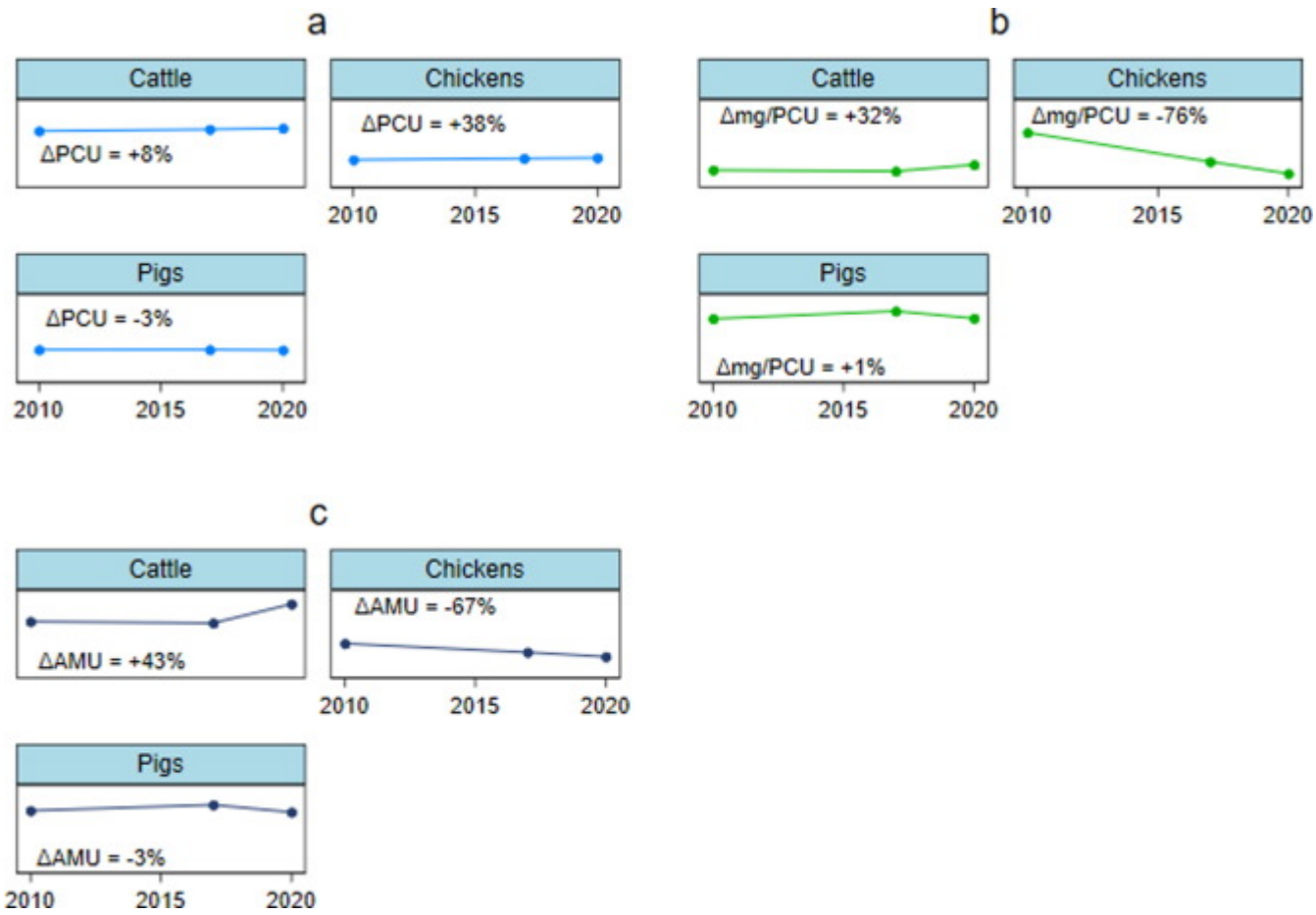
Global antimicrobial use in livestock farming: A revised estimate



Antimicrobial resistance (AMR) poses a significant threat to global health, driven by the overuse and misuse of antibiotics in both human medicine and livestock farming. In livestock farming, antimicrobials are still used extensively for therapeutic and non-therapeutic purposes. However, estimates of the quantities used per species are notoriously hard to derive from fragmented, incomplete, or unstandardized data around the world.

A recent article ("Global antimicrobial use in livestock farming: an estimate for cattle, chickens, and pigs", *Animal*, 18(2), 2024) attempts to update the figures by estimating global biomass at treatment of cattle, pigs, and chickens, considering distinct weight categories for each species in biomass calculation, and using the European Medicines Agency's weight standards for the animal categories. With these more refined calculations, authors Zahra Ardakani, Maurizio Aragrande, and Massino Canali aim to provide a more accurate estimate of global antimicrobial use (AMU) in cattle, chickens, and pigs. Understanding these patterns is crucial for addressing AMR and developing strategies for sustainable livestock management.

Key Findings

The study estimates that the global annual AMU for cattle, chickens, and pigs amounts to 76,060 tons of antimicrobial active ingredients. This is a significant revision from previous estimates due to a more detailed evaluation of animal weights and categories:

1. Cattle: 40,697 tons (53.5% of total AMU)
2. Pigs: 31,120 tons (40.9% of total AMU)
3. Chickens: 4,243 tons (5.6% of total AMU)

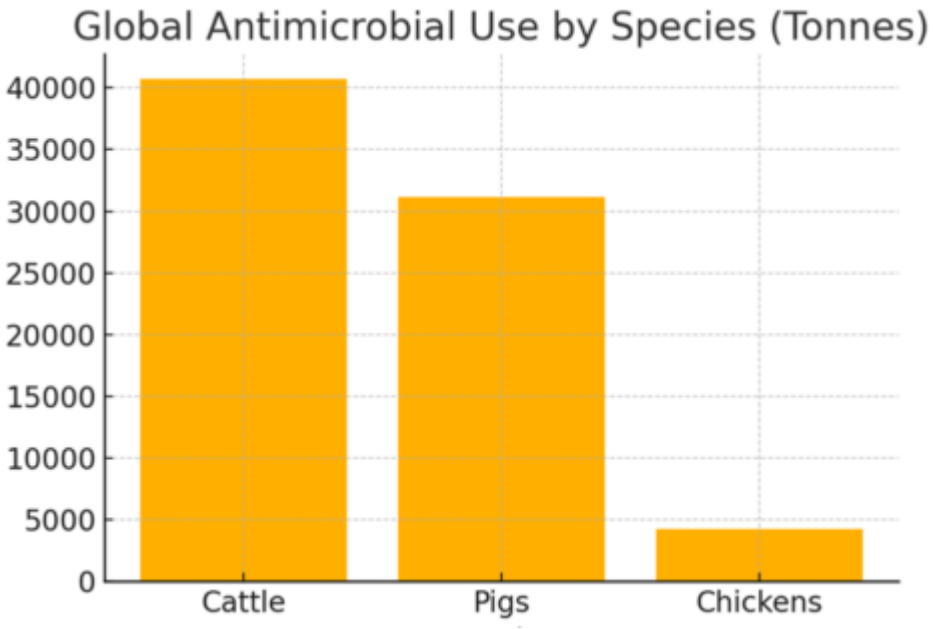


Figure 1: Distribution of global antimicrobial use among cattle, pigs, and chickens.

Methodology

The study utilizes the concept of Population Correction Units (PCU) to estimate antimicrobial usage, taking into account the weight and category of livestock at the time of treatment. This method differs from previous approaches that relied on live weight at slaughter, providing a more accurate representation of AMU.

The PCU is calculated by multiplying the number of animals by their average weight during treatment. This approach allows for differentiation by age and sex, which is particularly important for species like cattle and pigs.

Figure 2: (a) Changes in global PCU (million tonnes), (b) changes in global antibiotic use in mg per PCU, and (c) changes in global AMU (thousand tonnes) for cattle, chickens, and pigs; between 2010 and 2020. Abbreviations: PCU = Population Correction Unit; AMU = Antibiotic Use.

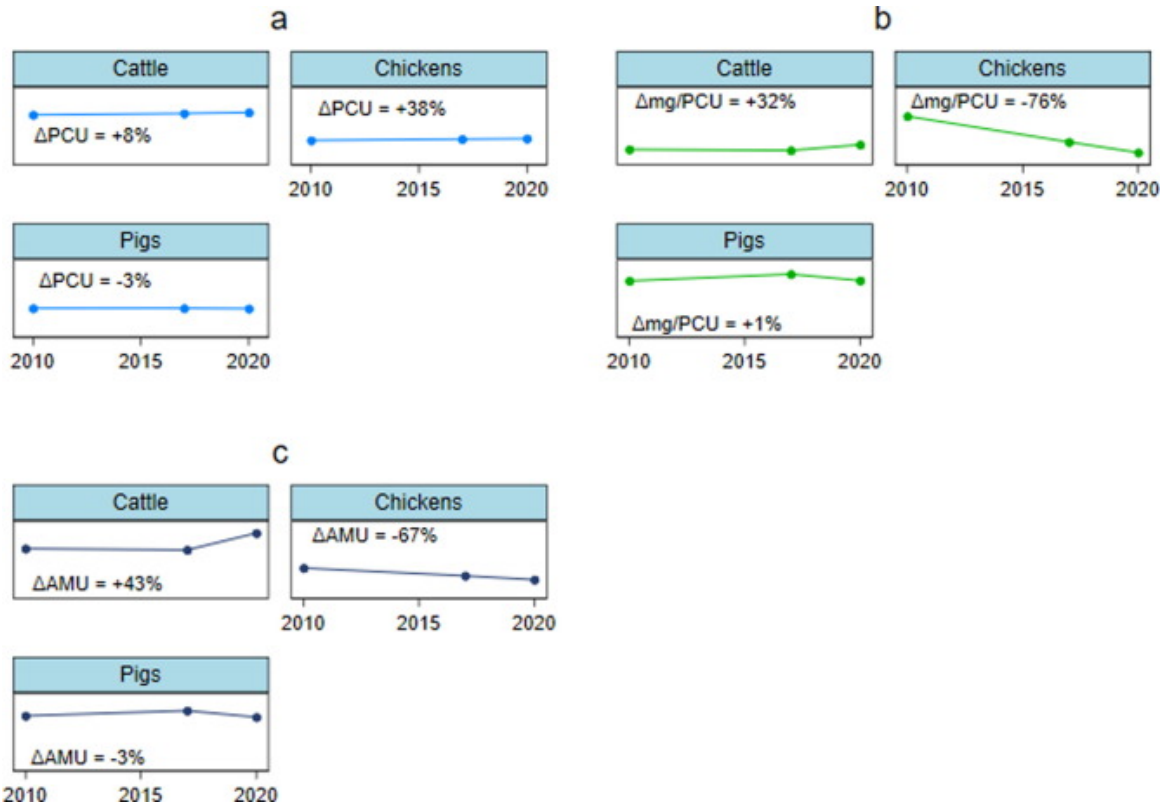


Figure 2: (a) Changes in global PCU (million tonnes), (b) changes in global antibiotic use in mg per PCU, and (c) changes in global AMU (thousand tonnes) for cattle, chickens, and pigs; between 2010 and 2020. Abbreviations: PCU = Population Correction Unit; AMU = Antibiotic Use.

Study shows lower AMU than previous estimates

The study highlights a significant shift in AMU patterns, with chickens showing a remarkable decrease in antimicrobial use despite increased production. This is indicative of improved management and more responsible use of antibiotics in the poultry industry.

The lower AMU in cattle and pigs, compared to previous estimates, underscores the importance of considering animal age and weight at treatment. These findings align closely with World Organization for Animal Health (WOAH) estimates, validating the methodology.

However, the study also acknowledges limitations, including reliance on European standards for average weight at treatment, which may not reflect global variations. Additionally, the lack of comprehensive global data on veterinary antibiotics presents challenges in creating fully accurate estimates.

Corrected estimate highlights improved production advances

This study provides a revised and potentially more accurate estimate of global antimicrobial use in livestock. By accounting for the weight and treatment categories of animals, it offers insights that could guide policy and management practices to mitigate the spread of antimicrobial resistance.

The article also indicates that the industry may have over-estimated antimicrobial usage in livestock and, just as importantly, that antimicrobial use has been kept in check or even reduced, despite increases in

farmed animal headcounts. The lower usage is likely due to regulatory oversight and improvements in alternative methods to control and mitigate health challenges.