# GO-GLOBAL Delphi study

Lynn Frewer, Meike Wentholt, Arnout Fischer, Gene Rowe and Hans Marvin

WP2

GO-GLOBAL Seminar: Accra, Ghana, 27th April 2009

# Overview

- Introduction
- Problem statement
- Delphi methodology
- Delphi results
- Conclusions and Implications

# Introduction (WP2)

- Aim of research: A foresight activity focused on

*"The development of **international consensus** regarding risk identification, risk assessment and risk management activities with respect to emerging food safety risks"*

# Delphi method: definition

A procedure to:

"obtain the most reliable consensus of opinion of a group of experts … by a series of intensive questionnaires interspersed with controlled opinion feedback"



Dalkey & Helmer, 1963, p458

# Delphi methodology

- Internet-based survey, with several ‘rounds’
  - including feedback of participants’ views
  - anonymous responses
- Allows inclusion of many ***geographically dispersed*** experts
- Pre-empts ***difficulties with group meetings***
  - unequal contributions of members
  - unstructured data collection



Rowe & Wright, 1999

# Go-Global Delphi

- First round
  - “flag up” important issues for follow up
- Second round
  - Focus on specific and highly relevant issues
  - Quantify differences in opinion
  - Provide feedback on the views of other participants, particularly for issues where consensus has not occurred
  - Identify directions for the future

# Question development round

- First round Delphi (summer 2007)
  - 49 returned questionnaires with usable data
  - Global response
- Issues of importance for global society
  - Climate change
  - Increased disease prevalence
  - Development of technology
  - War and terrorism
  - *Economic depression*

# Second round

- September 2008
- Survey comprised 30 questions
- Internet administered
  - English
  - French
  - Spanish
  - Portuguese
- Word versions also available

# Second round

## Overview of responses

- Surveys with usable data: 272
  - Countries: 60
  - All continents included

- Expert *average age* between 45-55
  - Male 61%
  - Female 39%
  - EU citizens 61%

# Factors preventing effective emerging food safety risk identification

- Access to relevant data
- Access to global networks for information exchange
- Willingness of food safety stakeholders to share data and information
- Cost of predictive technologies
- Human resources and expertise
- Lack of political urgency
- Lack of methodology/systems

# Summary of round 2 conclusions

- ***Africa* and *Latin America***
  - most concern  about availability of data
- ***North and Latin America***, and (to a lesser degree) ***Europe***
  - Most concern about  about willingness to share data
- ***Africa*** and ***Latin America***
  - Most concern about the cost of predictive methods
- ***Latin America***
  - Most concern about lack of human resources

# Summary of round 2 conclusions

- ***Europe***
  - in favour of international regulation for dealing with emerging food risks
- ***North and South America***
  - tend to be against international regulation
- ***Africa*** and ***Europe*** a
  - not acceptable to develop different regulations / standards for risk identification internationally

# Third round

- March 2009
- Survey comprised 20 questions
- Internet administered
  - English
  - French
  - Spanish
  - Portuguese
- Word versions also available

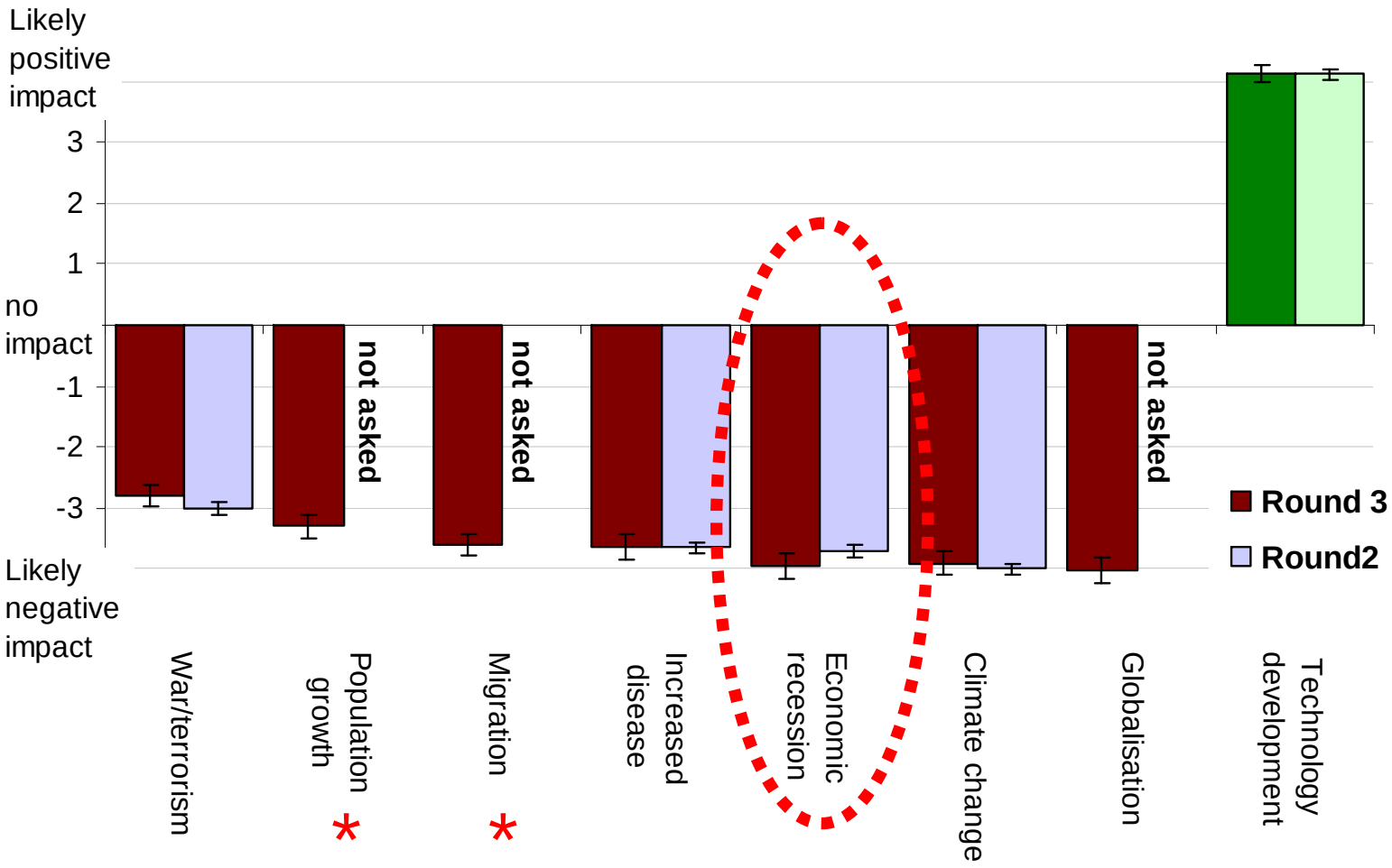
# Third round

## Overview of responses

- Surveys with usable data: 98
  - 36% of round 2 participants
  - Countries: 39

- Expert *average age* between 45-55
  - Male 65%
  - Female 35%
  - EU citizens 68%

# Most important drivers of emerging food risks in your country (next 20 years)



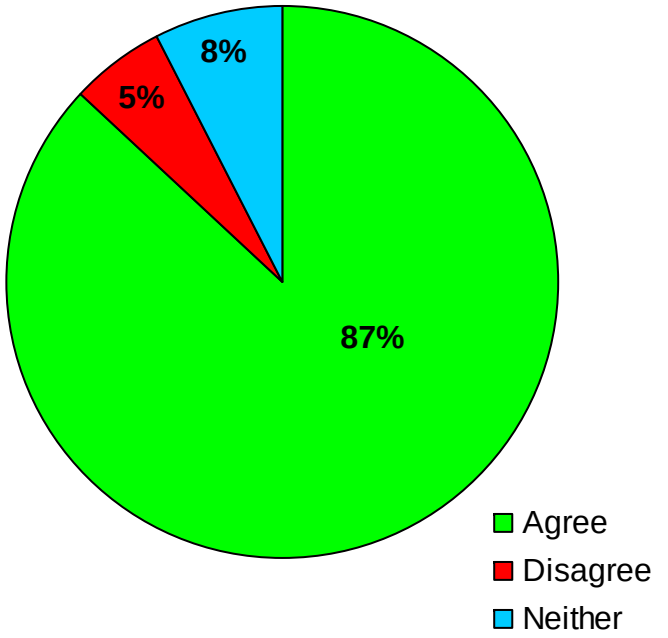

* New option round 3

(F(7,83)=21.62; p<.01)

# The impact of technology development on people living in my country will be positive

"Technology development is the only solution to filling the energy gap, battle global warming, fight new emerging diseases, built new jobs, provide food for growing populations."

[Germany]



# Some concerns about technology development also expressed….

"I think overall technology development will probably benefit people, though some unforeseen risk may accompany this…"

[Japan]

"…Issues concerning the environment, natural resources, and food security are strongly inter-related and their implementation will depend on the political will…"

[Kenya]

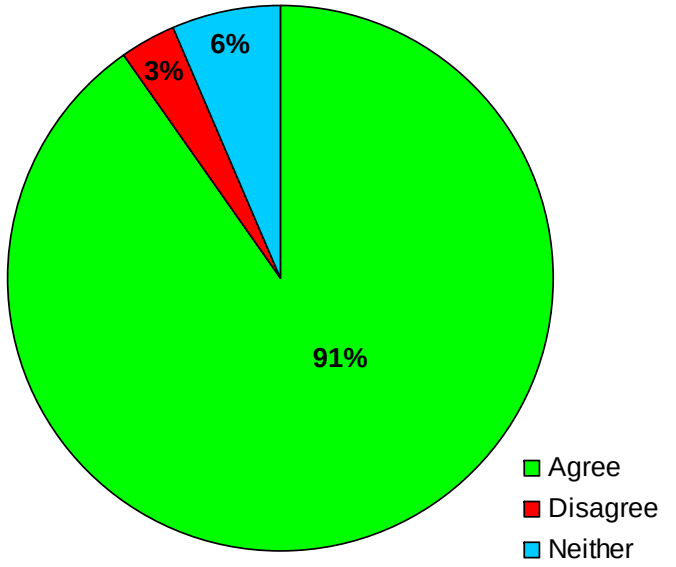
"…An area of concern is that appropriate research funding may be reduced due to the financial crisis and insufficient support of governments…"

[the Netherlands]

# Technology development contributes to the identification of emerging food risks

"A country … sensitive to public health should continually review its (R and D) infrastructure and identify gaps based on existing technology for continual improvement and mitigation…"

[Kenya]



# Ranking predictive methodologies

- **Foresight**
  - expert ranking of scenarios
- **Vulnerability assessment**
  - critical points in the food chain
- **Horizon scanning**
  - expert/stakeholder consultation regarding risk mitigation priorities
- **Risk profiling**
  - predictive risk assessment – mitigation “triggered” by threshold exceedence
- **Risk trending**
  - retrospective analysis of hazard/health outcome data
- **Early warning systems**
  - collation/centralisation of data bases and network analysis

# Ranking predictive methodologies

- Participants were asked to rank 12 attributes of the 6 predictive methods

- Significant difference between the methods

$F(12,298)=16.65;\ p<.01$

- Each of the attributes was tested for differences between methods

# Significant differences between attributes of different predictive methodologies

- Accuracy

  F(1,61)=8.66; p<.01

- Timely identification of emerging food risks

  F(1,61)=8.32; p<.01

- Available data

  F(1,61)=11.22; p<.01

- Efficient incorporation of judgmental inputs of experts

  F(1,61)=11.13; p<.01

- Efficient incorporation of judgmental inputs of experts

  F(1,61)=10.34; p<.01

- Low development and maintenance costs

  F(1,61)=5.86; p<.01

- Ease of interpretation of available data

  F(1,61)=4.89; p<.01

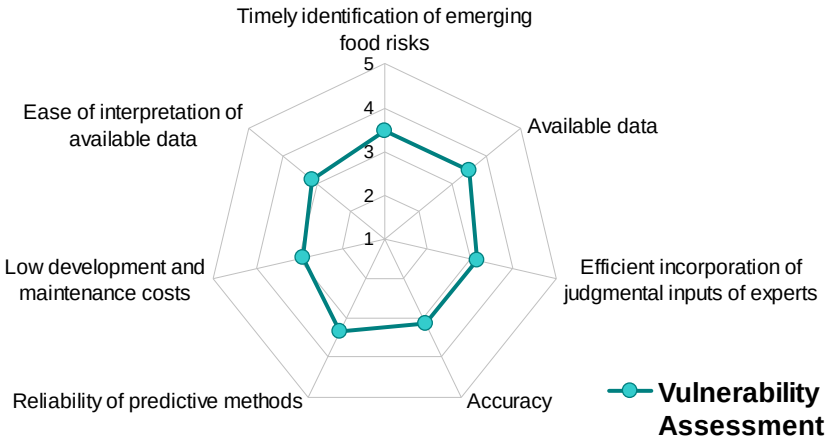
# No differences between attributes of different predictive methodologies

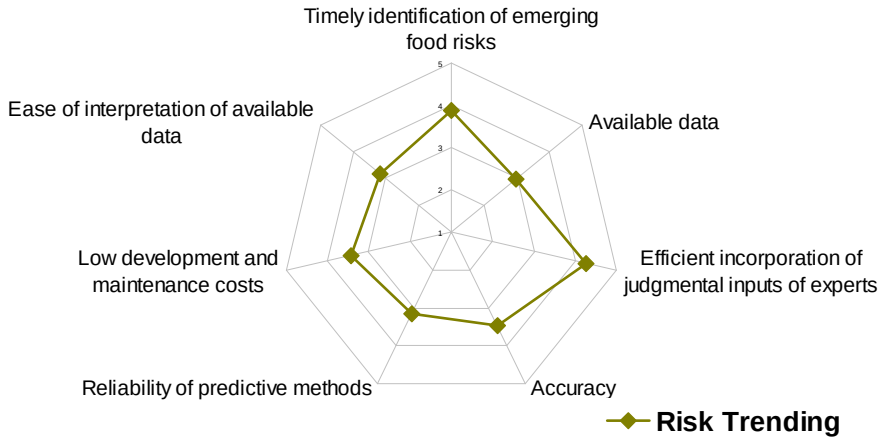
- Improved decision making
- Reduced costs associated with the emerging food safety risk
- Flexibility
- Usefulness for emerging food safety risks
- Ease of use

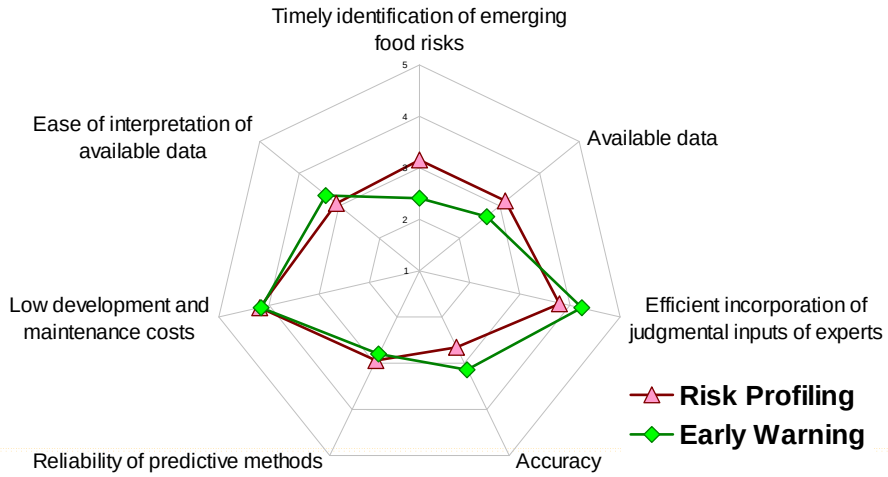
# Ranking of different predictive methods against attributes

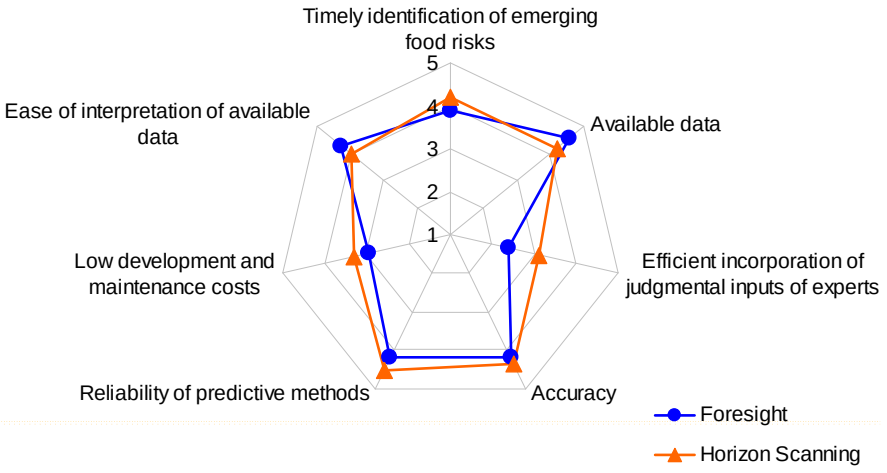
- Lower scores = higher preference for method
- Four patterns of ranking of the different methods identified
  - Average
  - Good overall, but slow and limited use of experts' views
  - Best, but expensive and limited use of experts' views
  - Good use of experts' views and less expensive, but ranked lower on other attributes

# Strength/weakness profile of the 6 methods

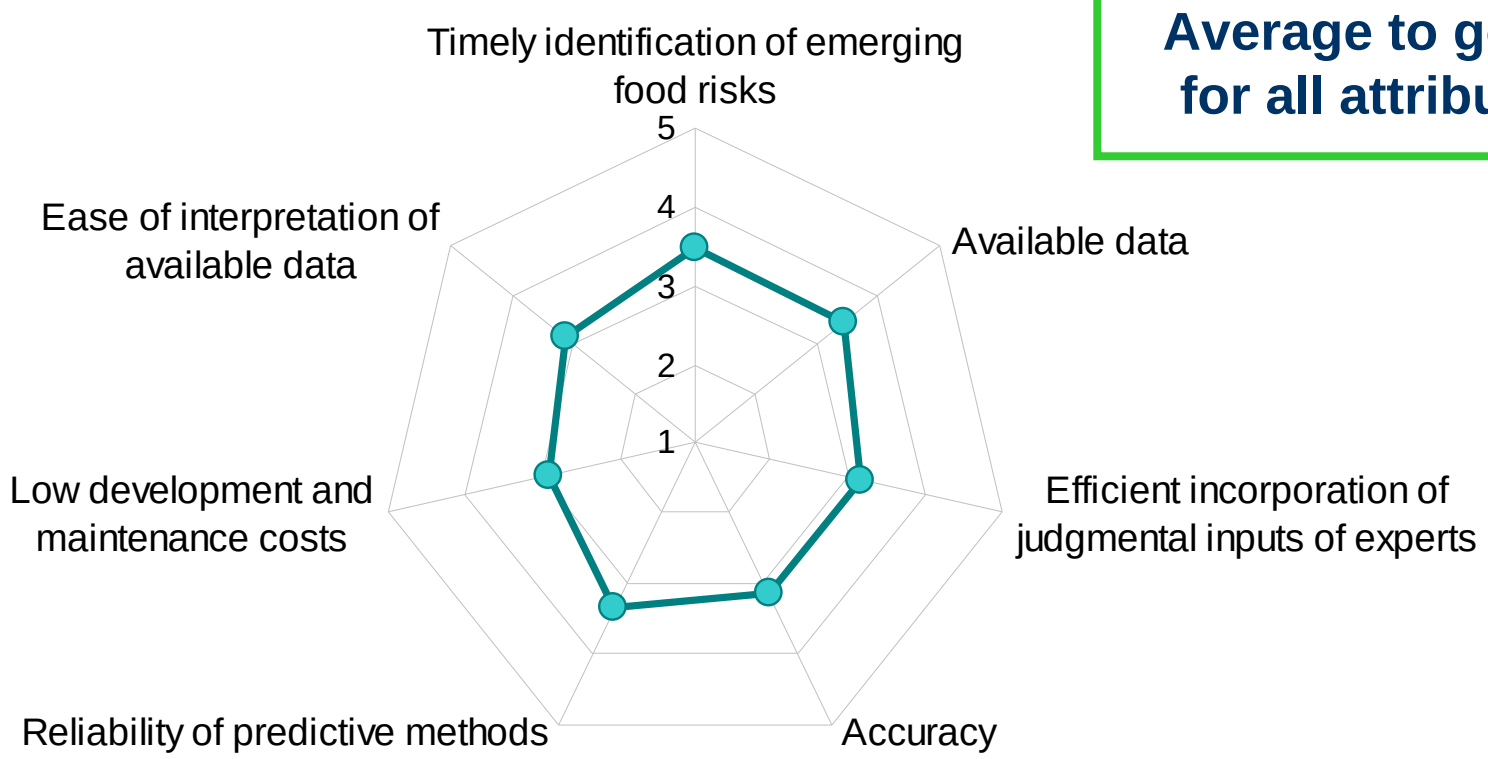


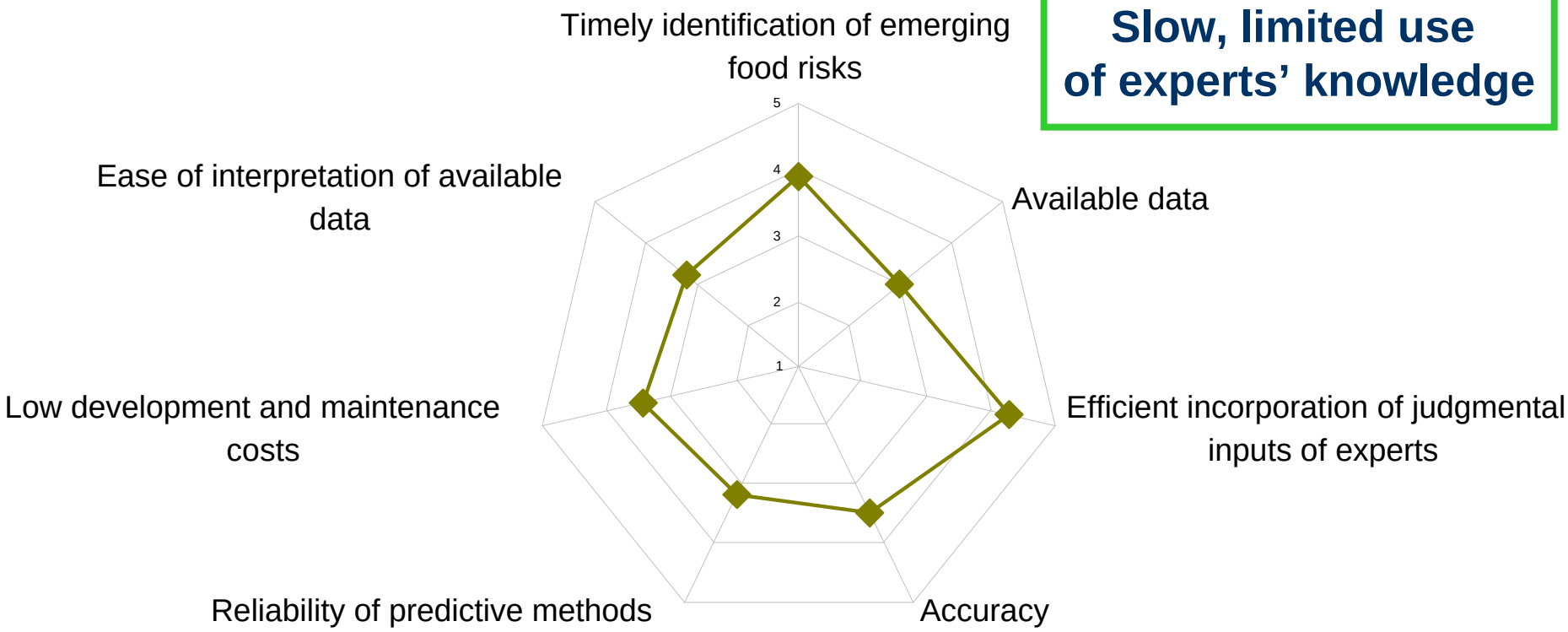
# Vulnerability Assessment




**Average to good for all attributes**

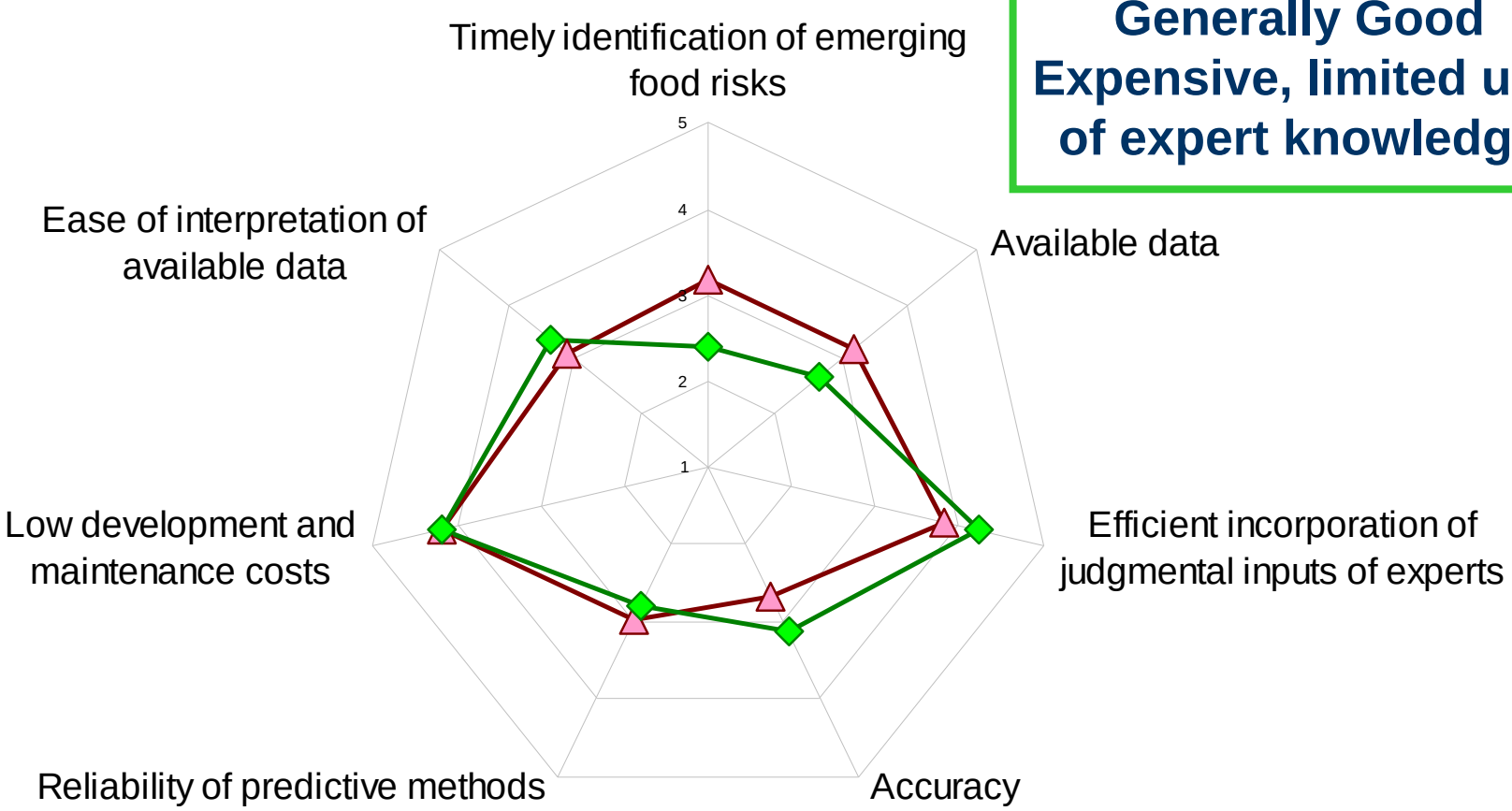
# Risk Trending

**Generally good**
**Slow, limited use**
**of experts' knowledge**



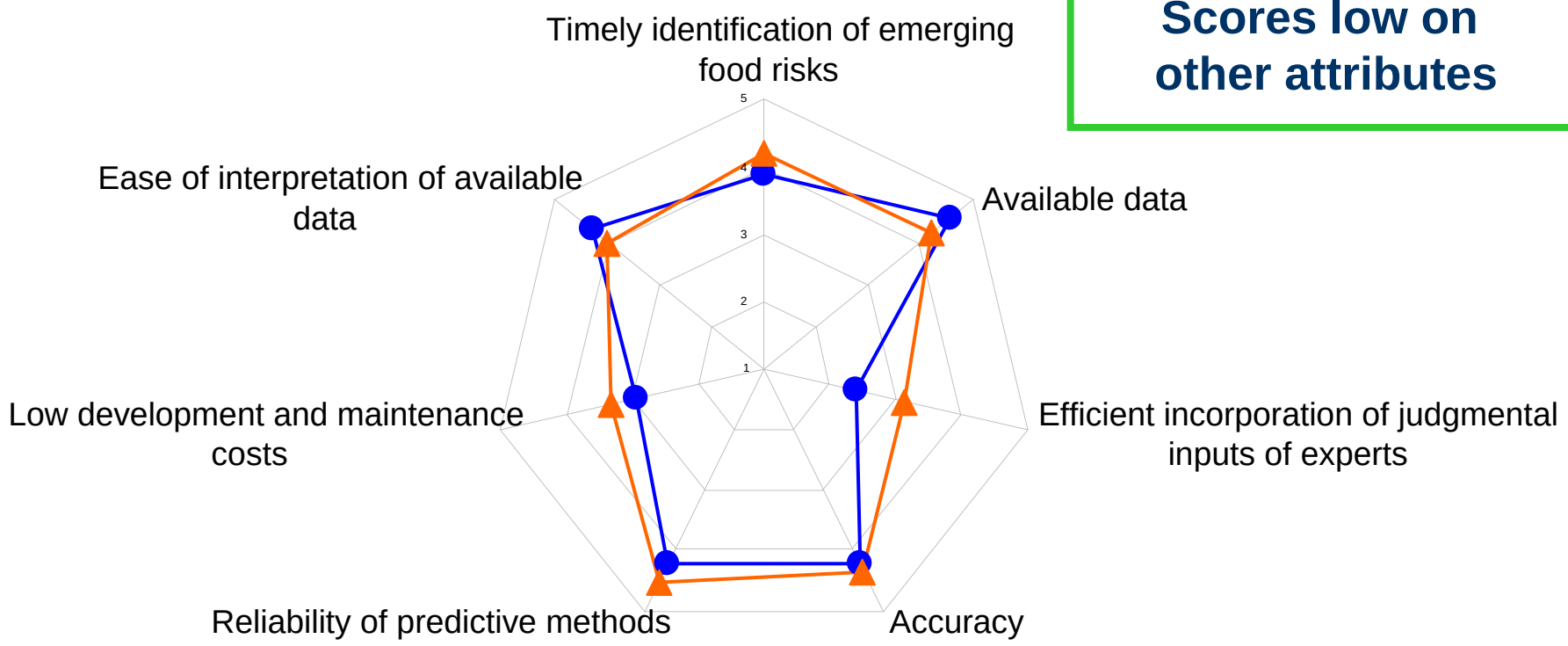
# Risk Profiling
# Early Warning

**Generally Good**
**Expensive, limited use of expert knowledge**



# Foresight
# Horizon Scanning

**Expert knowledge used, less expensive Scores low on other attributes**

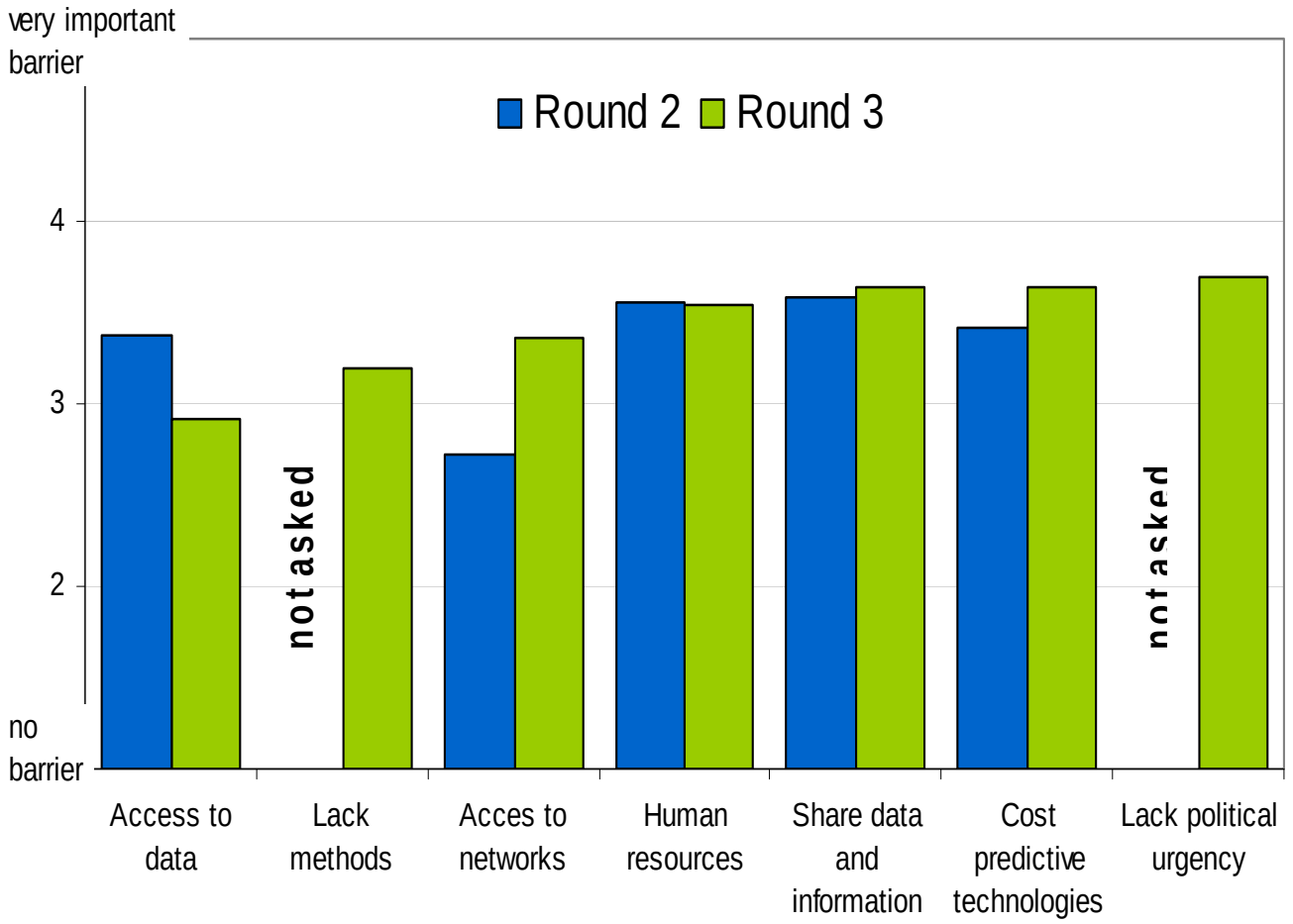


# Summary Table: Method comparison

| Method \ Attribute | Accuracy | Timely Identification | Data availability | Expert input | Development Cost | Reliability | Ease of interpretation | All other |
|---|---|---|---|---|---|---|---|---|
| Foresight | ✗ | ✗ | ✗ | ✓ | ✓ | ✗ | ✗ | ○ |
| Vulnerability Assessment | ✓ | ○ | ○ | ✓ | ✓ | ✗ | ✓ | ○ |
| Horizon Scanning | ✗ | ✗ | ✗ | ✓ | ○ | ✗ | ✗ | ○ |
| Risk Profiling | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ○ |
| Risk Trending | ○ | ✗ | ✓ | ✗ | ○ | ✓ | ✓ | ○ |
| Early Warning systems | ✓ | ✓ | ✓ | ✗ | ✗ | ✓ | ✓ | ○ |

**All other: Improved decision making, reduced cost in emerging food risk, flexibility, usefulness, ease of use**

# Barriers to emerging risk identification



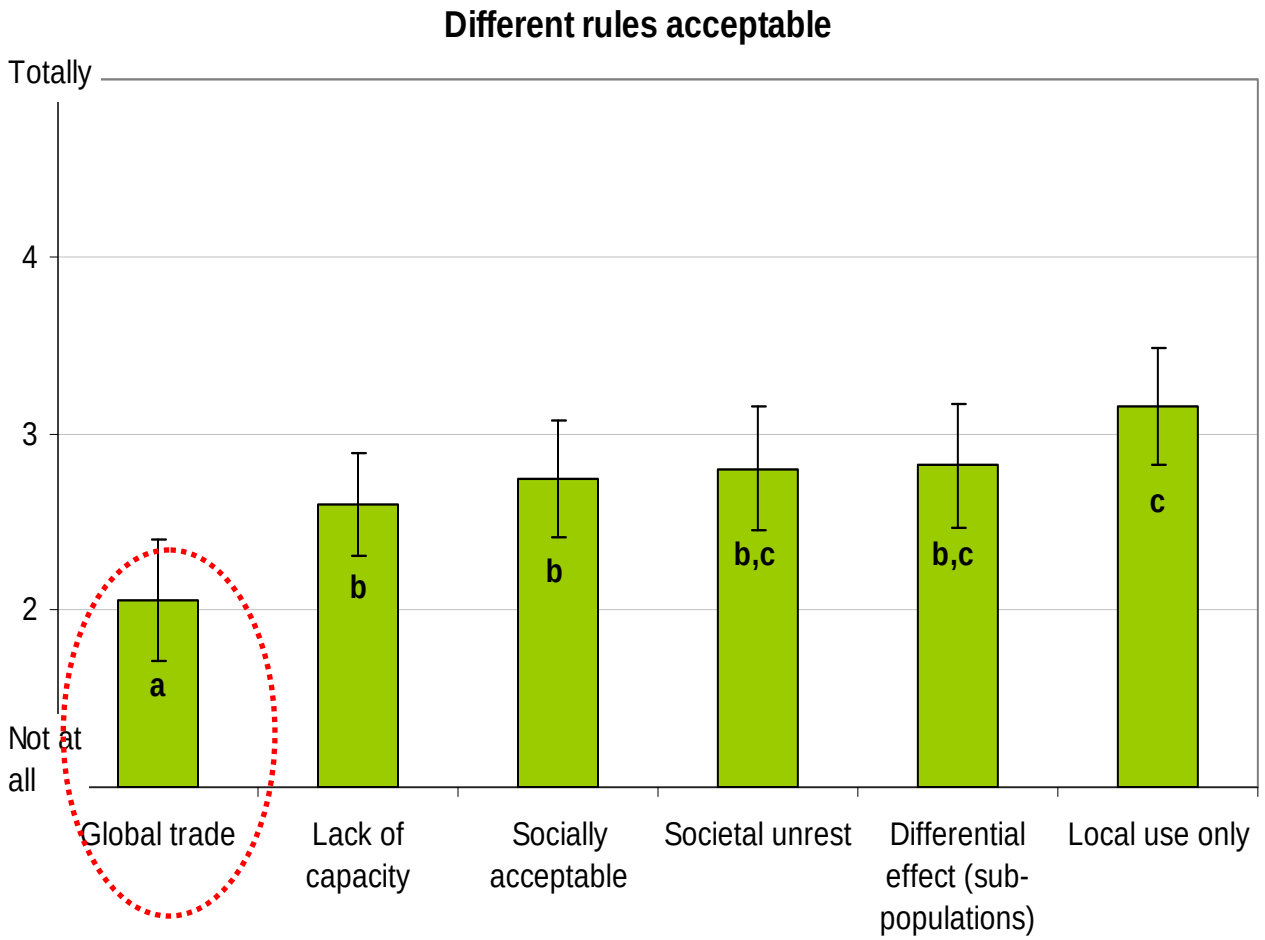
# Barriers to emerging risk identification

- Access to data less of a problem compared to 6 months ago
- Access to networks more of a problem

# Are different rules for emerging food safety risk identification are acceptable if…

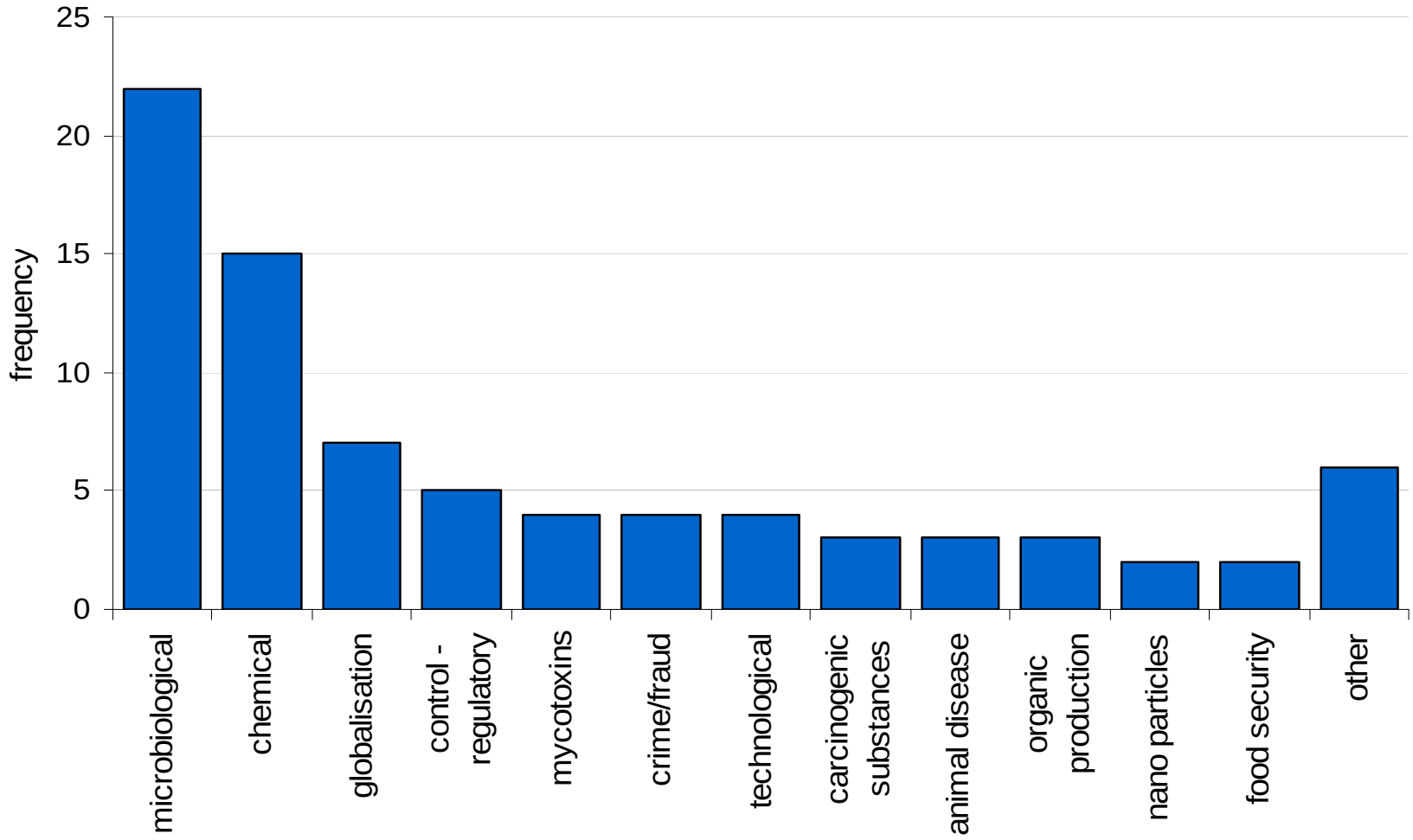
- The products are for local use…
- Lack of capacity at local level…
- Products intended for global trade…
- Differential effect on vulnerable populations…
- Other cultural determinants of acceptability (e.g. dioxins and free range eggs)
- Societal unrest (e.g. GM foods)

# Different rules are acceptable…




F(5,60)=5,60; p<.01

# What are the most important emerging food risks *in your country?*




Other: plant disease; capacity/capability; environment
risk communication; allergen; nutrition

# Conclusions

- Differences in opinion regarding the effectiveness of detection methods
- Consistency in drivers of emerging food risk over time (temporal stability)
  - Global recession no impact
  - Technology is seen as a solution to emerging food risk identification
  - Barriers to emerging food risk identification
- Lack of **political urgency**
- **Cost** and **willingness** to share data

# Most frequently identified emerging threats

1. Microbiological
2. Chemical
3. Globalisation
4. Control and regulation
5. Mycotoxins
6. Crime and fraud
7. Technology (e,g. Nanoparticles)

# Thank you for your attention!

# *Selected Results GO-GLOBAL Delphi study*
# WP2

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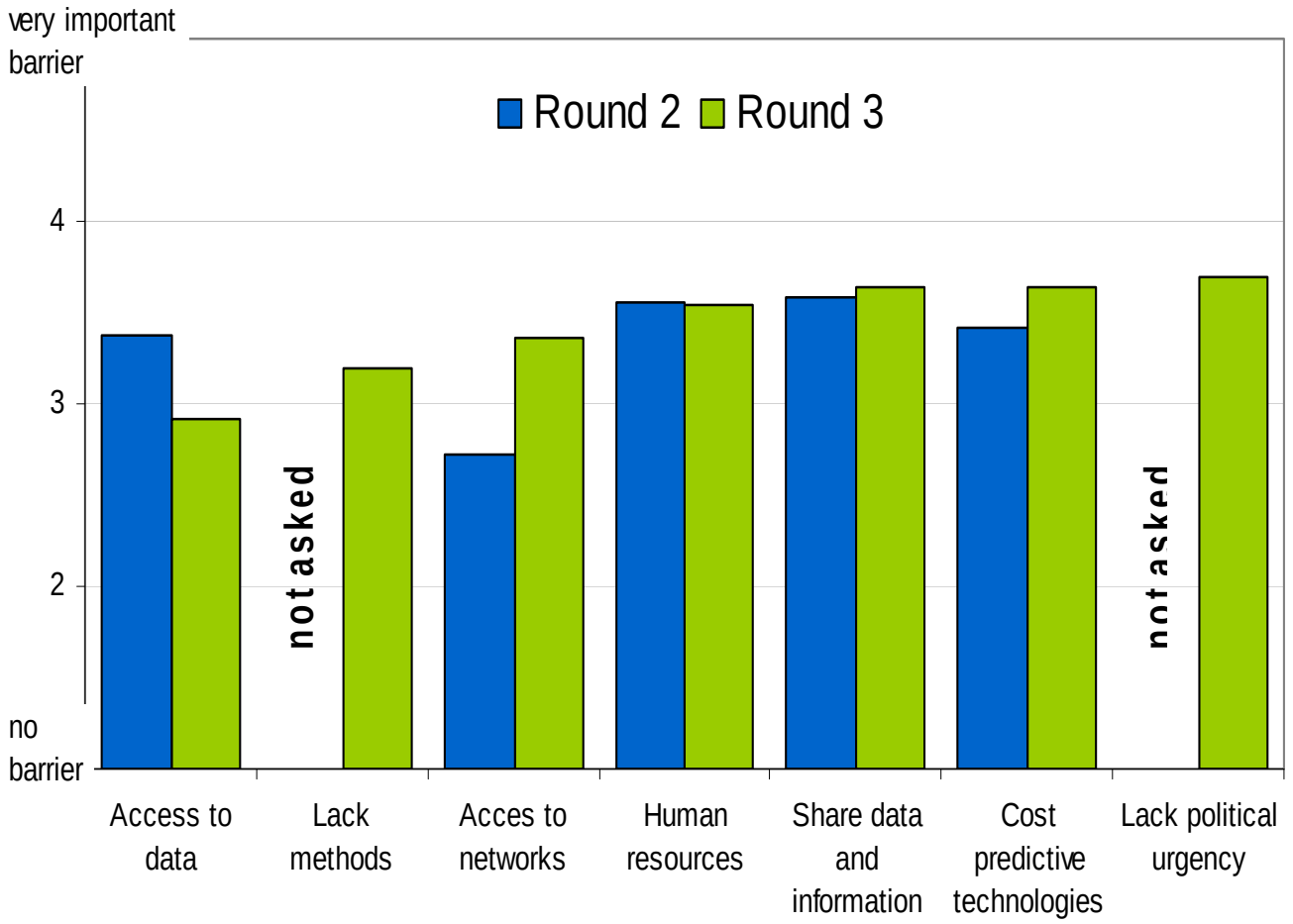
WP2

GO-GLOBAL Consortium meeting: Accra, Ghana, 28th-29th April 2009

# Barriers to emerging risk identification



## Access to relevant data

"By enforcing a system where industry has to openly provide all data (anonymised)"

[Switzerland]

"Regulatory barriers to sharing information must be eliminated, and streamlined. Workers in food safety must not be allowed to operate in 'silos' at any level of jurisdiction."

[Canada]

## Access to global networks

"Discussion among relevant experts and major countries *(is needed)* to establish aneffective information network system."

[Japan]

"Some type of freenet that all Food Safety scientists can access, *(and)* that is not restricted by government paranoias…but that is not possible."

[USA]

# Willingness to share information

"In particular private industry may dislike sharing information."

[Norway]

*"(It is important for)* stakeholder groups *(to)* share information and report as a team, so that individual company information is not 'shared' associated with their name - needs lots of trust."

[USA]

"Government regulatory agencies should have the political will to get stakeholders to actively participate in food safety mitigations, consultations."

[Philippines]

# Cost

"Now we have very fast tests but not every stakeholders may (be able to) to use them because its expensive for them… I don't think that I should pay something for my work from my salary."

[Bulgaria]

"Many people think dealing with aftermath is more important than (applying) precautionary action, and prediction does not make money."

[Japan]

"Is predictive paramount? Process control rather than testing preferable."

[New Zealand]

# Human resources

"Absence of staff represents enough (of a) serious problem to carry out correctly (the) estimation of emerging risks."

[Armenia]

"Good communicators should be trained with effective knowledge on food safety…"

[Japan]

# Political urgency

"Perhaps scientists and epidemiologists need to get better at 'social marketing' to get the message across, and to spur action"

[Canada]

"I do not know - sometimes it seems that only scandals can give some political urgency"

[Denmark]

"….emerging food risks seem not to be so pressing as terrorism or the economic crisis."

[Slovakia]

"Good governance is needed, however the difference between urban and rural ideas seems to be the barrier."

[Thailand]

# Lack of appropriate detection and monitoring methods

"Government and other stakeholders should get their act together to come up with appropriate systems."

[Philippines]

"Enforce Research and Development (and) increase in collaboration between research, public and private (industry) sector."

[Switzerland]

"Experts must be taught, promoted and obliged to use modern international methodologies instead of those adopted (in the past)."

[Ukraine]

# Different rules acceptable…


F(5,60)=5,60; p<.01

# Justification for different rules related to food safety

"Times of conflict or famine or enforced deprivation due to external forces."

[Ireland]

"Religious specific rules."

[Switzerland]

"Countries producing food should be treating domestic and international consumers equally."

[New Zealand]

# Are the risk identification systems in you country capable of identifying emerging food risks in a timely and capable manner? (1)

"Absence of staff, the legislative basis.., weak material base of laboratories ……."

[Armenia]

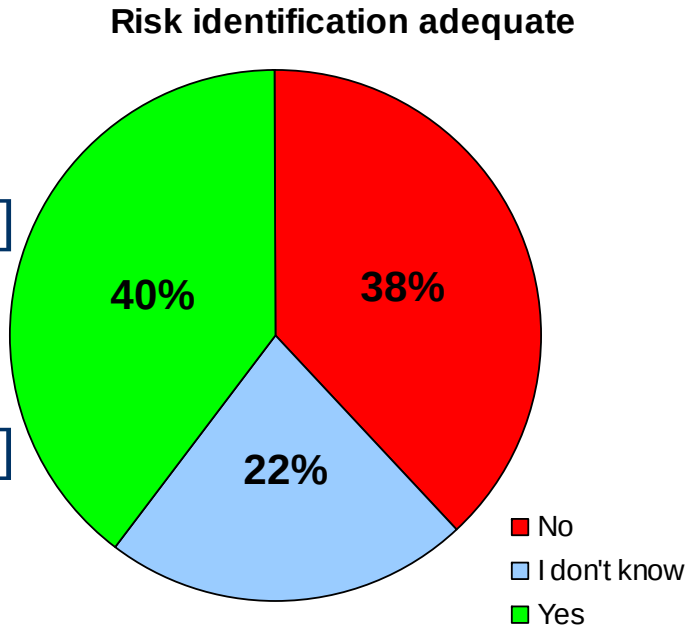
"Shortage of financial resources - lack capacity- NO coordination, NO prioritization."

[South-Africa]

"The system of control is very weak and directed towards exported food mostly." [Poland]

"All systems are reactive and will depend on the effort put in monitoring."

[the Netherlands]



# Are the risk identification systems in you country capable of identifying these emerging food risks in you country in a timely and capable manner? (2)

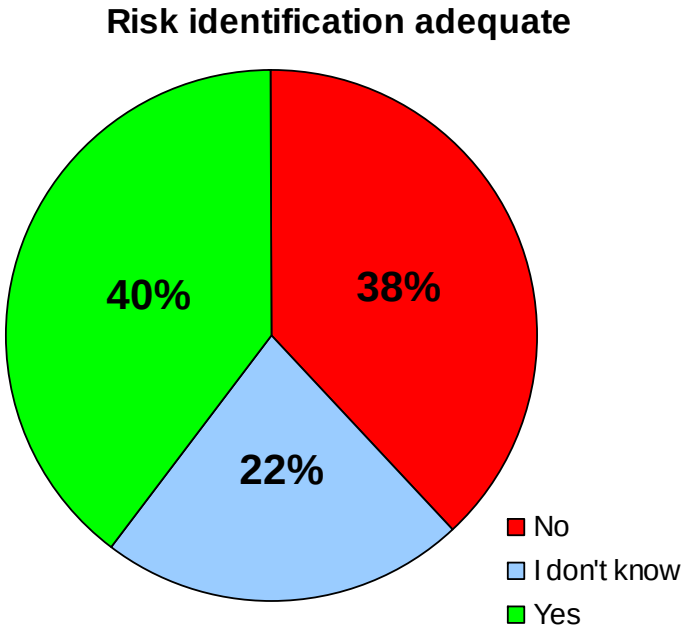
## Yes, with caveats…

"The central national laboratory has the capability but limited resources to identify (emerging food risks)."

[Ireland]

"Yes, but (there is) still need to maintain and build new capacities to address new issues as they arise."

[Canada]



# Can these improvements be made in the next 5 years?

"Not a real priority - Effects (are only identified following) long term exposure."

[Belgium]

"All it takes is a government willing to require industry to comply."

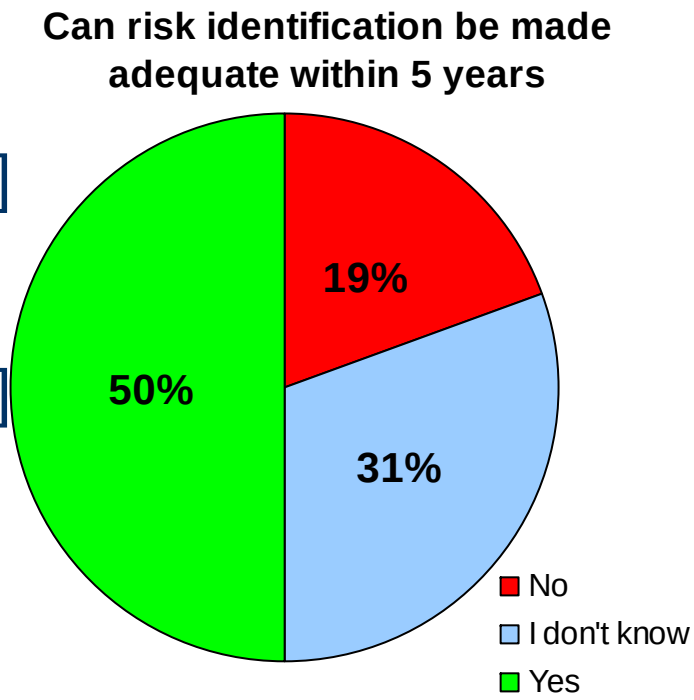
[Canada]

"Government and especially politicians do not understand and consider (the) importance of food security."

[Japan]

"Just needs the will."

[USA]



# How do funding bodies in your country identify emerging risk topics for future research?

"I think that in my country (funders) haven't future plans for identification of  emerging (food) risk."

[Bulgaria]

"We believe that they are still not aware of real danger."

[Croatia]

"They don't."

[Portugal]

"Through different scenario techniques."

[Norway]

"By what's on fire currently."

[USA]

# If resources are limited, how do funding bodies in your country prioritise different emerging food risks for further investigation?

"Depending on severity as experienced by public and media."

[Norway]

"…prioritization is depended on…local and national agencies or universities."

[Thailand]

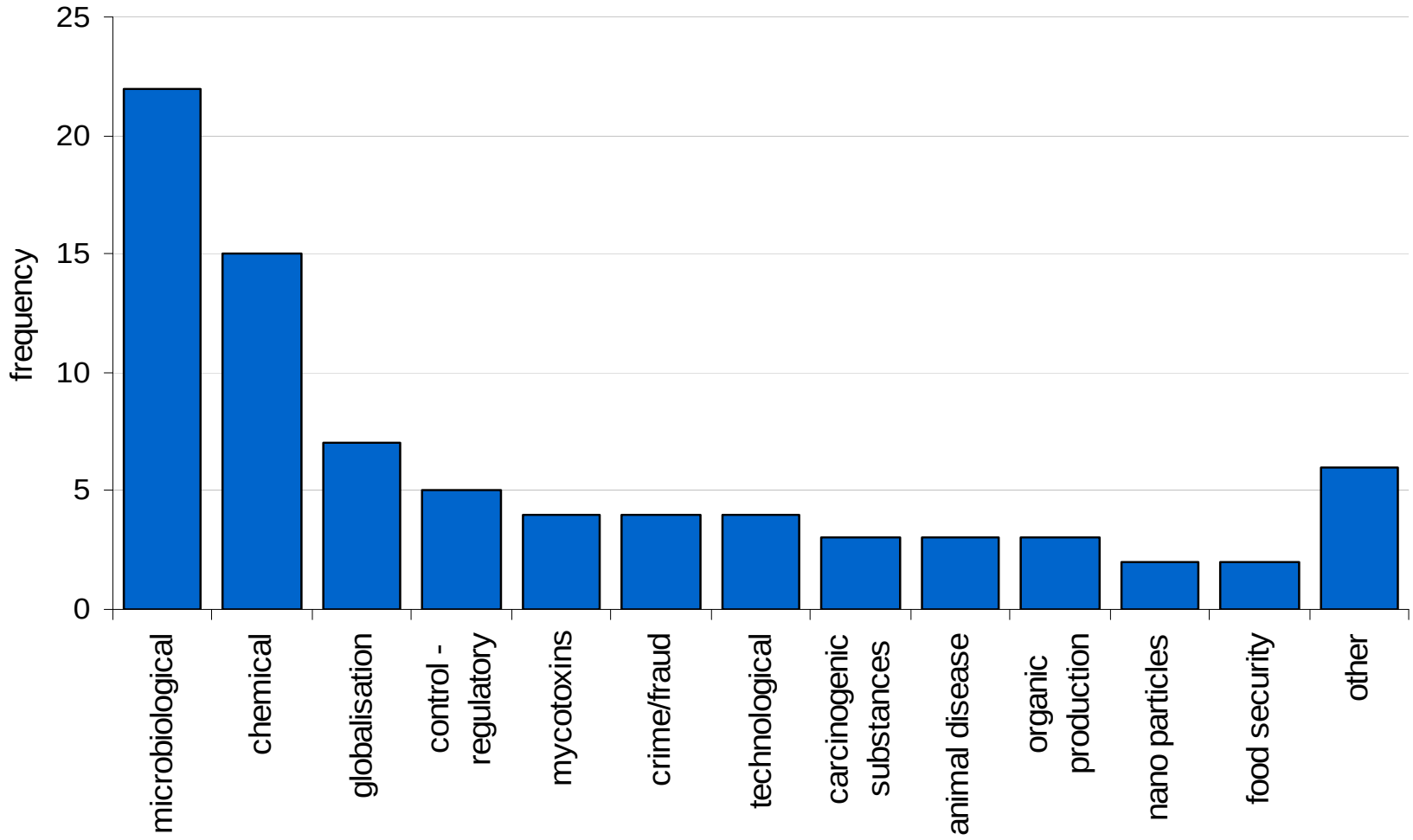
"Political strategy and interest of stakeholders."

[Switzerland]

"On academic merit."

[Germany]

# What are the most important emerging food risks *in your country?*




Other: plant disease; capacity/capability; environment
risk communication; allergen; nutrition

## Diversity of views identified

- Microbial and chemical contaminants a priority?
- Globalisation a threat?
- Barriers?
  - Socio-political (“political will”)
  - Concerns about resources
  - Institutional resistance to adoption of new methodologies
  - Reactive  rather than proactive risk identification systems
  - Lack of institutional structures tied to risk identification

# Thank you for your attention!