
CSE
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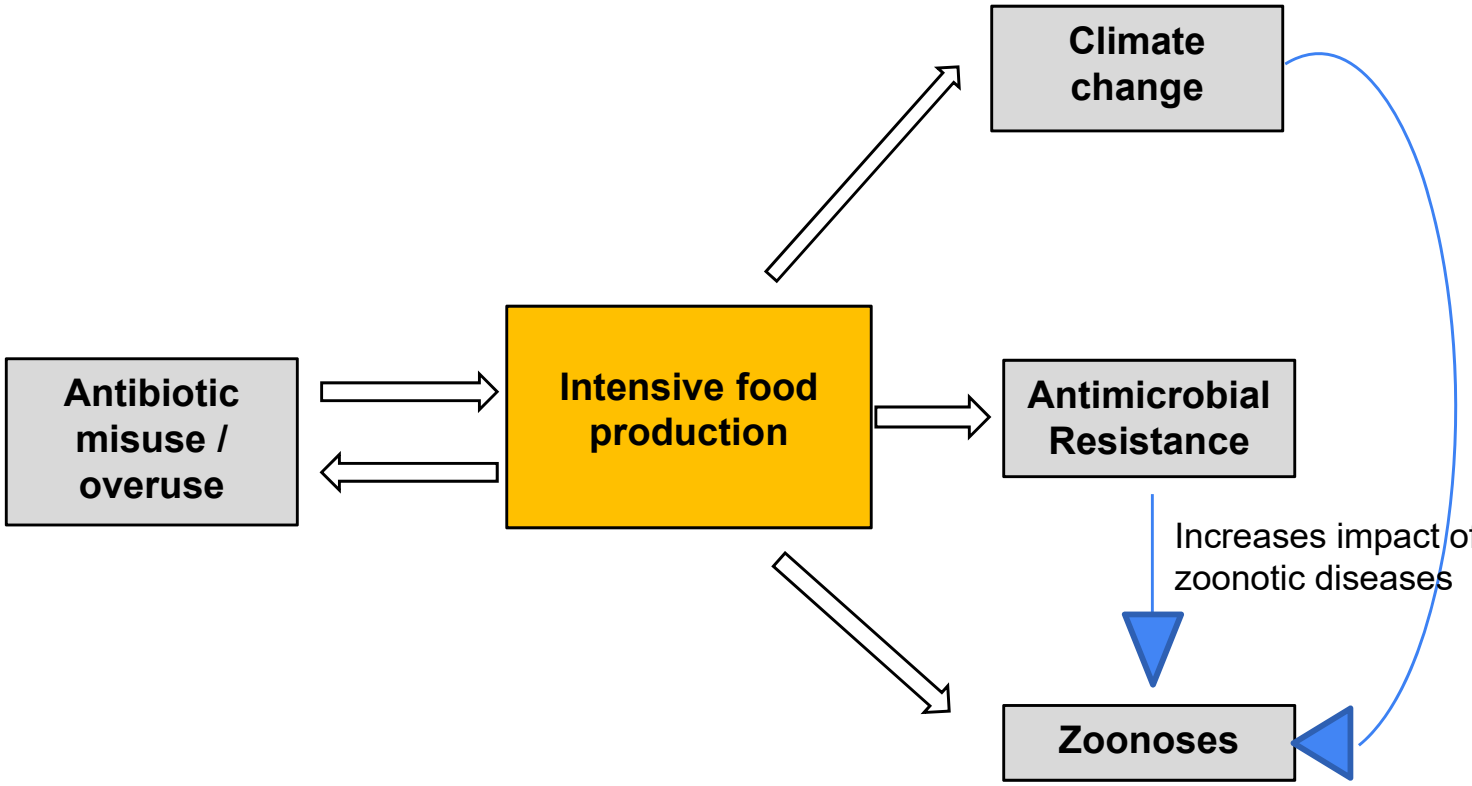
Characteristics of intensive food-animal production systems

- Large-scale units with high stocking density of animals/birds/ fish
- Genetically selected similar breeds for productivity (not disease resilience)
- Kept under confined conditions and in close proximity; limited focus on animal husbandry; high stress
- Dependence on commercial feed, inputs (also known as animal feeding operations, factory farms)
- Often geographically concentrated; vertically integrated by large players; involves contract farming
- Industrial systems but considered agriculture; can bypass required regulatory attention

Drivers of intensive food production

- Growing food demand (protein, animal protein)
- Growing population
- Growing incomes / purchasing power
- Urbanization
- Changing food habits, evolving taste
- Less people and less land to grow food
- Political mandate - for exports, livelihood opportunities
- Availability of inputs - machines, feed, drugs and chemicals

Intensification-dependent on chemicals (like antibiotics); it is a driver for AMR, Zoonoses, Climate Change

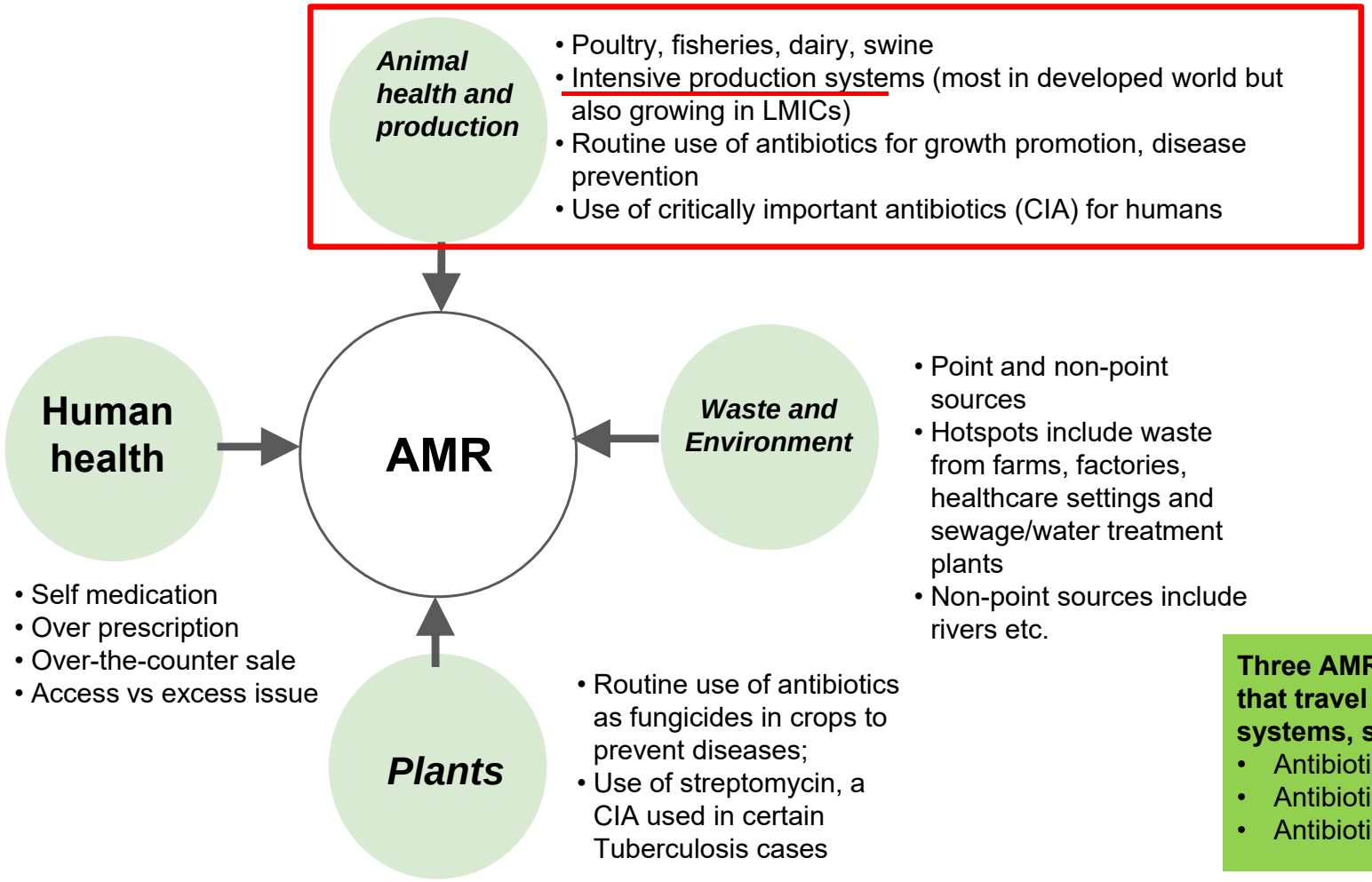


Source: CSE analysis

What is Antimicrobial Resistance?

- Antimicrobial resistance (AMR) is the ability of bacteria and other microbes to resist the drugs used to inhibit or kill them. These microbes are sometimes referred to as 'superbugs' and are responsible for causing drug-resistant infections that are difficult to treat.
- This means antibiotics are becoming ineffective. The more antibiotics we use, the more we lose. They are a global 'public good' but continually misused and overused.
- It impacts health of humans, animals and plants. It can also impact food productivity, livelihood, economy and development.
- A recent analysis estimated 4.95 million deaths associated with bacterial AMR in 2019, including 1.27 million deaths attributable to bacterial AMR.
- Countries have developed national action plans. At the global level, the tripartite of (WHO, FAO & OIE) along with UNEP is involved in addressing AMR.

AMR is cross cutting; has strong multi-sectoral linkages; It needs a truly One Health Response



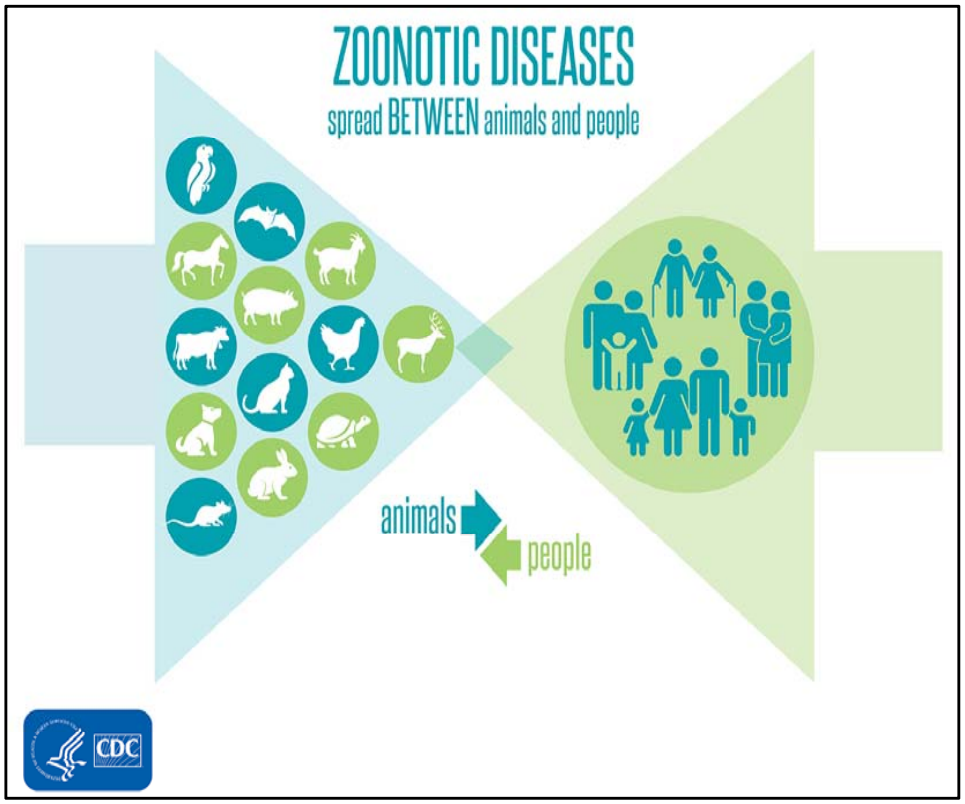
Three AMR determinants that travel across the systems, sectors

- Antibiotic resistant bacteria
- Antibiotic resistance genes
- Antibiotic residues

What is Zoonoses?

- Zoonoses are diseases that can spread between animals and people, moving from wild and domesticated animals to humans and from humans to animals (UNEP-ILRI report, 2020)

- Caused by harmful germs like bacterial, viruses, parasites and fungi which can spread



Zoonoses can spread through…

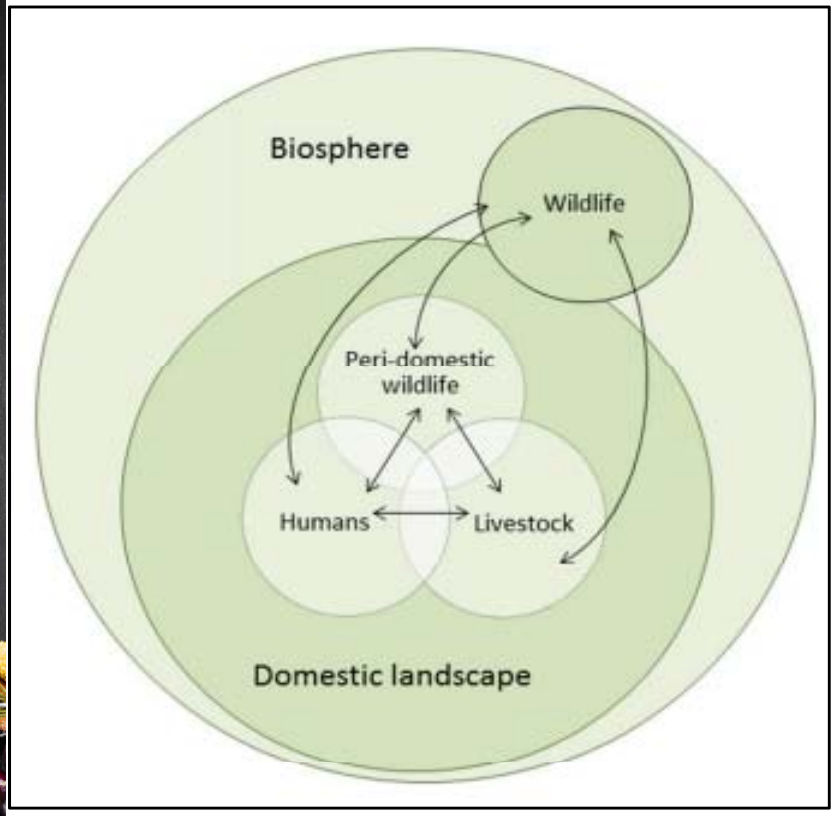
Domestic animals and peri-domestic wildlife can act as bridges for the emergence of human diseases; natural reservoirs may be wildlife

- Viruses generated in bio-insecure industrial and intensive agricultural systems can result in zoonotic forms:
  - E.g. Highly pathogenic avian influenza (HPAI), an important economic disease of domestic poultry that evolves from low-pathogenic viruses that circulate commensally in the environment in wild bird populations

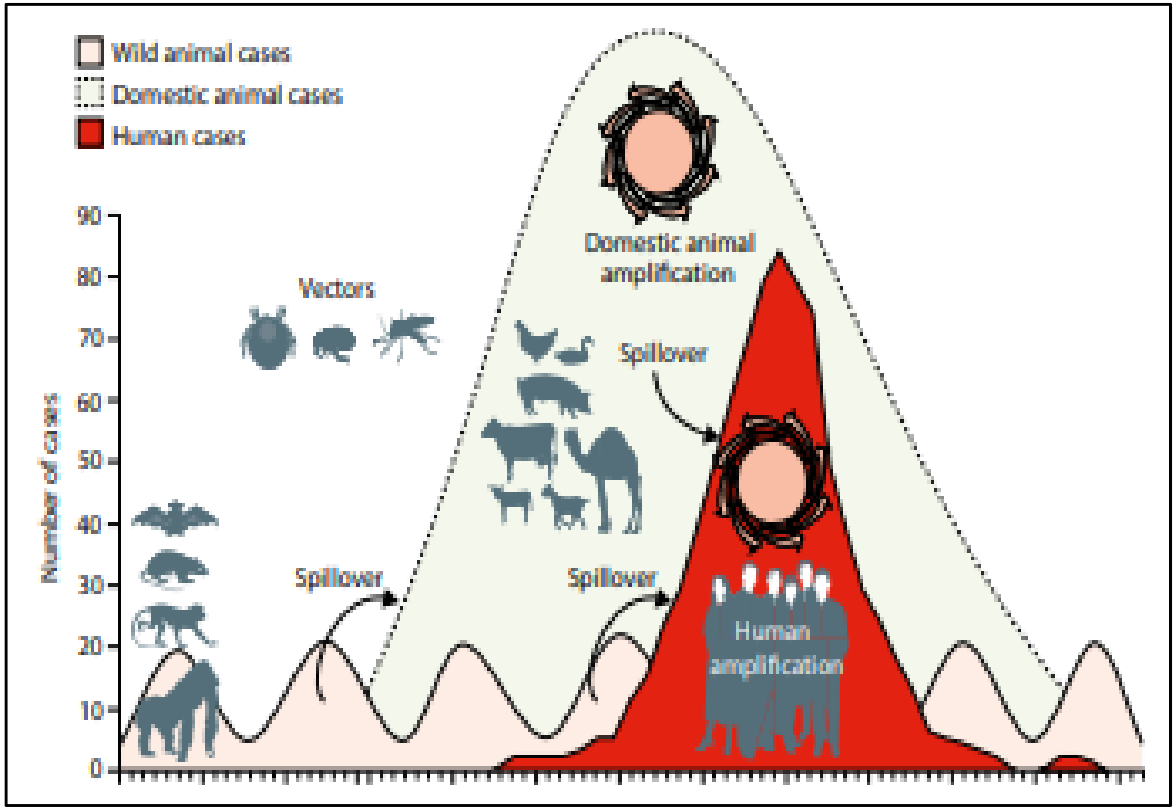
- Amplification of pathogens/virulence due to 'monoculture effect' as there are more contact opportunities among those lacking genetic diversity. NO SOCIAL DISTANCING

- Agriculture expansion for animal feed crops (e.g. soy) and intensification entering into forests and natural habitats diffuses boundaries b/w human-animal-wild-life

Pathogen flow at the wildlife–livestock–human interface



Spillover and amplification; high domestic animal cases



Source: Jones et al., 2013, PNAS, 110: 8399-8404
Karesh et al. (2012) Lancet, 380: 1936–45

Four out of 10 policy options suggested by UNEP to reduce the risk of future zoonotic pandemics are directly related to food systems

1. Raise awareness of health and environment risks and prevention
2. Improve health governance, including by engaging environmental stakeholders
3. Expand scientific inquiry into the environmental dimensions of zoonotic diseases
4. Ensure full cost financial accounting of the societal impacts of disease
5. Enhance monitoring and regulation of food systems using risk-based approaches
6. Phase out unsustainable agricultural practices
7. Develop and implement stronger biosecurity measures
8. Strengthen animal health (including wildlife health services)
9. Build capacity among health stakeholders to incorporate environmental dimensions of health
10. Mainstream and implement one health approaches

The Big task is to produce more with less chemicals, less resources and how it could be done

But there are several questions as well…

• Despite high food production already, a big part of the world is still under-nourished, starving or overweight. How much of this is also about the quality of food, about nutrition security?

• How much of the problem is really about food production? A big part of food produced is wasted. What about problems in food distribution? And about a holistic response focusing on livelihood of small farmers and protection of environment?

• Is the demand for proteins real or created? And how much from animals?

• How much of the chemical/antibiotic use is unnecessary at its first place or which can be avoided with basic prevention and stewardship approaches?

More questions…

What about consumption? How much can be addressed by just making slight shifts in consumption

• Is the solution more about going back to basics (agro-ecological practices) or use of innovation and technology or both? Is there anything like sustainable intensification?

• Different countries are at a different levels of intensification. Aren't those with less of overall food production from intensive systems (such as India), stand a better chance to unlearn and move towards sustainable production practices and yet produce enough good quality food?

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