

# Puzzling over links between monkey research and human health

March 21 2012

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Studies in monkeys are unlikely to provide reliable evidence for links between social status and heart disease in humans, according to the first ever systematic review of the relevant research.

The study, published in *PLoS ONE*, concludes that although such studies are cited frequently in human health research the evidence is often "cherry picked" and generalisation of the findings from monkeys to [human societies](#) does not appear to be warranted.

Psychosocial factors such as stress, social instability and work dynamics are often believed to play an important role in the emergence of disease, with the negative effects associated with high [stress levels](#) deriving from disturbances and sudden change. In evaluating these effects on humans, the scientific community often relies on primate models because it is easier to induce changes in their environment, and because of monkeys' biological closeness to us. Such studies have historically provided one foundation for the suggestion that factors such as stress or position in a social hierarchy may lead to some people suffering more ill health than others.

Researchers from the London School of Hygiene & Tropical Medicine and the University of Bristol undertook an extensive search of relevant studies and found 14 which offered evidence on coronary artery disease (CAD) and [social status](#) and/or psychosocial stress within the natural social hierarchies of primates.

They conclude: "Overall, non-human primate studies present only limited evidence for an association between social status and CAD. Despite this, there is selective citation of individual monkey studies in reviews and commentaries relating to human disease aetiology. Such generalisation of data from monkey studies to human societies does not appear warranted."

Lead author, Mark Petticrew, Professor of Public Health Evaluation at the London School of Hygiene & Tropical Medicine, says that without assessing the validity of primate studies first, there is little point in using them to build theories of causes of human ill-health.

He says: "Before we can apply results from primates into our society, we need to make sure that the evidence coming from these studies is reliable. Systematic reviews of animal studies are still uncommon but they are essential for assessing the consistency and strength of their findings. It is unscientific to selectively refer a same small handful of positive findings and discard all the others that do not fit the hypothesis."

The researchers also warn against generalising results from primate data to human societies and point out that many primatologists themselves have drawn attention to the limitations in reaching such conclusions, as their findings are not necessarily comparable between similar species of monkey, and sometimes not even within the same species. Too many factors are at play that can introduce bias, such as the environment the primates were brought up in, the laboratory settings and other potentially traumatic experiences like relocating from the wild to a laboratory.

The study suggests that if studies correlating [social hierarchy](#) and [heart disease](#) in monkeys cannot be generalised to other [monkeys](#), it makes even less sense to extend these findings to [human health](#) outcomes.

Co-author Professor George Davey Smith, of the University of Bristol,

says: "In the UK, systematic reviews are an essential requirement when used to informing decisions about human care, as NICE recommends. We should expect the same from studies in animals, and even more so when those studies are then applied to humans."

Health services researcher Sir Iain Chalmers, one of the founders of the Cochrane Collaboration and coordinator of the James Lind Initiative, comments: "A thousand years ago Ibn Sina warned against incautious extrapolation from animal experiments to humans; yet, as the study by Petticrew and Davey Smith illustrates, this practice continues today. A recent increase in the numbers of systematic reviews of animal studies has begun to address this problem. As shown by Petticrew and Davey Smith here, these reviews have begun to reveal not only citation biases, but also important methodological deficiencies in many animal studies."

**More information:** Petticrew M, Davey Smith G (2012) The Monkey Puzzle: A Systematic Review of Studies of Stress, Social Hierarchies, and Heart Disease in Monkeys. *PLoS ONE* 7(3): e27939.

[doi:10.1371/journal.pone.0027939](https://doi.org/10.1371/journal.pone.0027939)

Provided by London School of Hygiene & Tropical Medicine

Citation: Puzzling over links between monkey research and human health (2012, March 21) retrieved 3 May 2024 from

<https://medicalxpress.com/news/2012-03-puzzling-links-monkey-human-health.html>

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