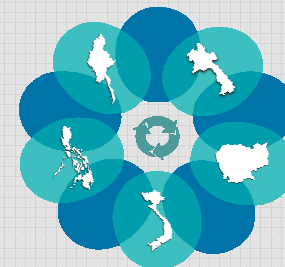


# Steering Committee 15-16 January 2019 - Hanoi

## PREVALENCE OF LEPTOSPIROSIS AND THE ROLE OF CLIMATIC FACTORS AND AGRICULTURAL PRACTICES IN ITS CIRCULATION IN VIETNAM

*A/Prof. Le Thi Phuong Mai. PhD.  
National Institute of Hygiene and  
Epidemiology*



ECOMORE II



WP VIETNAM

# GENERAL OBJECTIVES

- 1. Describe epidemiological status of Leptospirosis in Vietnam**
- 2. Define risk factors of Leptospirosis in varied social-economic and climate areas.**

# SPECIFIC OBJECTIVES

1. To estimate the incidence of Leptospirosis in hospitalization patients in selected areas in Vietnam
2. To describe the main Leptospirosis serogroups circulating in human and animal
3. To identify the main risk factors associated to Leptospirosis transmission
4. To improve capacity in laboratory testing, clinical diagnosis and management of Leptospirosis for participating institutions i.e. hospitals, provincial preventive medicine center and NIHE.
5. To improve inter-sectoral collaboration between health, veterinary and environmental authorities

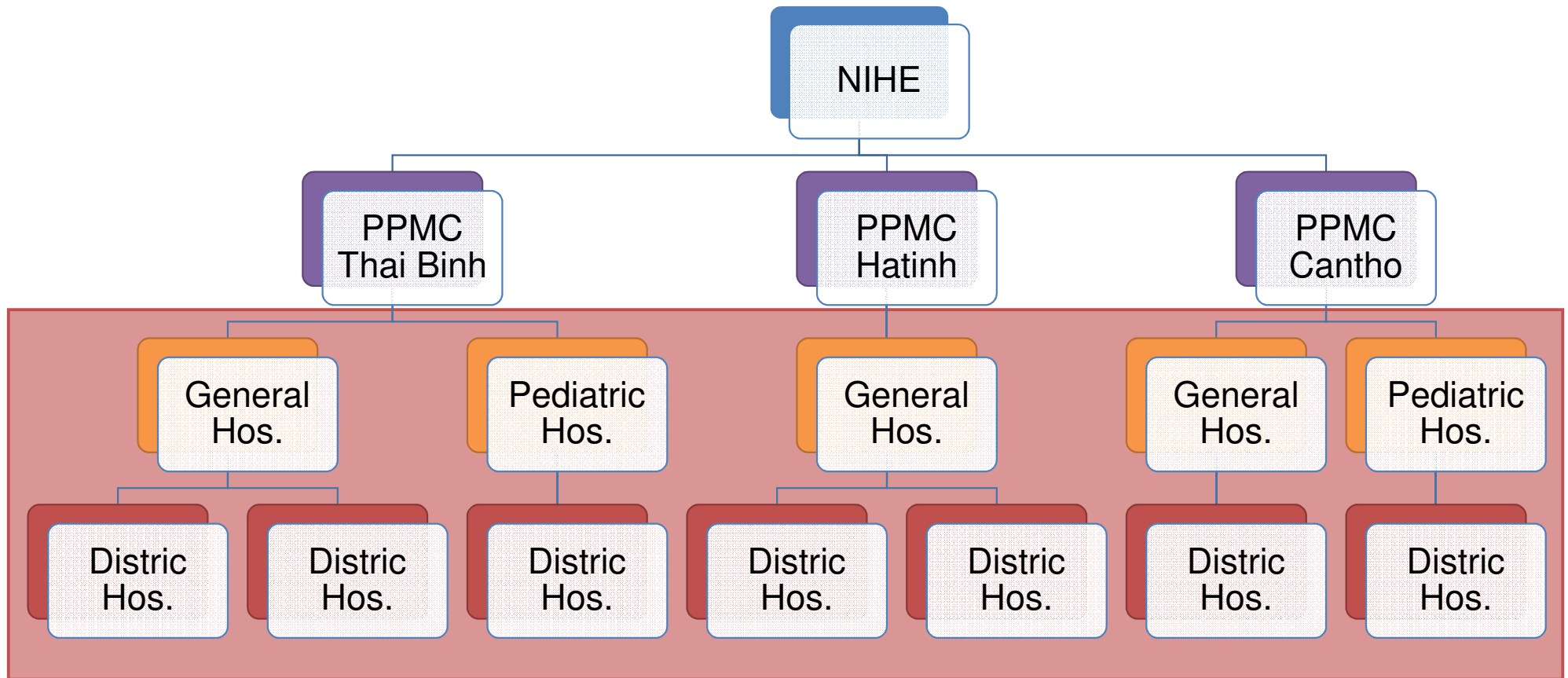
# METHODOLOGY

# #Objective 1&2. Hospital-based surveillance

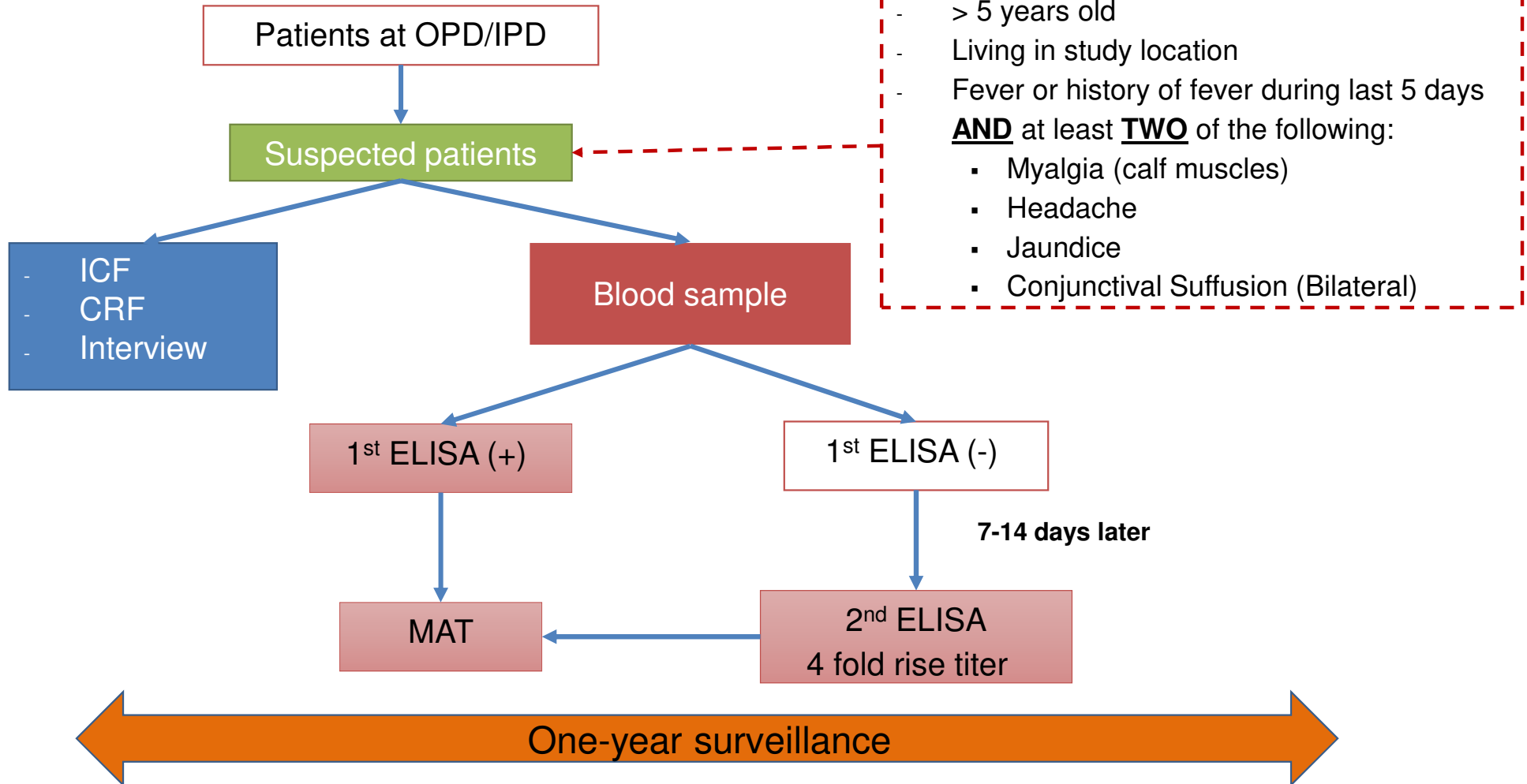
- Selection criteria:
  - Populous and flooding
  - Located in different climate areas
- 03 selected provinces:
  - Thai Binh
  - Ha Tinh
  - Can Tho



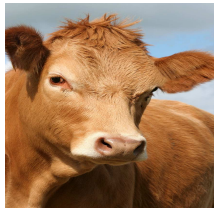
# #Objective 1&2. Hospital-based surveillance



# #Objective 1&2. Hospital-based surveillance



# #Objective 1&2. Serology cross-sectional survey



**Location:** 3 selected provinces

**Time:** April 2019

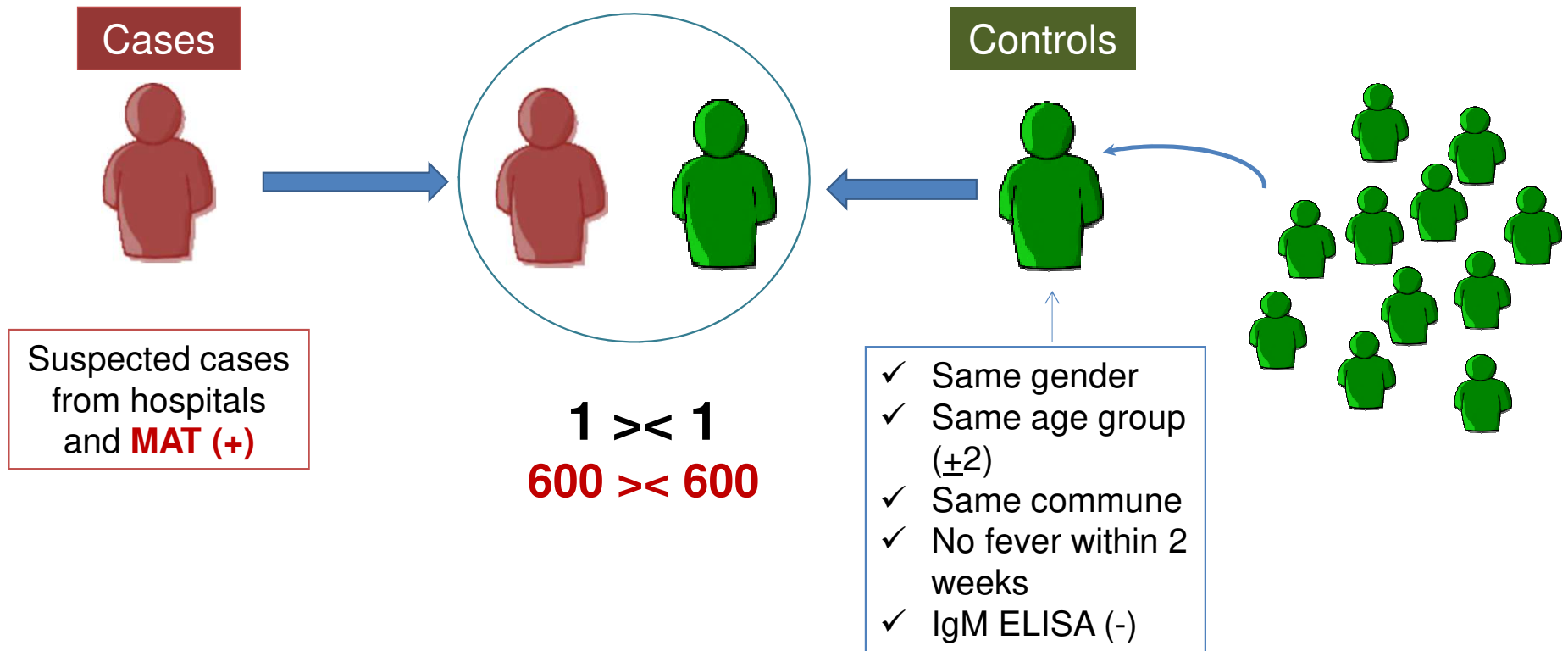
Random  
sampling

**1,200** blood  
samples

MAT



## #Objective 3. Community-based case – control study



# #Objective 4. Improve capacity

Document development

Training



Lab work practice



## #Objective 5. Strengthen collaboration cross sectors

Partnership  
Workshops



Working group meetings with  
animal health and climate  
sectors



# FIELD ACTIVITIES



# Activity Timeline



# Preparation of Document

1. Patient enrollment flowchart
2. SOP for data collection
3. SOP for sample collection, storage and transportation
4. SOP for lab test
5. Monitoring guide
6. Weekly/monthly reporting flow

BAR CODE

**PHIẾU H1: ĐIỀU TRA CA BỆNH LEPTOSPIRA**  
(Tại cơ sở y tế: \_\_\_\_\_)

TIÊU CHUẨN CHỌN VÀO	Đánh dấu vào dấu hiệu BN có
1. Bệnh nhân trên 5 tuổi	<input type="checkbox"/>
2. Sốt và/hoặc có tiền sử sốt trong vòng 5 ngày qua	<input type="checkbox"/>
3. Sống trong địa bàn tình nghi nghiên cứu	<input type="checkbox"/>
<b>VÀ có ít nhất 2</b> trong các triệu chứng sau:	
4. Đau cơ (bắp chân)	<input type="checkbox"/>
5. Đau đầu	<input type="checkbox"/>
6. Vàng da	<input type="checkbox"/>
7. Mắt đỏ 2 bên	<input type="checkbox"/>

Câu hỏi	Trả lời	Mã
<b>A. THÔNG TIN BỆNH NHÂN</b>		
1. Họ và tên	.....	
2. Địa chỉ	Thôn/ấp .....	
	Xã/phường .....	
	Quận/Huyện .....	
	Tỉnh .....	
	Điện thoại .....	

BAR CODE

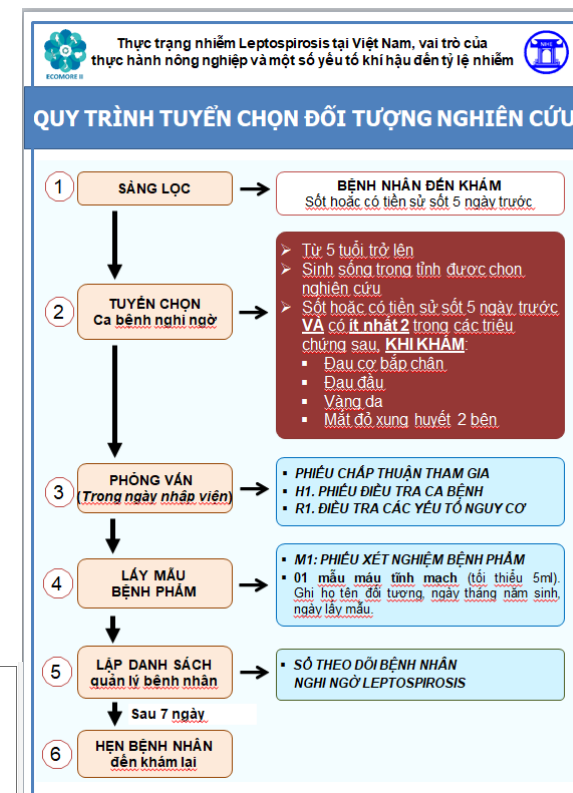
**PHIẾU R1: ĐIỀU TRA CÁC YẾU TỐ NGUY CƠ**

Câu hỏi	Trả lời	Mã
<b>A. THÔNG TIN CHUNG</b>		
1. Họ và tên	.....	
2. Địa chỉ	Thôn/ấp .....	
	Xã/phường .....	
	Quận/Huyện .....	
	Tỉnh .....	
	Điện thoại .....	
3. Ngày tháng năm sinh	____/____/____	
4. Giới tính?		Nam 1 Nữ 2
5. Dân tộc		Kinh 1 Khơ Me 2 Mường 3

BỘ Y TẾ  
VIỆN VỆ SINH DỊCH TỄ TRUNG ƯƠNG

**HƯỚNG DẪN THU THẬP SỐ LIỆU**

THỰC TRẠNG NHIỄM LEPTOSPIROSIS TẠI VIỆT NAM,  
VAI TRÒ CỦA THỰC HÀNH NÔNG NGHIỆP VÀ MỘT SỐ  
YẾU TỐ KHÍ HẬU ĐẾN TỶ LỆ NHIỄM

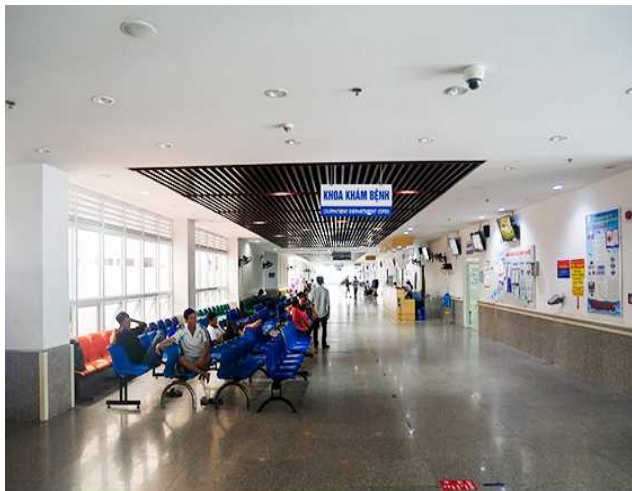


# Preparation of Study site

## ➤ Site visit:

- Briefing about the project
- Setting up study team in the field

At **12** hospitals  
and **3** PPMC



# Preparation of Study site

Activities	Time
1 <sup>st</sup> National Stakeholder Meeting:	7 Aug.
03 Kick-off meetings in Thaibinh, Hatinh, Cantho	10 – 28 Sep.
■ Training in: <ul style="list-style-type: none"><li>✓ Data collection</li><li>✓ Leptospirosis clinical diagnosis and treatment</li><li>✓ ELISA IgM testing for <i>Leptospira</i></li></ul>	10 – 28 Sep.





# Study subject enrollment

## HOSPITALS

- ICF
- CRF
- Interview
- Blood sample

Patient screening

Suspected case

- > 5 years old
- Living in study location
- Fever or history of fever during last 5 days **AND** at least **TWO** of the following:
  - Myalgia (calf muscles)
  - Headache
  - Jaundice
  - Conjunctival Suffusion (Bilateral)

Control selection

ELISA (+)

ELISA (-)

7-14 days

MAT (+)

2<sup>nd</sup> sample (+)

Confirmed case

## COMMUNITY

## PPMC AND NIHE

# Patient enrollment flow at hospitals

## OUTPATIENT DEPT.

Screening desk

Patients with fever

Assigned consultation rooms

Patients meet case definition

- ICF
- CRF
- Interview

## INPATIENT DEPT.

General ward

Hospitalized adult patients

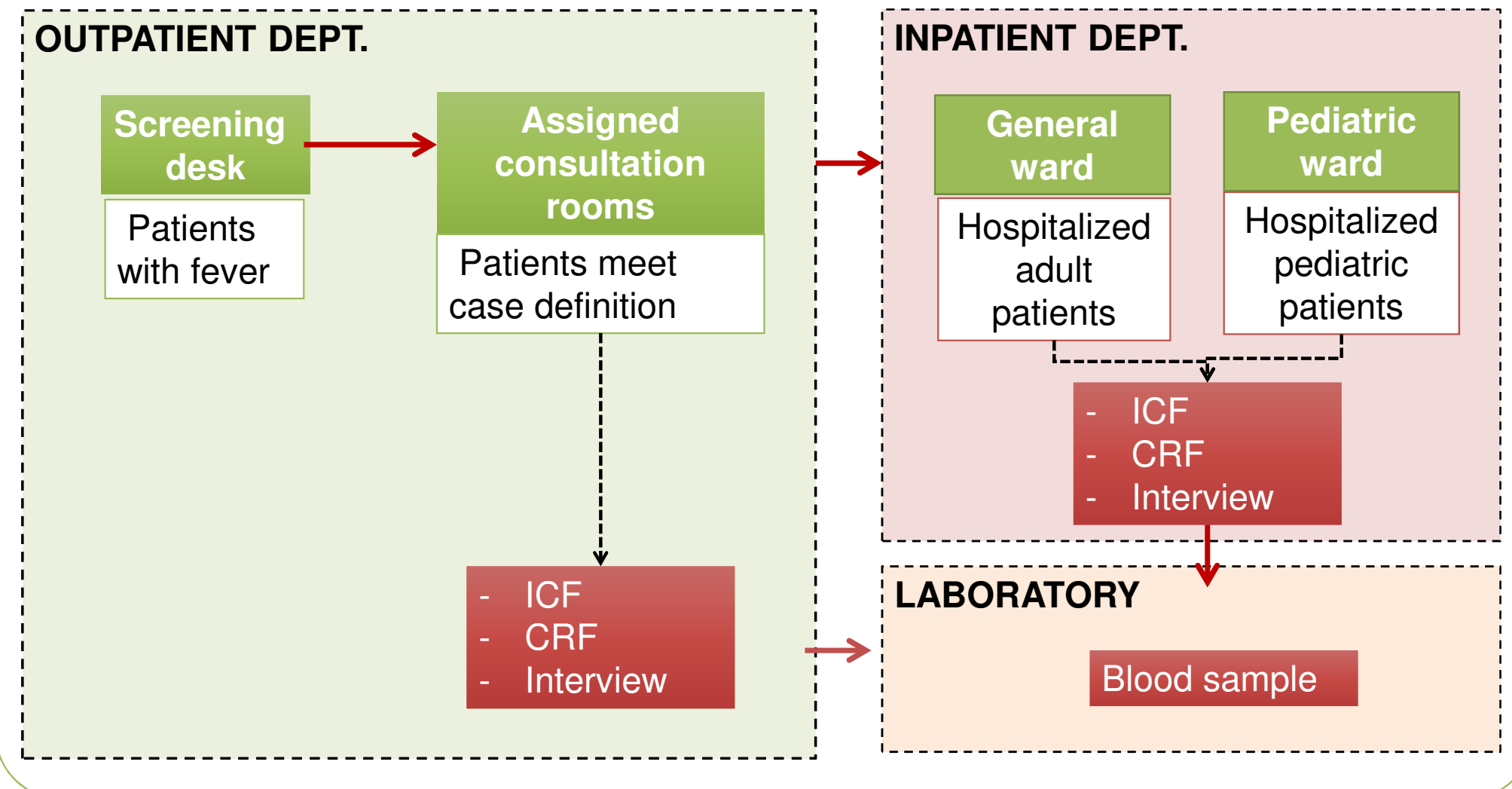
Pediatric ward

Hospitalized pediatric patients

- ICF
- CRF
- Interview

## LABORATORY

Blood sample

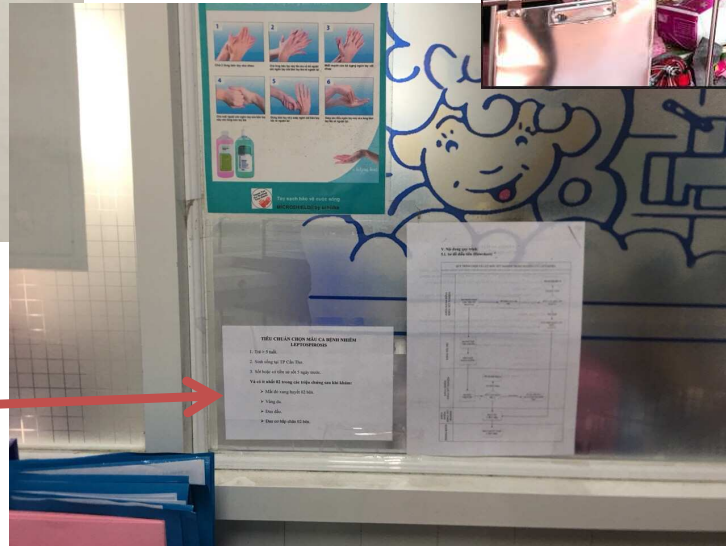


# Patient enrollment at OPD and IPD

## Patient enrollment flowchart



## Selection criteria



# 2<sup>nd</sup> sample collection

- Ask patient come back after **7-10** days
- ECOMORE **stamp**
- Return test result or take 2<sup>nd</sup> blood

At hospital

At household

- If patients do not come back
- Make the list

- Contact patient
- Take sample at household

At household

BAR CODE

**ECOMORE**

PHIẾU HỎI ĐIỀU TRA CA BỆNH LEPTOSPIRA

PHIẾU CHUẨN CHON VÀO

	Đánh dấu vào dấu hiệu BN có
1. Bệnh nhân trên 5 tuổi	<input type="checkbox"/>
2. Sốt và/hoặc có tiền sử sốt trong vòng 5 ngày qua	<input type="checkbox"/>
3. Sống trong địa bàn tình nghi nghiên cứu	<input type="checkbox"/>
<b>VÀ</b> có ít nhất 2 trong các triệu chứng sau <b>KHI KHAM</b>	<input type="checkbox"/>
4. Mất độ xung huyết 2 bên	<input type="checkbox"/>
5. Vàng da	<input type="checkbox"/>
6. Đau đầu	<input type="checkbox"/>
7. Đau cơ bắp chân 2 bên	<input type="checkbox"/>

Câu hỏi	Trả lời	MA
<b>A. THÔNG TIN BỆNH NHÂN</b>		
1. Họ và tên	.....	
2. Địa chỉ	Thôn/lấp .....	
	Xã/Phường .....	
	Quận/Huyện .....	
	Tỉnh .....	

## 2<sup>nd</sup> sample collection



# Sample processing

## HOSPITAL

Blood sample

Within 24h

Centrifuged

Within 24h

Storage at -20oC

## PPMC

Twice a week

ELISA result

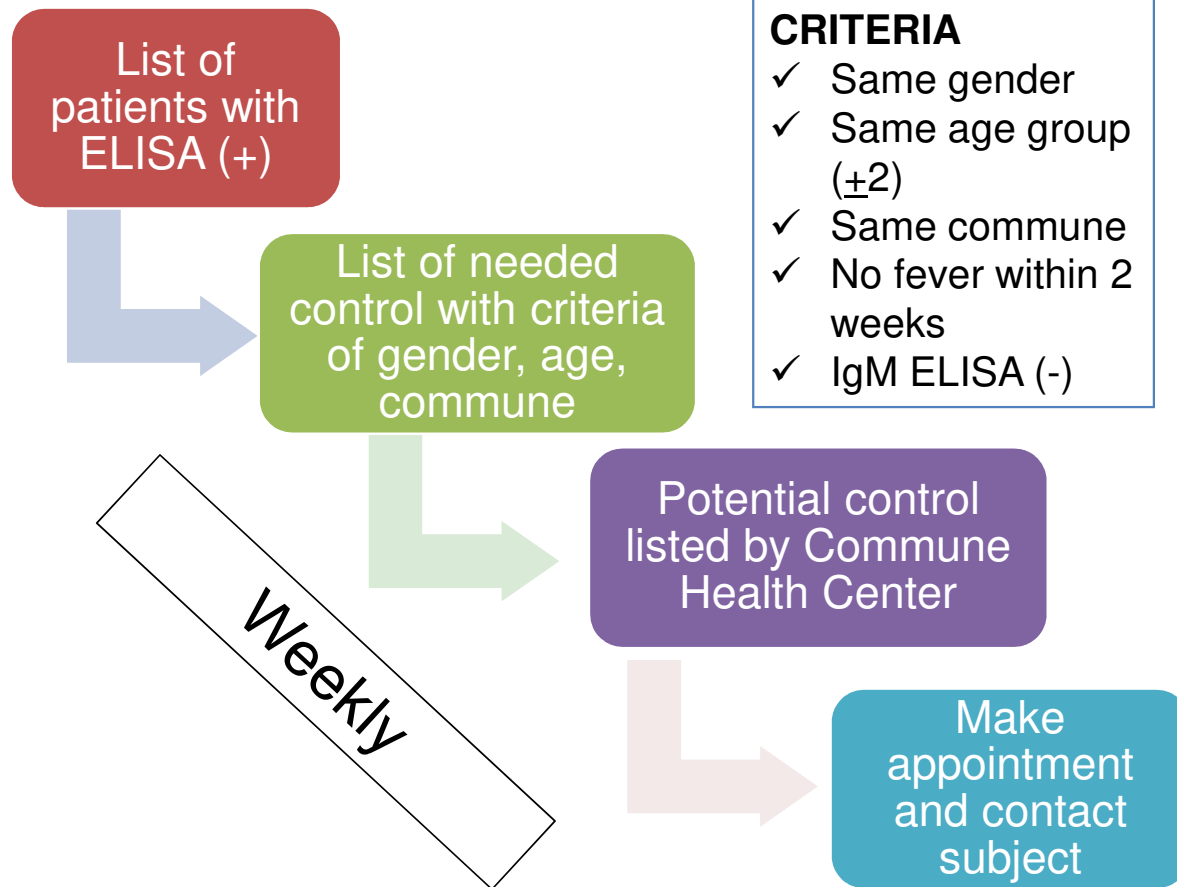
ELISA tested

## NIHE

Once or twice a month

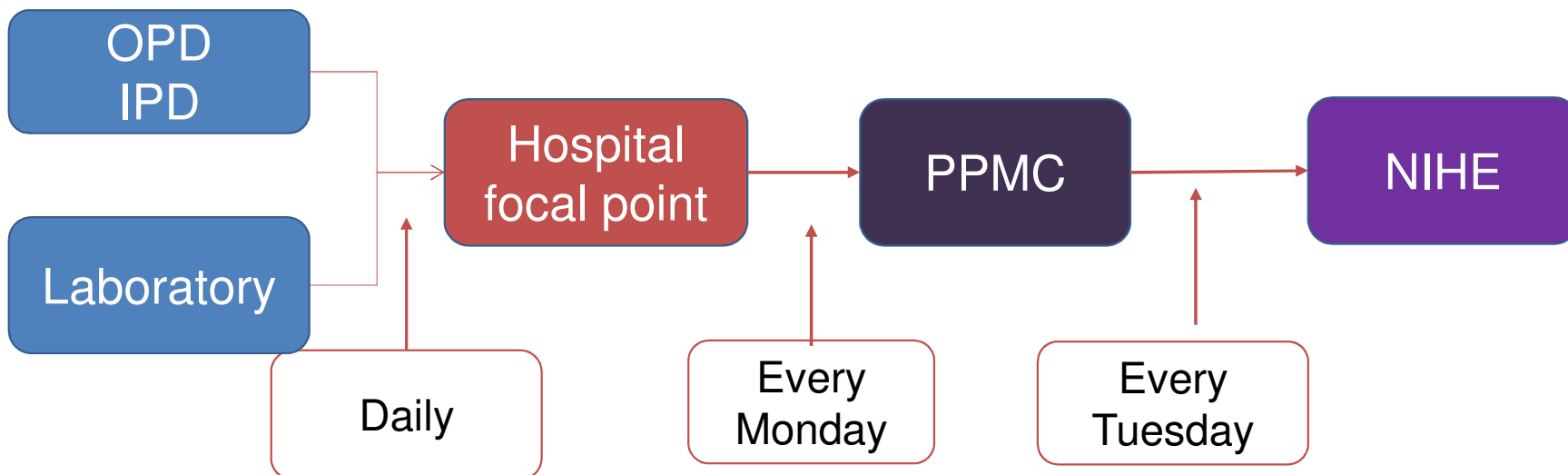
MAT tested

# Control selection and investigation



# Reporting and monitoring

- Distance monitoring



Gdrive

SỞ TỔNG HỢP BỆNH NHÂN NGHI NGỜ LEPTOSPIRA TRUNG TÂM Y TẾ DỰ PHÒNG TỈNH THÁI BÌNH													
Stt	Tuần	Bệnh viện	Số BN đến khám/nhập viện	Số BN sốt không rõ nguyên nhân	Số BN tham gia nghiên cứu	Phiếu H1		Phiếu R1		Số mẫu đã lấy	Xét nghiệm		
						Số phiếu hoàn thành	Số CHƯA phiếu hoàn thành	Số phiếu hoàn thành	Số CHƯA phiếu hoàn thành		Số mẫu (-)	Số mẫu (+)	Tổng
1	Tuần 40 (1/10 - 7/10)	Đa khoa tỉnh	354	51	0	0	0	0	0	0	0	0	0
		Nhi	2862/585	280	1	1	1	1	1	1	0	1	1
		Kiến Xương	2515/367	33	0	0	0	0	0	0	0	0	0
		Tiên Hải	3870/413	18	1	1	1	1	1	1	0	1	1
		Nam Tiên Hải	22	9	0	0	0	0	0	0	0	0	0
		<b>Cộng</b>	<b>376</b>	<b>391</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>
2	Tuần 41 (8/10 - 14/10)	Đa khoa tỉnh	368	65(8 Lấy)	1	1	1	1	1	1	0	1	1
		Nhi	2493/564	214	1	1	1	1	1	1	0	1	1
		Kiến Xương	2238/319	18	1	1	1	1	1	1	0	1	1
		Tiên Hải	3286/333	19	1	1	1	1	1	1	0	1	1
		Nam Tiên Hải	25	13	0	0	0	0	0	0	0	0	0
		<b>Cộng</b>	<b>393</b>	<b>264</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>4</b>
3	Tuần 42 (15/10 - 21/10)	Đa khoa tỉnh	432	56(8 Lấy)	4	4	4	4	4	4	2	2	4
		Nhi	2493/564	214	1	1	1	1	1	1	0	1	1
		Kiến Xương	2112/302	45	6	6	6	6	6	6	5	1	6
		Tiên Hải	3203/336	24	1	1	1	1	1	1	1	0	1
		Nam Tiên Hải	29	9	1	1	1	1	1	1	0	1	1
		<b>Cộng</b>	<b>461</b>	<b>292</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>13</b>	<b>9</b>	<b>4</b>	<b>13</b>
4	Tuần 43 (22/10 - 28/10)	Đa khoa tỉnh	365	45(9 Lấy)	2	2	2	2	2	2	1	1	2
		Nhi	2433/511	259	2	2	2	2	2	2	1	1	2
		Kiến Xương	1876/305	32	6	6	6	6	6	6	3	3	6
		Tiên Hải	3389/338	13	1	1	1	1	1	1	0	1	1
		Nam Tiên Hải	21	8	0	0	0	0	0	0	0	0	0
		<b>Cộng</b>	<b>386</b>	<b>312</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>5</b>	<b>6</b>	<b>11</b>



# Reporting and monitoring

- **On-site monitoring:** Twice a week by PPMC, every month by NIHE
  - Review enrollment flow
  - Check criteria of patient enrolled
  - Check reporting, quality of data collection
  - Refresh training



# IMPROVE CAPACITY

## ➤ For NIHE:

- Training in lab technique in New Caledonia
- Online training in using Kototoolbox by smartphone
- Consultation from external experts



## ➤ For PPMC:

- Training in Leptospirosis diagnosis and treatment
- Training in ELISA technique for *Leptospira*



# STRENGTHEN COLLABORATION CROSS SECTORS

- Group-work meeting with meteorological and One Health group

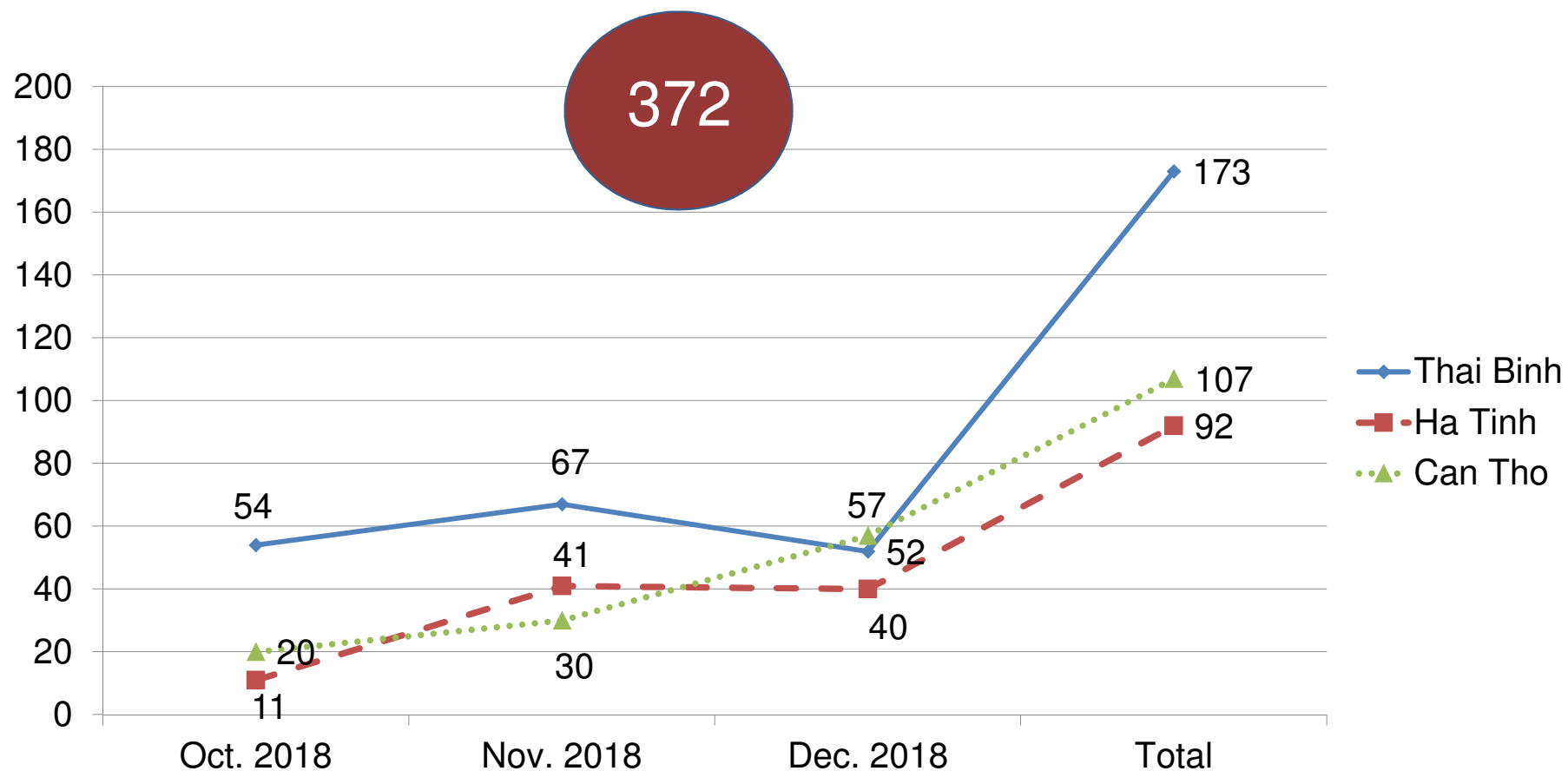




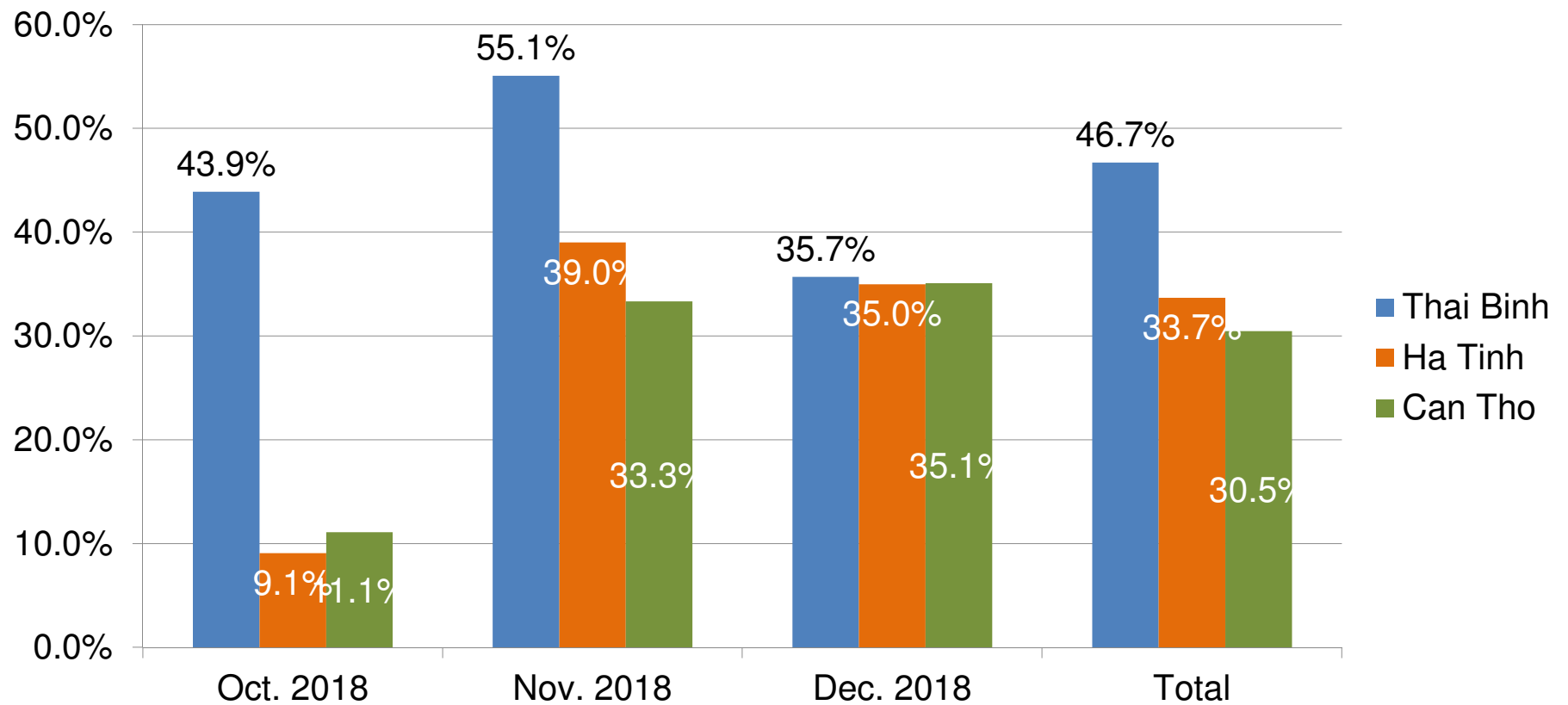
# PRELIMINARY RESULTS



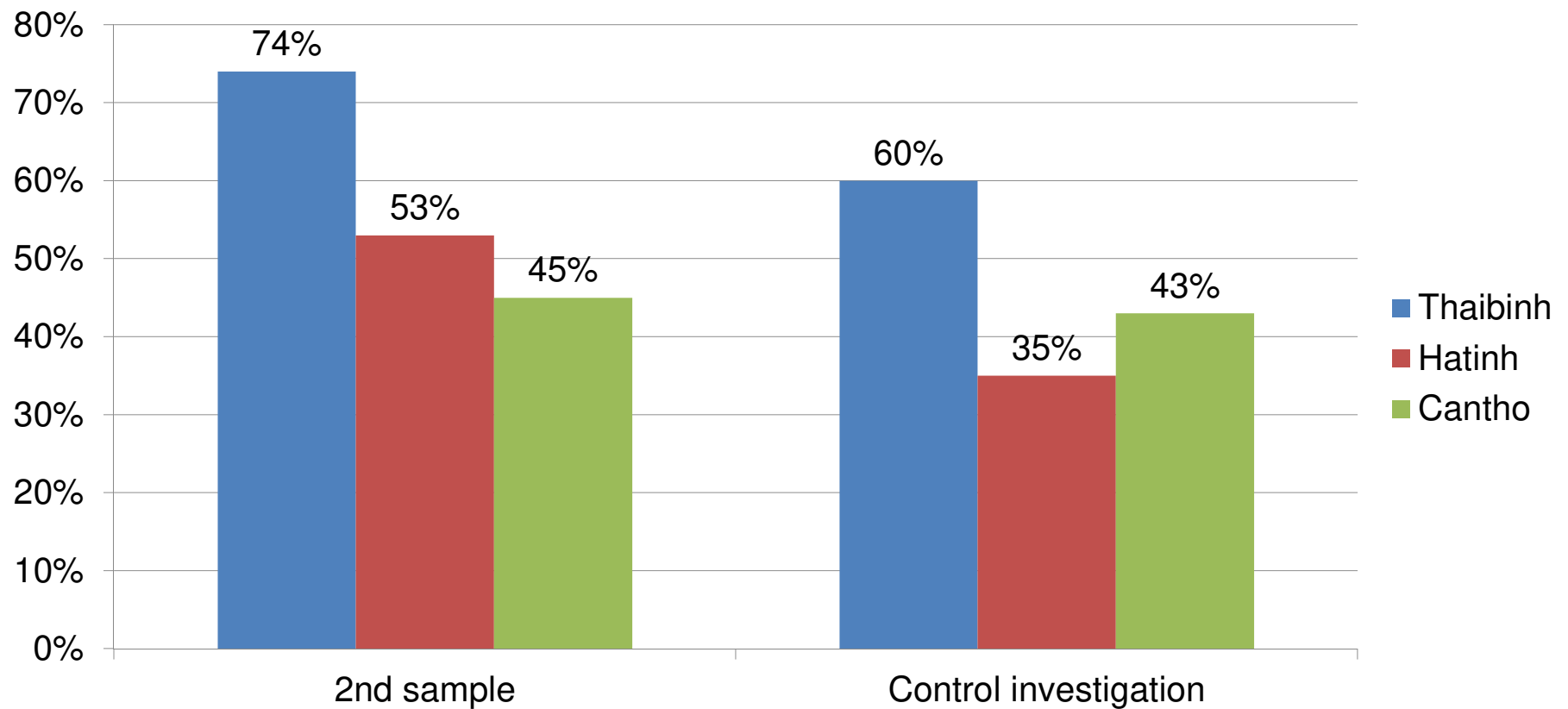
# Patient enrolled in the study



# Percentage of 1<sup>st</sup> ELISA IgM positive



## Percentage of 2<sup>nd</sup> samples taken and the controls investigated

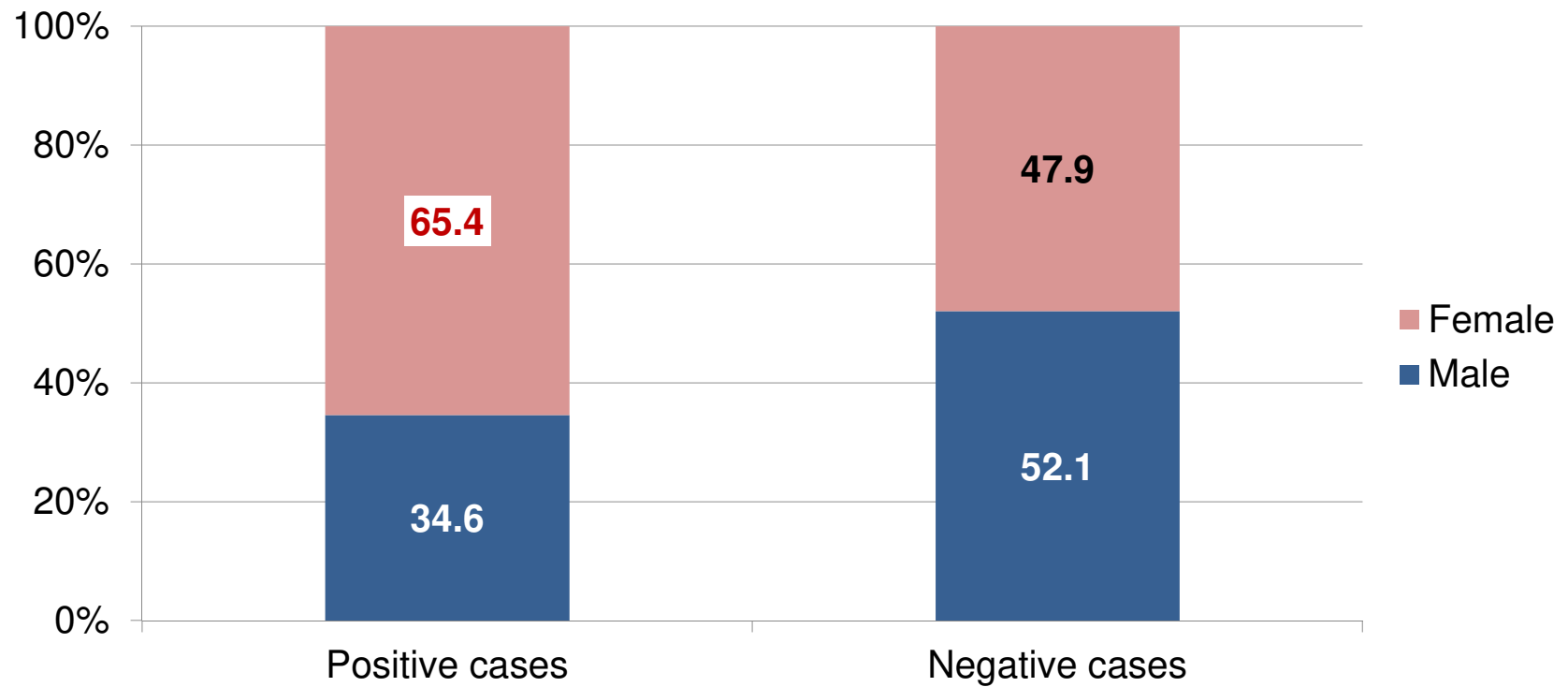


## Preliminary analysis - 174 subjects were entered

Province		ELISA (-)	ELISA (+)
CAN THO	n	31	18
	%	63.3%	36.7%
HA TINH	n	19	18
	%	51.4%	48.6%
THAI BINH	n	46	42
	%	52.3%	47.7%
Total	n	96	78
	%	55.2%	44.8%



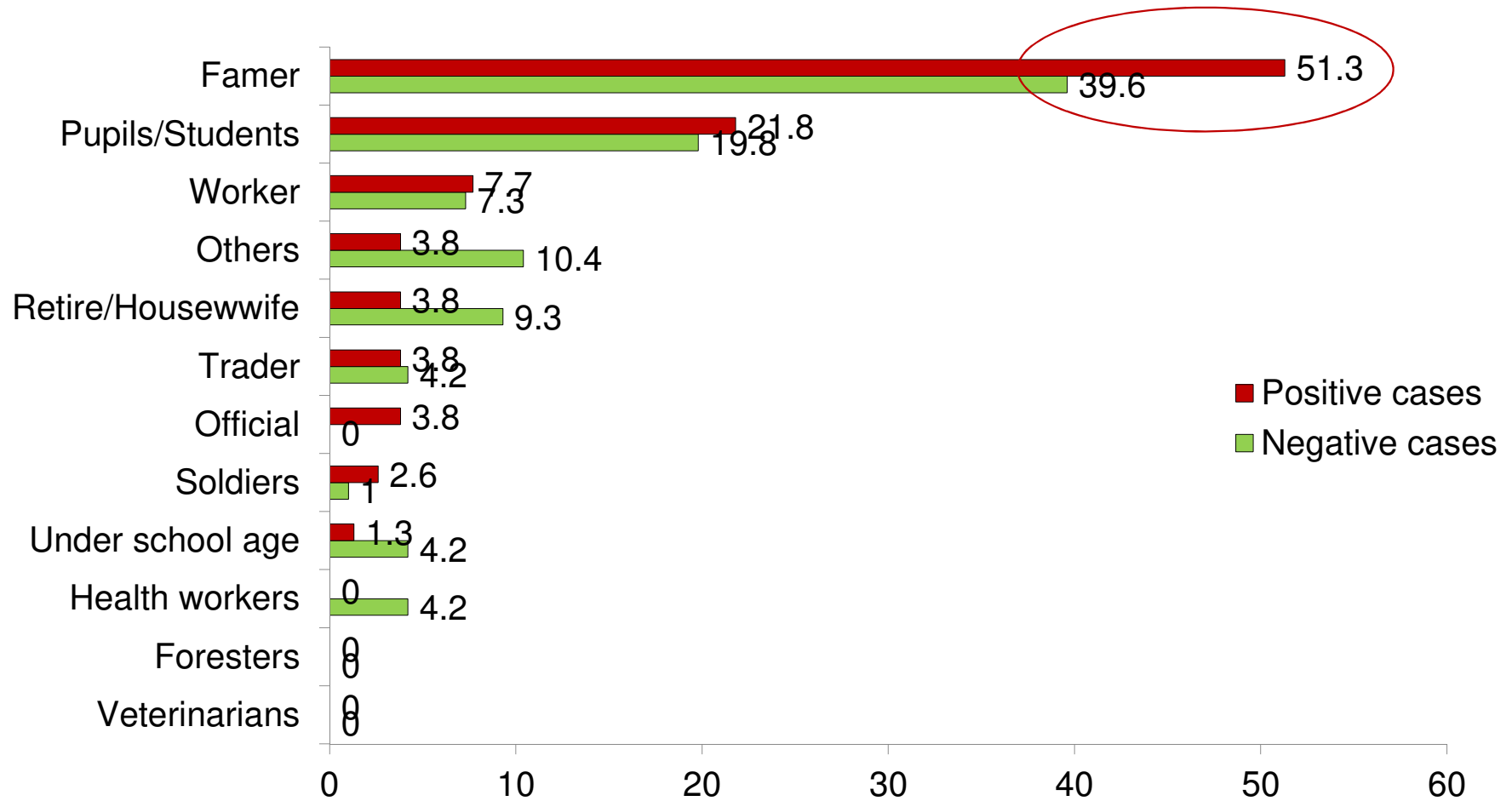
## Preliminary analysis - By gender



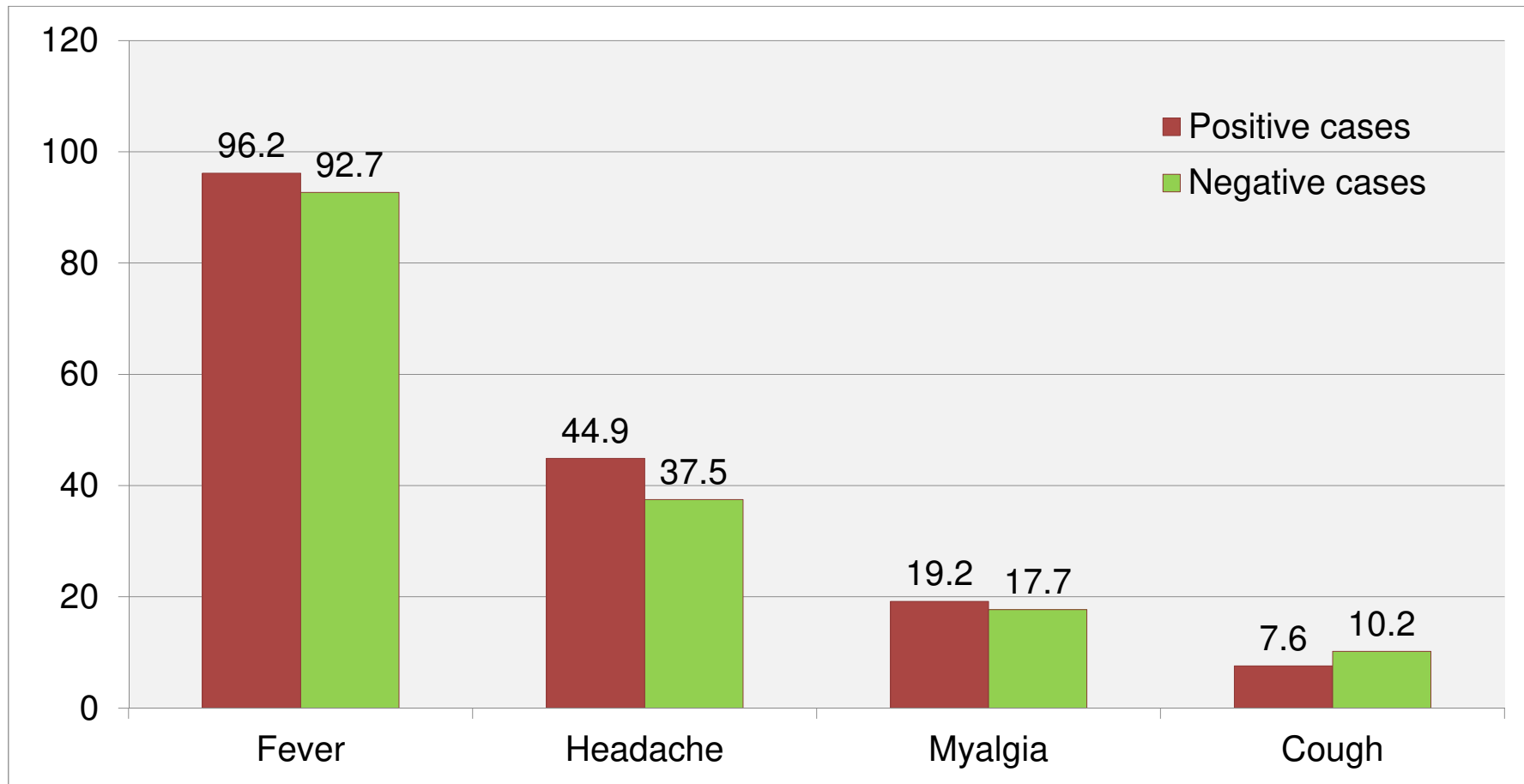
## Preliminary analysis - By age

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>
Positive cases	78	5.0	86.8	38.051
Negative cases	96	5.0	96.9	42.494

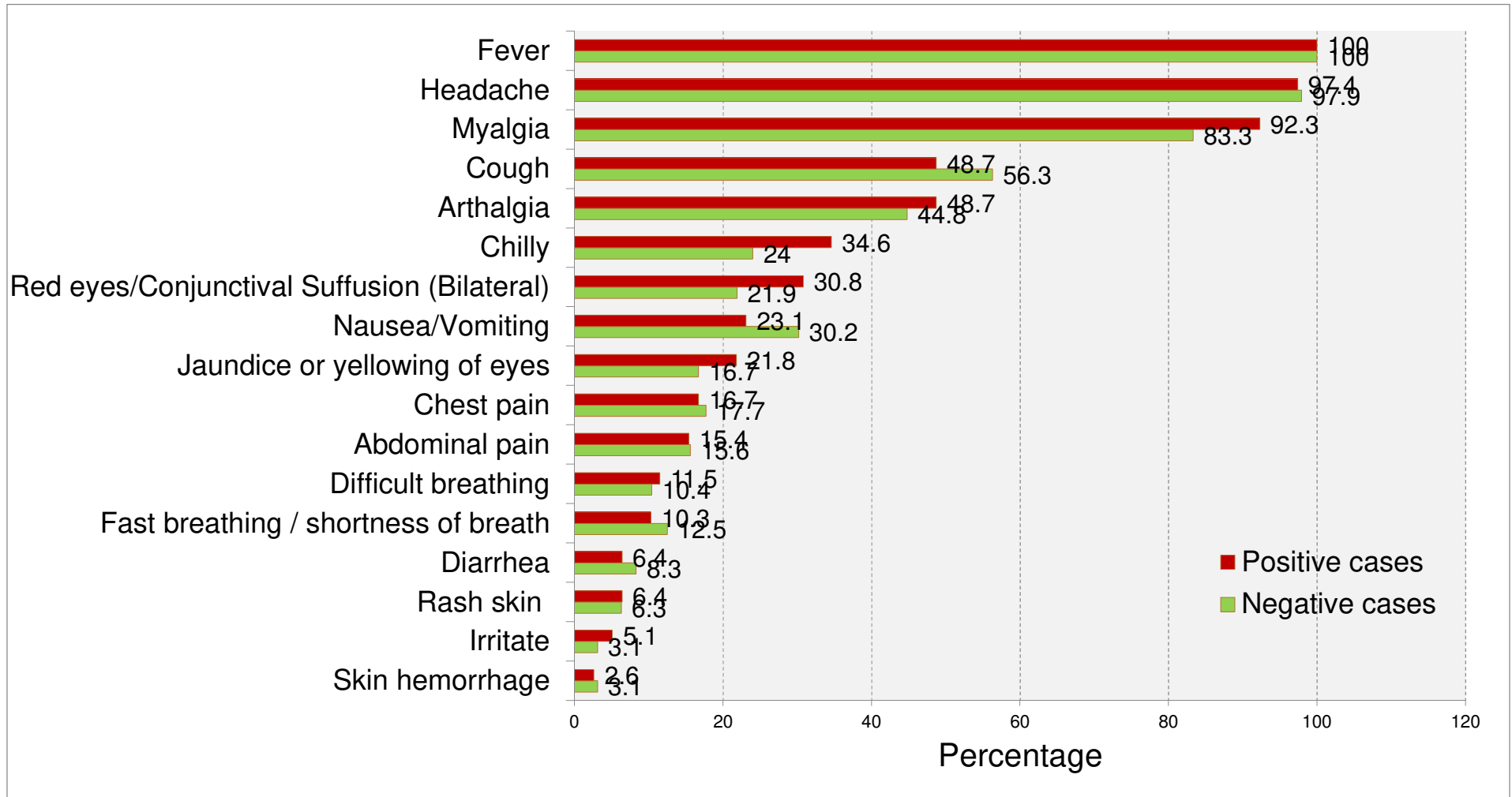
# Preliminary analysis - By Occupation



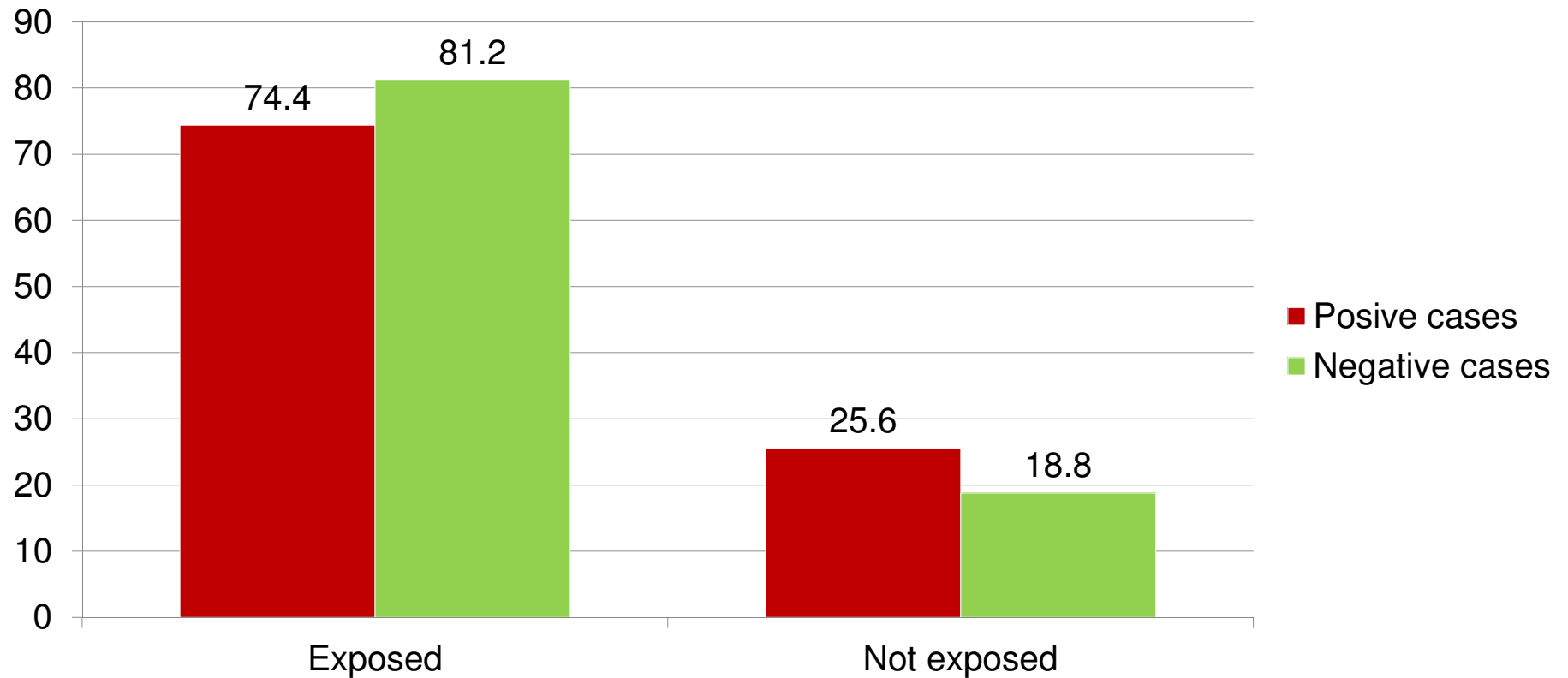
## Preliminary analysis – Onset symptoms



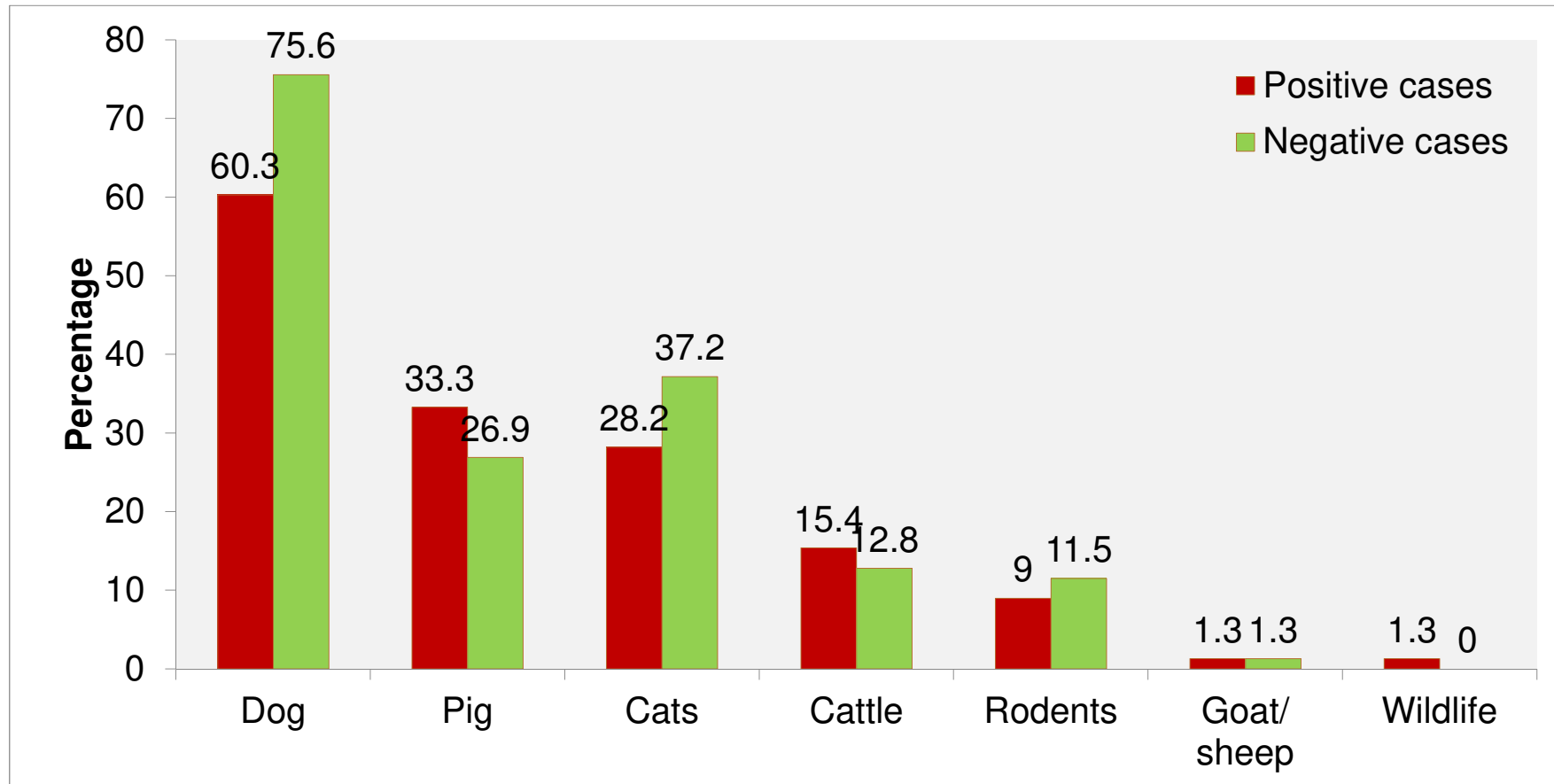
# Preliminary analysis – Symptoms appearance



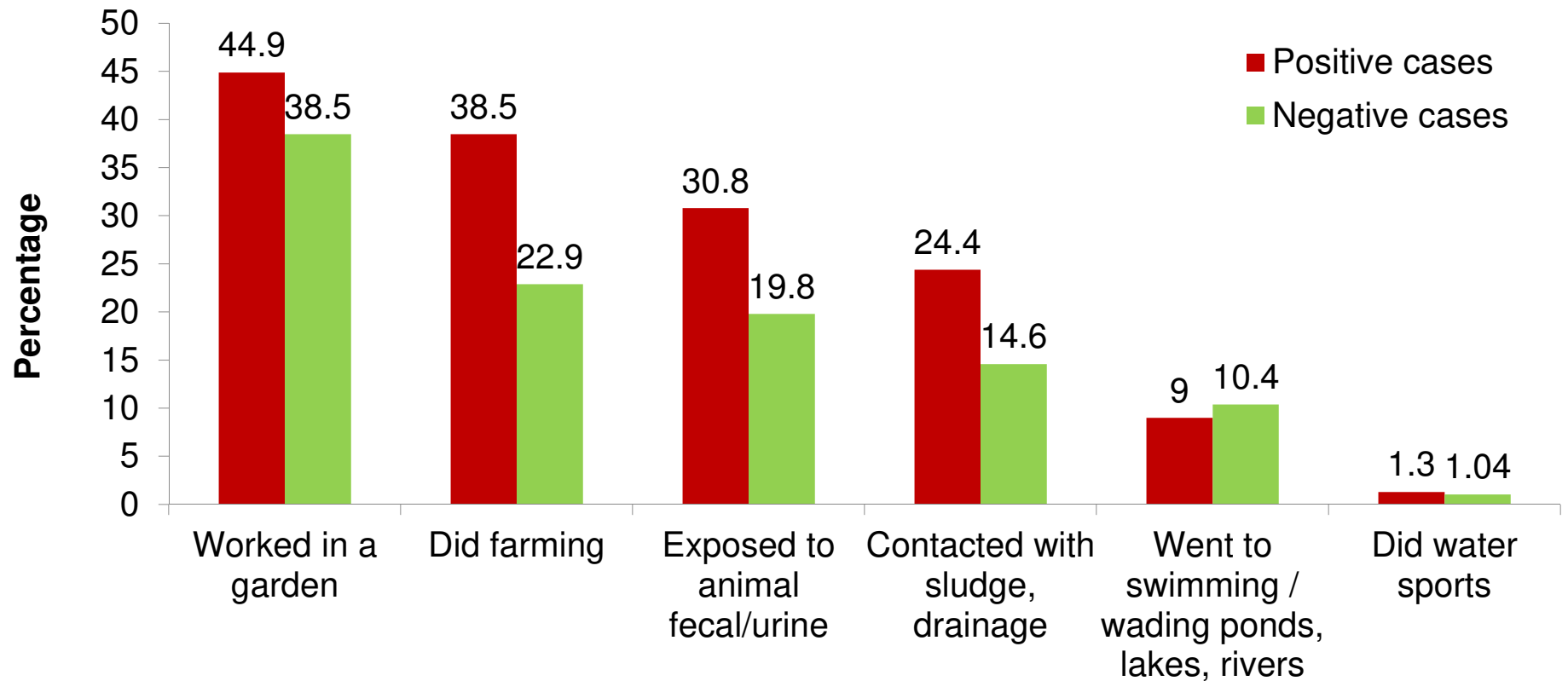
## Preliminary analysis – Animals exposed



## Preliminary analysis – Type of Animals exposed



## Preliminary analysis – Activities within last 30 days





# Modified Faine score \_WHO

<b>Part A: Clinical Data</b>	<b>Score</b>
Headache	2
Fever	2
If fever, temperature 39°C or more	2
Conjunctival suffusion (bilateral)	4
Meningism	4
Muscle pain (especially calf muscle)	4
Conjunctival suffusion+Meningism+Muscle pain	10
Jaundice	1
Albuminuria or nitrogen retention	2
<b>Part B: Epidemiological Factors</b>	<b>Score</b>
Rainfall	5
Contact with contaminated environment	4
Animal contact	1
<b>Part C: Bacteriological and Laboratory Findings</b>	
Isolation of <i>Leptospira</i> on culture	Diagnosis certain
Positive serology	
ELISA IgM positive*; SAT positive*; MAT single high titre* (Any one of the three tests should be scored)	15
MAT rising titre (paired sera)	25

Presumptive diagnosis of leptospirosis is made of:

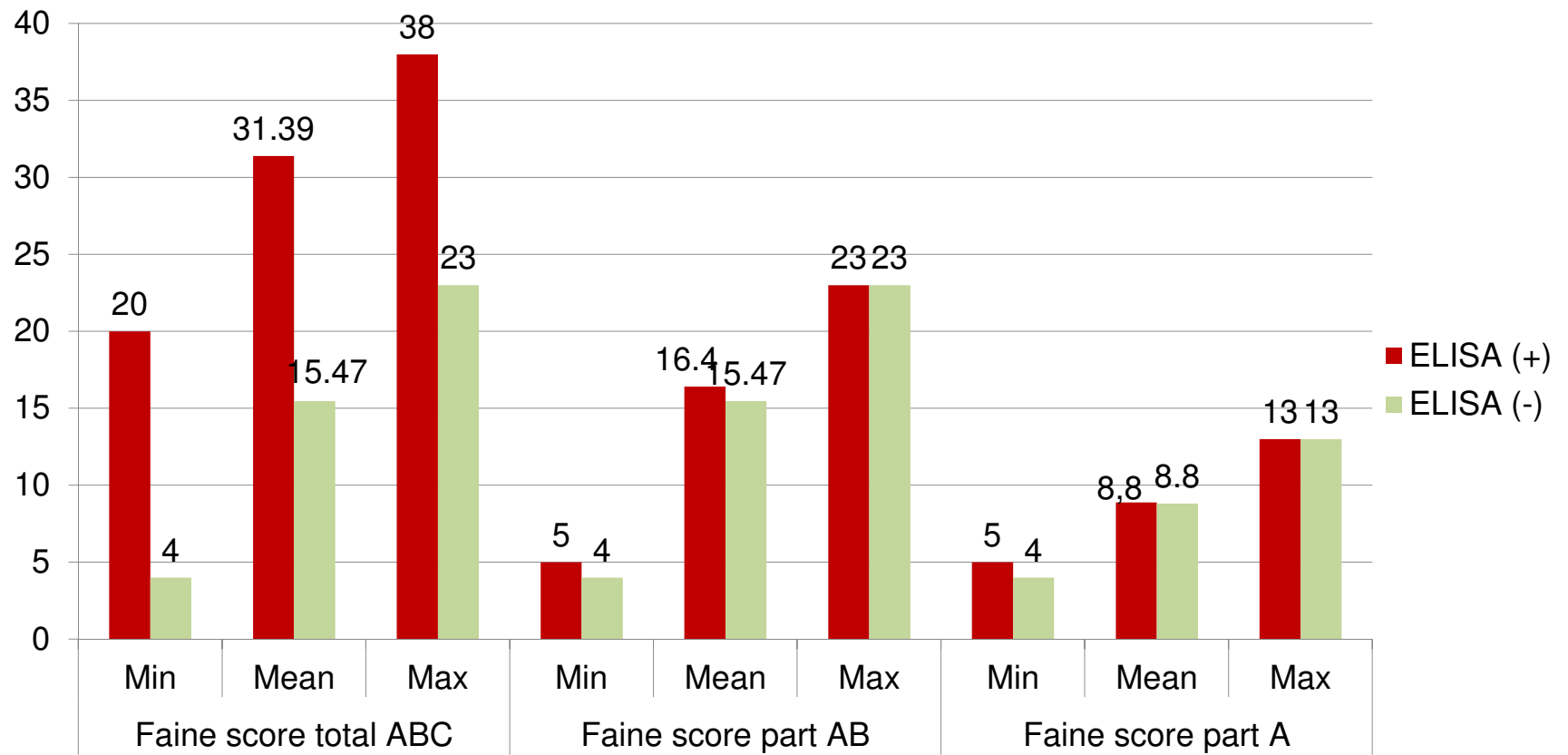
Part A or Part A & Part B score : 26 or more

Part A, B, C (Total) : 25 or more

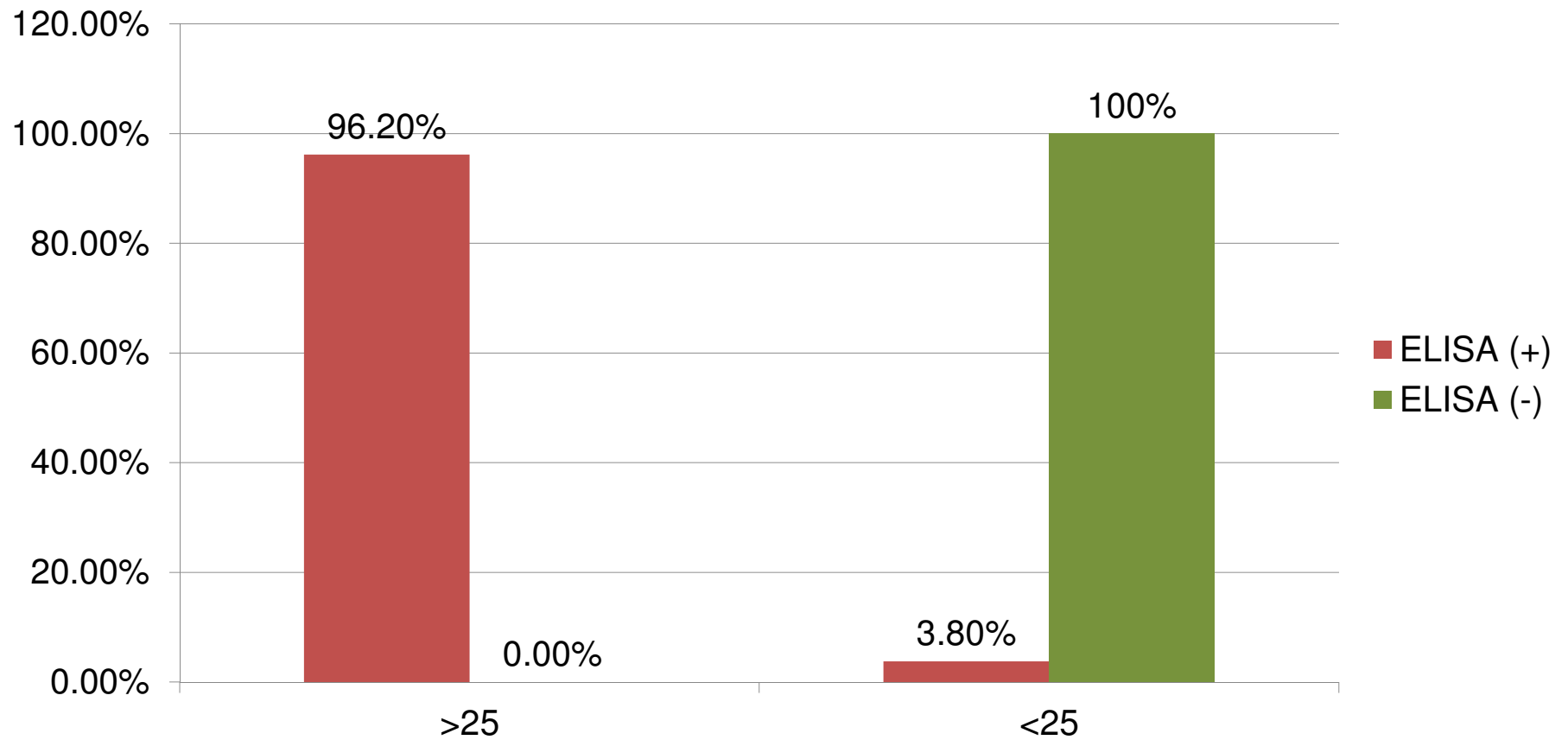
A score between 20 and 25 suggests leptospirosis as a possible diagnosis.

A presumptive diagnosis of leptospirosis may be made if: (i) Score of Part

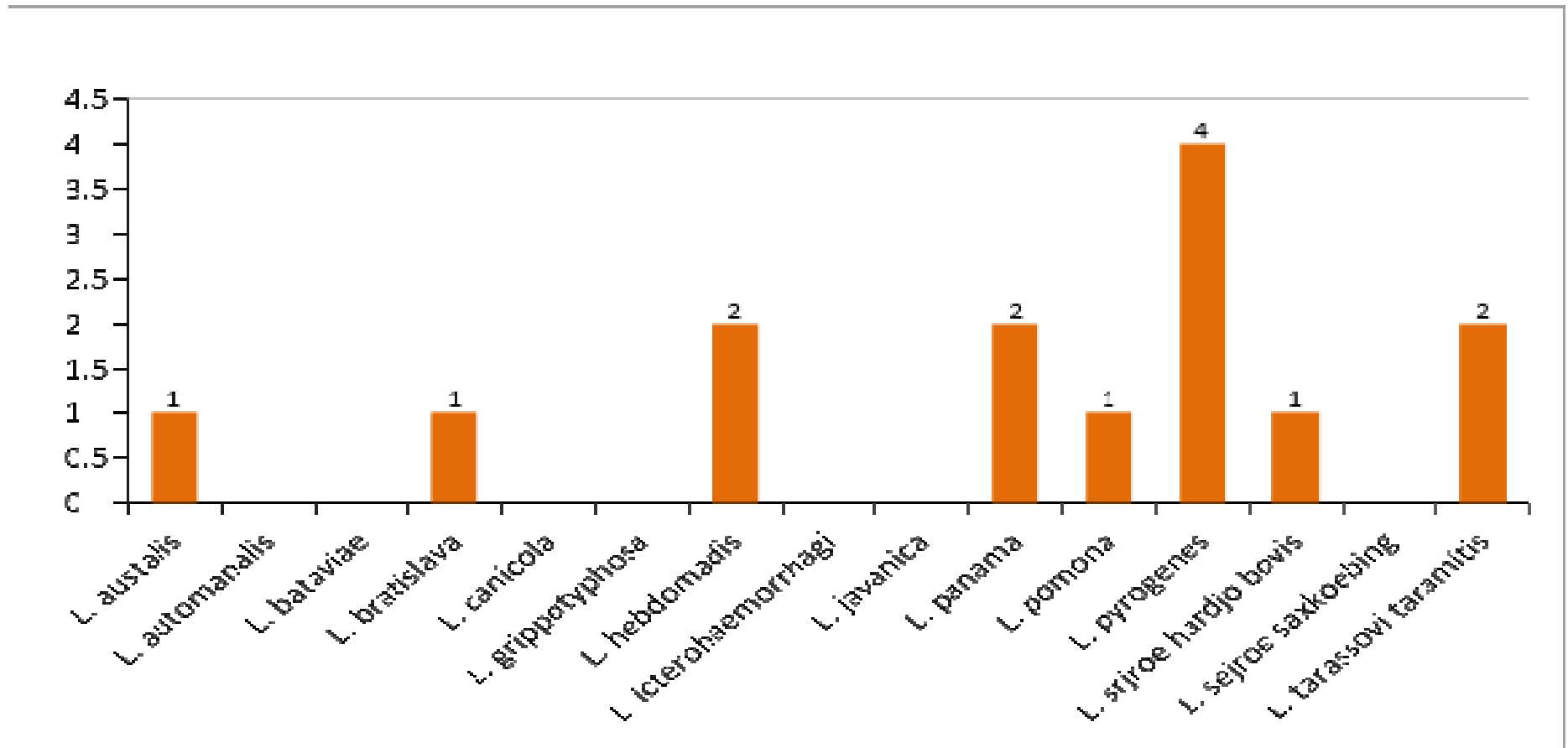
# Faine score by scoring part



## Faine score of Part A + B + C



## Preliminary analysis – MAT result (60 samples)



# DIFFICULTY AND CONSTRAINS

- Enrollment of patient at hospitals
- 2<sup>nd</sup> sample collection:
  - Number of patient coming back
  - Catching patient at household on time
- Control selection in community
- Sufficient sample size for case-control study
- Lab quality control

# WHAT NEXT?

- Continue data collection at hospital and community
- Group work meetings with animal health group
- Organize animal serology survey
- Group work meetings with meteorological group
- Meeting with medical doctors to develop guideline for Leptospirosis management at hospital

