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Global Environmental Health

Final Report:

Diarrheal Disease

The World Health Organization released an assessment of the burden of disease from environmental risks in 2016. The study estimated the burden of diseases and injuries attributable to the environment, and how diseases could be prevented with modifiable factors. The United Nations created Sustainable Development Goals (SDGs) to improve health globally, many of which are closely linked to environmental health and environmental exposures (Pruss-Ustun, et. al., 2016). There are 17 of these goals, ranging from ending poverty to achieving equality. The goals are broad and idealistic, but they offer a target for which policies and programs should be formed around.

When it comes to the burden from unhealthy environments, the WHO recommends several approaches: focusing on primary prevention, considering health in all sectors, supporting local government’s ability to address environmental health, and considering emerging risks due to climate change (Pruss-Ustum, et. al., 2016). It is important that policies and programs be proactive in addressing current issues as they relate to climate change. Effects of climate change are likely to exacerbate many global health problems. Mitigation and adaptation methods should be researched that not only seek to improve current conditions, but also contend with future circumstances posed by climate change.

One global environmental health problem that is highly attributable to environmental risk factors is diarrheal disease. Diarrheal disease is one of the leading causes of death in children under five years old (Soboska, 2021). According to the WHO’s report on the burden of disease from environmental risks, total environmental risk accounts for 58% of the disease burden from diarrheal disease (2016). Therefore, children under five are the target population of those most affected by this global health issue. Considerable progress has been made to reduce deaths from diarrheal disease by establishing exposure prevention measures like increasing access to clean water, better sanitation, and improved nutrition (Andrade, et. al., 2019). Still, diarrheal disease is highly preventable and further work is necessary to improve conditions and save young children.

The geographical areas most affected by diarrheal disease are Sub-Saharan Africa and Southeast Asia, where many areas have inadequate water availability, shortage of sanitation, and poor hygiene habits (Soboska, 2021). Pathogens that cause diarrheal disease are predominately transmitted when water and food contaminated by feces are ingested. In some areas, open defecation is a common practice, which leads to people encountering human or animal excreta, or flies landing on feces and then carrying pathogens to food products. Another common practice is the reuse of wastewater for irrigation, allowing for a potential transmission route of diarrheal disease pathogens (Contreras, et. al., 2020). Malnourished children are most susceptible to these pathogens. The WHO estimates that morbidity from diarrheal disease could be reduced by 45% by filtration and safe storage of water (Pruss-Ustum, et. al., 2016).

The global burden of diarrheal disease is associated with nearly all UN Sustainable Development Goals in some way, but several specifically. Goal 6 is to “ensure availability and sustainable management of water and sanitation for all”. Goal 10 is to “reduce inequality within and among countries”. Goal 13 is to “take urgent action to combat climate change and its impacts”. Additionally, target goals of the SDGs include: to provide universal health coverage for essential care and to further reduce under-5 mortality (Binns, et. al., 2018).

There are many ways to reduce the burden of diarrheal diseases. Most of these solutions seem easy to achieve to those living in high-income countries where clean water and sewer systems are commonplace. However, in areas where the infrastructure for pipe water or latrine systems is not available, the risk for diarrheal disease is very high. Most child health aid provided to highly affected areas is targeted to combat diarrheal diseases and malnutrition (Bavinger, et. al., 2017). It is essential for this aid to be implemented effectively to solve this global health problem. Improved sanitation, access to clean water sources, and vaccines are obvious ways to lower the burden. Some other solutions include breastfeeding, nutrient supplementation, and health promotion activities. One health promotion study showed that even with limited resources and inadequate infrastructure, improved hygiene is still possible by focusing on water storage and handling methods that limit contamination (Andrade, et. al., 2019).

Water, sanitation, and hygiene (WASH) interventions are a global initiative to improve life conditions related to clean water (cdc.gov). Many organizations have created programs and policies to try to improve conditions related to WASH. A cost-effective intervention that works well to prevent death from diarrhea is administering oral rehydration solutions (ORS). One study showed that there is a strong association between ORS coverage and government effectiveness (Andrus, et. al., 2020). This is likely due to the financing available to health facilities being dependent on local government support. Another intervention called SHINE (Sanitation and Hygiene Innovation in Education) is a research project that focuses on voluntary participation and draws on the integrated behavioral model (Hetherington, et. al., 2017). The purpose of the study is to educate school age children about sanitation and hygiene, and to expand participation to the community. The study was well-received and beneficial but only effective on a small-scale. However, changes in perception and knowledge may have lasting effects within a community if the knowledge is passed on.

A concerning issue is the increasing decline of water quality due to the effects of climate change. Flooding is expected to increase in frequency and is strongly linked to outbreaks of diarrheal disease (Alexander, et. al., 2018). Also, there are socioeconomic factors that pose risk factors for diarrheal disease. Lack of access to clean water is more likely to affect those living in poverty and lack education (McIver, et. al., 2016). I would recommend that the effects of climate change on our ability to achieve clean water, sanitation, and hygiene be heavily researched in the next few years. That way, policy development and programs can be proactive in their strategies. Without mitigation, it is projected that diarrheal diseases and vector-borne diseases will account for an increased burden due to climate change effects like extreme weather (Sheffield, et. al., 2011). Climate change is expected to continue for decades to come, even if we achieve carbon-free goals. Preventing increased disease burdens and adapting to inevitable changes is required. I think that health promotion and expanding education are critical initiatives to prepare for the future. Knowledge is power, and education, like healthcare, should be a basic human right. According to the United Nations, the right to education should enable every child and adult to contribute actively to society and enjoy the benefits of development (Matsuura, 2008). Therefore, programs that lead to more highly educated communities may help to improve the environment that people live in and reduce the burden from illnesses like diarrheal disease.

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