

Re-Examining the Distinction between Odour Nuisance and Health Impact: A Community's Campaign against Landfill Gas Exposure in Shongweni, South Africa

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Abstract : Hydrogen sulphide (H₂S) is a minor component of landfill gas, but significant in its distinct odorous quality and its association with landfill-related community complaints. The World Health Organisation (WHO) provides two guidelines for H₂S: a health guideline at 150 µg/m³ on a 24-hour average, and a nuisance guideline at 7 µg/m³ on a 30-minute average. Albeit a practical distinction for impact assessment, this paper highlights the danger of the apparent dualism between nuisance and health impact, particularly when it is used to dismiss community concerns of perceived health impacts at low concentrations of H₂S, as in the case of a community battle against the impacts of a landfill in Shongweni, KwaZulu-Natal, South Africa. Here community members reported, using a community developed mobile phone application, a range of health symptoms that coincided with, or occurred subsequent to, odour events and localised H₂S peaks. Local doctors also documented increased visits for symptoms of respiratory distress, eye and skin irritation, and stress after such odour events. Objectively measured H₂S and other pollutant concentrations during these events, however, remained below WHO health guidelines. This case study highlights the importance of the physiological link between the experience of environmental nuisance and overall health and wellbeing, showing these to be less distinct than the WHO guidelines would suggest. The potential mechanisms of impact of an odorous plume, with key constituents at concentrations below traditional health thresholds, on psychologically and/or physiologically sensitised individuals are described. In the case of psychological sensitisation, previously documented mechanisms such as aversive conditioning and odour-triggered panic are relevant. Physiological sensitisation to environmental pollutants, evident as a seemingly disproportionate physical (allergy-type) response to either low concentrations or a short duration exposure of a toxin or toxins, remains extensively examined but still not well understood. The links between a heightened sensitivity to toxic compounds, accumulation of some compounds in the body, and a pre-existing or associated immunological stress disorder are presented as a possible explanation.

Keywords : immunological stress disorder, landfill odour, odour nuisance, odour sensitisation, toxin accumulation

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