Observatory thematic study

2024

Use, challenges and impact of zoning and compartmentalisation

Part 1*: Descriptive report on the use, challenges and impact of **zones** established in relation to avian influenza, African swine fever and foot and mouth disease in WOAH Members from 2018 to 2022

* This descriptive analysis will be followed by a more detailed analysis in Part 2.

World Organisation for Animal Health
Founded in 1924

Organisation mondiale de la santé animale
Fondée en 1924

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Use, challenges and impact of zoning and compartmentalisation

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Foreword

Dr Monique Eloit
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Throughout my career, and more specifically as Director General of the World Organisation for Animal Health (WOAH), I have seen how disease control and safe trade are the ultimate goals of Veterinary Services and that they are intrinsically linked. Among other control measures, zoning and compartmentalisation can surely contribute to improving disease control and facilitating safe trade of animals and animal products. Whilst the first report produced by our Observatory last year raised awareness of some of the existing gaps in the implementation of the standards linked to these two key concepts, there was still some uncertainty as to the reasons for this and the associated impacts.

In this context, the first Observatory thematic study focuses on exploring the objectives, the challenges and the impact of using zones and compartments in relation to diseases of interest for our Members. This first descriptive report, dedicated only to zoning in relation to avian influenza, African swine fever, and foot and mouth disease, is based on an ambitious survey with impressive contributions from our Members. I would like to take this opportunity to express my warmest thanks to them.

After reading this first report, I am delighted to see that it begins to answer questions that the whole veterinary community, including WOAH, has been reflecting on for a long time. It highlights the fact that Members should ensure that all the prerequisites are in place before taking the zoning approach and that the implementation of zoning must be considered on a case-by-case basis, tailored to each Member's context and needs. The report provides a wealth of information on the challenges presented by implementing zoning-related standards, which will surely stimulate further brainstorming on the practical approaches, solutions and tools needed to establish and successfully maintain a disease-free zone. The recommendations offered, both to WOAH and our Members, will open the door to new opportunities and perspectives for Members and pave the way for our future research.

I am hopeful that this report will significantly impact readers' minds. It is the first part of a larger project dedicated to both zoning and compartmentalisation and will allow for more investigations and deeper analysis. I am sure you will be looking forward to the rest of this work as much as I am. Stay tuned!

Executive summary

The international standards of the World Organisation for Animal Health (WOAH, founded as OIE) for zoning and compartmentalisation support Members to prevent and control the spread of disease, and contribute to ensuring the safe trade of animals and related commodities. However, previous work has shown that the effective implementation of zoning and compartmentalisation standards remains challenging. Members' capacity to fulfil these standards is still limited. The WOAH Observatory aims to monitor the implementation of WOAH standards, and has therefore decided to focus its first thematic study on these two key concepts. In the project's first phase, a survey was conducted to assess the use of zoning for avian influenza (AI), African swine fever (ASF) and foot and mouth disease (FMD), alongside the associated challenges, benefits and drawbacks. The present report provides a descriptive analysis of the results. This will be followed by a study focused on compartmentalisation for AI and a deeper analysis on these two concepts, to be carried out in 2024.

The study was conducted using a questionnaire-based approach. Three separate questionnaires were designed to address the topic for each of the three selected diseases (AI, ASF, FMD). The target respondents were members of the Veterinary Services among all WOAH Members. Each country/territory was invited to complete one questionnaire for each disease. The questionnaires were made available in English, French and Spanish on an online platform. Members could submit their answers electronically from 30 May 2023 to 4 September 2023. Data were then cleaned, with identification of the most meaningful indicators, and quantitative descriptions of the respondents' answers, mainly in the form of percentage distributions.

By the end of the three-month data collection period, 60% of WOAH Members had answered the AI-related questionnaire, 50% the ASF questionnaire, and 56% the FMD questionnaire. These response rates were highly satisfactory, and the geographical distribution was representative of WOAH Members. The following conclusions can be drawn from the descriptive analysis:

- Between 2018 and 2022, 70% of the responding Members affected by highly pathogenic AI (HPAI) in poultry used zoning in relation to AI over the same period. Approximately 55% of ASF-affected Members used zoning for ASF, and 50% of FMD-affected Members used zoning for FMD. Moreover, 50% of Members who do not currently use zoning reported plans to do so in future. The majority of other Members advised that they lacked the capacity to implement zoning.
- The analysis showed that 27% of Members using zoning reported no or only partial integration of WOAH standards into their regulatory framework. 34% reported no or partial integration of WOAH standards into their practices. Surveillance, biosecurity measures, and identification and traceability systems were the main points for which standard implementation was reportedly the weakest.
- Respondents reported that the main challenges to establishing zones were the staffing level of veterinary resources and the enforcement of biosecurity requirements (average severity scores of 2.8 and 2.7 on a 1-to-4 scale, respectively). Other challenges were cited with lesser but still considerable impact, which should also be considered for future action.
- An increase in human resources and the development of public–private partnerships were cited as the main success factors for implementing zones. Respondents requested WOAH's support, alongside other tools, in the development of new regulations and the establishment of public–private partnerships.
- Responding Members acknowledged the positive impact of zoning for disease control (81% of Members advised zoning was highly beneficial to control AI, 84% to control ASF and 91% to control FMD). From the trade perspective, zone acceptance led to significant benefits for export volumes (e.g. an increase in export volumes was reported in 73% of cases where zones had official WOAH recognition as being free from FMD).
- However, zone acceptance appeared to be a far-from-easy process and may take over two years. Though peacetime trade agreements can help zone acceptance, the factors of transparency and trust in the certification system proved to be the main drivers of zone acceptance by trading partners (average scores of 3.9 on a 1-to-4 scale, from both importer and exporter perspectives).

These results provide valuable insights to both WOAH and WOAH Members, and have informed the recommendations listed in this report's conclusion. In addition to this main report, a one-page infographic is available on the WOAH website.

Acknowledgements

The World Organisation for Animal Health (WOAH) would like to thank all WOAH Members, Delegates, national Focal Points and other government officials who answered the questionnaires. Without these data, the knowledge and insights presented in this report on the successes and barriers to the implementation of WOAH standards on zoning would not be possible. We also wish to thank all WOAH staff from Headquarters and the Regional and Subregional Representations who contributed to this report. We extend particular thanks to the Members of the Observatory Consultation Group and the Members of the Observatory Expert Group for their feedback and guidance during the development of this report.

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AI: avian influenza
Aquatic Code: WOAH *Aquatic Animal Health Code*
ASF: African swine fever
CBA: capacity-building activities
FMD: foot and mouth disease
HACCP: Hazard Analysis and Critical Control Point
HPAI: highly pathogenic avian influenza
PCP–FMD: Progressive Control Pathway for FMD
PVS: Performance of Veterinary Services
PVSIS: Performance of Veterinary Services Information System
SPS Agreement: WTO Agreement on the Application of Sanitary and Phytosanitary Measures
Terrestrial Code: WOAH *Terrestrial Animal Health Code*
WAHIS: World Animal Health Information System
WOAH: World Organisation for Animal Health (founded as OIE)
WTO: World Trade Organization

1. Background, relevant literature and study objectives

1.1. The concepts of zoning and compartmentalisation

Zoning and compartmentalisation are two key concepts that support animal disease control strategies and the safe trade of animals and related commodities. A '**zone**' is defined in the WOAH *Terrestrial Animal Health Code* (*Terrestrial Code*) as 'a part of a country defined by the Veterinary Authority, containing an animal population or subpopulation with a specific animal health status with respect to an infection or infestation for the purposes of international trade or disease prevention or control'.

A '**compartment**' is defined as 'an animal subpopulation contained in one or more establishments, separated from other susceptible populations by a common biosecurity management system, and with a specific animal health status with respect to one or more infections or infestations for which the necessary surveillance, biosecurity and control measures have been applied for the purposes of international trade or disease prevention and control in a country or zone' (*Terrestrial Code*). **Figure 1** visually presents these two concepts and the differences between them.

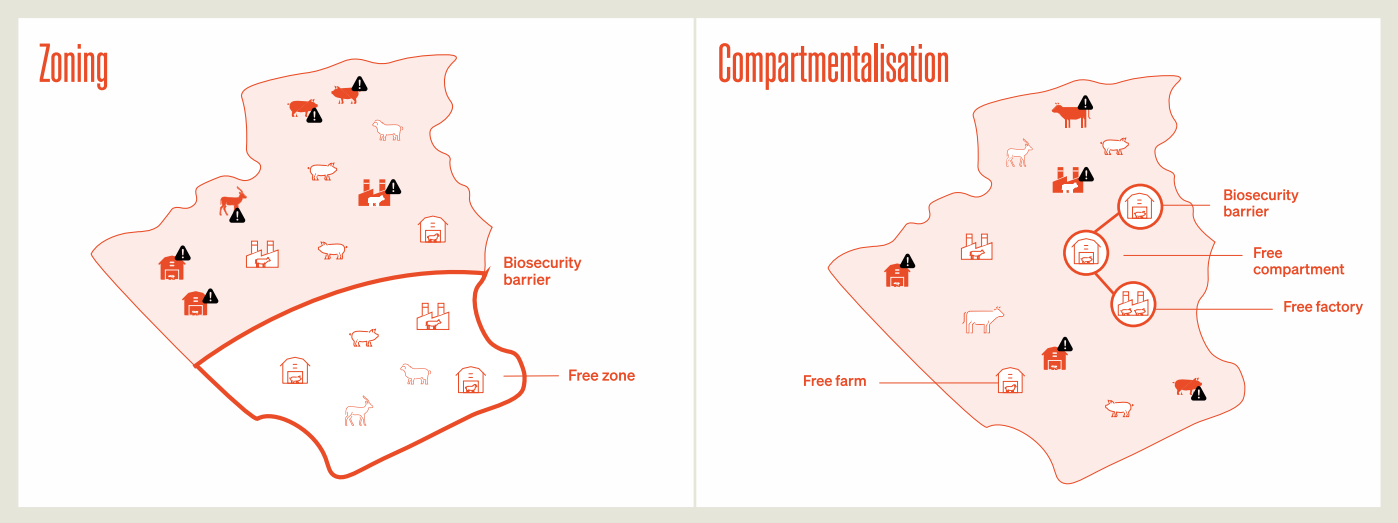

Figure 1. Visual representation of zoning and compartmentalisation

Figure 1 represents the concepts of zoning (left) and compartmentalisation (right). On the left, the white area represents a disease-free zone, which is primarily defined by its geographical limits and guaranteed by surveillance and control measures, such as control of animal movements and biosecurity measures. On the right, the white area represents a disease-free compartment, which is primarily defined by common biosecurity management and husbandry practices, alongside required surveillance and control measures.

- Biosecurity barrier
- Infected
- Disease-free
- Animals
- Premises
- Infected area
- Free area

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1.2. Purposes of using zoning and compartmentalisation

Zones can be used for many different purposes. For example, during the early stages of an event, defined in Chapter 1.1. of the *Terrestrial Code* as 'a single outbreak or a group of epidemiologically related outbreaks', Veterinary Authorities may establish zones to aid with disease investigation and response, including disease containment. This can facilitate the application of different regulations, levels of surveillance and control measures to different geographical areas. In cases of more stable epidemiological situations, such as the later stages of an outbreak, or when a disease is considered to be endemic, zones may be used for disease control purposes, such as preventing the spread of disease to disease-free areas, and/or aiding control or eradication efforts. Zones may also be established to facilitate the safe trade and movements of animals and animal products, both domestically and internationally. If it is to be used for international trade purposes, a zone must be formally recognised by the Veterinary Authority of the importing country. In addition, the Veterinary Authorities of both trading partners (exporter and importer) should agree on the sanitary measures applied to the commodities originating from the zone, based on the recommendations in the *Terrestrial Code*. Since these sanitary measures intend to mitigate the risk of introducing disease through trade, they are dependent on a zone's animal health status.

Compartmentalisation can be used by business operators to maintain the disease-free status of a subpopulation of animals in a compartment, irrespective of the health status of other animals that may be in the same geographic area, but which are outside of this compartment. If disease does occur in that geographic area, established compartments should be able to prevent disease incursion to the disease-free subpopulation while still maintaining production and trade. Veterinary Authorities may bilaterally recognise the disease-free status of compartments certified by the Veterinary Authorities of another country or territory, and pre-emptively agree to allow trade to continue from these compartments, even if the country or territory is infected by a disease and has a different disease status from that of the compartment.

Zoning and compartmentalisation can be useful tools to prevent and control diseases and facilitate trade. However, they cannot be applied in all situations. Each country or territory, as well as individual producers, should assess whether zoning or compartmentalisation are suitable for their specific circumstances. This assessment should take into account various factors, including the availability of resources, the capacity of Veterinary Services, the potential for public–private partnerships, geographic considerations, and the epidemiology of the particular disease in question.

1.3. Acceptance of zones and compartments by trading partners and trade-related aspects

The use and acceptance of zones and compartments for trade purposes can have significant impacts on trade volumes and can also mitigate the negative effects of disease outbreaks on trade. To be used for trade, zones and compartments must be recognised by trading partners. Some trading partners may automatically recognise zones that have been granted official status and recognition by WOAH (see Section 1.5 on p. 12), whereas other trading partners recognise the status of each other's zones and compartments through a bilateral process, as described in Article 4.4.8. and Chapter 5.3. of the *Terrestrial Code*.

Importantly, zoning is recognised in Article 6 of the ***World Trade Organization (WTO) Sanitary and Phytosanitary Agreement (SPS Agreement)***[1]. This article requires WTO Members to 'ensure that their sanitary and phytosanitary measures are adapted to the sanitary or phytosanitary characteristics of the area — whether all of a country, part of a country, or all or parts of several countries — from which the product originated and to which the product is destined' (Article 6, *SPS Agreement*). An analysis of historic WTO SPS notifications[2], which references WOAH as the relevant standard-setting body, found that 22% of all notifications submitted between 2005

[1] For terminology, the *SPS Agreement* uses 'disease-free area' to describe a disease-free zone and 'regionalisation' for zoning in relation to animal diseases.

[2] WTO Members can submit SPS notifications to notify their trading partners about new or modified sanitary legislation that may have a significant effect on trade.

and 2021 indicated that the new or modified legislation only targeted a specific region or zone, rather than an entire country/territory or all trading partners (*2022 Annual Report of the Observatory*). This indicates the use and importance that zones have for trade in animals and animal products. However, bilateral acceptance of zones and/or compartments between trading partners appears to be a challenge.

Despite the existence of standards and guidelines on import risk assessment and the description of WOAH procedures for the application of the *SPS Agreement*, the steps for bilateral acceptance are rarely harmonised, particularly in terms of the information required by countries for their risk assessment and final decision-making (Funes *et al.*, 2020). Owing to the scarcity of literature in this area, further research is needed to better explore the main drivers of bilateral acceptance of zones and/or compartments.

1.4. Previously identified challenges of implementing zones and compartments

Implementing zoning and compartmentalisation may not be an easy task for countries and/or territories. For instance, they may lack the human, technical and financial resources to effectively implement the measures considered prerequisite to the establishment of a zone or compartment (e.g. disease surveillance, disease reporting, diagnostic capability, vaccine efficiency, movement control). This, in turn, may prevent or complicate the implementation of zoning and/or compartmentalisation (Brückner, 2011). Long-term maintenance of zones and of the required resources can also present challenges. Some authors reported the need for a national or subnational framework to assess, organise and support the resources necessary to implement and maintain compartmentalisation (e.g. financial, human, organisational and technical resources) (Ratananakorn and Wilson, 2011).

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Training is also essential to improve public- and private-sector stakeholders' understanding of international standards and their implementation, as well as to raise awareness among farmers of basic biosecurity (Ratananakorn and Wilson, 2011). In addition, cooperation with the scientific community is often necessary. For example, a sound biosecurity plan can define the animal subpopulations that are to be contained in a compartment, and secure the epidemiological separation of a compartment subpopulation from other populations and potential sources of infection (Ratananakorn and Wilson, 2011). Gemmeke *et al.* (2008) also highlighted the need for close cooperation between Veterinary Services and scientific institutions. They reported on the necessity of established procedures for assessing and validating biosecurity plans and hygiene levels, based on the Hazard Analysis and Critical Control Point (HACCP) methodology. In addition, Mtaallah *et al.* (2022) discussed the potential contributions that epidemiology and modelling can have for zoning implementation. They developed a spatial model that identifies existing natural and artificial barriers to the movement of live animals in Tunisia, and which can target areas to fit the zoning definition. As such, these types of models can inform decision-making and pave the way to a different approach for fighting FMD.

From a political and organisational perspective, a major challenge is achieving mutual understanding and close collaboration between the competent authority and relevant stakeholders (private companies, associations, etc.). This is especially the case for compartmentalisation (Ratananakorn and Wilson, 2011). For example, in compartmentalisation, the private sector is usually responsible for setting up compartments and operating them to maintain the biosecurity of individual compartments.

On the other hand, the public sector is responsible for setting the minimum requirements (in the form of model biosecurity plans), monitoring and auditing the operating procedures, conducting international negotiations and providing the relevant health certification for commodities exported from these compartments. Mechanisms and structures should be in place to achieve effective cooperation and internal consensus among all stakeholders, as this ensures the credibility of zoning and/or compartmentalisation (Funes *et al.*, 2020). Ratananakorn and Wilson (2011) also discussed factors that may explain why some companies are reluctant to participate in the compartmentalisation process. Among others, these factors include the large investment needed in both human and financial resources, as well as the absence of a mechanism for independent evaluation of the compartmentalisation system that would lead to international or bilateral recognition.

1.5. WOAH's resources and activities to support Members in implementing zoning and compartmentalisation

WOAH has developed international standards related to zoning and compartmentalisation to support Members in preventing and controlling disease spread and to help ensure the safe trade of animals and related commodities. More specifically, the WOAH standards describe: (1) how to define and implement zoning and compartmentalisation; (2) the roles and responsibilities of the various actors and entities when setting up zones and compartments; (3) how to safely trade from free zones and compartments; and (4) how bilateral recognition of zoning and compartmentalisation can be achieved. The horizontal standards for zoning and compartmentalisation in terrestrial animals are contained in Section 4 of the *Terrestrial Code* and, more precisely, in Chapters 4.4. and 4.5., respectively. However, the implementation of zoning and compartmentalisation also requires compliance with additional horizontal standards, including those relating to 'Notification of diseases and provision of epidemiological information' (Chapter 1.1.); 'Animal health surveillance' (Chapter 1.4.); 'Surveillance for arthropod vectors of animal diseases' (Chapter 1.5.) where appropriate; 'Quality of Veterinary Services' (Chapter 3.2.); 'Evaluation of Veterinary Services' (Chapter 3.3.); 'Veterinary Legislation' (Chapter 3.4.); 'General principles on identification and traceability of live animals' (Chapter 4.2.); and 'Design and implementation of identification systems to achieve animal traceability' (Chapter 4.3.).

In addition to these standards, WOAH has developed a checklist for the practical application of compartmentalisation[3], which provides more detailed guidance on its implementation. It has also produced guidelines on the use of compartmentalisation for specific diseases: the 'Checklist on the practical application of compartmentalisation for avian influenza and Newcastle disease'[4] and 'Compartmentalisation Guidelines – African Swine Fever'[5].

Moreover, WOAH provides procedures for its Members to acquire and maintain official recognition of the animal health status of their entire territory or zone(s) for six WOAH-listed diseases (FMD, contagious bovine pleuropneumonia, peste des petits ruminants, African horse sickness, classical swine fever and bovine spongiform encephalopathy). This procedure does not include the recognition of compartments. For other diseases, WOAH publishes self-declarations of animal disease freedom in a specific country, zone(s) or compartment(s).

WOAH has previously conducted primary research in consultation with its Members to better understand how zoning and compartmentalisation are being implemented and used (Kahn and Muzio Llado, 2014; Thiermann, 2008).

[3] Checklist on the Practical Application of Compartmentalisation (2012), available at: https://www.woah.org/app/uploads/2021/03/a-cmp-checklist-1.pdf

[4] Checklist on the practical application of compartmentalisation for avian influenza and Newcastle disease (2007), available at: https://www.woah.org/app/uploads/2021/03/en-final-compartmentalisation-ai-nd-10-05-2007.pdf

[5] Compartmentalisation Guidelines – African Swine Fever (2021), available at: https://www.woah.org/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/ASF/ASF-CompartmentalisationGuidelines_EN.pdf

More recently, the WOAH Observatory (**Box 1**) has conducted activities on zoning and compartmentalisation. In its 2022 report, it identified critical issues related to zones and compartments, such as the limited use of zoning and compartmentalisation by WOAH Members; lack of or inconsistencies in reporting related to zoning and compartmentalisation; the absence of other control measures such as movement control necessary for effective zoning implementation; likely lack of understanding of the concepts; and the low capacity of Veterinary Services regarding zoning and compartmentalisation, as assessed in Performance of Veterinary Services (PVS) reports.

Box 1. The Observatory: a data-driven programme to monitor the implementation of WOAH standards

Developing international standards for animal health and welfare based on the latest scientific information lies at the heart of WOAH's mandate. When Members vote for the adoption of these standards at the WOAH Annual General Session, they are expected to translate them into their national legislation. The implementation of WOAH standards at country level can involve challenges, such as a lack of financial and human resources or the relevant infrastructure. The extent to which they are put into practice remains unclear. A new transversal programme, the Observatory, was established in 2018 to provide insights into the uptake of international standards on animal health and welfare and veterinary public health by Members. The Observatory contributes to the progressive improvement of standard implementation as well as the constant assessment of WOAH's corporate initiatives by providing valuable feedback and recommendations.

Given the major importance of zoning and compartmentalisation, both for disease control and trade purposes, and the limited information available in literature, it is crucial to further investigate the use of these two concepts by WOAH Members. To that end, the WOAH Observatory has chosen to dedicate its first thematic study (**Box 2**) to zoning and compartmentalisation.

Box 2. The Observatory: thematic studies

The Observatory produces two kinds of deliverables: (1) an overall monitoring report, produced regularly and presenting a systematic overview of the implementation of a broad selection of WOAH standards worldwide; and (2) thematic studies. Each thematic study focuses on a different priority topic for WOAH and its Members, such as a particular disease, standard or topic of interest. The thematic studies collect and use new data to provide a more detailed understanding of the implementation level of one or more standards. Above all, the thematic studies explore the challenges Members may face when implementing these standards. This allows WOAH to identify specific Member needs and propose targeted recommendations to meet them.

The purpose of this report is to present descriptive results for the first part of this thematic study dedicated to zoning and compartmentalisation. In this first phase, the WOAH Observatory conducted a survey to assess the use of zoning for AI, ASF and FMD, as well as the associated challenges, benefits and drawbacks. Given the extensive outbreaks these diseases can cause, as well as their severe consequences on trade, these three diseases are of major interest to countries/territories, and there is significant value in using zoning to control them.

This analysis lays the foundation for further analysis to explore correlations and factors influencing the use of zoning, the level of uptake of WOAH standards, the challenges experienced, and more. In addition, a second phase of this study will be launched shortly, and will explore the use, benefits and challenges of implementing compartmentalisation for AI. Data on compartmentalisation will be collected from both Veterinary Authorities and the private sector, using written questionnaires, interviews and/or focus groups.

2. Approach and methodology

2.1. Study design

The study was conducted using a questionnaire-based approach. Three separate questionnaires were designed to address the topic for each of the three selected diseases (AI, ASF, FMD). The target respondents were staff from the Veterinary Services of all WOAH Members. Each country/territory was invited to complete one questionnaire for each disease.

The three questionnaires (available here) could be completed independently and were similarly structured in six sections, aiming to:

- investigate to what extent zoning is used within countries/territories and for what purposes (section A);
- assess to what extent WOAH standards on the use of zoning are integrated into national policies and regulations (section B);
- explore potential barriers to the use of zoning (section C);
- assess the positive and negative consequences of using zoning (section D);
- investigate how countries/territories consider zoning when defining their import procedures (section E);
- collect general information about the responding country/territory (section F).

Each questionnaire was composed of 43 questions. However, depending on the logical structure of the questionnaire and the answers provided to previous questions, not all respondents were required to answer all questions. Survey questions were mainly presented in closed-ended format (single-answer multiple-choice questions, multiple-answer multiple-choice questions, Likert scale questions, matrix questions, etc.) to increase the comparability of respondent answers. However, several free-text fields were provided to allow respondents to elaborate on their answers. The estimated time to complete each questionnaire was 45 minutes.

The questionnaires on AI and ASF covered all types of zones. However, the FMD questionnaire focused on FMD-free zones that were officially recognised by WOAH. To gather the most recent information available, the three questionnaires covered the period from 2018 to 2022.

2.2. Data collection

The three questionnaires were developed using Survey Monkey® software[6] and were made available in the three WOAH official languages (English, French and Spanish). The links to these questionnaires, as well as the PDF and Word copies (to facilitate coordination and data collection within countries), were emailed to all 183 WOAH Delegates. Responses were collected between 30 May 2023 and 4 September 2023.

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[6] https://www.surveymonkey.com/

2.3. Data analysis

Data were first cleaned: duplicates were handled (e.g. by contacting the countries concerned and clarifying each duplicate case with them) and inconsistent data were consolidated. For the latter, data were cross-referenced with existing data sets. For example, the WOAH data set on official statuses attributed to Members was used to clean responses about FMD official status and zones.

The most meaningful indicators[7] were then identified and respondent answers were quantitatively described, mainly in the form of percentage distributions. The indicator results were interpreted according to the disease being considered, while also accounting for data limitations. In particular, certain percentage results required careful interpretation as they were based on a small number of respondents (e.g. the number of Members reporting the use of zones officially recognised as free from FMD). Other limitations were related to the data collection method itself. Potential survey biases have been highlighted throughout the report, where relevant.

Moreover, to understand the extent to which zoning was used among affected Members, responses on the use of zoning were cross-referenced with existing data sets about Members' circumstances regarding each of the three diseases. This information was taken and assessed from WAHIS six-monthly reports and the immediate notifications of the occurrence of these three diseases. For AI, only situations of HPAI were considered.

This report presents a preliminary and descriptive analysis only. It presents a vertical analysis of survey data, i.e. the study of all answers for each survey question, thus capturing the diversity of situations possible for a single question. A more in-depth analysis will be performed at a later stage and will include a horizontal analysis, i.e. the study of the same respondent's answers to the survey questions. This will enable the creation of a typical respondent profile, considering a Member's overall situation in relation to all the aspects of the topic addressed.

Moreover, further work will include a comparative analysis, with the second part of the thematic study dedicated to the use of compartmentalisation.

Box 3. How to read this report

This report consists of four sections. The results of the survey are presented in the third section, with subsections corresponding to the questionnaire sections. For each of the subsections, a note indicates whether all respondents have been considered in the analysis. In the graphs, when disease-specific information is presented, AI-related data are in blue, ASF-related data in orange and FMD-related data in grey. When percentages or means have been calculated, the denominators are explained in the captions. As some questions were multiple choice, where more than one option could be selected, the sum of the percentages may equal more than 100%.

The main outcomes are highlighted in bigger and bolder font.

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[7] A statistical indicator is the representation of statistical data for a specified time, place or any other relevant characteristic, corrected for at least one dimension (usually sample size), to allow for meaningful comparisons. It is a summary measure related to a key issue or phenomenon and derived from a series of observed facts. Indicators can be used to reveal relative positions or show positive or negative changes. Indicators can help set targets and monitor their achievement; they can inform policies, guidelines and activities, among other things. By themselves, indicators do not necessarily contain all aspects of development or change, but they contribute greatly to explaining them. Indicators allow for comparisons over time between, for example, countries and regions. In this way, they assist in gathering evidence for decision making [definition derived from the EU glossary].

3. Survey analysis and discussion

3.1. Study sample

Among the 183 Members contacted, 119 (65%) completed at least one of the three questionnaires, and 86 Members (47%) completed all three. More precisely, the questionnaires were completed by 109, 92 and 103 out of the 183 contacted Members for AI, ASF and FMD, respectively.

This resulted in respective response rates of 60%, 50% and 56%. Detailed results per disease and WOAH region are available in **Table 1**. The highest response rates for each disease were found in the Americas region. Most likely as a result of limited pig production in the Middle East, no country from this region answered the survey on ASF.

Table 1. Number of respondents per WOAH region and per questionnaire and associated response rate

Region	Avian influenza	African swine fever	Foot and mouth disease
Africa (*n*=53 Members)	21 (40%)	14 (26%)	21 (40%)
Americas (*n*=32 Members)	22 (69%)	23 (72%)	22 (69%)
Asia-Pacific (*n*=34 Members)	23 (68%)	22 (65%)	22 (65%)
Europe (*n*=52 Members)	35 (67%)	33 (63%)	31 (60%)
Middle East (*n*=12 Members)	8 (67%)	0 (0%)	7 (58%)
Total (*n*=183 Members)	109 (60%)	92 (50%)	103 (56%)

3.2. Use and objectives of zoning in Members

Please note that this section of the questionnaire was intended to be completed by all respondents.

a) Use of zoning

Among the 119 respondents, 75 (63%) reported having used zoning for at least one disease. More precisely, 54 (i.e. 50% of the respondents), 25 (27%) and 24 (23%) indicated having established and practically implemented zones over the period 2018–2022 in relation to AI, ASF and FMD, respectively (Figure 2). This percentage varied depending on the region under consideration, with the highest percentage being found in Europe for AI.

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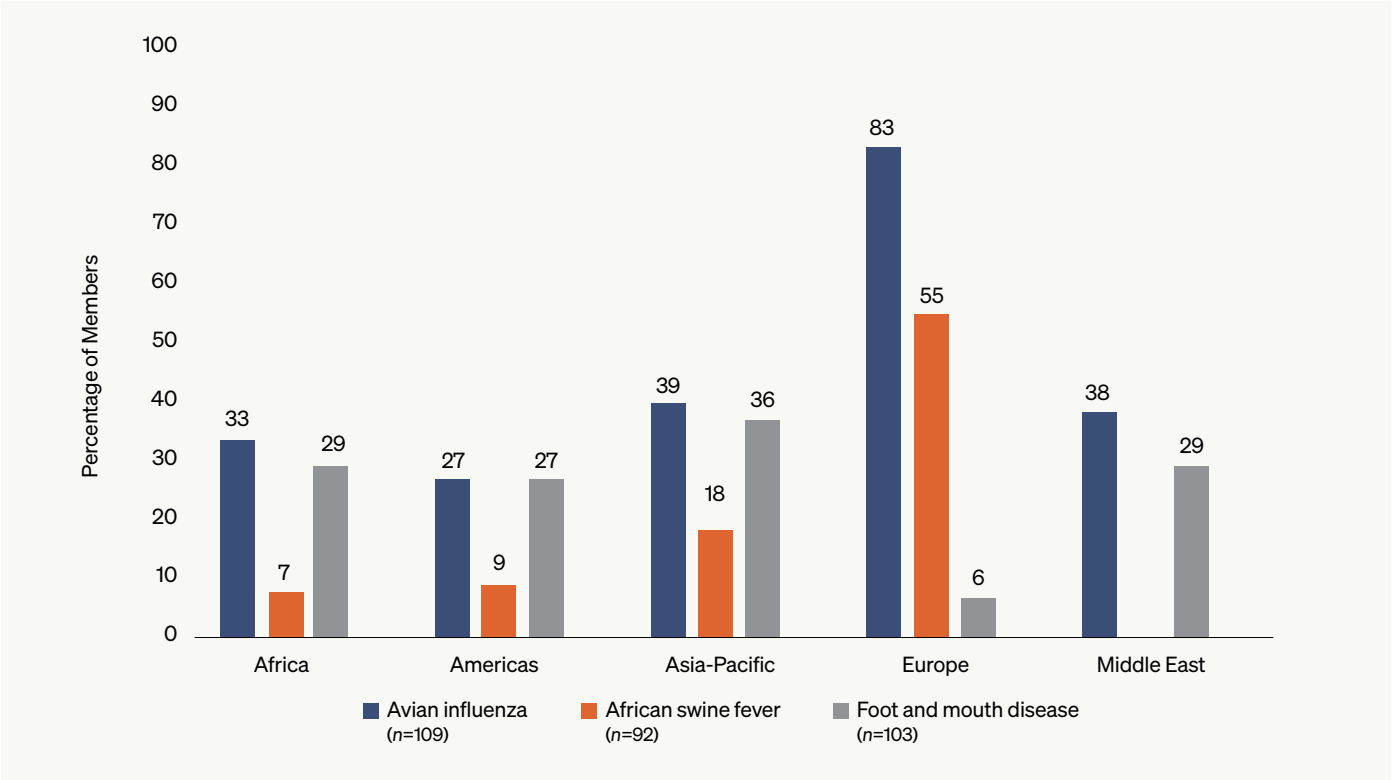

Figure 2. Percentage distribution of Members reporting having established and practically implemented zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey) over the period 2022–2018, presented by WOAH region

Percentages were calculated based on the total number of responding Members for each of the three diseases and in each of the five WOAH regions

Among the 86 Members who completed all three questionnaires, 30 (i.e. 35%) advised they did not use zoning for any of the diseases.

Three (3%) reported having used zoning for all three diseases. The other combinations are presented in **Table 2.**

Table 2. Distribution in number and percentage (in brackets) of Members using zoning for more than one of the three diseases, presented by disease combination, among Members who completed the three questionnaires

Percentages were calculated based on the total number of Members who completed all three questionnaires

Members using zoning for:	Avian influenza	African swine fever	Foot and mouth disease
Avian influenza	21 (24%)	15 (17%)	4 (5%)
African swine fever	-	4 (5%)	0 (0%)
Foot and mouth disease	-	-	9 (10%)

These percentages should be interpreted in line with the number of Members being affected by the disease. Among the 109 Members who answered the AI-related questionnaire, 55 reported the presence or suspicion of HPAI in poultry over the period 2018–2022 (data from WAHIS six-monthly reports and immediate notifications). **Among these 55 AI-affected Members, 70% reported having used zoning for AI (38 Members).** This figure was lower for ASF and FMD: **among the 33 Members who were affected by ASF in domestic or wild animals over the period 2018–2022 and answered the ASF-related questionnaire, 55% reported using zoning for ASF over the same period (18 Members).** Among the 36 Members who were affected by FMD in domestic or wild animals over the period 2018–2022 and answered the FMD-related questionnaire, **50% reported the use of zoning for FMD over the same period (18 Members).** These figures look similar to the global percentage of affected Members who have reported using zoning in WAHIS six-monthly reports (**Table 3**), showing good representativity of the sample under consideration in the present survey.

Table 3. Percentage of affected Members reporting the use of zones, calculated by cross-referencing survey data with existing data sets related to disease situation (left column), or using data from WAHIS six-monthly reports and immediate notifications only (right column)

Disease	Percentage of affected Members reporting the use of zones for the same disease over the same period in the questionnaire[8]	Percentage of affected Members reporting the use of zones for the same disease over the same period in WAHIS six-monthly reports[9]
Avian influenza	70%	77%
African swine fever	55%	58%
Foot and mouth disease	50%	41%

Among the 55 Members who reported not having established or practically implemented zones for AI, 29 (53%) indicated that they plan to do so in the future. This figure was found to be higher for ASF (40 Members, i.e. 60%) and for FMD (55 Members, i.e. 70%).

Among the Members who reported no plan to establish zones in the future, the main reason cited by the respondents was that their country/territory did not have enough capacity to implement zoning **(Figure 3)** (e.g. 38% of Members not planning to use zoning for FMD). The irrelevance of zoning for the country/territory was also mentioned by many respondents (e.g. 35% of Members not planning to use zoning for AI).

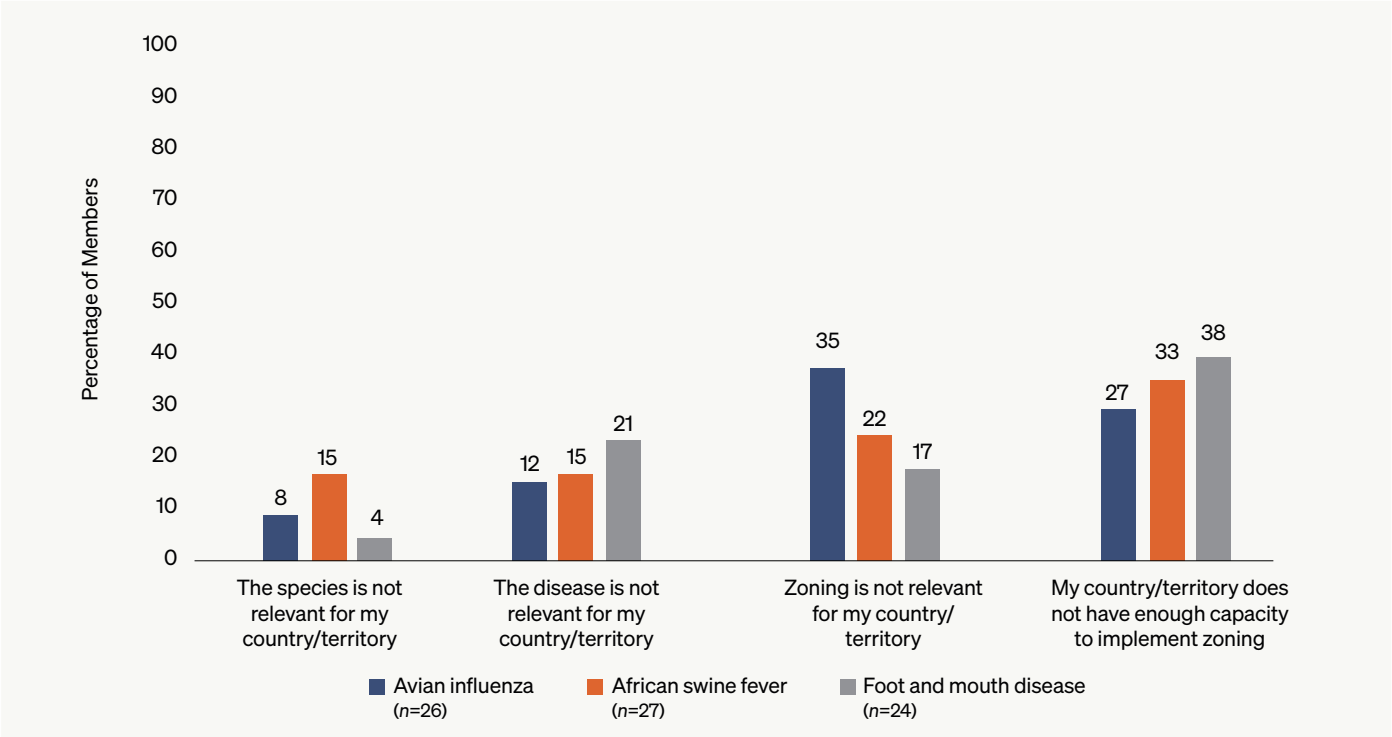

Figure 3. Percentage distribution of Members according to the reason(s) they do not plan to establish zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)

Percentages were calculated based on the total number of Members who reported no plan to establish zones in the future for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

[8] This percentage was calculated by cross-referencing survey data with existing data related to the country or territory's disease situation (from WAHIS six-monthly reports and immediate notifications) as follows: number of Members reporting the use of zones for a given disease over the period 2018–2022 **in the questionnaire**, among those answering the questionnaire AND reporting the presence or suspicion of the same disease over the same period in WAHIS six-monthly reports or through immediate notifications.

[9] This percentage was calculated by using data from WAHIS six-monthly reports and immediate notifications only, as follows: number of Members reporting the use of zones for a given disease over the period 2018–2022 **in WAHIS six-monthly reports,** among those reporting the presence or suspicion of the same disease over the same period in WAHIS six-monthly reports or through immediate notifications.

b) Objectives of using zoning

Most Members using zones or planning to use zones reported that zoning was/would be mainly used as a response to an outbreak in their country (**Figure 4**). For instance, 92% of Members indicated that they used/would use zoning as a response to a domestic AI outbreak.

The second most common objective reported by Members was securing international trade of live animals and animal products. Differences between diseases are evident, e.g. the use of zones as a response to an outbreak in a neighbouring country was reported more often for ASF than for other diseases. More details are available in **Figure 4**.

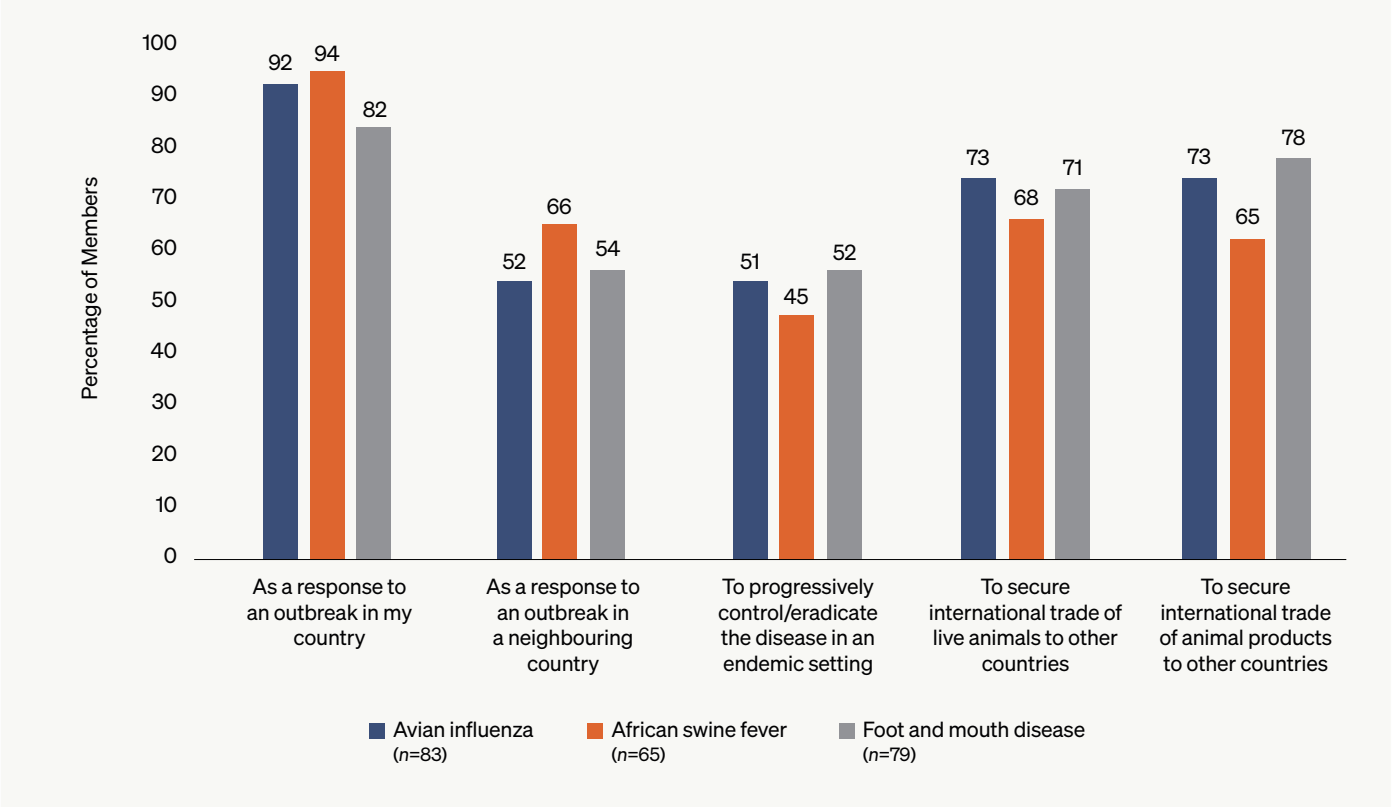

Figure 4. Percentage distribution of Members according to the purpose(s) for establishing zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

c) Types of zones

Figure 5, **Figure 6** and **Figure 7** show the type of zones Members use or would use in relation to AI, ASF and FMD, respectively. Infected, free and protection zones are implemented by approximately half of those Members using zones for AI and ASF, whereas containment zones appear to be less frequently used for the same two diseases. As for FMD, those most frequently used are FMD-free zones with vaccination. Around a third of Members who have established FMD-related zones have obtained WOAH recognition, either for FMD-free zones without vaccination (38%) or for FMD-free zones with vaccination (25%).

Interestingly, 20% and 25% of Members (without or with vaccination, respectively) planning to use FMD zones in future reported that they would implement FMD-free zones without official recognition from WOAH. It would be useful to explore this more fully and understan thed whether this relates to a zoning approach aiming at progressively controlling FMD (first targeting a zone nationally considered as free from the disease and then having it recognised as officially FMD-free by WOAH, as suggested by the Progressive Control Pathway for FMD [PCP–FMD]), or whether there are any factors that prevent those Members from considering establishing zones for official recognition by WOAH. Further analysis on this point is recommended.

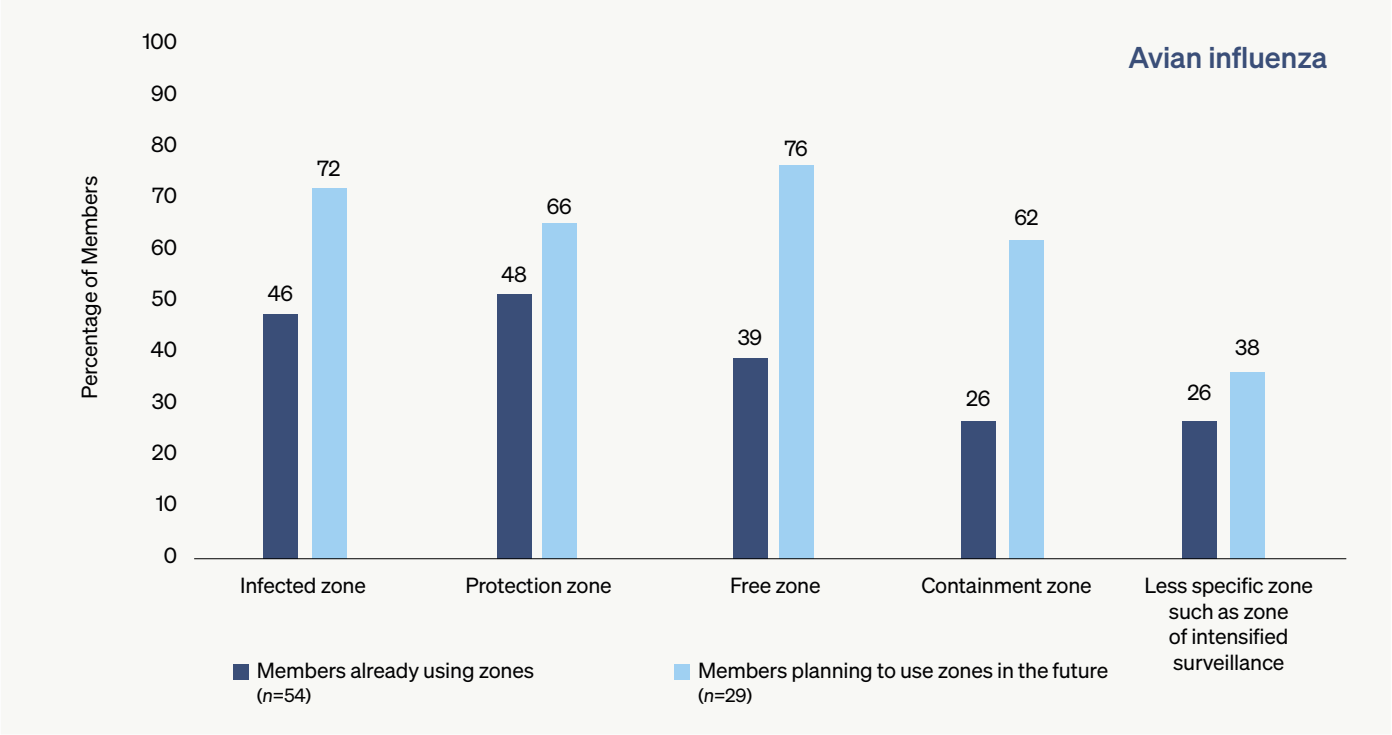

Figure 5. Percentage distribution of Members according to the type(s) of zone(s) established for avian influenza. Members who have implemented zones are shown by the dark areas, and Members planning to implement zones by the light areas

Percentages were calculated based on the total number of Members who reported using zones for avian influenza and the total number of Members who reported planning to use zones in the future. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

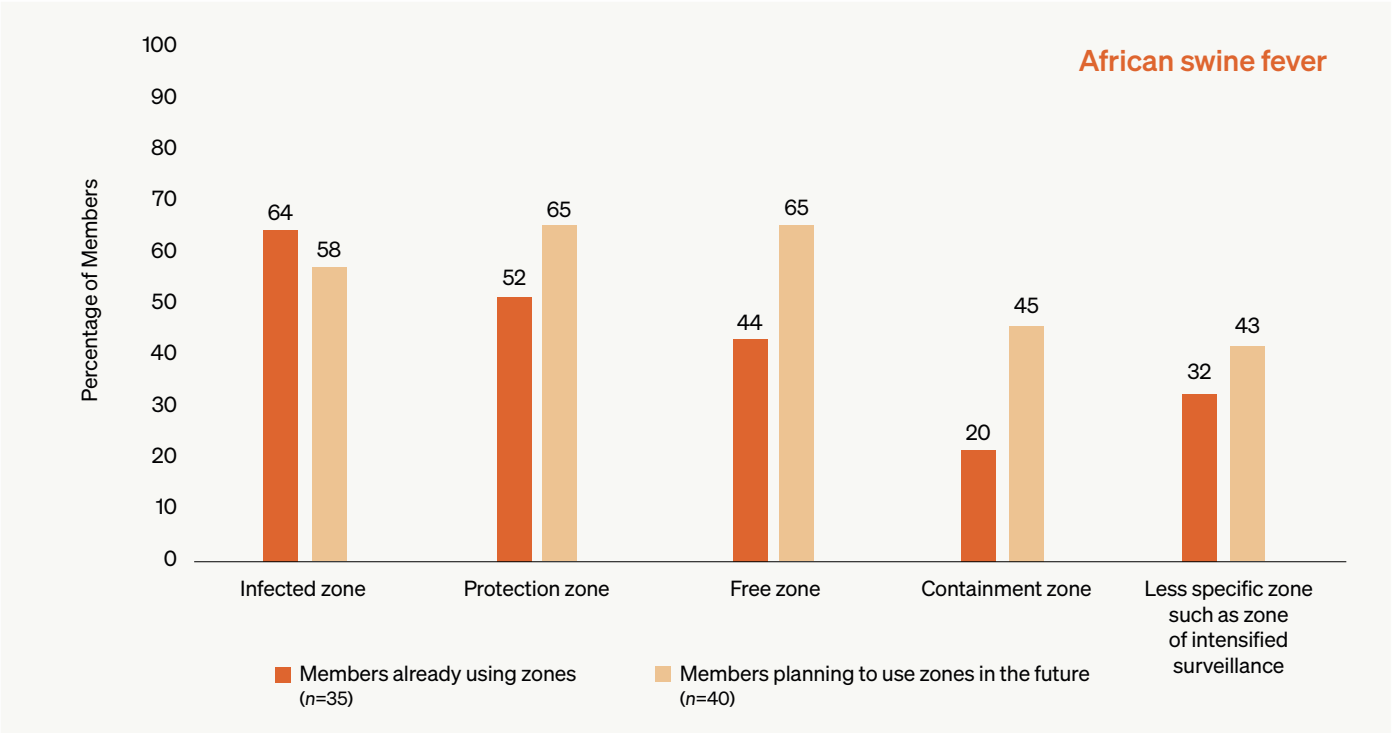

Figure 6. Percentage distribution of Members according to the type(s) of zone(s) established for African swine fever. Members who have implemented zones are shown by the dark areas and Members planning to implement zones by the light areas

Percentages were calculated based on the total number of Members who reported using zones for African swine fever and the total number of Members who reported planning to use zones in the future. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

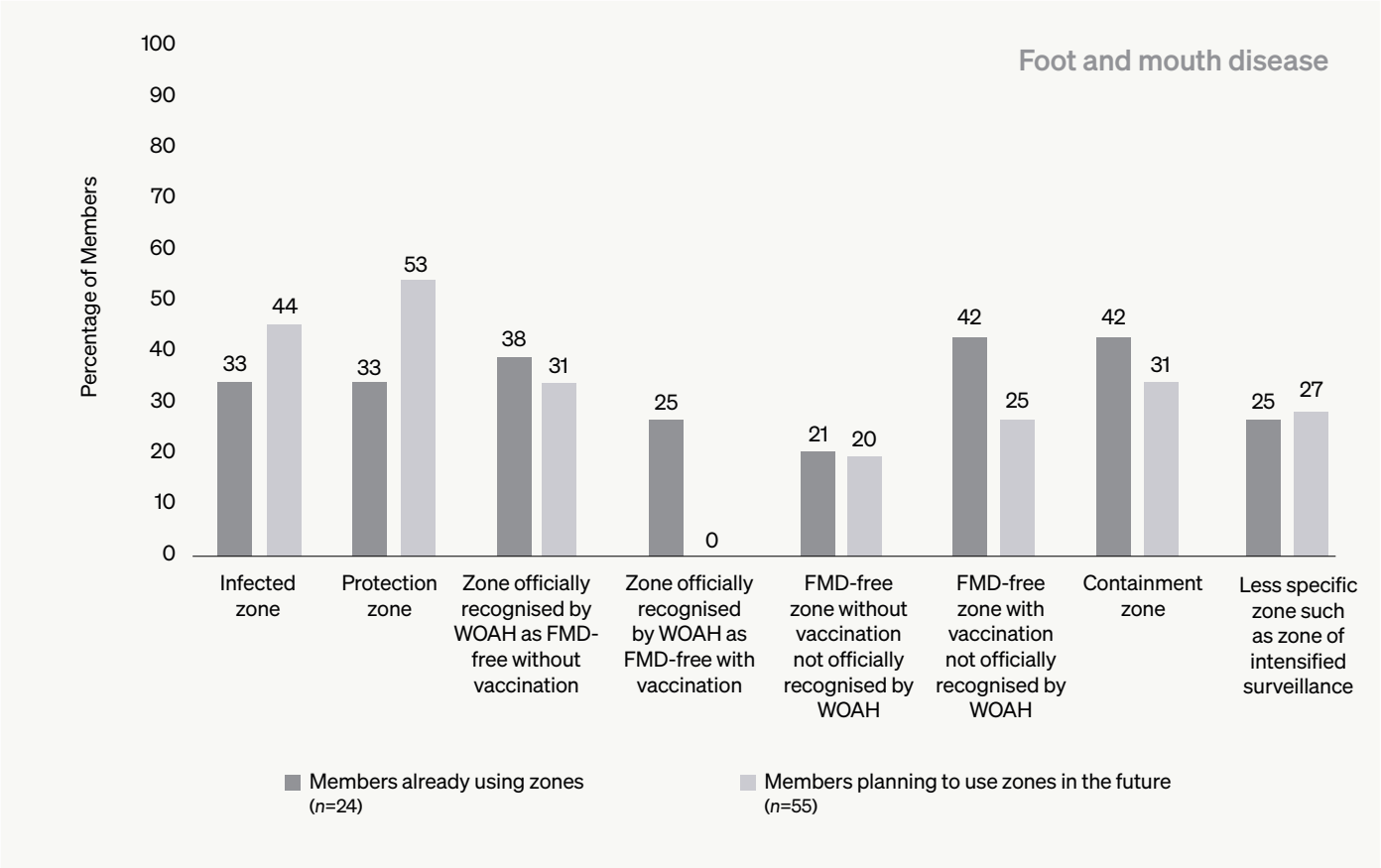

Figure 7. Percentage distribution of Members according to the type(s) of zone(s) established for foot and mouth disease. Members who have implemented zones are shown by the dark areas, and Members planning to implement zones by the light areas

Percentages were calculated based on the total number of Members who reported using zones for foot and mouth disease and the total number of Members who reported planning to use zones in the future. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

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d) Contingency plans

Among the Members who answered the AI-related questionnaire, 77% noted that zoning was included in their AI-specific contingency plan. This figure was found to be slightly lower for ASF (72%) and FMD (73%). Detailed results presented in **Figure 8** also show that 8% of Members who used zones for FMD reported not having a contingency plan for this disease, while 4% reported having a contingency plan which did not include zoning as a measure. It must be stressed here that a contingency plan is of major importance for the establishment of zones, especially when it comes to zones officially recognised by WOAH.

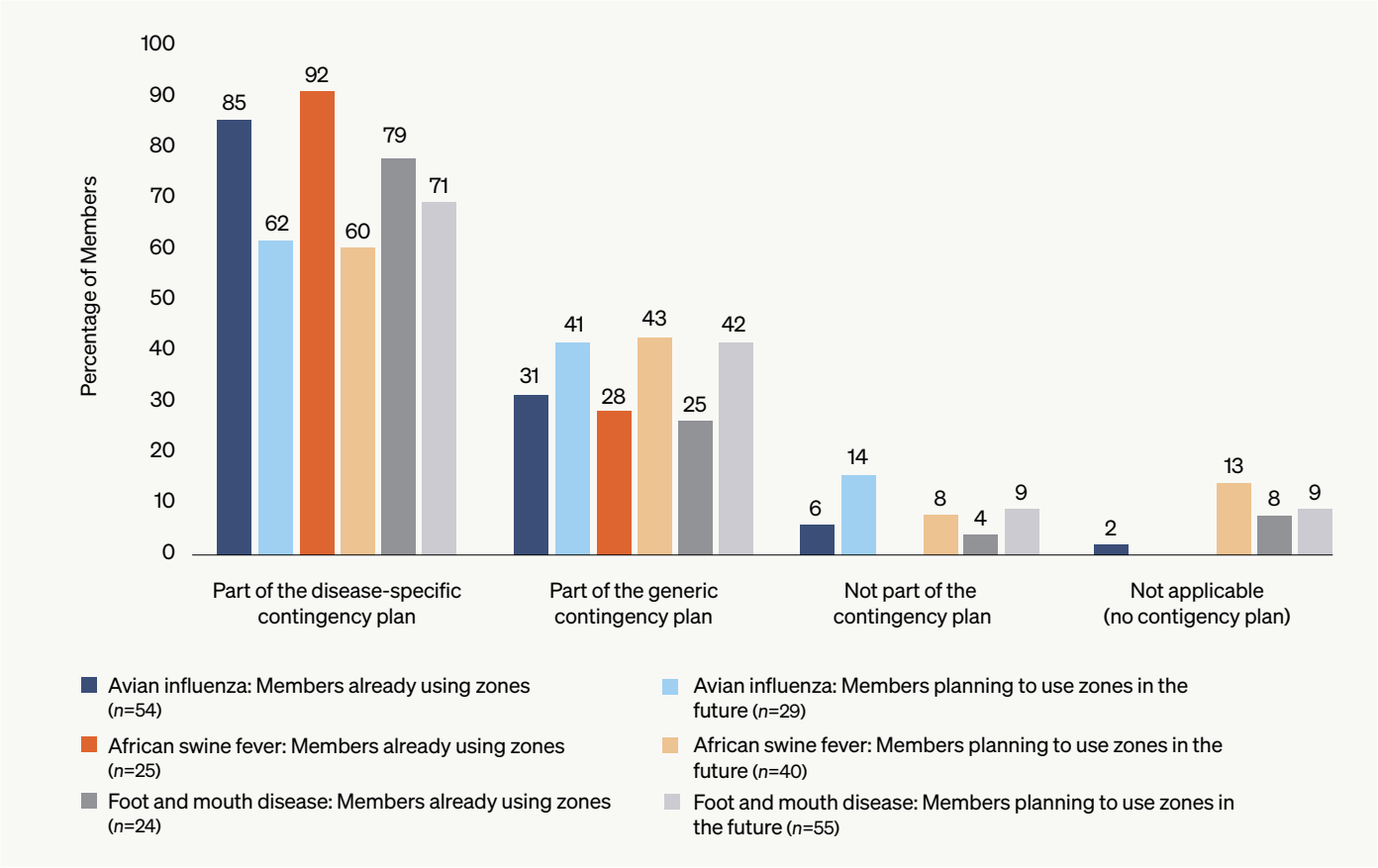

Figure 8. Percentage distribution of Members according to the inclusion of zoning in their contingency plan for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey). Members who have implemented zones are shown by the dark areas, and Members planning to implement zones by the light areas

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

3.3. Integration of WOAH zoning standards into Members' regulatory frameworks and practices

Please note that this section of the questionnaire was only intended to be completed by Members who had implemented zones over the period 2018–2022 or were planning to implement zones in future.

As shown in **Figure 9**, 70% of Members using zones for AI, ASF and/or FMD reported completely integrating WOAH zoning standards into their legislation, regulations and policies. This figure is slightly lower when it comes to standard integration into programmes, guidelines and practices (63%). Consequently, this means that 27% of Members using zoning reported no or only partial integration of WOAH standards into their regulatory framework. Similarly, 34% of Members who used zoning reported no or only partial integration of WOAH standards into their practices. Detailed results per disease and for current/future use of zoning are available in **Figure 10** and **Figure 11**.

It is worrying to note that one Member (i.e. 4%) who was using zones for ASF reported having no regulatory framework at all to support the use of zoning. It is also worth highlighting the fact that a large percentage of Members who plan to implement zones in the future have not included or have only partially included WOAH standards into their regulatory framework (e.g. 38% of Members planning to implement AI zones) or practices (35% of the same Members), so far.

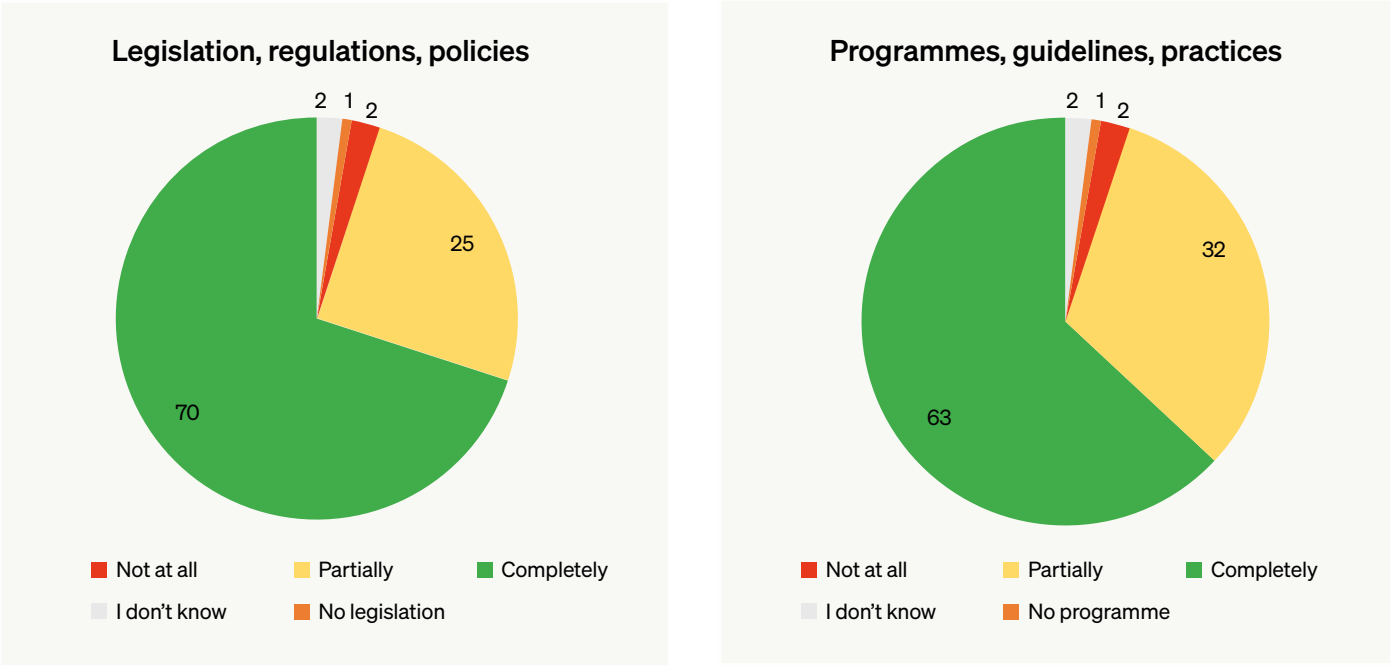

Figure 9. Percentage distribution of Members according to their level of integration of WOAH standards on zoning into their legislation, regulation and policies (left) and programmes, guidelines and practices (right) for Members using zones, all diseases considered

Percentages were calculated based on the total number of Members who reported using zones, with all diseases considered. These figures were derived from a question to which only one answer could be given

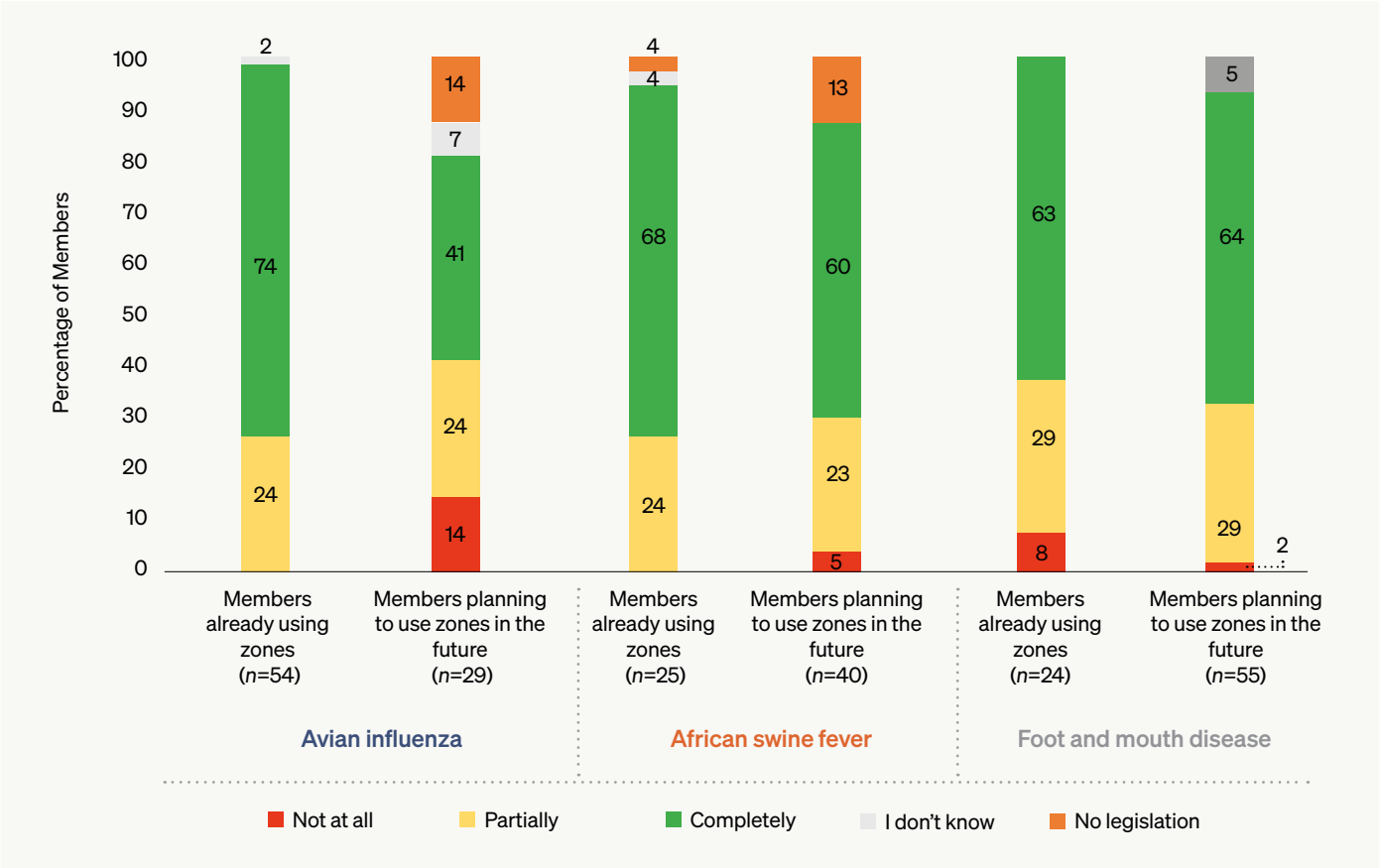

Figure 10. Percentage distribution of Members according to the level of integration of WOAH zoning standards into their legislation, regulation and policies for avian influenza, African swine fever and foot and mouth disease, for Members with zones and Members planning to implement zones

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which only one answer could be given

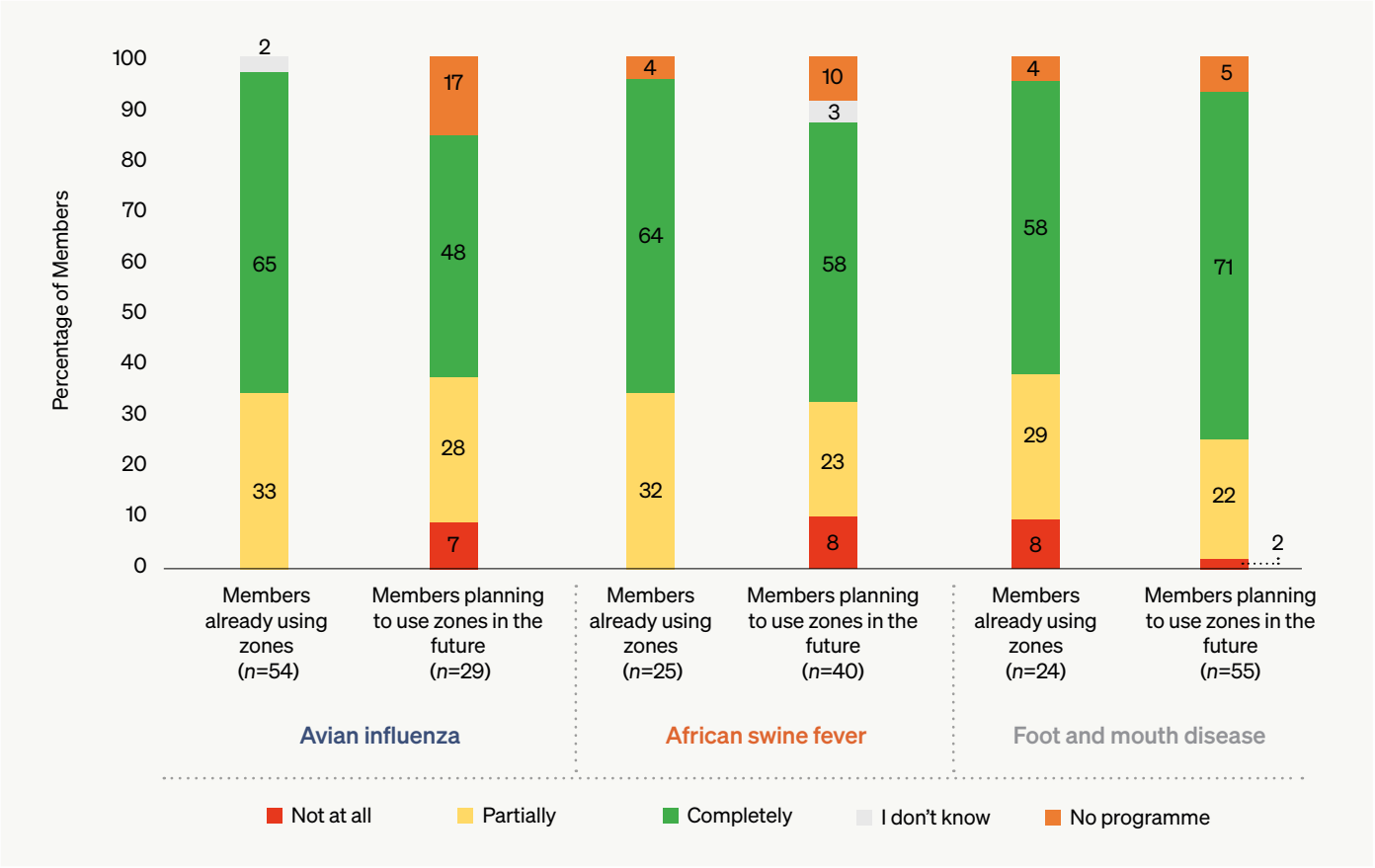

Figure 11. Percentage distribution of Members according to the level of integration of WOAH zoning standards into their programmes, guidelines and practices for avian influenza, African swine fever and foot and mouth disease, for Members with zones and Members planning to implement zones

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which only one answer could be given

Figure 12, Figure 13 and **Figure 14** present the results to the questions about the requirements for zone definition, establishment and maintenance. All Members reported having defined the boundaries of zones, irrespective of the disease. **Most Members defined zones based on legal boundaries,** although natural and artificial boundaries were used to a lesser extent (**Figure 12**). Members using zones generally appeared to apply surveillance measures (94% of Members implementing AI zones, 92% for ASF zones, 79% for FMD zones). However, measures related to epidemiological separation between subpopulations and biosecurity requirements were implemented to a lesser extent (87% of Members implementing AI zones, 80% for ASF zones, 83% for FMD zones) (**Figure 13**). **Figure 14** also shows interesting results in terms of identification and traceability: over 90% of Members using zones reported having a system in place to control movements of live animals, but **animal identification systems, traceability systems for animal products and systems to control movements of animal products appeared less often (e.g. only 70%, 72% and 81% of Members implemented these three measures for AI-related zones**). It is worth emphasising that these measures constitute important requirements that must be in place before considering establishing zones.

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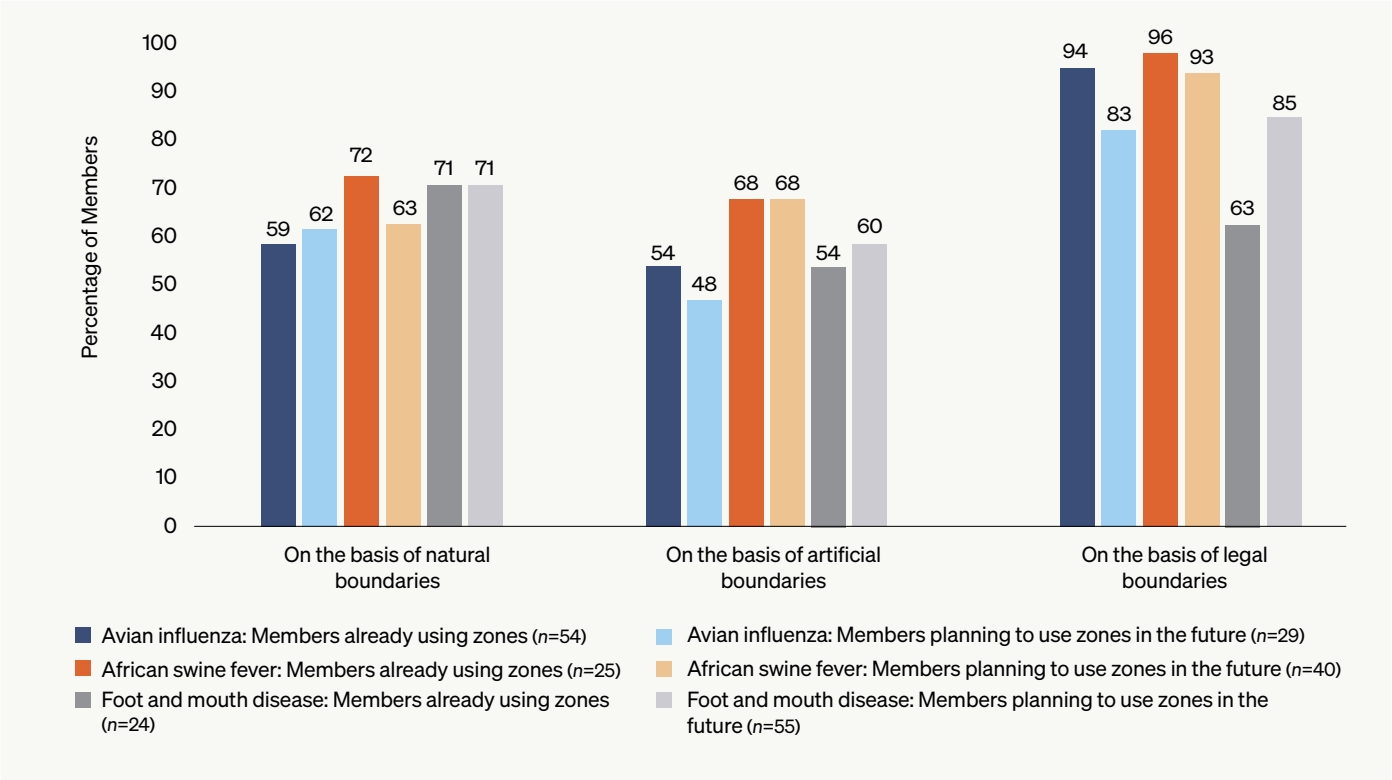

Figure 12. Percentage distribution of Members according to their definition of zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey) for Members with zones (dark areas) and Members planning to implement zones (light areas)

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

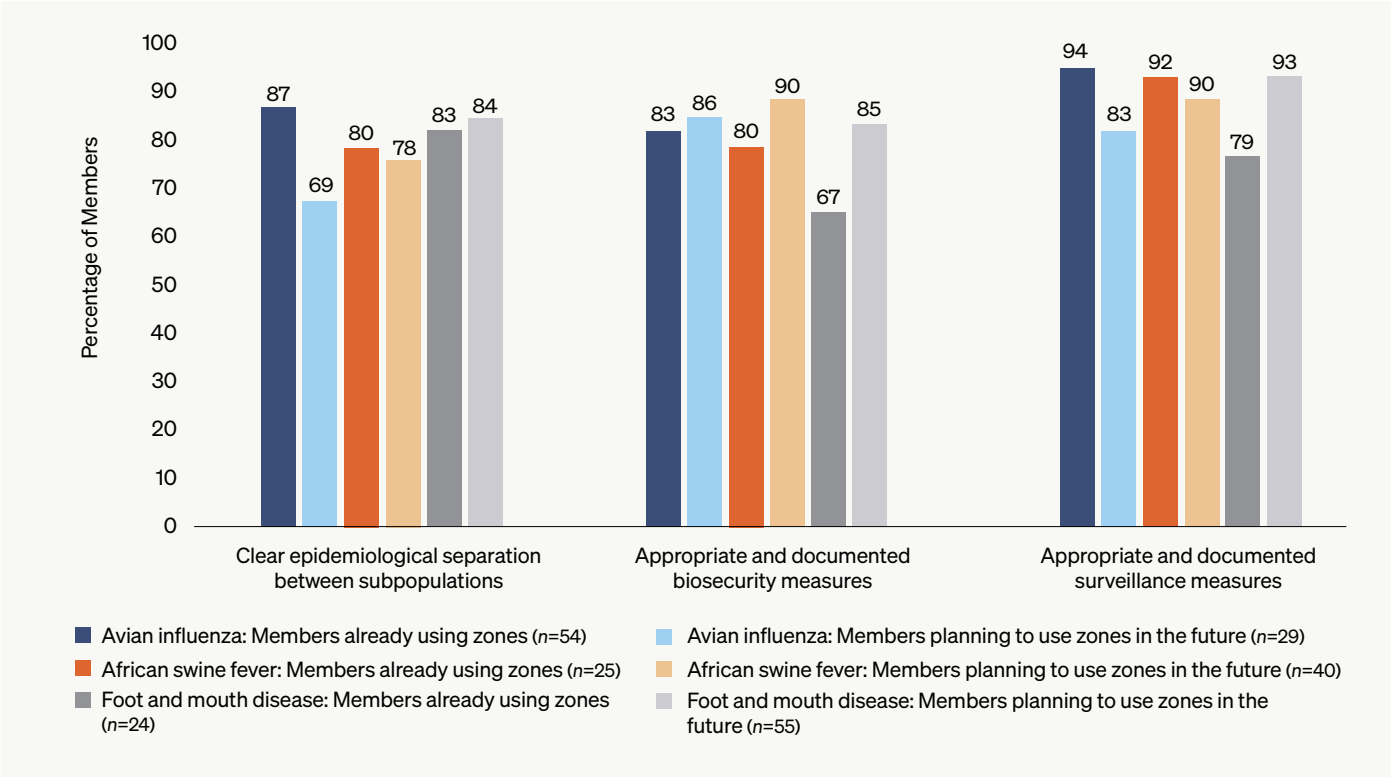

Figure 13. Percentage distribution of Members according to measures taken to establish and maintain zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey) for Members with zones (dark areas) and Members planning to implement zones (light areas)

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

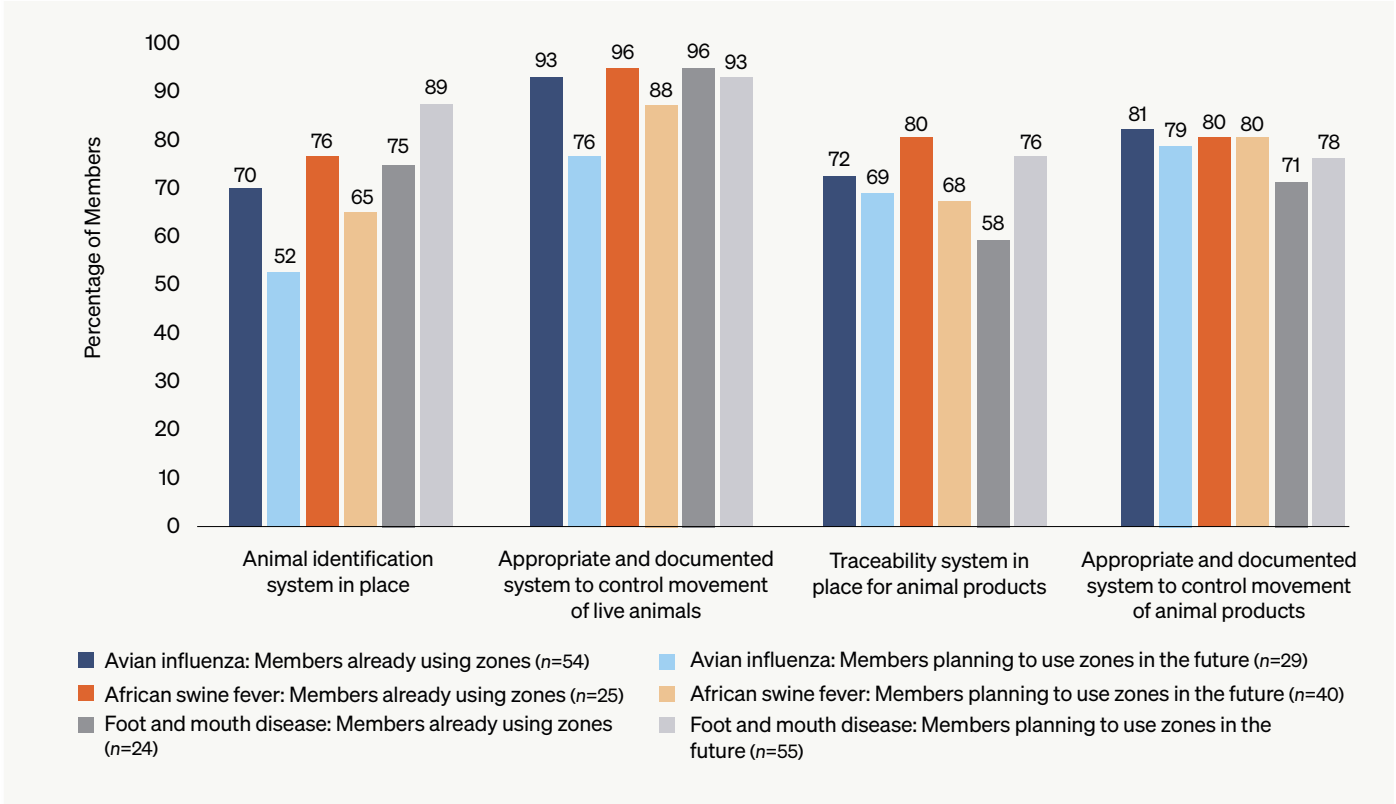

Figure 14. Percentage distribution of Members according to measures taken to guarantee identification and traceability for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey) for Members with zones (dark areas) and Members planning to implement zones (light areas)

Percentages were calculated based on the total number of Members who reported using zones and the total number of Members who reported planning to use zones in the future, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

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3.4. Challenges of using zoning

Please note that this section was only intended to be completed by Members who had implemented zones over the period 2018–2022. For AI and ASF, all kinds of zones were considered whereas, for FMD, only zones that were officially recognised by WOAH as FMD-free were addressed in the questions. This represents a small number of Members (11). For this reason, percentages related to FMD responses should be interpreted carefully. Nevertheless, these 11 responding Members represent 85% of all those WOAH Members who have zones officially recognised by WOAH as FMD-free zones. The conclusions drawn from this sample can thus be safely extrapolated to all Members who have zones officially recognised by WOAH as FMD-free zones.

Figure 15 shows the average scores given by respondents to the challenges they may face when implementing zones, on a scale ranging from 1 (not severe at all) to 4 (very severe). When all diseases were considered, average scores ranged from 1.6 to 2.8. The top five challenges for zone implementation appeared to be: staffing of Veterinary Services (average score 2.8); enforcement of biosecurity requirements (2.7); laboratory diagnosis (2.5); animal identification, traceability and control of domestic movements (2.4); and political support (2.3).

Other challenges were given a lower but still significant score and should be considered for further recommendations. When evaluating the results by disease (Figure 16), the reported challenges faced for the implementation of ASF zones appeared more severe than those for AI and FMD zones.

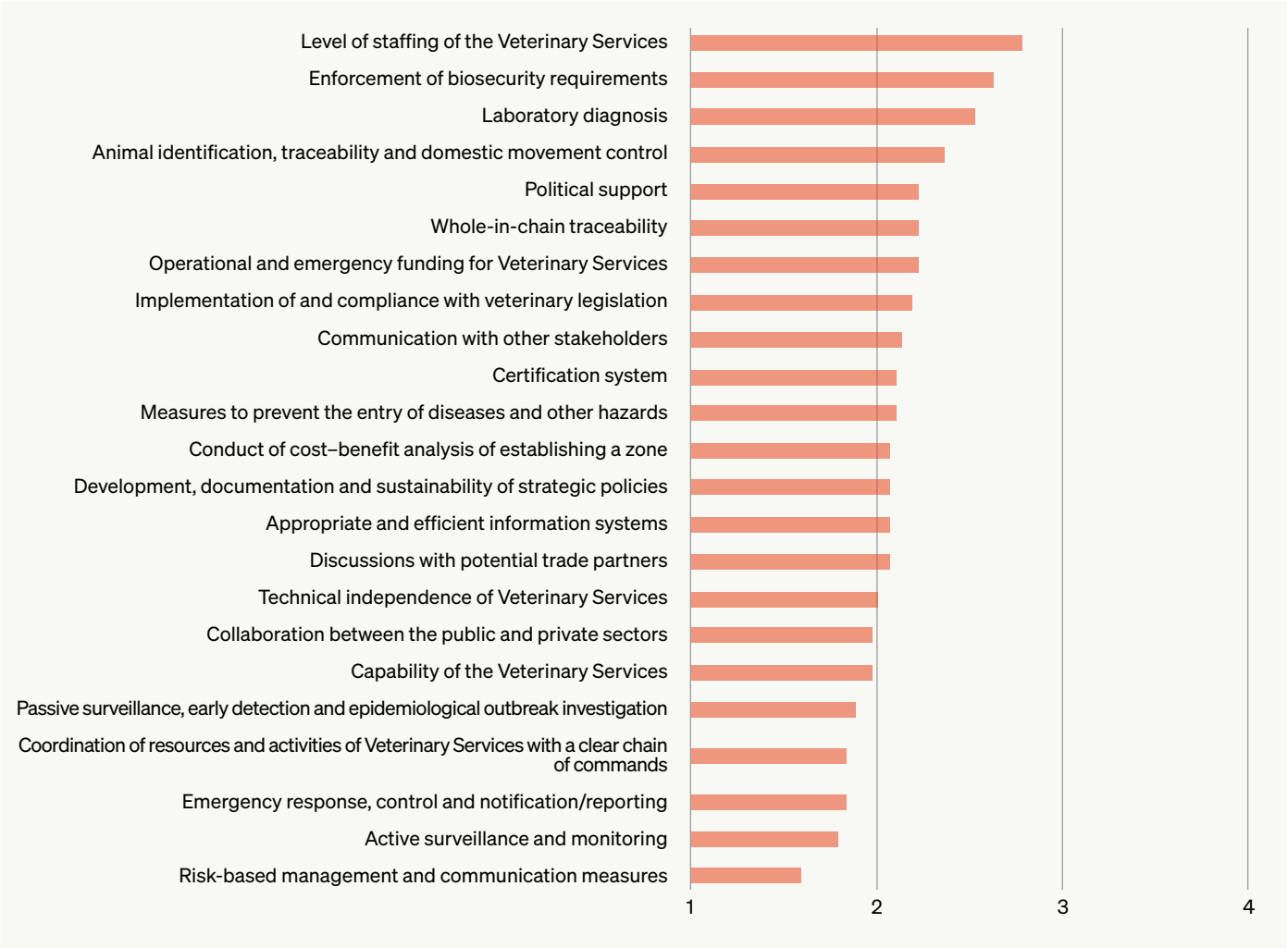

Figure 15. Average severity of challenges faced for the implementation of zones, ranging from 1 (not challenging at all) to 4 (very challenging), all diseases considered

Means were calculated based on the total number of Members who reported using zones, all diseases considered

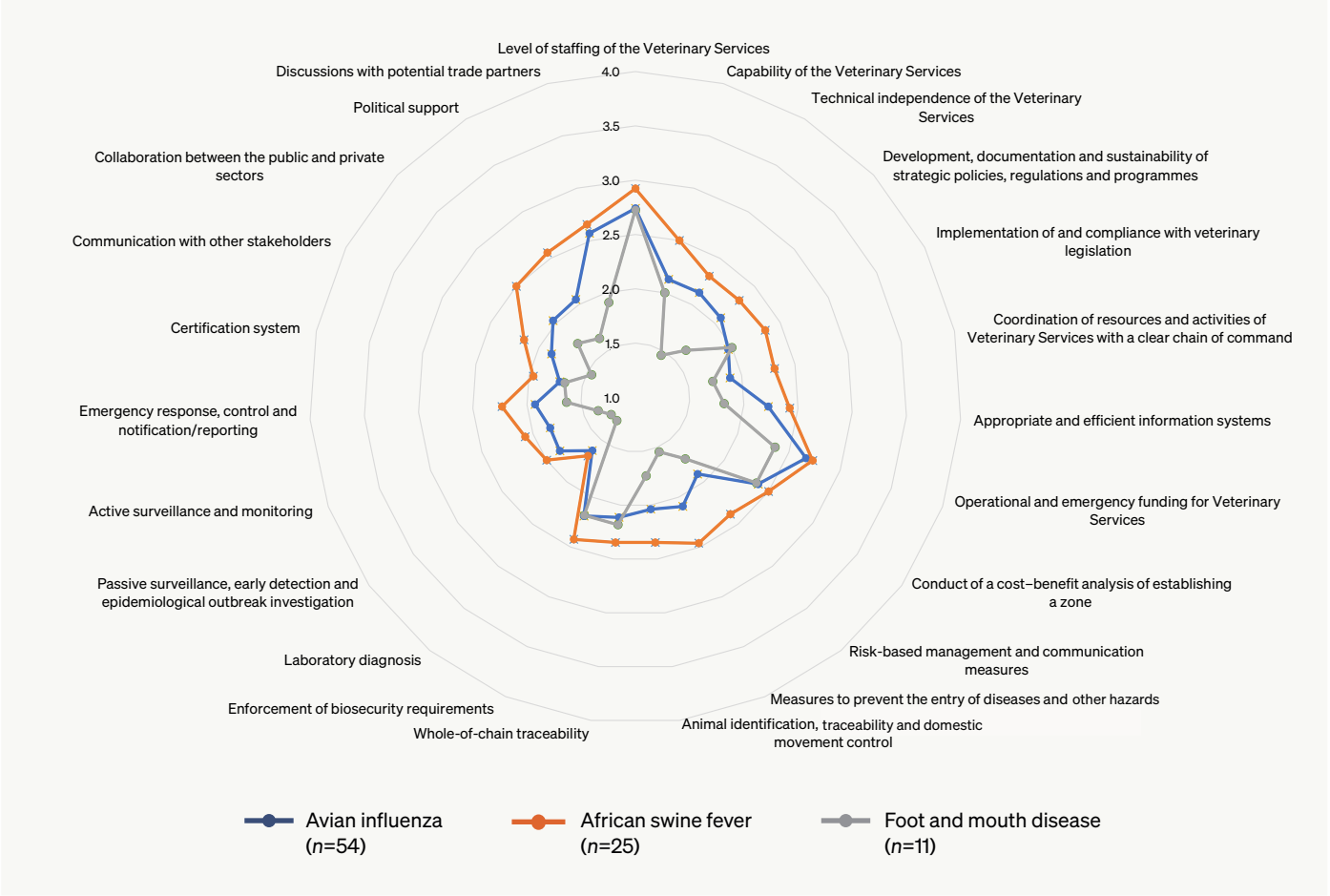

Figure 16. Average severity of challenges faced for the implementation of zones, ranging from 1 (not challenging at all) to 4 (very challenging), for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)
Means were calculated based on the total number of Members who reported using zones for each of the three diseases

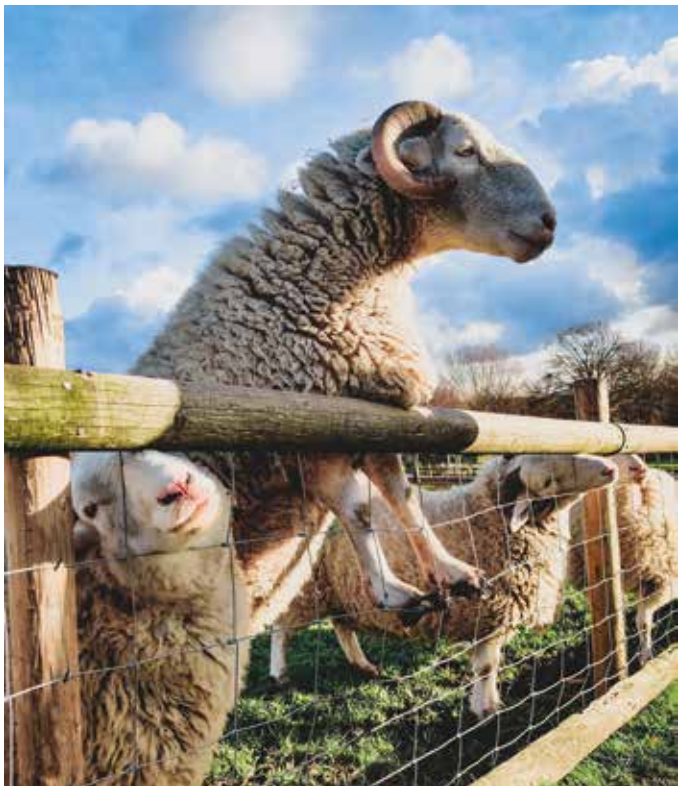

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Figure 17 shows the percentage distribution of responding Members, according to the factors that helped them overcome the challenges they faced when implementing zones. Results varied depending on the disease considered. **For AI- and ASF-related zones, the main factor reported as being useful to overcome challenges was an increase in human resources (72% and 76%, respectively), whereas public–private partnerships were the most valuable factor reported for zones officially recognised as being FMD-free (82%).**

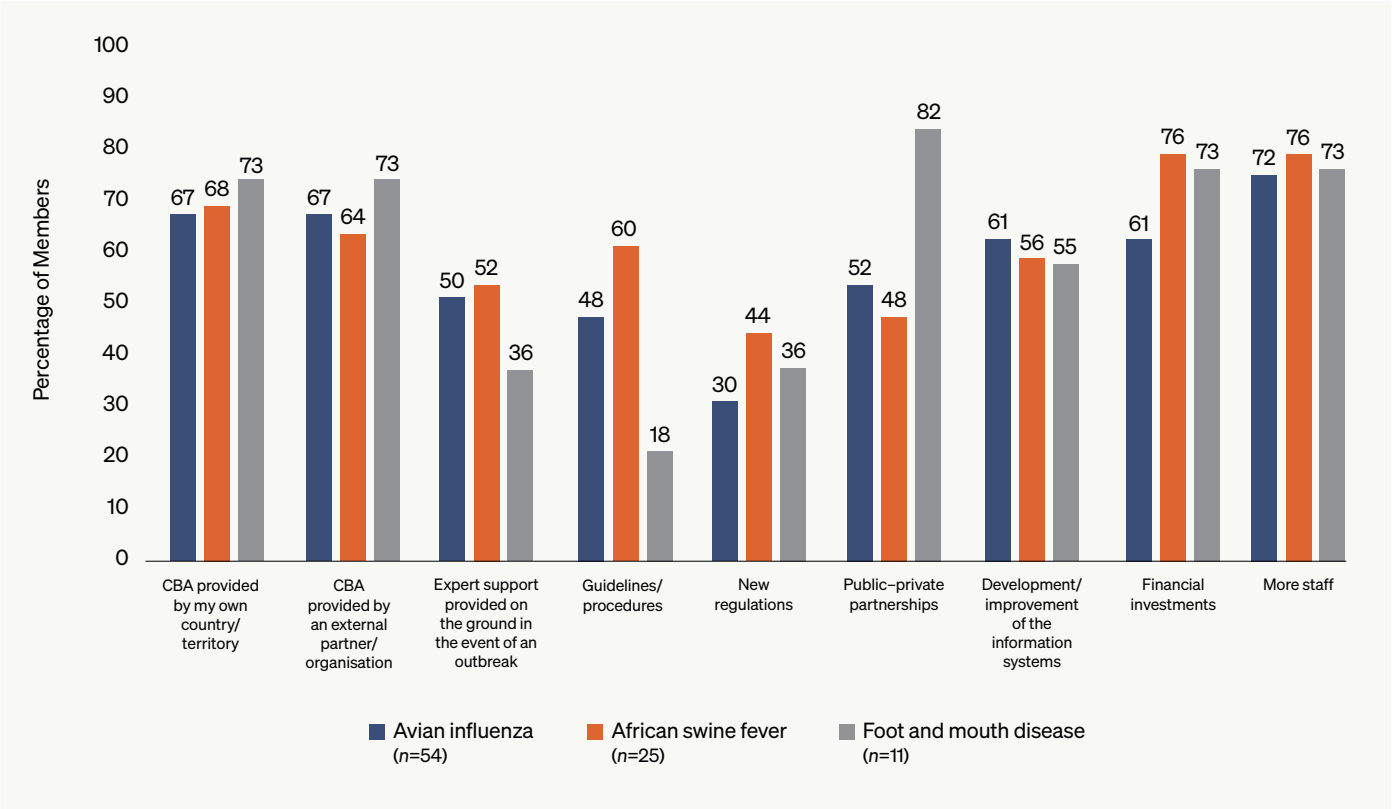

Figure 17. Percentage distribution of Members according to factors that help to overcome the challenges in implementing zones, for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)
Percentages were calculated based on the total number of Members who reported using zones, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%
CBA: capacity-building activities

When addressing specifically how WOAH could support Members for the implementation of zones (**Table 4**), public–private partnerships were cited as the most valuable tool WOAH could provide to help Members use AI- and ASF-related zones (average scores of 3.4 and 3.5, respectively, on a 1-to-4 scale). Regarding zones officially recognised as being FMD-free, responding Members were more interested in WOAH's support in the development of new regulations in their country/territory (average score of 3.5).

It is important to note that the need for guidelines and procedures was ranked higher for FMD than for other diseases. This raises the question whether this may be linked to the disease itself, to the procedure for official recognition, or to other factors. It is also worth noting that, among the proposed tools for Members, capacity-building activities were given the lowest score (average scores of 1.9, 1.9 and 1.4, for AI, ASF and FMD respectively).

Table 4. Average scores attributed by Members to the tools WOAH provides to support the implementation of zones for avian influenza, African swine fever and foot and mouth disease
Means were calculated based on the total number of Members who reported using zones or planning to use zones, for each of the three diseases

Tools provided by WOAH	Avian influenza (*n*=83)	African swine fever (*n*=65)	Foot and mouth disease (*n*=11)
Capacity-building activities	1.9	1.9	1.4
Guidelines/procedures	2.6	2.7	3.3
Support to develop public–private partnerships	3.4	3.5	2.7
Support to develop new regulations	3.3	3.3	3.5
Forum to exchange best practices with other countries/territories	3.0	2.8	3.3

3.5. Drawbacks of using zoning

Please note that this section was only intended to be completed by Members who had implemented zones over the period 2018–2022. For AI and ASF, all kinds of zones were considered whereas, for FMD, only zones officially recognised by WOAH as being FMD-free zones were addressed in the questions. This represents a small number of Members (11). For this reason, percentages related to FMD responses should be interpreted carefully. Nevertheless, these 11 responding Members represent 85% of all WOAH Members who have zones officially recognised by WOAH as being FMD-free zones. The conclusions drawn from this sample can thus be safely extrapolated to all Members who have zones officially recognised by WOAH as being FMD free.

Figure 18, **Figure 19** and **Figure 20** show the extent to which Members who used zoning for AI, ASF and FMD experienced drawbacks. The severity of the drawbacks varied, depending on the disease. For AI-related zones, the main drawback reported was the economic impact of zoning on producers (39% of respondents advised it was very negative, and 31% moderately negative). For ASF-related zones, the main drawbacks were also the economic impact (60% gave the answer of 'very negative', 12% 'moderately negative'), as well as the difficulties of understanding and implementing disease control measures due to the high number of measures (20% and 52%). The economic impact reported by Members may be related to the cost of biosecurity and surveillance measures. It would be worth exploring this point further in future analyses. For FMD-related zones, the main drawback reported was the social impact of the separation of the territory, assessed as 'very negative' by 9% of respondents and 'moderately negative' by 64% of respondents.

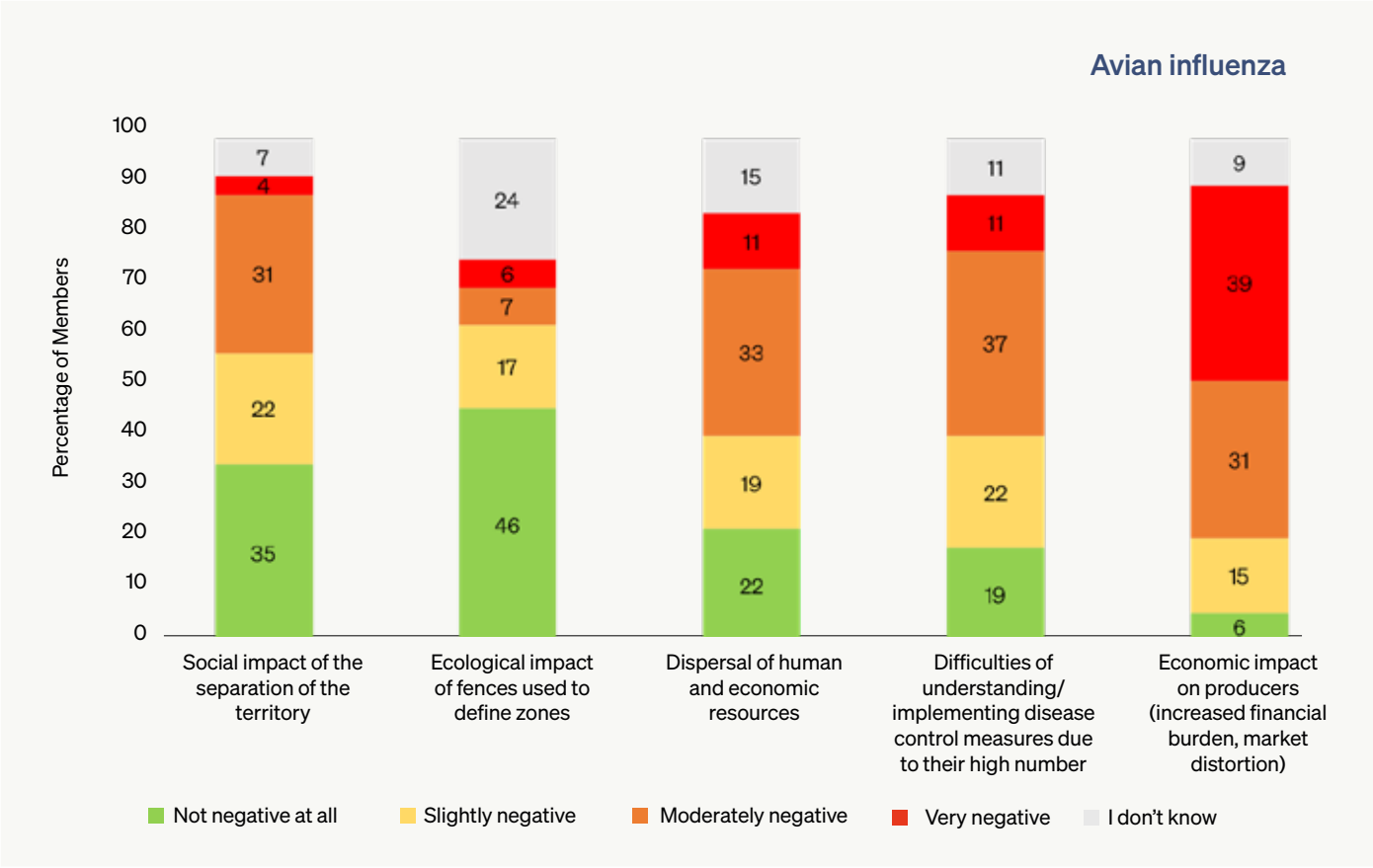

Figure 18. Percentage distribution of Members according to the severity of drawbacks experienced when implementing zones for avian influenza

Percentages were calculated based on the total number of Members who reported using zones for avian influenza. These figures were derived from a question to which only one answer per option could be given

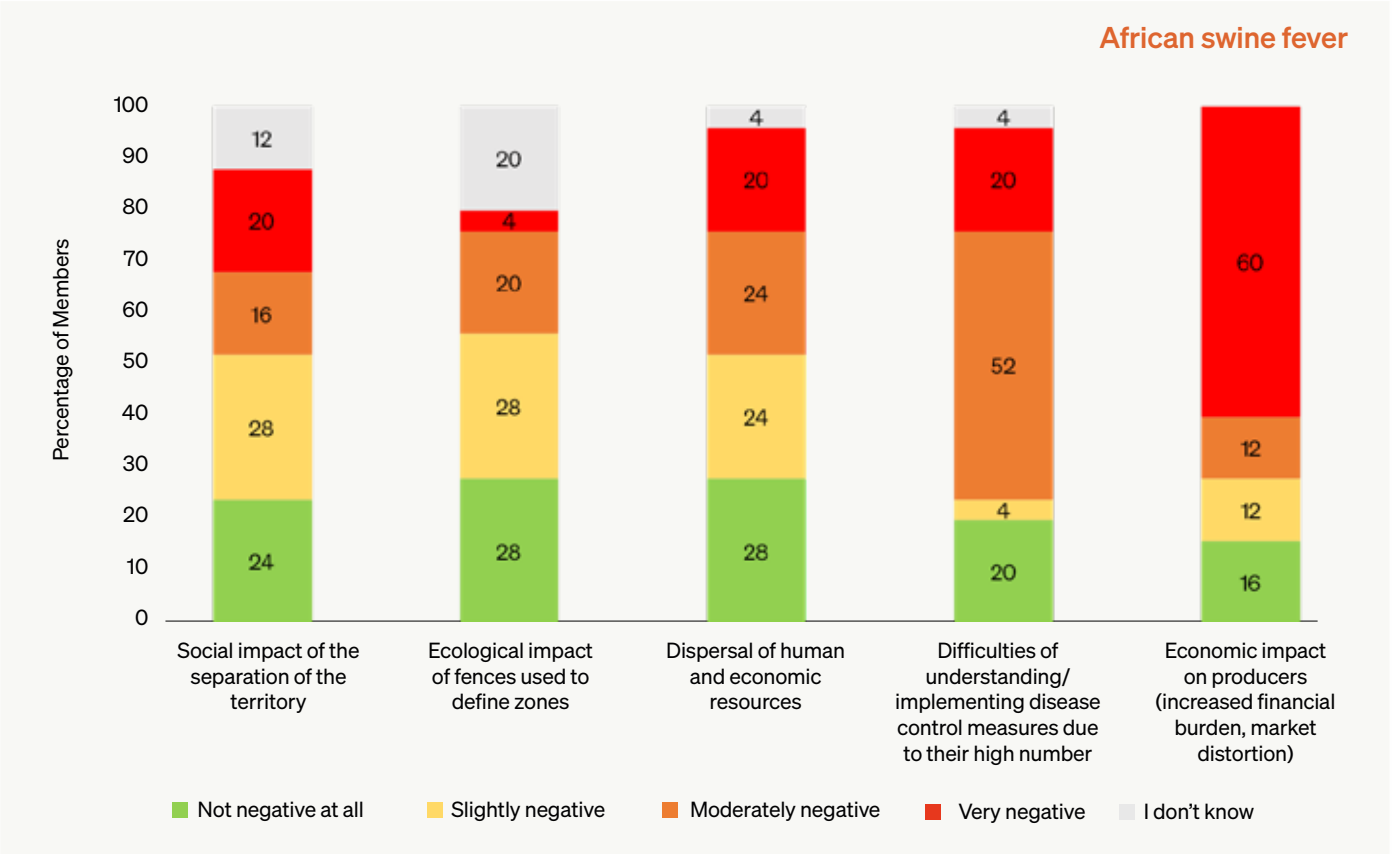

Figure 19. Percentage distribution of Members according to the severity of drawbacks experienced when implementing zones for African swine fever

Percentages were calculated based on the total number of Members who reported using zones for African swine fever. These figures were derived from a question to which only one answer per option could be given

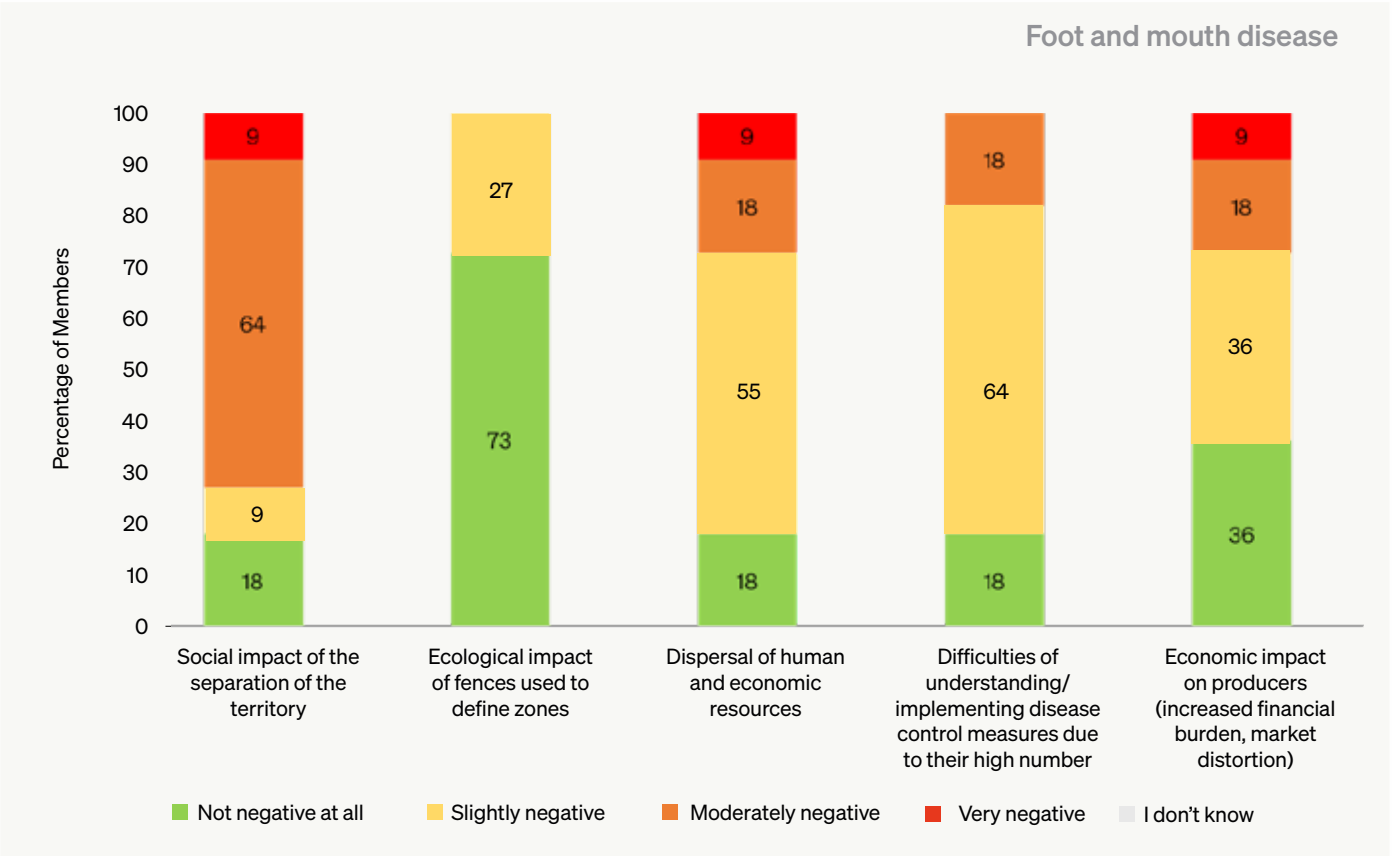

Figure 20. Percentage distribution of Members according to the severity of drawbacks experienced when implementing zones for foot and mouth disease

Percentages were calculated based on the total number of Members who reported using zones for foot and mouth disease. These figures were derived from a question to which only one answer per option could be given

Among the 54 Members who had implemented AI-related zones, 35% reported they would expect to experience more drawbacks in the coming years; 19% reported that they do not expect future drawbacks; and 46% had no opinion.

These figures were similar for ASF-related zones (36%, 16% and 48%, respectively). For FMD, a higher percentage of Members who have zones officially recognised as being FMD-free advised they would expect to experience further drawbacks in the future (46% of Members) (**Table 5**).

Table 5. Percentage distribution of Members showing whether they expect to face future benefits and drawbacks in relation to the use of zoning for avian influenza, African swine fever and foot and mouth disease
Percentages were calculated based on the total number of Members who reported using zones, for each of the three diseases. These figures were derived from a question to which only one answer could be given

Respondent answers	Avian influenza (*n*=54)		African swine fever (*n*=25)		Foot and mouth disease (*n*=11)	
	Further benefits expected	Further drawbacks expected	Further benefits expected	Further drawbacks expected	Further benefits expected	Further drawbacks expected
Yes	46%	35%	44%	36%	91%	46%
No	10%	19%	8%	16%	0%	27%
I don't know	44%	46%	48%	48%	9%	27%

3.6. Non-trade-related benefits

Please note that this section was only intended to be completed by Members who had implemented zones over the period 2018–2022. For AI and ASF, all kinds of zones were considered whereas, for FMD, only zones that were officially recognised by WOAH as being FMD-free zones were addressed in the questions. This represents a small number of Members (11). For this reason, percentages related to FMD responses should be interpreted carefully. Nevertheless, these 11 responding Members represent 85% of all WOAH Members who have zones officially recognised by WOAH as being FMD-free. The conclusions drawn from this sample can thus be safely extrapolated to all Members who have zones officially recognised by WOAH as being FMD-free zones.

Non-trade-related benefits gained by Members when implementing zones were also explored (**Figure 21, Figure 22, Figure 23**). Better disease control was the most frequently reported advantage of using zoning (81% of Members advised zoning was highly beneficial to control AI, 84% to control ASF, and 91% to control FMD). When comparing answers to this question with those described in Section 3.2.b, 'Objectives of using zoning', the percentage of Members reporting zoning as very beneficial for disease control was higher for Members who used zones to respond to an outbreak in their country than for Members who used zones to control an endemic disease (e.g. 83% versus 57% for ASF-related zones) (**Table 6**). Domestic animal movements were also reported to be more secure, thanks to the zoning approach. On the other hand, opinions were more mixed regarding the collaboration between the private and public sectors, and the trust of domestic customers in the disease control system.

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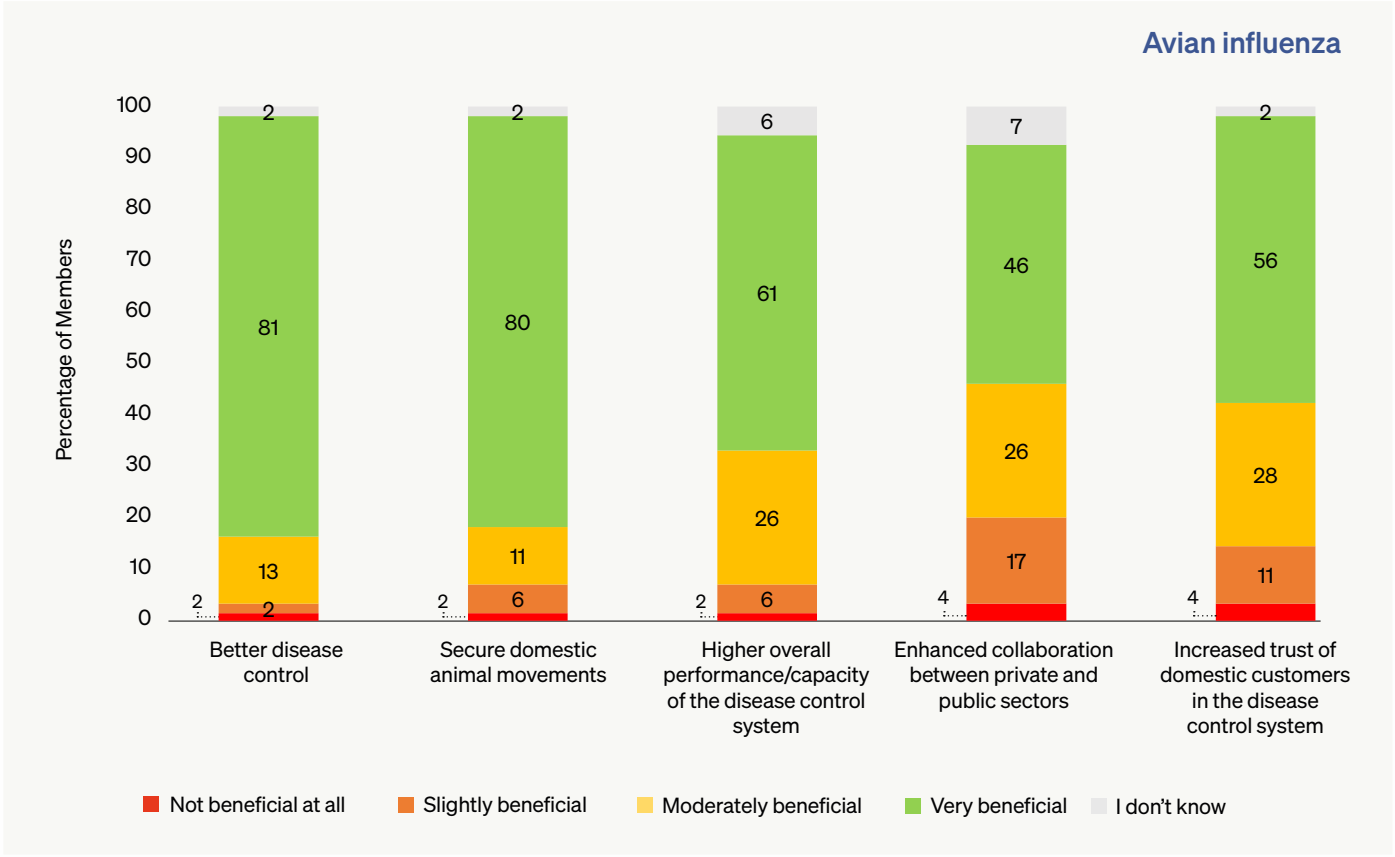


Figure 21. Percentage distribution of Members according to the importance of benefits experienced when implementing zones for avian influenza

Percentages were calculated based on the total number of Members who reported using zones for avian influenza. These figures were derived from a question to which only one answer per option could be given

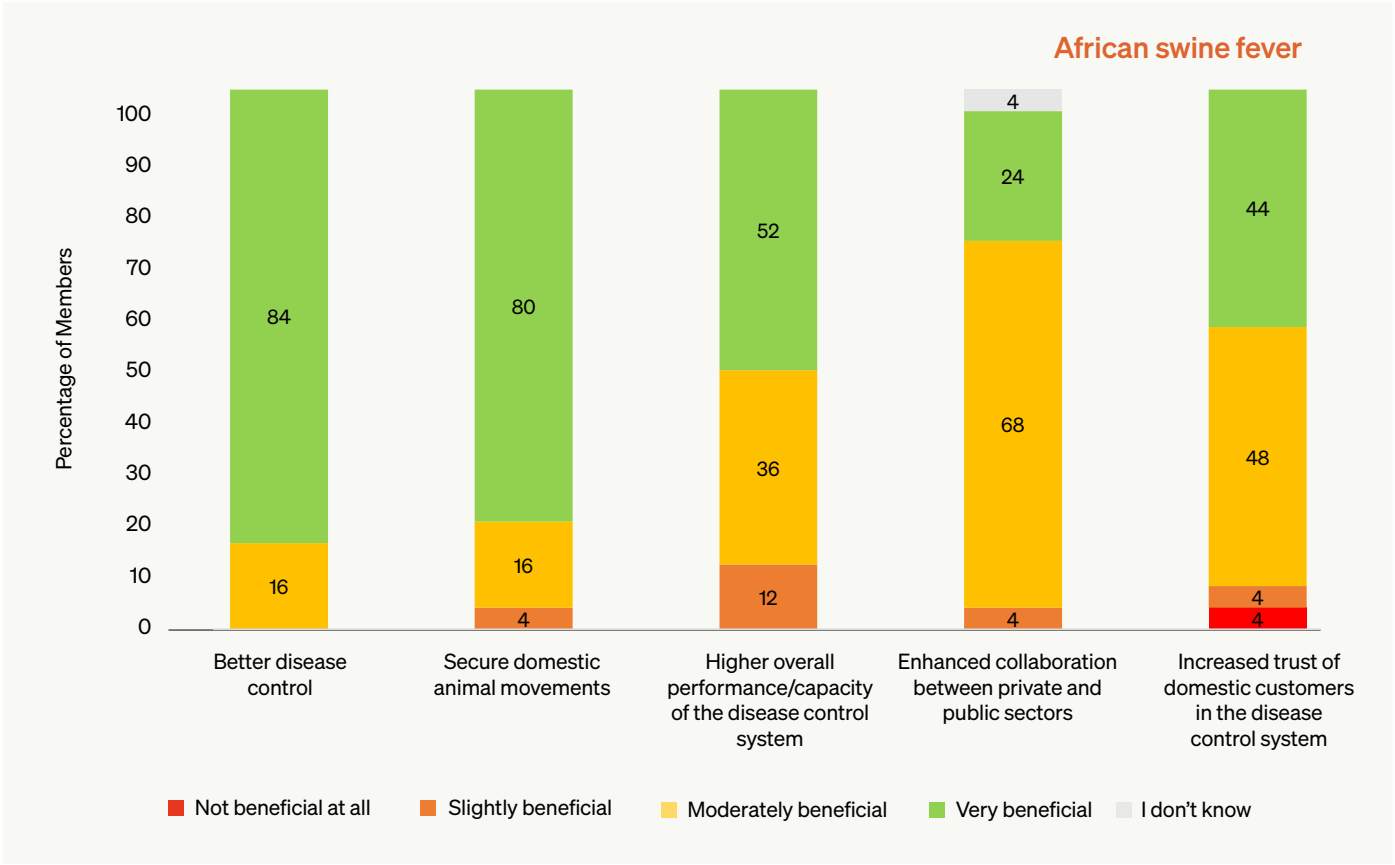


Figure 22. Percentage distribution of Members according to the importance of benefits experienced when implementing zones for African swine fever

Percentages were calculated based on the total number of Members who reported using zones for African swine fever. These figures were derived from a question to which only one answer per option could be given

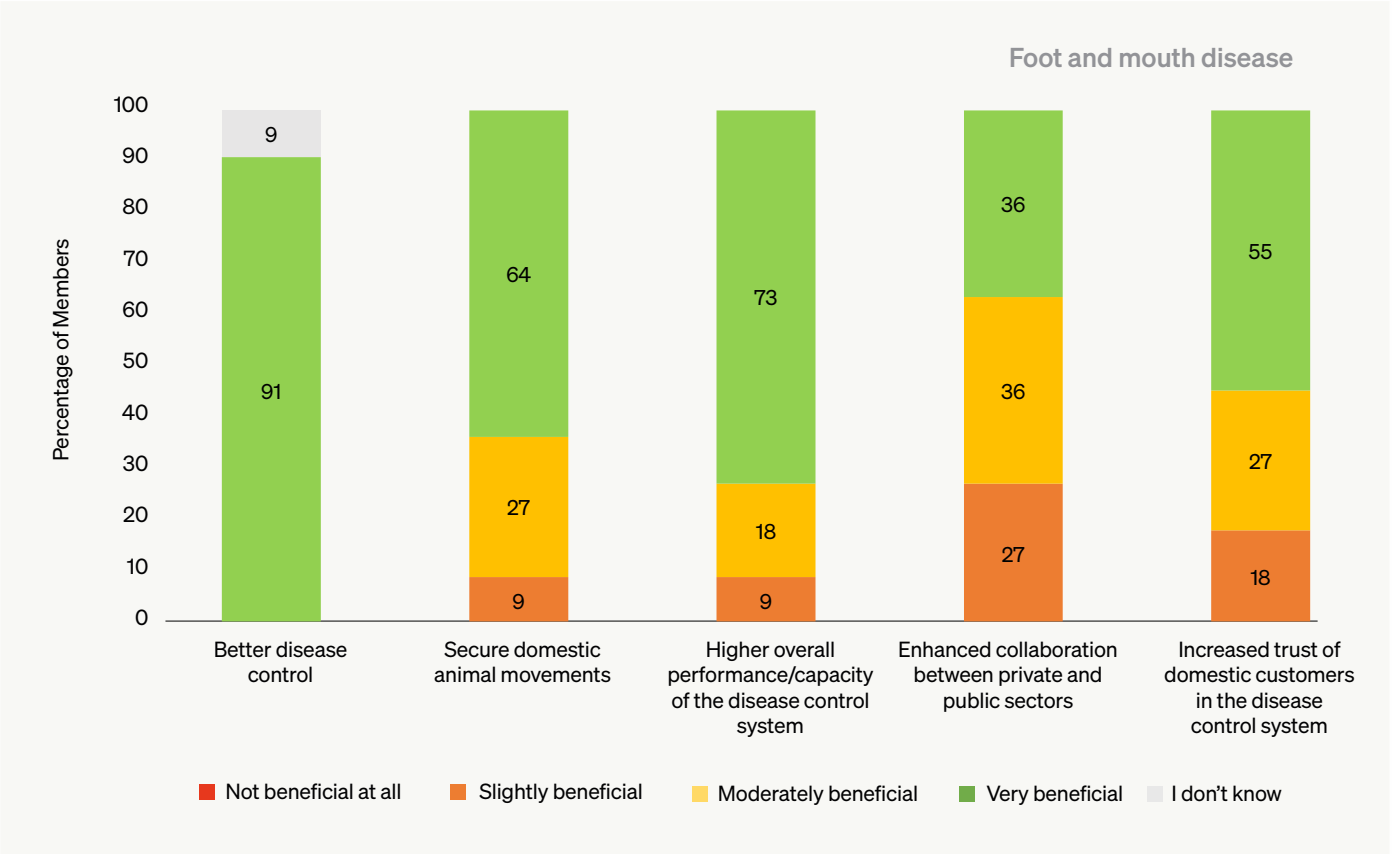


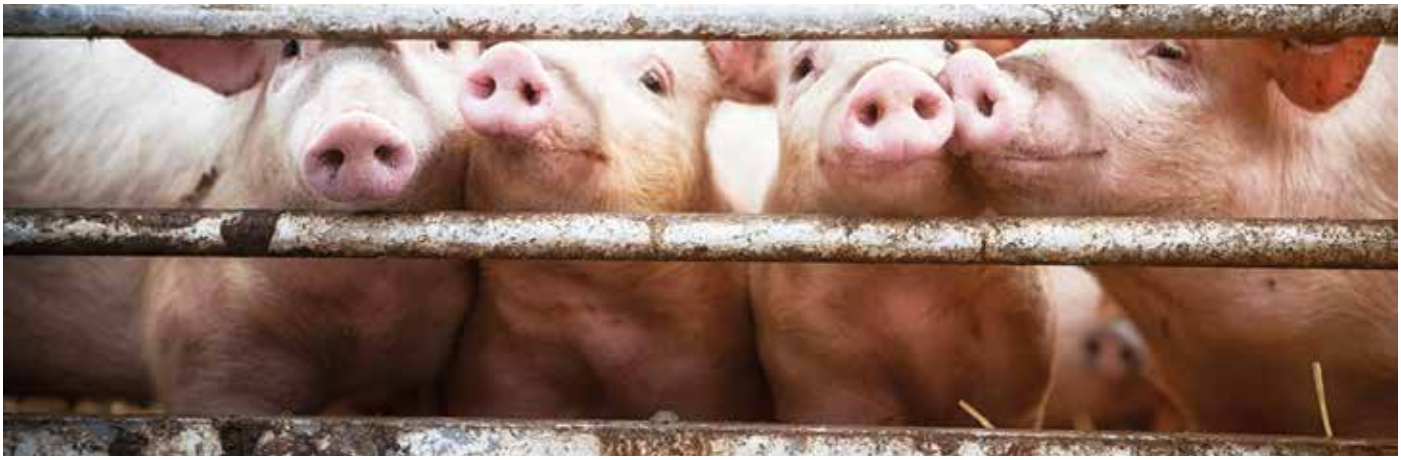
Figure 23. Percentage distribution of Members according to the importance of benefits experienced when implementing zones for foot and mouth disease

Percentages were calculated based on the total number of Members who reported using zones officially recognised as free from foot and mouth disease by WOAH. These figures were derived from a question to which only one answer per option could be given

Table 6. Percentage distribution of Members who report zones as very beneficial for disease control, according to their objective for using zones (as a response to an outbreak or to control an endemic disease) for each of the three selected diseases

Percentages were calculated based on the total number of Members who reported using zones as a response to an outbreak (first row) or to control an endemic disease (second row) for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

Purpose of zones	Avian influenza	African swine fever	Foot and mouth disease
To respond to an outbreak in the country	84%	83%	100%
To progressively control the disease in an endemic setting	75%	57%	80%



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Among the 54 Members who had implemented AI-related zones, 46% reported that they expected further benefits in the coming years, 10% reported that they did not and 44% had no opinion. These figures were similar for ASF-related zones (44%, 8% and 48%, respectively). For FMD, 91% of Members who have zones officially recognised as being FMD-free advised they expected to receive further benefits in the future (see **Table 5** above).

Among the 54, 25 and 11 Members who had established zones in relation to AI, ASF and FMD, 4 (i.e. 7% of Members), 2 (8%) and 5 (45%) had performed a cost–benefit analysis, respectively (**Table 7**). Among these, 2 Members (50%), 2 Members (100%) and 5 Members (100%), respectively, reported that establishing zones was found to be cost-effective for the three diseases. If the cost–benefit analyses were performed before the zones were implemented, it would be valuable to have additional information about Members with established zones, despite the absence of cost-effectiveness shown during the cost–benefit analysis.

Table 7. Distribution in number and percentage (in brackets) of Members according to their plan to perform a cost–benefit analysis of the use of zoning for avian influenza, African swine fever and foot and mouth disease
Percentages were calculated based on the total number of Members who reported using zones, for each of the three diseases. These figures were derived from a question to which only one answer could be given

Responses to carrying out cost–benefit analyses	Avian influenza (*n*=54)	African swine fever (*n*=25)	Foot and mouth disease (*n*=11)
Cost–benefit analysis performed	4 (7%)	2 (8%)	5 (45%)
Plan to perform a cost–benefit analysis in the future	17 (32%)	10 (40%)	3 (27%)
No plan to perform a cost–benefit analysis in the future	27 (50%)	10 (40%)	3 (27%)
No opinion	6 (11%)	3 (12%)	0 (0%)

It is worth noting that some publications have already discussed the costs and economic benefits of using zones. For example, Hafi *et al*. (2022) estimated the expected economic benefits of trading zones as part of foot and mouth disease (FMD) control measures in the event of limited-duration outbreaks in Australia. Based on epidemiological models and economic analyses, they found that implementing zoning in response to FMD introduction could reduce producer losses in revenue by AUS$ 3 billion to AUS$ 9 billion. These outcomes were in line with previous Australian studies (Cao *et al*., 2003; Abdalla *et al*., 2005) as well as with a study conducted later in Pakistan (Lyons *et al*., 2021). However, under some circumstances, zoning may not be cost-effective. For instance, Häsler *et al.* (2021) studied the relevance of implementing an FMD-free zone in Tanzania, where FMD is endemic. Their analysis indicated that this would be unlikely to be cost-effective with the current FMD status in Tanzania for a number of reasons, including: lack of high-end export-market opportunities; the fact that cattle are mainly kept as a store of capital, to be commercialised based on need, resulting in a low off-take; and the perceived low impact of FMD by most farmers in the area.

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3.7. The exporter point of view: trade-related benefits of zoning

Please note that this section was only intended to be completed by Members who had implemented zones over the period 2018–2022. For AI and ASF, all kinds of zones were considered whereas, for FMD, only zones that were officially recognised by WOAH as being FMD-free zones were addressed in the questions. This represents a small number of Members (11). For this reason, percentages related to FMD responses should be interpreted carefully. Nevertheless, these 11 responding Members represent 85% of all WOAH Members who have zones officially recognised by WOAH as being FMD-free. The conclusions drawn from this sample can thus be safely extrapolated to all Members who have zones officially recognised by WOAH as FMD-free zones.

Figure 24 shows to what extent zones established by Members were accepted by their trading partners. Responses varied depending on the disease. Among the 54 Members who had established AI-related zones, 7% reported that all established zones were accepted by all trading partners, 13% that all zones were accepted by some trading partners and 50% that some zones were accepted by some trading partners. 15% of Members reported that no zones were accepted by any trading partners. It would be worthwhile to conduct further qualitative research to understand why a given country/territory may only accept some zones from a given trading partner, rather than all zones from that trading partner.

Regarding ASF-related zones, more Members reported that all zones were accepted by all trading partners (24%), and fewer Members reported that no zones were accepted by any trading partner (4%). As for FMD-related zones, the question was only targeted at Members with established zones officially recognised by WOAH as being free from FMD. Among the 11 respondents, 64% advised that all their zones were accepted by all trading partners. As some 36% of Members still reported that only some zones were accepted and not by all trading partners, further qualitative research should be undertaken to understand why some zones were not accepted by some trading partners.

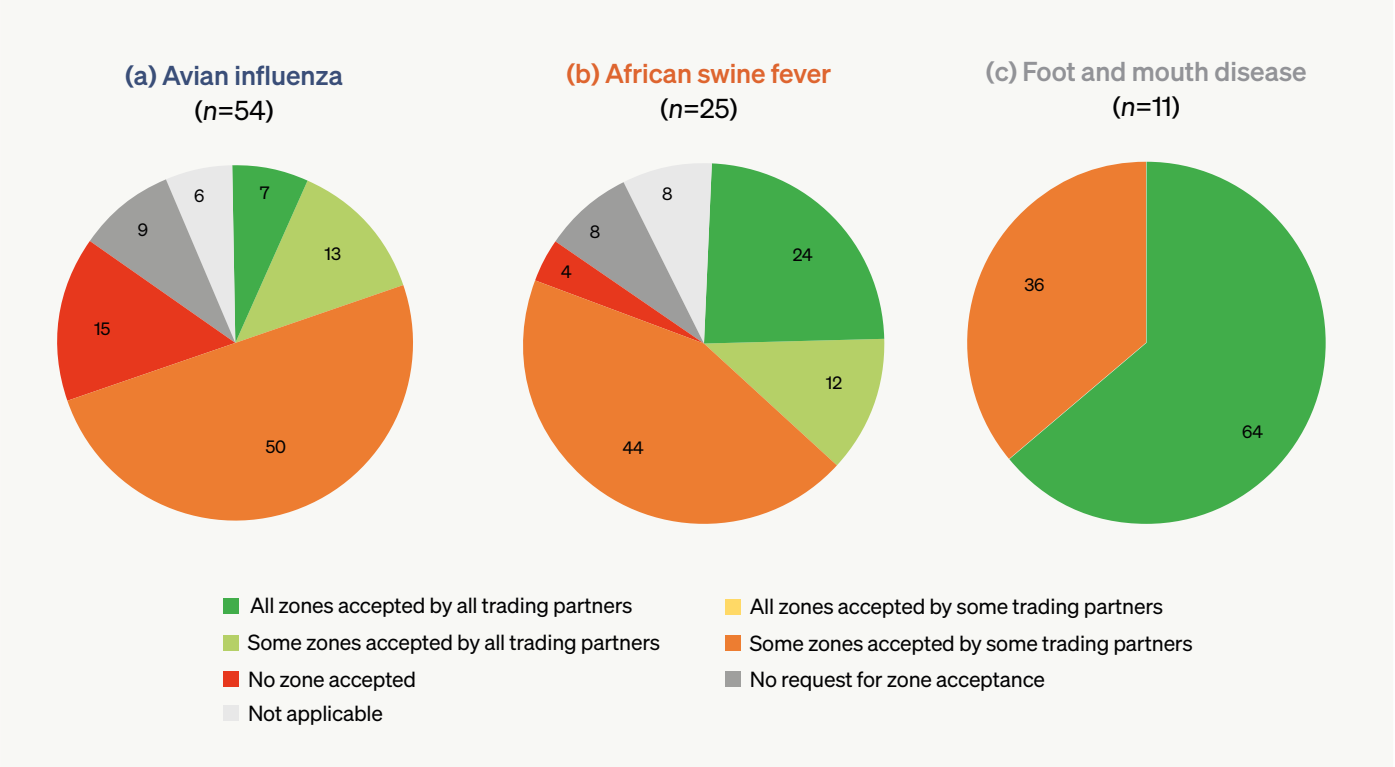

Figure 24. Percentage distribution of Members showing whether their zones were accepted by trading partners for avian influenza (a), African swine fever (b), and foot and mouth disease (c)
Percentages were calculated based on the total number of Members who reported using zones, for each of the three diseases. These figures were derived from a question to which only one answer could be given

The impact of zone acceptance on trade differed, depending on the disease under consideration (**Figure 25**). Regarding zones established for AI, the acceptance of these zones led to stability or recovery of export volumes for 61% of Members. Additionally, they led to maintenance of trade relationships despite a decrease in export volumes for 34% of Members, and to an increase in export volumes for 13% of Members.

For zones established in relation to ASF, these figures were 65%, 70% and 10% respectively, for stability or recovery of export volumes, maintenance of trade relationships and increase in export volumes. **For zones that were officially recognised as being free from FMD, an increase in export volumes was reported in 73% of cases.** This figure is much higher than for the other diseases, highlighting the importance of FMD zones in relation to trade.

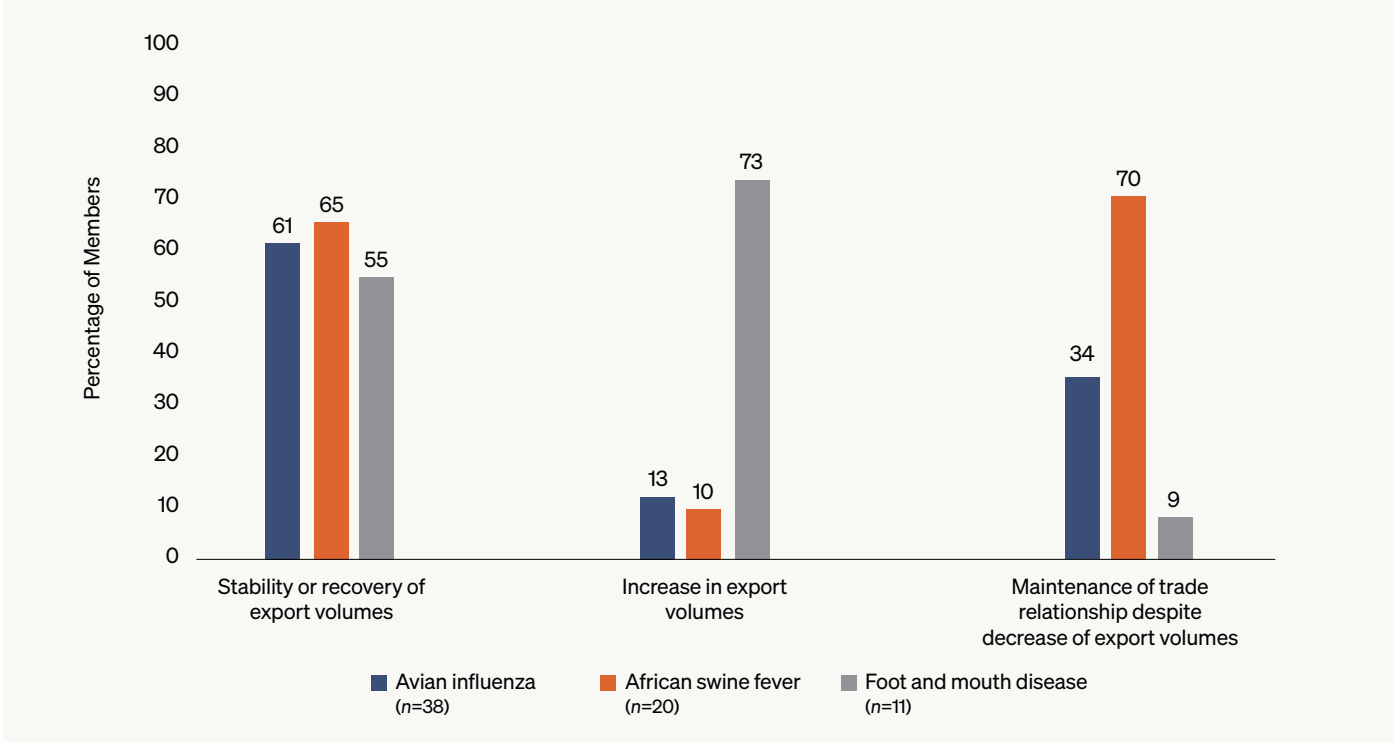

Figure 25. Percentage distribution of Members showing the impact of zone acceptance on trade for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)

Percentages were calculated based on the total number of Members who reported having their zones accepted by trading partners, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

As shown in **Table 8**, **more than 50% of Members who had AI- or ASF-related zones accepted by trading partners advised that zone acceptance took more than 24 months.** This time frame appears very long and incompatible with the reality 'on the ground', especially considering how quickly the epidemiological situation may change for these two diseases. Further work is necessary to explore this point, to investigate whether the reported time relates to the first acceptance of the zoning approach taken by the infected country, and if subsequent requests for specific AI- or ASF-related zones would be accepted more quickly. **Regarding FMD, 64% of Members who had a zone officially recognised as being FMD-free reported that zone acceptance by trading partners took less than six months.**

This may be due to trading partners placing an increased level of trust in zones that are officially recognised by WOAH, or to the relatively slower-moving epidemic situation in countries/territories using zoning for FMD.

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Table 8. Distribution in number and percentage (in brackets) of Members according to reported time taken for zones to be accepted by trading partners, for avian influenza, African swine fever and foot and mouth disease

Percentages were calculated based on the total number of Members who reported having their zones accepted by trading partners, for each of the three diseases. These figures were derived from a question to which only one answer could be provided

Time taken to obtain zone acceptance by trading partners	Avian influenza (*n*=38)	African swine fever (*n*=20)	Foot and mouth disease (*n*=11)
Less than 6 months	14 (37%)	6 (30%)	7 (64%)
Between 6 and 12 months	1 (3%)	3 (15%)	1 (9%)
Between 12 and 24 months	2 (5%)	1 (5%)	2 (18%)
More than 24 months	21 (55%)	10 (50%)	1 (9%)

The long time to obtain zone acceptance by trading partners has also been discussed in literature. For example, Funes *et al.*, 2020, discussed the practical implications of inspection visits, which involve some logistics and require resources to be available. In some cases, inspection missions may take several years to complete. The long lead times of the procedure make it necessary not only to manage the technical and economic resources of both the exporting and importing countries (which may be scarce, particularly in developing countries), but also, very often, to update and expand the information provided. These requests for supplementary information and delays in the procedure create unpredictability. They also cause internal difficulties because of restrictions between zones within the same country due to their differing animal health status and the fact that some zones do not enjoy the benefits of trading with external markets (Funes *et al.*, 2020).

When asked about the conformity of trade agreements with WOAH standards, Members with zones accepted by trading partners mostly reported that their trade agreements conformed with WOAH standards on zoning (82% for AI-related zones, 90% for ASF-related zones and 73% for FMD-related zones) (**Figure 26**). Interestingly, 27% of Members with a zone recognised as being officially FMD-free by WOAH reported that the terms of their trade agreements went beyond WOAH standards on zoning.

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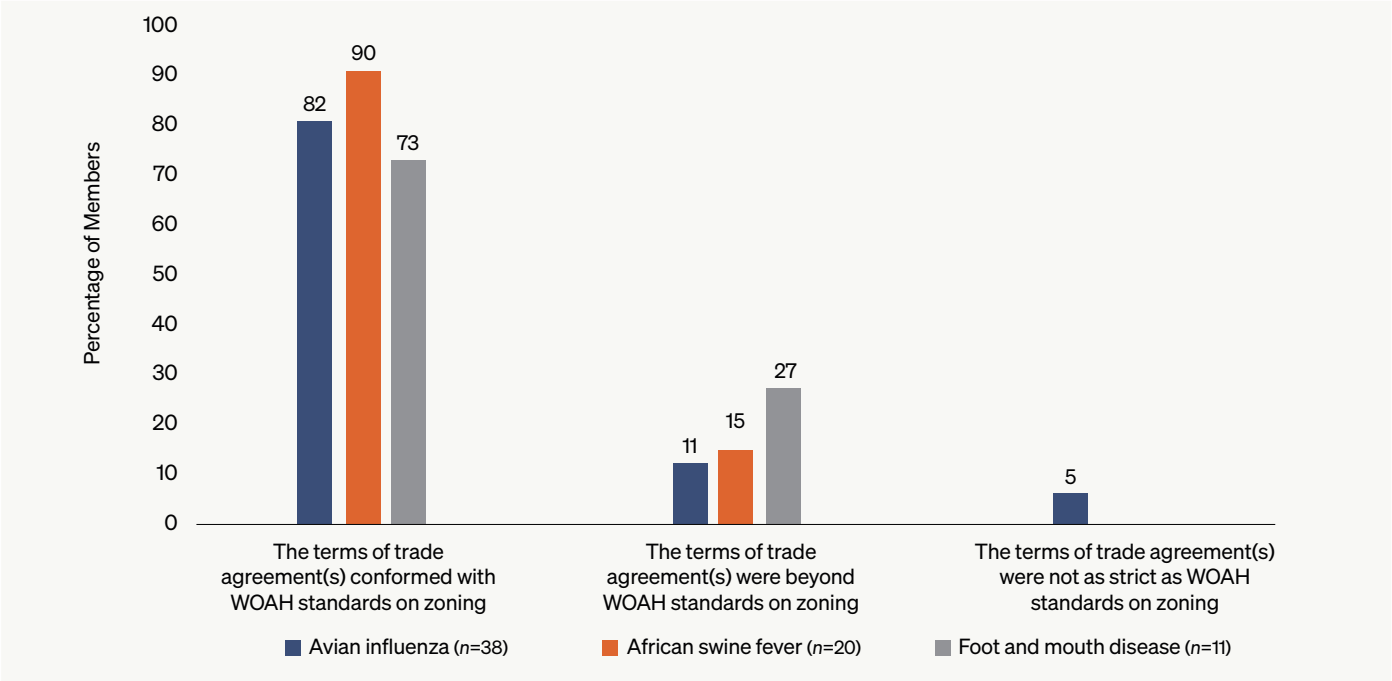

Figure 26. Percentage distribution of Members showing accordance of their trade agreements with WOAH zoning standards for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)

Percentages were calculated based on the total number of Members who reported having their zones accepted by trading partners, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

As shown in **Figure 27**, **74%, 80% and 82% of Members who had zones accepted by their trading partners reported that they had a peacetime agreement with their trading partners to pre-emptively accept the use of zones for AI, ASF and FMD, respectively.**

FMD-related zones were accepted by trading partners most of the time when these zones were established in the exporting country/territory. However, most AI- and ASF-related zones were not accepted, despite a pre-emptive agreement having been signed.

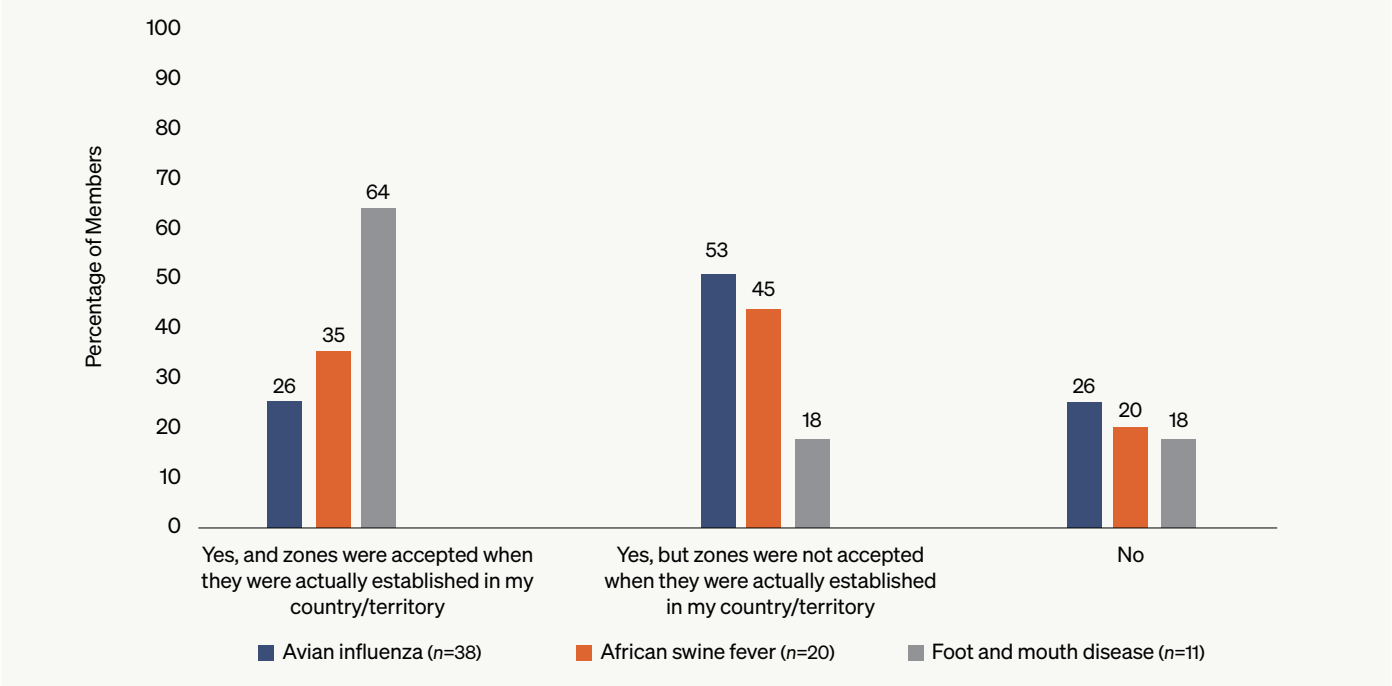

Figure 27. Percentage distribution of Members according to the presence of a peacetime trade agreement to pre-emptively accept the use of zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)

Percentages were calculated based on the total number of Members who reported having their zones accepted by trading partners, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

Literature that discussed the main drivers facilitating zone acceptance by trading partners was scarce. Lack of trust, difficulty in sharing information and insufficient coordination mechanisms were mentioned as barriers to the recognition of zones (Funes *et al*., 2020).

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In the present survey, Members who had sought zone acceptance were asked to rank the factors that facilitated such acceptance by their trading partners, on a scale ranging from 1 (not important at all) to 4 (very important). All diseases were considered, and average scores were high, ranging from 2.8 to 3.9 (**Figure 28**). Transparency of the disease situation appeared to be the most important factor facilitating zone acceptance (average score 3.9), followed by trust in the certification system (3.8), a stable epidemiological situation (3.8), the existence of a bilateral procedure (3.8), and information about biosecurity measures (3.8). The self-declared or official status of the zone published by WOAH and the existence of a recently published PVS Evaluation report were seen as less important factors (average scores 3.2 and 2.8, respectively). Looking at the results by disease (**Figure 29**), it appears that the official status of FMD zones was reported as more important than the self-declared status of AI- and ASF-related zones (an average score of 3.9 versus 3.1 and 3.0, respectively). Moreover, the existence of a recently published PVS Evaluation report scored 3.1 on average for ASF- and FMD-related zones, whereas it only scored 2.6 for AI-related zones.

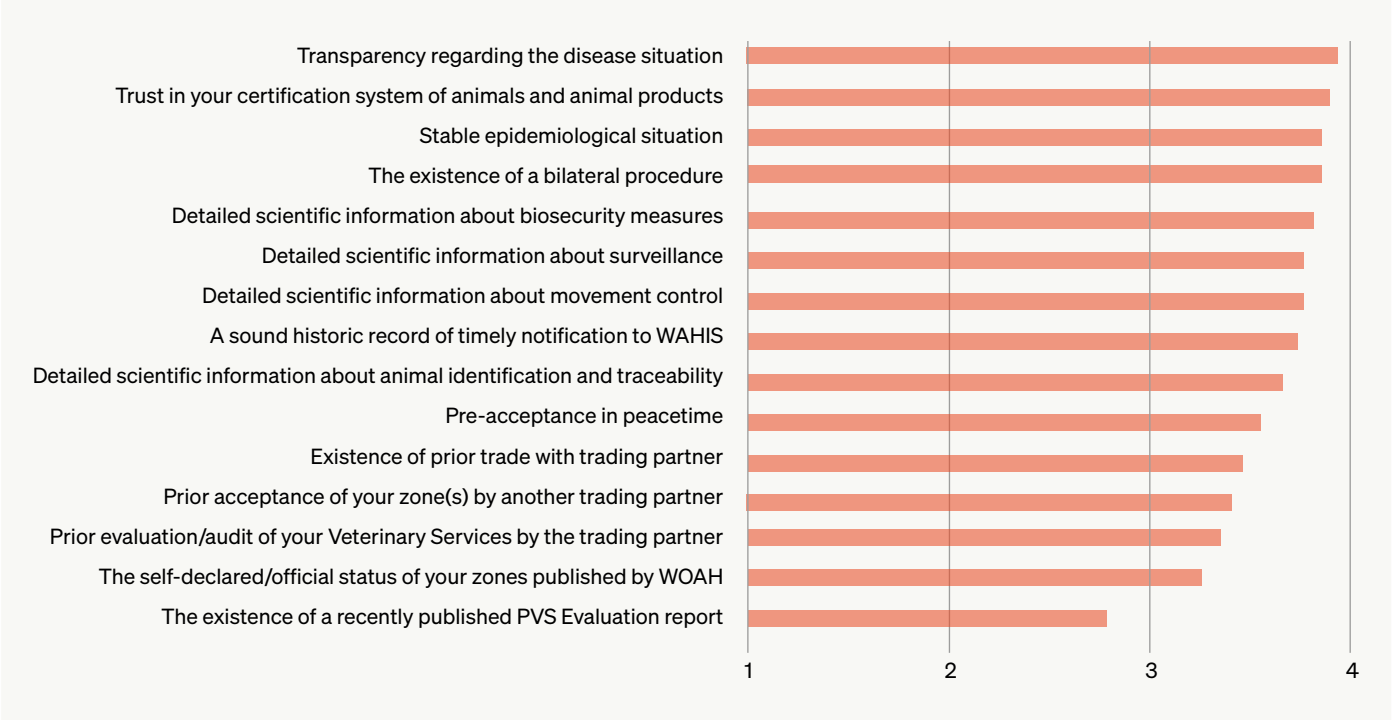

Figure 28. Average importance of factors that facilitated zone acceptance by trading partners, ranging from 1 (not important at all) to 4 (very important), all diseases considered

Means have been calculated based on the total number of Members who reported having their zones accepted by a trading partner, all diseases considered

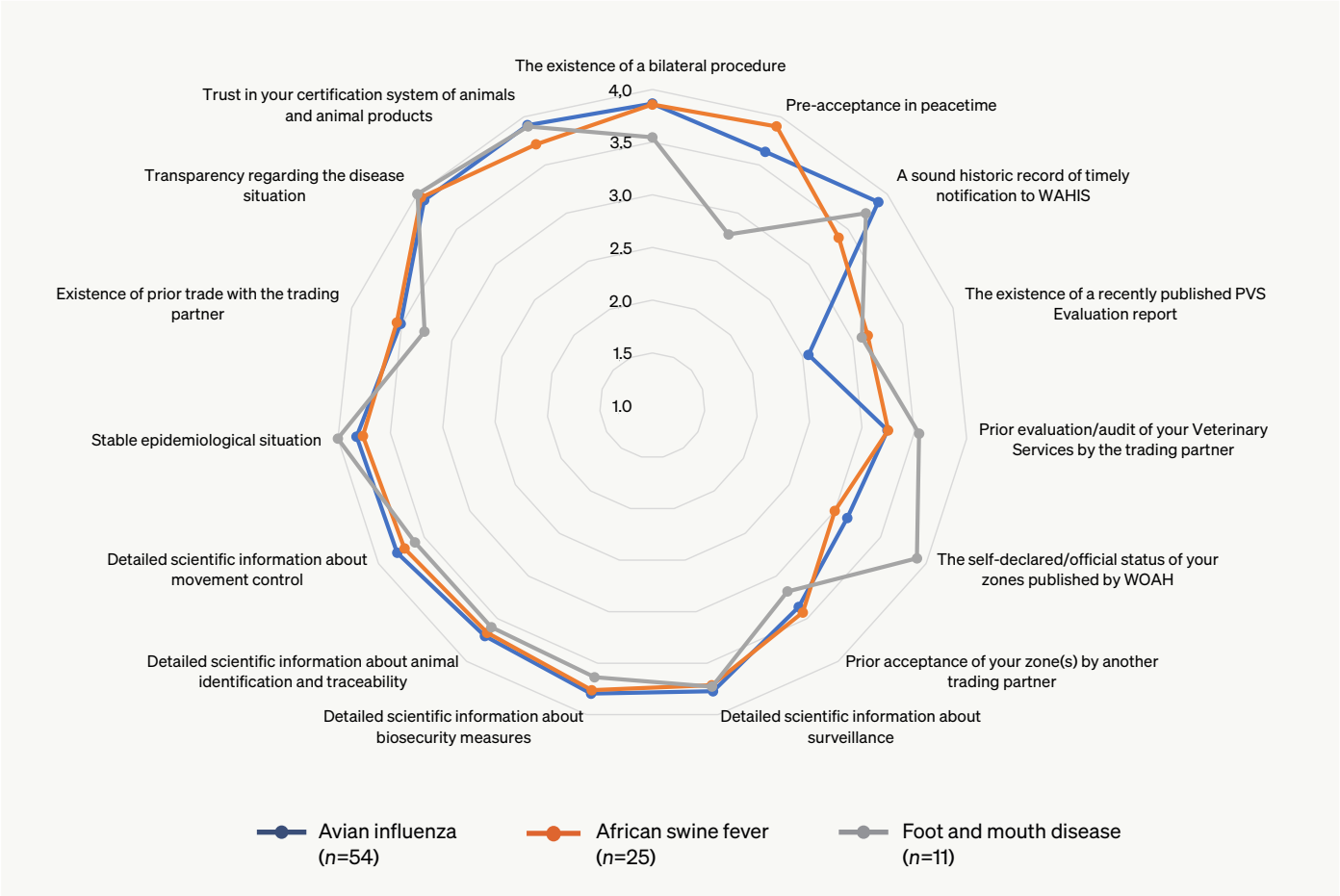

Figure 29. Average importance of factors that facilitated zone acceptance by trading partners, ranging from 1 (not important at all) to 4 (very important) for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)
Means have been calculated based on the total number of Members who reported having their zones accepted by the trading partner, for each of the three diseases

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3.8. The importer point of view: acceptance of zones established by trading partners

Please note that this section was intended to be completed by all respondents.

Members were asked questions similar to those addressed in Section 3.7, this time to investigate the importer point of view, i.e. to what extent a country/territory would accept zones established by its trading partners and what the influencing factors were. Care must be taken when considering a comparison of countries'/territories' answers for both export- and import-related questions for the following reasons:

(i) Section 3.8 was intended to be completed by all respondents, whereas Section 3.7 was only intended to be completed by Members who had established zones over the period 2018–2022; therefore, the two samples cannot be compared. Only the subset of Members who have completed both Section 3.7 and 3.8 may be compared;

(ii) in any kind of survey, conformity bias may be present as respondents tend to be more likely to provide 'good' answers when the question relates to their own behaviour (in this case, the importer's point of view) than when describing others' behaviour (in this case, the exporter's point of view).

Figure 30 shows to what extent countries/territories accepted zones established by their trading partners. Responses varied depending on the disease. For AI, 17% of Members advised that they accepted all zones from all trading partners who requested zone acceptance; 26% reported they accepted all zones from some trading partners; 6% accepted some zones from all trading partners; and 28% accepted some zones from some trading partners. Only 6% of respondents reported not accepting any zones from any trading partner. This figure was similar for ASF-related zones (7%). However, it was much higher for FMD-related zones, as 24% of respondents reported not accepting any zones from any trading partner.

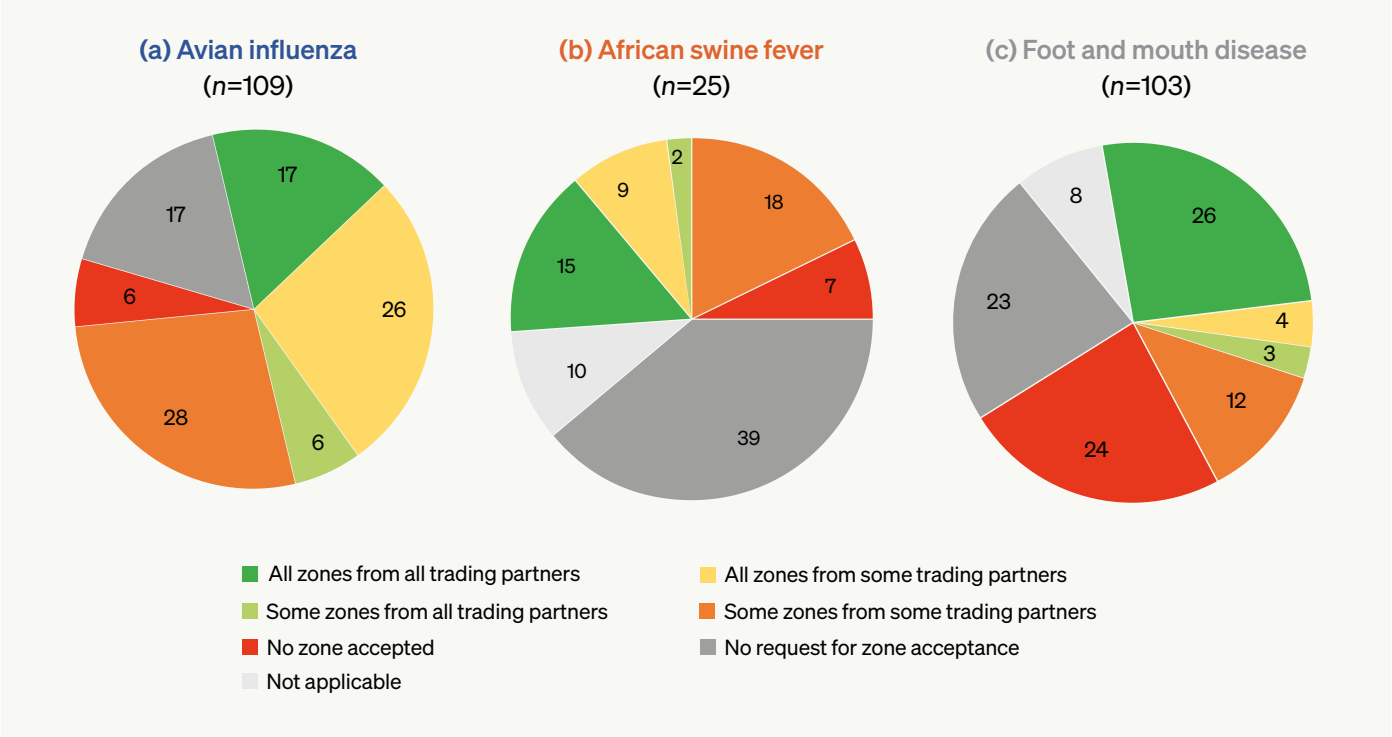

Figure 30. Percentage distribution of Members showing whether they accepted zones from their trading partners for avian influenza (a), African swine fever (b) and foot and mouth disease (c)

Percentages were calculated based on the total number of responding Members, for each of the three diseases. These figures were derived from a question to which only one answer could be given

As shown in **Table 9**, 87%, 68% and 81% of Members reported taking less than 12 months to accept their trading partners' zones for AI, ASF and FMD, respectively.

Moreover, 63%, 65% and 67% of the responding Members reported having a procedure to follow when their trading partners requested zone acceptance for AI, ASF and FMD, respectively.

Table 9. Distribution in number and percentage (in brackets) of Members according to reported time taken to accept their trading partners' zones, in relation to avian influenza, African swine fever and foot and mouth disease
Percentages were calculated based on the total number of Members who reported having accepted their trading partners' zones, for each of the three diseases. These figures were derived from a question to which only one answer could be given

Time taken to accept trading partners' zones	Avian influenza (*n*=84)	African swine fever (*n*=41)	Foot and mouth disease (*n*=46)
Less than 6 months	34 (41%)	17 (41%)	22 (48%)
Between 6 and 12 months	39 (46%)	11 (27%)	15 (33%)
Between 12 and 24 months	5 (6%)	4 (10%)	3 (6%)
More than 24 months	6 (7%)	9 (22%)	6 (13%)

When asked about the conformity of trade agreements with WOAH standards, Members who accepted their trading partners' zones mostly reported that their trade agreements conformed with WOAH standards on zoning (75% for AI-related zones, 78% for ASF-related zones and 76% for FMD-related zones) (**Figure 31**).

However, 6%, 10% and 4% of Members who had accepted zones advised that the terms of the trade agreement were not as strict as WOAH standards on zoning for AI, ASF and FMD, respectively.

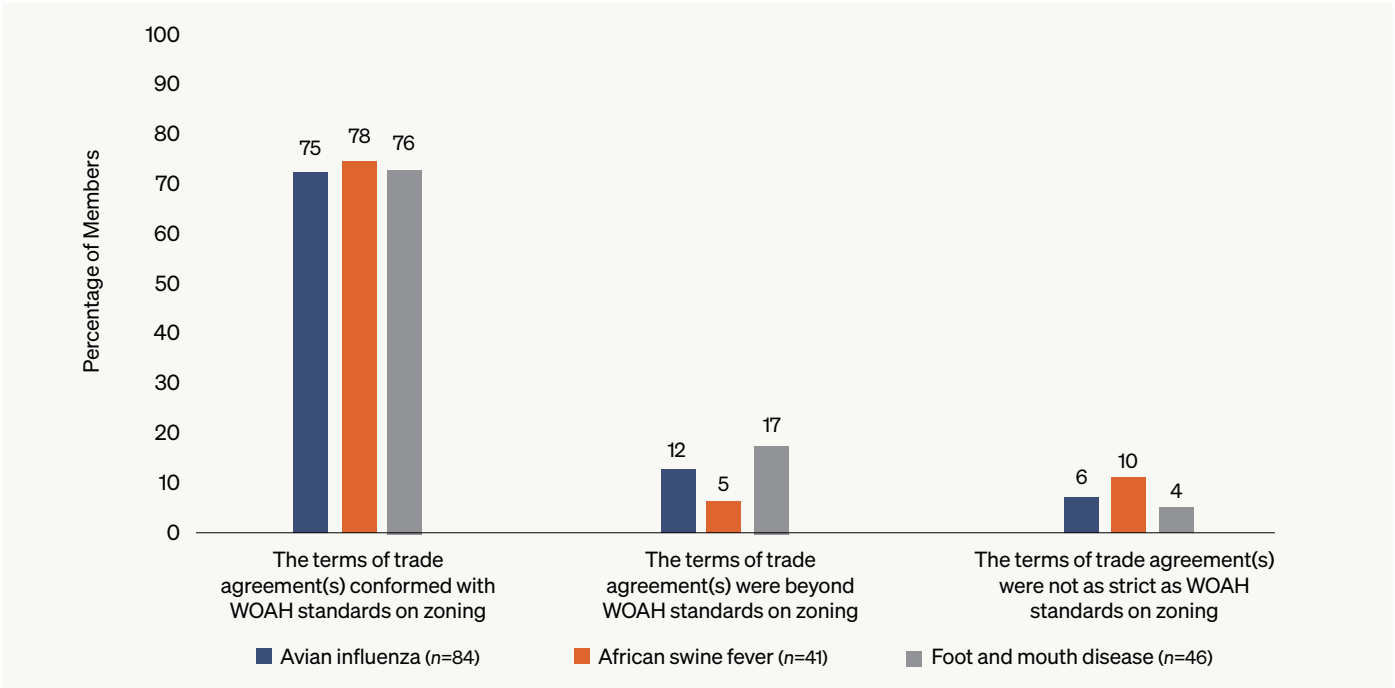

Figure 31. Percentage distribution of Members showing accordance of their trade agreements with WOAH zoning standards for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)
Percentages were calculated based on the total number of Members who reported having accepted the zones of their trading partners, for each of the three diseases. These figures were derived from a question to which only one answer could be given

As shown in **Figure 32**, **Members who had accepted zones reported that, in 56%, 69% and 68% of cases, they had a peace-time agreement with their trading partners to pre-emptively accept the use of zones for AI, ASF and FMD, respectively.**

For the most part, zones were then accepted by trading partners when they came to be established in that country/territory. However, in 44%, 32% and 33% of cases, respectively, Members reported that no peace-time agreement was established.

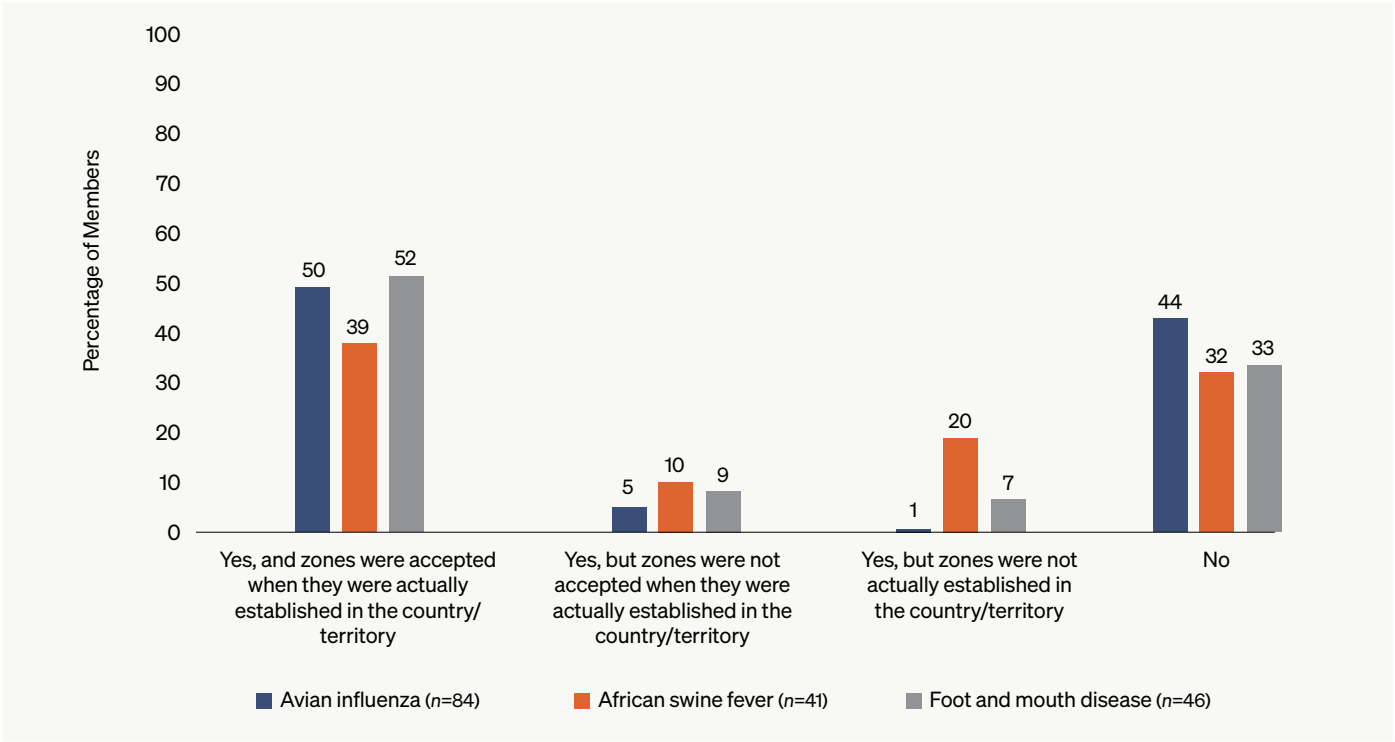

Figure 32. Percentage distribution of Members according to the presence of a peacetime trade agreement to pre-emptively accept the use of zones for avian influenza (blue), African swine fever (orange) and foot and mouth disease (grey)
Percentages were calculated based on the total number of Members who reported having accepted the zones of their trading partners, for each of the three diseases. These figures were derived from a question to which more than one answer could be given, which may lead to the sum of the percentages equalling more than 100%

Similarly to **Figure 28**, **Figure 33** shows the average scores attributed by Members who had accepted their trading partners' zones to the factors that facilitate zone acceptance, on a scale ranging from 1 (not important at all) to 4 (very important). All diseases considered, average scores were high, ranging from 2.7 to 3.9. **Transparency regarding the disease situation appeared to be the most important factor facilitating zone acceptance (average score 3.9); followed by trust in the certification system (average score 3.9); information about biosecurity, surveillance and movement control (3.9); a stable epidemiological situation (3.9); and information about movement control (3.9)**. The existence of a bilateral procedure and of a recently published PVS Evaluation report were reported as less important factors, according to the respondents (average scores 2.7 and 2.8, respectively). No major disease-specific variations were observed (data not shown).

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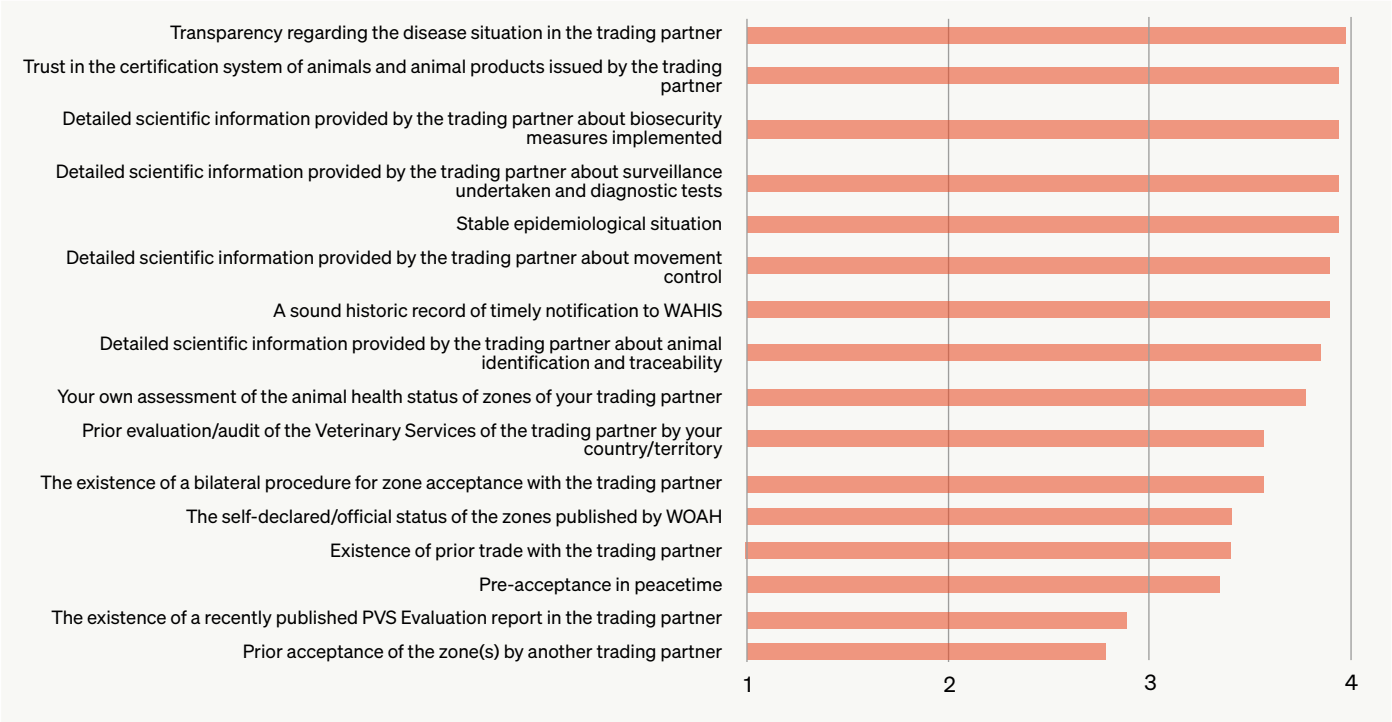

Figure 33. Average ranked importance of factors that facilitated acceptance of zones from trading partners, ranging from 1 (not important at all) to 4 (very important), all diseases considered

Means have been calculated based on the total number of Members who reported having accepted the zones of their trading partners, all diseases considered

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4. Conclusions and recommendations

This report presents descriptive results of the survey designed to explore the use, challenges and impact of zones for AI, ASF and FMD over the period 2018–2022[10]. After a three-month period of data collection, 60% of WOAH Members answered the AI-related questionnaire, 50% the ASF-related questionnaire, and 56% the FMD-related questionnaire. These response rates were highly satisfactory, and the geographical distribution was representative of WOAH Members.

This allows us to draw the conclusions summarised below. It is worth noting that, even though the analysis of the responses linked to zones that are officially recognised as being FMD-free was based on a small number of respondents (11), these respondents represent 85% of all WOAH Members who have zones officially recognised by WOAH as being FMD-free. The conclusions drawn from this sample can thus be safely extrapolated to all Members who have zones officially recognised by WOAH as FMD-free.

To what extent is zoning used for AI, ASF and FMD?

This study shows that, over the period 2018–2022, 70% of the responding Members affected by HPAI in poultry used zoning in relation to AI; 55% of ASF-affected Members used zoning in relation to ASF; and 50% of FMD-affected Members used zoning in relation to FMD. These percentages are consistent with global data already available through WAHIS six-monthly reports, thus supporting the representativeness of the sample.

Only 50% of Members who were not using zoning at present reported plans to do so in the future. Other Members mostly advised that they lacked the capacity to implement zoning. Some Members also advised that zoning was not relevant in their context. Therefore, the implementation of zoning must be considered on a case-by-case basis and tailored to each country's situation and needs.

To what extent are the WOAH standards for zoning integrated into Members' regulatory framework and practices?

Survey answers on the uptake of WOAH standards for zoning showed that there is room for improvement, as 27% of Members using zoning reported no or only partial integration of WOAH standards into their regulatory framework.

Additionally, 34% of the same Members reported no or only partial integration of WOAH standards into their practices. Animal identification and traceability systems were found to be the main points for which standard implementation was reportedly weakest.

What are the main barriers to the use of zones for AI, ASF and FMD?

The main challenges to establishing zones reported by the respondents were the level of staffing of veterinary resources and the enforcement of biosecurity requirements (average severity scores of 2.8 and 2.7, on a 1-to-4 scale, respectively). An increase in human resources and the development of public–private partnerships were cited as the main success factors for implementing zones.

Respondents identified potential support from WOAH in areas such as the development of new regulations and the establishment of public–private partnerships. Interestingly, few countries reported having carried out a cost–benefit analysis. When performed, these cost–benefit analyses mostly demonstrated the cost-effectiveness of zoning, but more data would be necessary to support this conclusion.

[10] As mentioned in the introduction, the current document is the first part of the thematic study on zoning and compartmentalisation. These first descriptive findings lay the foundations for further analysis on zoning, as well as on compartmentalisation, that will be conducted in 2024. Some areas to be explored are described in the first recommendations of this document.

What is the reported impact of zoning for AI, ASF and FMD?

Despite the reported economic burden on producers and the difficulties of understanding/implementing control measures due to their high number, responding Members advised a positive impact of zoning in terms of disease control (81% of Members advised zoning was highly beneficial to control AI, 84% to control ASF and 91% to control FMD). From the trade perspective, zone acceptance led to considerable benefits in terms of export volumes (e.g. an increase in export volumes was reported in 73% of the cases of zones that were officially recognised by WOAH as being FMD-free). However, zone acceptance appeared to be a far-from-easy process and may take up to more than two years. Though peacetime trade agreements may help zone acceptance, transparency and trust in the certification system appeared to be the main drivers of zone acceptance by trading partners (average scores of 3.9 on a 1-to-4 scale, from both importer and exporter perspectives).

These preliminary conclusions have led to the following recommendations:

1) Further analysis based on this survey and other data sources should be undertaken by the Observatory in collaboration with other WOAH departments.

2) Recommendations should be made to WOAH Members for better implementation and acceptance of zoning.

3) Advocacy, capacity-building and other support activities should be provided to Members by WOAH.

Further analysis based on this survey and other data sources to be undertaken by the Observatory in collaboration with other WOAH departments

- As previously mentioned, this preliminary analysis was descriptive only and focused on analysing answers in a vertical way. More work should be carried out to analyse answers in a horizontal way and explore deeper factors influencing the use of zoning, the level of uptake of WOAH standards, the challenges experienced, etc. Finding correlations between the different sections would help us to understand the issues better. For instance, it could be useful to know if there is any relationship between the lack of incorporation of standards into regulations and the difficulty of having zones accepted by trading partners. Similarly, the potentially positive effects of publishing a self-declaration on the time taken by a partner to accept a zone could be explored. It would also be interesting to cross-reference the current data with those from other sources, e.g. trade profiles, production data, animal population data, WAHIS data, self-declaration data, etc.
- A follow-up study should be conducted with a more qualitative approach to gain greater insights into the barriers that Members face. For example, it would be interesting to:
  - know why a third of Members who used zoning reported not integrating WOAH standards into their legislative framework, especially considering respondents' requests for WOAH support when developing their regulations. Possible hypotheses may include lack of understanding of the WOAH standards, lack of capacity or human resources, WOAH standards not being fit for purpose or not well-enough adapted to the country's/territory's situation, etc.;
  - explore the factors influencing the time for zone acceptance;
  - understand why trade agreements' require-ments differ from WOAH standards (in that they go beyond the WOAH standards or are not as strict).

  Therefore, conducting focus groups and/or interviews with a small number of Members, selected based on their answers to this survey, should be considered in the near future.
- With the development of the PVS Information System (PVSIS), a wealth of qualitative data has been extracted from the more than 220 Evaluation-type reports[11] and structured into a transactional database. This means that these historical data can be more easily analysed to better understand the strengths and weaknesses of Members over time and, since 2007, in relation to the Critical Competencies on zoning[12], as well as the recommendations made by independent PVS Experts to improve their individual capacities in this area. In addition, impact evaluation and monitoring of actions taken to implement the recommendations will be conducted prospectively for all engaged Members through the PVSIS, in preparation for the future. This will allow Members to track and prioritise the recommendations made, and actions taken to assist in advocacy efforts. In this context, WOAH and its Observatory may consider exploring this data set that can, once available, be useful to understand persistent challenges preventing the proper implementation of zoning.

[11] PVS Evaluation, Follow-up Evaluation, Aquatic Evaluation, Aquatic Follow-up Evaluation, and Specific Content (rabies, peste des petits ruminants and ASF) since 2007.

[12] IV-6, according to the PVS Tool – Terrestrial, 2019 version, 7th edition: https://www.woah.org/app/uploads/2021/03/2019-pvs-tool-final.pdf

Recommendations to WOAH Members for better implementation and acceptance of zoning

- **Members should ensure that all the pre-requisites are in place before considering establishing zones; in particular, appropriate surveillance, identification and traceability systems** (which were reportedly the main points for which standard implementation was weakest), as well as enforcement of biosecurity requirements and development of appropriate and comprehensive contingency plans. Members are encouraged to evaluate their own capacity, e.g. via a PVS Evaluation, to assess if they have the capacity, infrastructure, etc. required to implement zoning effectively. To build their capacity for zoning and related WOAH standards, Members are also encouraged to take the e-learning module currently being developed by WOAH.
- Special attention should be given to the existence of appropriate legislation and relevant public–private partnership(s). Members are encouraged to ask WOAH for specific support through the PVS Veterinary Legislation Support Programme[13] or support targeted to public–private partnerships as part of the PVS Evaluation, Follow-up or Gap Analysis mission.
- As stated in the introduction of this report, the implementation of zoning must be considered on a case-by-case basis and tailored to each country's/territory's situation and needs. Therefore, before considering establishing zones, available resources should be systematically assessed and a cost–benefit analysis should be performed (which is rarely the case to date, according to the results of this survey).
- When appropriate, Members are encouraged to advocate the benefits of zoning to their respective governments (e.g. the large benefits in terms of disease control and increase in trade volumes, as reported in this survey), and the necessity of increasing human and financial resources in Veterinary Services (as these were the main challenges reported by respondents).
- Considering how important trust in the certification system and transparency were as factors facilitating zone acceptance, as reported in this survey, Members should invest in and prioritise the development/maintenance of robust certification systems and transparency to build trust with trading partners.
- Members are encouraged to raise the challenges they face at WOAH forums, to share their experience with other Members, and to seek support and capacity-building activities when needed.

Practical areas for improving zone acceptance have already been highlighted in the literature (Funes *et al*., 2020):

(i) establishing bilateral veterinary agreements or free-trade agreements with clear procedures and timelines to be implemented by trading partner countries for the recognition of zones;

(ii) promoting dialogue, transparency and the ongoing exchange of information among trading partners, to build trust among their Veterinary Services and authorities;

(iii) establishing parallel, reciprocal and simultaneous procedures for the acceptance of zones by trading partner countries, which would create a win-win situation;

(iv) promoting, as far as possible, the harmonisation of requests for information (questionnaires) and procedures for recognising the animal health status of countries or their zones, considering the validity of the tools available, such as previous audit reports, PVS reports or recognition granted by other countries or WOAH.

Overcoming these barriers, related to both the implementation and the acceptance of zoning, requires sustained political will, financial and technical support, capacity-building, trust building, and effective communication, as well as established coordination mechanisms such as guidelines and bilateral protocols. Members are also encouraged to promote the acceptance of zones in other international organisations such as WTO; for example, via the SPS annual report on the implementation of regionalisation[14].

[13] The Veterinary Legislation Support Programme (also known as VLSP) aims to identify gaps and weaknesses in national veterinary legislation, and to assist Members in revising or developing new legislation.

[14] Annual report on the implementation of Article 6 of the Agreement on the Application of Sanitary and Phytosanitary Measures.

Advocacy, capacity-building and other support activities to be provided by WOAH to Members

- Since the main challenge reported is the level of staffing of Veterinary Services, WOAH should continue to advocate for the critical importance of dedicating enough human and financial resources to Veterinary Services.
- Cost–benefit analyses were not reported as having been widely carried out. WOAH could explore ways and partnerships that could support the development of cost–benefit analysis capacity within Veterinary Services to help countries/territories assess whether they should engage in a zoning approach and anticipate the associated costs.
- Since trust in the certification system and transparency were reported as the main drivers facilitating zone acceptance, WOAH should continue advocating and developing capacity-building activities to improve the role of Veterinary Services in ensuring and facilitating safe international trade. WOAH should also continue to aid in the development of sound national official assurance systems based on high-quality Veterinary Services, to support international veterinary certification. Moreover, another thematic study could be dedicated to certification systems. Regarding transparency, WOAH could also reflect on how the current and future activities conducted on transparency via the Observatory indicators could help overcome this challenge.
- WOAH should continue to advocate the proper use of WOAH international standards for international trade. This should go beyond the mere use of the recommended sanitary measures for trade, to include the use of horizontal standards for bilateral assessment and acceptance of animal health status at origin and national official assurance systems, including the use of zoning, based on sound criteria.
- WOAH should consider organising an inter-regional forum. Such a forum would be an excellent opportunity to (i) share practical experiences of Members from different parts of the world in establishing disease-free zones, examining both the challenges faced and the successes achieved; (ii) fostering global brainstorming on practical approaches, solutions and tools to be considered for creating and successfully maintaining a disease-free zone. Members wishing to engage in a zoning approach will have a pool of practical solutions to build on, and Members who have already achieved disease-free zones may identify possible solutions to strengthen the sustainability or cost-effectiveness of their zoning approach.

In conclusion, this first report provides promising results and paves the way for further work. The Observatory will build on this initial study in the future, based on Members' feedback.

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