Catalyzing the Potential of Regional Action to Combat AMR

Critical Insights on Data Sharing and Use of One Health Data in **South Asia**
INTRODUCTION

Antimicrobial resistance is a silent pandemic.

A human, animal and environmental issue that spans the One Health paradigm

A complex issue, involving...
  - Cross-sectoral coordination (involving numerous ministries) and the need for political will across each
  - Need for significant investments in microbiology laboratory capacities, quality control and equipment
  - Involves several types of data collection and reporting systems, complex analyses, and information that is not easily communicated to policy-makers.
  - Involves behavior change in clinicians, pharmacists/vendors, community members, veterinarians, food producers, farmers, etc.

AMR has no borders
  - With increasing movement of people between countries, international trade of livestock commodities and food, and alterations in the environment due to climate change, monitoring of AMR trends across borders has become increasingly important.
  - Control will take local, national, regional and global involvement and coordination, each with different but important roles.

The first antibiotic (penicillin) was created <100 years ago

The last antibiotic class that hit the market was over 35 years ago

36% increase in Antimicrobial consumption between 2000-2010 in humans.

700,000 human deaths per year are attributed to AMR approximately

Deaths attributed to AMR are projected to rise to 10 million per year by 2050, which may cost $100 trillion
• Significant efforts have been made to strengthen national level surveillance systems in LMICs

• Now that national level surveillance systems are increasing in quality, we are now at a time point where the role and utility of the regional level needs to be established to further bolster national and regional control efforts

• Coordinated approaches and policies across countries is the only way for AMR to be controlled

• Each region operates in its own unique manner, internally intertwined through their economic and trade, animal husbandry practices, and health practices.

• Therefore, the role and utility of the regional level in control of AMR needs to be tailored to each region to maximize its impact.
Assessment Goal

• The goal of the RADAAR project is to gather the necessary information to establish or enhance regional data sharing and further the establishment of a regional One Health framework for AMR and AMU/C.

Assessment Objectives

• Depict current AMR and AMU/C data sharing pathways and networks at the national, regional and global levels
• Assess the status of surveillance systems and the availability of human and animal health AMR and AMU/C data on the national and regional levels
• Identify information gaps at the national and regional level, where regional level activities could potentially fulfill such gaps and impediments.
• Identify stakeholders’ perceived benefits and expectations of a regional framework and data foundation
• Identify barriers and facilitators to sharing of data into a regional data foundation
• Gather insights on trusted organizations, both technically and in leadership
• Provide conclusions drawn from the information above to inform the regional framework and data foundation
Frameworks drawn upon and reviewed in building one health data sharing assessment framework:
Overview of Methods

KII Global Level

- **KII - Regional Level (Africa)**
  - Malawi, Uganda, Tanzania, Zambia, Zimbabwe, Kenya, Eswatini, Nigeria, Ghana, Senegal, Sierra Leone
- **KII - Regional Level (S. Asia)**
  - Nepal, Bangladesh, India, Pakistan, Bhutan, Sri Lanka
- **KII - Regional Level (S.E. Asia)**
  - Timor Leste, Vietnam, Lao PDR, Myanmar, Indonesia, Papua, New Guinea

- **KII - National Level (Malawi)**
  - Malawi Report
- **KII - National Level (Nepal)**
  - Nepal Report
- **KII - National Level (Timor Leste)**
  - Timor Leste Report

- **KII - National Level (Uganda)**
  - Uganda Report
- **KII - National Level (Bangladesh)**
  - Bangladesh Report
- **KII - National Level (Vietnam)**
  - Vietnam Report
Bangladesh and Nepal were selected based on the following:

- Fleming Fund target country
- Executed MOU in place between UK government and target country for Fleming Fund
- National Action Plan for AMR in place
- Large or mid-sized country in South Asia with a shared border with India, where many antibiotics are locally produced

- Cross-sectoral Antimicrobial Resistance coordination committee (AMRCC) in place and active
- Human and animal health sectors at minimum engaged in the AMRCC
- Political atmosphere and network in place to facilitate interviews with stakeholders
National Participants- Nepal (12) and Bangladesh (11)
- Government administrations of animal and human health
- Leaders of public health and veterinary laboratories
- Experts from WHO and FAO local offices

Global and Regional Participants (20)
- WHO-HQ, WHO-GLASS, and regional offices of WHO with backgrounds in human health
- FAO-HQ and OIE-HQ and other regional offices of FAO and OIE with backgrounds in animal health, aquaculture and fisheries and plant health, UNEP
- Regional organizations working on AMR (e.g., CDDEP, CAPTURA project)
- Multinational pharmaceutical companies (e.g., Pfizer and Health for Animals)
Coding, Analysis, Report Generation

**Methods**

**Coding**
- Codebook developed
- Key Informant Interview notes were coded

**Thematic Analysis**
- Codes were grouped into themes
- Themes were then summarized by research question

**Generation of Findings and Report**
- Findings were summarized in national level reports and a questionnaire was developed to validate the findings
- A regional report was developed (by a cross-sectoral research team) to guide the regional framework
Existing (& future) networks in South-Asia

**Key Findings**

Regional level

- **AMC/U**
- **AMR**

Existing (& future) networks in South-Asia

**Key Findings**

National data

- **AMC/U**
- **AMR**

- **AMC/U**
- **AMR**

- **AMR**
- **AMC/U**
- **AMR**

- **AMC/U**
- **AMR**

- **AMC/U**
- **AMR**

Humans

Animals

Food

Plants & crops

Environment
Existing (& future) networks in South-Asia

Key Findings

- IQVIA
- MIDAS
- CAPTURA
- Fleming Fund

Global level

- Global AMC/U collection
  - OIE
  - > 90
- AMC/U
- AMR

Regional level

- Existing (& future) networks in South-Asia
- 11 A
- AMC/U
- AMR

National data

- AMR
- AMC/U
- AMR

Humans

Animals

Food

Plants & crops

Environment
Existing (& future) networks in South-Asia

Key Findings

- GLASS
  - WHO
- GRAM
  - BDI-IHME
- GASP
  - WHO
- CDDEP
  - B&M Gate F.
- IQVIA
  - MIDAS
- CAPTURA
  - Fleming Fund

AMC/U

AMR

AMC/U

AMR

AMR

AMC/U

AMR

Humans

Animals

Food

Plants & crops

Environment

Global level

Regional level

National data
Feedback and information received

- Assistance for data cleaning
- Unclear level and frequency of feedback
- Annual report (global, regional, and national analysis)

- **Regional level:** no/unclear
- **National level:** few examples in Asia

Use of feedback

- **Regional & national levels:** not yet, generating a valid baseline requires 4/5 years (cf. ESVAC)

Positive impact

- Enhancing data quality, healthy competition
- Planned improvements: IT tools (facilitating analysis, visualization, automatic report for countries, connection WAHIS …)
“To be sincere, we don’t get any feedback from GLASS. You can’t keep sending data to GLASS if you can’t get feedback.” (national stakeholder, HH)

“We don’t have any structured evidence of changes in the national or local policies based on the GLASS data. It's happening gradually” (global stakeholder, HH)

“I would suggest to countries to be more demanding towards WHO” (global stakeholder, HH)

“Talking of AMU reporting to OIE, the most important impact and precious thing is that our country has now started to develop its own database(...) Before that we had no idea of how to calculate data” (national stakeholder, AH)

“Although countries cannot see the full picture, OIE reports help us understand some situations of what is going on in the region and globally. Countries consider it as an advantage.” (global stakeholder, AH)
Utility of generated feedback in informing decision making

**Key Findings**

Q5H3. If feedback was provided from the regional or global level for human health AMR/U/C, was the feedback utilized (useful) for updating/enhancing any of the following?

- Enhancing existing surveillance system: 12
- Improvement of data quality: 12
- Advocacy & awareness: 11
- Updating treatment guidelines: 5
- Updating antibiogram: 5

Q5A3. If feedback was provided from the regional or global level for animal health AMR/U/C, was the feedback utilized (useful) for updating/enhancing any of the following?

- Improvement of data quality: 7
- Advocacy & awareness: 6
- Enhancing existing surveillance system: 5
- Updating treatment guidelines: 3
- Identification of AMR trends in bordering countries: 3
- Updating antibiogram: 3
Critical gaps where a regional hub would be advantageous

Gaps in surveillance (1)
Gaps in surveillance (1)

Critical gaps where a regional hub would be advantageous

**AMR surveillance**

- **Desire for AMR cross-border surveillance**
- Need for official regional pathway for AMR data, harmonization of methods/metadata & reg. baseline for AMR trends

**Key Findings**

- AMR trends & early detection of emergence
  - Lack of (quantity), quality, timely data
  - Gap in food safety and foodborne AMR transmission
  - Lack of international standards and guidelines for AMR surveillance in plant and environment
Critical gaps where a regional hub would be advantageous

Gaps in surveillance (1)

“**We have a big gap in private sector data, as they are not required to share data to the national level. We know it’s quality data, so it would be very beneficial to receive it. But the private facilities need incentives to share.**” (national stakeholder, HH)

“The countries realize the importance to collect the AMU data at the field level as well, so you can establish the linkages between AMU and AMR data” (regional stakeholder, AH)

**AMC/U surveillance**

- Need for a global and regional AMC/U baseline
- Need for AMR/U correlation between countries to identify regional issues
- AMC trends monitoring
  - Insufficient quantity of AMC data
  - Need to improve the validity of AMC data
- **Lack of accurate AMU data**
  - Scarce point-prevalence surveys (pharmacy)
  - Lack of species-specific field data (farm records ...) to inform risk management
- Need to study temporal associations between AMU and AMR
- Critical knowledge gap on the use of AM in aquaculture, apiculture, and plant sectors
Gaps in surveillance (2)

AMR/C/U surveillance

- Desire for stronger regional collaboration, networking, exchange of best practices etc.

- Insufficient capacity for data analysis, interpretation, reporting, and use = surveillance data not translated into actions

(more pronounced in AH sector)

Key Findings

“Data sharing is also an experience sharing. It’s not just data (...) It should be a learning and sharing platform. We can work together” (national stakeholder, AH)

“We are very weak in the data analysis. That may be a reason why we are not getting real benefit from the data we have already generated.” (national stakeholder, AH)
Critical gaps where a regional hub would be advantageous

Gaps in surveillance (2)

AMR/C/U surveillance

- Desire for stronger regional collaboration, networking, exchange of best practices etc.
- Insufficient capacity for data analysis, interpretation, reporting, and use = surveillance data not translated into actions
  (more pronounced in AH sector)

ONE HEALTH

Key Findings

- Need for an integrated glob/reg surveillance system, high data fragmentation across sectors
- Poorly-defined concept of “integrated surveillance”, need for a more operational guidance
- Need for monitoring AMR transfer between sectors
- Poor collaboration and lack of integrated analysis between sectors in countries

Desire for stronger regional collaboration, networking, exchange of best practices etc.
Insufficient capacity for data analysis, interpretation, reporting, and use = surveillance data not translated into actions

(more pronounced in AH sector)
Critical gaps where a regional hub would be advantageous

Advocacy & awareness

- Lack of regional evidence for political buy-in, e.g.,
  - Economic burden at regional level
  - AMR/U causal relationship
- No awareness about AMR (at any level) in plants as AMU & AMR burden are unknown

- Insufficient **national (powerful) evidence** to influence policy makers
  - Lack of health and economic data to make the business case for AMR
  - Limited economic analysis
- Lack of tailored guidance on how to persuade policymakers
- Lack of evidence to drive massive public awareness campaigns for environmental sector

“**When you know those economic data then you can really go to the politicians and the regional stakeholders to show them the reality which they couldn’t see because we didn’t have the data. And it’s the way you can help them, encourage them, or themselves can initiate the development of the right policies**” (global stakeholder, AH)

“So **we should know the situation. Knowledge is a challenge in the plant sector. We never thought AMR was a big issue. So we have no technical knowledge, no policy. We cannot raise alarm.**” (global stakeholder, plant sector)
“The banning of colistin from pig farming: the economic consequences of removal without replacement, this is a knowledge gap for them... It’s possible to say to a country, you need to ban this antibiotic and you will have less AMR, but this is ignoring the economic factors, the business case, the sustainability.” (global stakeholder, research sector)

Critical gaps where a regional hub would be advantageous

Key Findings

Policies, guidelines & regulations

- Need to deploy a regional strategy for scaled-up measures in the future
- Lack of political will to regulate AM use in plant sector (at any level)
- Scarce environmental regulation (at any level)
- Difficulties to update essential medicines list, treatment guidelines
- Inability to tailor interventions/regulations to national context
- Knowledge gap on interventions actionable in livestock
- Inability to monitor efficacy of interventions, to assess cost/benefices etc.
  - E.g., impact of banning GP in LMIC?
Major barriers & facilitators to sharing/using AMR/C/U data

Key Findings

- Funding and sustainability
- Cross-sectoral coordination
- Trained workforce
- Current/previous network and ties
- Data sharing processes
- Legal & ethical framework
- Data availability, quality and form
- Data privacy & access
- Perceived risks
- Political will
- Trust

Key Findings
Major barriers & facilitators to sharing/using AMR/C/U data

**Cross-sectoral coordination**
- Irregular ad-hoc coordination
- Vet. drug under MOH (AH)
- Lack of specific funding
- Sectors left behind HH (all other sectors)
- **Lack of formal processes & adequate platform** for data sharing between sectors

**Current/previous network and ties**
- Some countries w/o precedents to build upon (HH)

**Legal & ethical framework**
- May take time to process

**Data privacy & access**
- Key concerns for countries due to trade implications (AH).

**Political will to share data reg.**
- Weaker for “unofficial” channels w/o legal obligation
- High level of commitment might be requested

**Key Findings**
- **OH structures usually exist**
- Hotspot/zoonoses, OH set as a priority in SA
- Future platforms, all using WHONET software

- Ongoing participations in GLASS, OIE, FAO-RAP... constitute a basis and precedent
- MOUs are the preferred tools, precedents exist
- Non-disclosure of national-level data in AH: AMC/U data aggregated by region for OIE.
- Globally present, as long as it is beneficial for the country (w/o negative economic impact)
Major barriers & facilitators to sharing/using AMR/C/U data

Key Findings

**Trust**
- Due to competitive economic interests (exports), countries can harbor distrust (AH)
- Private sector uncertain

**Perceived risks**
- Potential risk for tourism (HH) and export (AH): data misuse, such as protectionism in disguise (e.g. EU market)

**Data availability, quality and form**
- Low AMR data quality (and quantity for AH), timeliness, format and structure, geo. representativeness (+++ in AH)
- Pharma. industry reluctant to share AMC data (business concern)

**Data sharing processes**
- Insufficient IT resources, staff time, and varied dataset structures, few automated processes (+++ in AH)

**Trained workforce**
- Poor capacity to manage, analyze, interpret and use data for policy-making (+++ in AH)

**Funding and sustainability**
- AMR is a low priority (+++ in AH), most countries rely on ext. assistance ... but sustainability?
- Few dedicated AMR analysts

- Trust in global and glob/regional partners is generally high
- Quantity and quality enhanced through donor-funded programs.
- GLASS, OIE, FAO, FF act as catalysts
- External supports: WHO-WIPRO, FF, FAO, OIE etc.
- Automated analysis?
Key Findings

Q7B1. What barriers do you foresee (or did you experience) to sharing AMR/U/C data at the regional level?

- Low availability/insufficient quality and coverage of the data: 25
- Absence of central database and adequate software: 22
- Lack of time and skills required to manage the data: 19
- Restrictive data format (data not yet digitalized, incompatible electronic format...): 13
- Ownership right concern or potential of misuse: 13

Restrictive data format (data not yet digitalized, incompatible electronic format...): 22
Ownership right concern or potential of misuse: 21
Lack of time and skills required to manage the data: 10
Lack of time and skills required to manage the data: 10
Ownership right concern or potential of misuse: 7
✓ Clearly outline benefits that countries will experience by participating, and continually manage country expectations.

✓ Insist that member states drive its priorities and activities.

✓ Understand that each country's surveillance system must be tailored to that country.

✓ Focus first on enhancing the capacity of the national reference laboratory.
✓ Starting with realistic expectations (prioritization, stepwise approach). Establishing a data foundation requires significant time.

✓ At a regional level, major point is to have countries working in a way where results can be used together.

✓ Generate and utilize data on the economic burden of AMR. Many policymakers react best to an economic/cost argument.

✓ Utilize regional economic communities, as they have deep network and are influential in AMR-related trade issues.

✓ Utilize private sector data, and persuade stakeholders who have an inherent distrust of private sector actors.
✓ Design and agree on a governance structure

✓ Establishment of a One Health coordinating centre operationalizing activities

✓ Multi-lateral information sharing agreement or MOU as agreed for member states

✓ Identify and agree on custodiam of data and sharing mechanism (integrated surveillance system)

✓ Sustainable funding identified with commitment (governments plus donor organizations/institutions)
A regional framework must **enhance national-level capacity** to improve the quantity, quality, and representativeness of data by providing active technical assistance and feedback.

A regional framework must focus on **providing technical assistance guidelines, which allow countries to sustainably realize benefits in exchange for data sharing.**

A regional framework must **set a precedent for integrated analysis** in South Asia and support the countries to translate and utilize the data in a manner to better inform policy and decision-making.

A regional framework must **support the countries to translate and utilize the data in a manner to better inform policy and decision-making.**

A regional framework must demonstrate sufficiently broad and deep expertise to **fill a range of knowledge gaps noted by national stakeholders.**

An effective regional framework must seriously consider **utilizing data from the pharmaceutical industry.**
An effective regional framework must **enhance the advocacy capacity of national stakeholders**.

A regional framework must be **composed of a range of organizations** which expertise in data management and analysis, advocacy and policy, and research, among others.

Providing **access to an IT tool for data analysis and visualization** would be an attractive asset for a regional data foundation.

**Confidentiality and privacy concerns need to be carefully addressed** to overcome trade-related barriers.

A regional framework must support countries to **assess the economic AMR burden in animal health sector**.

A long-term goal of a regional framework must include the **monitoring of advanced parameters to quantify transmissions pathways between sectors**.