculture Committee, the House Subcommittee on Nutrition and Horticulture, and the leadership and ranking members of the U.S. Senate and the Senate Agriculture Committee.

Caveats

The limitations of these projections should be noted. The underlying regression model relies on known statistical relationships between income and health, compiled from more than 3,000 counties in the United States and state-based data on diabetes rates. The pervasiveness of these associations in the analyses presented here, and found throughout the literature are compelling, but associations do not definitively prove causality. Knowing the rates of mortality and disease that are expected in places with higher poverty rates does not necessarily prove that increasing poverty rates will produce those outcomes. Mortality data are from 2007-2009 and diabetes data are from 2009. Assumptions about medical care costs in our model are based on county-level estimates of per capita expenditures for Medicare enrollees and the American Diabetes Association estimate of \$6,649 as the national per capita cost of diabetes care.

More details about the methods and limitations entailed in the analysis can be found at http://countyhealthcalculator.org/wp-content/uploads/2012/01/CHC_Tool_V2_TechDoc.pdf. Appendix B also discusses common questions about the quality of evidence that links income and health.

CONCLUSIONS

The limitations just stated make it inappropriate to state conclusively that the proposed SNAP legislation would cost more than it saves by increasing medical spending, but the body of evidence reviewed earlier suggests that this is a serious possibility that policymakers should consider. The evidence detailed in this report is, however, adequate to conclude that the economic stresses on low-income households who lose SNAP benefits will produce adverse health consequences that claim lives, increase disease rates, and increase health care costs—even though the exact magnitude of this effect cannot be stated with scientific precision. The above “ballpark estimates” suggest the real possibility that the budgetary savings intended by policymakers could be partially or fully offset by increases in medical care costs and will certainly claim a toll on the health of Americans, especially children. An effect on workforce productivity is also likely when children in low-income families who lose SNAP benefits today become tomorrow’s adults. The reduction in benefits could ultimately serve no purpose if, in the end, it produces little savings or ultimately induces higher costs. The adverse impact on the health and economic wellbeing of SNAP households, the future health and productivity of children in those households, and the economic future of tomorrow’s workforce—all in a failed effort to save money—would be an undesirable legacy of the legislation.

APPENDIX A

Percentage Increase in Deaths, Diabetes, and Medical Costs for Diabetes (Per Year) by Percentage Increase of Population in Poverty												
	Excess deaths (all causes)				New cases of diabetes				Medical care costs for new cases of diabetes (\$) in millions			
<i>Increase in US poverty rate</i>	<i>0.1%</i>	<i>0.25%</i>	<i>0.5%</i>	<i>1.0%</i>	<i>0.1%</i>	<i>0.25%</i>	<i>0.5%</i>	<i>1.0%</i>	<i>0.1%</i>	<i>0.25%</i>	<i>0.5%</i>	<i>1.0%</i>
United States	4,060	10,980	22,442	45,093	40,257	108,699	221,596	443,058	267.7	722.7	1,473.4	2,945.9
Alabama	52	144	296	594	502	1,381	2,831	5,682	3.1	8.6	17.6	35.2
Alaska	9	34	76	157	55	205	451	933	0.4	1.3	2.8	5.7
Arizona	69	229	496	1,026	844	2,805	6,057	12,497	5.2	17.5	37.9	78.2
Arkansas	21	68	145	296	205	658	1,408	2,884	1.1	3.8	8.1	16.7
California	395	1,299	2,803	5,800	3,777	12,383	26,611	54,642	27.5	90.0	193.3	396.9
Colorado	82	217	440	887	808	2,119	4,297	8,619	4.7	12.3	25.0	50.2
Connecticut	63	148	290	568	817	1,918	3,731	7,278	6.0	14.0	27.3	53.2
Delaware	23	48	88	168	192	401	744	1,413	1.3	2.7	4.9	9.4
DC	12	26	50	97	81	175	331	640	0.5	1.1	2.1	4.0
Florida	391	834	1,567	3,010	4,659	9,925	18,615	35,670	35.5	75.6	141.8	271.8
Georgia	119	335	693	1,401	1,231	3,456	7,127	14,332	7.5	21.0	43.4	87.2
Hawaii	43	88	164	313	369	763	1,411	2,677	1.8	3.7	6.9	13.2
Idaho	25	62	124	248	309	789	1,583	3,152	1.6	4.0	8.1	16.1
Illinois	234	520	994	1,935	2,435	5,392	10,278	19,894	16.7	36.9	70.2	135.9
Indiana	56	198	433	896	588	2,073	4,520	9,317	3.7	12.9	28.2	58.2
Iowa	40	110	226	454	391	1,074	2,201	4,412	2.0	5.6	11.5	23.1
Kansas	50	122	241	477	498	1,202	2,366	4,662	2.9	7.0	13.8	27.2
Kentucky	79	158	288	543	771	1,540	2,810	5,302	5.1	10.1	18.5	35
Louisiana	67	141	261	496	688	1,440	2,681	5,120	5	10.5	19.6	37.4
Maine	21	49	94	183	299	691	1,337	2,607	1.8	4.0	7.7	15.1
Maryland	108	300	616	1,235	1,172	3,246	6,646	13,237	8.4	23.1	47.3	94.2
Massachusetts	126	277	527	1,021	1,964	4,315	8,200	15,835	14.7	32.2	61.2	118.2
Michigan	68	264	589	1,232	761	2,927	6,512	13,585	5.4	20.8	46.3	96.7
Minnesota	42	159	354	743	368	1,396	3,093	6,429	1.9	7.4	16.3	33.9
Mississippi	35	86	171	339	296	739	1,470	2,910	2.0	4.9	9.8	19.4
Missouri	135	284	529	1,014	1,068	2,237	4,164	7,944	6.6	13.8	25.6	48.9
Montana	14	38	76	152	153	408	828	1,658	0.8	2.0	4.1	8.2
Nebraska	20	62	132	270	192	590	1,247	2,543	1.1	3.4	7.0	14.3
Nevada	83	176	330	632	883	1,864	3,481	6,651	6.2	13.2	24.7	47.2
New Hampshire	22	60	121	241	326	855	1,724	3,418	1.9	5.0	10.2	20.2
New Jersey	194	396	728	1,379	2,553	5,202	9,538	17,919	19.4	39.5	72.5	136.2
New Mexico	19	73	162	339	202	757	1,678	3,502	1.0	3.9	8.6	18.0
New York	313	657	1,226	2,345	3,981	8,341	15,503	29,441	30.2	63.2	117.5	223.1
North Carolina	74	278	616	1,286	721	2,714	6,008	12,497	4.2	15.9	35.2	73.3
North Dakota	12	26	50	98	112	253	486	945	0.5	1.2	2.3	4.4
Ohio	141	381	777	1,560	1,627	4,383	8,932	17,866	10.8	29.1	59.2	118.3
Oklahoma	51	129	258	511	499	1,265	2,530	5,022	3.3	8.2	16.4	32.5
Oregon	83	169	313	597	719	1,470	2,713	5,165	3.6	7.4	13.7	26.2
Pennsylvania	100	351	763	1,570	1,200	4,186	9,074	18,528	8.0	27.8	60.3	123.2
Rhode Island	15	38	78	155	175	459	927	1,845	1.2	3.1	6.2	12.3
South Carolina	40	140	305	629	394	1,356	2,945	6,068	2.3	8.1	17.6	36.3
South Dakota	7	24	52	108	66	233	508	1,047	0.3	1.1	2.5	5.2
Tennessee	78	194	386	762	703	1,759	3,502	6,928	4.6	11.3	22.6	44.6
Texas	386	874	1,684	3,288	3,436	7,782	14,972	29,154	25.1	56.9	109.3	212.9
Utah	31	108	236	491	322	1,112	2,422	5,010	1.8	6.4	13.9	28.8

Vermont	10	22	43	84	122	279	539	1,050	0.7	1.6	3.0	5.9
Virginia	160	382	749	1,473	1,700	4,043	7,895	15,407	9.4	22.3	43.6	85.0
Washington	139	302	575	1,116	1,222	2,662	5,045	9,746	7.0	15.1	28.6	55.3
West Virginia	33	71	135	259	389	845	1,594	3,058	2.4	5.2	9.8	18.9
Wisconsin	78	197	393	780	967	2,430	4,839	9,547	5.4	13.6	27.1	53.5
Wyoming	19	39	71	135	202	409	750	1,420	1.1	2.1	3.9	7.3

APPENDIX B

HOW STRONG IS THE EVIDENCE THAT INCOME AFFECTS HEALTH?

Not everyone is convinced that lower levels of income actually lead to poorer health; several economists have noted that poorer health can be the cause of low income rather than the other way around. Most economists accept that severe material deprivation due to extreme poverty can play a causal role in poor health outcomes (Subramanian and Kawachi 2006), but some question the notion that income has a major influence on health. In addition, many people assume that the connections between economic resources and health are explained by access to health insurance and medical care.

The literature on this subject is extensive. Although most of the evidence underscores the strong influence of income on disease, there are ongoing debates and some studies have concluded that income does not influence health (Kawachi et al., 2010). The largest body of evidence consists of what are known as cross-sectional studies, which show a consistent correlation between income and poor health, but correlation does not prove causality. As discussed below, some critics ask whether the correlation represents reverse causality, in which poor health leads to lower income.

However, prospective or longitudinal studies, which track health outcomes years after individuals or populations were exposed to losses of income, have generally produced consistent findings indicating that income does indeed influence health, and the same is true of modeling studies (Lindahl, 2002; Case, 2004; Buckley et al., 2004; Kaplan et al., 2007; Paxson and Schady, 2010; Hajat et al., 2011). Results of longitudinal studies should carry more weight because they can answer the question of whether the arrow goes from income to health or vice versa. Longitudinal studies have generally affirmed that although health can indeed affect income, “reverse causation” does not explain the strength of the observed links between income and health; the most important effects are those of income on health.

Studies reporting that more income does not lead to better health suffer from other methodologic limitations:

- **Short observation periods.** Based on the pathways and biological mechanisms through which income can affect health, it makes sense that short-term increases in income would not necessarily lead to improved health. It is long-term, chronic poverty/low income that is expected to have appreciable effects.
- **Ignoring the heterogeneity of health outcomes.** One would not expect income to affect all health outcomes. Some authors who reviewed findings by those who concluded that income has no effect on health found that these reviewers had overlooked significant income effects on particular outcomes.
- **Ignoring the heterogeneity of individuals.** One would not expect income to have a positive effect on health among all individuals in all contexts. One study (Snyder & Evans, NBER 2002) found that increases in Social Security income did not improve health among the elderly; accumulated wealth may be more important than income among the elderly. Research suggests that income would have the greatest effects on children and that the effects would diminish with age. In addition, that study found that Social Security recipients who received higher payments were less likely to continue working, and other studies have documented that employment is associated with better health. One would not expect income to improve health in all circumstances.
- **Adjustment for the wrong covariates.** Many studies are biased against detecting the health effects of income because they adjust for education, health insurance, and other factors that are likely to be on the causal pathway between income and health at an earlier stage of the life course.

The evidence of a causal effect is not universal. For example, examination of mortality effects of the “social security notch”—a decline in payments created by legislation in the 1970s—did not show a causal effect (Snyder and Evans, 2006). However, that study focused on senior citizens, a population less likely to experience health benefits from economic changes. Many studies that have failed to observe an income effect on health have had observation periods that were too short to detect the health effects that would be predicted based on current knowledge of development and stress physiology. Others have failed to focus on the populations most likely to be affected.

Some frequently-raised questions about the links between income and health are noted below, along with a brief summary of relevant evidence answering the questions. However, analysts who have carefully critiqued this literature have concluded that income plays an important causal role in health (Kawachi et al., 2010). “None of this evidence is perfect, which is certainly not unusual in the policy arena, but the consistency and breadth of the evidence is impressive” (Kaplan, 2009).

Question 1: The role of health insurance. Aren’t the links between greater income and better health explained primarily by the fact that having more money allows a person to obtain medical care by purchasing medical insurance and/or paying out-of-pocket for medical expenses not covered by insurance?

Answer 1: No. The ability to pay for medical care undoubtedly contributes to health, but the evidence (including that presented earlier) indicates that this does not fully explain the links between economic resources and health.

- Strong and consistent stepwise gradient patterns linking health and socioeconomic advantage—with health improvements seen with every step up the socioeconomic ladder—have been observed pervasively in western European countries including the United Kingdom, France and the Netherlands, despite universal medical care insurance coverage (Marmot, Smith et al. 1991, Kunst, del Rios et al. 1998, Mackenbach, Cavelaars et al. 2000, Kunst, Bos et al. 2005, Avendano, Kunst et al. 2006).
- A number of studies in the United States have found strong associations between income and different health indicators even after taking insurance coverage into account (Sorlie, Johnson et al. 1994, Ross and Mirowsky 2000, Newacheck, Hung et al. 2003, Sudano and Baker 2006, Szanton, Allen et al. 2008, McGrail, van Doorslaer et al. 2009, Victorino and Gauthier 2009).

Question 2: Does income affect health, or does health affect income? Many researchers have asked whether the links between income and health are actually explained by the fact that poorer health leads to reduced income, rather than lower income leading to worse health. This is referred to as “reverse causation.”

Answer 2: Both are true, but studies have shown that the effects of income on health are more important than the reverse. We know that the pathways linking health and economic resources operate in both directions—income affects health, and health can affect income. For example, serious illness can lead to loss of employment and the burden of medical expenses. This question arises particularly when studies examine only a single point or short period in people’s lives. As summarized above, however, based on well-designed studies that have followed people over time, it is clear that substantial changes in health and important health-related risk factors occur *following* changes in income; this means that the changes cannot be due only to the effects of health on income (Daly, Duncan et al. 2002, Herd, Goesling et al. 2007, Avendano and Glymour 2008). Thus, reverse causation does not fully explain the observed connections between income and health (Backlund, Sorlie et al. 1996, McDonough, Duncan et al. 1997, Goldman 2001, Case, Lubotsky et al. 2002, Muennig 2008, Kawachi, Adler et al. 2010).

Question 3: Other factors. Could the links between income and health be due to other factors that haven't been considered?

Answer 3: Unlikely. The case supporting the health effects of economic resources has been presented above, including the evidence regarding scientifically plausible pathways that may explain the observed links. Some researchers have contended that income differences in health reflect differences in innate intelligence (Herrnstein and Murray 1994); that proposition has been discredited (Link, Phelan et al. 2008). It is further strengthened by evidence from several randomized studies and natural experiments (Kawachi, Adler et al. 2010).

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