Integrated Surveillance of AMR and AMU: A One Health Approach

Sabiha Essack and Jaap Wagenaar

Co-Chairs: Quadripartite Technical Group on the Integrated Surveillance
Overview

- Why do we need integrated surveillance?
- What is integrated surveillance?
- How do countries implement integrated surveillance?
- How will integrated surveillance be of benefit to countries?
- Role of the Quadripartite Technical Group on Integrated Surveillance
- Proposed focus areas for the GLG
WHY? AMR is Complex & Interconnected
WHY? AMR has Multi-Sectoral Impact

THE IMPACT OF AMR BY 2050 WOULD BE WIDE-RANGING

- 28 MILLION PEOPLE projected to fall into poverty because of AMR
- Up to 7.5% decline in global livestock production
- Up to 3.8% decline in global exports
- Up to 1 TRILLION US $ global increases in healthcare cost

IMPACTS OF ANTIMICROBIAL RESISTANCE

- Missuse and overuse of antimicrobials; poor access to quality, affordable medicines, vaccines and diagnostics; lack of awareness and knowledge; population movement
- Missuse and overuse of antimicrobials; poor access to quality, affordable medicines, vaccines and diagnostics; lack of awareness and knowledge; movement of animals

Drivers of Antimicrobial Resistance

- Food & Feed: Poor infection and disease prevention and control; transmission of resistant pathogens in food production, storage, distribution and preparation
- Plants & Crops: Discharge of waste from healthcare facilities, pharmaceutical manufacturing and farms
- Environment: Discharge of waste from healthcare facilities, pharmaceutical manufacturing and farms
- Humans: Missuse and overuse of antimicrobials; poor access to quality, affordable medicines, vaccines and diagnostics; lack of awareness and knowledge; population movement
- Terrestrial & Aquatic Animals: Missuse and overuse of antimicrobials; poor access to quality, affordable medicines, vaccines and diagnostics; lack of awareness and knowledge; movement of animals

One Health response to address the drivers and impact of antimicrobial resistance

“One Health” refers to designing and implementing programmes, policies, legislation and research in a way that enables multiple sectors and stakeholders engaged in human, terrestrial and aquatic animal and plant health, food and feed production and the environment to communicate and work together to achieve better public health outcomes.
What is Integrated Surveillance?

Public health surveillance is “the ongoing, systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice.”

Integrated One Health Surveillance is the “collaborative, coordinated, ongoing, systematic collection, analysis, interpretation and communication of AMR and AMU data (from humans, animals, plants and the environment) essential for action, i.e. planning, implementation, and evaluation of interventions to optimize One Health policy, legislation and practice to mitigate AMR.”
What is Integrated Surveillance?

Quadripartite Global Surveillance Architecture

Global Integrated Surveillance for AMR/AMU

Health System

Agricultural System

Environmental Health System
What is Integrated Surveillance?: A Conceptual Framework

- Technical capacity for harmonized data collection, analysis, interpretation and communication to inform action at policy and practice levels

Surveillance & Research (GAP) of AMR and AMU/AMC/Exposure
- Humans
- Animals (terrestrial & aquatic)
- Plants
- Environment

AMR Burden

Interventions (GAP on AMR)
- Governance
- Awareness & Education
- Environmental Dimensions of AMR
- WASH, IPC, Biosecurity
- Optimal AMU
- Sustainable Investment, R & D

Alleviate the AMR burden and ensure efficacy of antimicrobials for future generations

Adequate, Sustainable Human, Infrastructural & Financial Resources

Logos:
- Food and Agriculture Organization of the United Nations
- UN Environment Programme
- World Health Organization
- World Organisation for Animal Health
HOW? - Resources

External:
• Multi-Partner Trust Fund
• Fleming Fund

In-country: Integrate into existing surveillance systems e.g.
• TB, HIV and malaria (legislation, surveillance, laboratory & IPC infrastructure)
• Food safety and animal health and welfare programmes
• Water quality testing and wastewater surveillance for SARS-CoV-2

Requires the 5 “Cs”
• Consultation, Collaboration, Coordination, Communication and Capacity Building

Implementation Research is the scientific inquiry into questions concerning implementation—the act of carrying an intention into effect, which in [One] Health research can be policies, programmes, or individual practices (collectively called interventions).\textsuperscript{1}

\textsuperscript{1}Peters DH, et al. \textit{BMJ} 2013; 347: f6753.
Benefits of Integrated Surveillance

Integrated Surveillance:

• Detects AMR reservoirs and hotspots.

• Determines the drivers of resistance - inappropriate AMU (AMR-specific) or sub-optimal WASH/IPC (AMR-sensitive)

• Identifies potential transmission routes and directionality

• Provides data for action: informs risk management policy, legislation and practice strategies.

• Serves as an indicator to measure the success of interventions to mitigate AMR and optimize AMU
Quadripartite Technical Group on Integrated Surveillance

Aim:
• To develop a technically feasible public health value proposition for the implementation of integrated One Health surveillance by all member states.

Roles and Responsibilities:
• Reach consensus on the definition of Integrated Surveillance
• Review current approaches and guidance on integrated surveillance
• Develop a framework for integrated surveillance based on the review
• Identify minimum technology laboratory and diagnostic capability for sector-specific and integrated surveillance including the incremental implementation of genomic surveillance
• Ensure adaptability in different resource settings and specifically in LMICs
GLG: Call for Action

Advocacy for:

• Multi-sectoral governance: consultation, collaboration, coordination, communication, capacity building
• Build on existing surveillance of AMR and AMU to incorporate integrated surveillance
• Harmonized data collection and data sharing
• Mobilization of resources and advocacy for domestic resource allocation/repurposing for integrated surveillance
• Inclusion of integrated surveillance in communiques of the G7, G20, others
• Inclusion of integrated surveillance in the 2024 UNGA Political Declaration
THANK YOU

essacks@ukzn.ac.za
@EssackSabiha
https://sabihaessack.ukzn.ac.za

j.wagenaar@uu.nl