Report of the meetings of the *ad hoc* group on prioritisation of diseases for which vaccines could reduce global antibiotic use in animals (PROEVA)

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Table of Contents

1. Introduction 2
2. Welcome 2
3. Adoption of agenda and appointment of chair and rapporteur. 2
4. Review and address the Terms of Reference for the *ad hoc* group meeting 2
5. Updating the 2015 priority disease lists 3
5.1. Process 3
5.2. Poultry 4
5.3. Pigs 8
5.4. Fish 12
6. Ranking the 2026 priority disease lists 16
6.1. Approach 16
6.2. Criteria and weights 16
6.3. Ranked disease lists 17
7. Communication, Dissemination and Exploitation plan 19
7.1. Purpose and scope 19
7.2. Target audiences 19
7.3. Further development of the CDE plan 20
7.4. Assessing the reach and impact of the 2015 priority disease lists 20
8. Next steps 21

List of Annexes

Annex 1. Agenda 22
Annex 2. List of Participants 24
Annex 3. Stakeholder survey on WOAH priority vaccines for AMU reduction 25
Annex 4. Insights from stakeholder survey 29

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1. Introduction

The *ad hoc* group was convened by the Director General following the adoption of Resolution 29 at WOAH's 92nd General Session (May 2025), which recommended that WOAH update its list of priority diseases for which vaccines could reduce antimicrobial use (AMU), in alignment with commitment #72 of the 79th United Nations General Assembly Political Declaration on Antimicrobial Resistance (AMR).

Antimicrobial resistance remains one of the most pressing global health threats of our time, already claiming lives on a scale comparable with HIV/AIDS and malaria combined. Forecasts for 2025–2050 project 38.5 million human deaths associated with bacterial AMR. In animals, resistant pathogens threaten health, welfare, and productivity across livestock and aquaculture sectors worldwide, with annual GDP losses of US$17 billion, expected to rise steadily in the decades ahead, reaching to annual global livestock GDP losses up to US$ 1.7 trillion. Despite longstanding international commitments, global trends in antimicrobial use in animals remain concerning: WOAH ANIMUSE data show no further reduction in overall use since 2017, the number of countries still using antimicrobials as growth promoters has not decreased, and the range of use intensity across countries (from 4 to 300 mg/kg) reflects profound disparities in responsible use practices. Achieving optimal, responsible antimicrobial use requires effective alternatives, of which vaccines are a critical component.

WOAH previously convened *ad hoc* working groups to produce the first global lists of priority diseases for which vaccines could meaningfully lower AMU in swine, poultry, and fish (2015) and in cattle, sheep, and goats (2018). A decade on, the landscape has evolved considerably: novel and re-emerging pathogens, climate-linked disease pressures, rapidly advancing vaccine technologies, and fresh political commitments all demand an updated, forward-looking prioritisation. The present *ad hoc* group was therefore established to deliver an updated, evidence-based list of priority animal diseases for which vaccines could achieve the greatest global reduction in AMU in pigs, chickens, and fish, with a clear line of sight to the 2030 AMR targets and the next UNGA High-Level Meeting on AMR planned for 2029. The *ad hoc* group was multidisciplinary in nature, bringing together scientists, veterinary products regulators and representatives from both the food producing industry and vaccine R&D and manufacturing, while ensuring balanced representation across production sectors, regions and gender.

The *ad hoc* group met virtually on 26 January 2026 for an introductory session, during which members introduced themselves and were briefed on the group's mandate, deliverables, ways of working, and expected outputs from the in-person meeting. The group met in person from 18 to 20 February 2026 at WOAH Headquarters, 12 rue de Prony, Paris, France. Sector-specific sub-groups met virtually from 17 to 19 March 2026 to reach group consensus on the scoring of the disease tables.

2. Welcome

The *ad hoc* group was welcomed by Dr Montserrat Arroyo, Deputy Director General for Standards Setting and Implementation, and Dr Javier Yugueros-Marcos, Head of the Veterinary Products and Drug Resistance Department. Both speakers thanked participants for their commitment to this work and underscored the urgency of the group's mandate, emphasising that the goal is not merely to produce an updated priority list, but to deliver a concrete implementation plan which can lead to results visible by 2030.

3. Adoption of agenda and appointment of chair and rapporteur.

The agenda was adopted without changes. Dr Liz Wagstrom accepted to serve as Chair of the *ad hoc* group and Dr Nigel Swift was appointed as Rapporteur for the joint discussions. For the break-out group discussions, Dr Noemi Garcia del Blanco reported on fish, Dr Liz Wagstrom on pigs, and Mr Ali Md Hazrat on poultry.

The agenda of the in-person meeting and the list of participants are presented in Annex 1 and Annex 2, respectively.

4. Review and address the Terms of Reference for the *ad hoc* group meeting

The group reviewed the Terms of Reference and the scope of the 2026 update as presented by the Secretariat, drawing on the 2015 report as a reference point. The following points were discussed and agreed:

- *Geographic scope*. The group acknowledged that while the **objective is to produce a global list**, the application of certain prioritisation criteria may result in some diseases that are more geographically localised being ranked highly. The group agreed this is acceptable, provided the reasoning is transparent and well documented.

- *Barriers to vaccine uptake*. The Terms of Reference refer to an analysis of barriers and levers to vaccine uptake. The group **agreed to broaden this scope to encompass barriers to vaccine availability and access as well,** recognising that uptake cannot be addressed in isolation from whether vaccines are available and accessible in the first place.

- *Terminology*: antimicrobials versus antibiotics. The group agreed that the **work should consistently use the term "antibiotics" rather than "antimicrobials",** reflecting the narrower and more precise scope of the exercise. This should be reflected in the title of the group and its outputs. The group also adopted a shorter, more user-friendly name for the group and its work: **PROEVA: PRiority diseases for Overcoming antibiotic dependence through Effective Vaccination in Animals.**

- *Types of diseases in scope:* In theory, antibiotics are used in farming systems to treat bacterial diseases. In practice, farmers may use antibiotics in response to disease syndromes that they perceive to be antibiotic-responsive. Non-bacterial infections in chickens, pigs and fish (e.g. protozoal, viral) leading to clinical signs that may trigger antibiotic treatment (e.g. for diarrhoea), and which may also frequently result in bacterial co-infection are thus considered in scope. The group **agreed that in some cases a reduction of antibiotic use could be achieved by effective vaccines against a viral or parasitic disease**.

- *Vaccines within a broader prevention framework*. The group emphasised that **vaccines are not a silver bullet and** that **biosecurity, genetics, good husbandry practices, and other prevention measures all contribute to animal health and to reducing antibiotic use**. These should be promoted alongside vaccination, and the group's outputs should make clear that vaccines are in many cases a second line of defence within a broader integrated approach.

- *Autogenous vaccines*. Unlike the 2015 group, which excluded autogenous vaccines from its scope, the present group had a strong **desire to capture the value of autogenous vaccines**. These are a common approach in response to development of locally adapted strains of virus or bacteria and are of particular importance in aquaculture. Difference in standards in the production and regulation of autogenous standards vaccines among (and within) the different regions means that while a global autogenous vaccine solution cannot be prescribed for a specific pathogen, autogenous vaccines will be discussed throughout the work of the *ad hoc* group, in particular during the later stages of developing target product profiles.

- *Poultry versus chickens*. The group discussed whether the scope should be limited to chickens, as in 2015, or broadened to poultry. It was **agreed to retain a chicken perspective** when updating the disease tables given their dominance of the poultry sector and the scarcity of global data available (in particular in terms of antibiotic use) for the other species (e.g. ducks, turkeys).

- *Aquaculture vs fish*. The group acknowledged the growing importance of invertebrate aquaculture including mussels, oysters, clams and shrimp. *Vibrio spp* is a driver of AMU in shrimp operations. Given the desire to focus on classical vaccines, **invertebrates are out of scope of this report**, like it was in 2015. The group nevertheless acknowledges the recent advances in trans-generational immune priming of the innate immune system in shrimp and other invertebrates as an area that holds promise and warrants investment.

5. Updating the 2015 priority disease lists

5.1. Process

The group reviewed the 2015 disease tables for chickens, pigs, and fish (Tables 1–3 of the 2015 report) with the aim of producing updated versions reflecting the current state of knowledge and scope of this *ad hoc* group. The updating process was guided by the following questions, applied to each disease entry in turn:

First, the group asked whether the disease remains globally prevalent in the production sector concerned and is still associated with significant antibiotic use. Where the answer was no, the entry was removed from the table, with the justification documented. Where the answer was yes, the entry was retained and updated.

For retained entries, the group considered five questions:

1. Have the global prevalence and impact changed (increased, decreased, or stayed the same) since 2015?
2. Has antibiotic use in response to the disease changed since 2015?

3. Have new commercial vaccines come onto the market in the past ten years, and if so, have they addressed (even partially) the vaccine design constraints identified in 2015?
4. What constraints (including other than vaccine design) may limit uptake of the commercial vaccines?
5. Has there been research activity on developing new vaccines in the past ten years?

Finally, the group considered whether new diseases should be added to the tables in light of novel or re-emerging pathogens, climate-linked disease pressures, or other developments since 2015. Where new entries were proposed, the same set of questions was applied.

The updating exercise was carried out in three break-out groups, one per production sector, before being presented and discussed in plenary on Day 2.

As was noted in 2015, it became evident that significant data gaps remain. A comprehensive list of vaccines with current marketing authorisation, reliable estimates of antibiotic use disaggregated by disease or syndrome, and data on the relative incidence of different infections worldwide are still not available. The conclusions of the updated tables are therefore based on the best available expert opinion.

5.2. Poultry

The experts highlighted that antibiotic use and preventative practices vary a lot between chicken production systems This includes differences between high income countries (HIC) and low- and middle-income countries (LMICs), as well as variations among commercial, semi-commercial, and subsistence farming practices.

In commercial systems (whether in HICs or LMICs), access to veterinary technical advice and preventive vaccination programmes is generally sufficient to manage disease proactively, and vaccination is well established as considerably more cost-effective than reactive antibiotic treatment. The greatest challenge is therefore in semi-commercial and smallholder systems, especially in LMICs, where access to both veterinary advice and vaccines is constrained by availability, pack size, dose requirements and cold-chain limitations. In these settings, disease management remains largely reactive, with antibiotics serving as the primary, and often only, accessible intervention. The efficacy of this approach, not necessarily directed by technical experts/veterinarians may be variable.

The 2026 update (Table 1) retains the core pathogens from the 2015 exercise, while adding Salmonella as a new entry on the basis of its increased global prevalence and impact.

E. coli remains a major driver of antibiotic use, especially in broilers, and that while use has declined in many well-regulated, vertically integrated commercial systems, it remains high in other settings. Yolk sac infection stands apart from other E. coli syndromes in that it is fundamentally a hatchery hygiene problem; vaccination cannot substitute for good biosecurity and should not be framed as the primary intervention. For the remaining syndromes, the most promising current research direction targets conserved antigens (notably outer membrane proteins and iron acquisition proteins) as a means of achieving broad heterologous protection across serotypes. However, much of this work is concentrated in specific regions, notably China, and the extent to which findings will translate to diverse field conditions globally remains to be demonstrated.

Both infectious bursal disease virus (IBD) and infectious bronchitis virus (IBV) contribute to antibiotic use primarily through indirect pathways: IBD-induced immunosuppression predisposes birds to secondary bacterial infections, while IBV damages the respiratory mucosa, creating conditions for secondary infection particularly E. coli. It is these downstream effects that drive empirical antibiotic treatment at the flock level, and effective control of either virus therefore has direct implications for AMU. For IBD, vaccine advancements e.g. immune-complex formulations, recombinant herpesvirus of turkeys (HVT) vector vaccines etc. and more sophisticated vaccination schedules and region-specific products have been important advances that partially overcome maternal antibody neutralisation. For IBV, similar advances have been made in disease control through vaccination. Both viruses nonetheless share a fundamental and ongoing challenge: high mutation rates mean antigenic evolution is a permanent feature of the landscape rather than a problem that can be solved once, requiring continuous surveillance, strain monitoring and vaccine updating regardless of production context.

Necrotic enteritis presents a particular paradox: its increased prevalence over the past decade is in part a direct consequence of the reduction in prophylactic antibiotic use, creating a disease control gap that vaccination has not yet adequately filled. This gap has been partially bridged by non-vaccine interventions (e.g. probiotics, prebiotics, acidifiers and improved nutrition) rather than by vaccines per se. Vaccine research has nonetheless been active and diverse, spanning toxoid-based formulations, NetB-targeted constructs, recombinant and subunit approaches, vector-based platforms, live delivery systems and maternal immunisation strategies. There is broad consensus that an

effective vaccine will need to combine multiple antigens targeting different pathogenic mechanisms, and emerging platforms including multi-antigen subunit vaccines, genetically engineered live vectors and novel delivery routes offer promise for the next generation of products. Despite this breadth of activity, no candidate has yet reached broad commercial deployment globally, and the field remains largely pre-commercial.

Coccidiosis control remains heavily dependent on coccidiostats in many production settings, and the sustainability of this approach is increasingly in question as resistance to major anticoccidial compounds emerges. On the vaccine side, new live attenuated and live non-attenuated vaccines offering broader coverage of multiple Eimeria species, with strain mixtures better matched to current field populations, have reached the market over the past decade, delivering improvements in lesion reduction and production performance. However, all commercially available coccidiosis vaccines continue to depend on in vivo propagation of oocysts in live chickens, a production process that is labour-intensive, biologically variable and inherently difficult to scale. This fundamental manufacturing constraint limits uptake, particularly in LMIC contexts where the disease burden is greatest and the need for scalable, affordable solutions most acute.

Salmonella was added to the 2026 table primarily on the basis of its increased global prevalence and impact, with improved diagnostic capacity contributing to greater visibility of the disease burden over the past decade. Vaccine development has advanced meaningfully, with new multivalent, live attenuated, vectored and in ovo formulations improving serovar coverage and mucosal immunity compared to products available in 2015.

Highly pathogenic avian influenza (HPAI) was not included as a vaccine priority, consistent with 2015, as the group felt that biosecurity, stamping out and movement restrictions remain still the most widely adopted control measures within poultry value chains; however, the group noted that poorly managed outbreaks in settings with weak veterinary governance can indirectly drive non-judicious antibiotic use.

The overall picture that emerges from the 2026 update is two-fold:

- Improved conventional and recombinant vaccines for several priority pathogens have already contributed to reduced antibiotic use, particularly in well-resourced commercial systems. However, most next-generation multivalent vector vaccines (which hold a great promise for broad, efficient protection across multiple pathogens) remain in research or early pilot stages and are not yet widely available on the global market.

- The next frontier is therefore both technological, accelerating the development and commercialisation of true multi-antigen, multi-pathogen vector platforms, and distributional, ensuring that the gains already achieved in commercial systems are extended to semi-commercial and low-income production contexts where antibiotic dependence remains highest.

Notes on autogenous vaccines:

Autogenous vaccines are used in practice (notably for *E. coli* and variant IBD strains where commercial vaccines do not match local field strains) and can meaningfully reduce disease burden and antibiotic use at the farm-level. However, their custom-made, small-batch nature increases costs and regulatory complexity, limits scalability, and makes global impact difficult to quantify. The group noted the absence of harmonised international guidance on quality control and immunogenic consistency for autogenous products as a gap warranting attention.

Table 1. Pathogens for which vaccines could reduce global antibiotic use in chickens. * denotes non-bacterial pathogens which drive secondary bacterial infections. Pathogens in bold are new additions to the 2015 list.

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Escherichia coli	Likely increased in LMICs; broadly unchanged in HICs	Overall largely unchanged; some reductions in HICs through stewardship; extensive use persists in LMICs, often without veterinary oversight	Yes, several. Newer vaccines offer better safety profiles and broader protection.	Challenges persist, including limited heterologous protection and practicability for application.	Active research; multiple approaches (live attenuated, recombinant/subunit, DNA/vector, nanoparticle); regional polyvalent candidates advancing but remain largely pre-commercial
Infectious bursal disease virus *	Increased; vvIBDV and novel variant IBDV (nVarIBDV) now predominant in some regions, notably China	Decreased overall, driven by better vaccines and prevention; reductions concentrated in commercial operations; limited data for smallholders	Yes; recombinant HVT-VP2 vaccines and immune-complex formulations partially address maternal antibody interference and application timing constraints.	Vaccine uptake generally good in commercial settings; however outbreaks still occur despite vaccination, suggesting residual gaps in field efficacy or coverage	Significant progress; recombinant HVT vectors, immune-complex, subunit and novel delivery systems have improved immunogenicity, duration of immunity and early protection
Clostridium perfringens type A	Increased, partly as a consequence of reduced prophylactic antibiotic use in HICs	Overall decreased; driven by stewardship policies, prescription requirements and improved husbandry, nutrition and biosecurity	No widely adopted standalone commercial broiler vaccine has reached global routine use; technological advances made (toxoid, NetB-targeted, recombinant/subunit, vector-based, maternal immunisation) but constraints from 2015 largely unresolved	Epidemiology of the disease depends on other predisposing factors. Hence, risk for producers may change over time.	Active; next-generation approaches include multi-antigen subunit vaccines, genetically engineered live vectors, reverse vaccinology and novel delivery routes (*in ovo*, oral, intrapulmonary); promising but mostly pre-commercial.

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Eimeria spp.	Increasing; a major and growing issue in semi-commercial and smallholder systems in LMICs, where prophylactic coccidiostats in feed remain the predominant control tool	Increased, reflecting growth in poultry production; resistance to major anticoccidials is driving additional, often non-judicious, antibiotic use for coccidiosis-associated morbidity and mortality	New live vaccines with broader multi-species coverage and improved lesion reduction available; however all commercial vaccines still rely on in vivo oocyst propagation : a key scalability constraint unresolved since 2015.	Cost and variable field effectiveness remain significant barriers, particularly in LMICs.	Focused on refinement of existing live vaccines; recombinant and multi-antigen approaches explored in academia and industry but no recombinant vaccine has reached commercial development.
Infectious bronchitis virus *	Unknown; likely some decrease in commercial sector.	Increased overall; IBV-driven antibiotic use is predominantly indirect, responding to secondary bacterial infections (especially E. coli) triggered by respiratory epithelium damage; exacerbated by emergence of new variant strains.	Yes; region-specific vaccines tailored to circulating genotypes (793B/4/91, QX-like, D274/D388 derivatives) and more sophisticated combination schedules; no widely marketed recombinant vector vaccine yet; strain coverage constraints from 2015 partially but not fully addressed.	Strain coverage gaps; cost barriers for small-scale producers; logistical challenges in vaccine delivery.	Active; reverse genetics, recombinant viral vectors, multivalent mRNA, nanoparticle stabilisation and adenovirus vector platforms under investigation; most remain pre-commercial but next-generation products may differ substantially from current offerings.
Salmonella spp.	Increased overall, driven by production growth and improved diagnostics; significant regional variation linked to differences in biosecurity, regulation, vaccination strategies and consumer pressure.	Decreased in some settings, driven by regulatory pressure, AMR concerns, consumer demand and improved biosecurity; outbreaks increasingly managed through culling rather than treatment.	Yes; multivalent, live attenuated, vectored and *in ovo* formulations now available; serovar coverage, mucosal immunity and early protection partially improved; intestinal carriage reduction remains a challenge.	Regulatory frameworks, producer awareness, cost, logistics, flock size and type, integration with existing programmes, and accessibility particularly in LMICs.	Active; live bacterial vectors, genetically defined live vaccines, reverse vaccinology, multi-epitope and prime-boost regimens under development; broad cross-serovar protection remains the central unresolved challenge

5.3. Pigs

The 2026 update (Table 2) retains the full 2015 swine disease list, reflecting the group's view that no pathogen had sufficiently diminished in importance to justify removal. Four pathogens were added: ***Mycoplasma hyosynoviae* and *M. hyorhinis*,** reflecting their growing contribution to antibiotic use, particularly in herds experiencing Porcine Reproductive and Respiratory Syndrome virus; **Porcine Epidemic Diarrhoea Virus and Porcine Delta Coronavirus**, whose gut insult predisposes pigs to secondary infections with pathogens such as *E. coli* that are subsequently treated with antibiotics. ***Glaesserella parasuis***, formerly classified as ***Haemophilus parasuis***, was taxonomically updated.

The group noted that AMU data reported to WOAH is currently aggregated at species level, and that more granular data on AMU by disease indication would be of considerable value in informing future prioritisation exercises. The expert inputs were informed by practicing veterinarians, farmers and laboratorians, but the evidence base would be substantially strengthened by more complete and disaggregated AMU reporting.

Several pathogens were considered and explicitly excluded. ***Salmonella enterica*** was discussed at length: while vaccines exist for key serovars and it contributes to enteric disease, the group considered it not a major driver of AMU in pigs. Porcine circovirus type 2 was excluded on the basis that vaccines are widely used and have been largely effective in controlling disease. ***Staphylococcus hyicus* and *Actinobacillus suis*** were excluded as neither was considered a medium-to-high driver of global antibiotic use in the sector, the latter showing wide regional variation and largely sporadic occurrence. African Swine Fever virus, Classical Swine Fever virus and Foot-and-mouth disease virus were excluded as they do not drive antibiotic use.

The group emphasised strongly that neither vaccines nor antibiotics should substitute for good management. Disease is not caused by pathogens alone, and the best vaccines cannot overcome poor biosecurity, hygiene deficiencies, improper nutrition, inadequate housing or other factors that diminish host resistance. This principle applies across all production systems, though the specific management challenges differ between intensive commercial operations and smallholder or extensive systems.

Non-vaccine-design constraints to uptake including economic challenges, regulatory and policy barriers, cold-chain requirements, maternal immunity interference, access to diagnostics, vaccine availability by country, and veterinary availability were identified as common across pathogens rather than specific to individual diseases. The burden of these constraints falls disproportionately on smallholder and semi-commercial systems in LMICs, where reactive antibiotic use remains the primary accessible intervention.

The group debated the potential of combination vaccines as a means of improving uptake and broadening pathogen coverage. If efficacy is maintained, multi-antigen products could achieve greater AMU reductions by addressing several pathogens simultaneously. However, concerns were raised about cost implications for smallholders, and about whether the need for complementary non-vaccine preventive measures across multiple pathogens might limit the practical benefit.

Notes on autogenous vaccines:

The utility of autogenous vaccines was acknowledged, particularly where commercial vaccines are unavailable or where circulating strains are not covered by licensed products. A notable development since 2015 is the approval in several countries of backbone platforms for custom-made vaccines, most applied to swine influenza virus. This technology was considered to hold significant promise for producing vaccines matched to contemporary circulating strains. While representing a meaningful advance beyond traditional autogenous approaches (both in terms of quality and consistency), scalability and regulatory harmonisation remain challenging.

Table 2. Pathogens for which vaccines could reduce global antibiotic use in pigs. * denotes non-bacterial pathogens which drive secondary bacterial infections. Pathogens in bold are new additions to the 2015 list.

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Mycoplasma hyosynoviae and ***M. hyorhinis***	Increased; often secondary to viral infections and management deficiencies	Increased, reflecting increased prevalence	Yes; killed vaccine for *M. hyorhinis* approved in US and Canada; market penetration limited	As secondary pathogens, control of environmental and management factors may reduce disease burden independently of vaccination	Yes; limited detail available
Streptococcus suis	Stable to increased	No evidence of change	None; market viability concerns may have limited commercial investment; autogenous vaccines used in some systems	Vaccine effectiveness remains the primary barrier; other uptake constraints are secondary to this	Yes; candidates under development but none yet commercialised
Glaesserella parasuis (formerly *Haemophilus parasuis*)	Stable to increased	No evidence of change	Limited progress; avirulent live vaccine with expanded global approvals; inactivated vaccine approved in Great Britain in 2025; autogenous vaccines used in some systems; strain specificity constraints remain largely unresolved	Strain specificity and effectiveness concerns are the primary barriers; other uptake constraints secondary to these	Yes; candidates under development but none yet commercialised
Pasteurella multocida	Increasing	No evidence of change	None; autogenous vaccines used in some systems	Frequently secondary to M. hyopneumoniae or swine influenza virus; effective control of primary pathogens would reduce disease burden independently of a dedicated vaccine	Yes; candidates under development but none yet commercialised

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Mycoplasma hyopneumoniae	Stable to increased	No evidence of change	Yes; significant expansion of licensed products since 2015, including multiple new bacterins and combination products from several manufacturers	Available vaccines provide some clinical protection but have a limited effect on transmission (animals continue to shed).	Yes; ongoing
Actinobacillus pleuropneumoniae	Stable to increased	No evidence of change	None known; serovar coverage constraints from 2015 remain unresolved	Poorly understood; serovar diversity (at least 19 serovars) limits cross-protection and complicates vaccine deployment	Yes; ongoing
Porcine Reproductive and Respiratory Syndrome virus*	Increasing	Increased	Yes; new products available but sub-optimal effectiveness and strain coverage constraints identified in 2015 remain largely unresolved	Safety concerns with modified live vaccines; demanding vaccination protocols (up to 4 times per year); effectiveness limitations	Yes; several ongoing projects
Swine Influenza Virus*	Increased; growing strain diversity and complexity	Increased	Limited; one modified live vaccine marketed and subsequently withdrawn; platform for custom-made vaccines more widely approved; strain coverage constraints from 2015 remain unresolved	Updating commercial vaccines to new strains is time-consuming and expensive; circulating strain diversity may outpace vaccine updates	Yes; ongoing but none yet commercialised
Escherichia coli (post-weaning diarrhoea)	Increased in EU, linked to reduction in use of zinc oxide	Increased in EU, for the same reason	Yes; new products available but effectiveness remains sub-optimal	Sub-optimal effectiveness is the primary barrier to wider uptake	Yes; ongoing; post-weaning diarrhoea vaccine development identified as a continued research priority
Lawsonia intracellularis	Uncertain; possibly stable at high levels	Uncertain	Yes; injectable vaccine now available alongside existing oral live attenuated vaccine; uptake uncertain	Waning effectiveness of existing vaccine over time reported	Yes; ongoing but none yet commercialised
Brachyspira hyodysenteriae and *B. pilosicoli*	Uncertain; possible increase linked to removal of antibiotic growth promoters; *B. pilosicoli* appears more	Uncertain	Significant development; a bacterin vaccine for *B. hyodysenteriae* received a positive regulatory opinion in the EU in 2025, with authorisation	First approved product only just reaching market	Yes; ongoing for both species, none yet fully commercialised

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
	prevalent but causes milder disease		imminent; first vaccine approval for this pathogen		
Rotaviruses*	Uncertain; increased awareness and improved diagnostics have improved disease visibility	Uncertain	Yes; new products available; cross-protection across rotavirus strains remains an unresolved constraint	Cross-protection requirements limit effectiveness of available vaccines	Yes; ongoing but none yet commercialised
Porcine Epidemic Diarrhoea Virus and **Porcine Delta Coronavirus***	Stable at high levels	Uncertain; presumed high	Yes; killed pre-farrowing vaccine available	Killed vaccine effective only after prior exposure; a safe modified live vaccine is identified as a priority development need	Yes; ongoing but none yet commercialised

5.4. Fish

Aquaculture presents fundamentally different challenges to vaccine development compared to pig and poultry production. Species diversity is extreme, pathogens are often local and species-specific, environmental exposure is difficult to control, and the farm/wildlife interface is frequently open, enabling ongoing exchange of pathogens. These factors make universal vaccine solutions largely unachievable and require species- and region-specific approaches. A further distinctive feature of aquaculture is the economics of vaccine delivery: injectable vaccines are impractical for low-value, high-volume species. Oral or bath administration, while preferred as vaccine delivery mechanisms, remains technically challenging to develop with sufficient efficacy and consistency.

The group emphasised strongly that vaccination cannot substitute for good husbandry. Several pathogens in Table 3 (notably *Aeromonas*, *Pseudomonas* and *Flavobacterium*) can in many cases be considered secondary or opportunistic pathogens driven by poor water quality, overstocking, suboptimal nutrition and accumulated environmental stress. The emergence of hypervirulent strains of *A. hydrophila* complicates this picture, but the general principle holds: optimizing husbandry limits disease burden and shifts vaccine focus to primary pathogens.

In well-regulated commercial systems, a combination of regulatory enforcement, premium pricing for antibiotic-free fish, improved biosecurity and effective vaccines for primary pathogens has driven meaningful reductions in antibiotic use. However, structural issues in many regions mean that the socioeconomic drive for fish protein is growing faster than the regulatory frameworks and the infrastructure and technical knowledge needed for quality husbandry to become established. In these settings, antibiotics remain easily available, relatively inexpensive, and are used reactively for urgent health problems that better prevention, surveillance and vaccination could have avoided.

The 2026 update retains the full 2015 fish disease list, with one exception: ***Vibrio anguillarum*** was removed from the freshwater salmonid group on the basis that vaccination occurs in freshwater while exposure to Vibrio occurs after transfer to sea. Several pathogens were added across species groups, reflecting increasing prevalence and impact since 2015: **Cyprinid Herpesvirus 3 and *Aphanomyces spp***. under freshwater cyprinids; **Tilapia Lake Virus** under freshwater cichlids; and ***Lactococcus garvieae, Edwardsiella tarda, Francisella spp***. and infectious spleen and kidney necrosis virus under other marine fish. The addition of viral and oomycete pathogens is noteworthy as their inclusion reflects the recognition that primary immunosuppressive diseases drive secondary bacterial infections and associated antibiotic use.

Notes on autogenous vaccines:

These are increasingly and now widely utilized across global finfish aquaculture and are a vital tool to address infectious disease. These vaccines are bespoke, usually small batch vaccines manufactured for specific named farms and fish under veterinary prescription and can be permitted where either there is no commercial vaccine or the authorised vaccine has been shown as ineffective. In aquaculture the diversity of farmed fish species (>200 species farmed), and the development of farms into new regions, and/or with novel farming methods, means that fish are frequently challenged with emerging pathogens or variants for which there are no commercial vaccines and autogenous vaccines present an increasingly important means to control fish disease and reduce antibiotic use. However, the use of autogenous vaccines also presents challenges due to the different approach to regulation between regions, lack of standardization and monitoring of effectiveness and reporting of adverse effects in the field.

Table 3. Pathogens for which vaccines could reduce global antibiotic use in fish. * denotes non-bacterial pathogens which drive secondary bacterial infections. Pathogens in bold are new additions to the 2015 list.

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Freshwater cyprinid					
Aeromonas hydrophila and other Aeromonas spp.	Unchanged	Unchanged; remains high	Yes; vaccine authorised in China; delivery route constraints from 2015 remain unresolved	Injection not economically viable for cyprinids; oral or dip administration needed	Yes; oral, live attenuated, recombinant subunit and nanoparticle-encapsulated approaches reported
Pseudomonas spp.	Unchanged	Unchanged; remains high	None known.	Environmental pathogen requiring integrated approach with surveillance and diagnostics; bath administration needed for young fish; relevant protective antigens yet to be identified; affordability critical	Yes; ongoing
Flavobacterium columnare	Unchanged	Unchanged; medium	None for cyprinids	Environmental pathogen requiring integrated approach with surveillance and diagnostics; bath administration needed; relevant protective antigens yet to be identified; affordability critical	High genetic diversity presents fundamental challenge to vaccine development; research ongoing
Streptococcus agalactiae and ***S. dysgalactiae***	Increased	Increased; high	Yes; commercial vaccines authorised in certain regions for tilapia; not available for all cyprinids; regional access remains limited	Regional access and cost; injection delivery in small fish challenging; cost justification against antibiotic use needed; monitoring required to address evolving subtypes	Yes; ongoing in both industry and academia
Freshwater cyprinid					
Lactococcus garvieae	Increasing	Increased	None currently available	Availability of vaccine	Yes; ongoing
Cyprinid Herpesvirus 3*	Increasing	Increased	None currently available; one product previously existed but is no longer on market	Cost; producer education; vaccination not permitted in EU	Yes; ongoing

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
Aphanomyces spp.*	Increasing	Increased	None. Water moulds present a fundamental biological challenge, complicating conventional vaccine development approaches	No vaccine available.	Very limited
Freshwater cichlids					
Streptococcus iniae and *S. agalactiae*	Unchanged	Unchanged; medium	Yes; commercial vaccines available in certain regions	Regional access and cost; injectable delivery only viable in fish above 15g; cost justification against antibiotic use needed; monitoring required to address evolving subtypes	Yes; ongoing
Tilapia Lake Virus *	Increasing	Increased	None; autogenous vaccines used in some regions	No commercial vaccine available; autogenous approaches filling the gap in some regions	Yes; ongoing
Freshwater salmonids					
Aeromonas salmonicida, *Yersinia ruckerii*, *Flavobacterium psychrophilum*	Stable; *F. psychrophilum* and *Y. ruckerii* remain the most impactful in trout	Unchanged; medium	Yes for *Y. ruckerii* and *A. salmonicida*; none for *F. psychrophilum*; availability can be an issue for new Yersinia vaccines	*F. psychrophilum*: vaccination of very young/small fish is a key application challenge; *Y. ruckerii*: supply and availability constraints	Yes; ongoing
Marine salmonids					
Piscirickettsia salmonis	Increasing across multiple regions	Increased	Yes; new products including autogenous vaccines; not fully authorised in Europe; effectiveness constraints from 2015 remain unresolved	Vaccine uptake is good but effectiveness is insufficient; reasons for poor protection not fully understood	Yes; substantial ongoing research in both industry and academia
Other marine fish (including marine tilapia)					
Vibrio spp., Photobacterium spp.	Probably increased, though partly	Unchanged; medium	Commercial vaccines authorised for *Vibrio* and *Pasteurella* in some countries; autogenous vaccines used;	Cost-benefit justification challenging; annual variation in disease occurrence	Yes; ongoing

Primary pathogen(s)	Have the global prevalence and impact changed since 2015?	Has antibiotic use in response to the disease changed since 2015?	Have new commercial vaccines come onto the market and have they addressed (even partially) vaccine design constraints highlighted in 2015?	What constraints (inc. other than vaccine design) may limit uptake of the commercial vaccines?	Has there been research on developing new vaccines in the past 10 years?
	attributable to production growth		strain coverage constraints remain	makes farmers reluctant to commit to vaccination programmes	
Streptococcus spp.	Unchanged	Unchanged; medium	Yes; available in some regions	Strain coverage and regional access constraints remain. Injectable delivery challenging in small fish; cost justification against antibiotic use needed; evolving subtypes require ongoing monitoring.	Yes; ongoing
Lactococcus garvieae	Increasing	Increased	There are authorised vaccines for high value species (Seriola spp.), in some countries (Japan) but no vaccines for other species or regions	Cost and availability of vaccine	Yes; ongoing
Edwardsiella tarda	Increasing	Increased	Yes; vaccine authorised in China	Regional access to effective vaccines the primary constraint	Unknown
Francisella spp.	Increasing	Increased	None	Disease currently primarily controlled through culling; commercial vaccine viability uncertain	Unknown
Infectious spleen and kidney necrosis virus *	Increasing	Increased	Yes; vaccine authorised in China; multiple strain diversity constraints remain	Emerging in new regions; multiple strains complicate vaccine coverage	Yes; ongoing
Catfish					
Edwardsiella ictaluri, E. tarda	Increasing	Increased	Commercial and autogenous vaccines used; efficacy constraints remain unresolved	Oral/feed administration preferred over injectable; efficacy the primary barrier to wider uptake	Yes; academic research ongoing
Aeromonas hydrophila and other Aeromonas spp.	Increasing	Increased	Yes; vaccines authorised in China and Vietnam.	Environmental pathogen requiring integrated approach with surveillance and diagnostics; emergence of hypervirulent strains complicates vaccine coverage	Yes; ongoing

6. Ranking the 2026 priority disease lists

6.1. Approach

The group agreed to use a Multi-Criteria Decision Analysis (MCDA) framework to rank the diseases in the updated tables and produce a "Top 6" list of priority diseases (two per production sector) on which advocacy and investment efforts over the next five years should concentrate. The use of MCDA was considered essential to ensure that the prioritisation process is open, transparent, and reproducible.

The overall ranking process involves six stages, three of which were *completed* during the in-person meeting (in italics below), with the remaining steps finalised during a subsequent virtual meeting of the group:

- *Identify the diseases for prioritisation* (see section 5 above)
- *Formulate the criteria against which diseases will be assessed*
- Score each disease against the agreed criteria [March 2026]
- *Weight the criteria according to their relative importance*
- Rank diseases based on final weighted scores [March 2026]
- Identify the top two diseases per sector to form the "Top 6" list [March 2026]

The group agreed to apply a two-stage assessment process that blends individual scoring with a group consensus step.

In the first stage, each participant independently scored all diseases against the agreed criteria. This individual scoring phase ensures that personal expert judgement is captured without undue group influence.

In the second stage, the group convened to compare individual scores. Where scores diverge, members discussed the reasons for the differences, drawing on their respective expertise. Members were invited to adjust their scores in light of new insights emerging from the discussion, with the aim of reaching a shared final scoring matrix.

The overall score assigned to any disease was calculated using a simple additive model, in which the score for each criterion is multiplied by its assigned weight and the resulting products are summed:

$D = \Sigma$ (Criterion score × Criterion weight)

To avoid inappropriate double-counting, it was agreed that criteria should be as independent as possible. The group further agreed to retain no more than eight criteria in the final list, to keep the scoring exercise manageable.

6.2. Criteria and weights

The group discussed a broad range of candidate criteria for prioritisation before agreeing on a final set. The following criteria were discussed, but ultimately rejected: Total antibiotic use *vs.* use of priority WHO antibiotics; likely vaccine efficacy; one health / public health impact beyond AMR; animal impact of the disease (mortality/morbidity); impact of disease on smallholder farmers *vs.* large commercial producers; risk of global spread; whether the disease is a direct (bacterial) or secondary (e.g. viral disease) driver of antibiotic use; commercial attractiveness / potential market size for vaccine

The following 4 criteria were adopted. Criteria 1 and 2 together capture the size of the problem; Criteria 3 and 4 together capture the potential value of vaccination as a solution.

- *Criterion 1: Estimated number of animals globally affected by the disease*

This criterion captures both the prevalence of the disease and its geographic distribution. It reflects the scale of the problem at the global level.

Proposed weight: 0.34

- *Criterion 2: Antibiotic use in response to the syndromic indication or diagnosed disease, relative to overall antibiotic use in that animal species or group*

This criterion assesses how significantly the disease in question drives antibiotic use.

Proposed weight: 0.28

- *Criterion 3: Extent to which existing vaccines address the disease problem*

This criterion captures the unmet need, that is, how well currently available vaccines, if any, are already solving the problem. A disease for which no effective vaccine exists, or for which available vaccines have significant limitations, would score higher on this criterion.

Proposed weight: 0.19

- *Criterion 4: Contribution of vaccination to disease control compared with other available non-antimicrobial interventions*

This criterion assesses the relative value of vaccination as a disease control tool, recognising that biosecurity, good husbandry, and other measures may in some cases be more effective or more accessible alternatives. It reflects how useful vaccination would be in practice.

Proposed weight: 0.19

The group noted that a five-level scoring scale for each criterion needs to be defined by the group ahead of the scoring exercise in March.

6.3. Ranked disease lists

The overall score assigned to each disease can be found in Table 4 for chickens, Table 5 for pigs and Table 6 for fish. Within each table, diseases were ranked based on their overall score. Subsequent work of the *ad hoc* group will focus on the top two pathogens in each group.

Vaccine target product profiles (TPPs) will be developed for

- *Eimeria spp.* and *Escherichia coli* in chickens,
- Porcine Reproductive and Respiratory Syndrome virus and *Escherichia coli* in pigs,
- *Aeromonas hydrophila* and other *Aeromonas spp.* in freshwater cyprinids and
- *Streptococcus iniae* and *S. agalactiae* in freshwater cichlids.

Table 4. Overall score and rank of pathogens for which vaccines could reduce global antibiotic use in chickens. The top two pathogens are highlighted in green.

Primary pathogen(s)	Overall score	Table rank
Escherichia coli	**4.24**	**2**
Infectious bursal disease virus	4.15	3
Clostridium perfringens type A	3.38	5
Eimeria spp.	**4.34**	**1**
Infectious bronchitis virus	4.15	3
Salmonella spp.	3.19	6

Table 5. Overall score and rank of pathogens for which vaccines could reduce global antibiotic use in pigs. The top two pathogens are highlighted in green.

Primary pathogen(s)	Overall score	Table rank
Mycoplasma hyosynoviae and *M. hyorhinis*	*3.53*	7
Streptococcus suis	*4.19*	3
Glaesserella parasuis	*3.53*	7
Pasteurella multocida	*3.72*	6
Mycoplasma hyopneumoniae	*3.87*	5
Actinobacillus pleuropneumoniae	*3*	12
Porcine Reproductive and Respiratory Syndrome virus	***4.81***	**1**
Swine Influenza Virus	*4.06*	4
Escherichia coli	***4.53***	**2**
Lawsonia intracellularis	*3*	12
Brachyspira hyodysenteriae and *B. pilosicoli*	*3.19*	10
Rotaviruses	*3.34*	9
Porcine Epidemic Diarrhoea Virus and Porcine Delta Coronavirus	*3.19*	10

Table 6. Overall score and rank of pathogens for which vaccines could reduce global antibiotic use in fish. The top two pathogens are highlighted in green.

Primary pathogen(s)	Overall score	Table rank
Freshwater cyprinid		
Aeromonas hydrophila and other Aeromonas spp.	***4.62***	**1**
Pseudomonas spp.	*3*	18
Flavobacterium columnare	*3.72*	8
Streptococcus agalactiae and *S. dysgalactiae*	*3.23*	16
Lactococcus garvieae	*2.42*	19
Cyprinid Herpesvirus 3	*3.81*	5
Aphanomyces spp.	*3.29*	14
Freshwater cichlids		
Streptococcus iniae* and *S. agalactiae	***4.62***	**1**
Tilapia Lake Virus	*4.19*	3
Freshwater salmonids		

Primary pathogen(s)	Overall score	Table rank
Aeromonas salmonicida, *Yersinia ruckerii*, *Flavobacterium psychrophilum*	*3.34*	13
Marine salmonids		
Piscirickettsia salmonis	*3.62*	9
Other marine fish (including marine tilapia)		
Vibrio spp., Photobacterium spp.	*3.81*	5
Streptococcus spp.	*3.53*	10
Lactococcus garvieae	*3.19*	17
Edwardsiella tarda	*3.47*	11
Francisella spp.	*3.29*	14
Infectious spleen and kidney necrosis virus	*3.38*	12
Catfish		
Edwardsiella ictaluri, E. tarda	*3.81*	5
Aeromonas hydrophila and other Aeromonas spp.	*4*	4

7. Communication, Dissemination and Exploitation plan

A Communication, Dissemination and Exploitation (CDE) plan is a structured approach to ensuring that the outputs of the *ad hoc* group reach the right audiences, in the right form, at the right time. CDE activities form a continuum: communication begins at the outset of the project and focuses on informing audiences about the work itself; dissemination starts when results become available and focuses on making those results accessible to those best placed to use them; and exploitation focuses on the active utilisation of results to drive concrete decisions, policy change, and ultimately behaviour change on the ground.

7.1. Purpose and scope

The purpose of this CDE plan will be to ensure that the outputs produced by the PROEVA group (the updated disease lists, the target product profiles and the barriers and levers analysis for the Top 6 priority diseases) translate into concrete decisions and actions that meaningfully reduce global antibiotic use in pigs, poultry, and fish by 2030.

This plan is not a general awareness campaign about antimicrobial resistance or the value of vaccines. Its purpose is narrower and more strategic: to ensure that the right outputs reach the right decision-makers at the right moments, in a form that is actionable, so that a reduction in the global use of antibiotics across the three sectors is observed through targeted investments in the most relevant vaccines.

7.2. Target audiences

Against the goal set out above, the group identified two primary audiences for this plan.

- *Primary audience 1: Public and mission-aligned funders*

This audience encompasses any public or private funder whose investment decisions are not driven by direct financial return but rather by policy objectives, supply chain resilience or social impact (including impact on global health, food security and AMR). It may include national governments, large philanthropic and multilateral mechanisms, primary producer associations and large integrators and impact investors.

What unites these otherwise diverse actors is that their decision-making is not governed primarily by the logic of commercial pharmaceutical markets. For many of the priority vaccines identified by this group, the commercial case for private investment is often insufficient. Private manufacturers understand this landscape well, and where they have chosen not to invest, there is generally a rational commercial reason. Closing these gaps therefore requires public or mission-aligned investments to de-risk research and development, support early-stage work that the private sector will not fund, and in some cases create the conditions under which commercial investment becomes viable. Engagement with private manufacturers will be of a different and more limited character.

- *Primary audience 2: WOAH Member governments and relevant regional intergovernmental bodies*

WOAH Member governments and relevant regional intergovernmental bodies form the second primary audience. Individually, each government shapes the environment in which animal health decisions are made within its borders; collectively, they determine whether the global policy landscape becomes more or less conducive to vaccine uptake at scale.

The 79th UNGA Political Declaration on AMR commits signatory countries to ensuring that animal vaccination strategies are defined with an implementation plan by 2030, taking into account WOAH's list of priority diseases. This commitment is only meaningful if it translates into national policy and regulatory environments that create genuine demand for the vaccines in question whether it is through procurement incentives, regulatory harmonisation, and the removal of barriers that currently make antibiotics the path of least resistance for farmers and veterinarians. Policy fragmentation across countries also undermines manufacturer confidence: a more homogeneous enabling environment across key production regions would signal a viable and sustainable market.

- *Secondary audiences*

Other stakeholders (veterinary associations, farmers and their organisations, individual veterinarians, and animal health providers …) are not absent from this plan but are addressed primarily as downstream beneficiaries of the two core objectives rather than as direct targets of CDE activities. Their behaviour change, greater vaccine uptake and reduced reliance on antibiotics, is ultimately what success looks like at the farm level, but it flows from the investment and policy decisions that this plan is designed to influence upstream.

7.3. Further development of the CDE plan

Work on the CDE plan began during the in-person meeting and will continue through subsequent virtual meetings of the group. A first full draft will be presented at the second virtual meeting (June 2026), with a final draft completed by the fifth virtual meeting (November 2026).

7.4. Assessing the reach and impact of the 2015 priority disease lists

As part of the preparatory work for the in-person meeting, a short stakeholder survey (Annex 3) was conducted to assess the use and utility of the 2015 priority disease lists, and to gauge future engagement with the updated outputs. The survey was distributed to a targeted set of stakeholders including vaccine R&D organisations and manufacturers, research funders, academic research networks, and food producing industry representatives. In total, 49 responses were received across all channels, of which 41 were complete. The results are presented in full as an annex to this report (Annex 4); the key findings relevant to the design of the CDE plan are summarised below.

Awareness of the 2015 lists was limited and uneven. Only 55% of respondents (27/49) were aware of the 2015 priority disease lists. Awareness was highest among government departments and ministries (80%), research funders (71%), and vaccine manufacturers (57%), but was notably low among academic research consortia (39%) and absent among the single food producing industry respondent. The WOAH website and official publications were the primary discovery channel (48%), with professional networks and scientific literature each accounting for around 11%. These findings indicate that the 2015 lists had limited penetration into the broader research and industry community, and that a more active and diversified dissemination strategy will be required for the updated outputs.

Where the lists were known, they demonstrably influenced decisions. Among those aware of the 2015 lists, concrete examples of use were reported across a range of stakeholder types: funders used the lists to design calls for proposals (IDRC, UKRI-BBSRC), the European Commission cited the reports in communications to research consortia it funds (STAR-IDAZ, ICRAD), a vaccine manufacturer in Bangladesh used them to focus quality-improvement efforts, and a Tanzanian academic institution referenced them when developing a funding application. One manufacturer reported initiating a targeted R&D programme specifically in response to the 2015 list's

identification of viral infections as drivers of antibiotic use in poultry. These examples demonstrate that WOAH's prioritisation outputs can meaningfully influence stakeholder behaviour when they reach the right audiences.

The main barriers to impact were visibility and actionability, not content quality. The most frequently cited limiting factor was simple lack of awareness (21/49 respondents). Among those who knew the lists, the most common concerns were the absence of a clear pathway for implementation or follow-up (8/49), difficulty finding the reports (7/49), and a lack of actionable details such as vaccine specifications or target product profiles (6/49). Geographic and sectoral misalignment was noted by 9 respondents. Notably, 11 respondents stated that no factors had limited the usefulness of the lists. These results point to a dissemination gap rather than a credibility gap: the prioritisation framework is broadly accepted, but outputs did not reach or activate enough of the target audience.

Stakeholder appetite for engagement with the 2026 update is high. Interest was strongest for target product profiles (93%) and the updated priority disease list (89%), followed by the barriers and levers analysis (78%) and the CDE plan itself (68%). For communication channels, email notifications from WOAH were the universal preference (100%), followed by webinars (46%) and direct outreach (32%). These results suggest that direct, personalised outreach to specific organisations will be more effective than relying on passive publication channels.

Stakeholders identified facilitation, regulation and partnership as the most valued forms of WOAH support. When asked how WOAH could best support action on the updated outputs, the most frequently selected responses were: facilitating connections between funders, developers and manufacturers (63%); supporting regulatory harmonisation (49%); convening stakeholder workshops or partnerships (46%); and supporting advocacy for increased funding and investment (44%). In terms of concrete actions respondents anticipated taking over the next five years, the most common were collaborating with other organisations on priority vaccines (68%), initiating or expanding vaccine R&D programmes (66%), and advocating with policymakers (46%). These responses reinforce the case for positioning WOAH as a convener and connector in the CDE plan, rather than primarily as a communicator.

8. Next steps

The following actions were agreed for members of the *ad hoc* group ahead of the next virtual meeting:

- Each sector sub-group to score its updated disease table against the four agreed MCDA criteria.
- Produce the first draft of the 2026–2030 CDE plan.

The Secretariat will be responsible for disseminating the updated disease tables with proposed weights and scores to WOAH Regional and Sub-Regional Representations for information.

The Secretariat informed the *ad hoc* group that once validated by the WOAH Director General, this report will be presented to the Scientific Commission for Animal Diseases for consideration at its September 2026 meeting.

The second virtual meeting of the whole *ad hoc* group is provisionally scheduled for Tuesday 9 June 2026. By the end of that meeting, the *ad hoc* group will have discussed and generated feedback on the first draft of the 2026–2030 CDE plan to incorporate into the next draft (due in November 2026). They will also have presented initial scoping work on the six TPPs and agreed on individual roles and tasks to be completed to present the first drafts at the following virtual meeting (planned in early July).

…/Annexes

Annex 1. Agenda

WOAH *ad hoc* group meeting on prioritisation of diseases for which vaccines could reduce global antibiotic use in animals

18-20 February 2026, Paris

Time	Topic	Lead
Day 1 (18 February 2026)		
09:30 – 09:40	Opening remarks	WOAH
09:40 – 10:00	Introduction by WOAH • Welcome and brief (re-)introduction of the participants (name and area of expertise/sector representation) • Housekeeping • Appointment of chair and rapporteur	WOAH (*ad-hoc* group secretariat)
10:00 – 10:45	Objectives of *ad hoc* group meeting • Definition and agreement on objectives and outputs from this meeting • Adoption of the agenda	*ad hoc* group chair
10:45 – 11:00	***Coffee/tea break***	
11:00-11:30	Short presentation & QA – how do we propose updating the disease tables?	WOAH (*ad-hoc* group secretariat)
11:30-12:00	Short presentation & QA – the human factor in animal health.	WOAH
12:00-13:30	***Lunch***	
Break-out session 1		
13:30-14:00	[Members separated into break-out groups by sector (3 groups)] Warming up for the break-out group discussion Re-introductions within the break-out group Nomination of a note taker and facilitator Re-reading of the relevant section in 2015 report	One facilitator per group
14:00 – 15:30	Break-out group discussion - each group to review the 2015 list, consider whether diseases need to be added or removed, and update the tables.	One facilitator per group
15:30-15:50	***Coffee/tea break***	
15:50 – 17:00	group discussion - continues	One facilitator per group
End of break-out session 1		
17:00-17:30	Short presentation: WOAH template for Target Product Profiles	Vish Nene
17:30 – 17:45	Wrap-up and instructions for the next day	*ad hoc* group chair
19:30	***Ad-hoc group dinner*** ***Le Bistrot d'Yves, 33 rue Cardinet, 75017 Paris***	
Day 2 (19 February 2026)		
09:00 – 10:30	group discussion - Each break-out group gives a short presentation highlighting what has changed in the 2026 table compared to the 2015 one + open up for discussion	*ad hoc* group chair
10:30-10:45	***Coffee/tea break***	
10:45-12:15	group discussion - continues	*ad hoc* group chair
12:15-13:30	***Lunch***	
13:30-14:30	Short presentation & QA - how do we propose ranking the tables and producing our 'top 6' list?	WOAH (*ad-hoc* group secretariat)

Time	Topic	Lead
14:30 - 16:00	group discussion - Define the criteria to be used as part of the multi-criteria decision analysis and whether each criterion should be scored qualitatively or quantitatively.	*ad hoc* group chair
16:00 – 16:20	***Coffee/tea break***	
16:20 – 17:30	group discussion - propose the weight that should be assigned to each criterion.	*ad hoc* group chair
17:30 – 17:45	Wrap-up and instructions for the next day	*ad hoc* group chair
Day 3 (20 February 2026)		
09:00 – 09:40	Short presentation & QA – exploring the past influence of the 2015 lists	WOAH (*ad-hoc* group secretariat)
09:40 – 10:00	Short presentation & QA – what is a communication, dissemination and exploitation (CDE) plan?	WOAH (*ad-hoc* group secretariat)
10:00-10:30	group discussion - agreement on purpose of the communication, dissemination and exploitation (CDE) plan	*ad hoc* group chair
10:30-10:50	***Coffee/tea break***	
10:50 - 13:15	group discussion – draft skeleton CDE plan	*ad hoc* group chair
13:15 – 14:30	***Lunch***	
14:30 – 15:30	Closing remarks - Acknowledgement - Tasks to be completed before next virtual meeting - Anticipated engagement of *ad hoc* group members (agreement on individual roles and responsibilities)	WOAH (*ad-hoc* group secretariat)
End of Meeting		

Annex 2. List of Participants

WOAH *ad hoc* group meeting on prioritisation of diseases for which vaccines could reduce global antibiotic use in animals

18-20 February 2026, Paris

MEMBERS OF THE *AD HOC* GROUP

Dr Elizabeth Wagstrom (Chair)
Retired; Previously Chief Veterinarian, National Pork Producers Council,
UNITED STATES OF AMERICA

Mr Nicolò Cinotti
Secretary General, International Poultry Council, Rome
ITALY

Dr Nelly Isyagi
Consultant, African Union Interafrican Bureau of Animal Resources
KENYA

Dr Vish Nene
Retired; Emeritus Fellow, International Livestock Research Institute, Nairobi
KENYA

Dr Maureen Ziba
Head of Vaccine Production, Central Veterinary Research Institute, Lusaka
ZAMBIA

Prof Refaat El-Gamal
Director, WOAH Collaborating Centre for Fish Health Management in the Middle East
EGYPT

Dr Gita Malik-Dahiya
National Manager, Canadian Centre for Veterinary Biologics
CANADA

Mr Ali Md Hazrat
Head of Veterinary Medicine & Vaccine Marketing Strategy, Incepta Pharmaceuticals Ltd.,
BANGLADESH

Dr Hamish Rodger
Chief Fish Health Officer, PatoGen AS
IRELAND

Prof Adebowale Oluwawemimo (remote participation)
College of Veterinary Medicine, Federal University of Agriculture
NIGERIA

Dr Andy McFadden (remote participation)
Director, Animal Health and Biosecurity Services Ltd.,
NEW ZEALAND

Dr Nigel Swift
Retired ; Previously Global Head of Veterinary Public Health, Boehringer Ingelheim Animal Health,
UNITED STATES/France

Prof Lars Erik Larsen
Department of Veterinary and Animal Sciences, University of Copenhagen
DENMARK

Dr. Naila Siddique
Principal Scientific Officer, National Reference Laboratory for Poultry Diseases,
PAKISTAN

Dr Noemi Garcia del Blanco
Head of Biologicals and Emerging Therapies, European Medicines Agency
THE NETHERLANDS

WOAH HEADQUARTERS

Dr Flavie Vial
Programme Officer on vaccines and vaccination, Department of Veterinary Products and Drug Resistance

Annex 3. Stakeholder survey on WOAH priority vaccines for AMU reduction

WOAH *ad hoc* group meeting on prioritisation of diseases for which vaccines could reduce global antibiotic use in animals

18-20 February 2026, Paris

WOAH Priority Vaccines for AMU Reduction: Stakeholder Survey

Estimated completion time: 8-10 minutes

Introduction

The World Organisation for Animal Health (WOAH) is updating its list of priority diseases for which vaccines could reduce global antimicrobial use (AMU) in pigs, chickens, and fish. This work builds on a previous prioritisation exercise conducted in 2015.

Your insights will help us understand the impact of our previous work and shape how we engage stakeholders with the updated priority list and vaccine target product profiles (TPPs) over the next five years (2026-2030).

All responses will be treated confidentially and reported in aggregate form only.

SECTION 1: About you and your organization/professional entity/ institution

1.1 Name of your organization/professional entity/ institution : [Free text]

1.2 Your name (optional): [Free text]

1.3 Your role/position: [Free text]

1.4 Which of the following best describes your organization /professional entity/ institution 's primary role? (Select one)

- [ ] Research funding organization
- [ ] Research consortium/academic institution
- [ ] Veterinary pharmaceutical/vaccine manufacturer
- [ ] Food producing industry (livestock/aquaculture producer or producer organization)
- [ ] Other (please specify): _____

1.5 Geographic scope of your organization/professional entity/ institution 's activities: (Select all that apply)

- [ ] Global
- [ ] Africa
- [ ] Americas
- [ ] Asia and Pacific
- [ ] Europe
- [ ] Middle East

1.6 Which animal production sectors do you work with? (Select all that apply)

- [ ] Pigs
- [ ] Chickens (broilers and/or layers)
- [ ] Fish/aquaculture

SECTION 2: Awareness and impact of previous WOAH priority disease lists

2.1 Were you aware of WOAH's priority disease list published in 2015 (pigs, chickens, fish) ?

- [ ] Yes
- [ ] No

2.2 If you answered "Yes" to 2.1, how did you first learn about these lists? (Select all that apply)

- [ ] WOAH website or publications
- [ ] Scientific literature/peer-reviewed journals
- [ ] Industry conferences or meetings
- [ ] Professional networks/colleagues
- [ ] Funding organization communications
- [ ] Research consortium or collaborative network
- [ ] Other (please specify): _____
- [ ] Not applicable - was not aware

2.3 To what extent did the 2015 priority disease list influence your organization's decisions or activities?

Please rate on a scale of 1-5, where 1 = No influence and 5 = Significant influence

For each area that applies to your organization:

- Research priority setting: [1] [2] [3] [4] [5] [N/A]
- Funding allocation decisions: [1] [2] [3] [4] [5] [N/A]
- Vaccine R&D investment: [1] [2] [3] [4] [5] [N/A]
- Manufacturing/scale-up decisions: [1] [2] [3] [4] [5] [N/A]
- Advocacy efforts: [1] [2] [3] [4] [5] [N/A]
- Industry recommendations/guidelines: [1] [2] [3] [4] [5] [N/A]

2.4 Can you provide a specific example of how your organization used or referenced the 2015 priority list?

[Free text - optional]

2.5 What factors limited the use or impact of the 2015 list for your organization? (Select all that apply)

- [ ] Not aware of the lists
- [ ] Difficult to access or find the reports
- [ ] Lacked actionable details (e.g., vaccine specifications, TPPs)
- [ ] Priorities did not align with our geographic/sector focus
- [ ] Insufficient evidence or data to support the prioritization
- [ ] No clear pathway for implementation or follow-up
- [ ] Other barriers (please specify): _____
- [ ] No factors - the lists were useful as published
- [ ] Not applicable

SECTION 3: Future engagement with the updated priority list (2026-2030)

3.1 WOAH will update the list with focus on pigs, chickens, and fish. The expert group will identify a "Top 6" priority diseases (2 per sector) and develop target product profiles (TPPs) for new or improved vaccines, plus analyse barriers to uptake for existing vaccines.

How valuable would the following outputs be to your organization?

Rate on a scale of 1-5, where 1 = Not valuable and 5 = Extremely valuable

- Updated priority disease list (Top 6): [1] [2] [3] [4] [5]
- Vaccine target product profiles (TPPs) for new/improved vaccines: [1] [2] [3] [4] [5]
- Analysis of barriers and levers to vaccine uptake for existing vaccines: [1] [2] [3] [4] [5]
- Communication, dissemination and exploitation plan for the 3 outputs above: [1] [2] [3] [4] [5]

3.2 Would your organization be interested in reviewing and providing feedback on draft outputs during the expert group process (2025-2026)?

- [ ] Yes, definitely interested
- [ ] Possibly interested - depends on timing/capacity
- [ ] No, but we would like to receive the final outputs
- [ ] No

3.3 If you answered "Yes" or "Possibly" to 3.2, which outputs would you be most interested in reviewing? (Select all that apply)

- [ ] Updated priority disease list
- [ ] Vaccine target product profiles (TPPs)
- [ ] Barriers/levers to uptake analysis
- [ ] Communication, Dissemination, Exploitation plan
- [ ] All of the above

3.4 How would you prefer to be informed about the findings from this work? (Select all that apply)

- [ ] Email notifications from WOAH
- [ ] WOAH website/publications page
- [ ] Webinars or virtual presentations
- [ ] In-person presentations at conferences/meetings (please specify relevant conferences): _____
- [ ] Direct outreach from WOAH to our organization
- [ ] Through industry associations or networks
- [ ] Social media (LinkedIn, Twitter/X, etc.)
- [ ] Other (please specify): _____

3.5 Who in your organization should WOAH engage with to present findings and discuss potential alignment around R&D priorities, manufacturing, or implementation?

Please provide:

- Name: [Free text - optional]
- Role/Title: [Free text]
- Why this person: [Free text - e.g., "leads our AMR portfolio," "chairs our vaccine investment committee"]

3.6 Beyond disseminating findings, how could WOAH best support your organization to act on the updated priority list and TPPs? (Select up to 3)

- [ ] Facilitate connections with other stakeholders (funders, developers, manufacturers, etc.)
- [ ] Provide technical support on vaccine implementation
- [ ] Convene stakeholder workshops or partnerships
- [ ] Support advocacy for increased funding/investment
- [ ] Develop communication materials tailored to your stakeholder group
- [ ] Provide regular progress updates on vaccine development/uptake
- [ ] Support regulatory harmonization efforts
- [ ] Other (please specify): _____

3.7 What specific actions might your organization take in response to the updated priority list and TPPs over the next 5 years? (Select all that apply)

- [ ] Adjust research funding priorities
- [ ] Initiate or expand vaccine R&D programs
- [ ] Invest in manufacturing capacity/scale-up
- [ ] Incorporate priorities into industry recommendations/guidelines
- [ ] Advocate with policymakers for supportive policies/incentives
- [ ] Collaborate with other organizations on priority vaccines
- [ ] No specific actions anticipated
- [ ] Other (please specify): _____

SECTION 4: Additional Insights

4.1 What are the most significant barriers your organization faces in advancing animal vaccines that reduce antimicrobial use?

[Free text]

4.2 Are there specific diseases in pigs, chickens, or fish that you believe should be prioritized but might not be widely recognized?

[Free text - optional]

4.3 Any additional comments or suggestions for WOAH's work on prioritizing vaccines to reduce antimicrobial use?

[Free text - optional]

Thank You

Thank you for taking the time to complete this survey. Your input is invaluable to ensuring the updated priority list and target product profiles meet the needs of the animal vaccine ecosystem and contribute meaningfully to global efforts to reduce antimicrobial use and resistance.

If you have questions about this survey or WOAH's work, please contact: [insert contact email]

Would you like to receive updates on this work?

- [ ] Yes, please add me to the mailing list
- [ ] No thank you

If yes, please provide your email: [Free text]

Annex 4. Insights from stakeholder survey

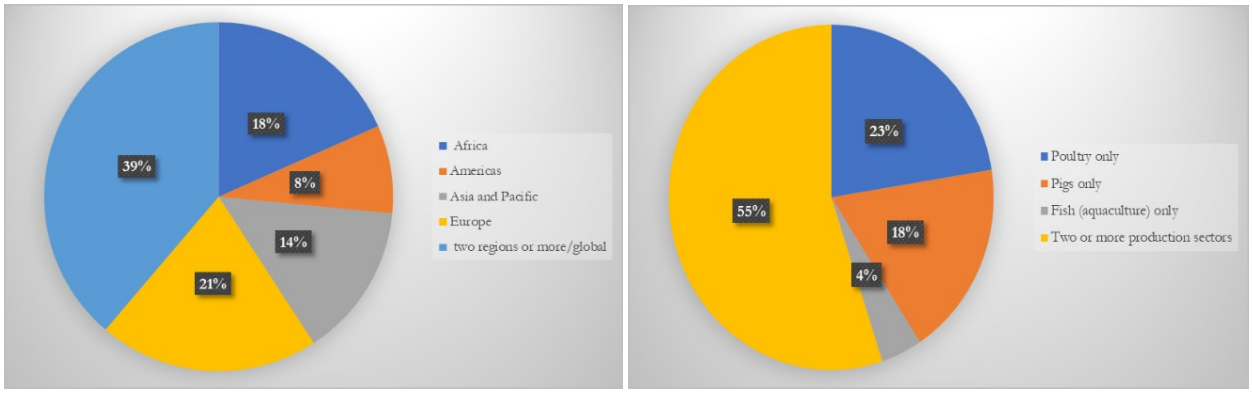
WOAH *ad hoc* group meeting on prioritisation of diseases for which vaccines could reduce global antimicrobial use in animals

18-20 February 2026, Paris

In total, 49 replies were received across the following types of organizations :

- 7 research funding organizations
- 18 research consortium/academic institution
- 14 Veterinary pharmaceutical/vaccine manufacturer
- 5 Government departments/ministries
- 1 Food producing industry (pork producer in Mexico)
- 4 Other (1 Federal government research agency, 1 Biotech startup company, 1 veterinary production consultancy)

Figure 1. Geographic scope (left) and animal production sector (right) of the respondents.



Just over 50% of the respondents (27/49) were aware of the WOAH 2015 lists. The breakdown per organization type is as follows :

- 80% (4/5) Government department/ministry
- 75% (3/4) Other
- 71% (5/7) Research funding organization
- 57% (8/14) Veterinary pharmaceutical/vaccine manufacturer
- 39% (7/18) Research consortium/academic institution
- 0% (0/1) Food producing industry (livestock/aquaculture producer or producer organization)

Figure 2. Mechanisms through which respondents had become aware of the 2015 lists.

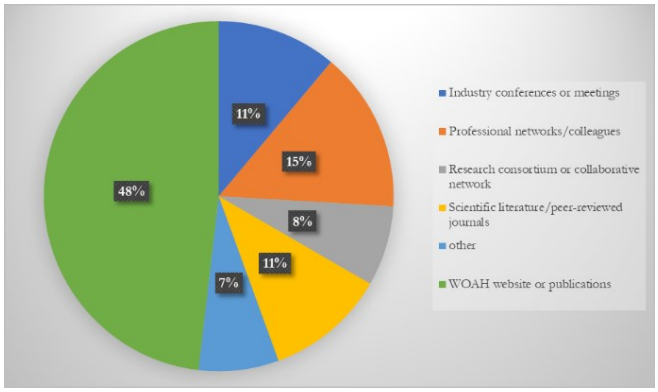
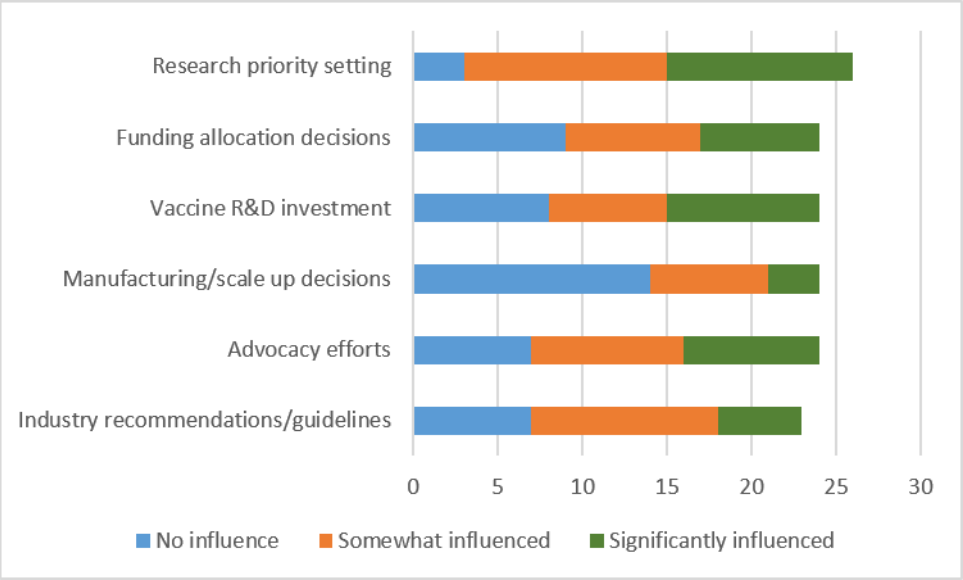


Figure 3. Extent to which the 2015 lists influenced the decision or activities of the respondents' organizations.



Anonymized examples of how the lists were used included :

'*We used the priority list to develop our 1st call for proposals for the InnoVet-AMR program.'*

'*We advertised the existence of the two WOAH reports (2015, 2018) to entities funded by the European Commission: STAR-IDAZ International Research Consortium, ICRAD ERA-NET, and more recently the European Partnership on animal health and welfare.'*

'*The WOAH's priority disease list of Chicken has helped to focus on availability of cost-effective quality vaccine against the prioritized diseases to minimize the AMU*.'

'*To choose the diseases to target in our funding application*.'

'*Developing the ICRAD funding proposal to the EU Commission*.'

'*Specifically, following the 2015 priority list's identification of viral infections like Infectious Bronchitis (IB) and Infectious Bursal Disease (IBD) as key drivers of secondary bacterial infections and antibiotic use in poultry, [we] initiated a targeted R&D program. Our goal was to develop vaccines with optimal antigenic homology to the diverse strains circulating in our primary operational regions*.'

Figure 4. Factors perceived by respondents as limiting the use or impact of the 2015 lists for their organization.

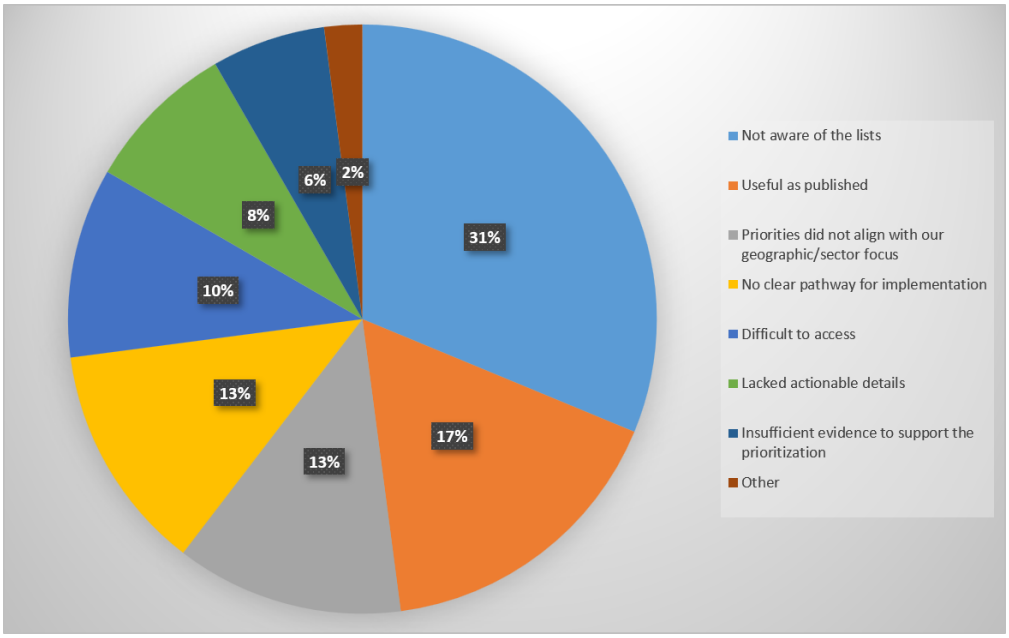
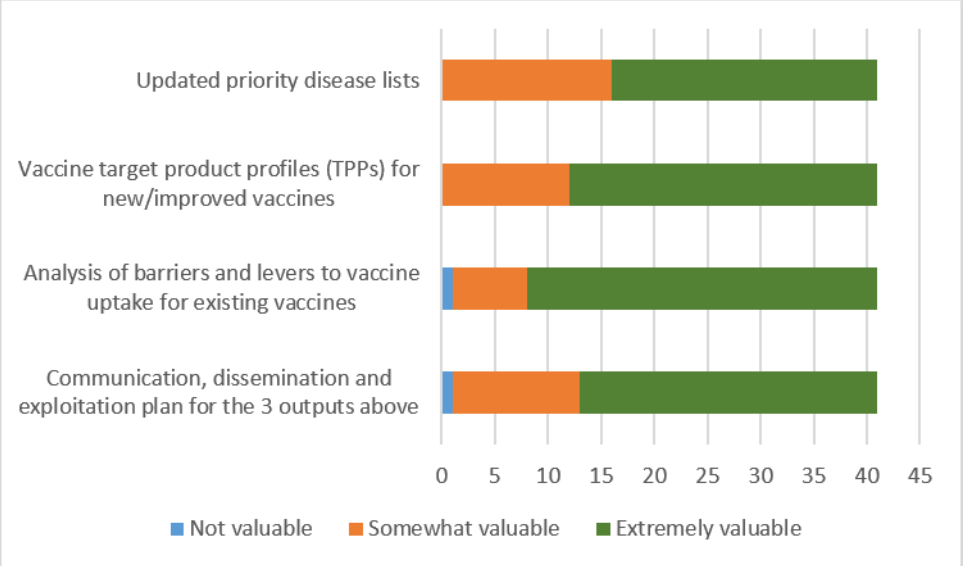


Figure 5. Respondents' perception of the value of the outputs of the PROEVA group to their organization.



When asked which of the outputs they woud be most interested in engaging with, the respondents replied:

- TPPs – 93% (38/41)
- Updated priority disease lists – 89% (36/41)
- Analysis of barriers and levers – 78% (32/41)
- CDE plan – 68% (28/41)

When asked how they would like to be informed about the outputs from the PROEVA group, respondents replied:

- Email from WOAH – 100% (41/41)
- Webinar/virtual presentation – 46% (19/41)
- Direct outreach from WOAH to your organization – 32% (13/41)
- WOAH website/publication – 32% (13/41)
- Through industry association/network – 12% (5/41)

When prompted to specify the actions their organization may take in response to the updated priority lists over the next 5 years, respondents selected:

- Collaborate with other organizations on priority vaccines – 68% (28/41)
- Initiate or expand vaccine R&D programs – 66% (27/41)
- Advocate with policymakers for supportive policies/incentives – 46% (19/41)
- Adjust research funding priorities – 34% (14/41)
- Incorporate priorities into industry recommendations/guidelines – 29% (12/41)
- Invest in manufacturing capacity/scale-up – 24% (10/41)
- No specific actions anticipated – 5% (2/41)
- Other:
    - Examine resources available in national vaccine banks that could be part of knowledge exchange for emergencies; – 2% (1/41)
    - Establish a dedicated training program or technology transfer initiative for researchers and manufacturers in low- and middle-income countries, focusing on the technologies (e.g., platform tech, adjuvants) most relevant to producing the priority vaccines; – 2% (1/41)

Finally, when given the opportunity to comment on how WOAH could best support their organization to act on the updated priority list and TPPs, respondents mentioned:

- Facilitate connections with other stakeholders (funders, developers, manufacturers, etc.) – 63% (26/41)
- Support regulatory harmonization efforts – 49% (20/41)
- Convene stakeholder workshops or partnerships – 46% (19/41)
- Support advocacy for increased funding/investment – 44% (18/41)
- Provide regular progress updates on vaccine development/uptake – 41% (17/41)
- Provide technical support on vaccine implementation – 37% (15/41)
- Develop communication materials tailored to your stakeholder group – 12% (5/41)