



Application of the WHO estimates of the burden of foodborne diseases in risk ranking at the national level

Arie Havelaar on behalf of the TARTARE research teams

WHO webinar “Ranking food safety risks at the national level”

June 10, 2024

The team



TARTARE

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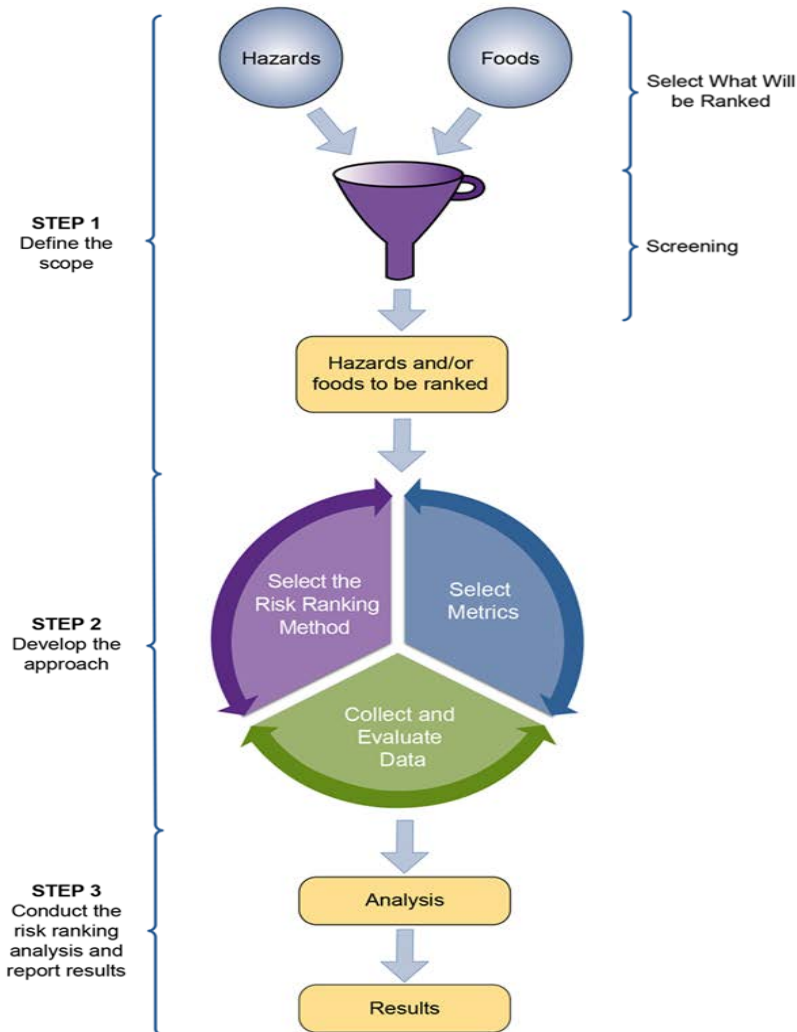
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The problem



Ranking and Prioritizing Risks



- Risk-based system based on assumption that there are limited resources.
- What to work on?
 - Multitude of hazards/foods
 - Number, complexity of methods
 - Resource needs
- Without sound risk ranking, small risks may receive unwarranted attention while large ones are neglected.
- Essential for effective risk management!

Scoping workshop

- Reviewed WHO disease burden estimates for 28 hazards in Ethiopia
- Experts selected key public health metrics for ranking
- Experts identified 15 additional hazards of interest for Ethiopia
- Disease burden estimates were developed by TARTARE study team for nine of these hazards, based on limited data from literature and sources in Ethiopia
 - Assumptions and estimates reviewed by experts from Ethiopia

Risk ranking workshop (March 2020)

- Statement of concern
- Statement of purpose
- Disease burden data available in interactive [dashboard](#)
- Three rounds
 - Rank by one metric (subgroups)
 - Incidence, mortality, DALYs, Case-Fatality ratio
 - Rank by two (or more) metrics (subgroups)
 - Plenary discussion



Risk Ranking Goals and Objectives

Statement of Purpose

The purpose of this risk ranking is to identify the hazards that are relatively higher priorities for Ethiopia in terms of their contribution to the overall public health burden (e.g., mortality, disability, morbidity) of foodborne disease. Ranked risks and a final prioritized set of food hazards can inform stakeholders working on food safety in Ethiopia. These tools can leverage their collaborative effort and available resources in a systems approach for a greater impact in risk reduction.

Risk Ranking Workshop



- 2.5 day workshop in June 2022 in Addis Ababa
- 27 stakeholders engaged
 - Government agencies
 - Academic institutions
 - Non-governmental organizations
- Ranked 37 hazards as high, medium, low importance based on estimates of public health impact in Ethiopia
- Provided pre-read to participants

Final ranking of 37 foodborne hazards in Ethiopia

High (12)	Medium (6)	Low (19)
<ul style="list-style-type: none"> • Aflatoxin B1 • Arsenic • <i>Campylobacter</i> spp. • Enteropathogenic <i>E. coli</i> • Enterotoxigenic <i>E. coli</i> • <i>Mycobacterium bovis</i> • Non-typhoidal <i>Salmonella enterica</i> • Rotavirus • Shiga toxin producing <i>E. coli</i> • <i>Vibrio cholerae</i> 	<ul style="list-style-type: none"> • <i>Cryptosporidium</i> spp. • <i>Echinococcus granulosus</i> • Hepatitis A virus • <i>Listeria monocytogenes</i> • <i>Salmonella</i> Paratyphi • Shiga-toxin producing <i>E. coli</i> 	<ul style="list-style-type: none"> • Acrylamide • Aflatoxin M1 • <i>Ascaris</i> spp. • <i>Bacillus anthracis</i> • <i>Brucella</i> spp. • Cadmium • <i>Clostridium botulinum</i> • Dioxins • Enteric fever • Lead • Methylmercury • Rift Valley Fever virus • <i>Staphylococcus aureus</i> • <i>Taenia saginata</i> • <i>Toxoplasma gondii</i> • <i>Trichinella</i> spp.

High burden and mortality

High burden, low mortality

Risk Prioritization Workshop

TARTARE
RISK PRIORITIZATION WORKSHOP
JUNE 2023



- 2.5 day workshop in Addis Ababa in June 2023
- 22 stakeholders from government, academia, NGOs
- Goal was to develop concrete suggestions to contain risks associated with 12 hazards ranked high risk
- Considered which foods contribute most to transmission and how transmission could be controlled

Risk prioritization workshop

- Shifted from pathogen-food lens to food chain lens
- Conducted Delphi survey to identify food chains that contribute most to foodborne deaths: beef, dairy, poultry meat and vegetables.
- Identified where 12 hazards of interest could be prevented, reduced, or eliminated from food chains (i.e., Critical Control Points).
- Quantified and weighted relative impact of each CCP on preventing foodborne deaths due to anthroponotic pathogens, zoonotic pathogens and chemicals.
- Identified short- and long-term risk management strategies that were acceptable and feasible as well as the good, the bad, the ugly and the lovely of food safety risk management coordination in Ethiopia.
- Conducted *What I Need From You (WINFRY)* exercise to surface needs from different stakeholder groups to improve collaborations.

Delphi Results

Figure 1: Foodborne deaths in Ethiopia by hazard attributed to food groups

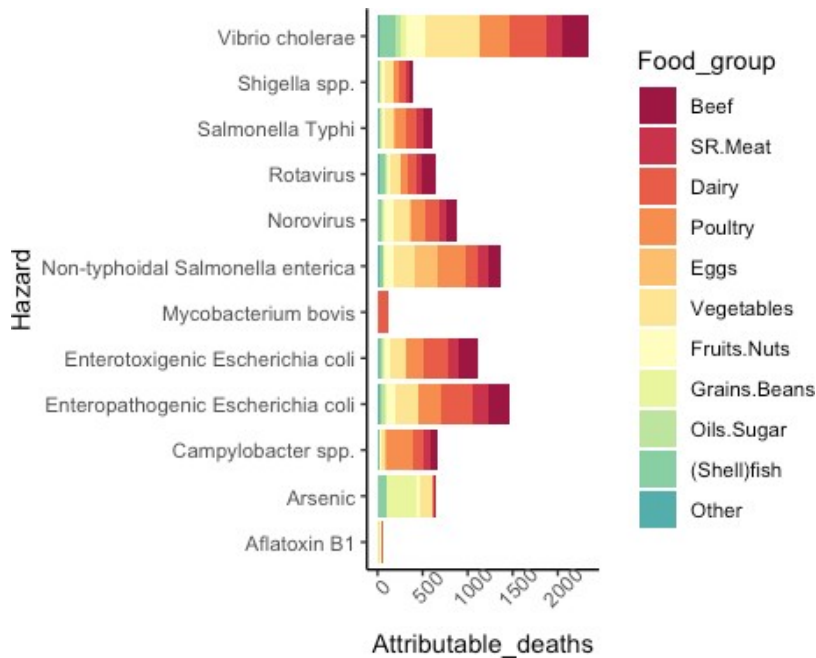
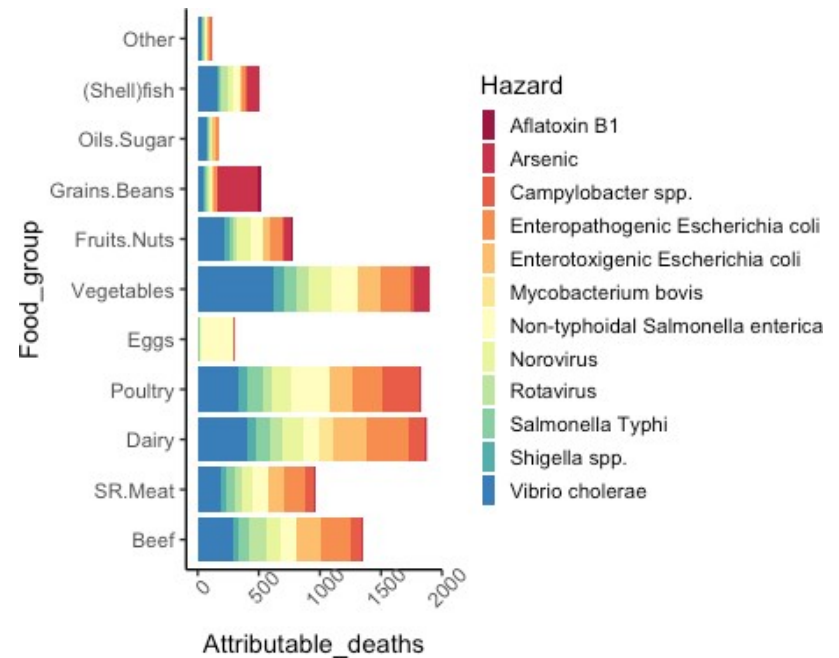


Figure 2: Foodborne deaths in Ethiopia by food group attributed to hazards



Focus on four food groups causing highest number of deaths:
Vegetables, Dairy, Poultry Meat-Eggs, and Beef-Small Ruminant Meat

Relative Impact of CCPs in Vegetable Chains

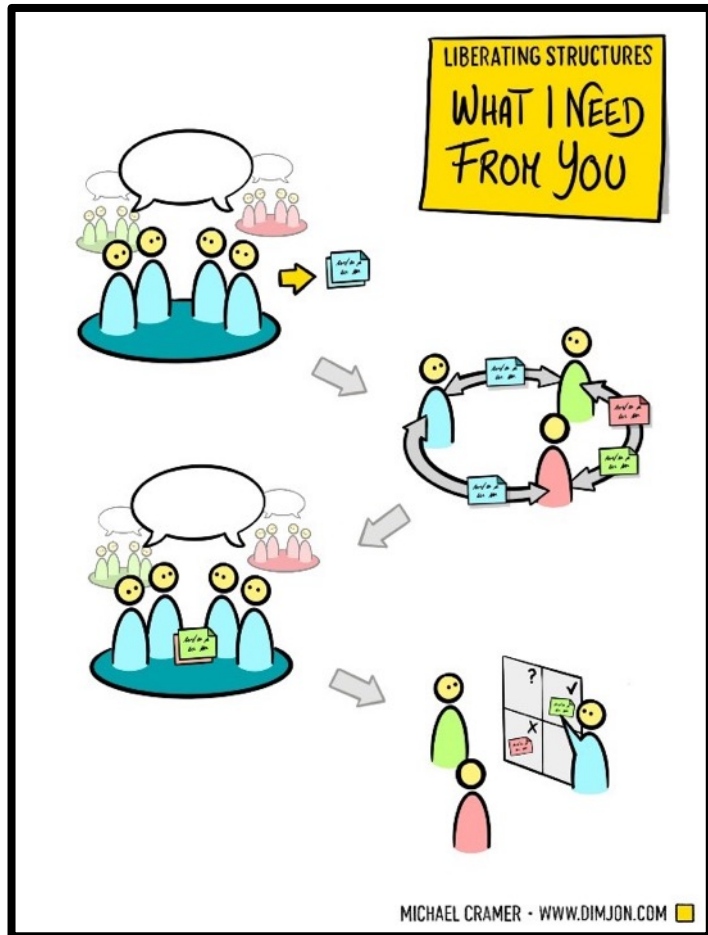
Step	CCP	Anthroponotic	Zoonotic	Chemicals
Farm	Agricultural Water	2	2	10
Harvest	Sanitation	1	1.5	0
Harvest	Worker hygiene	1.5	1.5	0
Transport	Clean vehicles	1.5	1	0
Transport	Sanitation	1.5	1	0
Markets	Improved infrastructure	1.5	2	0
Household	Education	1	1	0
		10	10	10

Identifying Risk Management Strategies



- Identified short- and long-term risk management strategies that were acceptable and feasible.
 - Conducted root cause analysis using fishbone model for 2-3 CCPs per food value chain
 - Asked to consider 3E's: effectiveness, efficiency, equity
 - What are prerequisites for these strategies to work?
- Identified good, bad, ugly and lovely of food safety risk management coordination in Ethiopia.

Improving Coordination and Collaboration



*Define 1-2 things you **NEED** from each of other groups to successfully push food safety risk management forward*



Potential Answers...

YES

(YES, THOUGH) IT DEPENDS ON...

NO

HUH (we don't understand)?

WHATEVER (sorry that's not for us)

Conclusions

- Important to use stakeholder-driven methods and actively involve government leadership to define scope of risk ranking and prioritization efforts
- Risk ranking exercises can be conducted with minimal resources but should be regularly updated as new evidence emerges
- Stakeholders should be engaged in identifying and prioritizing risk management strategies
- Need improved coordination and collaboration within and between stakeholder groups in Ethiopia
- Risk ranking and prioritization can provide a roadmap for allocating limited resources to maximize public health impact

Backup

Data Dashboard – One Metric



Data Dashboard – Two Metrics

