Vector-Borne Disease: Malaria in Children

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Living in the United States, we are privileged to not have to see a lot of things that are more common in developing countries of the world. Through taking environmental health this semester I have gained greater understanding of how just a small shift in an individual's circumstances, plays an enormous role in an individual's health. In America, we have access to health care that provides prevention and treatment of many diseases, and promotes good health, but in other parts of the world individuals are not as privileged. Malaria is one of those diseases, that's rate of contraction skyrockets depending upon where you live in the world. Malaria is a vector-borne disease, which is less common in the United States, but has a significant presence in many parts of the world, and more importantly, in Africa and India. Malaria is also a communicable disease which means it can be transmitted from one person or animal to another. And a vector-borne disease is "an infectious disease, caused by protozoa, bacteria, and viruses that are spread by organisms such as mosquitoes or ticks (Frumkin, 2010, p. 307). Specifically, Malaria is transmitted by female anopheles mosquitoes that have been infected through a previous blood meal taken from an infected person or animal. In this paper, I will discuss a case study done in the Africa about Malaria and the children it affects, and a second case study that looks at Malaria in India. The purpose of this paper is to develop an understanding of Malaria and how it is contracted, as well as looks at cases that are working to prevent and cure the spread and prevalence of Malaria among children in developing countries of the world.

Methodology/Measurement of the Issue

The Centers for Disease Control and Prevention says that, "Malaria or a disease resembling malaria has been noted for more than 4,000 years" (The History of, 2012). And records have been kept to keep track of its prevalence for many years. Being that Malaria is a temperature sensitive disease, there are more cases during certain temperature levels, seasons, and the prevalence of disease like HIV/AIDs, Tuberculosis, and other neglected tropical diseases are affected by the climate changes that are occurring. In this case, Malaria is a disease that thrives in warmer climates. In Frumkin, it discusses how the prevalence of diseases in Africa and India has more of an impact in areas with higher humidity levels and temperatures. The rate Malaria is measured by its incidence rate that is determined by the annual parasite rate. While Malaria's vector is the female anopheline mosquito, there are many species that are capable of infecting humans as seen in Figure 1.

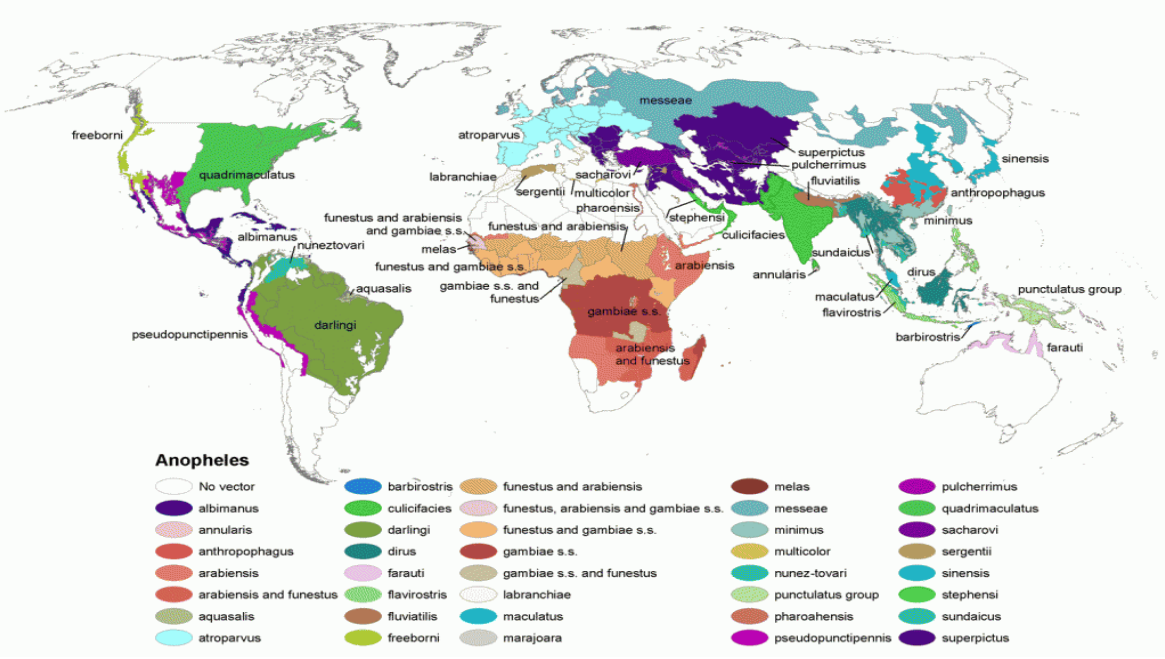


Figure 1: Different Anopheles Species in the World and their location.

In Figure 1, you can see the species of mosquitoes that most affects Africa is anopheles gambiae s.s. and the anopheles culicifacies in majority of India. Prevention of Malaria means staying inside when mosquitoes are most likely out, the time between dusk to dawn, but since that's not always possible there are other precautions that individuals can take in developing countries. Use of mosquito repellent sprays and creams as well as using an insecticide-treated mosquito net is the more common way to prevent mosquito bites in these countries.

Malaria & Children in Africa

Africa is a continent unlike any other in the world. It is one continent comprised of many developing countries with diverse cultures and languages. In 2013, Malaria claimed 584,000 lives, with an uncertainty range of 367,000 to 755,000; mostly among African children under the age of five (Malaria, 2015). Figure 2 shows how the mortality rates of Malaria for children less than 5 years of age, 5 years and over, and compared to the global rate of the disease over all ages.

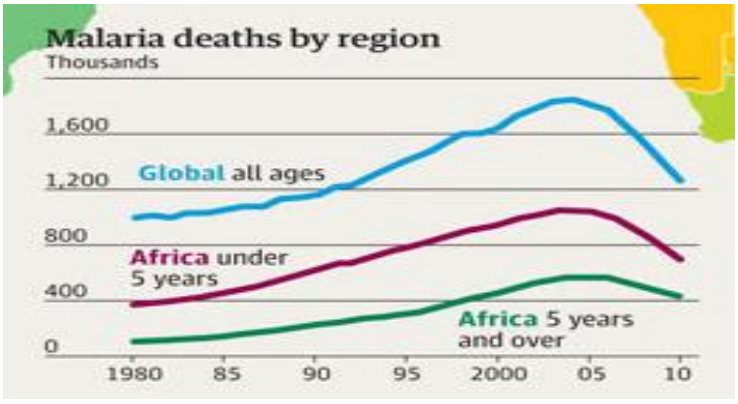


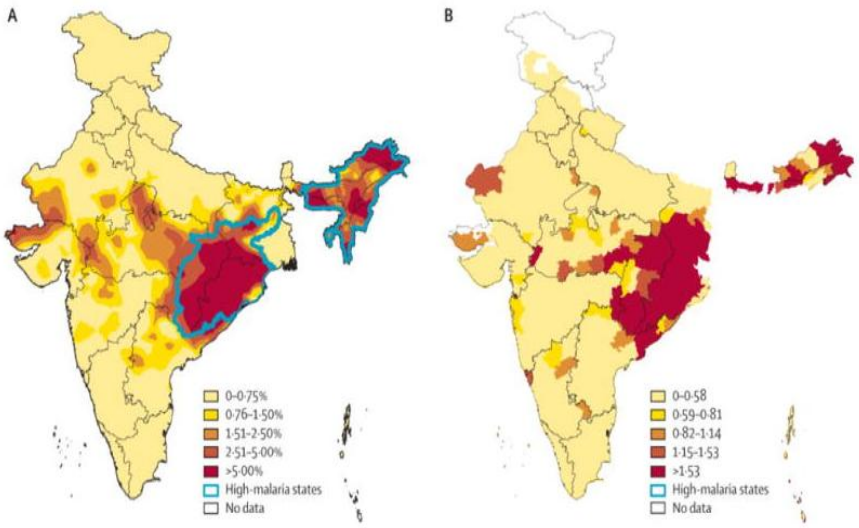
Figure 2: Malaria Mortality rates during 2010.

The mortality rate of Malaria in Africa is significantly higher than individuals over the age of 5 in Africa during 2004. But in a cases study performed by UNICEF states that,

"…Malaria causes approximately 20 percent of all child death," but for children who escape death from this disease are not out of the clear (2004, October 1). Malaria hinders their development and causes more problems as they go through life. Malaria also takes a toll on the children who do not directly contract the disease, but when those in their families that support them get the disease they are also affected in a major way. Often times when the parents of African children contracts Malaria, the eldest child takes on the role of the provider to the house. This removes them from school limiting their educations and affecting their health indirectly.

Malaria & Children in India

In a study published in the National Center for Biotechnology Information Journal, NCBI, Malaria is reported by the Indian Government as being concentrated mainly in a few states in the east and northeast states of India. These states are as shown by the area outlined in blue in Image A and the red shaded region in Image B of Figure 3 (Dhingra, 2010).



There is also a great burden of Malaria in pregnancy in India. Mothers that are infected with Malaria, have babies that are affected by having side effects that include premature interruption of pregnancy, low birth weight, parasite sequestration in placenta which means the parasite "taking over" the placenta. Newborns born to mothers that have been infected by Malaria are at increased risks of being born with Malaria and often times these pregnancies result in infant mortality and maternal death. Babies in India to mothers infected with "…Malaria with low birth weights, had significantly lower rates during the first six months…" this impacts the babies' growth and development (Estimation, 2010). Affects of stunted development are diminished intellectual functioning, less schooling, and reduced earnings, placing these children a step behind everyone else.

Analysis

African countries have seen great devastation from Malaria. In the case study, it focused on Malaria in children in sub-Saharan Africa. It cost Africa $10 billion to $12 billon US dollars every in the loss of gross domestic product because so many of their young people are infected and are unable to work. The case study also discusses the steps that UNICEF is taking to help aid the epidemic of malaria in African countries. The article stressed the importance of widespread use of insecticide-treated nests and providing education to individuals about the transmission of the disease.

In the case study for India, it discussed the Indian economy of the affected areas. India's gross domestic product, GDP, is the fourth largest in the world, and is the 9th wealthiest country in the world. This means that India is a fairly wealthy nation compare to nation in Africa (Zuliani, 2011). The states with the lowest childhood Malaria

rates in India are associated with having more parents of higher socioeconomic status. In India, the government has established many programs to assist its citizens to receive vaccinations, and spread the necessary equipment (i.e. insecticide treated nets and bug sprays) to families in need. Malaria eradication has started in India, but there is still a great deal of work that needs to be done to protect its citizens and most importantly pregnant mothers and newborns.

Conclusion

In America, our children have the privilege to have a home where they can lay their heads, whether it is the fanciest of houses or simply an apartment. However in many areas of the world, such as India and countries in Africa, children do not have the same advantages and have to sleep in tents to protect themselves from vector borne diseases. Malaria is a communicable disease that is completely curable and can be treated, and through aggressive programs, funding and support assistance for countries that are affected by Malaria, we can make a difference in the lives of many children. The rates of Malaria are beginning to shift into the direction we all want to see them moving, decreasing. International and government programs are all working tremendously to provide treatment to African families. Former President Herbert Hoover said, “Children are our greatest natural resource”, and by insuring their health and the environment that they live in, we can insure the future of their children, and the future of the country.

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