

[Webinar] Global burden of foodborne diseases, European Burden of Disease Network

Evidence based public health policy for disease prevention: the burden and control of foodborne diseases

Sara Monteiro Pires, smpi@food.dtu.dk

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The global burden of foodborne diseases

The burden of foodborne diseases is substantial

Every year foodborne diseases cause:

almost **in 10** people to fall ill | **33 million** healthy life years lost

Foodborne diseases can be deadly, especially in children <5

420 000 deaths

Children account for **1/3** of deaths from foodborne diseases

FOODBORNE DISEASES ARE PREVENTABLE. EVERYONE HAS A ROLE TO PLAY.

For more information: www.who.int/foodsafety
#SafeFood
 Source: WHO Estimates of the Global Burden of Foodborne Diseases, 2015.

WHO ESTIMATES OF THE GLOBAL BURDEN OF FOODBORNE DISEASES

FOODBORNE DISEASE BURDEN EPIDEMIOLOGY REFERENCE GROUP
2007-2015

Prioritizing food safety interventions

1. What is the public health impact of different foodborne diseases?

How do we compare and **prioritise diseases**?

2. What causes these problems?

How do we identify **sources** of disease and **routes of transmission**

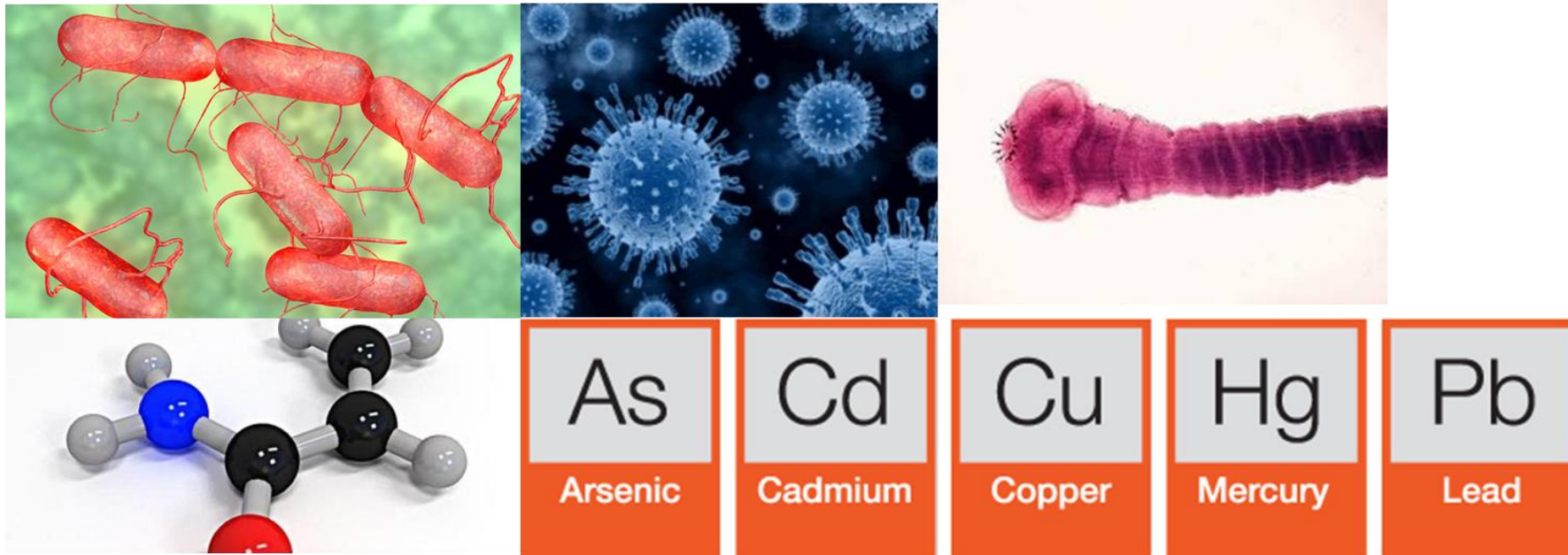
3. What are the options for **intervention**?

Which are more effective?

4. How do we measure the **effect** of each intervention?

Challenges

- Over 250 foodborne diseases, caused by bacteria, viruses and parasites, and chemicals



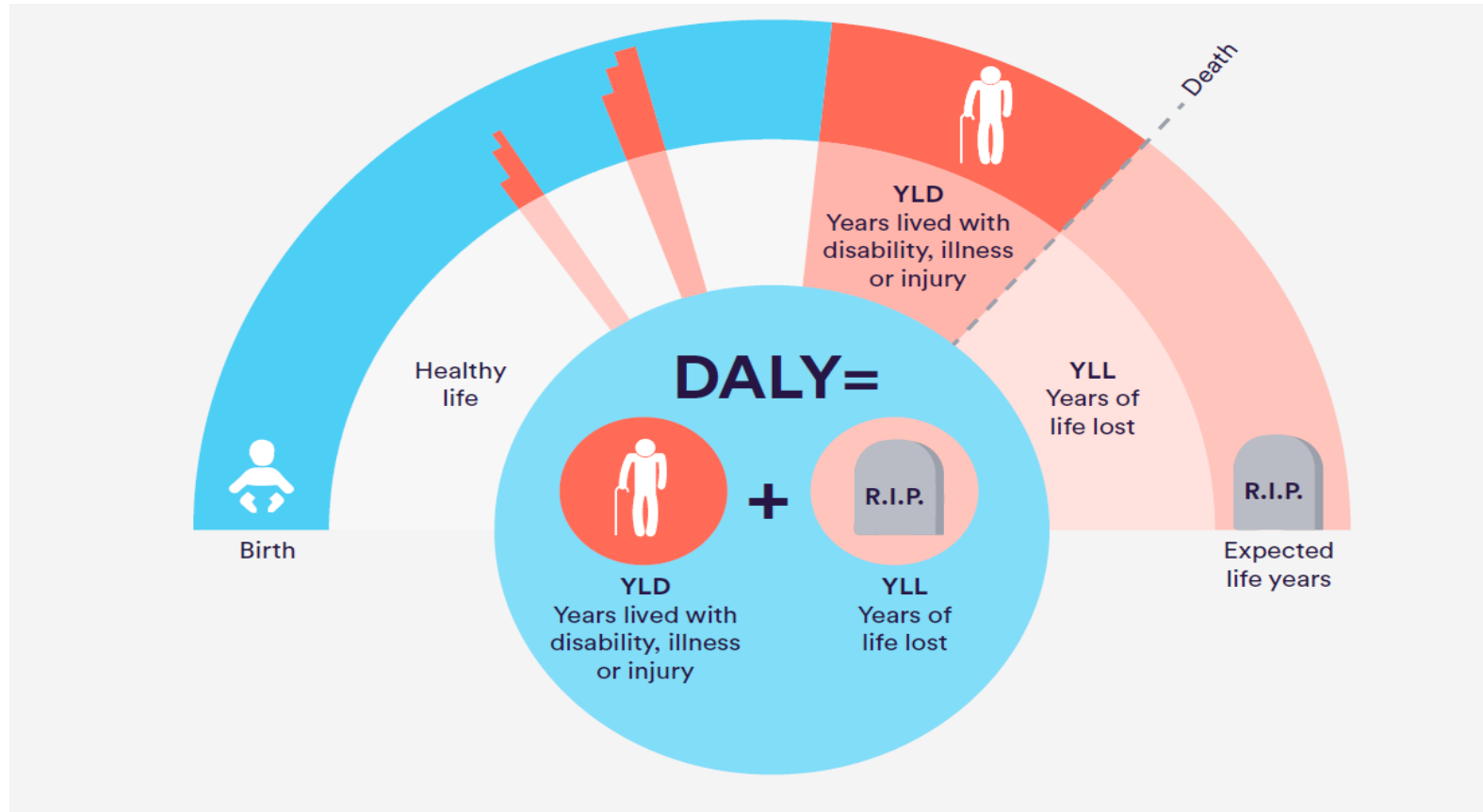
Challenges

- Over 250 foodborne diseases, caused by **bacteria**, **viruses** and **parasites**, and **chemicals**
- Underreporting
- Diverse **health effects** – severity, duration, mortality
- Chronic diseases are difficult to attribute to a specific exposure
- Various sources and routes of exposure – relative importance different across countries

Burden of foodborne disease studies

- **Goal:** to rank and prioritize foodborne diseases based on their overall public health impact in the population
- **Objectives:**
 - To estimate the burden of disease caused by identified foodborne hazards, in terms of **incidence, mortality** and Disability Adjusted Life Years (**DALYs**) by age and sex
 - Develop a framework for routine updating of estimates and evaluation of trends
 - Provide a baseline against which food safety interventions can be evaluated

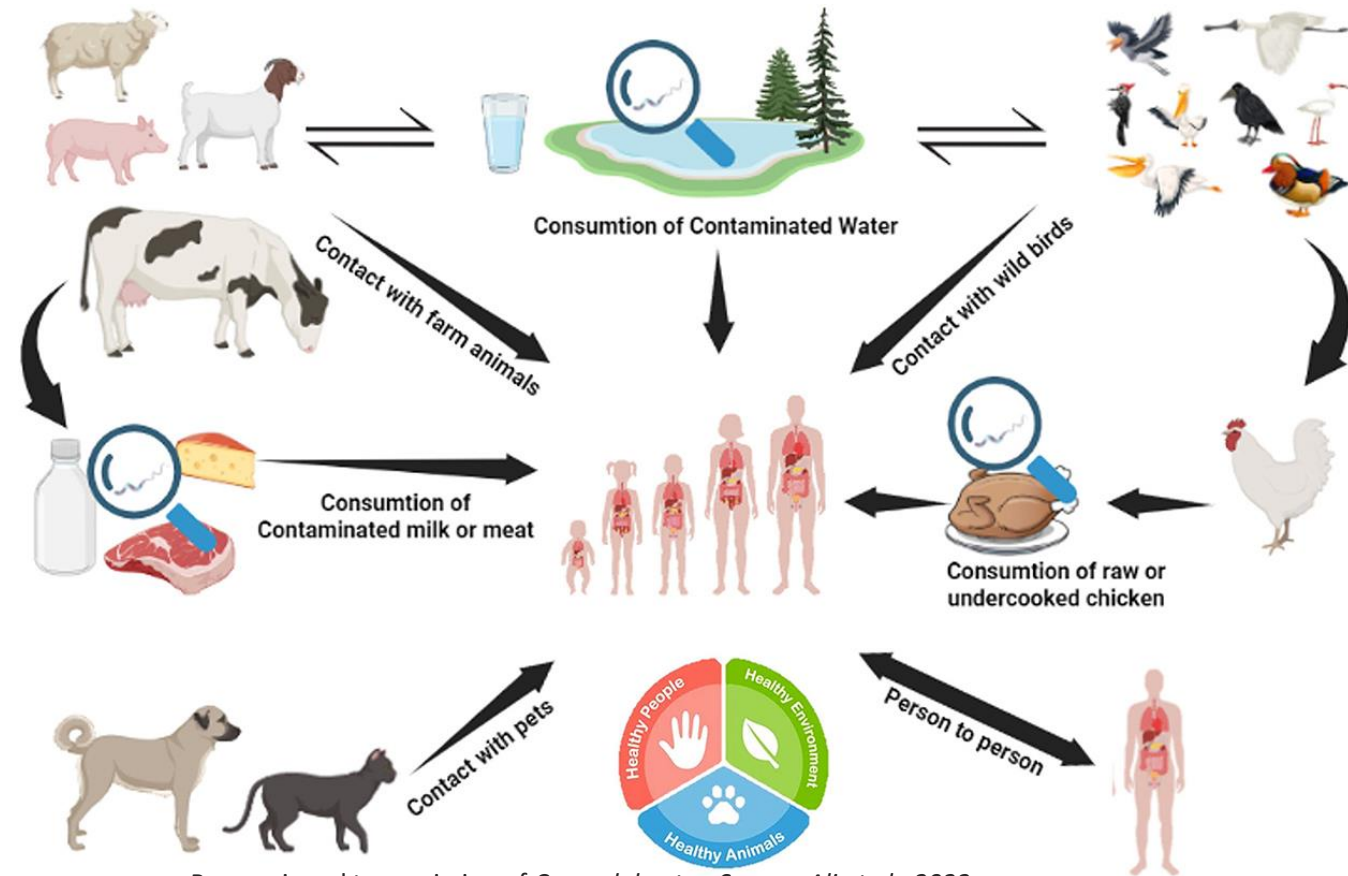
Disability-adjusted life years (DALYs)



Source: Public Health England (2015). Reproduced under Open Government Licence

What are the most important foods?

- One hazard often has many exposure routes
- Delineating routes of transmission is difficult



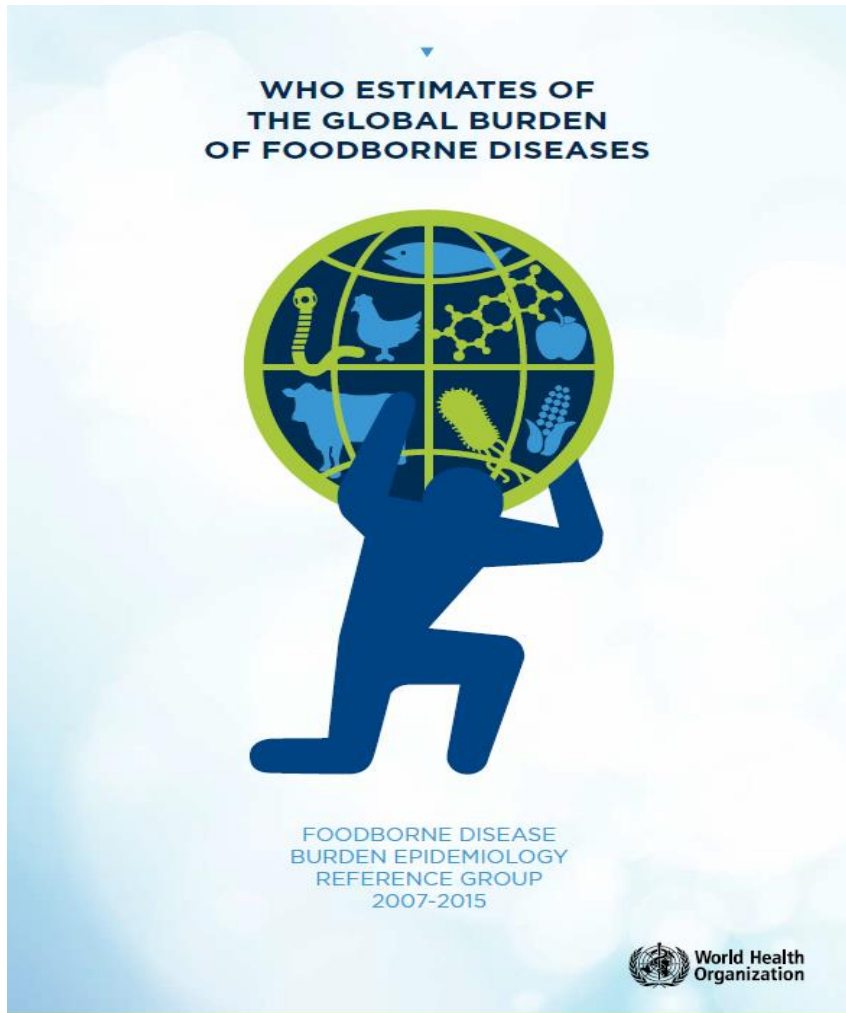
Reservoir and transmission of *Campylobacter*. Source: Ali et al., 2022.
<https://doi.org/10.3389/fpubh.2022.1045599>

What is source attribution?

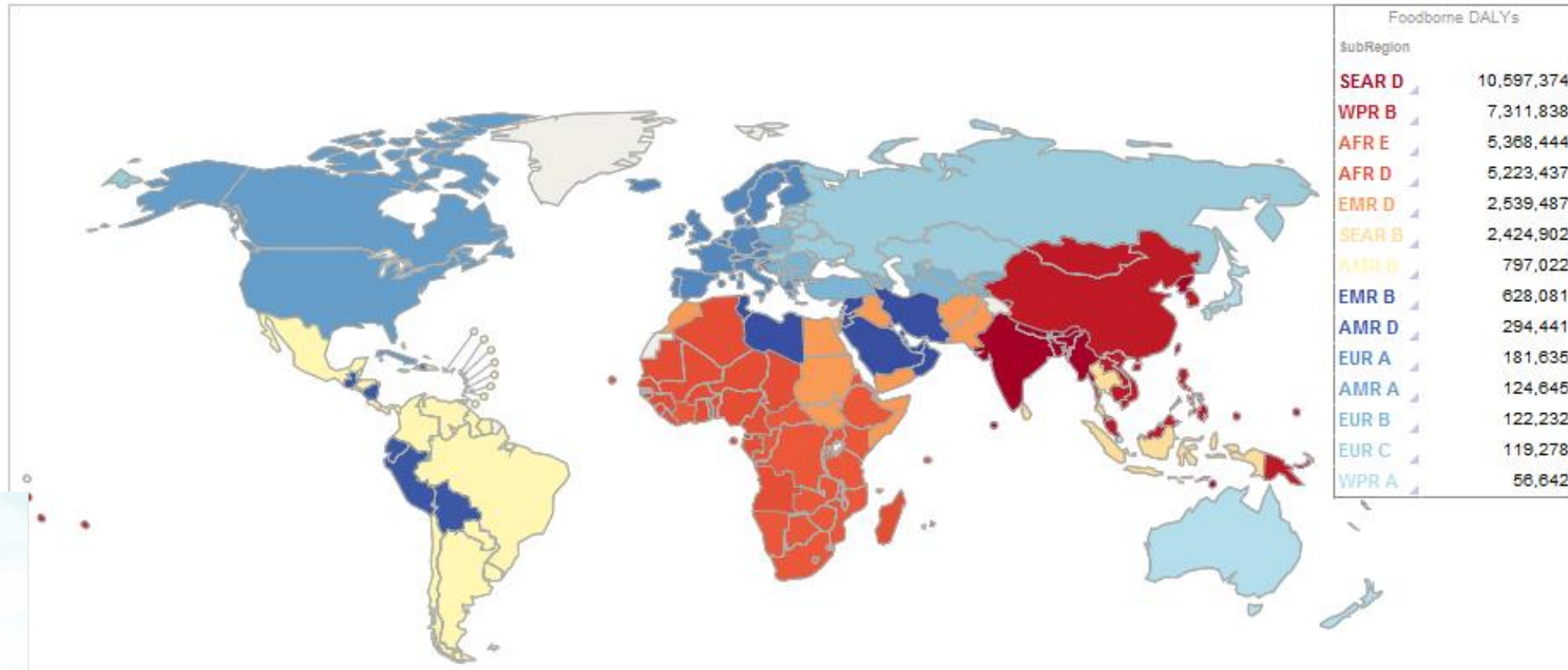
The partitioning of the human disease burden of one or more foodborne illnesses to specific sources, where the term *source* can include reservoirs or vehicles

- Attribution to main transmission routes
- Attribution to specific foods

The global burden of foodborne diseases



The global burden of foodborne diseases, 2010

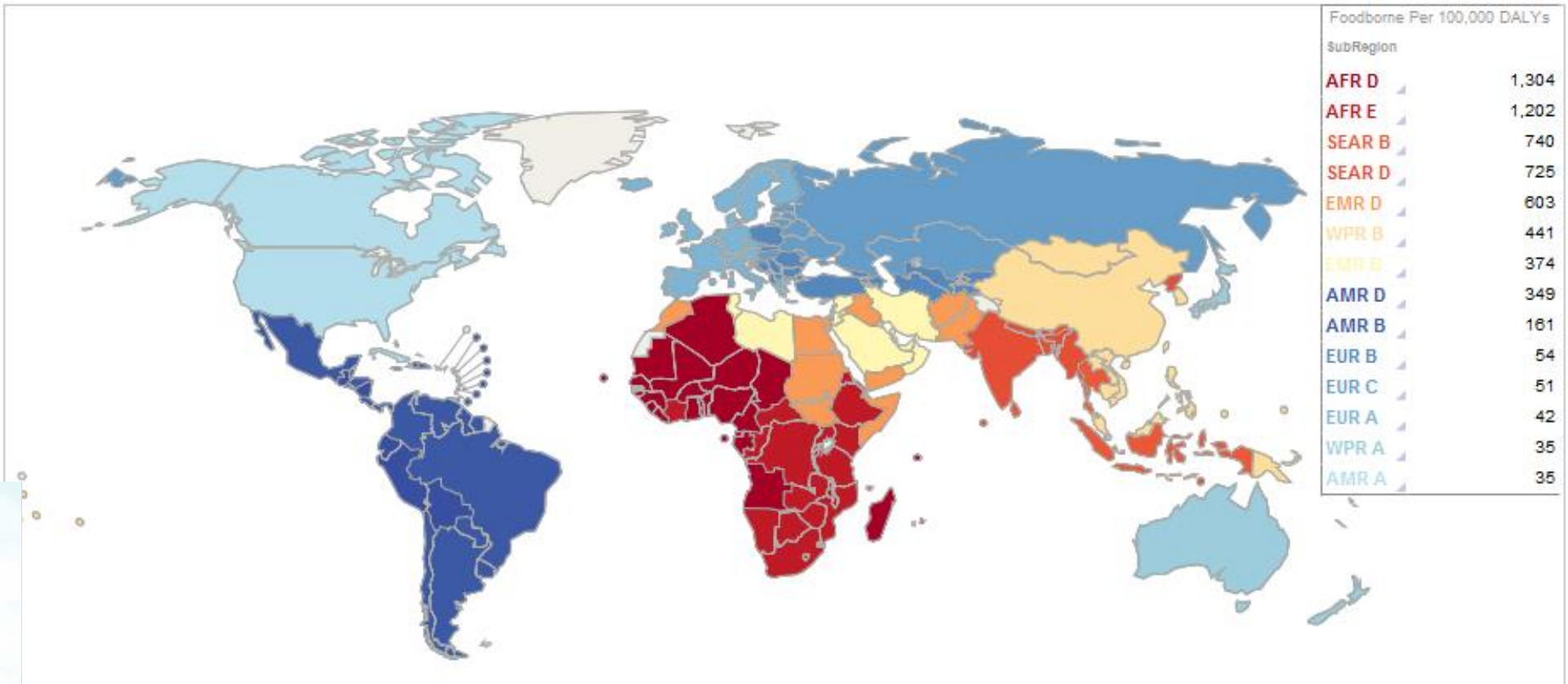


31 hazards: 600M illnesses; 420k deaths; 33M DALYs
 Diarrheal hazards: 550M illnesses; 230k deaths; 18M DALYs

[WHO, 2015](#)



The global burden of foodborne diseases, 2010

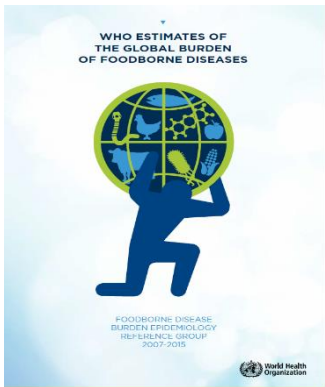
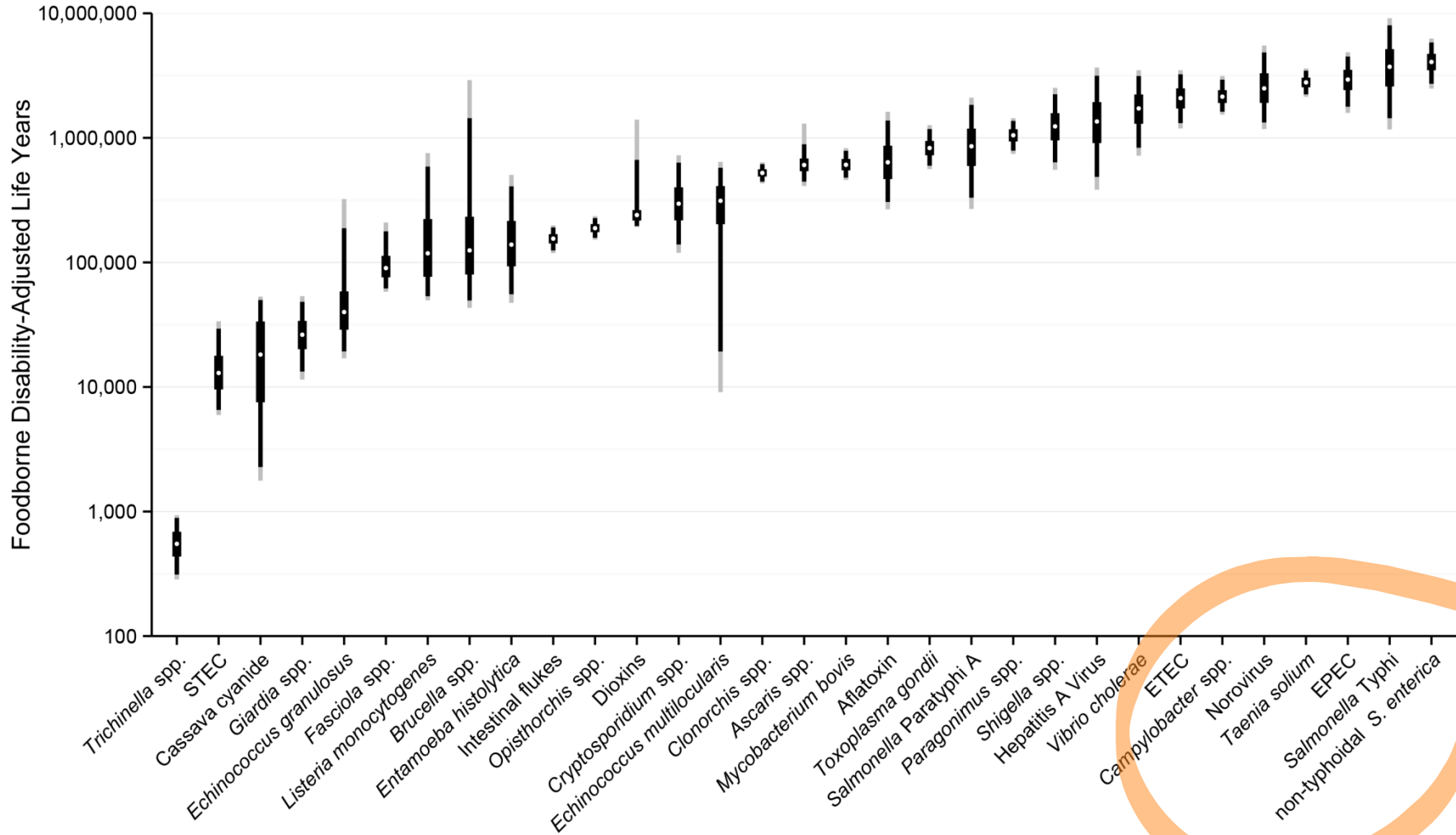


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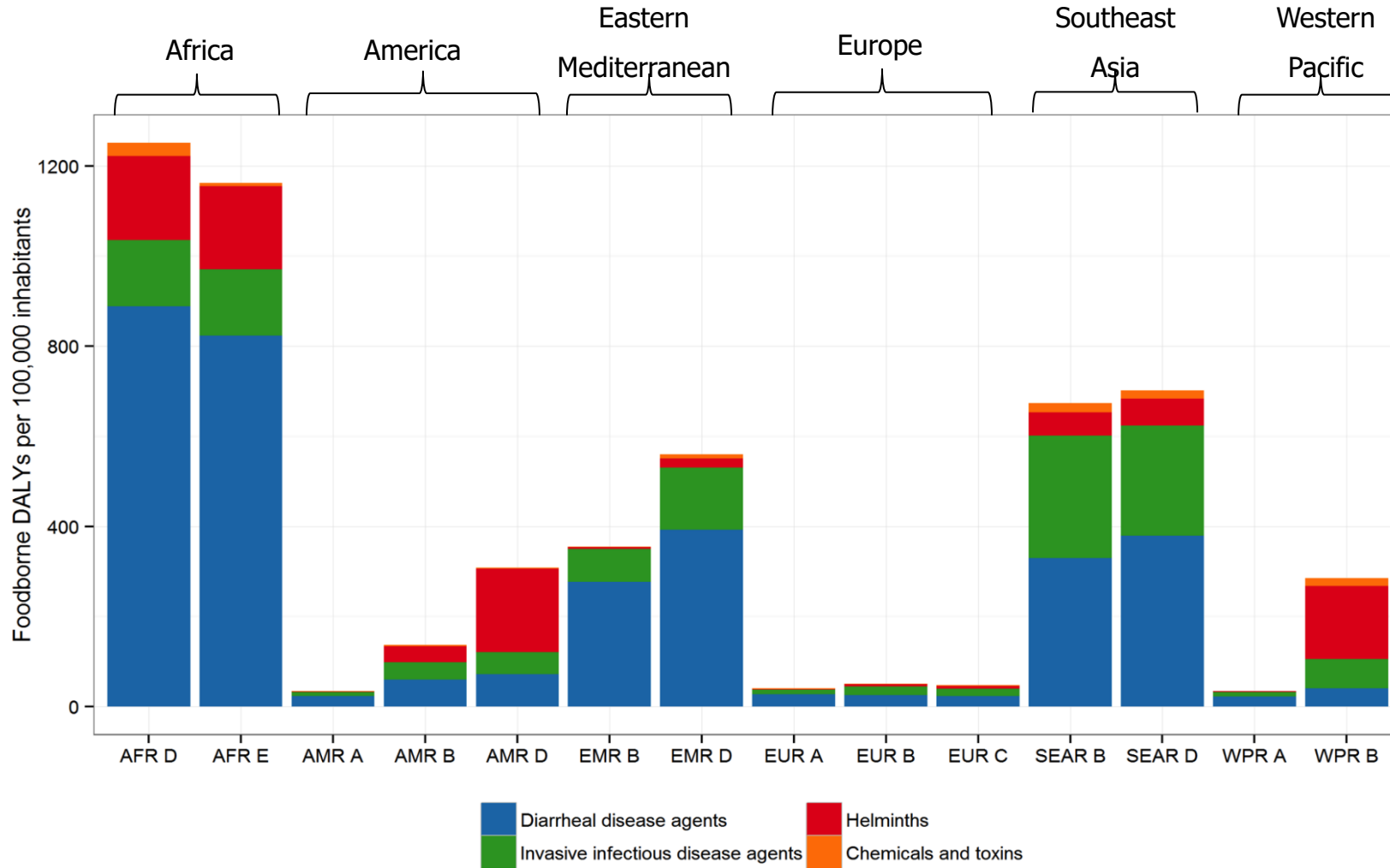
[WHO, 2015](#)



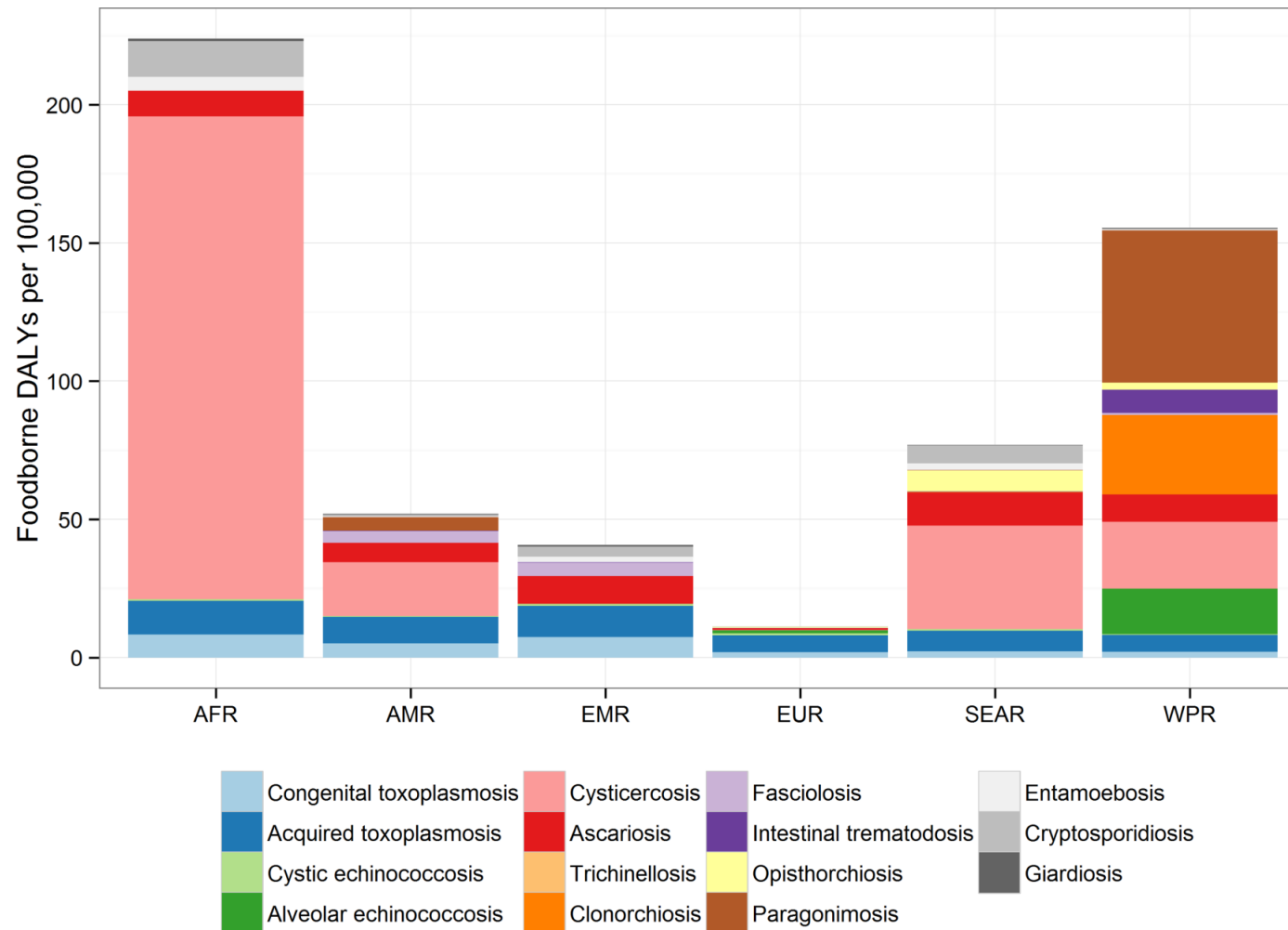
The global burden of foodborne diseases, 2010



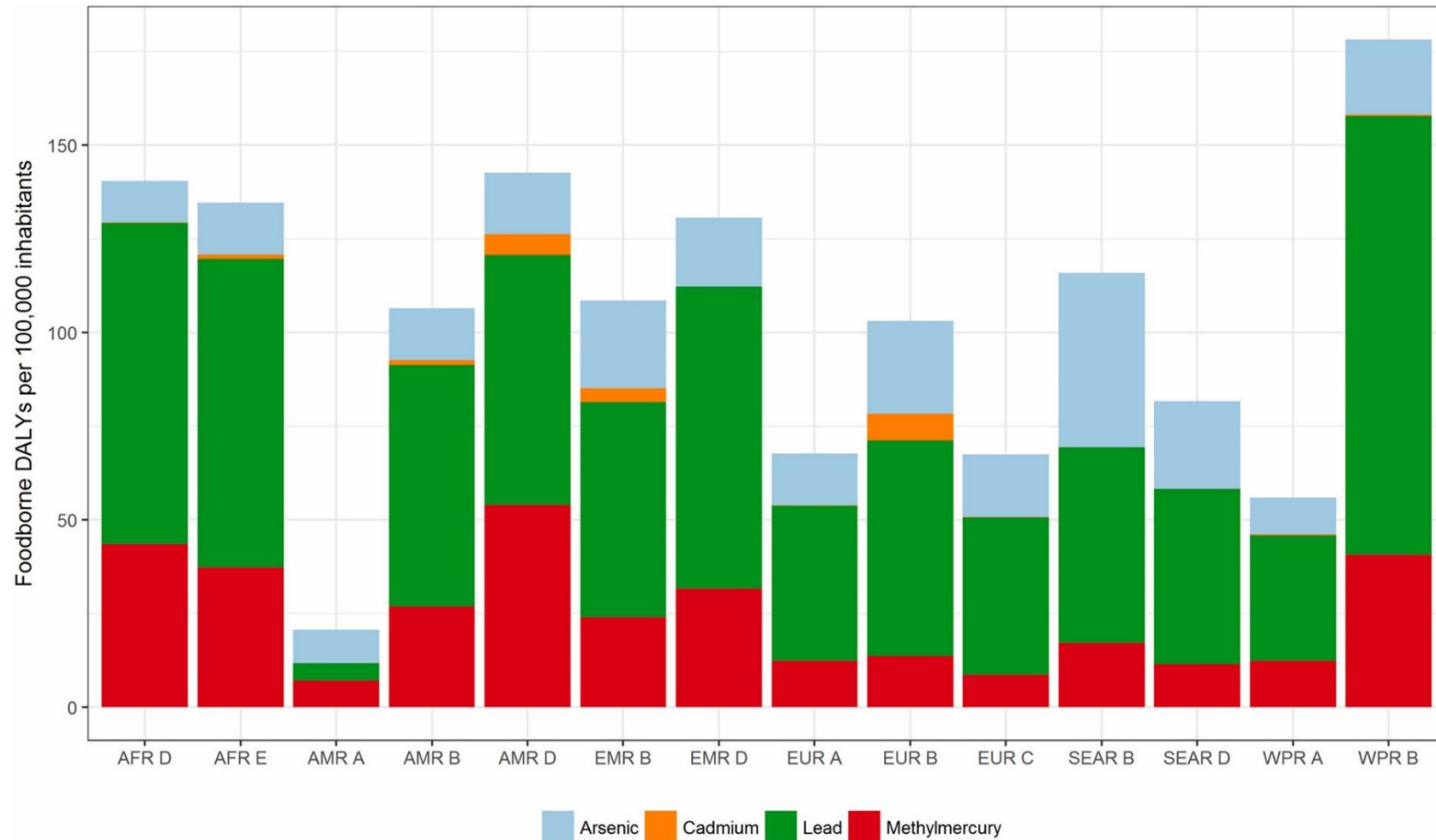
Regional disparities



Regional differences



Regional differences

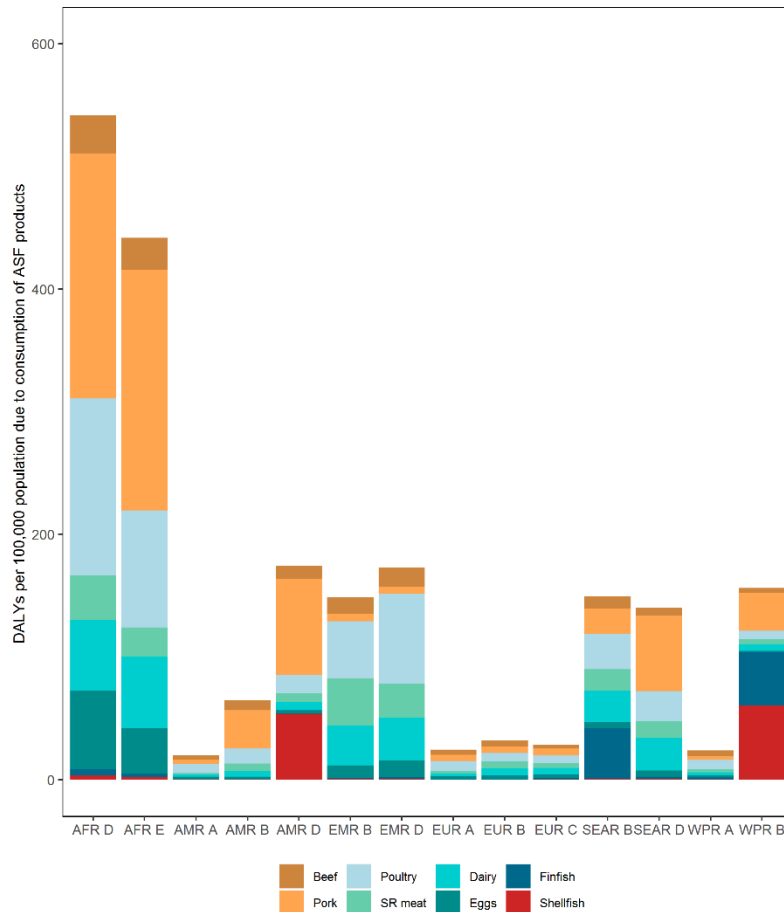


Gibb et al., 2019



Sources of foodborne diseases

Global disease burden of pathogens in animal source foods, 2010



- Rich sources of macro and micronutrients
- Improve maternal health, child growth, cognitive function



[Li et al., 2010](#)

From global to national studies

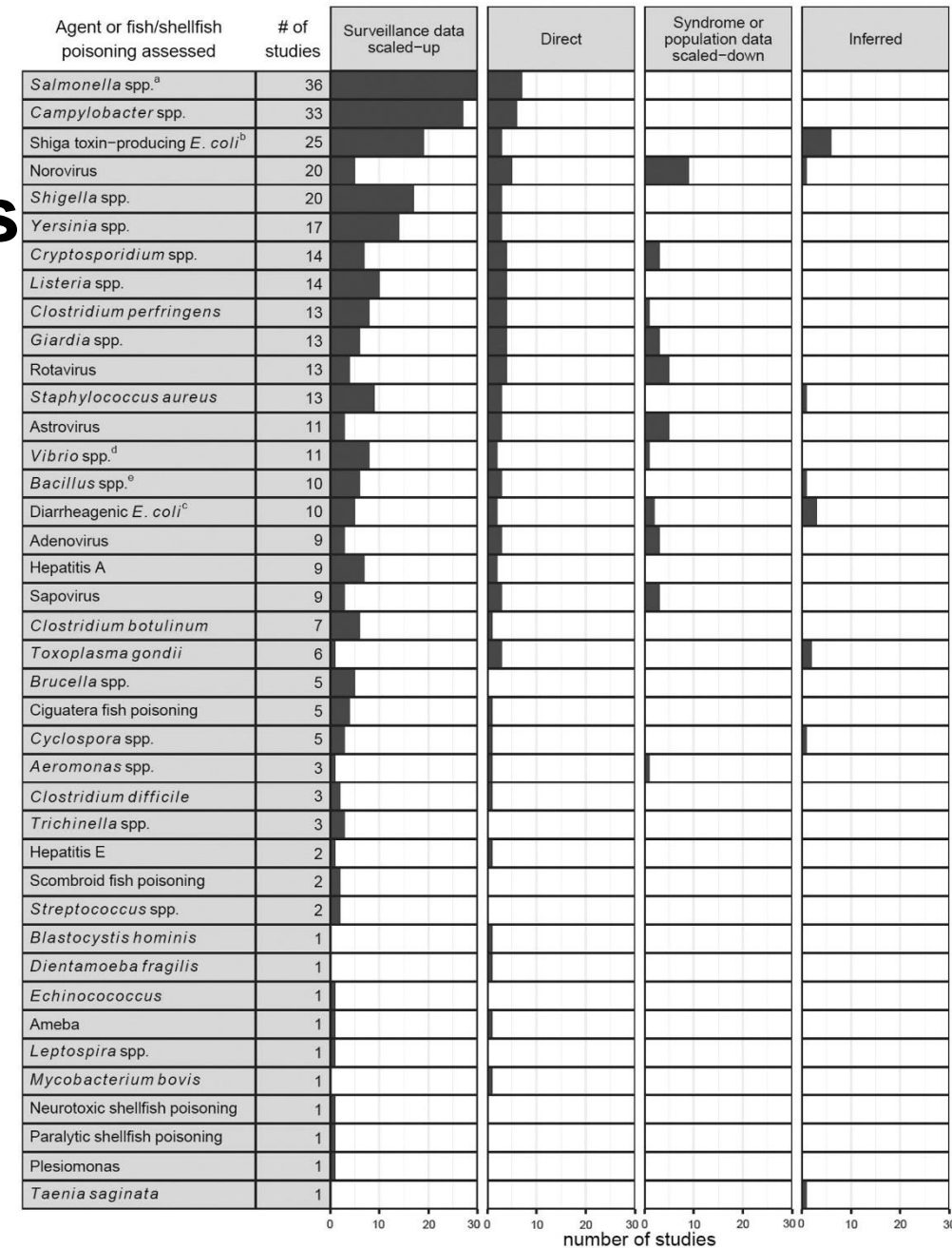
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Estimating the Number of Illnesses Caused by Agents Transmitted Commonly Through Food: A Scoping Review

Elaine J. Scallan Walter,^{1,1} Patricia M. Griffin,² Beau B. Bruce,² and Robert M. Hoekstra³

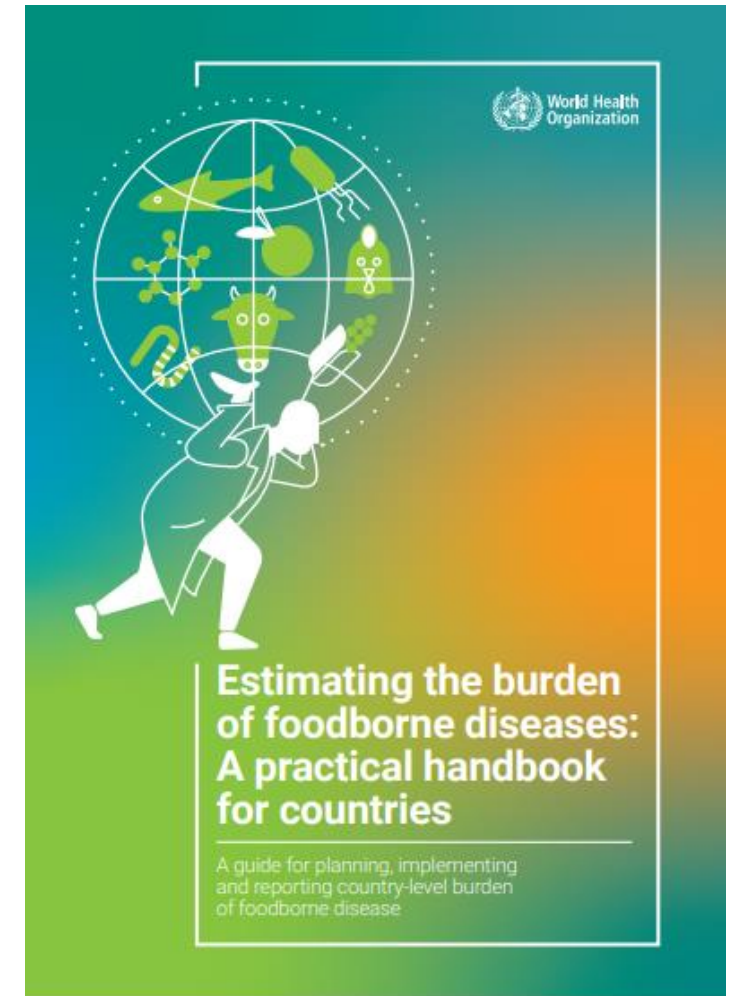
Abstract

Estimates of the overall human health impact of agents transmitted commonly through food complement surveillance and help guide food safety interventions and regulatory initiatives. The purpose of this scoping

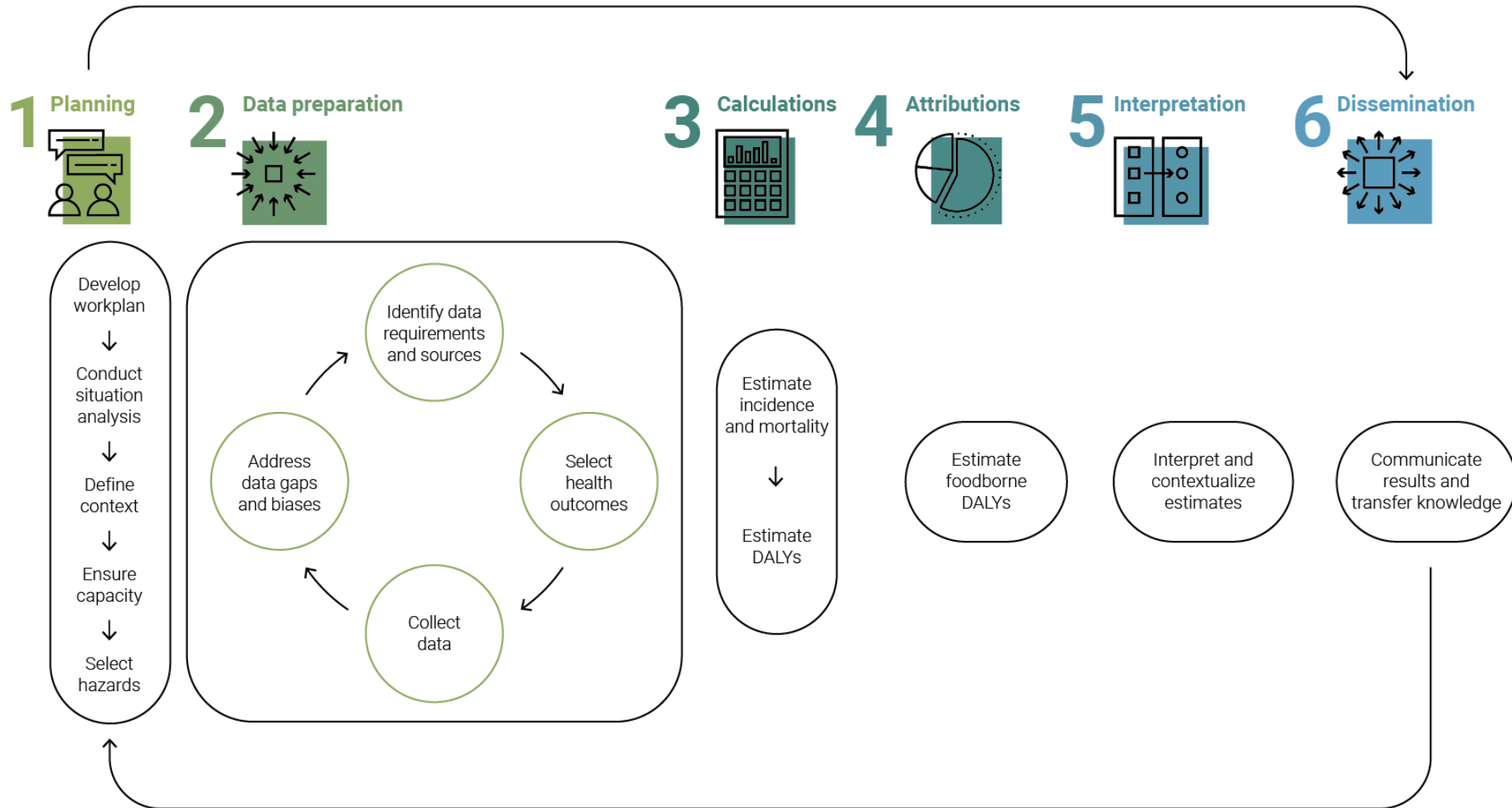


Estimating national burden of foodborne diseases

- Guidance for anyone planning to assess the burden of foodborne diseases, particularly at national level
- Aims to foster harmonization of methodologies for estimating foodborne disease burden across countries



Main elements of a burden of disease study



Requirements of a burden of disease study

- Data (surveillance, demographic, contamination and consumption, literature)
- Capacity to analyze surveillance data, apply methods to adjust for data gaps and biases, and calculate DALYs
- Possibility to engage key actors with clinical and contextual knowledge and experts in selected diseases and data

From outputs to impact

Outputs (of a burden of foodborne disease study)

- Comprehensive estimates of the burden of foodborne diseases
- Evidence of the most important sources

Outcomes

- Increased adoption of food safety strategies
- Enhanced food safety practices

Impacts

- Reduced burden of foodborne diseases
- Safer food systems
- Improved public health, reduced health care costs and inequalities, ...

Why estimate the burden of foodborne diseases?

- **Prioritize food safety priorities for resource allocation for disease prevention**
- Identifying needs and data gaps
- Contribute towards facilitating trade and compliance with international market access
- Support development of risk-based food safety systems and (inter)national standards
- Support stakeholder engagement

Global burden of foodborne diseases 2025



Foodborne Disease Burden Epidemiology Reference Group (FERG)

Established first in 2007, Foodborne Disease Burden Epidemiology Reference Group (FERG) is a WHO's technical advisory group that advises WHO on the methodology to estimate the burden of foodborne diseases. Its work now also includes advising WHO on the methodology to develop and monitor global food safety indicators.

Summary

- Burden of foodborne diseases studies:
 - Useful to establish priorities
 - Require data and capacity
 - Benefit from established surveillance systems
 - Inform food safety strategies and control of foodborne diseases
- Global efforts are essential to provide estimates for all countries and hazards

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