

Scientists urge balance in the war on antimicrobial resistance

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Scientists are urging policymakers to reconsider priorities in efforts to understand and control antimicrobial resistance. The new research, published today, was led by Royal Veterinary College Principal Professor Stuart Reid in his previous position at the University of Glasgow.

Antimicrobial resistance is when micro-organisms, including bacteria, viruses and parasites, are no longer killed by the drugs that have previously been effective. In the case of bacteria, there is increasing concern over the spread of resistance and the possibility of returning to the situation 100 years ago when many diseases affecting humans and [animals](#) were untreatable.

[Antimicrobial resistance](#) in humans is frequently attributed to veterinary use of antimicrobials, but the relative contribution to the problem from animals and humans is poorly understood at the [population level](#). Despite this, proposals are under consideration by the [European Parliament](#) to phase out the precautionary (or prophylactic) use of some antibiotics in animals in the hope that the rate of increase in the occurrence of antimicrobial resistance would be slowed. The plan has been opposed by the British Veterinary Association, which said that the ban would compromise animal health and welfare.

Dr Alison Mather, working with an interdisciplinary research team within the College of Medical, Veterinary and Life Sciences, exploited long-term [surveillance data](#) of Salmonella Typhimurium DT104 from co-

located humans and animals in Scotland, demonstrated how animal and [human](#) DT104 populations differ significantly in several ways such as prevalence, linkage, time of emergence, and diversity. The findings, published in the [Proceedings of the Royal Society B](#), suggest that the local [animal populations](#) are unlikely to be the major source of resistance in humans, and questions policies that restrict the use of antimicrobials in local [domestic animals](#).

Professor Daniel Haydon, Director of the University of Glasgow's Institute of Biodiversity Animal Health and Comparative Medicine, said: "In our study, there were significantly more human-only types of resistance than we might have expected if the animal and human microbial communities were well-mixed, suggesting that the risk of resistances passing from animals to humans is lower than previous research has indicated.

"We also found that, in the majority of resistances which are common to both animals and humans, the resistances appeared first in humans. While it's inevitable that contact, direct or indirect, between animals and humans will lead to some transmission of disease and resistance in both directions, it appears unlikely that the animal population is the major source of resistance diversity for humans."

Professor Stuart Reid, the senior author of the work and now Principal at the Royal Veterinary College, London, added: "It remains true that the use of [antimicrobials](#) promotes resistance in microorganisms and of course we advocate prudent use in all species but our work does call into question the, at times, singular focus on veterinary usage.

"Whilst our study has focused on a single bacterial species, our findings do demonstrate that we must ensure that our local policies do not impact disproportionately on domestic livestock without considering imported foodstuffs and animals abroad, as well as the medical use of antibiotics.

There is still much to be done if we are to understand the problem at the level of the global ecosystem."

The research was carried out by the University of Glasgow, in partnership with the Scottish Salmonella Shigella and Clostridium difficile Reference Laboratory at Stobhill Hospital; Health Protection Scotland; the Public Health Agency of Canada and the University of Guelph in Canada.

More information: The report, entitled "An ecological approach to assessing the epidemiology of antimicrobial resistance in animal and human populations", is available from tinyurl.com/dxr7prd

Provided by Royal Veterinary College

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