Political Economy of Antimicrobial Resistance and Infectious Diseases (AMR/ID) in Livestock Systems

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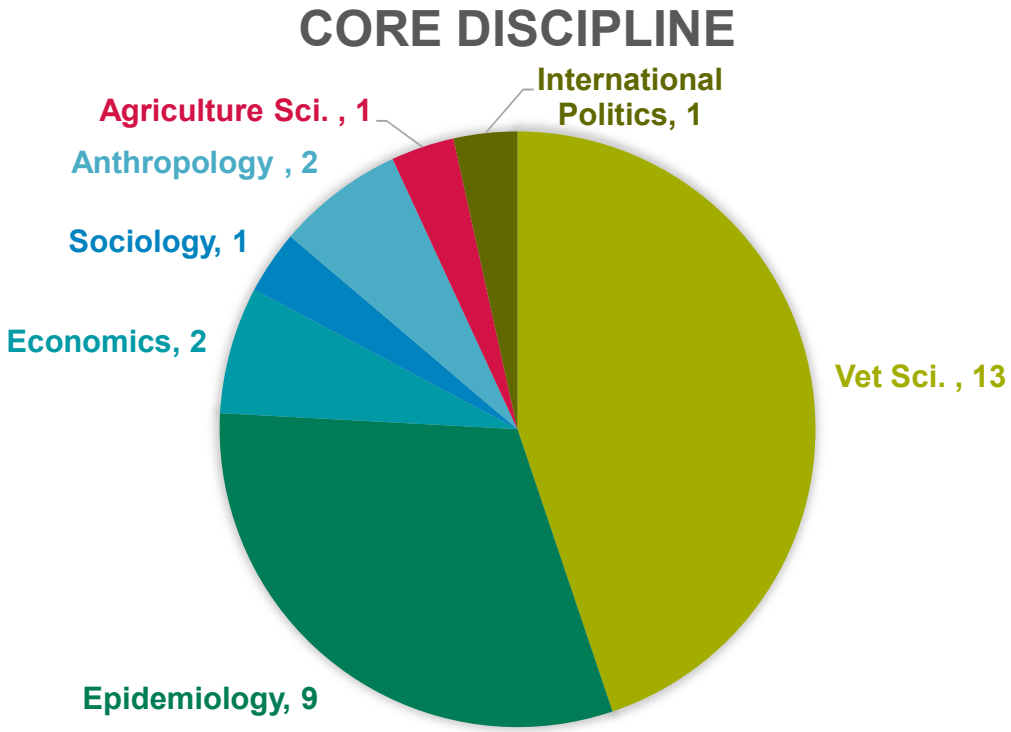
Disciplines of Participants



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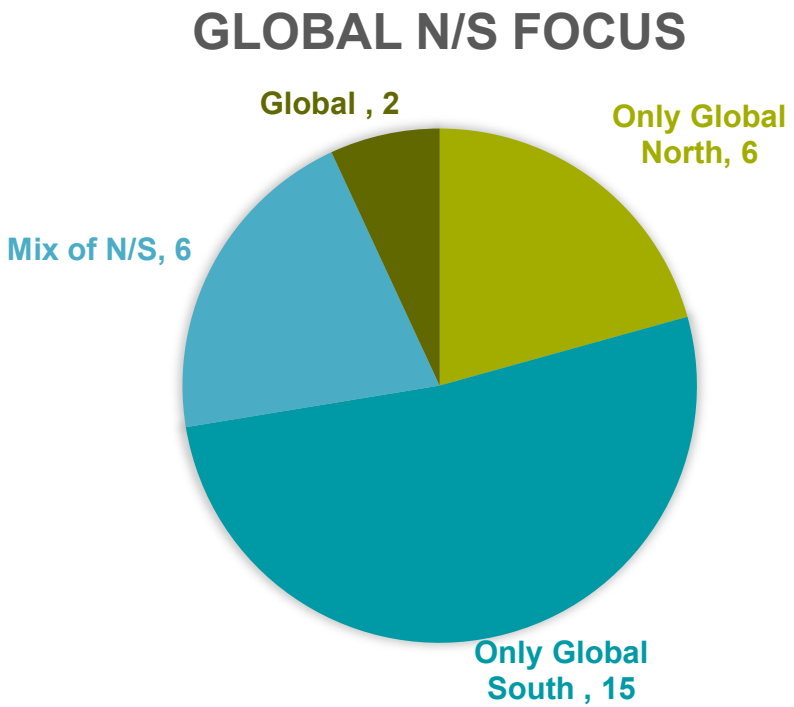
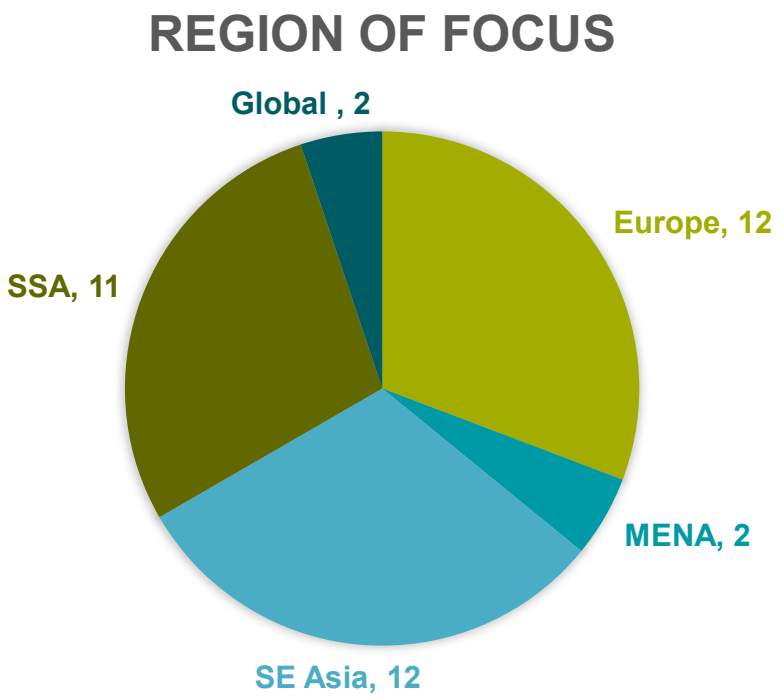
Research Locations





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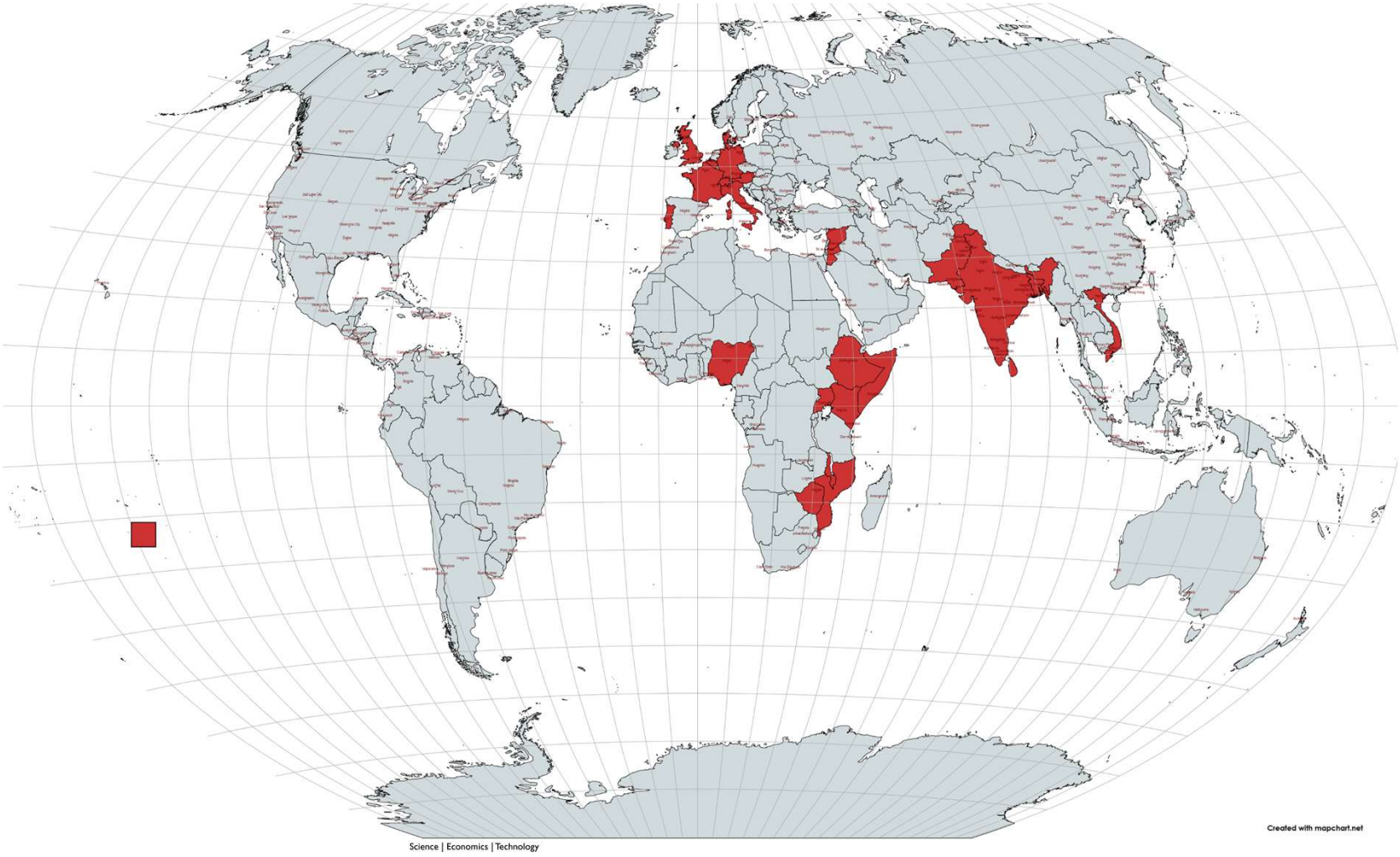
Research Locations

Broad regions include:

- EU
- Sub-Saharan Africa



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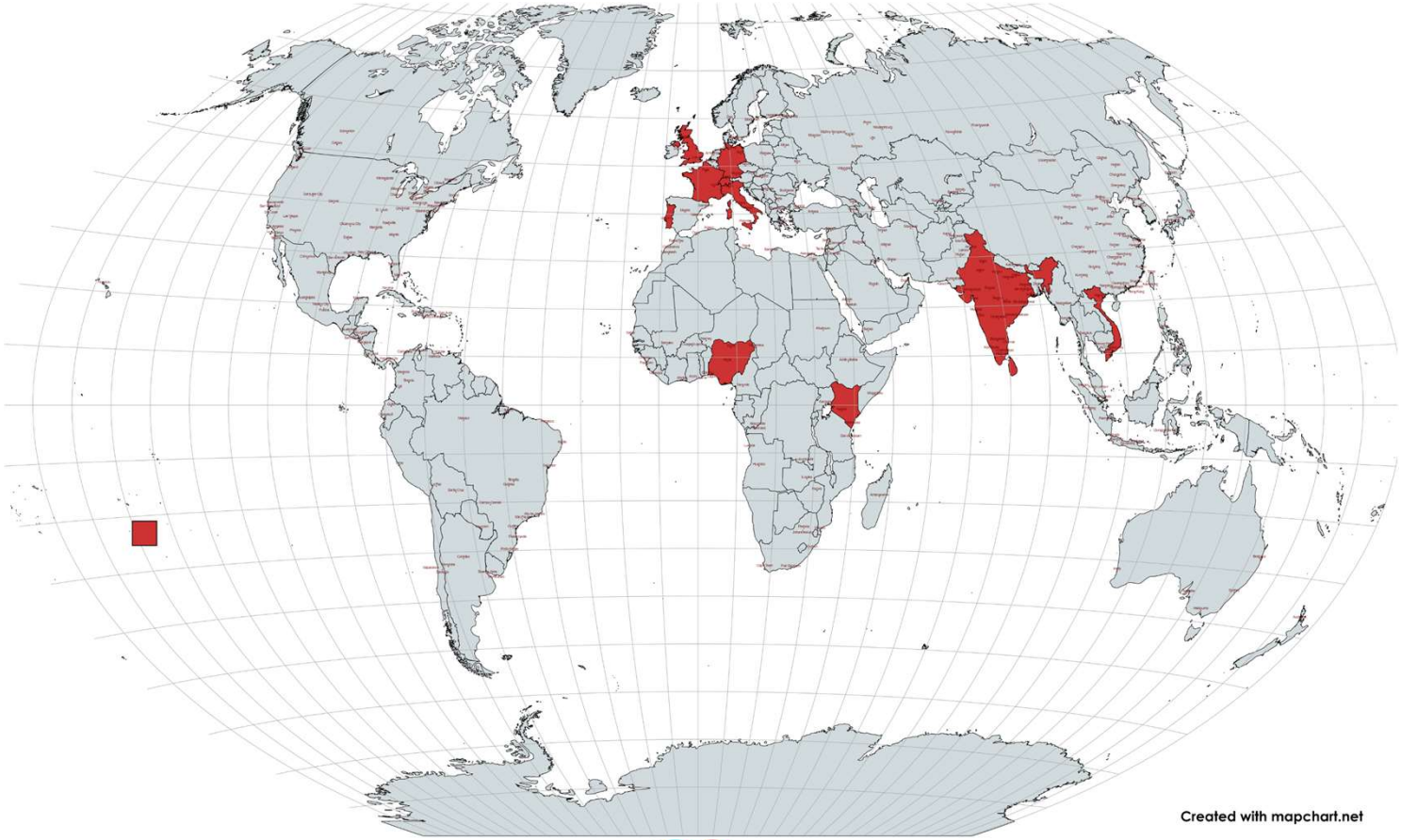
Institutional locations



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Course Participants

- Go to www.menti.com and use code 71 01 50 8

Course Learning Objectives

- Recognise key political economy concepts related to AMR and ID in livestock systems
- Critically examine political economy questions in the context of their AMR and/ or ID research
- Identify the underlying paradigms, philosophical assumptions and politics of their research in LMICs

Learning Objective	1	2	3
Lecture 1	●	•	•
Lecture 2	●	•	•
Lecture 3	●	•	•
Lecture 4	●	•	•
Lecture 5	●	•	•
Lecture 6	●	•	●
ICA	•	●	•
Workshop	•	●	•
Live Forums	•	•	•

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Course Structure and Timeline

Activity	Topic	Date	Lecturer
Lecture 1	Political Economy of Antimicrobial Resistance and Infectious Diseases	15th February 2021	Mehroosh Tak, Adam Willman
Lecture 2	Global health governance and big pharma in the age of crisis	22nd February 2021	Feyzi Ismail
Lecture 3	Insights from Feministic Political Economy	1st March 2021	Sara Stevano
	Reading week – NO CLASS	8th March 2021	
Lecture 4	Market Liberalisation and Value Chains	15th March 2021	Mehroosh Tak
Lecture 5	Livelihoods	22nd March 2021	Mehroosh Tak
Lecture 6	Methods and Wrap Up	29th March 2021	Adam Willman
	In-course assessment	14th April 2021 11:55pm	
	Workshop	22/23rd April 2021	

Live Lectures

- 2 hour lecture live lecture every Monday 11am to 1pm GMT
- Core reading prior to lecture
- Lectures are interactive and require participation

In-Course Assessment

- Critical appraisal essay
- Up to 3,000 words
- Tutor meetings x 2
- 14th April 2021

Course Workshop

- Key notes
- Presentations
- Feedback from tutor and peers

- Questions?

Lecture 1: Political Economy Approaches to AMR/ ID Research

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Learning Objectives

- By the end of this lecture, you should be able to…
  - Identify political economy questions in relation to AMR and infectious disease in livestock systems research
    - Apply the concept of meatification of diets in relation to a country of your choice
    - Describe the industrial livestock disease complex
  - Distinguish between ontological and epistemological differences between natural science, mainstream economics and political economy approaches to research

Context

1. Meatification of Diets
2. Industrial Livestock - Disease Complex
3. Why Political Economy?

[Focused on course learning objective #1: Recognise key political economy questions in relation to AMR and infectious disease research]

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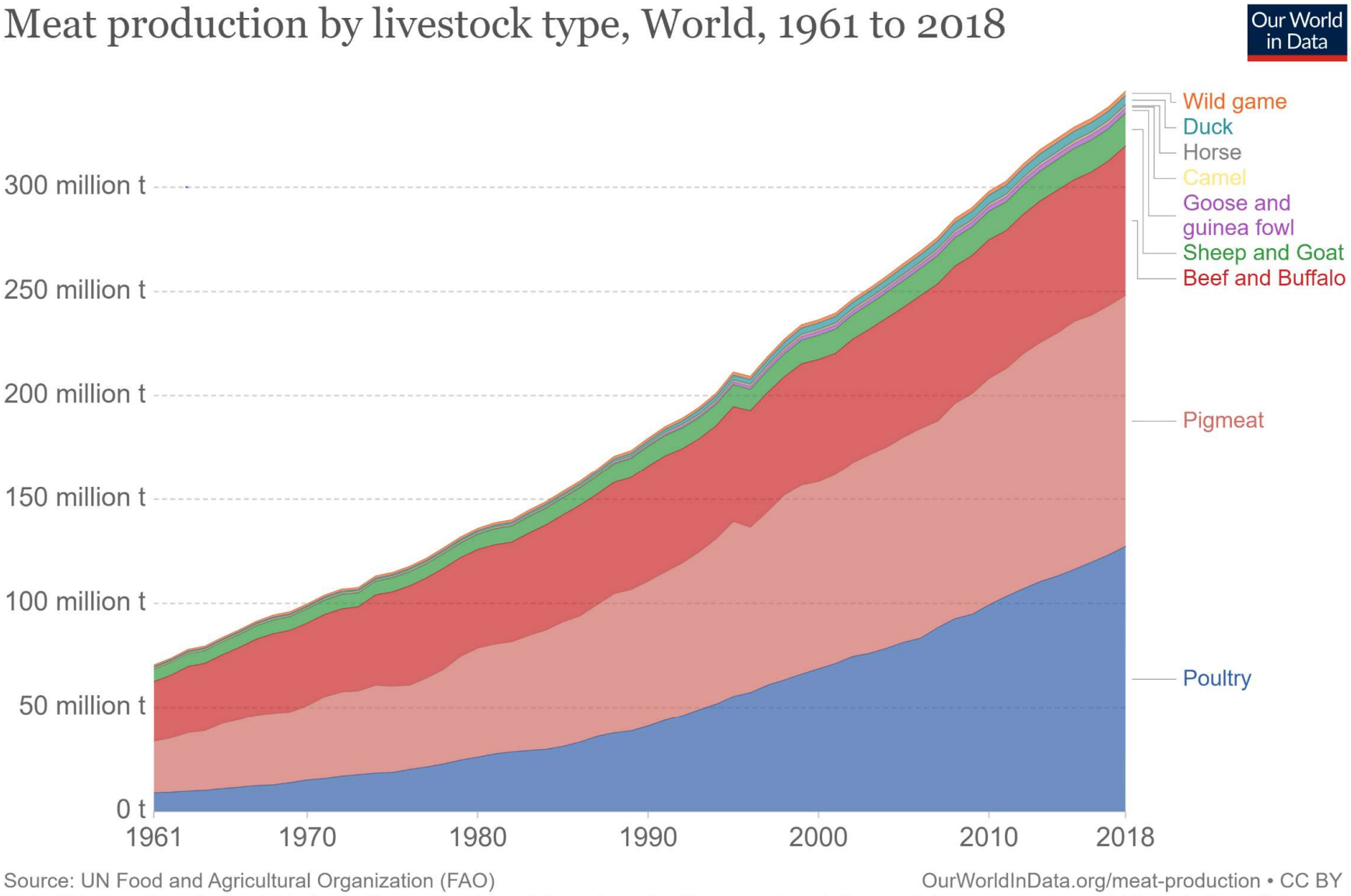
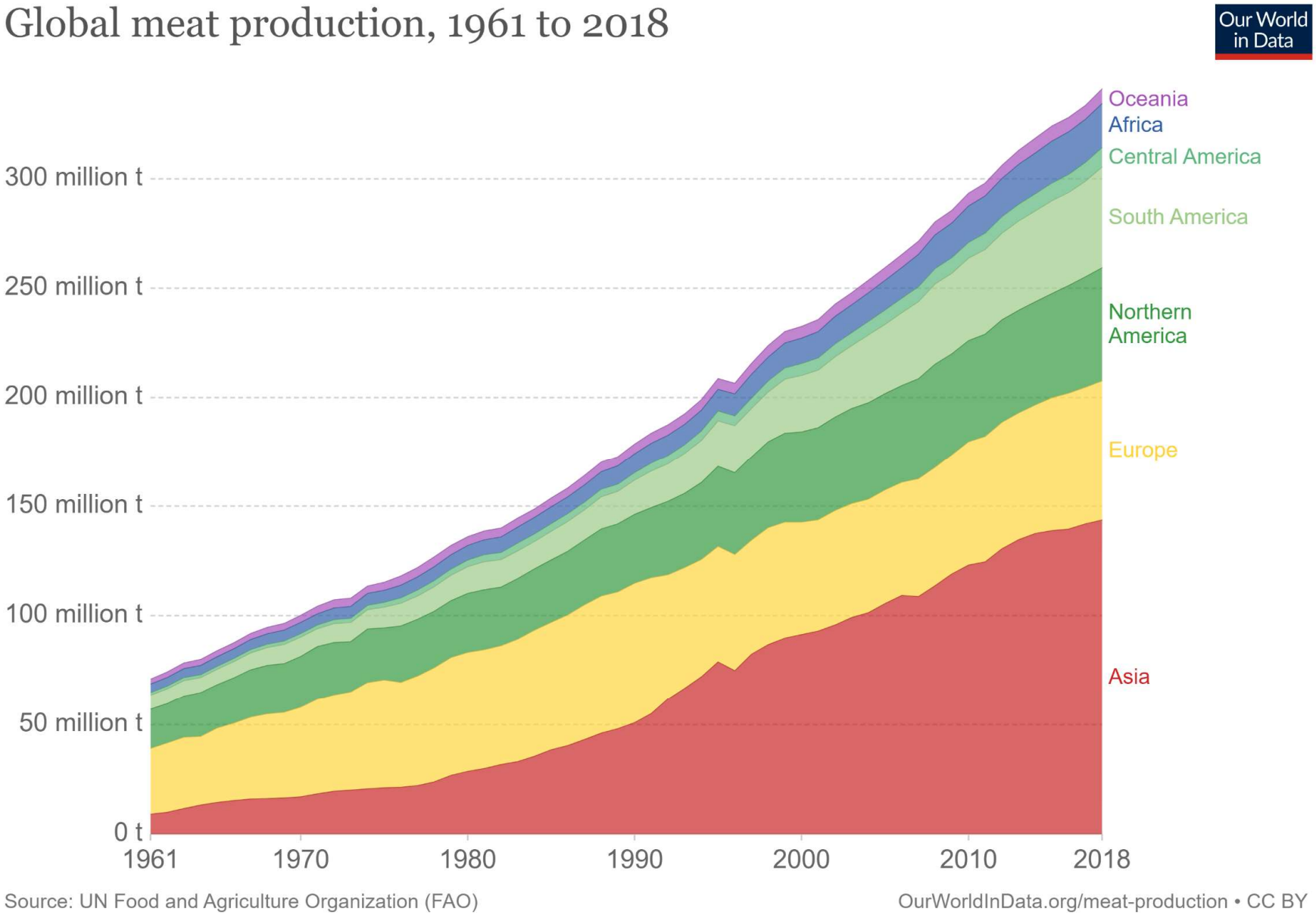
Meatification of Diets

- Production of meat has increased drastically since 1960s. 380% increase
- Key contributors are pig, poultry, beef volumes
- Yet, triple burden of malnutrition is persistent
  - coexistence of over nutrition, undernutrition and micronutrient deficiencies
- Part of the solution to malnutrition lies in increased consumption of ASF, which supply multiple bioavailable nutrients



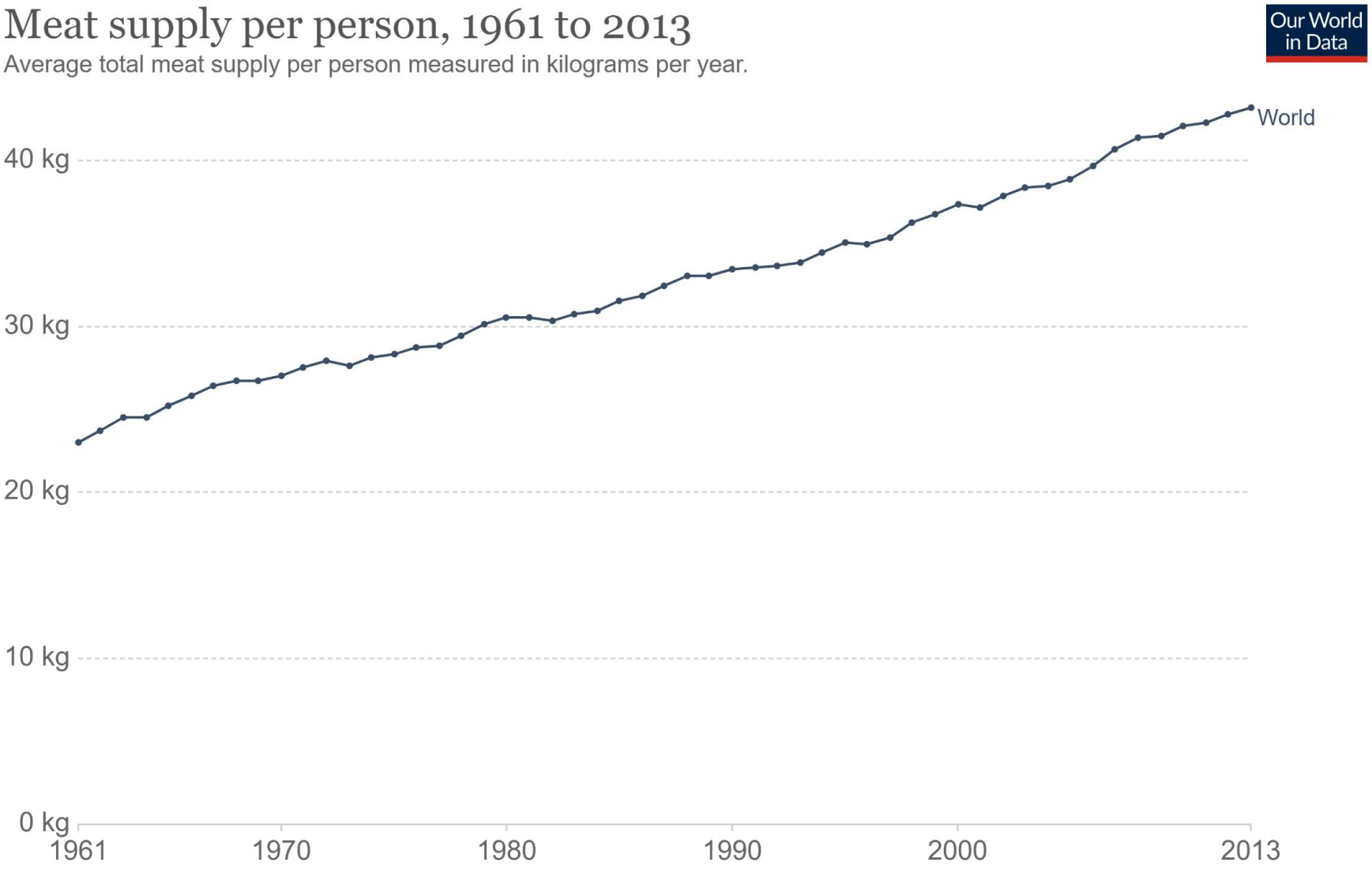
380% increase in volume of meat produced since 1961 to 2018

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report



Asia produces 42% of global meat volume

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report



This rapid rise in consumption of meat and scale of change on the back of industrialised livestock production systems is term as ‘meatification’ of diets
by Tony Weis

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report

Meatification of Diets:

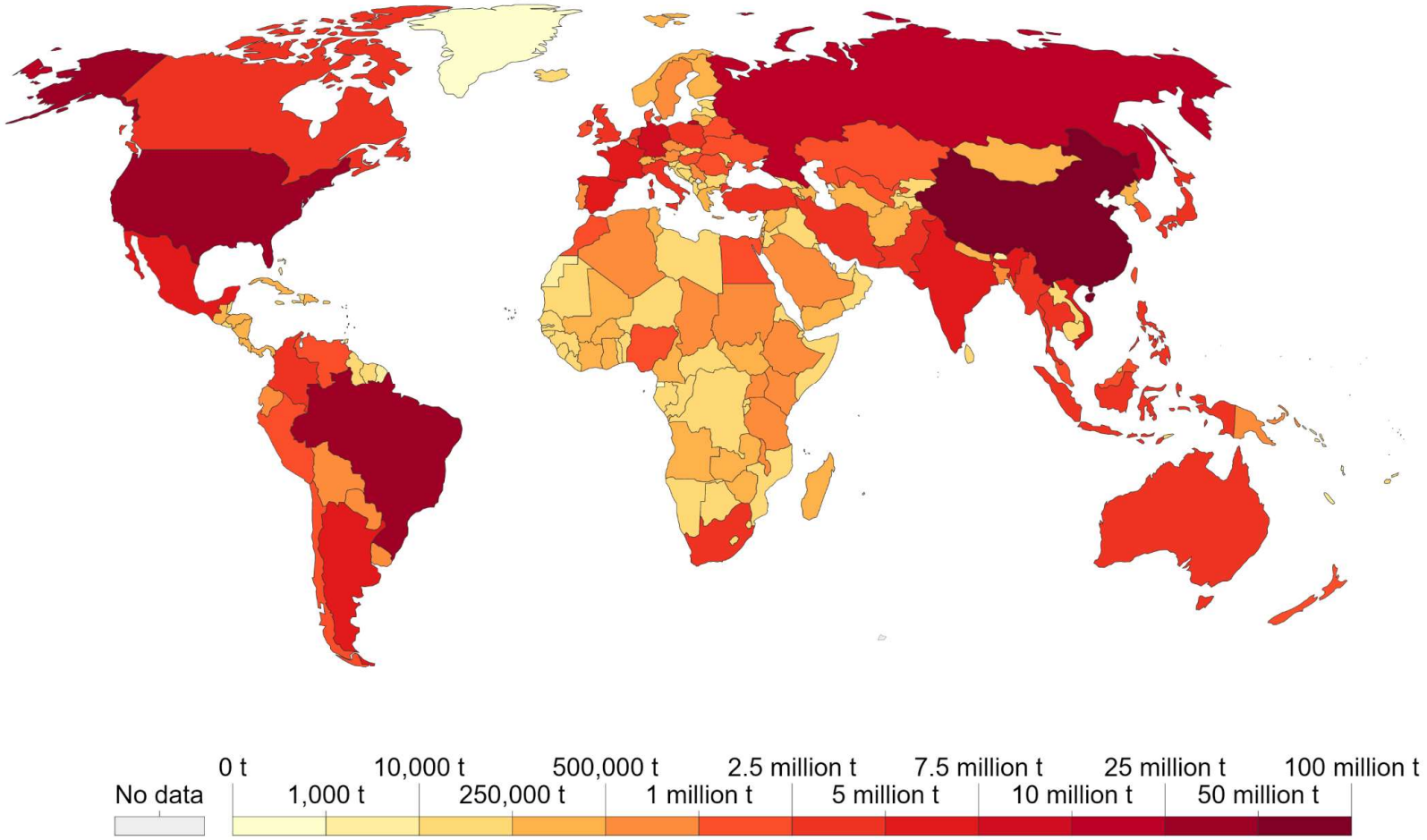
A Problem of High Production and Low Consumption

- Global spatial inequity: Country level production and consumption volumes don't match up
- Correlation between GDP per capita and consumption of ASF
- Correlation between consumption of ASF and malnutrition

Meat production, 2018

Meat includes cattle, poultry, sheep/mutton, goat, pigmeat, and wild game.

Our World in Data

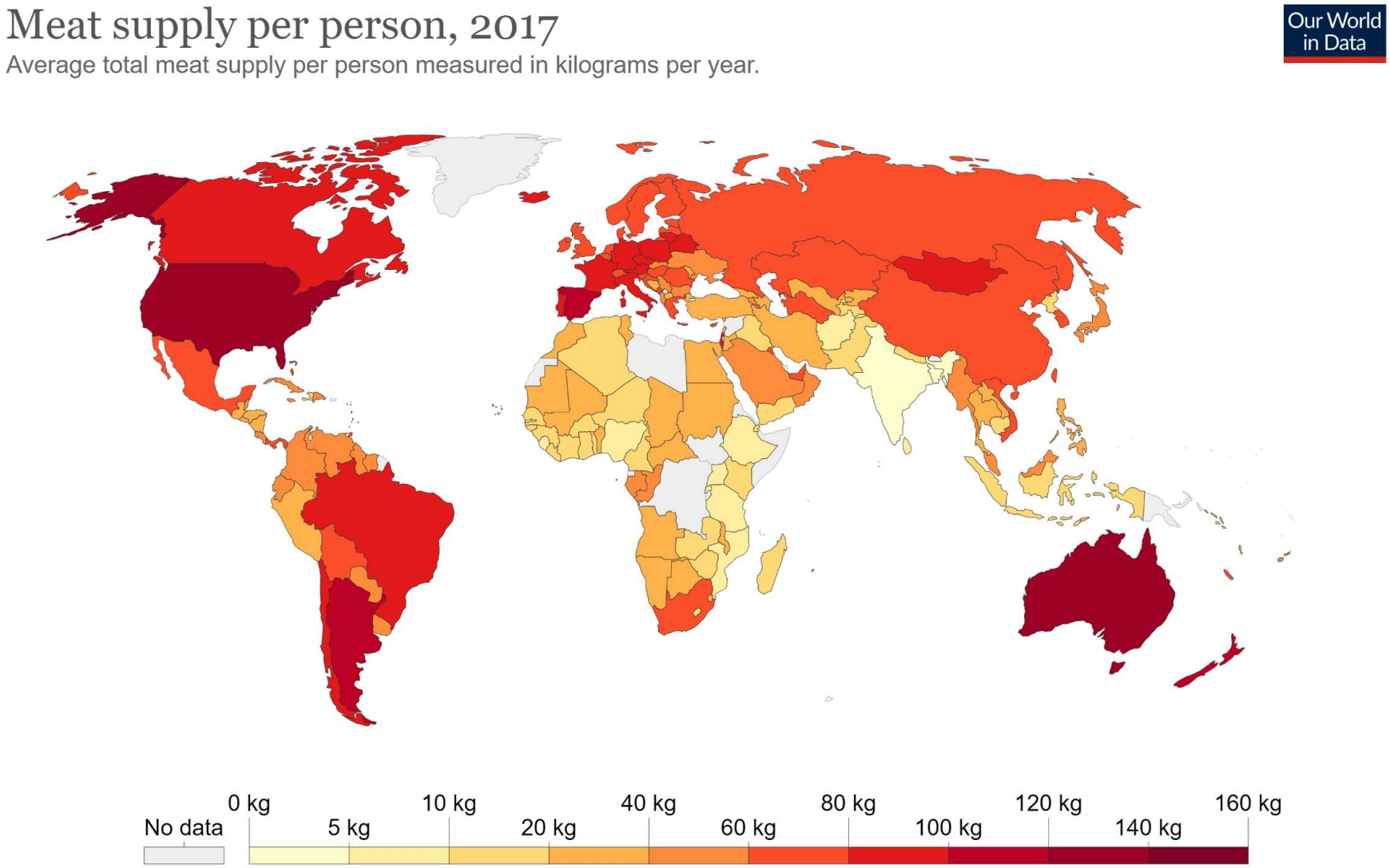


Source: UN Food and Agricultural Organization (FAO)
Note: Figures are given in terms of dressed carcass weight, excluding offal and slaughter fats.

OurWorldInData.org/meat-production • CC BY

China, USA and Brazil – largest producer

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report



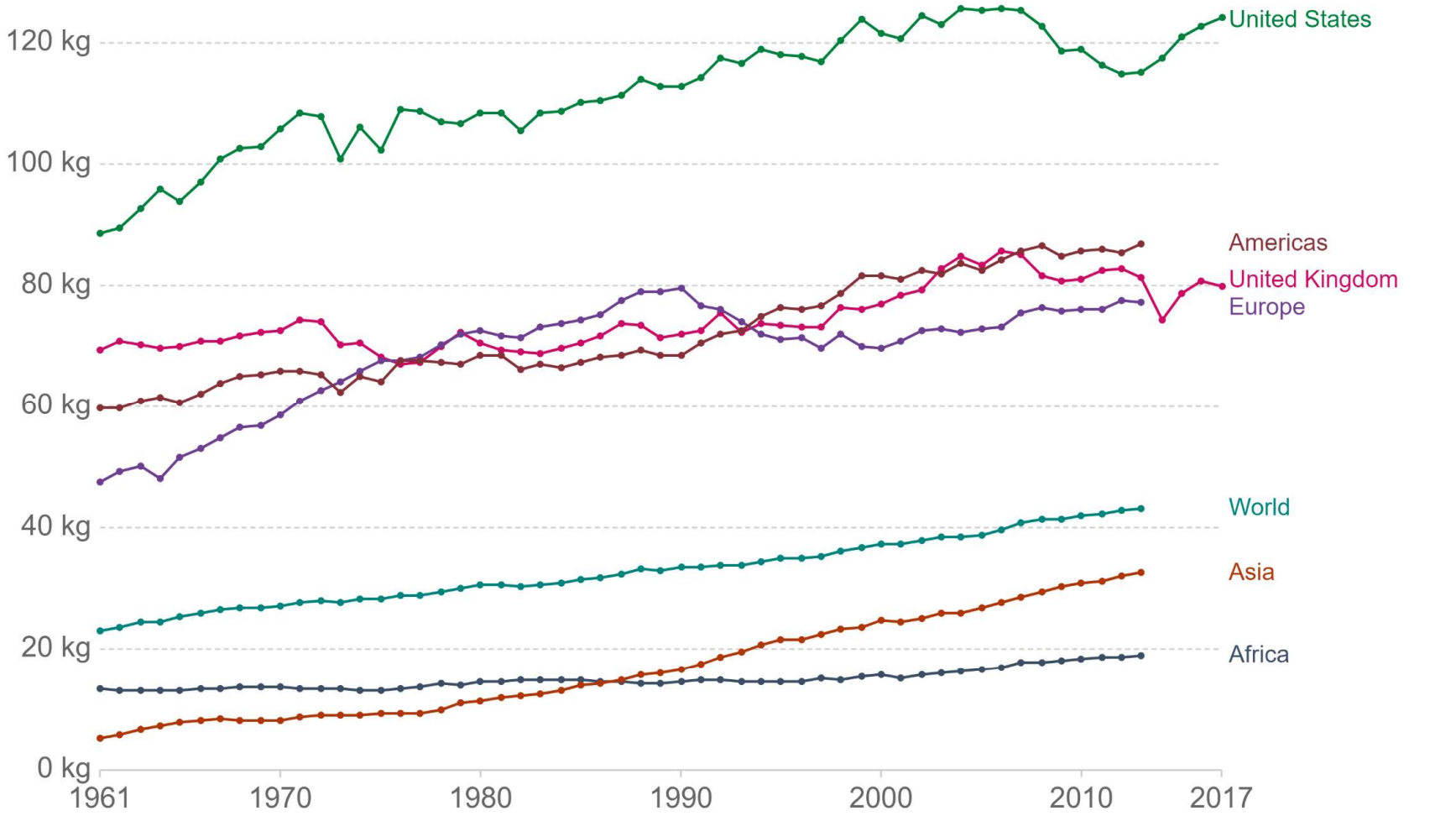
A Problem of High Production and Low Consumption

- Inequities in consumption and production practices

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report

Meat supply per person, 1961 to 2017

Average total meat supply per person measured in kilograms per year.



Source: UN Food and Agriculture Organization (FAO)

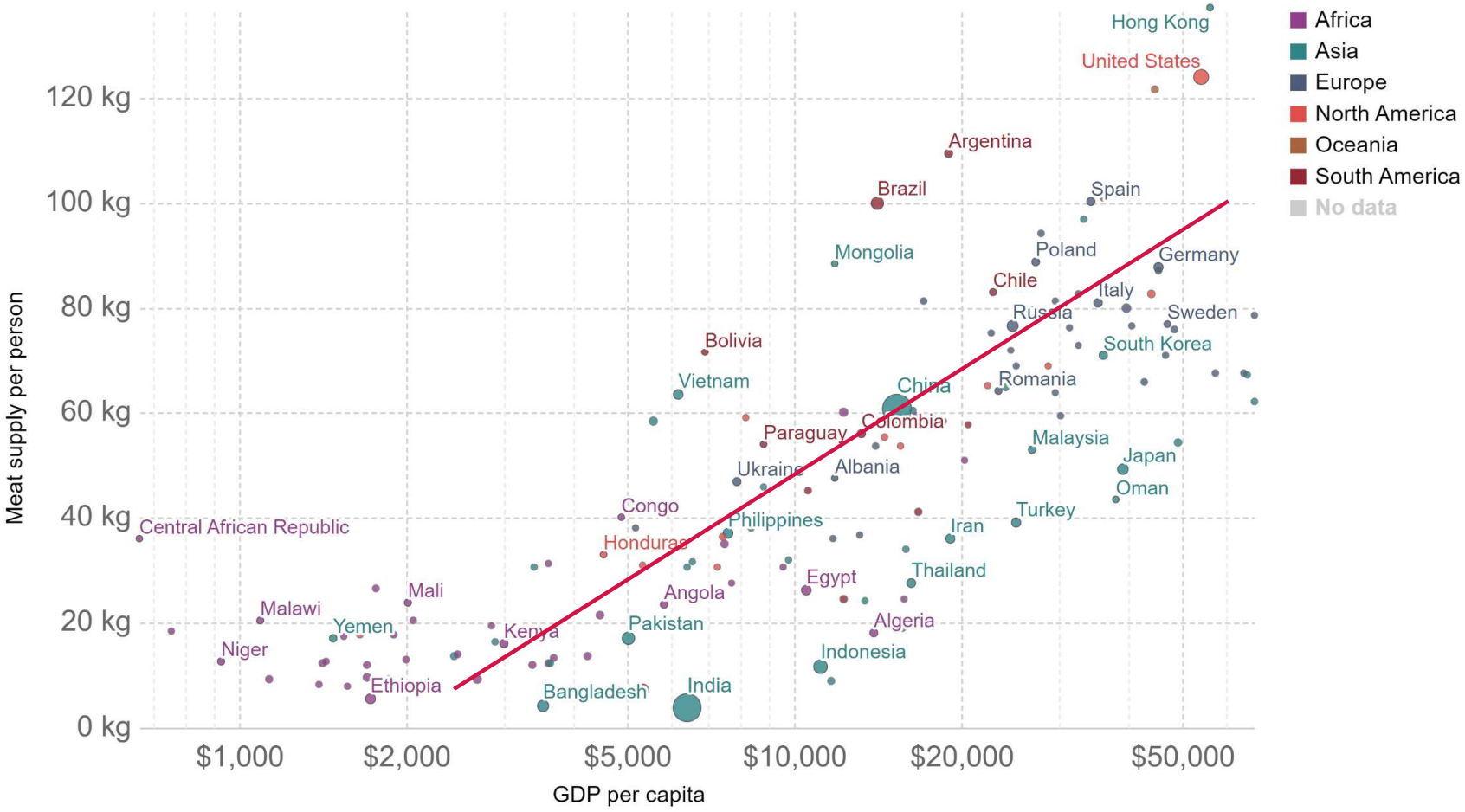
OurWorldInData.org/meat-production • CC BY

Note: Data excludes fish and other seafood sources. figures do not correct for waste at the household/consumption level so may not directly reflect the quantity of food finally consumed by a given individual.

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report

Meat consumption vs. GDP per capita, 2017

Average meat consumption per capita, measured in kilograms per year versus gross domestic product (GDP) per capita measured in 2011 international-$. International-$ corrects for price differences across countries. Figures do not include fish or seafood.

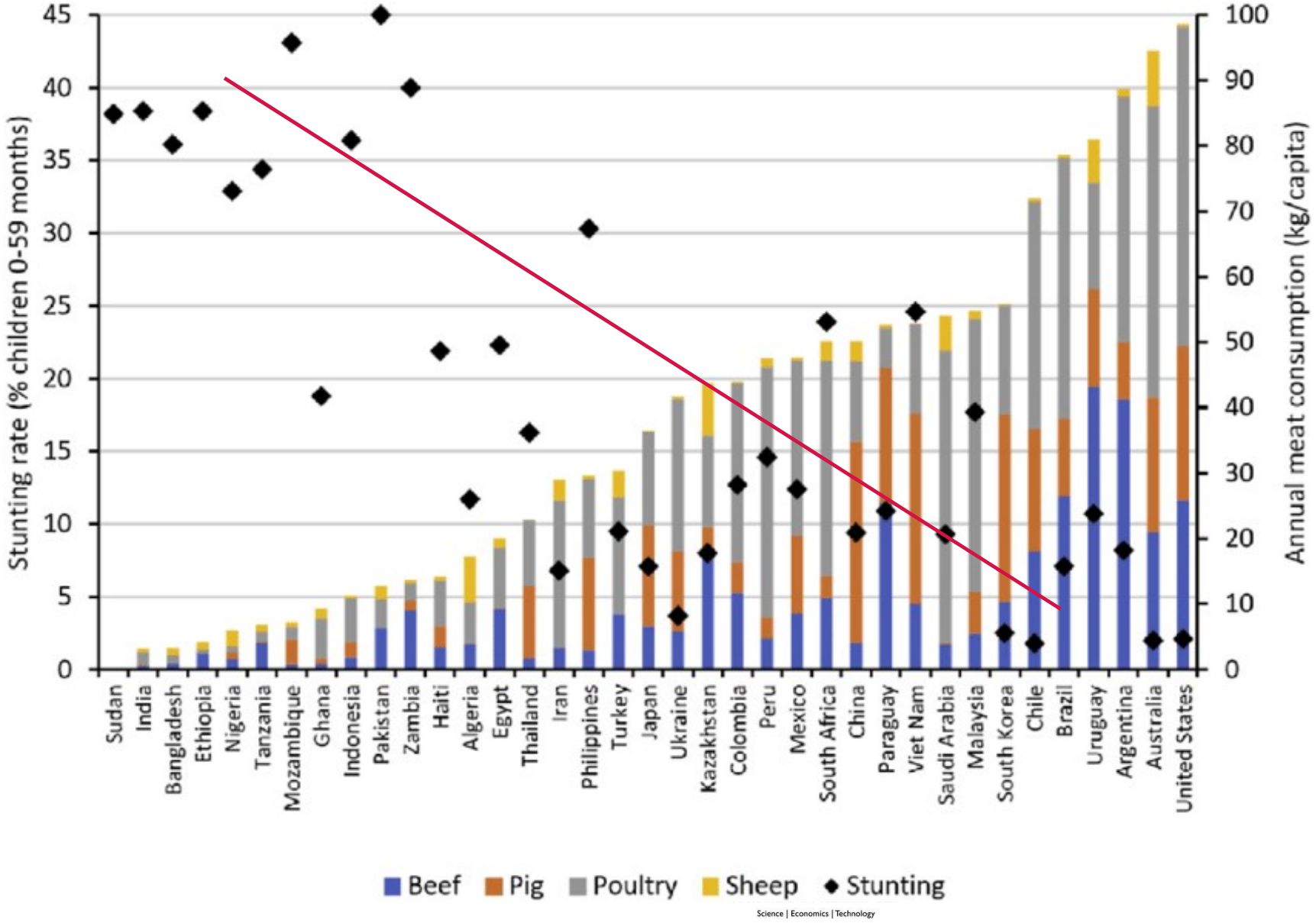


Source: UN FAO; World Bank, World Development Indicators

OurWorldInData.org/meat-production • CC BY

There is a positive correlation between income and consumption of ASF

Sources:
https://ourworldindata.org/meat-production
FAO Food Balance sheet
http://www.fao.org/faostat/en/#data/FBS/report



There is a correlation between stunting and consumption of ASF

Sources: Adesogan et al, 2020

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Discussion

Apply the concept of meatification of diets in relation to a country of your choice.

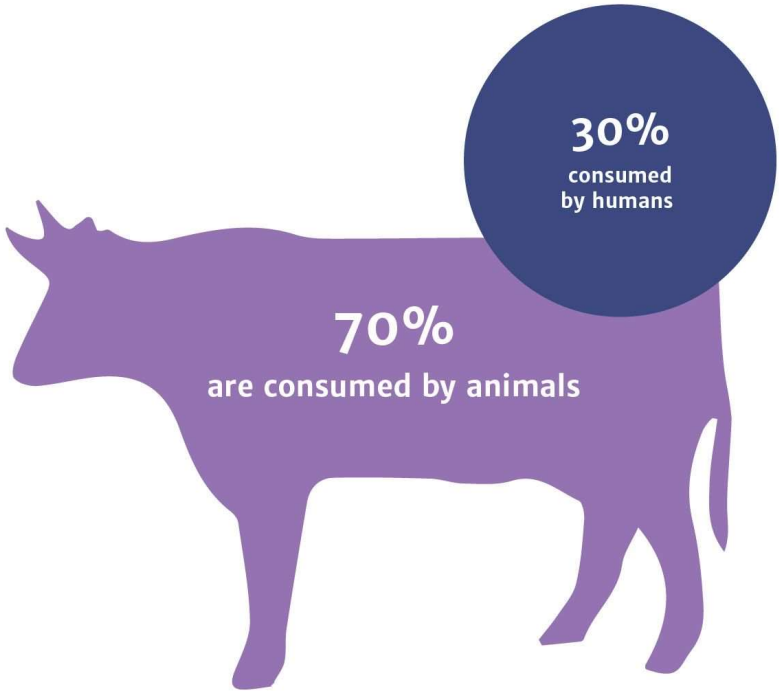
Does this concept apply to your country of study? If so, how? If not, why?

Industrial Livestock Disease Complex

Role of Industrial Production Systems in Meatification

- Industrial livestock production systems produce
  - 60% of pork and 85% of chicken meat and eggs (LGA, 2016)
  - ½ of aquaculture production comes from industrial farming
- Some estimates suggest use of anti-microbials in livestock is high in comparison to humans (Aarestrup 2000, WHO 2012, Landers et al, 2012)
- Burden of AMR in LMICs – due to their share of livestock production volume
- Resistance in LMICs
  - 4 antimicrobial drug most commonly used in farm animals to help them gain weight — tetracyclines, sulfonamides, quinolones and penicillins — have the highest resistance rates
  - Between 2000 and 2018, the proportion of drugs to which bacteria have become resistant almost tripled in chickens and pigs, and doubled in cattle (Van Boeckel et al, 2019)

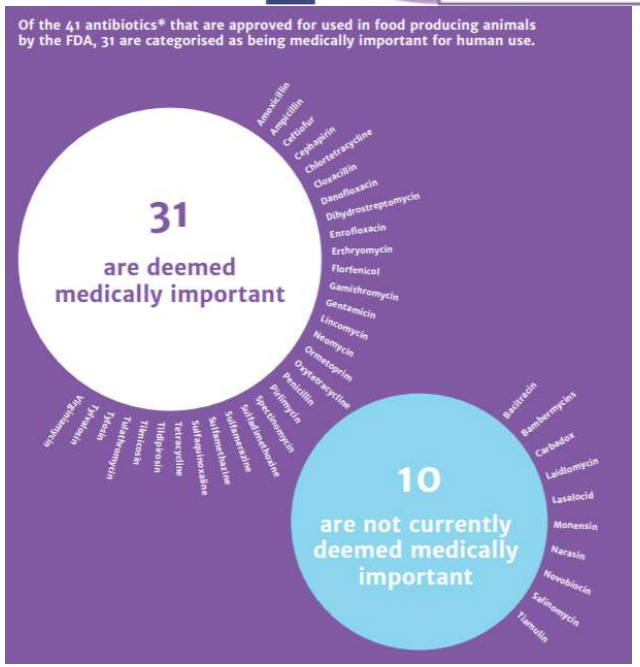
ANIMALS IN THE USA CONSUME MORE THAN TWICE AS MANY MEDICALLY IMPORTANT ANTIBIOTICS AS HUMANS



Source: Animal consumption figure of 8,893,103kg from FDA, 2012. Human consumption of 3,379,226kg in 2012 based on calculations by IMS Health. The figures are rounded from 72.5% used in animals and 27.5% used in humans.

Review on Antimicrobial Resistance

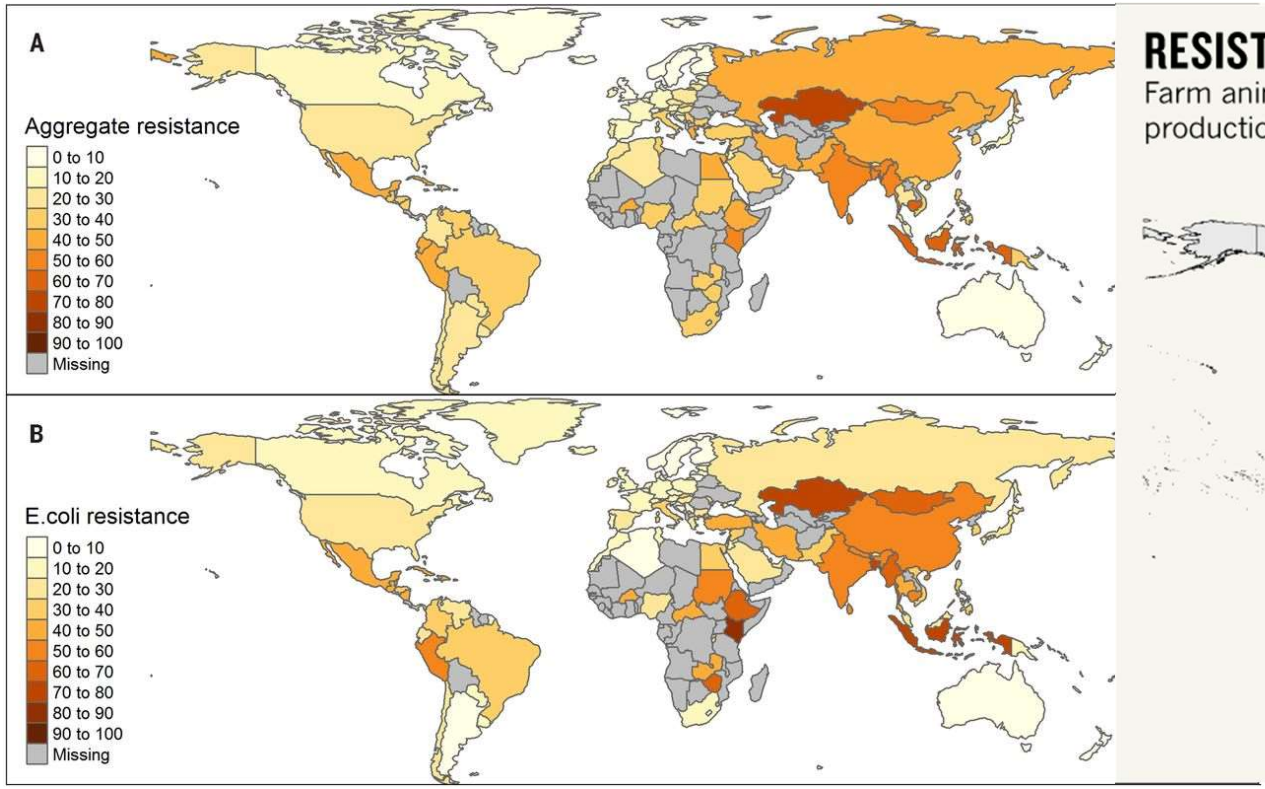
Figure 1. Current uses of antibiotics in livestock

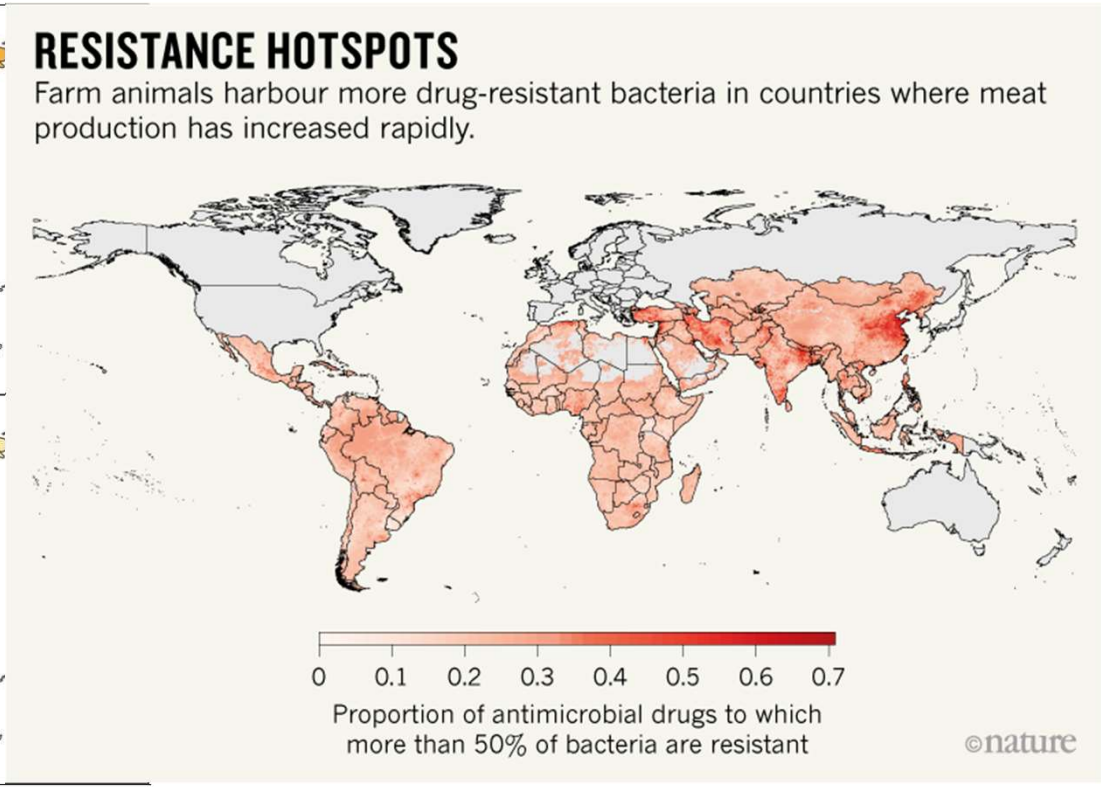


Sources: Jim O'Niel Review on AMR

Why Low & Middle-Income Countries (LMICs)?

The burden of AMR is higher in LMICs





Source: Roope et al, 2019

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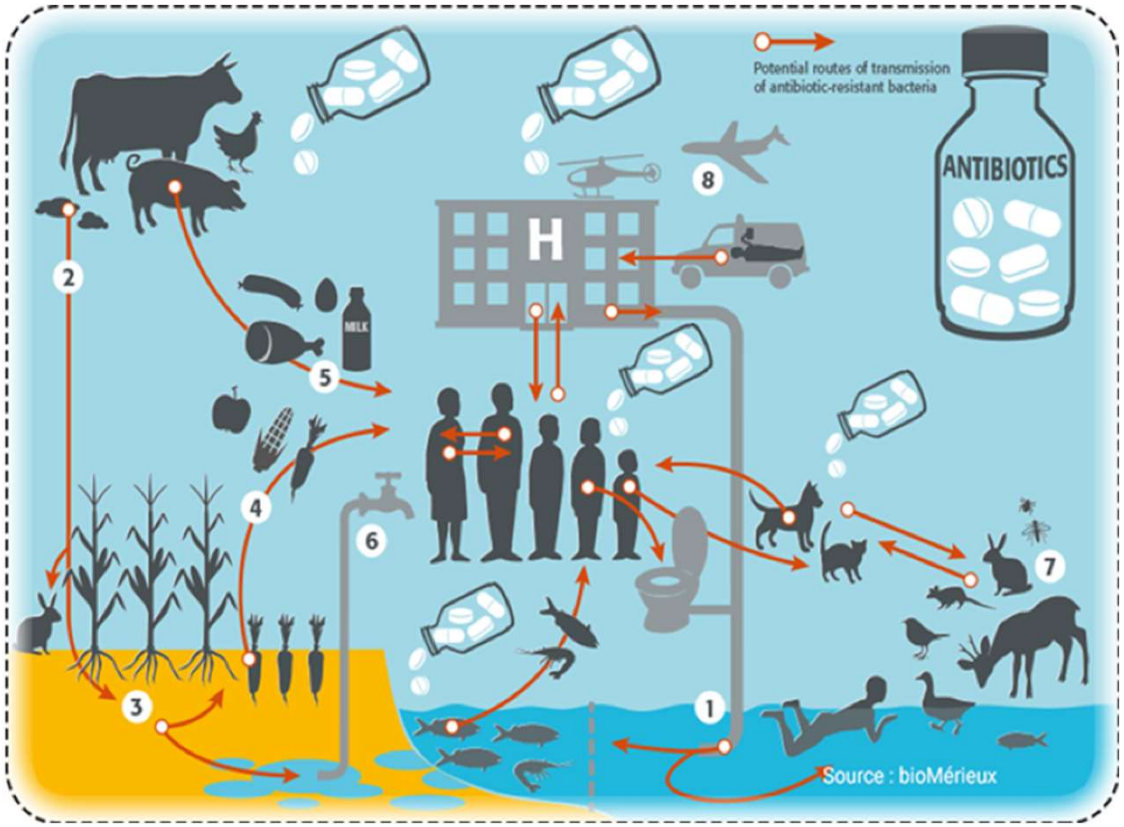
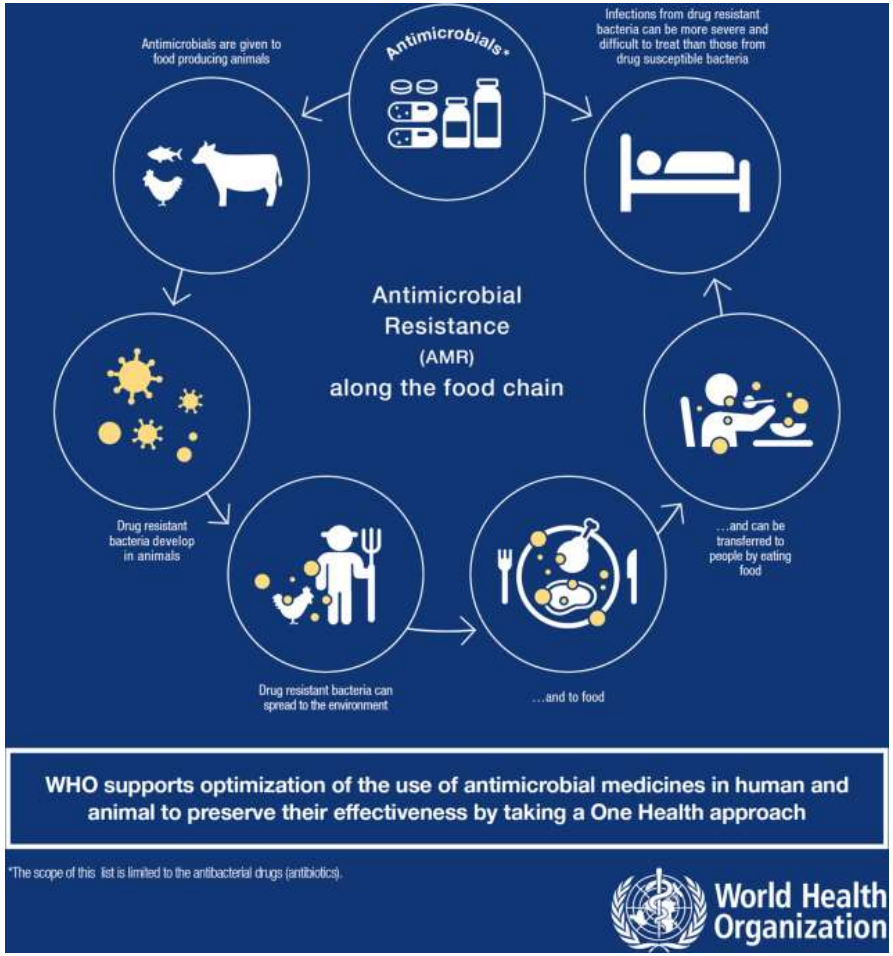
AMR and Livestock Systems

- Biosecurity and disease spread on farms
  - Short lifespan of animals
  - Animal welfare issues
  - Use of anti-microbials
- Risk of zoonosis – due to ecological damage caused by industrial production systems
  - Example of Nipah virus outbreak among pig farmers in Malaysia 1999 - attributed to damage to natural reservoirs of fruit bats for harvesting tropical hardwood
- Industrial grain-oilseed- livestock complex (Weis)
  - Feed for poultry, cattle and pigs consists of more than 80% grains, fodder crops and by-products from the food and energy sectors
  - 1/3 of global grain produced is consumed by livestock
  - Nutrient loss in feedlots

Why Political Economy?





Source: https://www.who.int/foodsafety/areas_work/antimicrobial-resistance/AMR-food-chain-infographics/en/ Copyright © WHO (2017), all rights reserved

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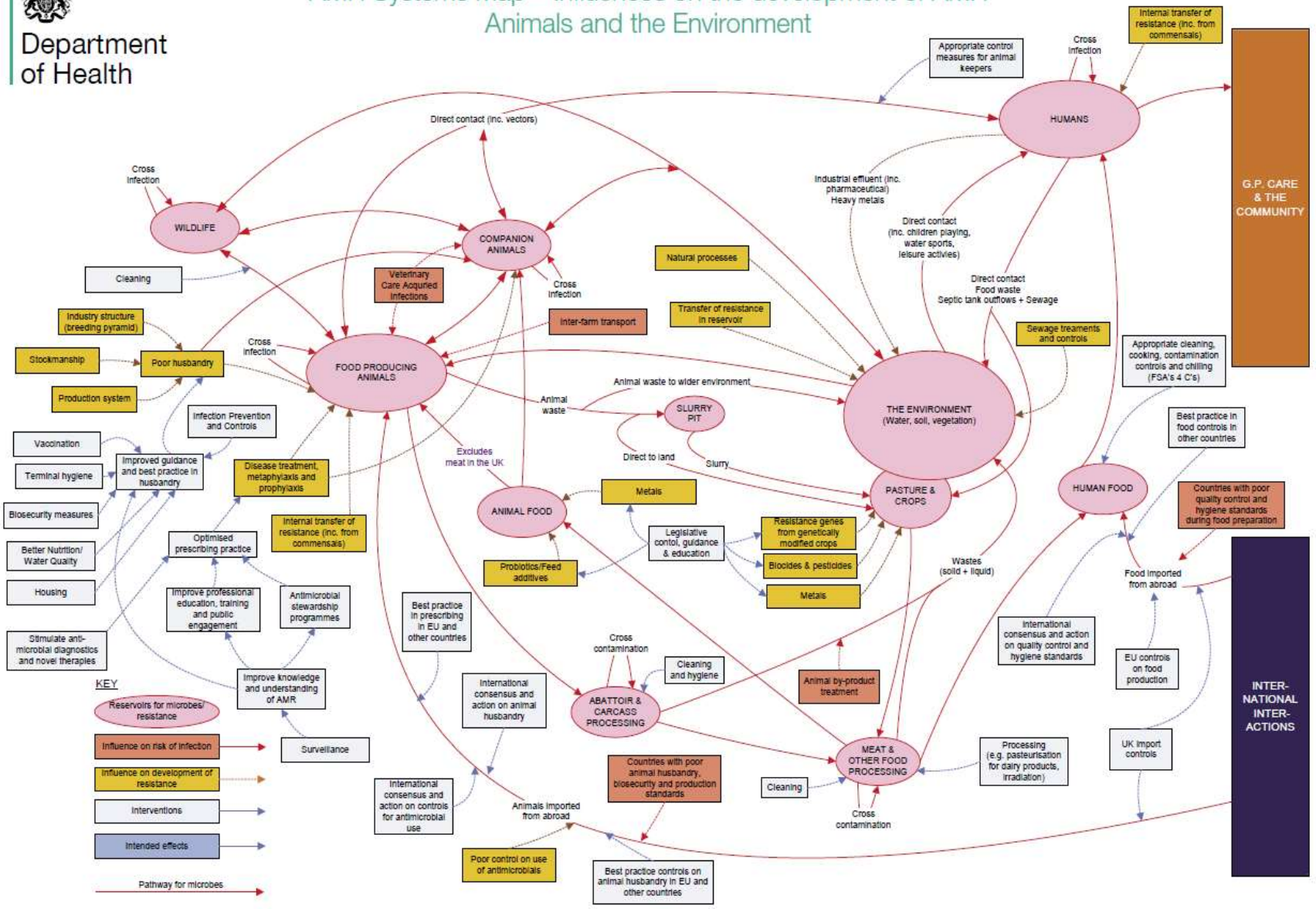
Department of Health

AMR Systems Map – Influences on the development of AMR
Animals and the Environment



Sources: Microbial Maps UK Dept of Health
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/387746/Microbial_Maps.pdf

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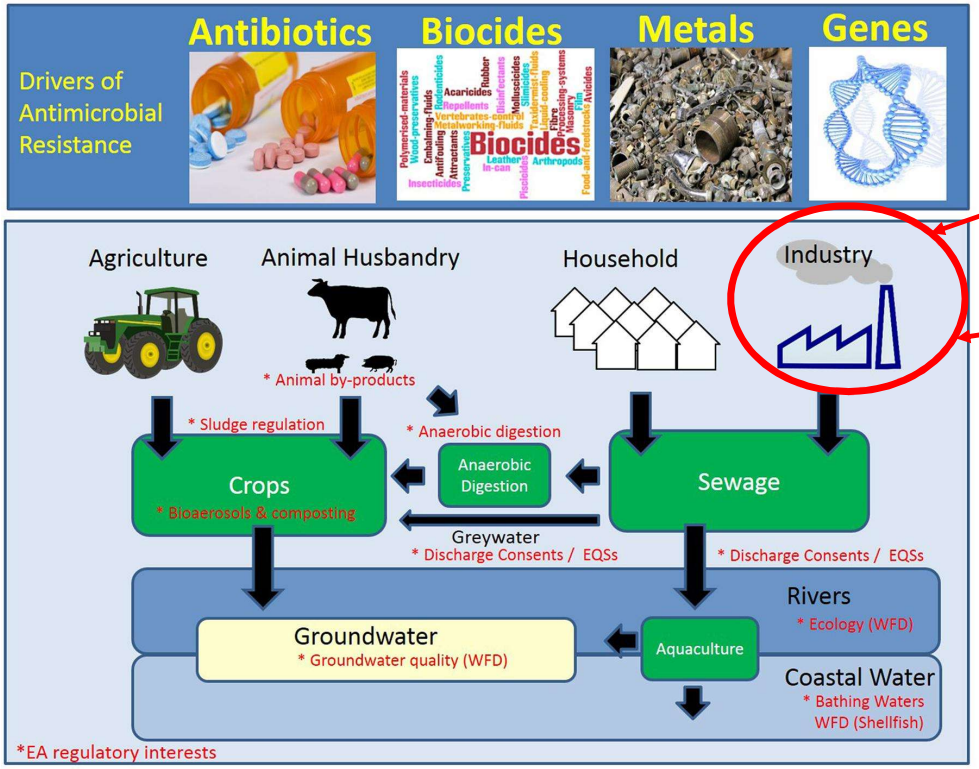

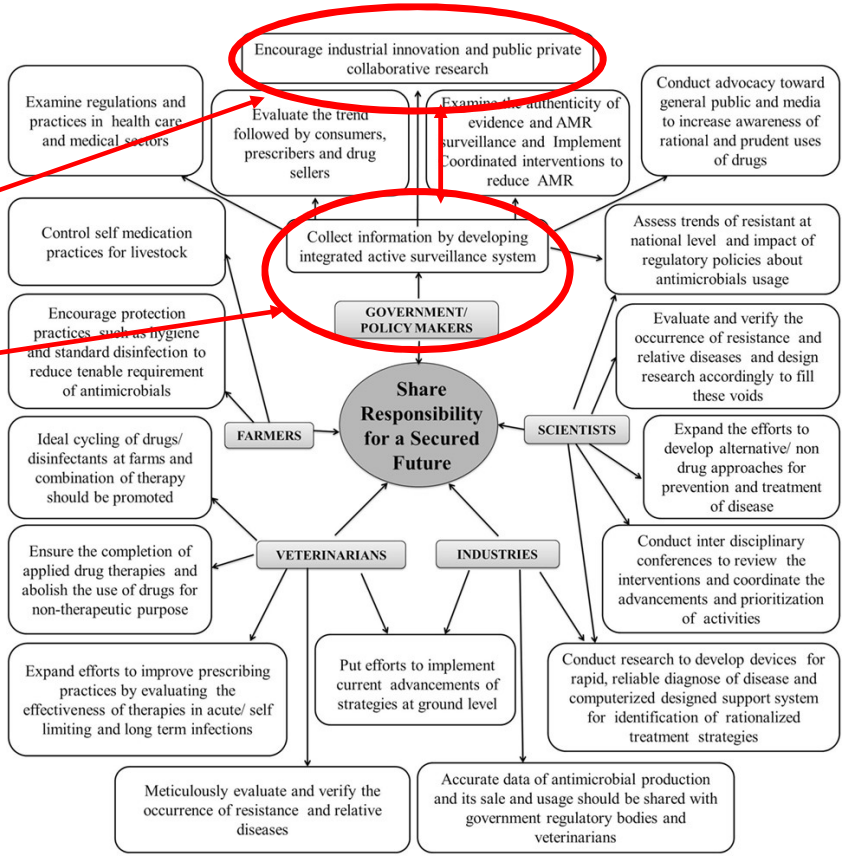

Sources:
1. Andrew C. Singer, Helen Shaw, Vicki Rhodes and Alwyn Hart
Front. Microbiol., 01 November 2016 | Review of Antimicrobial Resistance in the Environment and Its Relevance to Environmental Regulators
2. Sharma Chetan, Rokana Namita, Chandra Mudit, Singh Brij Pal, Gulhane Rohini Devidas, Gill Jatinder Paul Singh, Ray Pallab, Puniya Anil Kumar, Panwar Harsh, 2018, Antimicrobial Resistance: Its Surveillance, Impact, and Alternative Management Strategies in Dairy Animals, Frontiers in Veterinary Science
https://www.frontiersin.org/article/10.3389/fvets.2017.00237

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Institutions

Power

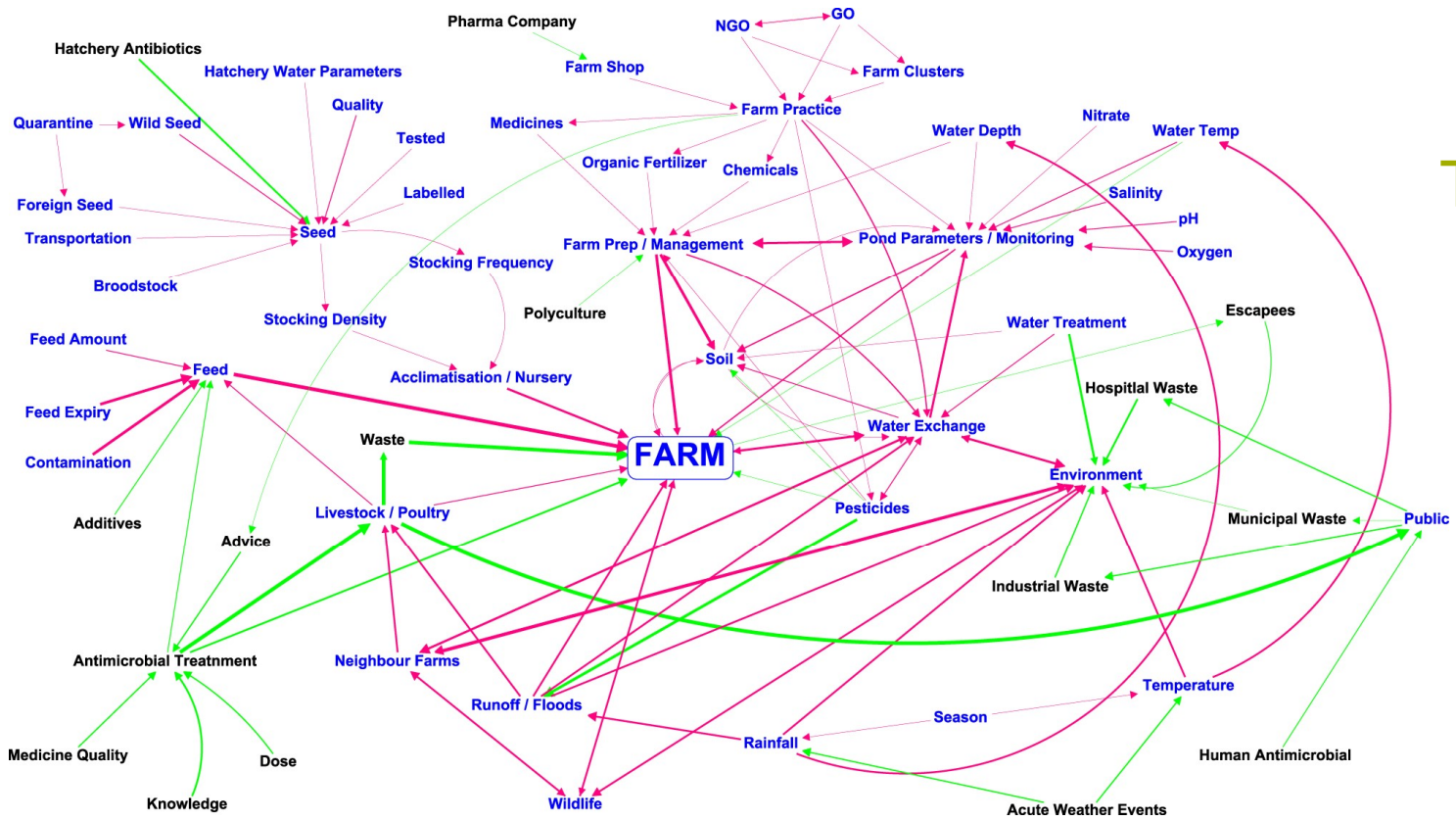
Role of State

Global Inequities

Technology Transfer

Macro-economy

Markets



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Sources: Hinchliffe, S., Butcher, A. & Rahman, M.M. The AMR problem: demanding economies, biological margins, and co-producing alternative strategies. Palgrave Commun 4, 142 (2018). https://doi.org/10.1057/s41599-018-0195-4

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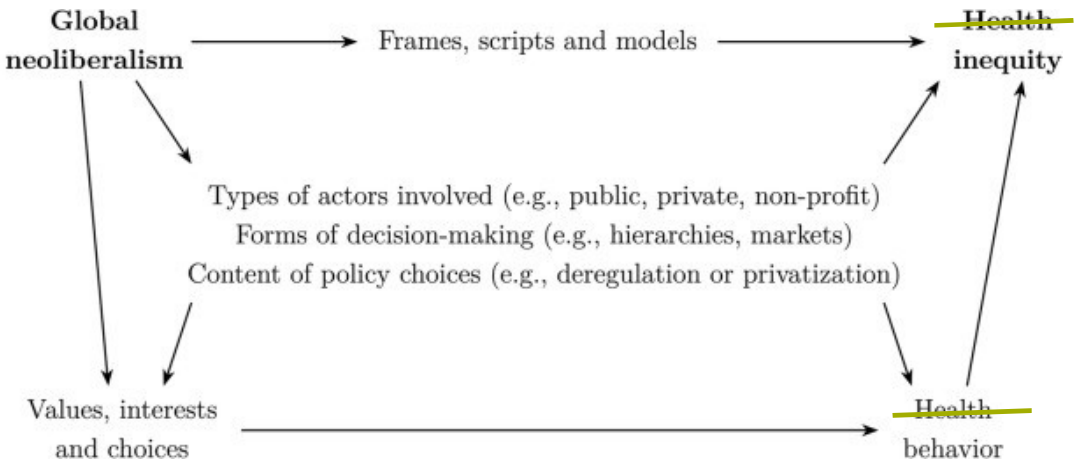
Institutions

Power

Role of State

Global Inequities

Resistance/Disease



Technology Transfer

AMU and production behaviours

Macro-economy

Markets

Sources: Kentikelenis, A., & Rochford, C. (2019).

What is Political Economy?

- P.E. deals with the identification and study of the **issues** or **factors** as they relate to the economy and society
- Political economy analysis is concerned with the interaction of political and economic processes within a society
  - The distribution of power and wealth between different groups and individuals
  - The processes that create, sustain and transform these relationships over time
- Interactions run both ways
  - That is, how political forces influences economy and how economy influences political forces

Political Economy - Assumptions

- Mainstream economics examines
  - how rational individuals use the resources at their disposal – such as capital, labour, land
  - to maximise some utility function – such as maximising profits, income or yield
  - by producing goods and services and participating in markets
- Political economy examines how such individuals maximise their utility by participating in political activity
- Agents have capital and labour as resources that they can utilise to influence political processes in order to generate policy outcomes that benefit them
  - This process is termed as rent seeking

How do farmers make decisions about ABU?
Mainstream vs Political Economy

- **Mainstream Economics**
  - Rational choice theory
    - Individuals always make decisions that provide them with the highest amount of utility
  - Free market and Adam Smith's invisible hand
    - Market failure - Inefficient distribution of goods and services in the free market
  - Δ income or assets
    - How much do the farmers invest and rate of return on investment? How much profit impacted?
    - Opportunity cost of diseases on farm
  - Information asymmetries
  - Technological intervention
    - Reduce disease prevalence

- **Political Economy**
  - Rationality cannot be assumed
  - Markets
    - Inherent power dynamics shape the market
  - Δ income or assets
    - Who makes profit across value chain?
    - Who is included and excluded from economic/ profit making activities?
    - Underlying factors for inclusion/exclusion
  - Incentives (market and non-market)
    - Power dynamics—who's making decisions? Who benefits most from this? How is patronage being used?
    - Inherent social dynamics that govern decision making such as class and caste relations

Political Economy Approaches: Ontology and Epistemology

[Focused on course learning objective #3: Identify the underlying paradigms, philosophical assumptions and politics of their research in LMICs]

Adam Willman (He/Him): SOAS, University of London

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Ontology

- Principle big question: What is reality, truth?
- Spectrum from **realists** (1, objective reality) to **relativists** (many, subjective realities)
- Various ontological beliefs within political economy

Epistemology

- How does one learn about the world around them?
  - "…concerned with all aspects of the validity, scope, and methods of acquiring knowledge, such as, with what constitutes a knowledge claim; how knowledge can be produced or acquired; and how the extent of its applicability can be determined."—Moon and Blackman (2014)

- Spectrum from **objectivism** (object independent of researcher) to **subjectivism** (subject/object act and are acted upon each other)

Natural Sciences

Social Sciences

Realism:
1 reality,
independent of us

Ontology:
the nature and
existence of reality

Relativism:
many realities from
human perspectives

Positivists:
Scientific method,
falsification

Epistemology:
how to acquire
knowledge

Interpretivists:
different truths exists

1.0 ONTOLOGY: What exists in the human world that we can acquire knowledge about?

← Realism: one reality exists → ← Relativism: multiple realities exist →

1.1 Naïve realism	1.2 Structural realism	1.3 Critical realism	1.4 Bounded relativism	1.5 Relativism
Reality can be understood using *appropriate* methods	Reality is *described* by scientific theory, but its underlying nature remains uncertain	Reality captured by broad *critical* examination	Mental constructions of reality are equal in space & time within boundaries (e.g., cultural, moral, cognitive)	Realities exist as multiple, intangible mental constructions; no reality beyond subjects

2.0 EPISTEMOLOGY: How do we create knowledge?

2.1 Objectivism	2.2 Constructionism*	2.3 Subjectivism
Meaning exists within an object: an objective reality exists in an object independent of the subject	Meaning created from interplay between the subject & object: subject *constructs* reality of object	Meaning exists within the subject: subject imposes meaning on an object

3.0 THEORETICAL PERSPECTIVE: What is the philosophical orientation of the researcher that guides their action/research?

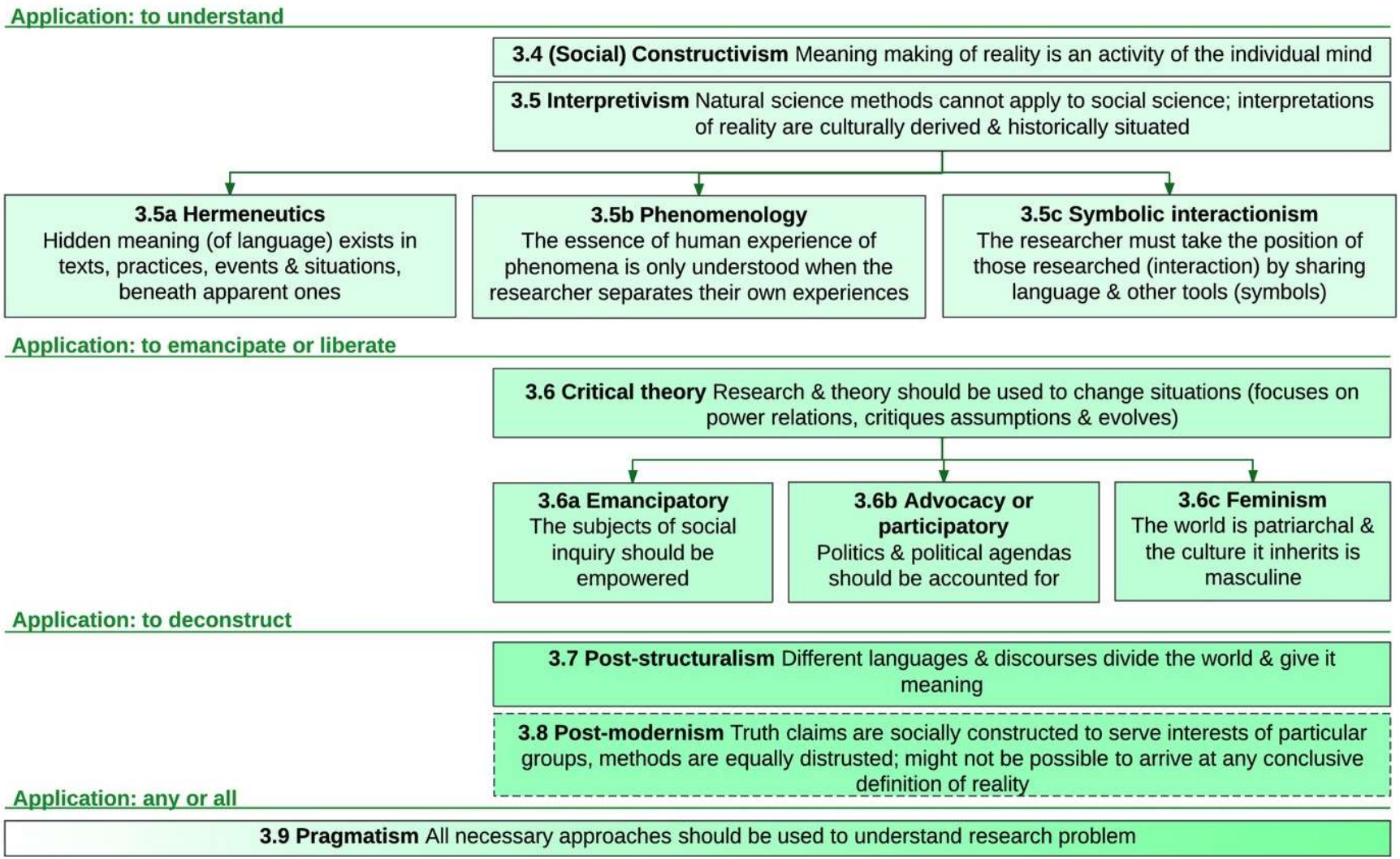
Knowledge acquisition is deductive, 'value-free', generalizable ← → Knowledge acquisition is inductive, value-laden, contextually unique

Application: to predict

3.1 Positivism	3.2 Post-positivism
Natural science methods (posit, observe, derive logical *truths*) can be applied to the social sciences	Multiple methods are necessary to identify a *valid* belief because all methods are imperfect

3.3 Structuralism The source of meaning comes from the formal structure found in language & can apply to all aspects of human culture

Conservation Biology, Volume: 28, Issue: 5, Pages: 1167-1177, First published: 24 June 2014, DOI: (10.1111/cobi.12326)


Application: to understand
3.4 (Social) Constructivism Meaning making of reality is an activity of the individual mind
3.5 Interpretivism Natural science methods cannot apply to social science; interpretations of reality are culturally derived & historically situated
3.5a Hermeneutics
Hidden meaning (of language) exists in texts, practices, events & situations, beneath apparent ones
3.5b Phenomenology
The essence of human experience of phenomena is only understood when the researcher separates their own experiences
3.5c Symbolic interactionism
The researcher must take the position of those researched (interaction) by sharing language & other tools (symbols)
Application: to emancipate or liberate
3.6 Critical theory Research & theory should be used to change situations (focuses on power relations, critiques assumptions & evolves)
3.6a Emancipatory
The subjects of social inquiry should be empowered
3.6b Advocacy or participatory
Politics & political agendas should be accounted for
3.6c Feminism
The world is patriarchal & the culture it inherits is masculine
Application: to deconstruct
3.7 Post-structuralism Different languages & discourses divide the world & give it meaning
3.8 Post-modernism Truth claims are socially constructed to serve interests of particular groups, methods are equally distrusted; might not be possible to arrive at any conclusive definition of reality
Application: any or all
3.9 Pragmatism All necessary approaches should be used to understand research problem

How do farmers make decisions related to AMR/ID?

Animal Sci.

- Positivist
  - Δ Feed Conversion Ratio
  - Δ Milk output
  - Pest & disease pressure
  - *Control and limitation of external factors*

Economics

- Both
  - Δ income/assets
  - Agrarian & industrial policies (Inspection requirements)
  - Incentives (market and non-market)

Anthropology

- Interpretivist
  - Culture
  - Historical context
  - Personal, familial, community relationships
  - *'External' variables are the focus of the study*

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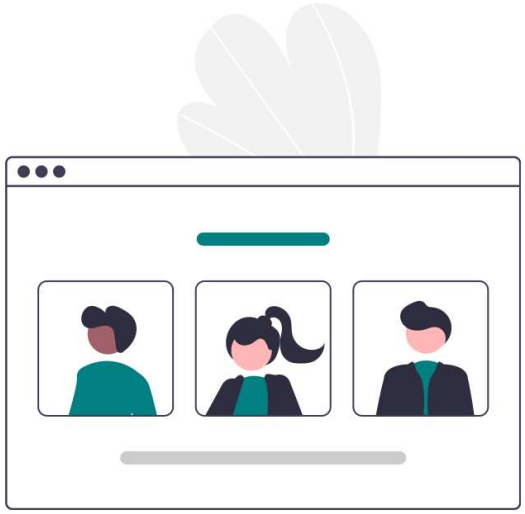
Ontology and epistemology of PE

- Broad beliefs across the spectrum
  - Concerned with claims of:
    - Causality
    - Generalisability
    - Validity
    - Knowledge production

- Consciously and subconsciously dictate how you conduct research
  - Impacts what questions we ask and how we ask them

Discussion:

How would you describe your ontological, epistemological and philosophical beliefs on research?



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Questions and discussion

Further research methods will be discussed in the last lecture

Next lecture

- Topic: Governance and corporate power by Dr Feyzi Ismail--SOAS
- Date: 22 February 2021