

The use of national risk assessments in the Netherlands and the UK

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Abstract

The use of national risk assessments, a process used to assess the risks associated with large scale unwanted events that might cause disruption of entire states and their societies, is becoming increasingly popular among European countries. National risk assessments usually consist of several phases; scenario development, scenario analysis by experts, assessment by bureaucrats and compilation of a matrix depicting the scores of the scenarios in relation to each other in terms of probability and impact. They generally examine both intentional threats and accidents that might impact the functioning of infrastructure and society in general with nearly the same methodology; hence they may be described as using an all hazard approach.

Most of the writing on national risk assessments has focused on issues related to the methods; how likelihood and impact are scored as well as how these are combined to reflect a specific point in the risk matrix. The actual use and results of national risk assessments do not appear to have received similar attention, perhaps because they are still a relatively new phenomena. This is an interesting issue because actual use of risk assessments, even at lower levels of government in terms of informing and developing policy, appears to be challenging.

This dissertation therefore considers two main dimensions of use of national risk assessments;

1. What are the broad functions of national risk assessments for the actors that participate in or use it?
2. In terms of actual concrete policy making what are the type of projects that emanate from national risk assessments?

This dissertation explores the manner in which the Netherlands and the UK have undertaken use of their national risk assessment, what this says about the general functions these programs have, and the meanings attributed to the national risk assessments.

Rather than seeing the national risk assessments through the lens of and measuring them against a particular normative framework, this dissertation focuses on exploring how national risk assessments are used. This is done by focusing on developing an understanding of how the assessments are used based mainly on empirical evidence. To do this a grounded theory approach which asks the researcher to base the development of his or her understanding of phenomena on empirical data rather than pre constructed, theoretical frameworks, is be used.

Through the use of grounded theory, a main category; development of capabilities is derived. Based on, this types of use; both of the process and the findings from the national risk assessments such as policy development, dimensioning of exercises, public information, regional and local planning and prioritization are explored in terms of how these occur in the Netherlands and the UK. Examination of these and several other categories show that the national risk assessments are more than mere symbolic tools, they contribute to policy making and government planning both through specialist ministries and the national risk assessment secretariats.

Abbreviations

CCS	Civil Contingencies Secretariat
DEFRA	Department for Environment, Food and Agriculture (United Kingdom)
DoH	Department of Health (United Kingdom)
DSB	Directorate of Civil Protection and Emergency Planning
IWNV	Interdepartmental Working Group on National Safety and Security (Netherlands)
MoH	Ministry of Health (Netherlands)
LRF	Local Resilience Forum (United Kingdom)
MEAAI	Ministry of Economic Affairs, Agriculture and Innovation (Netherlands)
MIE	Ministry of Infrastructure and the Environment (Netherlands)
MIKR	Ministry of Interior and Kingdom Relations (Netherlands)
MSJ	Ministry of Security and Justice (Netherlands)
NRR	National Risk Register (Netherlands)
NSRA	National Security Risk Assessment (United Kingdom)
NSS	National Security Strategy (United Kingdom)
NSSS	National Safety and Security Strategy (Netherlands)
RRF	Regional Resilience Forum (United Kingdom)
SNV	Steering Group on National Safety and Security (Netherlands)
UK	United Kingdom

Preface

This master's dissertation is the culmination of two years of studies of societal safety at the University of Stavanger. It would have been much harder and certainly less fun without the constant company of my main partner in crime; Renate thank you for amazing days of essay and dissertation writing, coffee drinking and running on the tread mill. To my wonderful office mate Lucas; thank you for providing a calming atmosphere, your iTunes and an abundance of cookies.

This dissertation is the result of a project that began in the summer of 2010 when I was asked to write background reports for the Norwegian National Risk Assessment by Professor Ove Njå who has also been my dissertation advisor. Ove; thank you for believing in me, for encouraging me and for providing much needed guidance along the way.

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1. Introduction

The use of national risk assessments, a process used to assess the risks associated with large scale unwanted events that might cause disruption of entire states and their societies, is becoming increasingly popular among European countries (European Organization for Security Civil Protection Working Group, 2009, p. 11). The use of this type of assessment tool, whereby society's exposure to a wider array of threats is considered in one framework might be linked to larger developments in Western security practices such as:

1. A widening of the concept of security to not only include protection against military attacks but also threats against economic, environmental and societal security as well, a shift towards a more comprehensive view of security and a focus on how the challenges to national security and safety are interrelated (Bailes, 2007). This increased securitization also appears to have led governments to take more holistic approaches to security whereby cross-sectoral cooperation is considered to be a key element in preventing and planning for crises and disasters (Caudle & de Spiegeleire, 2010).

2. A change in the manner in which comprehensive security challenges are conceptualized in terms of danger to the public, whereby national security doctrines focus more on risk narratives because national security is affected by threats and hazards that are both known and unknown (Bailes, 2007).

These changes were illustrated by director of the Civil Contingencies Secretariat (CCS) in the United Kingdom (UK), Bruce Mann (2007):

“There has, since 2001, been a fundamental shift in the purpose and organization of civil protection in the UK. The Cold War model of civil defense – focused on a single, monolithic threat, managed top-down by central government in secret and restricted to a small community – has gone. In its place has come a model better suited to a modern network society with its increased connections and interdependencies bringing with them greater vulnerability to external shock. The new model addresses a wide range of security risks, from terrorism through accidents to natural disasters. It involves a broad range of organizations, in the public sector and beyond. Work at local level is the building block of preparedness. And there is a premium on inclusiveness and transparency.”

These two key developments appear to have impacted the role of national protection agencies and offices responsible for emergency and crisis planning, which increasingly seem to have become responsible for developing knowledge about the multitude of insecurity and risks

facing the state (European Organization for Security Civil Protection Working Group, 2009). As part of this work several agencies and specialized offices have undertaken national risk assessments, which are the focus of this dissertation.

1.1. National risk assessments

The term national risk assessment denotes a process that is conducted to assess risk which consists of several phases, the nature of which varies somewhat from country to country. The goal of risk assessments is: "...the generation of knowledge linking specific risk agents with uncertain but possible consequences." Renn (2008, p. 68) also notes that much effort has been spent in attempts to create: "a harmonized set of terms and conceptual phase model that would cover a wide range of risks and risk domains." He finds that the three main generic components of risk assessments are hazard identification and estimation, exposure and vulnerability assessment, and risk estimation.

National risk assessments usually consist of several phases; scenario development, scenario analysis by experts, assessment by bureaucrats and compilation of a matrix depicting the scores of the scenarios in relation to each other in terms of probability and impact. National risk assessments may however also be defined in a wider manner as the creation of a risk matrix, though this is rarely the final stage as states usually also perform some form of capability analysis. Having a capability is considered to be related to having an ability. In the context of the national risk assessments this may be the ability to prevent or manage crises or emergencies related to the impacts described in the scenarios that are used. In national risk assessments capability analyses are examinations of what the necessary organizational arrangements and physical resources, as well as plans, training and legislation, are in relation to the conclusions from the previous phases of the risk assessment process and whether the current capabilities are sufficient or must be improved (Ministry of Interior and Kingdom Relations, 2009).

National risk assessments generally examine both intentional threats and accidents that might impact the functioning of infrastructure and society in general with nearly the same methodology; hence they may be described as using an all hazard approach (OECD, 2003). National risk assessments are conducted by several European countries, among them the United Kingdom, the Netherlands, Switzerland, Sweden, Germany and Norway.

Because an all hazard approach necessitates coordination and interaction between a wide array of public actors it is common for national risk assessments to use a whole-of-

government approach whereby there is an emphasis on engaging the interest and participation of a broad spectrum of public agencies, ministries and authorities so as to mirror the situation that exists in relation to many of the scenarios that are considered (OECD, 2003). An electricity blackout for example will affect the work and planning of a wide array of actors. The assessments also use scenarios that describe a risk – a more or less specific situation in which a large section of society will be impacted. These are created based on input from agencies and ministries using worst case assumptions. Scenarios are scored based on impact on pre selected criteria and on probability by groups of experts on the topic (Caudle & de Spiegeleire, 2010). Based on method documents and official reports on national risk assessments it appears that the main aim of countries using such processes is to employ the findings in planning for, and preventing, unwanted events that affect society at large (Ministry of Interior and Kingdom Relations, 2007, 2009; United Kingdom Cabinet Office, 2010b, 2010c).

1.2. The use of national risk assessments

Most of the writing on national risk assessments has focused on issues related to the methods; how likelihood and impact are scored as well as how these are combined to reflect a specific point in the risk matrix. The actual use and results of national risk assessments do not appear to have received similar attention, perhaps because they are still a relatively new phenomena. This is an interesting issue because actual use of risk assessments, even at lower levels of government in terms of informing and developing policy, appears to be challenging.

This dissertation therefore considers two main dimensions of use of national risk assessments;

3. What are the broad functions of national risk assessments for the actors that participate in or use it?
4. In terms of actual concrete policy making what are the type of projects that emanate from national risk assessments?

The Norwegian Directorate of Civil Protection and Emergency Planning (DSB) finished its first national risk assessment in March 2011. According to a respondent at the Ministry of Justice and the Police consultations regarding how the Norwegian national risk assessment will be used are ongoing; hence it was not possible to study its use. The two countries that have used national risk assessments for the longest period of time, and whose methodologies are frequently used as models by other countries, are the Netherlands and the UK. This dissertation therefore explores the manner in which these two countries have undertaken use

of their national risk assessment, what this says about the general functions these programs have, and the meanings attributed to the national risk assessments. This will be interesting because the development of national risk assessments does not, in and of itself, mean that they will be used to manage risk, or that they will not be used in other ways as well. To explore use of National risk assessments it appeared prudent to not only examine the overall use of their findings, but also to look closer at two scenarios from each country; pandemics and flooding, as this approach was considered more likely to result in specific examples and information regarding translation of recommendations into policy.

To examine *use* of national risk assessments the term use had to be operationalized. The main idea was for the interviewed respondents to be part of this operationalization. When asked how the national risk assessments were used their view of use would contribute to the operationalization of the concept. It was obvious before the interviews were conducted that use usually entails some purposeful action taken by an actor or participant who is aware of their actions. Even before the interviews regarding national risk assessments, based on readings of method documents it was clear that the purpose of the assessments was to support decision and policy making. This therefore provided a foundation on which to develop the concept of use.

The ideal type of findings from an examination of use would be data that not only described the processes, programs and projects that have taken place or been influenced by the national risk assessments, but also the results of these. Impact is however a much more difficult concept to describe and measure than mere use. Even use was at times difficult to understand because national risk assessments are far from the only tools used by governments and specialist ministries in their work to prevent and manage emergencies and crises. Documenting impacts is, according to a respondent at the Netherlands Ministry of Health (MoH), something they and most other government organizations struggle with in much of their work. In particular it can be difficult to trace the extent of an effect back to one specific variable. Although it would have been interesting to describe the impact of the use of national risk assessments, this appeared to be impossible due to time and resource constraints. It would also have been interesting to consider how the findings regarding use of the national risk assessments in the UK and the Netherlands might be applied in the Norwegian context. This would however have necessitated an examination of the Norwegian context and method for which there was not enough time.

1.3. The concept of national risk assessments

The concept of a national risk assessment may also be examined by considering the three main aspects which the name entails.

National

The risk assessments are national because they consider risks that might affect the countries on a national scale, or that might demand a national response because the scenarios that are examined describe reasonable worst case scenarios. The risk assessments are also national because they involve the central government ministries and agencies and use a cross governmental approach – which often leads to them being described as whole of government assessments.

Risk

According to the UK *Orange Book Management of Risk - Principles and Concepts* (2004, p. 7) risk is “uncertainty of outcome.” Assessment of risk, it is recommended, should be done in terms of the likelihood of something happening and the impact that arises if it actually does happen. In the Netherlands national risk assessment method document risk is defined as “a composition of the impact (total of the consequences of the incident scenario and likelihood (a forecast about the occurrence of the incident scenario)” (Ministry of Interior and Kingdom Relations, 2009, p. 24). The Dutch document also explains that the traditional likelihood x consequence definition was not utilized because it implies a purely quantitative interpretation which the Netherlands does not subscribe to.

Assessment

The term assessment may be considered to denote some type of analysis followed by an interpretation of the findings from that analysis, for example the scoring of risk scenarios which is one part of the national risk assessments in the Netherlands and the UK. The actual assessment phase may therefore be considered to be the phase during which findings are considered in light of current realities to determine what should be done. The term assessment also indicates that there has been some application of criteria; in this case not necessarily acceptance criteria, but there may be value judgments in terms of which areas should become the focus of projects, where should money be spent etc. The term national risk assessment therefore indicates that there has been some form of analysis based on a set of criteria, and that these have been considered in light of their implications. When national risk assessments

are referred to in this dissertation it is a reference to the entire process – scenario development, scoring, assessment and creation or determination of findings. The national risk assessments carried out by the UK and the Netherlands differ somewhat in how the analysis, the actual scoring of the scenarios, is assessed. In the Netherlands the findings from the actual risk analysis are used in a capability assessment which then leads to the creation of a findings report, hence the risk analysis is assessed in terms of capabilities to determine what to focus on improving. In the UK the risk analysis and assessment appear to be more intertwined, and though there is a capability assessment it is not as closely tied to the national risk assessment process as the capability assessment in the Netherlands is.

1.4. Research design

Risk analysis and management and the totality of these processes, which at the government level is often referred to as risk governance, are described in numerous normative frameworks which are meant to be adaptable to a variety of circumstances (Aven & Renn, 2010; Renn, 2005, 2008). They make recommendations about what phases a risk analysis or assessment should contain and how the various phases should, ideally be carried out but. Though it is interesting to consider how to best carry out processes such as national risk assessments in light of recommendations this dissertation has a somewhat different focus. Rather than seeing the national risk assessments through the lens of and measuring them against a particular normative framework, it focuses on exploring how national risk assessments are used. This is done, not by measuring actual national risk assessments against and using categories developed in normative frameworks, but rather by focusing on developing an understanding of how the assessments are used based mainly on empirical evidence. To do this a grounded theory approach which asks the researcher to base the development of his or her understanding of phenomena on empirical data rather than pre constructed, theoretical frameworks, will be used. This will also allow for a more exploratory approach in terms of developing an understanding of the meaning involved actors attribute to the national risk assessments.

1.5. The structure of this dissertation

Chapter two explores the method and research design employed in this dissertation; the nature of the data collection and the dilemmas and issues that ensued and the use of grounded theory and the approach it entails to data analysis in the form of open and axial coding. It also

describes the efforts that have been undertaken in terms of ensuring what Lincoln and Guba (1985) describe as the trustworthiness of the research.

Chapter three provides background on the national risk assessments undertaken in the UK and the Netherlands. This was included because an understanding of how national risk assessments are used depends in part on a comprehension of how the relevant findings were developed. The chapter examines the contexts in which the assessments were developed and are used – how they fit into wider frameworks for national emergency and crisis preparation and prevention. It also examines the methods that are used by describing the main phases of each assessment and the main products that the process leads to.

Chapter four presents the main findings from the empirical data collection and, where relevant, discusses the differences between the findings from the Netherlands and the UK. The findings are presented in the form of the main categories derived through use of a grounded theory approach, including open and axial coding. The chapter is not merely descriptive as it contains analysis of the differences between the two main cases; the UK and the Netherlands. This is a result of the use of grounded theory which advocates the use of constant comparison when developing categories; hence it appeared natural to include the results of this process in the findings chapter.

Chapter five; a concluding discussion provides further analysis and a summary of the findings at a more aggregated level and describes how a tentative substantial model from grounded theory in relation to the use of national risk assessments might look. It also attempts to clarify what the use of national risk assessments might indicate about the meaning attributed to these processes in the Netherlands and the UK. In addition it discusses the main findings in relation to the risk management phase of Renn's risk governance framework and the use of a resilience based approach to handle events within identified high risk areas and the differences in the capability concepts employed by Renn and the UK and the Netherlands in relation to the national risk assessment.

2. Method and research design

In this chapter the research design and strategy, data collection and analysis are described. It also deals with issues regarding the trustworthiness of the research process. The aim is to reflect over, explain and justify the decisions that were made and the manner in which the dissertation work was conducted and organized.

2.1. Research design

A qualitative approach was chosen to explore the use of national risk assessments. It was considered the most appropriate research design as it allows for a detailed and rich examination of phenomena and organizations (Creswell, 2009).

Because of the state of knowledge about the use of national risk assessments an exploratory design was chosen. It is commonly used in situations where there is a relatively low level of information about a phenomena or problem, and where the aim is to increase understanding and collect information (Johannessen, Tufte, & Kristoffersen, 2004). It is a design type that is well suited for situations where the nature of the main variables and the dimensions of the research problem are not easily defined in advance of the data collection itself (Grønhaug, 1985). There are normative theories that are concerned with how risk governance, the whole process from risk assessment to risk management should be conducted (Aven & Renn, 2010; Renn, 2005, 2008). It would have been possible to use one of these as a framework for examining the national risk assessments. This approach was not chosen because what was considered to be interesting was not how the use of national risk assessments in risk governance measures up to normative theories that describe ideal processes. Instead the focus of the research has been on developing and understanding how actors actually use the national risk assessments. To do this it appeared prudent to utilize a particular type of exploratory design; grounded theory.

Grounded theory was developed by Glazer and Strauss (1999) as both a methodology and a method; that is, as a way of thinking about how to study and think about social reality and a set of specific procedures and techniques for collecting and analyzing data. As with the normative ideal for risk governance the grounded theory method described by Strauss and Corbin (1998) may also be considered to describe an ideal research process which cannot always, due to time and resource constraints, be replicated. For example the idea of collecting data until additional data does not add to the categories that have been created is difficult to

apply during work on a master's thesis. The idea is that research is not begun with a list of specific variables in mind, rather one allows for an organic development of the direction of the study through a continual interaction between data collection and analysis. The idea is to begin "...with an area of study and allow the theory to emerge from the data"(Strauss & Corbin, 1998, p. 12). According to Mjøset (2005, p. 384) "Grounded theory generates knowledge at the middle or low level, which means that it applies within more or less broadly specified contexts." Strauss and Corbin (1998, p. 22) define theories as: "...a set of well-developed categories (e.g., themes and concepts) that are systematically interrelated through statements of relationship to form a theoretical framework that explains some relevant, social, psychological, educational, nursing or other phenomenon." It is, however, before one actually begins coding the collected data, difficult to know what one will find, and therefore whether it will be possible to actually develop mid level theories based on the collected data.

When using the grounded theory method it is recommended that the data collection and analysis should be conducted in a parallel process. Using this approach enables researchers to start the data collection with an open mind and as the study progresses narrow the focus of the research or take it in new directions. According to Johannessen et al. (2004) grounded theory can be used in two ways; to generate theory grounded in data or merely as an approach to data collection and analysis. Strauss and Corbin (1998) emphasize that even if the grounded theory method is used the end goal need not necessarily be the generation of theory, attempting a mere conceptual ordering, the main purpose of this dissertation is also a legitimate goal.

When using a grounded theory approach the ideal is to have an a-theoretical approach to the research question and data collection, merely focusing on the data at hand as it is collected rather than preconceived ideas about how systems or processes work. This entailed that the initial focus was not on finding a theoretical framework into which the use of national risk assessments might fit, rather it was discovering as much as possible about the national risk assessment processes and how the recommendations from these were used by actors. One of the main benefits of this approach is that one does not come to organize and examine the empirical data through one specific lens; rather, one's own understanding of the process, as free as possible of frameworks, is allowed to develop.

Strauss and Corbin (1998) note that there is no expectation of the researcher conducting data analysis without a theoretical background; rather they expect researchers to arrive with an open mind. They note that "It is by using what we bring to the data in a systematic and aware

way that we become sensitive to meaning without forcing our explanations on data” (Strauss & Corbin, 1998, p. 47). Lijphart (2008, p. 256) agrees that in reality this is not feasible as: “...almost any analysis of a single case is guided by at least some vague theoretical notions and some anecdotal knowledge of other cases.” Hence, during data collection it is important to be aware that: “...it is not the researchers’ perception or perspective that matters but rather how research participants see events or happenings” (Strauss & Corbin, 1998, p. 47). Researchers will in most cases have some preconceived idea as to what they are looking for, or perhaps knowledge about theoretical frameworks and concepts that may be related to the topic. There is, in essence, some notion of what one is looking for, or looking at, as well as some categories that one uses to sort information as it becomes available. The theories that have dominated my pre-understanding of the topic are mainly related to public policy formation, policy and implementation tool selection and implementation processes as well as theories of risk governance and models that describe ideal types of such processes.

2.2. Conceptual ordering

Since a grounded theory approach and an exploratory design were used the exact nature of the variables to be measured or considered were not defined in advance, hence the direction of the data analysis and the actual categories into which it was organized were developed gradually. The main variable, *use* had been selected during the development of the research question. However, it had only begun to be developed as a concept when the data collection was begun. The idea was to let the categories develop alongside the data collection.

Grounded theory methodology: “...provides a systematic process for the abstract conceptualization of latent patterns within a social reality” (Holston, 2007, p. 269). The abstraction process, known as coding may occur in several stages. The essence of coding is “...to abstract from empirical indicators (incidents in the data under analysis the conceptual idea without the burden of descriptive detail” (Holston, 2007, p. 272). The goal is not merely to describe what the data describes, but rather to explain how phenomena occur in several groups and settings. In grounded theory the coding process, the analysis of the data is not a separate stage, but rather a continuous process (Strauss & Corbin, 1998).

2.2.1. Open coding

The initial and most basic type of coding is referred to as open coding: “...the analytic process through which concepts are identified and their properties and dimensions are discovered in data” (Strauss & Corbin, 1998, p. 101). The aim of open coding is to use the

data to develop categories, essentially grounding the categories in the data collection, the process by which they are generated. According to Strauss and Corbin (1998, p. 101), during open coding: "...data are broken down into discrete parts, closely examined and compared for similarities and differences" to develop categories of observed phenomena. The various parts of the coding process are meant to give: "...the researcher a condensed, abstract view with scope and dimension that encompasses otherwise seemingly disparate phenomena" (Holston, 2007, p. 238). The initial step of the open coding process calls for identification of concepts, essentially labeling of phenomena which are described in the collected data (Strauss & Corbin, 1998).

Strauss and Corbin (1998) note that open coding can be done by word, sentence, paragraph or page, depending on the content that is being coded. During the open coding collected data in the form of transcribed respondent responses were analysed by paragraph – in terms of answers to interview questions. This approach was chosen because it was not as time consuming as sentence by sentence coding. During the interviews – which had a semi structured format – respondents on numerous occasions spoke of issues that were not directly relevant to the research question. After coding the paragraphs it became clear that some paragraphs contained more interesting answers than others. Based on this some of the paragraphs were also coded using sentence by sentence coding. Among the phenomena that were coded were events, actions, interactions and objects. For example a respondent at the CCS commented we: "...basically give them a description of what the different risks are that they should be looking at." This was labeled top down risk description. Another respondent at the CCS who worked on the pandemic influenza scenario explained: "...they [the business continuity group at the CCS] will basically take these figures in terms of absenteeism and actually pandemic flu has one of the highest figures and telling businesses, you need to plan to have up to 20% of your work force off sick, and you need to think about prioritization." This was initially coded as using specific figures to illustrate importance of preparedness to businesses in terms of business continuity.

The documents that were analyzed were examined in a more general manner. When it had been established that the document, and thereby also a strategy, program or project could be related to the national risk assessment the section of the document that described the link to the national risk assessment was analyzed and a label was created. In addition, it was important to understand what other factors had influenced the project/ strategy / program.

Also, the sections of the document that described its purpose in terms of how and who was responsible was considered.

Initially the coding was done by using the transcribed interview documents and inserting comments to identify the phenomenon. Eventually these were listed in a table. If a label was used several times they were listed together in the table to make it easier to work with category development later. This coding process was done after the first six interviews which were all with respondents who had worked with the method or the scenarios from the national risk assessments.

Based on document analysis and preparation for the interviews it had already become clear that there were two main aspects of the national risk assessment that could be “used.” These are the process itself and the findings and results. As the initial, open labeling was taking place it also began to become evident how they might be linked in terms of having common characteristics and therefore be part of a category. During the coding memos in the form of notes were written. These contained additional reflections regarding the labels and ideas about how they might be related. The development of the categories also made it clear that there were certain concepts such as capabilities and policy that would have to be explored both in terms of how they were treated in academic literature, what respondents meant when they used them and how they were described in the national strategy and method documents. These are discussed in the empirical findings chapter.

The difficulty was deciding what type of categories would work best. It was, for instance possible to categorize use in terms of the actors that undertook the use – central government and national risk assessment secretariats, ministries, local and regional authorities and thereafter create subcategories for each. It also appeared that some of the categories, such as prioritization of risk areas could be stand-alone categories but could also be considered a subcategory of the category policy development. Hence, the problem was that several of the categories could be related to each other. Discovering links between categories, though frustrating in terms of determining structure is however an important part of grounded theory coding; it is known as axial coding.

2.2.2. Axial coding

Axial coding is: “... the process of relating categories to their sub categories, termed axial because coding occurs around the axis of a category, linking categories at the level of properties and dimensions” (Strauss & Corbin, 1998, p. 123). This aim is, as described above,

to discover how categories cross-cut and link. In terms of relating categories to sub categories it was for example necessary to think about how the various types of “working with capabilities” such as confirming and thereby perhaps not adding anything new, discovering new capabilities and encouraging further development of existing capabilities related to each other.

Another important aspect of the analysis process was the use of constant comparison. The purpose of using this technique is: “...to see if the data support and continue to support the emerging categories” (Strauss & Corbin, 1998, p. 67). According to Strauss and Corbin (1998, p. 67) the use of comparisons are important during data analysis because: “...they enable identification of variations in the pattern to be found in the data.” They note that the researchers’ interest should not merely be in categories and patterns but also about in how the pattern varies dimensionally. Strauss and Corbin (1998) find that they use comparisons in ways that are both similar and dissimilar from the traditional comparative method. They use comparisons in terms of comparing incidents or cases and in terms of doing theoretical comparisons to: “...stimulate our thinking about properties and dimensions and to direct our theoretical sampling” (Strauss & Corbin, 1998, p. 72). It is natural to compare the incidents or cases etc. in order to classify the data – this way one uncovers both similarities and differences. The comparison therefore serves to develop or uncover the meaning of a category.

Constant comparison was used when the findings data from the Netherlands and UK were considered after both were transcribed. To a certain extent it was also part of the interview process during both the first and second round of the interviews in The Hague, which were conducted after the interviews in London. During the labeling, and as the various categories described in the data analysis emerged through constant comparison, it also appeared necessary to develop each of the categories further in terms of their properties and dimensions, the aim being the identification of sub categories which might distinguish similar phenomena from each other.

Though open and axial coding have been described separately above they are in actuality often ongoing at the same time and build on each other. According to Strauss and Corbin (1998) this is the norm because the types of coding build on each other.

The categories of use that are discussed in the results chapter were derived through the coding process and the use of comparisons. The final categories hence became the variables, the attributes or features which vary amongst the units.

2.2.3. The main categories that were developed:

Use of findings

- Communication with the public
- Prioritization of risk areas
- Policy related activities

Use of the process

- Coordination of government / ministerial efforts
- Discovery of dilemmas
- Involvement of new actors
- Agenda setting

2.2.4. Selective coding: building theory – or models

The aim of using grounded theory may be described as developing either a theory or a model that explains a phenomenon (Strauss & Corbin, 1998). Based on the time available and number of respondents that were interviewed, it appeared impossible to develop a “theory” in relation to the use of national risk assessments because it was not possible to collect enough data to get to a point of saturation – where new data and analysis would modify or add to the findings. Based on the findings from the coding processes it has been possible to create a tentative model regarding how the UK and Netherlands use their national risk assessments. Glaser and Strauss (Glaser & Strauss, 1999) describe these types of results as substantive models because they describe a particular specific group or phenomenon. Having based the data collection on only two national risk assessment programs does however limit the ability to generalize about the use of other countries’ national risk assessments. The Netherlands and the UK methodologies have however provided input to several other National risk assessments, hence it might be argued that there could be similar types of use. The use of the national risk assessments will however also depend on the context in which the program is placed, for example in the UK and the Netherlands the programs are part of wider national security strategies.

2.3. Case selection

The national risk assessments and planning, emergency and crisis response and prevention work conducted by the UK and the Netherlands were the two main cases through which the research question was explored. In each of these countries two scenarios from the national risk assessments; flooding and pandemic influenza, were examined in closer detail to understand how their findings had been used. The use of the term “case” in relation to a grounded theory may, at first, seem somewhat contradictory as case studies are a separate methodology. Literature on case studies is highly diverse with regard to how cases are defined and views on how they should and can be used (Ragin & Becker, 1992).

In their initial description of grounded theory Glaser and Strauss (1999) avoided using the word case and instead referred to selecting groups for comparison, or groups from which to collect data. If one considers the use of cases to be a research strategy rather than a method as Yin (2009) appears to, it might be argued that the use of grounded theory does not exclude the use of cases. Eisenhardt (1989) appears to view case studies as being compatible with attempts at theory development through for example the use of grounded theory. She categorizes the work done by Glaser and Strauss and Strauss and Corbin as exemplifying how one might go about: “...building theory from case study research” and finds the approach to emphasize: “...both the emergence of theoretical categories solely from evidence and an incremental approach to case selection and data gathering” (Eisenhardt, 1989, p. 536). Eisenhardt (1989, p. 534) defines case studies as: “...a research strategy that focuses on understanding the dynamics present within single settings.”

The selection of cases that are to be studied is important because the sample that is examined – in this case the national risk assessments of the Netherlands and the UK – defines the extent to which generalization and thereby also theory development is possible based on the findings. The Netherlands and the UK were selected because they are considered to be the most well developed national risk assessments. They are also the most mature national risk assessments, hence a sufficient amount of time had passed since the initial assessments to allow for actual use in terms of for example policy development. National risk assessments are not a widespread phenomenon; hence it was considered that examination of two cases might provide insights regarding how they are used. Ideally several other national risk assessments such as those carried out by Canada and Germany might also have been examined.

As constant comparison is one of the main techniques used in grounded theory research the groups that are compared might be referred to as cases. Eisenhardt (1989, p. 537) notes that in grounded theory “cases are chosen for theoretical, not statistical, reasons.” According to Glaser and Strauss (1999, p. 49): “...The researcher chooses any groups that will help generate, to the fullest extent as many properties of the categories as possible.” They note that ideally the researcher “cannot cite the number and types of groups from which he collected data until the research is completed” (Glaser & Strauss, 1999, p. 50). This was not the case in terms of this dissertation. The limited time for data collection meant that the two main cases had been defined in advance. The extent of the data that would be collected regarding each of the cases was however not defined in advance but was, at least in part determined by the initial round of interviews. Strauss and Glaser (1999) emphasize that the comparability of groups or cases should not be of concern when using grounded theory because similarity and variety between cases can both contribute to the development of categories during conceptual ordering.

To explore the use of national risk assessments it was considered prudent to examine two national risk assessments, two scenarios in each and the specific use of these. Pandemics and flooding were chosen based on several factors. A pandemic is likely to be similar across countries, hence if there is a pandemic influenza in the UK it will likely be the same virus as in the Netherlands. Similarly, especially in terms of coastal flooding, if the UK experiences a coastal flood the Netherlands is likely to be affected as well. The examination of two scenarios was considered likely to provide more in depth information about how secretariats and ministries use the national risk assessment. In addition, as the national risk assessments involve many individuals it was unlikely that one person would be knowledgeable about the entire process. Examining specific scenarios was also beneficial because the respondents who were knowledgeable about the scenarios and who worked in ministries that were responsible for the related risk areas, could give clear examples of projects and detailed accounts of the work that was undertaken in relation to them.

The two main scenarios both cover civil emergencies. There are publicly available documents regarding preparedness and prevention of flooding and pandemics online for both countries, though the degree of information regarding the national risk assessment and the relevant scenarios varies, the Netherlands being more open and the UK more restrictive. Though it would have been interesting to examine whether the cases related to hazards are used differently than those related to national security, such as terrorist attacks, access to such

information is not readily available and the initial contact persons at each of the secretariats discouraged pursuing that type of scenarios.

2.4. Data collection

Strauss and Corbin (1998) note that the focus of grounded theory is emergence – of categories and potentially of theories. They discuss data collection as part of the research design and note that it must be allowed to emerge because: “As concepts and relationships emerge from data through qualitative analysis, the researcher can use that information to decide where and how to go about gathering additional data...” (Glaser & Strauss, 1999, p. 33). The idea is that the researcher will determine when enough data has been collected, but this end point will not be pre-defined. Though the first round of interviews with respondents at the secretariats that were responsible for national risk assessments was used to determine what type of data should be collected and what type of respondents should be interviewed, the data collection for this dissertation was severely limited by the time constraints. Had time been available it would have been beneficial to examine the national risk assessments of several more countries, a greater variety of scenarios within each of them, to speak to at least two groups of individuals at ministries; those who worked on policy and who implemented policies, as well as individuals at the local and regional level. It would also have been interesting to discuss the use of the national risk assessments with political appointees and individuals who held senior positions in the ministries to gain an understanding of how they view the roles of the national risk assessments.

The data that was utilized to attain information about the use of National risk assessments was collected from government documents outlining the National risk assessments, presentations and publications by the offices and agencies responsible for the National risk assessments and interviews with relevant respondents.

2.4.1. Official documents

Documents outlining the method behind the national risk assessments were used to gain information for the chapter outlining the process of undertaking a national risk assessment. These do however only mention use briefly, often merely stating that the national risk assessment has a policy development purpose. In terms of describing the method behind the national risk assessments the official documents should be considered to describe an ideal process. The interviews were however used to confirm or gain added insight into the descriptions from the method documents.

Presentations by individuals who have been involved in the national risk assessments were also used. They proved in particular to be a good source of diagrams that illustrate the various processes. In addition documents that describe public projects and programs were used. These however often did not spell out what the background of the project or program was and what the impetus for their development was; hence the relevant documents were often only identified after interviews with individuals who had been involved in the national risk assessments. Respondents in several instances mentioned documents that the national risk assessments were related to, though this often was not mentioned in the actual documents. These were used to provide illustrations of the types of policy programs or measures the national risk assessments have been used to develop.

2.4.2. Interviews

To gain access to information regarding the use of the national risk assessments it was necessary to conduct interviews with two main groups; individuals who work in the national risk assessment secretariats and who work in government agencies, ministries and administration whose activities are related to the recommendations from the national risk assessment. Information about the processes, the recommendations that were made and how these are followed up was provided during interviews with employees at the agencies responsible for the UK and the Netherlands' respective national risk assessments. The respondents were recommended by contacts in the respective secretariats, access to whom was facilitated by the DBS.

It was considered to be necessary to get perspectives on the use of the national risk assessments other than those held by respondents at the secretariats. Therefore individuals employed by the agencies and ministries which are actually responsible for dealing with, or planning for, the threats outlined in the scenarios were also interviewed in a second round of interviews. These interviews had two main goals; to gain an insight into their views of the national risk assessment process, and how the recommendations from the national risk assessments had been used. Upon deciding who the best interview objects in agencies and ministries would be it might have been prudent to interview individuals without ties to the national risk assessment who were knowledgeable about the activities carried out by the ministry in relation to the risk area in question. It was also considered important to gain an insight into how the end users of the national risk assessment projects worked with what came out of the assessments. The ideal would have been to do both, but access to respondents that were not related to the National risk assessments. Gaining access to such individuals was

however considered to be very difficult, hence respondents from the first round of interviews were asked to recommend individuals who had worked on the national risk assessments at the ministries, and who therefore could be considered to be “end users.” The first round of interviews did however show that the distinction between working on the method and the scenarios and working with the end results of the assessments were often connected tasks. The individuals at the secretariats that were responsible for a scenario often also worked with ministries on the use of the findings. The option of interviewing individuals at the ministries who were end users was chosen because access to these individuals could be facilitated by the interview objects from the secretariats, otherwise it would have been difficult to identify relevant persons, and to gain access to these as there would not be a contact person to facilitate this. Using individuals who were recommended by the secretariat based respondents did however lead to a near complete absence of what might be considered critical voices. During the second round of interviews the respondents that had been recommended were however at times, if not critical of the national risk assessment processes themselves, then certainly of the extent to which they influenced policy making. The second round of interviews was conducted after the initial interviews with the individuals who had been involved in the national risk assessment were completed and had been analyzed using techniques outlined in the section on grounded theory. This meant that the findings from the initial round of interviews could be used when designing the interview guides for the second round and the impressions held by the national risk assessment administrators could be compared with those held by the actual end users. The interview guides that were used are included in the appendix.

The initial contact persons at the UK CCS and the Netherlands Ministry of Interior and Kingdom Relations (MIKR) received a general description of the project and were asked to provide the names of individuals who would be knowledgeable about the specific scenarios and who would be able to discuss the method of the national risk assessments in detail. They both provided the names of two persons who would be able to discuss the pandemic flu and flooding scenarios in the respective countries. The interview subjects in the Netherlands also provided the name of a third interview subject with whom the IT related scenarios were discussed. All three interviews with the individuals that were involved in the national risk assessment projects from the ministries with administrative responsibilities were interviewed at the MIKR in The Hague. After the interviews the interview subjects were asked to provide the name of persons who had been involved in the use of the actual findings in ministries for

the flooding and pandemic scenarios, these two individuals were interviewed during the second trip to The Hague.

In the UK the initial contact person from the DSB as well as two Senior Advisors who had worked in the flooding and pandemic flu scenarios was interviewed during the first trip. These were also asked to provide the names of persons who would be able to speak about their experiences with the national risk assessment scenarios from more of an implementation point of view. This led to the second batch of interviews in London with representatives from the Department of the Environment, Food and Rural Areas (DEFRA) and with an official at the Department of Health (DoH).

All interviews were done in person in a semi structured format. An interview guide was prepared in advance for each of the interviews. The interview guide contained a list of topics that the interview should touch on such as; prioritization, findings, scenario development etc. On a separate page of the interview guide there was also a list of specific questions that could be used if it was difficult to get the interview to flow more like a conversation and that might be cross checked at the end of the interview to check if there were specific issues that had yet to be covered. The benefits of using only topics in the initial part of the conversation was that it allowed the interview subjects to structure the interview, which meant that different issues than the ones initially considered by the interviewer could be brought up. The aim was to allow the interview objects to speak freely about issues, questions were typically asked in the format: “can you tell me about...”, “can you explain what you meant by ...” Follow up questions were based on the initial responses in terms of asking for clarification of terms, or more in depth information about the issues that had been mentioned. It proved necessary to ask follow up questions related to processes and projects that were mentioned in the format of clarifying connections to the NRA because this was not always made apparent by the interview object. The interviews were conducted in person because it was believed that this would yield the best results and allow for an actual conversation. The interviews were recorded with the permission of the interview subjects. This option was chosen because it was believed to facilitate the conversation format that was desired. Interviewing the individuals in person also allowed them to use maps, brochures and power point slides to illustrate their points. For example, during the interview regarding the IT scenarios in the Netherlands the interview subject was able to examine the Netherlands Cyber Security Strategy and point out which parts of it were related to the national risk assessment.

2.5. Trustworthiness of the research

Lincoln and Guba (1985) advise researchers to evaluate and ensure the quality of their own research by considering its trustworthiness. This should be done based on four main aspects; credibility, dependability, transferability and confirmability.

Credibility refers to whether there is confidence in the findings of the research. According to Lincoln and Guba (1985) this has two main aspects; conducting the study to increase its credibility and making an effort to demonstrate the credibility of the research process and findings to readers. One way to ensure credibility is, according to Thagaard (1998) to provide a thorough account of the research process and how it was developed, which has been the purpose of the methods and research design chapter. It describes the use of a grounded theory methodology as well as how the various aspects of the method such as open and axial coding was done.

Dependability refers to whether the research findings are consistent and can be replicated by other researchers with the same respondents or in the same context (Lincoln & Guba, 1985). To make this possible it is necessary to provide a thorough account of the method, data collection and the context in which it took place as well as the analysis techniques that were used to, in this case develop the main categories described in the findings section.

Transferability refers to whether the findings are applicable in other contexts or cases. Lincoln and Guba (1985) recommend that the researcher should provide a thick description in terms of describing phenomena in detail so as to enable others to determine whether the findings might be transferable to other situations or contexts. The context in which the national risk assessments have taken place, as well as the methods used to conduct the national risk assessments have been described in the two background chapters. This was done to allow others to understand the particularity of each process, but also their commonalities. In addition the selection of cases was in part based on the position of the two National risk assessments as they have been used as input for several other national risk assessment methodologies.

Confirmability is related to whether the researcher has remained neutral during the research and whether the findings have been shaped by the particular interest or motivations of the respondents (Lincoln & Guba, 1985). To show that the analytical categories in the data analysis are grounded in the empirical data quotes from the interviews as well as references to explanations made by respondents have been used. To ensure an as thorough as possible

understanding of the use of national risk assessments respondents from the secretariats and the ministries that used the findings were interviewed, this might be considered a form of source triangulation. The respondents in the second round of interviews were however selected based on recommendations from the initial respondents; hence the extent to which the second group of respondents were independent might be questioned. During the interviews these sources did however appear to be critical of the national risk assessments and their overall role in the work done by ministries.

3. The nature and background of national risk assessments

To understand and discuss the manner in which national risk assessments are used it is necessary to provide an introduction to the national risk assessments; their methodology and content as well as the context in which they were developed. The descriptions of the national risk assessments are based on information from respondents at the administering organizations. In addition publicly available documents have been consulted; in the case of the UK the National Risk Register (NRR) and testimony submitted about the national risk assessment to the House of Commons, and for the Netherlands the main method document as well as a conference presentation by De Spiegeleire who has written extensively about the Netherlands national risk assessment and National Safety and Security Strategy (NSSS). The descriptions below are therefore not merely based on normative documents which outline the recommended methods for each of the assessments.

3.1. The United Kingdom

The UK government has carried out a national risk assessment since 2005 as a result of the creation of the Civil Contingencies Act in 2004. According to Cornish: (2007, p. 10) “The key driver for change in UK domestic security policy has been the recent surge in international terrorism, most notoriously the attack on the United States on 11th September 2001.” Terrorism has come to be “...treated as one of a number of causes of emergency, which should be planned for and managed using a variable architecture of co-operation between central/regional and local government, and between the competent agencies” (Cornish, 2007, p. 10). The framework for organizing this work was the Civil Contingencies Act. According to respondents at DEFRA and the CCS the national risk assessment also forms the basis for recommendations regarding civil emergencies in the National Security Risk Assessment (NSRA) and the National Security Strategy (NSS). The assessment, the results of which are classified, is also the basis for the UK National Risk Register (NRR) which provides the public with an overview of the emergencies that the government believes might have a major impact on all, or parts of the UK, and the well-being and safety of its inhabitants (United Kingdom Cabinet Office, 2010c).

3.1.1 The National Security Strategy

Though the national risk assessment is not a direct part of the NSS its purpose still fits well with the goals outlined in the strategy. The first strategy edition, published in 2008, focused on developing capabilities and resilience as well as the need to improve the ability to predict future threats: "...through scanning and effective risk assessment"(United Kingdom Cabinet Office, 2008a, p. 41) . The 2010 version, published after the Cameron government came into office, emphasized that the UK should have a whole-of-government approach to dealing with national security. This meant that agencies and ministries together were to engage with the identified issues. The use of such an approach was justified based on an understanding of security as something that extends beyond military effects. The Cameron government emphasized that their view of security would extend to prevention of domestic emergencies which may be caused by accidents, natural hazards or malicious acts. Based on an understanding of civil contingencies as a security matter, the national risk assessment appeared to fit well with the goals outlined in the NSS (United Kingdom Cabinet Office, 2010c) which states:

"We must do all we can, within the resources available, to predict, prevent and mitigate the risks to our security. For those risks that we can predict, we must act both to reduce the likelihood of their occurring, and develop the resilience."

One of the respondents at the CCS who worked on the flooding scenario noted that the development of the newest NSS by the Cameron government had been beneficial because the national risk assessment now fits into a clear framework regarding national security. The NSS (United Kingdom Cabinet Office, 2010c) focuses on:

- Understanding and tackling the drivers of threats
- Creating planning assumptions to guide security priorities
- Creating capabilities, defined as "personnel, equipment and training, plans, doctrines and concepts of operations, and undertaking actions to tackle the drivers and address the threats outlined in the national risk assessment" (Cabinet Office, 2011a) .

These are goals that appear to be compatible with the work done through the national risk assessment. The National Security Strategy also focuses on how a single capability can be useful in dealing with a multitude of issues. The armed forces, for example, may be used to address threats from states and civil emergencies such as flooding, which fits with the

approach taken by the CCS in terms of the UK Capabilities Program (United Kingdom Cabinet Office, 2008b, 2009, 2010c).

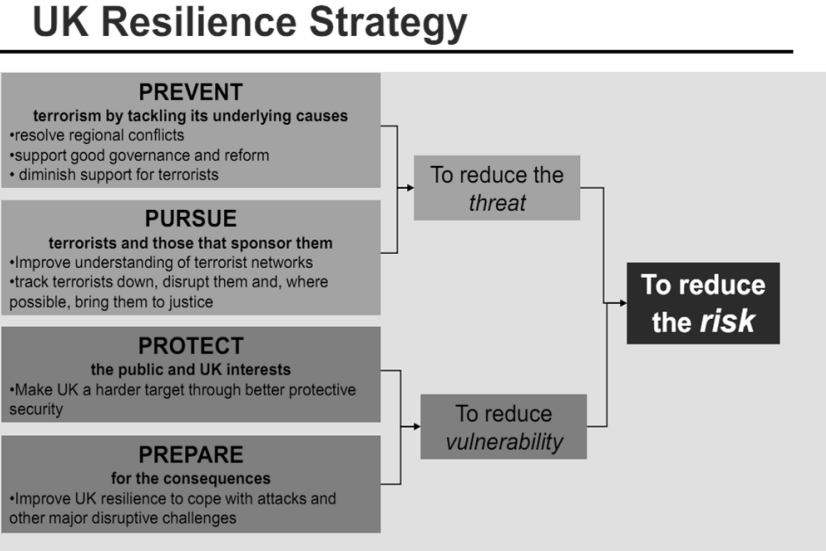
3.1.2. Organization of societal safety in the UK

Societal safety in the UK is organized according to the framework set out in the Civil Contingencies Act of 2004 (Civil Contingencies Secretariat, 2005). The act defines an emergency as “...an event or situation which threatens serious damage to human welfare, or the environment, in a place in the United Kingdom; or war, or terrorism, which threatens serious damage to the security of the UK” (House of Commons Science and Technology Committee, 2011). The purpose of the act was to “provide a single framework for civil protection in the United Kingdom”(Civil Contingencies Secretariat, 2005) The 2004 Civil Contingencies Act mandates the Civil Contingencies Secretariat, an office at the core executive of the Cabinet office with coordinating and facilitating emergency preparedness and

response in the UK (Zebrowski, 2009). When

established in 2001 it “was responsible for addressing the challenges to British society arising from the exponential increase in the circulation of people, money ideas, goods, services, diseases and information that accompanied neo-liberal

Figure 1 The UK Resilience Strategy (Kirby, 2009)



globalization”(Dillon, 2005). The work done by the CCS is organized around a resilience strategy, an illustration of which is provided here using the example of terrorism (Kirby, 2009). The focus is on building resilience into organizations as well as infrastructure networks to enable them to “...withstand, re-route and recombine in the wake of a potentially catastrophic event to maintain system operability” (Zebrowski, 2009, p. 11). The CCS describes the concept of resilience as promoting the ability to detect, prevent and if necessary handle disruptive challenges. Resilience is considered to be a suitable framework for societal safety because there “is an acknowledgement that threats will always be present, and the focus is therefore placed on being able to reorganize and rebound from unwanted events”

(Zebrowski, 2009, p. 11). The CCS does not work directly with emergency response, but rather is responsible for coordinating and facilitating optimal conditions that allow the relevant responders to be self-sufficient. It is also responsible for developing the use of risk analyses in the area of civil contingencies, developing capabilities, conducting exercises, working on business continuity as well as infrastructure and community resilience (Cabinet Office, 2006). Because risk reduction requires mapping of risks the national risk assessment may be considered to be part of the wider resilience strategy employed by the UK government.

3.1.3. The national risk assessment process

The national risk assessment is conducted as a cross government process, also known as “all of government” which uses input from ministries and agencies to assess: “...the impact and likelihood of the major risks, both hazards and threats that the country could face over a five year period” (United Kingdom Cabinet Office, 2008b). The national risk assessment is used to gather knowledge, and therefore examines threats and hazards that are considered to have the potential to provide severe and sudden damage to the population of the UK, its institutions and way of life over a five year period. The main purpose of the assessment is to enable planning for and prioritization of efforts in terms of dealing with emergencies in the UK (United Kingdom Cabinet Office, 2008b). A respondent at the CCS explained that the assessment only covers events that are considered to be so severe that they would require the involvement of the central government. The strategy documents published in 2008 and 2009 outlined a framework for working with threats to national security which included conducting a national risk assessment that leads to the production of a publicly available NRR.

When discussing the actual role of the national risk assessment a respondent at the CCS who worked on the administration of the assessment explained:

“...the national risk assessment is the main risk assessment that we do. The government does, it’s the big one the one that everybody, that is the one that the government uses as sort of its authority. there are other risk assessments going on but this is the one that all the main threats and hazards in the UK reflects, for the next five years... this drives resilience planning across central government but also regional and local government as sort of another part. And what we do is that: the description of the risk define what the capabilities you need to deal with that risk, but also the level that you need to set it at, where do you need to, how much of a capability will you need, for a particular risk.”

The national risk assessment forms the initial step of the resilience planning cycle by identifying the risks faced by the UK. During the national risk assessment process the CCS and individual ministries also agree on planning assumptions and discuss what dealing with the identified risks will mean in terms of resilience requirements and what capabilities are needed to develop a sufficient resilience level (Kirby, 2009).

The UK uses an all hazards approach, whereby both malicious and non-malicious hazards are described in scenarios, which are then assessed, using mostly the same methodology for both types, to allow for comparison across risk areas (United Kingdom Cabinet Office, 2010b). A respondent at the CCS who has worked on the administration of the assessment explained that the reason for using the same method on different risk areas is that they look for:

“...the consequences of risk, the common consequences of risk, so for example we do not talk about a crowded attack on a sports, sorry, an attack or a conventional attack on a sports stadium as one risk and an attack on a shopping center as another. What we have is a conventional attack on a crowded urban area, and the reason we have that is the consequences of your sports stadium, or your street or supermarket or big shopping mall, they essentially have the same consequences.”

Identification of such consequences then lead to the determination of capability needs.

The main stages of the national risk assessment process are:

1. Identification of risks. During this phase the CCS conducts consultations with a wide range of experts in various government departments to ensure that the National Risk Assessment is based on a comprehensive understanding of potential accidents, threats and hazards in accordance with the criteria set out in the Civil Contingencies Act (House of Commons Science and Technology Committee, 2011). According to a respondent at the CCS the government departments propose topics for assessment, most of which are then developed into scenarios.
2. Reasonable worst case scenarios are developed based on the identified risks. These are defined by the Cabinet Office as being: “...a plausible yet challenging manifestation of this phenomenon” [here referring to a reasonable worst case scenario in terms of a severe space weather event] (House of Commons Science and Technology Committee, 2011, p. EV 102). The main purpose of this approach is: “...to exclude theoretically possible scenarios which have so little probability of occurring that planning for them would be likely to lead to disproportionate use of resources” (House of Commons Science and Technology Committee, 2011, p. EV 95). The scenarios are not considered to be predictions of how a type of event

will play out, but rather the worst manner in which it might. According to the Government Office for Science and the Cabinet office the purpose of using worst case scenarios for planning is to ensure that there is a: "...high probability of meeting the demands posed by the hazard should it occur" (House of Commons Science and Technology Committee, 2011). A respondent at the CCS explained that this statement is based on an assumption that most events within the various risk areas will be less severe than the event described in the scenario, hence the capabilities that are necessary should be dimensioned to enable management of the emergency.

3. According to a respondent at the CCS who has worked on the flooding scenario the main responsibility for scenarios is usually held by the ministry that is responsible for the threat area. The Department of the Environment, Food and Agriculture (DEFRA), for example is the lead government department (LGD) in regard to the flooding scenario. Within the ministries a wide variety of experts are used to create the main parameters of the scenarios. They may also consult subsidiary agencies and other ministries as well as scientific advisors during the construction of the scenarios.

A respondent at the CCS who has worked on administration of the program explained that the goal is to keep the UK national risk assessment scenarios as generic as possible so as to cover a range of possible events and geographical areas. This approach was chosen because it is considered to yield more widely applicable and usable recommendations and results, and thereby also better planning tools. The scenarios are described in terms of impacts, for example: a flood that affects up to 300 000 properties for up to 14 days, if necessary, the location of the event is also part of the description (Civil Contingencies Secretariat, 2009). However, since the purpose of the national risk assessment is to develop planning assumptions which are distributed to national, regional and local authorities the scenarios are meant to be so general that their findings might be applied anywhere in the country (United Kingdom Cabinet Office, 2010c).

4. Assessment of likelihood/ plausibility and impact. According to a respondent at the CCS the finished scenarios are distributed to the individual ministries for analysis and assessment. Ministries consider the impact of the scenario on policy areas that they are responsible for. This is done by policy advisors and scientific expert groups within each ministry. Ministries assess the likelihood of a scenario occurring and its potential impact. A respondent at the CCS who worked on the pandemic influenza scenario noted that the

department of Education, for example, considered the effect of a pandemic influenza on the education system in terms of whether schools would need to close due to the severity of the pandemic or a lack of personnel.

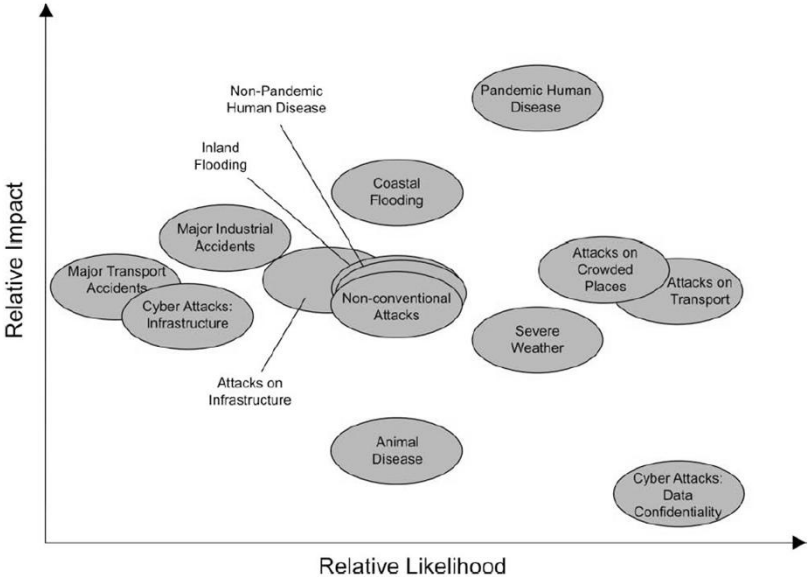
The analysis of the scenarios – both in terms of impact and likelihood is done in two steps. A respondent at the CCS who worked on the administration of the assessment explained that initially expert groups which have been compiled within ministries assess the scenarios “using objective historical, statistical and scientific data where they are available” (House of Commons Science and Technology Committee, 2011). The findings from the departmental assessments are then discussed at meetings involving all the relevant government departments. The respondent noted that the participants in the second phase of the scenario analysis “...are tapped into different groups of experts who all sit in different places in the government, within their departments so they have their scientific advisory groups and they can draw upon their chief scientific advisors.” This means that the participants during the inter-ministerial assessment meetings bring with them their pre developed analysis of the scenario and data to back up their findings.

The impact analysis is done by using ten different headings that measure the economic damage, number of fatalities that are likely to be the direct result of the event, human illness and injury which will occur as a result of the event over a given period of time and disruption of daily life as well as societal disruption in terms of the possibility of public outrage and anxiety that can be expected as a result of an event (House of Commons Science and Technology Committee, 2011). The likelihood of hazards is analysed using a likelihood scoring scale which contains five rather broad categories – a reflection of the difficulty of accurately analyzing likelihood. For the malicious threats separate scores are developed for vulnerability and threat, which are then combined into a likelihood score. For the malicious events: “...the willingness and motivation of individuals or groups to carry out attacks is assessed and balanced against what is known of their capability and capacity, and the vulnerability of their intended victims or targets” (Office for Science & Cabinet Office, 2010). The manner in which the likelihood analyses are done depends on the availability of data. For some of the scenarios more of a reasoning process is required as the experts consider which factors might cause, or increase, the chances of an event. Because the UK’s national risk assessment method is classified, it is not possible to show examples of the scoring and assessment tables. According to a respondent at the CCS who works on administration of the assessments the majority of the risks in the national risk assessment are assessed on a yearly

basis; new scenarios are added if the ministries and the CCS considers them to be necessary. The respondent noted that the CCS for example currently is working on developing a space weather scenario due to the potential effects of increased solar activity on ICT infrastructure.

5. Construction of a National Risk Matrix. According to a respondent at the CCS the impact and likelihood scores for the various scenarios are combined to determine the placement of each scenario in the risk matrix. This is done by combining the scores from the impact criteria into a single impact score and taking the single probability score. Together these determine the location of the scenarios in the risk matrix – an example of which is seen below. The results of the National Risk Assessment are available to the public through the unclassified report the National Risk Register.

Figure 2 National risk matrix UK, 2010 (United Kingdom Cabinet Office, 2010b).



3.2. The Netherlands

The Dutch government has carried out national risk assessments since the development of its National Safety and Security Strategy (NSSS) in 2007 (Caudle & de Spiegeleire, 2010). In the initial findings letter to the parliament issues related to safety were considered to be caused by “disasters, system or process faults, human failure or natural anomalies such as extreme weather” (Ministry of Interior and Kingdom Relations, 2007). In the same document security issues were deemed to be caused by intentional human actions. The method document that describes the NSSS notes that “Threats to our safety and security are changing and are becoming increasingly intertwined ” (Ministry of Interior and Kingdom Relations, 2007). This is an implicit grouping together of what others might refer to as threats (intentional) and hazards (non-intentional). The two are however grouped together as both being able to cause disruption of the state or society. This understanding also forms the foundation for the use of an all hazards method whereby, according to the 2009 method document: “An approach is required that is holistic and coherent, that can consider all threats: no longer must specific (known) threats underpin planning and policy, but the extent to which national safety and security is threatened or could be threatened must be taken as the starting point” (Ministry of Interior and Kingdom Relations, 2009).

3.2.1. Organization of societal safety and security in the Netherlands

According to Van Erde (2011) the ministries in the Netherlands are responsible for preparing for crises within their own policy domain, but coordination of crisis management is now the responsibility of the Ministry of Security and Justice (MSJ). There is also a National Crisis Center within the MSJ that coordinates the efforts of ministries if a situation that requires the attention of more than one ministry arises. The operational coordination during crises is done through the National Cooperation and Coordination center. At the regional level safety and security is the responsibility of the mayors from the municipalities in the region. There are 25 safety regions whose work is coordinated by the mayor of the largest municipality within each of them and the fire brigade. The chairperson of each safety region is responsible for governmental coordination and cooperation during disasters and crises with regional impact. In addition there are twelve provinces which are headed by the queen’s commissioners who play a role in crisis management at the provincial level.

3.2.2. The National Security and Safety Strategy

In 2004 the government of the Netherlands began to focus on the mechanisms in place for security planning. Based on several studies which were conducted by groups that were internal and external to the civil service the government concluded that there was: "...an absence of a common framework for national security," which, it was deemed, might lead to inefficiencies (Oosthoek, 2006). In addition the project showed that there was not a policy instrument in place that could aid prioritization of efforts and funding, "no unity of command on national security," which had implications for division of responsibilities and decision making power (Oosthoek, 2006). The project also led the government to conclude that there was a need to create a coordinated risk assessment that would improve the ability to discover threats as they were developing and the ability to conduct nationwide risk analyses to determine the actual content of risks. It was also determined that there was "...insufficient proactive national security policy development..." and that "...some government departments required more awareness of security risks" (Caudle, 2009). As a result of this the government tasked the MIKR with leading an interdepartmental project called the National Security Project which was initiated in 2006 (Oosthoek, 2006).

The project focused on what the Dutch call "the entire security chain"; different elements through which the government works to ensure security and safety such as pro-action, prevention, preparation, response and aftercare in relation to nine threats facing the Netherlands (Ministry of Interior and Kingdom Relations, 2007). The Dutch National Safety and Security project led to the development of a National Security and Safety Strategy (NSSS). It was developed in the context of recognition by the government of the Netherlands, the state, and its citizens were increasingly vulnerable to threats which were themselves becoming more and more intertwined and which had the potential to widely impact society and its functioning. They also found that: "...the answer to existing and new threats cannot be formulated by one ministry or organization along. Reinforcement of national security requires a joined-up, integral approach..." (Ministry of Interior and Kingdom Relations, 2009, p. 12).

The purpose of the developing of a NSSS was to create a process function as a guide for national security policy efforts, which could be used by ministries, regional and local government bodies as they created their own subsidiary strategies (Caudle & de Spiegeleire, 2010). The Dutch NSSS was therefore developed to contribute to the prevention of social disruption as a result of disasters or crises in the Netherlands and to assist the government in developing capabilities to respond to crises and disasters (Ministry of Interior and Kingdom

Relations, 2009). The strategy was meant to put “the roles and responsibilities of all parties involved in a coherent framework” so as to increase cooperation and coordination and avoid unnecessary overlap (Ministry of Interior and Kingdom Relations, 2007). National Security is considered to be at stake when vital interests of the Netherlands and its society are: “...threatened to such an extent that it might lead to societal disruption” (Ministry of Interior and Kingdom Relations, 2007, p. 15). The aim of the NSSS is to, through a coherent and holistic approach; deal with threats to the vital interests of the Netherlands. The vital interests are considered to be territorial, financial and ecological security, physical safety and social and political stability. The threats to these interests are considered to consist of three categories; classic threats such as terrorism and wars, socio- economic threats such as disruption of financial and digital systems and natural threats such as flooding and other natural disasters (Ministry of Interior and Kingdom Relations, 2009). The strategy uses a whole of government approach which entails the involvement of ministries and agencies across government in planning to improve national security. According to De Spiegeleire this approach entails the use of three main mechanisms; a government wide foresight function, national risk assessment and a: “...strategic planning system for national security based on government-wide capabilities-based planning (De Spiegeleire, 2009).

3.2.3. The National Safety and Security Working Method

As can be seen in the diagram below the Netherlands national risk assessment is part of a comprehensive process which includes short and long term threat analysis that leads to scenario development and analyses and a capability analysis which is based on the findings from the national risk assessment (Ministry of Interior and Kingdom Relations, 2007). Because the main findings from the national risk assessment are processed through a capability analysis before a findings report is issued, future references to the national risk assessment in the Netherlands include the capability analysis. Hence, when reference is made to the use of the Dutch national risk assessment it indicates how the process or the results of the entire process, the findings have been used.

Figure 3 The Netherlands National Safety and Security Working Method (Ministry of Interior and Kingdom Relations, 2007).



3.2.4. The national risk assessment

According to a respondent at the MIKR the Dutch national risk assessment process has previously been organized by the Threats and Capabilities Programme at the Ministry of Interior and Kingdom Relations but is now the responsibility of the Risk Assessment & Capability Planning Programme in the Directorate of National Security at the Ministry of Security and the Police. This development was a result of reorganization of ministries after the election of a new government in the Netherlands. A respondent who worked on the national risk assessment method explained that in addition to the administrative team at the Ministry of Security and the Police the working method for the NSSS, the national risk assessment process is overseen by two main bodies; the Interdepartmental Working Group on National Safety and Security (IWNV) and the Steering Group on National Safety and Security (SNV). The IWNV consists of civil servants from each of the ministries and the SNV is made up of directors general from each of the ministries which supervise and approve the work done by the IWNV.

According to a respondent at the MIKR the process is based on analysis of pre-defined scenarios which represent threats to the identified vital interests. The national risk assessment process uses an all hazards approach, meaning that all the scenarios or hazards are analyzed using the same impact and probability criteria and scored based on the same scoring method to enable comparison between the scenarios. It is also an all of government process because it involves actors from all relevant sectors of the government so as to enable wide consultation as well as implementation (Caudle & de Spiegeleire, 2010).

The main stages of the national risk assessment process are:

1. Government wide analysis of threats and risks. The risks that are assessed in the national risk assessment are identified during threat analyses based on long, mid and short term time horizon scanning. The main scenarios are developed for the mid-term – up to five years and consist of the development and identification of new and known threats with the aim of developing policies. The threat analyses are thematic in depth studies that make it possible to examine links between several different perspectives such as the effect climate change might have on infectious diseases and extreme weather. In addition analyses are performed to identify long term risks as an exploratory exercise and as a strategic foresight analysis. They examine threats that might influence national security in five or more years. The short term analysis is a horizon scanning exercise which examines threats that might be realized within six months. Signs of urgent threats are shared throughout the government to enable the various agencies and ministries to take action to prepare themselves and to limit the impact of the events (Ministry of Interior and Kingdom Relations, 2007).

The findings from the threat analysis make up the background for the selection of topics for each year's national risk assessment. According to a respondent at the MIKR who worked on method development the final decision regarding which scenarios to include in the National Risk Assessment are made by the IDWG and the SNV. A respondent at the Ministry of Economic Affairs, Agriculture and Innovation (MEAAI) explained that since the national risk assessment was initiated in 2008 the specialist ministries responsible for the policy fields within which the identified threats belong have been tasked with developing the scenarios, often in cooperation with interdisciplinary working groups. Where necessary the scenario development is undertaken using experts from other ministries, corporations, think tanks and private individuals as well. The respondent at the MEAI noted that the scenarios related to IT were commissioned by the ministry from an international IT consultancy firm, which then involved several external IT actors. The method for the scenario development and the requirements for scenarios are outlined in the method document *Working with scenarios, risk assessment and capabilities in the National Safety and Security Strategy of the Netherlands* (Ministry of Interior and Kingdom Relations, 2009). Scenarios are meant to describe an unwanted event that

affects the vital interests defined as affecting national safety and security. The scenario descriptions contain information about the context of the event such as nature and scale as well as vulnerability towards it in the exposed area, the situation leading up to the event such as underlying causes and triggers (Ministry of Interior and Kingdom Relations, 2009). A respondent at the MIKR explained “We write the scenario on a certain place but we do not use the outcome for that particular place.” He found that this way one “...can use the outcome, use the specific nature of the scenario to have the experts visualize what can happen and make a credible scenario and then we generalize it and make it usable for the entire country.” The scenarios also describe the impact of the event in terms of the effect it might be expected to have on the physical environment, critical infrastructure, people and society as well as institutions and administration.

In the Netherlands the scenario development is a highly comprehensive process because most of the information regarding the scenario is put in before the risk assessment stage during which the scenarios are scored. The scenarios that are developed must be possible in principle and there must be an expectation that the described event will have an impact on a national scale. In addition the scenarios have to be so specific that it is possible to deduce a list of necessary capabilities from them. They are meant to cover the scope of possible events in terms of risk gradation (Ministry of Interior and Kingdom Relations, 2009). A respondent at the MIKR explained that efforts are currently underway to change the manner in which scenarios are developed. From 2012 the scenarios will for the most part be written by expert groups from outside the government to minimize the impact ministries and agencies can have on the actual scenario.

New scenarios are developed for each yearly risk assessment, however, the ones that have already been assessed are not reassessed each year even if measures have been undertaken to improve prevention and management efforts. Respondents at the MIKR and the Ministry of Health (MoH) emphasized that some of the scenarios are reassessed, though not yearly. The MoH is for instance, working with the MIKR to update the pandemic scenario this year. When asked whether he thought there should be a reassessment of the risks every year a respondent at the MIKR who worked with method development explained that the method had not been developed to determine how new measures might affect the scenario likelihood and impact. Because scenarios are not reassessed every year it might be argued that the national risk assessment does not lead to the creation of an updated risk image.

2. Analysis of identified risks. During the risk analysis phase the events that are described in the scenarios are measured against pre-defined criteria concerning the impact of the event on the vital interests of the Netherlands and the likelihood of the event taking place (Ministry of Interior and Kingdom Relations, 2009). The impact of a scenario is scored in terms of the following criteria:

Figure 4 Impact criteria Netherlands national risk assessment (Ministry of Interior and Kingdom Relations, 2009).

Vital interest	Impact criterion
1. Territorial safety	1.1 Encroachment on the territory of the Netherlands 1.2 Infringement of the international position of the Netherlands
2. Physical security	2.1 Fatalities 2.2 Seriously injured and chronically ill 2.3 Physical suffering (lack of basic necessities of life)
3. Economic security	3.1 Costs
4. Ecological security	4.1 Long-term impact on the environment and on nature (flora and fauna)
5. Social and political stability	5.1 Disruption to everyday life 5.2 Violation of the democratic system 5.3 Social psychological impact

Figure 5 Consequence scores Netherlands national risk assessment (Ministry of Interior and Kingdom Relations, 2009).

A	Limited consequences
B	Substantial consequences
C	Serious consequences
D	Very serious consequences
E	Catastrophic consequences

For each of the impact criteria a score between A and E is determined. The scoring is based on the extent of the consequences. For each of the criteria the experts are given a description of what impact range the various letters represent (Ministry of Interior and Kingdom Relations, 2009). The table below shows the letter scores for the category 2.1 fatalities.

Figure 6 Fatalities scoring criterion Netherlands national risk assessment (Ministry of Interior and Kingdom Relations, 2009).

time ↓	number →	< 10	10-100	100-1,000	1,000-10,000	> 10,000
		Immediate death (within 1 year)	A	B	C	D
Premature death (within 2-20 years)		A	A	B	C	D

The aim of the risk analysis phase is to be able to develop a complete score for each of the scenarios that enables placement of them in a matrix which represents the relative impact and likelihood scores. The stated purpose of the creation of a risk matrix is to enable prioritization of resources and policy efforts (Ministry of Interior and Kingdom Relations, 2009).

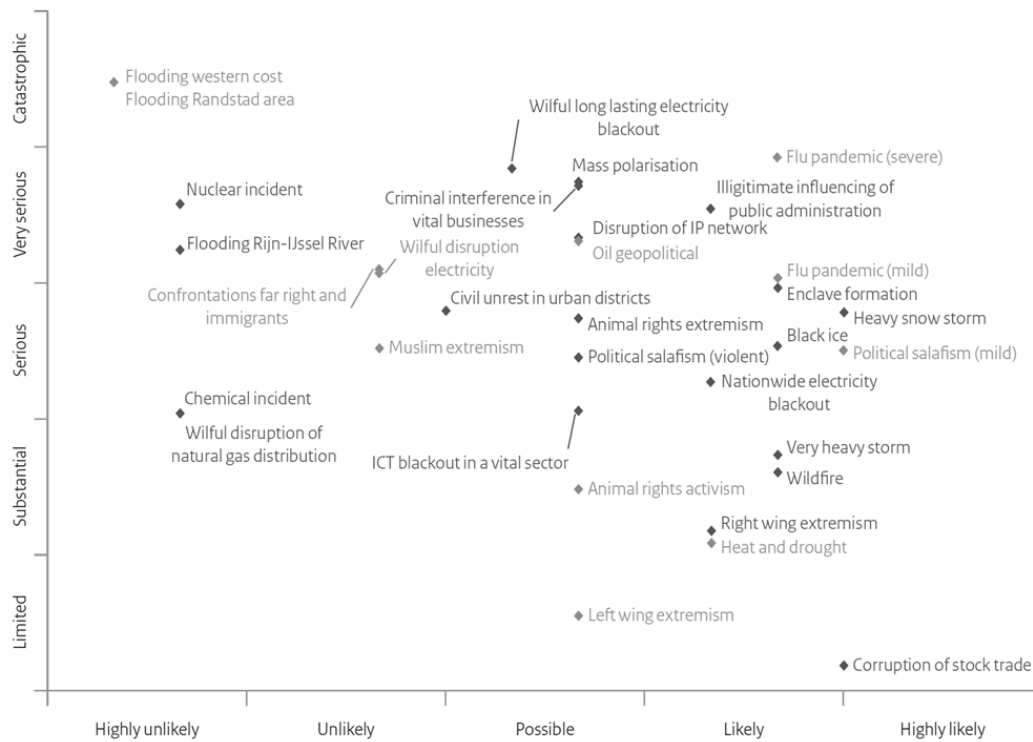
In addition to determining the appropriate score the group of experts must determine the forecast value (V), the lower limit (O) and the upper limit (B) for each impact criterion during the assessment process. The process is not repeated in regard to the likelihood scores.

The purpose of this tool is to make experts explain “the reasons for choosing particular values” (Ministry of Interior and Kingdom Relations, 2009). The information provided from the risk analysis is used in the sensitivity analyses and is meant to “provide greater certainty about the results” (Ministry of Interior and Kingdom Relations, 2009). In addition the groups working on scenarios are provided with a selection of pre-collected data for the economic criteria, for instance a table of average costs for damage to property, infrastructure, health damages and financial losses. Based on the scores a multi-criteria analysis is carried out, combining the scores from each criterion to arrive at an overall impact score for each risk scenario is calculated using a weighted sum method (Ministry of Interior and Kingdom Relations, 2009).

The likelihood of each scenario is also evaluated based on five categories A to E, where A represents a scenario that is very unlikely and E represents a scenario that is very likely. Within each of the categories there are also three sub-categories, low-medium and high. This classification is used for the V, O and B scores. The likelihood score is determined by the trigger; hence it is important that the scenario is clear regarding the causation of events. The likelihood assessments can be based on historic, similar events, statistics, failure data, strategies and actor analyses as well as expert opinions. There are different procedures for the likelihood assessment of threat and hazard scenarios. For the threat scenarios both the likelihood of the scenario and the vulnerability of the expected targets are assessed (Ministry of Interior and Kingdom Relations, 2009).

5. Creation of a National Risk Matrix. Based on the findings from the scoring process national risk matrix is compiled. The stated purpose of the risk matrix is to enable comparison of the various scenarios. The scoring of the scenarios is done using multi-criteria analysis and the weighted sum method whereby each label such as A or E is converted into a numerical value. Each impact criterion carries equal weight in the matrix seen above. Using the total impact and likelihood scores a logarithmically structured risk diagram, such as the one below from 2009 is constructed. The use of this matrix, or the scores used to assemble it will be explored in chapter four.

Figure 7 National Risk Matrix the Netherlands 2009 (Van Erde, 2011).



4. Capability analysis. In the method document the capability analysis is described as the third part of the NSSS (Ministry of Interior and Kingdom Relations, 2009). Though it is considered to be separate from the national risk assessment process, it is the final and crucial step for actually developing recommendations and findings based on the National Risk Assessment. According to the Dutch method document a capability: “...may be a skill or knowledge as well as things like measuring apparatus, or people to do things or legislation to prevent dangerous situations” (Ministry of Interior and Kingdom Relations, 2009). According to a respondent at the MIKR the purpose of the analysis is to determine what can be done to limit the risk, both in terms of the probability or impact of the scenario and whether additional capabilities should be developed to do this. This is a political and value based decision, though it is aided by the relative location of the scenarios in the risk diagram. The respondent noted that the participants in the capability analyses are generally civil servants who are knowledgeable about the state of capabilities and possible manners to improve them. During the capability analysis the experts must also consider the extent to which a capability can be rapidly improved and the value for money in terms of alternative capability investments.

When carrying out the capability assessment the groups are asked to consider who should be in charge of the improvement of specific capabilities and “...the extent to which this party actually wishes to commit to reinforcing this capability...,” hence information is collected regarding willingness to commit to capability improvement projects (Ministry of Interior and Kingdom Relations, 2009). A respondent at the MIKR noted that because several different scenarios may require the improvement of the same capability areas the capability analysis may be performed by groups that focus on themes among the scenarios. A capability such as evacuation or communication with the public may for example be necessary to prevent or manage several different scenarios. In other cases the capability may be specific to a scenario, detailing necessary organizational change and reform or physical capabilities that should be improved (Ministry of Interior and Kingdom Relations, 2008).

5. The findings report. A respondent at the MIKR the capability analysis findings are then reviewed by the IWNV which contributes, together with the administrative unit to the writing of a findings report based on the scenarios assessed that year. The findings report is then sent to the SNV which reviews and ultimately approves the report before it is sent to the Council of Ministers for consideration at the political level.

4. Findings

The two main national risk assessment processes that were examined, though different in many ways, have a basic structure in common in terms of the phases that are used; risk identification, scenario development and analysis, assessment of findings, development of risk matrices and some form of capability assessment. The UK and the Netherlands' assessments both involve a wide array of actors; ministries, agencies, research institutions and an assortment of scientific experts. Individuals who had taken part in the national risk assessment processes in the Netherlands and the UK emphasized that the process itself, not just the findings and results were used in the sense that they had a deliberate function for many of the actors that participated, including the secretariats themselves. The assessments are a meeting place, a forum for coordination and exchange of information. Because of the manner in which the findings from the risk and capability assessments are used the process itself is also an important arena for actors to influence what the content and thereby also the findings, results and recommendations will be.

To understand how the processes themselves are used by various actors it is important to understand the nature of participation in them. In the UK participation in national risk assessment processes appears to be quite high level, only the ministries participate in the actual scoring of the scenarios, though agencies and other actors may be consulted by the ministries during the internal ministry-analysis process. The process is also supposed to be fed by input from regional risk assessments, but the interview objects described the process as being top – down focused. In the Netherlands the participation structure in the national risk assessment process is currently undergoing change in terms of which actors are involved in the selection of risks and scenario development. The process does however appear to include a wider variety of actors and be less hierarchical as regional representatives until now for example have participated in the development of scenarios.

This chapter begins by exploring the general concept of public policy and capabilities and its operationalization in the UK and the Netherlands. Subsequently it explores how the findings from the Netherlands and the UK are used by central government agencies and ministries to develop policy – often within the framework of capabilities in terms of; prioritizing which risk areas to focus on, creating a common foundation for cross government cooperation and planning, empowering specialist responsible ministries with respect to cooperation and coordination with other ministries, discovering knowledge gaps. It also examines how the

findings are used to identify new necessary capabilities, contribute to development of existing capabilities and to confirm the suitability of ongoing policy efforts. Finally it examines the use of the findings in regional and local planning, communication with the public and in the design of exercises.

4.1. Public Policy

The national risk assessments can, at the most basic level, be considered to be used to develop public policy. Definitions of public policy range from short and concise, exemplified by Dyes “...what government chooses to do or not to do,” to lengthy and complex, detailing the content components, levels and tools involved (Dye, 1975). Laswell (1968) emphasized that public policy has several elements; it involves both intentions and behaviors – essentially policy goals and policy means. It arises from a process which is conducted over time, and it usually involves both intra and inter-organizational relationships. Howlett, Ramesh and Pearl emphasize that public policy – the process of matching goals and means, is an applied problem solving process that has two dimensions: a technical one whereby the policy makers attempt to “...identify the optimal relationship between goals and tools” (2009, p. 4), and a political one whereby all the involved actors may not agree on whether or not a policy problem exists, and if it does exist, what the best solution might be. According to Howlett public policy is: “...a set of interrelated decisions taken by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specified situation where those decisions should, in principle, be within the power of those actors to achieve” (Howlett et al., 2009, p. 6). This definition focuses on how policy making is a dynamic process and that policies involve a series of interrelated decisions often taken by several different actors. Hogwood and Gunn (1984, p. 23) argue that public policy to a certain extent is subjectively defined and that it “involves a key, but not exhaustive, role for public agencies,” thereby implying that private actors may also participate in the processes related to policy design. Policies can focus on attaining a specific output or can be focused on more cognitive and normative outputs. A substantive policy usually contains a form of general and rather abstract aims or goals. In addition it also contains less abstract objectives which, if met, are expected to achieve those aims. Following these are often more specific targets or measures which allow for the allocation of policy resources. The means or tools selected for use to achieve the policy goals also range from highly abstract preferences to more concrete tools and mechanisms; for example regulation or information campaigns (Ringeling, 2005). Public policy can therefore be considered to be a complex concept because it is: “...composed

of policy goals and means arranged in several layers, ranging from the most general level of a relatively abstract governance mode, to the level of a policy regime and finally to the level of specific program settings” (Howlett, 2011, p. 16). Based on the aforementioned definitions and characterizations it is clear that public policies usually contain some intention or goal, a designated actor or agency – or several, that is charged with realizing the intention, and often there is also a clarification of the resources available for the task as well as a designation of which instruments are to be used to achieve these. The national risk assessments in the Netherlands and the UK both appear to focus on a specific type of policy aim – the development of capabilities.

4.2. Capabilities

Capabilities based planning is defined by Davis (2002, p. 1) as “planning under uncertainty to provide capabilities suitable for a wide range of modern day challenges and circumstances.” The aim of the process is to develop capabilities, defined as “the general potential or wherewithal to deal effectively not just with a well-defined single problem but with a host of potential challenges and circumstances” (Davis, 2002, p. 2). The idea of capabilities based planning is often attributed to defense planning and the need to “plan based on a changing and more diffuse threat picture” (Ministry of Interior and Kingdom Relations, 2007, p. 24). Both the UK and the Netherlands focus on developing capabilities in their national security strategies which the national risk assessments are related to (Ministry of Interior and Kingdom Relations, 2007; United Kingdom Cabinet Office, 2010c).

According to the Netherlands’ *National Security Strategy and Work Programme 2007-2008* (2007) document the strategic planning phase which is meant to be based on the national risk assessment in terms of prioritization and the development of planning assumptions relies on a capability based approach. It notes that:

“This approach is not geared towards one specific threat or risk. Rather it focuses on what is necessary to prevent the consequences of threats or risks as much as possible (prevention) and/or to be prepared (preparation and response). It is a flexible approach: tasks and capabilities can be used in this approach to withstand various threats” (Ministry of Interior and Kingdom Relations, 2007, p. 25).

Capabilities are considered to be flexible because a skill or the ability to execute a task may be necessary for several threat areas. For example a large scale nuclear accident and a flood may both require the execution of a large scale evacuation (Ministry of Interior and Kingdom Relations, 2008). The actual utilization of this approach was underscored by De Spiegeleire

(2009) during a presentation at the NATO International Conference on Defense Capability Portfolio Analysis. He noted that the Netherlands' national risk assessment: "...forms the basis for a strategic planning system for national security based on government-wide capabilities based planning." He also considers the use of a capabilities approach to be a result of the increasingly complex threat picture and a realization that crises, though caused by a variety of threats, often lead to demand for similar capabilities.

The UK Security strategy also emphasizes the need for a capability based approach and uses the term in relation to discussions of both civil contingencies and emergencies and more traditional national defense issue areas. The UK Cabinet Office defines the capability concept as stemming from defense planning and including: "...personnel, equipment and training and such matters as plans, doctrine and the concept of operations" (Cabinet Office, 2011a). The development of capabilities is considered to be the core framework through which to accomplish the government's goal to: "...build resilience across all parts of the United Kingdom" (Cabinet Office, 2011a). Resilience is defined by the CCS as: "The ability at every level to detect, prevent, prepare for and if necessary handle and recover from disruptive challenges" (Cabinet Office, 2004). According to O'Brien and Read: (2005, p. 354) "...the term is increasingly used in the disaster management sphere and reflects a trend towards a holistic and proactive approach that has the community, its ability to resist and recover as its focus." Cornish (2007, p. 11) found "that the term 'resilience' was chosen in order to indicate the need for a flexible, disseminated, infrastructure wide capability to absorb disruption on a regular basis: distinct from and in addition to the reactive, occasionally convened, centrally controlled character of 'emergency management' and more traditional, security-intelligence agency-led." (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) (Cornish, 2007) The approach is also by nature cross governmental and encompasses capabilities that may be needed by national, regional and local government in a variety of crises.

Based on readings of national risk assessment documents and NSS documents it appears that the national risk assessments are meant to contribute to the identification of high risk areas and the potential impacts of risks and the capabilities that are necessary to prevent or manage these impacts (Ministry of Interior and Kingdom Relations, 2007, 2009; United Kingdom Cabinet Office, 2008a, 2010c). In line with grounded theory the capabilities definitions mentioned above were not considered when developing interview guides or during the data

analysis, the clarification of the capabilities concept was written after the coding and development of analytical categories, hence, respondents were interviewed without specific categories of capabilities in mind and were invited to explain how the national risk assessments were and are used without reference to the concept.

4.2.1. What enables capability building?

The general mandates of the national risk assessments appear to be facilitated by two important aspects of both the Dutch and British processes; a whole of government process and high level ministerial – in the form of civil servant and political – participation and involvement of subsidiary agencies and organizations. According to respondents who have worked on the assessments this high level participation and involvement is crucial for creating processes that have an influence on policy making. In the Netherlands the results of the national risk assessments are processed by the steering group and the intergovernmental working group as well as the Council of Ministers which approves the suggestions laid out in the findings report. In the UK the actual risk assessment and development of planning assumptions is also done by high level civil servants and political appointees. A respondent who worked on the national risk assessment at the CCS pointed out that the participation of high level civil servants enabled the creation of cross governmental policy recommendations and planning assumptions because they were considered to represent the interests and points of view of entire government departments.

4.3. Use of national risk assessment processes

4.3.1. Coordinating government / ministerial efforts:

The national risk assessments in the UK and the Netherlands appear to be actively used by the secretariats and other participating actors to, especially during the risk and capability assessment phases, coordinate efforts related to crisis and emergency planning and prevention. Coordination may be considered to be efforts to ensure common or harmonized action. A respondent at the MIKR who had worked on method development emphasized that because the national risk assessment process necessitates the collection and sharing of information, the actors become informed about each other's efforts to deal with the issues outlined in scenarios, which can contribute to the development of cooperation on areas where there are overlapping responsibilities. The positive side effects of use were described as being able to avoid waste and eliminate confusion over responsibilities where these overlapped.

In the UK and the Netherlands the respondents focused particularly on the manner in which participation in the national risk assessment process can allow for improved coordination between ministries, which by a respondent at the CCS who worked on the flooding scenario were described as sometimes having a “silo” like approach to their own areas of responsibility. Coordination between ministries may be considered to be particularly important in terms of efforts to improve general capabilities that several ministries may have use for or have ownership of. The same respondent noted that generic capabilities such as evacuation, ability to clean up debris after accidents etc. are thought to be relevant for events that may occur within the responsibilities of several ministries.

A Dutch respondent at the MIKR found it to be natural that the national risk assessment was used by ministries to coordinate efforts because the whole aim of the national risk assessments are to examine issues that might be considered to require the efforts of more than one ministry. The same respondent also noted that if the events that were covered in the national risk assessments were considered to be limited to handling by one ministry or agency only then the process had failed before it had begun. This was because the foundation of the national risk assessments was the observation that risks in the form of hazards and threats are complex, hence so also must the prevention and preparation for events be. The national risk assessments were also described as being used by the participants to attain information related to policy areas where they have a stake from other actors. A respondent at the MIKR found that the national risk assessment facilitated the exchange of knowledge so that each of the actors could gain a more comprehensive understanding of a threat or hazard they were responsible for. The respondent worked on the flooding scenario in the Netherlands and found this to be particularly important because flooding policy traditionally in the Netherlands has been the responsibility of actors who appear to work relatively isolated from each other. Another Dutch respondent who worked on method development and the pandemic influenza scenario explained that the physical meeting of participants had yielded positive results in terms of getting projects which previously had been on ice while individual lower level bureaucrats in different ministries discussed back and forth. When the issue of the lack of progress was discussed during the national risk assessment by higher level civil servants at the respective ministries the project quickly gained momentum. Ministries and the secretariat organizations also use the actual results to increase cooperation, they are after all the evidence of where and how there are overlapping impacts, this is discussed further in the section on use of results.

4.3.2. Discovering dilemmas

If a crisis occurs there are often limited resources available to deal with them. According to both British and Dutch civil servants who worked on the administrative side of the national risk assessments the process of discussing potential unwanted events itself can lead to the discovery of dilemmas, particularly in terms of resource use. The process itself was therefore described as being used to discover dilemmas. This type of discoveries among others led to projects aimed at how to handle situations where resource allocation becomes a political issue.

The British respondent who worked on the flooding scenario used the example of multiple regions or municipalities who all need the same resources during a flood. Part of their plans may be to borrow said resources, for example means of transportation or locations for evacuees from other areas. The problem faced by one region may, however also affect others, leaving the emergency resources plan developed by the authorities flawed. A Dutch respondent who worked on the administrative side of the flooding scenario focused on dilemmas at a political level in terms of what policy areas, for example which sectors or groups should be prioritized during a flood. The various scenarios showed that this type of situation was not uncommon, which led to the conclusion that there was a need to strengthen the decision making tools that were meant to enable relatively rapid decisions regarding prioritization, for example during floods.

4.3.3. Involvement of new actors – buying into an area

The national risk assessment in the Netherlands has showcased the importance of business continuity in relation to several risk areas (Ministry of Interior and Kingdom Relations, 2008). Several respondents that were interviewed in the Netherlands emphasized that process itself has proven to be a good arena in which to get these actors involved in thinking about how they would handle complex unwanted events.

In the Netherlands the two respondents who had worked on the pandemic and IT security scenarios emphasized how the national risk assessment had been a valuable tool for involving businesses in societal safety planning. They explained that the extent to which businesses are prepared to handle unwanted events such as a power failure or employee absenteeism related to a pandemic could prove highly influential in terms of how society as a whole might be affected by such an event. Particularly in terms of the IT scenarios, of which there have been four in total, businesses, not the government or other authorities are the most vulnerable and

likely targets in terms of how an event might occur. According to a respondent at the Dutch Department of Health (DoH) participation in the national risk assessment process proved to be an effective way of involving businesses in planning for a pandemic. The involvement of businesses occurred in several ways; they were invited to contribute to the development of the scenarios, or individual businesses and industry organizations took part in the assessments. A respondent at the MEAI explained that one example of business involvement in the national risk assessment is the participation of a telecom firm that deals with IT security in developing scenarios related to IT disturbances such as electricity blackouts or fallout of IP addresses. The individual involved in the IT scenarios found that cooperation through the process itself had created valuable partnerships between private businesses and government agencies and ministries. The process also created a forum for knowledge exchanges.

The individuals interviewed in the UK explained that companies usually are not involved in the national risk assessment; hence there is little room for generating cooperation through the process itself. Work on business continuity has however been one outcome of the resilience strategy that the national risk assessment results are fed into.

4.3.4. Agenda setting

While the forms of use previously mentioned in this section have focused on cooperation and coordination, individuals who have worked on the assessments undertaken by the UK and the Netherlands emphasized that actors also use the national risk assessment processes in more self-serving ways. An example of this is attempts to influence the agenda related to which risks are dealt with in the national risk assessment and therefore which risks become the focus of inter-ministerial policy making and the political agenda. The agendas that the actors attempt to influence can therefore be the view of the whole government in terms of what is considered to be a risk and in terms of what their own responsibilities are deemed to be. Agenda setting may be considered to be efforts to determine the issues which ministries or agencies are tasked with handling as well as efforts to control the process related to determining the prioritization of issues. In the context of the national risk assessments it may also be attempts at ensuring that the importance of a policy issue or topic becomes a commonly known or agreed upon issue outside one's own organization. Respondents who had been involved in the national risk assessment processes emphasized that this type of use can be considered to be both positive and negative; actors may attempt to place issues on the agenda, or work to ensure that they are kept off the agenda. The implications of this type of use is that national risk assessments are considered by actors to be an important process

because it has implications for future projects run by the secretariat organizations in terms of capabilities or the work that individual ministries do.

The National Risk Assessment process offers the involved actors' two main opportunities to influence the governments risk area agenda; the risks that are identified for scenario development and currently, the scoring of those risks in terms of impact and likelihood. By participating in either of these processes actors can influence which risk areas become the focus of the whole of government risk approaches used by the UK and the Netherlands. The opportunity to place issues they find to be important and in need of cross departmental attention on the national risk assessment agenda was believed by the individuals that had been involved with the Dutch process to be important to ministries. They emphasized that when an issue was part of the national risk assessment it might become the subject of increased attention as well as projects and at times additional funding. In the Netherlands one of the interviewed individuals suggested that ensuring that an issue became more high profile and thereby also recognized across government is a way for ministries to share their workload – or at least ensure that other ministries and agencies are also working on issues related to their area of responsibility.

In terms of influencing the actual issues that become part of the National Risk Assessment it appears that there might be more opportunities for this in the Netherlands as the National Risk Assessment there examines new risks, or new variations of risk areas every year. In the UK the actual risks in the assessment are for the most part the same every year. New risks may be added if they are considered to be necessary, but there is no requirement for new risks to be examined every year. This difference may perhaps be explained in terms of the level of specificity of the scenarios that are assessed and the nature of the policy making the assessments are used for, a difference that will be discussed further in the next section.

A Dutch respondent who worked on development of the national risk assessment method noted that the fact that ministries and organizations work actively to get issues into the national risk assessment is not necessarily negative, though he emphasized that the relative power of organizations might be important in terms of how much attention they were able to garner for their own issue. He noted that a far more worrying aspect is when organizations work to keep their own responsibilities off the agenda of the national risk assessment. He argued that this way they can keep their own portfolio to themselves rather than having to share resources and responsibilities with others. It was also noted that this can be a problem,

especially in organizations that are rather specialized or that have had the sole proprietorship of policy areas for a long time.

Actors may also influence the agenda of each scenario by participating in the development of it because this is the phase during which the contexts of the scenario as well as the general areas that are influenced by a risk are outlined. It was explained that this feature of the Netherlands national risk assessment was considered to be less than desirable because it is seen as influencing the independence and therefore the legitimacy of the assessment process. The respondent commented that when: "...you use the experts to write up the scenarios so there is less influence on the writing of the scenarios because of course you can choose the boundaries of the scenarios and the magnitude of the consequences. And if you scale down the magnitude or you make the scenario smaller in its consequences you can keep subjects off the table." He explained that experts who were not employees at ministries and directorates were considered to be better suited to developing scenario because "...they can just write, without any political problem they can just write a scenario that they think is realistic and probable." The respondent noted that to eliminate part of the problem the Steering Group has decided that from 2012 the first stages of the national risk assessment will be outsourced to consultancy companies, academics and think tanks. This way the civil servants will be allowed less leeway in determining the contents of the scenarios themselves, and will instead have to deal with the scenario as it has been developed and scored by external experts. The main role of civil servants will hence be participation in the actual impact, likelihood and capability assessment where they have the needed knowledge about available and shortages in resources. Although this will make the process more independent of the civil servants it appears that this also opens the process more to the same type of activities but by a different group of actors might also have strong interests in the nature of the national risk assessment.

4.4. The use of findings and results from the national risk assessments

The national risk assessments performed in the UK and the Netherlands result in findings that are presented in different formats. Both the UK and the Netherlands produce risk matrices that summarize the findings from the scoring phases of the national risk assessments. In the UK the other main outputs are the scenario descriptions which form planning assumptions that are given to national, regional and local authorities in different formats. According to the NRR and NSS the aim of the scenarios and planning assumptions are to contribute to the identification and development of necessary capabilities, the main purpose of which is to build resilience (United Kingdom Cabinet Office, 2010b, 2010c). In the Netherlands the

scenarios are also considered to be an important output. In addition the Netherlands, which performs a capability assessment using the scenarios from the national risk assessment as part of the National Safety and Security working method, also produces a findings report which outlines the capabilities that are in need of improvement and suggests measures that should be undertaken to improve capabilities. The results of the risk assessment might therefore be described as being translated into a usable – policy oriented format through the capabilities assessment.

The method documents and strategies that outline the national risk assessments of the Netherlands and the UK emphasize that the main goal is to use the findings of the processes to improve policy related to crisis and emergency prevention and planning (Ministry of Interior and Kingdom Relations, 2007, 2009; United Kingdom Cabinet Office, 2010a, 2010b, 2010c). The statements are however quite general. For example the Netherlands' document on working with scenarios notes that: "...based on the risk assessment of all the scenarios analysed, an investigation is conducted to find out which capabilities are already available and which of these could contribute to a reduction of the impact or the likelihood" (Ministry of Interior and Kingdom Relations, 2009, p. 11). In the UK the national risk assessment is described as leading to the identification of high risk areas and the development of planning assumptions that are designed to provide the basis for assessing whether existing plans, infrastructure, equipment, supplies and training are adequate; and, if not, for introducing capability enhancements..."(United Kingdom Cabinet Office, 2010b, p. 55).

4.4.1. Prioritization of measures

Comparison and prioritization are listed as two of the functions of the risk matrices or diagrams that present the scores of the in both the Netherlands and the UK (Ministry of Interior and Kingdom Relations, 2009; United Kingdom Cabinet Office, 2010b). According to Majone (2006, p. 238) the: "...notion of priority stems from the commonsense proposition that one should do first things first," and "...from a normative viewpoint, a rational setting of priorities implies that the opportunity costs of alternative proposals are duly taken into account." Prioritization can occur at several different levels: in terms of prioritizing which scenarios should be considered high risk, or even which impact categories of scenarios should receive the greatest focus, in terms of allocation of actual resources such as funding and at a more general level in terms of what ministries must focus on through the capabilities program. Prioritization is at the heart of policymaking because there are always decisions to be made in terms of which areas, projects or actors should receive attention and funding,

hence, in the broadest sense of the concept, if national risk assessments are used to make policy they are in some general manner used to prioritize.

In order to prioritize between risk areas it is often necessary to compare options, which is facilitated by the use of the all hazards approach where all the risks are assessed using the same impact, and likelihood criteria. When asked what prioritization actually means a respondent at the CCS explained that "...if they [the likelihood and impact scores] are very high, high likelihood and high impact then you are very likely, then it is clearly a high priority risk." The same respondent also said that it is the:

"...high impact high likelihood risks that they [ministries, local and regional government] need a specific contingency plan for. These are the more common risks [said while pointing at risks with lower impact scores] that are more plausible with a more moderate impact and they can be prepared for in a more generic way, that is the point, you can prepare for these things by having plans in place that would cover the consequences of lots of these different things."

This indicates that the prioritization of risk areas occurs in relation to how the CCS and ministries works to develop relevant capabilities, specific for high risk areas and more general for "moderate" risk areas.

Both in the UK and the Netherlands respondents who have worked on the method and projects based on the national risk assessment explained that the risk matrices in the form that they are available to the public are meant to give a general idea of how the risks are rated in relation to each other, a visual tool of sorts. Decisions on prioritization are however not simply based on examining the risk matrices as they are presented rather the scores themselves are used. Several of the respondents commented that it can be hard to explain to the public what the risk matrices are actually showing because the scales that are used tend to be logarithmic. The production of the matrices does however illustrate the basic results of the assessment process to the public.

In the Netherlands one risk area on which a scenario was based appears to have been chosen every year for special focus and in depth examination, which is a form of prioritization. According to a respondent at the MIKR so far these have been flooding, pandemic influenza and cyber security (which has been the focus of four different scenarios so far). Each year a new area has received increased focus, but projects related to the focus scenarios can go on for several years. One type of prioritization that is based on the national risk assessment therefore appears to be in terms of which risk area should be selected for special attention

each year. A respondent at the MIKR in the Netherlands also explained that there is no specified cutoff in terms of which scenarios are used for further policy development. The capability analysis which is led by the responsible specialist department writes a report based on the assessment recommending which capabilities should be improved. The respondent at the MIKR described the capability analysis as a process whereby one identifies specific capabilities that are necessary for the high risk scenarios and where one also combines the needs that are identified in the lower scenarios, the purpose being to identify capabilities that are common for several scenarios. The recommendations are then used by senior level civil servants from the IWNV to write the findings report regarding which capabilities should be reinforced. The respondent did however emphasize that lower level risks such as polarization may become the subject of projects or programs, though not necessarily within the framework of national safety and security. The findings report regarding national security that was sent to the parliament in 2008 shows that projects were undertaken related to scenarios that were considered to have a lower risk, though these were often discussed in terms of more generic capabilities such as being able to deal with scarcity, continuity of critical infrastructure and the ability of citizens to take responsibility for their own safety in crises (Ministry of Interior and Kingdom Relations, 2008). In addition the same progress letter notes that the position in the risk matrix is not the only determining factor in terms of prioritization. Also, expected future developments within the risk area are taken into consideration, for example in terms of and the increased scarcity of oil and climate changes (Ministry of Interior and Kingdom Relations, 2008).

The lower or moderate level risks are however prioritized in the sense that their needs may be addressed though the more general capabilities program dealing for example with evacuation. Other scenarios, a respondent at the MIKR revealed, may not lead to any policy developments related to National Security and Safety – so no policy changes at all within the framework of the national risk assessment program. For example the scenario that addressed stock market corruption was deemed to be highly likely but with a limited impact, therefore no projects were undertaken. The respondent did however point out that though the scenario assessment may determine that a scenario does not warrant further attention under the national risk Assessment umbrella changes may still be suggested after the capabilities assessment, which may lead to improvements.

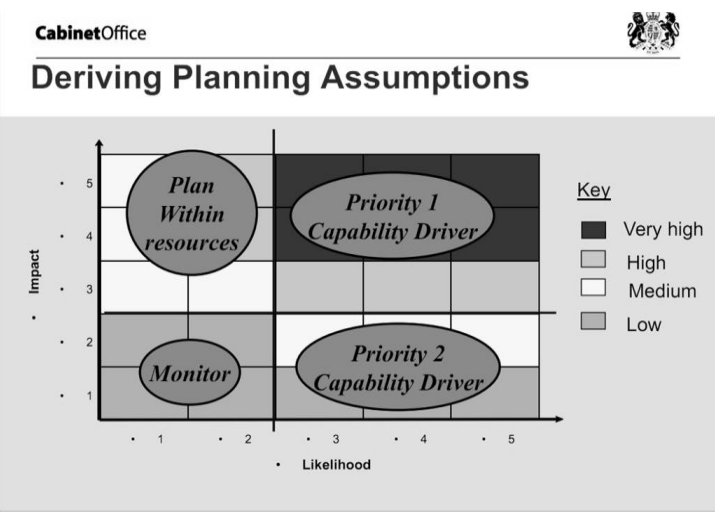
The choice of the pandemics and flooding scenarios – both of which were considered to be high risk and received specific projects, had quite different risk profiles. Flooding was

considered by the government to be a high priority risk and worth focusing on through a more specialized capabilities project program even before the national risk assessment was completed. A respondent at the Ministry of Infrastructure and the Environment (MIE) emphasized that work on prevention and preparations for flooding had been a focus area for the government before the national risk assessment. He pointed out that the increased prioritization of flooding and the creation of a cross ministerial project, Task Force Management Flooding took place before the national risk assessment. Rather than leading to prioritization he explained that the inclusion of the flooding scenario in the national risk assessment was a result of previous prioritization by the government. He did not find that the national risk assessment had led to increased prioritization of the flooding issue within the ministry.

The flooding scenario scored quite low in terms of likelihood, but was considered to have a potential catastrophic impact. The respondent at the MIKR that worked on the flooding scenario commented that the flooding scenario might not to an outsider appear to be a clear candidate for top priority status. There were, however, other incentives to pick the flooding scenario as the main scenario in 2008; political prioritization and a need to demonstrate that a crisis similar to Hurricane Katrina could not occur in the Netherlands. He described hurricane Katrina as “...a kind of wake up call for our government...” The respondent at the MIE explained “Two of our ministers went there [to New Orleans] and heard what had happened and in the plane back they said, how is it with us, are we able to cope with it, so they had a conference and they asked that question and the answer was no.” The MIE respondent explained that the MIKR had become involved because “...when a flooding is really started, then it is not anymore the ministry of infrastructure that is coping, but it is the ministry of internal affairs that is responsible, because by then, you have to decide on evacuations and that is the part of the internal affairs.” Hence, there was a definite political impetus behind the selection of the flooding scenario in 2007. Though the government knew that the flood prevention and management systems in place were in good shape they wanted to assess and deal with the rest risks that were identified during the scenario analysis. The pandemic scenario, though assessed in 2008 as well became the main focus area in 2009. Unlike the flooding scenario the influenza pandemic (severe) scenario was found to have a borderline very serious/catastrophic potential impact and to be likely. In addition a mild influenza pandemic was also considered to have borderline serious / very serious potential implications and to also be likely (Van Erde, 2011).

A respondent at the MEAAI explained that the last risk area to gain its own specialized focus and high priority status is cyber security. The issue had been on the government agenda since 2007 when a Cyber Security Strategy was developed. This was the background for including the topic in the national risk assessment. The Cyber Security or IT risk area has so far been assessed in four national risk assessment scenarios; ICT blackout in a vital sector, disruption of IP networks as well as a hacking of the Amsterdam Internet exchange and cyber conflict. Prioritization of the cyber security risk area appears to have been based on the findings from the Cyber Security Strategy project and from the actual national risk assessment. According to a respondent who worked on the project the findings from the national risk assessment when the first two IT related scenarios were developed was that the Netherlands was “...lacking two main items, we were lacking good contingency planning in the Netherlands to tackle a main IT crisis and we needed to be aware of the fact that our vital infrastructures were not

Figure 8 Deriving Planning Assumptions (Kirby, 2009)



always that good at tackling IT criticality within their own organizations.” In the UK prioritization is done in a similar manner in the sense that risk areas that have high impact and likelihood scores relative to the other risks receive more focus and may become the subject of their own specific capability work stream if they are considered to be high, or part of the

priority one section of the risk matrix. In the UK as in the Netherlands certain risk areas are, based on the scenarios, considered to necessitate their own projects and a special focus. In the UK the risk matrix, or the scoring that creates the foundation for the risk analysis is also used to determine which scenarios should be singled out for specific projects. So far the flooding and pandemic scenarios have also been selected for as special focus risk areas. As in the Netherlands scenarios that are not found to be high risk are used to determine which general capabilities the CCS should focus on in the Resilience capabilities program which includes streams such as warning and informing, recovery, evacuation and shelter and site clearance (MacKenzie, 2011). The point of these capabilities is that they may be necessary during a flooding, after an intentional attack or after a storm.

In the UK the scenarios are also placed in four main categories, as seen in the diagram above. Since even the risks that have relatively low impact and likelihood scores are monitored these may be considered to be prioritized in their own right, hence mere participation in the national risk assessment appears to lead to a form of prioritization by the CCS and relevant ministries. A respondent at the CCS explained that the pandemic scenario had received its own project because it was a top risk. She found that "...all the remaining risks are used to identify generic capabilities that we need, so to identify common consequences that the UK needs to plan for." What she described appears to be a two tier prioritization system in terms of what types of capabilities are developed. The respondents that were interviewed at the CCS did not have the impression that there is prioritization within, for example the priority two category, because they contribute to determining what should be the focus of the general capabilities. It therefore appears to be difficult to determine which scenario has the strongest impact on policy in the form of capability development. When asked whether there, is prioritization within scenarios in the UK in terms of what should be done a respondent at the CCS explained "I would say that is all kind of equally important." She explained that this was because the changes that are suggested are the responsibility of such a variety of actors.

A respondent at the CCS who worked on the flooding scenario noted that "we need to have the capacities to deal with the emergencies, and we have systems such as the risk assessment system in place to help us identify the places where our priorities are." Hence the relative placement of scenarios – in terms of groups rather than to each other within the group – appears to be the level at which prioritization is mainly done in the UK. One reason for this was that the measures that were suggested were meant to be carried out by such a diversity of actors; the point of involving so many actors was after all to allow for shared responsibility.

Funding allocation

The main form of prioritization appeared to be in terms of where policy should be developed or changed by responsible actors. In the UK the planning assumptions that result from the national risk assessments do not come with specific extra resources attached to improve necessary capabilities, rather the responsible actors must find available funds and reprioritize among their own projects. For the focus scenarios there is some funding. A respondent at the DEFRA explained that the department had received an increase in funding in their general budget in terms of the amount that was meant to be used for flooding related policies and infrastructures. He also pointed out that the national risk assessment had affected the prioritization of the flooding area indirectly through its input into the NSRA. When the

Cameron government came into office in the UK in 2010 the NSRA was undertaken for the first time, the findings and methods of which were based mainly on the national risk assessment. The NSRA fed into the new National Security Strategy which the Cameron government published that same year. In the strategy flooding is considered to be a priority one risk alongside international terrorism. The respondent emphasized that since flooding was mentioned in the NSS, which was signed by the prime minister himself flooding had become a focus area across government. Hence the national risk assessment findings were used to justify the prioritization of flooding not only by the CCS, but by the Cabinet Office itself.

According to a respondent in the Netherlands there is some extra funding available for projects related to the main scenarios that are chosen every year. He explained that the MIKR has "...a budget for subsidizing research projects, which is not allocated specifically to the risk analysis, but if a subject, a scenario is high on the list of the risk assessment, then of course it helps if an organization applies for subsidies." He emphasized that the most common way to deal with the projects that are outlined in the findings from the national risk assessments in the Netherlands is that the responsible actors have to reallocate funding within their own budgets.

4.4.2. Policy development

The national risk assessments appear to be used to develop policies – guide projects and planning that the secretariats that carry them out, ministries, local and regional authorities actually do. The following section examines how the secretariats that organize the national risk assessments and government ministries use the findings from the national risk assessments in their policy making activities. The main products of the Netherlands and UK national risk assessments are centered on the concept of capabilities. Describing use of national risk assessments in terms of their effect on capabilities can be difficult because the concept itself is highly imprecise. A capability can be something as general as having evacuation plans for use in a variety of emergencies and crises or as specific as being able to rescue individuals who are stranded in their houses during a flood using rescue boats. The sections that describe how ministries use the planning assumptions and capability findings will illustrate the different types of capabilities mainly through examples taken from the two main scenarios that were studied in the UK and the Netherlands; pandemic influenza and flooding. To facilitate an understanding of the role played by the national risk assessment at the national level it will be helpful to first consider the format of the findings and results and

thereafter the different manners in which the findings from the national risk assessments contribute to developing capabilities.

4.4.2.1. Planning assumptions

The final format of the scenarios that are scored in the UK make up findings that respondents at the CCS referred to as planning assumptions. The National Risk Matrix is therefore not the only important tool that results from the national risk assessment. The scenarios themselves in their full form, based on the input from all the ministries are also important because they become the planning assumptions that are used across government. Based on conversations with respondents it appears that planning assumptions may be defined as “statements regarding what agencies, ministries, regional and local authorities should base their planning for specific events or areas on”. According to a respondent at the CCS the planning assumptions are used to support medium term resilience planning, to provide planners with an agreed upon statement or description of a challenge and to describe the nature and scale of generic consequences that emergency responders and planners may face. The completed scenarios describe the potential impact of an event, a flood for example – in the UK the scenario includes three types of flooding – surface water inundation, coastal and river floods and these then become the planning assumptions.

A respondent at the CCS who worked on the pandemic influenza scenario explained that the planning assumptions are written up in several different formats depending on the level of government for which they are intended. Ministries, for example receive “classified planning assumptions designed to provide the basis for assessing whether the existing plans, infrastructure, equipment, supplies and training are adequate; and, if not, for introducing capability enhancements in areas for which they have national responsibility” (United Kingdom Cabinet Office, 2010b, p. 55). The planning assumptions were described by a respondent at the CCS as “a common view of what a risk looks like across government” because the scenarios have been developed through a whole of government process. They are therefore, at its most basic, a description of the worst case scenario in terms of impact within a given risk area. A respondent at the CCS explained that “What we do is that the description of the risk define what the capabilities you need to deal with the risk, but also the level that you need to set it at, where you need to, how much of a capability do you need, for a particular risk.” The planning assumptions might be considered to be an instrument for use by the various actors that receive them.

The pandemics scenario which was developed by statisticians, epidemiologists and policy makers from the DoH, the National Health Service and research institutions, may be used to illustrate the nature of planning assumptions. For the pandemic scenario the national risk assessment led to the development of a general set of planning assumptions which describe what a severe pandemic might realistically look like if one assumes a worst case scenario. According to a respondent at the CCS who worked on the scenario the assumption is that the impact of most pandemics will be less severe than what is described in the worst case scenario. In written testimony to the House of Commons regarding the use of Scientific Evidence in Emergencies the Office for Science and the Cabinet Office explained the use of planning assumptions based on worst case scenario as suitable because “by planning for the reasonable worst case scenario planners are assured that they have a high probability of meeting the demands posed by the hazard should it occur” (Office for Science & Cabinet Office, 2010, p. EV 94). According to the Office for Science and the Cabinet Office (2010, p. EV 104) evidence submitted to the House of Commons Science and Technology Committee some of the current planning assumptions for a pandemic influenza are:

- “Up to 50 % of the population ill (with infection attack rates up to 80-85%).
- Of which from 10 – 25 % are expected to have complications.”
- Absence rates of around 10 -12 % (measured in new clinical cases per week as a proportion of the populations)
- Case hospitalization demand rates up to 4% with an average six day length of stay.
- Absence rates for illness reach 15-20% in the peak weeks (at a 50% overall clinical attack rate, assuming an average seven working day absence for those without complications, 10 for those with, and some allowance for those at home caring for children).”

The planning assumptions are used in several ways in the UK; to inform the work of individual ministries and cross government programs such as the National Resilience Capabilities Program and devolved administrations, and to inform regional and local planning by actors such as Regional and Local Resilience Forums and first responder organizations (Office for Science & Cabinet Office, 2010).

At the national level the planning assumptions are used in two main ways; by individual ministries in their individual planning processes in terms of their emergency and crisis prevention and management planning, and by the CCS in its administration of the cross government National Resilience Capabilities Programme. It can be argued that there is a

degree of overlap between the two because ministries can have their own programs as well as participating in the capabilities program. According to a respondent at DEFRA the assumptions given to ministries are specific as to what the worst case situation the ministry or agency should be dimensioned to handle. Hence the scenario itself is used to set the boundaries for what ministries must be prepared to handle within their own areas of responsibility. A respondent at the CCS who worked on the flooding scenario explained that the rationale behind this type of assumption is if one uses worst case scenarios in planning, then one will be able to handle situations of the same type but of smaller magnitude.

4.4.2.2. *Findings reports*

In the Netherlands the results from the national risk assessment – the impact findings, are used to conduct a government wide capability assessment to determine whether the government has the necessary capabilities to deal with the described impacts, which areas are in need of improvement and by whom before policy advice and recommendations are given.

The capability analysis is an instrumental part in developing the findings from the actual risk assessment into findings in terms of what ministries and other actors should do to improve preparation for and prevention of unwanted events. During this stage the participants consider what capabilities the government and the nation in general needs to have to deal with the foreseen risks as well as considering who should develop and maintain the selected capabilities.

The focus is therefore mainly on developing both general and specific capabilities based on the impacts that are described in the scenarios. The capabilities focus is fully anchored in the NSSS. According to De Spiegeleire's presentation (2009) the Netherlands capability approach:

“...is not geared towards one specific threat or risk. Rather it focuses on what is necessary to prevent the consequences of threats or risks as much as possible (prevention) and/or to be prepared (preparation and response). It is a flexible approach: tasks and capabilities can be used in this approach to withstand various threats.”

According to a respondent at the MIKR the INGW writes up a findings report after the completion of the capabilities analysis which is then sent to the SNV. The SNV passes it on to the cabinet which may accept the suggestions of the SNV or make changes in terms of which areas should be prioritized. According to De Spiegeleire (2009) the government, when considering which risks to focus on considers what capabilities it already has, and those possessed by business communities and other organizations. A respondent at the MIKR

explained that the recommendations that come out of the risk, capability assessment and steering and intergovernmental group discussions outline future policy developments by the MIKR in cooperation with other ministries and by specialist ministries by themselves. A reading of the findings reports that have been sent to the parliament show that the interpretation of capabilities is quite wide. The findings reports contain recommendations that range from general to quite specific in terms of the issue that should be addressed and how it should be done. The process may lead to the outlining of specific capabilities that should be improved or even descriptions of specific projects that should be undertaken to improve capabilities. The findings from the national risk assessment process can however also come in the form of a list of capabilities that should be improved which also outlines the agents that are responsible for the capability. For example in the case of the pandemic scenario the findings report that was published in 2007 outlined the specific project and who was to run it. The same report also mentions that there is a need to work on emergency evacuation but goes into less detail about the specific projects that will be undertaken to the capability.

The Netherlands and the UK both produce risk matrices. The main purpose of these or the scores that determine the placements in the matrix, are prioritization of risk areas and thereby capability improvements (Ministry of Interior and Kingdom Relations, 2009; United Kingdom Cabinet Office, 2010b). In order to determine what should actually be done to improve capabilities the impact of the scenarios appears to be critical. The impact descriptions form the foundation for the planning assumptions created in the UK and are used in the Netherlands when undertaking a central capability assessment. The descriptions of the main products of the actual risk assessments show that there is also a difference in terms of how the capability improvement suggestions are developed. In the UK it appears that capability assessments are not undertaken in as close a relation to the national risk assessment as they are in the Netherlands, which leaves the ministries to carry out capability assessments themselves to understand how their current capabilities measure up to the impacts that are described in the scenarios. In the Netherlands bureaucrats come prepared to discuss particular capabilities and their available resources during the capability analysis. This analysis together with the review by the INGW are the phases during which the findings from the risk analysis are operationalized and future policies are suggested. A respondent at the CCS described the capabilities assessment as being a voluntary process which is carried out by the CCS. It is sent to a variety of organizations and is in the form of a questionnaire that is to be filled out. The Netherlands capabilities analysis is the foundation for the work that is done at the national

level whereas the capabilities assessment in the UK appears to have a more secondary role, though it does play into the national Capabilities program.

4.4.2.3. Capability development at the central government level

The main level at which the recommendations from the national risk assessments appear to be used is by government ministries and departments in three main ways; by leading to recommendations for general or specific capability improvements within government ministries or projects conducted by specialist responsible ministries in cooperation with other ministries as well as in the form of cross ministerial projects run by the organizations responsible for administering the national risk assessments.

4.4.2.4. UK Capability development through cross ministerial efforts

In the UK the CCS which administers the national risk assessment uses its findings in the form of prioritization of risk areas and planning assumptions to drive the UK National Resilience Capabilities program which it administers.

The UK Capabilities Programme

The UK Resilience Capabilities Program is the “core framework through which the Government is seeking to build resilience across the United Kingdom” (Cabinet Office, 2011a). The stated aim of the capabilities program is to “ensure that a robust infrastructure of response is in place to deal rapidly, effectively and flexibly with the consequences of civil devastation and widespread disaster inflicted as a result of conventional or non-conventional disruptive activity and natural disasters” (Cabinet Office, 2011a).

According to a respondent at the CCS many of the risks have similar capabilities needs – for example fatalities, warning the public and recovery are capabilities that may be needed for a variety of risks. She explained that by using relatively general scenarios the CCS finds that these common capabilities are distillable. One respondent at the CCS explained that it was not considered necessary to have a scenario for example for mass casualties in several rather similar scenarios. The focus is determining what general capabilities are needed. In addition several risks have their own work streams in the Capabilities program such as infectious diseases in humans – a substantial part of which focuses on planning for an influenza pandemic.

When asked about how the CCS and cabinet office uses the national risk assessment in their own work a respondent at the CCS explained:

“So we take the planning assumptions, so we have weeded it down to a document that is sort of that thick and when it gets to flooding it is basically a page, but it gives us all the key factors, it will say what is the economic impact of it, what is the likely infrastructure impact, what is the impact on life and casualties etc, homes. And all of that is basically what we do within the capabilities program.”

The respondent also noted that: “We manage and oversee the entire program that it works. It is run as a UK government program; it is for all departments to contribute, the ways that they contribute is that all the work is broken down into work streams...” A respondent at the CCS explained that the planning assumptions are used, in combination with inputs from lead government departments (LGDs) who have the main responsibility for a risk area to determine which capabilities should be developed.

- Twelve work streams that focus on functional areas such as infectious diseases in humans, mass casualties, evacuation and shelter as well as flooding, recovery, warning and informing the public, site clearance, community resilience, infectious diseases in animals and plants and chemical, biological, radiological and nuclear resilience
- Four work streams that are structural and address central, regional and local capabilities as well as resilient telecommunication
- Six work streams that deal with essential services such as health, finance, energy, post, telecom, food, water and transport (Cabinet Office, 2011a).

A respondent at the CCS explained that each of the work streams is led by the ministry that might be considered to be responsible for the general capability, though the point is to coordinate the work of the various ministries through the project. These work streams are influenced by the national risk assessment because the impacts that are described in the scenarios, especially those that become tier one or tier two risks, are the ones that the capabilities program is meant to deal with. The planning assumptions are used to create what is known as resilience requirements which are what help ministries determine exactly which capabilities they need to improve. The same respondent commented on the capabilities program and made the link to the planning assumptions derived from the national risk assessment clear saying that each:

“... work stream has a lead government department that is driving the capability and ensuring that they are meeting the needs of the planning assumption, and we oversee it by managing these work streams and ensuring that the relationships between these elements, ensuring that the information flows, ensuring that they all fit into the common program.”

Both the pandemic influenza and flooding scenarios – the subjects of more in depth examinations – have, since they are considered to be tier one risks (based on the risk matrix), received their own capability streams. The DoH is the lead government department on pandemic influenza. According to a respondent at the DoH some of the preparation work is done through the Capabilities program, but the department also has its own separate projects. For example the CCS has worked closely with the DoH to ensure that the wider impacts of pandemic influenza are planned for not just the health wise implications but also the wider ones such as whether or when to close schools, putting travel restrictions in place in terms of travel to and from the UK etc. The respondent who worked on the pandemic influenza scenario and on the pandemic influenza work stream explained that these types of issues all come out of the planning assumptions developed through the national risk assessment. The dimensioning of capabilities is therefore according to a respondent at the CCS based on the planning assumptions that are derived through the national risk assessment and: “...in terms of the pandemic flu it [cross governmental planning] is very much about being driven by the scenarios that were produced by the national risk assessment.”

The capabilities stream related to flooding has resulted in a variety of projects. Some, such as the National Flood Emergency Framework focuses on the development of flexible planning and response at the national, regional and local levels and focus on organization of efforts (Department for Environment Food and Rural Affairs, 2011). A respondent at the CCS explained that DEFRA which is the LGD on flooding has developed physical capabilities through the program increasing flood rescue capabilities. Based on an interview with a respondent at DEFRA it did however appear that the capabilities program also receives input from the specialist departments. The DEFRA respondent noted that:

“The capabilities program is something that we contribute to, but we do that in a way that suits our own way of working. It is a program that is managed by the cabinet office we have to input into it. Locally we have a flood / flooding, we deal with, we have a flooding coastal erosion program in DEFRA, very specific with lots of work streams with one on emergencies and so on. That is where we identify all the projects that we need to pursue in terms of for example increasing our capability for rescue or improving mapping or those sorts of things, so we focus much more on our own program than we focus on the capabilities program, but the two things mesh very easily.”

This statement exemplifies one of the methodological challenges of researching the effects of a specific program on policy; there will usually be different understandings of whether factors have contributed to which developments and if so, to what extent. It also illustrates an aspect

of how national risk assessments are used by ministries in their own efforts and in cross government efforts.

A respondent who works on flooding for the CCS in cooperation with DEFRA, when commenting on the work done by DEFRA through the capabilities program noted that “Because we know what we are planning for through the planning assumptions we can identify what we need to have in place because they will, realistically, this is what might occur and we need to have people that are able to rescue people from their homes with a helicopter, we need people to be rescued by boat and we need to have a very good emergency operations center in place and we need to have a concept of operations on how to extract persons from water.”

Another example of how the CCS and the Cabinet office use the findings from the national risk assessment in their work with the capabilities program is the document *Keeping the Country Running: Natural Hazards and Infrastructure* (Cabinet Office, 2011b). It is a guide for infrastructure owners and operators as well as emergency responders, industry, regulators and government departments whose aim is to support their work on the resilience of critical infrastructure and essential services. In the guide the natural hazards that are addressed were mainly taken from the NRR, a public version of the national risk assessment findings. The guide also contains hazard descriptions and information about how individual natural hazard can involve a variety of challenges after the initial event, both of which were based on information taken from the NRR. The scenarios from the national risk assessment were described by the Cabinet Office as being “reasonable worst cases and as representing “an upper limit on the risks for which the Government plans and against which infrastructure owners and operators can reasonably be expected to build resilience” (Cabinet Office, 2011b, p. 22).

4.4.2.5. *Netherlands Capability development through cross ministerial efforts*

In the Netherlands the findings from the national risk assessments and capability assessments are used by the lead department on crisis planning and management – the MSJ to determine which capabilities the central government should improve. Based on interviews with respondents at the MoH and of MIE it is clear that some projects related to the Netherlands national risk assessment are carried out by specific lead departments whereas others are run by the MSJ, or the MIKR which has previously been responsible for the national risk assessment. They found that the capabilities program in the Netherlands exists in parallel with

the planning efforts undertaken by ministries. A respondent at the MoH emphasized that the ministry had its own programs in terms of pandemic influenza and that it cooperates with the MIKR on other pandemic influenza projects. Hence, as in the UK it appears that ministries work on prevention of and preparation for events in risk areas outlined in the national risk assessment both on their own and in cooperation with other ministries.

For the pandemic scenario the major project that has been undertaken by the government has been the continuity project which looked at how both the government and businesses were prepared in terms of handling a pandemic influenza. The respondent from the MoH also explained that a project related to continuity in terms of vital interests: “The continuity project started from my group and was then at a certain point handed over to the ministry of the interior.” Hence, a capability that had been worked on before became the responsibility of the MIKR after the national risk assessment. He explained that this might have been because the national risk assessment led to an understanding of the topic as being wider than the MoH had defined it. Rather than merely focusing on continuity in terms of traditional medical services in case of a pandemic the project was expanded to cover continuity in other areas such as among businesses. A respondent who worked on the project noted that this manner of working together to improve capabilities was positive “...there were a lot of things to be done, but the scenario, the close cooperation between health and at that time the Ministry of the Interior was very helpful to put it even more in perspective and to put it more together, and make it a more integral approach.” The project focused on encouraging businesses and government organizations that might be considered to be linked to vital sectors to create continuity plans in case of large scale absenteeism. The project might also be viewed as part of a larger focus on continuity in terms of the absence of employees or other resources. Many of the risks in the national risk assessment were well known to the government before the national risk assessment, but the inclusion of the pandemic influenza scenario in the assessment was also considered to have been a positive element. One of the individuals that worked on the project noted: “I think without the scenario we would have decided to work on continuity, but it would have less impact and it would have had less solid ground than the scenario and the risk diagram offered us.” This may be considered to be an example of how the national risk assessment contributed to the development of what a capability should be – not merely continuity in the medical community but across government and business as well.

A respondent in the Netherlands who worked on method development and the pandemic scenario emphasized that he considered it to be a goal to have as many of the projects

emanating from the national risk assessment as possible to be a cooperation between ministries. He also emphasized that projects regarding capabilities that were considered to be general often were initiated by the MIKR, but might be handed over to the responsible ministries when they were running. The MIKR defined generic capabilities as being “relevant to several scenarios,” which means that several specialist ministries will have tasks related to improvement because “An essential condition for strengthening these capacities is cooperation among government bodies at central, regional and local level, and between government and the business community.”

Respondents from both the MoH and the MEI emphasized that projects related to the national risk assessment were often run in parallel to their own projects in terms of dealing with risk areas, though, it was emphasized that the projects related to the national risk assessment usually focused on large scale, generic capabilities that were necessary across government. A respondent at the MoH pointed out that a “...thing that clearly came out from the risk assessment was that all kinds of companies, outside the government, started with courses on business continuity planning in pandemic situations, conferences were organized without any of our involvement, so this was a completely separate line of activities.” Hence, the MIKR created a project aimed at a wide variety of actors based on the pandemic influenza scenario that were not connected to the MoH.

The first report on the national risk assessment sent from the MIKR to the parliament in 2008 shows that the ministry, which was also the administrator of the national risk assessment initiated several projects after the first assessment. For example, it notes that:

“The national risk assessment shows that the interdependence of vital sectors (both public and private) has a major impact on the scenarios. It is currently unclear at what level vital goods and services would be provided in the various scenarios. In a public-private cooperation arrangement (involving central government, vital sectors, and the VNO-NCW employers’ organization), the level of delivery desirable or available in crisis conditions will be explained to the sectors concerned, the government, the safety regions, and the end users. Then agreements will be made to achieve that delivery level, with the objective of improving continuity and reducing damage” (Ministry of Interior and Kingdom Relations, 2008, p. 1)

This clearly sets out tasks for the MIKR to carry out itself or delegate to the relevant authorities. The assessment also appears to have highlighted areas where the state of knowledge regarding vulnerabilities was lacking. For example, the MIKR in the 2008 report notes that:

“We are still unsure about the extent to which the communications infrastructure would still work. We will conduct further research in this area, covering the use of C2000, cell broadcasting, the emergency network, the emergency switchboards and evacuation locations, and the regional disaster broadcasters. We will also study the scope for communication between government and vital sectors and among the vital sectors themselves (at both operational and administrative level).”

This shows that the national risk assessment contributed to identifying areas where knowledge of the state of capabilities was unclear and further research was required. This was not a project that contributed directly to capability building, but rather highlighted knowledge gaps.

The national risk assessment also proved helpful for the MIKR in identifying areas where capabilities were in need of further strengthening. It was noted that:

“We need to broaden and intensify our efforts to strengthen self-reliance. Our first basic assumption is that individual citizens should be encouraged as much as possible to take responsibility for their own well-being. The lower tiers of government will have a central role to play in motivating the public, and to do so, they will require assistance from central government.”

When asked whether most of the projects were carried out by a specific ministry or were part of a cross departmental effort a respondent at the MIKR explained that both were common. He noted that:

“...if the consequence would be that all of the capacities would have to be developed by single parties then I would doubt the quality of the outcome because the whole concept of national safety and security is that crises are supra, single ministry, so there has to be input from more than just one ministry.”

He therefore considered it to be important to carry out projects across ministries, which appears to reflect the Dutch view of how the improvement of “general” capabilities related to national security and safety should be conducted. An example of this was how the focus on evacuation was shifted from merely addressing evacuation from flooding to also examining large scale evacuations in case of forest fires and chemical, biological, radiological and nuclear accidents (Ministry of Interior and Kingdom Relations, 2008).

The 2008 findings report noted that:

“The results of the national risk assessment and the recommendations on large-scale evacuation in the event of floods show room for improvement and make suggestions for action. Both reports devote attention to these themes. On this basis, the Government will take priority measures in or continue to focus on the following areas.”

The report then goes on to list the areas that are in need of improvement, outlines the main projects that will take or are taking place and at times mentions which actors are responsible for the policy developments. The main point of the quote is however to illustrate that based on the national risk assessment the government did develop suggestions for capability improvements, further analysis of the need for capabilities and how these should be developed and continued work on already ongoing projects or measures. As shown above the capabilities that were deemed to be in need of improvement could be quite general. A respondent at the MIKR emphasized the variety in terms of the type of capability recommendations that were made by describing how after the assessment of two digital scenarios in 2009 "...one of the capabilities was to implement an advisory committee in case of a major crisis with IT with government, science and private parties in the advisory committee." The capability in question might be described as being preparatory because it was aimed at creating an organizational tool that could work assist the government during a crisis.

4.4.2.6. Efforts within ministries

In both the Netherlands and the UK the national risk assessments are not merely used by the secretariats that organize or coordinate them. Individual ministries also appeared to make use of the findings from the National risk assessments in their own internal work and their cooperation with other ministries that was not organized through the secretariats. The use of the national risk assessment by the specialist ministries is interesting because these have often been working on issues within the risk area before the actual risk assessment. Hence, where the secretariats might see the use of the national risk assessment as being very important for their own work because they might not have focused on the issues that are brought up in the national risk assessment, the same might not necessarily be true for the specialist ministries.

The UK

In the UK the use of the national risk assessment was examined based on input from DEFRA and the DoH. It can be argued that there is a degree of overlap between the two because ministries can have their own programs as well as participating in the capabilities program. Ministries receive "classified planning assumptions designed to provide the basis for assessing whether the existing plans, infrastructure, equipment, supplies and training are adequate; and, if not, for introducing capability enhancements in areas for which they have national responsibility" (United Kingdom Cabinet Office, 2010b, p. 55).

At the DoH the national risk assessment was described as having driven the strategic planning done by the department. For example the pandemic influenza planning assumptions that were created based on the national risk assessment were used to dimension the 2007 Pandemic Influenza Preparedness Strategy. The strategy was created by the DoH which had the lead in cooperation with other ministries. A respondent at the CCS explained that the creation of this plan was facilitated by the planning assumptions from the national risk assessment. She noted that through the national risk assessment and by agreeing to the pandemic influenza planning assumptions:

“...all government departments, not just the health department, but say for instance the department for education , the department of business innovation and skills, all of those departments have been engaged in the production of this plan [the 2007 Pandemic Influenza Preparedness Strategy] and have signed up for this being their strategy and then they all have underpinning guidance that sits underneath this, that says specifically what their department is doing to contribute to this strategy, but they are all working from the same numbers and the same national risk assessment planning assumptions.”

Another example of the use of the planning assumptions – the description of the worst case scenario- was their role in dimensioning physical investments such as the purchases of anti virals and preparing for how to manage the distribution of vaccines by the Department of Health. Based on the reasonable worst case scenario the DoH is currently developing a new National Framework for Pandemic Influenza preparedness. In this framework the DoH has developed more detailed, lower impact scenarios based on the worst case scenario from the national risk assessment as a way of exemplifying what a less severe scenario might look like. The framework also contains more detailed planning assumptions for the various ministries and agencies as well as local and regional government and business sectors.

A respondent who worked on the pandemic scenario that based on this basic description the various ministries can consider how they will be affected; what it will be necessary to do in terms of medical counter measures, the need for anti-virals, what resources will be needed to deal with excess deaths. Table 6 shows more specific pandemic influenza planning assumptions derived from the worst case scenario in terms of possible developments in regard to domestic travel and public transport as well as healthcare and essential repairs or maintenance of power lines etc To enable ministries and local organizations to adapt their response to the severity of the pandemic the data developed for the national risk assessment has been used to create a sliding scale of scenarios. One of the project managers for the pandemic scenario explained that the idea is to “plan for the high end scenario but have

Figure 9 Planning assumptions pandemic influenza UK (Cabinet Office & Department of Health, 2010)

Area of policy response	WHO Phase 4 Small cluster of cases with limited person-to-person transmission	WHO Phase 5 Large cluster(s) of cases with person-to-person transmission	WHO Phase 6 Increased and sustained transmission in general population (pandemic confirmed)	
			UK alert level 1 Cases outside the UK	UK alert levels 2–4 Outbreaks in the UK
Assistance to foreign nationals in the UK	The current policy will apply during a pandemic, ie no assistance apart from emergency healthcare. For public health reasons, visitors who develop influenza symptoms whilst in the UK will be given emergency treatment with antiviral medicines if necessary.			
Essential services				
Healthcare	Normal service levels.		The NHS plans to care for large numbers of cases and will only provide essential care.	
Domestic travel/public transport	Normal service levels.		Business as usual for as long and as far as that is possible. Some disruption is expected at the peak of a pandemic. Relaxation of regulations on drivers' hours may be considered if required to maintain services.	
Essential repairs or maintenance of power lines, telecommunications, gas pipelines and energy supply	Normal service levels.		Essential repairs will continue. Routine repairs may be curtailed by staff shortfalls, particularly at the peak of the pandemic.	

mechanisms in place to scale back and have a proportional response so that when they reach certain trigger points and they are identified within this plan [...] you can start to scale back your arrangements to the moderate and low.” In the new draft of the Pandemic Influenza strategy the DoH emphasizes that the planning assumptions are important because:

“The precise characteristics and impact of an influenza pandemic will only become apparent as the virus emerges. Therefore, some assumptions about a pandemic’s course – and presumptions as to the UK’s likely response in a number of key areas – are necessary to describe the impact the Government is currently planning for” (Cabinet Office & Department of Health, 2007, p. 23).

They found that “the use of common assumptions and presumptions across all public and private sector organizations avoids confusion and facilitates integrated preparation” (Cabinet Office & Department of Health, 2007, p. 28) A respondent at the DoH noted that they also use the national risk assessment based planning assumptions in their own work. For example the DoH has created a databank with possible exercises for local and regional authorities based on scenarios that have been scaled down in terms of area affected and severity.

Another example of the national risk assessment informing planning done by ministries is the work done by the DEFRA on flooding. The flooding scenario and therefore also the planning assumptions describe three main types of flooding; coastal and tidal flooding affecting parts of or more than two UK regions, severe inland flooding affecting more than two UK regions or a major reservoir or dam failure or collapse. A respondent involved in the flooding scenario and with projects related to the flooding planning assumptions noted that the planning assumptions derived from the national risk assessment are the foundation for flooding planning. She explained that this is the case because the resilience requirements i.e. determination of which capabilities to improve is determined by asking: “...if we are expecting this kind of event to occur, what do we need to have in place to be able to respond to that event.” The planning assumptions contain an agreed upon description of flooding in terms of the key impacts on pre defined values such as the economic, infrastructure, fatality and casualties. A respondent at DEFRA noted:

“...If that was to happen, we had a repeat of the weather from 1953 we had a failure of some of the flood defenses, these are the consequences, we know that if there was a real event it would be different, not just like that, it is completely unpredictable, obviously, like the weather. But that is the basis for our national

planning. So if we know we have to evacuate 600 000 people we know we have to evacuate, sorry, rescue 11 000 people in 36 hours, because that is what the scenario [the national risk assessment scenario] says. Then that gives us the basis for our capabilities planning, so we can then ask ourselves, do we have enough rescue teams to be able to do that, what are our evacuation plans, are they fit to be able to ensure that we would get people, these numbers of people evacuated in that time. So that is the purpose of the NRA, it sets out the scenario that we think is the reasonable worst case scenario.”

The Netherlands

In the Netherlands conversations with respondents at the MoH, MEI and the MEAAI showed that there was considerable variation in terms of how ministries use the findings from the national risk assessment.

A respondent from the MoH emphasized that the issues that were brought up in the national risk assessment were already being worked on by the MoH. For example when asked about the business continuity project that was eventually transferred to the MIKR in terms of whether the project had been developed before the national risk assessment he answered:

“I think the honest answer should be yes. I hired Marc from the ministry of the interior to my department to think about the societal effects of a pandemic flu. We were clear on that there was a lot of work to be done there but it was not our area of expertise. So that was why we hired him. I think that was about the same time as the risk assessment started or was under way, so I think it was more or less in parallel.”

Hence, the national risk assessment appears not to have been the source of the work on business and government continuity during a pandemic. Instead it appears to have led to increased focus for a project that was under way. The respondent also emphasized that the MoH has used the scenarios from the national risk assessment in its own work related to a future pandemic influenza. He noted: “...one of the things we[the Ministry of Health] did was to prepare a quite extensive communication plan handbook based on the scenarios, based on the cases, on the WHO cases and based on, one extra dimension that we added to that was distance or perceived distance between a, between a pandemic and the Netherlands.” The respondent noted that the manner in which the national risk assessment findings and scenarios were used within the ministry was as a “...useful framework of thinking.” When asked whether it was used as a dimensioning tool the respondent noted, regarding the medical community and the national risk assessment findings: “No, I am not sure that they used it that way, no like I said I think it was more like a framework for their thinking and their discussions internally than in a dimensioning way. We use it in that way ourselves of course

as well.” One example of how he found that the national risk assessment had been used as a framework was in terms of creating awareness about absenteeism in relation to a pandemic influenza. There was no suggestion that the numbers from the scenario should provide the basis for planning specifically, but they were used to illustrate that absenteeism could become a problem.

A respondent at the MIE emphasized that: “...we are already coping with the flooding, long before the NRA started, so the NRA just used our information, and maybe some new things has been acknowledged, so the policy has slightly been different now, but we do already, for a long time a lot of things against flooding.” This illustrates how the national risk assessment findings build upon ongoing projects in the specialist ministries.

As previously mentioned the flooding scenario was part of the national risk assessment after the initiation of large project called Task Force Management Flooding. Based on conversations with respondents at the MIKR and the MIE it appears that the findings from the national risk assessment were blended into the already ongoing project, hence capability improvements were done within an existing framework. In addition the input from the national risk assessment regarding the flooding scenario and the Task Force Management might also be considered to have confirmed that the projects that were already under way were appropriate.

When discussing the approach used by the national risk assessment the respondent at the MIE explained that “Most of it [flooding response] is in the Netherlands organized regional. But it was now recognized that if it happens it is not a regional problem, but it is a national problem, and that step, that it is a problem, a national risk, that was developed in the last four years.” Hence, it appears that considering the flooding scenario on a national scale, which was a development associated with the national risk assessment led actors to consider the issue on a wider scale. The respondent emphasized that the national risk assessment appeared to have influenced the work done with other ministries by the MIE, but that the effect on actual planning and policy within the ministry in terms of its own work on flooding was negligent. When asked whether the national risk assessment had been more of a symbolic process in terms of the flooding scenario the respondent noted that he believed the national risk assessment had been a catalyst which had increased awareness among other actors. He noted that cooperation between different administrative levels; the national, regional and local was: “...one of the things that has come out of the task force management flooding, and at the same time the NRA because they are nearly at the same time.”

A respondent at the MIKR explained that, based on the national risk assessment his own ministry had worked on a project separately to create a National Operational Staff, which was to be a unit that has to advise the ministerial crisis team when there is a scenario going on. He explained what the task of the organization would be by using a fictional example involving an ongoing or expected flood in a specific region “...There are a lot of people living in that area, there is also a lot of agriculture in that area. The minister of the interior and agriculture say, well I need all the transport capacity that we have to put out the crop. No, people first. So there is a struggle between the two, a conflict of interest.” He also noted that: “The question to the National operational team is; is it possible to help them both? Or can’t we help them both either. Is it based on the dilemmas between the facts and the figures and it is about political choice, but can it be deployed.” This is an example of how the national risk assessment led to a realization of the need for a specific decision making capability and the undertaking of a project related to it.

4.5 Working with other ministries and departments – through creating awareness

Respondents in the UK and the Netherlands, both in specialized ministries and departments and in the secretariat organizations emphasized that the findings from the national risk assessments are used to increase cooperation between ministries. This was considered to be caused by the actual findings identifying areas where ministries have overlapping responsibilities and thereby where cooperation or at least coordination is necessary. This identification of areas was considered by the secretariats to have contributed to improved cooperation between ministries and the respondents at the specialized ministries considered the findings to have been important in terms of raising awareness and thereby also contributing to improvements in their cooperation with other ministries.

A respondent who worked on the method of the Netherlands national risk assessment explained that he believed that the findings from the national risk assessment had helped the MIKR and other specialist ministries in their efforts to get other ministries to take actions in areas where there were overlapping responsibilities. He noted: “I think maybe that [spurring of action] is even the best, no one of the positive outcomes of what this risk assessment does.”

A respondent who worked on the pandemic influenza scenario in the UK found that the national risk assessment was instrumental in laying the foundation for cross ministry cooperation on issues related to civil contingencies explaining that: “...the main point about the NRA is that it is a common view that is recognized across government about what a

particular risk might look like,” which she found to be helpful in promoting cooperation between ministries. She exemplified it by referring to the production of a National Pandemic Influenza Strategy which uses the planning assumptions from the national risk assessment – by using the scenarios in this way it is, according to the respondent possible to:

“...create a Department of Health documents that is actually cleared across government, so all government departments, not just the health department but say for instance the department for education, the department for business innovation and skills, all of those departments have been engaged in the production of this plan and have signed up for this being their strategy and then they all have underpinning guidance that sits underneath this, that says specifically what their department is doing to contribute to the strategy, but they are all working from the same numbers and the same national risk assessment planning assumptions.”

She also found that plans were better coordinated between ministries because “...they all emanate from the scenario; they are all using the same planning assumptions.”

A respondent at DEFRA found that the national risk assessment had impacted the ability of DEFRA to gain cooperation from other government departments in two main ways; through the position of the flooding scenario in the risk matrix and through its contribution to the NSRA and thereby the NSS. He noted that: “Even the foreword to the NSS just mentions, and this is signed by the prime minister and the deputy prime minister, just mentions flooding alongside pan flu and terrorism so we have not had to try very hard in the last year to get people to take seriously the work they need to do for us.”

A respondent at the Netherlands MIE emphasized that he considered awareness among actors who traditionally were not considered to have responsibilities related to flooding was an important result of the national risk assessment. He noted that: “The point of the extreme scenario [from the national risk assessment] is the awareness, the awareness that it might happen and the awareness in the policy that in fact we should think about and be aware of are we capable to cope with it if it happens and what will happen when something happens.” He pointed out that in terms of the flooding scenario where the task force management had already been started the national risk assessment catalyzed some of the processes that were already taking place within the project. When asked about cooperation between the MIE other ministries he noted that:

“...also the other departments, so they started the process to show that this is the effect of such a scenario, and in that process the extreme scenarios were very useful because you cannot say, it won't harm me” All departments in fact have to do something and in that way also making the other departments aware that there are threats in which they also have a role and that was also an input

for the national risk assessment and the awareness of other departments that this was risks that they also have to act.”

He found that in the case of the flooding scenario the risk assessments main result had in fact been the awareness it created.

Another respondent in the Netherlands who worked at the MoH also emphasized that the effect of the pandemic influenza scenario being in the national risk assessment was that “...it helped us in, especially in the discussion with other departments and especially in the discussion with the outside world to illustrate how important it was, what we were doing and that they had to do something.” He did however emphasize that it in general is difficult to determine the effect of the national risk assessment on policy developments and awareness because the assessment does not take place in a vacuum. He noted: “We say that preparedness is about a continuance of actions, and one stands on the shoulders of the other, so that is why it is so difficult to clearly point out the role of the risk assessment to actions later on.” When asked whether the national risk assessment had helped the ministry in terms of cooperation with other ministries and getting them to prepare for a pandemic that “...of course that helped and I think the ministry, this example of social affairs, they even started before we came to them their preparation activities and were ready before we were, In that sense the tool, it definitely helped us to persuade others to start, continue or finish their preparation activities.”

It therefore appears that both in the Netherlands and the UK the national risk assessment findings were used by ministries to engage other ministries in dealing with issues that could be tied to their own. This is however, as was pointed out by one respondent, a difficult concept to quantify or measure, but several of the respondents noted that the ministries had referred to the national risk assessment in their interactions with other ministries. Several of them also noted that after the national risk assessment this type of cooperation was easier to achieve. This may also, however be attributed to many other issues surrounding flooding and pandemics. The comments regarding the use in terms of ministerial cooperation was however also made by individuals who worked in the secretariats in both the Netherlands and the UK, hence the comments were not merely made in relation to the pandemic influenza and flooding scenarios.

4.5. Design of exercises

The two scenario types that were examined; pandemic influenza and flooding are quite different in terms of how one might exercise to be able to manage emergency situations or

crises. It is however possible to compare the manner in which the two countries use the same type of scenarios in relation to exercises.

4.5.1. Flooding

In the UK the flooding scenarios that describe a reasonable worst case scenario for both coastal and river flooding have been used when designing flooding exercises. Exercise Watermark, which was held in 2009, lasted for four days and was a cross governmental exercise which used scenarios related to surface water flooding, river flooding, reservoir flooding and a coastal flood. A respondent at DEFRA noted that: "...the scenarios were based loosely on the national risk assessment. What I would say is that the coastal flooding on the last day was based heavily on the NRA scenario [...] the scenario was the national risk assessment Scenario, a 1953 east coast flood, high tides and surge." Hence, it appears that the findings from the national risk assessment in terms of impacts – the specific numbers that are identified – actually influence what DEFRA exercises for both in terms of amounts, but also in terms of the general impacts that are expected to occur. When asked whether the exercises feed into the national risk assessments a respondent at the CCS explained that: "It is almost the reverse of that. We use the NRA to feed into how, what we are going to exercise, what we are going to test."

In the Netherlands a respondent at the MIE explained that the Task Force Management for Flooding which featured several projects that were influenced by the national risk assessment undertook a large exercise two years after the project had been initiated to see if the over 60 sub projects had been beneficial. According to a respondent who worked on the scenario at the MIKR the scenario did however focus on issues that had been brought up by the Task Force Management and in the risk assessment process, hence there was a focus on the types of impacts that had been identified. The respondent at the MIE did however explain that he was skeptical of the use of extreme scenarios for exercises because the participants are often skeptical of worst case scenarios, saying that there is little point in exercising for something that appears to have a very low probability of happening.

4.5.2. Pandemic influenza

A respondent at the Department of Health in the UK explained that DOH has created an exercise bank that local and regional authorities as well as hospitals and other organizations whose activities might be affected by a pandemic influenza. The exercises in this database are dimensioned based on the national risk assessment worst case scenario, though they are

dimensioned to be less severe than the main scenario. The use of several different scenarios in the exercise bank was explained by a desire to allow planners to plan for lower impact scenarios and to thereby become more focused on being more flexible.

When asked about the use of the scenarios from the national risk assessment in exercises in the Netherlands a respondent from the MoH explained: “We have tried, in the preparedness period, to use these scenarios [from the national risk assessment] for everything that we did, including on many national exercises. The RPN, like the Department of Health in the UK has an exercise bank from which interested actors can draw scenarios which are based on the national risk assessment scenarios.” The respondent from the MoH did however caution that though the Netherlands scenarios, like the UK scenarios, are based on mathematical models of how an influenza pandemic might develop. The actual numbers from the national risk assessment in the Netherlands are not considered to be as important as they appear to be in the UK. He spoke about this based on his experiences and interaction with British colleagues through his work at the MoH and explained his impression was that in the UK the models were key: “Everything was ordered and arranged around the numbers, the numbers were holy, they have never had that status in the Netherlands.” He found that the focus was more on the impacts of a pandemic and the capabilities that actors would need to deal with various scenarios. A respondent at the MIKR noted:

“I don’t think it, the scenario, of course a scenario is not really suitable to function as a scenario for an exercise, the scenario of the risk assessment because it has another purpose, but it definitely is the case that the way a subject comes out of the risk assessment it influences the chance that it will be exercised. So the choice of the exercise or the subject of the exercise is influenced by the scoring of the risk assessment, I mean we had the flooding, we had the pandemic, we had IT last year, its highly related...”

This view of the appropriateness of the scenarios for use in an exercise appears to be in agreement with the views held by the respondent from the MoH. The themes from the scenario impact assessments do however appear to be considered appropriate for consideration during exercises. One MIKR respondent noted that based on the scenario assessments: “...we knew what would be the interesting dilemmas, because in the scenarios we see what are the interesting dilemmas about, working on the subject and the scenario, we see, if you have too little vaccine delivered, how are you going to spread it to the population?” These were the types of insights from scenarios he believed were usable during exercise planning.

It appears that the scenarios from the national risk assessment are used to dimension exercises, though in somewhat different manners in the UK and the Netherlands. In the UK the actual scenario, the numbers, are used to create exercise scenarios. A respondent in the MIE emphasized that the scenarios were however not being used in the same manner by the MIE during the design of new national exercises which, instead, will focus on lower severity scenarios. The pandemic scenarios in the UK and the Netherlands were used to dimension exercises, though in the Netherlands the focus was not on the specific numbers from the scenarios like it appears to have been in the UK. Respondents at both ministries of health did however emphasize that exercising for worst case scenarios is only a small part of their exercise programs, in fact exercising and planning for a variety of lower severity scenarios as well as planning for flexible adaptation to an actual pandemic is the most important thing to practice.

4.6. Regional and local planning

Several respondents in the Netherlands and the UK mentioned regional and local planning in relation to discussions of the role of the national risk assessment. This chapter consists of sections on the UK and Netherlands which first briefly describe the system of regional and local governance in relation to emergency preparedness and planning and thereafter explain how the national risk assessment is related to these administrative levels and their activities.

4.6.1. The UK

In the UK the respondents at the CCS and the DoH and DEFRA viewed the impact of the national risk assessment on local and regional planning as resulting from its input on regional and local risk assessments and because the scenarios provide planners with planning assumptions on which to base their own efforts.

In the UK the organization of emergency preparedness and response at the various administrative levels in the UK is organized according to the provisions laid out in the 2004 Civil Contingencies act. Actors are organized in Regional and Local Resilience Forums. There are nine Regional Resilience Forums (RRFs) in England. The purpose of these are “to bring together the main authorities and agencies, identify resilience capabilities within regions, and act as link between local and central government” (Cornish, 2007, p. 23) According to a report published by the think tank Chatham House the RRFs: “...play an important role in ensuring efficient and effective co-ordination among the many agencies and organizations involved in regional civil protection, as well as encouraging the development

of an emergency response ethos which is multi-agency in character and which is habituated to rapid information-sharing” (Cornish, 2007, p. 23).

There are a total of 42 Local Resilience forums (LRFs) in England and Wales, the boundaries of which are defined by Police Areas. The purpose of the LRFs: “...is to ensure effective delivery of those duties under the act [The Civil Contingencies Act] that need to be developed in a multi-agency environment” (Civil Contingencies Secretariat, 2011a). The LRFs consist of emergency responders from within the police area. They are responsible for creating a risk profile for the area in the form of a community risk register upon which their work on prevention and preparation should be based. The RRFs have similar tasks, though they cover wider areas. The purpose of the national risk assessment is to: “ensure that Category 1 responders have an accurate, shared understanding of the risks that they face so that planning is proportionate and soundly based” (Civil Contingencies Secretariat, 2011b, p. 20). They are also undertaken so as to enable the creation of a fully integrated risk assessment process. Hence, it is considered desirable that the risk assessments at the national, regional and local level should be based on an examination of the same risk areas.

Though it is considered necessary that the risk assessments should be based on the same risks there is also recognition of the need to tailor risk assessments to the particular circumstances and nature of the local area or region for which risk is being assessed. Therefore: “Both these regional and local risks assessments are informed by the national-level view of risks but produce a specific risk assessment that reflects, as far as possible, the unique characteristics of each region and local area”(United Kingdom Cabinet Office, 2010b, p. 55).

One of the manners in which the national risk assessment is used is therefore as a guide for regional and local risk assessments and the development of community risk registers which influence the planning and preparations done by local category one responders such as the police, hospitals and fire and rescue services. The national risk assessment serves to identify the risks that the LRFs and RRFs should consider in their own risk assessments.

Because this function influences the manner in which the risk assessment process is conducted, using scenarios that are as general as possible, without references to specific locations or areas where possible is considered to be beneficiary. According to a respondent at the CCS the scenarios, and thereby also the planning assumptions are therefore widely applicable for use by local actors, English regions and the devolved administrations; Wales, Scotland and Northern Ireland.

According to the NRR, the publicly available version of the national risk assessment: "...there is a two way flow of information: local and regional risk assessments are reviewed and feed back into the national risk assessment" (United Kingdom Cabinet Office, 2010b, p. 55). When asked about this respondents at the CCS did however comment that the process: "...is a two way feed, but probably more top down than bottom up feed...", hence local and regional risk assessments do not to a great extent influence the national risk assessment. For example at the local level authorities are given the document Local Risk Assessment Guidance which includes: "...a generic threat statement, as well as information on non-malicious hazards, that is based on information contained within the national risk assessment" (Civil Contingencies Secretariat, 2010).

The national risk assessment contributes to policy making in the UK related to lower levels of government both through direct use of the planning assumptions and because the ministries based on their own work with the planning assumptions develop guides for regional and local planning. The national risk assessment process' main product, planning assumptions are also used by local and regional planners to dimension their own capability planning, which, though related to their risk assessments may be considered to be somewhat different. According to a respondent at the CCS the planning assumptions are developed they in two main formats, for the ministries and for the local / regional actors. The planning assumptions given to the regional and local actors are often somewhat more general.

One respondent at the CCS explained that the CCS gave the RRF and LRFs the risks and that: "...the idea is to give them a general view of what a risk might look like but then think about, what would it look like from them in their area, and what they should do more than us telling them what they should plan for." According to the NRR (United Kingdom Cabinet Office, 2010b, p. 54):

"In planning for emergencies, local responders have to decide what types of risk, and what levels of consequence, to plan for. Putting a great deal of effort into preparing for risks that are either very unlikely to happen or are likely to cause relatively minor damage is unlikely to be the best use of the time and resources available to prepare. Priority is instead given to high risks: risks that are both relatively likely and could have a serious impact. Apart from identifying the highest risks, the Government also provides guidance in the form of planning assumptions, at a national level and to the Devolved Administrations and LRFs, on the range and type of damage and disruption that might result from a selection of the higher risks."

These planning assumptions might, for example be in the form of how many individuals hospitals might need to treat in the event of a large emergency or how many people might

have to be evacuated from their houses in case of river or coastal flood (United Kingdom Cabinet Office, 2010b). The findings from the national risk assessment which are presented in the NRR (the risk matrix and a general overview) and the national resilience planning assumptions, therefore contribute to local emergency management planning.

There is however an ongoing discussion in the UK regarding the planning assumptions that are given to local planners. A report published by the House of Commons entitled *Scientific evidence in Emergency planning* mentions that there are some concerns as to whether the planning assumptions given to local planners are detailed enough with regard to providing them with the necessary information regarding the risks, or whether the national risk assessment findings merely become symbolic guidelines (House of Commons Science and Technology Committee, 2011).

Respondents who had worked on the pandemic influenza and flooding scenarios in the national risk assessment explained that the risk assessments at the local and regional level are mandatory according to the Civil Contingencies Act. When asked how they ensure that the national risk assessment is in fact being used as guidance for the abovementioned processes explained that the LRFs and RRFs carry out self assessments and that "...we also do a capability survey which asks local response what they have in place, actually trying to seek assurances from them that they are actually doing the planning that they need to do at the local level." In addition exercises are also considered to be a good way of testing whether the advice that is contained in the planning assumptions has been used.

Some of the areas that are considered to be high risk are also accompanied by translation tools which, for instance, allow regional or local resilience forums and their members such as planners and first responders to scale down the numbers found in the national planning assumptions to fit their area. The national planning assumptions can, for instance be adapted to the local level by the use of translation tools. For example The CCS developed a calculator for use by local resilience forums to determine the impact on their community. One such example is a simple excel calculator that was designed to create a local estimate of "...clinical cases, deaths, hospital admissions, GP consultations and body processing capacity that might be needed by local authorities in case of a severe pandemic influenza (Civil Contingencies Secretariat, 2006). The respondent who worked on the pandemic influenza scenario explained that the planning assumptions are accompanied by:

"...guidance for local planners which essentially tells them how to interpret this, at the local level. So that means for local and regional planners how do

you break down the numbers so that it is proportionate for your population, for example if you are in a rural or urban area the effects might obviously be slightly different for them depending on how close you are to other people.”

The respondent at the DoH explained that the use of worst case scenarios as a basis for local and regional planning was not without challenges. One of the largest challenges had so far been a lack of flexibility in the plans of regions and local authorities when they planned for specific scenarios, hence work on increasing the flexibility of organizations in terms of the ability to scale down and adapt to situations as they developed was ongoing.

The manner in which recommendations translated to the local and regional level varied considerably between the flooding and pandemic scenarios. This was perhaps mainly due to the nature of the threat. A pandemic was considered to have the same basic nature across the country. A respondent at DEFRA emphasized that: “...our national planning has to prompt local planning as well for the people who receive our NRA.” The respondent also noted that a flood situation would be very different depending on the geographical location of a region or local area. The respondent explained that for the LRFs and RRFs:

“...it is very important for them to transform that national scenario, you know for them, so in many ways we developed planning assumptions for local planners from the national risk assessment so they can, we can work with the LRFS to say, east coast flooding is one of them, and there, this is the impact on your area that we assess through this process, to help them with their plans.”

The same type of guidance is developed for adapting other, high risk scenarios such as flooding. A respondent from DEFRA noted that the impact of a flood naturally will depend on the location of the region or area as well as its topography, density of population etc, issues which the guides to local and regional resilience forums take into consideration. The Cabinet office also uses the national risk assessment, in the form of the published NRR in the production of guides and frameworks that are in part aimed at emergency responders and infrastructure owners and operators – which may need to consider local conditions, such as the abovementioned *Keeping the Country Running: Natural Hazards and Infrastructure* framework which mentions that emergency planners can “use the guidance derived from the national risk assessment to inform their own assessment” (Cabinet Office, 2011b).

4.6.2. The Netherlands

Respondents at the MIKR; MEAAI and MIE all emphasized the importance of local and regional emergency planning and organization when discussing the use of the national risk assessment at the regional and local level.

The Netherlands is made up of 431 municipalities, 12 provinces and 25 Safety regions (which were formed in 2010). The establishment of the safety regions was based on an understanding that “The new forms of threat require a different type of approach, different partners and a different strategy. The need arose for a bigger organizational scale than the municipal scale: most municipalities are too small to be able to perform all tasks required for disaster and crisis management” (Ministry of Security and Justice, 2010). Security regions are generally structured along the same borders as police regions and are managed by the mayors from the municipalities in the region. According to the information document regarding the new law: “...the municipalities will continue to be involved in the fire services and disaster management” (Ministry of Security and Justice, 2010). The mayors and thereby the local or municipal level are still considered to be important in terms of maintaining public order, managing the fire services and providing crisis communication to the population of the municipality.

According to a respondent at the MoH in the Netherlands the principle of dealing with issues at as local a level as possible affects the management of crises and emergencies and also the manner in which ministries can instruct the lower level authorities. Flooding for example had been managed by the local water boards long before the Netherlands became a consolidated state, hence the regional and local level have a strong ownership over water management in their own areas. The local water boards are, for instance, financed by the individuals who live within their area of responsibility. A respondent at the MoH explained that: “...we start at the local level. Only in cases where the local level cannot cope we regionalize or go to the national level.” The respondent explained that until the creation of a new public health law in 2007 the MoH only had a weak mandate in terms of organizing coherent and integrated emergency plans for a pandemic influenza. The regions in the Netherlands have an active role in the national risk assessment process. They have for example participated in the development of several scenarios for the assessment; among them the one that dealt with wild fires. According to a respondent at MIKR they were included in the creation of scenarios because the regional level is important in terms of emergency management and planning.

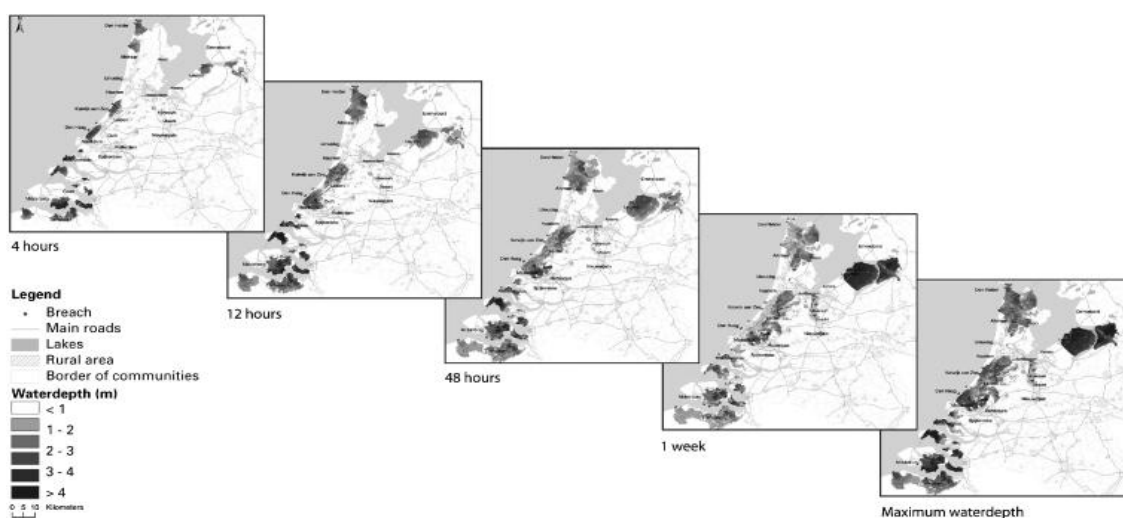
The regional and local authorities have access to the findings from the national risk assessment, but based on interviews with respondents at the MIKR it appeared that the conclusions in terms of what dangers the Netherlands faces is important for the regional and local level. The safety regions conduct their own work on risk in the form of developing a

regional risk profile; this makes no mention of the national risk assessment though it is considered to be connected to the NSSS. When asked how the regions are informed of the national risk assessment findings a respondent who worked on the pandemic scenario and the development of the national risk assessment method explained that the regional risk assessment method is comparable to that of the national risk assessment and that the methods were in fact written by the same work committees. He also emphasized that the assessments: "...fit together..." in terms of the issues that are addressed. The respondent explained that the regions receive the analysis and the scenarios in a more elaborate form than they send to the parliament and that "...we inform them about what they can do with this information. Besides there are a lot of scenarios where the safety regions have a role." He also noted that the regional level rather than the municipal level is the receiver of this information because according to the same respondent "...since the new law [on safety regions] the fire services and the medical services, in case of emergencies, are located at the regional level, so region is local level, there is not really a local level."

A respondent who worked on the flooding scenario emphasized that the nature of flood management necessitated the involvement of regional and local authorities in terms of considering what the effects of a worst case scenario flood would be. As previously mentioned the projects related to the flooding scenario were also part of a larger project – the task force management flooding. One of the main projects that were partially attributed to findings from the national risk assessment by a respondent at the MIKR was Dikering 100 which focused on municipal and regional cooperation during flooding. The respondent described how the mayors had, after three years of work, written a letter to the MIKR and MIE where they questioned whether it would be possible to evacuate all their inhabitants – about 3, 6 million people, if there should be a major coastal flood. This led to further studies in relation to evacuation based in part on experiences from Hurricane Katrina where all traffic lanes were used to direct traffic out of certain areas. Hence, the inclusion of the municipalities in the process led to the recognition for new knowledge and further studies. According to a respondent at the MIE the strategy for evacuation now focuses on vertical evacuation in terms of getting people to go to higher ground in their own houses or areas rather than a complete evacuation of populations from areas. The respondent did however point out that much work remains in terms of how one should deal with the individuals who have been vertically evacuated.

Some of the projects that were based on the national risk assessment also focused on meeting what the assessments considered to be the needs of the regions. For example one of the projects that was influenced by the flooding scenario focused on developing flood maps and forecast models for regions that showed how for instance a coastal or river flood would spread in their region, how many days it would take before the various defenses would give in based on specific water levels etc. According to a respondent who worked on the flooding scenarios these maps were in part a result of findings from the national risk assessment.

Figure 10 Flood maps created as part of Task force management flooding, Netherlands (Ten Brinke, Kolen, Dollee, Van Waveren, & Wouters, 2010).



The flood maps were meant to enable better evacuation and emergency management planning as they created a better understanding of the development of flooding situations. The respondent at the Ministry of Interior and Kingdom relations emphasized that through the development of the flood maps it was discovered that the main airport in the Netherlands, Schipol would be operational for longer than the regional emergency planners had previously thought.

In terms of the pandemic influenza the respondent who worked on the scenario explained that: “...the regions have a definite role in the large scale health diseases or accidents.” After the development of the scenario concerning a severe influenza pandemic the MoH and MIKR discussed with the regions how the consequences that were mentioned in the scenario should be scaled down. A respondent at the MoH pointed out that the police, “...some ministries and in particular in the regions people went too far, spent their time on the wrong things...” when attempting to use the worst case scenarios to prepare for unwanted events. He emphasized that

there is much work to be done in terms of determining how to best use worst case scenarios in local and regional planning.

The national risk assessments in the UK and the Netherlands both appear to be used for various forms of regional and local planning, though based on conversations with respondents it seems that the UK uses the national risk assessment in a more structured manner because regional and local risk assessments are directly influenced by the risks in the national risk assessment.

The main reason for this might be the manner in which the local and regional risk assessments and planning are based on the planning assumptions from the national risk assessment in the UK. In the Netherlands it appears that the regions are also given information on the findings from the national risk assessment where it is considered to affect their responsibilities. In addition the regions appear to be involved in the actual assessment to a much greater extent than in the UK, hence the issues that are brought up in the actual scenarios, using today's scenario building and scoring method, can actually come from the regions whereas the UK appears to have a more top-down approach to the relationship between central and local / regional government in terms of the national risk assessment.

One of the challenges that appear to be common both in the UK and the Netherlands in terms of using the national risk assessment findings for regional and local planning is the process of scaling down the findings from the scenario assessments – which are written in terms of the national impact. When local and regional planners attempt to use the findings they have to find ways of understanding what the actual impact that they would have to deal with is. The use of reasonable worst case scenarios is therefore not a straight forward process. A respondent at the UK department of Health commented that in her experience the use of the reasonable worst case scenarios as a planning background could lead to a lack of flexibility in the approaches taken by regions and local authorities. She found that there was often too much focus on being prepared for the worst case scenario and less on being able to tailor ones response to the actual circumstances. Hence, in the new framework for pandemics the focus is very much on being able to plan for a range of scenarios, the reasonable worst case one being merely one of them. The same sentiment was echoed by the respondent at the Netherlands MoH who found that the main focus in the regions should be on being able to undertake a flexible response.

4.7. Communication with the public

As explained above, information about the risks that are assessed are to a varying degree made available to ministries as well as regional and local government in the UK and the Netherlands. In the UK the national risk assessment in itself is a classified document and process, in the Netherlands the process and findings appear to be more transparent and easily available to the public in terms of the method that is used and the findings that are arrived at.

In the UK respondents at the CCS explained that the findings from the national risk assessment are made available to the public in a simplified form through the national Risk Register which describes the risk areas that have been assessed but does not outline the specific planning assumptions that have been created for each of the areas. A respondent at the CCS explained that it is used to inform individuals as well as private companies and organizations as to how they might prepare for emergencies.

In the Netherlands there does not seem to be a similar effort to use the national risk assessment as part of a public information campaign. Rather, the respondents in the Netherlands agreed that the risk matrix and descriptions of scenarios are not necessarily a good way to communicate with the public because the meaning and implications of worst case scenarios is not easy to explain to the public. Respondents in the UK agreed that communicating with the public in terms of worst case scenarios is not necessarily easy; in fact it can lead to confusion and fear rather than having a reassuring effect.

The NRR communicates what type of emergencies individuals and businesses should be prepared for and how they might do this, hence it is more like a guide in terms of what the potential impacts are, and does not appear to focus heavily on the likelihood aspect of the assessment.

A respondent at DEFRA explained that it does not use the national risk assessment as part of its public information campaign, mainly because the information they try to present to the population is usually more targeted in terms of what the risks in the various areas are. They do however at times refer to the NSRA which in part is based on the national risk assessment, as this is a document that the prime minister has signed.

In the Netherlands the national risk assessment reports which are submitted to the parliament are available online. They outline the main findings in terms of the various risks and provide an update on the efforts that are ongoing within each risk area. There does however not appear to be a deliberate use of the process as part of a public information campaign.

5 Concluding discussion

The aim of this dissertation has been to understand how national risk assessments that apply an all hazard approach are used in the Netherlands and the UK. To facilitate an understanding of the use of the risk assessments it was also necessary to develop an overview of what the actual risk assessment processes entailed, because the opportunities for use of the process and findings appeared to depend on the manner in which the national risk assessments are conducted. The purpose of using a grounded theory approach in this study has been to develop an understanding of how national risk assessments are used without referring to how normative theories of risk governance recommend that such processes should be undertaken. The benefit of this approach is that the meaning of concepts as they are used in the processes rather than as defined in normative frameworks can be developed. This chapter will first provide a summary of the findings in terms of the categories developed through open and axial coding. Thereafter it will discuss what the implications of these findings are, what they imply about how the national risk assessments are understood and what meaning their findings are given in the UK and the Netherlands. It will also consider how this model of use can be related to certain aspects of one of the most prominent normative risk governance frameworks, that presented by Renn in *Risk Governance* (2008).

Use of a process or product – both of which national risk assessments may be considered to entail was operationalized as the research proceeded. The respondents were asked how the national risk assessment was used; hence the concept of use was developed in terms of their understanding. Use appears to imply some deliberate action, often with a specific goal or purpose in mind, such as the development of capabilities. Based on the interviews it appears that respondents realized that the national risk assessments have a formal type of use – in particular in relation to policy and in terms of prioritization of risk areas. These were the purposes that were outlined in the method and strategy documents related to the national risk assessments. Use does however also appear to have less formal aspects in terms of how individual actors use both the process and the findings in pursuit of their own goals, which is not necessarily considered to be a negative development.

In grounded theory model development is meant to be focused on deriving a single overarching category to which the other categories can be linked. In terms of the national risk assessment that category appears to be work on capabilities. Most of the categories that were

presented in the findings chapter can be related to the capabilities concepts that the UK and the Netherlands employ, though these are admittedly very wide. The concept of capabilities was developed in the findings section. In common for both the Netherlands and the UK is a view of them as being a broad concept. For example the ability to evacuate individuals no matter the crisis is considered to be a capability, but likewise is the availability of boats to rescue individuals during a flood.

In the description below the tentative model which describes the relationships between the various categories from the open and axial coding and the main category – capabilities, as well as the relationships between the categories and between the categories and sub categories is explored.

5.1. The use of the national risk assessment process

It appears that the process of undertaking national risk assessments, that is creating scenarios, analysis and assessment of findings are considered to be phases during which the participating actors actively use their roles to shape the future findings of the national risk assessment and thereby also future cross governmental projects and prioritization. This was emphasized to a much greater extent by respondents in the Netherlands than in the UK. The category discovering dilemmas –discovering areas where there might be a need for prioritization and thereby a decision regarding what resources or values to protect, or in which order to protect was described by a Dutch respondent. This is an example of how, by actually discussing the implications of a scenario, participants realized that there was a need of a specific decision making capability. The respondent described the discovery of this issue as a bi-product rather than something that was actively sought out. It is however possible that the national risk assessments- either during the scenario analysis or capability assessments might actively be used as a forum to discover these types of situations in the future. The need to organize decision making and prioritization appears to be a quite typical Dutch response to the identification of an issue. A respondent from the Ministry of Health emphasized that in the Netherlands capabilities are often considered in organizational terms in addition to as physical resources. This is perhaps because the focus of the Dutch national risk assessment appears to be on cross governmental cooperation where organization and the availability of forums for decision making are considered to be important. This appears relevant because even though a physical capability exists there may be a need for organizational cooperation during a crisis to enable the most effective use of these resources across different risk areas.

The involvement of new actors in the national risk assessment process whose goal it is to develop capabilities appeared to be a deliberate choice in the Netherlands, for instance related to several of the IT scenarios. These were areas where there was a need to involve new actors because they held special competence in terms of IT security, but also because the businesses would potentially be the actors tasked with handling an IT event, whether it was malicious or accidental. It could be argued that the use of the national risk assessment process to allow for the involvement of new actors might also become a positive side effect – an opportunity that can be harnessed. This might be particularly relevant in terms of areas which involve sophisticated technology or where private actors are heavily involved, such as in the IT sector. Since the end goal is to prepare for and prevent unwanted events it might be argued that including new actors in the national risk assessment process can be a way to encourage capability development because it involves those who need to actually develop the capability. It is also possible to accomplish this by creating projects with new actors in the form of businesses or business organizations, but the direct input from businesses in the actual assessment process may also yield valuable feedback and tie actors into the processes and their projects in a somewhat different manner. For example by creating a sense of ownership of the results and findings and thereby ease the process of getting those new actors to carry out projects. The use of the national risk assessment process in this manner appears to be easier to carry out in the Netherlands than in the UK, mainly because of the structure of the analysis and assessment processes. In the UK the national risk assessment is very much a cross government process because it determines planning assumptions. A respondent at the CCS explained that the participants at the analysis meetings were bureaucrats, but that there was room for business involvement when scenarios were being analyzed within ministries. In the Netherlands, because the participant structure in the assessment process – from scenario development to analysis – this type of participation and use may be more easily accomplished.

The category “agenda setting” was initially not included in the categorization at first because it was considered to be self evident. In a process where risk areas are selected for consideration in terms of developing policy of course agenda setting in the form of the scenario selection was occurring. However, because respondents in the Netherlands had emphasized this aspect, it was considered to be a meaningful phenomenon for them. Agenda setting can be both a positive and negative phenomenon, depending on whether the purpose is to avoid inclusion of a risk area or event in the national risk assessment or whether actors use the process to create attention around issues they believe would benefit from being considered

in terms of cross government cooperation and coordination. Agenda setting may be considered to be related to capabilities because scenario selection and scoring of scenarios both contribute to determining which capabilities will be necessary later on. The scoring of a scenario can for instance contribute to determining the amount of a capability that will be needed, especially in the UK where the scenario descriptions are used as planning assumptions and thereby as dimensioning tools for certain capabilities such as vaccines against pandemic influenzas. Though the agenda setting aspect of national risk assessments was not brought up, one might assume, based on the fact that all actors have an agenda, and that when actors provide input to the scenario selection, they are de facto influencing the agenda of the process. On the other hand there might be less of an opportunity for this in the UK because the same scenarios are assessed every year, there is no automatic inclusion of new scenarios. The emphasis on this category in the Netherlands shows that it at least is important to be aware of the power actors involved in risk assessments can have – the effect of agenda setting will however vary depending on what the impact of the findings and their recommendations are. It may also be argued that if actors work to have risk areas they are responsible for included or excluded they might actually consider the national risk assessment to be a process that has an effect on capabilities.

The process of conducting national risk assessments was also found to be able to improve coordination of cross government measures because the national risk assessment provided actors with a meeting place in which to discuss ongoing efforts. The impact of the process was therefore that it functioned as a catalyst for projects that might have been stalled. The national risk assessment was therefore considered to be useful as a forum for ministries to discuss ongoing projects which were meant to improve capabilities.

5.2 The findings from the national risk assessments

When the use of the results from the national risk assessments were discussed with respondents in the UK and the Netherlands the discussions were in regard to different types of findings. In both the Netherlands and the UK the risk matrix itself – based on the likelihood and impact scores are considered to be an important outcome.

The risk matrices and the scores that they represent appear to mainly be used in terms of prioritization because they provide an overview of how the risks are positioned in relation to each other. In both the UK and the Netherlands the prioritization process does not appear to rank all the scenarios in relation to each other, rather risks are considered to be part of what

might be termed “risk categories” according to their placement in the matrices. The placement in the matrices influences whether the scenarios become the subject of different types of capability efforts. In the UK scenarios which are considered to have the highest risk in terms of likelihood and impact are given their own work streams in the capabilities program. In the Netherlands some of the areas which are considered to be high risk; among them flooding and pandemic influenza, have also become the subject of special capability improvement programs. It is however important to recognize that many of the risk areas that are considered in the national risk assessments are already being worked on, hence it cannot necessarily be assumed that the actual prioritization process in the national risk assessment has led to new projects within responsible ministries. There is however a real prioritization in terms of the attention risk areas get within the framework of the national risk assessment and during the capability assessment. In the Netherlands the two high risk areas were located in quite different locations in the risk matrix. The actual prioritization process in the Netherlands therefore shows that prioritization is not merely mechanical and based on the scores, but also on the political realities of the individual country; flooding, for example is highly important in the Netherlands.

The aim of conducting a prioritization is to determine where to focus resources in terms of capabilities – where are they needed the most and where should efforts at developing relevant capabilities be targeted. The aim of both national risk assessments is however not only developing capabilities that are specific to the high risk areas. In addition they focus on more general capabilities which are considered to be useful in several different types of risk areas. In the UK the focus on general capabilities appears to be somewhat more systematic because the capability efforts are organized in a cross governmental resilience capabilities program which focuses on both organizational and physical capabilities. The aim of the scenarios is to, based on the impact, determine which capabilities are necessary, and in the lower risk scenarios to attempt to determine which capabilities will be useful for several risk areas. In the Netherlands the focus of the prioritization part of the national risk assessment is also determining in which areas capabilities are most needed, but also to determine which capabilities may be used for several risk areas.

Determining to what extent the national risk assessment actually does lead to prioritization is not an easy task as individuals are unlikely to agree on the relative role and importance of different processes and tools, such as the national risk assessment in influencing decisions. The national risk assessments do not take place in a vacuum, processes are under way and the

responsible ministries have often been working on issues within risk areas before they were included in the national risk assessments. The prioritization of an issue or a capability in relation to a risk area across ministries does however appear to be influenced by the prioritization element of national risk assessments. In the Netherlands and the UK the importance of the national risk assessments in terms of cross government and ministry cooperation was considered to be perhaps the most important aspect of the programs, a sentiment that appears to be fully in line with the broader view of security which is presented in the national security strategies of both countries. Hence, for national risk assessments to be valuable tools it might also be argued that it is necessary to have an agreement or understanding of the importance of capabilities and how achieving a sufficient level of these and an ability to use them in several different situations will often need to be the result of coordinated ministry action. Respondents at the ministries responsible for flooding and pandemic influenza in the Netherlands and the UK in general agreed that the high prioritization of their risk areas had resulted in projects and certainly increased attention and willingness to cooperate from other ministries regarding overlapping responsibilities. From the ministries point of view the prioritization from the national risk assessments had however added to the prioritization of, rather than created the entire impetus for such developments. It is also important to remember that the final decisions that are made in terms of which risk areas to prioritize in terms of projects, programs and funding depend on a wide array of inputs, an issue which has not been explored extensively in this dissertation due to time and resource constraints.

The most extensive use category was labeled policy development. As described in the findings chapter policy, like capabilities is a concept that may be interpreted quite widely. Policy can be defined widely as deliberate efforts made by government agencies, ministries and authorities. Influencing policy making can occur in a variety of ways; this was reflected in the interviews with respondents both from the secretariats and ministries. Some discussed policy in terms of developing capabilities, others mainly referred to specific programs which are, in essence, designed to improve capabilities. The main products of the national risk assessments that were used during this stage were the scenario in the UK; (in the UK in the form of planning assumptions, this term was not used by respondents in the Netherlands) and in the Netherlands the findings from the capability analysis following the scoring of the scenarios.

The use of the scenarios in the UK and the Netherlands appears to differ significantly. A respondent in the Netherlands described the UK as being more focused on the specific numbers from the scenarios. In the Netherlands the specific scenario descriptions do not appear to be dimensioning of policy efforts in the same manner. This was certainly true of the pandemic scenario which the UK respondents at the DoH and CCS described as being dimensioning of vaccine purchases. This variety in use might perhaps be explained by how the specialist ministries conduct their planning in terms of whether reasonable worst case scenarios are considered to be proper dimensioning tools. The scenario descriptions were used by ministries in the Netherlands as well, but respondents had the impression that this was done more in an illustrative capacity or to give actors a framework to think within – but not necessarily in terms of what actors should plan specifically for. The ministries that were consulted in the Netherlands appeared to use the scenarios to a lesser extent to directly dimension their own policies in relation to the risk areas. An example of this was exercise planning. Whereas the scenarios from the national risk assessment were used to directly dimension exercises in the UK they appeared to function more as a framework or provided planners with indications of which implications should be included in the Netherlands. In common for the ministries was that they used the national risk assessment in terms of the findings, in particular impacts and the relative position of the scenarios in the matrices in their work with other ministries which had overlapping or related responsibilities. The national risk assessments appear to be used to legitimize or illustrate the need for cooperation and certain measures related to findings, especially the impact sections from scenarios. The use of the assessment towards other ministries was considered to lead to cooperation on projects to improve specific physical capabilities – rescue boats in the UK, and organizational capabilities in terms of business continuity planning in the Netherlands.

National risk assessment findings in the UK in the form of planning assumptions and in the Netherlands in the form of findings from the capability assessment, appear to be used by the secretariats to drive capability development through cross ministerial and cross governmental programs. Some of the projects that were described by respondents were considered to have been given greater legitimacy by the findings in the national risk assessment, but were not a direct result of the findings. In other cases the findings from the assessment had led to the creation of specific projects such as an IT response board which is to assist the government during an IT crisis in the Netherlands. Findings from the national risk assessment were also described as having legitimized ongoing measures, which may therefore also classify as

contributing to capability improvement by strengthening ongoing programs. It is however difficult to measure the actual effect of these types of statements, mainly because policy and implementation in particular is affected by a variety of factors.

Another manner in which capabilities were improved by the national risk assessment was through identification of knowledge gaps and thereby initiation of research to, for example determine which capacities will be needed as well as the extent or level that is necessary. Hence by identifying knowledge gaps the findings can also contribute to capability improvements or at least to determine which capabilities should be improved. These types of programs appear to mainly have originated within the context of the national risk assessment secretariats as they require input from a variety of actors.

The national risk assessments are only to a limited extent used in communication with the public. The need for the public to take a greater role in their own protection – self sufficiency is emphasized by both the governments in the UK and the Netherlands, hence to improve some of the identified capabilities it is necessary to communicate with the public. The actual findings from the national risk assessments do however not appear to receive widespread distribution. In the UK the national risk register presents an unclassified description of the risks but it gives only a very general overview of the risks. In the Netherlands communication with the public about the national risk assessment also appeared to be limited, perhaps because the reasonable worst case scenarios and their implications can easily be misunderstood.

At times it was difficult to determine which projects and programs were connected to which administrative unit, specialist ministries or secretariat organizations. It was natural that ministries cooperated with the secretariat organizations to carry out projects, some of which might have originated within the specialist ministries and then been transferred to the secretariats. It was however easier to distinguish between the central government and regional and local use of the national risk assessment.

In the context of local and regional administrative units the national risk assessment findings were used mainly as a way of determining which risk areas to focus on during emergency response and prevention planning. In the UK the filtering down of findings from the national risk assessment to the local and regional level appeared to be quite structured as it was anchored in the civil contingencies act. In the Netherlands the national risk assessment did not appear to be filtered down in the same manner.

Differences in terms of the use of national risk assessment at the regional and local level must also take into account the roles of these units and the level at which responsibilities are placed. In the Netherlands, for example, the regions were described as being the most important level in terms of emergency management; hence it would not be as natural for the local authorities to use the national risk assessment findings. In the UK the emphasis was placed on the local resilience forum. They were described as using the scenario descriptions from the national risk assessment to shape their own local risk registers. In the Netherlands the involvement of the regional and local authorities appeared to also occur through direct involvement in specific national risk assessment related projects. This might also have been a result of the relative importance of the regions and municipalities in terms of responsibilities for health care and flooding preparedness though. Respondents in the UK and the Netherlands noted that there are problems associated with national risk assessment use at the local and regional level. In particular the respondents noted that there were issues related to the use of scenarios because the manner in which they should be scaled down to the local and regional level is not always clear. In addition the findings from the national risk assessment are related to national issues; hence all the findings will not necessarily be relevant for all areas. To use the national risk assessment at the local and regional level therefore requires some form of processing of the findings and an understanding of the actual meaning and purpose of reasonable worst case scenarios.

The role of local and regional authorities in actually determining the content of the national risk assessments appeared to be quite limited, though more so in the UK than in the Netherlands. A respondent in the UK explained that though the process was meant to be bottom up, the national risk assessment did not feature much input from the regional and local level. In the Netherlands there appeared to be a greater role for regions, especially in terms of contributing to scenario development and assessment.

5.3. *Implications*

Using a grounded theory approach entails a focus on the meaning given by respondents or documents to concepts rather than the researcher starting out with a set view of a concept contains. The aim was to, by using an exploratory approach, once again, discover what the individuals involved meant by the concept of use in terms of national risk assessments. Through this approach it should therefore be possible to say something about what kind of tool the national risk assessment is and how actors understand the concept of national risk assessments. The manner in which use is described, and the type of use respondents

described, may also provide indications as to how they view the national risk assessment – a concept which itself was explored in the introduction based on its three main aspects.

The perhaps most prominent aspect of the national risk assessment, and a fact that was underscored by all the interviewed respondents, even the respondent who considered the national risk assessment to have had a minimal influence on his own ministry emphasized the impact it had, and could have on cooperation between ministries. This indicates that the national risk assessment findings function as a platform for cooperation and capabilities development. By including risk areas these issues are, depending on their placement in the matrix, given attention and the need for cooperation across government regarding their potential impact is brought to the forefront, essentially legitimizing an area as a national concern. The national risk assessments are national in the sense that they engage ministries across risk areas and ask them to think about how the functioning of the nation, a unit that is highly complex and interwoven will be affected by events. This means that the national risk assessment functions as a platform for planning and cooperation that ministries may have found difficult to initiate and sustain without a wider agreement on issues. Another aspect of the assessments being national, is the fact that the conclusions that are reached are meant to be national – the result of input across government, and in the Netherlands from other important actors in society as well. By creating a product that is national in scope and participation the foundation for acting on the findings that are reached may also be considered to be more solid than if individual specialist ministries were given a similar task. The participatory element of national risk assessments was therefore considered to be important as well.

The national risk assessment appeared to be particularly appreciated as a tool that the central government and the specialist responsible ministries could use to make other ministries and agencies consider the impact of an event on their own areas of responsibility or to encourage them to undertake projects and measures to prepare for such events. In the Netherlands the role of the assessment as a framework that could be used as a catalyst to encourage further work was emphasized by several respondents. In the UK, in addition to this role the assessment was also described as being a framework for dimensioning specific capabilities rather than merely determining what capabilities were needed. It might be argued that in the UK more detailed recommendations were derived from the analysis phase of the national risk assessment. However, in the UK it appears that the analysis and assessment may occur simultaneously during the scoring of the scenarios. In the Netherlands details regarding capabilities were developed more based on the formal capability assessment, but also within

the specialist ministries, though this did not appear to be related to the national risk assessment in the same way as it was in the UK. This might reflect two different views on the level of detail that can be derived from the national risk assessment, and from the use of worst case scenarios. It is however important to emphasize that the scenarios that are used in the assessments are usually the result of input from specialist ministries, hence it may reflect what they have already based their planning on rather than actual new knowledge.

The national risk assessments are both used to derive capabilities that the government considers to be necessary to a) handle events in specific high risk areas and b) to handle more general impacts of events in lower risk areas. Hence it is considered to be possible to derive, based on a description of a reasonable worst case scenario some necessary capabilities which will also be applicable in scenarios which are of a lower severity and therefore also lower impact. The assumption in both cases appears to be that the capabilities that are needed in extreme events are also those that will be necessary under less severe circumstances. Several of the respondents focused on the difficulties associated with using scenarios by scaling them down. The uncertainty related to the impacts was only brought up by two of the respondents, both in relation to scaling down scenarios in terms of severity, or in terms of the effects of a worst case scenario at the local level. In a further examination of the national risk assessments it would be interesting to examine how the determined impacts are viewed in terms of the uncertainty related to their designation. Further examinations of the national risk assessments might also consider the manner in which the two main elements of the assessments, the impact and likelihood are considered by actors. A tentative observation in relation to this is that the uncertainty related to the findings appeared to be considered to a lesser extent, in particular in the UK where the scenarios are used as planning assumptions.

The same might be said for considerations of risk in terms of interpretation and use of national risk assessments. It would also be interesting to examine whether the actors and individuals that use the national risk assessment findings have actually reflected over the validity and implications on the findings of the method and approach that is used in national risk assessments. A tentative observation regarding this is that if the use of risk related techniques and tools is accepted at the central government then the focus is perhaps more on the conclusions rather than the process through which they have been derived – if they are a result of a cross ministerial process – and the process therefore is considered to be legitimate. This is particularly interesting in light of the manner in which the two main scoring elements of the national risk assessments are used. The impacts appear to be the far more widely

utilized part of the scoring, whereas the likelihood mainly appears to be important during the prioritization phase.

In light of this examination and the overall remarks regarding the national risk assessment, through an as theory free framework as possible, it is however also interesting to consider the findings in light of normative risk governance theories such as that presented by Renn (2005, 2008). In *Risk Governance* Renn (2008) outlines a normative framework detailing how to undertake risk assessment; from analysis, assessment, decision making to risk management. By examining the use of national risk assessments using a grounded theory, research design has also provided interesting insights into the process of developing national risk assessments. Though it would have been interesting to compare the method used by the national risk assessments with the recommendations made by Renn (2008) in terms of how to conduct a risk assessment process it will not be done here because it is the key issue of discussion in this dissertation.

Renn (2008) argues that the characteristics of a risk should have implications for the selection of risk management strategy. In the UK and the Netherlands the overall strategy in relation to large scale risks that might affect the functioning of society and threaten its core values appears to be one of dealing with risk by focusing on resilience – the ability to manage or recover from unwanted large scale events. When recommending generic risk management strategy Renn (2008) distinguishes between risks that are characterized mainly by complexity, uncertainty and ambiguity. One of the categories risk characteristic categories Renn (2008, p. 182) uses is called “uncertainty induced risk problems.” This denotes a situation which implies “that the (true) dimensions of the risks are not (yet) known” (Renn, 2008, p. 179) Renn (2008, p. 179) also notes that with risk absorbing systems: “...the main objective is to make these systems resilient so that they can withstand or even tolerate surprises.” This, he explains, can be accomplished by focusing on improving the: “...capability to cope with surprises” (Renn, 2008, p. 179). The national risk assessments and national security strategies of both the Netherlands and the UK are focused on building resilience through the development of capabilities. Renn (Renn, 2008, p. 183) recommends that capabilities can be built by using: “...diversity of meant to accomplish desired benefits, avoiding high vulnerability, allowing for flexible responses and by developing preparedness for adaptation.”

Renn (2008) emphasizes that the strategy chosen for risk management should depend on the nature of the risk; does it represent an intolerable, tolerable of acceptable situation? In terms

of the national risk assessment scenarios there are two ways to look at this aspect; a) the scenarios are designed to represent a reasonable worst case scenario, hence it might be assumed that the goal is to describe an intolerable situation in terms of that risk area and b) the tolerability of the scenarios in relation to each other might be described as being determined during the assessment – during which the focus scenarios and the general capabilities are selected. It appeared that risk reduction might be undertaken by individual ministries within risk areas in the Netherlands which were not considered to be so serious as to be included among the risks that required follow up on a cross national scale, hence the situation was not considered to be so intolerable as to warrant inclusion in the general capabilities focus. The ministries themselves are however often working on the issues, though, if not they probably would not have been included in the national risk assessment. The national risk assessments themselves may be considered to be based on one approach – building resilience to risks because of the large degree of uncertainty in terms of who will be affected, how, what the event will be etc. Due to this uncertainty it has been deemed best to build general capabilities that can be used under several different circumstances, and in that case it appears to be necessary.

Renn (2008) also recommends that a resilience focused approach also needs to focus on allowing for flexible responses and preparedness for adaptation, good advice which respondents in both the UK and the Netherlands found that it was, at times difficult to promote based on the use of reasonable worst case scenarios, especially in cases where the content and the actual meaning, what the scores and findings represented in terms of advice was unclear, an issue which ministries are still struggling with in the UK and the Netherlands. In light of the use of scenarios in the national risk assessments, it is particularly necessary to consider how the findings from scenario assessment and analysis should be transformed into actual recommendations, in particular in terms of determining how findings from one scenario can be made relevant for an entire risk area, and how findings from various scenarios can be tied together using the concept of capabilities to create flexible responses.

Renn (2008) defines capabilities in terms of the organizational capacity of governing actors to fulfill their roles in risk governance processes. The importance of capabilities is therefore in terms of whether “society has developed the institutional and organizational capability to perform all the tasks prescribed in each component” (Renn, 2008, p. 356). Renn (2008) considers institutional capacity in terms of assets, skills and capabilities. These three categories combined appear to match the capability concept used by the Netherlands and the

UK. Assets, for example are defined as being resources such as physical infrastructure, organizational integration and regulations. Among the important skills Renn (2008, p. 356) mentions flexibility which is important in terms of: "...making sense of a dynamic situation." He also finds that capabilities "constitute the framework in which assets enriched by skills can be exploited for developing and implementing successful risk governance policies" (2008, p. 357). He finds that they are, in particular; relations, networks and regimes. The focus of his capability concept therefore appears to be more on organization than physical capabilities. This approach, it may be argued, is more in line with the capabilities approach used by the Netherlands which several respondents described as being organization- focused than that of the UK.

It is interesting that the UK and the Netherlands have chosen one of the approaches advocated by Renn (2008), resilience as the manner in which to deal with risk assessment. It would also be interesting to examine how risks that are found to not be in need of capability improvements through the national security strategy programs are treated by the ministries that are responsible for them. Do they work on capabilities but merely on a larger scale? It is also interesting to consider the use of a resilience strategy and the selection of risks and risk scenarios because the level of uncertainty related to risk areas does not seem to gain much attention, yet Renn (2008) argues that it should be the determinant of which risk management strategy to choose. In the national risk assessments it appears that risks that are considered to have sufficiently high likelihood or impacts or both are managed by using a capabilities approach, though there does not appear to be much focus on uncertainty when discussing the results and when using them to dimension planning. This also brings to mind discussions regarding how to determine whether issues should be handled through the national risk assessments. Scenarios are placed in a risk matrix, yet there do not appear to be specific risk acceptance criteria which determine when a risk should be handled by the specialist ministry alone rather than by using a cross governmental capability approach. In addition it is worth considering whether the specialist ministries use a similar capabilities approach to issues which have not been considered to be in need of capabilities at the national level.

Discussing the use of the national risk assessment is difficult because it is possible to point to forms of capability development such as legitimization of ongoing policies, identification and initiation of work on new capabilities and mere recognition that the ongoing capability efforts, but it is difficult to determine the actual impact and to track whether the programs that were described have actually been carried out. National risk assessments in the UK and the

Netherlands appear to contribute to capability development, at times in concrete manners such as determining the need for specific measures and programs, by dimensioning resources in the UK and by determining the types of events that regional and local authorities plan for. To determine more exactly the nature of the use it would be interesting to among others examine how more of the scenarios have been used, what the projects and programs that are related to the national risk assessment have achieved and how regional and local authorities view the national risk assessment findings. As respondents emphasized time and again, work on national security and safety is a continuous and ongoing process, the national risk assessment captures and examines a small aspect of this work, what the possible worst case scenarios are, but attempts to translate this into more general findings in terms of what capabilities are necessary to deal with crises, a link that should be explored further. Based on this study it appears possible to say that the national risk assessments are far from mere symbolic processes, they have real influence on programs and policy in a number of risk areas, but the effects of the use forms described in this dissertation require further examination.

6. References

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7. Appendix

Interview guides:

- Civil Contingencies Secretariat UK
- Department of Health UK
- Department of Environment, Food and Agriculture UK
- Ministry of Interior and Kingdom Relations / Ministry of Economic Affairs, Agriculture and Innovation Netherlands
- Ministry of Infrastructure and the Environment
- Ministry of Health Netherlands

Interview guide
Civil Contingencies Secretariat
UK

- The process
- The scenarios
- The findings from the scoring and assessment
- The capabilities analysis
- Use of findings – what is done

The process

- Can you quickly describe how you go from the NRA findings to recommendations
 - o Who is involved in creating the recommendations – the same people who will use them later – specialized agencies or ministries or is it mainly experts with an outside affiliation?
- Can you describe what the recommendations look like – content?
 - How detailed are the recommendations
- Who participates in the process
- How do you think departments use the NRA?

The scenarios

- How specific are the scenarios that are used – compared to the Netherlands
- Do you find that there are challenges involved with going from scenarios that are worst case to actual planning – complaints about how to dimension in Norway.
- The thematic in-depth study – can you elaborate on this. It results in scenario descriptions.
 - o Who conducts it,
 - o Who decides which scenarios to include
 - o Are new scenarios considered every year – how about the old ones?
- How are the scenarios used later on – by organizations, by the government? Do they become the main dimensioning tool for capabilities
- How are the duplicate scenarios used – where you have variations on a risk
- How detailed are the scenarios – so what do they actually tell you
 - o “the scenario must be concrete enough so as to be able to assess which capabilities are necessary, which are already available and whether there are capabilities that need to be reinforced.” How concrete would that be?
- How are the scenarios that are developed used – are similar ones used in more localized or specialized risk assessments – are they models for these or are they completely separate?
- Are other organizations allowed to influence the scenario during the assessment, or is it already set
- What is a balanced group of experts that is used ? Who does this consist of – does the makeup of the NRA influence how it is used – in the UK it is persons from the departments who arrive with data in advance – this reflects the more general scenarios that are used there.

The capabilities analysis

- How do you test / determine capabilities during the capabilities analysis.
- Who leads the capabilities assessment – the agencies themselves?

- The capabilities that need to be reinforced – are these prioritized, does it happen that there are already projects underway to deal with the issue? So do agencies receive extra attention for projects that are ongoing

The outcome of the process

How does the NRA help the “Cabinet to make better-substantiated decisions about where to set priorities and how to do this, but also to consider those choices in relation to one another?”

- What is the purpose of weighing the risks up against each other, how is the ranking used
- Do departments have to reprioritize their own efforts because of the NRA, do you find it easy to get them to do as the cabinet recommends.
- Who determines how businesses, people, civil society can do in terms of reducing vulnerabilities / exposure
- How do businesses contribute to the NRA / How are businesses affected by the NRA
- How is the NRA used in communication with the population
- How is the NRA used to explain / justify policy decisions

Monitoring

- How is the monitoring done – are the capabilities tested up towards the worst case scenario that comes out of the NRA
- Are there new threats every year – on purpose because there is a goal of covering as many as possible, or do you review them all every year
- What are the political / administrative choices, and how are they converted into policy, legislation and concrete actions
 - o Can you give an example of this

Use and implementation of recommendations

- How do the recommendations from the NRA contribute to policy
 - o Do ministries work out the specific projects after the capabilities have been decided by the cabinet?
 - o What is the difference between informing policy and direct action?
 - o Are the capabilities both procedural and substantive
 - o At what level are the capabilities improved – locally, regionally or centrally
 - o What is the effect of the ranking of risks, and ranking of capabilities
 - o How does politics interfere with what you are doing – what you want to do. Does it happen that capabilities are chosen more for their political factors?
- How is the prioritization of the risks / relative scores of the risks reflected in the final recommendations

- How detailed are the recommendations?
 - o Is there a timeline / deadline for the programs and improvements?
 - o Are all the recommendations used? (Either by your office or by others)
 - How do you ensure that things get done
 - o What happens to the ones that are not used?
 - o If a department or agency has several recommendations/ issues that have to be dealt with – do you prioritize or give guidance on how they should prioritize?
 - Can you give an example of a prioritization?
- The participants in the scenario assessment and capability assessment
 - o Are they the same organizations that initiate projects based on the NRA
 - o Do they ever tell you that they already have plans to deal with a specific issue – so the NRA ends up validating the work that has already been done?
 - o Do you find that they use them for projects that are already being worked on? The critical infrastructure project for example.
 - o How does the NRA tie into work that is already being done by ministries and agencies, do findings from it / the planning assumptions overrule their own risk assessments?
- What kind of documentation is created when the NRA process is completed?
 - o How is this used?
- Used in the National Security Strategy? Is it used by the military / intelligence services as well, or is it mainly by civilian departments?

Legislation: new in terms of strengthening the managing role of the central government during imminent crisis – how did / did the NRA contribute to this.

Do you find that the new scenarios demand different capabilities than the previous ones, or is there some overlap?

Pandemic influenza scenario respondent

- Description of the scenarios
 - o What were the main findings / recommendations
 - Not just the continuity in planning for an influenza, anything else
 - After 2009 – changes in the scenarios / capabilities needed
 - Was the main outcome policies, not legislation and direct actions?
- How are the two pandemics scenarios used together?
 - o How are these related to the work already done by other agencies / to other plans? Does it overrule them?
 - o Do you say – yes it is a likely and high impact scenario

- Is the scenario developed for the NRA used by others later as the standard for what one has to plan for?
- Use of the findings
 - How do you prioritize within each scenario what is most important – or does the responsible ministry / agency do this?
 - How were the findings used in planning – by whom?
 - What agencies, at what levels?
 - Can you give examples of specific actions / improvements / projects?
 - The continuity project – run by the department of health – who else?
 - The flu pandemic exercise in 2009 – how was it influenced by the NRA?
- Do you track the use of the recommendations by agencies and ministries
 - Are they positive towards the recommendations?
 - Are most of the end users involved in developing the planning assumptions?
- Outline specific projects that have resulted from / can be traced back to findings from the NRA.
 - Who developed the recommendations for the project?
 - Who implemented it?
 - How was your office involved? Where does your responsibility end?
 - When projects / actions are recommended based on the NRA is there an allotment of funding – do agencies and ministries have to set aside own funding for them?
 - Are the projects mainly run by one ministry or do several participate?
 - Who are the projects aimed at / who cooperated with you – was it run by the civil contingencies secretariat or by specialist agencies?
 - Is there any official publicly available information about any of the projects?
 - How do you follow up on ongoing projects?
- The participants in the scenario assessment and capability assessment
 - Are they the same organizations that initiate projects based on the NRA
 - How are businesses involved in the projects
 - Do they ever tell you that they already have plans to deal with a specific issue – so the NRA ends up validating the work that has already been done?
 - Do you find that they use them for projects that are already being worked on?
- How have the results from the NRA contributed to planning for an influenza, not just in terms of the specific projects

Flooding scenario respondent

- Description of the scenario
 - What were the main findings / recommendations / planning assumptions
 - How are these related to the work already done by other agencies / to other plans? Does it overrule them?
 - Do you say – yes it is a likely and high impact scenario – then do you consider specific capabilities?
 - Is the scenario developed for the NRA used by others later as the standard for what one has to plan for?

- How did the findings from the NRA fit with already ongoing plans / programs – do you ever determine that some of these should merely be strengthened?
 - How are NRA projects integrated into ongoing policy efforts
 - How do findings from the NRA / National Security Strategy play into efforts such as the Dutch Major hazards policy

- Use of the findings
 - How were these used to determine areas for improvement?
 - What capabilities were identified for improvement?
 - How do you prioritize within each scenario what is most important – or does the responsible ministry / agency do this?
 - How were the findings used in planning – by whom?
 - What agencies, at what levels?
 - Can you give examples of specific actions / improvements / projects?
 - Who develops the planning assumptions that are sent to the various groups – who sat in on your process?
 - From NRA – findings-planning assumptions- UK resilience Capabilities program. What other factors play in to this/ what other tools do you use?

- Do you track the use of the findings / planning assumptions by agencies and devolved administrations?
 - Are they positive towards the recommendations?
 - Are most of the end users involved in developing the planning assumptions?

- Outline specific projects that have resulted from / can be traced back to findings from the NRA.
 - Who developed the recommendations for the project?
 - Who implemented it?
 - How was the civil contingencies secretariat involved?

- When projects / actions are recommended based on the NRA is there an allotment of funding?
 - When does the involvement of the Civil Contingencies Secretariat end? Is it mainly a coordinating role?
 - Is there a prioritization among the planning assumptions – what has it been here?
 - Are they substantial or procedural, aimed at improving physical capabilities or organizational / cooperation?
 - Who are the projects aimed at / who cooperated with you – was it run by the civil contingencies secretariat or by specialist agencies?
 - Is there any official publicly available information about any of the projects?
 - How do you follow up on ongoing projects?
- The presentation mentions six National worst credible scenarios – how do these differ from each other, and how does having six contribute to overall use
 - Have capability needs identified through the NRA contributed to increased international cooperation.
 - How has the NRA affected flooding policy, or is it more specific projects
 - How about coordination and cooperation- has the NRA affected this?
 - How does the NRA affect exercises – does it?
 - How do findings from the NRA affect action on the local and regional level in terms of preparing for and preventing flooding?
 - Most focus on preparing for or preventing?
 - How has the NRA contributed to the flood protection program
 - The National taskforce on Flood Emergency management and the
 - National Exercise Water proof
 - The National Waterplan

Interview guide

Respondent

Department of Health

UK

- The involvement of the Department of Health in the national risk assessment
- The process of developing the pandemic influenza scenario
- What were the findings from the pandemic influenza scenario
- How is this used by the Department of Health
- Planning by the department of Health in relation to pandemic influenza
- The capabilities program

Involvement in the National Risk Assessment

- How does the department of Health contribute to the National Risk Assessment
- Who are the participants
- Development of scenarios
 - o who do they involve – which groups in the department of health, ex scientific advisors and other organizations / groups give advice on the development and scoring of the scenarios?
 - o which ones have they been the most involved in
- How does the department of Health contribute to the capability assessment

How does your organization use the National Risk Assessment?

- The process
- The results
 - o The planning assumptions
 - o What are they for pandemic influenza
 - o How specific
 - o What is the difference between what is in the National Risk Register and what departments are given in terms of the planning assumptions for pandemic influenza
- How do the planning assumptions play in – what are the other organizations and tools that are used by the department of health when planning
- Does the NRA help the department of health in terms of getting others to plan for pandemics ex the department of education – so is it a useful tool for them to get cross government planning going
- The new pandemic influenza strategy
 - o What was the impact of the National Risk Assessment – the planning assumptions on this?
 - o What is their role compared to other information / other processes that they have internally
 - o Often describe NRA as creating a foundation that everyone agrees on – then they each build on that – do you agree?
 - Can you give examples of how other organizations have built on the Pandemic Flu planning assumptions
- Can you explain the updating process of the National Risk Assessment - in terms of the pandemic scenario – how does this work every year – are there big changes?
- Who administers this process?
- What are the implications of changes – do they deal with most of it?
- The National Risk Assessment planning assumptions and regional planning
 - o How does the department of health use the planning assumptions in their work with regional and local authorities

- The role of the pandemic flu scenario
 - o What were the effects when it was developed
 - o Were there plans from the beginning as to how the department of health should use the findings from the National Risk Assessment when the scenario had been scored?

- Can you give examples of specific documents that the planning assumptions have been used in, and the purpose of these

- My impression is that the National Risk Assessment planning assumptions are quite general, so what can their actual contribution be, they set the agenda?

- The capabilities program and the National Risk Assessment
 - o Can you tell me a little about the infectious diseases (humans) workstream and the work that is done in it
 - o How has the National Risk Assessment contributed to this workstream
 - o Has NRA been important in placing the pandemic flu at the top of high risk crises
 - o Do you use the findings when cooperating with other organizations and ministries?
 - o Has it influenced how one works on pandemics – in terms of resources that are available, the manner in which efforts are organized or plans are made?

- How does the National Risk Assessment fit in with all the other work that is done by the Department of Health on the pandemic influenza issue.

- How do the findings from the National Risk Assessment influence communication with the public
 - o Did the DoH write the pandemic influenza part of the National Risk Register?

Interview guide

Respondent

DEFRA

UK

- The involvement of the Department of Health in the national risk assessment
- The process of developing the pandemic influenza scenario
- What were the findings from the pandemic influenza scenario
- How is this used by the Department of Health
- Planning by the department of Health in relation to pandemic influenza
- The capabilities program

Describe own role / position

Involvement in the National Risk Assessment

- How does DEFRA contribute to the National Risk Assessment
- Who are the participants
- Development of scenarios
 - o who do they involve – which groups in DEFRA, ex scientific advisors and other organizations / groups give advice on the development and scoring of the scenarios?
 - o which ones have they been the most involved in
- How does DEFRA contribute to the capability assessment

How does your organization use the National Risk Assessment?

- The process
- The results
 - o The planning assumptions
 - o What are they for flooding – how specific are they
 - o How specific
 - o What is the difference between what is in the National Risk Register and what departments are given in terms of the planning assumptions for pandemic influenza
- Can you describe the impact of the National Risk Assessment planning assumptions on the planning done by DEFRA and the various directorates work ?
- How do the planning assumptions play in – what are the other organizations and tools that are used by DEFRA when planning
- Does the NRA help DEFRA in terms of getting others to plan for floods – so is it a useful tool for them to get cross government planning going
- Explain the importance of having everyone planning based on the same planning assumptions.

- Exercise Watermark – how did the planning assumptions /NRA influence this
 - o What was the impact of the National Risk Assessment – the planning assumptions on this?
 - o What is their role compared to other information / other processes that they have internally
 - o Often describe NRA as creating a foundation that everyone agrees on – then they each build on that – do you agree?
 - Can you give examples of how other organizations have built on the flooding planning assumptions

- Can you explain the updating process of the National Risk Assessment - in terms of the flooding scenario – how does this work every year – are there big changes?
- Who administers this process?
- What are the implications of changes – do they deal with most of it?

- The National Risk Assessment planning assumptions and regional planning
- The role of the flooding scenario
 - o What were the effects when it was developed
 - o Were there plans from the beginning as to how DEFRA should use the findings from the National Risk Assessment when the scenario had been scored?
 - o At what level was the scenario scored – ie political / bureaucrat?
- Can you give examples of specific documents that the planning assumptions have been used in, and the purpose of these
- My impression is that the National Risk Assessment planning assumptions are quite general, so what can their actual contribution be, they set the agenda?
- The capabilities program and the National Risk Assessment
 - o Can you tell me a little about the flooding workstream and the work that is done in it
 - o How has the National Risk Assessment contributed to this workstream
 - o To how great an extent has the NRA been important in placing flooding at the top of high risk crises
 - o Has it influenced how one works on flooding – in terms of resources that are available, the manner in which efforts are organized or plans are made?
- How does the National Risk Assessment fit in with all the other work that is done by DEFRA on flooding
- How do the findings from the National Risk Assessment influence communication with the public

Interview guide
Ministry of Interior and Kingdom Relations / MEAAI
April 5th 2011

- The process
- The scenarios
- The findings from the scoring and assessment
- The capabilities analysis
- Use of findings – what is done

The process

- Who participates in the Interdepartmental Working Group on National Safety and Security (IWNV) and a Steering Group on National Safety and Security (SNV)
- Can you quickly describe how you go from the NRA findings to recommendations
 - o Who is involved in creating the recommendations – the same people who will use them later – specialized agencies or ministries or is it mainly experts with an outside affiliation?
- Can you describe what the recommendations look like – content?
- To what extent is it a cross departmental process – do you drive it or do they?
- How do you think departments use the NRA to further their own goals?

The scenarios

- How specific are the scenarios that are used – compared to the UK
- Do you find that there are challenges involved with going from scenarios that are worst case to actual planning – complaints about how to dimension in Norway.
- The thematic in-depth study – can you elaborate on this. It results in scenario descriptions.
 - o Who conducts it,
 - o Who decides which scenarios to include
 - o Are new scenarios considered every year – how about the old ones?
- How are the scenarios used later on – by organizations, by the government?
- How are the duplicate scenarios used – where you have variations on a risk
- How detailed are the scenarios – so what do they actually tell you
 - o “the scenario must be concrete enough so as to be able to assess which capabilities are necessary, which are already available and whether there are capabilities that need to be reinforced.” How concrete would that be?
- How else are the scenarios that are developed used – are similar ones used in more localized or specialized risk assessments – are they models for these or are they completely separate?
- Are other organizations allowed to influence the scenario during the assessment, or is it already set
- What is a balanced group of experts that is used ? Who does this consist of – does the makeup of the NRA influence how it is used – in the UK it is persons from the departments who arrive with data in advance – this reflects the more general scenarios that are used there.

The capabilities analysis

- How do you test / determine capabilities during the capabilities assessment.
- Who leads the capabilities assessment – the agencies themselves?

- The capabilities that need to be reinforced – are these prioritized, does it happen that there are already projects underway to deal with the issue? So do agencies receive extra attention for projects that are ongoing

The outcome of the capabilities analysis

- How does the NRA help the “Cabinet to make better-substantiated decisions about where to set priorities and how to do this, but also to consider those choices in relation to one another?
- What is the purpose of weighing the risks up against each other, how is the ranking used
- Do departments have to reprioritize their own efforts because of the NRA, do you find it easy to get them to do as the cabinet recommends.
- Who determines how businesses, people, civil society can do in terms of reducing vulnerabilities / exposure
- How do businesses contribute to the NRA / How are businesses affected by the NRA
- How is the NRA used in communication with the population
- How is the NRA used to explain / justify policy decisions

Monitoring

- How is the monitoring done – are the capabilities tested up towards the worst case scenario that comes out of the NRA
- Are there new threats every year – on purpose because there is a goal of covering as many as possible, or do you review them all every year
- What are the political / administrative choices, and how are they converted into policy, legislation and concrete actions
 - o Can you give an example of this?

Use and implementation of capability recommendations

- How do the recommendations from the NRA – which contribute to the capability analysis, inform policy, legislation and direct action?
 - o What is the difference between informing policy and direct action?
- Is your agency ever the end user of the capability improvements, or is it always other ministries?
- How is the prioritization of the risks / relative scores of the risks reflected in the final recommendations
- How detailed are the recommendations?
 - o Is there a timeline / deadline for the programs and improvements?
 - o Are all the recommendations used? (Either by your office or by others)
 - How do you ensure that things get done
 - o What happens to the ones that are not used?

- If a department or agency has several recommendations/ issues that have to be dealt with – do you prioritize or give guidance on how they should prioritize?
 - Can you give an example of a prioritization?
- The participants in the scenario assessment and capability assessment
 - Are they the same organizations that initiate projects based on the NRA
 - Do they ever tell you that they already have plans to deal with a specific issue – so the NRA ends up validating the work that has already been done?
 - Do you find that they use them for projects that are already being worked on? The critical infrastructure project for example.
 - How does the NRA tie into work that is already being done by ministries and agencies, do findings from it / the planning assumptions overrule their own risk assessments?
- What kind of documentation is created when the NRA process is completed?
 - How is this used?
- Used in the National Security Strategy? Is it used by the military / intelligence services as well, or is it mainly by civilian departments?
 - To inform actual planning – aimed at capabilities.
 - How specific, what type
 - As a justification for closer examination or increased focus by individual ministries – so do they use it as a tool to set the agenda for their own work?
 - How do local and regional authorities use the findings from the NRA – coordination and cooperation with the security regions?
 - In Norway – also considered a way to get people talking – across organizations, what about here? Have you ever reflected over this type of effect?
 - Coordination role in the government / cabinet
 - How is it used towards the parliament – to show that taking action, to frame discussions on national security?

Legislation: new in terms of strengthening the managing role of the central government during imminent crisis – how did / did the NRA contribute to this.

Do you find that the new scenarios demand different capabilities than the previous ones, or is there some overlap?

Pandemic scenario respondent

- Description of the scenarios
 - What were the main findings / recommendations
 - Not just the continuity in planning for an influenza, anything else
 - After 2009 – changes in the scenarios / capabilities needed
 - Was the main outcome policies, not legislation and direct actions?

- How are the two pandemics scenarios used together?
 - How are these related to the work already done by other agencies / to other plans? Does it overrule them?
 - Do you say – yes it is a likely and high impact scenario – then do you consider specific capabilities?
 - Is the scenario developed for the NRA used by others later as the standard for what one has to plan for?

- Use of the findings
 - How do you prioritize within each scenario what is most important – or does the responsible ministry / agency do this?
 - How were the findings used– by whom?
 - What agencies, at what levels?
 - Can you give examples of specific actions / improvements / projects?
 - The continuity project – run by the department of health – who else?
 - The flu pandemic exercise in 2009 – how was it influenced by the NRA?

- Do you track the use of the recommendations by agencies and ministries
 - Are they positive towards the recommendations?
 - Are most of the end users involved in developing the planning assumptions?

- Outline specific projects that have resulted from / can be traced back to findings from the NRA.
 - Who developed the recommendations for the project?
 - Who implemented it?
 - How was your office involved? Where does your responsibility end?
 - When projects / actions are recommended based on the NRA is there an allotment of funding – do agencies and ministries have to set aside own funding for them?
 - Are the projects mainly run by one ministry or do several participate?
 - Is there a prioritization among the capability recommendations – what has it been here?
 - Is thought given to sustainability issues of the capability?
 - Are they substantial or procedural, aimed at improving physical capabilities or organizational / cooperation?
 - Who are the projects aimed at / who cooperated with you – was it run by the civil contingencies secretariat or by specialist agencies?
 - Is there any official publicly available information about any of the projects?
 - How do you follow up on ongoing projects?

- The participants in the scenario assessment and capability analysis
 - Are they the same organizations that initiate projects based on the NRA
 - How are businesses involved in the projects
 - Do they ever tell you that they already have plans to deal with a specific issue – so the NRA ends up validating the work that has already been done?
 - Do you find that they use them for projects that are already being worked on?

- How have the results from the NRA contributed to planning for an influenza, not just in terms of the specific projects

Flooding scenario respondent –

- Description of the scenario
 - What were the main findings / recommendations / planning assumptions
 - How are these related to the work already done by other agencies / to other plans? Does it overrule them?
 - Do you say – yes it is a likely and high impact scenario – then do you consider specific capabilities?
 - Is the scenario developed for the NRA used by others later as the standard for what one has to plan for?

- How did the findings from the NRA fit with already ongoing plans / programs – do you ever determine that some of these should merely be strengthened?
 - How are NRA projects integrated into ongoing policy efforts
 - How do findings from the NRA / National Security Strategy play into efforts such as the Dutch Major hazards policy

- Use of the findings
 - How were the findings used in planning – by whom?
 - What agencies, at what levels?
 - Can you give examples of specific actions / improvements / projects?
 - Who develops the planning assumptions that are sent to the various groups – who sat in on your process?
 - From NRA – findings-planning assumptions- UK resilience Capabilities program. What other factors play in to this/ what other tools do you use?

- Do you track the use of the findings / planning assumptions by agencies and devolved administrations?
 - Are they positive towards the recommendations?
 - Are most of the end users involved in developing the planning assumptions?

- Outline specific projects that have resulted from / can be traced back to findings from the NRA.
 - Who developed the recommendations for the project?
 - Who implemented it?
 - How was the civil contingencies secretariat involved?
 - When projects / actions are recommended based on the NRA is there an allotment of funding?
 - When does the involvement of the Civil Contingencies Secretariat end? Is it mainly a coordinating role?
 - Is there a prioritization among the planning assumptions – what has it been here?
 - Is thought given to sustainability issues of the capability?
 - Are they substantial or procedural, aimed at improving physical capabilities or organizational / cooperation?
 - Who are the projects aimed at / who cooperated with you – was it run by the civil contingencies secretariat or by specialist agencies?
 - Is there any official publicly available information about any of the projects?
 - How do you follow up on ongoing projects?

- The presentation mentions six National worst credible scenarios – how do these differ from each other, and how does having six contribute to overall use
- Have capability needs identified through the NRA contributed to increased international cooperation.
- How has the NRA affected flooding policy, or is it more specific projects
- How about coordination and cooperation- has the NRA affected this?

Cyber scenario – respondent: blackout

- Description of the scenario
 - What were the main findings / recommendations in terms of impact
 - How was this scenario connected to other scenarios?
 - Especially the link between the deliberate IP outage and the hacking of vital sector
 - How are these related to the work already done by other agencies / to other plans? Does it overrule them?
 - Is the scenario developed for the NRA used by others later as the standard for what one has to plan for?

- How did the findings from the NRA fit with already ongoing plans / programs – do you ever determine that some of these should merely be strengthened?
 - How are NRA projects integrated into ongoing policy efforts

- What capabilities were identified for improvement?
 - According to ppt presentation actions that were proposed were:
 - National Response capability
 - Dependencies
 - International cooperation
 - Who has been involved in these actions and what have the results been in terms of projects and capability improvement.

Use of the findings

- How were these used to determine areas for improvement?
- How do you prioritize within each scenario what is most important – or does the responsible ministry / agency do this?
- How were the findings used in planning – by whom?
 - What agencies, at what levels?
 - Can you give examples of specific actions / improvements / projects?
- What type of projects were undertaken after the identified capabilities improvements.
- Were they mainly oriented at ministries or also at businesses and organizations
- How about the public, did you inform about the projects that were under way?

Reports and projects

- How did the NRA contribute to the National Cyber Security Strategy
- How did the NRA contribute to the projects outlined in it:

Monitoring

- Do you track the use of the recommendations by agencies and devolved administrations?
 - Are they positive towards the recommendations?
 - Are most of the end users involved in developing the capabilities recommendations
- Outline specific projects that have resulted from / can be traced back to findings from the NRA.
 - Who developed the recommendations for the project?
 - Who implemented it?
 - How was your office involved?
 - When projects / actions are recommended based on the NRA is there an allotment of funding?
 - When does the involvement of your office end? Is it mainly a coordinating role?
 - Is thought given to sustainability issues
 - Are they substantial or procedural, aimed at improving physical capabilities or organizational / cooperation?

- Is there any official publicly available information about any of the projects?
- Can you outline the ICT disturbance project

Interview guide

Respondent

Ministry of Infrastructure and the Environment

Netherlands

- The involvement of the MIE in the national risk assessment
- The process of developing the flooding
- What were the findings from the flooding scenario
- How is this used by the MIE
- Planning by the MIE in relation to flooding

Involvement in the National Risk Assessment

- How was the RWS involved in the National Risk Assessment
- Did you bring the flooding risk to the steering group?
- What was the role of the RWS in the development of the flooding scenarios?
- Who from the RWS contributed to the scenario and scoring
- On what was the scenario based – mathematical modeling
- How detailed was the scenario? Can you give an example of what it entailed?
- Was the scenario expanded to include all the different impacts?
- Is the scenario development and scoring process continuous?
- How has the RWS been involved in other scenarios in the National Risk Assessment?

How does your organization use the findings from the National Risk Assessment?

- What were the findings?
 - o The score was obviously high, but what were the conclusions of the capability assessment?
 - o Were these unknown to the RWS?
 - Which ones – natural that they would know of some weaknesses beforehand?
 - Were any of the findings from the assessment a surprise?
 - o In what format was the flooding scenario written when finished.
 - o What function do the actual scenarios have for the RWS?
 - How does the RWS use this reasonable worst case scenario afterwards?
 - Is it used in in house planning
 - How is the model of a potential worst case used by the department?
 - o What does participation in the actual risk assessment process mean to the MIE
 - o Do you find that it has aided the work of the RWS in terms of planning for a pandemic ?
- What happened after the development of the findings?
 - Did the findings report make recommendations – what were they
 - How has the position on the National Risk Assessment affected planning for flooding in the Netherlands
 - Have any of the capabilities been quite general – so derived from several of the scenarios?
- What are the plans forward after the completion of the projects - are there new capability assessments, will there be more flooding scenarios in the National Risk Assessment
- Are the scenarios used for common planning - ref the UK
 - o So how do other departments use the findings from the National Risk Assessment pandemic flooding scenario?
- How did the RWS use the findings from the National Risk Assessment in house

- Other forms of use – ref interviews with the previous group in the Netherlands
 - o In planning exercises / dimensioning response
 - o In the UK the planning assumptions that are contained in the scenario form the foundation for decisions about investment in new resources etc. Is it the same in the Netherlands?

- Regional and local use of the scenario and the findings
 - o The regional level has responsibilities in case of flooding
 - o How are the regions and local authorities involved in the National Risk Assessment, ex in formulating the scenarios
 - o How are they given information about the findings afterwards
 - o How does the RWS use the findings from the National Risk Assessment in its work with regional and local authorities?
 - o Are the expected numbers found in the scenario used as the basis for local and regional planning in terms of a flood?
 - o How are they scaled down / used – is it difficult to plan using a reasonable worst case scenario?
 - o Are the scenarios used for planning in the same manner as they are in the UK, or is it more in terms of specific projects rather than overall planning frameworks?
 - o What kind of funding have the flooding projects received – additional because of the situation

- How important has the National Risk Assessment been for the work on preparing for and managing flooding?

Interview guide

Respondent

Department of Health

Netherlands

- The involvement of the Ministry of Health in the national risk assessment
- The process of developing the pandemic influenza scenario
- What were the findings from the pandemic influenza scenario
- How is this used by the Department of Health
- Planning by the department of Health in relation to pandemic influenza
- The capabilities program

Involvement in the National Risk Assessment

- How was the department of health involved in the National Risk Assessment
- Did you bring the pandemic risk to the steering group?
- What was the role of the department of health in the development of the pandemics scenario?
- Who from the department of health contributed to the scenario and scoring
- On what was the scenario based – mathematical modeling
- How detailed was the scenario? Can you give an example of what it entailed?
- Was the scenario expanded to include all the different impacts?
- Is the scenario development and scoring process continuous?
- How has the Department of Health been involved in other scenarios in the National Risk Assessment?

How does your organization use the findings from the National Risk Assessment?

- What were the findings?
 - o The score was obviously high, but what were the conclusions of the capability assessment?
 - o Were these unknown to the department of health?
 - Which ones – natural that they would know of some weaknesses beforehand?
 - Were any of the findings from the assessment a surprise?
 - Mark spoke about the social impact of a pandemic flu – that more research had to be done – increased knowledge – so how was that done?
 - o In what format was the pandemic influenza scenario written when finished.
 - o Is there a report – I have seen the findings report

 - o What function does the actual scenario have for the department of health?
 - How does the department of health use this reasonable worst case scenario afterwards?
 - Is it used in in house planning
 - How is the model of a potential worst case used by the department?

 - o What does participation in the actual risk assessment process mean to the Department of Health – is it an opportunity to increase cooperation / make the issue more interdepartmental?
 - o Does he find that it has aided the work of the department of health in terms of planning for a pandemic ?

- What happened after the development of the findings?
 - o More meetings to determine what should be done, or were the capabilities that should be improved detailed in the findings report?
 - o What kind of recommendations were there?
 - o What were the projects that were initiated after the National Risk Assessment

- Who were the responsible actors together with the department of health
 - Do they lead on the health issue and work with other departments?
 - Did the findings report make recommendations in terms of the prioritization of the different projects / capabilities?
 - How has the position on the National Risk Assessment affected planning for influenza pandemics in the Netherlands
- Are the scenarios used for common planning - ref the UK
 - So how do other departments use the findings from the National Risk Assessment pandemic influenza scenario?
- Can you tell me more about how the department of Health works to improve pandemic influenza planning where does the National Risk Assessment fit into this?
- How did the Department of Health use the findings from the National Risk Assessment in house
- Were the capabilities that were worked on procedural or processual.
- Other forms of use
 - In planning exercises / dimensioning response
 - In the UK the planning assumptions that are contained in the scenario form the foundation for decisions about vaccine purchases etc. Is it the same in the Netherlands?
- Regional and local use of the scenario and the findings
 - The regional level has responsibilities in case of pandemics
 - How are the regions and local authorities involved in the National Risk Assessment, ex in formulating the scenarios
 - How are they given information about the findings afterwards
 - How does the department of health use the findings from the National Risk Assessment in its work with regional and local authorities?
 - Are the expected numbers found in the scenario used as the basis for local and regional planning in terms of an influenza pandemic?
 - How are they scaled down / used – is it difficult to plan using a reasonable worst case scenario?
- Can you tell me a little about the difference between the mild and severe pandemic scenarios – and how they are used?
 - Together, separately,
 - How do the findings interact
 - What has having two scenarios meant for planning?