Disease vectors, enemies of the future

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In today's society we all face the constant threat of global warming, economic crisis and war, both in the present as in the future. Some people choose to ignore these problems while others try to face them in order to create a better future for those less fortunate and improve prospects for coming generations. In the end, all of these problems will affect the entire world in one way or another. A major part of humanity is and will be suffering from starvation, disease, overpopulation and from many other threats in the future. Humans are not the only ones being affected whereas many ecosystems will also be negatively affected by global warming. This can lead to extinction of species that simply don't have the same ability as mankind to adapt to these rapid changes on the planet.

Vector-borne diseases

In nature there are some species that can quite easily adapt to rapid changes and actually thrive because of them. Disease vector species belong to this group and include mosquitos, ticks, flies, fleas, Triatominea beetles and aquatic snails. These are mostly invasive species that have the ability to quickly adapt to new changes in the environment and can spread at incredible speed within new ecosystems. These vector species also often carry deadly pathogens with them, having the ability to cause massive outbreaks of diseases in both animals and humans.

While vector species present a minor problem for most parts of the contemporary world, they will increase in both occurrence and geographic spread because of global warming. In many exotic parts of the world, these vector-mediated diseases have been a common problem for a long time as climate has been conducive for both vectors and pathogens. Because of climate change, many of these vector diseases have been able to spread much further than before in response to higher temperature and humidity. Combined with the fact that human populations are much denser than they have ever been in a lot of areas, the spread of these diseases will be amplified.

In many developed countries there are countermeasures to limit the spread of disease by controlling vector populations, educating the population and treating cases of the disease. With average global temperatures predicted to increase by 5.8° C before the end of the century, we may expect detrimental effects on society. Factors such as poverty, crop failure and an inadequate public health system will then be a possibility also in developed countries. This will then enhance vector spread diseases to such a degree that it can no longer be controlled and this may in turn cause epidemics.

Important facts involving vector-borne diseases

Are responsible for about 17% of all infectious diseases

Over 1 billion people are infected every year, with dengue fever alone causing about 390 millions of those cases. 2.5 billion people run the risk of getting infected by dengue every year!

Vector-borne diseases cause 1 million deaths annually, malaria is having the highest mortality with more than 450000 yearly deaths.

Most affected by vector-borne diseases are children under 5 years of age

Vaccines for most vector-borne diseases only work to a certain degree since many are still under development

The Black Death is one example of a vector spread disease that got out of hand and killed nearly half of Europe's population in the 14th century. Most of the vector-spread diseases that are carried by vectors don't have the same ability to spread without a vector, as seen for the plague, but if the spread and intensity of vectors continue to increase, we might face a similar problem in a not too distant future.