

The WOAHObservatory: a data-driven approach to address the needs of its Members

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Summary

This article outlines what the World Organisation for Animal Health (WOAH, founded as OIE) Observatory entails, as well as its objectives, direction and progress achieved so far. It explains the benefits this data-driven programme offers as a system of improved access to data and analysis of information whilst ensuring confidentiality, as well as the challenges it faces and its inexorable link to the Organisation's data management. The development of the Observatory is of the utmost importance, not only because of its relevance to the development of WOAHOInternational Standards and their implementation worldwide, but also because of the role it plays as one of the drivers of WOAHO's digital transformation plan. This transformation is essential change given the major role of information technologies in supporting regulation for animal health, animal welfare and veterinary public health.

Keywords

Data management – Data visualisation – Digital transformation – Indicator – Monitoring implementation – WOAHOInternational Standards.

Introduction

The World Organisation for Animal Health (WOAH, founded as OIE) is the intergovernmental organisation that aims to improve animal

health and welfare, protect public health and assist national Veterinary Services worldwide.

As part of its historical mandate, WOAHA collects data and receives notifications of significant epidemiological events from its Members. Once they have been verified and validated, WOAHA publishes this information to update the international community on the international animal health situation, so that Members can update their risk assessment and ultimately prevent the global spread of animal diseases [1].

WOAHA also sets International Standards [2] concerning animal health and welfare. These Standards help improve the prevention and control of animal diseases and support the safe trade of animals and animal products while avoiding unnecessary impediments to trade [1]. WOAHA is the World Trade Organization (WTO) reference institution for standards related to animal health and zoonoses, as recognised in the Agreement on the Application of Sanitary and Phytosanitary Measures (known as SPS Agreement). However, whilst international animal health norm-setting has been considered essential by WOAHA Members [3], there is limited information on the uptake of these standards in domestic legislation.

WOAHA has therefore explored options for better monitoring of the implementation of its standards and has progressively developed the Observatory. The WOAHA Observatory aims to be a continuous and systematic mechanism to analyse the practices of Members' in implementing WOAHA International Standards by using information from various WOAHA work-streams, as well as external sources. The development of this programme has taken a multi-phased approach:

- A preliminary phase (2017–2018) focused on advocacy to WOAHA Members for the need of a new mechanism to monitor the implementation of the Standards. As a result, in May 2018, the World Assembly of WOAHA Delegates approved a resolution [4] recommending the design of an Observatory to increase transparency and to identify difficulties faced by its Members.

- The design phase (2018–2019) aimed at planning the layout of the Observatory, collaborating with the Organisation for Economic Co-operation and Development. A study [3] concluded that the implementation of WOAHA Standards by its Members is neither defined nor prescribed, because these norms are of a voluntary nature. Consequently, Members have significant latitude in considering and using WOAHA Standards, which results in disparate approaches across WOAHA Members, and making it difficult to gauge the consistency of national measures with WOAHA Standards.
- The pilot phase (2020–2021) tested, through small-scale studies called ‘prototypes’, different aspects of the development of the WOAHA Observatory, such as the methodological approach, data collection and data analysis. The main outcome of the pilot phase was the development of a ‘Standards Monitoring Framework’, a set of indicators that ensures a standardised and repeatable methodology and metrics to assist future work of the Observatory.
- The implementation phase (2022–2025) is beginning at the time this article is being written, and it is the period where the WOAHA Observatory must consolidate itself as a recognised system for the monitoring of the implementation of WOAHA Standards.

This manuscript endeavours to explain the concept of the Observatory as a data-driven programme that is based on a set of selected indicators that establish a repeatable methodology, which is the ‘Standards Monitoring Framework’. It then covers the link between the Observatory and WOAHA digital transformation and highlights lessons learned and the next steps of the programme, before finalising with some concluding remarks.

The concept of the WOAHA Observatory

The approach of the Observatory consists of accessing information assets and analysing them with a dual purpose. First, to ascertain the

degree with which WOAHS Standards are put into practice by its Members and identify potential barriers that may hinder their implementation. Second, to promote improvements of data management within WOAHS. The insights from this work aim to support national authorities and the international community in making evidence-based decisions to improve global animal health and welfare, as well as, to facilitate trade in animals and products of animal origin.

By having evidence-based information about the level implementation of its International Standards, as well as on the barriers that prevent their implementation, WOAHS can improve the standard-setting process, and act upon the challenges that may prevent their application by its Members. In light of this, one of the outputs of the Observatory is the publication of an ‘annual implementation review report’, providing a descriptive account of its findings with regard to the uptake of International Standards by WOAHS Members.

A data-driven approach

The WOAHS Observatory acknowledges that it is essential to adopt a robust data management approach and to establish a ‘Standards monitoring framework’. This framework is a set of indicators that will be regularly measured to have an overview of the implementation of WOAHS Standards. It is an ambitious but realistic exercise that aims to link all WOAHS workstreams to the Organisation’s core referential data (standards, Members, diseases, official disease status, etc.) [5]. To put this idea into practice, the Observatory has worked to:

- Identify in-house information-gathering activities, carried out centrally by WOAHS, that relate to the implementation of WOAHS Standards and the datasets or databases collected by different WOAHS Departments as part of established activities (e.g. annual reports, outbreak notifications, self-declarations and mission reports delivered by the Performance of Veterinary Services [PVS] department).
- Link the relevant WOAHS Standards that correspond to all these data. Finding relevant linkages between these data sources has

allowed the Observatory to provide a clearer description of the situation.

- Find external official data sources that can assist to understand national processes in relation to the implementation of International Standards. Examples of these sources could be the notifications to the WTO and specific-trade concerns submitted to WTO by its Members.
- Identify the limitations and the constraints linked to the use of each dataset and database.
- Collect and clean the data into comparable datasets, with appropriate use of data referentials.
- Analyse the data and provide recommendations on their collection or storage processes, as well as, when relevant, on WOA's processes and services to its Members.
- Explore tools for data analysis and visualisation to help devise presentation formats that meet the Observatory's objectives. An aggregated format will be used for the dissemination of the findings in order to maintain confidentiality. There will be no singling out of specific Members to ensure they all maintain their confidence in trusting information to WOA.

This is a dynamic process that can be configured in four areas: data accessibility, data collection, data analysis and data visualisation (Figure 1).

Standards Monitoring Framework

The Observatory's Standards Monitoring Framework associates WOA Standards with data sources that can provide insights into the uptake of these Standards by Members, and the challenges they may face to implement them. Then, selecting a set of indicators that have valuable intelligence, assist in identifying patterns, raise 'red-flags' and facilitate conclusion drawing. The Standards Monitoring Framework provides a standardised and repeatable methodology to transform data

into knowledge about the level of adherence to WOAHA Standards. As a result, the WOAHA Observatory will provide an overview about the degree to which Members put the WOAHA Standards into practice.

The Standards Monitoring Framework was developed based on results chain logic [6]. According to this theory, the monitoring of the implementation of a given standard or policy requires looking into activities at different levels, such as key success factors, outputs and outcomes. Applying this concept to the WOAHA Observatory provides three areas of focus:

- Inputs/Processes: The WOAHA Observatory can monitor the Members' capacity to implement WOAHA Standards, through the evaluation of information based on funding, laboratories, workforce, legal framework, and information system.
- Outputs: This involves measuring the Members actions that contribute to the implementation of WOAHA Standards. Examples of these can be programmes, policies or notifications on disease diagnosis, surveillance, disease prevention and control, international trade, control of antimicrobial resistance and animal welfare.
- Outcomes and Impact: This consists of monitoring the results of the efforts of implementing WOAHA Standards and specific strategies/programmes as well as evaluating impact regarding global goals.

Identification of data sources and definition of indicators

The data collection, with some exceptions, is not intended to burden Members by seeking extra evidence from them; rather it is to use readily available information. As previously described, the WOAHA Observatory has identified in-house and external sources of information, that are linked to WOAHA Standards and that are already regularly collected through established channels. These data consist, therefore, of information that is already provided by our Members, and that is currently/or has been gathered for purposes other than those of

the Observatory. The appropriate identification of data limitation is consequently critical for their interpretation. Efforts have been made to select the information that can best assist the Observatory in monitoring the implementation of WOAHS Standards by Members.

As part of the selection criteria, the Observatory favoured data that were reliable, of a high quality and that had been validated by WOAHS and/or by WOAHS Delegates. Data had also to be analysable – that is, presented in a format that facilitated extraction and scrutiny. Information was also valued when it was regularly collected and thus kept up to date. Finally, the Observatory focused on data collected at global level, referring to the majority of WOAHS Members as opposed to clusters of territories in specific regions.

During the pilot phase, the Observatory developed nine groups of indicators, each one having been extracted from different data sources, as described above. This is not the final ‘product’, as more groups of indicators will be developed in the future work of the Observatory. The mapping of the information corresponding to these groups of indicators sought to outline the relevance of the data, the rationale and objectives behind its collection, the units of measure and presentation formats after analysis. The pros and cons of the indicators were also pondered and captured in an interests-and-constraints matrix. An indicator matrix and a data catalogue were developed; a metadata catalogue was drafted and should be further developed as WOAHS progresses on data management and harmonisation. Table I below illustrates the general group of indicators that the WOAHS Observatory has identified in the most recent study carried out during the pilot phase.

The main difficulty the Observatory faced was to find sources of information that allow the monitoring of WOAHS Standards, because, as previously mentioned, the Observatory does not receive tailor-made information but rather uses readily available data. Combining data from different sources that inevitably present different perspectives of the same concept, has allowed the Observatory to describe the area under study and thus the indirect monitoring of the Standards.

Other technical challenges included dealing with data limitations, for example:

- data being in pdf format and requiring manual extraction from multiple documents
- data having a qualitative nature for which unquestionable measurement units had to be identified
- lack of contemporaneous and/or recurrent data, such as one-off reports
- the level of obligation for the submission of the reports, such as those sent voluntarily by Members *versus* the notifications that Members are compelled to submit.

The Observatory and WOAAH digital transformation

WOAH's Seventh Strategic Plan [7] has identified digital transformation as a key strategic objective. It is an important step in becoming a more modern and agile organisation [7] and to strengthen animal health and welfare regulation and decision-making worldwide. Managing data to provide added value is becoming an increasingly complex and digitally driven task. It requires organisations that are responsible for compiling, managing and communicating data to do so from a structured and strategic perspective, in line with best international practices [5].

This is an ambitious approach that requires a cultural change in data management by improving accuracy, availability and accessibility of data as well as developing data intelligence and managing data confidentiality. The WOAAH Observatory is aligned to this core objective and is a strong driver for digital transformation and data stewardship across WOAAH's Member-centred programmes [8].

The WOAAH Observatory acts as a trigger to improve the quality of the data collection and storage within the organisation and to improving links to existing databases or datasets (e.g. PVS Pathway, World Animal Health Information System [WAHIS], WOAAH Antimicrobial

Use [AMU] Database, Official disease status, Self-declaration). It is expected that Members, when understanding the use that is made of the data they submit, will realise the added-value of providing good quality information. In addition, the use of data from different sources and departments is expected to contribute to the reflection on data processes, data flows and more generally on data management within WOA. In return, digitalisation of information storage is key for the Observatory so that an automated system for updating and recovering information can be put in place to secure systematic and repeatable analysis and monitoring methods.

Lessons learned

The Observatory will present a general overview of the Members adherence to WOA Standards. However, it is not intended that this work can categorically evidence whether specific WOA Standards are implemented or not; this cannot be the case with the data sources currently available and as long as additional and specific information is not requested from WOA Members.

Some reflections drawn from the Observatory after the pilot phase suggested that the benefits to the Organisation and its Members, of collecting information, have to outweigh the costs, both in terms of financial and human resources. Processes that require vast investment of time, work and/or funds and where returns are questioned should be reviewed in order to achieve optimisation. In addition, data collected by the organisation should be transferable so it can be used by a variety of departments, as well as partners and stakeholders. This would not only reduce inconsistencies, by avoiding having similar data assets in different departments, but would also minimise the burden that multiple information requests present to our Members.

Another consideration is that the Observatory should rely on the collection of information from stable and periodically updated data sources to allow benchmarking, comparisons and trend identification.

Finally, the Organisation can benefit from encouraging liaison between departments, and even partner organisations, in order to update data

collection procedures and support information sharing and consistent measurement of indicators.

Next steps

At this stage, key outputs of the Observatory will include the publication of an ‘annual implementation review report’, the first of which is expected at the end of 2022. It will be based on the standardised set of indicators and repeatable methodology established during the pilot period. However, the Observatory will have to continue working on the calibration of the value of each of these indicators. The aim will be to acknowledge their benefits, relevance and limitations to ensure the ‘Standards Monitoring Framework’ meets the strategic objectives of the Observatory.

It is imperative that the Observatory continues to work on visualisation tools to present its findings in a clear manner. This data sharing must also ensure confidentiality in order to honour WOAHA’s commitment to providing ‘stakeholders with access to animal health information in accordance with data protection and sensitivity requirements’.

Other prototyping work might be needed to bring in new functional areas, work programmes or strategies to the Standards Monitoring Framework. Furthermore, specific priority topics, with an in-depth analytical component, will be addressed in pluriannual ‘thematic analysis reports’. This reflection may include consultations with WOAHA Members to identify better the barriers to the implementation of specific WOAHA Standards, as well as the potential development of a methodology for the collection of direct information on whether or not Standards are implemented. To do so, the meaning of ‘Standards implementation’ will have to be clearly defined.

The Observatory needs to continue to contribute to the progressive improvement of WOAHA activities by providing reflections, feedback and suggestions on the data collection, identified gaps and information storage systems. On the one hand, this will help respond to the concerns identified by the Observatory. On the other hand, this will support WOAHA’s digital transformation, especially for the management and

processing of animal health data, aiming to optimise the potential of the significant information WOAHA gathers, analyses and publishes.

With input from the Observatory and other WOAHA Departments, a comprehensive data catalogue will be developed and be progressively completed in terms of new data, data sources as well as metadata. At present, WOAHA is defining its expectations of data stewardship through the establishment of a data governance strategy to ensure that data management is geared towards producing efficient and meaningful data analysis. This will support both WOAHA and national decision-makers in making informed and fact-based decisions [7].

Finally, a robust stakeholders' engagement strategy will need to be established in order to establish channels for information sharing and the receipt of feedback to improve data gathering systems.

Conclusions

The purpose of the WOAHA Observatory is to provide a consistent and repeatable methodology to transform raw data into relevant pieces of information to understand the effectiveness of its standards and how they are implemented by Members. These activities will deliver on the strategic goals of the Observatory, namely to identify Members' capacity building needs and adapted solutions to bridge long-standing gaps between the Standards and their application. It will also enhance the standards-setting process, should this analysis reveal that some Standards are not fit for purpose.

Challenges related to big data management in a rapidly evolving environment are not alien to WOAHA. Acknowledging that automation is one of the essential tasks required to improve data quality, the digital transformation has become a priority objective for the Organisation. Given its data-driven and horizontal approach, the WOAHA Observatory is a programme that acts as one of the catalysts for the fruition of this digital transformation. The WOAHA Observatory achieves its objectives by instigating the design of information systems that support data interoperability, repeatable value-added analytical processes, intuitive

and informative data visualisations, and feedback loops for system improvements [9].

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Table I

Indicators, based on existing data sources, that were monitored in the ASF prototype published in May 2022, grouped in line with theory of change

Input/Processes	Output	Outcome
→ Governance and Performance of Veterinary Services Engagement of Members in PVS Pathway Performance of VS for each of the four Fundamental Components	→ Detection, surveillance and diagnosis Diseases notifiable at national level Surveillance in place and diagnostic capacity available for diseases that are notifiable at national level Existence of National Reference Laboratories for ASF Proficiency testing organised by WOAHO Reference Laboratories PVS CC on surveillance	→ Transparency Quality of immediate notifications to WOAHO <i>Immediate notifications due to WOAHO tracking activities</i> Confidential status of PVS reports PVS CC on transparency
→ Workforce and other resources Density of veterinarians and veterinary paraprofessionals Competency and education of veterinarians and veterinary paraprofessionals Relevant PVS CCs on other resources	→ Prevention and control measures Control at borders and movement control within the Member – notification in WAHIS Relevant PVS CCs	→ Disease free status Self-declarations of freedom of disease
→ WTO notifications WTO notification WTO SPS annual report on regionalisation Specific trade concerns	→ Emergency preparedness Confidence in trusting information Members that have shared their contingency plans with WOAHO Members that have reported simulation exercises to WOAHO Cross-check with Members that have self-declared specific disease freedom Relevant PVS CCs	
	→ Zoning and compartmentalisation Notification in WAHIS (occurrence code and control measures) PVS CC Link with self-declarations Annual report on the implementation of article 6 (Regionalisation) of SPS Agreement	

ASF: African swine fever
CC: Collaborating Centre
CCs: Collaborating Centres
PVS: Performance of Veterinary Services
SPS: Application of Sanitary and Phytosanitary Measures
VS: Veterinary Services
WAHIS: World Animal Health Information System
WOAH: World Organisation for Animal Health
WTO: World Trade Organization

Pre-print

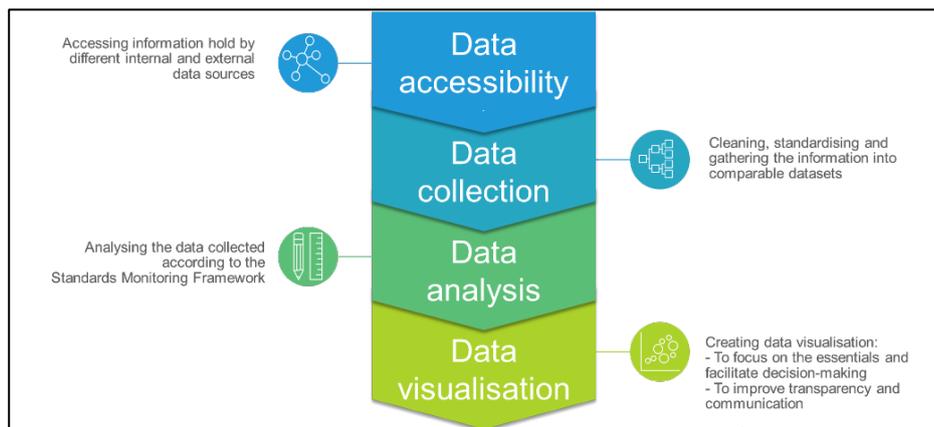


Figure 1
Data-driven approach of the WOA H Observatory

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