All Bases (and All Spaces) Covered: Addressing Outdoor Sleeping and Malaria Prevention in Rural Senegal

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Project Summary

- Malaria is a mosquito-borne illness that has a devastating effect on many tropical communities. Several international organizations such as the World Health Organization (WHO) have implemented interventions such as mass distribution of insecticide-treated mosquito nets for sleeping spaces to prevent disease transmission. In rural Senegal, a large majority of village populations start the night sleeping outside, as the insides of their huts get too hot during the day. The Senegalese Department of Health, with assistance from the WHO and the Roll Back Malaria initiative, provides nets for inside sleeping spaces, but not for outdoor spaces.
- By providing nets for outdoor sleeping spaces to several villages in the Kedougou a rural area in southeast Senegal, this project aims to provide valuable protection against malaria transmission.

Goal

- Goal: To decrease transmission of malaria in rural Senegal

- (Area colored in red marks the Kedougou region of Senegal)

Objectives

- To identify and provide mosquito net coverage for all outdoor sleeping spaces in a subset of villages in the Kedougou region of Senegal
- To demonstrate a statistically significant reduction in malaria transmission in these villages over time as compared to villages who do not receive outdoor sleeping space nets
- To provide a novel example of universal coverage against malaria transmission and its effects on morbidity over time as compared to the current WHO standard
- To provide the Senegalese Department of Health and WHO with information that may improve global health and humanitarian practices on a large scale

Background

- Malaria is a potentially fatal disease caused by *Plasmodium* species that is transmitted from person to person by mosquitoes. A significant proportion of malaria disease burden lies in sub-Saharan African countries such as Senegal. The *Anopheles* mosquito is the transmission vector for *Plasmodium*, and is most active during the dusk and dawn periods.
- In countries with a heavy malaria burden, the disease may account for as much as 40% of public health expenditure, 30-50% of inpatient admissions and up to 60% of outpatient visits. The use of insecticide treated nets is associated with significant reductions in all-cause child mortality and clinical episodes of malaria.
- Because of the high daytime temperatures in this area of the world, temperatures inside home dwellings can often reach sweltering levels. Outdoor sleeping at the beginning of the night while houses cool down is very common in rural Senegal, with villagers moving inside halfway through the night.
- Mosquito net mass distribution efforts as part of Senegal's universal coverage campaign are based on the WHO's recommendation of 1 net per 1.8 people. These nets do not cover outdoor sleeping spaces.
- Netlife is a small non-governmental organization co-founded by Dr. Andrew Sherman dedicated to providing free insecticide treated, long-lasting mosquito nets to rural inhabitants in West Africa. In 2012, Netlife's team surveyed 1700 family members in the Kedougou region and found that 1 net for every 1.2 people provided more accurate coverage, based on the people's cultural sleeping habits.

- Outdoor sleeping spaces with mosquito nets and a typical hut

Methods

- Netlife volunteers will travel to the Kedougou region of Senegal and provide free mosquito nets for outdoor sleeping spaces to randomized villages within the region.
- The organization will partner with local villagers who previously invented a cheap, effective net attachment system for outdoor sleeping spaces. This will promote local business as well as provide a sustainable source for the attachment systems.
- While in country, Netlife volunteers will also continue to provide extensive education on malaria prevention and net maintenance.
- Netlife volunteers, in partnership with Peace Corps Volunteers and local Senegalese health workers, will track the rates of malaria over the next few years in villages that received outdoor nets and villages that did not.

Observations/Conclusions

- Netlife has previously distributed over 60,000 nets in Southeast Senegal, saving over 3,000 lives. Previous post-distributions surveys and observations indicate that the use of nets in the target areas is over 90%.
- By making available mosquito nets for outdoor sleeping spaces, Netlife can further decrease rates of malaria transmission, thereby decreasing morbidity, mortality, and overall health care expenditures in Senegal.
- These practices, if implemented in further universal coverage campaigns by both the Senegalese Department of Health and other similar organizations, could contribute significantly to the eradication of malaria in sub-Saharan Africa.

- Villagers in Bandifassi pose with an outdoor sleeping space protected by mosquito nets.

Future Direction

- Continue to promote distribution of mosquito nets for outdoor sleeping spaces in areas where outdoor sleeping is prevalent
- Share our findings with the Senegal Ministry of Health and other organizations fighting malaria in similar populations.