Global Trends in Animal Antibiotic Use

Antibiotics are a cornerstone of modern medicine. These medicines are the only way to treat a bacterial disease; there is no alternative. Their importance to human and animal health cannot be understated, which is why the animal health sector recognizes antimicrobial resistance (AMR) as a significant global threat.

Since the United Nations issued their 'Political Declaration on AMR' in 2016, countries across the globe have implemented national action plans to address the threat of resistance. As developers of medicines, the Animal Health sector recognizes that it *must* be part of the solution and has been at the forefront of these efforts. The sector has set measurable targets for increasing prevention, worked with governments to implement responsible use strategies, and strengthened global cooperation.

However, AMR cannot be solved alone. Animal health companies and institutions will be ready to work together and share our knowledge to help strengthen the actions of others.

At the same time, researchers from leading institutions have undertaken robust analysis to better understand how AMR develops and transfers between people and across species. This essential work helps the world better target efforts in minimizing the threat of resistance and preserving antibiotics.

Six years on from the United Nations Political Declaration, this report analyzes global data to understand how efforts are progressing to better understand and tackle AMR. The key findings show:

1. **Animal antibiotic use is falling:** Globally, antibiotic use is down, and in many countries there have been significant and sometimes dramatic declines in the need for antibiotics in animals.

2. **Prevention works:** Reductions in antibiotic sales are mirrored by a rise in prevention products. Globally, antibiotics relative share of the animal health product portfolio has declined 39% while vaccines sales increased.

3. **Antibiotics remain a critical tool:** Many developed nations have achieved drastic declines that level off to a consistent level. This often reflects a state of 'optimized use' where prevention is maximized, but antibiotics remain necessary for treatment of disease that evades a farm's defenses.

4. **Progress cannot be achieved without One Health action:** Authorities like the European Centre for Disease Prevention and Control (ECDC) have found that the majority of human AMR transfer stem from human health care settings, while leading studies show human antibiotic use is growing. Research concludes that without corresponding action in human health, actions within the animal domain will have little impact.

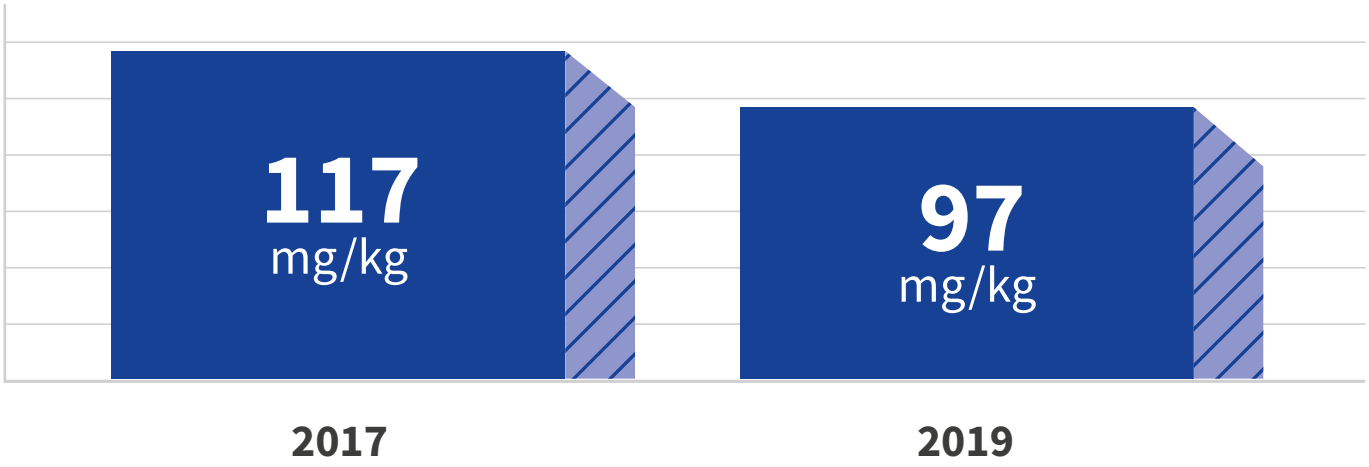
5. **Animal health is a global leader:** Authorities have recognized the significant progress made in reducing the need for antibiotics in animals. Animal health companies are building on this progress with actions such as the Roadmap to Reducing the Need for Antibiotics, which provided 25 measurable commitments to help address AMR and responsible use, all of which are on track for completion by 2025.

Animal antibiotics use has fallen across the world

Countries are reducing their need for antibiotics and continuing to support responsible use.

Global antimicrobial use is declining

The World Organisation for Animal Health collects global antimicrobial use data and found that "global antimicrobial use in animals has declined by 13% in 3 years," providing the following figures. Comparisons with human use are unfortunately not possible as this type of data is not widely collected in human health.



Source: https://www.woah.org/en/new-report-reveals-global-decrease-in-antimicrobial-use-in-animals/

Critically important antimicrobials have seen the largest reductions

-62% Polypeptides

-43% Macrolides

2016–2018

Using these shared class products only when necessary can help limit cross resistance development

Source: World Organisation for Animal Health, Annual report on Antimicrobial Agents Intended for Use in Animals, 6th Edition

Antimicrobial sales have fallen up to 65% in major markets

59% since 2014

36% since 2015

53% since 2011

68% since 2011

Although sales can offer an indicator of trends in antimicrobial use, it cannot measure whether AMR is rising or falling. Only testing for resistance itself can achieve this, which is why sales reporting must be accompanied by AMR surveillance.

Sources: UK Veterinary Medicines Directorate, https://assets.publishing.service.gov.uk/media/654cb220b9068c00130e75f9/_2671450-v1-UK_VARSS_Highlights_2022__2023_.PDF

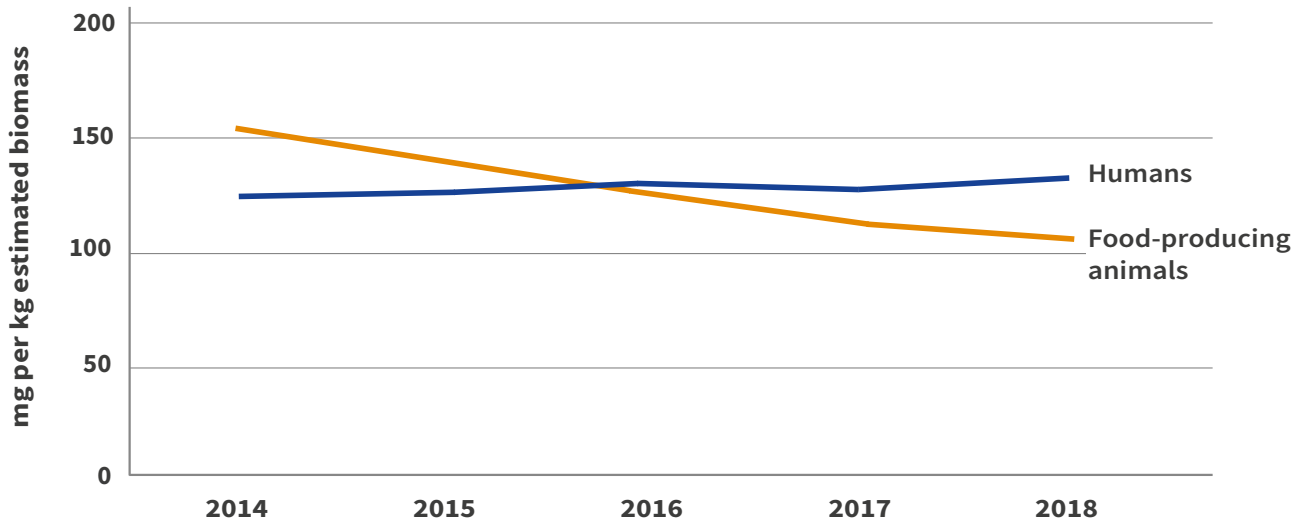
US FDA, https://www.fda.gov/animal-veterinary/cvm-updates/fda-releases-annual-summary-report-antimicrobials-sold-or-distributed-2022-use-food-producing

European Medicines Agency, https://www.ema.europa.eu/en/veterinary-regulatory-overview/antimicrobial-resistance-veterinary-medicine/european-surveillance-veterinary-antimicrobial-consumption-esvac-2009-2023

German Office of Consumer Protection and Food Safety, https://www.bvl.bund.de/SharedDocs/Pressemitteilungen/05_tierarzneimittel/2023/2023_PM_Abgabemengen_Antibiotika_Tiermedizin.html

"More progress in agriculture than in the human sector"

Antibiotics consumption in the EU/EEA, 2014–2018

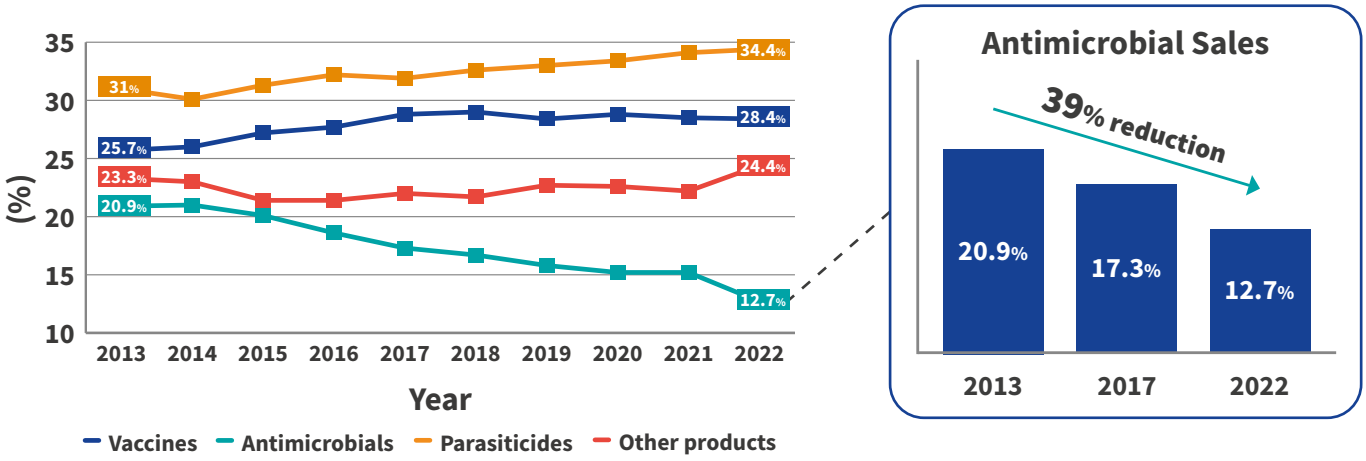


A recent report on antimicrobial use in the EU from the European Medicines Agency (EMA), European Food Safety Authority (EFSA), European Centre for Disease Control (ECDC) and OECD found there was "more progress in agriculture than in the human sector" and since 2016, "average consumption of antibiotics in humans is now higher than in food-producing animals". However, some markets have decreased human consumption of antibiotics alongside animal reductions. The report found that overall human antibiotic use in the EU had fallen, although when looking at specific classes, broad-spectrum antibiotic use in humans was still rising.

Source: Antimicrobial Resistance in the EU/EEA: A One Health Response, https://www.ecdc.europa.eu/sites/default/files/documents/antimicrobial-resistance-policy-brief-2022.pdf

Prevention can reduce the need for antibiotics

Sales per product category (%) (2013–2022)



Sales data from leading animal health companies demonstrate how global shifts towards prevention are reducing the need for antimicrobials worldwide. Since 2013, vaccines and parasiticides have grown from 56.7% to 62.8% of the product portfolio of the leading animal health companies, while antimicrobials fell from 20.9% to 12.7% (a relative reduction of 39%).

Source: HealthforAnimals, Global Trends in the Animal Health Sector, https://www.healthforanimals.org/reports/global-trends-in-the-animal-health-sector/

One Health action is necessary for minimizing AMR risk

Recent changes in human use of antibiotics

46% increase in antibiotic use

From 2000 to 2018 according to a Lancet study

Source: The Lancet, https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00280-1/fulltext#gr5

90% increase in 'watch' antibiotic use

From 2000 to 2016. 'Watch' antibiotics have 'higher resistance potential' according to the WHO

Source: The Lancet, https://www.thelancet.com/journals/laninf/article/PIIS1473-3099%2820%2930332-7/fulltext

Although global human antibiotic consumption may be rising, some markets have decreased use. An EU report, *Antimicrobial Resistance in the EU/EEA: A One Health Response*, found that overall human antibiotic use in the EU had fallen, although when looking at specific classes, broad-spectrum antibiotic use in humans has risen.

AMR is a 'One Health' challenge, meaning it requires complementary action across humans, animals and environment. This means reducing the need for antibiotics, researching transfer pathways, strengthening surveillance across all three domains. A University of Edinburgh study found that reducing antibiotic use only in animals but not in people has "little impact on the level of resistance in humans."

Source: Royal Society Open Science, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5414261/

Markets are achieving steady, ‘optimal’ levels of use

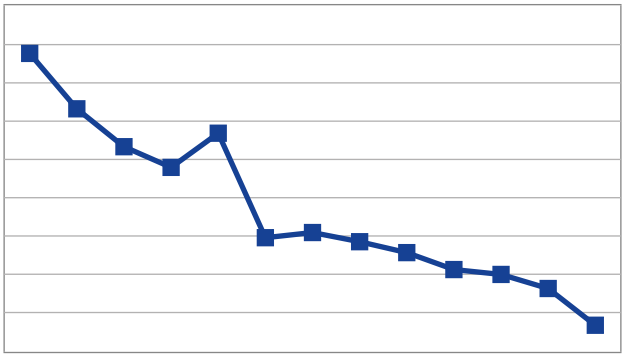
Animal antimicrobial Sales Trends (2010-2022)

The below charts show how animal antimicrobial sales have changed for six nations. The sales levels differ for each (see source below for the underlying numbers), however the trend lines are similar for all.

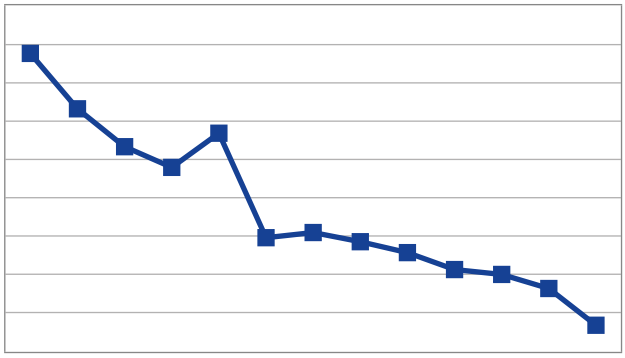
These drastic declines leveling off to a consistent level often reflect a state of ‘optimized use’ where prevention is maximized, but antibiotics remain necessary for treatment of disease that evades a farm’s defenses. It is a reminder that not all illness can be prevented, and these medicines remain the only way to treat bacterial disease.

Source: European Medicines Agency, https://www.ema.europa.eu/en/documents/report/sales-veterinary-antimicrobial-agents-31-european-countries-2019-2020-trends-2010-2020-eleventh_en.pdf
US FDA, https://www.fda.gov/animal-veterinary/cvm-updates/fda-releases-annual-summary-report-antimicrobials-sold-or-distributed-2020-use-food-producing

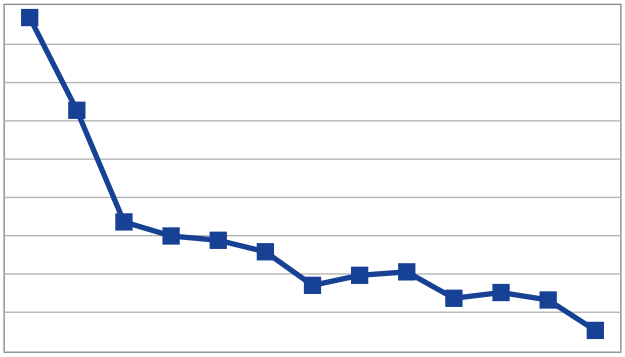
France



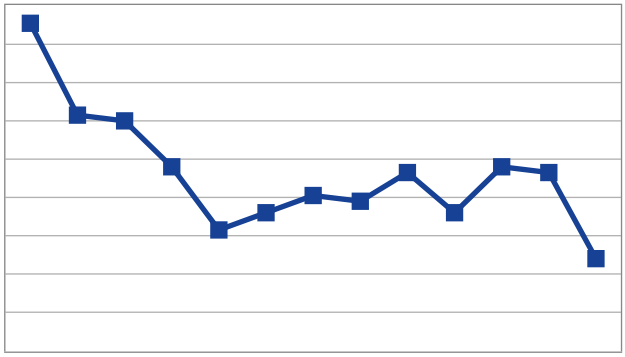
Germany



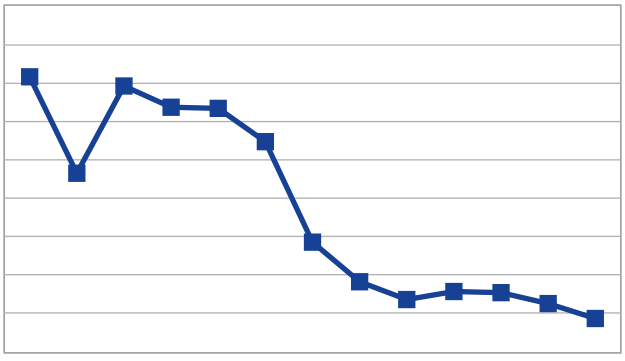
Netherlands



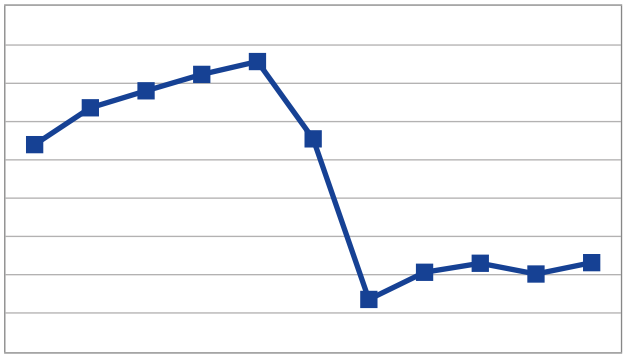
Sweden



United Kingdom



USA



Antimicrobial use and AMR can be vastly different between humans and animals

Understanding these differences enables complementary, One Health actions.

> **In the US, at least 80% of animal antibiotics** are an animal-only class or tetracyclines.

Types of antibiotics used in animals

The types of antimicrobials used in humans and animals are very different. According to the World Organisation for Animal Health, tetracyclines and penicillins represent about 50% of global animal antibiotic use, and neither of these classes are on the WHO list of highest priority critically important antimicrobials for humans.[1] Furthermore, WOAH does not include 'animal only' antibiotics in their measurements. These are antibiotics that are *only* authorized for use in animals and not considered contributors to human AMR. In the U.S., at least 80% of animal antibiotics are an animal-only class or tetracyclines.[2]

Antibiotics used in both humans and animals are known as 'shared classes.' Fluoroquinolones and cephalosporins are typically considered the most important to human health, and both account for less than 3% of the antibiotics used in animals. Cephalosporins are only used for individual animal treatment via injection. Veterinary fluoroquinolones make up less than 1% of all antibiotic use in U.S. agriculture and around 2.8% in Europe, which are only available through a veterinarian's prescription.[3]

Comparing use levels between people and animals

Developing a clear, reliable comparison between antimicrobial use in humans and animals is challenging. 1-to-1 comparison in volumes used is often misleading since a beef cattle weighing over 500 kilos will naturally require a different type and dosage of medicine compared to a 65 kg person. Therefore, when comparing quantities, it is important to consider:

- There are many more animals than humans, and there are differences in physiology and weight between humans and animals.
- Different species metabolize antimicrobials differently, meaning that some species may require more product to be effective, or may need to be treated for a longer period.
- Different antibiotics have different potencies. Older antibiotics such as tetracyclines – the largest group used in animal care – tend to have much higher doses than newer antibiotics such as fluoroquinolones.

Global authorities such as the World Organisation for Animal Health (WOAH) and leading markets have developed systems to measure the amount of antibiotics used per kilogram of biomass. These provide a greater standardization that better illustrates trends in antibiotic use and enables comparisons.

1 *Sources: WOAH,* https://www.fda.gov/animal-veterinary/antimicrobial-resistance/2022-summary-report-antimicrobials-sold-or-distributed-use-food-producing-animals
2 *Sources: US FDA,* https://www.fda.gov/animal-veterinary/antimicrobial-resistance/2022-summary-report-antimicrobials-sold-or-distributed-use-food-producing-animals
3 *Sources: European Medicines Agency,* https://www.ema.europa.eu/en/veterinary-regulatory-overview/antimicrobial-resistance-veterinary-medicine/european-surveillance-veterinary-antimicrobial-consumption-esvac-2009-2023, *US FDA,* https://www.fda.gov/animal-veterinary/antimicrobial-resistance/2022-summary-report-antimicrobials-sold-or-distributed-use-food-producing-animals

Understanding pathways for AMR development and transfer

Potential actions for tackling AMR are endless, but funding, time and manpower are not. Strategies must focus on actions that provide the greatest potential impact. This is why public authorities and international institutions have invested in better understanding where AMR transfer occurs, what actions can be most effective, and when it may originate in animals.

In a landmark study, the European Centre for Disease Prevention and Control found that "75% of disease linked to resistant bacteria is due to healthcare-associated infections"

Source: ECDC, https://www.ecdc.europa.eu/en/news-events/ecdc-calls-continued-action-address-antimicrobial-resistance-healthcare-settings

In 2019, the U.S. CDC published a report on 'Antibiotic Resistance Threats' that identified 18 bacteria and fungi that are a resistance concern for humans. Two (Campylobacter spp. and Salmonella spp.) of the 18 can originate in food animals.

Source U.S. CDC, https://www.cdc.gov/drugresistance/biggest-threats.html

An OECD analysis of antimicrobial resistance found that "three out of four deaths could be averted by spending just USD 2 per person a year on measures as simple as handwashing and more prudent prescription of antibiotics"

Source: OECD, https://www.oecd.org/health/stopping-antimicrobial-resistance-would-cost-just-usd-2-per-person-a-year.htm

The UK Government in a five-year antimicrobial strategy reported that "Increasing scientific evidence suggests that the clinical issues with antimicrobial resistance that we face in human medicine are primarily the result of antibiotic use in people, rather than the use of antibiotics in animals"

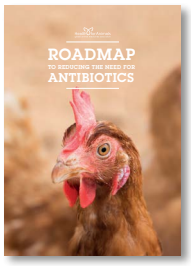
Source: UK Department of Health & DEFRA, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/244058/20130902_UK_5_year_AMR_strategy.pdf

Together, these reports indicate that animals can play a role in AMR development in humans, which is why the work outlined in the previous section have been so critical, but complementary action in human health is needed to make significant gains in the years ahead. AMR can only be managed through a One Health approach that works across human, animal and environmental health.

Animal health sector is leading the way

Significant actions and commitments by companies are helping reduce the need for antibiotics.

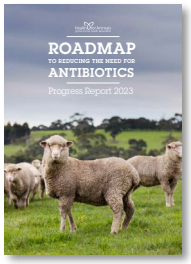
Animal health companies recognize the importance of reducing the need for antibiotics in animals and support greater shifts towards prevention. The sector has taken action for years to support this goal.



Clear Commitments

The 'Roadmap to Reducing the Need for Antibiotics' was launched by leading animal health companies in 2019. The Roadmap offered a vision for improving responsible use and outlined a list of 25 measurable actions the sector would complete by 2025.

Measurable progress



In 2023, the animal health sector released its 2nd Roadmap Progress Report showing that all 25 commitments made in the Roadmap were on track for completion. this included delivering 71 new vaccines, training 1.9 million medicine users, and donating over $25 million in veterinary scholarships and grants.

Coordinated Approach

RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE
ruma

Coalitions such as the UK's Responsible Use of Medicines in Agriculture Alliance or the EU's Platform for Responsible Use of Medicines in Agriculture have been in place for decades. These coalitions bring together farmers, veterinarians, research, retail, etc. to deliver improvements in responsible use, a unique approach that has not been replicated in human health.

Training and Data Collection

HealthforAnimals Members have created major programs to educate veterinarians in responsible medicine use, such as a collaboration between HealthforAnimals, the World Veterinary Association and the UNFAO's EUFmD Program to train para-professionals in Africa.

World Organisation for Animal Health
Founded as OIE

International institutions are also stepping up effort to improve data collection around antimicrobial use worldwide. The World Organisation for Animal Health's Annual Report on Antimicrobial Agents Intended for Use in Animals provides invaluable data that is helping to better target efforts. The United Nations Food and Agriculture Organization (UNFAO) is also supporting capacity building to help nations more effectively implement their national action plans.

Altogether, this work has made animal health the global leader in tackling antimicrobial resistance and our strong, collective action will continue in the coming years. However, AMR cannot be solved alone. Animal health companies and institutions will be ready to work together and share our knowledge to help strengthen the actions of others.