How climate change can fuel listeriosis outbreaks in South Africa

The listeriosis outbreak that began in early 2017 in South Africa (SA) is the largest recorded globally.[1] The source of the outbreak was located in early March 2018, when traces of the Listeria monocytogenes bacterium were found in a food production facility in Polokwane, Limpopo Province, SA, which produces ready-to-eat processed meat products.[2] By the time the source was identified, about 950 cases of invasive disease had been confirmed and 180 deaths reported, almost certainly underestimates of the actual extent of the disease.[3] Actions to halt the outbreak, such as product recalls and closing implicated processing plants, are clearly an immediate priority, as are steps to enforce environmental health standards. It is also important, however, to pay attention to factors relating to the longer-term, structural environment in which such outbreaks unfold and which may contribute to an increased frequency of cases in the near future. One such factor is climate change, which has garnered little attention thus far in the discourse surrounding the outbreak.

The wide-ranging environmental effects associated with global climate change markedly alter the epidemiology of food-borne diseases, including L. monocytogenes.[4] Even though Listeria species are ubiquitous within the natural environment, several features of the epidemiology and characteristics of the microbe make it especially climate sensitive. Spikes in ambient temperature and high summer temperature peaks, for example, have been linked to the occurrence of listeriosis, as with most diarrhoeal pathogens.[4,5] Hot weather extremes that become more common with climate change, augment the replication cycles of L. monocytogenes and could cause breakdowns in food cooling chains, with rapid rises in numbers of the bacteria on food products.[5] But, aside from temperature increases, altered rainfall patterns and lengthened dry seasons – as we have seen in the western regions of SA – may influence Listeria transmission.

L. monocytogenes is classically associated with the food chain, during pre-harvesting and processing and at retail level.[6] Water scarcity can compromise hand hygiene, as well as cleaning and sanitising operations in the food products industry. Cleaning hands during pre-harvesting and processing and at retail level. Without concerted action to prepare for the health effects of climate change, and in the absence of efforts to reduce further environmental degradation, South Africans may face many more large outbreaks of infectious diseases in years to come.

Ultimately, infectious disease outbreaks, which may become more frequent with rising ambient temperatures and water scarcity, are the proverbial canary in a coal mine. They serve as but one reminder of the devastating effects of climate change presently unfolding in SA. As with all nations, the country needs to take rigorous steps to prepare for these changes. The high levels of carbon emissions in SA, especially its reliance on coal for power, may well worsen the impact of climate change. In SA, 93% of electricity production is still obtained from coal, more than double the global average (42%), and renewable energy sources account for 2% of electricity compared with a world average of 22%. Also, challenges in public transport in the country, especially with train services, have heightened the use of taxis, cars and other forms of carbon-intensive transport. Without concerted action to prepare for the health effects of climate change, and in the absence of efforts to reduce further environmental degradation, South Africans may face many more large outbreaks of infectious diseases in years to come.

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