Containing antibiotic use/misuse in food systems and AMR: global and national overview
Rajeshwari Sinha, Programme Manager, Sustainable Food Systems, CSE
December 20, 2023
Food production systems – a key driver for AMR

Multiple drivers calling for a One Health approach

**Food-animal production systems**
- Poultry (eggs and meat)
- Fish for meat
- Buffalo and cattle (milk and meat)
- Bee-keeping

**AMR**
- Use/misuse/overuse of antibiotics

**Crop production systems**
- Bee-keeping for honey
- Crops (food, feed)

**Waste and Environment**
- Antibiotic resistant bacteria
- Antibiotic resistance genes
- Antibiotic residues

**Key sectors**
- Poultry (eggs and meat)
- Fish for meat
- Buffalo and cattle (milk and meat)
- Bee-keeping for honey
- Crops (food, feed)
Impact beyond human health; more in LMICs

Human Health

• **1.27 M deaths** in 2019 (attributed directly)

• **4.95 M deaths** in 2019 (associated with AMR)

• AMR killed more people than HIV/AIDS (0.86 M) or malaria (0.64 M) in 2019

• 10 million lives per year at risk by 2050, if no action taken
  – About 90% in Asia and Africa
  – About **2 M in India**

Livelihood, Economy and Development

High-impact scenario by 2050

• 3.8% global annual **GDP** lost

• **Livestock** production in LMICs would decline the most, with ~11% loss

By 2030

• Additional 24 million people into extreme **poverty**; most in LMICs
AMR could derail the achievement of SDGs by 2030
## Governance mechanism to fight AMR: countries working together at global platforms

### Global
- **United Nations** (UNGA high level meetings in 2016 and in 2024)
- **G7 and G20 nations**
- **Global Leaders Group on AMR** - advocating for political momentum
- **Quadripartite**
  - World Health Organization
  - Food and Agriculture Organization of the United Nations
  - World Organisation for Animal Health
  - United Nations Environment Programme

### National
- National and state governments
- Ministries/departments of animal husbandry, agriculture, fisheries, pollution control, human health etc.

...along with civil society, industry, scientific community, professional associations, media
Antibiotic use/misuse in food-animals

Antibiotic use

- Therapeutic
  - Therapeutic doses
  - Clinically diagnosed infectious disease
- Non-therapeutic
  - Increase the rate of weight gain
  - Increase efficiency of feed utilization
  - Mass, routine use (largely through feed at sub-therapeutic doses)
  - Individual or group of animals
  - With no clinical sign
  - Often routine use

Growth promotion

Therapeutically monitored

Prevention (prophylaxis)

Prevention – (control / metaphylaxis)

- In a group of healthy animals (presumed to be infected/may have already been sub-clinically infected because they are at risk of infection), where one or more animal is already infected

Though non-therapeutic, now being positioned as therapeutic by some agencies.
Global action – countries have reduced/are committing to reduce misuse

- **2022**: 47 countries, including India, committed to Muscat Manifesto targets:
  - Reduce total amount of antimicrobials used in agri-food system by 30-50% by 2030 from current level
  - Zero use of medically important antimicrobials for human medicine in animals for non-veterinary medical purposes or in crop production and agri-food systems for non-phytosanitary purposes

- **2023**: WOAH’s report highlights 107 countries have discontinued the use of antimicrobials as growth promoters in animals, with or without legislation; 41 still using it, 21 of which reported lack of proper legislation or regulation (India is using)

- **2022**: EU banned group preventative use of antibiotics in food-animals
Global action – call for countries to reduce antibiotic misuse but also momentum for food systems transformation and One Health approach

2021: GLG’s call to action to countries

- Reduce **overall use of antimicrobials, particularly HPCIAs** for terrestrial and aquatic animals and plants
- End the use of **medically important antimicrobials** for growth promotion, starting immediately with the HPCIAs
- Limit antimicrobial prophylaxis and metaphylaxis in animals and plants to **well-defined situations**, with a goal of markedly reducing use

GLG prioritizes the need for transforming food systems (one of the key priorities); Earlier UN Food Systems Summit-2021 also emphasized on food systems transformation to meet 2030 SDGs

2023: G20 New Delhi Leaders Declaration prioritized tackling AMR following the One Health approach
Problem of current food systems?

Antibiotics fuel intensification which is a driver for AMR, climate change, zoonoses and pandemics

Source: CSE analysis
So what do we know from the ground in India?

Residues of multiple antibiotics found in chicken meat; Practice of rampant non-therapeutic antibiotic use in industrial food production systems highlighted 2014

Antibiotic misuse in the fast food supply chain; ‘Double Standards’ of global giants as no such commitments are made by these for India; revisited in 2020-story largely same except Jubilant 2017

Antibiotics registered as fungicides; Indiscriminate use on crops; use in higher doses and frequency; streptomycin commonly used 2019

On-the-ground situation in India wrt CIA use in food-animal sector-dairy sector (21 CIAs from six classes), poultry sector (14 CIAs from four classes), aquaculture sector (3 CIAs from 1class) 2021
So what do we know from the ground in India?
CIAs and HPCIs used in all key food animal sectors

<table>
<thead>
<tr>
<th>Dairy</th>
<th>Poultry</th>
<th>Aquaculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 CIas from 6 Classes</td>
<td>14 CIas from 4 Classes</td>
<td>3 HPCIs from 1 class</td>
</tr>
<tr>
<td>13 HPCIs from 2 classes</td>
<td>8 HPCIs from 2 classes</td>
<td></td>
</tr>
</tbody>
</table>

**HPCIs**
- Third-, fourth- and fifth-generation cephalosporins, Eg: Cefotaxime
- Quinolones and fluoroquinolones, Eg: Levofloxacin

**CIAs**
- Aminoglycosides, Eg: amikacin
- Penicillins
- Ansamycins, Eg: Rifampicin
- Drugs used solely to treat tuberculosis or other mycobacterial disease

**HPCIs**
- Macrolides and ketolides, Eg: Erythromycin
- Quinolones and fluoroquinolones, Eg: Ciprofloxacin

**CIAs**
- Aminoglycosides, Eg: streptomycin
- Penicillins

**HPCIs**
- Quinolones and fluoroquinolones, Eg: Ciprofloxacin
So what do we know from the ground in India?

Antibiotics in honey, 2010

Antibiotic use in aquaculture, 2016

AMR in poultry environment, 2017

Antibiotics in feed, 2020

Use of ethnoveterinary medicines in dairy sector, 2021 and 2022

One health action to prevent and contain AMR, 2023
So what do we know about big government action in India: Centre and States

- **National Action Plan on AMR (2017-2021):** limited progress
- **National Action Plan 2.0** under-away
- **Delhi Declaration** calling for action from states on the ground: only four states- Kerala (2018), Madhya Pradesh (2019), Delhi (2020), Andhra Pradesh (2022)
- **FSSAI standards** (since 2018) for residual antibiotics in food from animals, but no data in public domain other than milk survey
- **MoHFW ban on use of colistin in food animals (2019):** enforcement results not known in public domain
- **MoA draft order to phase out/prohibit streptomycin and tetracycline use in agriculture (2021):** notified from Feb 2022; complete ban to be enforced from Jan 2024; phase out on condition of availability of alternatives, but we do not know if adequate work has happened to find alternatives
- **CPCB guidelines** on management of poultry and dairy sector waste (2020 and 2021): not AMR centric
Big gaps in food-animal and crop sector

- No data on **how much** and **what** kind of antibiotics are used in food-animals and crops in public domain
- No law to regulate **feed** and use of **antibiotic growth promoters** continue
- Not much recognition of the need to address **disease preventative use** of antibiotics
- **No law on CIAs**, other than colistin-many still being used
- National level **standard treatment guidelines** for veterinary sector not there
- No consolidated data on **antibiotic resistance** in food animals in public domain
- No data on **antibiotic residues** in food from animals other than milk survey
- No specific guidelines/standards to make **animal farm waste AMR safe**
Key question: How do we reduce dependence on antibiotics while producing food for big population and ensure livelihood of the producers?

**PREVENTION**
- How do we prevent infections in farms?
- Rearing systems, breeds, biosecurity tools, vaccination strategy?

**CONSERVATION**
- How do we reduce antibiotic growth promoters in feed?
- How do we reduce antibiotic based disease prevention?
- How do we conserve critically important antibiotics?
- How can we scale up EVM or other alternatives? EVM in poultry?
- What kind of surveillance would be cost effective and realistic-AMR and AMU?

**DEVELOPMENT**
- How do we scale up decentralized and/or extensive food production models?
- How do we incentivize the farmer to reduce chemical use/cover the risks?
Thank you!

For more information, contact:

**Amit Khurana**
Director
Sustainable food systems programme
k_amit@cseindia.org

**Rajeshwari Sinha**
Programme Manager
s_rajeshwari@cseindia.org

**Neeraj Kumar**
Deputy Programme Manager
neeraj_k@cseindia.org