Economic evaluations of One-Health interventions: *an antimicrobial resistance case study*

We want to assess the impact of different interventions to reduce antimicrobial resistance (AMR).

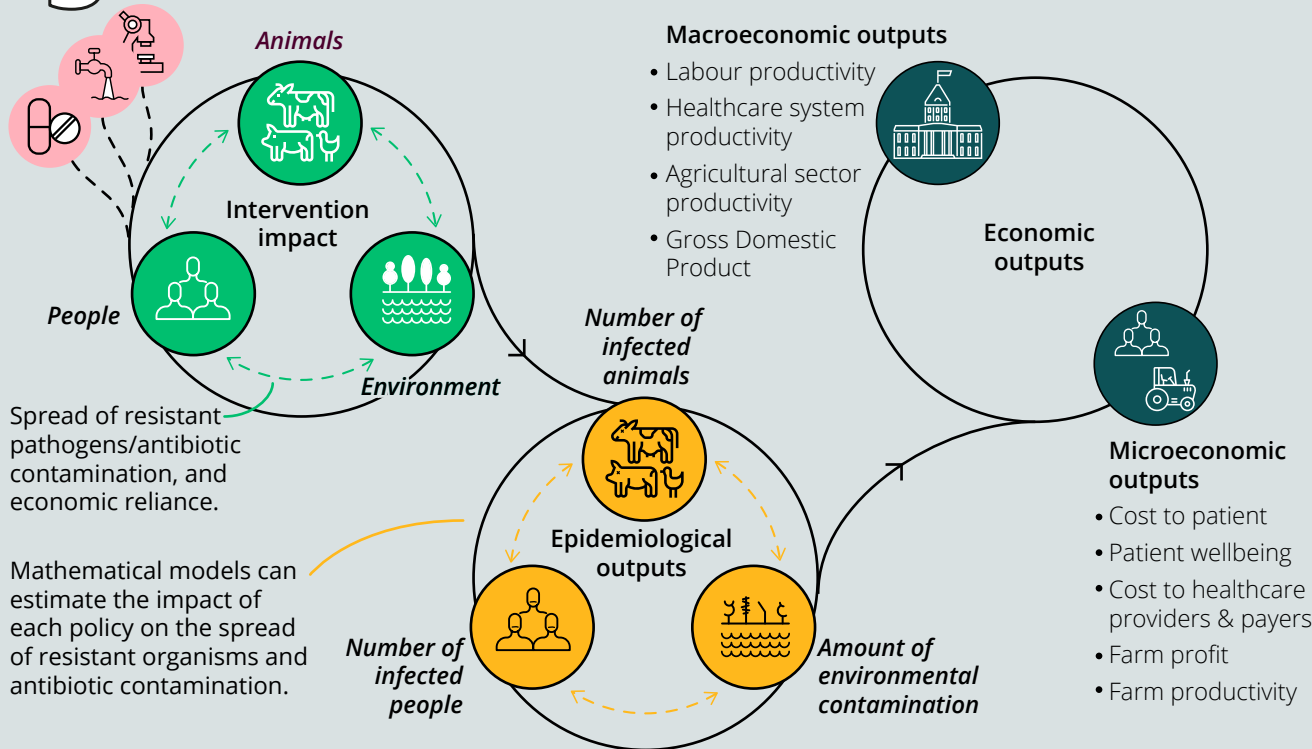LONDON SCHOOL *of* HYGIENE & TROPICAL MEDICINE

1 Consider the intervention options

- Eliminate use of antibiotics for promoting growth of animals
- Rapid and accurate diagnostics for drug-resistant infections in hospital
- Improved sanitation and hygiene on farms

2 Consider the stakeholders and their objectives

Public — I want to maximise my wellbeing

Farmers — I want to maximise profit

I want to maximise GDP

I want to maximise agricultural productivity

Treasury

Agriculture ministry

Health ministry

Environmental ministry

I want to maximise population health and wellbeing

I want to minimise environmental contamination

3 Model the impact of intervention options on stakeholder objectives over time

Intervention impact
Animals
People
Environment

Spread of resistant pathogens/antibiotic contamination, and economic reliance.

Mathematical models can estimate the impact of each policy on the spread of resistant organisms and antibiotic contamination.

Epidemiological outputs
Number of infected animals
Number of infected people
Amount of environmental contamination

Macroeconomic outputs
- Labour productivity
- Healthcare system productivity
- Agricultural sector productivity
- Gross Domestic Product

Economic outputs

Microeconomic outputs
- Cost to patient
- Patient wellbeing
- Cost to healthcare providers & payers
- Farm profit
- Farm productivity

Model outputs*

Number of infected people	100,000	150,000	250,000
Number of infected animals	600	700	800
Environmental contamination (mg/kg soil)	0.43	0.58	0.40
Population wellbeing (measured through quality-adjusted life years)	9800	10600	9000
Agriculture sector productivity ($m)	$1.2m	$1.4m	$1.1m
Gross Domestic Product (GDP)($bn)	$8.7bn	$10bn	$9.2bn

A weighted average is calculated according to the specified importance of each output and used to rank the policy options.

🥇 1   🥉 3   🥈 2

***Numbers are for example purposes only, this figure is not a depiction of real data**