



Research Brief

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Monitoring Antimicrobial Use in Livestock Production: Learning from California

Antimicrobial overuse in livestock production may contribute to the declining efficacy of our most important medical treatments. California's experiment is a step in the right direction, but also shows how better oversight is needed.

Background

Antimicrobials, medicines such as antibiotics that we use to treat bacterial infections, are one of the key twentieth century public health innovations which have led to profound improvements in the length and quality of human lives. However, frequent and excessive antimicrobial usage causes pathogens to become resistant, rendering these drugs useless and imposing enormous costs on society. In the U.S. alone, 2.8 million antimicrobial-resistant infections are contracted every year, causing 35,000 deaths and \$55 billion in economic losses.

Despite their importance for maintaining human health, almost three-quarters of antimicrobials in the U.S. are sold for use in livestock production. Antimicrobials can be administered to livestock to treat and prevent disease, but historically were also administered to increase animal growth while using less feed. The U.S. Food and Drug Administration (FDA) began to phase out non-therapeutic uses of antimicrobials in livestock production in 2017, but "disease prevention" uses may still allow for the continuous and indefinite administration of antimicrobials to animals. Numerous states have sought ways to address the public health risks of antimicrobial use in livestock production. In 2015, California passed Senate Bill 27 (SB-27), becoming the first U.S. state to prohibit the administration of antimicrobials to livestock in a "regular pattern". The law additionally tasked the California Department of Food and Agriculture (CDFA) with collecting and publicly reporting on livestock antimicrobial use to better understand the links to antimicrobial resistance.

POINTS FOR POLICYMAKERS

- **Antimicrobial resistance, driven by antibiotic overuse, poses a serious risk to public health.** The rising ineffectiveness of currently marketed antimicrobials due to heightened antimicrobial resistance is increasingly recognized as one of the most important global public health challenges of the twenty-first century. Notably, the majority of medically important antimicrobials are intended for use in livestock production.
- **Lawmakers should improve disclosure and reporting requirements.** Although California was first in the nation to ban antibiotics for livestock growth promotion under SB-27, the monitoring and disclosure requirements make it impossible to assess whether the law has achieved its intended effect of curbing antimicrobial use as critical information is missing. Data on the quantity of antimicrobials distributed for use in livestock production is specifically lacking. In contrast, the State of Maryland mandates that the total weight of antimicrobials used in livestock production be reported and disclosed at the county level, allowing for better data analysis.
- **Agencies must have the legal authority to monitor compliance.** Under SB-27, CDFA can only request data from manufacturers and distributors of medicated livestock feed on a voluntary basis, and the extent of compliance is unknown. While SB-27 requires a basic level of public reporting, it specifically exempts data from public disclosure making it impossible to monitor and study livestock antimicrobial use. The law should instead provide active disclosure requirements that guarantee the provision of useful data while protecting the anonymity of represented entities.
- **The use of antibiotics in livestock production should not be treated as merely an agricultural issue.** There are additional implications for environmental sustainability, food security, public health and the practice of medicine. Greater involvement from public health agencies will be critical to ensure effective design and implementation of any policy interventions.

To understand if the law's intent was being fully realized, a team including Stanford-affiliated researchers examined CDFA's implementation of SB-27's reporting and disclosure requirement. They learned that the CDFA has not reported any data on the total amount of antimicrobials used or approved for use in livestock operations. In addition, as no U.S. agency collects data on antimicrobial use despite recommendations to do so, it becomes challenging to determine how antimicrobial usage has changed as a result of regulatory action.

Discussion

Although the FDA report data on livestock antimicrobial sales and distribution quantities and CDFA report data on livestock antimicrobial distribution and manufacture quantities, the data quality makes it difficult to characterize the relationship between antimicrobial use, antimicrobial resistance and regulatory efforts. In the case of California, data analysis is also inhibited by a confidentiality clause giving CDFA broad interpretative power to determine the extent of data disaggregation allowable under the law. As a result, the limited data reporting makes it impossible to estimate antimicrobial quantities and determine whether antimicrobial use has in fact changed under SB-27.

The scarcity of data on antimicrobial use in livestock production is a long-standing obstacle to evaluating how the sector's antimicrobial use practices affect antimicrobial resistance in human and non-human populations. However, monitoring and reporting of antimicrobial usage in livestock production can be improved through better regulation. For example, the state of Maryland provides specific instructions on which data items must be collected and reported and at what level. Reporting may also be improved by mandating greater input from public health agencies on best practices and key monitoring outcomes. Measures such as these are essential to guiding effective policy responses to one of the most urgent public health challenges, especially given the rise in zoonotic and animal-transmitted diseases. Livestock production has implications beyond the agricultural and public health sectors, affecting the environment through contaminants and pollution which have adverse effects on aquatic life.



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This brief is based on [Limitations of Reporting Requirements under California's Livestock Antimicrobial Restriction Law](#) published in the journal *Environmental Health Perspectives*.

FOR MORE INFORMATION

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