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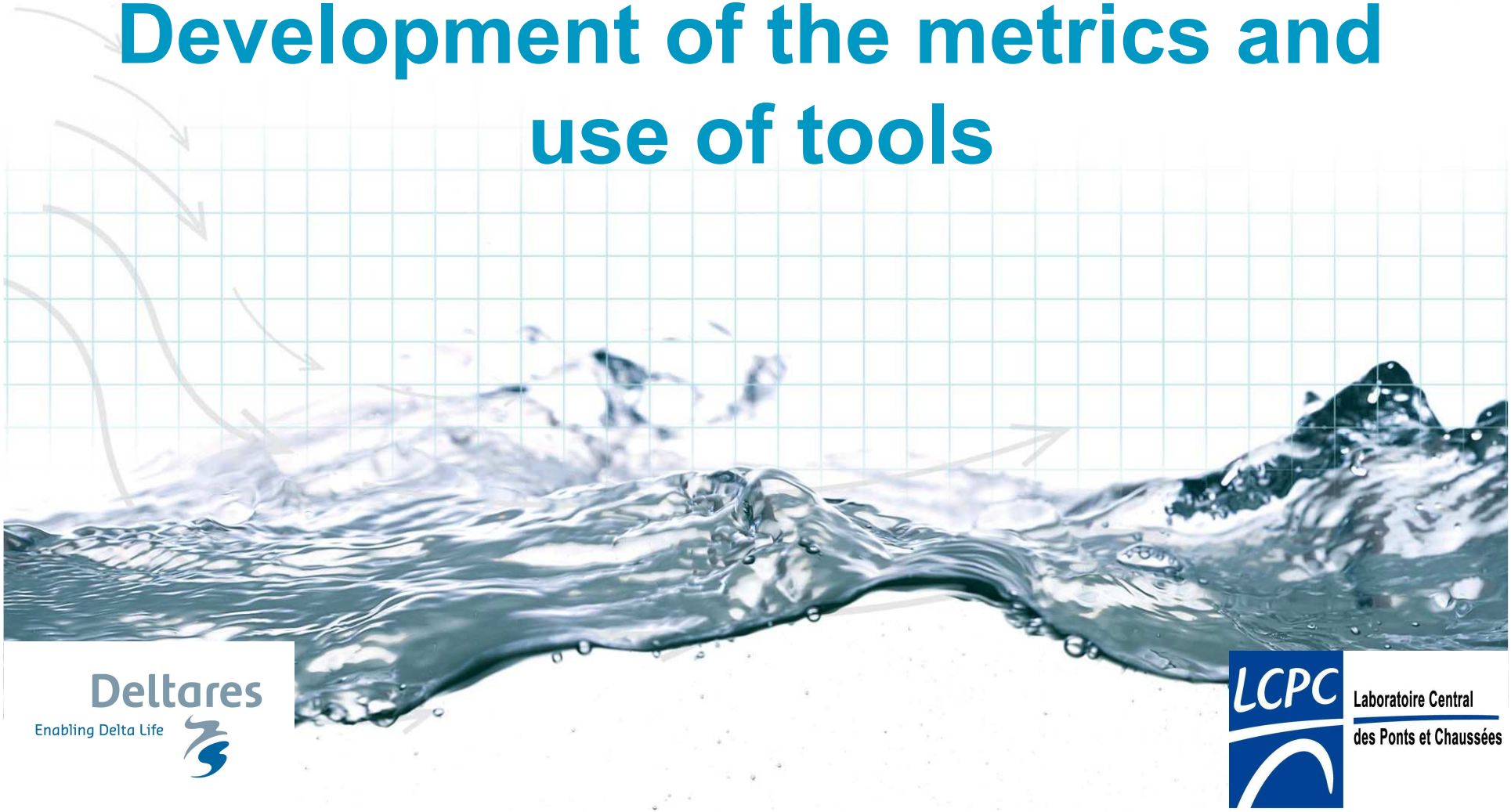
Development of the metrics and use of tools



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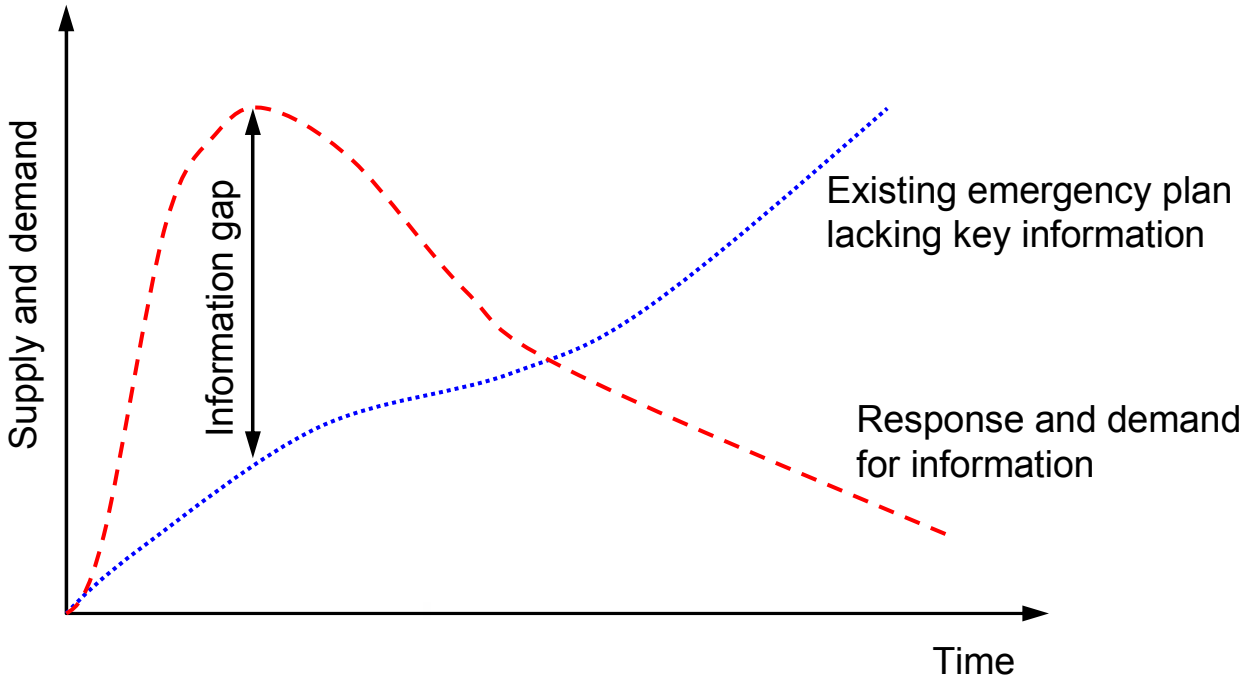
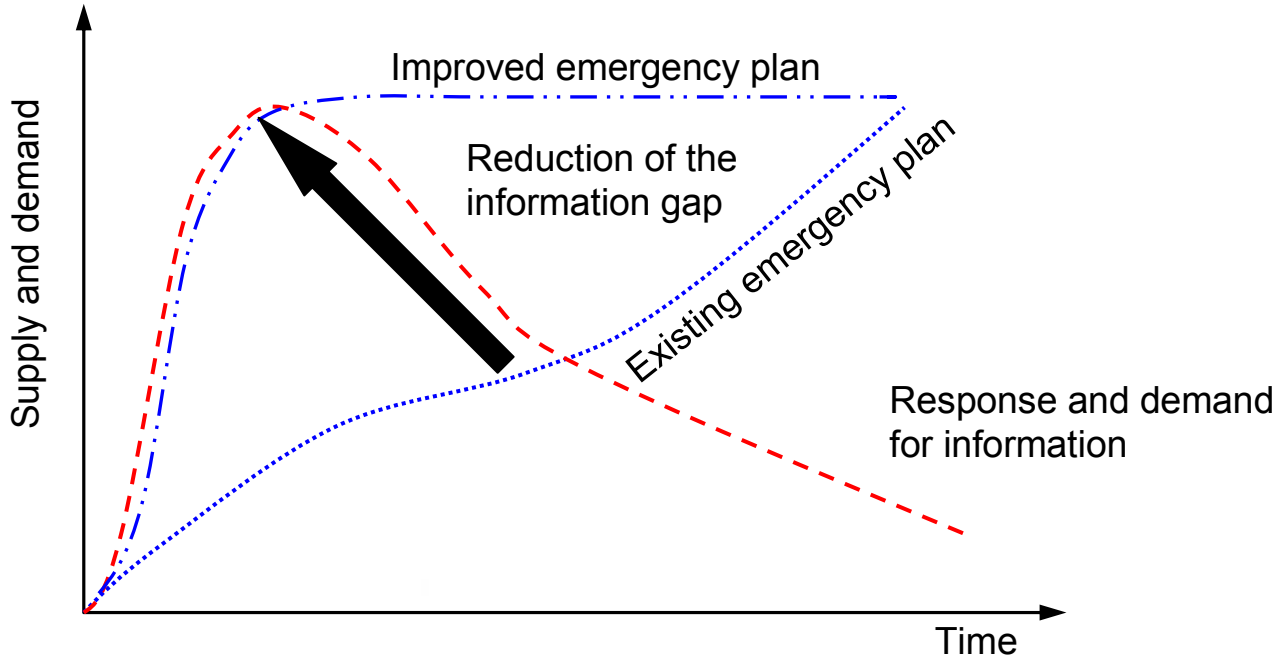
WP1 – Effectiveness of emergency plans

"Information gap"



WP1 – Effectiveness of emergency plans

Reducing the information gap



WP1 – Effectiveness of emergency plans

- Little in the way of metrics via which the "fitness for purpose" of emergency management plans for floods can be assessed
- Twenty-two metrics were developed to assess flood emergency plans. These fall into six categories as follow:
  1. Objectives, assumptions and target audience
  2. Organization and responsibility
  3. Communication
  4. Flood hazard
  5. Flood risk to receptors (e.g. people, buildings, critical infrastructure)
  6. Evacuation

WP1 – Effectiveness of emergency plans

Metric	Level of detail		
	Low	Medium	High
Objectives, assumptions and target audience			
Aims and objectives of plan	Not detailed	Aims and objectives included but could be clarified further	Clearly stated aims and objectives including the area covered, types and sources of flooding
Target audience and updating of the plan	Not detailed	Audience defined and plan dated	Audience defined and how they will be notified of updates and modifications to the plan included
Assumptions made by the plan	Not detailed	Covers some aspects	Covers all aspects including: flood warning lead time; method by which rescue will be undertaken; implications of the failure of critical infrastructure

Organisation and responsibilities				
Actions, roles and responsibilities	Not detailed		Brief details of the roles and responsibilities related to the activation of the plan provided	Details of the roles and responsibilities related to the activation of the plan provided including health and safety and environmental considerations
Recovery	Not detailed		Brief details of how the recovery is managed	Details of how the recovery is managed including clean up, waste disposal, repairs to public assets, humanitarian assistance
Training and exercises	Not detailed		Brief details of training and exercise requirements	Internal and external (with other organisations) training and exercises outlined
Plan activation	Not detailed		Brief description of the thresholds or levels used to activate plan	Description of the thresholds or levels used to activate plan together with flow chart

WP1 – Effectiveness of emergency plans

Communication				
Communication with other agencies	Not detailed		Outlined in words	Detailed and the links shown diagrammatically
Communication with the public	Not detailed		Outlined in words	Detailed and shown the links shown diagrammatically
Management of the media	Not detailed		Outline media management strategy in place	Well defined media management strategy in place
Flood warning (if available)	Not detailed		Levels of flood warning with details of the areas flooded at each level	Levels of flood warning with details of the areas flooded at each level and shown on a map
Relationship with complementary emergency plans detailed	Not detailed		Outlined in words	Detailed and the links shown diagrammatically

WP1 – Effectiveness of emergency plans

Metric	Level of detail		
	Low	**Medium**	**High**
Evacuation			
Evacuation routes	Not detailed	Evacuation routes shown on a map	Evacuation routes detailed together with roads likely to be closed and their accessibility for emergency vehicles and other vehicles
Shelters/Safe havens	Not detailed	Safe havens/shelters shown on a map	Safe havens/shelters shown on a map with their capacity and facilities
Flood hazard			
Flood hazard map	Not detailed	Flood hazard map(s) showing extent	Flood hazard map(s) showing water depth and velocity
Details of previous floods (if available)	Not detailed	Brief description of historical flood	Description of historical floods with the cause and a brief description of the risk in terms of people and properties affected

WP1 – Effectiveness of emergency plans

Flood risk to receptors			
Flood risk to people	Not detailed	Number of people potentially affected included	Potential injuries and loss of life included and mapped for a range of scenarios
Flood risk to vulnerable people (e.g. elderly or disabled)	Not detailed	Areas where elderly/sick people live mapped	Numbers of vulnerable people defined with a response strategy
Flood risk to residential property	Not detailed	Number of properties defined	Number of properties defined together with those at risk of collapsing during an extreme flood
Flood risk to businesses	Not detailed	Number of businesses defined	Number and type of businesses defined together with potential losses
Flood risk to critical infrastructure (e.g. water supply, gas, electricity, police, fire brigade)	Not detailed	Number of pieces of critical infrastructure shown on the flood map(s)	Number of pieces critical infrastructure shown on the flood map(s) and an assessment of their likelihood of failure during a flood
Potential for NaTech hazards at industrial facilities (if present)*	Not detailed	Potential NaTech sites shown on map	Potential NaTech sites shown on site and brief details of the response

WP1 – Effectiveness of emergency plans

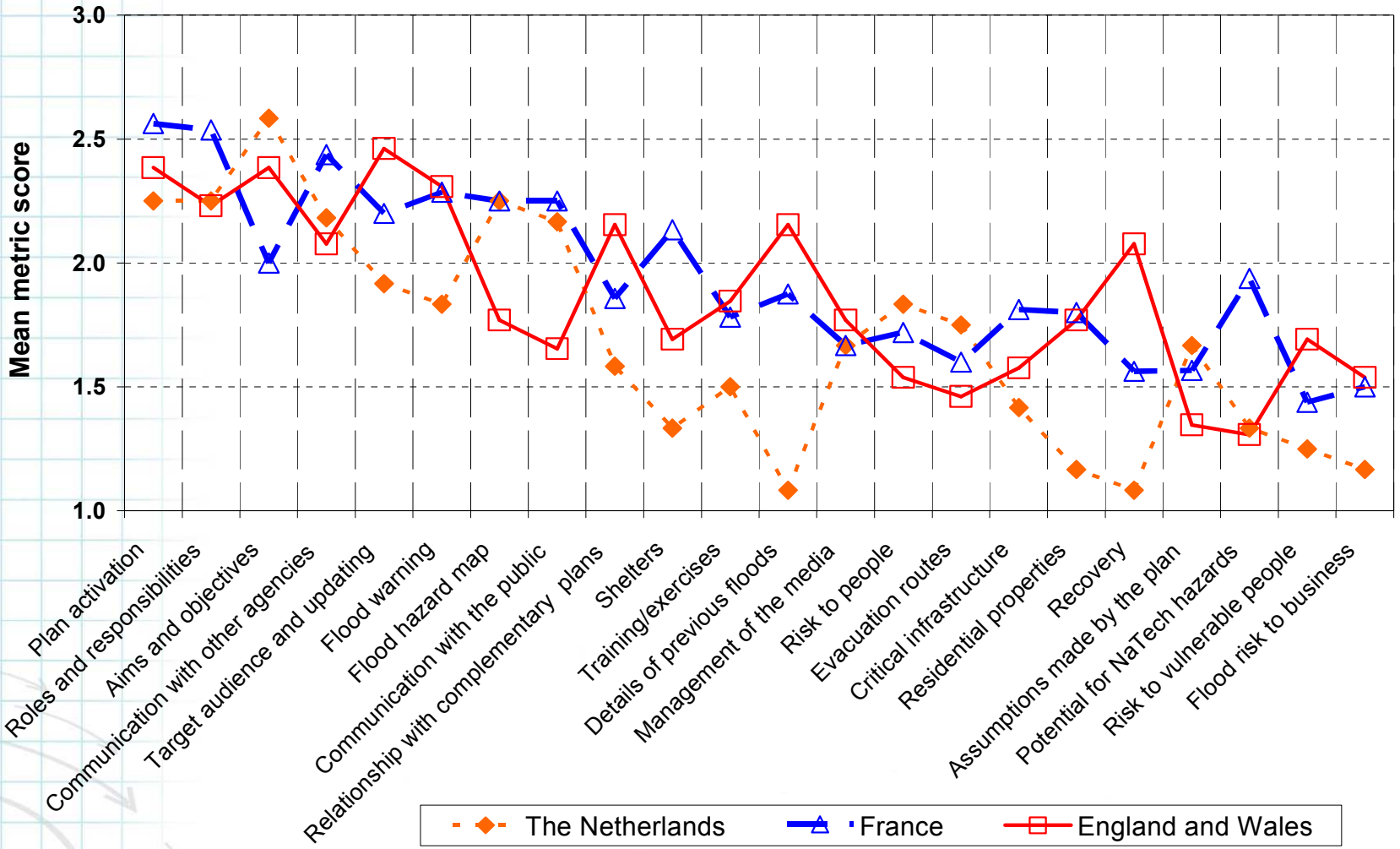
- Thirty-eight flood emergency plans in England and Wales, France and the Netherlands were assessed using these metrics. The development of the metrics allowed the plans to be “scored” in a quantitative manner

- An online survey was carried out in England and Wales, France and the Netherlands. The questions focused on the requirements for information in the plan development stage, and its usefulness and required level of detail.

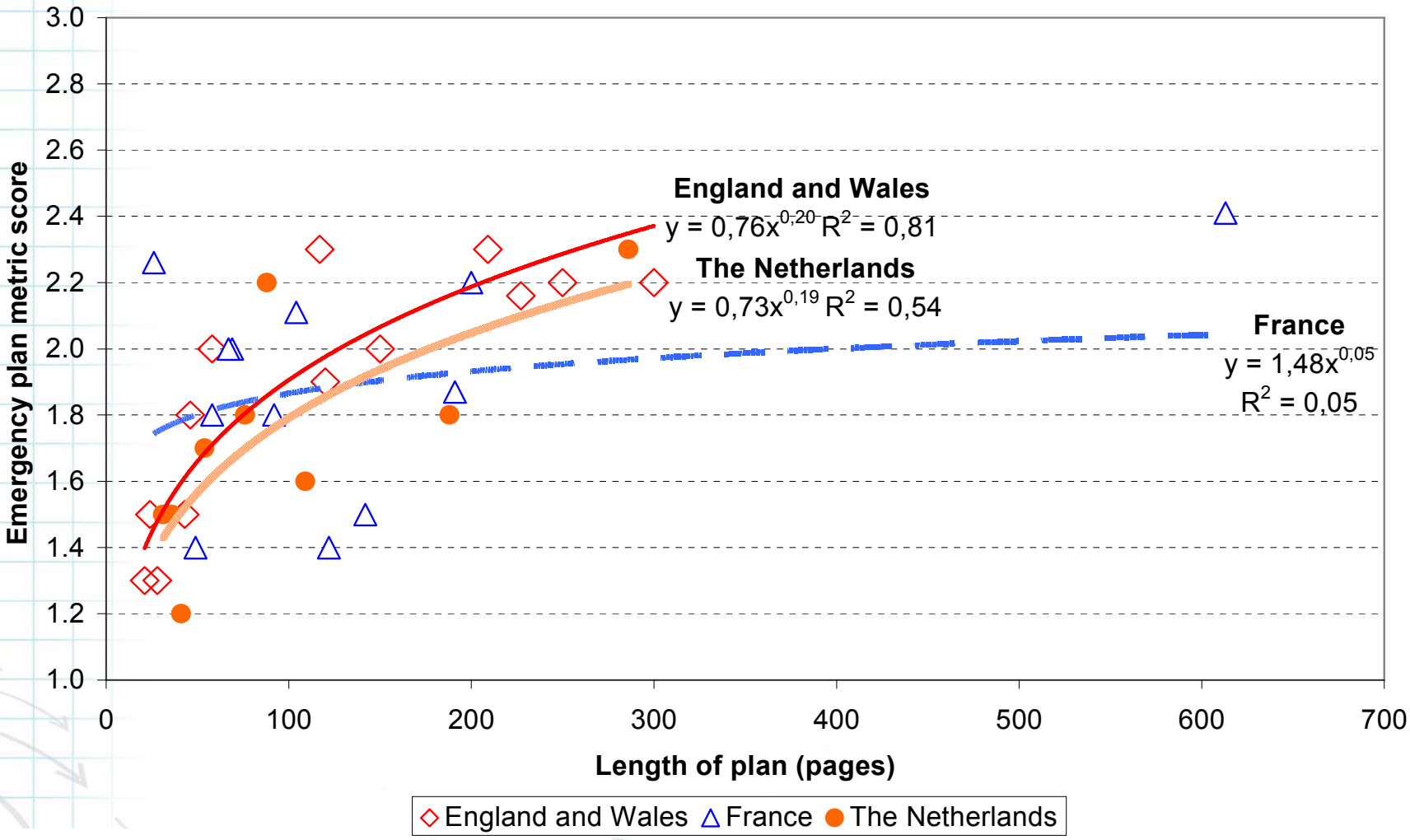
Example of scoring a plan

Metric	Room for improvement	Acceptable	Good	Score
Aims and objectives of plans			●	3
Target audience and updating			●	3
Details of previous floods		●		2
Flood hazard map		●		2
Flood Warning			●	3
Risk to people		●		2
Risk to vulnerable people			●	3
Flood risk to residential properties		●		2
Flood risk to business		●		2
Flood risk to critical infrastructure		●		2
Potential for NaTech hazards	●			1
Evacuation routes		●		2
Shelters/Safe havens		●		2
Relationship with complementary emergency plans			●	3
Communication with other agencies			●	3
Communication with the public		●		2
Management of the media		●		2
Assumptions made by the plan	●			1
Plan activation			●	3
Actions, roles and responsibilities			●	3
Recovery			●	3
Training and exercises		●		2
			Average score	2.3
			Rating	"Above average"

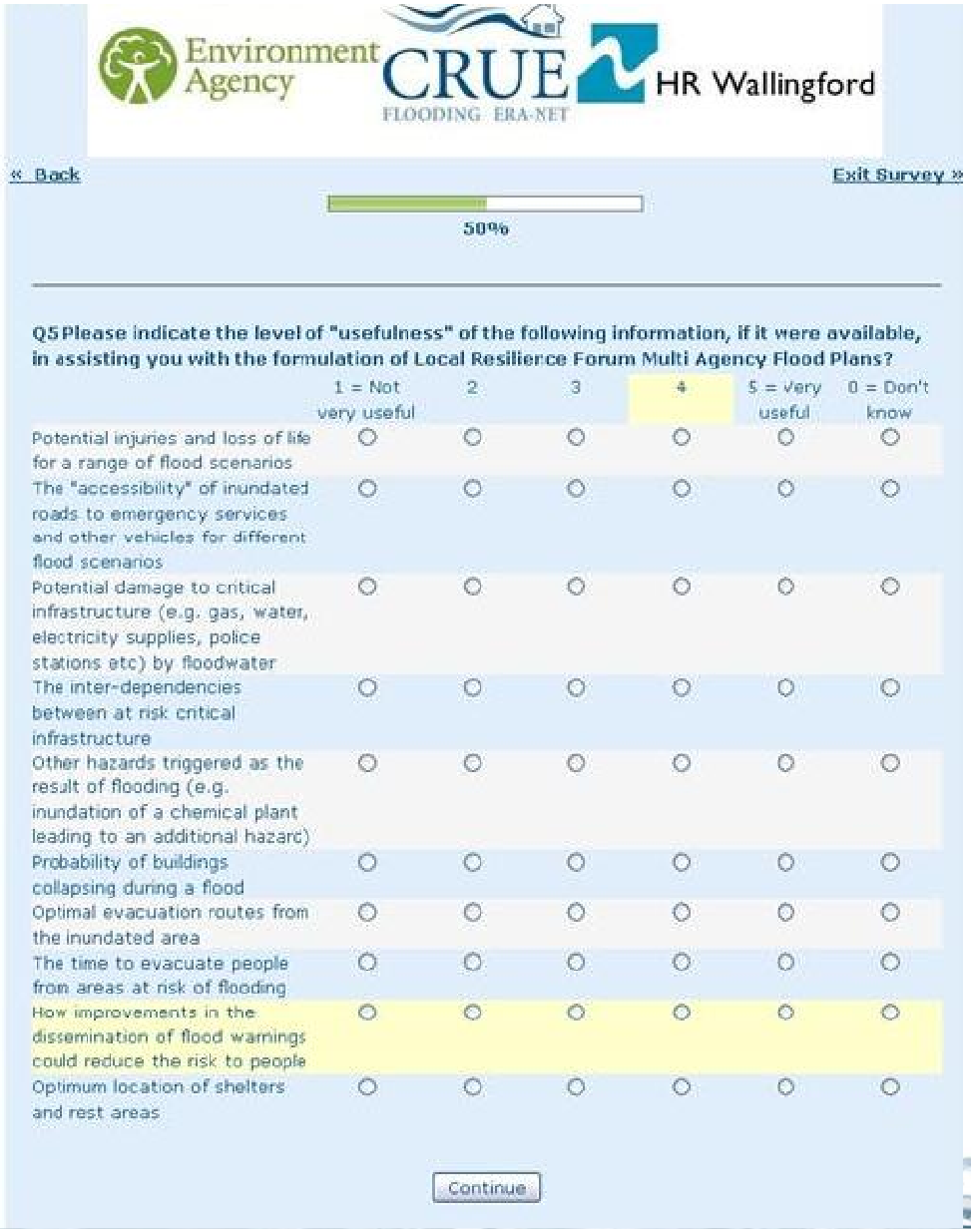
WP1 – Assessment of emergency plans



WP1 – Assessment of emergency plans



Example of part of the survey



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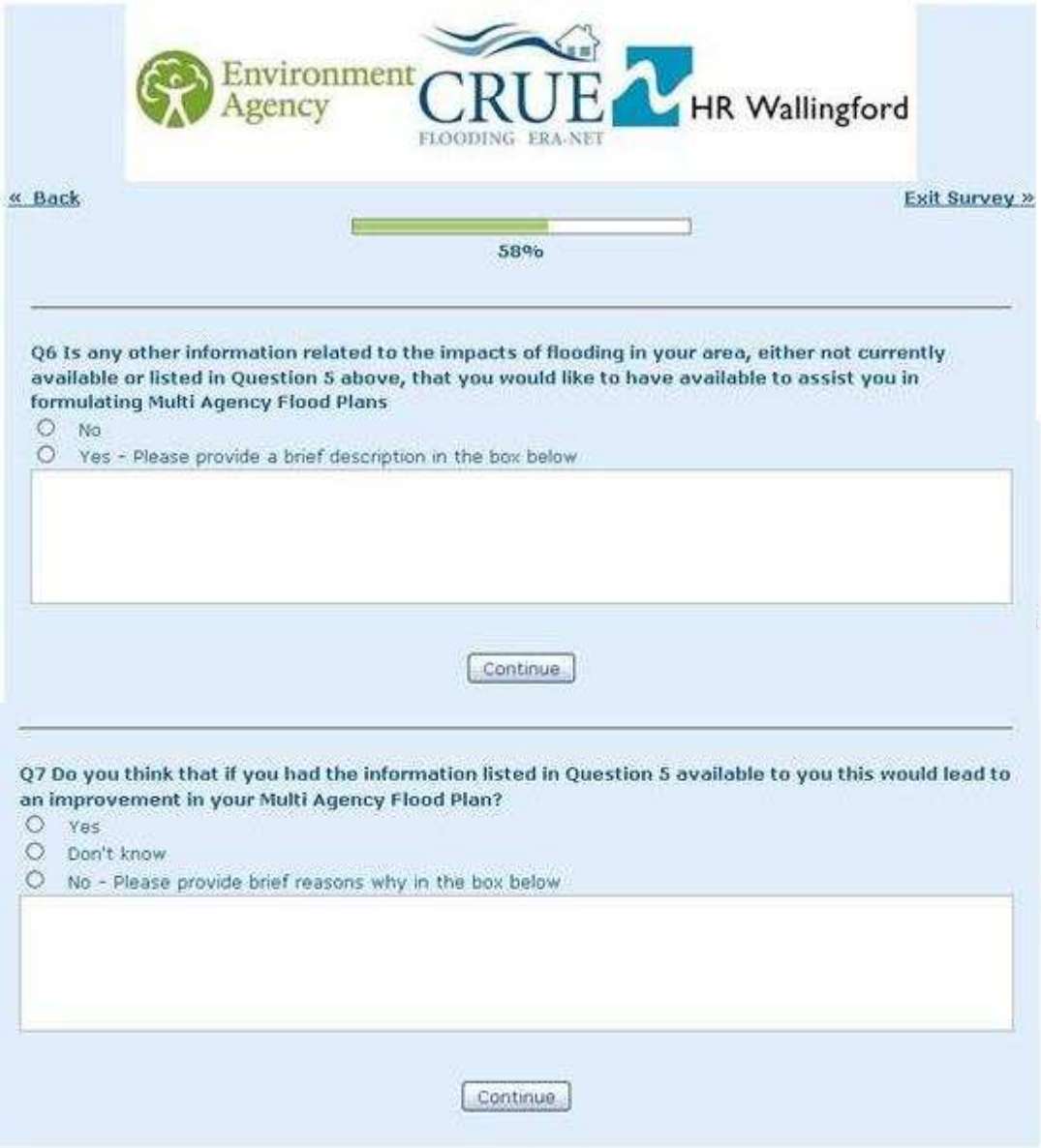
50%

Q5 Please indicate the level of "usefulness" of the following information, if it were available, in assisting you with the formulation of Local Resilience Forum Multi Agency Flood Plans?

	1 = Not very useful	2	3	4	5 = very useful	0 = Don't know
Potential injuries and loss of life for a range of flood scenarios	○	○	○	○	○	○
The "accessibility" of inundated roads to emergency services and other vehicles for different flood scenarios	○	○	○	○	○	○
Potential damage to critical infrastructure (e.g. gas, water, electricity supplies, police stations etc) by floodwater	○	○	○	○	○	○
The inter-dependencies between at risk critical infrastructure	○	○	○	○	○	○
Other hazards triggered as the result of flooding (e.g. inundation of a chemical plant leading to an additional hazard)	○	○	○	○	○	○
Probability of buildings collapsing during a flood	○	○	○	○	○	○
Optimal evacuation routes from the inundated area	○	○	○	○	○	○
The time to evacuate people from areas at risk of flooding	○	○	○	○	○	○
How improvements in the dissemination of flood warnings could reduce the risk to people	○	○	○	○	○	○
Optimum location of shelters and rest areas	○	○	○	○	○	○

Continue

Example of part of the survey



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58%

Q6 Is any other information related to the impacts of flooding in your area, either not currently available or listed in Question 5 above, that you would like to have available to assist you in formulating Multi Agency Flood Plans

- ○ No
- ○ Yes - Please provide a brief description in the box below

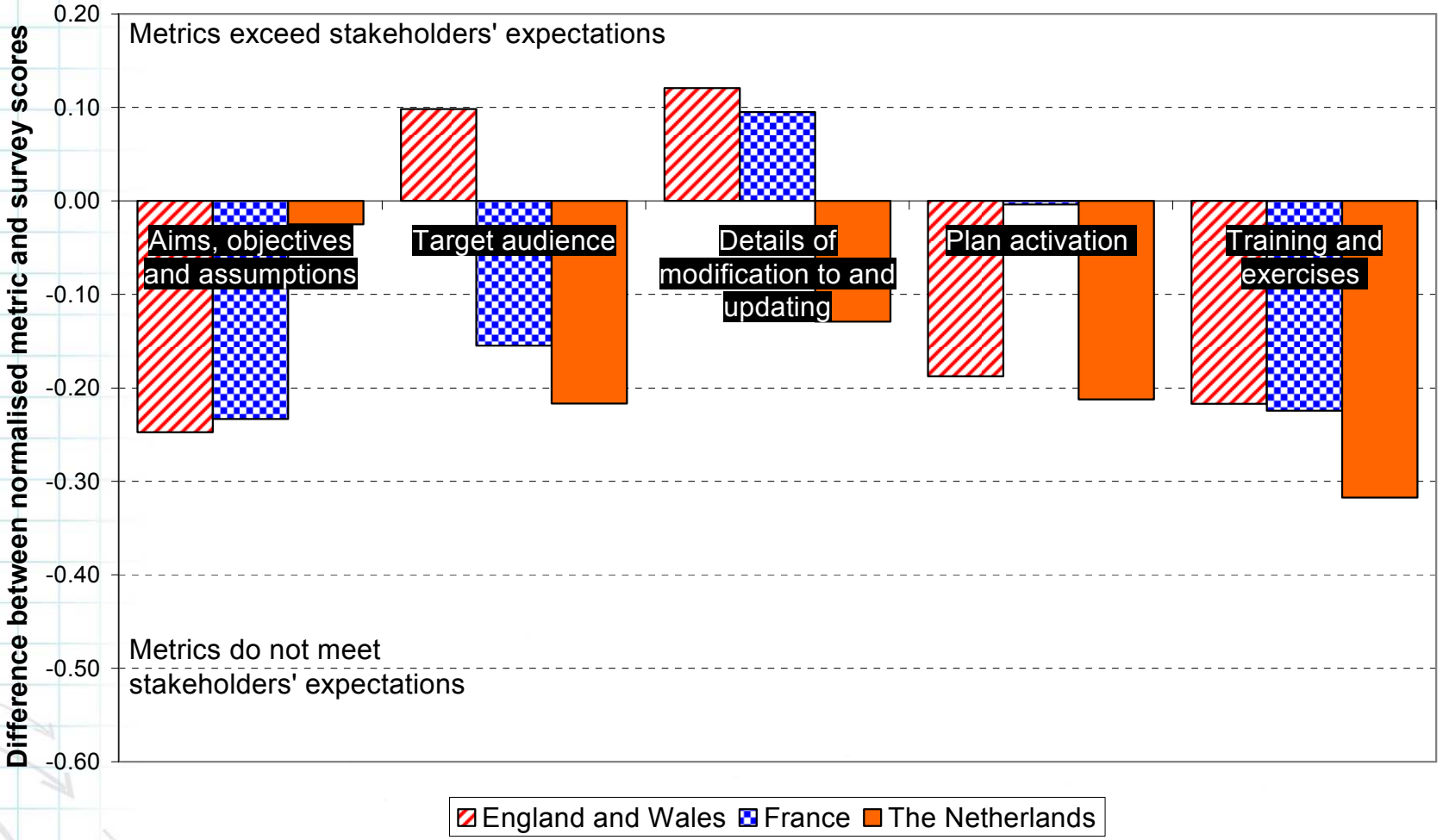
Continue

Q7 Do you think that if you had the information listed in Question 5 available to you this would lead to an improvement in your Multi Agency Flood Plan?

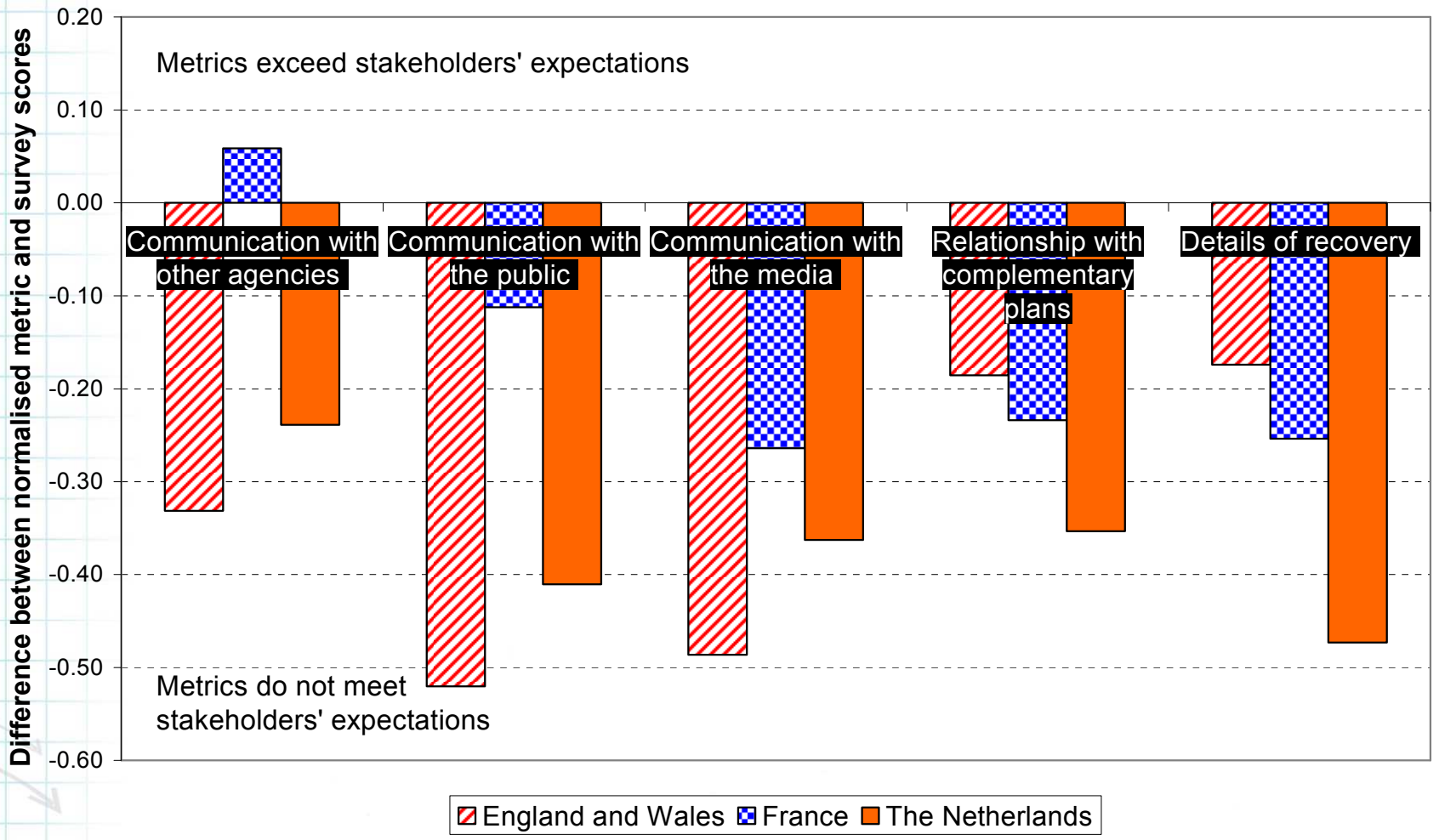
- ○ Yes
- ○ Don't know
- ○ No - Please provide brief reasons why in the box below

Continue

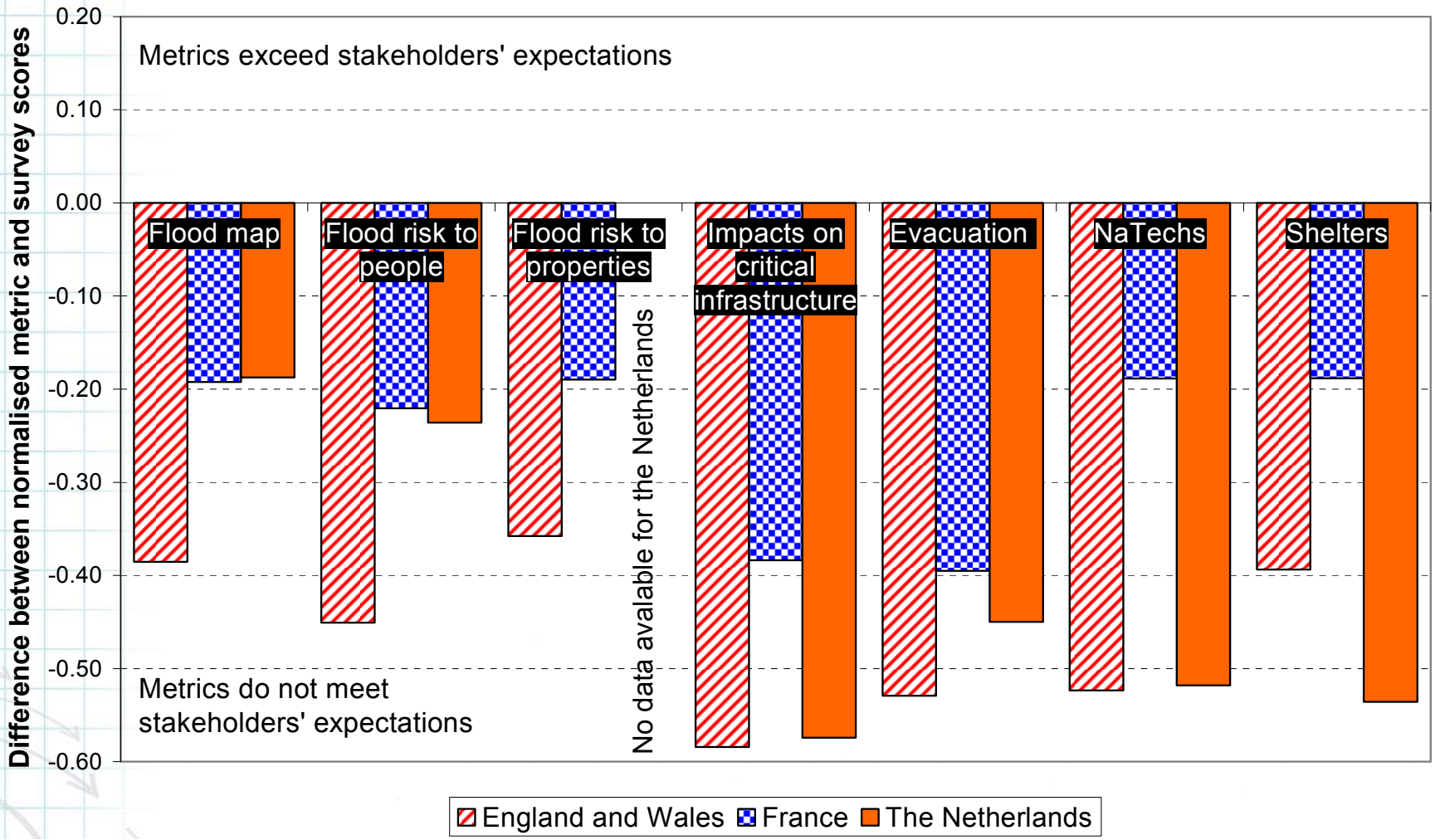
WP1 – Information gap



WP1 – Information gap



WP1 – Information gap



Factors perceived by stakeholders to be important in making a plan effective

Rank	England and Wales	France	The Netherlands
1	Roles and responsibilities	Roles and responsibilities	Roles and responsibilities
2	Trigger levels	Trigger levels	Information on the flood hazard and related information
3	Information on the flood hazard	Information on the flood hazard	Clarity and accessibility of plans
4	Clarity and brevity of the plan	Adaptability and simplicity	Training in the use of the plan
5	Relationship with other plans	Training in the use of the plan	Trigger levels

WP1 - Conclusions

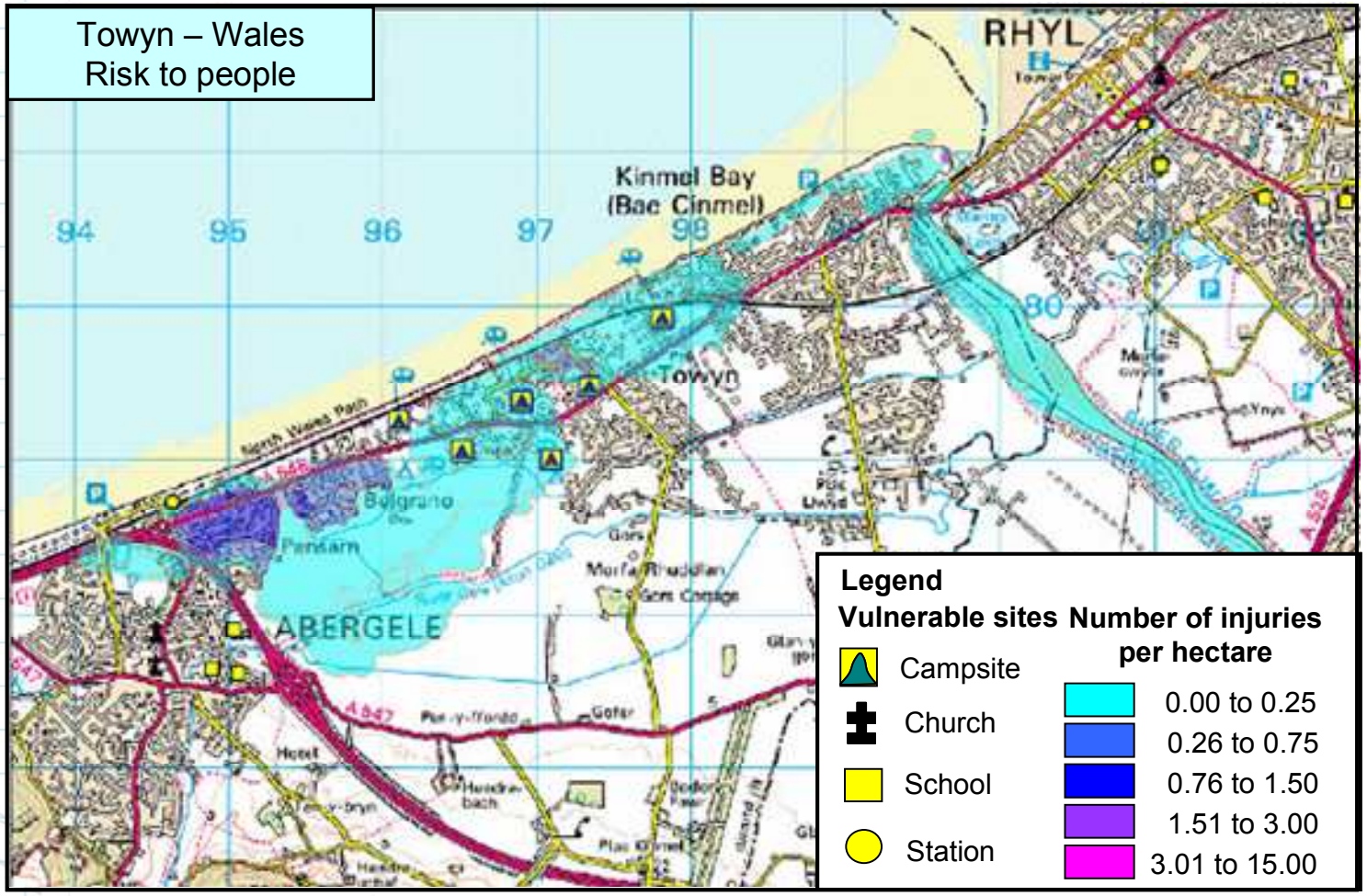
- Metrics provide a basis to map the where improvements can be made in the plans and the requirements of the stakeholders

- There was found to be a discrepancy between the level of detail required by emergency planners and the actual level of detail that is available within emergency plans for a number of issues

WP 2 – Comparison of currently available tools

- A brief review of tools that are available in the three countries was carried out. The tools reviewed fall into the following categories:
  - Guidelines and checklists
  - Flood hazard mapping tools
  - Tools related to assessing the risk to people, vehicles, evacuations times and safe havens
- Online survey regarding use of tools was disseminated to flood managers in the three partner countries

WP2 – Example of tool to assess injuries



Survey of flood managers

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Q6 For the tools, methods or guidance that are NOT being used to inform Multi Agency Flood Plans by you or other organisations please indicate the main reason why you think they are not used. If you think the tool or method is currently being used please tick the "Currently used" option.

	Currently used	Not relevant to plans	Unaware of method	Cost	User friendliness issues	Availability of data	Other reasons
Fluvial flood hazard	○	○	○	○	○	○	○
Coastal flood hazard	○	○	○	○	○	○	○
Flood hazard from dams	○	○	○	○	○	○	○
Flood hazard - other sources	○	○	○	○	○	○	○
Potential injuries and loss of life	○	○	○	○	○	○	○
"Accessibility" of inundated roads to vehicles	○	○	○	○	○	○	○
Optimal evacuation route(s) from inundated areas	○	○	○	○	○	○	○
Effects of improvements in the dissemination of flood warnings on the risk to people	○	○	○	○	○	○	○
Potential damage to critical infrastructure	○	○	○	○	○	○	○
Methods to assess the inter-dependency between critical infrastructure	○	○	○	○	○	○	○
Optimising the locations of shelters with respect to floods	○	○	○	○	○	○	○
Assessment of other hazards triggered by flooding	○	○	○	○	○	○	○
Probability of buildings collapsing during floods	○	○	○	○	○	○	○

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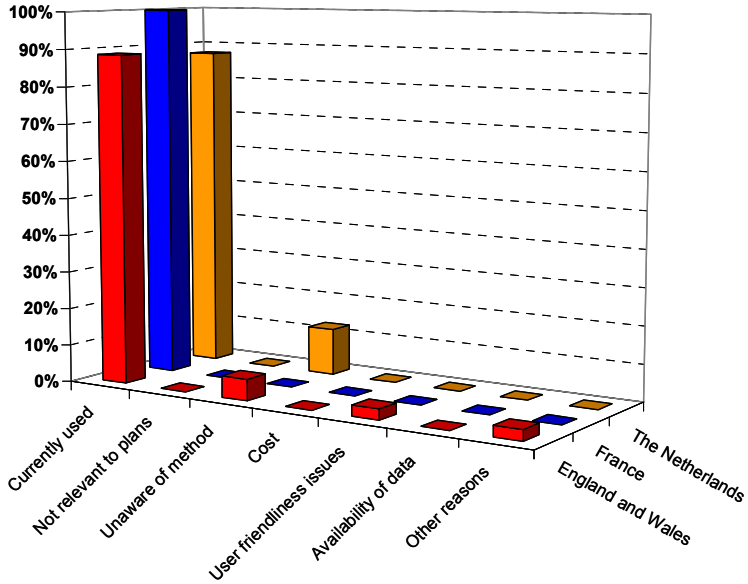
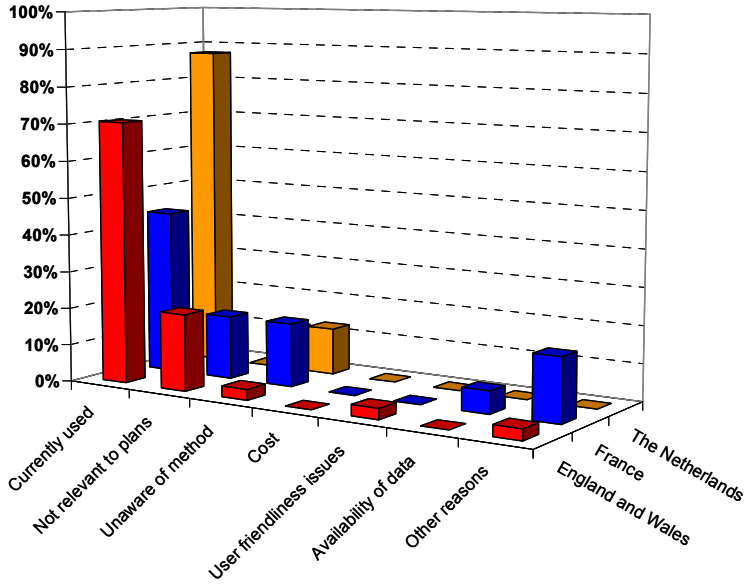
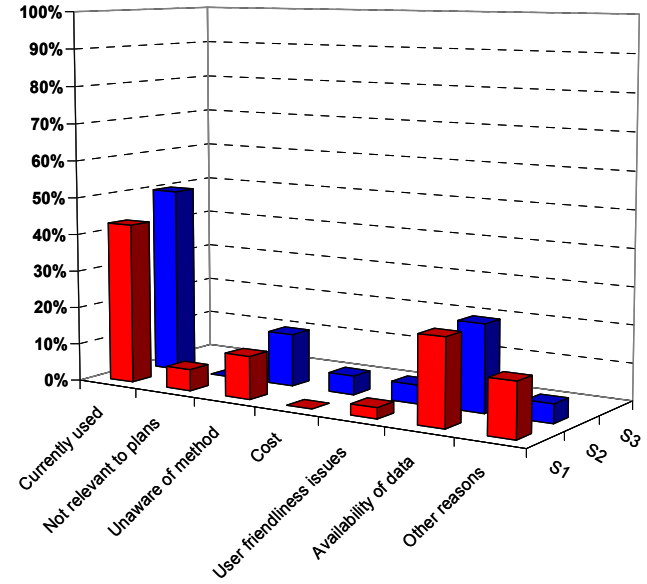
WP2 - Results of flood manager surveys



A Fluvial flood hazard

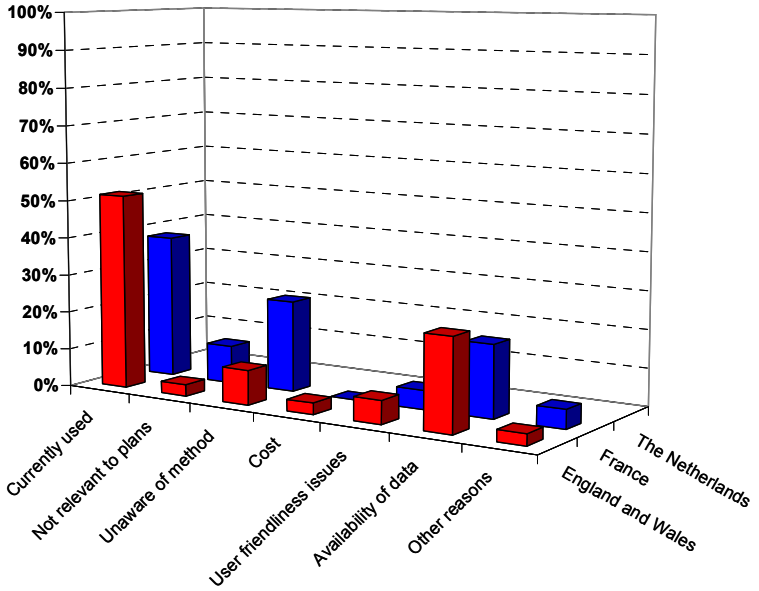


B Coastal flood hazard



Note: This question was not asked in the Netherlands

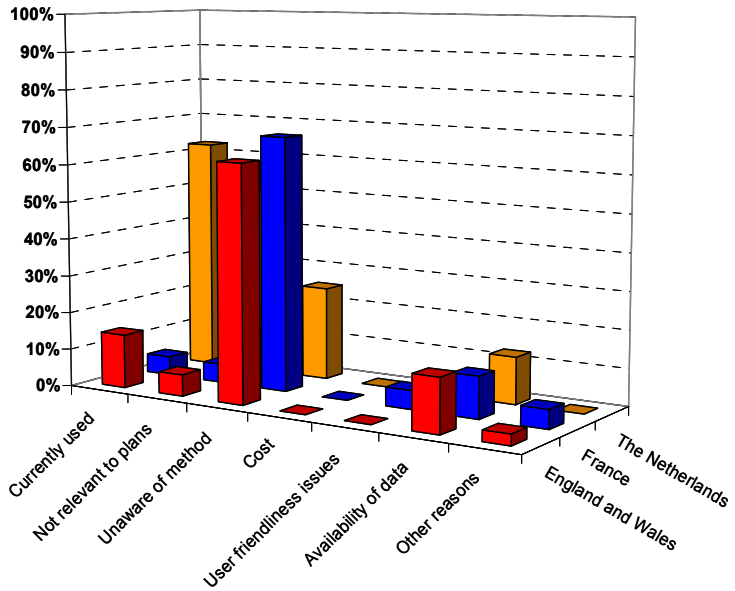
C Flood hazard from dam failure



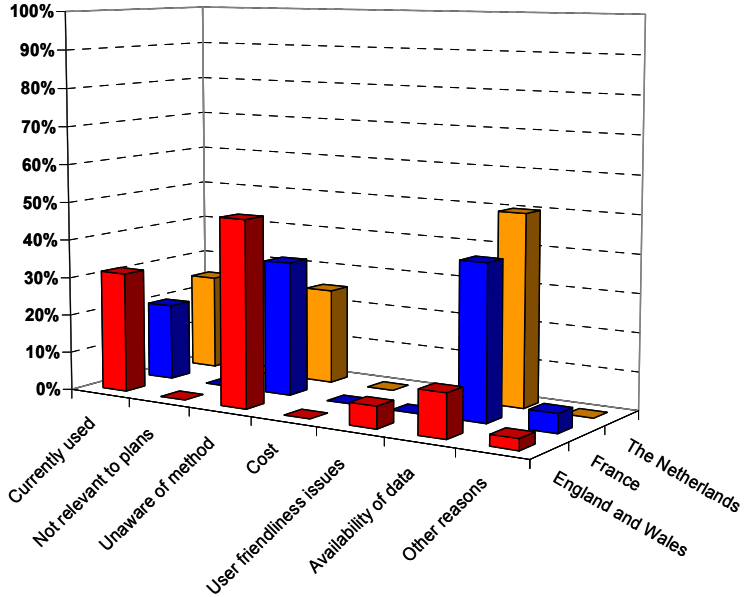
Note: This question was not asked in the Netherlands

D Flood hazard from other sources

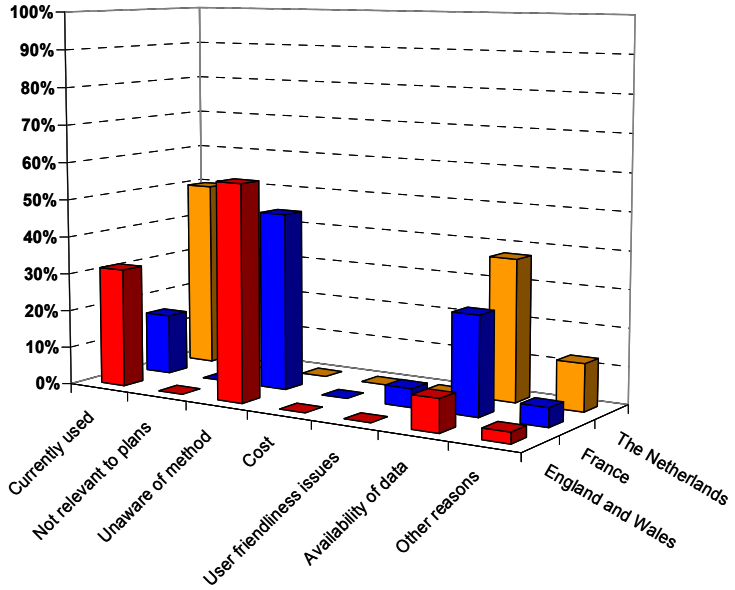
WP2 - Results of flood manager surveys



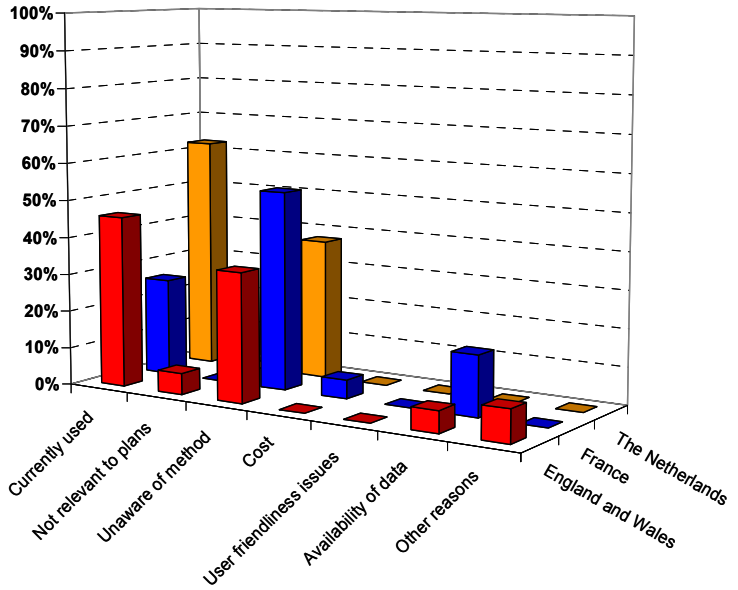
A Potential injuries and loss of life



B Accessibility of inundated roads to vehicles

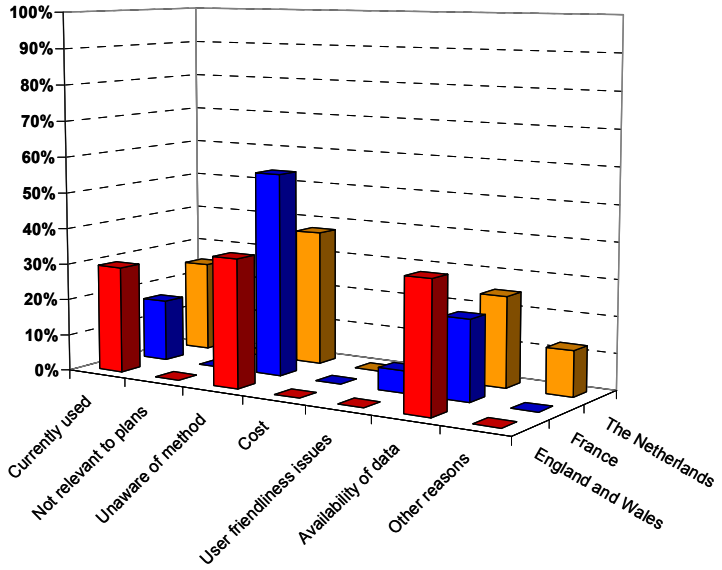


C Optimal evacuation routes from inundated areas

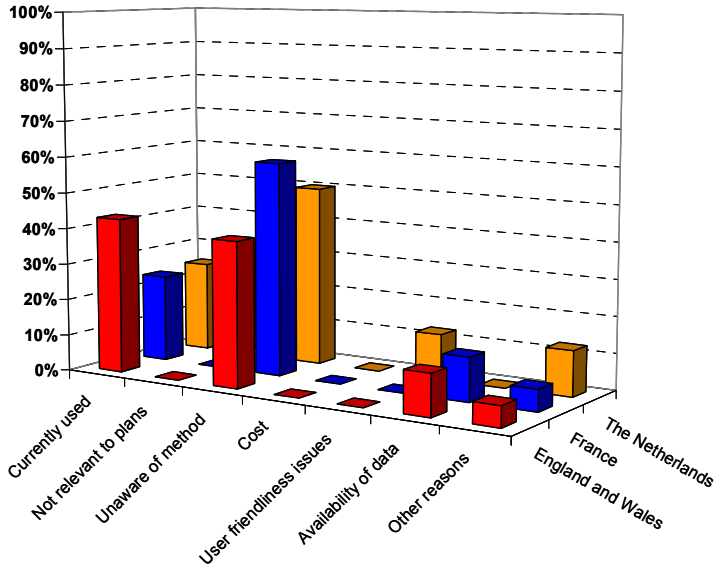


D Effects of improvements in the dissemination of flood warnings on the risk to people

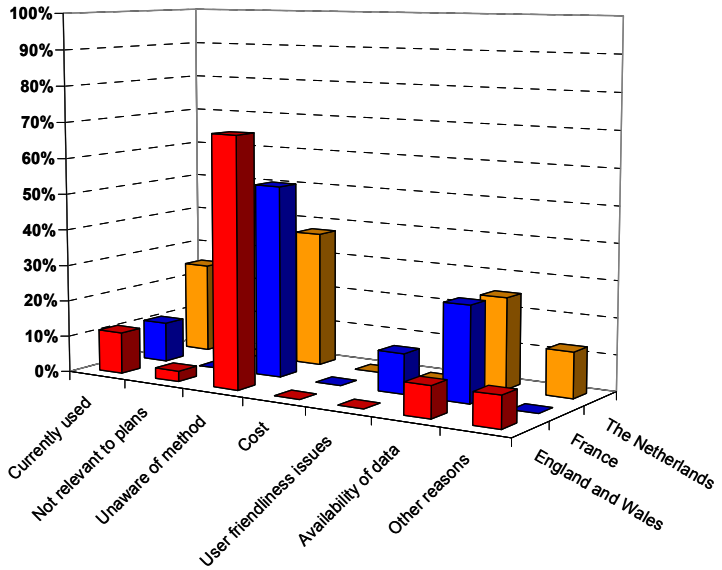
WP2 - Results of surveys



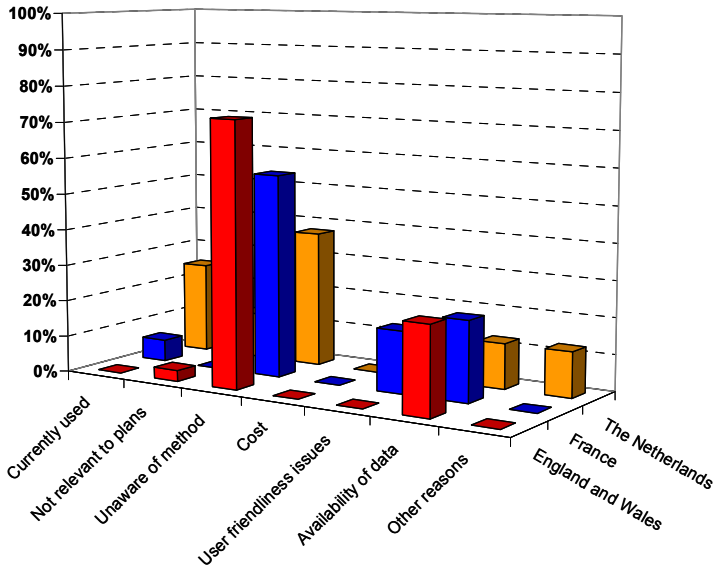
A Potential damage to critical infrastructure



B Optimising the locations of shelters with respect to floods



C Assessment of other hazards triggered by flooding



D Probability of buildings collapsing during floods

WP2 - Conclusions

- The two main obstacles to tools not being used appear to be:

1. Lack of awareness of the methods that are available
2. Availability of data

- There is a requirement for some form of guidance on what tools are available, what data they require and how they can be implemented to give information that can be used to improve emergency plans for floods.

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Questions?

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