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STAR-IDAZ

(Global **St**rategic **A**lliances for the Coordination of **R**esearch on the Major **I**nfectious **D**iseases of **A**nimals and **Z**oonoses)

Inventory of Foresight Methodologies and Studies

Work Package 5

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Contents

Report Structure

The report is divided into three main sections:

Section I: Inventory on foresight methodologies

Inventory on foresight methodologies

Section II: Foresight studies in the animal health sector performed by STAR-IDAZ partners

Foresight studies in the animal health sector performed by STAR-IDAZ partners

Sub-section A: "Analysis of preliminary survey on foresight studies, futures/horizon scanning activities performed or on going at national level".

Sub-section B: "Analysis of the questionnaire on foresight/futures/horizon scanning and risk analysis activities"

Section II: Foresight studies in the animal health sector performed by STAR-IDAZ partners

Conclusions and FPU Recommendation)

References

Introduction

The Global Network on Animal Health Research (STAR-IDAZ) aims to extend the collaborative activities started under EMIDA and under the forum of the Standing Committee on Agricultural Research (SCAR) Collaborative Working Group on Animal Health and Welfare Research by developing mechanisms to ensure durable cooperation and coordination of (national) research programmes on animal (including aquatic animal) health and zooonoses world-wide. It will build on the groundwork established by the Collaborative Working Group on Animal Health and Welfare Research, the EMIDA ERA-NET project and specific INCO-NETs involving partner countries. In particular, the project addresses weaknesses in provision of research evidence in the development of effective preventive strategies and policies for global infectious diseases.

The specific objectives of the global network are to:

- Strengthen the linkages between and reduce the duplication of global research effort on high priority infectious diseases of animals (including zoonoses) maximise the efficient use of expertise and resources and accelerate coordinated development of control methods.
- Identify and co-ordinate the response to gaps in research activities for targeted diseases.
- Create the necessary critical mass and capacity to address emerging infectious disease threats.
- Improve the cost–effectiveness and added value to network partners of current research programmes.
- Develop durable procedures for a better co-ordinated, rapid response to urgent research needs.
- Identify unique regions with localised diseases and improve access to research in those areas.
- Improve access to, and the utility of research results across all partner organisations.
- Facilitate the establishment of research management capacity and programmes in those partner countries wishing to develop research activities in this area.

In particular, **Work Package 5** (*Developing strategic trans-national animal health research agendas*) aims to extend the EMIDA Foresight synthesis exercise to identify strategic and innovative requirements for global animal disease research and to develop criteria for priority setting and develop a common longer-term (5-15 years) strategic research agenda. In order to build on the activities of the EMIDA Foresight and Programming Unit (FPU) and extend its remit to consider global and regional needs, WP5 is in charge of developing an inventory of the methodologies used in relevant foresight and horizon-scanning studies performed and analyse the scope of these kind of studies, their validity and feasibility, mapping their outputs on an on-going basis in respect of the needs of the global network. In addition, WP5 will propose to the STAR-IDAZ Foresight and Programming Unit (FPU) methods for future survey or foresight studies to cover the dynamics of the animal health area.

A Foresight and Programming Unit (FPU) was established under the EMIDA ERA-NET, which identified and reviewed relevant futures studies identifying issues and drivers. This work was further developed and refined in a Delphi study, for which participants from a broad range of disciplines were identified. Following an expert consultation workshop a draft long-term strategic research agenda was produced.

The aim of the STAR-IDAZ FPU is to build on the work of the EMIDA ERA-NET FPU, and the tasks identified to be addressed under STAR-IDAZ project are:

- analysis of the relevance to the global network of the outputs of the EMIDA FPU, including an inventory of methods used in relevant foresight and horizon-scanning studies performed and the use of their outputs in respect of the needs of the global network;
- analysis of preferred methods for future survey or foresight studies in animal health and zoonose;
- development of a common strategic research agenda and action plan based on shared priorities, at the regional and global levels:
- draft criteria for priority-setting based on the activities of the EMIDA FPU and information gathered by relevant research mapping exercises, including those of this project;
- produce draft lists of drivers, issues and possible future strategic research topics on a regional and global level and rank these by priority through one or more international, multidisciplinary exercises.

Section I: Inventory on foresight methodologies

Background

Foresight covers activities aiming at:

- thinking,
- debating,
- shaping the future.

Thinking the future:
Forecasting, technology assessment, futures studies and other forms of foresight try to identify long term trends and thus to guide decision-making. Foresight emerged in the recent years and aims at identifying today's research and innovation priorities on the basis of scenarios of future developments in science and technology, society and economy.

Debating the future:
Foresight is a participative process involving different stakeholders, which may include public authorities, industry, research organisations, non-governmental organisations, etc. The process can be organised at different levels: cross-national, national, or regional. Open discussion between the participants is encouraged, for example in the form of panels.

Shaping the future:
Foresight aims at identifying possible futures, imagining desirable futures, and defining strategies. Results are generally fed into public decision-making, but they also help participants themselves to develop or adjust their strategy.

Since the end of the twentieth century there was a worldwide shift in future studies which are so far based mainly on statistical methods. The development of a social, not only a strictly scientific vision of the future has become crucial. It appears that the biggest role in this context was played by technology foresight programs, integrating traditional methods of forecasting as well as those derived from the social sciences, economics, management science, etc.

The “Foresight” or “Technology Foresight” is one of the most frequently used expressions nowadays among the technology policy masters. This tool, which was applied for the first time many years ago far away from Europe, has become slowly part of the policy formulation process in the post industrialized nations. After several years of foresight exercises in Europe, we have traditions and lessons, success and failure stories, useful knowledge and the necessary political attention related to this activity.

The term “foresight” has long been used to describe readiness to deal with long-term issues (especially on the part of governments). Large-scale exercises drew in numerous stakeholders as sources of knowledge and influence, and the prominence of these exercises led to “foresight” being used much more widely to describe futures activities of many kinds. While few new tools and techniques have been developed in these exercises, they represent an unprecedented diffusion of forecasting, planning and participatory approaches to long-term issues.

Technology forecasting first came to prominence in the late 1950s in the United States defence sector and in work by consultants such as the RAND Corporation. The latter were responsible for developing some of the principal tools of technology forecasting, such as the Delphi questionnaire survey and scenario analysis.

Large forecasting exercises were carried out during the 1960s by the United States Navy and the United States Air Force. Technology forecasting was also taken up by private companies (e.g., in the energy sector). However, the next developments, and the emergence of what we now term "foresight", took place in Japan. In 1970 Japan decided to launch a 30-year national forecast exercise on the future of S&T. Its aim was not selecting priority areas, but giving advises for both public and private decision-makers by a broader direction-setting based on deep analysis of long-term trends. Thousands of experts were involved into this consensus building process, which was repeated every five years until 1991.

The Japanese government was interested in obtaining views of future technological and societal developments in order to identify those areas of development that would be critical to Japanese competitiveness in the future. The Delphi questionnaire survey had the distinct feature of providing experts with an opportunity to change their views in light of the group result, viewed as especially important, since it meant that the Delphi would also inform experts in the system (many of whom came from industry) of any consensus on future developments.

During the 1980s, France and the Netherlands initiated limited technology foresight exercises. But the real surge of interest came about in the early 1990s, when the Germans and then the British began to use technology foresight. The Germans opted for using Delphi and decided at first to translate the Japanese questionnaire. In subsequent Delphi exercises during the 1990s, the Germans collaborated with their Japanese counterparts in developing and implementing national Delphi studies. The British also used Delphi in their first technology foresight exercise, but were largely disappointed with the results and have not used it since. The British approach was, however, quite different from that of the Japanese and Germans, since they established free-standing expert panels to conduct the foresight exercise.

By contrast, the Germans and Japanese had used groups of experts to determine the Delphi topic statements, but had then dismantled these groups and conducted the Delphi centrally. In other words, groups of experts were used to service the German and Japanese Delphi studies, whereas in the British case, the Delphi was used to service panels of experts. Indeed, the British foresight panels have been described as the "hubs" of the national technology foresight exercise, since nearly all foresight activity passed through them. This model was to be later emulated in many countries around the world. The term "Technology Foresight" took off in Europe in the 1990s, sought new policy tools to deal with problems in their science, technology and innovation systems. In Europe France ran the first foresight-like programme (in the early 1980s), then Sweden and Norway followed. In the 1990s many European governments decided to apply (and test) this tool.

By the turn of the Millennium, virtually every Member State of the EU had undertaken a national technology foresight exercise, as well as a few Candidate Countries. Even in those EU countries where a national exercise has not happened, e.g. Finland, foresight is being used extensively in sectors and/or regions. Moreover, through the activities of international organisations, such as UNIDO, several countries in Latin America and other parts of the world have been experimenting with technology foresight.

Scenario methods, for example, have become widely used in some European countries in policy-making. The FORSOCIETY network brings together national Foresight teams from most European countries, and the European Foresight Monitoring Project is collating material on Foresight activities around the world. In addition, foresight methods are being used more and more in regional planning and decision –making ("regional foresight").

At the same time, the use of foresight for companies ("corporate foresight") is becoming more professional and widespread. Corporate foresight is used to support strategic management, identify new business fields and increase the innovation capacity of a firm.

At a first glance, the focus of a foresight programme determines the themes to be discussed/ analysed to a large extent. For instance, typical themes for a technology forecast program would be specific fields of science and technology, such as microelectronics, communications, bioinformatics, energy technologies, new materials, bio- and nanotechnology. The time horizon can be driven by the dynamics of a given discipline or the imagination (agenda) of the futurist.

It is not uncommon, however, to try to predict major events in a 50-100 years time horizon. The so-called critical or key technologies method is also concerned with technological fields – as its name clearly indicates – but in this case the time horizon is much shorter, usually 5-10 years, as it is derived from policy-makers' needs to set midterm priorities. For example, Since its creation in 1994 the Foresight Programme has helped the UK Government to think systematically about the future, by combining the latest science and evidence with futures analysis, and helping policy makers tackle complex issues with a better understanding of the potential opportunities and challenges that lie ahead.

This has been done in three ways:

- Major Foresight Projects: in-depth two-year studies which build a comprehensive evidence base on major issues looking 20-80 years into the future
- Policy Futures Projects: shorter projects which provide futures and evidence analysis to fill a specific gap in existing policy understanding
- The Foresight Horizon Scanning Centre: training, toolkits and networks to strengthen futures thinking capacity and share best practice within and across government

This work is used to stimulate and inform the development of more effective strategies, policies and priorities at national and international levels.

A typical second-generation foresight programme, deals with economic sectors, such as chemicals, construction, financial services, food and drinks leisure and learning, retailing and distribution, transport, as well as technological fields, such as aerospace and defence, communications, IT and electronics, life sciences, materials. At a national level only a handful of third-generation foresight programme have been conducted so far, concerned with broad socioeconomic issues, such as human resources, health, ageing population, crime prevention, usually with a time horizon of 20-25 years.

Another example can be found in the Atomic energy sector: envisioning to define the most promising technologies as well as their R&D needs to achieve deployment within the next 30 years, led to the establishment of some international initiatives. Two of them deserve to be mentioned due to their importance. The first one, launched in 2000 under the leadership of USA, is the Generation IV International Forum – GIF. Ten countries are participating in this Forum, including Brazil. The GIF main objectives are identify, evaluate and develop new systems of nuclear energy with the possibility of licensing, constructing and generating electricity at competitive prices while complying satisfactorily to nuclear safety, minimization of waste generation, proliferation resistance and public acceptance requirements. The second initiative was set by the International Atomic Energy Agency – IAEA – in 2001 and was named INPRO (International Project on Innovative Nuclear Reactors and Fuel Cycle).

This project has the participation of 12 countries, including Brazil, to assure that nuclear technology is permanently available in order to help the countries all over the world during the 21st century to meet its energy needs contributing to their sustainable developments. In short, both initiatives try to address the challenges for the future of nuclear energy which are: (a) to prove that nuclear energy is economically competitive in an environment ruled by market forces and (b) to get the public acceptance concerning safety, waste deposition, environmental and proliferation issues. Among the several methodologies available to perform a technological foresight, the Delphi method was chosen due to its easiness of involving experts in an anonymous and asynchronous way.

Typical reasons for starting a Foresight exercise

A Foresight exercise is usually launched when a region, nation or organisation finds itself facing a specific challenge. In the past a variety of situations have prompted public bodies to initiate and fund Foresight exercises:

Preparing long-term decisions:

- Formulating longer term national and regional programmes;
- Setting research priorities, for example, by matching opportunities for investment in producing new knowledge and capabilities, with social and market requirements for the application of such capabilities;
- Planning science and technology funding;
- Planning major public spending with long-term implications (e.g. infrastructure);
- Strategic decisions;
- Defining the strategy of a company or industry.

Coping with challenges:

- Transition in the economic or political system;
- Improving long-term competitiveness within a certain territory;
- Changes to the socio-economic framework (new markets, new legislation etc);
- Changes in the natural environment (e.g. coastal flooding, climate change);
- Demographic changes.

The **objectives** of a Foresight exercise must be clearly stated, internally consistent and (at least initially) avoid being too specific. This is important to gain widespread support for the exercise early on, although care must be taken not to promise too much to too many players. Ideally, the objectives should be debated by the key players in order to ensure early buy-in to the exercise.

Typical objectives of Foresight exercises include:

- **Informing policy-making** so that key actors in the commissioning body are more aware of longer-term developments and how these are liable to interact with current policy decisions. This can involve gathering intelligence on possible longer-term developments and how these may interact with the policy decisions made today, or providing alerts on major future risks and opportunities. Often a Foresight exercise will be stimulated by the need to take a particular decision. However, the knowledge developed, and the Foresight capabilities embedded in the organisation as a result, should have a wider significance.

- **Building** networks that bring together people from different sectors and institutions involved with shaping the future of a particular topic. They will be brought together to work on their visions and assessments of the future. The purpose of this is to help them become better able collectively to understand the challenges and opportunities that they are liable to confront, and the strategies and objectives that others might pursue.
- **Developing capabilities** widely throughout a region or organisation and develop a "Foresight culture". The aim here is for people with a variety of backgrounds to be able to define and embark upon their own Foresight activities and create their own Foresight networks.
- **Building strategic** visions and creating a shared sense of commitment to these visions among Foresight participants.

Foresight involves systematic attempts to look into longer-term future of science and technologies and their potential impacts on society with a view of identifying the areas of scientific research and technological development likely to influence change and produce the greatest economic, environmental and social benefits for the future. Foresight can support the development of a vision and its translation into a Strategic Research Agenda (SRA), a process which needs to be politically endorsed. It does so by mobilizing stakeholders to participate in the process and through common vision building and priority-setting processes.

Foresight methods are used for a multitude of purposes, including:
• investigation of the long-term (e.g. trend extrapolation, simulation, Megatrend analysis, etc.),
• opinion elicitation (e.g. interviews, surveys, Delphi, etc.),
• deliberation (e.g. working groups and panels, workshops, conferences, public forums, etc.),
• creation and envisioning of futures (e.g. scenarios, essay-writing, science fiction, etc.), and
• determination of courses of action (e.g. technology road mapping, multicriteria analysis, various prioritisation techniques, etc.).

Methods used for mapping the future

SWOT ANALYSIS

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis is used to provide background inputs to Foresight activities. Sometimes main Foresight activities will also result in analysis presented in SWOT terms - this may, for example, come out of Delphi studies - but more usually SWOT is less based on an assessment of the longer-term. SWOT is often presented in a 2x2 matrix, an overview of significant internal and external factors influencing strategies or possible futures. It is usually prepared by an expert team using a variety of data sources and often a programme of interviews. Opportunities and threats are prioritised in terms of their importance and probability; strengths and weaknesses in terms of importance to performance to each factor, too. SWOT analysis is widely used, especially as a preliminary step in planning. The methods may also be used in workshops involving a wide range of participants.

BACKCASTING

Backcasting is a futures technique that helps people create a clear vision of a preferred future; and then to devise strategies to make the preferred future happen. The concept of “backcasting” is central to a strategic approach for sustainable development. It is a way of planning in which a successful outcome is imagined in the future, followed by the question: “what do we need to do today to reach that successful outcome?”

It is a technique that often is pointed out as an opposite to forecasting. It involves identification of a particular scenario and tracing its origins and lines of development back to the present.

BENCHMARKING

Benchmarking involves comparing the activities (process benchmarking) and performance (target benchmarking) of one's organisation or region, with those of similar entities elsewhere.
It offers learning opportunities, as well as scope for setting goals and identifying likely competitive challenges. It is important to examine the topic area carefully, so as to identify the most appropriate issues around which to build indicators, and to examine which of various indicators might be most useful.

HORIZON SCANNING/ENVIRONMENTAL SCANNING

The systematic examination of potential threats, opportunities and likely future developments which are at the margins of current thinking and planning. Horizon scanning may explore novel and unexpected issues, as well as persistent problems or trends. The aim is to develop a view of where important developments are taking place, what trends need to be watched, who the key players are and might be. Methods used are very varied: they include systematic analysis of media (and of the Internet), review of reports from specialised consultancies; examination of specialised databases. Many organisations routinely engage in such scanning, but most often it is conducted in a “one-off” fashion when a new activity is being planned. This may save costs, but reduces learning opportunities. It is possible to become too tied to specific methods and data sources, so that alternatives may be neglected.

TREND EXTRAPOLATION

Extrapolation can indicate the scale of change that would follow from a trend continuing into the longer-term; showing that small seeds may become big things, that ceilings are liable to be reached, that surprising developments may be confronted. It is important to identify what forces are driving a trend (and whether these will persists); and what assumptions about such forces are built into the extrapolation. Especially problematic are: inferring a trend on the basis of very limited time series; assuming that ceilings will be reached at arbitrary points; failing to assess underlying driving forces adequately; not recognising that enough of a quantitative change usually implies qualitative transformation.

EXPERT PANELS

Normally consists of 12 to 15 individuals who are mandated to use their collective expertise in addressing a particular problem or set of issues. Panels of sectoral and/or technological experts are commonly used to commission and synthesise Foresight analyses. Panels may make a general overview of major issues, or be oriented to specific topics or sectors. The main task of a Panel is usually that of synthesising a variety of inputs - research reports, outputs of forecasting methods, etc. - to provide a vision of future possibilities and needs for their topic areas. Brainstorming and SWOT analysis are among the methods used in Panel work. Panels require open-minded and creative team workers, who speak as experts rather than as interest group representatives. Giving panels too much autonomy can create difficulties for synthesis of their outputs, combining their scenarios, reaching shared priorities, etc.

BRAINSTORMING

Brainstorming is a method used in groups in order to support creative problem-solving, the generation of new ideas and greater acceptance of proposed solutions, aiming to stimulate creativity and novel viewpoints. The original definition refers to a process involving a period of freethinking, which is used to articulate and capture ideas, with no critical comments; followed by more rigorous discussion of these ideas, typically involving grouping them and prioritising the most important themes. Brainstorming is a starting point, and should not be expected to generate output that can be directly used. A skilled facilitator is required to reiterate and enforce the groundrules so as to maintain openness.

DELPHI METHOD

Delphi can be defined as a method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem. It involves a survey of expert opinion - most commonly about when particular developments might happen, and often also about possible constraints and facilitating factors, economic or social implications, etc. It uses the iterative, independent questioning of a panel of experts to assess the timing, probability, significance and implications of factors, trends and events in the relation to the problem being considered. Delphis are mainly conducted through postal surveys, but can be used within group meetings, and through computer- and Internet-based methods. The critical feature that makes Delphi different from other opinion surveys is that the survey is reiterated a number of times with the respondents receiving feedback on the structure of responses at previous rounds Delphi studies provide impressive results, but require careful and laborious choice of participants, preparation of questions, and provision of feedback. Studies employing Delphi method tend to be difficult to perform. Delphi's primary strength is its ability to explore, tranquilly and objectively, issues that require judgement. Unlike panel sessions, the iterative Delphi method allows the forecasting and assessment to be done without the effect of strong personalities or reputations influencing other panelists and also overcomes the difficulty of getting all experts together in a single time and place.

GAP ANALYSIS

Gap analysis, which can vary in complexity and sophistication, is the methodical identification and investigation of specific gaps between the current position and the ideal future situation. Equally it can also identify the needs and the resources available. It is recognised that ideal solutions for the control of disease may not be achievable but an assessment of the improvements that are possible still needs to be undertaken. The main objectives is to identify the gaps in key areas and then to consider how the gaps could be filled.

SCENARIO (PLANNING)

Consist of visions of future states and courses of development, organized in a systematic way as texts, charts, etc. It is a plausible description of how the future may develop, based on a coherent and internally consistent set of assumptions about key relationships and driving forces. Scenarios are one of the most popular and persuasive methods used in the Futures Studies. A scenario is not a specific forecast of the future, but a plausible description of what might happen.

They assist in selection of strategies, identification of possible futures, making people aware of uncertainties and opening up their imagination and initiating learning processes. One of the key strengths of the scenario process is its influence on the way of thinking of its participants. Although it is a very rewarding method it is also very demanding.

The difficulties in its use can arise from a lack of clear focus, purpose or directions. As a result too many scenario stories can be created and/or their content may not be directly related to the strategic question.

CAUSAL LAYERED ANALYSIS (CLA)

This method is one of the newest developments in the Futures Studies. Causal layered analysis focuses on "opening up" the present and past to create alternative futures rather than on developing a picture of a particular future. CLA is based on the assumption that the way in which a problem is formulated changes the policy solutions and the actors in charge of initiating transformations. The key principle of the method is using and integrating different ways of knowing. There are a number of benefits arising from the application of this method: CLA increases the range and richness of scenarios; leads to inclusion of different ways of knowing among participants in workshops; appeals to wider range of individuals through incorporation of non-textual and artistic elements; extends the discussion beyond the obvious to the deeper and marginal; and leads to the policy actions that can be educated by alternative layers of analysis.

TREND ANALYSIS

Trend analysis is one of the most often used methods in forecasting. It aims to observe and register the past performance of a certain factor and project it into the future. It involves analysis of two groups of trends: quantitative, mainly based on statistical data, and qualitative, these are at large concerned with social, institutional, organisational and political patterns. In the quantitative trend analysis data is plotted along a time axis, so that a simple curve can be established. Short term forecasting seems quite simple; it becomes more complex when the trend is extrapolated further into the future, as the number of dynamic forces that can change direction of the trend increases. This form of simple trend extrapolation helps to direct attention towards the forces, which can change the projected pattern. As trends never speak for themselves, the identification and description of patterns is partly empirical and partly creative activity. The most challenging part of qualitative trends analysis is identification of a tendency early, as recognition of a mature trend is "relatively useless" in influencing anyone's behaviour.

WILD CARDS AND WEAK SIGNALS (WE-WI)

Often in scenario planning exercises participants will be asked to build a list of **wild card events**. These are low probability events, but if they were to occur they would have a significant impact on the future environment. It is helpful to look at the key certainties (assumptions), key uncertainties (possible variables) and wildcards all together. Such a review will often result in an item moving from one list to another. Either a certainty is judged a variable, or a wildcard is judged not that unlikely an event and hence also worthy of consideration as a variable. Sessions that are to develop wildcards are often hard to control because participants are tempted to identify those issues which, while truly wildcards, would be very hard for managers or decision makers to plan for. In futures research "weak signals" may be understood as advanced, noisy and socially situated indicators of change in trends and systems that constitute raw informational material for enabling anticipatory action. "Wild cards" refer to low-probability and high-impact events. This concept may be embedded in standard foresight projects and introduced into anticipatory decision-making activity in order to increase the ability of social groups adapt to surprises arising in turbulent business environments. Such sudden and unique incidents might constitute turning points in the evolution of a certain trend or system. Wild cards may or may not be announced by weak signals, which are incomplete and fragmented data from which relevant foresight information might be inferred.

In order to manage surprising and potentially damaging events the wild card management system can be used. In summary, the conceptual framework is suitable both for the anticipation of future developments based on recent signals and for the genealogy of past developments. In policy processes, weak signals anticipate the agenda setting. Weak signals anticipate that "the policy window" of an issue might open. Sometimes weak signals – e.g. wild cards - anticipate dramatic changes in the agenda.

Conclusions

There is no single set of methods used in all foresight/futures activities. The methods used need to reflect the resources available and the objectives of the exercise. The choice of methods is critical, though it often appears to be based upon what is fashionable or which practitioners have experience in. The methods may be organised and interrelated in different ways – this is methodology, but there is little advice on the sequencing of methods. By far the most popular means of assessing possible future events seems to be literature searches and expert opinions, closely followed by scenario studies. It should be borne in mind that the methods are named and listed according to the way they are addressed and mentioned in the reviews. In fact, expert opinion assessment or literature review can take a number of shapes.

Section II: Foresight studies in the animal health sector performed by STAR-IDAZ partners

Among the specific tasks of WP5 in the STAR-IDAZ programme there is the need to gather information on foresight studies in the animal health sector performed by STAR-IDAZ partners. In this regard this section of the report is divided into the following two sub-sections:

Sub-section A presents the analysis of a first survey concerning foresight/futures/horizon scanning activities or studies going on in some of the STAR-IDAZ partner countries.

Sub-section B aims at providing a more complete picture of foresight/futures/horizon scanning and risk analysis activities relating to animal health going on in the STAR-IDAZ partner countries. This information has been collected through a specific questionnaire circulated among STAR-IDAZ partners.

SUB-SECTION A - Analysis of a first survey

This sub-section of the report presents the results of a preliminary survey, circulated in February/March 2012, concerning foresight/futures/horizon scanning activities or studies going on in some of the STAR-IDAZ partner countries. The aim was to start to collect details of what has been done recently or is currently under way in STAR-IDAZ organisations/countries, including studies relating to food security, climate/environmental change, infectious diseases etc – basically anything that might in some way impact on animal health. This activity was a preliminary step, before the circulation of a questionnaire (sent in April 2012 to the countries participating in the STAR-IDAZ programme) aimed to collate and analyse information on research strategy development and foresight and horizon scanning activities performed by partner organisations in the animal health area (see below, Sub-Section B). The list of the studies collected in the preliminary survey is reported in the following table (Table 1).

Study No	Country or Region	Study Title	Lead Organisation	Stage
1	Australia	Summary of Foresight activities	Mike Nunn - DAFF	N/A
2	Brazil (South America)	The Great Brazilian National Challenges in Agriculture	Mirian Therezinha Souza da Eira - Chief of Department of Research and Development (DPD) chefia.dpd@embrapa.br	In progress
3	Europe/Global	Foresight. The Future of Food and Farming	The UK Government Office for Science, London	Completed 2011
4	Europe/Global	The Third SCAR Foresight Exercise: Sustainable food consumption and production in a resource-constrained world	Standing Committee on Agricultural Research (SCAR), European Commission	Completed February 2011
5	Europe	Towards an integrated approach in surveillance of vector-borne diseases in Europe	marieta.braks@rivm.nl; hein.sprong@rivm.nl from RIVM, The Netherlands	Completed

6	Europe	NordRisk - Climate change and vector borne diseases in the Nordic countries	DTU National Veterinary Institute (Denmark). info@nordrisk.dk	In progress
7	Netherlands	Ministry of Economic Affairs, Agriculture and Innovation (EL&I) Not aware of any foresight activity on animal health in the Netherlands		
8	Russia	Development of vaccines against highly pathogenic avian influenza	All-Russian Research Institute for Veterinary Poultry (VNIVIP)	completed
9	Russia	Chemopreparations for emergency protection of animals against ASF	All-Russian Research Institute of Veterinary Virology and Microbiology (VNIIVViM)	in progress
10	Russia	Diagnosis and vaccination for rabies	Center for Standardization and Quality of Veterinary Drugs and Feed (VGNKI)	in progress
11	Russia	Diagnostic and vaccination of bluetongue	(VNIIVViM)	in progress
12	Russia	Vaccine against the disease of Aujeszky's disease and Teschen disease (SEM)	(VNIIVViM)	in progress
13	Russia	Vaccine against peste des petits ruminants and sheep pox	(VNIIVViM)	in progress
14	Russia	Diagnosis of dangerous (emerging) infectious diseases for Russia	(VNIIVViM) and (VGNKI)	completed
15	Russia	Vaccination against spring viraemia of carp(SVC). PCR test system for identification of the causative agent SVC	All-Russian Scientific Research Institute of Experimental Veterinary (VIEV)	in progress
16	Russia	Vaccine against IRT-PI3-VD of cattle	(VIEV)	in progress
17	Russia	Addition (completing) The Collection of Microorganisms	(VNIIVViM)	constantly
18	Russia	Improving diagnosis and control of anthrax	(VNIIVViM)	in progress/completed
19	Russia	Diagnosis of bluetongue	(VNIIVViM)	completed
20	Russia	Development of criteria for the classification of biological hazards in the diseases of animals and humans	Federal Centre for Animal Health (ARRIAH)	in progress
21	Russia	The new vaccine against brucellosis	(VIEV)	in progress
22	Russia	Vaccine against dermatomycoses and candida infection at carnivores	(VIEV) and (VGNKI)	in progress

23	Russia	A comprehensive PCR-diagnosis of diseases of horses and vaccination	(VIEV)	in progress
24	Russia	Methods of diagnosis of leukosis of cattle	(VIEV) Institute of Experimental Veterinary of Siberia and the Far East	completed
25	Russia	Prevention of actinomycosis of cattle	(VIEV)	in progress
26	Russia	System diagnosis of trichinosis and disease control	All-Russian Institute of Helminthology (VIGIS)	in progress/completed
27	Russia	Development of national standards	All-Russian Research Institute of Veterinary Sanitation, Hygiene and Ecology	completed
28	Russia	Development of prevention of infectious poultry diseases	All-Russian Research Institute for Veterinary Poultry (VNIVIP)	in progress
29	Russia	Veterinary regulations for the prevention and elimination of particularly dangerous (quarantine) animal diseases	(VNIIVViM)	completed
30	Russia	Early diagnosis of tuberculosis	All-Russian Research Institute of Tuberculosis and Brucellosis animals	completed
31	Russia	A series of research experiments on animal helminthes	All-Russian Research Institute of Veterinary Sanitation, Hygiene and Ecology	in progress
32	Russia	Monitoring of major animal diseases for the Russia	ARRIAH	constantly
33	Russia	Toxicological, radiation and biological safety	Federal Center of Toxicological and Radiation Safety of animals (FSTRB),	constantly
34	UK/Global	Overview of (Animal Health related) Foresight Studies	EMIDA Foresight and Programming Unit	Completed
35	UK/Global	The Detection and Identification of Infectious Diseases	UK Office of Science and Innovation	Completed 2006

Table 1: List of studies and respondent organizations

The survey listed 34 studies/activities, either completed or in progress, performed by 21 different respondent organizations. Except one respondent, stating not to be aware of any foresight activity on animal health in his country, the others listed several studies/activities that we can divide into three different levels:

- Foresight studies/activities (in green in Table 1 above) (17,65%)
- Survey/control of diseases studies/activities (in blue in Table 1 above) (76,47%)
- "Border line" studies/activities (in orange in Table 1 above) (5,88%)

Foresight studies

Six out of thirty-four studies (17,64%) can be defined "relevant" foresight studies, involving the components of a foresight study: a time scale of the outlook and a clear methodology used for mapping the future and identifying relevant topics.

The NordRisk Project A series of foresight analysis aiming to quantify the potential direct impact of increasing temperatures on the transmission of vector borne infections. The impact of global warming during the coming 50 year period is quantified for production animals, wildlife, pets and humans in the Nordic countries. NordRisk foresight analysis are based on process based mathematical models of vector borne infections and driven by an ensample of down scaled climate change models for the Nordic area. The temperature driven models estimate the daily risk in a spatial grid given an introduction of each disease.
EMIDA Foresight and Programming Unit An inventory of foresight methodologies used in 44 relevant foresight studies in the animal health area performed to date and an analysis of the outputs of these studies which results in a draft list of future research needs.
UK Office of Science and Innovation Aim of the project was to produce a challenging and long-term vision for the detection and identification of infectious diseases in plants, animals and humans. This vision took account of: the evolving risk of diseases; changing user requirements for detection and identification; and cutting edge science. Objectives: to take a broad look across plants, animals and humans; to consider international as well as national issues; to look 10-25 years into the future; to build upon the best work by others in this area.
UK Office of Science and Innovation Aim of the project was to explore the pressures on the global food system between now and 2050 and identify the decisions that policy makers need to take today, and in the years ahead, to ensure that a global population rising to nine billion or more can be fed sustainably and equitably. A major conclusion of this Report is the critical importance of interconnected policy-making. Other studies have stated that policy in all areas of the food system should consider the implications for volatility, sustainability, climate change and hunger. Here it is argued that policy in other sectors outside the food system also needs to be developed in much closer conjunction with that for food. These areas include energy, water supply, land use, the sea, ecosystem services and biodiversity. Achieving much closer coordination with all of these wider areas is a major challenge for policy makers. More food must be produced sustainably, demand for resource-intensive food must be contained and waste in the food system minimised.
The Third SCAR Foresight Exercise: Sustainable food consumption and production in a resource-constrained world The purpose of the 3rd Foresight Exercise (FEG3) is to update the state of some critical driving forces and to focus on the transition towards an agricultural and food system in a resource-constrained world, given the likely critical importance of those driving forces. Its aim is to provide building blocks for longer-term perspectives to prepare a smooth transition towards a world with resource constraints and environmental limits and to guide agricultural research in the EU and its Member States. The inter-connections between these combined challenges and the limited understanding of the various feedback loops linking them contribute to the uncertainty about future developments. There is growing evidence that these challenges are so large that a "business-as usual" approach is not an option but that transformative change is needed which will open up a window for innovation, for new ideas and new paradigms. In order to make progress in making the transition to sustainable food consumption and production, it is crucial that we understand the new level of change, what this may mean for food production and consumption, and what needs to be done in preparation for the changes already visible on the horizon.
Australian Government – Department of Agriculture, Fisheries and Forestry (DUFF) The Department has been working in the area of animal health foresight for some time and outlines the range of activities undertook (including 'over the horizon scanning' as promoted via a foresight e-mail list and two websites: http://aquatichealth.net/ and http://www.shapingtomorrow.com/). Summaries are available from the 'Foresight Survey and Additional Information' folder under WP5 of the STAR-IDAZ members area: https://members.star-idaz.net/index.php

Survey/control of diseases studies/activities

Twenty-six out of thirty-four studies (76,47%) can't be defined "relevant" foresight studies, the documents are an overview on the state-of the-art in vaccines, pharmaceuticals and diagnostic tests systems useful in the control for animal diseases, monitoring of vaccinated animal, control of emergencies, monitoring of the most important infectious diseases of animals. It can be assumed that these activities are "compulsory"activities, following National and International rules.

Border line studies/activities

Two out of thirty-four studies (5,88%) can be defined "border-line" studies/activities: they are "necessary" analysis, focused on disease threats, offering the occasion to underline the importance of multidisciplinary approaches, both at governmental and scientific level, in order to confront animal/human/global health issues. These kind of studies/activities relate to scenario planning and early warning, without detailing methodologies.

The Great Brazilian National Challenges in Agriculture Research and Development (R & D) strategic projects compose the Macroprogram 1 Great National Challenges portfolio, as part of the Brazilian Corporation for Research in Agriculture (Embrapa) System of Project Management (SEG). The SEG was designed to provide the necessary tools to manage the whole life cycle of R & D Projects, as they are: planning, financial resources release, conduction, follow ups and final evaluation. It also provides Embrapa with a better organizational flexibility and transparency in generating technology. The induction and financement of R & D projects occur through the Macro Programs (MP) with the purpose to compose and manage a strategic portfolio of projects of high technical and scientific quality, in order to accomplish the institutional goals The folders' portfolio contains the 18 Projects of MP1, representing the greatest themes into the Brazilian research scenario, capable to induce the establishment of large research nets. Each one of these projects comprises from 120 to 550 researchers from Embrapa and collaborating institutes. The research nets are clearly enhancing, in a very organized way, the scientific knowledge in agriculture.
RIVM, The Netherlands Vector borne disease (VBD) emergence is a complex and dynamic process. Interactions between multiple disciplines and responsible health and environmental authorities are often needed for an effective early warning, surveillance and control of vectors and the diseases they transmit. To fully appreciate this complexity, integrated knowledge about the human and the vector population is desirable Depending on the context, whether a VBD is endemic or not, surveillance activities are required to assess disease burden or threat, respectively. Following a decision for action, surveillance activities continue to assess trends. Needs more attention in the veterinary world (risk assessment and risk management level) as it identifies the main issues that need to be addressed, next to the opportunities for further integration of surveillance approaches of VBD in Public Health and Animal Health. Furthermore, it focuses on indicator identification for early warning, which could support developments in the field of emerging diseases.

SUB-SECTION B- Analysis of foresight/futures/horizon scanning and risk analysis activities

This sub-section of the report presents the results of a survey to gather specific information regarding foresight/futures/horizon scanning and risk analysis activities relating to animal health going on in the STAR-IDAZ partner countries, building on the earlier Foresight Activities Survey circulated in February/ March 2012. The information was collected through a questionnaire sent in April 2012 to the countries participating in the STAR-IDAZ programme.

This questionnaire supports an aim of WP5, which is to identify well established and organised methodologies, and the presence of expert groups charged with the identification of diseases that are not yet problems but is perceived as threats.

The questionnaire has been developed to:

- **collate and analyse information on research strategy development and foresight and horizon scanning activities performed by partner organisations in the animal health area, completing the earlier survey where perceived threats were identified (Preliminary Inventory of Research Activities and Priority Research Needs)**
- **identify contact persons on foresight activity (related to animal health) for possible further engagement in the development of the SRA**
- **give a better understanding of national and regional futures activities in the area of animal health**

In order to:

- identify and select expert groups and structures to be involved in the FPU of STAR-IDAZ, in order to facilitate priority setting and selection of experts for the consensus workshop (June 2013)
- propose new foresight studies to cover identified gaps in future outlooks on regional or trans-national level, including recommendations as to how such studies could be resourced and progressed;
- propose strategic research topics/drivers to the FPU of STAR-IDAZ

The objective is to provide a systematic overview of the foresight/futures/horizon scanning activity and to map the risk assessment and related research landscape in each country, in order to identify commonalities, differences, overlaps and possible opportunities for collaboration.

Analysis of the questionnaire

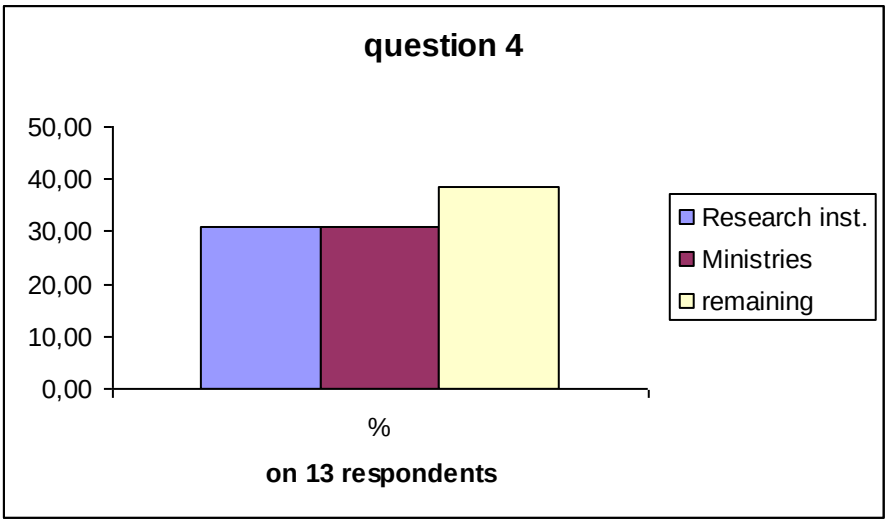
The following is an analysis of the answers received up to date **(June 2012)**. **Thirteen (13**) STAR-IDAZ participants (see list of respondent organizations below, **table 2**) answered the questionnaire **(see Annex 1)**

ACRONYM	NAME OF ORGANISATION	COUNTRY
ETPGAH & DISCONTOOLS	European Technology Platform for Global Animal Health & DISease CONtrol TOOLS	Belgium
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation)	Brazil
CFIA	Canadian Food Inspection Agency	Canada
LVRI CAAS	Lanzhou Veterinary Research Institute, CAAS	China
DTU VET	National Veterinary Institute	Denmark
FZJ-PTJ	Forschungszentrum Juellich GmbH/Projektträger Juelich (Project Management Agency Juelich)	Germany
MOH	Dipartimento della sanità pubblica veterinaria, della sicurezza alimentare e degli organi collegiali per la tutela della salute Ministero della Sanità Department of Veterinary Public Health, Nutrition and Food Safety Ministry of Labour, Health and Social Affairs	Italy
CONASA	Consejo Tecnico Consultivo Nacional de Sanidad Animal National Council of Animal Health	Mexico
MAF (from 31 April 2012 will become MPI)	Ministry of Agriculture and Forestry (from 31 April 2012 will become the Ministry for Primary Industries)	New Zealand
ICISTE	Аналитический центр международных научно-технологических и образовательных программ (International Centre for Innovations in Science, Technology and Education)	Russia
MGAVM&B	Московская государственная академия ветеринарной медицины и биотехнологии им. К.И.Скрябина (Moscow State Academy of Veterinary Medicine & Biotechnology n.a. K.I.Skryabin)	Russia
INIA	Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria The National Institute for the Agricultural and Food Research and Technology	Spain
DEFRA	Department for the Environment, Food and Rural Affairs	United Kingdom

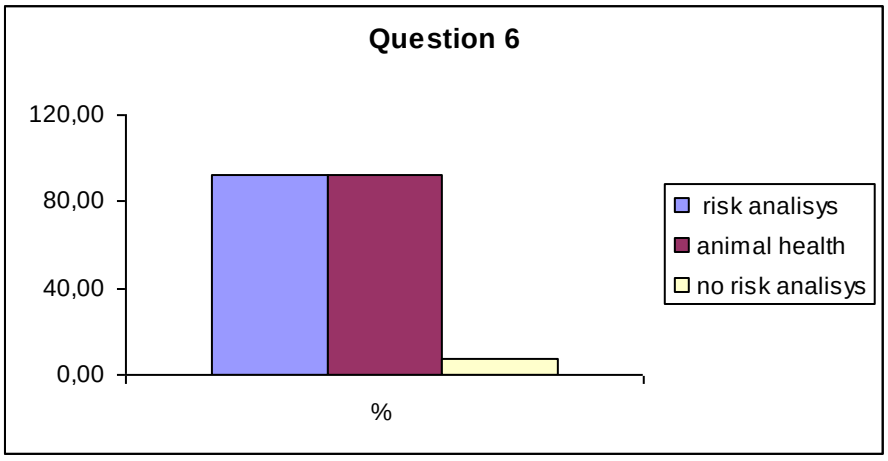
Table 2: List of respondent organizations.

Question 1: Countries
The thirteen (13) STAR-IDAZ participants that answered the questionnaire are located in the following countries: Belgium, Brazil, Canada, China, Denmark, Germany, Italy, Mexico, New Zealand, Russia, Spain, United Kingdom. Is it possible to notice that 8 respondent are located in Europe, while 3 are located in the Americas,1 in Australia and one in Asia

Question 4: Nature of the organisations
Among the respondents, 30,77% are Research institutions (4), 30,77% Ministries (4), and the remaining 38,46% are Private (1), University (2) and Agencies for Ministry (2).



Question 5 and 6: Engagement in risk analysis and/or foresight studies and presence of specific foresight teams
Among the respondents, 84,61% (11 respondents) indicated that they are engaged in risk analysis and/or foresight/futures activities to inform their research strategy, and 92,30% (12 respondents) answered that they engage specific foresight teams on animal health risks. Only one respondent gave a negative answer.



Question 8: Use of foresight studies/long term SRA
Among the respondents, 92,30% (12) stated that they make use of foresight studies and/or long term SRA when developing research strategies, against only one giving a negative answer. It must be stressed that two respondent out of 12 have pointed out that these tools are not used in the animal health sector or for developing research strategies.

Question 9: Workshops/conferences addressing foresight activities relevant to animal health attended
Among the respondents, 69,23% (9) stated that they have attended workshops/conferences addressing foresight activities relevant to animal health, and 30,77% (4) gave a negative answer. Among the positive answers, 33,33% (3) attended the EMIDA Consensus Workshop, the others attended national or international (FAO, WHO, OIE, IICA, ETPGAH & DISCONTOOLS) foresight workshops/conferences.

Question 12: Presence of a Risk Analysis or Foresight Unit
Among the respondents, 69,23% (9) state that a Risk Analysis or Foresight Unit is present, and 46,15% (six) are aware of the presence of more than one Unit, belonging to different Administrations.

Question 13: Presence of a national data base of experts
Among the respondents, 38,46% (5) make use of a national Data Base of Expert to facilitate foresight activities on animal health. Concerning the other 61,54% (8) answering no, they point out the use of different tools, such as University data bases, national and international contacts, general S&T experts data bases, EC expert roasters, etc.

Question 14: Main objectives and topics of the last foresight study/risk analysis related to animal health performed in the country
Among the respondents, 30,76% (4) answered listing animal diseases: Echinococcus multiocularis (2), Classical Swine Fever (2), Vector Borne Diseases (2) and Rift Valley Fever, Rabies, Schmallemberg Virus, Antibiotic Resistance, BSE, Avian Influenza, FMD, Blue Tongue were listed at least once.

Question 15: Main sources of data used
Among the respondents, 46,15% (6) make use of national Animal Registries as main source, while 30,77% make use of experts (expert opinion). In addition, we can find technical data, statistical data, land use maps.

Questions 16, 17, 18, 19: use of mathematic models, regular basis of the studies, publication of results and dissemination
At a first glance, 46,153% (6) of respondents use mathematic models to analyse data (quantitative models as a component of a qualitative assessment) and only 30,77% (4) state that they perform Foresight and Risk Analysis on a regular basis. Concerning the publication of the results of the studies, 53,85% (7) specify a web site in which results are published, and 46,15% (6) of respondents disseminate results by internal workshops, national conferences, formal consultation process with domestic and international stakeholders. The following table (table 3) lists the web sites (pointed out in the answers) where is possible to find published documents and studies results:

www.forecan-precan.ca
www.magrama.es
www.defra.gov.uk/animal-diseases/monitoring
www.izs.it
www.izslt.it/izslt
www.izsvenezie.it
www.etpgah.eu/strategic-research-agenda.html
www.biosecurity.govt.nz/regs/imports/ihs/risk
www.senasica.gob.mx

Table 3 List of the web sites where is possible to find published documents and studies results

Question 20: Use of foresight exercises/horizon scanning studies to select strategic research areas

Among the respondents, 61,54% (8) answered "no" and 38,46% (5) stated that in their countries foresight exercises and horizon scanning studies are used to select strategic research areas. In three cases (one Ministry of Agriculture and Forest and two Research Institutions) the same respondent is the Institution responsible for the exercises/studies, in one case the responsible is the Ministry of Health, and the last respondent didn't answer to the second part of the question.

Question 22: Responsible for identification/monitoring of emerging animal diseases

First of all, only twelve (12) out of thirteen (13) respondents answered the question, because the organization that didn't answer is a transnational technology platform. Concerning the body responsible for identify/monitoring the presence of any emerging animal diseases, eleven respondents stated that the Ministry of Agriculture of their country is in charge of this function, while one stated that the Ministry of Health is responsible for the identification and monitoring of animal diseases. It must be stressed that in ten cases out of twelve (83,33%) the respondents don't belong to the Ministry of Agriculture: four are Research Institutions, two are Universities and two are Agencies (one belonging to a different Ministry (Research and Education), the other is a federal Regulatory Agency). We should assume that the respondents forwarded the questionnaire to other relevant organisations in their countries that are not STAR-IDAZ participants (as asked in the Guidance of the questionnaire); in any case it should be taken into account the need to check the dissemination of the questionnaire and the coverage of the relevant stakeholders in each country.

Question 23, 24, 25: List of emerging animal diseases, drivers and threats

First of all, only twelve (12) out of thirteen (13) respondents answered the questions, because the organization that didn't answer is a transnational technology platform. Concerning the list of emerging animal diseases, the diseases with the highest number of outbreaks are:

Avian Influence	5 out of 12 respondents
African Swine Fever	5 out of 12 respondents
FMD Type A	4 out of 12 respondents
Schmallemberg Virus	4 out of 12 respondents
Rabies	3 out of 12 respondents
Brucellosis	3 out of 12 respondents

Table 4 List of emerging animal diseases

Concerning the drivers that may influence the emergence of infectious animal diseases, 100% of respondents (12) identified:

Economy and trade	at least 4 respondents
Environment	at least 4 respondents
Social changes	at least 4 respondents
Vectors	at least 2 respondents
Tourism	at least 2 respondents
Brucellosis	at least 2 respondents
Waste disposal	at least 2 respondents

Table 5 List of drivers

As regards the threats to animal/public health more likely to emerge in the short and medium term, we can list:

African Swine Fever	at least 2 respondents
Blue Tongue	at least 2 respondents
Avian Influence	at least 2 respondents
Salmonellosis	at least 2 respondents
West Nile Fever	at least 2 respondents
Vector Borne Diseases	at least 2 respondents

Table 6 List of threats

Question 26, 27: Financement of research on emerging animal diseases

Only four respondents (30,77%) stated that their country doesn't finance any research on the emerging animal diseases mentioned in Question n° 23. Concerning the financing mechanism, in seven cases (53,85%) the allocation of research funding takes less than 3 months; in six cases (46,15%) it takes between 3 and 6 months.

Section II: Foresight studies in the animal health sector performed by STAR-IDAZ partners

CONCLUSIONS

There is no single set of methods used in all foresight/futures activities. The methods used need to reflect the resources available and the objectives of the exercise. The choice of methods is critical, though it often appears to be based upon what is fashionable or those which practitioners have experience in. Combinations of methods may be used but there is little advice on how best to combine them. By far the most popular means of assessing possible future events seems to be literature searches and expert opinions, closely followed by scenario studies. It should be borne in mind that the methods are named and listed according to the way they are addressed and mentioned in the reviews. In fact, expert opinion assessment or literature reviews can take a number of forms.

From the analysis of the studies and of the questionnaire we can state that most of the STAR-IDAZ partners are engaged in risk analysis and/or foresight/futures activities to inform their research strategy and to transmit data to the research managers.

Less clear is how these results (especially the results of risk analysis) are transferred to the Strategic Research Agendas (SRA), despite the majority claiming to use them. Workshops and seminars are the main dissemination methods used to connect researchers with their policy clients but the effectiveness of these methods is questionable given that the policy clients are often absent. The lack of communication between research and policy could be improved by strengthening direct channels through the use ofreciprocal communication tools (flows). International organizations and projects funded at European level (such as the 7th Framework Programme) are useful new tools to be utilised in this respect.. European and Global coordination particularly, seem to be the key to the future, and should be strengthened as a tool to improve communication.

The responses to question n° 12 of the questionnaire suggest that most countries have Risk Analysis and Foresight Units with many located in outside institutions. If a multidisciplinary approach is correct, a way needs to be found to bring together the different units (that sometimes do not communicate)and the various methodologies they use so as, to identify a joint and coordinated path. To this end, it becomes vital to have reliable database of expert groups..

In the framework of the questionnaire, Question n° 20 has been one of the key questions: "Are there foresight exercises / horizon scanning studies on animal health dedicated to select strategic research areas?" Among the respondents, a large percentage (61.54 %) answered "no", thus demonstrating the need to develop tighter links between a vast range of foresight exercises and their application to the selection of strategic research areas in the animal health sector.

With regard to Question n°. 23, 24, 25 of the questionnaire (list of emerging animal diseases, drivers and threats), despite the obvious geographical diversity of the respondents, there was a strong correlation in the answers: the respondents identified a list of drivers in which Economy and trade, Environment and Social changes stand out (see table5 above). There was also agreement on the risk of emergencies in the short and medium term, primarily due to Vector Borne Diseases (and Avian and Influenza and Salmonellas), linked to climate change and the effect of globalization.

Finally, in the philosophy of STAR-IDAZ, rather than predicting the future it is important to be ready to respond effectively when emergencies arise. An important element of reflection is a fact

revealed by the questionnaire: funding for research should be made available when there is an emergency, in time to make it possible to cope with the events, thus improving and optimizing surveillance and diagnostics.

These recommendations can not be designed solely to provide an address for foresight research towards the maintenance of the SRA because, as was evident from the results of the questionnaire, more steps are necessary to enable regular foresight exercises to be performed by Risk Managers at national level and to activate necessary and stable channels of information exchange between these and the research world . Therefore it seems reasonable that the recommendations contain elements and suggestions that may go beyond the specific purposes of the Foresight & Programming Unit of STAR-IDAZ but which we believe are essential for this FPU on research or other FPUs to be successful.

Recommendations for STAR-IDAZ FORESIGHT PROGRAMMING UNIT

It is important to first improve and encourage Risk Analysis and Foresight activities and their utilisation at national level

It is essential to persue the creation of metadata systems (common website / dissemination of information and where to find them) that are affordable, usable and standardised so as to ensure the robustness of data accessibility and usability by all researchers, even outside the national context (participants must clearly indicate how and where to find this data in an agreed form)

A central database for all farmed species and production animals is desirable

A database of experts for regular consultation needs to be developed

A multidisciplinary approach (multidisciplinary groups) for the choice of experts, definition of scenarios and use of data is recommended

Identify the primary dissemination conferences of those disciplines relevant to foresight and risk analysis at the national level allowing integration of data that may reveal aspects that would've escaped the individual aspects (for example, for Italy, one moment could be the Veterinary National Conference of Epidemiology – held each two years – for integrate data without losing the aspects that may escape the expert/statistical data method

Encourage risk analysis activity at a national level to include monitoring and regular circulation of reports including those from experts on environmental scanning

Improving communication between the institutions responsible for agriculture and the environment resulting in Risk Analysis Units communicating with each other and providing guidelines for policy planning

Consultation processes and risk analysis should be repeated on a regular basis

Activate and/or improve communication between Risk Analysis Units, managers of the research and their policy clients with regularconsultation exercises(3/5 years) to re-consider research needs

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ANNEXES

ANNEX I – QUESTIONNAIRE

Questionnaire on
Animal Health Foresight

Project acronym:	STAR-IDAZ
Project full title:	Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses
WP 5 task title	Developing strategic trans-national animal health research agendas
Author:	WP5 leader(s)

Table of Contents

Guidance

The aim of the STAR-IDAZ Foresight and Programming Unit (FPU) is to build on the work of the EMIDA ERA-NET FPU, expanding its remit to a global context to develop and maintain common strategic research agenda in animal health. The FPU's objectives are:
to identify strategic and innovative requirements (including infrastructure and expertise) for global animal disease research and to develop criteria for priority-setting and subsequently a common longer-term (5–15 year) strategic research agenda based on agreed priorities; to develop a database of key experts for foresight exercises across the globe; to maintain and evaluate on a regular basis the common strategic research agenda based on shared regional and trans-national priorities, to be taken forward through coordinated funding of research programmes; to facilitate the establishment of (strategic) research programmes in Partner Countries wishing to develop research activities in the field of animal diseases and zoonoses.

This questionnaire has been developed to gather specific information regarding foresight/futures/horizon scanning and risk analysis activities relating to animal health going on in the STAR-IDAZ partner countries, building on the earlier Foresight Activities Survey. It will support an aim of WP5 which is to identify well established and organised methodologies, and the presence of expert groups charged with the identification of diseases that are not yet problems but are perceived as threats.

The questionnaire will help to:

- **collate and analyse information on research strategy development and foresight and horizon scanning activities performed by partner organisations in the animal health area, completing the earlier survey where perceived threats were identified (Preliminary Inventory of Research Activities and Priority Research Needs)**
- **identify contact persons on foresight activity (related to animal health) for possible further engagement in the development of the SRA**
- **give a better understanding of national and regional futures activities in the area of animal health**

In order to:

- identify and select expert groups and structures to be involved in the FPU of STAR-IDAZ, in order to facilitate priority setting and selection of experts for the consensus workshop (June 2013)
- propose new foresight studies to cover identified gaps in future outlooks on regional or trans-national level, including recommendations as to how such studies could be resourced and progressed;
- propose strategic research topics/drivers to the FPU of STAR-IDAZ

The objective is to provide a systematic overview of the foresight/futures/horizon scanning activity and to map the risk assessment and related research landscape in each country. This will enable us to identify commonalities, differences, overlaps and possible opportunities for collaboration.

Since we are aiming to get as comprehensive an overview as possible, it is the responsibility of each STAR-IDAZ participant to identify which other organisations in their country are involved in foresight activities specifically related to animal health. If you identify relevant organisations in your country that are not STAR-IDAZ participants, please also forward the questionnaire to them and collect their responses.

Please note: Information provided will only be used for the purpose of STAR-IDAZ and will only be available to STAR-IDAZ partners and the European Commission.

Definitions:

For the purposes of this questionnaire, the following terms are defined as shown below:

- *Foresight/Risk Analysis:*

  Foresight (futures/horizon scanning activity/risk analysis) provides a framework in which longer-term strategic requirements are identified in a systematic way, building on knowledge on future aspects of animal disease development in Europe and the world, and linking this to existing research programmes.

- *Foresight Unit:*

  A mechanism of permanent consultation (one or more groups, also divided in thematic/strategic areas) on animal health (periodic assessments of information so that the results feed into the organisation's strategic planning and provide information that can be periodically assessed by a process of review and analysis)

- *Driver:*

  A driver or driving force is an external condition acting on a large scale (climate, energy, technology, social events, …), which has the potential to directly or indirectly influence animal and human health (for example: Climate change, Intensification of livestock transports and trade, increasing international travel and transport, economy and trade, land use change, urbanization, wild life, biodiversity, policy, environment, changing agriculture practices, zoonotic challenges to human health, ….)

- *Threat:*

  A threat is a hazard that affects directly (or indirectly) animal and / or human health, like a pathogen, pathogen-carrier or a (bio)terrorism event.

- *Animal health* and related topics within the scope of the global network, STAR-IDAZ include:

  Emerging and major infectious diseases of production animals, including fish and bees and including those conditions which pose a threat to human health but excluding food safety issues relating to livestock products and diseases of wildlife except where they act as reservoirs of infection for humans or production animals.

- *Emerging disease*:

  A new infection resulting from the evolution or change of an existing pathogen or parasite resulting in a change of host range, vector, pathogenicity or strain; or the occurrence of a previously unrecognised infection or disease. A re-emerging disease is an already known disease that significantly increases its prevalence.

A. General Information		
1.	Country	……..
2.	Name of your organisation	Please provide details of your organisation: Acronym:…… Full name:…….. Translation in English:……... Full Address: …… …… ……
3.	Person compiling the questionnaire:	Name:……..…… Role:……..…….. Full Address: …… …… …… Telephone:……. E-mail:…….
4.	Please specify the nature of your organisation.	☐ Ministry ☐ Public independent agency ☐ Private ☐ Research Institution Other, please describe……..
5.	Does your organisation/country engage in risk analysis and/or foresight/futures activities to inform your research strategy?	☐ Yes ☐ No
6.	Are there specific foresight teams, including in the academic community, you engage with on animal health risks?	☐ Yes ☐ No
7.	If applicable, please provide contact details for the individuals or team engaged in this type of foresight activity	……..
8.	Have you made use of foresight studies and/or long term SRA published internationally when developing research strategies? If yes please give details.	

9.	Have you attended workshops/conferences that have addressed foresight activities relevant to animal health? If yes please give details	
10.	Any comments or additional information to clarify section A	

B. Tools to perform national foresight/horizon scanning (topics, timetable and characteristic)		
11.	Person to contact for information on foresight, if different from question n° 3 (please specify who we can contact in order to get detailed information on foresight activities). Please specify if this person has been informed on our survey and on the possibility to be contacted directly by STAR-IDAZ Foresight Unit within the timeline of the project Fill in for more than one persons if they belong to different organization	Name:……..…… Role:……..…….. Full Address: …… Telephone:……. E-mail:……. Informed? ☐ Yes …… ☐ No.....
12.	Does a dedicated Risk Analysis or Foresight Unit on animal health exist in your country?	☐ Yes ☐ No If yes , there are more than one? …… If yes, if they belong to different Administration. Please list. ……
13.	Does a national data base of experts who can be used to facilitate your foresight activities on animal health exist?	☐ Yes ☐ No If no or in case of different DB please specify which DB or different tools are used for the scope ……

14.	Please describe the main objectives and topics of the last Foresight or Risk Analysis relating to animal health performed in your country:	1. …… 2. …… 3. …… 4. …… 5. …… ……
15.	Which are the main sources of data used? (ex. Demographic Statistical data, etc.)	Please list: ……..
16.	Are mathematic models used to analyse data?	□ Yes □ No If yes please provide a list of the main software/mathematical models/stat analysis performed
17.	Are these studies performed on a regular basis?	□ Yes □ No If yes please provide indication on the frequency ……
18.	Are the results of the study regularly published on a web site?	□ Yes □ No If yes, please specify website address (if any in English) ……
19.	Are the results disseminated by workshops or other?	□ Yes □ No If yes, please specify title of the most recent events and kind of attendants…….
20.	Are there foresight exercises/ horizon scanning studies on animal health dedicated to select strategic research areas?	□ Yes □ No If yes, please specify Institution responsible for and main dissemination tools…….
21.	Any comments or additional information to clarify section B	

C. Perceived needs: Research on emerging animal diseases		
22.	Is there a body responsible for identifying/monitoring the presence of any emerging animal diseases in your country?	☐ Yes ☐ No If yes, please give name and to which Ministry it belongs …… …… If it doesn't belong to any Ministry please give its affiliation and describe its relations with other public bodies. …… …… …… Please give a brief description of roles and responsibilities. …… …… …… …… ……
23.	Which main emerging animal diseases have occurred in your country since 2009? (Please list the top five diseases and years of occurrence)	1)…… 2)…… 3)…… 4)…… 5)…… ……
24.	Which drivers can you identify in your country that may influence the emergence of infectious animal diseases in both the short and medium term? (Climatic change, Vectors, Trade, etc … see *Definitions* for more detail)	1)…… 2)…… 3)…… 4)…… 5)…… ……
25.	Which threats to animal health/public health could you identify as more likely to emerge in both the short and medium term in your country?	1)…… 2)…… 3)…… 4)…… 5)…… ……

26.	Did your country/organisation (delete as appropriate) finance any research on the above mentioned animal disease (see question n° 23) before they emerged in your country?	☐ Yes ☐ No If Yes, please specify (research and budget €) ……..
27.	Does your country/organisation (delete as appropriate) currently finance any *ad hoc* research on the above mentioned emerging animal diseases (see question n° 23)?	☐ Yes ☐ No If Yes, please specify (research and budget €) ……..
28.	How quickly do the financing mechanisms in your country/organisation (delete as appropriate) allow you to allocate research funding to study animal diseases in case of emergency?	☐ It takes more than a year ☐ It takes between 6 months and a year ☐ It takes between 3 and 6 months It takes less than 3 months
29.	Which fields are covered by research funding on risk and in which percentage?	☐ Risk management……..% ☐ Risk assessment……% ☐ Risk communication……% Please indicate the percentage of funding for each component on the basis of the last three years research budget
30.	Any comments or additional information to clarify section C	