

Egypt battle against FMD

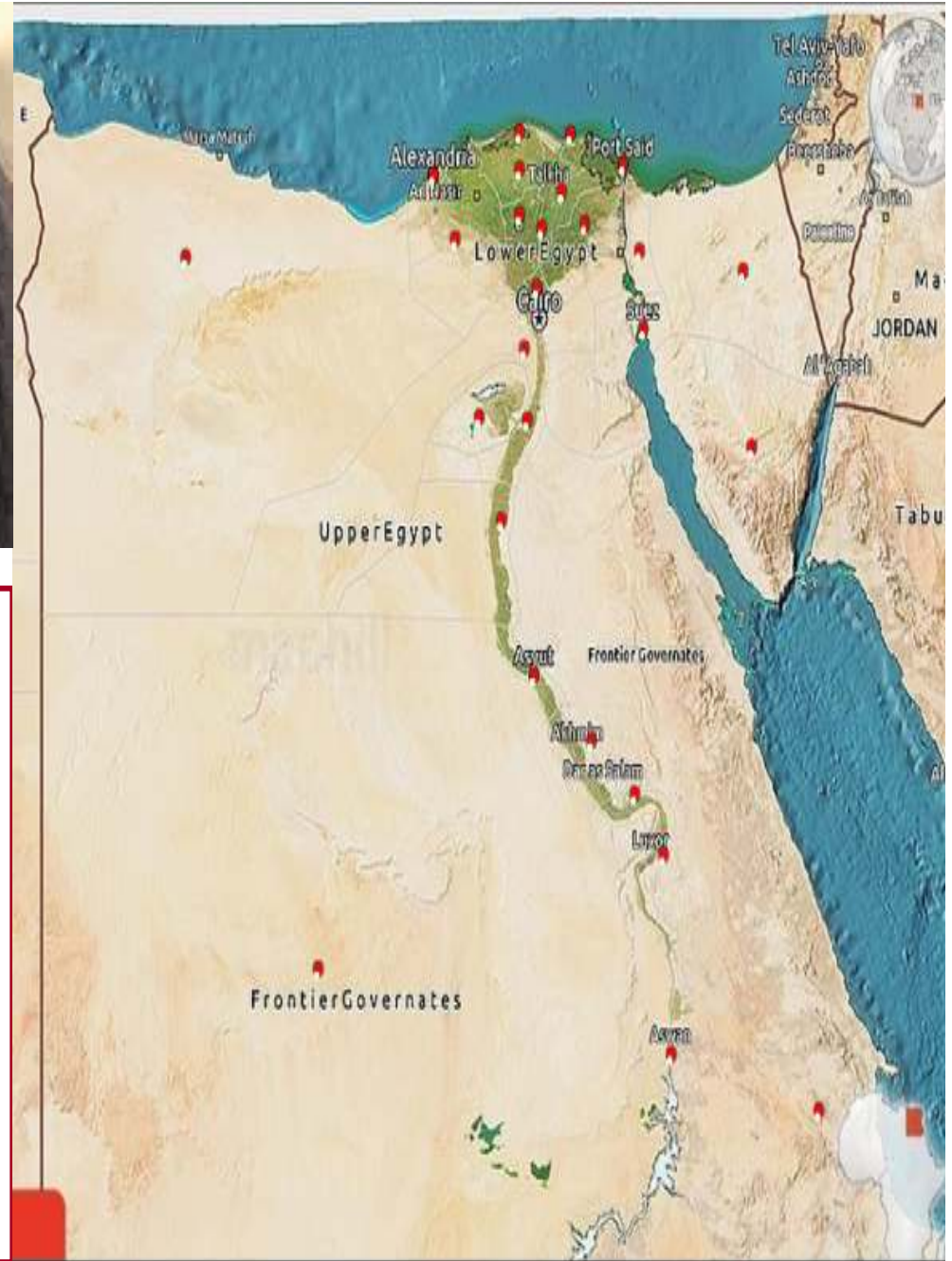
**Prof. Dr. Samah Eid
Chief Researcher
Animal Health Research Institute
2021**



Egypt



**Unique geographical location connecting
Africa, Asia and Europe.**



Highest population density in the Middle East, Northern Africa and the Mediterranean basin (102,722,022) persons.

CAPMUS, 6/DEC/2021.



Agriculture sector contributes to Egypt's GDP by 15% and to total employment by 25%.

Livestock and fishery sectors constitute to 40 % and 11.5 % to the value of agricultural production, respectively.

National livestock population



46 M layers
1.4 B broilers.



5.1 M cattle and buffaloes
5.4 M sheep, 4 M goats.

Key National Veterinary Organizations



Ministry of Agriculture and Land Reclamation

Agriculture Research center



General Organization of Veterinary Services

AHRI
Animal Health Research Institute



Central Laboratory for Evaluation of Veterinary Biologics

Veterinary Serum & Vaccine Research Institute

Animal Reproduction Research Institute

AHRI



Organization Chart

Animal Health Research Institute (AHRI)

**38
Provincial
Labs**

**14 Dep
14 Units**

**Reference
Laboratory
for food safety**

**Reference
Laboratory
for Quality
control on
poultry
production**

**Experimental
Lab animal
facility BL3**

**Center of
training
Education and
consultation**

AHRI Human Resources

Functions	Members
Researchers	2000
Veterinarians	800
Technicians	37
Administrative	200



AHRI

Accreditation- Certification



Role and Responsibilities AHRI

Protection of livestock from
TAD, endemic and emerging
animal diseases.

Selection of vaccinal seeds,
monitoring efficacy of
vaccination programs

Protection of public health from
zoonotic diseases.
(One Health)



Testing the safety of food from
animal origin



Testing feed concentrates , and
pet foods for fitness and safety
for animal consumption.



Evaluation of veterinary drugs





Carrying international horse
DNA typing test

Quarantine testing pets,
Animals, veterinary equipment

Monitoring equine diseases

Surveillance with GOVS for
livestock, poultry, fish diseases

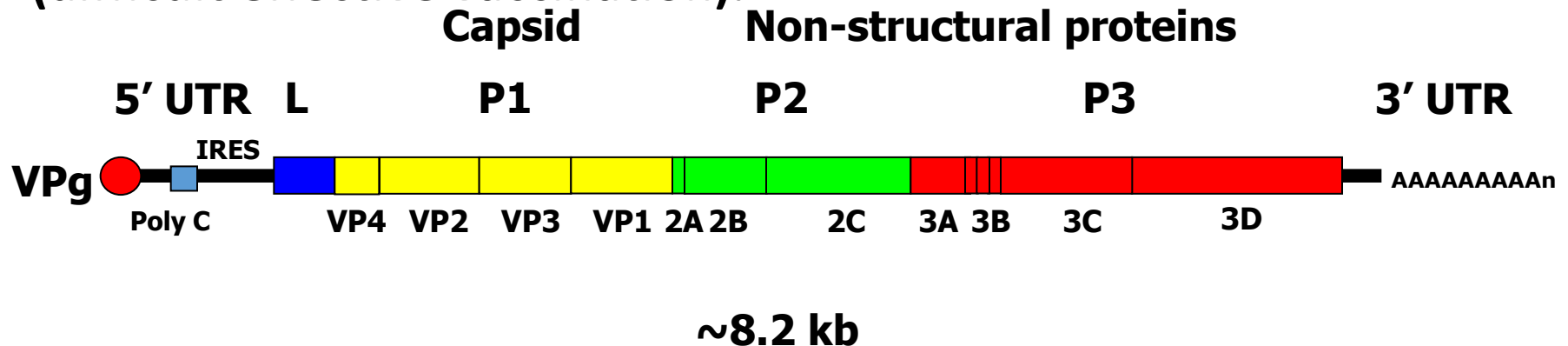
Foot and Mouth Disease

- **Acute, highly contagious viral disease of livestock that has a significant economic impact.**
- **Affects cloven-hoofed animals/cattle, buffalo, pigs, sheep, goats, and other ruminants.**
- **High morbidity rates 20-100% , usually low mortalities less than 1%.**
- **High mortality associated with new exotic strains or Mutants and bad control measures.**
- **Incubation period/ 7 ± 4 days, and a maximum of 14 days.**



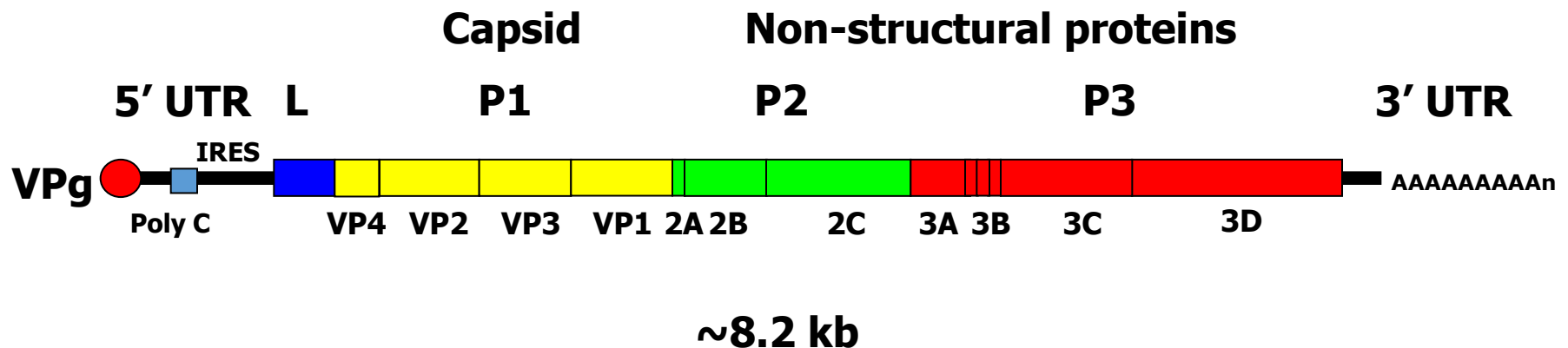
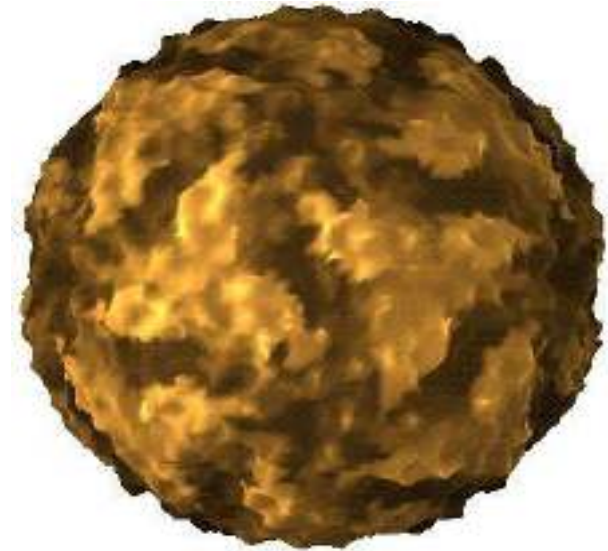
Foot-and-Mouth Disease VIRUS

- Family: *Picornaviridae*, genus Aphthovirus
- Single-stranded, plus-sense RNA genome of around 8.5 Kb
- 24 nm diameter non-enveloped virus
- Seven immunologically distinct serotypes A, O, C, Asia 1, and SAT 1, 2 & 3
- Multiple subtypes
- Wide spectrum of antigenic diversity (difficult effective vaccination).



Foot-and-Mouth Disease VIRUS

- 4 Structural (VP4, VP2, VP3, and VP1)
- 10 nonstructural (L, 2A, 2B, 2C, 3A, 3B1, 3B2, 3B3, 3C, and 3D) proteins



Transmission

- Breath

- Ruptured vesicles

- Saliva

- Milk

- Urine

- Feaces

INFECTED ANIMALS

DIRECT

INDIRECT

- Vehicles

- Bedding

- Clothing, Footwear

- People (farmers, vets,.....)

- Feed, Hay, Water.....

- Blood , offal, hides , Meat
Windborne (10km +

- 60%RH)

- Pets, birds

**SUSCEPTABLE
ANIMALS**

Movement of infected animals Spread the infection.

Transmission

Species	Host	Carrier
Sheep Goats	Maintenance	Pharyngeal tissue 4-6 months
Pigs	Amplifier	No
Cattle	Indicator	Pharyngeal tissue 6-24 months

Clinical Signs-Cattle

- Dullness, poor appetite, up to 40–41°C drop in milk yield.
- Salivation, lameness, Vesicles may appear inside the mouth on the tongue, cheeks, gums, lips and/or palate.
- Within 24 the fluid may drain, leaving an intact area of epithelium.



Clinical Signs: Cattle (cont).

- Coronary band, inter digital space: hot
- 1 day later vesicles appear on the coronary band and between the heels
- Feet lesions often take 2-3 days to rupture
- The vesicles are painful and cause lameness.
- Cracks in the heels may occur and it take a long time to heal in some animals, causing chronic lameness and weight loss.



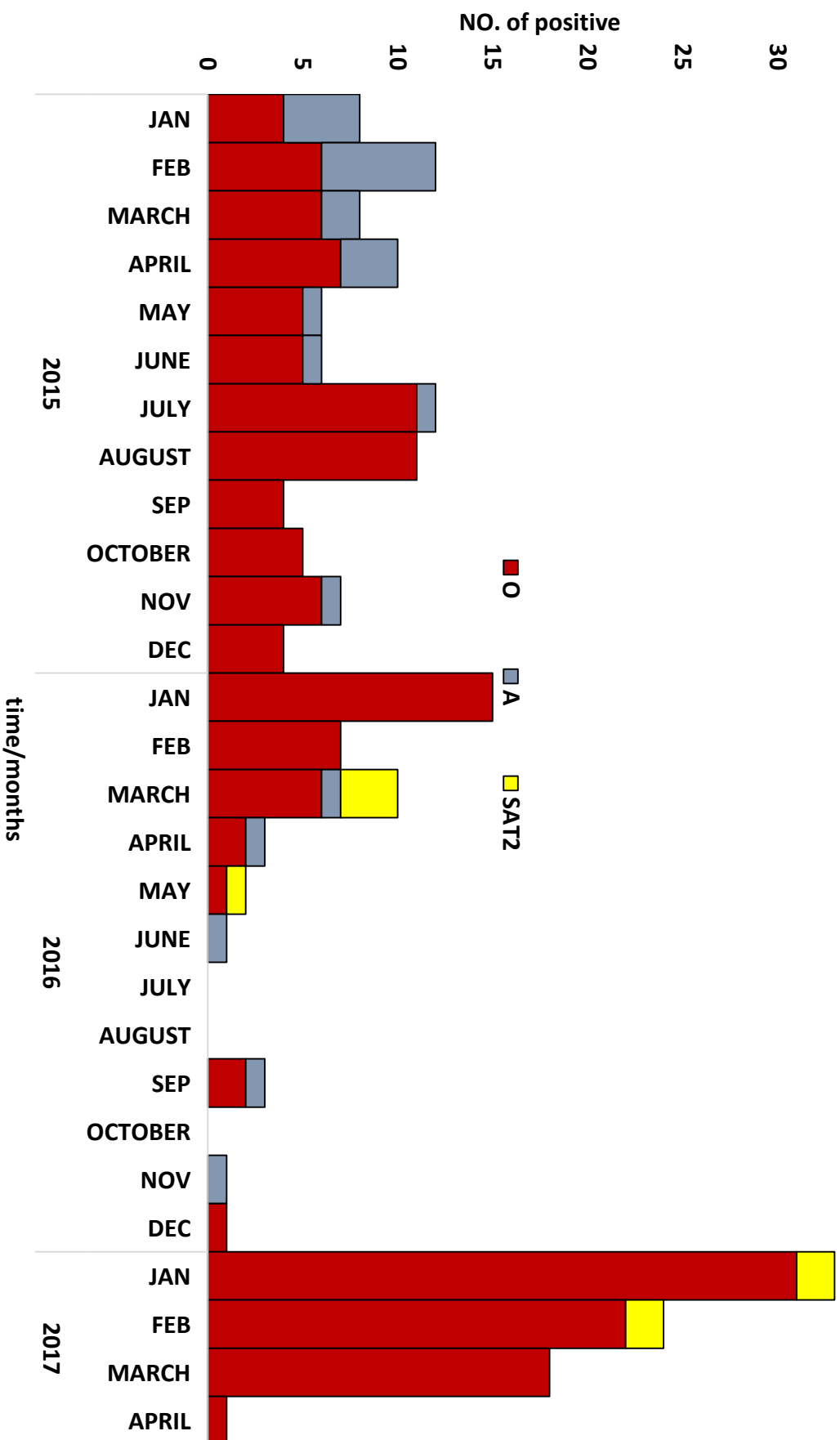
Clinical Signs: Cattle (cont).

- Lesions may also occur on the teats and udder and reduced lactation.
- Mastitis and abortion are common.
- Mortality in adults is usually low to negligible.
- However, up to 50% of calves may die due to cardiac involvement.



Temporal distribution of FMD strains from 2015-April 2017

35

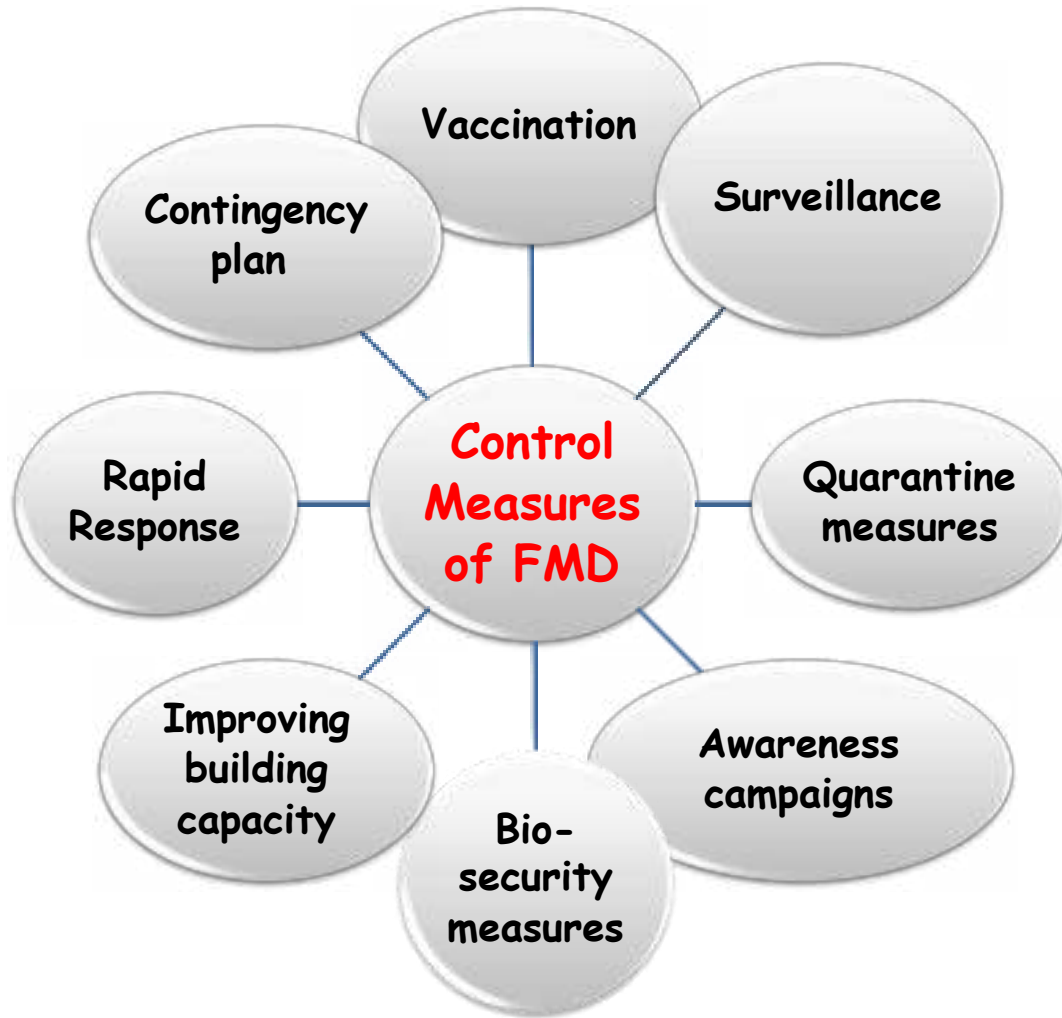


Situation of FMD in Egypt 2012-2021

- **2021** A/Africa/G-IV
O/EA-3
- **2020** SAT2 G-VII/Lib-12
A/Africa/G-IV
- **2019** O/EA-3
SAT2/G-VII/Lib-12
- **2018** A/AFRICA/G-IV
SAT2/G-VII/Ghb-12
SAT2/G-VII/Lib-12
- **2017** O/EA-3
SAT2/G-VII/Alx-12
SAT 2/G-VII/Ghb-12



FMD control strategy



Surveillance System

➤ **Active Surveillance**

Sero-surveillance of antibodies against NSP in Border governorates as the risk areas for introduction of new strains and sub-strains.

➤ **Passive Surveillance**

Detection of circulating serotypes if active cases were found

Vaccination Strategy by Egyptian Authorities

Types of vaccines

- Trivalent A-O-SAT2 oil adjuvant
- Prepared from local strains

Animal vaccinated

- All susceptible species are vaccinated

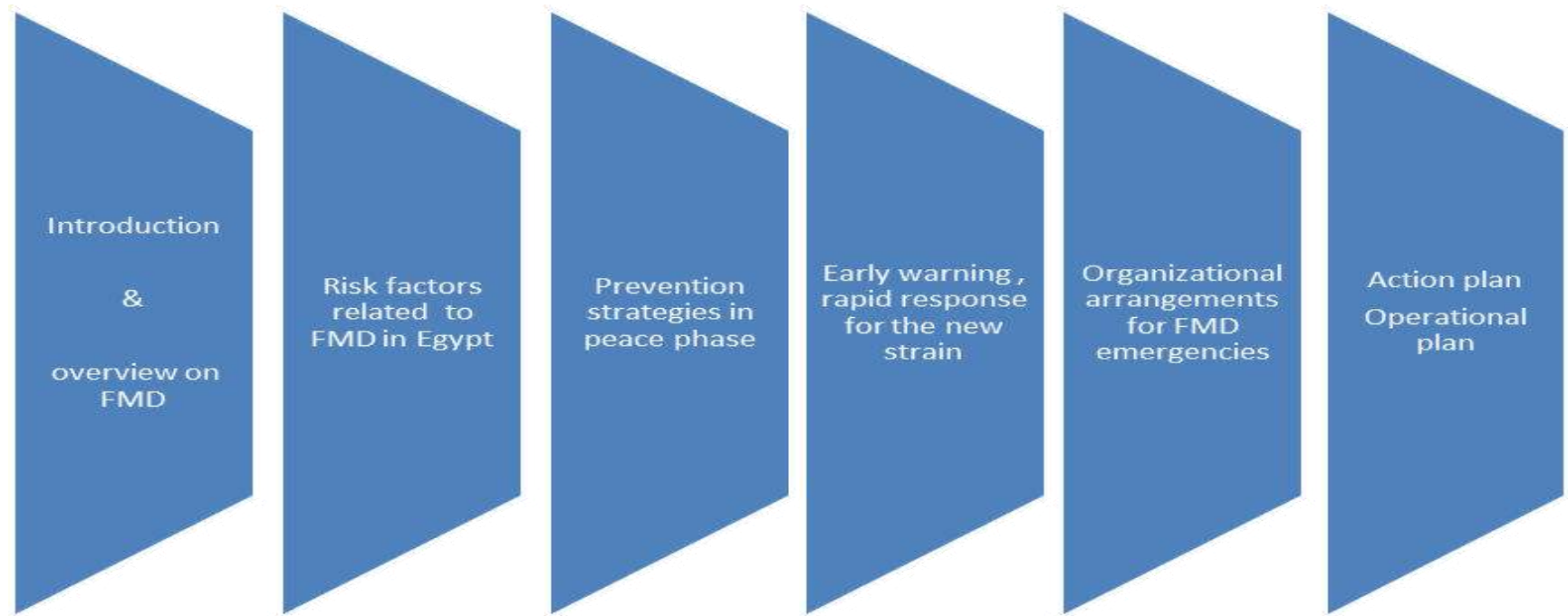
Policy of vaccination

- Ring vaccination immediately suspected foci (radius 10 km).
- Mass vaccination Since 2017, the mass vaccination policy changed from twice / year to be three massive vaccination campaigns /year in all Egyptian governorates
- 80% Decrease number of outbreaks

Rapid Response

- Outbreak investigation team (epidemiology , preventive medicine , extension department and laboratory).
- Awareness campaign isolation of infected animals , bio-security measures, animal movement restriction, Hygienic carcasses disposal
- Quarantine measures for infected premises for 21 days post the last death or last cured case
- Closure of livestock markets during outbreaks
- Target surveillance around the foci for a radius of 5 Km
- Samples collection for lab diagnosis
- Symptomatic treatment to prevent secondary bacterial infection
- Ring vaccination for 10 Km radius

Contingency Plan



- Design and continuously update contingency plan to give the most rapid and effective response to an outbreak with new strain.
- Inform and consult all relevant stakeholders

Biosecurity Measures

- Awareness campaigns about importance of application of biosecurity measures.
- Training of professionals
- Biosecurity requirements and regulations for premises
- Providing with the required supplies for disinfection.
- Missions for follow up application of biosecurity measures.

Quarantine Measures

- Importation of live animals or their products are in accordance with the OIE recommendation.

Contact

Address: 7 Nadi EL-Said St. Dokki-Giza

**E-mail address: ahri@arc.sci.eg
samaheid@ymail.com**

Tel. : 33374856- 37489022

Fax : 33350030

Personal E-mail address:



Thank You

