Laos: A Proposal for Sustainable Development Goal 3

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Laos has significant challenges to overcome to reach SDG 3, good health and well-being, by 2030. According to the Sustainable Development Report (2021), the most significant challenge appears to be decreasing the age-standardized death rate for non-communicable diseases, such as cardiovascular disease, cancer, diabetes, or chronic respiratory disease in adults aged 30-70 years old. Today, I will focus on the non-communicable disease with the highest age-adjusted death rate of 188.92 per 100,000 people, cardiovascular disease (IHME, 2020). To improve the age-adjusted death rate, I recommend improvements in education access focusing on literacy and healthy behaviors, increasing access to nutritious food by using nutrition-sensitive interventions and providing nutrition education, and improving the built environment with a reduction of air pollution and increased road access.

Cardiovascular disease is a group of disorders of the heart and blood vessels (WHO, 2021). Risk factors for cardiovascular disease include high blood pressure, smoking, high cholesterol, diabetes, being overweight or obese, and low socioeconomic status (SES) (Ada, 2022). Many of these risk factors are prevalent throughout Laos, especially in low SES people who are typically located in rural areas. With the majority of the wealth concentrated in the Vientiane area, with only 10% of the population, the rural areas suffer the most (Hays, 2014). Because cardiovascular disease has comorbidities with the majority of the other non-communicable diseases in the SDG indicator, improving cardiovascular disease will only seek to improve the disease burden for others.

1. Improve education access focusing on literacy and healthy behaviors in Laos.

In Laos, the education disparities are very apparent. Laotians living in rural communities do not receive education past grade 3 because the schools are not adequate, and they must help their family survive financially (World Bank Group, 2017). School is where you can promote

healthy behaviors because of regular attendance (CDC, 2020). Because of early dropouts, Laotians may not receive education on common health behaviors, such as handwashing. Learning these health behaviors at school provides the foundation for many individuals to live a healthier adult life.

Furthermore, you learn how to read, write, and comprehend literature at school. The literacy rate in Laos is 73% but is often lower in rural areas (Give a Day Global, 2021). Literacy is attributed to appropriate health behaviors, as well. For example, Takahashi et al. (2021) studied 68 patients prescribed antihypertensive medicines to identify how likely they were to adhere to treatment. They found only 38% of the patients began the treatment because they were able to read the written instructions. Illiteracy made it difficult for other patients to understand how and why they needed to take the antihypertensive medicine. Reading and comprehending your illness and the medications is imperative to playing an active role in your overall health. To increase retention at school, promote healthy behaviors, and improve literacy, we need to train local teachers on these specific skills and provide better resources for the schools. As evidenced by Save the Children and UNESCO's training program, net enrollment increased by 3% and subsequently literacy (Smith, 2016). To help those in the at-risk age group, we need to implement non-formal education programs in rural areas as well. Big Brother Mouse, a non-profit, serves as a great example of this. They have Lao trained staff teach reading and writing skills to young adults who may not have learned them in school (Big Brother Mouse, 2022). By improving education, Laotians will be able to take complete control of their health and apply these skills to decrease the risk factors of cardiovascular disease.

2. Increase access to nutritious food by using nutrition-sensitive interventions and provide nutrition education.

Malnutrition is a risk factor for cardiovascular disease prevalent in Laos (Eroğlu, 2019). Additionally, malnutrition leads to other health issues related to cardiovascular disease, including stunted growth, eye problems, and diabetes (Streit, 2018). In Laos, stunting affects about 33% of children under five (UNICEF, 2017). Stunting has significant consequences in your adult life, such as an increased risk of obesity and nutrition-related chronic diseases (De Sanctis et al., 2021). Therefore, preventing stunting at a young age will have major health benefits later. There are many different causes of malnutrition, namely inadequate food intake, dietary diversity, and household food insecurity. Rural and mountainous communities in Laos are typically low SES and isolated, which leads to limited access to food (Boulom et al., 2020). For instance, when the UN World Food Programme provides food aid, these remote areas are harder to reach (Eco-Business, 2019). Many of these communities engage in agricultural production that can contribute to food security, nutrition, and livelihood in the poor rural areas, but dietary diversity is limited (Boulom et al., 2020). So, it is imperative to implement nutrition-sensitive interventions to help combat malnutrition in these areas. Forest conservation is one of the ways to do this. Preserving natural resources and creating preservation zones will prove to increase food access by providing alternative sources of food. These natural resources provide non-timber forest products (NTFPs) (Boulom et al., 2020). NTFPs are alternative food sources that include nuts, fruits, mushrooms, honey, etc. (Gore, 2018). All of this food provides essential nutrients to help prevent malnutrition.

According to the World Health Organization (2019), malnutrition involves undernutrition, inadequate vitamins or minerals, and overnutrition. In addition, rice, processed and red meats, and alcohol are foods and drinks that can increase your risk for heart disease (DerSakissian, 2021). The commonly consumed foods in Laos, Khao Niew (sticky rice), Sai Kok

(spicy pork sausage), and Beerlao, contribute to the risk of developing cardiovascular disease (Allan, 2022). When these foods are consumed regularly, Laotians are at a higher risk for cardiovascular disease. For Laotians to understand the importance of eating healthier alternatives and how different foods affect their body, there should be widespread nutrition education programs. In particular, Aide et Action, an international non-profit, has implemented a nutrition education program in different communities in Laos. Their program with parents showed an increase in nutrition knowledge, how to cook nutritious foods, and understanding of the five major food groups (Redmond, 2021). Their program can serve as a framework for implementing a nutrition food program on a larger scale.

3. Improve the overall built environment by reducing air pollution and increasing road access.

The built environment in Laos disproportionately affects Laotians' health in different capacities. First, air pollution is a massive problem in Laos. According to World Health Organization 's (WHO) guidelines, the air quality in Laos is moderately unsafe. The country's annual mean ambient particulate matter pollution, PM2.5, is 25 $\mu g/m^3$, exceeding the recommended maximum of 10 $\mu g/m^3$ (IAMAT, 2020). The harmful air pollutants lead to cardiovascular disease's most severe health effects, like artery blockages leading to heart attacks and death of heart tissue due to oxygen deprivation, leading to permanent heart damage (PSR, 2009). Outdoor air pollution stems from vehicle emissions, agricultural burning, and coal-fired power stations (World Bank Group, 2021). Fires used for agricultural management are the primary sources of noxious pollutants that degrade the air quality (Cook, 2021). To reduce air pollution, we should promote a reduction in agricultural burning and an alternative way to dispose of agriculture. By reducing agricultural burning, health is substantially improved. The

reduction and its health effects were observed in Zheng and Unger's study of global air pollution. Zheng and Unger (2021) used a global Earth system model to quantify the impacts of 50% emission reduction. The 50% emission reduction illustrated we could avoid 4 million deaths if achieved.

Second, road access in Laos is extremely limited in rural areas. The roads are either nonexistent or inaccessible all-season round (Warr, 2008). The lack of all-season roads leaves many Laotians with no form of transportation**.** There are limited numbers of clinics in rural areas with services for chronic illness, so many people have to travel to district hospitals for treatment (WHO, 2014). Without road access, Laotians have an increasingly difficult time reaching the health centers. To improve cardiovascular disease mortality, we need to increase access to all-season roads. Laos' previous Rural Access Roads Project in 2009 demonstrated that expanding road access increased accessibility to health care facilities (Asian Development Bank, 2009). By continuing to expand this project, more rural Laotians will have more access to roads and healthcare services. Because of the improved road access, Laotians will be able to receive early diagnoses and treatment for cardiovascular disease, consequently improving their health and decreasing the mortality rate.

To reach SDG 3, good health and well-being, we need to invest in the best possible changes to produce favorable outcomes. Thus, the following recommendations must occur: improved education access focusing on literacy and healthy behaviors, increased access to nutritious food by using nutrition-sensitive interventions and providing nutrition education, and improved built environment with a reduction of air pollution and increased road access. These recommendations offer Laos the opportunity to prevent the disease burden of cardiovascular disease on the lives of the Laotian people.

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