LETTER

Unfounded assumptions in linking crop-damaging temperature and suicide in India

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Carleton (1) established that high temperature has caused 59,300 suicides during 1980–2013 in India and for temperatures above 20 °C, a 1 °C increase in a single day's temperature causes ∼70 suicides in the country. The author argues that high temperature stimulates suicides through a crop-damaging agricultural channel as the temperature deviations above the 20 °C threshold in growing season are significantly linked to rise in suicide, but not the deviations in the nongrowing season.

A link between high temperature and mortality has been established (2, 3), and this is also observed in India (4). So, Carleton's (1) finding that high temperature leads to high suicides is plausible, but the author's arguments that the causality works through an agricultural channel is flawed. The temperature effect on mortality is stimulated by the presence of high humidity, and late May and June witness the maximum number of temperature-related deaths in India due to the deadly combination of high temperature and high humidity from initial monsoon showers (4). Probably high temperature and high humidity stimulate suicidal tendencies, especially of people having health problems. Carleton (1) takes June to September as the growing season in India and the statistical link between suicide counts and temperature in the growing season is probably due to the combined effect of humidity and temperature, not to crop loss from high temperature. Controlling for the confounding effect of humidity would, probably, make the growing season insignificant or, at least, would show an unbiased effect of the growing and nongrowing season's temperature on suicides. Interacting temperature with rainfall in the estimation would have captured some aspect of it. There is also additional reason for such interaction as high temperature associated with dry spells causes crop loss.

Studies estimating the impact of climatic variables on Indian agriculture show high temperature to reduce yield by less than 5% (5, 6), and such loss is not likely to warrant suicidal tendencies. Crop loss is identified as a cause of farmers' suicides in India, but these are nearly total crop losses (7). Agricultural insurance schemes in India including the most recent Pradhan Mantri Fasal Bima Yojna do not even include high temperature/heat waves as an agricultural hazard (8) as the crop losses from heat are relatively less substantial. Daytime temperature only above 35 °C during June–September can hamper growth of rice (6, 9), the dominant Kariff crop in India. So, a threshold of 20 °C (or 15 °C to 25 °C) used by Carleton (1) to define warmer days is meaningless in an Indian context. In a tropical country like India a heat wave day is declared if temperature goes beyond 40–42 °C, which means, dermatologically, a temperature around 20 °C is pleasant weather in India and unlikely to induce any extreme decision like suicide.

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The author declares no conflict of interest.

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