

Interactive comment on “Extreme heat in India and anthropogenic climate change” by Geert Jan van Oldenborgh et al.

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The subject of the article is very interesting and provides a sound climate data base. However, there are 2 issues where I found room for improvement: To evaluate the impact on mortality due to extreme heat: absolutely numbers or adjectives (“ very lethal”) are not the clearest ways to express it. The death figures is likely that they are much higher than the registered as heat related illness is often recorded inaccurately and figures from rural areas are hard to attain. To provide a sound evidence of the real impact I recommend to use variations on the mortality rate occurred during the two extreme heat events analysed. This rate could support sentences as “ iČŸ “The previous year, a widely-reported very lethal heat wave occurred in the southeast, in Andhra Pradesh and Telangana, killing thousands of people “(page 1, l 2-3) iČŸ “From a health impact point of view, the severity of heat waves has increased in India” (page

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1, l 13)

Although the article insists in the impact on mortality during heat waves, I would recommend analysing the increase of mortality during extreme hot single days. A study conducted in Catalonia concluded 40

The relation of air pollution and temperature is partly addressed: although some air pollutants have a cooling effect, others are climate forcers, which have a potential impact on the planet’s climate and global warming in the short term (i.e. decades). Tropospheric O₃ and black carbon (BC), a constituent of PM, are examples of air pollutants that are short-lived climate forcers and that contribute directly to global warming. (Air Quality in Europe 2015 EEA Report No 5/2015)

Therefore, revision is needed in sentences as:

iČŸ Decadal variability cannot explain this, but both increased air pollution with aerosols blocking sunlight and increased irrigation leading to evaporative cooling have counteracted the effect of greenhouse gases up to now. (page 1, l 6-9)

iČŸ For the next decades, we expect the trend due to global warming to continue, but the cooling effect of aerosols to diminish as air quality controls are implemented. The expansion of irrigation will likely continue, though at a slower pace, mitigating this trend somewhat. Humidity will probably continue to rise. The combination will give a strong rise of the temperature of heat waves. The high humidity will make health effects worse, whereas decreased air pollution would decrease the impacts (page 1, l 14-17)

iČŸ The second is a masking due to a trend in aerosols, i.e., worsening air pollution that causes less sunshine to reach the ground and thus a cooling influence, especially in dry seasons. (page 10, l 25)

iČŸ Besides the obvious benefits, a reduction in air pollution will lead to even higher maximum temperatures during heat waves. (page 17, 5)

Homeless and outdoors professionals, should be added to the sentence Children and

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the elderly are most vulnerable (page 2, l 5)

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