

Animal Influenza Outbreak Investigation in humans

**Date of last changes:
May 2009**



**World Health
Organization**

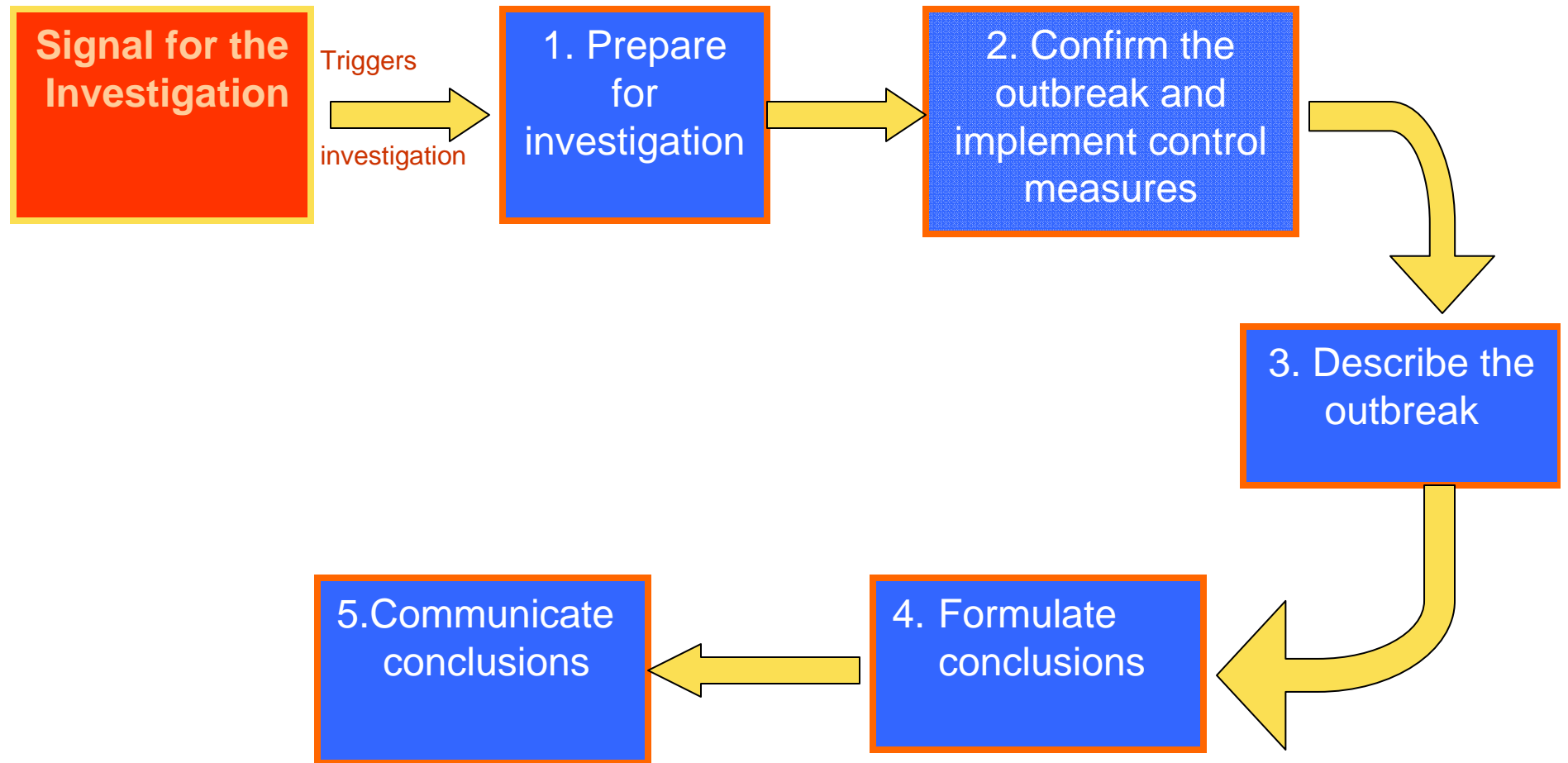
Learning Objectives

- Understand the purpose for investigating animal influenza outbreaks in humans
- Understand the key steps of the investigation
 - Pre investigation planning
 - Determine who, when, where, why, how
 - Conclusions
 - Challenges

Take home messages

- Goal of an AI outbreak investigation is to
 - Assess precisely the outbreak situation (who, when, where, why, how)
 - Confirm diagnosis
 - Detect potential additional cases
 - Prevent further spread by initiating control measures
 - Eliminate source(s) of infection
 - Assess if human-to-human transmission occurred
 - Assess if pandemic risk increased
- AI Investigations are multidisciplinary
- Efficient communication with stakeholders (e.g. authorities and public) is critical

Key steps for the investigation



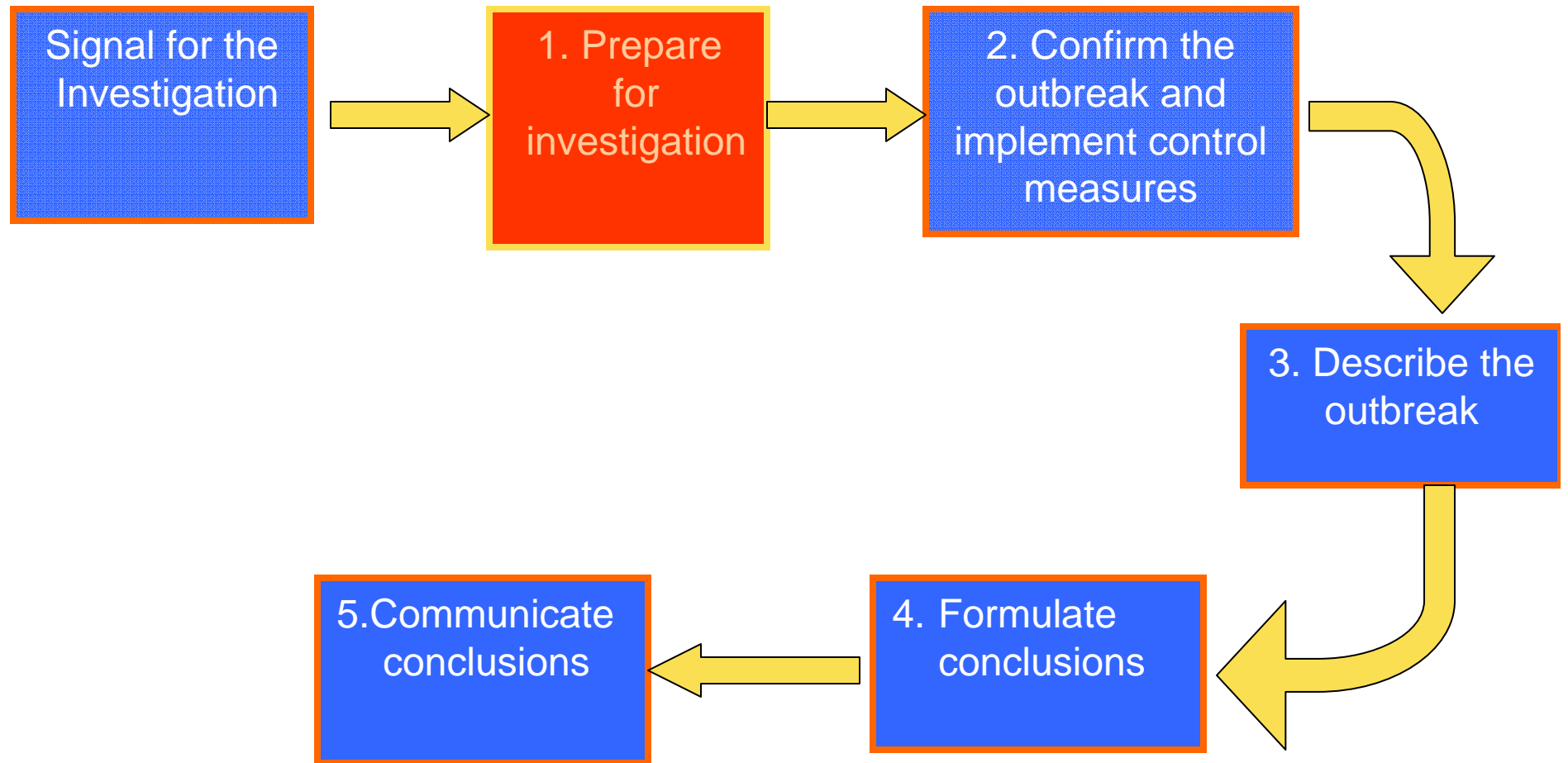
Possible Signals for Investigation

- Suspected case(s) of human infection with animal influenza
- Patients/deaths with moderate to severe respiratory illness of unknown aetiology
- AI positive laboratory results...
- Unusual distribution or presentation in routine scanned influenza surveillance

usually in a context of unexplained animals/poultry death or in an area where AI is circulating in poultry

TRIGGER: Health Authority initiates investigation

Key steps for the investigation



Step 1: Get ready for the investigation

- Mobilize and brief response team
- Gather preliminary information e.g. description of affected area, animal situation, health infrastructure
- Inform relevant authorities of the investigation (e.g. veterinarians, local officials, etc)
- Provide investigation tool kit (e.g. investigation materials, guidelines, medical supplies, non medical supplies)

Response Team Tasks

- Carry out the outbreak investigation
- Verify in the field the rumour of disease outbreak
- Initiate outbreak prevention and control measures
- Report findings

Response Team (1)

Core team functions:

1. Team lead
2. Field Epidemiology
3. Clinical management
4. Social mobilization

Response Team (2)

Consider additional needs:

Laboratory/ specimen collectors, Logistician, Infection control, Public health veterinarians, Environmental health specialists, Administrators, Media officer / public relations person, Psychologists/ medical anthropologists, translator, ...

Note: Team limited in size, members with clear functional tasks

Team Leader Role

- Integrate information and prepare regular situation reports
- Assign roles and responsibilities and oversee team member roles
- Communicate with other officials and the media
- Recommend prevention and control measures (e.g. suspected case referral, culling infected poultry)
- Ensure security and health of the team

Epidemiologist Role

- Verify the outbreak
- Establish a case definition and check application
- Conduct active case finding and contact tracing
- Collect and analyze data on:
 - Onset
 - Exposure
 - demographic
- Identify risk factors, exposures
- Monitor outbreak evolution
- Ensure linkage epidemiology – clinical – laboratory data

Clinician Role

- Advises on patient triage and case management
- Advises and collects clinical specimens from case-patients
- Educates, implements, and supervises infection control measures

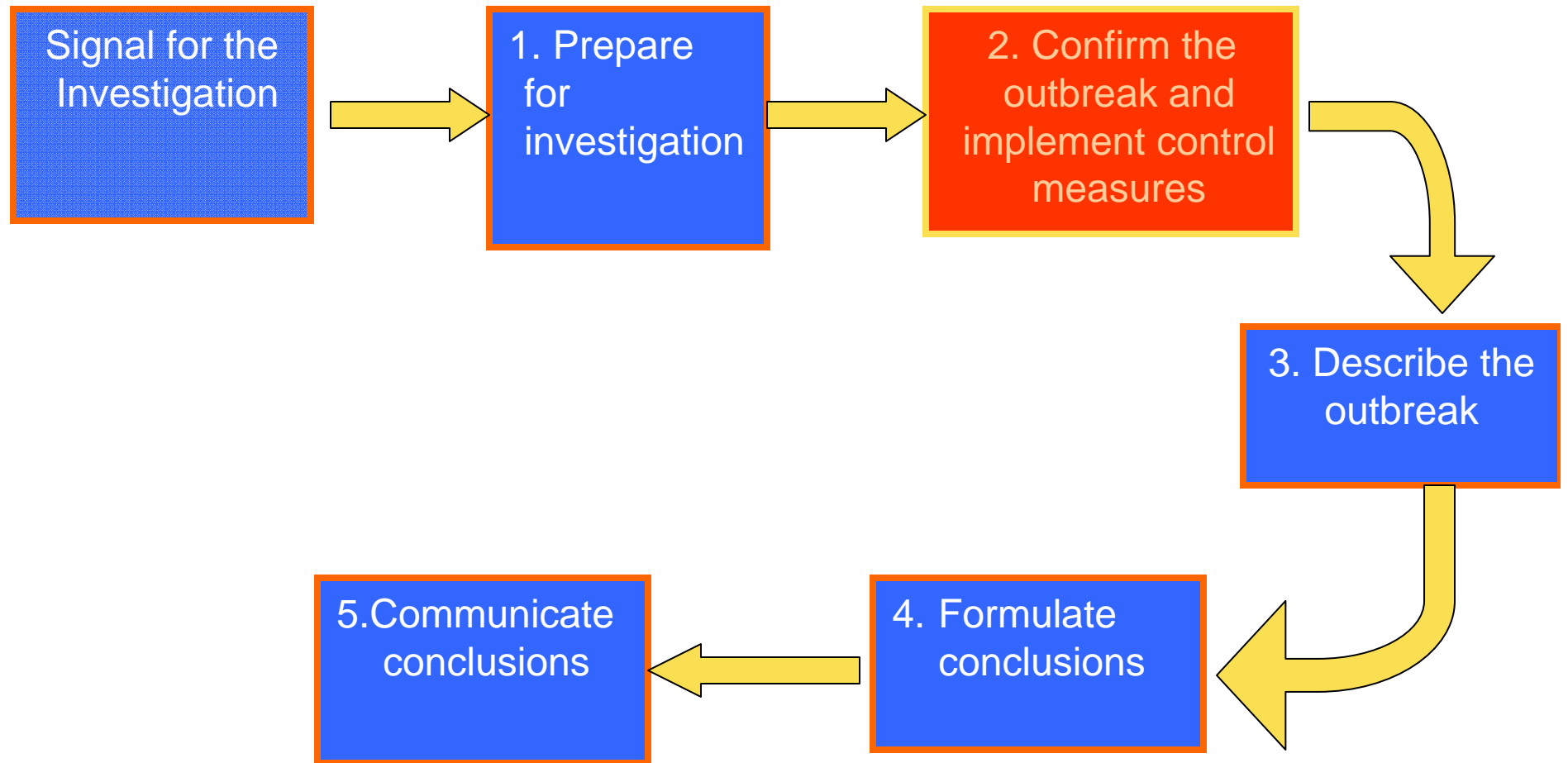
Other team members

- **Laboratory specialist**
 - Ensures proper specimen collection, transportation, and storage
 - Assess local laboratory capacity and laboratory safety
 - Coordinates procedures for sharing specimens with national or WHO laboratories
- **Veterinarian**
 - Advises on AI control in birds and other animals, Interface between animal health and human health activities
- **Administrator / Logistician**
 - Manages supplies, transportation, communications, ...

Response Team Tool Kit

- Case investigation material (e.g. questionnaires)
- Personal Protection Equipment
- Antivirals
- Guidelines
- Specimen collection and transport media
- Other logistical support...

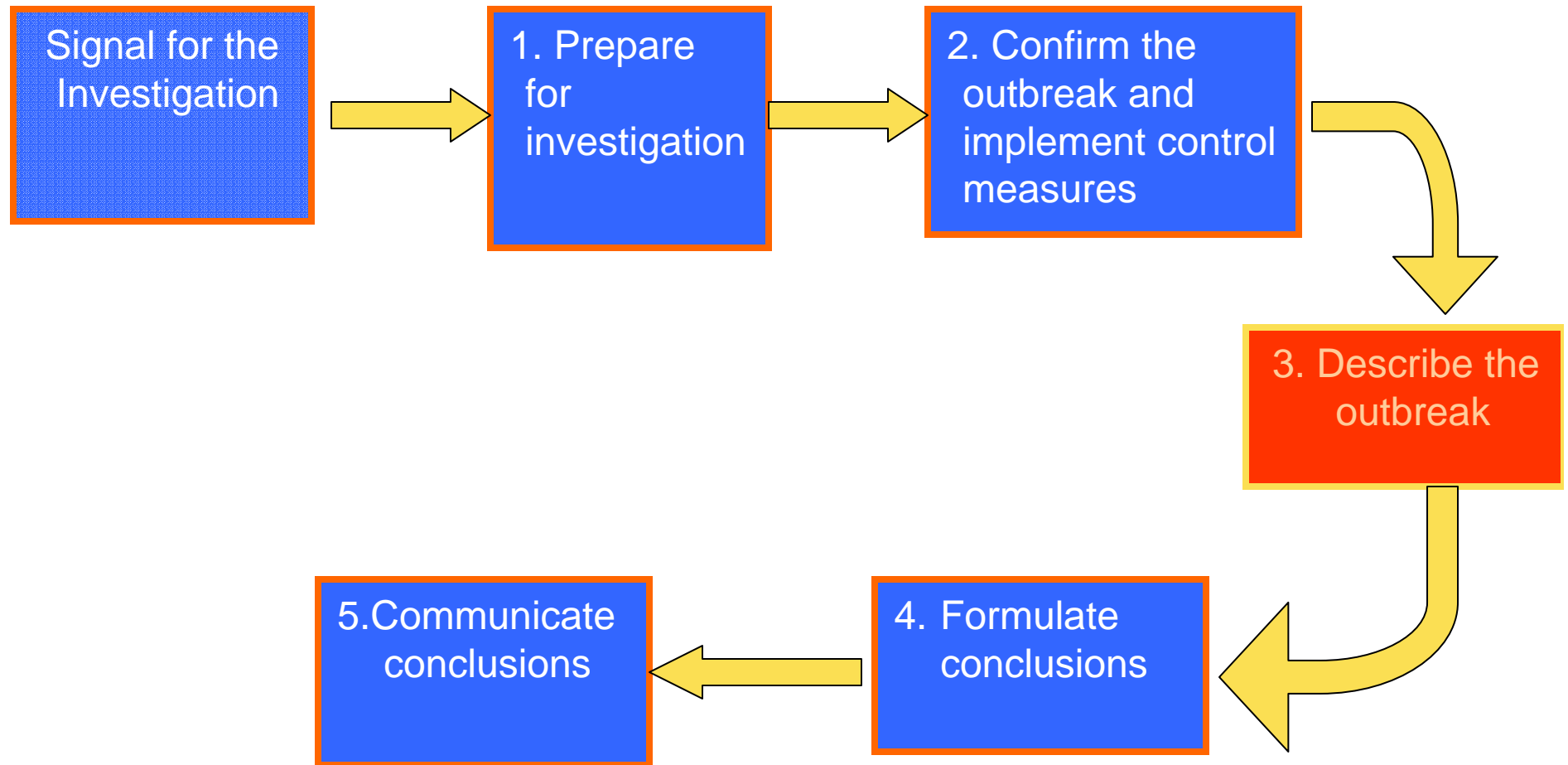
Key steps for the investigation



Step 2: Confirm the outbreak and implement control measures

- Verify signal
 - clinical
 - Epidemiology: apply case definition
 - laboratory testing/confirmation
- Control measures
 - Cull infected flocks
 - Refer, treat and isolate suspected cases
 - Trace contacts
 - Assess need for selective prophylaxis
 - Sensitize and inform local populations
 - ...

Key steps for the investigation



Step 3: Describe the outbreak

- Initiate active case finding
 - Visit health facilities, neighbouring homes, adjacent communities, etc.
- Trace case contacts
- Collect key information on cases and contacts
 - person, place, time
 - develop epi-curve
 - Build transmission tree
 - determine possible human-to-human transmission
- Ensure active surveillance

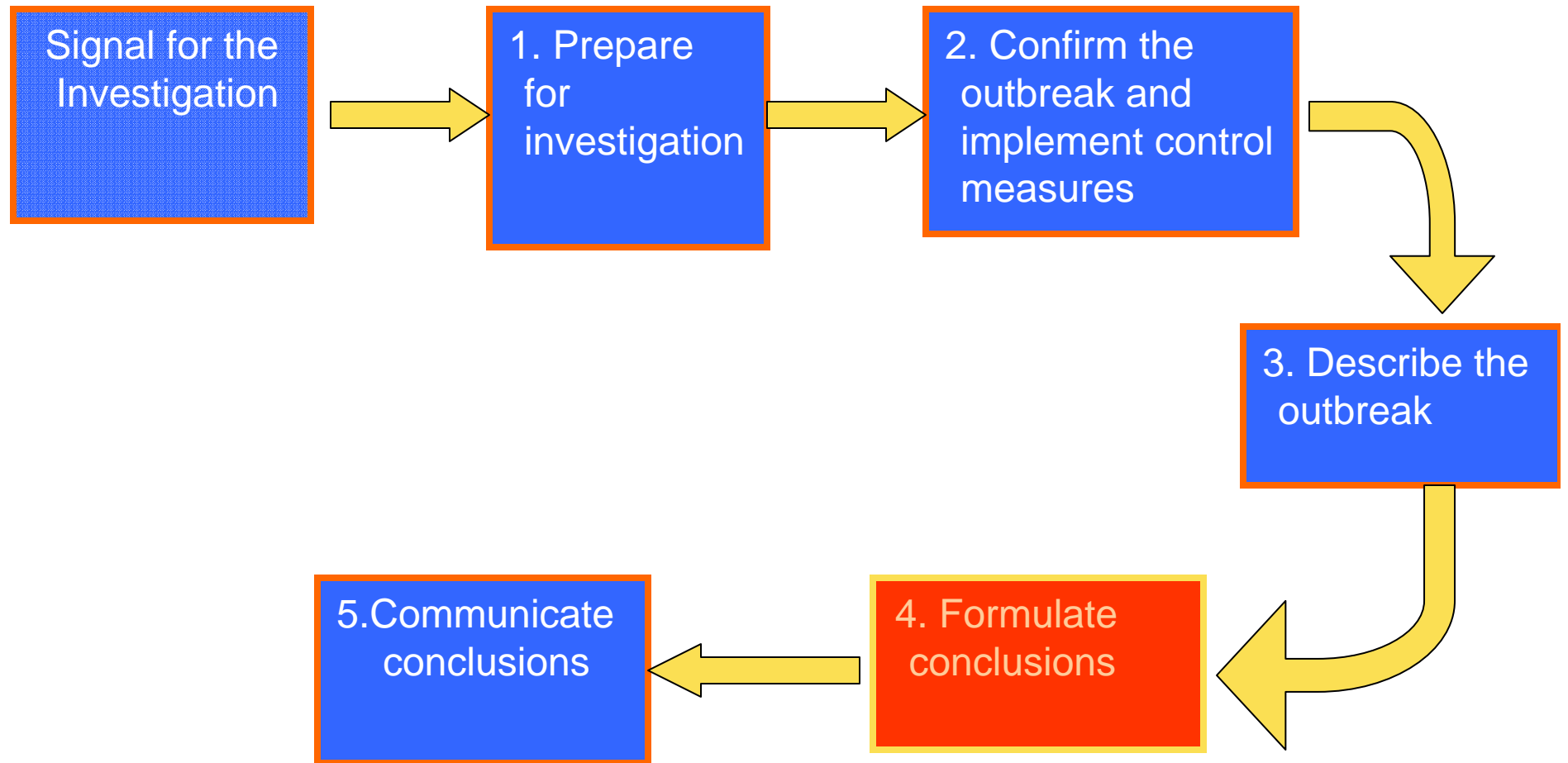
Animal and Environmental Exposures

- Consider following questions
 - Are there animals/poultry/birds in or around the house?
 - Do the animals/poultry/birds appear to be healthy?
 - What are living conditions like? Crowded? Clean?
 - Have animals/poultry/birds been vaccinated for AI?
 - Has there been recent animals/poultry/bird movement?
 - Are there wet markets or farms nearby?
 - Did the person visit wet markets or farms in last two weeks?
- Take appropriate samples
 - Animal
 - Environmental

Assessing Human-to-Human Transmission

- Cases occur close together in time and place among individuals who had close contact with a human case
 - Family members or health care workers
- Onset between two epidemiologically linked cases falls within the incubation period
- No alternative source of exposure is found
- Increase in number of cases
- Community spread

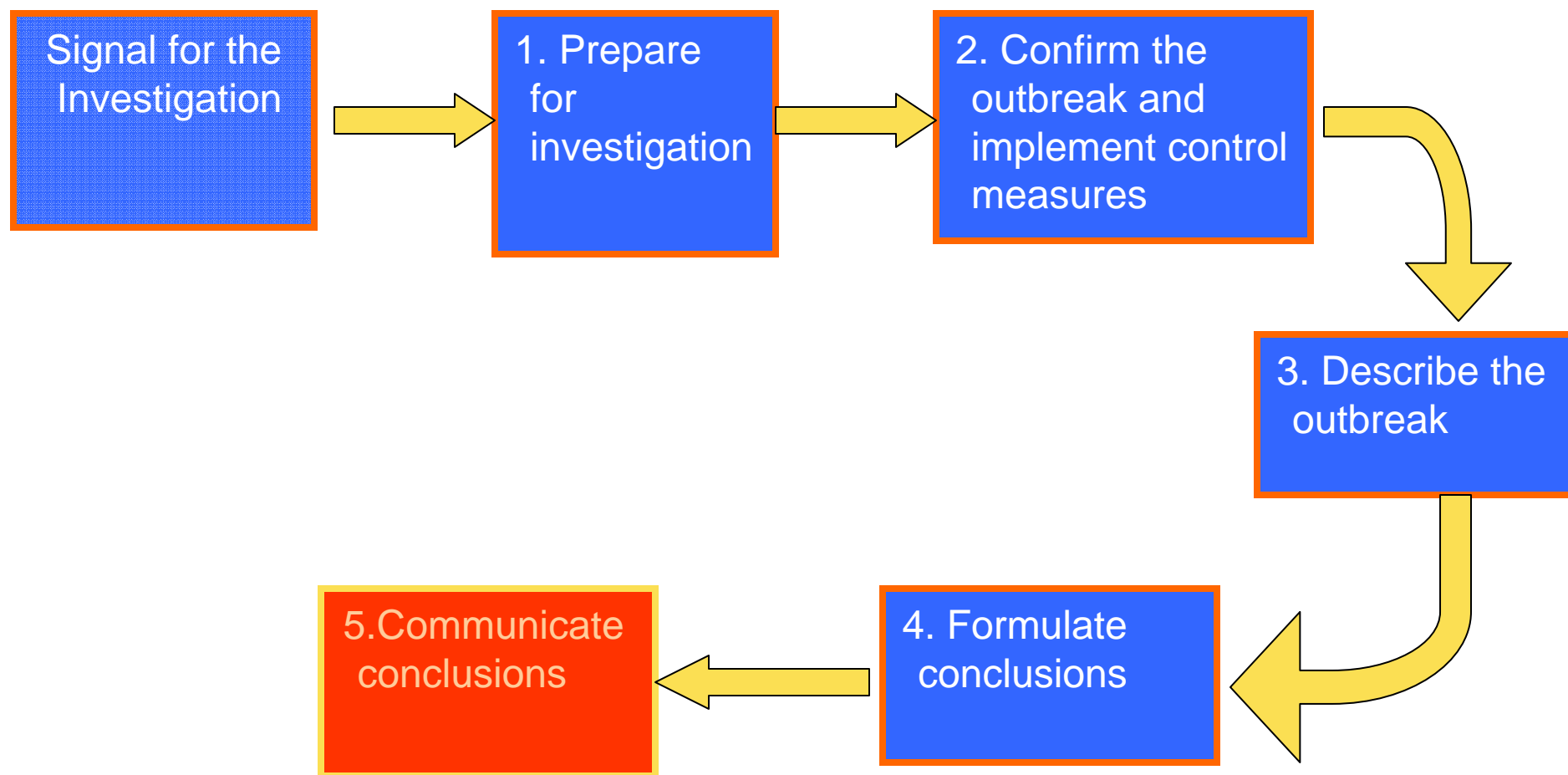
Key steps for the investigation



Step 4: Formulate conclusions questions to address

- Was the outbreak confirmed?
- Was there evidence of human-to-human transmission?
- Who and how many were affected?
- How did the cases become ill?
- Are the right stakeholders involved?
- Are the investigation and control measures effective?
- How can the next investigation improve?

Key steps for the investigation



Step 5: Communicate Conclusions

- Daily situation report
- Summary report, including evaluation of investigation
- Feedback to relevant authorities (local, national, international)
- Comply with International Health Regulations (IHR)
 - notification of highly-pathogenic strains of avian influenza
- Communication with media
- Communicate with social mobilization experts

Challenges of investigating Animal Influenza outbreaks in humans

- Rare, emerging disease that presents with symptoms common to various diseases
 - Clinicians may not suspect AI
- Occurs often before animal outbreaks are identified
- Requires rapid and resource intensive action
- Capacity and logistics of laboratory testing
- Coordination with multidisciplinary groups
- Politically and socially sensitive disease
- Need for good communication with media

Take home messages

- Goal of an AI outbreak investigation is to
 - Assess precisely an the outbreak situation
 - Detect potential additional cases
 - Prevent further human cases by initiating control measures
 - Eliminate source(s) of infection
 - Detect human-to-human spread
- AI Investigations are multidisciplinary
- Efficient communication with stakeholders (e.g. authorities, media and public) is critical

Developed by

The Global Influenza Programme of the World Health Organization with the assistance of:

- Department of Epidemic and Pandemic Alert and Response
- WHO/Food safety, zoonosis and foodborne diseases
- Centers for disease control and prevention
- Health Canada
- European Centre for Disease prevention and Control
- WHO/regional offices
- WHO/Indonesia country office