EMIDA Work Package 4

Strategic Research Agenda Workshop

Prague, 10-11 June 2010

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INTRODUCTION

The EMIDA ERA-NET on "Coordination of European Research on Emerging and Major Infectious Diseases of Livestock" is a Seventh Framework Programme-funded project of the European Union involving 27 partners in 19 countries. The project is concerned with the coordination of research activities of Member and Associated states of the EU at the level of the research funding organisations through sharing of information, organising joint research calls and working towards a common research agenda. This research will be additional to the research procurement within the EU framework programmes and will be organised and funded by the EMIDA partners themselves.
To prepare for the future and enable the setting of strategic goals for animal health research, a Strategic Research Agenda (SRA) with a timeframe of 10-15 years will be developed. It will have common objectives, but a regional focus will be included when considered appropriate. It is expected that, besides being a tool for EMIDA to manage research priorities and joint calls in the long term, the SRA can have influence on EC-DG Research procurement activities, as well.

The development of the common SRA requires that research topics will be identified based on the most important priorities in terms of (future) threats to livestock (including associated human health issues), animal health policy and the current research gaps. Therefore a review and analysis of existing foresight studies on (re-)emerging animal health risk has been carried out. As a first step of developing the SRA, this literature review was followed by a Delphi study to collect and collate additional points of view regarding Emerging and Major Infectious Diseases of Livestock which have general support from a wide range of experts. The third step in 'SRA-building' was to build upon these first two results and explore in detail any consensus, disagreement and priorities regarding necessary future research, with a select group of experts from various disciplines, and various geographical origin in Europe. Therefore a multidisciplinary Strategic Research Agenda Workshop (STRAW) was organised to allow face-to-face discussion between those experts to achieve the goals of this third step. Final step will be to evaluate the results of the workshop together with the results of the Delphi study and the literature review, with additional information from on-going work in the same field. This should lead to a list of research priorities on emerging and major infectious animal diseases for Europe, including a regional focus when appropriate, for the next 10-15 years.

This report will describe the methodology and results of the third step, the Strategic Research Agenda Workshop (STRAW), held in Prague on 10 and 11 June, 2010. (see Annex 1 for the programme)

METHODOLOGY

Background

Several studies focused on identification of (re-)emerging risks have been conducted in recent years (EMRISK – EFSA, 2006). Together with the 44 foresight studies concerning future animal health issues that have been reviewed and analysed as the first step of SRA-development, these studies have indicated that a holistic approach is needed in order to obtain useful information about the driving forces and future threats. This implies that multidisciplinary and interdisciplinary knowledge is required and should be applied to identify the relevant issues pertinent to developing the SRA in the context of future European animal health research.

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Considering this and to have appropriate discussion groups that were manageable, workshop attendance was by invitation only. To avoid any financial barriers for people to accept the invitation, travel and accommodation expenses were covered by the EMIDA-project. This allowed control over the number of participants and also the expertise and disciplines needed.
A debate was organised between 33 experts of government, research, industry and NGO's with a global, European and/or regional perspective, and with disciplines like epidemiology, virology, bacteriology, wildlife, economy, insurance, risk assessment and risk management (see Annex 9, *list of participants*, for a complete overview of disciplines).

The objective of the workshop was to list and prioritise research needs to enable EMIDA to identify, prevent/control/mitigate emerging infectious animal diseases in the next 10 to 15 years on a European level and, if appropriate, on a regional level.
The workshop was conducted in English.

Method

Selection of Participants
Several criteria were set in order to select participants who could provide valuable contribution to the discussions envisaged considering the workshop's objective.
Three groups of criteria were identified:

1. General
   - Known enthusiasm for the topic/objective
   - Ability to cross borders (lateral thinkers)
   - Delphi participant with a critical attitude (either positive or negative)

2. Representation
   - Equal geographical representation of 'Europe'
   - Government
   - Research
   - Industry
   - NGO's
   - Global/European organisations like FAO, OIE, EFSA

3. Disciplines
   - General veterinary medicine
   - Virology/bacteriology/parasitology
   - Epidemiology
   - Meteorology
   - Agro-economy
   - Zoonoses
   - Vectorborne diseases
   - Wildlife
   - …….

Information beforehand
To support the participants to prepare themselves for the workshop they received a discussion paper (Annex 2) a week before the workshop was held. The paper (two pages) contained a summary of both the literature review (step 1 SRA-development) and the Delphi study (step 2 SRA-development), and also touched upon several questions which still needed to be answered.

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Workshop guidance
To create manageable and effective discussion groups, each group had up to 10 persons. To guide and report the discussions a moderator and rapporteur were appointed for each group. For an effective series of workshops, it is important that the moderators run their workshops well and consistently. Therefore moderators and rapporteurs received, a week before the workshop, written instructions on how to conduct and report the discussion sessions. The moderator had to provide guidance by ensuring focus on the objective of the session, focus on all relevant topics, fair involvement of all participants, preventing premature closing of discussion on topics, and creating a neutral/cooperative atmosphere. Templates were provided for the rapporteurs' reports. All of this contributed to ensuring comparable outputs from the different sessions.

Workshop introductions
To create a level playing field and stimulate discussions, the results of the literature review and the Delphi study (Annex 3) were presented during a plenary introduction. This time more detail was provided than in the discussion paper. It was meant to support a mutual understanding of the work that was done already ('what we know') and, together with the workshop objective, of the work yet to be done ('what should we know'). The participants were expected to provide the latter during the two workshop discussion sessions. As the second workshop discussion sessions, with the objective being to identify research priorities concerning emerging infectious animal diseases, were supposed to build upon the results of the first discussion sessions - which focused on the identification of drivers and threats -, these results were collated, summarised and presented in a plenary session before the second group sessions.

Transparency is regarded as helpful and perhaps essential to conduct a fruitful and effective workshop. Therefore, before the outset of the actual discussions, the aims and processes of the workshop were clearly explained. Participants were informed about the workshop sessions' objectives, the rationale behind the composition of the different discussion groups, use of the outcome, and the roles of the moderator and the rapporteur.

Discussion sessions I: drivers and threats
The output of the literature review was organised as drivers and threats to animal health, and research priorities were identified based on the individual studies and the analysis thereof. Given the wide source material used for the literature review, it was inevitable that the scope of subjects collated as drivers, threats and research priorities would be broad. And due to the fact that different sources used different definitions for drivers and threats it was impossible to generate unambiguous lists of drivers and threats. This was less of a problem with the lists that resulted from the Delphi study, although there was no consensus regarding the direction of impact of some of the driving forces on incidence of infectious animal diseases. Therefore further discussion and review was necessary to help disentangle these outputs toward a structured frame-work in support of the SRA.
As it is generally accepted that relevant driving forces lead to animal health threats and as a consequence aid the process of identification of research priorities, the aim of the first session of the workshop was to obtain a clear-cut overview of the drivers and threats at stake. To guide the discussion definitions of drivers and threats were provided.

Driver: A general political, social, demographic, economic (including agriculture) or environmental condition acting on such a scale that it may directly or indirectly influence the (re-)emergence of animal and human infectious diseases.

Threat: A consequence of political, social, demographic, economic (including agriculture) or environmental decisions or actions, but with possible adverse effects on animal and human infectious diseases. In addition, pathogens are included as threats.

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The participants were divided into four groups, while trying to achieve an equal distribution of disciplines and representation. A warm-up question, derived from the basic material presented in the plenary session, was used to get everybody into the right mood.
Then, to let the groups arrive at lists of drivers and threats, two different sequences of questions were used. Two groups started with identifying driving forces, and the other two groups with threats. The question sequences were as follows:

A)

- *Which driving forces are expected to be most influential in the next 10-15 years for diseases to appear/increase?*
- *Which threats (diseases) does the group identify as relevant because of emerging potential considering the driving forces identified (timespan 10-15 years)?*
- *Can the group place the threats (diseases) (including the related driving forces) in order of significance?*

And
B)

- *Which threats (diseases) are expected to occur in the next 10-15 years?*
- *Which driving forces does the group identify as relevant to the emergence of infectious animal diseases identified (timespan 10-15 years)?*
- *Can the group place the driving forces (including the related threats) in order of significance?*

The participants were each asked to write their topics (influential drivers/threats) on paper. Then, as a group, they categorised/listed their answers, and identified the general and overarching topics. Special attention was given to the justification of the time span of drivers/threats identified, and when some appeared to be more short term they were recorded as such. The final step was to try and prioritise the identified drivers and threats.

Discussion sessions II: research priorities
Based upon the results of the discussion sessions on drivers and threats, the participants were asked to discuss which research priorities could be identified and prioritised at a pan-European level and at the level of different bio-geographical regions.

The participants were divided into four groups based on biogeographical regions as defined by the European Environment Agency in 2005 (Annex 6). A participant's country of origin determined which group they were in. The four regions used were: Nordic/Baltic, Atlantic, Continental and Mediterranean.
A warm-up question, derived from the results of the first discussion sessions presented in the plenary session, was used to get everybody into the right mood. Then, the following questions were asked:

- *Based on the results of the first discussion sessions what research topics at pan-European level can the group identify?*
- *Can the group place these pan-European research topics in order of significance?*
- *Based on these results what research topics at biogeographical region level can the group identify?*
- *Can the group place these regional research topics in order of significance?*

Individuals were paired and each team was asked to list two or three research topics they saw as being significant. A list of all topics was compiled then. Each pair joined another pair to form two groups of four. These groups were asked to discuss and to

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select, from the overall list, the two or three research topics they felt were the most significant. Again these topics were listed for further discussion. It was made clear that no ideas would be discarded and that all topics would be considered by EMIDA when developing the SRA - but the first objective was to prioritise. Next, the entire group was asked to discuss the six prioritised topics and decide which they thought were the two most important. Finally a list of all the research topics identified was compiled in order of priority (justification included).

RESULTS

Discussion sessions I

To warm up the participants they were asked if they thought that all the research topics identified through the Delphi study (Annex 4) were of equal importance. In general, they disagreed with this statement. Though they recognised that important topics were missing, the research areas mentioned were too broad, therefore overlapping, and sometimes belonged to different categories, a first quick attempt was made to prioritise the research topics. See Annex 7 for more detail.

Regarding the identification of drivers and threats there were no essential differences in the outcome of the discussions in the four groups. Though sometimes what was called a threat by one group was called a driving force by another group. This is reflected in the lists provided.
The drivers and threats, as brought forward by the four groups, were compiled and are listed in Table 1 and Table 2. The essence of what has been discussed is captured in the tables. Moreover these tables contain topics which are sometimes rephrased to combine similar topics of different groups. See Annex 7 for more detail.

Table 1. List of drivers

Economics (effect of competition in agriculture and associated costs)
Financial compensation for economic losses due to disease eradication
Globalisation
Climate change – Global warming
Movement of people
Movement / trade of animals (legal and illegal) and their products
Societal Aspects
Change of human behaviour (public perception, compliance with rules)
Social/Political developments (expanding EU, nature development – wildlife – biodiversity)
Lack of political will
Changes in wildlife populations
Lack of harmonisation of monitoring of surveillance systems
Lack of understanding disease pathogenesis
Biosecurity (on farm level, national level, EU level)
Different national capabilities to diagnose and control diseases
Changing farming systems (e.g. intensification, bigger holdings, organic/free range, disease free)

Table 2. List of threats

(re)Emerging diseases
(Emerging) Zoonoses

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Equine diseases
Classical epizootic diseases
Vectorborne diseases
Wildlife borne diseases
Waterborne diseases
Complex multifactorial diseases
Exotic viral/bacterial/parasitical pathogens
Antimicrobial resistance
Anthelmintic resistance
Pathogen evolution
High susceptibility (low resistance) of animals
Responsibility transfer and financial risk (government to farmer/industry)
Lack of quarantine / biosecurity measures
Animal markets and animal traders increase risk of disease introduction
Lack of preparedness and response
Lack of disease awareness
Lack of control instruments
Lack of consistent control of epidemic diseases throughout Europe (may need specific controls from region to region)
Lack of control of endemic pathogens
Lack of resources
Free range / organic farming
Hobby-farming
Lack of data on livestock demographics
Lack of data on herd and individual animal health status
Lack of knowledge on exotic diseases
Increased contact with wildlife
Climate change – Global warming

Discussion sessions II

First the participants were asked their opinion regarding the output of sessions I, the summarised lists of drivers and threats as presented in the plenary session. Although just a warming-up question it yielded very relevant remarks which were useful for further discussion in the sessions. The participants stated that the differentiation between drivers and threats was not always clear, and that the level (general versus specific) influences the kind of research required. In addition, it seemed obvious that not only equine diseases should be on the list but diseases of other species too. Various topics were lacking according the participants, like fungal diseases, (animal welfare) legislation, movement of farm workers, biosecurity issues, the need for alternative sources of protein, spread of disease as a consequence of animal markets, interactions of humans and domestic animals with wildlife, effect of declining veterinary services, and research on minor production species. One group even took an advance on identifying and prioritising research topics by mentioning the effect of changing sizes of livestock population, increasing trade and movement of animals and people, and risk communication as preferred research topics.

Three biogeographical groups, the Atlantic, Nordic/Baltic and Continental region, identified more or less the same research priorities for the next 10 to 15 years at the pan-European level and at biogeographic regional level. There was just a minor difference in the priority order. The results from the Mediterranean group were different from the other groups: the lists of research topics at pan-European and Mediterranean level were exactly the same as the other groups, but in a different order of priority. The results of the highest ranked priorities are depicted in Table 3. See Annex 8 for more detail.

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Table 3. List of research priorities at pan-European and regional level

Research topic	**Eur**	**A**	**N**	**C**	**M**
Improvement of surveillance	$1^{A,}$ 1^{C}	1		1	
(risk analysis of) Biosecurity measures on all levels, including border crossing of wildlife	2^{A}, 1^{N}, 3^{C}	2	2	2	
Improvement of preparedness for emerging and exotic diseases by an epidemiological approach of risk pathways identification	3^{A}	3			
Improvement of preparedness for emerging and exotic diseases by improvement of diagnostic tools	2^{N}		1		
Better understanding of host-pathogen interaction	4^{A}, 3^{N}, 4^{C}	4		4	
Development/improvement of vaccines and vaccine strategies	2^{C}, 4^{M}			3	
Better understanding of vectorborne diseases and health effects of ecosystem change	1^{M}		3	4	1
Improvement of understanding of emerging, neglected and endemic zoonoses	2^{M}				
Development of diagnostic tools and control methods for diseases of neglected species	3^{M}				2
Antimicrobial resistance			*	4	

A=Atlantic; N=Nordic/Baltic; C=Continental; M=Mediterranean
The numbers give the priority order according the discussion groups
* antimicrobial resistance should be considered as a priority due to increasing problems that have been revealed through surveillance and research lately (additional input received from Norwegian participant on the draft report)

DISCUSSION

Conducting an effective and efficient workshop depends on quite a diverse set of issues - predictable and unpredictable. These included identifying relevant participants, sending invitations in a timely manner, the venue and facilities, the programme and topics addressed, acceptance of the invitations, preparation (informing) of the participants, organising guidance and reporting of the workshop sessions, creating good atmosphere for the discussion sessions, weather conditions, travel conditions, and many more. Therefore such a workshop requires good preparation, well in advance of the event.
Without addressing all these issues in detail it must be said that the organising committee had no difficulties identifying veterinarians to invite, but it was much harder to identify people with other backgrounds. So, it was not an easy task to meet the requirements of a multidisciplinary make-up.
The overall response of the participants was positive concerning the way the workshop was conducted, especially with regard to the method used in the second discussion sessions, in the biogeographical groups identifying research needs.

The definitions for drivers and threats used during the first discussion sessions were obviously not clear enough. The participants expressed that there was still confusion regarding drivers and threats, which could be the reason that some topics were listed and ranked as both a driving force and a threat. Another reason for this could be the different starting point of the discussion in the groups; two groups started their discussion with threats and the other two groups with driving forces. Furthermore, the different levels of abstraction of the discussion within the different groups may have contributed to the confusion. Whatever reason, there was still debate on some topics whether they were driving forces or threats. Although an interesting scientific discussion, for the time being it was accepted as just a scientific discussion, or even semantics, because either classification helped to identify the research needs for how to identify, prevent/control/mitigate emerging infectious animal diseases, which was the aim of the workshop.

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Apart from the drivers and threats being mixed up in the lists and the different levels that can be recognised, the threats (diseases/issues) are not mutual exclusively grouped. This will hamper the identification of what kind of research can solve what kind of expected problem. Therefore it was suggested to try and create lists where every threat/disease can only fit into one group (for instance based on epidemiological issues).

There are different levels of driving forces and threats listed as outputs of the first discussion sessions, from very specific to generic. In general, the driving forces are more generic and each driving force affects the increase or decrease of several/many threats. The number of threats that are influenced by a driving force could be used as a guiding principle to distinguish between less and highly important driving forces, in order to support the priority setting of research topics for the next 10 to 15 years. Taking the position that a research topic corresponding to a driving force holds a more future perspective, as it is expected that driving forces do not have an immediate effect, but act on the longer term.

Although much can be said about improvement of the process to identify drivers and threats, coherence can be recognised between the outcome of the drivers and threats discussion and the list of future research topics to be addressed. For instance drivers/threats such as lack of preparedness and response, lack of control instruments, lack of consistent control of epidemic diseases, lack of surveillance harmonisation and different national capabilities to diagnose and control disease are reflected in research topics as improvement of surveillance, improvement of preparedness for emerging and exotic diseases by improvement of diagnostic tools, development of vaccines and development of diagnostic tools and control methods for diseases of neglected species (see Tables 1, 2 and 3).

The lists of research topics on pan-European level and biogeographical level are quite similar according the Atlantic, Nordic/Baltic and Continental groups, although there are some differences in priorities. However the list of the Mediterranean group contains some specific topics that were not identified as relevant by the other groups and also the highest priorities identified by the Mediterranean group differ. Especially, the top ranked vectorborne diseases research by the Mediterranean group is much lower on the priority list of the other groups.

CONCLUSION

The organising committee and the EMIDA consortium can be satisfied with the results of the workshop, because the applied methodology provided output which is easy to compare and process.

The lists of research topics on pan-European level and biogeographical level are quite similar except for the Mediterranean region, that contains some specific topics that were not identified as relevant by the other groups. This will require specific attention while developing the Strategic Research Agenda, because the overall consensus on prioritised research topics is not supported by the Mediterranean region. As could be expected, because the Mediterranean, bordering on Africa and Asia, is very different in relation to disease challenge and farming systems.

The research topics on pan-European level that were identified by two or more regional groups are:

- Improvement of surveillance
- (risk analysis of) Biosecurity measures on all levels, including border crossing of wildlife
- Better understanding of host-pathogen interaction

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- Development/improvement of vaccines and vaccine strategies

The topic with the highest priority in the Mediterranean region was:

- Better understanding of vectorborne diseases and health effects of ecosystem change

The future research topics which were identified are still on a generic level without the details needed to start research procurement. Which is not surprising of course, because when one is looking 10-15 years ahead then it is more about what research areas require more capacity or need to be maintained, rather than detailed research topics. But we can conclude that there was good agreement on the research topics, although the lack of detail is a challenge for the EMIDA consortium.

CONSIDERATIONS

As several problems were recognised while using the drivers and threats approach, it could be worthwhile to consider if there are alternative approaches to support the identification of future research topics. Taking into account the remarks made during the discussion group sessions and the plenary sessions, an approach that focuses on the pathways of introduction and spread of a threat (disease) could improve the process. This probably could also help to overcome the drawback of compiling lists of threats that are not mutual exclusive.

The challenge for the EMIDA consortium while developing a SRA which will be supported throughout Europe will be to answer the following questions:

- What level of detail is needed to create the Strategic Research Agenda?
- What level of guidance should the SRA provide to the EU Member States?
- Should it be only guidance or should it consist of a shortlist of the research required to achieve the necessary level of preparedness in the EU for major and emerging infectious diseases of livestock in the next 10 to 15 years?
- What level of cooperation with industry should be pursued considering the different research topics; for instance governmental funding of fundamental research for new vaccine technologies and industrial funding for development of the vaccine products.

ACKNOWLEDGEMENTS

The organising committee thanks all the workshop participants, moderators, rapporteurs, speakers and all others involved, for their contribution and effort to make the STRAW a success.

Logistics and planning nowadays, due to the number of physical meetings, in spite of the availability of improved information technology, requires a preparation well in advance of the event to be organised, as the competition for expert attendance is fierce. Apart from an interesting programme and an easy to reach venue, assessing the competition is important. As a matter of fact it was inevitable that the STRAW more or less coincided with a few other meetings which competed for attendance of people with similar expertise. Therefore the organising committee was pleased to recognise that most of the experts invited thought the STRAW interesting enough to travel to Prague, and that several participants even made the STRAW part of their 'meetings-tour'.

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ANNEX

1. Workshop Programme
2. Discussion paper
3. Delphi study results presentation
4. Delphi study result, list of research topics
5. Discussion groups composition
6. Biogeographical regions, 2005 (EEA)
7. Report discussion sessions I, including list of threats and drivers
8. Report discussion sessions II, including research topics priorities
9. List of participants

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1. Report of the EFSA Service Contract EFSA/SC/Tender/01/2004 "Forming a Global System for Identifying Food-Related Emerging Risks - EMRISK", coordinated by the Dutch Food and Consumer Product Safety Authority (VWA), 2006; http://www.efsa.europa.eu/en/scdocs/scdoc/224r.htm
2. Overview of foresight studies evaluated in Work Package 4, EMIDA ERA-NET; http://www.emida-era.net/upload/pdf/Report_FPU%20Foresight_reviews_final_v11%2005082009.pdf
3. EMIDA Delphi report, Expert views on European research needs regarding emerging infectious animal diseases: results of a Delphi study; *to be finalised, available on EMIDA website end of October 2010*;

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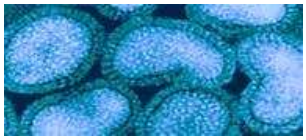
Strategic Research Agenda Workshop (STRAW)

10 June 2010, Thursday

11.00 – …….	Registration (at Jurys Inn hotel)
12.00 – 13.00	Lunch (at Jurys Inn hotel)
13.00	**Introductions**
13.00 13.05 13.15 13.25	• **Welcome**; *Wim Ooms, Workpackage leader* • **Welcome**; Offical welcome by *Jiri Urban, Ministry of Agriculture Czech Republic, deputy Minister for Environment, Research and Education* • **EMIDA**; a brief overview: *Alex Morrow, Coordinator EMIDA* • **Workpackage 4**; a brief overview: *Wim Ooms*
13.30	**Basic material**
13.30 13.45 14.30	*10.* **Review of existing foresights**; *Scott Sellers* *11.* **Results Delphi study**; *Lynn Frewer* *12.* **Introduction to break-out sessions**; *Wim Ooms*
14.45 – 15.00	coffee / tea break
15.30 – 17.00	**Break-out session 1 (identification and prioritisation of driving forces and future threats)** 4 groups; 2 groups addressing **driving forces**; 2 groups addressing **future threats**
18.00 - ……	Reception (at Jurys Inn hotel, lobby/bar), followed by dinner

11 June 2010, Friday

8.30 – 9.00	**Results break-out session 1** (plenary)
9.00 – 11.00	**Break-out session 2 (identification and prioritisation of research topics on regional level)** 4 groups (biogeographical distribution); each group addressing same topic
11.00 – 11.30	coffee / tea break
11.30 – 12.30	**Plenary session** with • summary of break-out sessions 2 • plenary discussion
12.30 – 12.40	Next steps
12.40	**Closure**, followed by lunch



ANNEX 2. STRAW REPORT

discussion paper

Aim: To gather existing knowledge and opinion on anticipated infectious diseases (threats) to animal health in the Europe. The results will contribute to the development of a Strategic Research Agenda (SRA) to guide the development and implementation of co-operative research to help mitigate against such threats.
It is recognised that much research and analysis has been undertaken by way of 'futures activity' in the field of animal health and related topics (e.g. medical). To address the needs of EMIDA, a two part approach was applied to review this subject area. The first, reviewed existing studies and publications with different (global) perspectives on infectious animal diseases to attempt to summarise the outputs relevant to animal health in Europe. The second, gathered current expert opinion on drivers, threats and research priorities through application of a Delphi study. This paper summarises the output of these activities in preparation for the STRAW, where the issue will be discussed in more detail. The output of the STRAW will be to provide evidence based opinion (and where there is expert agreement or disagreement) regarding the development of a strategic research agenda.
The primary output of the literature review was organised as drivers and threats to animal health and research priorities identified as a consequence of the individual studies and analysis. Details of the technique in undertaking the review are provided in the output paper, although for clarity drivers and threats are defined in table 1.
Given the wide source material used for the literature review it, was evident that the scope of subjects collated as drivers, threats and research priorities was broad. Categorised lists of each are provided as an annex to this document. Further discussion and review are necessary to help disentangle this output toward a structured frame-work in support of the SRA. In particular questions arise as to

Table 1
Driver: A general political, social, demographic, economic (including agriculture) or environmental condition acting on such a scale that it may directly or indirectly influence the (re-)emergence of animal and human infectious diseases
Threat: A consequence of political, social, demographic, economic (incl. agriculture) or environmental decisions or actions, but with possible adverse effects on animal and human infectious diseases. In addition, pathogens are included as threats.

- **which threats and research priorities need to be addressed in both the short and long term?**

Other questions that lend themselves to further analysis / discussion include:

- **consideration of current research both in the EU and globally that may highlight the need to focus resources (i.e. to overlay with some form of gap analysis)?**

- **what perceived threats and drivers may be more likely to transpire, in what timeframe?**

- **is the research or disease control infrastructure already sufficient or lacking in key areas, if so which?**

It should be noted that the futures studies reviewed can only be considered as scenario setting exercises, and will provide a range of views of many possible problems. The literature review was undertaken during 2008/09 to represent an ever changing situation. It is important to consider whether the themes are a reflection of the political/animal health situation at the time the analyses were made, or are they still as relevant as future priorities today. For example are vector borne diseases considered a priority area, or given recent activity to place research and control outbreaks of disease is there sufficient capability within the EU?

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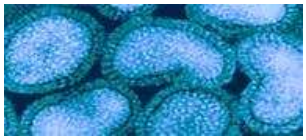

Table 2

Research topics from Delphi study, listed by agreement on their importance, although all identified as priorities:

Vaccine development

Emerging diseases

Virology

Epidemiology

Early warning systems

Vector related research

Risk assessment

Surveillance (diagnostics)

Pathogen/host interaction

Resistance of pathogens

Zoonoses (in general)

Immunology

Pathogens related to zoonoses

Emergency preparedness

Risk management

Emergency response

Risk communication

Ecology

Entomology

Studies at a molecular level

Economics

Climatology

Biology

Following on from this, questions included in the Delphi study were scripted to provide a temporal analysis of the results (*short and long term*) as well as to focus on *how the drivers and threats related to each other* and could be used *to prioritise research needs within the EU*. Expert opinion was gathered from across Europe which allowed for some geographical comparison of results.

Drivers which may influence future threats to animal health

There was broad agreement on those that were viewed to promote a risk and those which would help reduce disease. A third category was also identified where opinion was split, it is not clear whether this is a reflection of a difference in opinion or whether these drivers may be risky for some diseases whilst beneficial in helping to mitigate against others. These latter drivers dealt with intensification of agricultural production systems and international animal health regulations, but were not linked to the top threats identified.

Analysis of the identified threats

Groups of agents (e.g. viruses, zoonoses), **complex infections** (e.g. production diseases) and a changing **epidemiological situation** (introduction of exotic disease, antibiotic resistance) were viewed as those we should be most concerned about. There was little temporal difference observed in the results. When linking the threats to drivers, the more prominent drivers where most frequently connected to changes in epidemiology. It was interesting to note that assessment of EU capability to identify, control and prevent infectious animal diseases indicated that identification of emerging infectious animal diseases was strongest and prevention weakest. Given technological advances in the field of diagnostics and the inherent variability in what the next disease will be or where it will come from, this may not be a surprising result. **However, given the view that prevention is better than cure, does this indicate a steer for future research toward improving disease prevention?**

The Delphi output on research priorities provided a wide subject base for further consideration (Table 2). Given the scope of the subjects and that all were identified as priorities (to a greater or lesser extent) there is a clear need to focus and prioritise this list further.

Taking a step back and considering the use of this information as part of activities geared towards defining an SRA, it is important to establish what further refinement and discussion is necessary to provide a useful base of material. Questions that arise may include:

1. Are the threats (and drivers) still an appropriate reflection of current perception? Can these be defined or prioritised further?
2. Given current EU capability/capacity and expertise what are our greatest vulnerabilities (gaps in ability)?
3. Current research priorities are too broad in their scope, taking into account questions 1 and 2 can we focus these? Also what research can we use from outside the EU in order to improve European capacity and responsiveness?
4. The economic situation across the EU would suggest that resources in the future will become more limited. Are there areas where we can rationalise/co-operate better?

Funded by the European Commission's Seventh Framework Programme, Contract No. 219235

ANNEX 3. STRAW REPORT
A Delphi study: European research needs regarding emerging infectious diseases of animals

Professor Lynn J Frewer

Meike Wentholt MSc.

Marketing and Consumer Behaviour Group
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EMIDA - STRAW, Prague
10-11 June 2010

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The problem of gaining expert opinion

ANNEX 3. STRAW REPORT

- Group meeting
  - practical constraints: highly expensive, gathering experts in one place at one time
  - social pressure, unequal contribution
  - unstructured data collection
- Stakeholder survey
  - no debate or interaction: reveal disparate opinions
  - cannot offer the prospect of resolutions

Delphi methodology

ANNEX 3. STRAW REPORT

A procedure to:

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

Dalkey & Helmer, 1963, p458

Delphi methodology

- Internet-based survey, with several ‘rounds’
  - includes feedback of participants’ views
  - anonymous responses
- Allows inclusion of many geographically dispersed experts
- Pre-empts difficulties with group meetings
  - unequal contributions of members
  - unstructured data collection
  - linguistic inequalities (if relevant)

Rowe & Wright, 1999

A typical “Delphi” approach

- First round
  - “Flag up” important issues for follow up
- Second round
  - focus on specific and highly relevant issues
  - quantify differences in opinion
  - provide feedback on the views of other participants, particularly for issues where consensus has not occurred
  - identify directions for the future

EMIDA Delphi Study: objective

ANNEX 3. STRAW REPORT

To conduct a ***foresight exercise*** regarding

- research needs
- capacity building

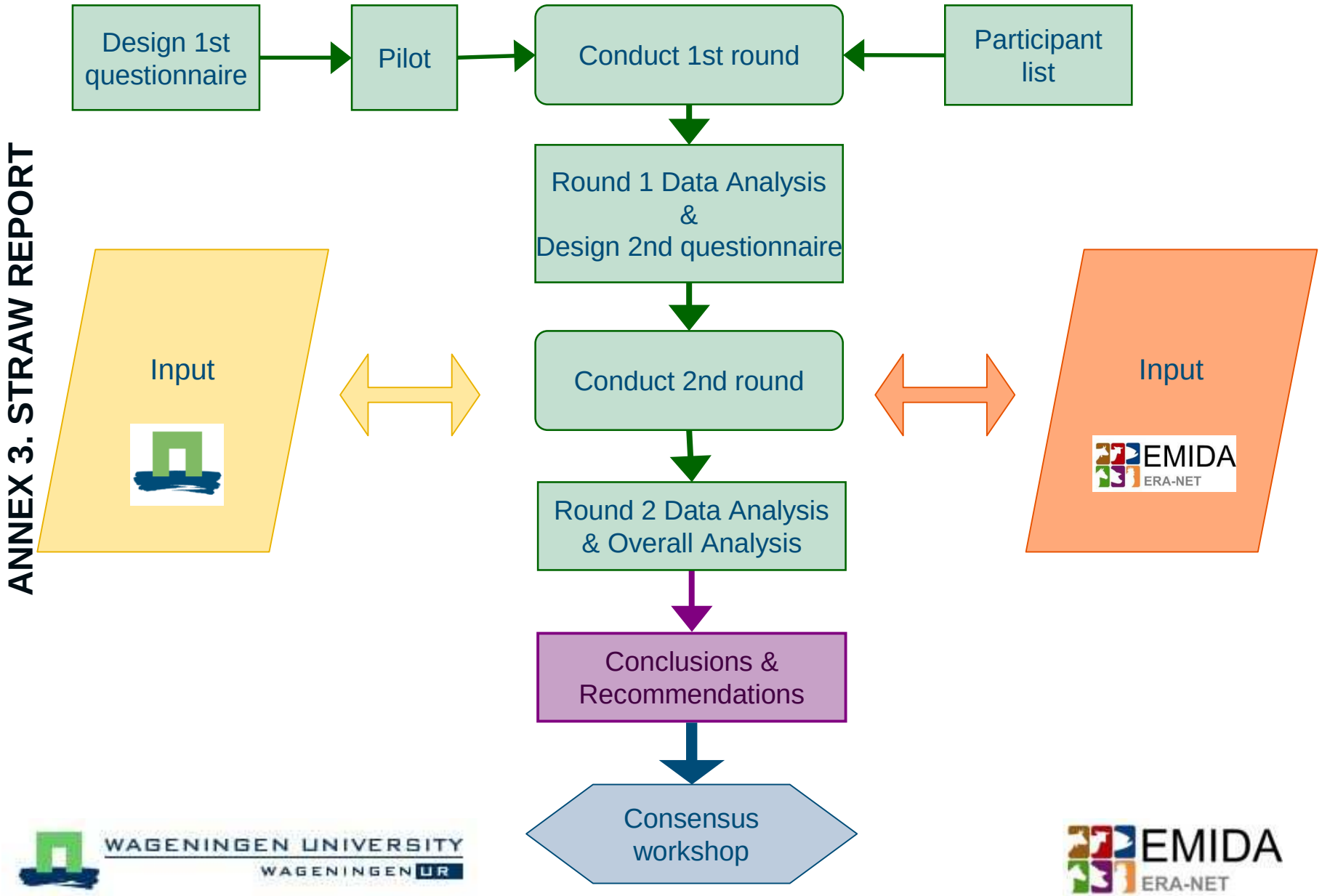
regarding emerging and infectious diseases of production animals

EMIDA Delphi study: in short

ANNEX 3. STRAW REPORT

- Round 1
  - Identification of ***driving forces*** for future threats to animal health
  - Identification of ***future threats*** to animal health
  - Identification of topics related to ***prediction and preparedness*** for emerging infectious animal diseases
  - Identification of ***future research topics*** relating to emerging infectious animal diseases
- Round 2
  - ***Quantify*** round 1 outcomes, through classifying and prioritisation
  - Time scale
    - short term: next **5** years
    - medium term: **10-15** years

EMIDA Delphi study design



ANNEX 3. STRAW REPORT

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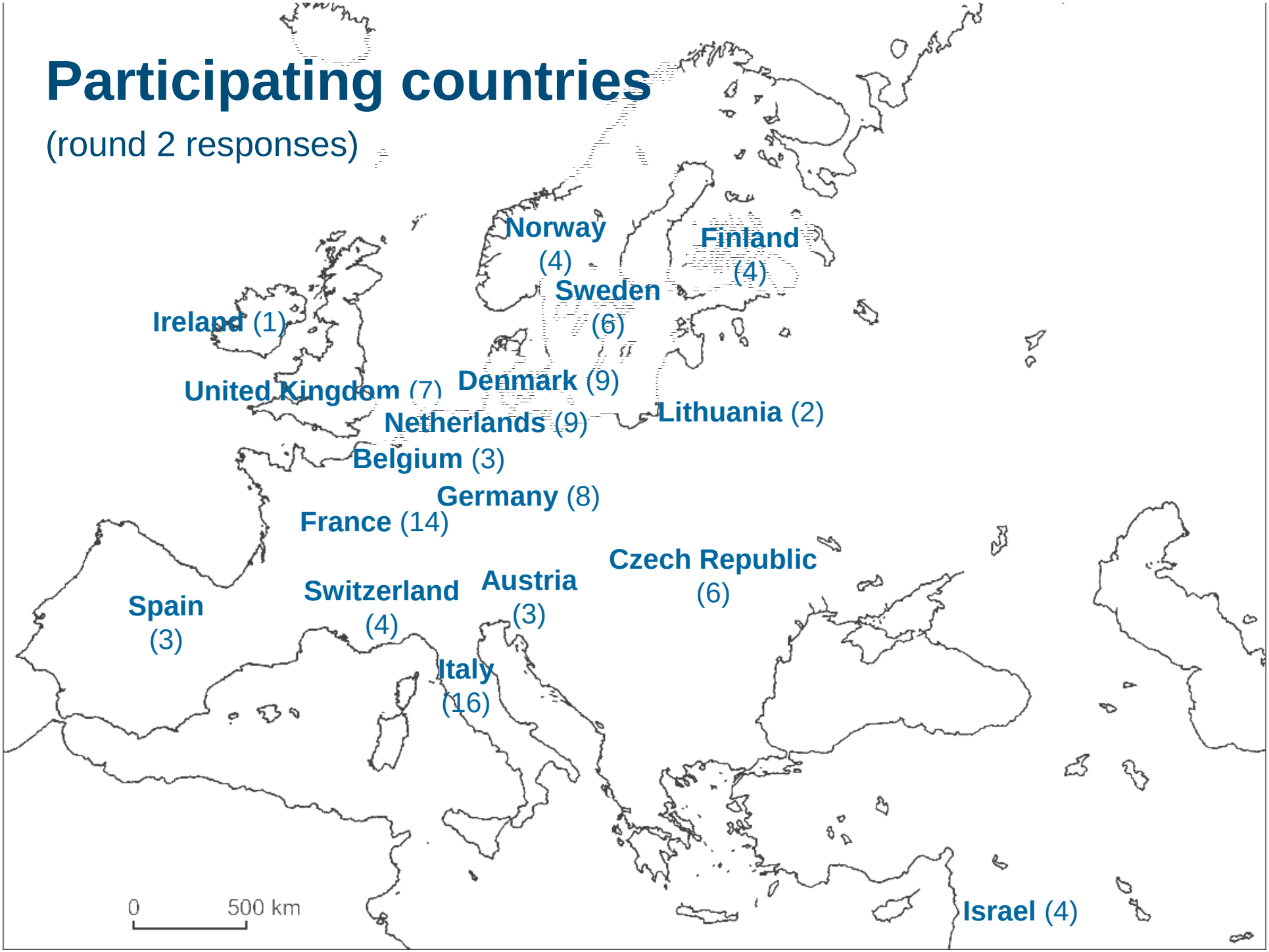
Background information participants*

ANNEX 3. STRAW REPORT

		Round 1	Round 2
Invited		216	142
Gender	**Female**	**30**	**22**
	Male	**98**	**86**
Age group	**20-35**	**7**	**7**
	36-45	**23**	**20**
	46-55	**69**	**56**
	56-65	**28**	**25**
	65+	**1**	**0**
Relevant work experience	**<5**	**14**	**10**
	6-10	**18**	**20**
	11-15	**19**	**18**
	16-20	**30**	**25**
	21+	**45**	**37**

Participating countries

(round 2 responses)



Sample characteristics

ANNEX 3. STRAW REPORT

- Round 2 invited 142 participants, 108 respondents (76%)
- Male participants over-represented
- The majority over 46 years old
- Tendency more relevant work experience

Driving forces for future threats to animal health

ANNEX 3. STRAW REPORT

- Which driving forces will have an impact on the incidence of infectious animal diseases
  - Increase
  - Decrease
  - No effect
- Two time scales
  - Short term (next 5 years)
  - Medium term (10-15 years)

- Driving forces which ***increase*** the incidence of infectious animal diseases

ANNEX 3. STRAW REPORT

Data represent percentages	**Increase** incidence of infectious animal diseases		**Decrease** incidence of infectious animal diseases		**No effect** on incidence of infectious animal diseases	
Driving forces	**5 year**	**10-15 year**	**5 year**	**10-15 year**	**5 year**	**10-15 year**
Increased movement of animals	**94**	**93**	1	0	2	4
Increased globalisation of trade	**92**	**83**	1	2	5	11
Increased trade in animal products	**86**	79	0	2	13	16
Increased emergence of novel infectious animal diseases	**80**	**80**	4	9	7	4
Climate change	68	**81**	0	1	21	9
EU Expansion	78	68	3	9	17	18
Increased interaction between wildlife and production animals	77	77	1	1	12	12
Increased movement of humans	68	67	0	3	23	22
Increased trade in food	60	59	0	2	34	30

- Driving forces which ***decrease*** the incidence of infectious animal diseases

ANNEX 3. STRAW REPORT

Data represent percentages	**Increase** incidence of infectious animal diseases		**Decrease** incidence of infectious animal diseases		**No effect** on incidence of infectious animal diseases	
Driving forces	**5 year**	**10-15 year**	**5 year**	**10-15 year**	**5 year**	**10-15 year**
Novel vaccine development	4	5	73	**86**	20	5
Increased control measures, outside of the EU	4	5	77	**84**	14	6
Increased control measures, in the EU	9	8	77	**81**	12	9
Increased surveillance and monitoring	17	9	69	**81**	13	8
International regulatory harmonisation in the area of animal health	8	4	65	78	19	13
European (EU) regulatory harmonisation in the area of animal health	9	4	61	71	25	19

- ***No consensus*** regarding the direction of impact of driving forces on incidence of infectious animal diseases

ANNEX 3. STRAW REPORT

Data represent percentages	**Increase** incidence of infectious animal diseases		**Decrease** incidence of infectious animal diseases		**No effect** on incidence of infectious animal diseases	
Driving forces	**5 year**	**10-15 year**	**5 year**	**10-15 year**	**5 year**	**10-15 year**
Intensification of agricultural production systems	**49**	**48**	12	12	**34**	**32**
Increased food production	**38**	**46**	3	2	**46**	**43**
Increased European (EU) differentiation in animal health regulation	**31**	**30**	16	**25**	**22**	17
Increased international differentiation in animal health regulation	**30**	**43**	11	18	**29**	**17**

Driving forces for future threats to animal health

Few differences observed in the short term and medium term

- Increase in incidence
  - movement (animal, human, food products)
  - globalisation and increased international trade
  - increased contact between animals (and animals and humans)
  - climate change
- Decrease in incidence
  - improved risk management
  - improved regulation and regulatory harmonisation
  - novel prevention strategies
- Lack of consensus
  - intensification of production systems
  - localisation of regulation (i.e. differentiation of national regulatory frameworks)

Future threats to animal health

ANNEX 3. STRAW REPORT

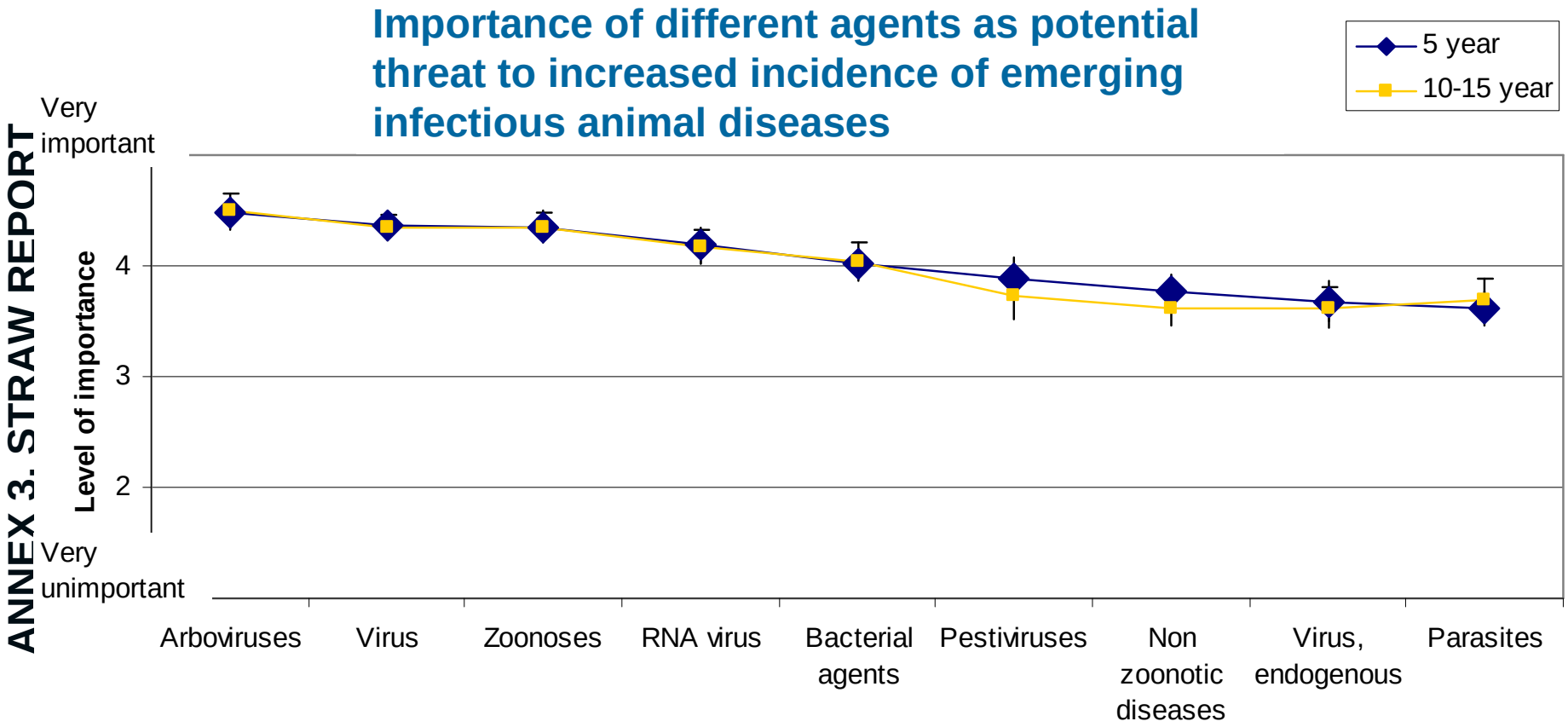
- Identification of specific types of animal diseases which *will* become problematic
- From round 1
  - future threats to animal health identified
- How important is each threat in terms of…?
  - Short term (next 5 years)
  - Medium term (10-15 years)

Future threats to animal health

ANNEX 3. STRAW REPORT

- ***Disease agents***
  - Arboviruses
  - Bacterial agents
  - Non-zoonotic diseases
  - ParasitesPestiviruses
  - RNA virus
  - VirusV
  - Virus, endogenous
  - Zoonoses
- ***Complex infections***
  - Complex / multifactorial disorders
  - Digestive system disorders
  - Infectious abortigenic agents
  - Locomotory system diseases
  - Mastitis
  - Production diseases
  - Reproductive disorders
  - Respiratory disease complexes
- ***Specific animal diseases***
  - Aquaculture diseases, (fish, molluscs)
  - Bee diseases
  - Other animal diseases
- ***Route of transmission***
  - Airborne infections
  - Direct contact zoonoses
  - Food borne agents
  - Rodent borne diseases
  - Vector borne diseases
  - Water borne agents
- ***Epidemiological situation***
  - Antibiotic resistance
  - Bioterrorism
  - Emerging & re-emerging agents
  - Emerging unknown / novel pathogens
  - Endemic diseases in Europe (threat of dissemination in Europe)
  - Increase in virulence Opportunistic diseases
  - Threat of introduction exotic diseases in Europe

Future threats: Disease agents

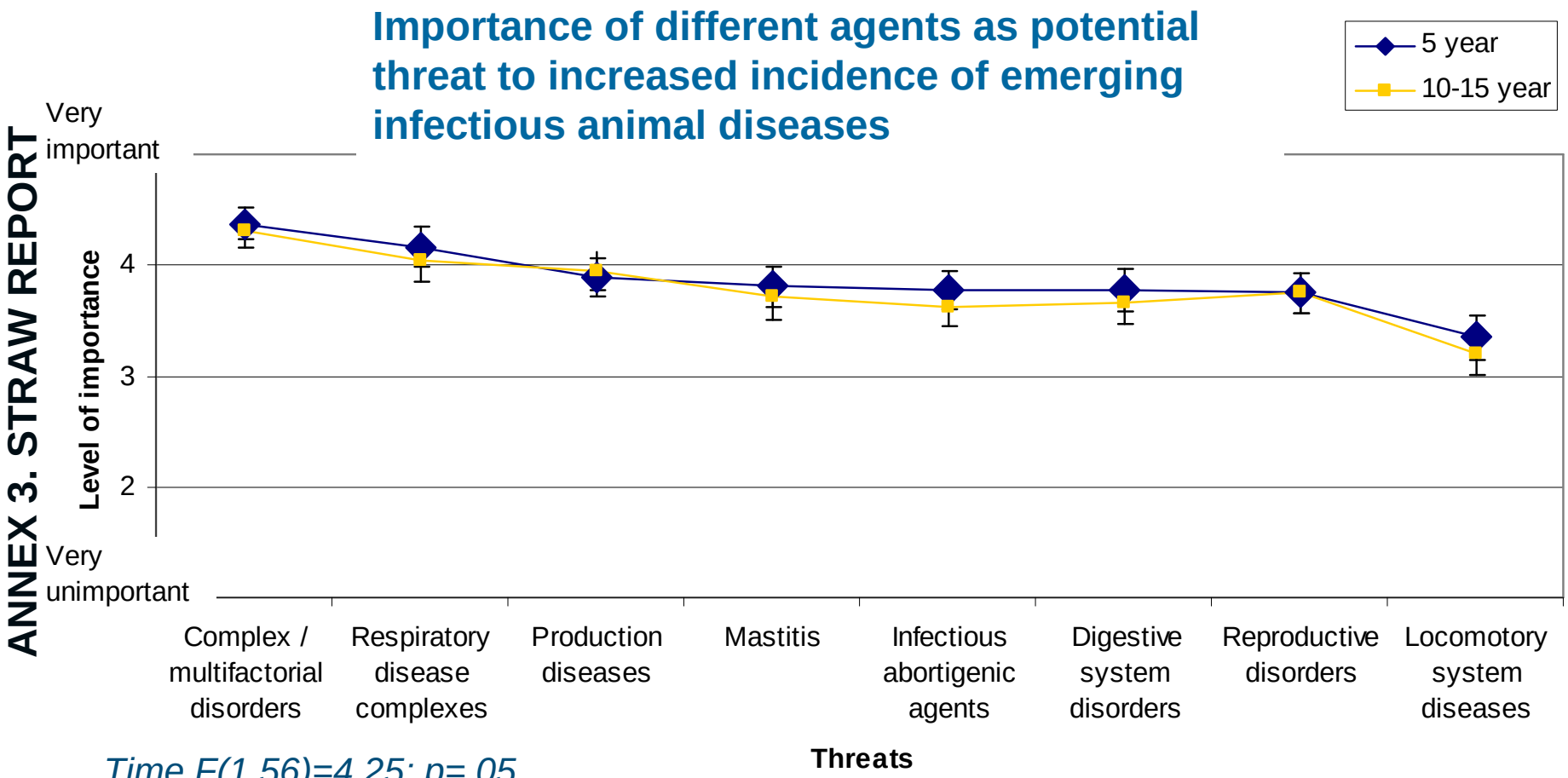


Time F(1,41)=4.51; p=.05

Threat F(8,34)=10.16; p≤.001

Interaction NS

Future threats: Complex infections

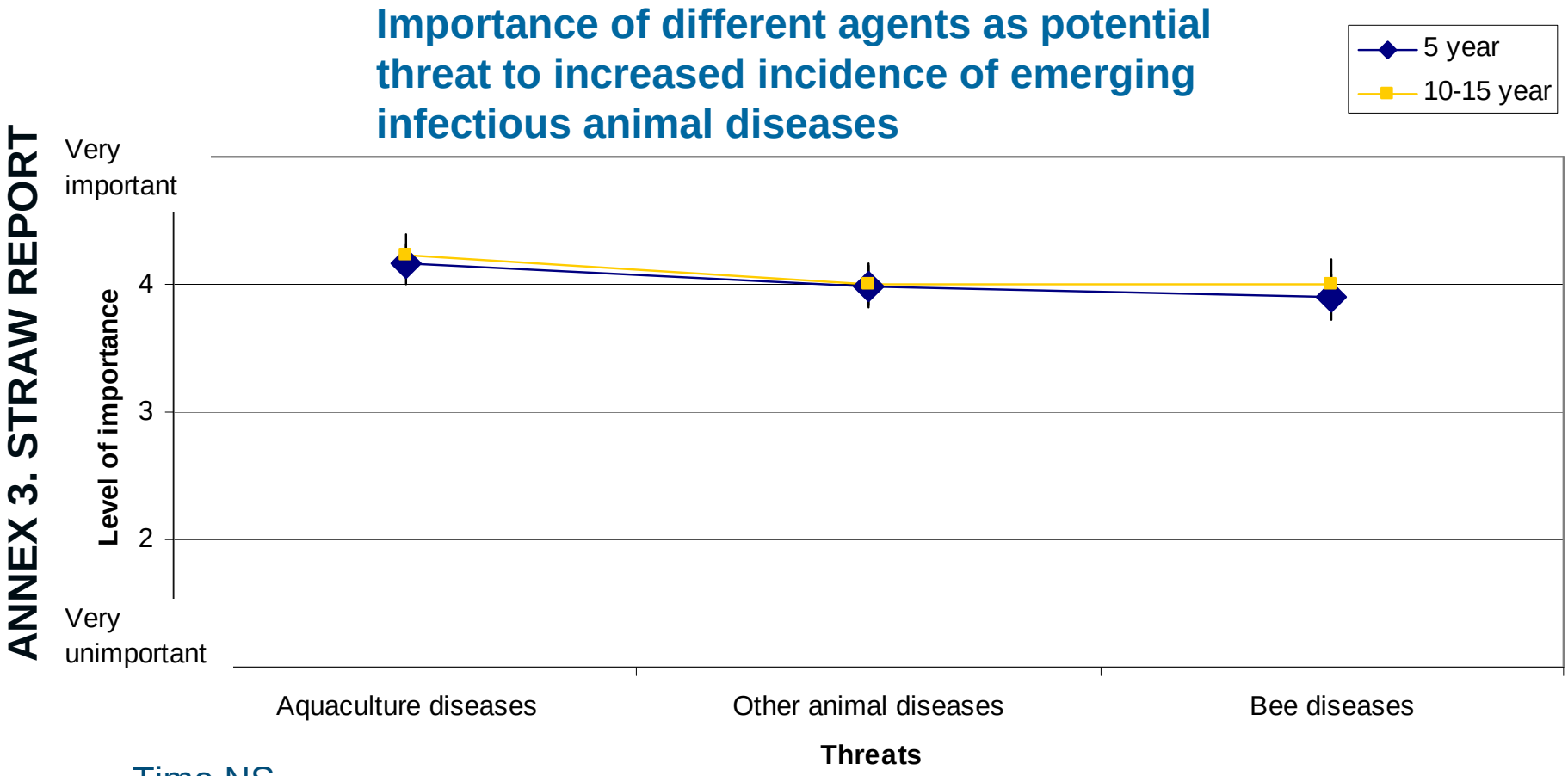


Time F(1,56)=4.25; p=.05

Threat F(7,50)=16.70; p≤.001

Interaction NS

Future threats: Specific animal diseases

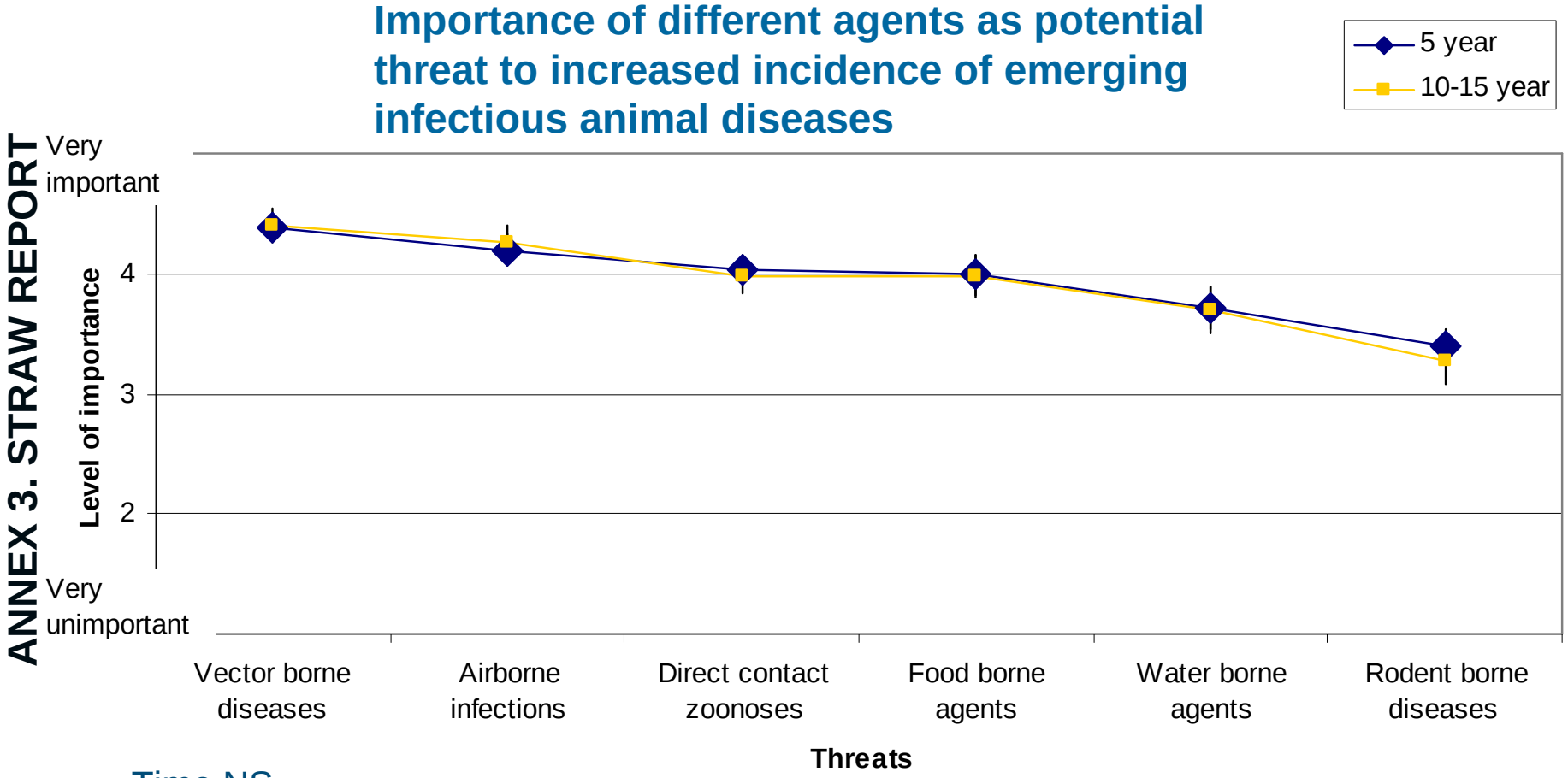


Time NS

Threat F(2,49)=3.90; p=.05

Interaction NS

Future threats: Route of transmission



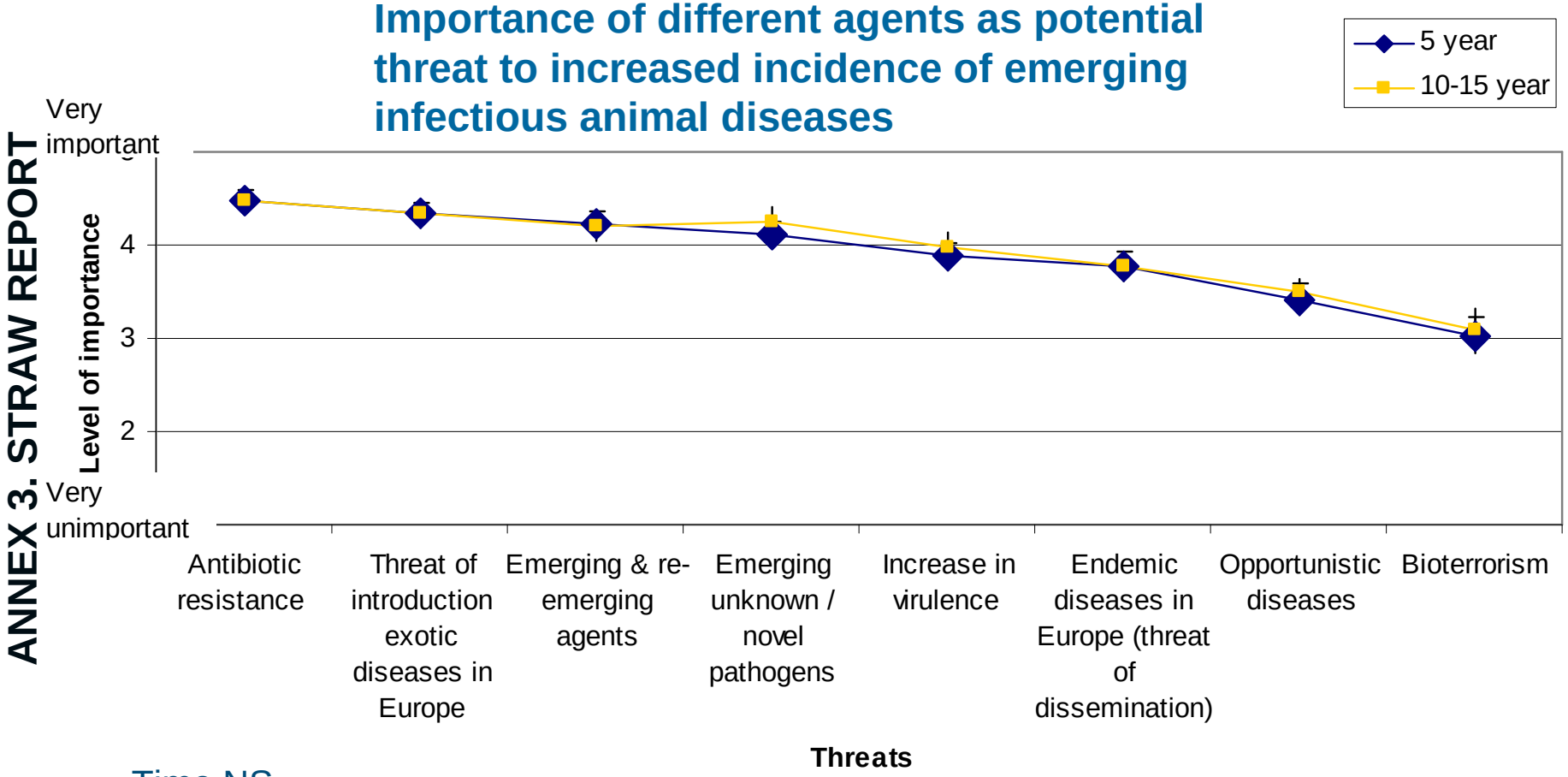
Time NS

Threat F(5,64)=25.61; p≤.001

Interaction NS

Future threats: Epidemiological situation

Importance of different agents as potential threat to increased incidence of emerging infectious animal diseases



Time NS

Threat F(7,56)=23.02; p≤.001

Interaction NS

Future threats to animal health

ANNEX 3. STRAW REPORT

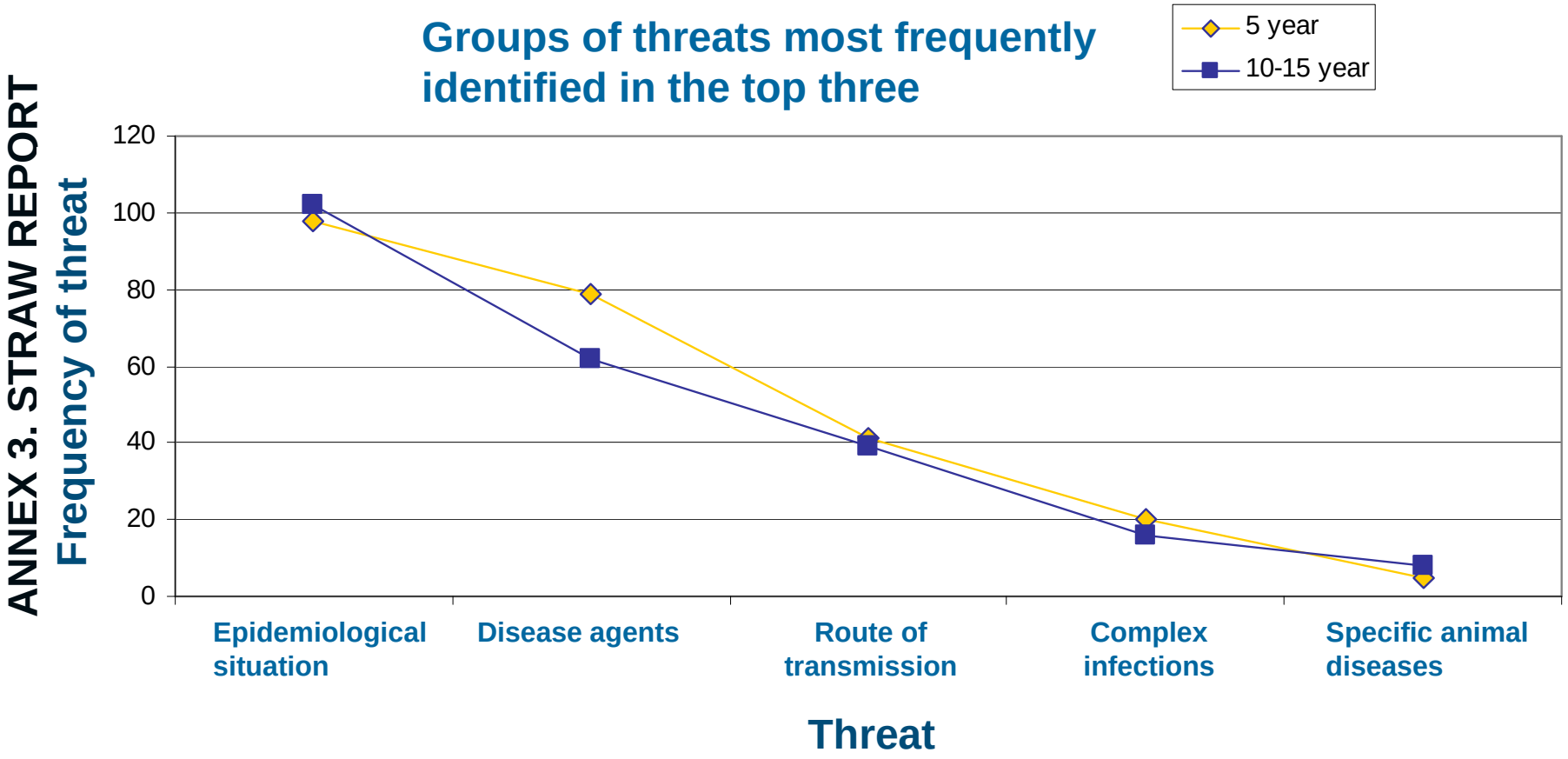
- Greater importance in the *short term*
  - disease agents
  - complex infections
- Differences in the importance of the threat
  - disease agents
  - complex infections
  - specific animal diseases
  - route of transmission
  - epidemiological situation

Future threats to animal health

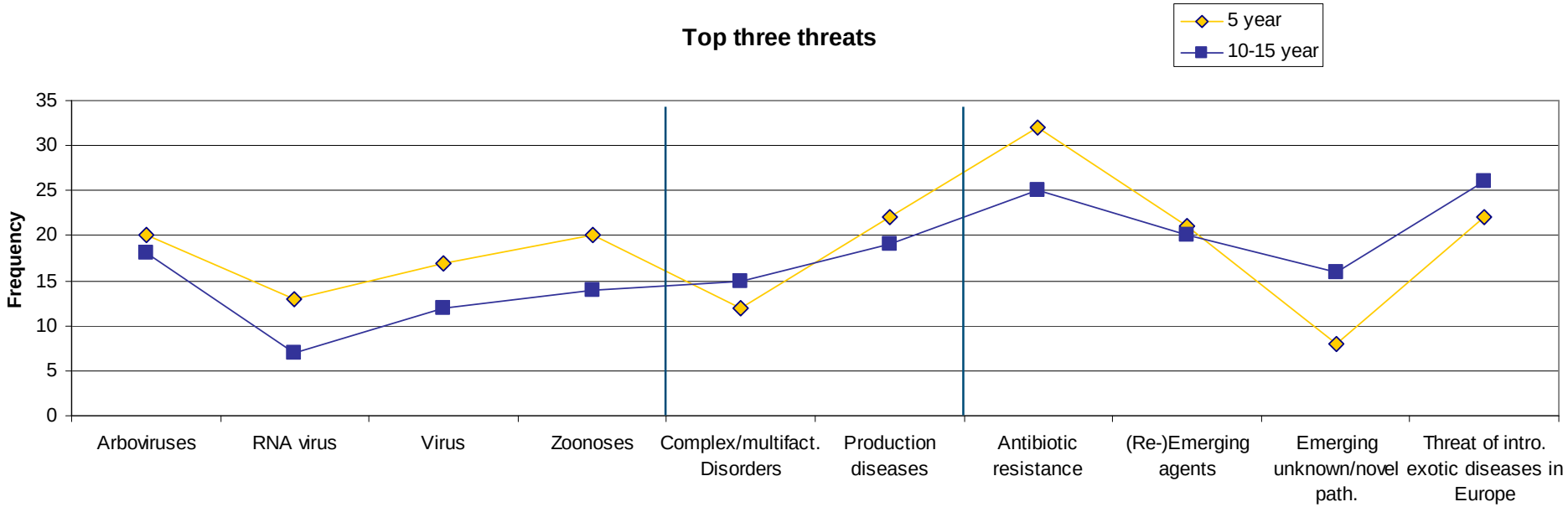
ANNEX 3. STRAW REPORT

- Of the threats included in the study, which are the ***three most important***?

Future threats: most important categories of threats



The 10 most frequently chosen threats



Disease agents | **Complex infections** | **Epidemiological situation**

Most frequently chosen threats: *connected to drivers*

ANNEX 3. STRAW REPORT

- Arboviruses
- Virus
- Zoonoses
- Production diseases
- Antibiotic resistance
- Emerging & re-emerging agents
- Threat of introduction exotic diseases in Europe

- The following were infrequently connected to drivers
  - RNA virus
  - Complex / multifactorial disorders
  - Emerging unknown / novel pathogens

ANNEX 3. STRAW REPORT

↓ Drivers / Threats →	Arboviruses	Viurs	Zoonoses	Production diseases	Antibiotic resistance	(Re-)Emerging agents	Threat of intro. Europe
Increased movement of animals	14	14	11	18	14	18	18
European (EU) regulatory harmonisation in the area of animal health	16	14	10	8	22	13	22
Increased surveillance and monitoring	14	12	11	12	17	17	20
Increased globalisation of trade	12	9	15	12	15	15	19
Increased control measures, in the EU	9	7	13	10	18	17	15
Increased trade in animal products	6	7	15	7	17	15	18
Climate change	19	7	9	18	3	12	15
EU Expansion	9	8	14	4	8	18	17
Novel vaccine development	10	12	8	13	5	15	15
Increased interaction between wildlife and production animals	12	10	13	10	5	14	11
Increased movement of humans	6	8	14	5	14	12	15
Increased control measures, outside of the EU	6	7	11	7	10	14	19
Increased emergence of novel infectious animal diseases	14	10	9	8	6	11	13
International regulatory harmonisation in the area of animal health	7	7	7	7	19	10	14
Increased trade in food	4	3	12	3	15	8	14
Intensification of agricultural production systems	*2*	*7*	*8*	*7*	*14*	*12*	*6*
Increased European (EU) differentiation in animal health regulation	*3*	*9*	*6*	*6*	*17*	*7*	*8*
Increased food production	*2*	*3*	*10*	*4*	*20*	*7*	*6*
Increased international differentiation in animal health regulation	*2*	*5*	*5*	*6*	*15*	*5*	*11*

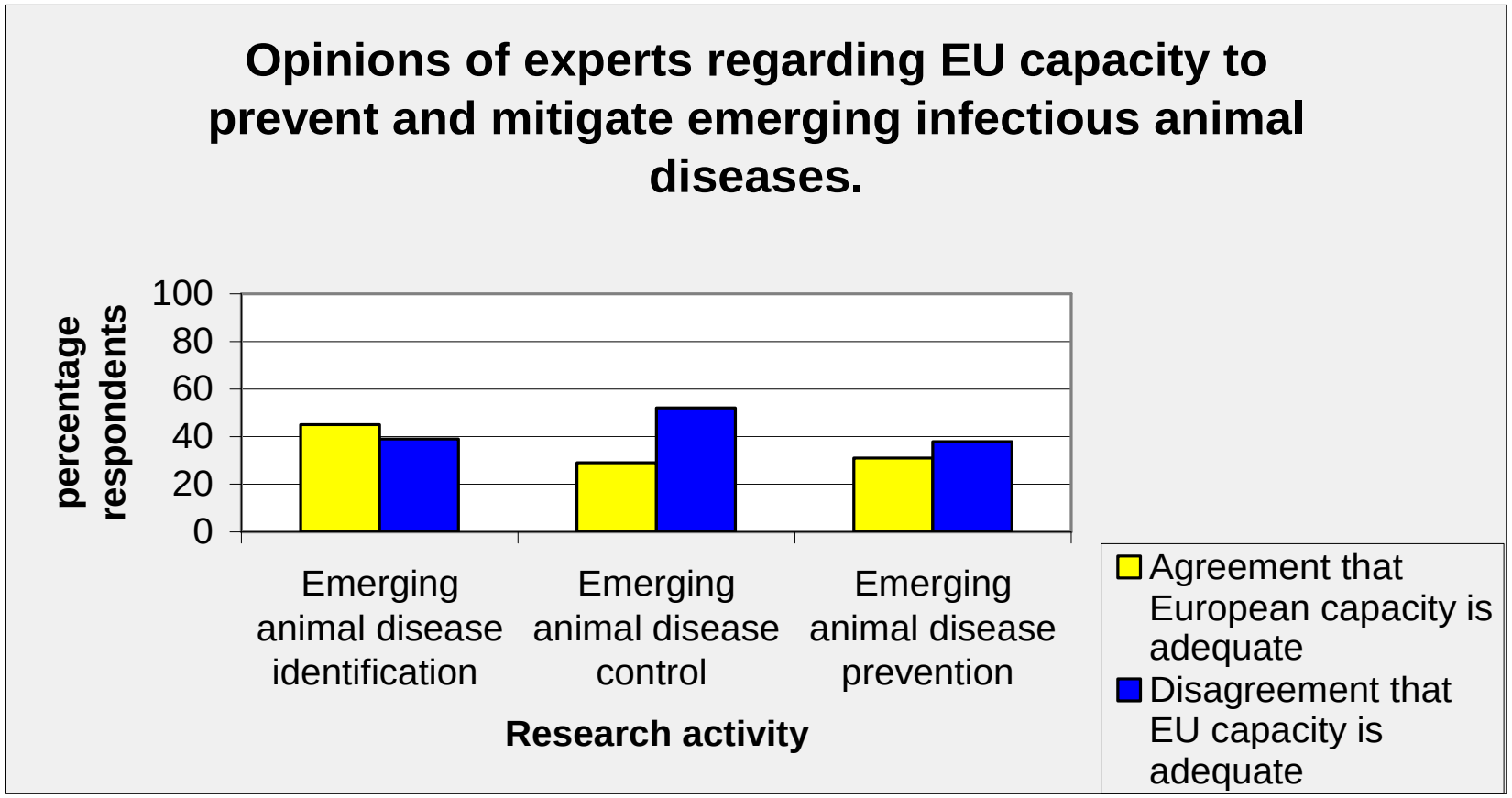
Future threats: most important threats

ANNEX 3. STRAW REPORT

- Threats related to the ***epidemiological situation*** most frequently connected to the drivers
- Disease agents were least connected to the drivers
- The drivers associated with lack of consensus were not linked to threats

Prediction and preparedness for emerging infectious animal diseases *(round one)*

ANNEX 3. STRAW REPORT



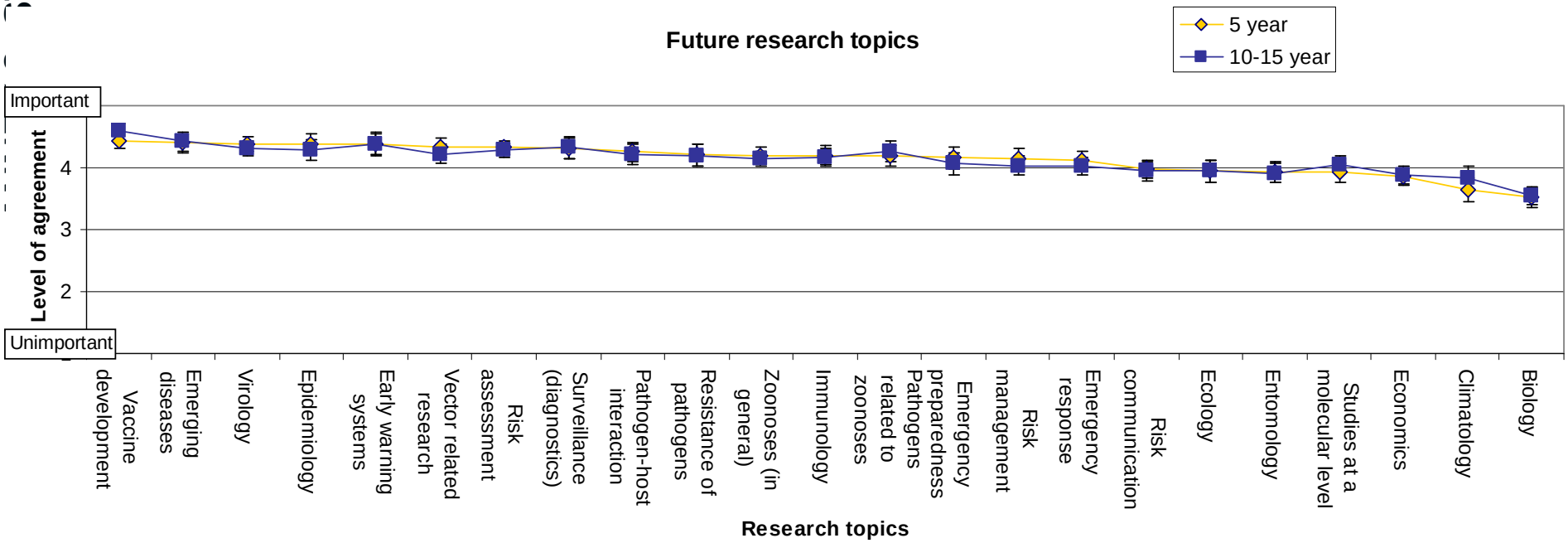
Prediction and preparedness for emerging infectious animal diseases

ANNEX 3. STRAW REPORT

- 83% agreed that European capacity to ***identify*** emerging infectious animal diseases is greater than the European capacity to ***control*** them
- Around half of the second round participants believed that the capacity to ***control*** is greater than the European capacity to ***prevent*** emerging infectious animal diseases
- About one third assumed the other way around: the capacity to ***prevent*** is greater than the *capacity* to ***control***

Future research topics relating to emerging infectious animal diseases

- All research topics regarded as priorities (all above midpoint of scale)
- No differences between research areas
- Short term regarded slightly more important than medium term (F(1,59)=0.85; p=.01)



Regional differences

ANNEX 3. STRAW REPORT

- Geographical regions
  - Different climate related and epidemiological factors such as:
    - proximity to other areas where animals diseases are emerging
    - traditional socio-political background
  - Northern Europe, Western Europe, Southern Europe, and Central Europe
- However, few significant differences were observed
- Exceptionally:
  Western Europe participants regarded research into *improving/developing early warning systems* as significantly ***more important*** research priority than Southern Europe participants (both short and medium term)

Conclusions

ANNEX 3. STRAW REPORT

- Participants
  - Excellent response rate (76%) for round 2
- Driving forces
  - Increase in incidence is linked to societal drivers
  - Decrease is linked to improved risk management strategies
  - Lack of consensus on intensification of production systems and locally driven differentiation of regulation

Conclusions *continued*

ANNEX 3. STRAW REPORT

- Future threats prioritised
  - Arboviruses
  - Virus
  - Zoonoses
  - Production diseases
  - Antibiotic resistance
  - Emerging & re-emerging agents
  - Threat of introduction exotic diseases in Europe
- Prioritised threats: *connected to drivers*
  - Threats related to epidemiological situation most frequently connected to the drivers
  - The group of agents were least connected to the drivers
  - The drivers associated with lack of consensus were not linked to threats

Conclusions *continued*

- Prediction and preparedness
  - Capacity for identification is greater than control which is greater than prevention?
- Future research topics
  - All research topics identified in (open-ended questions) round 1 were regarded as equally important in round 2

Next stage in the workshop

ANNEX 3. STRAW REPORT

- Discussions in break-out sessions on
  - driving forces and future threats
  - research topics
- Delphi is only an ***additional*** data stream upon which you can base your decisions

Thank you!

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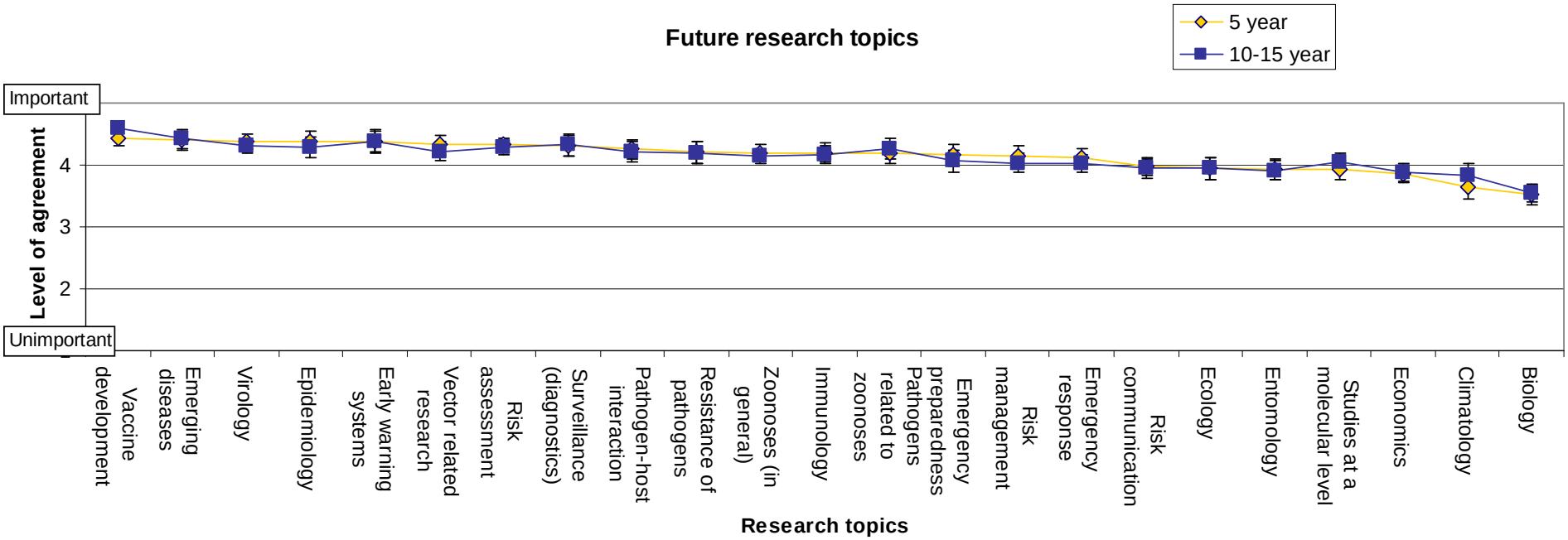
Future research topics relating to emerging infectious animal diseases

- All research topics regarded as priorities (all above midpoint of scale)
- No differences between research areas
- Short term regarded slightly more important than medium term (F(1,59)=0.85; p=.01)



Source: EMIDA-Delphi 2009/2010

Research topics - Delphi

- Biology
- Climatology
- Economics
- Studies at molecular level
- Entomology
- Ecology
- Risk communication
- Emergency response
- Risk management
- Emergency preparedness
- Zoonotic pathogens
- Immunology
- Zoonoses (in general)
- Resistance of pathogens
- Pathogen-host interaction
- Surveillance (diagnostics)
- Risk assessment
- Vector related research
- Early warning systems
- Epidemiology
- Virology
- Emerging diseases
- Vaccine development

ANNEX 5. STRAW REPORT

Group composition, Thursday 10.06.2010

GROUP A

Klemens Fuchs	AUSTRIA
Helmut Saatkamp	NETHERLANDS
Leona Nepejchalová	CZECH REPUBLIC
John Peel	SWITZERLAND
John Egan	IRELAND
Ed van Klink	NETHERLANDS
Hans Houe	DENMARK
Per Have	EFSA
Antonio Fasanella	ITALY

GROUP B

Jeremy Salt	UNITED KINGDOM
Eric Cox	BELGIUM
Matti Aho	FINLAND
Inger Dalsgaard	DENMARK
Bjørn Næss	NORWAY
Riccardo Orusa	ITALY
María José Pro González	SPAIN

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SEVENTH FRAMEWORK PROGRAMME

ANNEX 5. STRAW REPORT

Group composition, Thursday 10.06.2010

GROUP C

Hein Imberechts	BELGIUM
Andrew Cunningham	UNITED KINGDOM
Marco Terreni	ITALY
Bernard Charley	FRANCE
Elisabeth Erlacher-Vindel	OIE
Nikola Santini	ITALY
Gunn Berit Olsson	NORWAY
Modestas Ružauskas	LITHUANIA

GROUP D

Ramón Juste	SPAIN
Thomas Blaha	GERMANY
José María Nieto Martínez	SPAIN
Anette Botner	DENMARK
Aivars Berzins	LATVIA
Gerdien van Schaik	NETHERLANDS
Claudio DeLiberato	ITALY
Irene Schiller	SWITZERLAND
Olli Ruoho	FINLAND

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SEVENTH FRAMEWORK PROGRAMME

ANNEX 5. STRAW REPORT

Group composition, Friday 11.06.2010

GROUP Atlantic

Hein Imberechts	BELGIUM
Gerdien van Schaik	NETHERLANDS
Helmut Saatkamp	NETHERLANDS
Jeremy Salt	UNITED KINGDOM
Andrew Cunningham	UNITED KINGDOM
John Egan	IRELAND
Eric Cox	BELGIUM
Ed van Klink	NETHERLANDS

GROUP Continental

Klemens Fuchs	AUSTRIA
Leona Nepejchalová	CZECH REPUBLIC
John Peel	SWITZERLAND
Irene Schiller	SWITZERLAND
Thomas Blaha	GERMANY
Per Have	EFSA

EMIDA ERA-NET

SEVENTH FRAMEWORK PROGRAMME

ANNEX 5. STRAW REPORT

Group composition, Friday 11.06.2010

GROUP Nordic/Baltic

Aivars Berzins	LATVIA
Modestas Ružauskas	LITHUANIA
Anette Bøtner	DENMARK
Matti Aho	FINLAND
Gunn Berit Olsson	NORWAY
Olli Ruoho	FINLAND
Hans Houe	DENMARK
Inger Dalsgaard	DENMARK
Bjørn Næss	NORWAY

GROUP Mediterranean

Ramón Juste	SPAIN
Riccardo Orusa	ITALY
José María Nieto Martínez	SPAIN
Marco Terreni	ITALY
Antonio Fasanella	ITALY
Claudio DeLiberato	ITALY
Nikola Santini	ITALY
María José Pro González	SPAIN
Bernard Charley	FRANCE
Elisabeth Erlacher-Vindel	OIE

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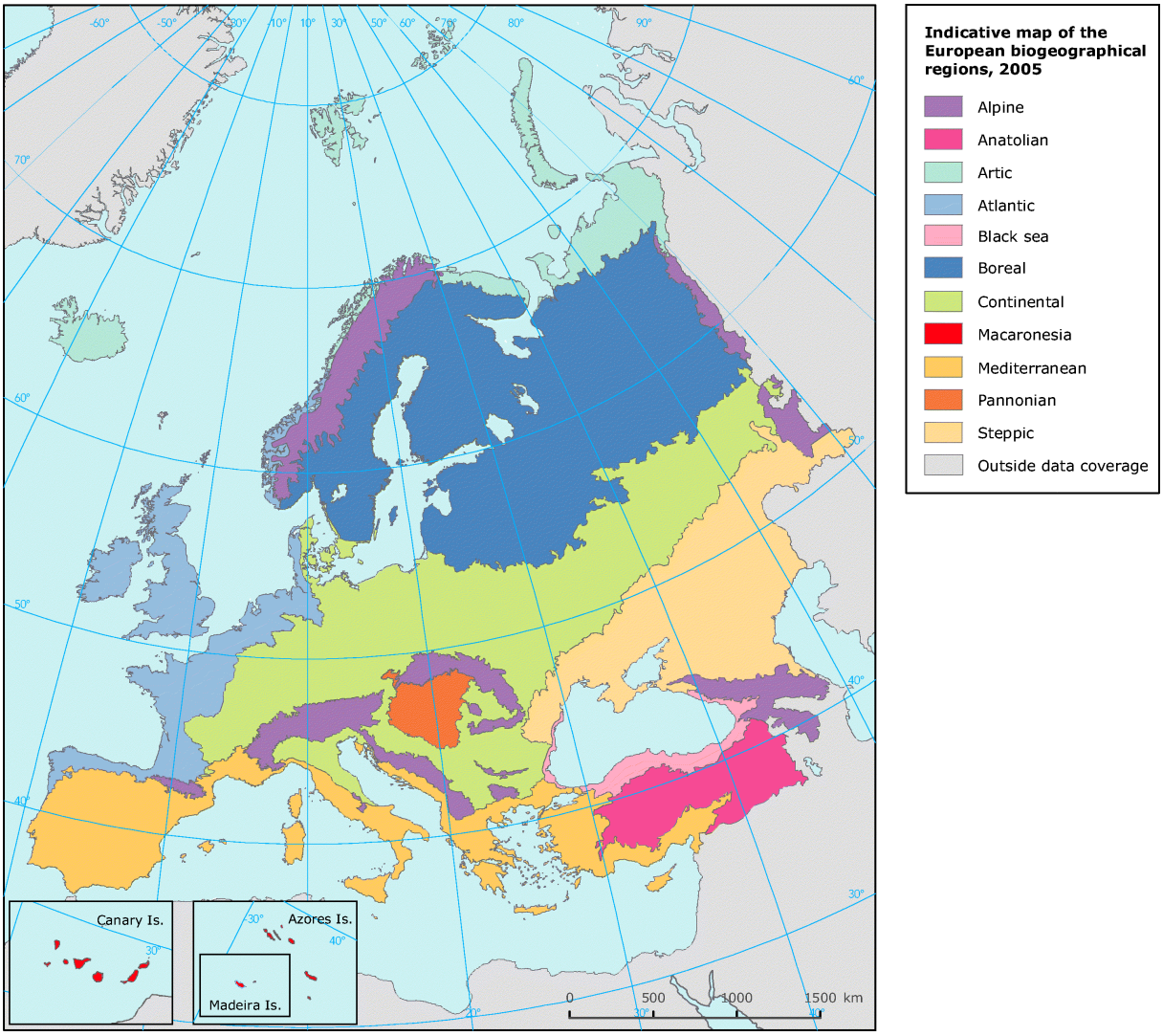
SEVENTH FRAMEWORK PROGRAMME

ANNEX 6. STRAW REPORT

Biogeographical regions, Europe 2005



Source: European Environment Agency (http://www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-europe-2005)

Funded by the European Commission's Seventh Framework Programme, Contract No. 219235

ANNEX 7. STRAW REPORT
BREAK-OUT SESSION REPORT GROUP A;
THURSDAY 10 JUNE 2010

Gave the participants their consent for the audio recording	Yes

Warm-up question	Are all the research topics listed as the result of the Delphi study of equal importance?
Opinions that are expressed:	**Higher importance:** -Pathogen host interaction -Epidemiology (3) -Risk Mangement (2) -Zoonoses (3) (one additional remark was, that zoonoses can be prevented best by good vaccination/vaccine development – comment from the industry) -Vector related diseases -Resistance of pathogens (3) (one comment: increase due to drug use) -Emergency response/Early detection (3)(one comment: for economical reasons) -Early warning systems - Vaccines/Vaccination (3) - Risk communication - Ecology on molecular level -New diseases (particular those that cannot be predicted) -Surveillance systems -Host resistance- **Lower importance** -Immunology -Climatology (2) **General remarks:** -The importance of a research topic is strongly related to the timeline of an emergency situation (When are they important?)-> Example: Diagnostics are important at the early stage. -Which agents are likely to emerge in which region? ➔ Time sequence

2nd Question	Which threats (diseases) do the participants expect to occur in the next 10-15 years?
Threats:	Here is a collection of almost all issues raised during the discussion, before summarising them on the flip over as headers. - In general: Confusion about the definition of threat and driver In first round we collected everything that was mentioned. In the second round the participant were asked to distinguish between threat and driver. **First round:** **New diseases** in new areas (not new disease, but new area!) -> to be well prepared if it happens! (Example from IT: Bluetongue)

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	Lack of instruments (Need of new measures) **Global political reasons**, illegal immigration of humans – re-emerging diseases, like reintroduction of tuberculosis via contaminated human beings) **Climate change** (water reduction -> diff between poor and rich –> social political differencest) **Import of products** **Economic pressure** (new funding systems in EU, funding regulations) **Movement of animals** (gap between poor and rich illegal transport) **Low resistance of animals (summarized to "High susceptibility"** Spread of african swine fever from south caucasus into the north of Russia Afican Horse sickness Rift Valley Fever Bluetonge**:** spread into new areas Avian influenza FMD Large spread in Eastern Asia **Transport of animals** **Animal Wellfare Productionsystems, e.g. Organic farming** **New disease** – no funding for unknown (labs are financial driven, lack of method to detect unkown, How to look for the unkown? Who looks for the odd?) -> **lack of resource for detection of unknown (-> later summarized to "Lack of resources for non-targeted research")** **Antimicrobial resistance** **Classical epizootic diseases - Viral diseases** In future there will be an increased demand for cheap animal products: -> High effecive production systems -> Movement of animals and relaxation of biosecurity measures on farms **Shift of responsibility and financial risk to the farming industry** **ASF** **Zoonoses** are not optimally handled at the moment: more interaction/cooperation needed between public health and veterinary health care. on both levels, political and research/medicine **Equine diseases** Second round was to select the "real" threat from this collection -> see document threats-drivers template A. After transferring the real threats into a new list, we obtained the following items as "left over" (drivers !!!!):

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	Economic pressure Global political situation Climate change Organic farming Transport of animals
Discussion:	A proposal has been brought up to distinguish between "single factorial threats" (particular group of diseases and "multifactorial threats" (making the general disease status worse - marked in the document threats-drivers template A with a B (broad))

3rd Question	Which driving forces does the group identify as relevant to the emergence of infectious animal diseases mentioned in the question before (timespan 10-15 years)?
Driving forces:	Driving forces were NOT collected randomly in this group. We asked the participants to find driving forces that are related to the threats identified. Drivers were listed in the right column within the document threats-drivers template A.
Discussion:	

4th Question	Can the group place the driving forces (including the related threats) in order of significance?
Discussion:	We ran out of time! There was no time left to make a prioritization.

The atmosphere of the discussion in keywords:	Extremely cooperative. Towards the end participant were excited in a positive sense.

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

ANNEX 7. STRAW REPORT
BREAK-OUT SESSION REPORT GROUP B;
THURSDAY 10 JUNE 2010

Gave the participants their consent for the audio recording	Yes

Warm-up question	Are all the research topics listed as the result of the Delphi study of equal importance?
Opinions that are expressed:	Difficult to prioritise, all are overlapping. Vaccine development. Does emerging include re-emerging? Rift VF big in Africa now, in EU later. Vector borne diseases are important. List doesn't include some important topics such as psychological reasons behind success or failure in disease control and need to know more about non-specific biosecurity measures (we always look at specific measures). Economic aspect – farmers reducing biosecurity, relaxed risk management leads to disease spread (view of insurance company representative). Genomics and proteomics are very important but not on list- these fields are cross disciplinary. Aquaculture – resistance of pathogens is big so new vaccines and medicines. Global warming important to Nordic countries and arctic and Nordic areas – affects sea temp and wildlife. Ecology is very important – already seeing big changes in population sizes etc. Farming systems important too, more intensive, less space. Opinions generally reflected their own backgrounds and interests.

2nd Question	Which threats (diseases) do the participants expect to occur in the next 10-15 years?
Threats:	See threats_drivers template B for list of threats.
Discussion:	General agreement on every threat someone raised – calm group, didn't talk over each other or argue at all.

3rd Question	Which driving forces does the group identify as relevant to the emergence of infectious animal diseases mentioned in the question before (timespan 10-15 years)?
Driving forces:	See threats_drivers template B for list of drivers
Discussion:	

4th Question	Can the group place the driving forces (including the related threats) in order of significance?
Discussion:	Main driving force is intensification, then globalisation, then climate change. The 4th encompassed several other drivers including Change in human behaviour with regard to management practices, companion animals, attitudes etc. The group did not want to prioritise any further down.

The atmosphere of the discussion in keywords:	Calm, agreeable, happy, friendly, cooperative. All were vets.

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

ANNEX 7. STRAW REPORT
BREAK-OUT SESSION REPORT GROUP C;
THURSDAY 10 JUNE 2010

Gave the participants their consent for the audio recording	**Yes**

Warm-up question	Are all the research topics listed as the result of the Delphi study of equal importance? No.
Opinions that are expressed:	No, all the research topics are not of equal importance (GENERAL AGREEMENT). More important research topics are: - Resistance of pathogens. - Pathogen-host interaction (related to ecology). - Vector related research. - Emerging diseases. - Vaccine development. Other considerations: There are too huge areas: biology, economics, climatology… Other ones are not considered exactly as research topics, like risk topics (communication/management/assessment). Clarification before starting: only about infectious diseases. "Drivers" and "threats": difficulties to distinguish both concepts in some cases.

2nd Question	Which driving forces do they expect to be most influential in the next 10-15 years for diseases to appear/increase?
Driving forces:	See threats_drivers template C
Discussion:	

3rd Question	Which threats (diseases) does the group identify relevant because of emerging potential based on the driving forces mentioned in the question before (timespan 10-15 years)?
Threats:	See threats_drivers template C
Discussion:	

4th Question	Can the group place the threats (including the related drivers) in order of significance?
Discussion:	See threats_drivers template C

The atmosphere of the discussion in keywords:	Relaxed, cordial, friendly. Agreement (in general).

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

ANNEX 7. STRAW REPORT
BREAK-OUT SESSION REPORT GROUP D;
THURSDAY 10 JUNE 2010

Gave the participants their consent for the audio recording	Yes

Warm-up question	Are all the research topics listed as the result of the Delphi study of equal importance?
Opinions that are expressed:	▪ Topics identified in the Delphi Study and shown to the group were considered to belong to different categories. ▪ Many headings covered broad areas. Biology as a heading is too broad. ▪ Some headings are strategic and need to be categorised. eg Climatology should be added to thinking regarding disease control – it needs to be more focused, in terms perhaps as the consequences of climate on animal health. ▪ Biosecuriy, is an important driver, should be on the list. ▪ Animal movement should also be considered on the list. ▪ Entomology and Vector Relate Research could be grouped together. ▪ The diagnostic capacity for diseases in individuals needs to be improved especially for DIVA systems.. **Current gaps were identified as :-** ▪ Economics (production related and social related) and improved information on livestock demographics. ▪ The majority of animal health losses are due to endemic/non-zoonotic agents and need more cooperation at a European level to improve surveillance capacity. ▪ More collaboration with eastern European neighbours is needed and if necessary support theses states. ▪ Improved economic evidence by eg more cost benefit analysis of research topics related to animal health disease control actions in order to justify spending. ▪ Cross border cooperation should be promoted.

2nd Question	Which driving forces do they expect to be most influential in the next 10-15 years for diseases to appear/increase?
Driving forces:	CONTRADICTORY EFFECTS ▪ In some cases eg intensification, there may be a decreasing **and** increasing effect of drivers. ▪ Regional controls as a driver may be considered to have positive effects on the control of some diseases but have a negative effect on other diseases. ▪ Intensification will decrease the threat of epizootic diseases but increase the incidence of complex multifactorial diseases. ECONOMICS ▪ Increased competition in agriculture and associated economic cost

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	has reduced money available to farmers for the diagnosis of diseases. ▪ Competition also has an impact on biosecurity at farm, region and national level . ▪ Intensification of production systems – some systems may increase the threat of disease spread There are differences in monitoring between states – compensation issues will have an effect on disease reporting and surveillance . WILDLIFE ▪ Increased density of wildlife and changes in habitats of wildlife will have an increased driver effect. CLIMATE CHANGE ▪ Global warming – will effect on vectors of warmer winters. DISEASE DETECTION AND UNDERSTANDING ▪ Better understanding on pathogenesis and transmission of diseases ▪ International harmonization of surveillance and diagnostic systems between member states and countries . MOVEMENT ▪ Legal movements of animals, their products and feed; movements of workers also increases risks. ▪ Animal movement and trade will be an increased driver within the EU and within a member state. ▪ Increased movement of humans – controls at members state level and EU level in comparison to USA.. SOCIETAL ASPECTS ▪ Societal Aspects eg Animal Welfare issues eg free range poultry, may increase threats ▪ Organic farming (and associated lack of use of insecticides) "improved" attention to biodiversity and ecosystems, increase the risk of some diseases eg tick borne encephalitis in Italy.
Discussion:	Enthusiastic and positive

3rd Question	Which threats (diseases) does the group identify relevant because of emerging potential based on the driving forces mentioned in the question before (timespan 10-15 years)?
Threats:	Do drivers (intensification, biosecurity, …) increase threats.
Discussion:	Classification of diseases as endemic, epizootic, as animal borne vectorborne, food borne may be a better system. DRIVER Movement:- Legal - Animal movement, trade,

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	illegal - smuggling THREAT This issue effects all diseases. Spread of disease to non-immune animal populations. Disease control should be focused on developed and undeveloped countries. Markets and dealers increase the risk. Most movement could be reduced if the cost of slaughtering was similar in member states - there needs to be more interdisciplinary research on the impact of indirect economic indicators. Lack of information of demographic information of livestock movements and identification. Lack of information on herd and individual animal health status – ie disease situation on the farm of origin. More information on risks of exotic diseases for general populations in member states. DRIVER – Different national capabilities to diagnose and control diseases. THREAT As greater differences develop between countries the threat of importation of disease increases. DRIVER – Biosecurity THREAT – Lack of quarantine DRIVER – Global warming THREAT – Vector borne diseases DRIVER – Societal Aspects THREAT – Free range farming – risk of epidemics increased eg AI. Higher risk of contact between farm animals and wildlife and vectors Management of ecosystems Less use of pesticides increase the risk of threats eg tick borne encephalitis. DRIVER Lack of new knowledge in disease pathogenesis THREATS Improvement of management and control of one disease may increase the risk of other diseases. Eg tapeworm in foxes. THREAT – Antibiotic resistance DRIVER – Lack of harmonisation of monitoring of surveillance systems THREAT – Epidemic disease need a consistent control system throughout europe, epidemic diseases may need specific controls from region to region. More attention needs to be paid to endemic diseases Better control of endemic pathogens. DRIVER – Changes in wildlife populations. THREATS – same as alternative/ecological systems above. (*Free range*

	farming – risk of epidemics increased eg AI. *Higher risk of contact between farm animals and wildlife and vectors* *Management of ecosystems* *Less use of pesticides increase the risk of threats eg tick borne encephalitis).* DRIVER – Movement of people THREAT - Lack of disease awareness. Food safety issues in food producing animals should be considered by EMIDA

4th Question	Can the group place the threats (including the related drivers) in order of significance?
Discussion:	1, Animal movement and trade as a disease threat 2. Vector borne diseases 3.

The atmosphere of the discussion in keywords:	Positive, cooperative

ANNEX 7. STRAW REPORT
threats/drivers list A

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
	Re-emerging diseases					Socio political development Climate change Globalisation (Traffic, transport, trade) Intensification		
	High susceptibility (low resistance) of animals (B)					Economic pressure (resulting in breeding strategies for higher production Intensification of farming, Closed disease free production Breeding of animals, less careful management) Movement to organic farming Example pig poultry outdoor: other risks than inside		
	ASF					Traffic, air-traffic (general) Lack of compliance with rules		
	Vector borne (AHS, Rift Valley ....) Including unknown					Ecological changes/policy Socio political developments Climate change Globalisation (Traffic transport)		
	Equine diseases					Ecological changes/policy Socio political events Climate change Globalisation (Traffic transport) Increased number of hobby horses Traffic (competition, events)		

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the tabel columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list A

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
	Classical epizootic diseases					Institutional changes in bigger holding systems, Lack of compliance with rules Wild life reservoir (also true for TB) Nature policies Expanding of EU		
	Lack of control instruments (B)					Public perception (do not kill healthy animals - stamping out) Lack of acceptance to buy products from vaccinated animals On EU-level: lack of uniformity of diagnostic infrastructure		
	Lack of Resources (money to look for unkown) (B)					Lack of political/economicaL will, Budget reductions		
	Antimicrobial resistance (B)	X (Leona)				Economic pressure Irresponsibility of the vets (repeated use of the same antibiotics, antibiotic prescription on demand of the farmer) Lack of preventive health approaches, suboptimal hers health programmes		
	Zoonoses (some of them are unknown)					Intensification (e.g.Q-Fever) Lack of standardized systems detection of Zoonoses Globalisation FOOD BORNE EXCLUDED !!!!) Pet Farms, Organic farming		
	Shift of responsibility and financial risk to the farming industry (B)					Public expenses (reducing compensation money) Responsibility shift from public to private		

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the tabel columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list B

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
1.	Vectorborne diseases -Arboviruses -Vectors moving	SL		1,2,3,4,5	1.	Climate change		3
2.	AMR (antibiotic and disinfectant) resistance Anthelmintic resistance	SL		2,6,8,9,7	2.	Globalisation (increased traffic and trade)		2
3.	Exotic viruses 2 & pathogen evolution 4 e.g. Crimean Congo HF	SL		2,	3.	Reforestation (affecting wild life such as deer)		
4.	Mycotoxins	SL		1,2,7	4.	Urban farming in developing countries, free range		
5.	Waterborne diseases – water temp rise leads to more bacteria (e.g. Mycobacterium marino)	SL		1,6	5.	Hobby farming, companion animals and free riders (don't respect rules) – increasing problems		
6.	Multifactorial disease complex			6, 7 (indirect, globalisation)	6.	Intensification (changing farming systems)		1
7.	Wildlife reservoirs (previously undetected). Outside EU. Spreading to food production systems.	S		2, 12,	7.	Economic		
8.	Emerging zoonoses e.g. Q fever	S		6,2,1,5,4,3	8.	Increasing welfare standards in Europe		

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the tabel columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list B

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
9.	Exotic parasites and bacteria	S		2, 5 (companion animals), 7	9.	Management practices		
10.	Hobby farming, companion animals and free riders (don't respect rules) – increasing problems			10	10.	Social thinking, healthy, back to nature caused by increasing affluence		
11.					11.	Overuse of vaccination		
12.					12.	Global sourcing of raw materials (live and dead) – bush meat		
13.					13.	Increased wildlife interactions with humans due to decreasing rural populations.		
14.					14.			
15.					15.	Change in human behaviour with regard to management practices, companion animals, attitudes etc (encompasses several drivers above).		4

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the tabel columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list C

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
1.	Multifactorial diseases		6	1, 9	1.	Climate change		
2.	Spread of diseases		2	1, 7, 8, 9, 10, 12	2.	Changes in livestock management/farming (increase of); (e.g., intensive farming, organic farming)		
3.	Emerging/re-emerging diseases		1	1, 2, 3, 4, 7, 9, 10	3.	Programming/National Policy/Veterinary Services (decrease of) Lack of coordination in animal control		
4.	New possible combinations		4	1, 9	4.	Training (decrease of)		
5.	Persisting diseases		4	2, 9	5.	Intensification of production/global needs for animal products; intensification of agriculture (related to intensive farming)		
6.	Parasite infection		6	2, 9	6.	Feed resources		
7.	General increase of diseases		4	2, 9	7.	Animal and products movement/trade		
8.	Antibiotic resistance/spread of resistance		3	3, 7, 9, 15	8.	EU and international regulations (slow adaptation to new situations, low flexibility of rules)		

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the table columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list C

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
9.	Mycotoxins		6	6, 9	9.	Social and economic changes		
10	Feed consequences in animal immunology, animal physiology...		4	6, 9	10.	Wildlife, closer interactions with domestic animals, ecology/interactions		
11	Exotic diseases		6	7, 9	11.	Environmental changes/land use		
12	Zoonotic diseases		4	7, 9, 10	12.	Extreme weather ('climatic catastrophes')		
13	New pathogens		6	10	13.	Chemical use		
14	New host-pathogen interactions		6	10, 11	14.	GMOs		
15	Transmission of viral diseases		6	12	15.	Prophylactic medication/vaccination		
16	Changes in opportunistic pathogens		6	13, 14	16.			
17	Changes in ecology relations		6	14	17.			

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the table columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list C

##	Threats	Short term[1]	Priority[2]	Related drivers[3]	##	Drivers	Short term[1]	Priority[2]
18	Increase of virulence		5	15	18.			
19	Partial inherited immunity		5	15	19.			

REMARKS:

2nd QUESTION OF THE BREAK-OUT SESSION:
Participants give a list of 15 drivers/driving forces.
More important drivers: animal and products movement/trade, social and economic changes, climate change, wildlife.
After that, participants propose threats as consequence of the listed drivers. Strong agreement is highlighted.

3rd QUESTION OF THE BREAK-OUT SESSION:
Participants chose the more important threats. Prioritisation is based on the number of times each threat was chosen by the participants in the threats list previously elaborated. Strong agreement is highlighted.

More important threats:
1. **Emerging/re-emerging diseases**.
2. **Spread of diseases**.
3. **Antibiotic resistance/spread of resistance**.

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the table columns on the right

ANNEX 7. STRAW REPORT
threats/drivers list D

No list available; see extensive break-out session report group D

[1] = please mark if short term
[2] = please use numbers of listed threats/drivers on the left in order of priority
[3] = please identify related drivers by their number from the table columns on the right

ANNEX 8. STRAW REPORT
Break-out session report Atlantic region group;
Friday 11 June 2010

Warm-up question	What do you think of the list of threats and driving forces as the outcome of yesterday's discussions? Is there something missing?
Opinions that are expressed:	Few min (3t) to go over the hand out list: (some participants taking note, some just looking at the list) Missing: Biosecurity? (claryfiction need) Threats and drivers mixed up? -Increasing incidence and spread of endemic disease -If equine disease defined as threat, than all other species should be included. -Exotic FUNGAL diseases should be included, when viral and exotic viral diseases are included

2nd Question	Based on these results what research topics at pan-European level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics pan-European:	Broad or narrow topic? 4 pairs: Vivid discussion, friendly atmosphere **General remark (made at the end of the discussion)** 2 level of research: generic and disease specific **Research topics that were mentioned as the "top 3".** **Riskmanagement/vet. Policy** Implementation of programmes, how to "sell" to the framer a technique, that has been developed – how to make sure, that people behave in a proper way to avoid spread of eg AFS **Risk assessment** (recording from this point of time again (10:25)) instruments **Epidemiology** EU policy, applied epidemiology Also prediction of outbreaks Note: There is a difference between prediction and early detection Gen remark: Topic is very broad. **Host pathogen interaction** **Resistance against treatment** (medication) no instruments to treat a disease **Surveillance** (development of diagnostic technology)

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	Animal genetics (susceptibility) – only specific diseases Array analysis If our budget was limited: generic basic research build up knowledge on threats, also disease specific – to be prepared in emergency case disease specific prioritisation to improve preparedness + global aspects on resistance +Vector borne is in participants opinion in any case a priority- Lack of **harmonization of surveillance systems** (across EU) Goal: pick up emerging diseases as early as possible Movement of animals -> **Biosecurity** on all levels, both European and national What is driving farmers to take risks? What happens illegally? (Why do farmers import sick cattle? Movement of animals and products **Research on disease emergence** Analyse the patterns from the past to use them in the future. drivers and infection dynamics (localisation, source, ...) (interface from source to animal) ➔ Preparedness oriented research
Discussion:	

3rd Question	Based on these results what research topics at geographical Region level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics biogeographical:	No comments on this – no wish to add a topic, no wish to rearrange the ranking.
Discussion:	- just two short statements, saying, that there were no differences and that for mediterranean region also no differences were expected.

The atmosphere of the discussion in keywords:	All over the atmosphere was always very nice and friendly and constructive.- no issues at all –

ANNEX 8. STRAW REPORT
Break-out session report Nordic/Baltic region group;
Friday 11 June 2010

Warm-up question	What do you think of the list of threats and driving forces as the outcome of yesterday's discussions? Is there something missing?
Opinions that are expressed:	ISSUES ▪ Ensure that animal products are included in the list with people and animals related to (illegal) movements. MISSING ▪ Legislation in particular animal welfare ▪ Movement of farm workers. ▪ Changing Farming systems – fish feed issues seeking alternative sources of proteins PRIORITIES ▪ Livestock demographics – effect of changing size of populations on diagnostics tools ▪ Increased trade and movement of animals and people leading to increased risk of exotic/emerging diseases ▪ Social science issue – communicating disease control message to stakeholders (and understanding/acceptance of the message)

2nd Question	Based on these results what research topics at pan-European level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics pan-European:	MAJOR TOPICS 1. Biosecurity measures (at all levels EU, MS, Farm, food chain level) – evidence base for effectiveness and cost benefit of measures, where does the responsibility lie – government/farmer/livestock industry balance 2. Preparadness for emerging and exotic disease - research into improvements in current diagnostics and development of new diagnostic and understanding of disease transmission , identification of diseases risks outside EU social economic issues –ethical issues 3. Better understanding of host pathogen interaction especially resistance issues – resistance of pathogens to controlling therapeutics antibiotic and anthelmintic Host pathogen interactions TOPICS DISCARDED BY GROUPS OF FOUR ▪ Disease control measures – vaccination, diagnostics, treatment, ▪ Farm levels diagnostics (including certification). ▪ Pathogen resistance. ▪ Biosecurity correlated with industrial and small scale farming (back yard/hobby farming). ▪ Disease control – transmission, diagnostic capability, socio-economic precondition

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

	▪ Resistance (in all pathogens) ▪ Emerging disease, diagnosis, pathogenesis ▪ Exotic virus diseases ▪ Vectorborne diseases ▪ Vector competence and presence of vectors ▪ Increased knowledge on diseases outside the EU to reduce risk for introduction and to maintain knowledge. TOPICS DISCARDED BY GROUPS OF TWO ▪ Wildlife borne diseases ▪ Harmonization of diagnostic preparedness for epidemic disease in the EU; establishing networks – exotic diseases ▪ How will we get rid of diseases which are already in the production system – endemic diseases. ▪ Global warming related diseases – vector borne diseases ▪ Improved resources for research on infections diseases
Discussion:	

3rd Question	Based on these results what research topics at geographical Region (Northern Europe area) level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics biogeographical (Northern European region):	RESEARCH TOPICS 1 Exotic diseases – improve understanding on how to control them eg developing buffer zones, (how to develop them and how big they should be) also with respect to wildlife. 2 Biosecurity – identification of risks associated with organic farming 3 More and intensified research on a recognised Vectorborne diseases and new vectorborne diseases 15 year scale - Exotic diseases, Biosecurity DISCARDED BY GROUPS OF FOUR. ▪ Farm level diagnostics – bulk milk and spot tests ▪ Eradication programmes for endemic diseases – cost benefit, economical/social ▪ Diagnostic collaboration on emerging and exotic diseases ▪ Common programme and legislation in fighting with antimicrobial and anthelmintic resistance.
Discussion:	

The atmosphere of the discussion in keywords:	Constructive, cooperative

ANNEX 8. STRAW REPORT
Break-out session report Continental region group;
Friday 11 June 2010

Warm-up question	What do you think of the list of threats and driving forces as the outcome of yesterday's discussions? Is there something missing?
Opinions that are expressed:	"Drivers" and "threats": mixed in some cases. Some concepts are very little specific and little clear. There are drivers and threats at different levels. Therefore, there are different levels of research. 'Responsibility transfer (government to farmer/industry)' is considered a task, not a threat. Too general categories. It would be adequate to add a list of diseases.

2nd Question	Based on these results what research topics at pan-European level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics pan-European:	SEE TEMPLATE.
Discussion:	

3rd Question	Based on these results what research topics at geographical Region level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics biogeographical:	SEE TEMPLATE.
Discussion:	

The atmosphere of the discussion in keywords:	Relaxed, cordial, friendly. Agreement (in general).

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

ANNEX 8. STRAW REPORT
Break-out session report Mediterranean region group;
Friday 11 June 2010

Warm-up question	What do you think of the list of threats and driving forces as the outcome of yesterday's discussions? Is there something missing?
Opinions that are expressed:	Additions to the circulated lists of threats and drivers: Threats: Animal markets.....diseases introduction AND SPREAD. Why mention equine diseases and not other animals, should not be species specific. Long term sustainability of veterinary services (decreased investment). Wildlife – interaction with domestic and humans. Complex multifactorial AND MULTI-ETIOLOGICAL diseases Driving Forces: Economics should include economic crisis and its effect of cutting corners on surveillance and research etc. Social political development (expanding EU, nature development – wildlife – biodiversity: – split into two points – 1) Social/Political developments and include here the difference between 1st and 3rd worlds i.e. increased separation between rich and poor. 2) Expanding EU, nature development – wildlife – biodiversity: – split into two points Changes in the human/animal interface – domestic and wildlife. Lack of research on minor production species.

2nd Question	Based on these results what research topics at pan-European level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics pan-European:	See template for research priorities.
Discussion:	Discussion took place within the small groups and so was not recorded.

3rd Question	Based on these results what research topics at geographical Region level can the group identify for the next 10-15 years? And how do they prioritise them?
Research topics biogeographical:	See template for research priorities
Discussion:	Discussion took place within the small groups and so was not recorded.

The atmosphere of the discussion in keywords:	Friendly, thoughtful, free expression of opinions. All except one were vets.

Please, highlight in the list and in the notes concerning the discussion (strong) disagreements and (strong) agreements

ANNEX 8. STRAW REPORT
research topics list Atlantic region group

Pan-European				Atlantic region			
##	Research topic	Short term[1]	Priority[2]	##	Research topic	Short term[1]	Priority[2]
16.	Research to improve surveillance		1	16.	Research to improve surveillance		
17.	Riskanalysis of Biosecurity		2	17.	Riskanalysis of Biosecurity		
18.	Epidemiological Research on risk identification of patterns of disease emergence to improve preparedness for emerging threats)		3	18.	Epidemiological Research on risk identification of patterns of disease emergence to improve preparedness for emerging threats)		
19.	Host pathogen interaction		4	19.	Host pathogen interaction		
20.	Disease specific prioritisation		5	20.	Disease specific prioritisation		
21.	Medication resistance		6	21.	Medication resistance		

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

ANNEX 8. STRAW REPORT
research topics list Atlantic region group

Pan-European				Atlantic region			
##	Research topic	Short term[1]	Priority[2]	##	Research topic	Short term[1]	Priority[2]
22.	Vector borne		6	22.	Vector borne		
23.	Genetics of susceptiblity		7	23.	Genetics of susceptiblity		

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

ANNEX 8. STRAW REPORT
research topics list Nordic/Baltic region group

No list available; see extensive break-out session report Nordic/Baltic region group

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

ANNEX 8. STRAW REPORT
research topics list Continental region group

Pan-European				Continental region			
##	Research topic	Short term[1]	Priority[2]	##	Research topic	Short term[1]	Priority[2]
1.	Surveillance Disease modelling Development of new diagnostic tests/strategies Disease monitoring systems in third countries		1	1.	Surveillance Disease modelling Development of new diagnostic tests/strategies Disease monitoring systems in third countries		1
2.	Stakeholders involvement/interaction with society		6	2.	Stakeholders involvement/interaction with society		5
3.	Development of new vaccines and improvement of the existing; new vaccination strategies		2	3.	Development of new vaccines and improvement of the existing; new vaccination strategies		3
4.	Microbiological resistance		5	4.	Microbiological resistance		4
5.	Clinics of emerging diseases		6	5.	Clinics of emerging diseases		5
6.	Biosecurity at all levels (including animal movement)		3	6.	Biosecurity at all levels (including animal movement)		2
7.	Zoonotic diseases		6	7.	Zoonotic diseases		5
8.	Development of alternative control measures		5	8.	Development of alternative control measures		4
9.	Role of wild animal in the transmission of diseases; pets		6	9.	Role of wild animal in the transmission of diseases; pets		5
10.	Vector control/vector competence		5	10.	Vector control/vector competence		4
11.	Host-pathogen interactions (including ecology and zoonoses)		4	11.	Host-pathogen interactions (including ecology and zoonoses)		4
12.	Host-disease resistance		5	12.	Host-disease resistance		5

REMARKS:

2nd QUESTION OF THE BREAK-OUT SESSION: PAN-EUROPEAN LEVEL
Participants give a list of 12 research topics, some of them especially broad (see, for example, the first research topic, which includes *surveillance, disease modelling, development of new diagnostic tests/strategies* and *disease monitoring systems in third countries*).
Participants chose the more important research topics. Prioritisation is based on the number of times each research topic was chosen by the participants in the research topic list previously elaborated. Strong agreement is highlighted.

More important research topics:

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

1. **Surveillance, disease modelling, development of new diagnostic tests/strategies and disease monitoring systems in third countries.**
2. **Development of new vaccines and improvement of the existing; new vaccination strategies.**
3. **Biosecurity at all levels (including animal movement).**

3rd QUESTION OF THE BREAK-OUT SESSION: REGIONAL LEVEL (CONTINENTAL)

Participants chose the more important research topics. Prioritisation is based on the number of times each research topic was chosen by the participants in the research topic list previously elaborated. Strong agreement is highlighted.

More important research topics:

1. **Surveillance, disease modelling, development of new diagnostic tests/strategies and disease monitoring systems in third countries.**
2. **Biosecurity at all levels (including animal movement).**
3. **Development of new vaccines and improvement of the existing; new vaccination strategies.**

Special attention (continental group) to other topics: microbiological resistance, development of alternative control measures, vector control/vector competence, host-pathogen interaction. At continental level, it is important to take into account the risk that animal movement/transit poses.

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

ANNEX 8. STRAW REPORT
research topics list Mediterranean region group

Pan-European				Mediterranean			
##	Research topic	Short term[1]	Priority[2]	##	Research topic	Short term[1]	Priority[2]
1.	Vectorborne diseases including tick borne diseases and including vectors (entomology, competence) AND Ecosystem change and health – improved knowledge in ecology and new reservoirs.		1	1.	Vectorborne diseases including tick borne diseases and including vectors (entomology, competence) AND Ecosystem change and health – improved knowledge in ecology and new reservoirs.		1
2.	Unidentified/new, emerging , neglected and endemic zoonoses – lack of control methods.		2	2.	Neglected species – bees, goats, sheep, rabbits - diagnostic tools and control of diseases.		2
3.	Neglected species – bees, goats, sheep, rabbits -diagnostic tools and control of diseases.		3	3.	Unidentified/new, emerging , neglected and endemic zoonoses – lack of control methods.		
4.	Vaccine development and (faster) diagnostics – new technology, particularly in wildlife.		4	4.	Vaccine development and (faster) diagnostics – new technology, particularly in wildlife.		
5.	(Cheap) Technology/systems for tracing animal and animal product movement			5.	(Cheap) Technology/systems for tracing animal and animal product movement		
6.	Innovative preventive measures (e.g. new vaccine delivery method) – new technology. Including genetics of resistance			6.	Innovative preventive measures (e.g. new vaccine delivery method) – new technology. Including genetics of resistance		
7.	Emerging and re-emerging diseases – mainly epidemiology			7.	Emerging and re-emerging diseases – mainly epidemiology		
8.	Changing farm animal practice with changing animal susceptibility to diseases. Livestock production diseases			8.	Changing farm animal practice with changing animal susceptibility to diseases. Livestock production diseases		
9.	Training for dealing with exotic and re-emerging diseases			9.	Training for dealing with exotic and re-emerging diseases		
10.	Wildlife			10.	Wildlife		
11.	Social sciences			11.	Social sciences		

[1] = please mark if short term
[2] = please use numbers to indicate level of priority (1 = highest priority, 2 = second highest, etcetera)

ANNEX 9. STRAW REPORT
LIST OF PARTICIPANTS

NAME	COUNTRY	INSTITUTION	DOMAIN	DISCIPLINE
Klemens Fuchs	**Austria**	**AGES**	**Agency**	Risk management
Eric Cox	Belgium	University of Gent	Research	Epidemiology
Hein Imberechts	Belgium	CODA-CERVA	Research	Microbiology
Leona Nepejchalová	Czech Republic	ISCVBM	Governmental body	Animal diseases, Zoonoses (including antimicrobial resistance)
Anette Bøtner	Denmark	DTU Vet , National Veterinary Institute	Research	Veterinary medicine/Virology
Inger Dalsgaard	Denmark	DTU Vet , National Veterinary Institute	Research	Fish health
Hans Houe	Denmark	University of Copenhagen	Research	Veterinary medicine/Animal diseases, Epidemiology, Welfare and Risk assessment
Matti Aho	Finland	CVO	Governmental body	Risk management
Olli Ruoho	Finland	Association for animal disease prevention	NGO	Risk communication and management
Bernard Charley	France	INRA	Research	Virology, Molecular immunology
Thomas Blaha	Germany	Tierärztliche Hochschule Hannover	Research	Veterinary medicine/Animal diseases; Epidemiology
John Egan	Ireland	Bacteriology Division, Central Veterinary Research Laboratory	Research	Veterinary bacteriology
Claudio DeLiberato	Italy	Istituto Zooprofilattico Sperimentale Lazio e Toscana Roma	Research/Governmental body	**Entomology/Parasitology**
Antonio Fasanella	Italy	Istituto Zooprofilattico Sperimentale PB	Research/Governmental body	Bioterrorism
Riccardo Orusa	Italy	National reference centre for wildlife disease	Research/Governmental body	Wildlife
Nicola Santini	Italy	**National Animal Disease Control Center DG Animal Health and Veterinary Medicinal Products** Ministry of Health	Governmental body	Veterinary medicine/Animal diseases; Risk management

ANNEX 9. STRAW REPORT
LIST OF PARTICIPANTS

NAME	COUNTRY	INSTITUTION	DOMAIN	DISCIPLINE
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Aivars Berzins	Latvia	Faculty of Veterinary Medicine; Institute of Food and Environmental hygiene	Research	Veterinary medicine/Epidemiology
Modestas Ružauskas	Lithuania	Veterinary Institute of Lithuanian Veterinary Academy	Research	Veterinary medicine/Animal diseases, Zoonoses
Ed van Klink	Netherlands	Food and Consumer Product Safety Authority, VWA	Governmental body	Veterinary medicine/Animal diseases, Risk management
Helmut Saatkamp	Netherlands	Wageningen University	Research	Agro-economy
Gerdien van Schaik	Netherlands	Animal Health Service	Research/Livestock industry	Epidemiology
Bjørn Næss	Norway	National Veterinary Institute	Research	Fish health
Gunn Berit Olsson	Norway	Nofima Marin	Research	Fish health
Andrew Cunningham	United Kingdom	Institute of zoology	Research	Wildlife
Jeremy Salt	United Kingdom	Pfizer	Research/Pharmaceutical industry	R&D
María José Pro González	Spain	ENESA	Governamental body	Risk asessment, Risk communication, Risk management
Ramón Juste	Spain	NEIKER	Research	Epidemiology
José María Nieto Martínez	Spain	CISA	Research	Animal disease
John Peel	Switzerland	Novartis Centre de Recherche Sante Animale SA	Research/Pharmaceutical Industry	Animal disease, Veterinary medicine
Irene Schiller	Switzerland	Swiss Federal Veterinary Office	Governmental Body	Risk management
Elisabeth Erlacher-Vindel	n/a	World Organisation for Animal Health, OIE	International organisation	Animal disease
Per Have	n/a	EFSA	Governmental body / EU	Risk assessment

ANNEX 9. STRAW REPORT
LIST OF PARTICIPANTS

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Meike Wentholt	**Netherlands**	**Wageningen University**	**EMIDA subcontractor**

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