Global Environmental Health Problem Analysis: Cardiovascular Disease

Emily R. Weaver

Old Dominion University

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Dr. Kekeh

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Cardiovascular diseases are responsible for 119 disability adjusted life years (DALYs) on a global scale and 31% are attributed to environmental causes (Prüss-Ustün et al., 2016). More than 75% of cardiovascular diseases occur in low-and-middle income countries (WHO, 2021). Since cardiovascular diseases are the leading cause of death globally, they affect most geographic areas around the world. Two cardiovascular diseases, ischemic heart disease and stroke, were focused on more extensively in the World Health Organization's report on Preventing Disease Through Healthy Environments than others. Environmental areas in need of attention to prevent disease include household and ambient air pollution, second-hand tobacco smoke, and chemicals (Prüss-Ustün et al., 2016).

Ischemic heart disease (IHD) has been an ongoing leading disease and only becoming more of a problem. "Ischemic heart disease is the leading cause of mortality and disability worldwide, accounting for 6.0% of the global disease burden in DALYs and 13% of global deaths" (Prüss-Ustün et al., 2016). Prüss-Ustün et al (2016) states that high blood pressure, diet, physical activity, and tobacco smoke are most important risk factors. However, environmental conditions, such as ambient and household air pollution, are also leading causes of the disease and make up 42% of the global burden for IHD (Prüss-Ustün et al., 2016). On a lesser scale, second hand smoke and exposure to lead also serve as environmental risk factors for IHD, attributing to 8% of the global burden for the disease (Prüss-Ustün et al., 2016). Stress and lack of physical activity also contribute greatly as risk factors for acquiring IHD. In conclusion, 35% of the total burden of IHD was due to environmental causes (Prüss-Ustün et al., 2016).

Following IHD, stroke is the second most important cause of global mortality with most of the burden falls on low-and-middle income countries (Prüss-Ustün et al., 2016). High blood pressure is the main risk factor for stroke followed by dietary habits and smoking (Prüss-Ustün et

al., 2016). As for environmental risk factors, ambient air pollution, exposure to fine particles (PM2.5), second hand smoke, lead and chemicals, as well as low physical activity levels were leading risk factors for stroke (Prüss-Ustün et al., 2016). Of these, ambient air pollution is to blame for 25% of the DALYs by stroke while 26% is caused by household air pollution (Prüss-Ustün et al., 2016). Strokes are also associated with occupational risks as long work weeks and stress attribute to the disease (Prüss-Ustün et al., 2016). The total burden of strokes due to environmental conditions is 42% (Prüss-Ustün et al., 2016).

The WHO's report on Preventing Disease Through Healthy Environments has outlined suggested interventions for cardiovascular diseases as a whole. Tobacco smoke free legislation and reducing the exposure to second-hand smoke, especially in workplaces, has shown improvement in cardiac health (Prüss-Ustün et al., 2016). Advancements in cooking stoves has improved household air quality, leading to less exposures (Prüss-Ustün et al., 2016). Outside the home, pursing cleaner air initiatives has led to less exposure to harmful chemicals and therefore less cardiovascular disease. Environmental risk factors have been taken into consideration when planning urban areas in terms of access to recreational facilities in hopes of increasing physical activity (Prüss-Ustün et al., 2016).

The Center for Disease Control and Prevention (CDC) recommend various prevention methods to reduce the risk of acquiring cardiovascular heart diseases. One recommendation is maintaining a healthy diet by eating fruits and vegetables and less processed foods (CDC, 2020). By doing so, less saturated, trans fats, and salt will be consumed while ingesting more fiber. Taking these precautions will also aid in preventing high blood pressure, diabetes, obesity, and high cholesterol (CDC, 2020). Sustaining a healthy weight is also an important prevention tactic in lessening risk of cardiovascular disease (CDC, 2020). Partaking in physical activity is

important for prevention as well (CDC, 2020). Finally, the CDC notes that smoking increases the risk of cardiovascular disease greatly (CDC, 2020). These are just a few tactics to prevent diseases of the heart but by pursing a healthier lifestyle the risk will decrease for many other diseases.

A systematic review was performed on monitoring the effectiveness of dietary advice in reducing cardiovascular risk. Providing dietary advice lowered total cholesterol by 0.15 mmol/L and LDL cholesterol by 0.16 mmol/L while blood pressure decreased by 2.61 mm Hg systolic and 1.45 mm Hg diastolic after 3 to 24 months (Rees et al., 2013). 24-hour sodium excretion by urine decreased by 40.9 mmol after 3 to 36 months (Rees et al., 2013). When compared to participants receiving no advice, those who received dietary advice increased their fruit and vegetable intake by 1.18 servings/day and fiber intake increased by 6.5 g/day (Rees et al., 2013). Meanwhile, total fat fell by 4.48% and saturated fat intake fell by 2.39% (Rees et al., 2013). In conclusion, patients receiving dietary advice benefit greatly in their attempt to decrease their risk to cardiovascular diseases.

Additionally, a systematic review by the Community Services Preventative Task Force (CPSTF) was done on involving community health workers as an intervention to preventing cardiovascular disease. This intervention also acts as a resource for screening services, health education, and increasing health behaviors such as healthy diet, exercise, and smoking habits (CPSTF, 2015). Community health workers also took part in reaching out to potential clients to help them apply for these services, provide monitoring, and follow-up (CPSTF, 2015). This is a great way to build a relationship with the community and aid them in their medical care. Another priority of this intervention was applying team-based care to the client's medical care as a way to coordinate the patient's experience (CPSTF, 2015). The Community Preventive Services Task

Force found strong evidence when considering the effectiveness of an intervention of community health workers engaging in team-based care in reducing blood pressure and cholesterol while improving health behaviors (CPSTF, 2015). By reducing blood pressure and cholesterol, stroke and other cardiovascular diseases are being prevented.

Based on these systematic reviews and recommendations by WHO and the CDC, there are a few important aspects of preventing cardiovascular disease I would include in policy or program. Most importantly, I recognize how important it is to have a link between the patient and the health care system to create team-based care. Community health workers fill this gap beautifully and provide the support and medical advice necessary. These clinics are important in reaching low-and-middle income groups, which is usually those most effected by health inequities. Providing screening tools to catch early diagnosis is crucial in cardiovascular disease and gives the patient time to make lifestyle changes before the disease has progressed. Health advice such as dietary choices, exercise habits, and environmental education such as household and ambient air pollution has also proven to be of resource for these patients. Many of the patients attending these clinics may have little to no education on healthy lifestyle habits. These initiatives may be beneficial in monitoring the on-going issue of cardiovascular disease.

The aspects I have mentioned previously correlate with sustainable development goals. Goal 3 states "ensure healthy lives and promote well-being for all at all ages," which a program of this kind would promote (Prüss-Ustün et al., 2016). Education and screening would be the best way to ensure healthier lives for all. Goal 10 states "reduce inequality within and among countries." (Prüss-Ustün et al., 2016). Providing a clinic as a resource to low-and-middle income countries, the health disparity gap would begin to close. These patients would have access to education on prevention, screening programs, medical guidance, monitoring, etc. that they

otherwise would not have access to. Goal 12 states "ensure sustainable consumption and production patterns" (Prüss-Ustün et al., 2016). Interventions such as clinics to reduce cardiovascular disease relate to this goal in that it pursues healthy nutrition advice. Urging education on healthy eating habits pays back to environmental health.

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