SURVEILLANCE OF ANTIMICROBIAL RESISTANCE AND USE

Information note of the Global Leaders Group on Antimicrobial Resistance.
July 2021.

**GLOBAL LEADERS GROUP
ON ANTIMICROBIAL RESISTANCE**

KEY MESSAGES

1 Surveillance of antimicrobial resistance and use is critical for an effective response to antimicrobial resistance across all sectors but there are significant challenges in each sector and in data sharing and harmonization across sectors to support a One Health response.

2 Data on antimicrobial resistance and use are most available in the human health sector and somewhat available in the animal sector. There is a paucity of data on antimicrobial resistance and use in the plant sector and on antimicrobial resistance in the environment.

3 Increased financial resources, infrastructure and technical capacity are needed to strengthen surveillance of antimicrobial resistance and use across all sectors, particularly in low- and middle-income countries (LMICs).

4 Significantly more effort is needed to ensure that data on antimicrobial resistance and use are analyzed and translated into action at all levels.

5 Global, regional, national and local surveillance efforts on antimicrobial use and resistance must be coordinated and aligned in data sharing, collaboration and partnerships across countries, sectors, companies and organizations.

1. Sector-specific surveillance of antimicrobial resistance and use and sharing and comparability of data across sectors to support a One Health response are critical but there are currently a significant number of challenges and gaps.

Up-to-date, actionable, credible and accessible data on antimicrobial use and resistance are crucial for generating political support and financing for the response to antimicrobial resistance and supporting informed and timely decision-making and interventions. The Tripartite, in collaboration with UNEP, developed standardized core and additional indicators for the monitoring and evaluation of the implementation of the Global Action Plan on AMR across all sectors.[1] They are also currently developing an integrated surveillance system platform that will harmonize data reported from countries across the human, animal, food, plant and environmental sectors. However, the current lack of resources and disparity in sectoral antimicrobial use and resistance surveillance systems and data non-availability mean that there are significant gaps in the data reported across sectors that limit the full realization of a global integrated One Health surveillance system for antimicrobial resistance.

2. Antimicrobial use and resistance surveillance infrastructure in low- and middle-income countries is severely underfunded, particularly for sectors other than human health, which limits the availability of quality data.

Many LMICs lack basic capacity to establish and maintain antimicrobial resistance and use surveillance systems such as laboratory capacity and quality control, microbiological diagnostic capacity, infrastructure and epidemiological tools.[2] A major bottleneck to improving the quality of microbiological data for many LMICs is limited access to affordable laboratory consumables (supplies).[3] Limited access to medical care and free-of-charge laboratory tests also represents a barrier to obtaining systematic unbiased samples. There is also difficulty in comparing national data, analysing trends over time and reporting on the impact of antimicrobial resistance on human health.[4,5]

1   FAO, OIE and WHO (2019). *'Monitoring and evaluation of the global action plan on antimicrobial resistance: framework and recommended indicators'.* Available here.
2   IACG (2018). *'Surveillance and monitoring for antimicrobial use and resistance'.* (discussion paper). Available here.
3   Iskandar, K et al. (2021). *'Surveillance of antimicrobial resistance in low-and-middle income countries: A scattered picture.'* Antimicrobial Resistance and Infection Control. Available here.
4   Wellcome (2020). *'The Global Response to AMR : Momentum, success, and critical gaps'.* Available here. (Pg. 51)
5   Frost, I et al. (2021). *'Status, challenges and gaps in antimicrobial resistance surveillance around the world'.* Journal of Global Antimicrobial Resistance. Available here.

3. The human health sector has many antimicrobial use and resistance data sets, but these are fragmented and often inaccessible.

Many existing datasets do not follow harmonized standards and data representativeness is often limited, including in some national surveillance systems. Many long-running antimicrobial resistance surveillance studies are led by the private sector and several pharmaceutical companies who make their data accessible to the scientific community and healthcare providers. However, some private sector surveillance systems only gather data from a small number of sites and are not always well-integrated with official national data. Better coordination of One Health antimicrobial use and resistance surveillance data protocols, analysis and interpretation, and timely information sharing across sectors and sources can support the collection and use of more robust data.

4. WHO has developed a standardized approach to the collection, analysis and sharing of human health antimicrobial resistance and use surveillance data, but it has several limitations.

The Global Antimicrobial Resistance Surveillance and Use System (GLASS) gathers data from more than 100 countries and territories on bacterial and fungal pathogens and antimicrobial consumption and use in humans. The number of countries submitting data to GLASS has grown in recent years. However, it only includes surveillance data from sites connected with national coordinating bodies that collate and submit data and the quality of data varies considerably due to country capacity and financial constraints. As result, GLASS does not yet provide a comprehensive picture of antimicrobial resistance and use in human health globally.

5. Surveillance systems that track antimicrobial resistance and use in animals are more limited.

The World Organisation for Animal Health (OIE) maintains a global database and tracks progress on antimicrobial agents intended for use in Animals. It also establishes baselines for countries to monitor the implementation of national regulatory frameworks in the animal sector. OIE also publishes an annual report analysing the use of antimicrobial agents in animals.[6] There are few other robust surveillance systems that collect global data on antimicrobial use and resistance in animals[7] and national and regional systems are limited. The Food and Agriculture Organization of the United Nations (FAO) is developing a data platform to support its Members in the collection of antimicrobial resistance data in food and agriculture sectors and on antimicrobial use in crops and plants.

At country level, barriers to collecting surveillance data on antimicrobial resistance use in animals include the lack of regulatory frameworks for veterinary products, a lack of electronic data collection tools connected to authorization of veterinary products, lack of coordination with other national sectors and the private sector, poor regulatory enforcement, selection bias in data collection, and circumstances that prevent the monitoring of antimicrobial use.

6. There is currently no global surveillance system for antimicrobial resistance in the environmental sector.

Although the environmental aspects of antimicrobial resistance are increasingly being recognized as important, there is currently no global surveillance system for antimicrobial resistance in the environment and a lack of international guidelines or recommended methodologies for sampling and testing to guide countries in setting up surveillance systems that can generate comparable data. However, interest in global wastewater surveillance is increasing, which may provide an opportunity to monitor antimicrobial resistant organisms, their genes and antimicrobial residues as they enter the environment, especially in treated effluent.

7. Surveillance data often do not translate into action.

Data should inform decisions by policy-makers and enable antimicrobial prescribers to optimize antimicrobial usage. However, many countries lack the capacity, knowledge and organizational structures to translate data from antimicrobial use and resistance surveillance into meaningful action. There is a need to combine clinical and microbiological data to generate actionable and timely information and to develop information management systems and communication methods and partnerships between surveillance and decision-making bodies including statistics agencies and institutions responsible for data analysis and translating data into policy.

8. Global efforts on genomic surveillance of antimicrobial resistance need to be strengthened, however there is currently insufficient capacity at country level.

Major investment and technical support are needed to further explore global genomic surveillance of antimicrobial resistance for all relevant pathogens.[8] Opportunities are emerging to strengthen the international surveillance network for pathogens with pandemic potential including interest on the part of the G7 and G20 which could also be useful for strengthening surveillance of antimicrobial resistance.

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6   OIE (2021). *'OIE Annual Report on Antimicrobial Agents Intended for Use in Animals'*. Available here.
7   ResistanceMap, led by CDDEP, collates data on antimicrobial use and resistance in animals but data are collected from a sample of institutions and does not represent official national data. (See here)
8   World Health Organization (2020). *'GLASS whole-genome sequencing for surveillance of antimicrobial resistance'*. Available here.