Antimicrobial resistance and the global livestock sector

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Antimicrobial resistance

The O’Neill Report (2014)

• AMR infections currently claim at least 50,000 lives each year across Europe and the USA alone ..... with many hundreds of thousands more dying in other areas of the world

• In 15 European countries more than 10% of bloodstream *Staphylococcus aureus* infections are caused by methicillin-resistant strains (MRSA) ..... closer to 50% in several of these

Source: O’Neill (2014)
Sources of antimicrobial resistance

- Antimicrobial (ab)use in medicine
- Intensive livestock and aquaculture
  - growth promotion
  - prophylaxis and metaphylaxis
  - Therapeutic use
- Natural phenomenon in environment
• Total consumption in the livestock sector in 2010 estimated at 63,151 tons
• Global antimicrobial consumption will rise by 67% by 2030
• It will nearly double in BRICS (Brazil, Russia, India, China, and South Africa) countries
Modelling intensification

Source: Gilbert et al. (in press)
Chicken systems

Extensive chicken production

Intensive chicken production

Source: Gilbert et al. (in press)
Antimicrobial resistance

Global antimicrobial consumption in livestock
(mg per 10km pixel)

Source: Van Boeckel et al. (2015)
Intensification trajectories

Source: Gilbert et al. (in press)
Intensification trajectories

Source: Gilbert et al. (in press)
Intensification trajectories

Source: Gilbert et al. (under review)
Antimicrobial resistance

What contribution does agriculture make to AMR in human medicine?

• In USA 80% of antimicrobial sales are in the agricultural sector
• China’s livestock industry by itself could soon be consuming almost one third of world’s available antibiotics.
• Review for DFID by Delia Grace indicates these to be considerable underestimates in some developing countries.
Antimicrobial resistance

• The European Union banned the use of antibiotics to boost animals' growth in 2006
• There is a ‘voluntary’ ban in the USA ...... Chick-fil-A, McDonalds and Costco
• Very difficult to regulate in the developing and emerging economies
  ➔ Strengthen the evidence base linking agricultural use to AMR in the medical sector
  ➔ Concerted action – multi-stakeholder platforms
  ➔ Appropriate approaches in different settings – poor countries may not have the ‘resilience’ or ‘capacity’ of Europe in withstanding a blanket ban, for example
  ➔ This is a global issue and calls for a coordinated, global response
1. Estimating antimicrobial consumption in agriculture
2. Biological analysis of transmission pathways
3. Scenario modelling and information management
4. Action research on reducing antimicrobial use in agriculture
5. Economic and policy analysis of interventions
6. Realising practice change in antimicrobial use in agriculture
better lives through livestock

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