To: Myron Ebell[Myron.Ebell@cei.org]
From: Myron Ebell
Sent: Sun 11/12/2017 6:06:23 PM
Subject: Reminder: Cooler Heads Coalition meeting Monday, 12 noon, at CEI

Reminder: the Cooler Heads Coalition will hold its regular monthly strategy meeting beginning at 12 noon on Monday, 13th November, at CEI, 1310 L Street, N. W., Seventh Floor. Please e-mail me with agenda items or questions.

I know some people will find this scientific study incredible, but it turns out that in past eras cold weather has led to crop failures and hence to famines and epidemics. If cold weather can do that, think what even more terrible things warm weather might cause.

Interestingly, the study suggests that long periods of cold, dry weather were the primary facilitators of epidemics in the past. The records suggest that cold periods in ancient and pre-modern China were associated with an increase in the frequency of droughts, as well as attacks of locusts.

https://www.eenews.net/climatewire/2017/11/07/stories/1060065835

SCIENCE

Cold climate tied to famine, locust swarms in ancient China

Chelsea Harvey, E&E News reporter

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Flooding in China has historically contributed to epidemics, and climate change could make that even worse. Paul Gonzalez/Flickr

Scientists are worried about the effects of long-term warming on human health and infectious disease, but a new study finds a link between epidemics and a cold climate.

By analyzing Chinese records throughout nearly 2,000 years of history — from between A.D. 1 and 1911 — researchers have found that climate-driven disturbances like floods, droughts and locust outbreaks were associated with disease epidemics. The findings, published yesterday in *Proceedings of the National Academy of Sciences*, particularly suggest that climate-related agricultural failures may have led to famines and declines in human health and nutrition, which made communities more susceptible to infection.

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As a result, the scientists write, "climate cooling could have resulted in collapsed agricultural production and reduced health conditions due to famine, thereby increasing the prevalence of human epidemic events."

The new research underscores the idea that climatic changes may affect human health in a variety of ways. Present-day concerns about climate change and infection often focus on the potential of higher temperatures to facilitate the spread of disease vectors, like mosquitoes. Indeed, scientists are already finding links between climate change and vector-borne diseases like malaria or dengue fever. But the new research suggests that climate-driven failures in agriculture may have had equally significant effects on human

health and susceptibility to disease in the past.

It's also not the first time ancient climate cooling events have been linked to an increase in infectious disease. Some studies — such as one examining years during the Renaissance, published in *PNAS* in 2011, and another covering a period in the Middle Ages, published in *Nature Geoscience* last year — have suggested that periods of cooling in Europe have also been associated with both social upheaval and disease outbreaks.

These studies may seem to contradict other research suggesting that hotter, wetter climate shifts contribute to increases in disease outbreaks. But the authors of the new paper point out that the links between climate conditions and disease transmission patterns may depend heavily on the time scale in question. Indeed, while long periods of cooling were associated with epidemics via agricultural failure, the researchers note that on smaller time scales, temporary spikes in temperature may have helped disease-carrying insects and other vectors to flourish — perhaps through increases in precipitation and flooding, as well as heat — causing temporary spikes in disease outbreaks.

"Future studies should pay more attention to the scale-dependent effects of temperature on human epidemic events," the researchers suggest.

Indeed, the effects of long-term warming on infectious disease among humans still remain in question, given that we only have a few centuries of human-driven climate change to examine so far. But scientists are growing ever more concerned about the effects of global warming on disease transmission.

Recent studies have suggested, for instance, that rising temperatures may help mosquitoes in the Northern Hemisphere expand their ranges into areas that were previously too cold for them. Similarly, increases in severe storms and flooding events may provide the damp conditions necessary for disease-carrying insects to breed or bacteria to proliferate.

And many scientists today have also warned that future climate change may pose a significant risk to agriculture in some parts of the world, through warming temperatures and increases in the frequency or intensity of floods, droughts, wildfires and other natural disasters.

It remains to be seen how these effects will play out over very long time scales, of the sort examined in this week's study. Yet the new study suggests that certain types of disturbances — droughts, floods and famines in particular — seem to contribute to disease transmission, regardless of the time scale or whether they were caused by warming or cooling trends. And if scientists expect an increase in these events over long periods in the future — which many studies suggest will be the case — concerns about future infectious disease may only grow more intense.

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