Tackling environmental AMR
Rajeshwari Sinha
Programme Manager, Food Safety and Toxins, CSE

AFRICA-ASIA VIRTUAL WORKSHOP

Containing the ‘Silent Pandemic’
The Future Agenda on Antimicrobial Resistance
March 22-24, 2021
Environmental AMR in NAPs and country-level preparedness

• Environmental AMR is covered in National Action Plans in most cases
  – indicates need, desire, stakeholder consensus
  – aligns with the overall mandate of preventing chemicals/polluting entities into the environment
  – focus on multiple aspects -surveillance, waste management, biosecurity
  – despite limited focus on waste management, sanitation, IPC (in LMICs)

• Limited on-the-ground progress so far for reasons such as:
  – AMR issue is complex and crosscutting
  – Evidence not yet fully consolidated; still emerging (transmission pathways/risk assessment)
  – The issue is heavily dependent/focused on surveillance, which is resource intensive and technically demanding
  – Historical focus of regulators on pesticides and heavy metals; whereas AMR is different; it is also a microbiology issue
  – Absence of global guidance – the national agenda struggles to move

Environmental AMR covered in NAPs but implementers less equipped/prepared to take it forward
### Structure of the Environmental AMR problem

<table>
<thead>
<tr>
<th>Point Sources</th>
<th>Non-point Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Farms</strong></td>
<td>Rivers, Reservoirs</td>
</tr>
<tr>
<td>Waste from:</td>
<td>Groundwater</td>
</tr>
<tr>
<td>• Animal farms – poultry, dairy, pig, fish etc.</td>
<td>Agricultural soil</td>
</tr>
<tr>
<td>• Agriculture farms</td>
<td></td>
</tr>
<tr>
<td><strong>Factories</strong></td>
<td></td>
</tr>
<tr>
<td>Effluents from:</td>
<td></td>
</tr>
<tr>
<td>• Pharma manufacturing</td>
<td></td>
</tr>
<tr>
<td>• Feed mills</td>
<td></td>
</tr>
<tr>
<td>• Slaughter houses</td>
<td></td>
</tr>
<tr>
<td>• Processing units (meat, dairy)</td>
<td></td>
</tr>
<tr>
<td>• Effluent treatment plants</td>
<td></td>
</tr>
<tr>
<td><strong>Households/Community</strong></td>
<td>Healthcare Settings</td>
</tr>
<tr>
<td>Effluents from:</td>
<td></td>
</tr>
<tr>
<td>• Sewage treatment plants</td>
<td></td>
</tr>
<tr>
<td>• Disposal of unused, expired drugs</td>
<td></td>
</tr>
<tr>
<td><strong>Healthcare Settings</strong></td>
<td></td>
</tr>
<tr>
<td>• Hospital sewage</td>
<td></td>
</tr>
<tr>
<td>• Waste from veterinary care settings</td>
<td></td>
</tr>
</tbody>
</table>

Three AMR determinants (antibiotic residues, resistant bacteria, antibiotic resistance genes) travel across multiple systems and multiple sectors—cross cutting and resource intensive.
Sources/pathways/hotspots: focus on waste management critical

- Waste from point sources should not go untreated
- Necessary focus on waste management and treatment facilities will help prevent non-point sources become ‘sink’

Sources/pathways/hotspots:

- **Human Healthcare (hospitals, labs, polyclinics, nursing homes etc.)**
- **Pharmaceutical Manufacturing**
- **Feed Mills**
- **Slaughter-houses**
- **Processing (dairy, meat, fish)**
- **Veterinary Care (hospitals, polyclinics, etc.)**
- **Local shops/wetmarkets**
- **Houses**
- **Animal farms (poultry, dairy, swine etc.)**
- **Aquaculture farms**
- **Agricultural farms**

**Point Sources**

- **Factories**
- **Healthcare settings**
- **Community**
- **Farms**

**Sink/possible Source**

- **Reservoirs/Rivers/surface water**
- **Soil**
- **Groundwater**

With or without treatment at drinking water plants

Source: CSE compilation from multiple sources
Gaps in global/national technical guidance and standards; it may take time but the environmental agenda cannot be delayed any further

- **No standards/limits for AMR determinants in waste at the national and global level**
  - Not even from hotspots like pharmaceutical industry (*industry prefers voluntary code/limits*; without global best practice, even the Indian initiative to develop antibiotic discharge limits seem to be pushed back by industry)
  - Current waste standards in most cases are about BOD, COD, which do not help
  - It is also expensive to monitor antibiotics in the environment; governments are wary of including these as pollutants because of this

- **Technical guidance by global/national agencies limited**
  - Such as on how to manage waste from farms/factories/house hold and healthcare settings w.r.t. AMR (recently, technical brief on role of WaSH and wastewater management came up); National level guidance exist in some cases but not aligned to the cause of AMR
  - Such as on monitoring / surveillance of environmental AMR
  - Guidance from Inter-governmental organization on environment (UNEP) is awaited
Way ahead

- Prioritize and invest in the environmental AMR agenda (national/global) as part of a true one-health action

- **Focus on preventative aspects.** Need to reduce antibiotic use at the first place, so that we pollute less. This will help avoid getting slowed down due to resource-intensive surveillance/monitoring

- **Manage waste well through AMR-centric approach: but make it relevant and affordable for emerging world:** Build capacity; identify hot-spots; set standards/discharge limits for hot-spots and work towards preventive management
  
  - Set necessary guidelines/SoPs (land application of farm waste plays a crucial role for enhancing fertility and productivity and so we need careful guidance on this)
  
  - Standard setting for ‘hot spots’ and waste streams/wastewater plants that are easier to identify and monitor
Thank you

For information, contact:

Amit Khurana
Director
Food Safety and Toxins programme
k_amit@cseindia.org

Rajeshwari Sinha
Programme Manager
Food Safety and Toxins programme
s_rajeshwari@cseindia.org

Divya Singh
Programme Officer
Food Safety and Toxins programme
divya.singh@cseindia.org

Deepak Bhati
Programme Officer
Food Safety and Toxins programme
deeak.bhati@cseindia.org