

WR0606 “Exposure-response relationships for bioaerosol emissions from waste treatment processes”: Explanatory Note

Aims

This study is a literature review of existing international research investigating bioaerosol emissions from waste treatment processes and the potential impact on human health. The study does not report new information but provides an updated understanding of such exposure-response relationships. It aims to bring together this existing information while placing it into a regulatory context and identifying gaps and possibilities for further research.

The review investigated exposure-response relationships for six metrics of bioaerosol exposure: dust, bacteria, endotoxin, peptidoglycan, fungi and beta (1→3) glucan.

Conclusions

The review found that background levels of exposure to bioaerosol are hugely variable with time and location and there are significant non-waste sources including agricultural activities and natural emissions. Nonetheless, it is evident from the studies reviewed that workplace exposure to bioaerosols in the waste industry is associated with an increased risk of developing upper and lower respiratory symptoms. However, studies also show that exposure levels vary within individual parts of the industry suggesting that there is potential to reduce exposure, and hence risk of health effects, through good practice.

With regards to community exposure, the review concludes that it is not clear whether bioaerosol emissions from waste processes present a significant public health problem. The review also concludes that there are no clear thresholds of effect for different bioaerosol components and some susceptible individuals (perhaps more than 10 per cent of the population) may experience adverse effects at background levels of exposure, in the absence of any waste-derived bioaerosols.

Limitations

The available data on the effects of community exposure to bioaerosols from waste treatment processes are too limited to reach any robust conclusions.

There are also significant limitations when it comes to using the available information to help inform regulations for waste management facilities. Sufficient data for setting exposure guidelines are only available for endotoxin; however, there is almost no information about levels of endotoxin in ambient air.

Government’s use of this work

The work is intended to provide an evidence base to support the current and future regulatory approach to managing waste disposal in general and composting in particular. The work will inform future assessments of the human health risks from bioaerosols and will help identify knowledge gaps and needs for future research.