Lack of Food Security Increases Coronary Heart Disease in Low-Income Areas

Chiara Cimarusti

Health Policy and Analysis Team at Harvard University

July 23, 2021

Edited on May 12, 2025

Lack of Food Security Increases Coronary Heart Disease in Low-Income Areas

"In 2019, 89.5 percent of U.S. households were food secure. The remaining 10.5 percent (13.7 million households) were food insecure" (Coleman-Jensen et al., 2020**)**. These households primarily came from low-income areas where adults were unable to obtain healthy food due to their limited funds and resources. People living in these areas were more prone to develop cardiovascular disease, like coronary heart disease (CHD). This problem still exists today as the number of people with CHD continues to rise. CHD is a type of cardiovascular disease (CVD) that occurs when the arteries cannot transport the proper nutrients contained in blood plasma to the heart, resulting in heart attacks (National Heart, Lung, and Blood Institute, 2024). Studies have shown that "participants with CVD who were categorized as 'low income' were 66% less likely to get their cholesterol checked within the last five years or their blood pressure checked within the past two years;" furthermore "participants with CVD who were categorized as 'poor/very low income' were 67% less likely to have their cholesterol checked within the last five years and 68% less likely to have had their blood pressure checked within the past two years" (Shahu, 2020). This begs the question: Why are adults who live in low-income areas more likely to present a higher risk of cardiovascular disease, like CHD, than those living in high-income areas?

Food insecurity is a primary reason why people living in low-income areas are more at risk of developing cardiovascular diseases (like CHD). Food insecurity is defined as a lack of consistent access to enough food for an active, healthy life (Feeding America, 2025a**)**. According to the American Heart Association, "those who listed themselves as 'poor/low-income' were nearly five times more likely to experience food insecurity. Among people with five or more

‘high-risk characteristics’ [of coronary heart disease], 44.1% reported food insecurity and had 23 times higher odds of being food insecure compared to those with one or no characteristics” (Christensen, 2020). Therefore, adults who live in low-income areas are more likely to be exposed to coronary heart disease due to food insecurity and a lack of healthy food options. This became a prominent public health issue, where it was estimated that “more than 47 million people in the US face hunger, including 1 in 5 children” (Feeding America, 2025b).

Those living with CVD are financially weighed down by the disease and are exposed to an increased risk of lethal complications. CVD, including CHD, can carry a serious mortality risk among U.S. adults: “About 10.6% of US adults were living with CHD, heart failure, or stroke between 2013 and 2016” (Liu & Eicher-Miller, 2021). Additionally, CHD imposes a significant financial burden on adults who live with it: In 2015, the total cost of treating and living with CVD was estimated to be $555 billion, a number that is expected to double to $1.1 trillion by 2035 in America (Khavjou et al., 2016). Specifically, the cost of treating CHD amounted to an estimated $188 billion in 2015 and is predicted to increase to $366 billion by 2035 (Khavjou et al., 2016).

Marginalized Communities are More at Risk for Developing CHD

Coronary heart disease (CHD) is the leading cause of death among older men and women living in the United States (Coronary Artery Disease, 2025). According to the Centers for Disease Control and Prevention (CDC), “coronary heart disease is the most common type of heart disease, killing 365,914 people in 2017” (Know Your Risk of Heart Disease, 2020). There is a relationship between socioeconomic status and the development of CHD: Studies show that people who report a lower subjective SES [socioeconomic status] are more exposed to several

physiological risk factors for CHD including a higher heart rate, BMI, and stress than people who report a higher-income (Phillips & Klein, 2010). With this, it is evident that marginalized communities, particularly, are more susceptible to this disease due to their low socioeconomic status. We also start to see that marginalized communities like African Americans are more likely to be susceptible to CHD (Graham, 2015). Internationally, communities from low-income areas are experiencing the same issues as marginalized minorities living in the United States. According to the Working Group, a medical group established by the European Society of Hypertension in 2011, "80% of all CVD-related deaths occur in underserved communities and in these communities hypertension is the leading risk factor" (Graham, 2015). People of color who live in underserved communities are more at risk of contracting health issues like hypertension and CHD due to the lack of resources that these communities have. Such communities are unable to afford (or even invest in) care prevention services, which help educate patients about these high-risk diseases. After analyzing a survey by the CDC, Peter J. Cunningham (2018) found that "lower-income people — those who earn 200% or less of the federal poverty level (FPL), or about $24,000 or less a year, and have fewer than three chronic conditions and no functional limitations — have higher health risks, greater social needs, and worse access to care than relatively healthy moderate-income (200-400% FPL) and higher-income (>400% FPL) people."

Poor Diet is Attributable to Food Insecurity

A poor diet is one of the main causes of coronary heart disease (CHD) and can be associated with food insecurity. CHD can pose serious health risks to the community because of the lack of access to nutritional food options, creating food deserts, which can be defined as "a location with both low access to healthy food and low income" (Kelli et al., 2017). Food deserts

can be associated with “decreased fruit and vegetable intake and higher systolic blood pressure” (Kelli et al., 2017).

Food deserts can be found in small mom-and-pop and convenience stores, both of which usually have a lower quality of healthy food options. A study that was conducted in New York shows that African American neighborhoods had fewer healthy items in convenience stores due to their large stock of foods that had a low nutritional value compared to white and Hispanic neighborhoods, which usually had foods of high nutritional value (Hilmers et al., 2012). Additionally, studies show that from 1999 to 2008, food insecurity was associated with a higher intake of high-fat dairy products, sugar-sweetened beverages, red/processed meat, and salty snacks (Leung et al., 2014; Morales & Berkowitz, 2016). These studies suggest that low-income areas that have a higher rate of food insecurity have more access to highly processed food than to healthier food options. A study of 21,976 US zip codes showed that full-service restaurants are more concentrated in high-income areas while fast-food restaurants are more highly concentrated in low- and middle-income areas (Hilmers et al., 2012). For example, the poorer areas in South Los Angeles (located in Southern California) have more fast-food restaurants and options, which promote unhealthy eating habits among these marginalized groups (Hilmers et al., 2012).

Racial Disparities in Food Insecurity

Race, in particular, is strongly correlated to the lack of food security in a community. According to the article, “Food Insecurity”, “In 2020, Black non-Hispanic households were over 2 times more likely to be food insecure than the national average (21.7 percent versus 10.5 percent, respectively)” (Office of Disease Prevention and Health Promotion, n.d.). At the same time, in Hispanic households, “the prevalence of food insecurity was 17.2 percent compared to

the national average of 10.5 percent" (Office of Disease Prevention and Health Promotion, n.d.). Furthermore, "predominantly Black and Hispanic neighborhoods may have fewer full-service supermarkets than predominantly White and non-Hispanic neighborhoods" (Office of Disease Prevention and Health Promotion, n.d.).

Lack of Transportation Leads to Food Insecurity

Lack of transportation is another cause that contributes to food insecurity. Many low-income Americans face this issue daily, especially if they live in rural and urban areas. According to the article, "Transportation and Food: The Importance of Access, "Low-income households are 6 to 7 times more likely than other U.S. households to not own cars" and thus rely mostly on public transportation to travel to places (Food Security, 2012). The same source clarified that "a quarter of low-income households lack access to an automobile" (Food Security, 2012). A study conducted in Detroit, Michigan found that "the most impoverished neighborhoods in which African Americans resided, on average, were 1.1 miles farther from the nearest supermarket than were the most impoverished White neighborhoods." (Zenk et al., 2005). This poses a problem in rural areas, where individuals are the furthest away from the supermarket and more "particularly vulnerable, and may rely more on smaller neighborhood stores that lack healthy foods or offer them at higher prices" (Lenardson et al., 2015). Overall, lower-income neighborhoods have difficulty accessing supermarkets for healthier food options due to the lack of convenient transportation available and their low socioeconomic status, which adds another challenge to achieving a healthy lifestyle. Thus, lower socioeconomic status is associated with poor diets and, consequently, higher risk of coronary heart disease and other health issues.

The Link Between Food Insecurity and CHD in Low-Income Areas

Marginalized adult groups who live in low-income areas are more likely to suffer from coronary heart disease (CHD) due to increased food insecurity. According to the article "Food insecurity linked to higher risk of cardiovascular death," U.S. counties that had the most increase in food insecurity levels had cardiovascular death rates that increased from 82 to 87 per 100,000 population. Counties that had a decrease in food insecurity had a cardiovascular mortality rate that remained stable at 60 per 100,000 population" (American Heart Association, 2020). Furthermore, a study showed that"research using comparable risk assessment methods and nationally representative data have shown that about 45% of cardiometabolic deaths were attributable to poor dietary habits" (Liu & Eicher-Miller, 2021). Marginalized people living in low-income areas experience more food insecurity, increasing their risk of developing CHD, which can shorten one's lifespan and generate a lot of health problems over time.

Recommended Solutions

Establishing a Community Garden

Establishing a community garden in low-income areas, which would introduce fresh fruits and vegetables to people and encourage healthy eating in the community, is one way to decrease the risk of food insecurity and, consequently, the risk of coronary heart disease. In Michigan, a study among urban adults showed that "individuals in community gardening households consumed fruits and vegetables 1.4 more times per day than did those in non-community gardening households and were 3.5 times more likely to consume fruits and vegetables 5 or more times per day" (Litt et al., 2011). Not only does the garden encourage healthy eating, but it also promotes more camaraderie among community members and families.

A Government Prevention Program

There is evidence demonstrating that federal campaigns can help lower the risk of cardiovascular disease. Such campaigns may involve placing fact-oriented advertisements on street benches about coronary heart disease (CHD), having radio advertisements inform their audience about CHD statistics and its relationship with food insecurity, posting flyers that talk about this issue, or having health center representatives talk to the community in town hall meetings.

An intervention called the North Karelia Project was performed in North Karelia, the eastern part of Finland, that aimed to reduce high cardiovascular mortality rates by decreasing several risk factors that contribute to the mortality rates:

> The main aim was to reduce the extremely high serum cholesterol, blood pressure, and smoking levels with lifestyle changes and improved drug treatment, especially for hypertension. Major declines were seen in serum cholesterol, blood pressure, and smoking levels. Coronary mortality reduced in the middle-aged population by 84% from 1972 to 2014. About 2/3 of the mortality decline was explained by risk factor changes and 1/3 by the improvement of new treatments developed since the 1980s (Vartiainen, 2018).

Focusing on communities' lifestyles and habits can help us prioritize what screenings we need more of in the future to lessen chronic diseases such as CHD. It will also help us understand the relationship between people and food, including the way they grow, store, and share food. These relationships can reveal how a community accesses nutrition and, ultimately, gain insight into

how to advocate for policies that increase access to adequate nutrition in marginalized communities.

Supermarket on Wheels

Lastly, having a supermarket on wheels that contains healthy fruits and vegetables can also decrease food insecurity and coronary heart disease rates. Placement of fruits and vegetables in these mobile markets can further allow individuals to gain access to healthy fruits and vegetables, and it can bridge the gap in getting adequate nutrition. Studies have shown that the "placement of fruit/vegetables near the front of corner stores increased purchases of produce by customers using WIC [Special Supplemental Nutrition Program for Women, Infants, and Children]. New policies that incentivize stores to stock and prominently display good-quality produce could promote healthier food choices of low-income families" (Thorndike et al., 2016).

Conclusion

In summary, people living in low-income areas are more at risk for cardiovascular disease due to multiple factors, such as a poor diet (attributed to food insecurity), prevalent racial disparities in access to fresh food, and a lack of transportation in rural and urban areas. There are, however, multiple solutions that can help lower this ongoing health issue. A study performed in Chicago, Illinois recruited participants to test patients' knowledge and perception for an educational program about coronary heart disease (CHD), and it revealed that participants' knowledge and perceptions about cardiovascular health improved significantly after the CHD patient education program (Shah et al., 2016). The results of this study teach us that community members and authorities must collaborate in order to increase awareness and use advocacy to address these issues. To start, we can apply the proposed solutions to this health problem:

establishing a community garden, a government prevention plan, and putting fresh produce at eye level. Through a collective effort, we can reduce the risk of coronary heart disease in low-income communities in our future.

References

American Heart Association News (2020, July 15) *Unhealthy housing can lead to an unhealthy heart*. https://www.heart.org/en/news/2020/07/15/unhealthy-housing-can-lead-to-an-unhealthy-heart.

American Heart Association. (2020, November 9). *Food insecurity linked to higher risk of cardiovascular death*. https://newsroom.heart.org/news/food-insecurity-linked-to-higher-risk-of-cardiovascular-death

American Heart Association. (2025). *People with heart disease experience high food insecurity rates*. https://www.heart.org/en/beyond-the-table/stories/people-with-heart-disease-experience-high-food-insecurity-rates

Christensen, T. (2020, December 1). *Food insecurity rates high among people with heart disease*. American Heart Association. https://www.heart.org/en/news/2020/12/01/food-insecurity-rates-high-among-people-with-heart-disease.

Coronary Artery Disease (2025, March 18). MedlinePlus. Retrieved July 24, 2021, from https://medlineplus.gov/coronaryarterydisease.html

Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2020, September). *Household Food Security in the United States in 2019* (Economic Research Report 275). USDA Economic Research Service. https://www.ers.usda.gov/sites/default/files/_laserfiche/publications/99282/ERR275_Summary.pdf?v=71924#:~:text=In%202019%2C%2089.5%20percent%20of,to%20a%20lack%20of%20resources.

Cunningham, P. J. (2018, September 27). *Why Even Healthy Low-Income People Have Greater Health Risks Than Higher-Income People*. The Commonwealth Fund. https://www.commonwealthfund.org/blog/2018/healthy-low-income-people-greater-health-risks

Feeding America. (2025a). *Hunger and Food Insecurity.* https://hungerandhealth.feedingamerica.org/understand-food-insecurity/.

Feeding America. (2025b). *Hunger in America*. https://www.feedingamerica.org/hunger-in-america#:~:text=More%20than%2047%20million%20people%20in%20the%20US%20face%20hunger%2C%20including%201%20in%205%20children

Finkelstein, E. A., Khavjou, O. A., Mobley, L. R., Haney, D. M., & Will, J. C. (2004, June). Racial/ethnic disparities in coronary heart disease risk factors among WISEWOMAN enrollees. *Journal of Women's Health (Larchmt), 13*(5), 503–18. doi: 10.1089/1540999041280963

Food Security. (n.d.) (2012, August 6). *Transportation and Food: The Importance of Access.* Food Security: Community Food Security Coalition. http://foodsecurity.org/policy_trans03_brief/

Graham, G. (2015). Disparities in Cardiovascular Disease Risk in the United States. *Current Cardiology Reviews, 11*(3), 238-245. https://pmc.ncbi.nlm.nih.gov/articles/PMC4558355/pdf/CCR-11-238.pdf

Gundersen, C. & Ziliak, J. P. (2015, November). Food Insecurity and Health Outcomes. *Health Affairs, 34*(11), 1830-1839. https://gattonweb.uky.edu/Faculty/Ziliak/GZ_HealthAffairs_34(11)_2015.pdf

Heart Disease Facts. (2024, October 24). Centers for Disease Control and Prevention. Retrieved July 24, 2021, from https://www.cdc.gov/heart-disease/data-research/facts-stats/?CDC_AAref_Val=https://www.cdc.gov/heartdisease/facts.htm

Hilmers, A., Hilmers, D., & Dave, J. (2012, July 19). Neighborhood Disparities in Access to Healthy Foods and Their Effects on Environmental Justice. *American Journal of Public Health, 102*(9), 1644–1654. doi: 10.2105/AJPH.2012.300865

Litt, S.J., Soobader, J.M., Turbin, S.M., Hale, W.J., Buchenau, M., Marshall,A.J. (2011, October 20). The Influence of Social Involvement, Neighborhood Aesthetics, and Community Garden Participation on Fruit and Vegetable Consumption. *American Journal of Public Health, 101(8),* 1466-1473. https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2010.300111

Kelli, M.H., Hannadah, M., Ahmed, H., Ko, Y., Topel, M., Tahhan-Samman,A., Awad, M., Patel, K., Mohammed, K., Sperling, S.L., Pemu, P., Vaccarino, V., Lewis, T., Taylor, H., Martin, G., Gibbons, H.G., Quyyumi, A.A. (2018,, September 1). Association Between Living in Food Deserts and Cardiovascular Risk. PubMed. https://pmc.ncbi.nlm.nih.gov/articles/PMC5810926/

Khavjou, O., Phelps, D., & Leib, A. (2016, November). *Projections of Cardiovascular Disease Prevalence and Costs: 2015-2035.* RTI International. https://www.heart.org/-/media/files/get-involved/advocacy/burden-report-technical-report.pdf?la=en

Know Your Risk of Heart Disease. (2020, January 31). Eastern Atlantic States. https://members.carpenters.fund/health/know-your-risk-for-heart-disease/#:~:text=Coronary%20heart%20disease%20is%20the,less%20than%2065%20years%20old.

Kreatsoulas, C. & Anand, S. S. (2010). The impact of social determinants on cardiovascular disease. *Canadian Journal of Cardiology, 26*(Supplement C), 8C-13C. doi: 10.1016/s0828-282x(10)71075-8

Liu, Y. & Eicher-Miller, H. A. (2021, March 27). Food Insecurity and Cardiovascular Disease Risk. *Current Atherosclerosis Reports, 23*(24). doi: 10.1007/s11883-021-00923-6

Lenardson, J.D., Hansen, Y.A., & Hartley, D. (2015, January 20). Rural and Remote Food Environments and Obesity. *Current Obesity Reports*, *4, 46-53*. doi: /10.1007/s13679-014-0136-5

Leung, C. W., Epel, E. S., Ritchie, L. D., Crawford, P. B., & Laraia, B. A. (2014, December). Food Insecurity Is Inversely Associated with Diet Quality of Lower-Income Adults. *Journal of the Academy of Nutrition and Dietetics, 114*(12), 1943–1953. https://www.sciencedirect.com/science/article/abs/pii/S2212267214010223

Mercado, L. (2021, February 25). *The Role of Community Gardens During the COVID-19 Pandemic*. Columbia University Mailman School of Public Health. https://www.publichealth.columbia.edu/public-health-now/news/role-community-gardens-during-covid-19-pandemic.

Morales, M. E., & Berkowitz, S. A. (2016, January 25). The Relationship between Food Insecurity, Dietary Patterns, and Obesity. *Current Nutrition Reports, 5*(1), 54–60. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6019322/#R17

National Heart, Lung, and Blood Institute. (2024, December 27). *What is Coronary Heart Disease?*. https://www.nhlbi.nih.gov/health/coronary-heart-disease

NHS. (n.d.). *Prevention: Coronary heart disease*. https://www.nhs.uk/conditions/coronary-heart-disease/prevention/

Nord M. (2007, May 31). *Characteristics of Low-Income Households With Very Low Food Security: An Analysis of the USDA GPRA Food Security Indicator* (EIB-25). USDA Economic Research Service. https://ers.usda.gov/sites/default/files/_laserfiche/publications/44171/11530_eib25_1_.pdf?v=43420

Nord M. (2009, September). *Food Insecurity in Households with Children: Prevalence, Severity, and Household Characteristics* (EIB-56). USDA Economic Research Service. https://eric.ed.gov/?id=ED508211

Office of Disease Prevention and Health Promotion. (n.d.). *Food Insecurity*. Healthy People 2030. https://odphp.health.gov/healthypeople/priority-areas/social-determinants-health/`literature-summaries/food-insecurity

Ohri-Vachaspati, P., DeWeese, R. S., Acciai, F., DeLia, D., Tulloch, D., Tong, D., Lorts, C., & Yedidia, M. J. (2019, July 3). Healthy Food Access in Low-Income High-Minority Communities: A Longitudinal Assessment-2009–2017. *International Journal of Environmental Research and Public Health, 16*(13), 2354. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6650883/

Phillips, J. E., & Klein, W. M. P. (2010, September). Socioeconomic Status and Coronary Heart Disease Risk: The Role of Social Cognitive Factors. *Social and Personality Psychology Compass, 4*(9), 704–727. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3140045/

Powell, L. M., Slater, S., Mirtcheva, D., Bao, Y., Chaloupka, F. J. (2007, March). Food store availability and neighborhood characteristics in the United States. *Preventive Medicine, 44*(3), 189-195. https://www.sciencedirect.com/science/article/pii/S0091743506003343?via%3Dihub

Rabbitt, M. P., Hales, L. J., & Reed-Jones, M. (2025, January 10). *Food Security in the U.S. - Definitions of Food Security*. USDA Economic Research Service. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security

Rabbitt, M. P., Hales, L. J., & Reed-Jones, M. (2025, January 8). *Food Security in the U.S. - Key statistics & graphics*. USDA Economic Research Service. https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics/

Shah, A., Clayman, M. L., Glass, S., & Kandula, N. R. (2015, February 3). Protect Your Heart: A Culture-Specific Multimedia Cardiovascular Health Education Program. *Journal of Health Communication, 20*(4), 424–430. https://www.tandfonline.com/doi/full/10.1080/10810730.2014.965366

Shahu,A. (2020, May 15). Low-income adults less likely to receive preventive heart disease care. *American Heart Association.* https://newsroom.heart.org/news/low-income-adults-less-likely-to-receive-preventive-heart-disease-care

Shaw, L. J., Shaw, R. E., Merz, C. N. B., Brindis, R. G., Klein, L. W., Nallamothu B., Douglas, P. S., Krone, R. J., McKay, C. R., Block, P. C., Hewitt, K., Weintraub, W. S., Peterson, E. D. (2008, April 8). Impact of ethnicity and gender differences on angiographic coronary artery disease prevalence and in-hospital mortality in the American College of Cardiology-National Cardiovascular Data Registry. *Circulation, 117*(14), 1787–1801. https://pubmed.ncbi.nlm.nih.gov/18378615/

Thorndike, A. N., Bright, O. M., Dimond, M. A., Fishman, R., & Levy, D. E. (2016, November 28). Choice architecture to promote fruit and vegetable purchases by families participating in the Special Supplemental Program for Women, Infants, and Children (WIC): randomized corner store pilot study. *Public Health Nutrition, 20*(7), 1297–1305. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5407909/.

Vartiainen, E. (2018, June 30). The North Karelia Project: Cardiovascular disease prevention in Finland. *Global Cardiology Science & Practice, 2018*(2), 13. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6062761/.

Zenk, S. N., Schulz, A. J., Israel, B. A., James, S. A., Bao, S., & Wilson, M. L. (2005, April) Neighborhood Racial Composition, Neighborhood Poverty, and the Spatial Accessibility of Supermarkets in Metropolitan Detroit. *American Journal of Public Health, 95*(4), 660–667. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1449238/.