# FAO Early Warning and Surveillance Tools

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Working for #ZeroHunger

Surveillance Coordination at Global Level

- Provide guidance for representative or targeted active surveillance >> harmonization of activities across countries and regions

- Review national disease-specific surveillance plans

- Participate in

  - National work planning meetings
  - National surveillance plan discussions
  - Ad hoc missions to support national teams in surveillance planning

- Regular coordination calls by disease and region

  - EA Epi-Lab
  - AI Asia (quarterly)
  - MERS-CoV Eastern Africa and Near East

- Build national veterinary capacities through trainings and exercises (sampling, data collection, analysis, GIS, risk assessment,…)
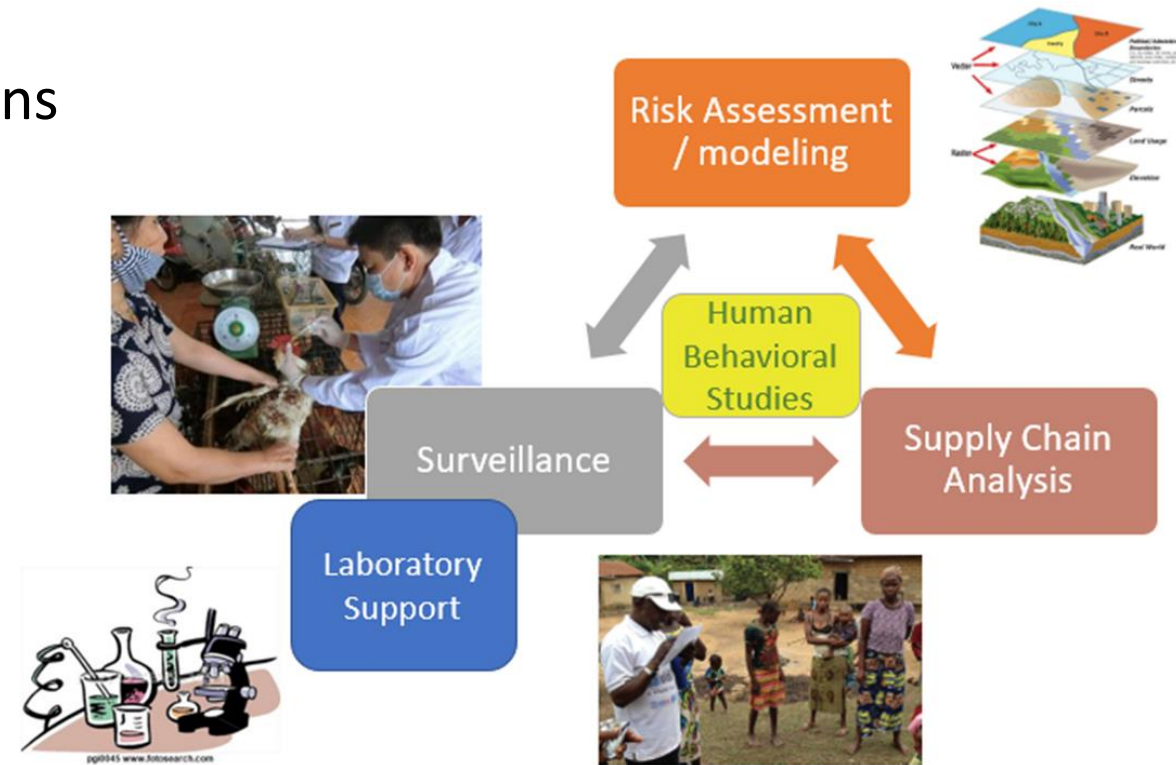
FAO Surveillance Evaluation Tool (SET)

- FAO tool for **comprehensive and standardized evaluation of national animal health surveillance systems**

- Automatically generates graphic results of **strengths and weaknesses**

- Results used to develop **country-specific action plan** with recommendations to improve national AH surveillance system

- Action plans used
    - By Ministies to develop national AH surveillance strategies
    - By FAO teams to guide yearly activities
    - By different projects as baseline assessment prior to project implementation

http://www.fao.org/ag/againfo/programmes/en/empres/tools_SET.html

FAO Surveillance Evaluation Tool (SET)

West and Central Africa

- Liberia (Sep. 2017)
- Cote d'Ivoire (Dec.2017)
- Senegal (Jan.2018)
- Mali   (Feb.2018)
- Guinea (Mar.2018)
- Burkina Faso (Apr.2018)
- Cameroon (Apr.2018)
- DRC   (Apr.2018)
- Sierra Leone (Sep.2018)
- Ghana (Mar.2019)
- Mozambique (Aug 2021)
- Niger (March 2022)

East Africa

- Tanzania (Jul. 2017) (re-assessment Nov. 2020)
- Kenya (Nov. 2017)
- Uganda (Mar.2018)
- Ethiopia (Apr.2018)

Asia

- Indonesia (Sep.2019)
- Kyrgyzstan (Sep.2019)
- Azerbaijan (Jan.2020)
- Tajikistan (April 2021)
- Kazakhstan (May 2021)
- Uzbekistan (Oct 2021)

North Africa and Near East

- Sudan (Mar.2020)
- Iraq (May 2020)
- Tunisia (Oct 2021)

25 Countries assessed under various projects

Indonesia
Evaluation for action

Assessing animal disease
surveillance capacities

August 2019

In the pipeline 2022
- Jordan
- KSA
- Lebanon
- Nigeria

Report available on webpage: http://www.fao.org/ag/againfo/programmes/en/empres/tools_SET.html

Next for SET

Updating toolkit (SET 2.0)

- Clarify problematic indicators

- Better integrate with other FAO tools

- Final debrief meeting Feb 2022

- SET 2.0 use in Niger mission (March 2022)

Increasing the list of trained SET assessors

- Decentralise capacity to lead/support SET

- Trainings of Trainers – in-person & Zoom versions

Stepwise approach to surveillance capacity enhancement

- Help countries implement recommendations in a prioritised and logical way

- More later....

Piloting and implementation of SET Biothreat Detection Module

- Developed under joint OIE-FAO-INTERPOL project of "Building resilience against agro-terrorism and agro-crime" supported by Global Affairs Canada ("GAC Project")

- Has 32 indicators on surveillance of criminal and terrorist animal health events

- Piloted in 2021 in Tunisia (next: Jordan)

- Will be later expanded to other beneficiary countries in Southeast Asia, Near East and North Africa.
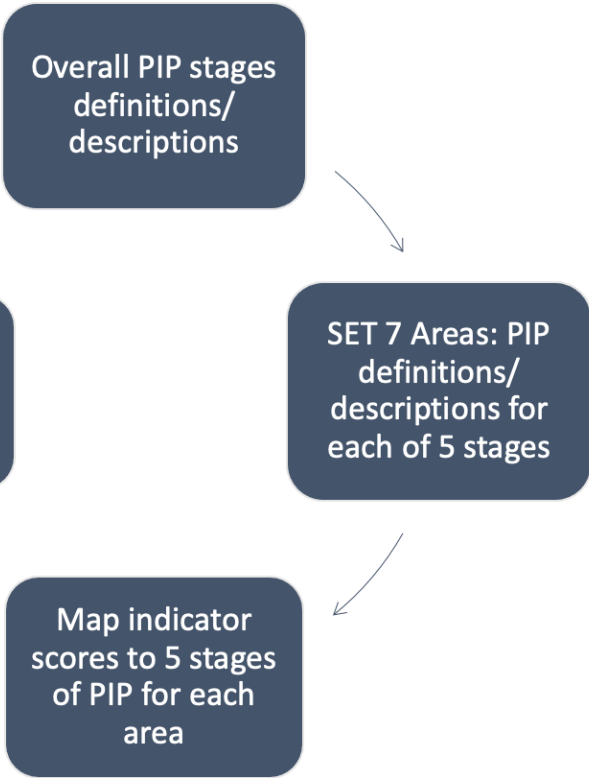
www.researchsquare.com/article/rs-205576/latest

SET-PIP

Needs/objectives

- Clear stages of development with definitions/descriptions
- Clear suggestions/action points for how to move to the next stage

--> Therefore, stages must be linked to specific indicators
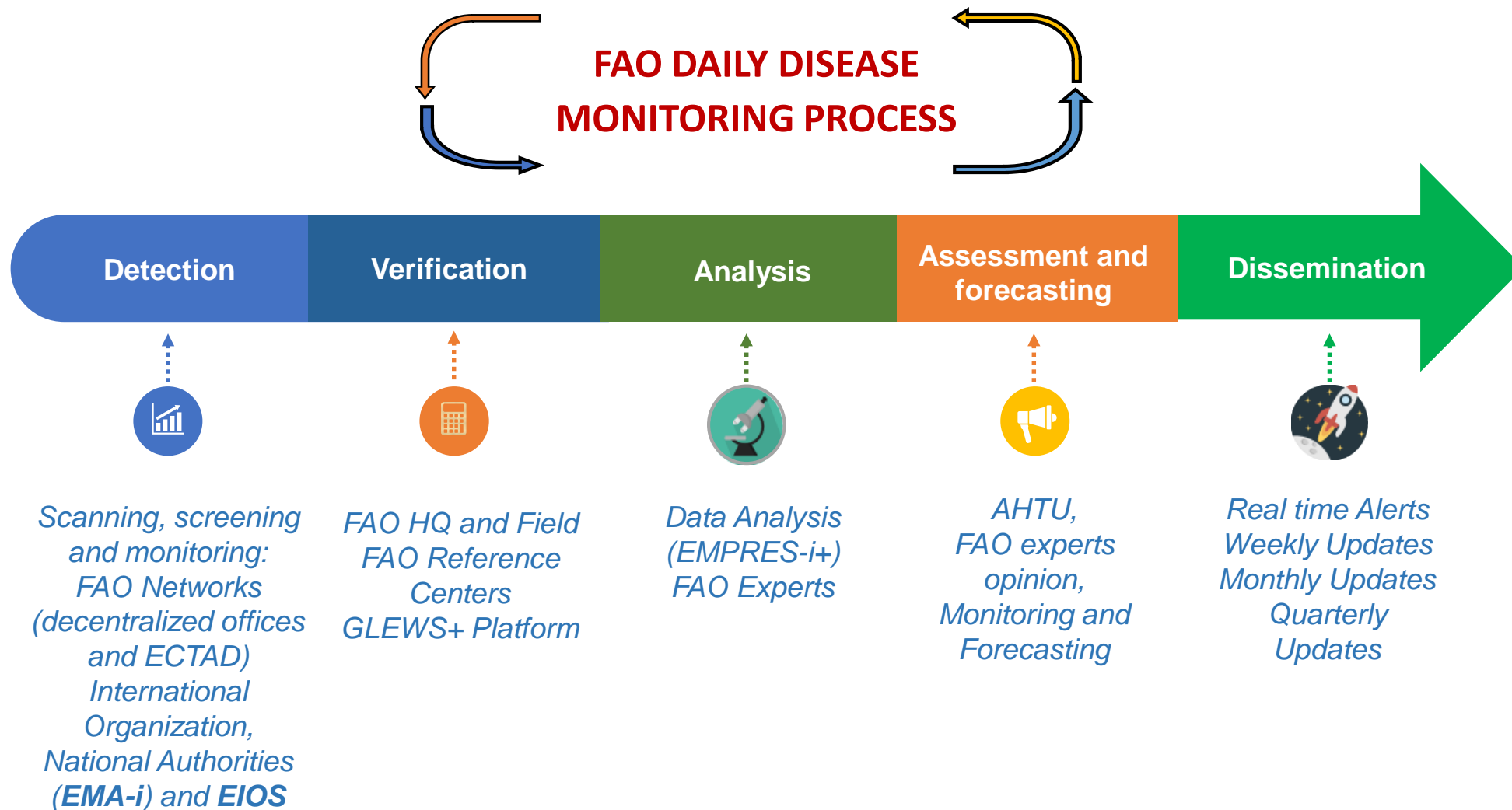
**Clear path of improvement in follow-up SET assessments

Overall PIP stages definitions/ descriptions

SET 7 Areas: PIP definitions/ descriptions for each of 5 stages

Map indicator scores to 5 stages of PIP for each area

Map PIP score for each SET area to an overall score

			No info						L18	≥1	≥1	≥2	≥2	≥2	≥4
Technical practices		Standard for AST- L19	No info						L19	≥1	≥1	≥2	≥3	≥4	≥4
		Bacterial inoculum calibration for AST - L20	No info						L20	≥1	≥1	≥3	≥3	≥3	≥4
		Panels definition- L21	No info						L21	≥1	≥2	≥4	≥4	≥4	≥4
	Antimicrobial susceptibility testing (AST) methods	Revision of panels of antibiotics- L22	No info						L22	≥1	≥2	≥3	≥4	≥4	≥4
		Method for reading disk diffusion results- L23	N/A						L23	≥1	≥1	≥2	≥2	≥2	≥2
		Method for reading MIC results- L24 it is mandatory to answer this question for a Reference lab scored PIPstage 5	N/A						L24	≥1	≥1	≥2	≥2	≥2	≥2
		Standard for interpretation of disk diffusion results - L25	N/A						L25	≥1	≥2	≥3	≥4	≥4	≥4
		Standard for interpretation of MIC results- L26 it is mandatory to answer this question for a Reference lab scored PIPstage 5	N/A						L26	≥1	≥2	≥3	≥4	≥4	≥4
	Molecular Tools	Molecular characterization (resistance gene confirmation or typing)- L27	No info						L27	≥1	≥1	≥1	≥1	≥1	≥2
		Sequencing of resistant strains- L28	No info						L28	≥1	≥1	≥1	≥1	≥1	≥3
Management of data and biological material	Management of biological material	Sample identification and follow-up- L29	No info						L29	≥1	≥2	≥3	≥3	≥3	≥3
		Proportion of isolates stored in a library- L30	No info						L30	≥1	≥1	≥1	≥2	≥2	≥4
		Method for bacterial preservation- L31	No info						L31	≥1	≥1	≥1	≥3	≥3	≥4
		Inventory of stored isolates- L32	No info						L32	≥1	≥1	≥1	≥3	≥3	≥3
		Duration for bacterial isolates storage- L33	No info						L33	≥1	≥1	≥1	≥2	≥3	≥4
	Data management	Individual reports on AMR data to the customers- L34 it is mandatory to answer this question for a laboratory sending results to customers	N/A						L34	≥1	≥2	≥3	≥3	≥4	≥4
		Data archiving- L35	No info						L35	≥1	≥2	≥2	≥3	≥3	≥3
		AMR data transmission to a dedicated epidemiology unit and analysis- L36	N/A						L36	≥1	≥1	≥1	≥2	≥3	≥3
Quality Assurance	Documentation	SOPs on AMR detection implemented- L37	No info						L37	≥1	≥1	≥2	≥3	≥4	≥4
		SOPs on AMR detection updating- L38	No info						L38	≥1	≥1	≥2	≥3	≥3	≥4
	AMR Detection	Reference strains for AST quality control- L39	No info						L39	≥1	≥1	≥2	≥3	≥4	≥4
		Proficiency testing for AST- L40	No info						L40	≥1	≥1	≥2	≥3	≥3	≥3
	Staff	Initial training in AMR testing- L41	No info						L41	≥1	≥1	≥2	≥2	≥3	≥4
		Staff skill validation and continuous proficiency- L42	No info						L42	≥1	≥1	≥2	≥3	≥4	≥4
Lab X PIP AMR Stage										1	2	3	4	5	5

Disease Intelligence Workflow

- **Disease intelligence** is the basis for **early warning and prevention.**

- **Monitoring of TADs (AI, ASF, LSD, FMD, RVF, SARS-CoV2...)**

- **Animal Health Threat Update meeting and Update (weekly)**

FAO DAILY DISEASE MONITORING PROCESS

Detection	Verification	Analysis	Assessment and forecasting	Dissemination

Scanning, screening and monitoring:
FAO Networks (decentralized offices and ECTAD)
*International Organization, National Authorities (**EMA-i**) and **EIOS***

FAO HQ and Field FAO Reference Centers GLEWS+ Platform

Data Analysis (EMPRES-i+) FAO Experts

AHTU, FAO experts opinion, Monitoring and Forecasting

Real time Alerts Weekly Updates Monthly Updates Quarterly Updates

One Health and Early Warning

New challenges

- Climate change, increasing population, food demand, as well as the increasing interaction between people and traditionally intact environments

Role of FAO

- Support countries build resilience & strengthen capacities to prevent, detect and respond to threats to agri-food systems.
- FAO is a neutral and specialised agency that collects, hosts and leverages disease information;

Disease Intelligence and Early Warning

- Collecting information across the world
- Technology for intelligence

EMPRES-i+

An instrument for early warning

https://empres-i.apps.fao.org/

Joint FAO/OIE/WHO Tripartite GLEWS + Global Disease Intelligence and Early Warning System

- A **global early warning system** that formally brings together human and veterinary public health systems (since 2006)

- To **share** health threats (including zoonotic disease outbreak) **information**

➢ To **share** epidemiological and risk **analysis**

➢ To conduct **Rapid Risk Assessment**

➢ To **deliver** early warning **messages** on areas at risk.

- Combines official reporting data, rumour tracking, trends analyses

Disease Tracking Systems

FAO EMPRES-i + Global Animal Disease Information System
WHO Event Information Site
OIE World Animal Health Information System

Analysis

Additional data

Other FAO and UN data
Refugees movements
Climatic data
Production, Economic data
Wildlife and other migration

Early Warning

Disease alerts
Trends and analysis
Forecasting
Risk assessment

GLEWS+

Food and Agriculture Organization of the United Nations

OIE WORLD ORGANISATION FOR ANIMAL HEALTH

World Health Organization

Global Early Warning System for transboundary animal diseases including zoonosis (GLEWS+)

- Mobile *App* for Veterinary Services **to facilitate quality** & **real time** reporting of animal diseases from the field
- Integrated into **EMPRES-i** to **safely store** epidemiological data
- Improve **communication** among veterinary services, animal health workers, laboratory experts
- Support **Early Warning** for an effective **Early Response** to disease threats.

Features:

- Data can be collected online and offline

- Data are sent, through a secure channel, with internet connection

- Visualization of outbreaks on a map and graphs on the smartphone
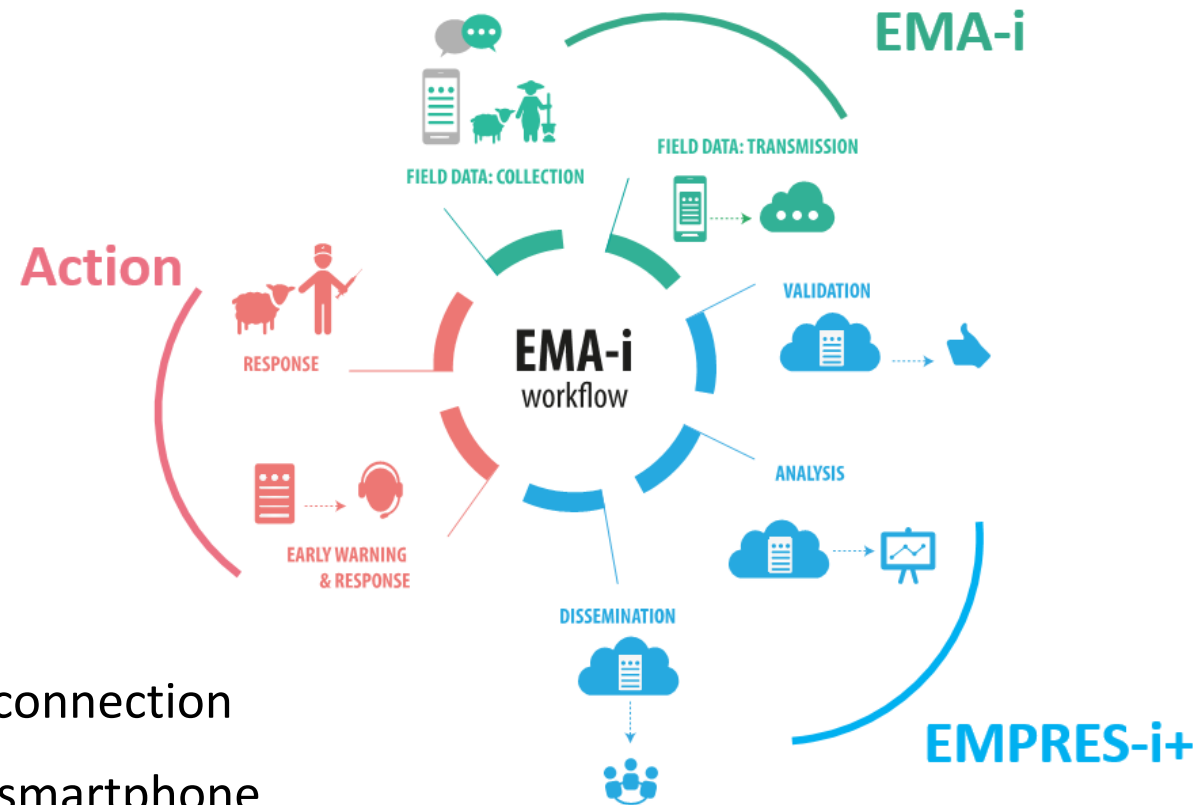
RVF Early Warning Decision Support Tool (DST) – Anticipate and mitigate the risk of RVF

Real-time monitoring, risk forecasting, mapping & assessment to guide informed early actions for prevention and control

- **Identifies climatic anomalies** to **forecast areas at risk** of **RVF vector amplification**

- **Prediction capacity**: 1-2 months before the first case is observed

- **Integrated** in **FAO Hand-in-Hand** geospatial platform / RVF events from **EMPRES-i**

- **Facilitates real-time data sharing, consultation among experts, risk interpretation**

- **Used to build capacity on environmental monitoring and risk forecasting**

- **Used to prepare RVF alerts and monthly updates**

- **Scalable** to other **regions** and **diseases (e.g., AI)**
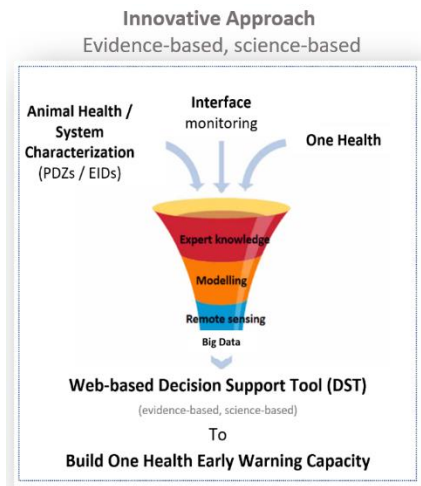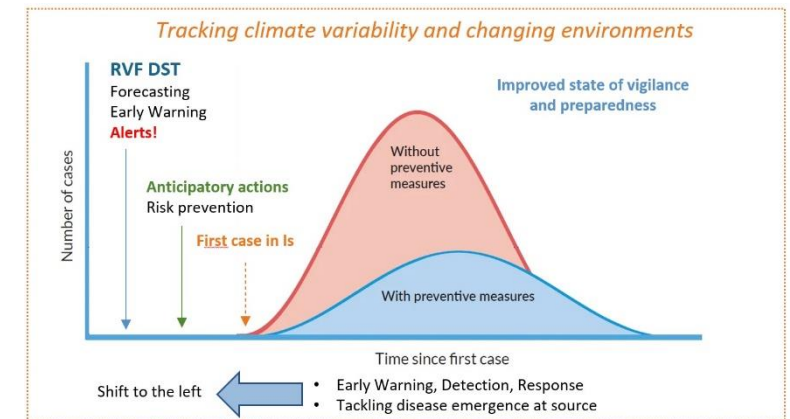
https://www.fao.org/documents/card/en/c/cb5875en
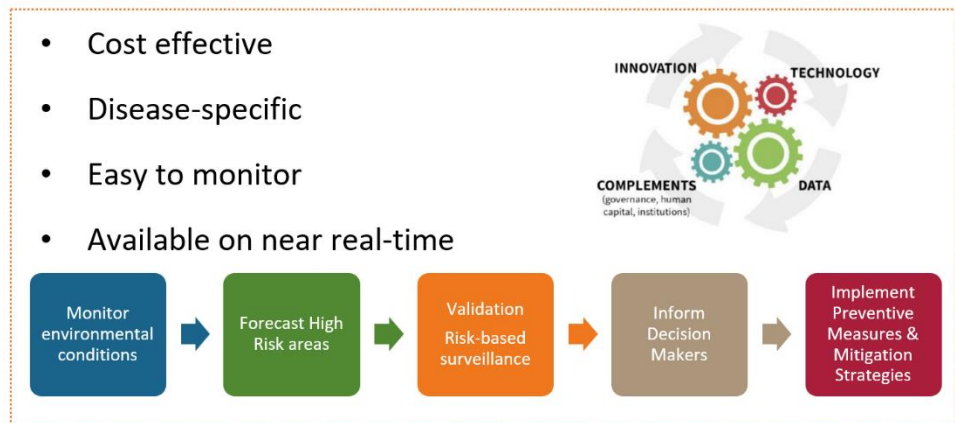
Joint Risk Assessment (JRA)

Animal, Human, and Environmental Health counterparts jointly assess zoonotic health risks

1. Gain consensus and produce a joint assessment on threats at the interface

2. Decision-makers build and implement science-based risk management and communication messages, aligned among the sectors

3. Identifies missing information and gaps where capacity can be usefully built

Sharing of information between sectors

Animal health sector
Sector specific assessment

Human health sector
Sector-specific assessment

Environmental sector
Sector specific assessment

Multiple sectors
Joint risk assessment
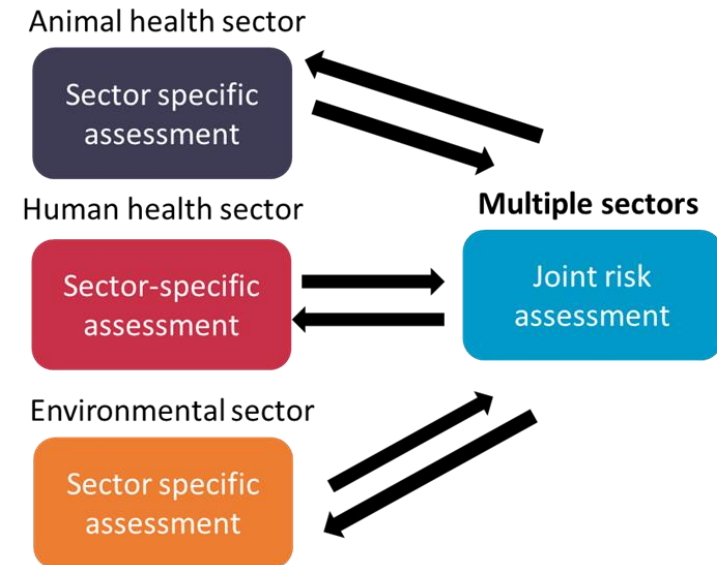
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4. Regular exchange among sectors fosters ongoing multi-sectoral collaboration

First TZG tool published!

https://www.fao.org/documents/card/en/c/cb1520en/

Current Progress – JRA OT

- Published by the Tripartite in Dec 2020: http://www.fao.org/3/cb1520en/CB1520EN.pdf in all UN languages

- FAO, WHO & OIE co-facilitating national workshops

- Development of an online JRA Facilitator training (ENG and FR): https://1drv.ms/u/s!Ai3L0Rdi50NBjXjTN6BTByD_W8pX?e=ImwtYD

- JRA impact assessment in development

JRA Completed
JRA Planned 2022-23
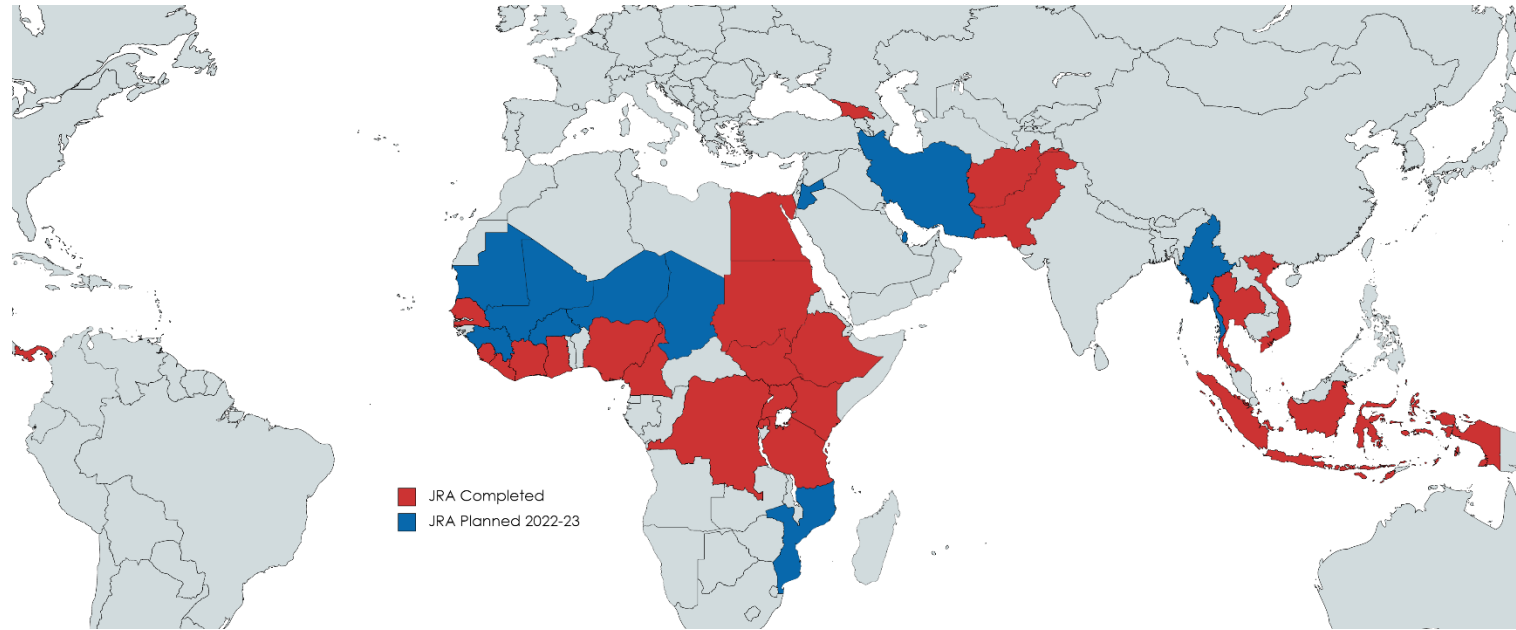
JRA Country Pilots/National Workshops 2018-2021
*Zanzibar not shown

Epidemiology Value Chain Platform (EVC)

Market Profiling Application (MPA)
Animal Movement Patterns (AMP)
Quickly Mapped Points (QMP)

- **Objectives**
  - Map, characterize, and visualize high risk locations along the value chain (e.g. markets) at national and regional levels and movements between them in a dynamic online interface
  - Digitize previously collected but under-utilized data to analyze and communicate risk

- **Decision making & targeted interventions**
  - Surveillance
  - Animal movement
  - Risk mitigation

- **Towards a "One Health - One Map" concept**
  - Mapping other epidemiologically important units (e.g. water sources, human interactions, etc.)
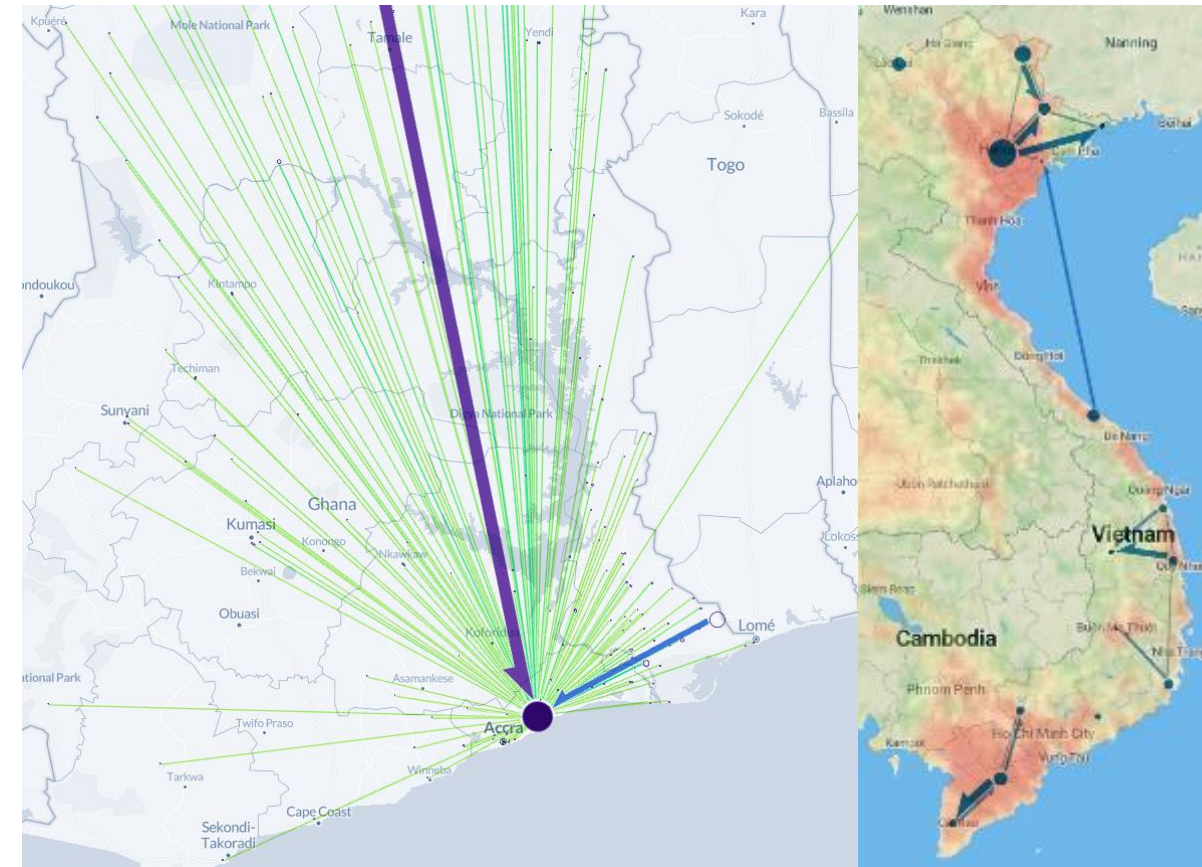
National OH approaches for surveillance and cross sectoral data sharing

Joint Outbreak Investigation (JOIN) Tool

- A tool to help standardizing zoonotic and non-zoonotic field outbreak investigation

- Applicable to many zoonotic and non-zoonotic disease outbreaks.

- Assessment of national and sub-national outbreak investigation procedures

- Automated generation of OH outbreak timeliness metrics, epi conclusions, outbreak investigation assessment and recommendations

- Assists in the operationalization of a OH approach and inter-sectoral communication at field, sub-national, national and regional levels

- Piloted in Nepal, Indonesia and Thailand
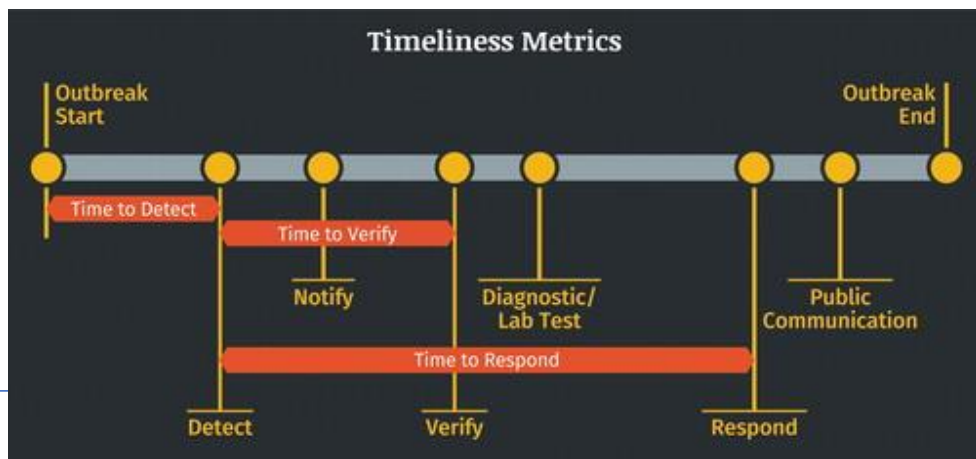
Survey on wildlife surveillance activities

Survey on wildlife surveillance

- Who is doing what?

- Situation and gaps in collaboration and information sharing

- How can FAO assist to address these gaps?

Piloted in 2021 (Guinea, Uganda, Vietnam) , roll-out in late 2022

Collaborating with FAO Forestry and EcoHealth Alliance on defining the contribution of ecosystems in the prevention of wildlife-borne zoonotic diseases in forest A-H-E interfaces

Sustainable Wildlife Management (SWM) Programme

https://www.swm-programme.info/

- Consortium between FAO (lead by Forestry Division), CIFOR, CIRAD and WCS

Thank you

Protecting people, animals, and the environment everyday