Will shallow burial of dung increase disease risk?

In an opinion piece in the NZ Herald it was stated that dung beetles present more risks to health than benefits for example: “Rapid, shallow burial of dung may not be as beneficial as speculated and may actually increase levels of some pathogens and parasites in soils because of their protection from the sanitising effects of sunlight and drying” Below we explain why we think this claim is misleading.

Public health experts in Australia have told us they are confident that there is no health risk associated with dung beetles in Australia. Indeed, in Australia, dung beetles are generally considered to have a positive impact on public health by reducing the amount of dung in pastures and by reducing contaminated runoff into waterways.

Burial of human faeces has been investigated in terms of the disease risk and the findings of these studies are relevant to the burial of animal dung because the underpinning logic remains the same.

Following the Christchurch earthquake, residents without access to sanitation were urged to bury their waste and follow scrupulous hygiene to avoid the spread of disease. It certainly was not suggested that they leave their faeces on the lawn to benefit from the “sanitising effects of sunlight and drying”. The World Health Organisation Guidelines are always to bury faeces.

While it is true that some bacteria present in human faeces can persist for at least one year when buried in the soil (Temple et al. 1982; Cilimburg et al. 2000), burial of faeces is, nevertheless, considered to be best practice because it reduces the possibility of animal and insect transmission of pathogens (e.g. by flies); and it reduces the possibility of water contamination due to runoff after rainfall (Cilimburg et al. 2000).

Cilimburg et al. (2000) also stated that there is no clear evidence to indicate that there is an optimal burial depth for bacterial mortality. As long as the faeces are sufficiently buried to avoid being uncovered by animals yet not buried so deeply as to affect the water table, the actual depth appears incidental. The depth (8-40 cm) that dung beetles bury their dung balls is optimal in this regard.

Moreover, unlike mechanical burial of dung, the processing of dung into brood balls by adult dung beetles, and direct feeding by dung beetles and their larvae, kills parasite eggs and larvae. The beneficial effect of dung burial by dung beetles on nematodes and *Cryptosporidium* (a cause of diarrhoea) has already been proven overseas (Ryan et al. 2011). Dung beetles reduced the viability of *Cryptosporidium* oocysts by 89% compared to the “sanitising effects of sunlight and drying” at 33%.

References

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