

Animal Diseases Challenges in the Middle East & North Africa

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World
Organisation
for Animal
Health

Organisation
mondiale
de la santé
animale

Organización
Mundial
de Sanidad
Animal

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Significant animal diseases in the ME and North Africa region

could be grouped or classified under:

- **TADs**
(FMD , PPR ,RVF).
- **Zoonotic animal diseases (zoonoses)**
(HPAI ,Rabies, MERS-CoV, Brucellosis).
- **VBD**
(LSD , CCHF,RVF, WNF, BT, BTB, Trypanosomiasis).
- **Equine diseases**
AHS
- **Poultry diseases**
HPAI, ND, IBD/ Gumboro.
- **Aquatic Animal diseases**

Recent reports IN reports to WHAIS :

- High pathogenicity avian influenza viruses H5N1. **Algeria** 2022/09/24, 2023/10/23
- West Nile Fever **Algeria** 2023/09/14
- West Nile Fever **Tunisia** 2023/10/17
(Recurrence of an eradicated disease).



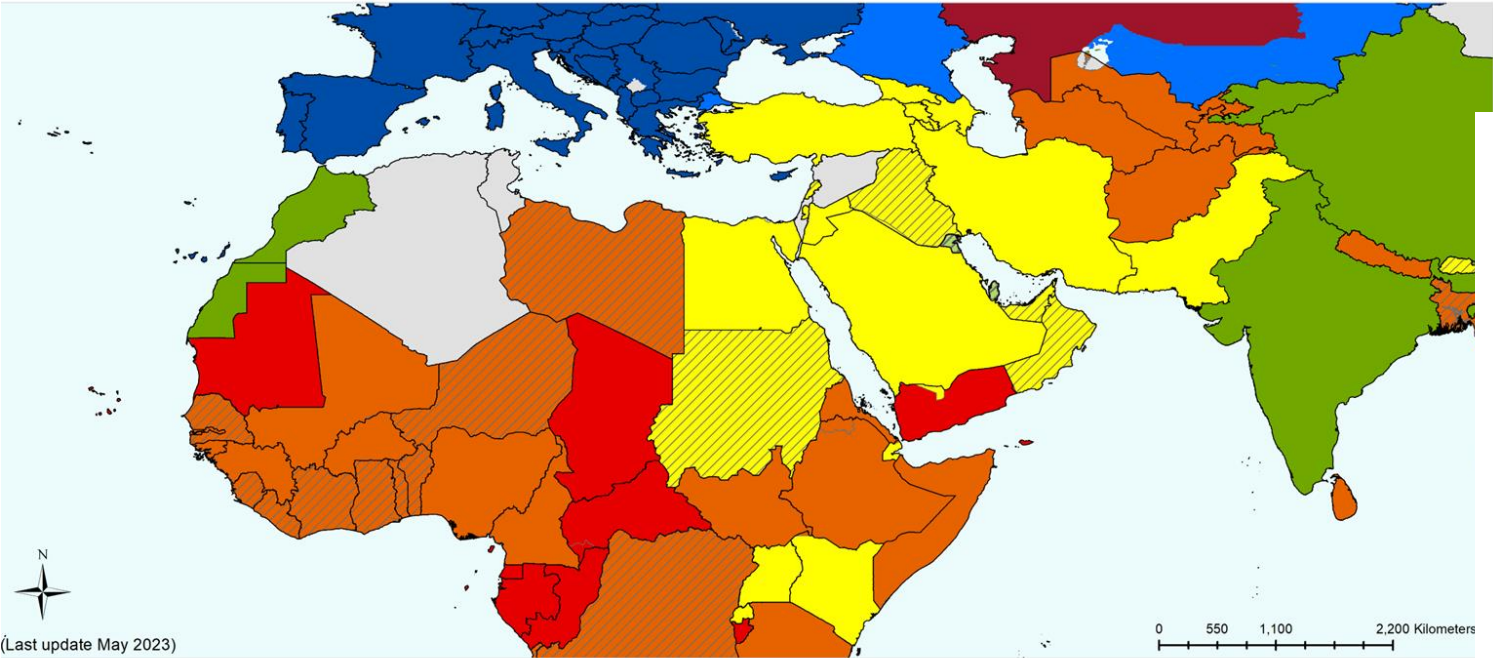
Foot and Mouth Disease (FMD)



- ❑ Severe, highly contagious of a significant economic impact, affecting cattle, swine, sheep, goats.
- ❑ It is a (TAD) that deeply affect the production, disrupting regional and international trade, results in damaging consequences for the livelihoods of farmers due to impacts on productivity, food security, & losses of income.
- ❑ FMDV is type species of the genus *Aphthovirus* within the *Picornaviridae*.

Challenges complicating by zoo-sanitary measures and vaccination campaigns :

- **Diversity of antigenic types** , multiple serotypes (7) , too numerous subtypes and variants.
- Multiple **host species including wildlife** and extreme **contagiousness**.
- Multiple variants **cocirculating** in different world areas, and sometimes within the **same geographical region**.
- Epidemics **jump** from endemic to free regions.



December 21 FMD PCP validated stages

Countries	Validated Stages										Expected Stages (not validated)				
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Bahrain	1	2	2	2*	2*	2*	2*	2*	2*	2	2	2	3	3	3
Egypt	1	1	2*	2*	2*	2	2	2	2	2	3	3	3	4	4
Iraq	2	2	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*	2*	2	3*
Jordan	1	1	2*	2*	2*	2*	2*	2*	2*	2*	2	2	3	3	3
Kuwait	2	2	3	3*	3*	3*	3*	3*	3*	3*	3	3	3	3	3
Lebanon	1	1	2*	2*	2*	2*	2*	2*	2*	2*	2	2	3	3	3
Libya										1*	1	2	2	2	3
Oman	2	2	2*							2*	-	-	-	-	-
Palestine			1	1	1	1	1	1	1	2	2	2	3	3	3
Qatar	2	2	3*	3*						3*	3	3	4	4	WOAH
Saudi Arabia	1	1	2*	2*	2*	2*	2*	2*	2*	2*	2	3	3	3	4
Syria ¹	2	2	2*	2*	2*	2*	2*	2*	2*		-	-	-	-	-
UAE	1	1	2	2*	2*	2*	2*	2*	2*	2*	2	3	3	3	4
Yemen	1	1	1*							0	1	1	2	2	3

GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES

Food and Agriculture Organization of the United Nations

World Organisation for Animal Health
Founded as OIE

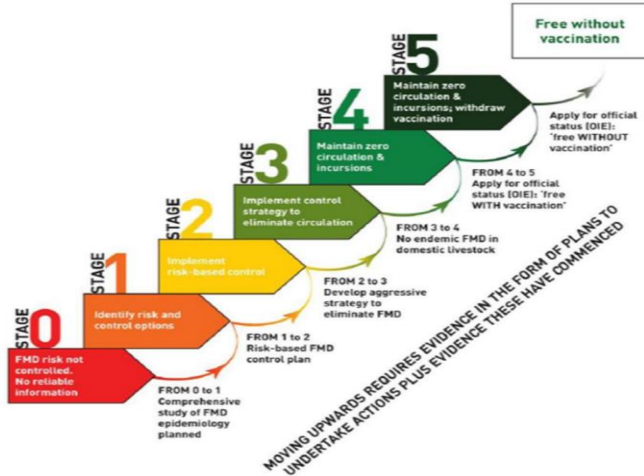
WOAH official status and FMD endorsed programmes, and PCP stages

- Countries and zones recognised as free from FMD without vaccination
- Countries and zones recognised as free from FMD with vaccination
- Countries and zones without a FMD official status or not assessed by the PCP
- Suspension of FMD free status
- Official control programme endorsed by WOAH
- PCP stage 3
- PCP provisional stage 3
- PCP stage 2
- PCP provisional stage 2
- PCP stage 1
- PCP provisional stage 1
- PCP stage 0

FMD PCP
Basic component of the FAO-WOAH Global FMD Control Strategy

Expected stages are not reached or fulfilled

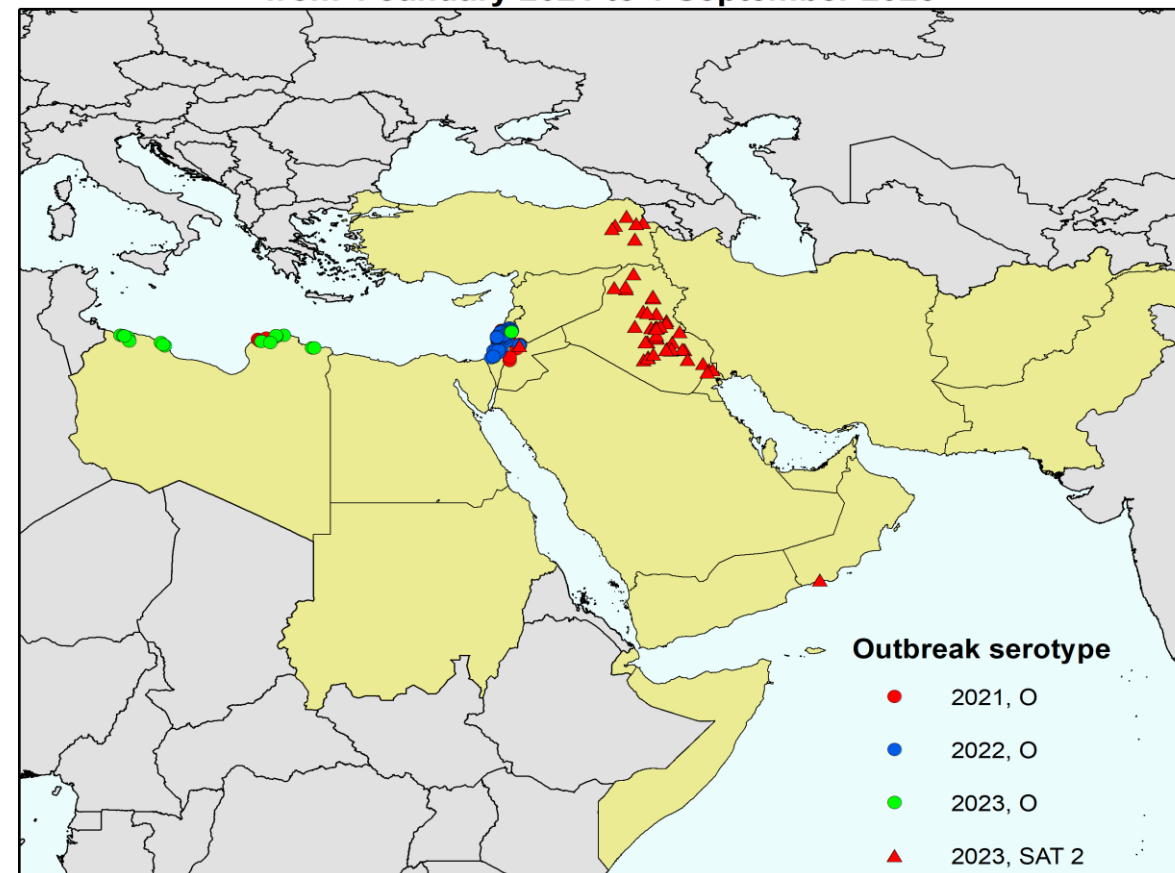
- Stage 1 Risk Assessment Plan
- Stage 2 Risk Based Strategic Plan
- Stage 3 Official Control Programme
- Stage 4 Endorsement of the Official Control Programme by OIE
- Status: Recognition of FMD freedom with vaccination
- Status: Recognition of FMD freedom without vaccination



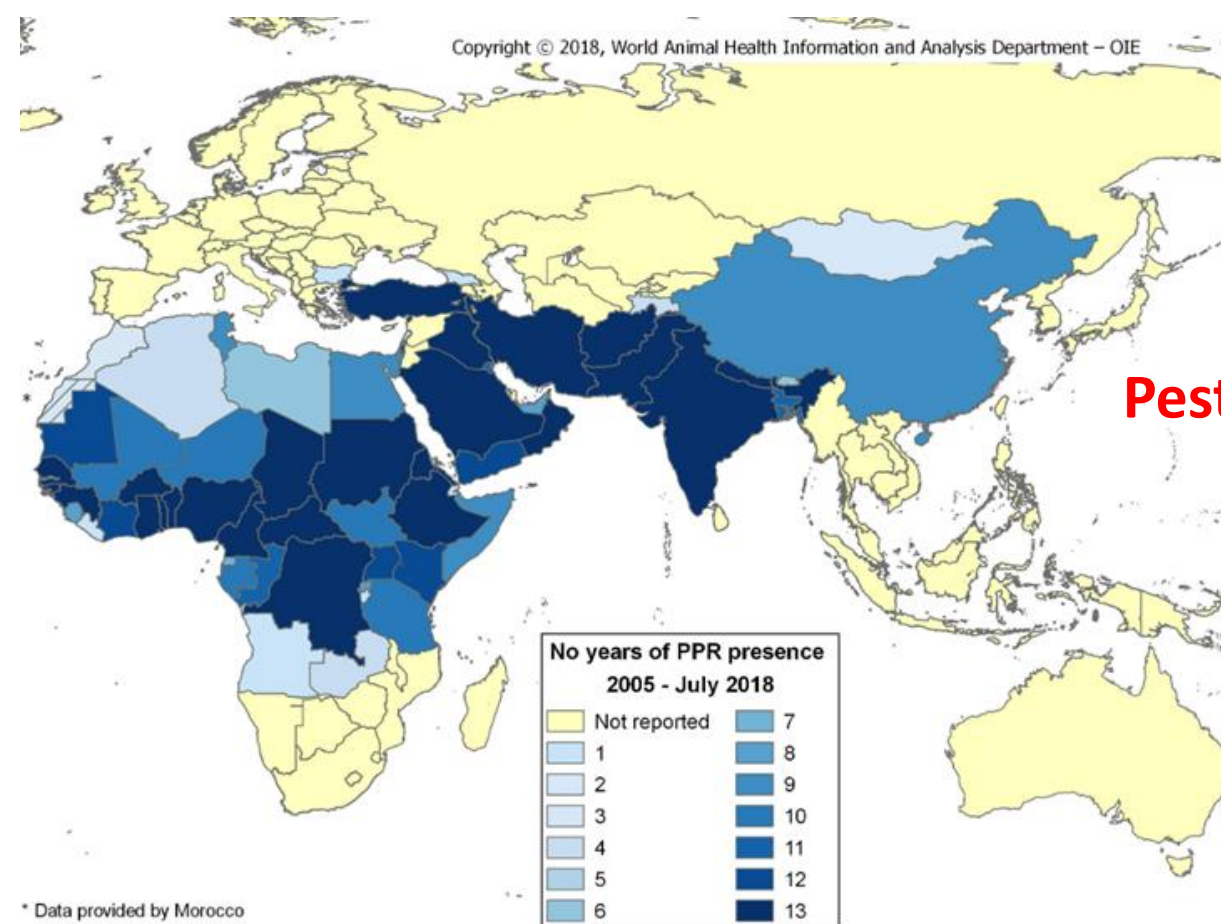
Major FMD controls Challenge in some ME & NA countries

- ❑ **VS Insufficient capability** to adequately track and control of outbreaks.
- ❑ Deficient VS capacity to support or periodically review the national strategic plans, based on risk assessment, **efficient use of the FMD PCP** mechanism and the related **Self-assessment Tool (SAT)**, and **PSO system**, to move and progress adequately in the control of the disease.
- ❑ **Inadequate** efforts to improve the national laboratories' diagnostic capacity, and the **need for stronger support** to enhance **regional epidemiology and laboratory networks (Epi-lab)** and **productive coordination** with concerned reference laboratories and collaborating centers.
- ❑ Weak control of cross-border unregulated 'informal' transboundary movement of livestock and their products between neighboring countries in ME poses difficulties implementing vaccination programs
- ❑ Need for stronger **commitment and political will to ensure a proper legal framework** and resources to support the activities of the VS in their workplan..
- ❑ Insufficient involvement of all concerned **stakeholders** to limit the socio-economic impact of FMD to stimulate investment in the disease control projects via **PPP**.

FMD outbreaks reported through the early warning module
from 1 January 2021 to 1 September 2023



- 29% of the outbreaks caused by serotype SAT2
- 71% of the outbreaks caused by serotype O



Pest of Small Ruminants (PPR)



- ❑ (PPR) affects goats, sheep,, as well as camels and infects the conservation of wild herbivores threatening **biodiversity** .
- ❑ PPRV belongs to the genus **Morbillivirus** of the family **Paramyxoviridae**.
- ❑ It is characterized by **severe morbidity and mortality rates** and has a high economic impact, it affects about **70 countries** in Africa, ME, & Asia, where small ruminants contribute to guaranteeing livelihoods.
- ❑ **In NA, PPR was reported in Morocco ,, Algeria Tunisia and Egypt**



PPR control challenges in the ME

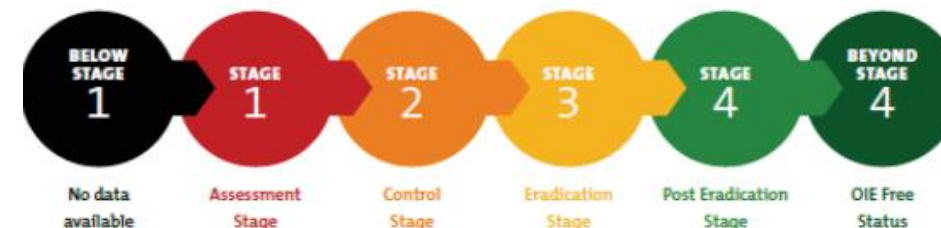
- ❑ PPR is endemic or suspected to be present in the entire ME region , most countries share similar hindrances in reaching the **immunization coverage** needed to eliminate the disease, apart from a few exceptions. This is reflected by the sluggish advancement in the **PPR GCES**.
- ❑ Prevailing **nomadic farming** systems, with transhumance movements which may involve multiple countries, leading to **uncontrolled A. movement** both internally and across borders.
- ❑ **Resources** scarcity and **insufficient funding** .
- ❑ **Underreporting** impedes **surveillance** campaigns.
- ❑ Poorly understood **impact** due to lacking socioeconomic studies.
- ❑ **Wild** and **atypical hosts** role is largely under-investigated.
- ❑ Insufficient genomic sequence data hampers understanding of PPRV circulation pathways across the region.
- ❑ **lack of awareness** and compliance are main obstacles to **disease reporting, vaccine administration** particularly in emergency situation .



Affected animals present high fever and depression, along with mucopurulent eye and nose discharges. animals suffer from severe pneumonia and diarrhea.

WOAH/FAO PPR - GEP 2016:

GCES was developed to achieve PPR eradication by 2030

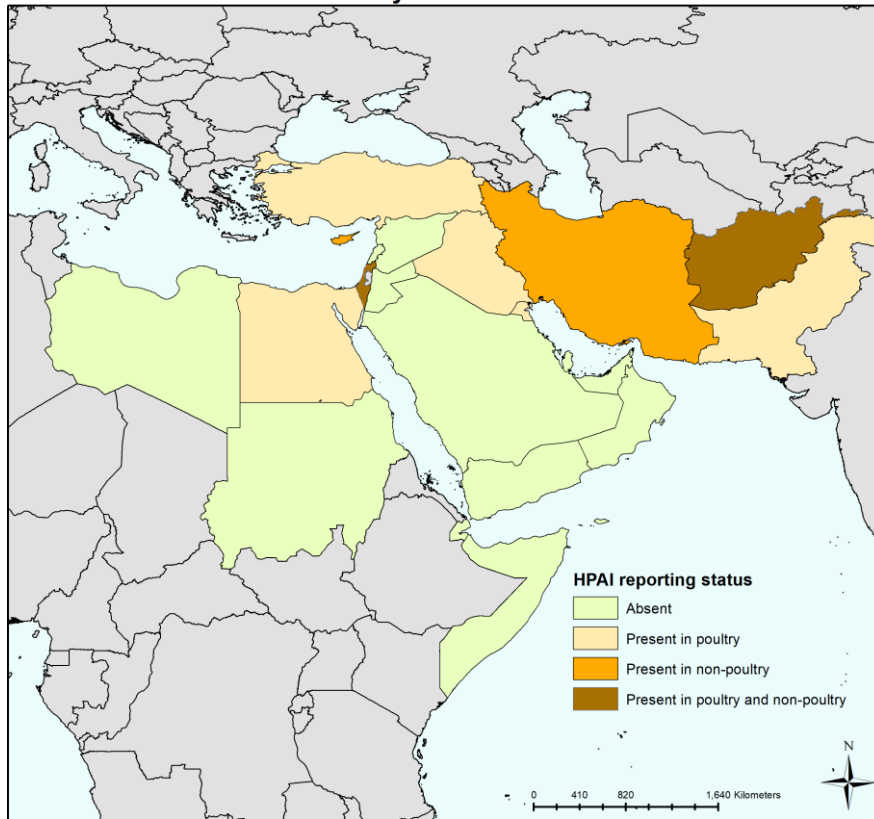


GCES : progressively reducing PPR incidence and spread through targeted vaccination.

- Based on **4 stages** each has, specific objectives.
- **PPR PMAT** uses an evidence -based, transparent **assessment** procedure to determine each country's Stage as per the PPR GCES Strategy .
- It is the companion tool composed **5 main technical elements** .
(*diagnostic,surveillance,prevention&control,Legislation,stakeholder involvement*).
- In **ME the TADs regional action plan target** is to support Countries to progress at least to stage 3 within the next five years.

Infection with highly pathogenicity avian influenza viruses (HPAI)

Reporting status of HPAI in the region through the monitoring module
from 1 January 2021 to 30 June 2023



Common challenges face effective control in some countries :

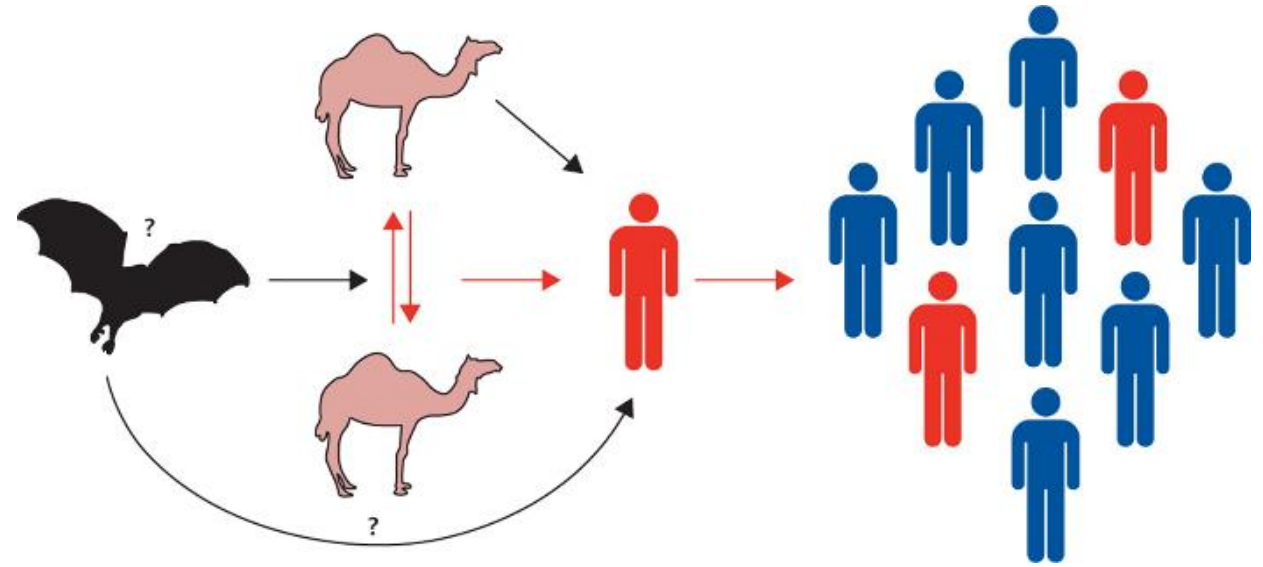
- ❑ **VS Limited capabilities** to face major risk factors such as **high human and poultry population densities**.
- ❑ Lack the expertise, manpower and other resources to develop sound **surveillance plans**.
- ❑ Poor farm **biosecurity Practices**, related in particular to t of large numbers of small-scale commercial producers **and substantial duck populations management**.
- ❑ **Internal local trade system** for movement of poultry, poorly regulated **LBM**s and **illegal movement** across international borders.
- ❑ **limited success** in some countries in engaging **communities** and achieving the appropriate **behavioral changes** to reduce Bio-containment& Bio-exclusion- related risks .
- ❑ Poorly developed and resourced **diagnostic laboratory capacities** in some affected and **at-risk countries**.

- ❑ Aetiology: **Influenzavirus A** of the family **Orthomyxoviridae**.

•**More efforts is needed** despite the considerable support being exerted through international donor programs **WOAH&/FAO reference laboratories**. &the **WOAH/FAO&OFFLU**, to

- Promote stronger collaboration and to create synergies between national public health and veterinary laboratories,
- Improve **sharing of viruses and gene sequences monitoring viruses for antigenic changes**, which is an integral part of competent surveillance systems.

Middle East Respiratory Syndrome Coronavirus (MERS-CoV).



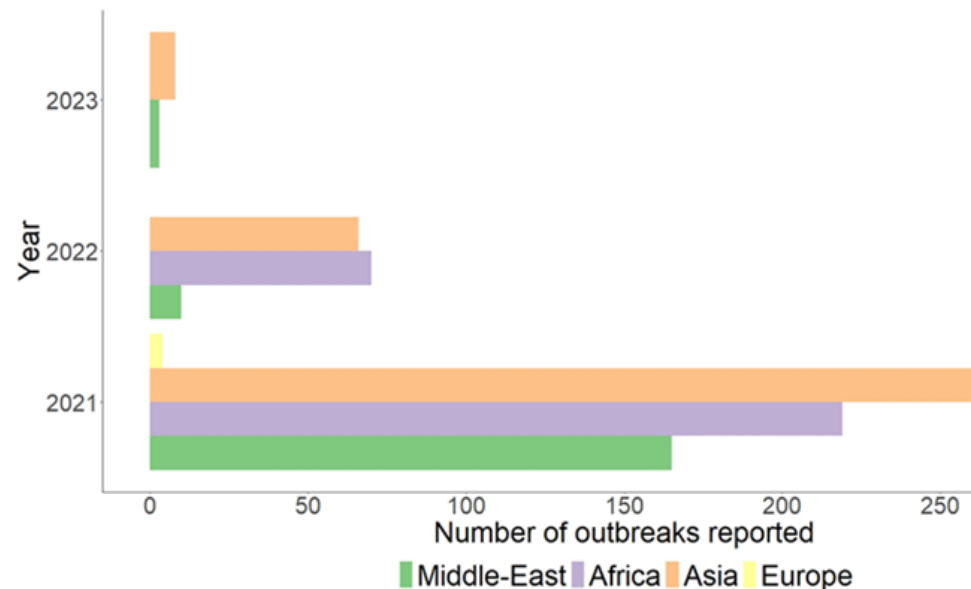
- ❑ **Dromedary camels (*Camelus dromedarius*)** confirmed as the natural host and zoonotic source of the MERS-CoV infection in humans.
- ❑ Human cases have been reported in: **Jordan, Qatar, United Arab Emirates, Saudi Arabia, and Tunisia. Approx. more than 80% is reported from AP.**
- ❑ While the impact of MERS-CoV on animal health is **very low**, human infections has a **significant** public health impact.

- ❑ An intermediate host **could** also transmit MERS CoV between camels and human beings. **bat-to-human** transmission seems unlikely.
- ❑ The **identification of possible intermediate host** is needed, virus circulation in other livestock species (cattle, sheep, & goat) cannot be ruled out. However, **susceptibility & epidemiological significance** in other species has not been proven.
- ❑ **Zoonotic transmission. Human-to-human transmission** has occurred by close contacts and in health care settings.
- ❑ The route for **camel-to-human** transmission could be from **direct contact** with infected animals, **or consumption of milk, urine, or uncooked meat—all practices are common in affected ME countries.**
- ❑ Whether dromedaries are the natural reservoir, or an amplifier host is a hypothesis that is open to further investigation.

Lumpy Skin Disease LSD

Caused by genus **Capripoxvirus** /family **Poxviridae** (prototype: Neethling poxvirus). Transmitted by blood-feeding flies and mosquitoes, or ticks. Eruptive, occasionally fatal characterized by **painful nodular lesions** on the skin.

Non-vector-borne **seminal transmission** may occur even in sub clinically infected bulls.



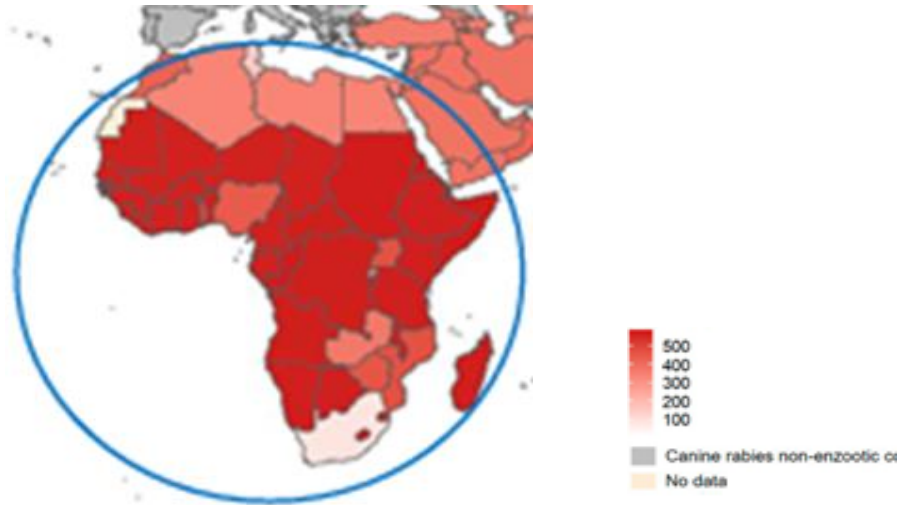
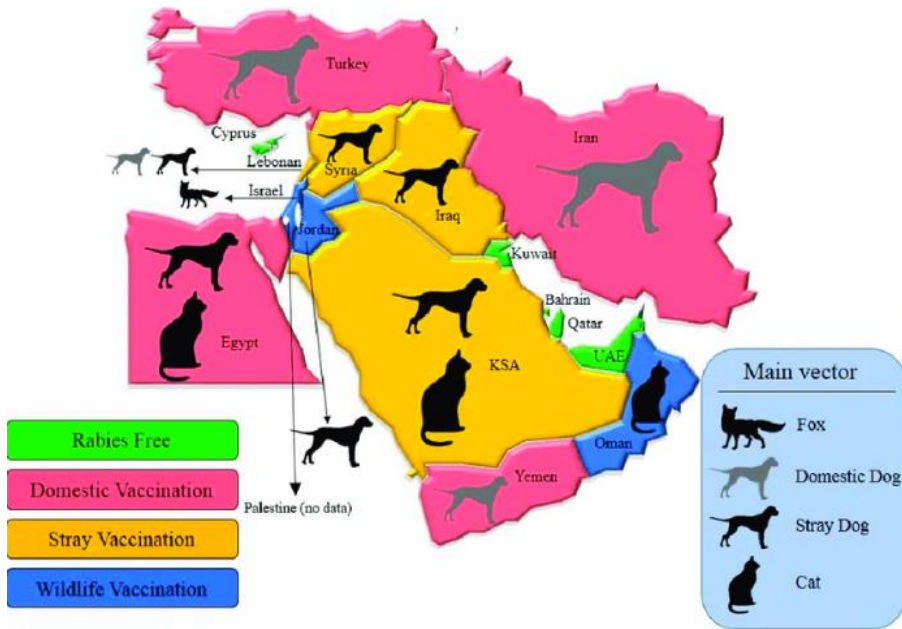
Reporting status of LSD in the region through the monitoring module from 1 January 2021 to 30 June 2023



- ❑ Present or 'suspected' in domestic species in over **60%** of the members in the ME region.
- ❑ **167** outbreaks were reported between **2021 -2023**
- ❑ A **significant decrease** in the number of outbreaks reported in **2022 compared to 2021**.
- ❑ In practice effective control is often difficult, LSD extended its geographical range outside of endemic sub-Saharan countries to the ME and NA& Asia indicating transboundary spread.
- ❑ Major challenges to **control is the movements of unvaccinated cattle** leading to spreading risks. During outbreak, It should be strictly regulated.
- ❑ **Economic losses**: reduction in milk production and sometimes death of the affected animals. severe emaciation, reduction in hide quality, draught power, reproductive losses, infertility.



ME countries classified into 4 groups based on the available data



Annual dog rabies incidence in NA (300-400 events)



Rabies

- ❑ Its an acute, progressive, viral **encephalitis** with poorly understood pathogenesis and a predictable fatal outcome Aetiology: **Lyssavirus**, Family: **Rhabdoviridae**.
- ❑ Rabies control remains elusive in many **ME&NA** countries.
- ❑ The **variability in rabies epidemiology** in different regions adds to the challenges that face efforts to prevent and eradicate the disease. **In ME Its unclear whether wildlife rabies is independent of dog rabies transmission cycle.**
- ❑ **Wildlife rabies** reported in **Iran, Oman, KSA and Yemen**. **Red foxes and jackals** implicated .
- ❑ **Fox rabies** is present in (**West Bank and GAZA Strip**), emerged in **Turkey** where most of cattle rabies results from contacts with rabid foxes.
- ❑ The **burden of the disease continues to be significant in countries in the ME** where the most important vector is the **free-roaming** or **stray dogs**.

wildlife and urban rabies Control efforts are hindered mainly by

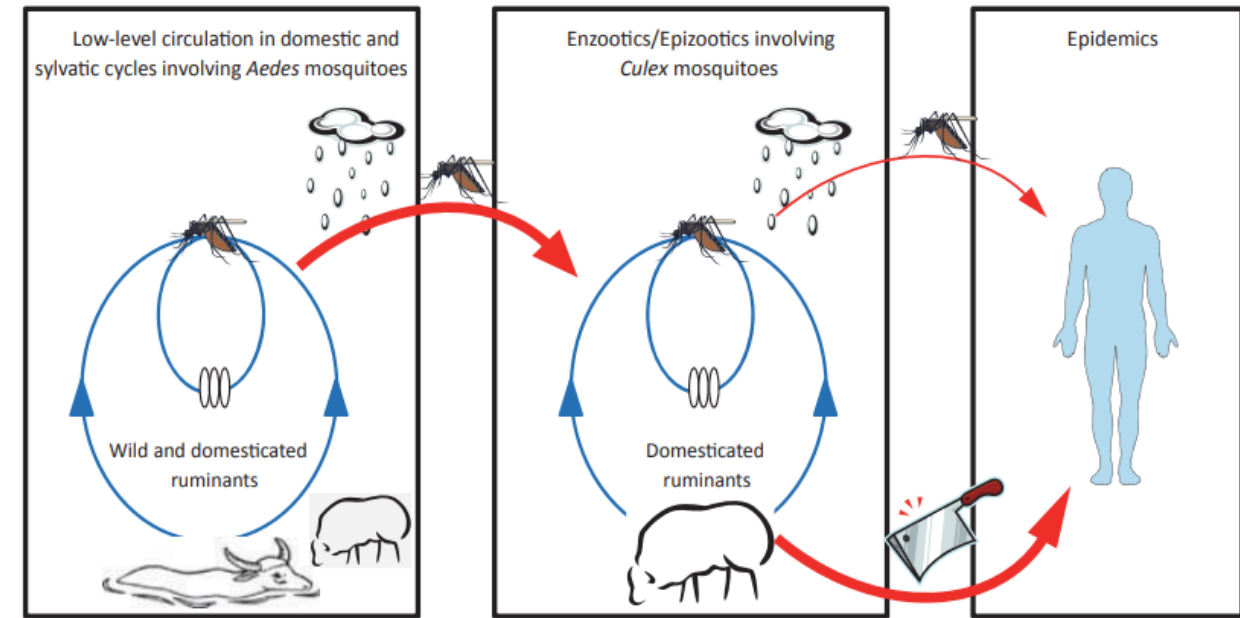
- ❑ **lack of awareness** (untimely administration and incomplete post-exposure prophylaxis (**PEP**)).
- ❑ **Difficulties facing free roaming dog management :**
 - Monitoring free-roaming D, and observation of suspected animals, registration, capturing, reproduction control , vaccination of non-rabid dogs, humane rabid dog euthanasia .laboratory diagnosis.
 - **Spill-overs** associated with infected stray dogs' **movement across the borders between neighboring countries** highlights the need for augmented **regional cooperation**.
 - Rabies control is usually affected by **Political and economic instability** with shifting governmental priorities adds further challenges to control.



Rift Valley fever (RVF)

- ❑ An acute **arthropod-borne**. Affects domestic animals, such as buffalo, camels, cattle, goats, and sheep and **man**. It is also regarded as a re-emerging disease.
- ❑ Aetiology: **Phlebovirus** /family **Bunyaviridae**. several mosquito species can spread RVFV, most commonly the **Aedes** and **Culex**
- ❑ Characterized by **long inter-epizootic intervals**, separated outbreaks.
- ❑ The **hyperacute nature** and **environmental Conditions**.
(elevated rainfall, and abundant vegetation propagation of populations of RVFV mosquito vectors, El Niño–Southern Oscilación (ENSO) phenomena).
- ❑ Continuing **mass vaccination** programs during **inter-epidemic periods** are unlikely to be **economically justifiable**, especially when using existing monovalent vaccines.
- ❑ Difficulty of **securing enough vaccine stockpiles in the absence of subsidized vaccine banks** limit V. campaigns success.
- ❑ **Diffiult Vector control** during widespread flooding, **Extensive breeding sites** limit the practicality of **larvicides usage**.
- ❑ **RVF** Has a profound negative effect on **meat value chains**.

RVF endemic and epidemic transmission cycles



In endemic areas, the virus is maintained in a sylvatic cycle involving wild ruminants, possibly other mammalian hosts and mosquitoes. An explosion of the mosquito population can result in spillover to domesticated ruminants, resulting in epizootics and, potentially, an enzootic situation. Human epidemics result from contact with animal fluids released during slaughtering of viremic animals or, less frequently, via mosquito bites.

Aedes



Culex



West Nile fever WNF

Recently reported Algeria & Tunisia 2023/09/14, 2023/10/17

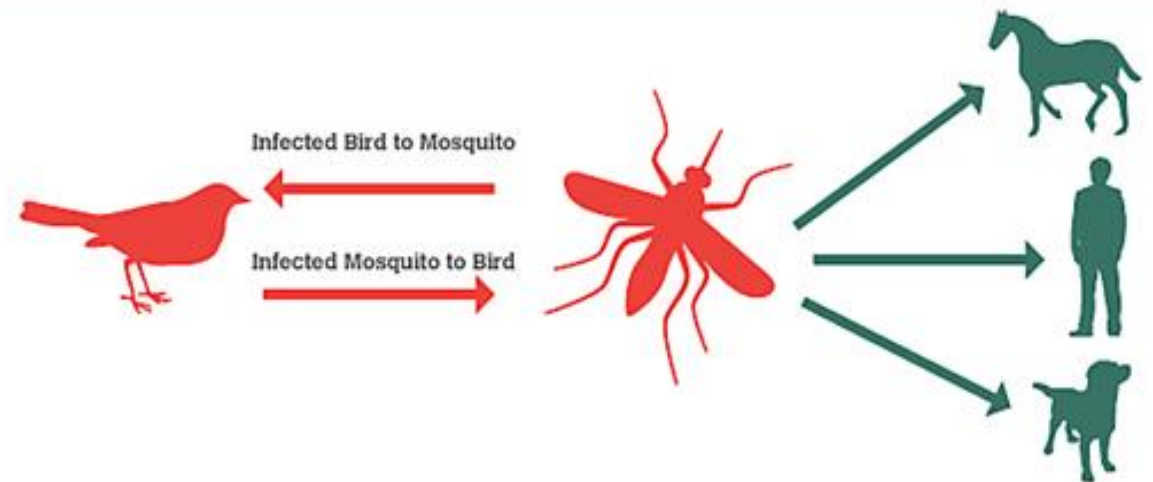
- ❑ WNF is a mosquito-borne viral disease **Flavivirus** belonging to the family **Flaviviridae** affects birds, **humans and horses** causing inapparent infection, mild fever, **meningitis, encephalitis**, or death.
- ❑ Usually there are no symptoms, but **weakness and lameness & ataxia** observed in horses.
- ❑ Mosquitoes **Culex** become infected by biting infected wild birds and then **transmit the virus through bites to people, animals and other birds, pets & horses**.
- ❑ **Common in the Middle East, parts of Asia, Africa.**



Some specific Challenges to WNF control:

- ❑ Geographically distinguished epidemic **spillover** and spread with **potential new hosts**.
- ❑ Compromised capabilities make it difficult to adopt **robust diagnosis support risk assessment and surveillance tools**.
- ❑ **Non-availability of unique therapies** to treat **WNV** infections.
- ❑ Mounting economic burden of WNV (estimated to be approximately **\$780 million** in direct and indirect costs between 1999 and 2012).
 - **The risk assessment tool determining the risk of human transmission.**
 - **Surveillance tool ArboNET to monitor for avian mortality and vector.**

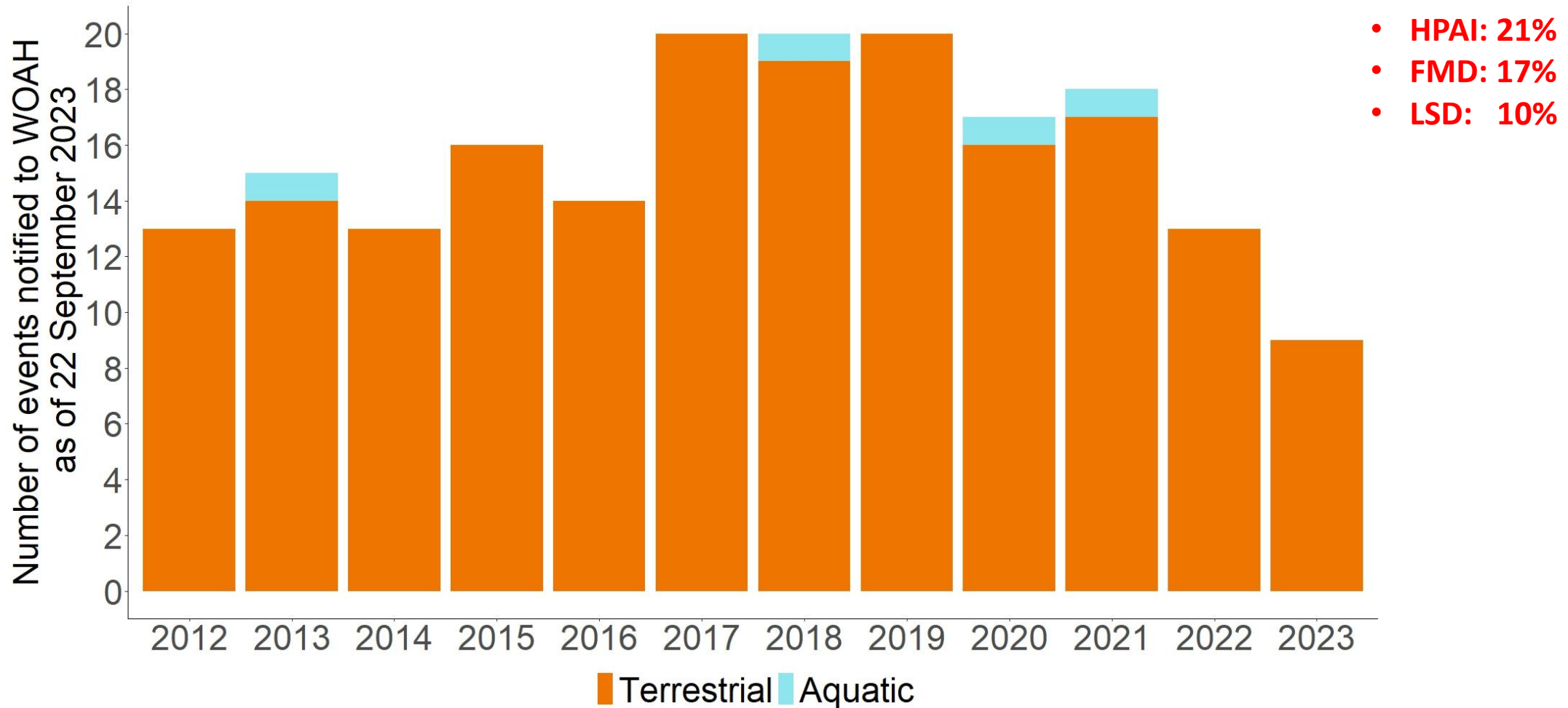
How West Nile Virus Is Transmitted



ME Animal Disease notification information

Early warning module: Immediate Notification (IN) and follow-up reports (FUR)

The main three diseases for which epidemiological events were notified to WOA between 2012 and 2023 were:



Priority zoonotic diseases situation in the GCC Subregion

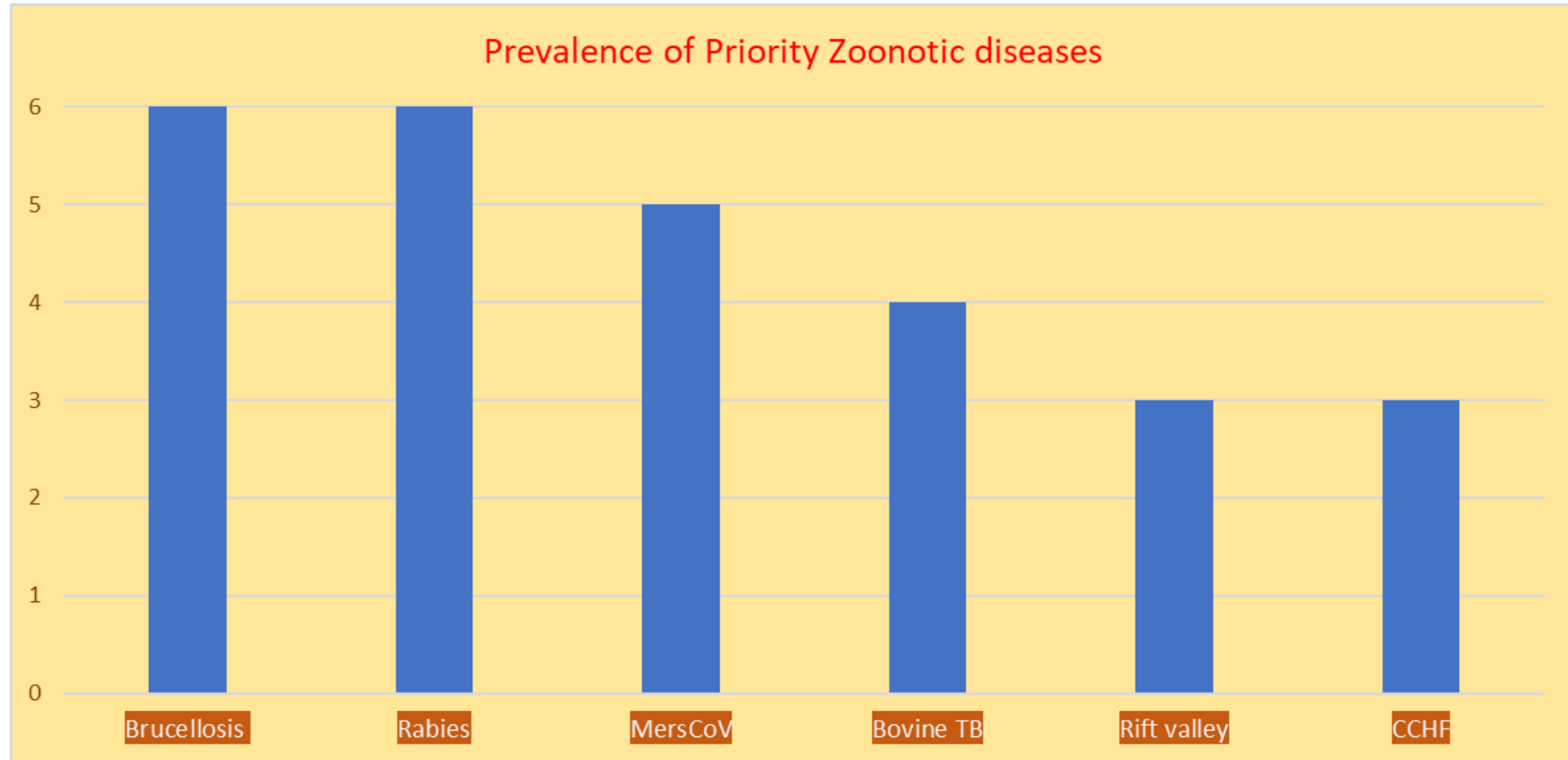


Figure 2. Common Priority Zoonotic Diseases among the six GCC countries. *Adapted from the Joint External Evaluation (JEE) report on One Health and Zoonotic Diseases in GCC.*

Animal Diseases : devastating impacts to Animal production & food security

Livestock disease reduces global production annually by

- ❑ 80 billion kilos of meat.
- ❑ 179.5 billion kilos of dairy.
- ❑ Producer revenue by \$358.4 billion.

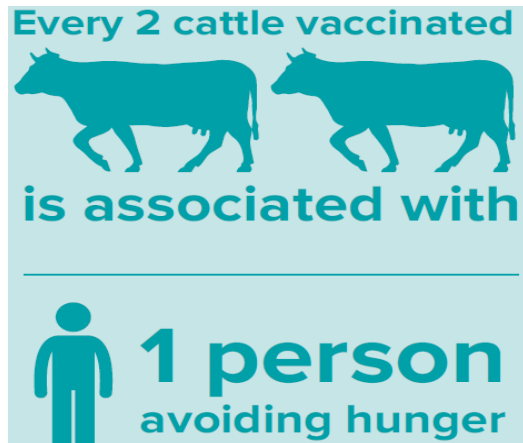
Economics of Reducing Disease

Every 1% reduction in beef cattle disease rates would

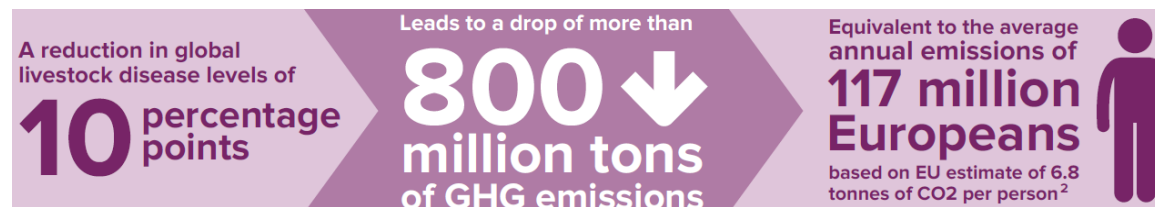
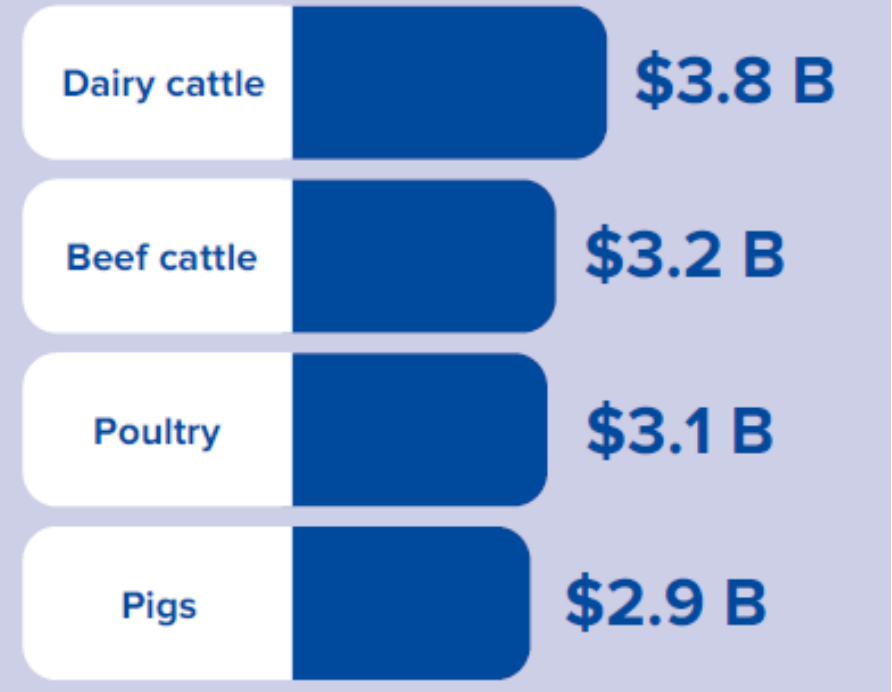
- ❑ increase beef production enough to meet consumption needs of 317 M people.
- ❑ increase producer revenue by US\$ **3.2 billion**.

Every 1% reduction in dairy cattle disease rates would:

- ❑ Increase dairy production enough to meet consumption needs of 80.5 M people.
- ❑ increase producer revenue by US\$ **3.8 billion**.



For every one percentage point reduction in global livestock disease levels, the following additional revenue is generated*:



Factors exacerbating the challenges of animal disease control

Understanding drivers associated with animal diseases (emerging and re-emerging zoonotic) is essential to combat their challenging threats and prevent future disease outbreaks.

❑ Anthropogenic factors:

Agricultural expansion, urbanization, deforestation, and animal hunting.

❑ Environmental factors:

Climate change, temperature, humidity, drought.

❑ Behavioural factors:

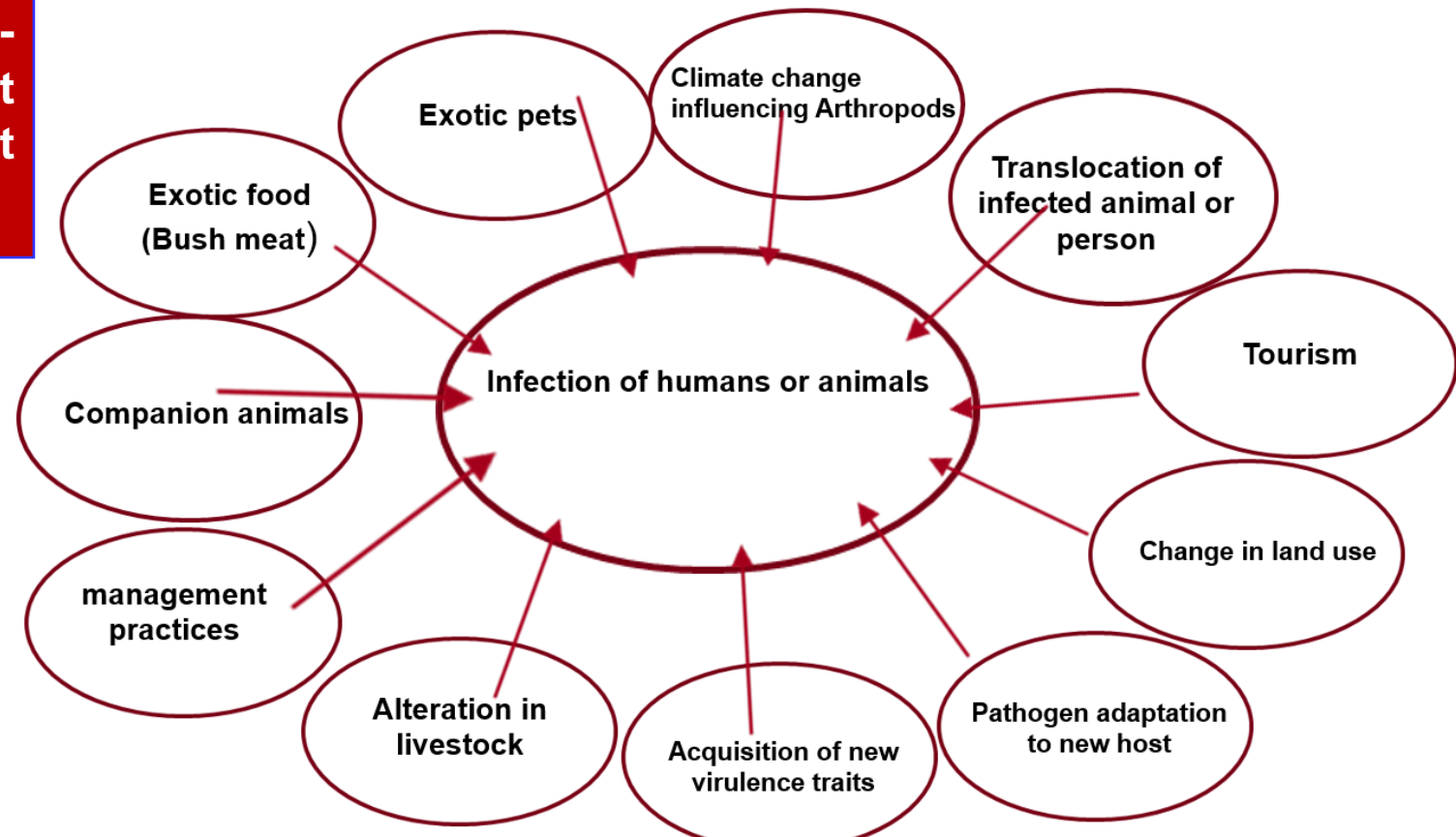
Trafficking and consumption of wild animals, animal production and marketing, animal-human interfacing.

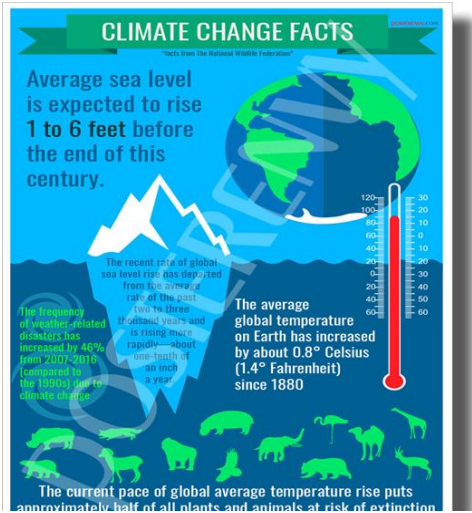
❑ Demographic factors:

Ageing, population growth, changing birth rates, globalization.

❑ Biological factors:

Genetic variation of causative microorganism & change in immunological status of population.

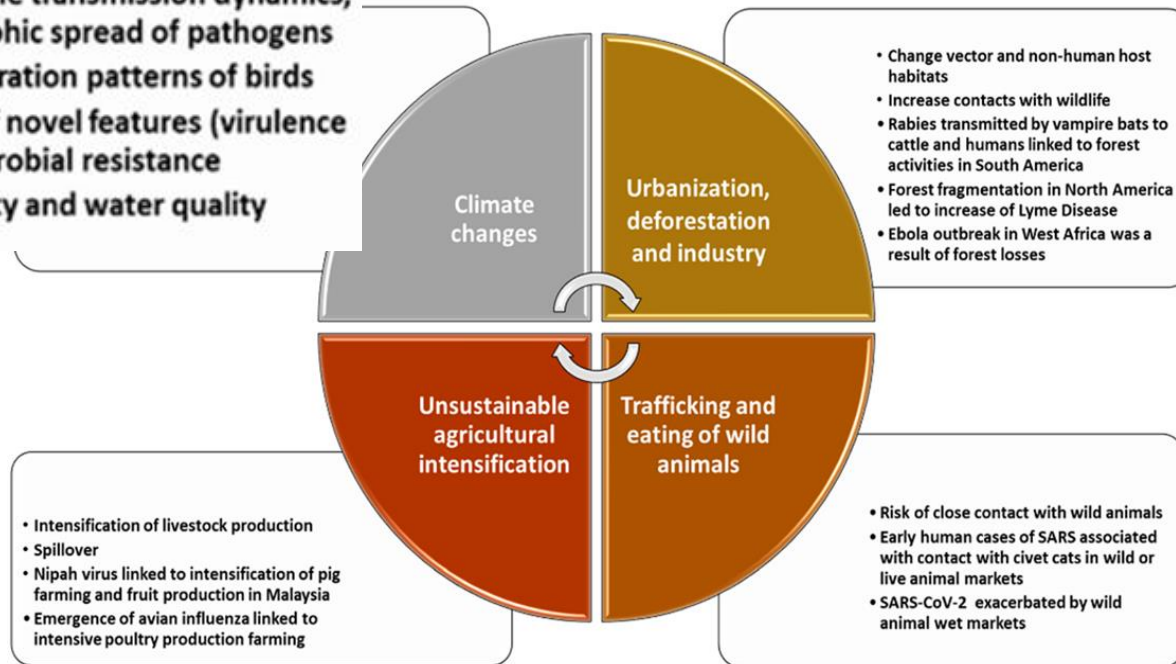




CLIMATIC CHANGES ASSOCIATED CHALLENGES

- **Climatic Changes**
 - **Altered weather patterns** affect the range, intensity, seasonality and the **rate of disease transmission**.
 - **Microbial agents and vectors organisms** are **sensitive to (temperature, humidity, surface water, wind, and changes in vegetation)**.
- **Global warming,**
- **More frequent storms** and flooding increases insect populations and higher incidence of **VBD**.
- **Displace some human populations**, resulting in migration into **wilderness areas** where zoonotic infectious agents are being transmitted.
- **Periods of drought**
 - Cause also extensive **migration of pastoral herds** in search of water and grazing and favor
 - Increase the **likelihood of livestock mingling with wildlife** populations and the transmission of pathogens.

- Changing the distribution and abundance of vectors
- Impacting the transmission dynamics, and geographic spread of pathogens
- Shifting migration patterns of birds
- Evolution of novel features (virulence and antimicrobial resistance)
- Food security and water quality



ANIMAL MOVEMENT AND TRADE DISEASE INCIDENCE ASSOCIATED CHALLENGES

Modern animal transport systems

- ❑ **Local trade** brings livestock from **different groups** **into contact**, and to areas of **heavy concentrations** of **wildlife animals**.
- ❑ Growth of **sea- and air-freight transport systems**, increased **road construction** in responding to expanding industrial needs, **facilitates easy and cheap transport of animals around the world**.

Some spectacular examples of the consequences of extended trade links.

- ❑ The introduction of the **New World screwworm** (*Cochliomyia hominivorax*) to **Libya** 1988: **for the first time**.
- ❑ The outbreaks of **FMD type SAT 2** in dairy herds in **Saudi Arabia** and in sheep **in Kuwait** during 2000 probably resulted from the importation into **the Arabian Peninsula** of cattle or sheep from **Eastern Africa** for the **first occasion**.
- ❑ Long-distance spread of **FMD occurred in 1999 in North Africa**. the disease was reported in **Algeria** in **cattle**. It spread quickly there, then crossed the border into **Tunisia and Morocco**.

CHALLENGES ASSOCIATED WITH POLITICAL AND SOCIAL INSTABILITY

There are strong associations between political upheavals, civil strife and increased incidence of disease.

- ❑ **Heavy migrations of refugees with their animal** introduced diseases to susceptible livestock population
- ❑ **Disruption of the control campaigns, vaccinators** denied access to livestock, kidnapped robbed and killed.
- ❑ **Continued occurrence of diseases in war-torn countries** threat both the countries themselves and the disease-free neighboring countries, particularly **when ceasing vaccination to achieve freedom status**.
- ❑ **Absence of professionally guided community-based campaign as component of humanitarian program** in conflict-affected areas to avoid major epizootics.
- ❑ **Migrations of wildlife** and livestock due to **social tensions** a source of disease dissemination.
- ❑ Movement of only a few sub-clinically infected animals from endemic areas, for instance **FMD, sheep pox, PPR, ND, IBD and others** **have been disseminated through such movements**.

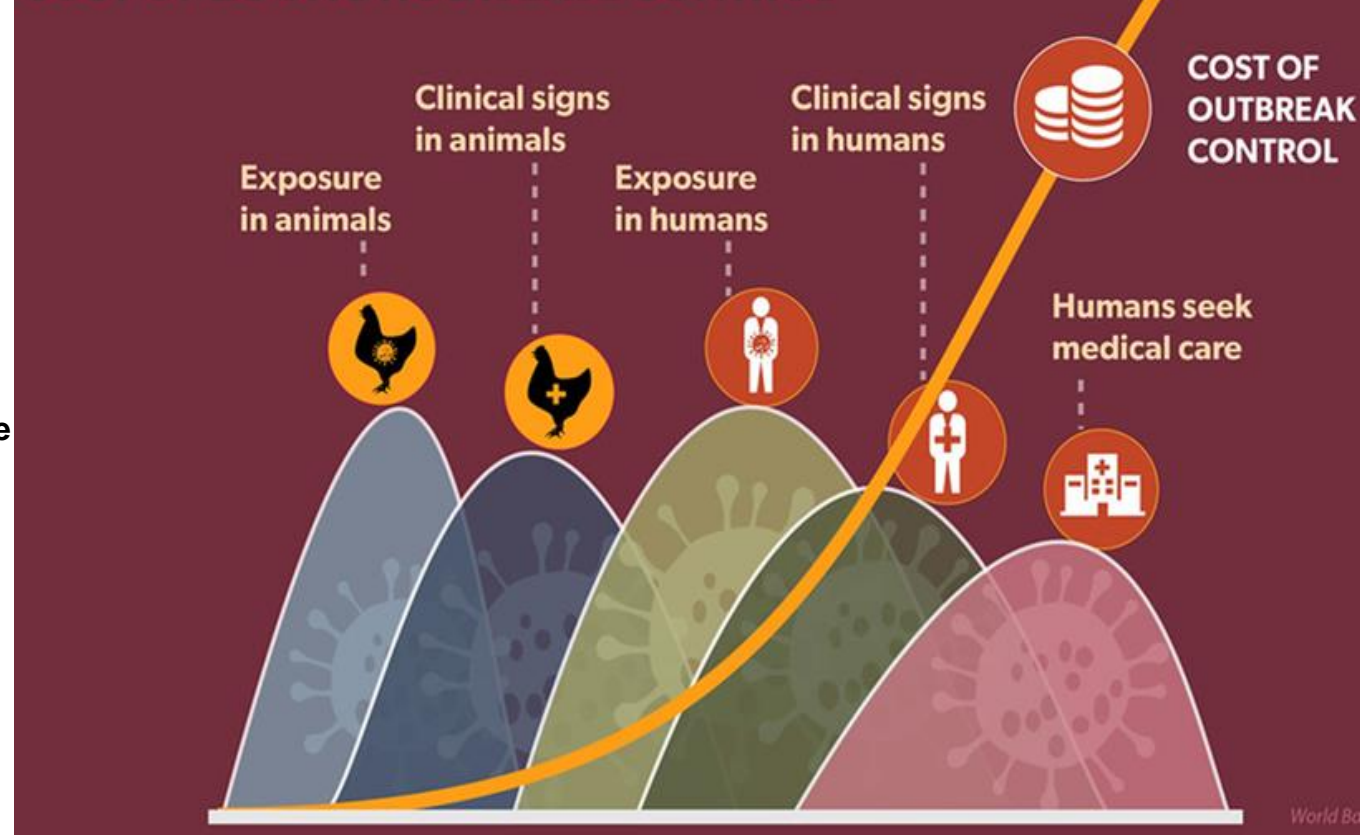


ECONOMICAL CHALLENGES

The economic costs of animal disease can be categorized as

- **Direct costs**
 - losses incurred by animal **mortality, morbidity, culling, vaccination**, and associated response.
 - Often **fail** to capture the wider, dynamic market impacts that could arise.
 - **Indirect costs**,
 - Economical losses incurred in markets **after disease freedom from disease outbreaks is declared**.
 - **Indirect costs** estimation is necessary for more **complete picture** of the costs of outbreaks to **better prioritize limited resources**.
- ❑ **About US\$ 22 – 31 billion** yearly are needed **globally** for prevention measures that reduce the risks of zoonosis spillover.
- ❑ Therefore, Its highly significant (**When designing of strategic interventions**),to address **constraints on data and analytical frameworks** that otherwise limit the estimation **of indirect costs**

COST OF ZONOTIC DISEASE CONTROL



Rising costs & expenses during the zoonotic incidence

Capability for the economic impact quantification of disease outbreak is an important determinant for prevention and control decisions

Challenging drawbacks hampering the success of vaccination programs as a prime means of disease control

Insufficient intrinsic efficacy of the vaccine to fully protect vaccinated animals and prevent new outbreaks,

- ❑ **Host-specific factors** (i external factors that adversely affect the host's immune system, such as **immunosuppressive diseases**) leading to **vaccine failure**.
- ❑ **Inadequate vaccine coverage within farms and/or regions** could prevent the achievement of sufficient **herd immunity** to stop virus circulation.
- ❑ **Inefficient surveillance** that may lead to the **inability to detector differentiate field virus in vaccinated animals** ,(DIVA) resulting in **clinically silent circulation**.

Therefore, VS must exert every possible efforts to :

- ❑ Use vaccines that **meet WOA H standards** of potency and safety.
- ❑ Strain /strains must antigenically **match** those circulating in the field.
- ❑ Vaccination programs carried out in a target population should meet several critical criteria, mainly:
 - **Coverage** should be at least **80%**;
 - **Campaigns duration** should be completed in the **shortest** possible time;
 - **Scheduled** properly to prevent **interference from maternal immunity**; to avoid reduced vaccine efficacy.
 - **Administered** in the correct **dose** and by the correct **route**;
 - **Planned exit strategy**. Must implemented.



Aspects of AH Frameworks improvement in ME&NA

What interventions are needed to strengthen AH services to face disease challenges in the region?

Interventions must address the following hindering limitations :

- ❑ lack of appropriate, and necessary AH & disease control **leadership and capacity & multisectoral coordination** .
- ❑ lack or **adequate efforts** for the **rapid development, validation, and adoption of new technological tools**.
- ❑ **Inadequate capacity and capability of diagnostic systems** for early detection of newly emergent, accidental, or intentionally introduced diseases.
- ❑ **Lacking support to multidisciplinary** research to address factors related to pathogenesis, interspecies transmission, and ecology.
- ❑ **Inadequate number of laboratories & BSL-3 facilities**, laboratories usually neither **strategically located** nor **suitably equipped** for research requiring biocontainment.
- ❑ **Insufficient engagement with international partners**.
- ❑ **Limited or ill-defined jurisdiction** for the import, and movement of exotic and wild-caught companion animals and of zoo specimens, **create a significant gap in preventing and detecting emergent diseases**.
- ❑ **Lack** of formal and science-based and **risk analysis systems** for anticipating potential challenges to AH and making **policy decisions**.
- ❑ **Inadequate veterinary staff** in research, public health, food systems, ecosystem health, diagnostic laboratory investigation.
- ❑ **Inadequate education and training** of those on the front lines for recognizing the signs of animal diseases is inadequate.
- ❑ **Absences of consumer awareness or public investment in maintaining a viable animal health infrastructure exists**.

To establish sustainable solutions to successfully strengthen the animal health systems & frameworks NVS must consider:

- **Periodic revalidation** of animal health framework, considering domestic management practices, economic impacts, and societal norms.
- **Consideration of Continuous changes** in animal and human populations and their interfaces.
- Improving the **Animal health** significantly contributes **to public health** and **ecosystem sustainability**, increasing efficiency of production, necessitates considering **OH** in addition to the **three traditional pillars of economics, society and environment** .

Conclusions and key messages

Sustained Animal Health systems require:

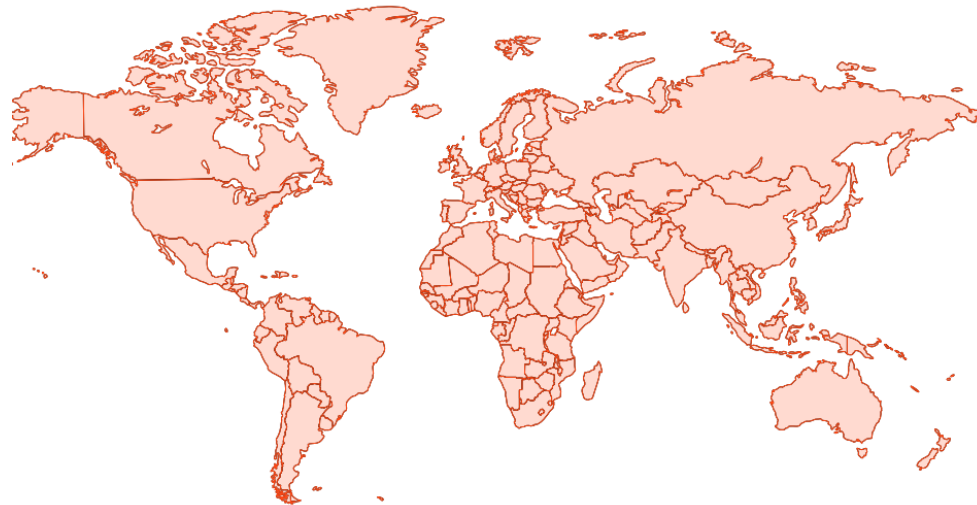
- ☐ *Socio-political stability.*
- ☐ *Provision of **trained manpower**.*
- ☐ *Access to all livestock by **veterinary** personnel.*
- ☐ ***Input of resources** to supply and deliver **vaccines**.*
- ☐ ***Input of resources** to implement **disease-control strategies** in the event of **outbreaks**.*
- ☐ *Maintenance of **effective surveillance systems** for early detection of suspected cases.*



WOAH's approach to addressing animal health risks provides real Opportunities to combat animal disease challenge

WOAH in a nutshell

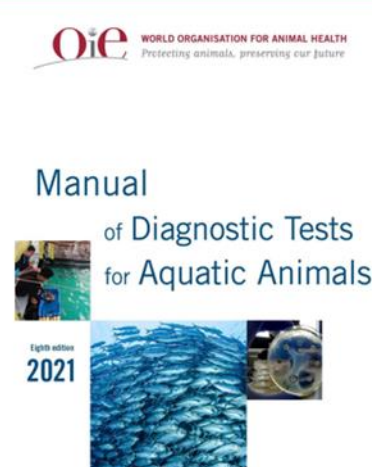
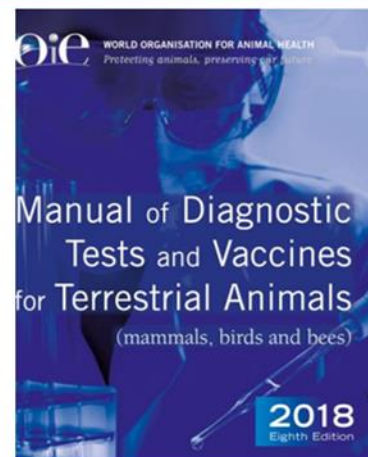
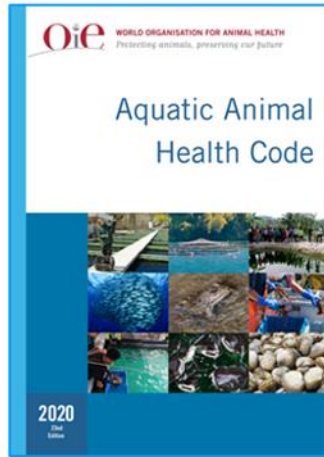
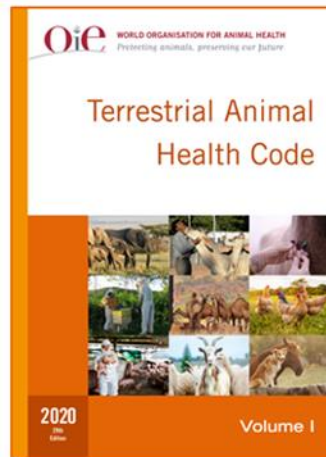
- improve animal health, veterinary public health and animal welfare world-wide
- intergovernmental organization recognised as a reference organisation by the World Trade Organisation
- 182 Member Countries in 2022
- 5 Regional and 7 Sub-Regional Offices



WOAH's approach to addressing animal health risks and sustainable combating of animal disease challenge

- ❑ Communicate **timely and high-quality accurate animal disease information**, by making the best use of **scientific data modelling**, modern **information technologies**, and tracking systems. **WAHIS** web-based interactive mapping tool and dashboard.
- ❑ **Develop** scientifically based **standards and guidelines** on all matters concerning **AH**, **VBH**, **AW**, assessment and relevant **recognition of members AH status**, sanitary safety in animal production and in international trade. (**Codes, Manuals**).
- ❑ WOAHA has a global network of **Reference Centers** consisting of **Reference Laboratories and Collaborating Centers**, **representing the central core of scientific excellence** promoting **international collaboration**, develop rapid and effective diagnosis processes.
- ❑ **Develop disease specific strategies** for prevention, control and eradication, considering the economic, social and environmental impacts of such measures.
- ❑ **Strengthen the capacity of Members' VS** to achieve the improvement of animal health, veterinary public health and animal welfare. **PVS pathway**.
- ❑ WOAHA-initiated **PROVNA project** to aid **NVS in North Africa** to improve **risk-based surveillance for vector-borne diseases** how to plan appropriate **resources** allocation in emergency. **RVF** was selected for the **first** application
- ❑ The **WOAH Wildlife Health Framework WLH** aims to strengthen the of **VS** ability to prevent **biodiversity loss** through the early detection of diseases in wildlife.
- ❑ The **WOAH is part of the Global Burden of Animal Diseases (GBADs)** program, which aims to **gather and use existing data** to **provide knowledge** and **improve AH** at local, national and global levels.
- ❑ The **emerging disease group** was initiated recently to support members in quick and effective response, identify gaps as well as **RA&M** and develop guidance & policy recommendations.
- ❑ The **WOAH, FAO & WHO** through the **Global Early Warning System (GLEWS+)** inform prevention and control measures for health threats at the **human-animal-ecosystems interface**.

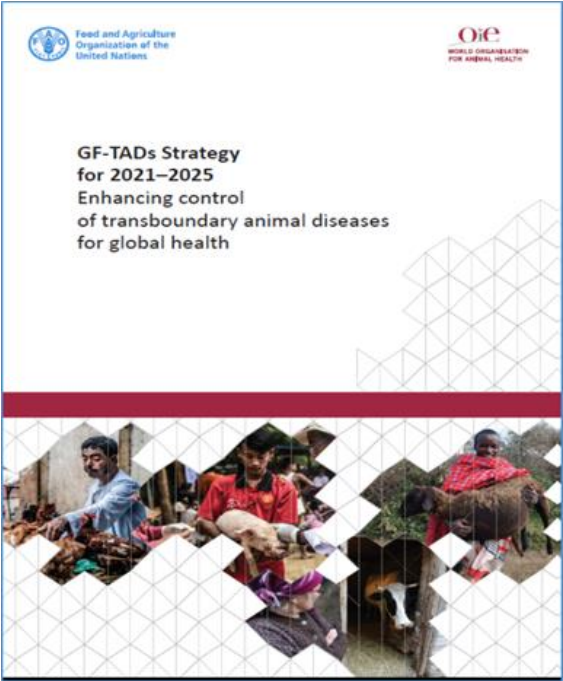
WOAH STANDARDS (Codes & Manuals)



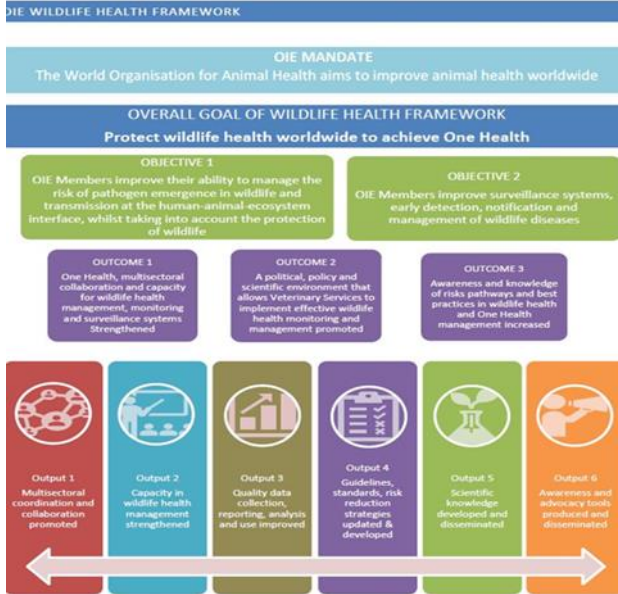
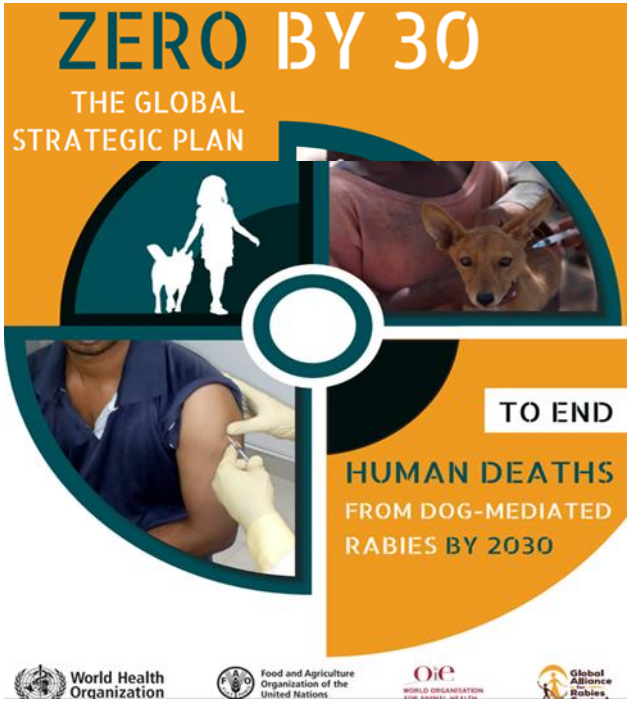
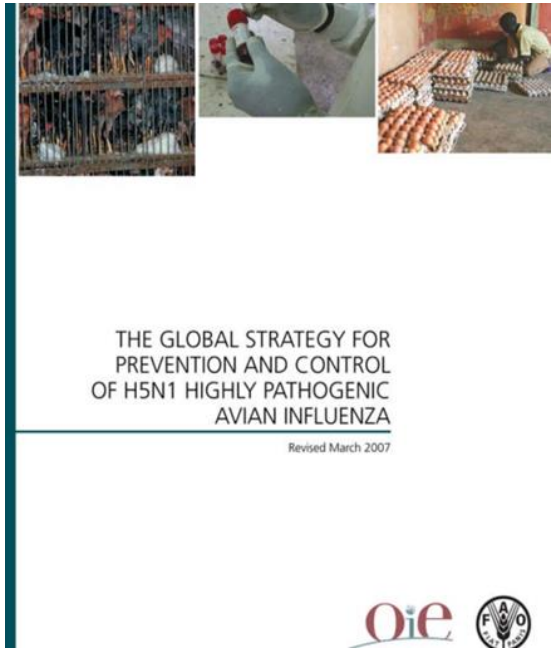
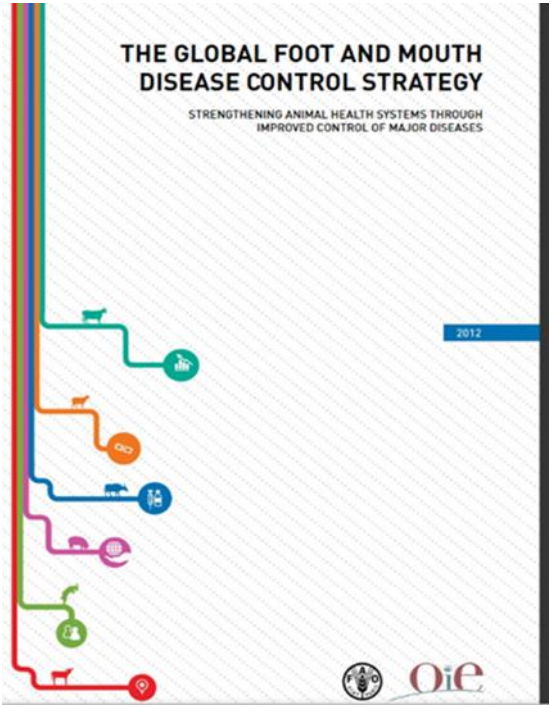
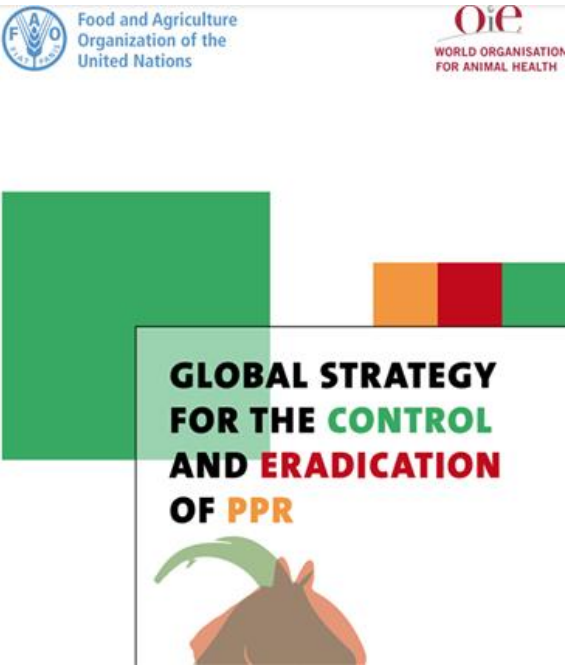
WOAHs international standards consist of regularly updated technical information in accordance with a science –based standards – setting process.

- **The Terrestrial Animal Health Code.** Recommendations protect animal health and welfare and ensure the safety of international trade in animals and animal products.
- **The Aquatic Animal Health Code.** Standards for the improvement of aquatic animal health and welfare worldwide. Should be used to set up measures for the prevention, early detection, reporting and control of pathogenic agents.
- **The Manual of Diagnostic Tests and Vaccines for Terrestrial Animals** provides a standardized approach to the diagnosis of the diseases listed in the Terrestrial Code, to contribute to the improvement of animal health worldwide.
- **The Manual of Diagnostic Tests for Aquatic Animals.** Standardized approach to the diagnosis of the diseases listed in the Aquatic Code, to contribute to the improvement of aquatic animal health worldwide.

WOAH in coordination with WHO& FAO developed several Strategies & Frameworks to help region combat Animal disease control and eradication challenges.



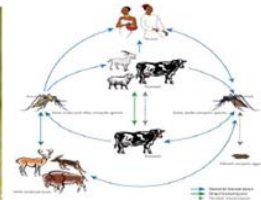
Establish strategies for priority TADs at the sub-regional, regional and global level.



Objectives of the GF-TADs Strategy for 2021-2025



Regional Action plan for the Middle East



Principal Objectives

- ❑ Facilitate collaboration and **maximize synergies among the Member countries, organizations, and stakeholders**, with a clear visibility of actions,
- ❑ Prevent occurrence and **reduce potential impact** of animal disease events on animal health and animal production as well as on public health, and economy in the region,
- ❑ Promote **good governance of VS in accordance with WOA standards** through capacity building programs at national and regional levels,
- ❑ Secure sustainable **funding for TADs surveillance and control**,
- ❑ Ensure the **appropriate monitoring for the efficacy of the plan** and evaluation of the expected results.

WOAH PVS Pathway & PVS -tool

WOAH PVS Pathway

- ❑ Global program for the sustainable improvement of a country's VS compliance with WOAH standards on the quality of VS.

WOAH PVS Tool

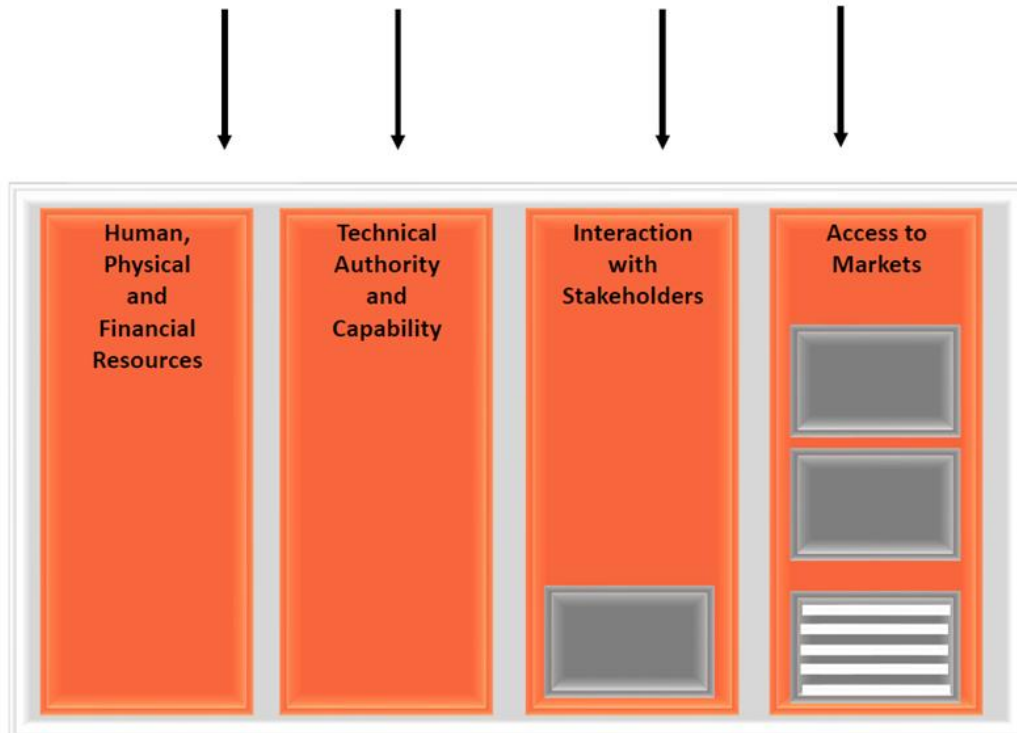
- ❑ A specific methodology Forms the basis for evaluating performance against the international standards published in the TAH Code.
- ❑ WOAH has progressively developed the **WOAH PVS Pathway** which takes the country PVS Evaluation using the **WOAH PVS Tool** and PVS **Gap Analysis missions as first steps**, and integrates them into a comprehensive, staged approach providing **targeted support** for the systematic strengthening of VS based on compliance with the international standards.



The Basic Elements of Professionally Effective VS

The PVS Tool structure: 4 Fundamental Components with 45 Critical Competencies

4 Fundamental Components



under the F.C, Technical Authority and Capability
5CC is directly related to disease challenges

- ii-1 **veterinary laboratory diagnosis.**
- ii-2 **risk analysis and epidemiology.**
- ii-3 **quarantine and border security.**
- ii-4 **surveillance and early detection.**
- ii-5 **emergency preparedness and response**
- ii-6 **disease prevention, control and eradication.**
- ii-7 animal production food safety.
- ii-8 veterinary medicines and biologicals.
- ii-9 AMR&AMU
- ii-10 residue testing, monitoring and management.
- ii-11 animal feed safety

45 Critical
Competencies

5 Levels of
Advancement

THANK YOU