

Setting the Stage

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September 4, 2024



Disclosure statement

I have no conflicts to disclose.

National Food Safety Education Month

1. CLEAN



2. SEPARATE



3. COOK



4. CHILL



September is National Food Safety Education Month!

Something's Poisoning America's Land. Farmers Fear 'Forever' Chemicals.

Fertilizer made from city sewage has been spread on millions of acres of farmland for decades. Scientists say it can contain high levels of the toxic substance.

The burden of foodborne disease is substantial.



THE GLOBAL HEALTH OBSERVATORY

Pathogens

Bacteria, viruses, fungi, and protozoa

Chemicals

Heavy metals, pesticides, drug residues, other organic compounds

Unsafe food causes

1 in 10

people to fall ill each year worldwide

Foodborne diseases cause

33 million

healthy life years lost annually

Children account for

1/3

of deaths from foodborne diseases

WHO ESTIMATES OF THE GLOBAL BURDEN OF FOODBORNE DISEASES



FOODBORNE DISEASE
BURDEN EPIDEMIOLOGY
REFERENCE GROUP
2007-2015

- World Health Organization – Foodborne Disease Burden Epidemiology Reference Group
 - 31 agents (pathogens and chemicals)
 - 600 million cases of foodborne disease per year
 - Children under 5 years at greatest risk from unsafe foods (40% of burden)
 - Over 200 diseases caused by eating contaminated food
 - Inequitably distributed
 - Burden is **underestimated**
- Update currently underway – release in 2025

Foodborne disease burden in the US

ESTIMATED ANNUAL NUMBER OF DOMESTICALLY ACQUIRED, FOODBORNE ILLNESSES, HOSPITALIZATIONS, AND DEATHS DUE TO 31 PATHOGENS AND THE UNSPECIFIED AGENTS TRANSMITTED THROUGH FOOD, UNITED STATES



Foodborne agents	Estimated annual number of illnesses		Estimated annual number of hospitalizations		Estimated annual number of deaths	
	Number (90% credible interval)	%	Number (90% credible interval)	%	Number (90% credible interval)	%
31 known pathogens	9.4 million (6.6–12.7 million)	20	55,961 (39,534–75,741)	44	1,351 (712–2,268)	44
Unspecified agents	38.4 million (19.8–61.2 million)	80	71,878 (9,924–157,340)	56	1,686 (369–3,338)	56
Total	47.8 million (28.7–71.1 million)	100	127,839 (62,529–215,562)	100	3,037 (1,492–4,983)	100

Each year in the United States:

- 1 in 7 people get sick
- Nearly 128,000 people are hospitalized
- > 3,000 people die

from foodborne diseases

The good news: there's lots we can do to minimize it.

Many opportunities to intervene to protect public health!

SUPPLY CHAIN PHASE	AGRONOMIC & PRODUCTION	PROCESSING	EDUCATION	PREPARATION & CONSUMPTION	BIOLOGICAL EXPOSURE MARKERS
EXAMPLES OF MONITORING AND/OR INTERVENTION OPPORTUNITIES	Low arsenic-accumulating cultivar selection Irrigation water quality testing Low arsenic fertilizer sourcing Manipulation of agronomic practice Soil testing	Ingredient monitoring and substitution Polishing or removal of high-arsenic containing commodities	Modification of consumer preferences Risk communication Patient contact Social media Targeting vulnerable populations	Modification of consumption patterns Modification of cooking techniques Monitoring dietary patterns	Monitoring exposure trends with arsenic urinalysis (e.g. NHANES) Monitoring vulnerable populations
RELEVANT STAKEHOLDERS	REGULATORS, FOOD PRODUCERS, RESEARCHERS	FOOD PRODUCERS	HEALTHCARE PROFESSIONALS, RESEARCHERS	REGULATORS, HEALTHCARE PROFESSIONALS, RESEARCHERS	REGULATORS, RESEARCHERS

Success requires coordination across all sectors and stakeholders!

Solutions require multi-sector and multidisciplinary approaches

- Our food system is complex, and successful public health interventions necessitate a systems lens
- We must recognize that safe food is part of a multi-objective enterprise
 - Nutrition, sustainability, affordability, access, cultural appropriateness, and many, many others
- Making progress requires multidisciplinary collaboration

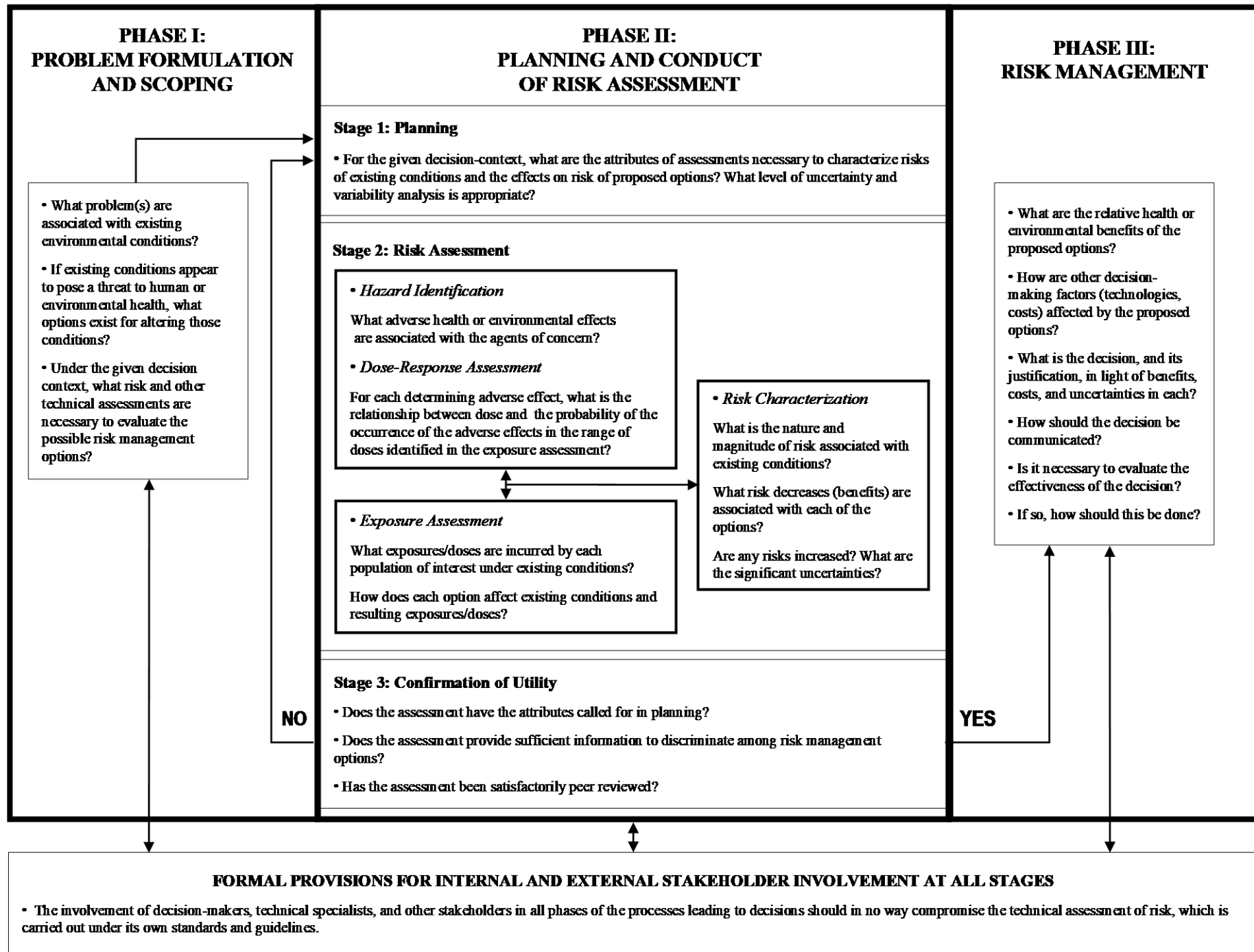
Agriculture, animal science, behavioral science, biostatistics, communication, chemistry, economics, engineering, epidemiology, exposure science, legal, microbiology, nutrition, policy, risk science, toxicology, veterinary medicine, and many others!

Food Forum – a perfect, um, forum for advancing the conversation

About

The Food Forum convenes scientists, administrators, and policymakers from academia, government, industry, non-profits, professional societies, and consumer groups on an ongoing basis to explore issues related to food (including safety, regulation, systems, nutrition, and health) and identify approaches to address them. It provides a unique way to identify areas of concordance among these diverse interest groups. It does not make recommendations, nor does it offer specific advice. It compiles information, develops options, and brings interested parties together.

But, can we talk to each other?



SCIENCE AND DECISIONS

Advancing Risk Assessment

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

Key food safety concepts and terms

- *Hazard Identification*

What adverse health or environmental effects are associated with the agents of concern?

- *Dose-Response Assessment*

For each determining adverse effect, what is the relationship between dose and the probability of the occurrence of the adverse effects in the range of doses identified in the exposure assessment?

- *Exposure Assessment*

What exposures/doses are incurred by each population of interest under existing conditions?

How does each option affect existing conditions and resulting exposures/doses?

Hazard Identification – is there evidence that exposure to an agent can cause a particular disease?

Dose-response assessment – how much exposure is needed to increase the risk of a disease?

Exposure assessment – how much contact with the agent do we expect in the population?

- *Risk Characterization*

What is the nature and magnitude of risk associated with existing conditions?

What risk decreases (benefits) are associated with each of the options?

Are any risks increased? What are the significant uncertainties?

Risk characterization– Given the hazard, it's dose-response relationship, and population exposures, how likely is it that people will get sick?

A simple idea, but implementation complexities abound

- How do we minimize population exposures to chemical and microbiological hazards in food?
- Which ones are the highest priority?
- How to we communicate about food safety risks in a way that encourages prudent, but not unreasonable behavior?
- How do we protect the most vulnerable without compromising their nutritional needs?
- How do we make it feasible and affordable?

For the next two days

Safeguarding the Food Supply: Integrating Diverse Risks, Connecting with Consumers, and Protecting Vulnerable Populations - A Workshop

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Workshop overview – Day 1 (today)

Session 1 – Considering Nutrition, Economic, and Equity Implications in Food Safety

Session 2 – Consumer Considerations When Communicating Hazard and Risk

Session 3 – Regulatory and Producer Perspectives on Food Safety Communication

Workshop overview – Day 2 (tomorrow)

Session 4 – National and International Perspectives on Risk Assessment and Tools to Mitigate Risk

Session 5 – Exploring Opportunities for the Future of Food Safety