

# Messaging should reflect the nuanced relationship between land change and zoonotic disease risk

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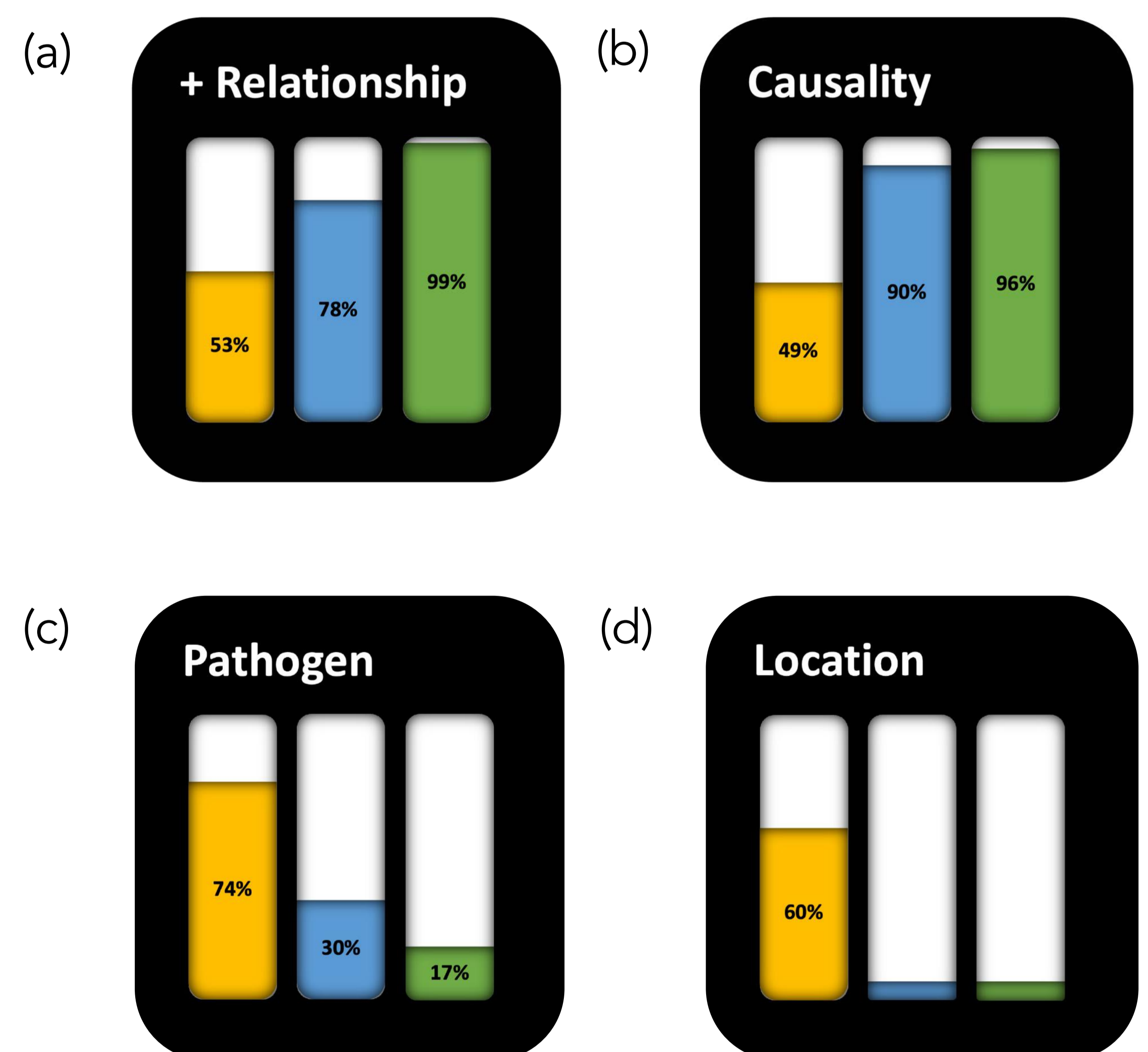
**Overview** Zoonotic disease spillover is when disease pathogens jump from animals to humans. Much of the media coverage around COVID-19 has been sending the message that land change (deforestation, ecosystem degradation, etc.) increases the risk of zoonotic disease spillover.

But does that apply everywhere? Is it backed up by the science? Does it matter if that message is wrong?

**Theory** We should not expect that land change will always increase the risk of spillover, because:

- There are **countless combinations** of ecosystems, pathogens, vectors, hosts and other variables.
- There are **different processes** by which land change takes place. For example, logging a tropical forest is likely to involve more contact with pathogen-carrying wildlife than burning of savanna.
- The **configuration of land change** can differ. For example, when a fragment of wild habitat is surrounded by modified land and shrunk by land change, it may have less interface with modified land, with reduced likelihood of interaction between humans and wildlife.

**Evidence** In a literature review of relevant studies and media, only about half of the primary science (mostly empirical studies) reported a correlation between land change and spillover risk. However, both the secondary science (mostly commentary in peer-reviewed journals) and the media (webpages and news articles), overwhelmingly implied a positive relationship between land change and spillover risk (a) and implied that this relationship was causal (b). The secondary science and media also specified pathogen (c) and location (d) less frequently, thereby implying that their conclusions applied to all pathogens and places.



n = 43 Primary science    n = 102 Secondary science    n = 132 Media

**Consequences** If policymakers and others apply the generic narratives of the media and secondary science:

- Local communities may be prevented from modifying habitats (like ponds with mosquitos) to reduce disease risk.
- Other infectious disease spillover risk factors might not receive the attention they deserve.
- Science could be discredited when simplistic conclusions turn out to be wrong.

**Recommendations** For a more accurate and nuanced picture of the relationship between land change and spillover risk, researchers and journalists can:

- specify the context of their claims rather than generalizing;
- use consistent terminology;
- explain the mechanisms behind their claims;
- and acknowledge uncertainty and exceptions.

Meanwhile, we should all be wary of simplistic messages about complex topics.