



Veterinærinstituttet
Norwegian Veterinary Institute



WOAH Collaborating Centre for
Epidemiology and Risk Assessment of
Aquatic Animals (Europe)

Reference Centre



World Organisation
for Animal Health
Founded as OIE

MANAGING DISEASE OUTBREAKS: Experiences and Lessons from the Streptococcus IA Outbreak in Tilapia

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As part of the joint work between ICA and NVI, an evaluation of the action taken during the *Streptococcus Agalactiae* IA emergency situation in Colombia was conducted using the 8-step procedure adapted by NVI for aquatic animal disease outbreak investigations.

COLOMBIAN AGRICULTURAL INSTITUTE



Colombian
Veterinary
Authority

Aims to contribute to the sustained development of the agricultural, and aquaculture sector, through the prevention, surveillance and control of sanitary, biological and chemical risks for animal and plant species, in order to protect the health of people, animals and plants and ensure trade conditions.

Ubicación oficinas locales Colombia -2024





WHAT IS THE OUTBREAK INVESTIGATION?



A systematic procedure to identify:

Patterns of occurrence

Cause, or factors associated with cause

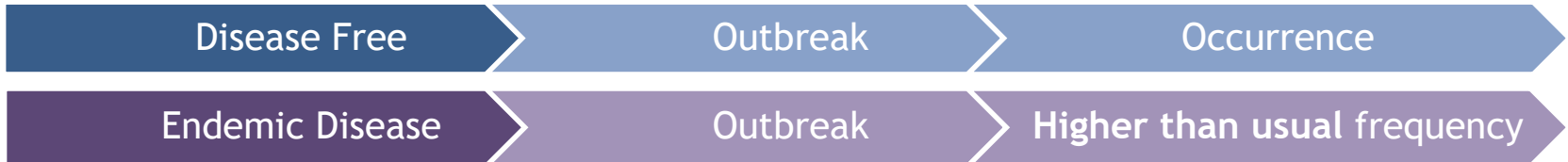
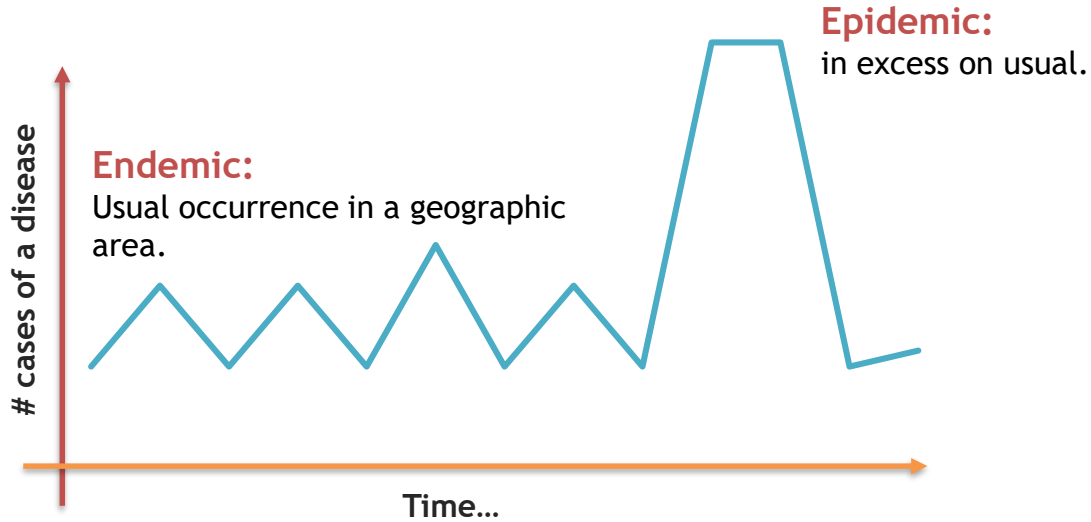
Source of introduction or new exposures

Population at risk: Are all involved species identified? (Clinical, Subclinical, Reservoir)

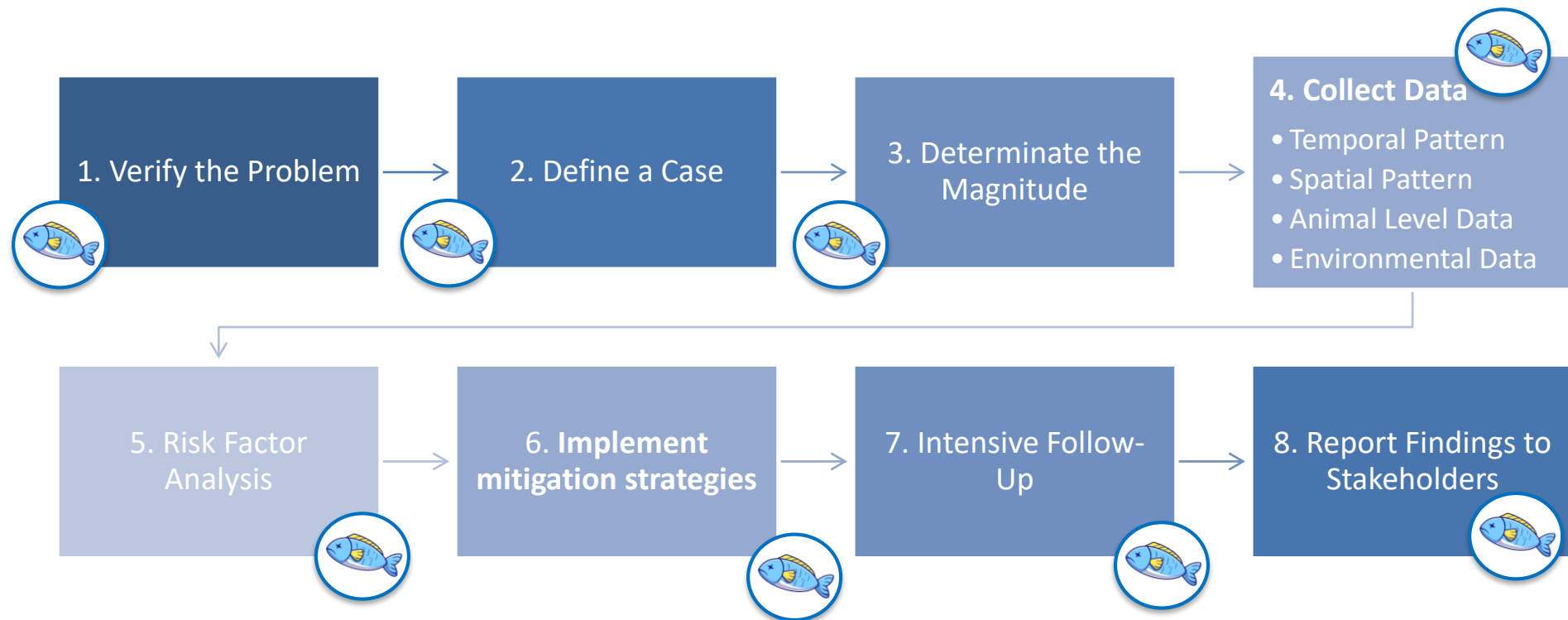
Investigate for future cases



DEFINING AN OUTBREAK



8 Steps Procedure

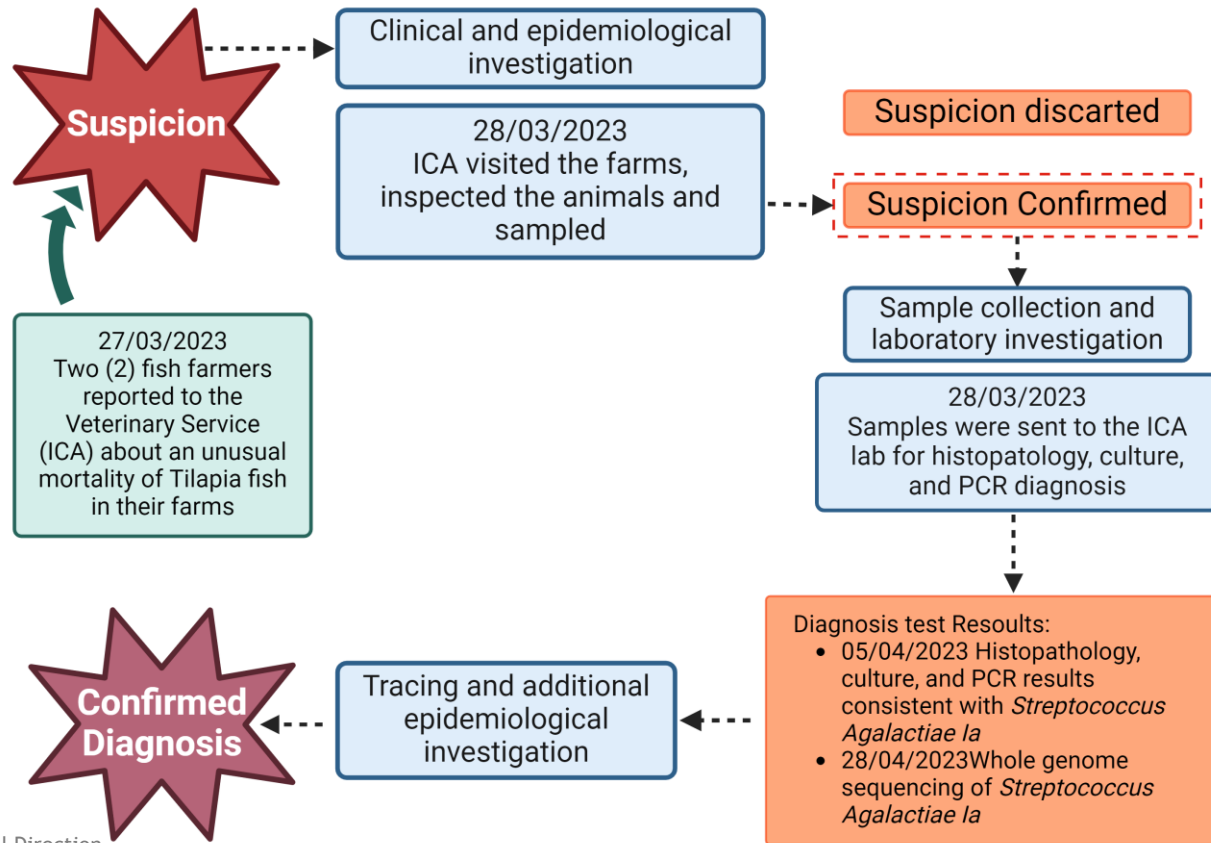




Let's do this Step by Step

1. Verifying the Problem

Example- *Streptococcus Agalactiae* la Outbreak



1. Verifying the Problem

Colombian Example - What was found

Affected
specie

Tilapia

NOT WOAH LISTED DISEASE

Causal Agent

Streptococcus Agalactiae
ST7 Serotype Ia
Gram+

Clinical sings

Loss of appetite, lethargy, erratic swimming, exophthalmia, and death.

Gross lessons

Hemorrhagic and friable liver, empty intestine, large gallbladder, skin lesions, congested brain, opaque eye.

Diagnosis Test

Histology, Bacteriology and Molecular Biology (PCR, RT-PCR)

Impact

High morbidities
High mortalities
Economic losses

2. Define a Case



CASE DEFINITION



Is a set of criteria
used to
distinguish a case
animal or an
epidemiological
unit from a non-
case.

2. Define a case

Case definition in Aquatic Animals



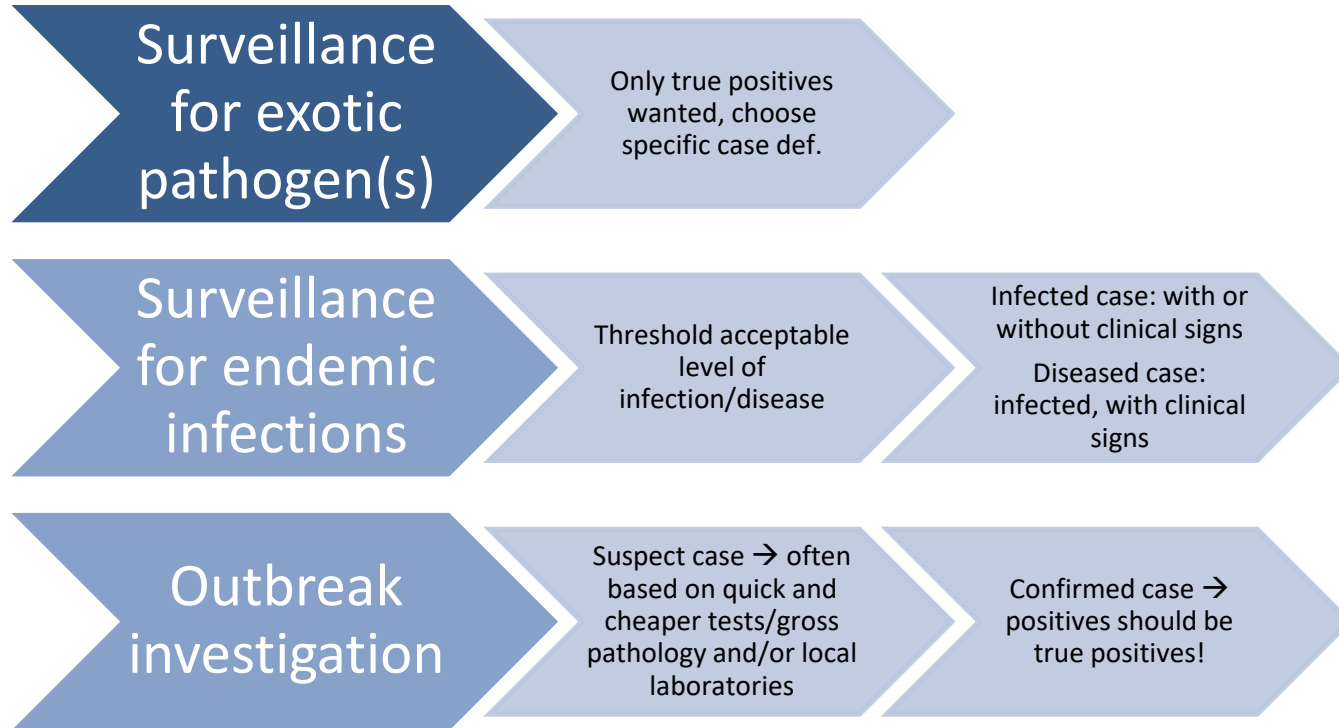
Can be non-specific clinical signs

Can be infection without disease

Knowledge relationship pathogenic
agent and disease is constantly evolving

2. Define a case

By the goal

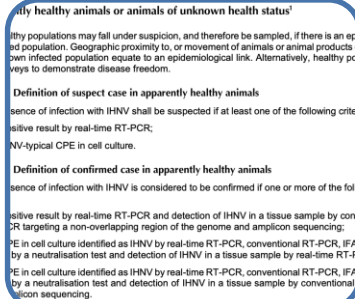


2. Define a Case

WOAH Listed Diseases



The relevant disease-specific chapter of the Aquatic Manual:
6. Corroborative Diagnosis Criteria



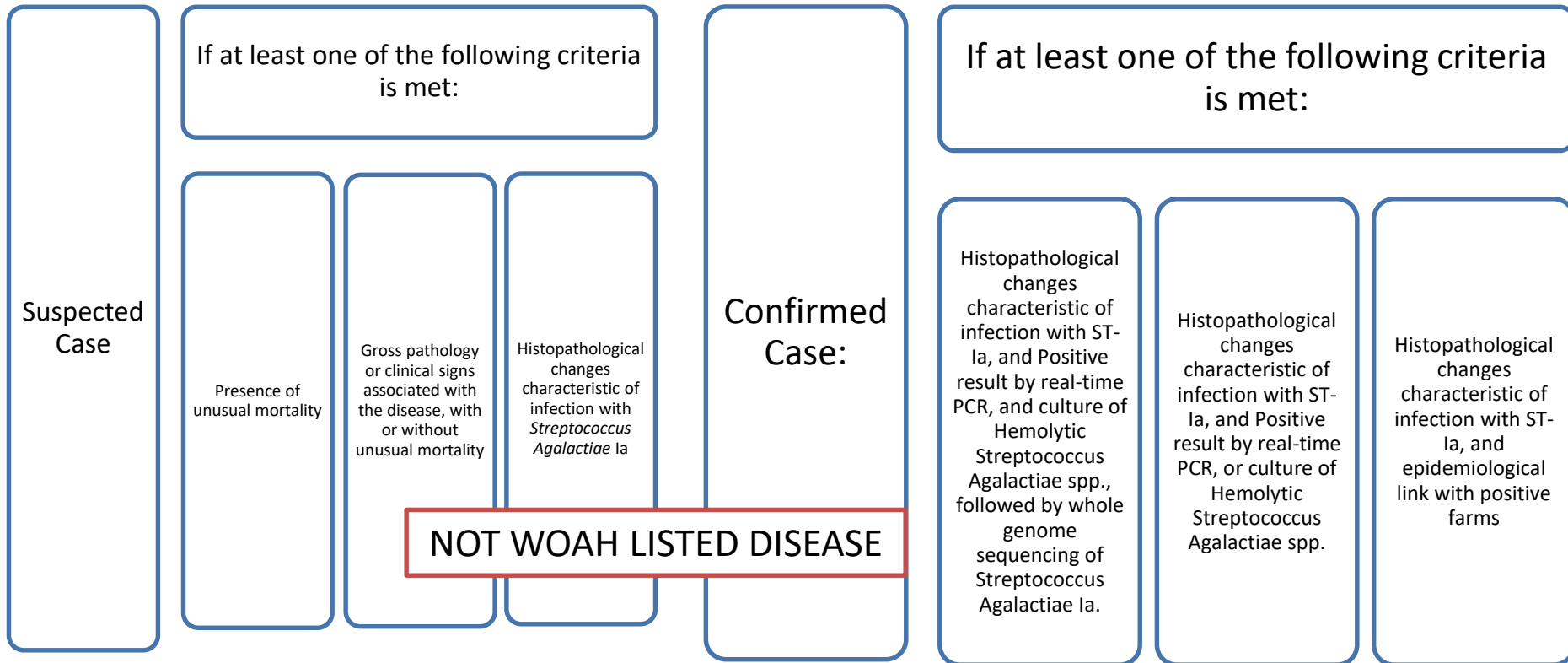
Provides Case definition for:

- * Suspect and confirmed Case in apparently healthy animals or animals of unknown health status
- * Suspect and confirmed case in clinically affected animals.

2. Define a case



Example- *Streptococcus Agalactiae* Ia Outbreak



3. Determinate the Magnitude

Media – Risk Communication

Potential pressure/interest from media can be expected at this stage



125,000 salmon die in disease outbreak at Lewis fish farms

© 20 October 2017 - Comments



'Extremely unfortunate'

Infected salmon become very lethargic, stop eating and as the illness progresses it can prove fatal.

Marine Harvest's business support manager Steve Bracken confirmed that the outbreak was "quite serious" and had taken its toll.

"The mortality is in the region of about 500 tonnes," he said. "The fish are around about 4 kilos so it is about 125,000 fish we have lost during this period."



GOOGLE

Portafolio INICIAR SESIÓN

TENDENCIAS INTERNACIONAL MIS FINANZAS OPINIÓN INDICADORES Y MERCADOS TECNOLOGÍA EMPRENDIMIENTO MÁS

FINANZAS 25 Jun 2023 - 10:45 p. m.

Emergencia sanitaria golpea el bolsillo del sector piscícola

La presencia de la bacteria 'Streptococcus agalactiae ST7 la' en los cultivos de tilapia, está desencadenando bajas en producción y el consumo.



Tendencias: Pico y plaza los sábados Racionamiento en Bogotá Eclipse solar Foro transformación digital Historias

Streptococcus agalactiae: la bacteria que está matando peces de cultivo en Colombia

Por esta bacteria que se esparció a varios cultivos en diferentes zonas del país, el Instituto Colombiano Agropecuario emitió la emergencia sanitaria nacional.

PUBLICIDAD



3. Determinate the Magnitude

Measures of Disease

Easily to
understand
for
everyone

Mortality

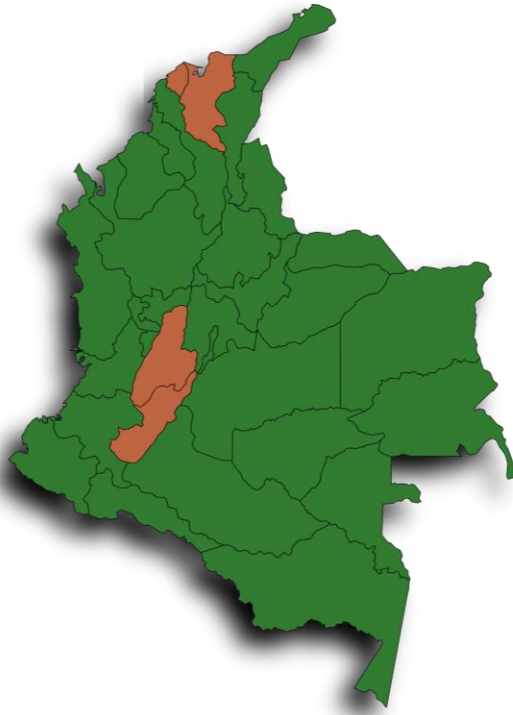
Morbidity

Fatality

3. Determinate the Magnitude

Example- *Streptococcus Agalactiae* la Outbreak

Data from June 2023



HUILA

- 12% Mortality (4.554.598)
- 81% Fatality

ATLÁNTICO

- 47% Mortality (1.621.665)
- 47% Fatality

MAGDALENA

- 37% Mortality (10.301)
- 86% Fatality

TOLIMA

- 10% Mortality (50.000)
- 100% Fatality

4. Collect Data

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World Organisation
for Animal Health
Founded as OIE

Temporal
pattern

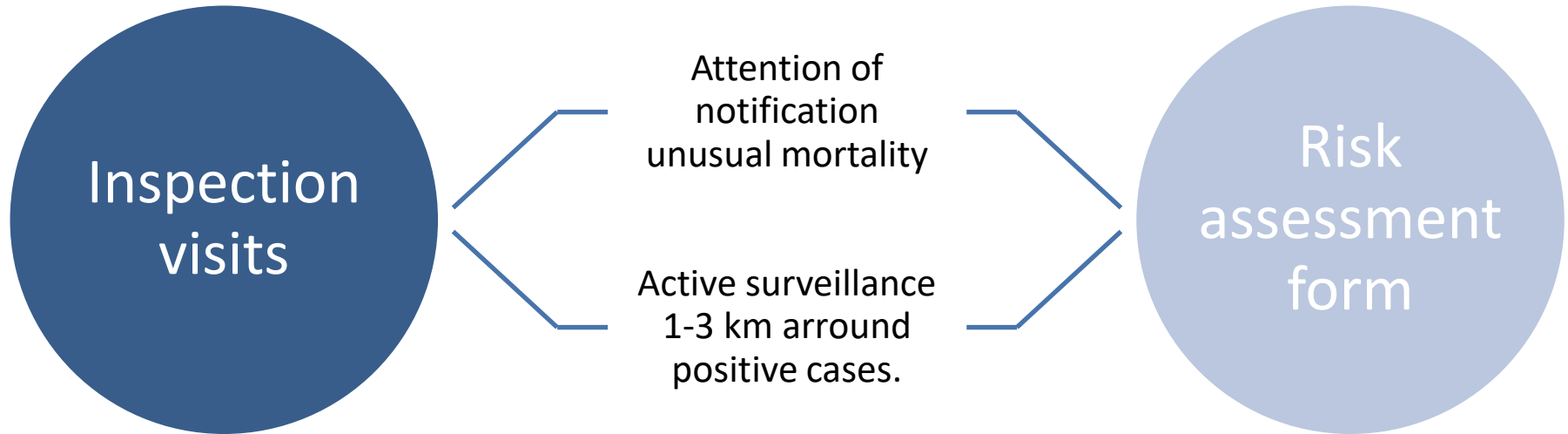
Spatial
pattern

Animal-level
data

Environmental
data

4. Collect Data

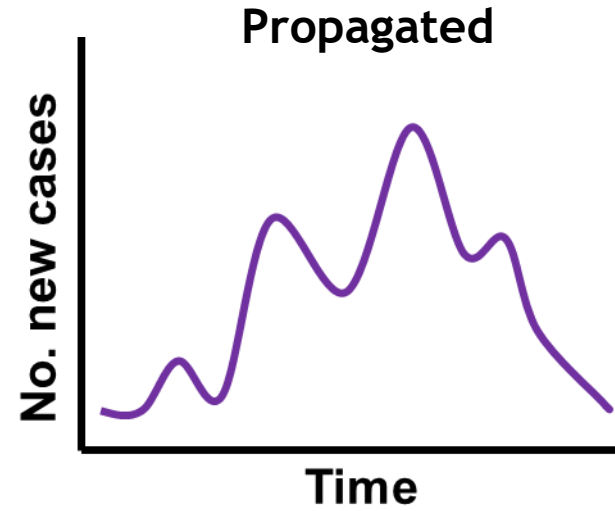
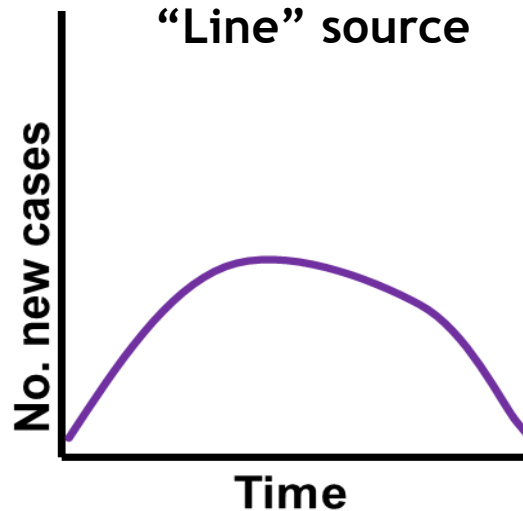
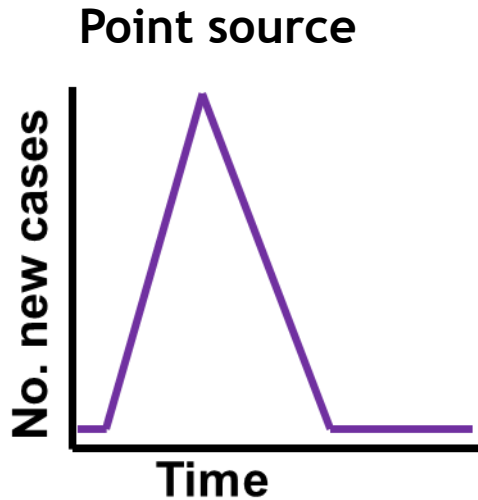
How to Collect - Example - *Streptococcus Agalactiae* la Outbreak



4. Collect Data

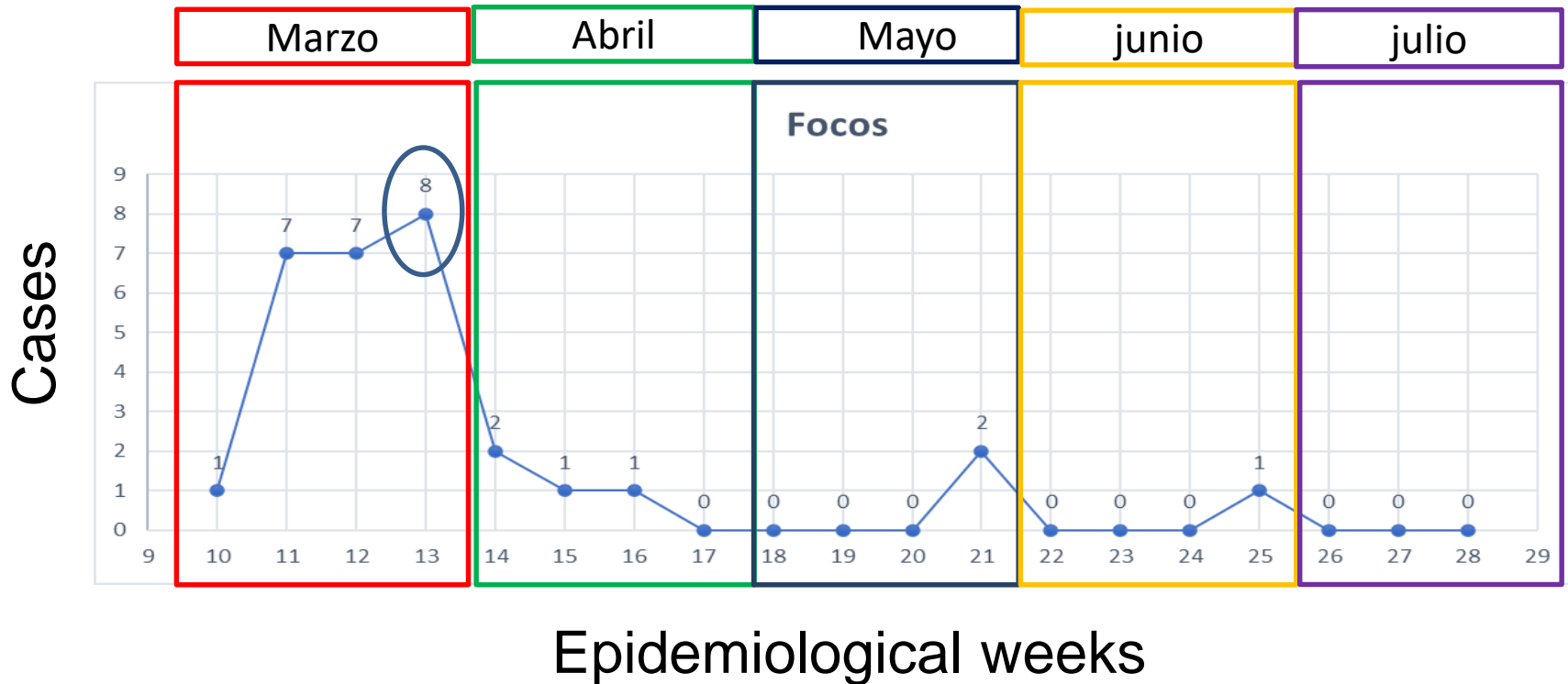
Temporal Pattern

An epidemic curve (often created as a bar/column chart or histogram) should be plotted using an appropriate time interval. The epidemic curve will help determine etiology type (distinguish between common source and propagated outbreak)



4. Collect Data

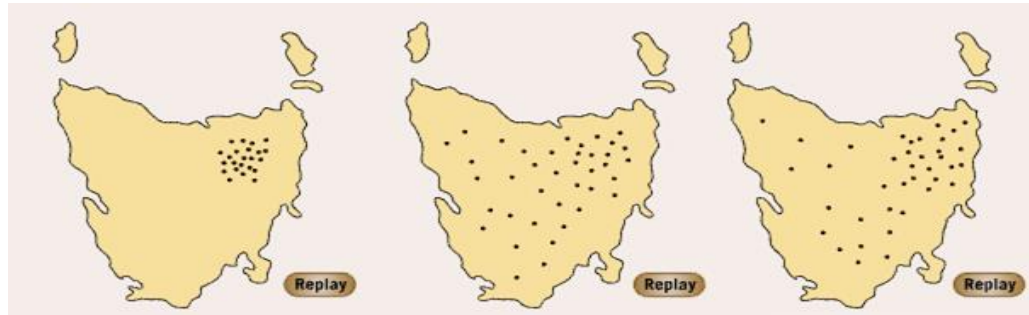
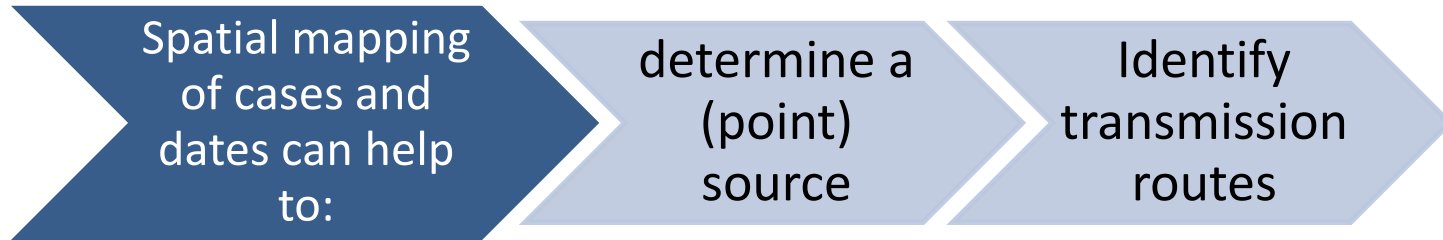
Temporal Pattern – Example - *Streptococcus Agalactiae* la Outbreak



4. Collect Data

Spatial Pattern

Where is the Infection?



Point Source

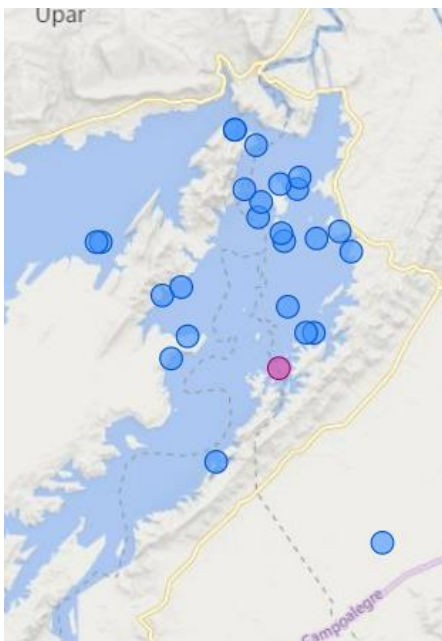
Sporadic

Propagated

4. Collect Data



Spatial Pattern - Example - *Streptococcus Agalactiae* la Outbreak



- Alteration of productive parameters
- Unusual Mortality

4. Collect Data

Animal and Environmental Pattern

Animal pattern

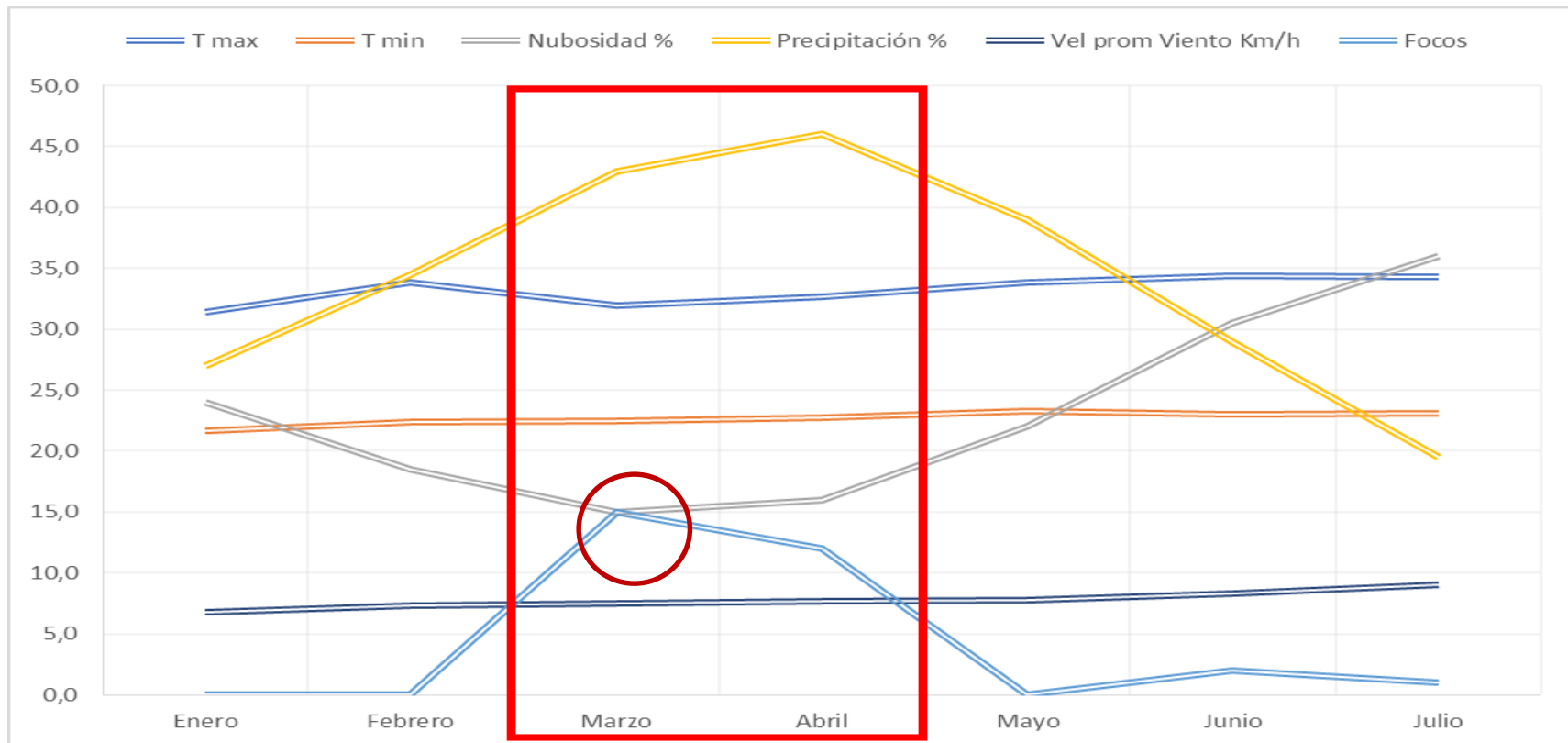
Data on species, age, sex, and other outbreak-specific factors should be collected for analysis

Environmental pattern

Data concerning general management (e.g., feed and water) and weather should be evaluated

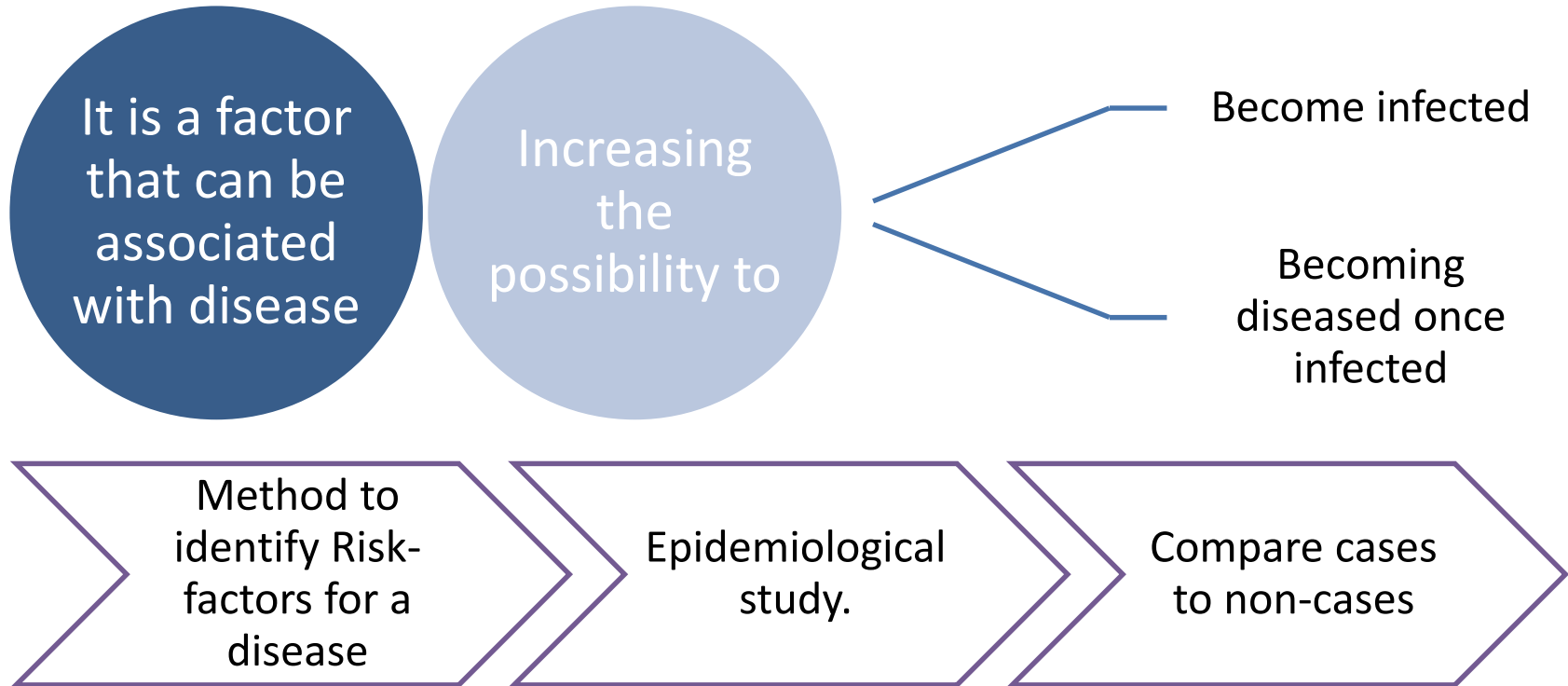
4. Collect Data

Environmental Pattern- Example - *Streptococcus Agalactiae* la Outbreak



5. Risk Factor Analysis

What is a Risk Factor?



5. Risk Factor Analysis

Measures of Association

Relative
Risk

Odds
Ratio

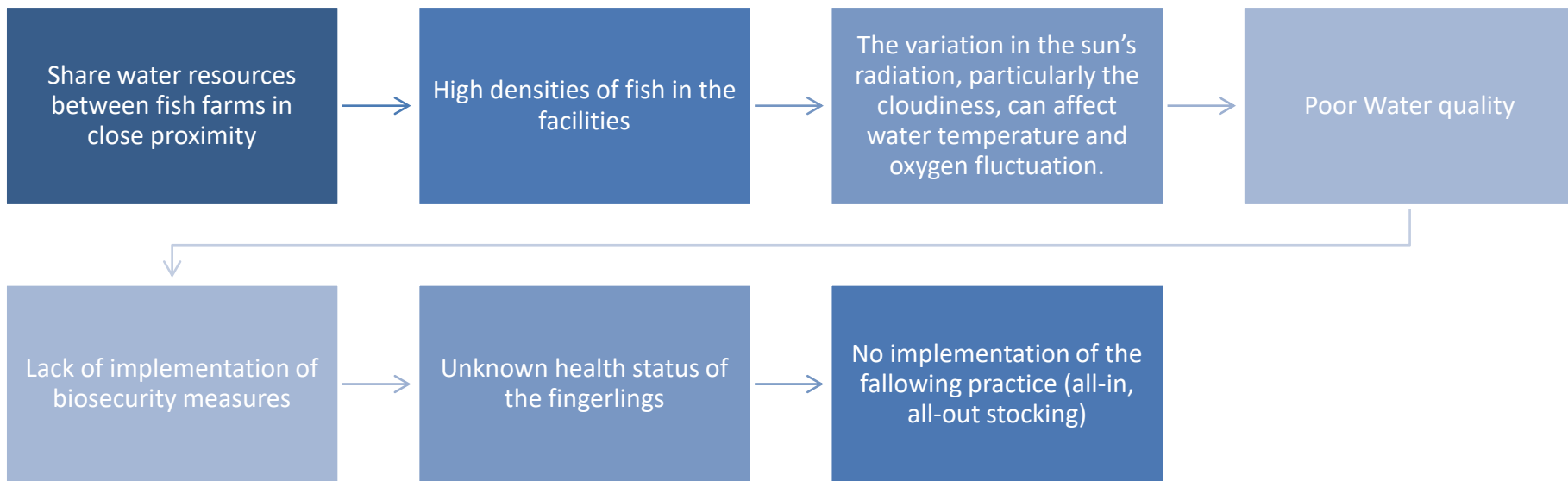
Incidence
Rate

Prevalence
Ratio

5. Risk Factor Analysis

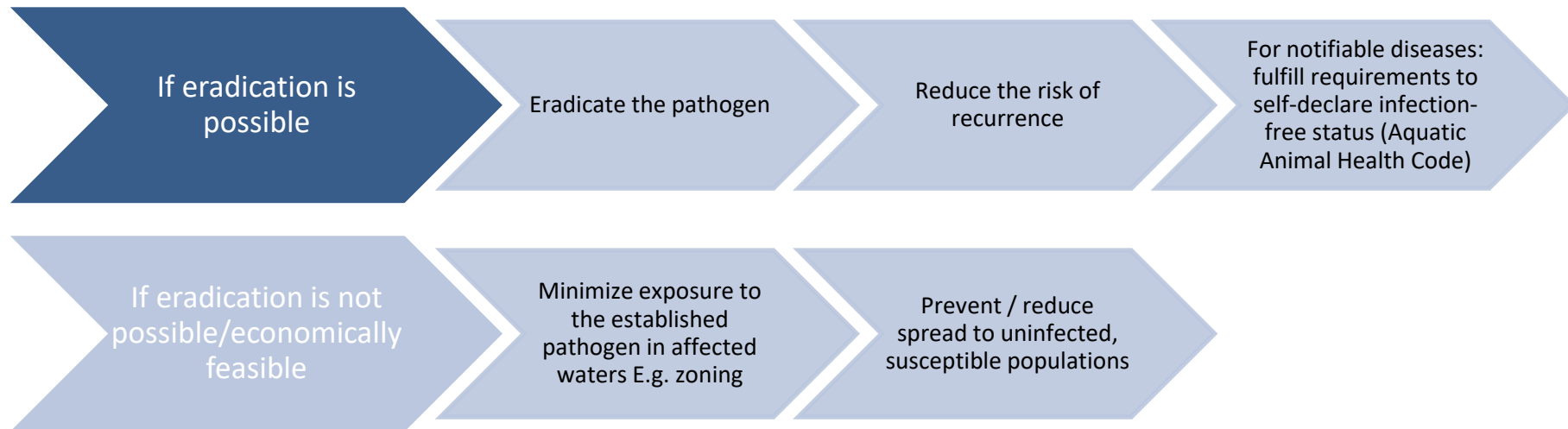


Example Risk Factors Related to- *Streptococcus Agalactiae* Ia Outbreak



6. Implement mitigation strategies

Control Measures according to the Goal



6. Implement mitigation strategies



Sanitary measures applied- *Streptococcus Agalactiae* la



RESOLUCIÓN No.00006535
(07/06/2023)

“Por la cual se declara el Estado de Emergencia Sanitaria en el territorio nacional por la presencia de Streptococcus Agalactiae ST7 serotipo la”

EL GERENTE GENERAL (E)
DEL INSTITUTO COLOMBIANO AGROPECUARIO - ICA

En ejercicio de sus atribuciones legales y en especial de las conferidas por el artículo 4 del Decreto 3761 de 2009 y el artículo 2.13.1.8.1 del Decreto 1071 de 2015

1

- Preventive

2

- Control

3

- Prohibitions

6. Implement mitigation strategies



Example Preventive Measures- *Streptococcus Agalactiae* Ia Outbreak



Increase biosecurity measures, and control entry of vehicles, objects, and personnel to fish farms.



Maintain the density of cultured fish according to the licensed permit, environmental conditions (temperature, cloudiness, etc.), and water quality related to available oxygen.



Implement cleaning and disinfection procedures for vehicles, objects, and supplies entering and leaving the establishment.



Report the unusual mortality or alteration of productive parameters in fish farms immediately to ICA.

6. Implement mitigation strategies



Example Control Measures- *Streptococcus Agalactiae* Ia Outbreak



Discard the mortality following the environmental authority recommendations immediately



Vaccination should be conducted against the specific serotype that has been previously authorized by the ICA.

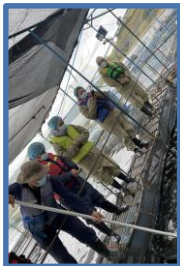


Epidemiological monitoring of the disease in accordance with the strategies established by ICA.

6. Implement mitigation strategies

Example Control Measures- *Streptococcus Agalactiae* la Outbreak

When infected animals leave the farm, the producer should:



Clean and disinfect the facilities, vehicles, equipment, and any objects that were in contact with the infected animals.



Eliminate disposable equipment such as nets, porous air hoses, and plastic buckets, or any other equipment whose material cannot be effectively disinfected or is damaged by disinfectants.



Once the cleaning and disinfection process is completed, implement a fallowing for at least 15 days

6. Implement mitigation strategies



Example Prohibitions- *Streptococcus Agalactiae* la Outbreak



Movement or commercialization of fish with clinical signs



Feeding of tilapia with fresh or live diets, mortality, or waste human food.



Disposal of dead fish or fish exhibiting clinical signs from water bodies and other water sources



Share equipment, vehicles or supplies with other fish farms.



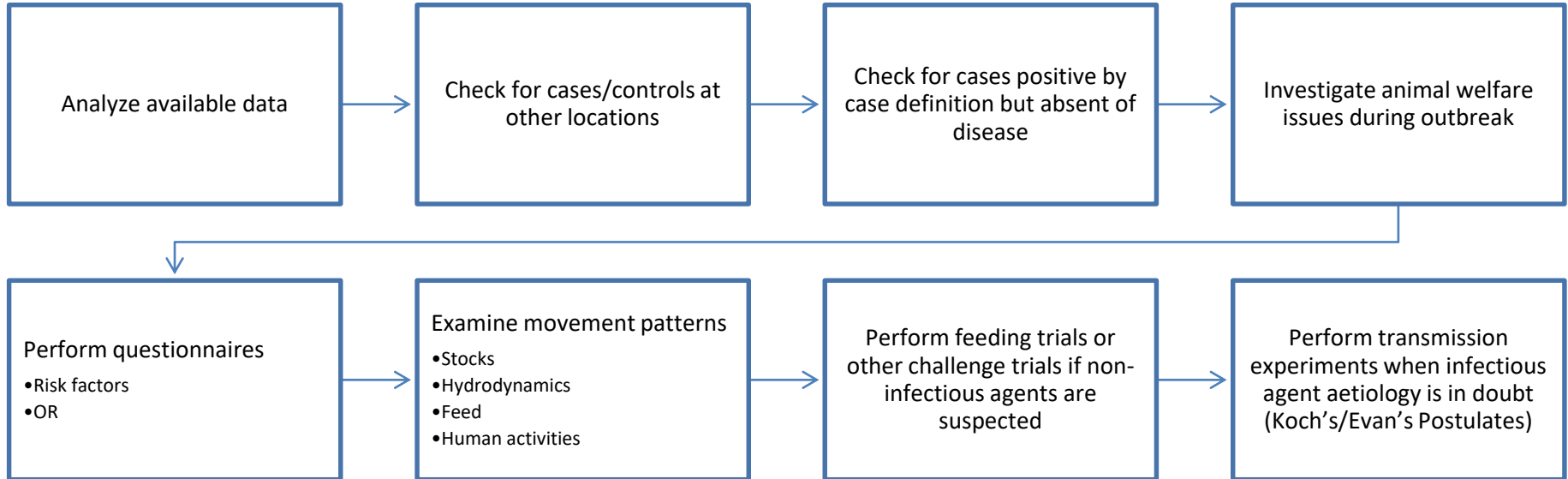
Use vaccines without ICA authorization.



Use of veterinary supplies that are not registered or authorized by ICA

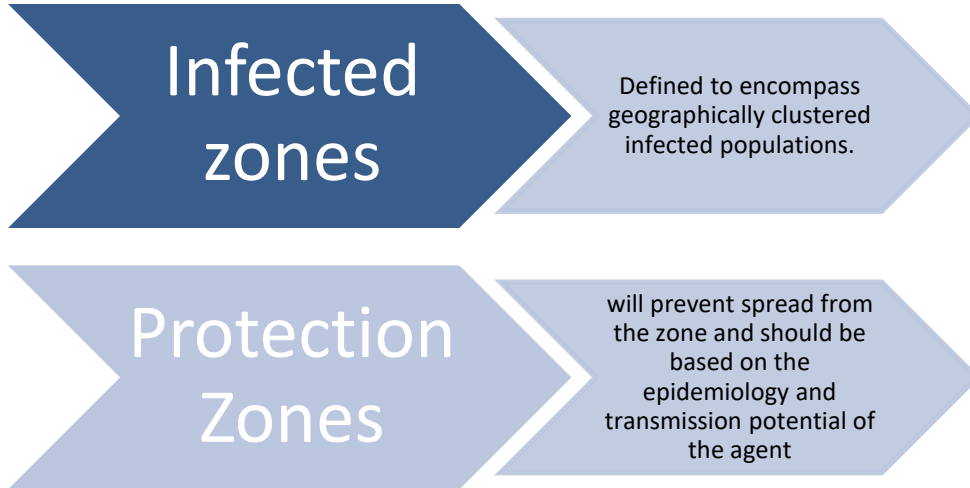
7. intensive Follow-up




Follow up

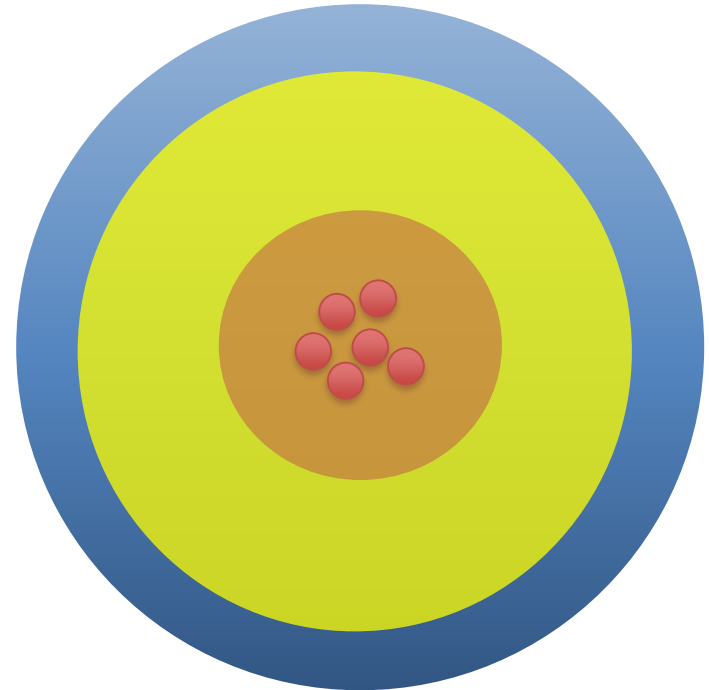


7. intensive Follow-up

Results of follow up- Establishment of Zones



- Infected Zone 
- Protection Zone 
- Free Zone 



7. intensive Follow-up



Example Active Surveillance and Monitority -*Streptococcus Agalactiae* la Outbreak



121 Fish farms

Surveillance visits to farms between 1 to 3 km around positive farms.

5 Fish farms

Broodstock Farms Traceability.

80 Fish farms

Monitoring to positive farm , After vaccine

19 Fish farms

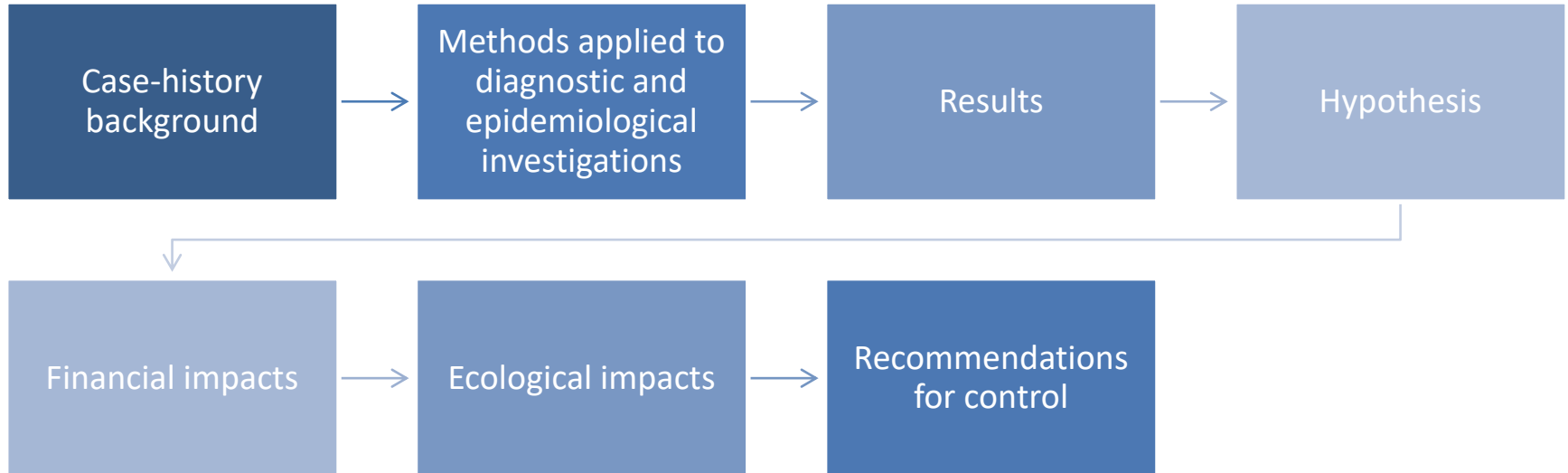
Monitoring in negative regions with high production

8. Report Findings to Stakeholders

Where report?



What report?



8. Report Findings to Stakeholders



Example *Streptococcus Agalactiae* la Outbreak

NO WOH LISTED DISEASE



Regionals Stakeholders meetings



ICA Colombia @ICACOLOMBIA · 1d
#HILO Nuestra líder nacional del progr
acuícola, María Fernanda Serrano, par
la agenda académica de la feria y d
conocer las acciones de inspección, vi
y control realizadas por el ICA ante la
mortalidad inusual de peces en el Huila



Official Social Media

El ICA atiende y vigila los casos de "Streptococ
la" presentados en Atlántico, Tolima y Magdal

06 de junio de 2023

El ICA atiende y vigila los casos de "Streptococcus agalactiae
-la" presentados en Atlántico, Tolima y Magdalena



Official Webpage

EXTERNAL STATEMENT

For: Fish farmers, rural communities, owners in any title of ani
production, traders, and the rest of the members of the aquacultur
and community at large.

From: Colombian Agricultural Institute – ICA

Subject: Clarification of health implication "Streptococcus Agalac
la in farmed fish (Tilapia).

Date

Trade Partners
Communications

CHALLENGES OF OUTBREAK INVESTIGATION

CONFIDENTIAL

Data sharing

Competing
objectives

Confidentiality

Law (differs
per country,
province)

Responsible
interpretation

Economics

Trade position

Integrity and
quality of data



How to be better prepared? What to do next?

Contingency Plan



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Complementary Activities

Continuous improvement of ICA's diagnostic capacity

- Personal training
- Proficiency test

Desk-Simulation Exercise:
Evaluating the Content and Relevance of the Contingency Plan

Field Simulation Exercise:
Evaluating ICA's Capacity to Implement the Contingency Plan

Let's empower ICA to strategically prioritize future actions to achieve maximum impact

*THANK YOU FOR YOUR ATTENTION
DOES ANYONE HAVE ANY QUESTIONS?*



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www.vetinst.no