

STUDY SPOTLIGHTS INDIA'S 'INTENSE' VETERINARY ANTIMICROBIAL USE

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A worker spraying disinfectant at a poultry farm in Namakkal. | Photo Credit: Special Arrangement

The 'intensity' with which India administers antimicrobial drugs in food-producing animals is much higher than the world average and is expected to stay that way by the end of this decade, a new modelling study has found.

The projection bodes ill for India's reputation as the site of "one of the world's highest rates of resistance to antimicrobial drugs ... both in humans and food animals," partly due to the "injudicious use of antimicrobials", according to [an article](#) in the *Indian Journal of Medical Research*.

The intensity of antimicrobial usage (AMU) – the number of milligrams administered per kilogram of meat – worldwide is expected to increase by 7.9%. But India's AMU intensity was estimated to be 43% higher than the global average in 2020 itself, and is expected to be 40% more than the average in 2030.

The study's paper was [published on February 1](#) in the journal *PLoS Global Public Health*.

Scientists developed antimicrobial drugs to fight infections in people and animals – but by 2019, "73% of all antimicrobials sold on Earth [were] used in animals raised for food," per a [2019 study](#).

The irrational use of these drugs by people and in parts of the poultry industry, to increase productivity, gave rise to antimicrobial resistance (AMR): certain classes of infection-causing bacteria began evading the effects of these drugs, while researchers struggled to develop more potent alternatives.

Today, AMR is considered to be one of the world's major health crises.

The 2019 study noted "a clear increase in the number of resistant bacterial strains occurring in chickens and pigs". People are also at risk of contracting deadlier infections. India is already confronting ["extremely drug resistant"](#) tuberculosis.

In the new study, researchers extrapolated data from 42 countries (mostly in Europe) to more than 180 countries – a mathematically fraught exercise.

“That’s a limitation of our study,” Thomas Van Boeckel, an assistant professor of health geography at the University of Gothenburg, Sweden, and a member of the research group, said.

They took this route because “only a handful of countries report antibiotic use; most countries are either unable or are unwilling to report that,” Dr. Van Boeckel added. India is one such country.

“Additionally, our predictions for 2030 are based on a ‘business as usual’ scenario” determined by the UN Food and Agriculture Organisation, Ranya Mulchandani, an infectious disease epidemiologist at ETH Zurich and the study’s first author, said. So the conclusions are “based on the assumption that countries don’t act to curb usage, and therefore are likely to be overestimates if countries act to curb antimicrobial usage in the coming years.”

They combined the small country-dataset with data of animal populations, maps of animal densities, and with multivariate regression models to create a function that predicted the AMU in different parts of the world.

To facilitate comparison, they developed a metric called ‘population correction units’ (PCUs). According to their paper, “The PCU represents the total number of animals in a country (alive or slaughtered), multiplied by the average weight of the animal at the time of treatment,” thus “accounting for differences in animal weight and number of production cycles per year between countries”.

Finally, they adjusted the model to match continent-level estimates prepared by the World Organisation for Animal Health.

They found that India’s AMU intensity would increase from 114 mg/PCU in 2020 to 120 mg/PCU in 2030. This is an increase of 5%, versus the expected global average of 8%.

In 2020, the largest user was China (32,776 tonnes), whereas by 2030, Pakistan was predicted to have the biggest relative increase (44%).

The use of a class of antimicrobials called tetracyclines were predicted to increase the most (9%) by 2030.

‘Hotspots’

Within the country, the researchers identified ‘hotspots’ in east and south India.

“Higher antimicrobial usage in the South could be due to the larger number of intensive farms in peri-urban areas that provide the more affluent city dwellers,” Dr. Mulchandani said.

Namakkal in Tamil Nadu hosts over a thousand poultry farms. [Experts have said](#) many farm-owners here use second-generation antibiotics called ciprofloxacin and enrofloxacin to shorten harvest time by a week, by when the chicken also weighs more than 2 kg each.

“We would encourage all countries to report publicly their antimicrobial usage data,” Dr. Mulchandani said. “This would allow us to more accurately track the impact of antimicrobial stewardship policies that aim to reduce usage.”

In 2017, India's Ministry of Health and Family Welfare floated a '[National Action Plan](#)' to contain antimicrobial resistance. Two years later, the government [banned the use of colistin](#) in all food-producing animals to protect its efficacy in humans as a last-resort antibiotic in critical care units.

A [2021 review](#) by researchers with the Indian Council of Medical Research, among others, found that the main gaps to have "veterinary laboratories in India ... participate in an integrated antimicrobial resistance surveillance network" included low dedicated funding, "shortage of reference strains", and lack of data-sharing mechanisms.

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