

THE ART OF RISK COMMUNICATIONS AND CONSUMER ENGAGEMENT IN FOOD DISTRIBUTION

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Factors Affecting Risk Communications (Food Safety)

- Three categories: Environmental, economic, social;
- Environmental factors: Pathogen evolution, climate change, contaminants, natural disasters;
- Economic factors: Structure, economic cycles, international trades, production methods, consumer trends;
- Social factors: Demographics, aging, mobility, population growth

Systemic Mitigating Factors

- Consumer Behaviour;
- Producer Knowledge;
- Regulations;
- Science and Technology.

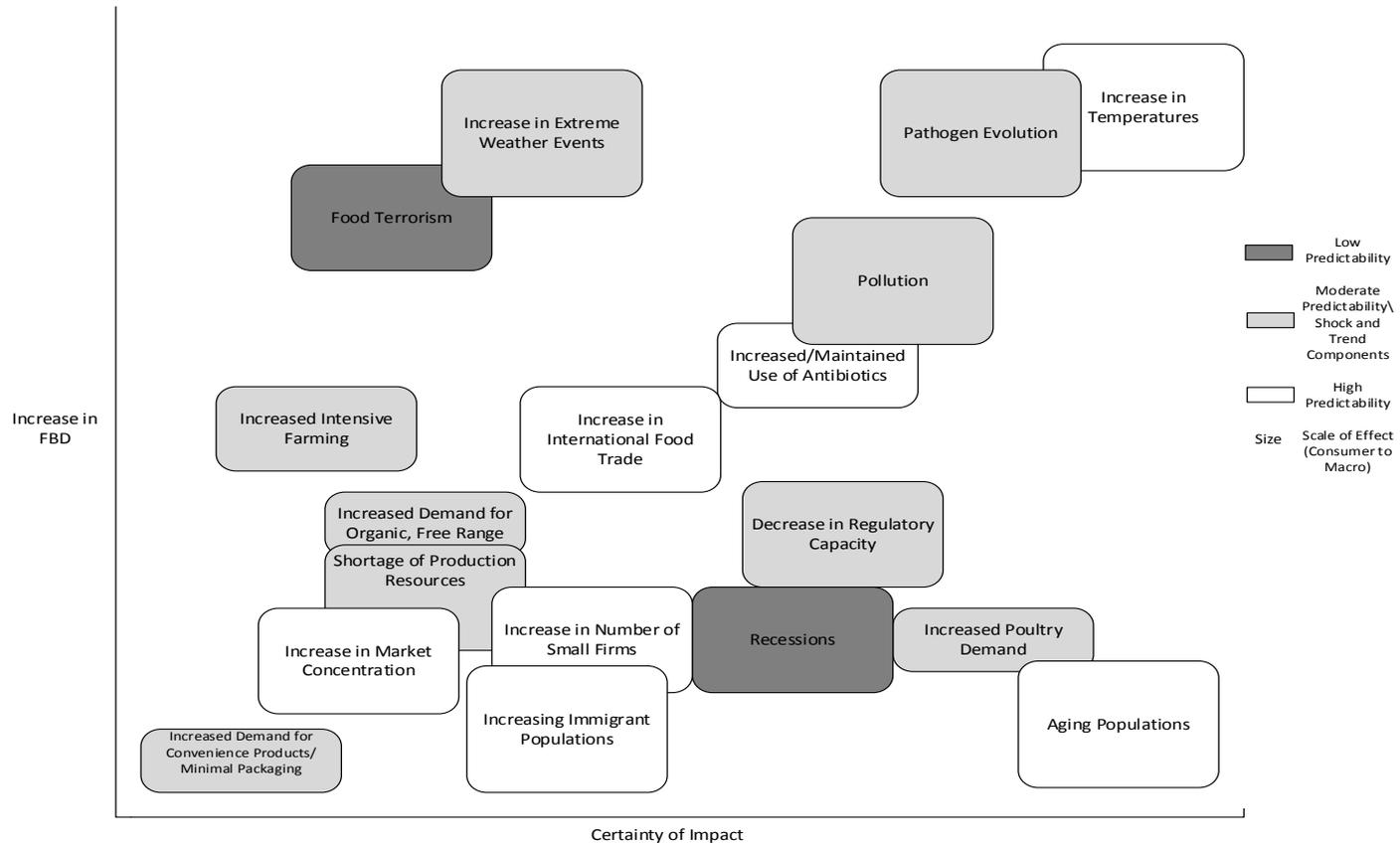
Ranking Factors

- *Increase in FBD*
 - *Hazard Severity/48 X Exposure*
- *Hazard Severity*
 - *Pathogen Increase X Pathogen Type Increases X Novelty of Pathogen*
- *Exposure*
 - *Proportion of Population Affected*

Risk Calculation Scale

Variable		Description	Score
Severity	Pathogen Increase	Significant	4
		Moderate	3
		Small	2
		None	1
	Novelty of Pathogen	High	3
		Moderate	2
		Low	1
	Increase in Number of Pathogen of Types	High (4+)	4
		Moderate (3-4)	3
		Low (1-2)	2
None		1	
Exposure	Proportion of population affected	100%	10
		75%	7.5
		50%	5
		20%	2
		5%	0.5

External Factors Affecting Foodborne Disease in Canada



Ranking of Factors

Rank	Risk	Predictability
1	Increase in Temperature	High
2	Pathogen Evolution	Moderate
3	Increase in Extreme Weather Events	Moderate
4	Pollution	Moderate
5	Increased Antibiotic Use	High
6	Food Terrorism	Low
7	Decrease in Regulatory Capacity	Moderate
8	Increased Consumption of Poultry	Moderate
9	Increase in International Food Trade	High
10	Increase in Number of Small Firms	High
11	Shortage of Production Resources	Moderate
12	Increased Intensive Farming of Animals	Moderate
13	Increased Demand for Organic Free-Range Animal	Moderate
14	Recessions	Low
15	Increase in Market Concentration	High
16	Increasing Immigrant Population	High
17	Aging Populations	High
18	Increased Demand for Minimal Packaging	Moderate
19	Increased Demand for Convenience Products	Moderate

Data Indicators for External Factors

Factor	Factor Measure	Indicator Name	Data Source	Data Location	Notes
Increase in International Trade	Trade of food relative to consumption	N/A			
	Number of countries food is sourced from	All Countries	Canadian Agri-Food and Seafood Imports by Country (by Value)	Statistics Canada	Would need identification of poorly regulated countries.
	Food imports from countries with poor regulation relative to total imports	Poor Regulation Countries/All Countries			
	Food imports from countries with poor regulation	Poor Regulation Countries			
	Import of food	Agri-Food and Seafood Imports from All Countries (Canadian Dollars)			
Increasing Immigrant Workforce**	Total immigrants in workforce relative to total workforce (in food industry)	Canadian Seasonal Agricultural Workers Program (CSAWP), UFCW	United Food and Commercial Workers (UFCW Canada); The National Union of Public and General Employees (NUPGE)	UFCW; NUPGE	Various tables. Does not group by food industry.
		Labour Force Characteristics by Immigrant Status	Labour Force Survey	Statistics Canada	
	Total immigrants in workforce (in food industry)	Canadian Seasonal Agricultural Workers Program (CSAWP)	Human Resources and Skills Development Canada with Service Canada		
Immigrant Population	Immigrant population relative to total population	Immigrants, Total	2011 National Household Survey	Statistics Canada	'Immigrants' / 'Total'. Custom table.
	Total immigrant population	Immigrants			
Increase in temperatures	Surface temperatures	Land Surface Temperature	NASA Earth Observations, Environment Canada	GSFC NASA; Environment Canada	Shows land surface temperatures from 2000-2100 as simulated by the Canadian Global Climate Model
	Water temperature	Water Temperature	National Oceanographic Data Center	United States Department of Commerce	
	Sea levels	Rising Sea Levels	Ministry of Environment and Canada's Department of Fisheries and Oceans	Sea Level Rise Adaptation Primer	
Increase in Precipitation	Increase in precipitation	Precipitation Trends in Canada	Statistics Canada	Statistics Canada	
Pathogen Evolution	Number of bacteria mutations	N/A			

* Pertains to 'Factor', not 'Factor Measure', ** Text in blue represents indicators that are a best proxy for the factor measure

Data Indicators for External Factors (Cont.)

Factor	Factor Measure	Indicator Name	Data Source	Data Location	Notes
Pollution	Accidents involving pollution of water supply or food source	N/A			
	Number of contaminants released into the environment	Pollutants	Environment Canada: Major Pollutants (Mercury and PCBs), VOCs, etc.	Environment Canada	Multiple pollutants available.
Aging of Population	Percentage of population over 65 as percentage of total population	Number of Seniors 65 Years and Over, Total Population	Seniors' Characteristics	Statistics Canada	Number of Seniors 65 Years and over / 'Total Population'
	Total population over 65 years of age	Number of Seniors 65 Years and Over			
	Food related illness composition	Nationally Notifiable Diseases (NND)	Enteric, Food and Waterborne Diseases, Count of Reported Cases of Disease in Canada by Age	Public Health Agency of Canada	
	Illness composition	Notifiable Diseases			Notifiable Diseases On-Line
Increased Demand for Convenience Products	Demand for convenience products	Consumer Demand for Convenience Products	Consumer Trend Report: Convenience	Agriculture Statistics	
	Number of new convenience products on market	N/A			
Increased Demand for Minimal Packaging	Demand for minimal packaging	Future Packaging Trends (Canada); WRAP Program in UK	2012 Survey of Future Packaging Trends; Agriculture and Agri-Food Canada	The Canadian Consumer Behaviour, Attitudes and Perceptions Toward Food Products	
Increased Demand for Minimal Packaging	Number of new products with minimal packaging	N/A			
Increased Demand for Organic Free-Range Animals	Demand for organic free-range animals	Certified Organic Operators	Table 004-0006 Census of Agriculture & Agriculture and Agri-Food Canada	Agriculture and Agri-Food Canada	'Certified Organic Operators'
		Certified Organic Operators , Total Farms in Canada			Certified Organic Operators' / 'Total Farms in Canada'
Increased Intensive Farming	Number of livestock per facility space	N/A			
Increase in Market Concentration	Sales of top firm relative to total sales	Farms Classified by Gross Farm	Table 004-0006 Census of Agriculture	Statistics Canada	Would need to do manual calculation.
	Sales of top five firms relative to total market	N/A			
	Number of firms in the market	Total Number of Farms	Table 004-0006 Census of Agriculture	Statistics Canada	

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Risk Communication

- To counter the challenges of food safety in an increasingly complex and interdependent food system there must be increased dialogue between scientists, risk assessors, and risk managers as well as consumers (Charlebois, 2009; Havelaar, Brul, de Jong, de Jonge, Zwietering, & Ter Kuile, 2010);
- Not only an ability to engage in private activities in an informed manner, but also the ability to contribute to public discussion about regulations and standards.

Risk Communication Failures

- *Expert-lay discrepancy*: Experts know best, evidence-based approach;
- *Psychometric Paradigm*: Incorporating the idea of complex evaluations of risk by consumers;
- *Social Amplification of Risk and Optimistic Bias*, both equally dangerous (GMO, nanoparticles, etc...);
- *Optimistic Bias* mitigated by social control i.e. obesity (control of risk)

Factors Affecting Reception of Message

- *Public Trust:* Low public engagement, risks can be unacknowledged, information flow delayed;
- *Information Source and Outlets* key factors.

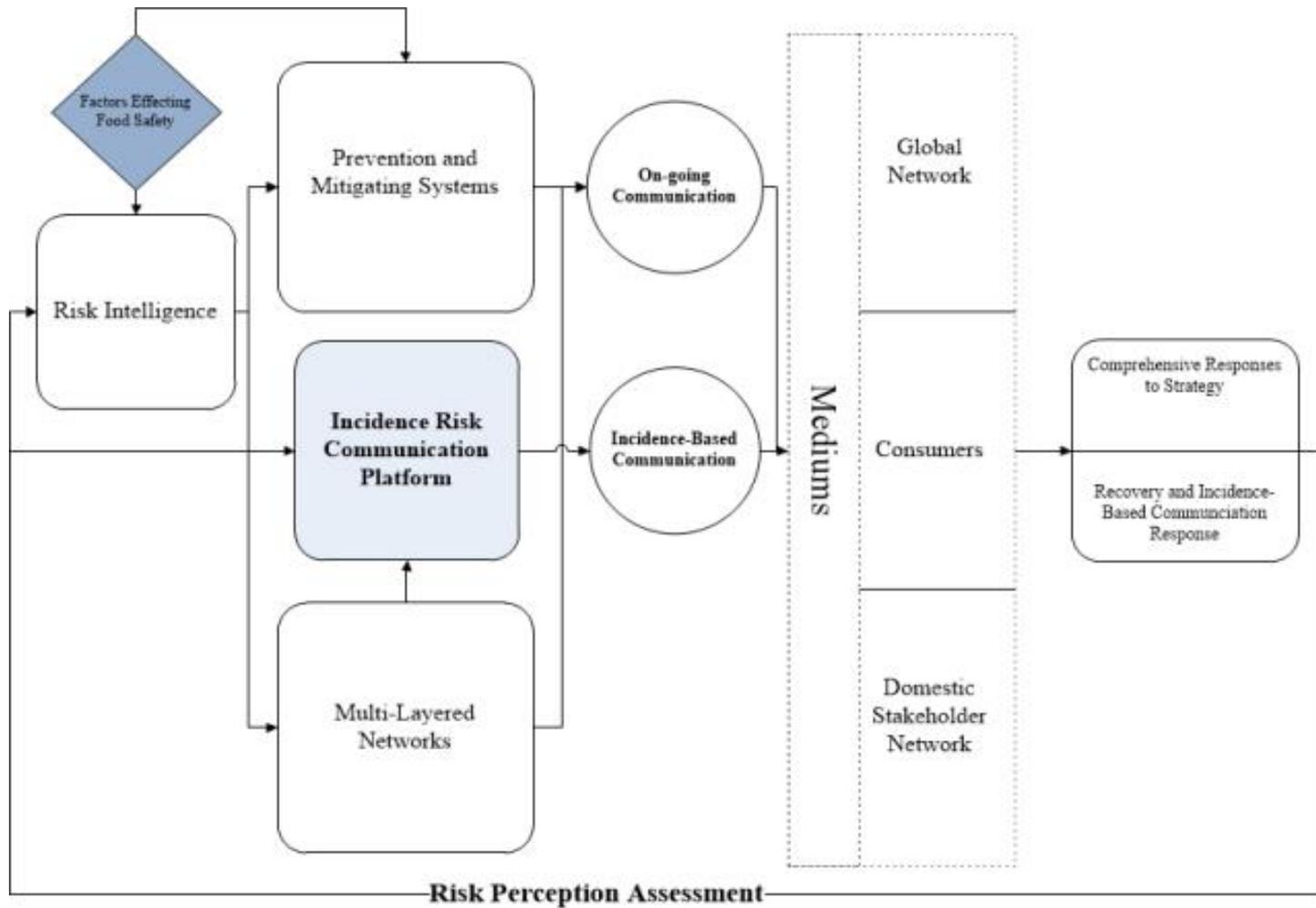
Risk Communication Strategy

- Core Principles to Strategy:
 - Openness;
 - Transparency;
 - Independence;
 - Responsiveness/Timeliness;
 - Public Legitimacy;
 - Public Engagement

Risk Communication Strategy (2)

- Core Principles to Strategy:
 - Partnerships;
 - Stakeholder engagement;
 - Communication effectiveness;
 - Understand Consumer Perceptions.

Risk Communication Framework



Framework Justifications

- Federal regulator should always be synchronously linked with environment and interacting with all stakeholders constantly, preferably in real time;
- More research would be required to better understand how organizations can effectively communicate with each of these groups in a meaningful matter.

Incident-based Strategy Component

- No two crises will be the same in scope or severity;
- Focus on feelings such as empathy, understanding, and reassurance is preferred;
- Mediums for Communicating Risk
 - Low/High/Change Risk Management;
 - Knowledge Dissemination/Relationship Building;
 - Static/Real Time;