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Africa-Western Collaborations Day 2020: Public Health Panel Overview

The Public Health panel kicked off with the topic of malaria elimination presented by Anusheh Hasan, Priscilla Matthews, and Gurleen Saini, whose project described a potential rollout of Bi-Impregnated Insecticide-Treated Mats & Curtains (ITMCs) in Tanzania. This project was intended to supplement Tanzania's Malaria Control program to help meet Sustainable Development Goal (SDG) Target 3.3, which is to end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases, as well as combat hepatitis, water-borne diseases and other communicable diseases by 2030. Currently, malaria is the leading cause of death in Tanzania, especially in children under 5. Although Insecticide Treated Nets have been previously distributed, there were several issues that led to their lack of usage, including the smell of the nets around the bed, deterioration of the nets, storing nets for guests, and insecticide resistance. A unique solution to these presenting issues was the distribution of mats and curtains with two types of insecticides - alpha-cypermethrin, which reduces human vector contact, and chlorfenapyr, which leads to loss of cell function and causes vector death. Replacing nets with mats and curtains resolved smell, deterioration, and storage issues, while the addition of another insecticide managed the effects of insecticide resistance. This project incorporated community involvement by using locally-sourced products as well as education teams. Local production would allow continuous production of ITMCs in the long-run and easy replacement if products deteriorated, while educational seminars would clarify the relationship between mosquitoes and malaria so that locals could prioritize the use of this equipment to prevent malaria outbreaks. Overall, community involvement would ensure the sustainability of the project for years to come and is an essential component in the fight against malaria.

SDG Target 3.3 was addressed again in presentations by Roger Antabe, Zhongtian (Eric) Shao, and Steven Trothen, who studied topics surrounding HIV. Antabe's research was about HIV prevention among the African, Caribbean, and Black heterosexual (ACB) male population in Ontario. Although there is a perception that behavioural factors are primarily responsible for the disproportionately high rates of HIV this population faces, Antabe's data analysis revealed other issues leading to poor preventative care, such as the unavailability of culturally sensitive care for ACB men. This creates structural barriers and promotes disengagement with HIV healthcare providers for ACB men.

Shao's research proposal will similarly examine high HIV rates, this time among male adolescents in Rakai, Uganda. The completed study may reveal a relationship between anaerobic bacteria in the penile microbiome and susceptibility to HIV. Meanwhile, Trothen's research identified four cytokines (interferon gamma, monocyte chemoattractant protein 1, macrophage inflammatory protein and C-X-C motif chemokine 10) present in high levels in the endocervical tract less than 60 days after contraction of HIV. Together, these three presentations underlined how social and biological factors work together to perpetuate the spread and presentation of HIV/AIDS, emphasizing the need for holistic policies and solutions surrounding this issue. Consideration of both biological and social determinants has the potential to improve existing prevention, testing, and treatment protocols for HIV.

'The Power of Poop', a presentation by Adaku Ohuruogu, Leigh Raithby, Jasandeep Sehra, and Ayah Karra-Aly, explored a biofuel-centered upstream approach to target diarrheal disease in Uganda. Diarrhea is currently a major driver of childhood malnutrition and continues to result in preventable deaths in the region despite the existence of oral rehydration therapy. A two-part initiative was proposed, where: (1) waste from latrines could be collected and converted

into methane in a biogas plant, and (2) Ugandan households would receive container toilets which are collected biweekly for conversion into a renewable charcoal energy source. A reduction in open defecation practices would decrease water contamination, targeting SDG 6 (clean water and sanitation) and subsequently reducing the incidence of diarrheal waterborne diseases (again targeting SDG 3.3). Benefits would be far-reaching, with impacts on several other SDGs surrounding sustainability, energy consumption and production, and climate change.

Next, Jason Were and Bianca Ziegler presented public health issues focused on women's health. Were's presentation studied the epidemiology of overweight and obesity in Ghana, focusing on predictors and risk groups amongst women of childbearing age. Ghana is a lower-middle income country where obesity is a major public health concern. Amongst women of childbearing age, 24.8% are overweight and 15.3% are obese. The study concluded that the strongest predictors for overweight and obesity for women of childbearing age in Ghana are age and wealth, and therefore older and wealthier women are considered a high-risk group.

Ziegler's study focused on antenatal care utilization in the Democratic Republic of Congo (DRC). In the DRC, 473 out of every 100,000 women die during childbirth. Antenatal care services are essential in reducing the number of pregnancy-related deaths; however, access to these services can be limited due to conflict within the DRC. This study found that women living in high-conflict areas were less likely to utilize antenatal care services than women living in areas with moderate levels of conflict. Other factors such as gender-based violence, autonomy, and wealth also influence whether women obtain antenatal care.

Both Were and Ziegler stressed the importance of group-specific and context-specific interventions when improving women's health. Using systems thinking, a multifaceted solution must be enforced in order to alleviate the numerous factors that negatively impact women's health and prevent them from accessing health care services. This will ultimately achieve SDG 3.1, reducing global maternal mortality, and SDG 3.7, ensuring universal reproductive healthcare services.

Lastly, Ryan LaPenna's presentation proposed a One Health approach to address challenges posed by rabies to dogs and people in rural areas in Victoria Falls, Zimbabwe. This novel solution aimed to prevent the occurrence of rabies in dogs and humans while enhancing the treatment of rabid animal bites among people, specifically children under the age of 15. About 99% of rabies cases can be attributed to dog bites, where 40% of the victims are children under 15. The objective of this project was to vaccinate dogs against rabies to preserve the interconnectedness of the Victoria Falls ecosystem. This consequently will improve the prevention of rabies in dogs and humans while also improving the provision and quality of rabid animal bite treatments in rural communities. Lastly, this project integrates an educational component to increase public awareness of rabies prevention. Like many of the presentations listed above, a One Health solution contributes to achieving SDG 3, good health and wellbeing, and SDG 15, improving life on land.

Overall, this panel consisted of numerous innovative ideas addressing major public health issues. The presentations showed the importance of sustainable and context-specific solutions in the fight to achieve the UN's Sustainable Development Goals.