Food and Agriculture Organization
of the United Nations

FAO Support for Avian Influenza disease control, prevention, and response

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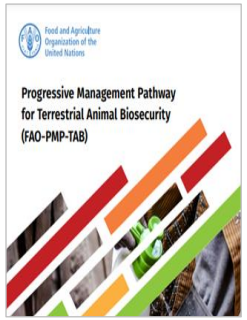
FAO's Focus on animal health for agrifood & livestock systems

Improving Animal Health for Sustainable Agrifood and Livestock Transformation and One Health Implementation

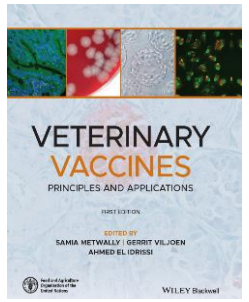
SUSTAINABLE DEVELOPMENT GOALS

Global animal disease control and eradication programmes	Improving the Prevention, Preparedness and Emergency Response at all levels	Building capacity of national laboratories; Reference Centres, OFFLU, Regional Support Lab, and Regional lab networks	Improving the accessibility & quality of vaccines and animal health workforce development	Strengthening One Health implementation for Pandemic & AMR prevention

EMPRES
ECTAD
GLEWS+
GF-TADs



- **Enhancing nat'l diagnostic capacity including through 6 FAO Reference Centres for animal influenza**
- **150+ labs supported through FAO ECTAD and FAO/IAEA VETLAB**



ONE HEALTH JOINT PLAN OF ACTION (2022-2026)

The Pandemic Fund
FOR A RESILIENT WORLD

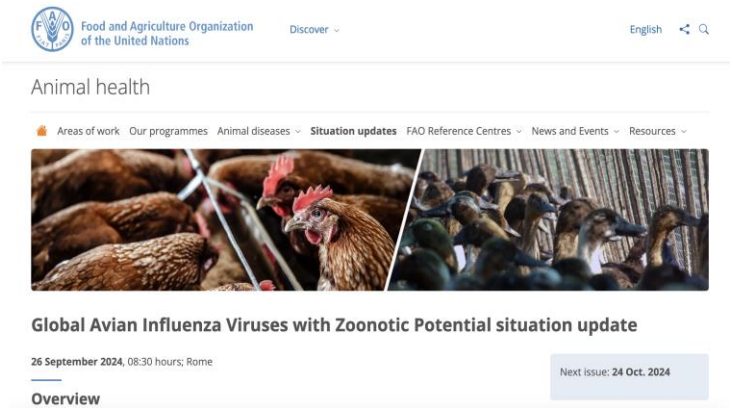
GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES

Food and Agriculture Organization of the United Nations
World Organisation for Animal Health

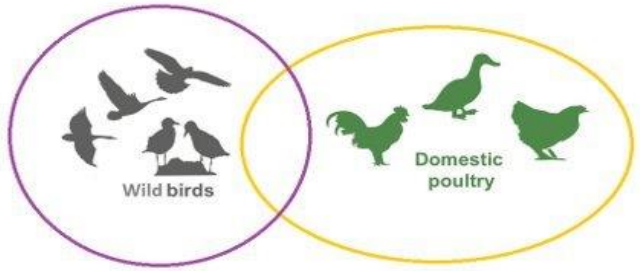
IAEA
Joint FAO/IAEA Centre
Nuclear Techniques in Food and Agriculture

Global Policy support, Risk Monitoring and Forecasting

- Global HPAI consultation- May 2023
- Regional consultations and regional strategies
- Disease Intelligence – internal risk monitoring with monthly global AIV situation and Sub-Saharan HPAI updates
- FAO Reference labs support to virus characterization, and monitoring virus evolution
- Mapping hotspots of domestic-wild bird interfaces and avian influenza forecasting tool
- Technical Guidance and risk assessments

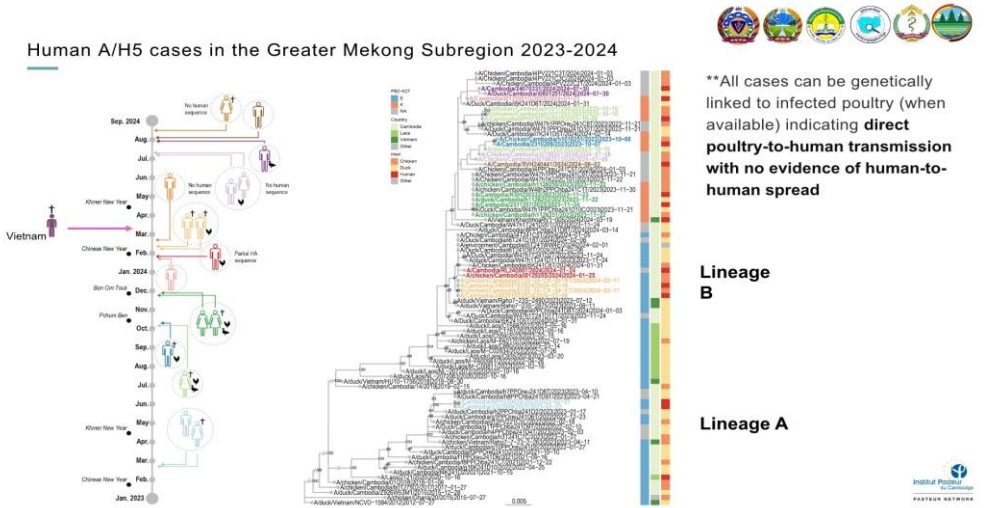


https://www.fao.org/animal-health/situation-updates/global-aiv-with-zoonotic-potential/en



FAO Regional and Country Support- operationalizing at scale

- In 2023, FAO supported
  - Risk-based surveillance in over 20 countries supported
  - Investigation/response to more than 60 AI outbreaks
  - Development of SOPs, guidelines, technical guidance or other tools related to risk reduction, surveillance, and/or outbreak response for poultry diseases.
- Disease outbreak response support
  - Provision of laboratory reagents, consumables and PPE through stockpile project
  - Emergency response missions and GEMP trainings
- Response to reassortant virus event in Asia through the FAO Regional office for Asia and the Pacific (RAP)
  - Rapid response teams, One Health Control, enhanced surveillance



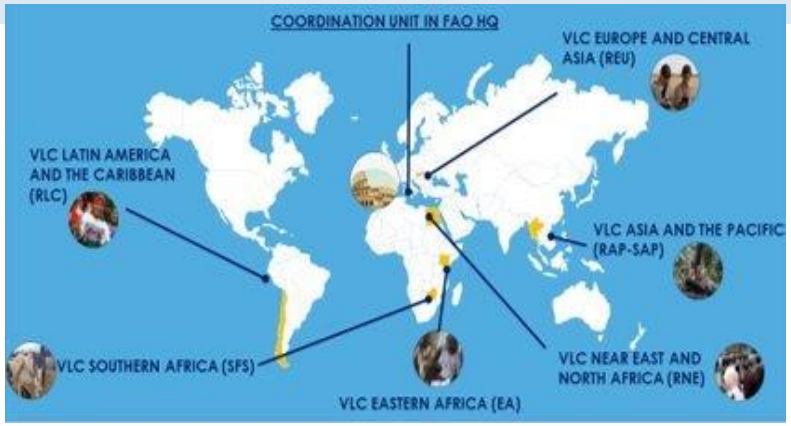
FAO Actions to Support Members on Influenza A

Capacity Development on HPAI and HPAI vaccination

https://virtual-learning-center.fao.org/

Virtual Learning Centers

- Open access courses
- Vaccine stewardship
- Webinars on HPAI vaccination
- AI preparedness in multiple languages
- >3 100 people have completed these courses since March 2022



OFFLU Avian Influenza Matching (AIM) for Poultry Vaccines

FAO Global Consultation on HPAI in Rome (May-2023)

Key recommendations to address HPAI:

- **Improving Prevention and Control:**
  - Evaluate and implement changes in poultry farming and value chains that are socially accepted to enhance ***biosecurity*** across the entire supply chain.
- **Advancing Vaccination Efforts:**
  - Enhance existing vaccination protocols for poultry and investigate the potential for vaccinating wild birds.
- **Enhancing Stakeholder Collaboration:**
  - Empower ***private sector*** entities and community groups involved in poultry production.
  - Foster stronger ***partnerships*** between the sectors of wildlife conservation and environmental management.
- **Implementing a One Health Approach:**
  - Integrate human, animal, and environmental health strategies to create a comprehensive response to HPAI challenges.

FAO Global Support to Policy: Global strategy for the prevention and control of high pathogenic avian influenza (2024-2033)

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

Vision

A world with effective HPAI **prevention and control** along poultry value chains that supports **protection** of humans, other domestic animals, wildlife and the environment, and aligns with the **sustainable transformation** of agrifood systems

Prevent	• HPAI epizootics, panzootics and negative impacts on biodiversity through multisectoral early detection and control
Protect	• poultry value chains, livelihoods, and the health of humans, ecosystems, and other animal species from HPAI impacts
Transform	• poultry value chains to improve resilience to HPAI threat

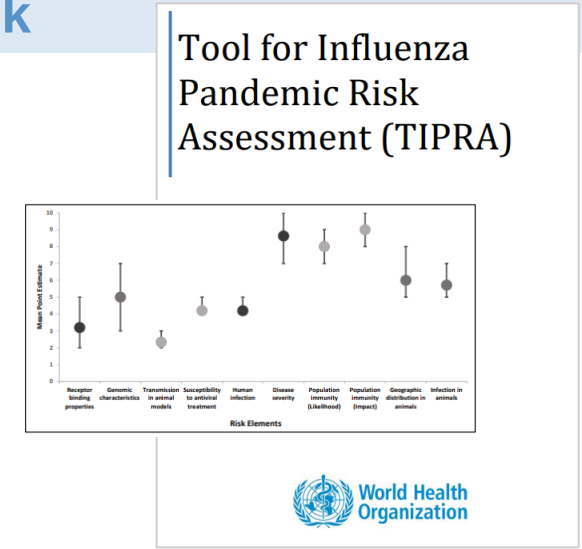
➢ Next step – regional engagement and development of national HPAI action plans

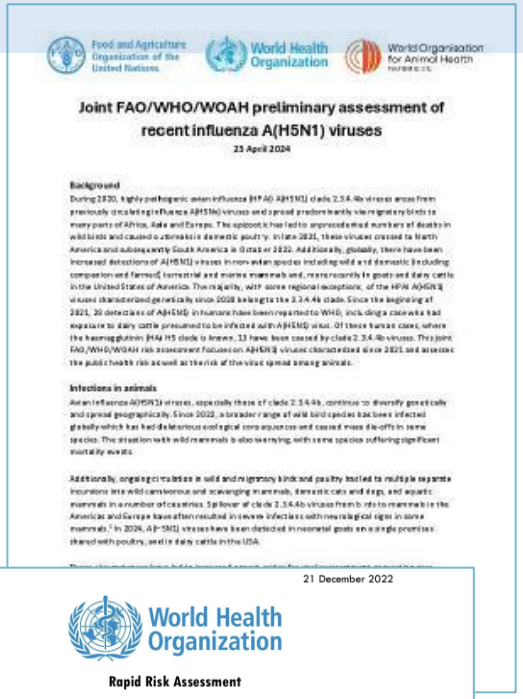
Food and Agriculture Organization of the United Nations

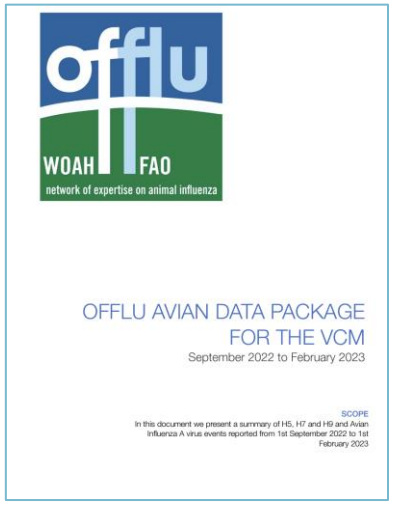
SUSTAINABLE DEVELOPMENT GOALS

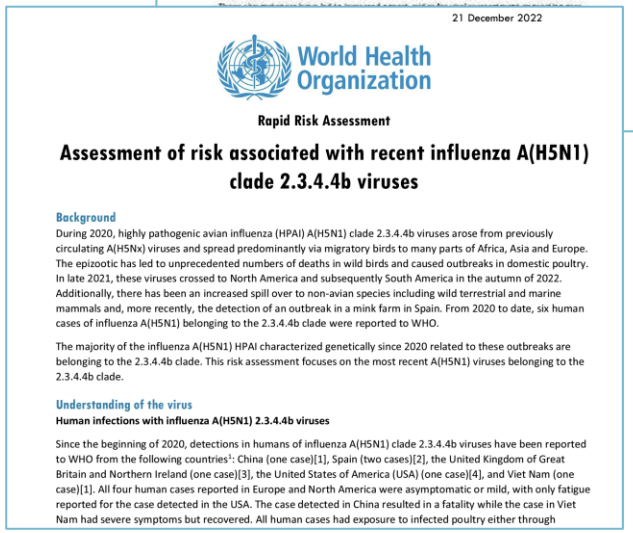
Collaborations with WHO & WOAH at the Global Level – Disease intelligence and Assessing pandemic risk

- Information sharing for preparedness – GLEWS+/EIOS
- Periodic coordination call - FAO, WHO, WOAH and OFFLU
- Risk assessments and joint statements publication
- Participation in WHO's TIPRA (Tool for Influenza Pandemic Risk Assessment) - ***H5N1 Genotype B3.13 ongoing***
- Joint technical guidance for policy planning
- Enhancing genetic data sharing - WHO GISRS (Global Influenza Surveillance and Response System)
- Pandemic preparedness through OFFLU support to WHO Vaccine Composition Meetings (VCM)









FAO Actions on emerging issues: influenza A(H5N1) recent events

FAO is attentively monitoring the situation:

- Periodic calls with WHO, WOAH and OFFLU
- Publication of EMPRES Watch
- Tripartite joint assessment on influenza A(H5N1) with focus on cattle (April and August 2024)
- FAO Food Safety recommendations on pasteurization (link)
- FAO's Recommendations for Surveillance of Influenza A (H5N1) in Cattle *to be published soon*

Food and Agriculture Organization of the United Nations
empres watch

Food and Agriculture Organization of the United Nations
World Health Organization
World Organisation for Animal Health
Founded as OIE

Updated joint FAO/WHO/WOAH assessment of recent influenza A(H5N1) virus events in animals and people

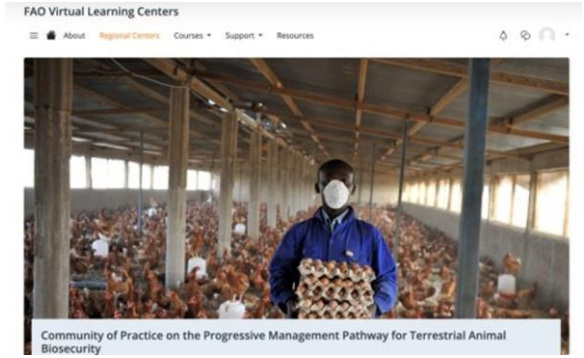
Assessment based on data as of 18 July 2024

14 August 2024

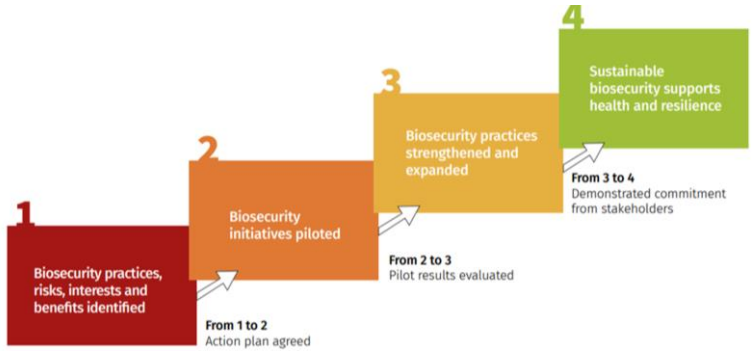
PMP-TAB: Progressive Management Pathway for Terrestrial Animal Biosecurity

FAO adopted a more **strategic and systematic approach** to support countries in strengthening biosecurity along livestock value chains and the human-animal-plant-environment interface through the PMP-TAB

Bottom-up



Progressive



A **process**, not a scoring tool

https://www.fao.org/documents/card/en/c/cc5771en

Supported by a **Community of Practice**

PMP-TAB pilots are on-going, with some of them supporting the poultry value chain

Building surveillance in countries: Laboratory capacity

Capacity building for *sustainable and reliable* functioning of animal health laboratories in Member States for improved national capacities to *prevent, detect and respond* to confirmed animal infectious disease events:

Basic and high-level diagnostic testing to enable rapid and reliable diagnosis of transboundary and priority zoonotic diseases.

Provide support for decision making by the Animal & One Health surveillance systems through sharing and application of reliable laboratory data

Increase connection and collaboration amongst national and subnational laboratories as well as with regional and international communities.

EXPANDING LAB SUPPORT ACROSS THE WORLD

Countries currently supported by FAO through ECTAD

Source: United Nations. 2022. Map of the World. [Cited 28 September 2023]. https://www.un.org/geospatial/content/map-world. The final boundary between the Sudan and South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. The dotted line represents, approximately, the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

RENOVATION OF LAB FACILITIES

In several CVLs and regional laboratories in Africa

PROCUREMENT OF LABORATORY ITEMS

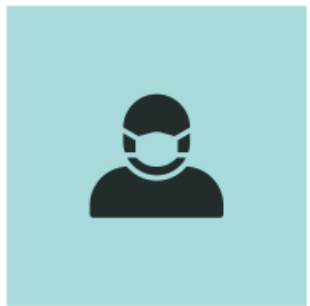
Laboratory reagents and consumables

Reagents for diagnostic analyses

(DFA, RT-PCR)

Equipment

PCR machines, ELISA readers, Fluorescente microscopes, etc..



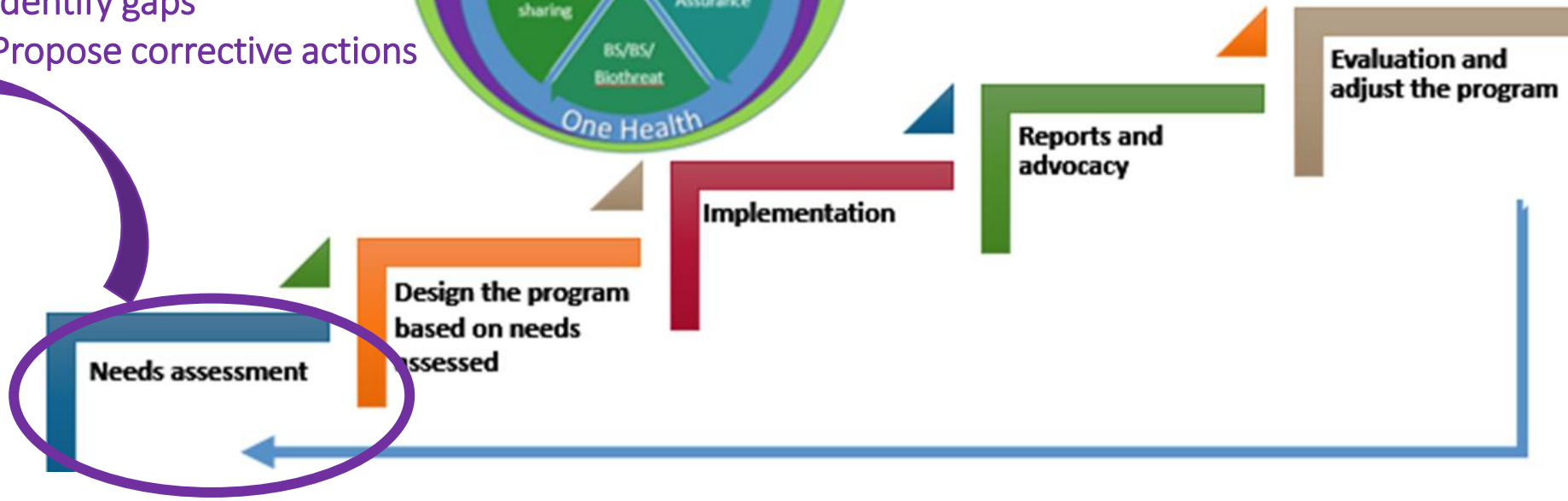
Field consumables and PPEs

Personal protective equipment, sample collection and necropsy materials, and field testing kits for on-site investigations

Laboratories evaluations: assessment for action

- ✓ Identify gaps
- ✓ Propose corrective actions

Stepwise approach to laboratory capacity building



OBJECTIVES OF THE PROFICIENCY TESTING

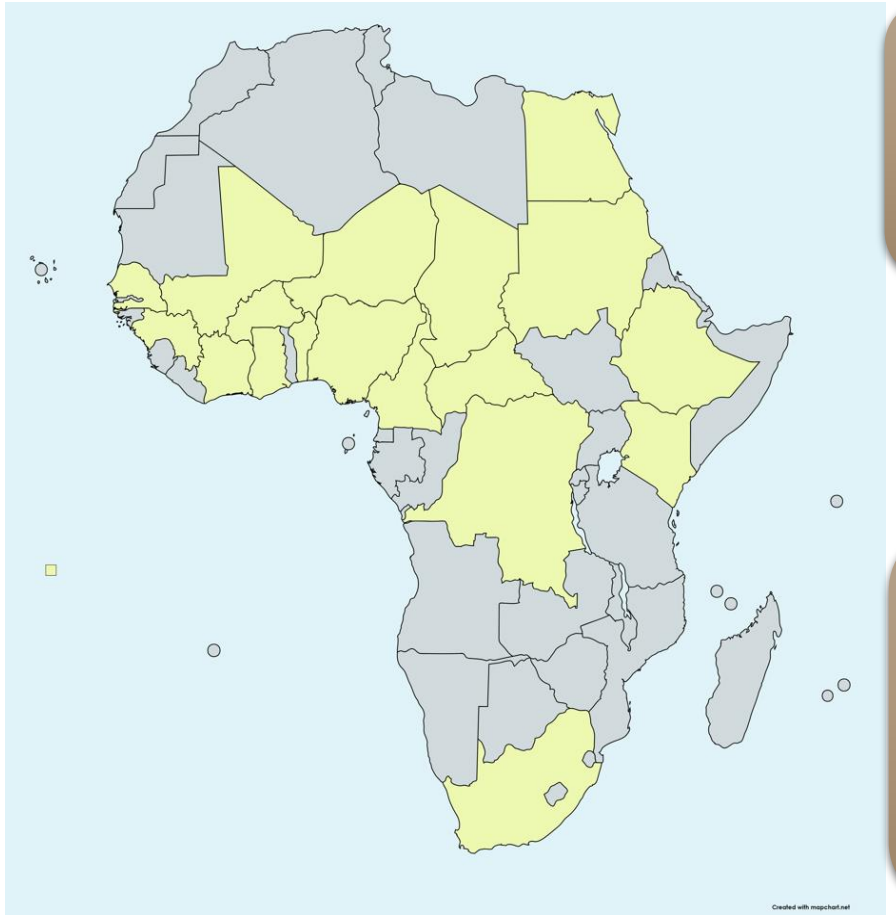
EVALUATE
Lab proficiency in diagnostic technics
Lab Quality Management System

GAPS/STRENGHTS IDENTIFICATION

ACTIONS
Proposed corrective actions

MEASURE PROGRESS

Regular AI/ND PTs - since 2008



FAO reference Centers for Animal Influenza/NDV WOAH and National Reference Laboratory for Avian influenza (IZSVe- Italy)

WOAH recommended Protocols:

- Serology (IH and or ELISA tests)
- Molecular testing (conv RT-PCR and/or Real-time RT-PCR)

PTs AI in 2008, CVLs

PT 2022: CVLs and provincial/district labs participation

PTs results in Africa

Evaluate the proficiency on diagnostic technics AI-H5

Table 14. Statistical analysis of molecular detection of AIV-H5 by real-time RT-PCR.

Sample		Laboratory code															
ID code	Type	L01	L03	L05	L06	L12	L13	L15	L17	L20	L22	L25	L26	L28	L29	L30	L33
M01	Negative	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
M02	H7N7	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
M03	PPMV-1	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
M04	H9N2	N	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N
M05	H5N8	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
M06	H7N7	N	N	N	N	N	N	P	N	N	N	N	N	N	N	N	N
M07	H5N8	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
M08	Negative	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
M09	H5N1	P	N	P	P	P	P	P	P	P	P	P	P	P	P	P	P
M10	APMV-1	N	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N
M11	H5N5	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
M12	H5N6	P	P	P	P	P	P	P	P	P	P	P	P	P	P	N	P
Se (%)**		100	80	100	100	100	100	100	100	100	100	100	100	100	100	80	100
Sp (%)**		100	85.71	85.71	100	100	100	85.71	100	100	100	100	100	100	100	100	100
Concordance (%)*		100	83.33	91.67	100	100	100	91.67	100	100	100	100	100	100	100	91.67	100
Kappa		1.00	0.66	0.83	1.00	1.00	1.00	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.00
p-value		0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

P = Positive; N = Negative; Se = Sensitivity; Sp = Specificity
In **black**: correct specification; in red: result different from the target value
In light blue data referring to the individual laboratory and in light orange data deriving from the overall evaluation of the results given per sample
* Percentage of reported results in agreement with the assigned target value per total number of expected results
** Percentage assessed as (*) on the following expected results:
Five (5) AIV-H5Nx positives and seven (7) AIV-H5Nx negatives

Evaluate the proficiency on diagnostic technics AI-N1

Table 18. Statistical analysis of molecular detection of AIV-N1 by real-time RT-PCR.

Sample		Laboratory code												
ID code	Type	L03	L05	L06	L12	L13	L15	L17	L20	L25	L26	L28	L29	L33
M01	Negative	N	N	N	N	N	N	N	N	N	N	N	N	N
M02	H7N7	N	N	N	N	N	N	N	N	N	N	N	N	N
M03	PPMV-1	N	N	N	N	N	N	N	N	N	N	N	N	N
M04	H9N2	N	N	N	N	N	N	N	N	N	N	N	N	N
M05	H5N8	N	N	N	N	N	N	N	N	N	N	N	N	N
M06	H7N7	N	N	N	N	N	N	N	N	N	N	N	N	N
M07	H5N8	N	N	N	N	N	N	N	N	N	N	N	N	N
M08	Negative	N	N	N	N	N	N	N	N	N	N	N	N	N
M09	H5N1	P	P	P	P	P	P	P	P	P	P	P	P	P
M10	APMV-1	P	N	N	N	N	N	N	N	N	N	N	N	N
M11	H5N5	N	N	N	N	P	N	N	N	N	N	N	N	N
Se (%)**		100	100	100	100	100	100	100	100	100	100	100	100	100
Sp (%)**		90.91	100	100	100	81.82	100	100	100	100	100	100	100	100
Concordance (%)*		91.67	100	100	100	83.33	100	100	100	100	100	100	100	100
Kappa		0.63	1.00	1.00	1.00	0.43	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
p-value		0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

P = Positive; N = Negative; Se = Sensitivity; Sp = Specificity
In **black**: correct specification; in red: result different from the target value
In light blue data referring to the individual laboratory and in light orange data deriving from the overall evaluation of the results gi
* Percentage of reported results in agreement with the assigned target value per total number of expected results
** Percentage assessed as (*) on the following expected results:
One (1) AIV-HxN1 positive and eleven (11) AIV-HxN1 negatives

Activities implemented after PT results

Laboratory interviews:

2.Identify gaps

- Evaluation of the results obtained
- Interview with the participating labs and discuss root cause
- Agree on the main gaps identified

3.Propose corrective actions

- Agree on the main actions and plan for next steps

Comments from IZSVe	Comments from FAO	Comments from the lab
Excellent skills in molecular testing: 3 FN, the IZSVe recommend to test these samples again.	Were the samples retested?	Due to high diagnostic activity in the lab, the staff has not had the chance to test the samples yet.
Issues with the use of inadequate molecular diagnostic reagent kits	FAO online service available to assist with primer and probes supply	Problem in the supply of the appropriate diagnostic kits (amplification kits, extraction kits….). For this reason, the change of kits is often done according to what is available. The last of couple of years, the lab managed to always analyse the samples. The same is applicable to primers and probes. To place order, the authorization of the Chief executive so that purchases can be performed.
All positive samples were detected by molecular testing, main problem is the presence of 5 FP (1 for M gene and 4 for AIV-N1)	. - Contamination of kits or equipment (like pipettes). - Specificity of the protocol used to be assessed **Action:** The panel should be retested for M gene and AIV-N1 protocols	• probable source of contamination: centrifuge • Protocol use for N1 detection: duplex for H5N1 • CT value of the false positive results + amplification plots: to be provided by the laboratory by 12/03/2021 • H5N1 used as positive control **Action:** 1) decontamination the PCR room + equipment (SOPs to be shared with the lab – (trough regional BS/BS network via th whatsapp group) 2) Study of the data and have a following discussion on the contamination 3) re-test the samples.
s this exercise relevant for your needs? Scope of the test, techniques used for the test, disease		The lab would request the PT AI/NDV and Rabies for the next year **Action :** FAO ECTAD country to insert these activities in the WP

SUSTAINABILITY

IMPROVEMENT

RAPIDE DETECTION

RESULTS CONFIRMED BY REF LABS

ADVOCACY FOR FUND RAISING

Disease testing - based on gaps and prioritization

- Technical, operational and logistics assistance and follow up of procurement process for lab equipment, reagents
- Access to reference reagents and primers/probes for all targeted countries through establishment of long term procurement mechanisms (LTA)
- Reagents monitoring informatics system in the laboratory (module in the LIMS SILAB)
- Immediate shipment of laboratory items (including temperature controlled) in case of emergency/outbreaks to priority countries.

- Training curriculum (online, on-site), Regional (ToT) and National levels
- Mentorship, remote assistance
- Participation to yearly internationals PTs

- Provision of diagnostic algorithms and protocols for core tests
- Provision of access to confirmatory testing and sequencing by WOAH/FAO Ref labs
- Plan troubleshooting mission
- Guidelines (&Mobile app) for field sample collection, preservation and transport
- Development & implementation of LIMS (SILAB) for harmonized lab diagnostic processes and sample tracking in a country and a region.

Diagnostic capacity improved

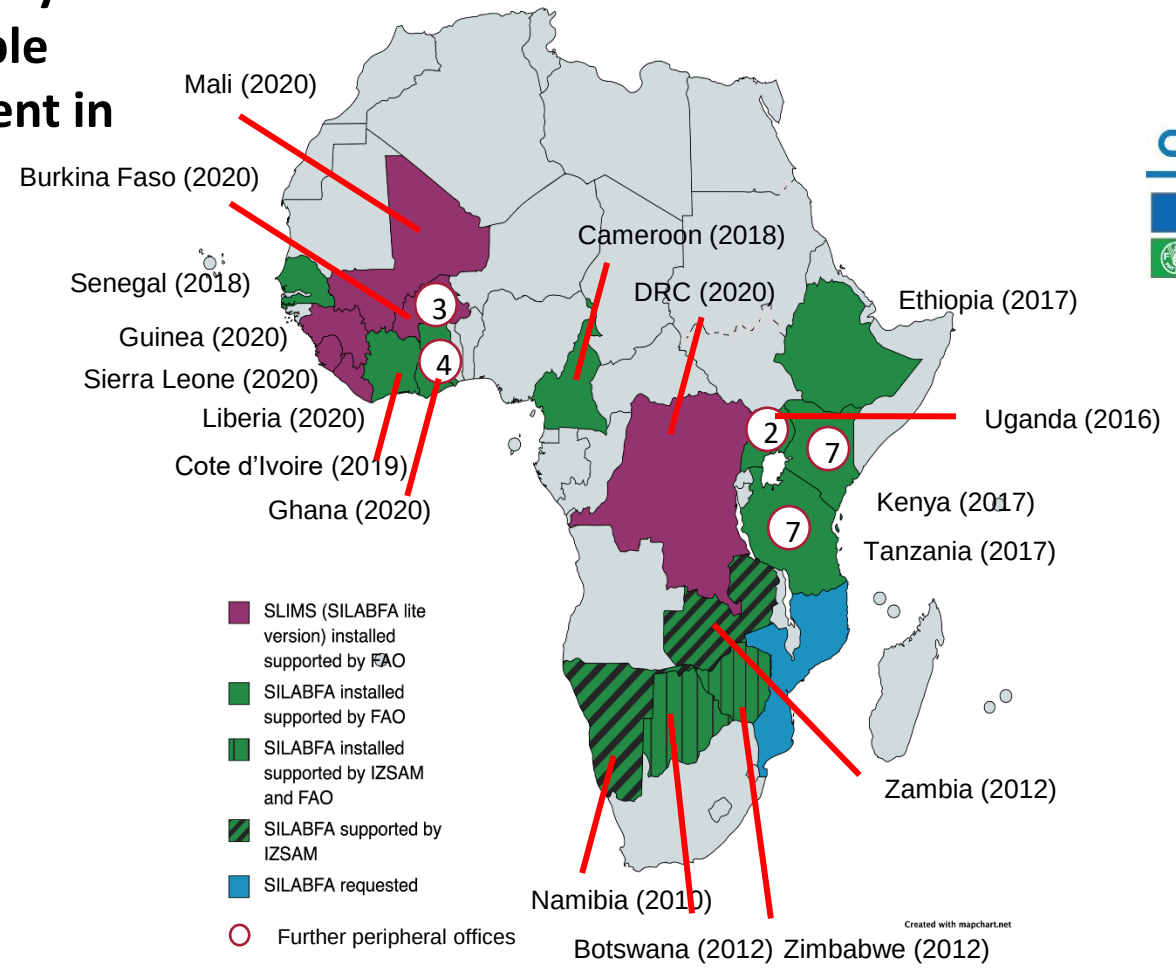
Development of a sampling manual and its mobile application

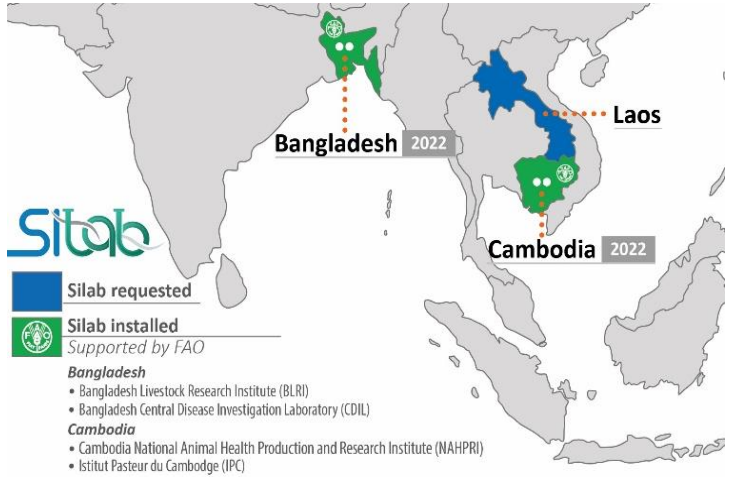
Currently being adapted from a manual developed by a FAO Reference Centre for animal diseases and Laboratory IT systems. The aim is to improve the safety of sampling activities and samples quality

- Should suit field condition
- Fast access to simple sampling instruction and recommendation
- Will be available in En and Fr
- Paper version and electronic version (mobile app)
- Friendly user application **under development**
- Pilot testing in the coming months

Laboratory Information Management System : LIMS SILAB-FA

Standardization of laboratory diagnostic processes, sample traceability and management in veterinary laboratories:





- ✓ FAO ref center for LIMS (Teramo)
- ✓ Modular approach
- ✓ Interoperability
- ✓ 18 countries Africa
- ✓ 2 countries in Asia
- ✓ In 67 laboratories

ADDRESSING ELECTRICITY SUPPLY CHALLENGES WITH FREEZE-DRIED KITS

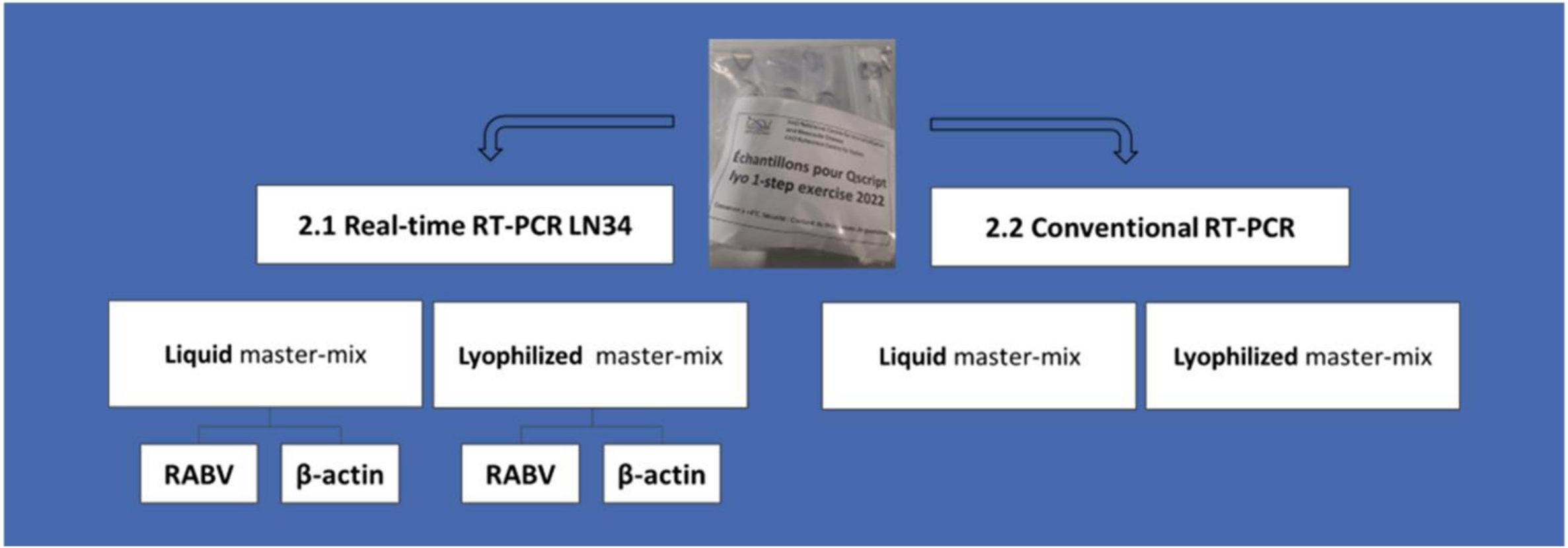
Cost saving (i.e. single tube reaction)

Friendly for the end-user

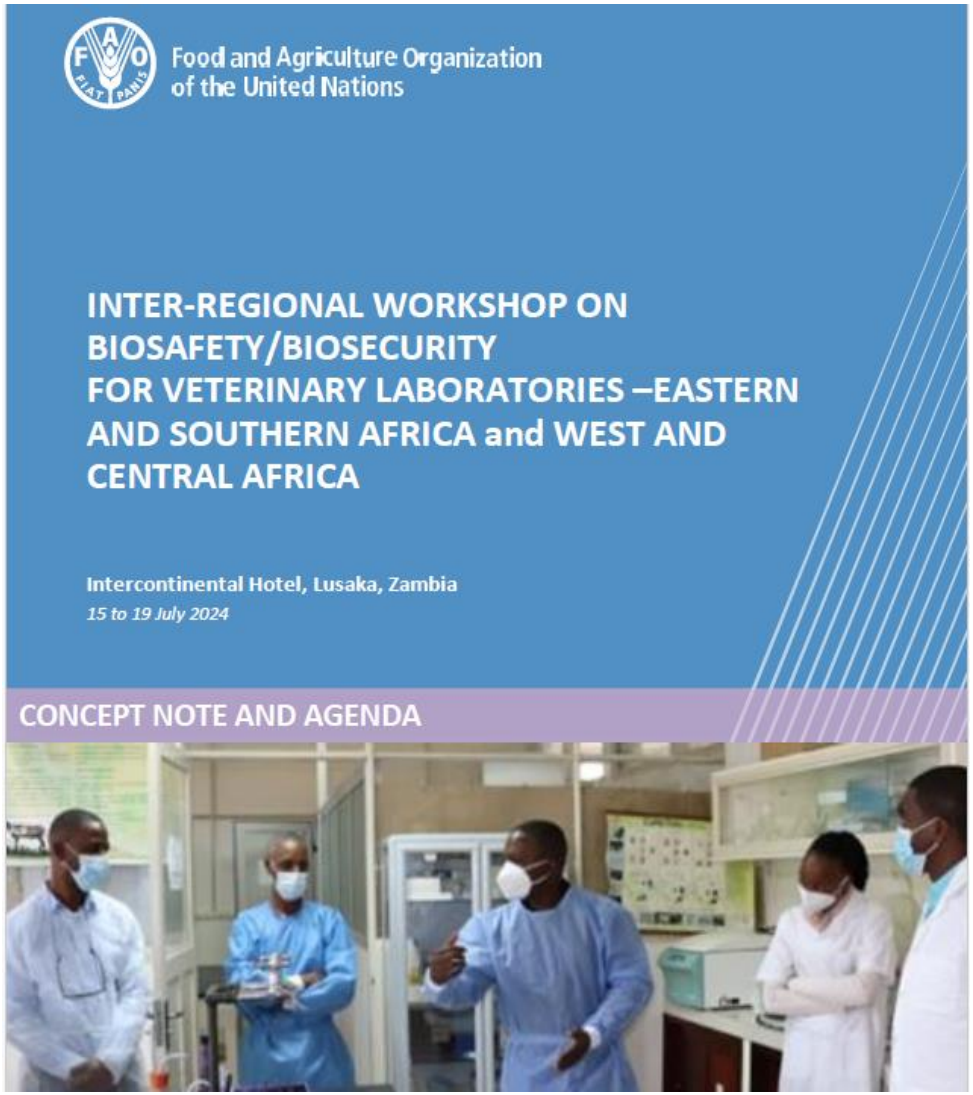
Acceptable performance

Temperature stability:

- Optimal at +4°C
- Ok 30°C for 10 days
- Room temperature (@ 20°C) for 9 months



LYOPHILIZED FORMAT SUCCESSFULLY IMPLEMENTED IN 4 CVLS IN SUB-SAHARAN AFRICA THANKS TO AN INTER-LABORATORY REPRODUCIBILITY TEST



Regional programs on BS/BS in Africa

Food and Agriculture Organization of the United Nations

SUSTAINABLE DEVELOPMENT GOALS

Thank you for attention!

Laboratory Team, HQ, WCA, EA, Asia

Food and Agriculture Organisation