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Negative affective states and their effects on morbidity, mortality and longevity

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Abstract

Mortality rates are often used in population-level animal welfare assessments because they are assumed to reflect rates of disease or injury and other problems likely to cause poor welfare. High mortality is thus assumed to correlate with factors likely to cause negative affective states. Here, we argue that negative affective states are also related to mortality rates more directly, via causal rather than merely correlational routes. In humans, negative affective states predict elevated morbidity and mortality rates as well as decreased longevity, while self-reported happiness does the opposite. This review investigates whether mortality rates and longevity can thus be used to make inferences regarding past affective states in animals. The proposed mechanism is that chronic stressors cause negative affective states and thence harmful physiological consequences through continual activation of the hypothalamic-pituitary-adrenal and sympathetic-adreno-medullary axes, which in turn can lead to increased mortality. The convergent validity of mortality as an indicator of past negative affect is demonstrated via examples of how stressors such as bereavement in humans and social isolation in social non-human species cause negative affective states, and then increase the morbidity of potentially lethal conditions such as cardiovascular disease, cancer and HIV/AIDS, ultimately leading to increased mortality and reduced longevity in both humans and animals. The potential drawbacks of using mortality rates to infer animal welfare are also discussed, including its low sensitivity and the multiplicity of factors unrelated to affective states that can influence mortality rates. However, providing these issues are accounted for, it is suggested that this indicator has value in welfare assessment, and is especially well suited for cases where animals are allowed to live out their natural lifespans, such as tends to be the case with zoo and companion animals.

Keywords: *animal welfare, longevity, morbidity, mortality, negative affect, stressors*