



Sciences Economiques & Sociales de la Santé
& Traitement de l'Information Médicale

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Mise en place d'un système de surveillance syndromique au Gabon

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Implementation of a syndromic surveillance system for infectious diseases with potential epidemic in Gabon

« Primary study in 4 sanitary establishments »

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Infectious diseases definition (1)

- Caused by pathogenic microorganisms,
 - bacteria, virus, parasites or fungi;
- transmitted, directly or indirectly **from** person to person;

[(WHO) Available at: http://www.who.int/topics/infectious_diseases/fr/.
World Health Organization 2017. Accessed on 30 Juin 2017].

Infectious diseases symptoms (2)

- **Fever** and at least 3 of the following symptoms:

Headaches;

Muscular or articular pains;

Abdominal pains;

Anorexia/ loss of the appetite;

intense fatigue

– Hemorrhagic Symptom

Skin (petechiae,, rashes);

Eyes (conjunctival injection) ;

Nose (epistaxis);

Gums (gingivorragia);

Injection points;

Vomitings/nausea;

Diarrhea;

Difficulties swallowing;

Difficulties breathing;

Hiccup;

Vomits (hematemesis);

Blackish saddles (melena);

Rectorragies ;

Vaginal other settle.;

Red urines (hematuria) ;

Infectious diseases (3)

Mortality in the world

- Cardiovascular diseases 17,3 million;
- **Infectious diseases 12,2 million;**
- Cancers 7,5 million;

[Source: who.int/gho/data].

Infectious diseases (4)

Syndromic surveillance ?

- Monitoring indicators
 - Epidemiological in real time or near real time (at least once a day) in order to
 - Detect usual or unusual events earlier
would have been possible

*(Center for Disease Control and
Prevention)*

Infectious diseases (5)

Syndromic surveillance

- In real time, new way to detect epidemics;
- Detect influenza outbreaks; at an early stage (Ontario-Canada 2003).

[Moore K. *Eur J Emerg Med.* 2004].

Infectious diseases (7)

nowadays

- New infectious diseases emerge or re-emerge permanently:
 - Developing countries than industrialized; countries [*Roué et al., 2001 ; Leport et al., 2003 ; Snowden, 2008*].
 - The epidemic risk is higher in developing; countries [*Dalton et al., 2008 ; Brugères-Picoud, 2010; Astagneau, 2011*].

Health

Watch...

New concept for an old idea

Research questions and hypotheses

- In Gabon
 - The monitoring integrating diseases and response (MIDR);
 - The available data are not collected;
 - data potentially collected are not sent at central.

The use of an approach syndromic for the surveillance does she allow

- to detect more quickly than the standard approach of the epidemic phenomena on one hand;
- and on the other hand to determine the existence of phenomena of health gone unnoticed by a retrospective analysis of data?

Objectives

Overall objective

To optimize the insertion of a health monitoring in relay to improve the surveillance of the infectious diseases in the Gabon.

Specific objectives

- to Analyze the impact of the current variability of the infectious diseases with epidemic potential;
- to Develop new strategies of surveillance for the MIPE;
- Suggest the creation of a national database of surveillance syndromique;
- Proposing an improvement of the epidemiological surveillance by the interconnection of devices collecting data in routine.

Part I.

Design and development of system of syndromic surveillance

Methods (1)

Network SuSyMIPE

- Four data sources identified
 - Hospital and pediatric emergency departements
 - Health centers
 - Private clinics and nursing practices
- Sources d'information already available in evolving hospitals (Consultations registers)
- Two imperatives to work
 - Data transparency
 - In near real time

Methods (2)

Network SuSyMIPE

- Number of establishments
 - 4 institutions transmit their data
 - Start of transmission janv 2016 (Oyem, Lbv, Gamba and Koulamoutou)
- Evolution of the number of establishments
 - Jan - Oct 2016 : 4 establishments
 - Spring 2017 : + 6 establishments = 10
- Few transmission problems (humans +++)

Methods (3)

Descriptive analysis
Jan – Octobre 31, 2016

Study : transverse,
observationnelle, descriptive
and multicentrique

Sites: Gamba, LBV,
Koulamoutou and Oyem



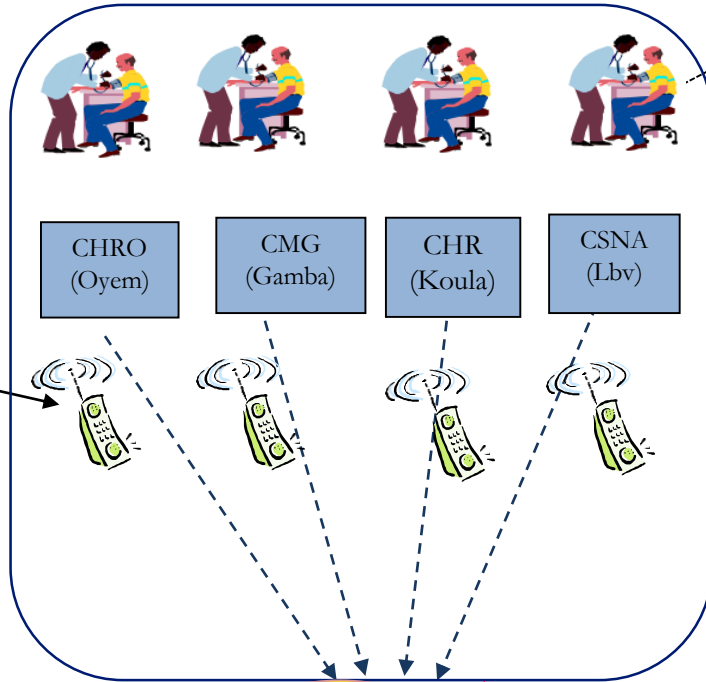
Fig 1. Study sites

SuSyMIPE: Syndromic Surveillance of Infectious Diseases with Epidemic Potential

QUESTIONNAIRE	
Nom
Prénoms
Sexe
Date de naissance: / /	
Lieu de naissance: / /	
Lieu de résidence: / /	
Date de consultation: / /	
Motif de consultation: / /	
Diagnose syndromique: / /	
Diagnose définitive: / /	
Médicaments prescrits: / /	
Autres observations: / /	
Date de remplissage: / /	
Nom du médecin: / /	
Nom de l'établissement: / /	
Nom de la commune: / /	
Nom de la région: / /	

Individual daily recordings: age, sex, place of residence, reason for consul, syndromic diagnosis.. / ...

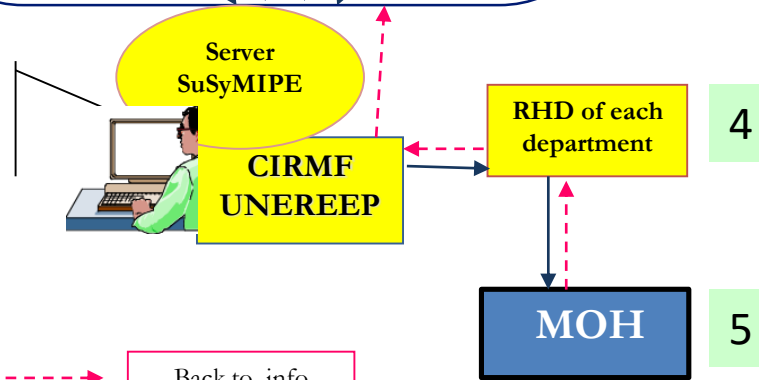
1 Consultation/hospitalization



2 Direct sending

Short Message Service (SMS)
Coded notifications:
1= Algic fever
2= Acute respiratory
3= Diarrhea
4= Autres./...

3 Daily dashboards:
Daily notifications.. / ...



————— Regional level

————— National level

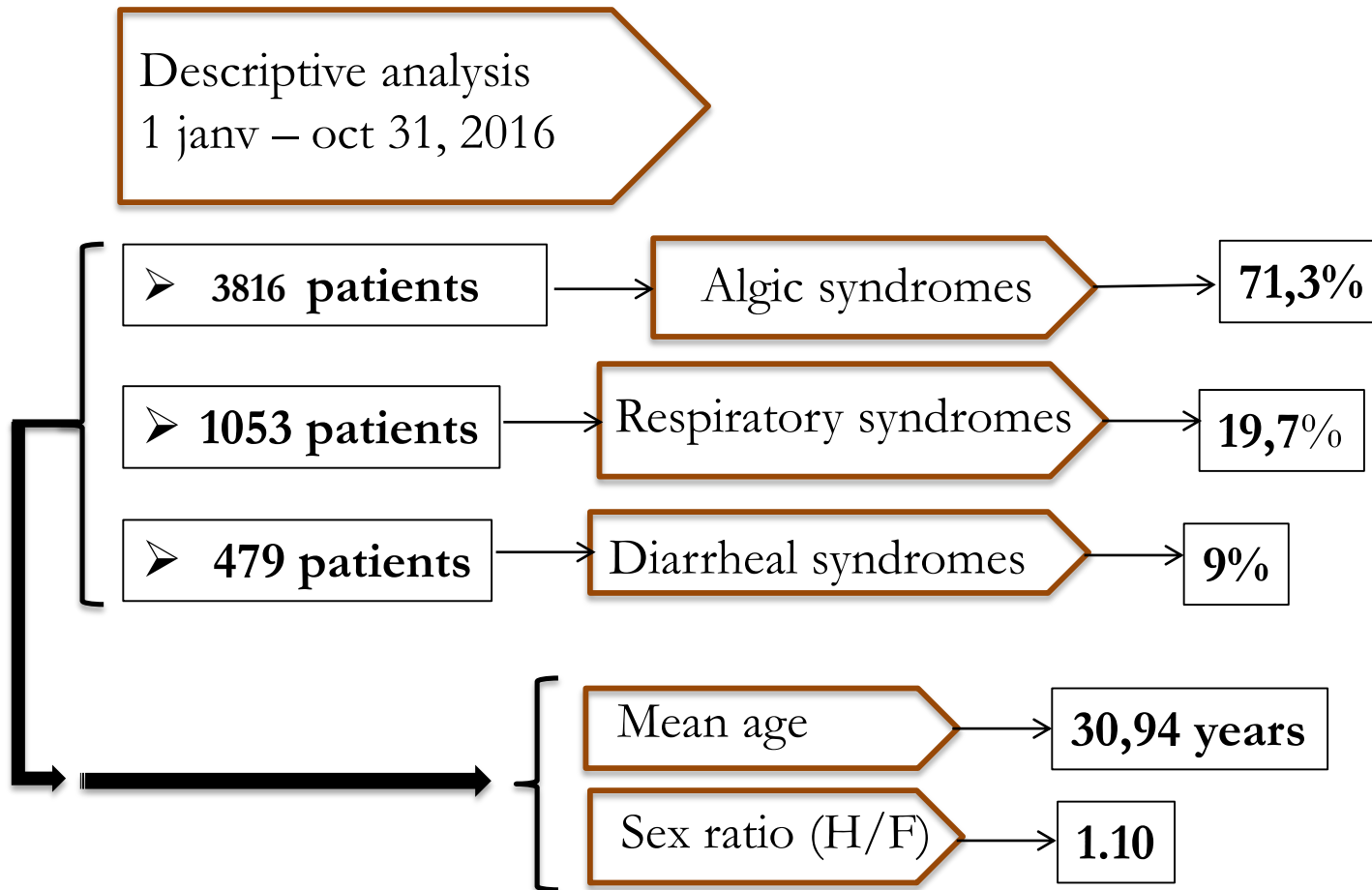
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Results



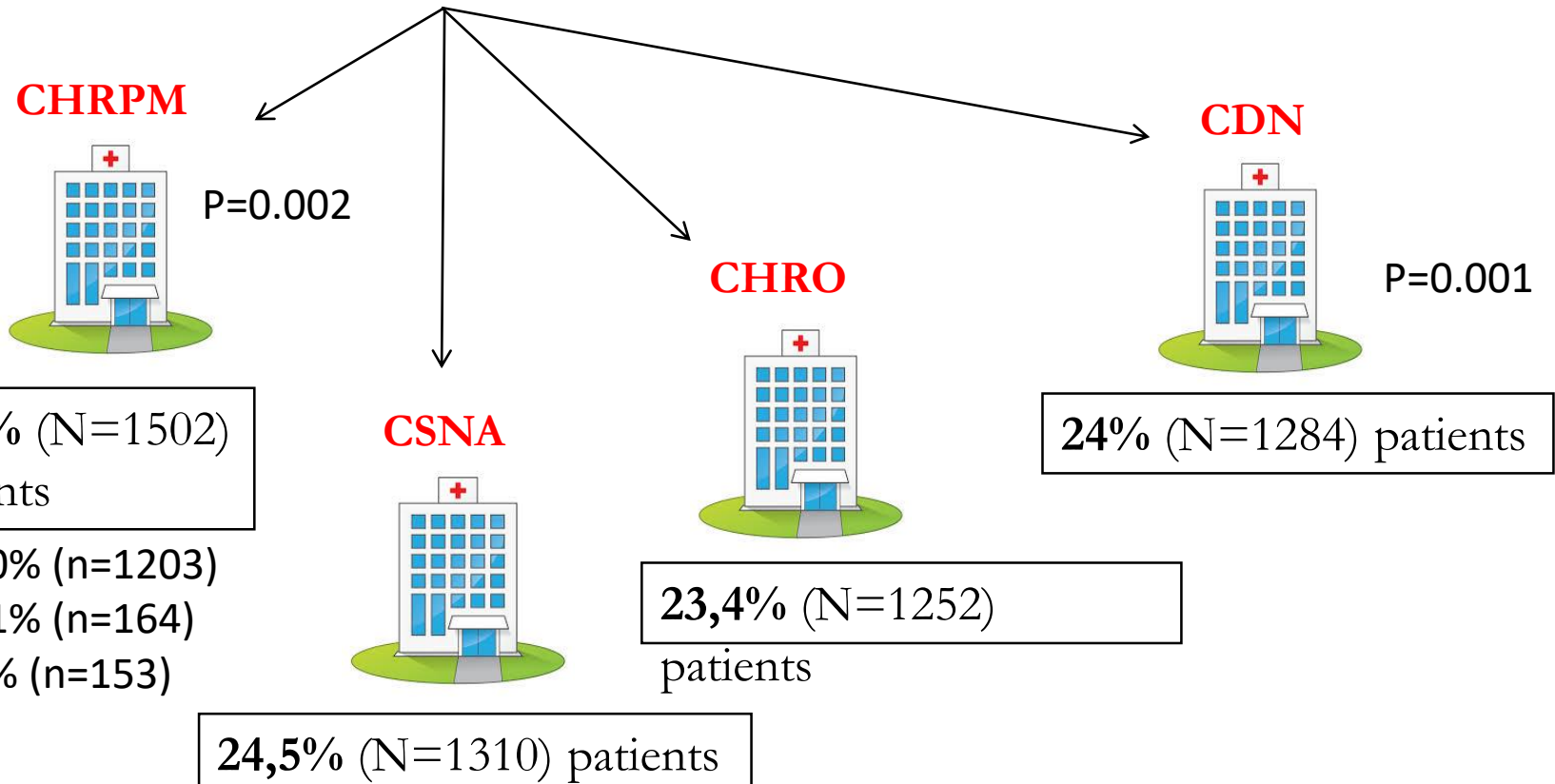
Results... (1)

- **5348 consultants in four hospital structures**



Results... (2)

➤ 5348 consultants in four hospital structures



Results... (3)

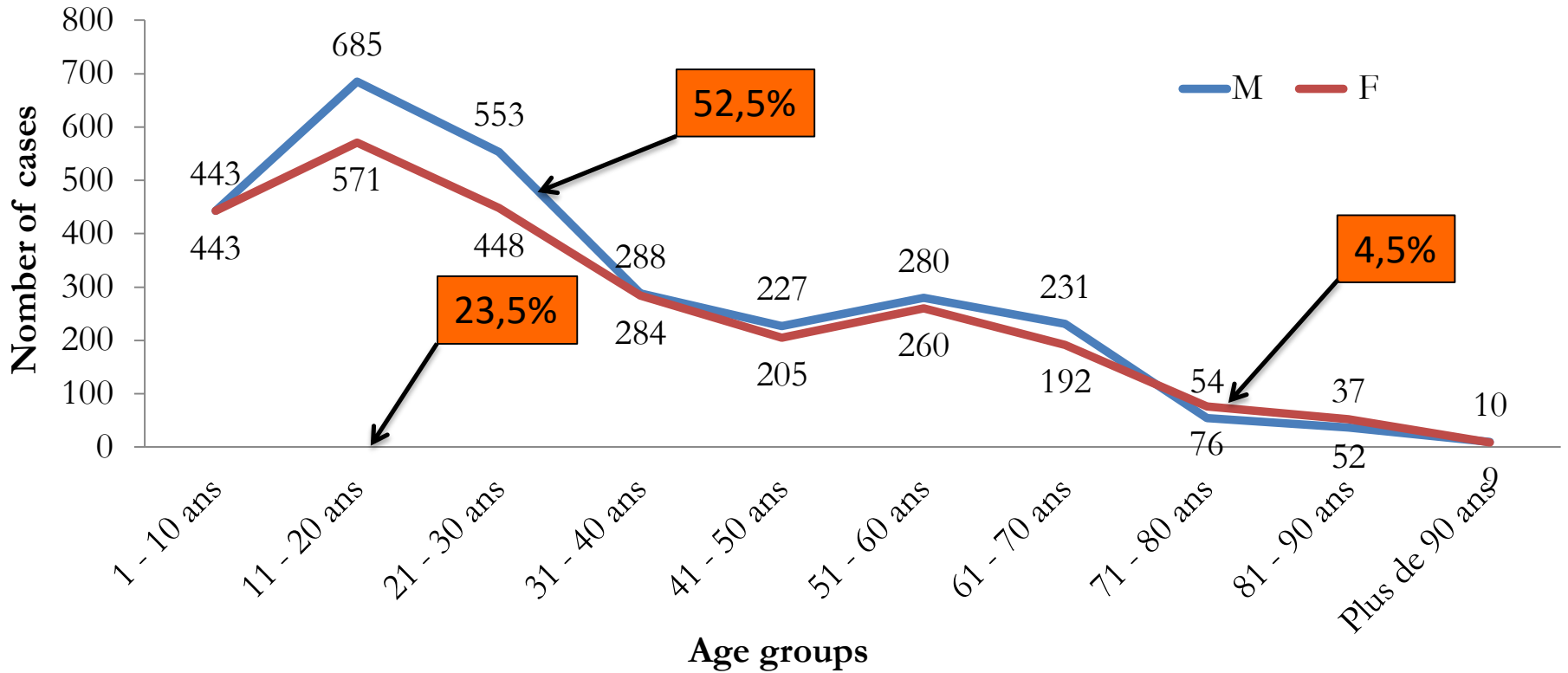


Fig 1. Distribution of age groups and sex of included patients.

Results... (4)

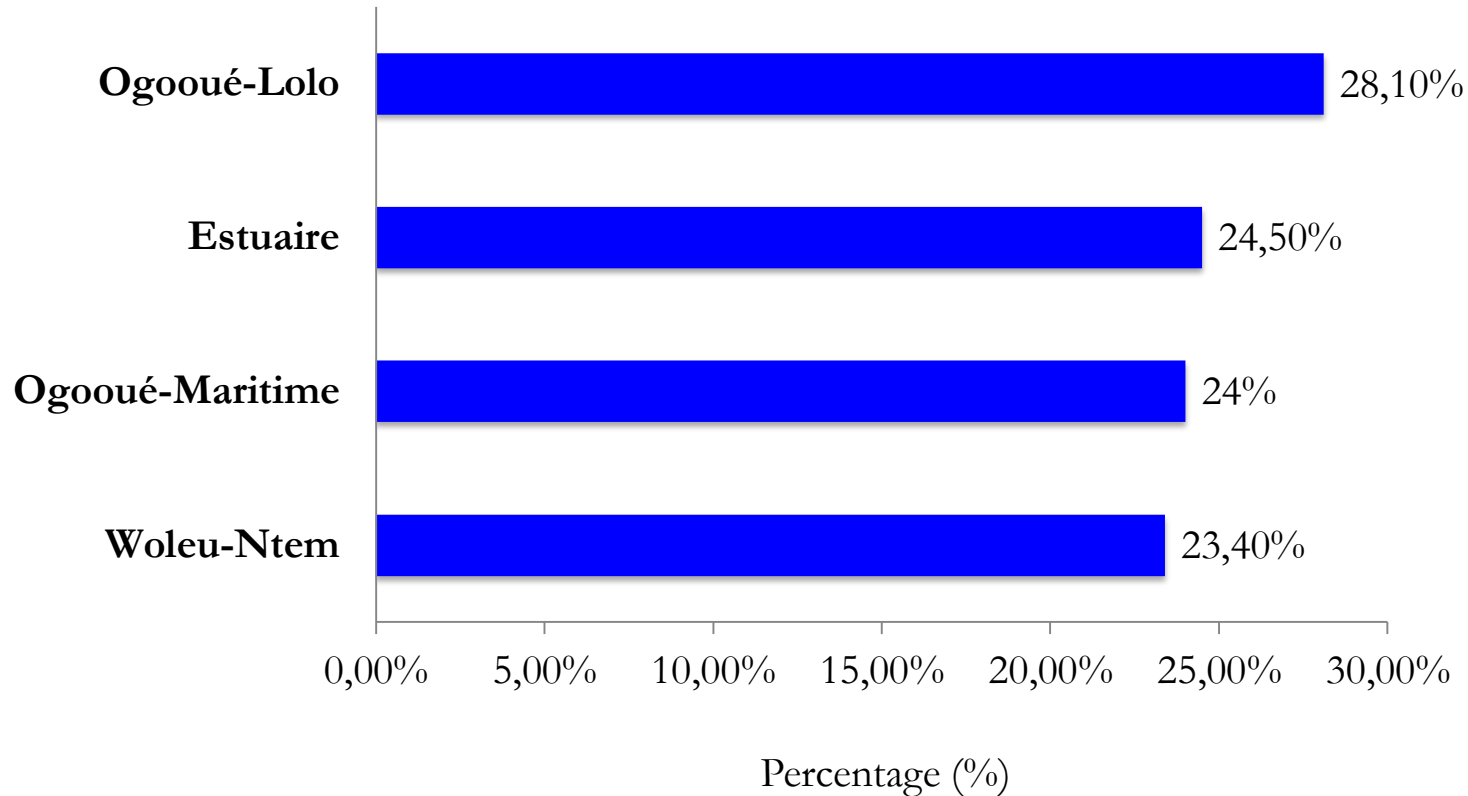


Fig 2. Distribution of patients enrolled in city of residence

Results... (5)

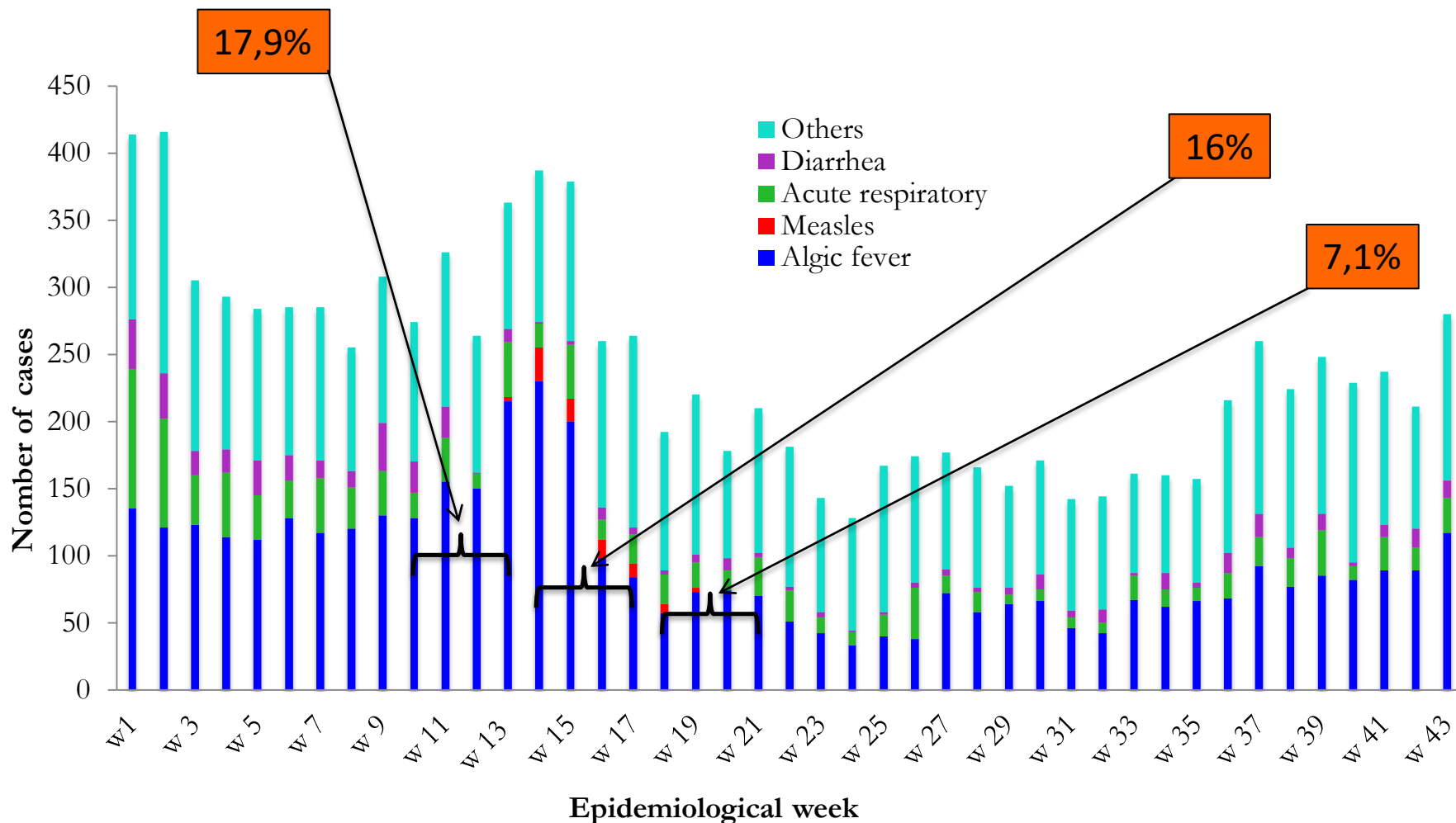


Fig 3. Weekly distribution of syndrom notified in emergency services from.

Part II.

Detection of measles epidemic

Epidemiology...

- Measles virus (*Paramyxovirus*)
- One of the most contagious infectious diseases
- Characteristic/ Reservoir exclusively human
- Cosmopolitan, with the exception of a few Islands and Western Europe – 50,000 deaths/year in the world
- Mostly aerial transmission (Pflügge droplets or direct contact with rhino-pharyngeal secretions)

[*Moss and Strebel. 2011*].

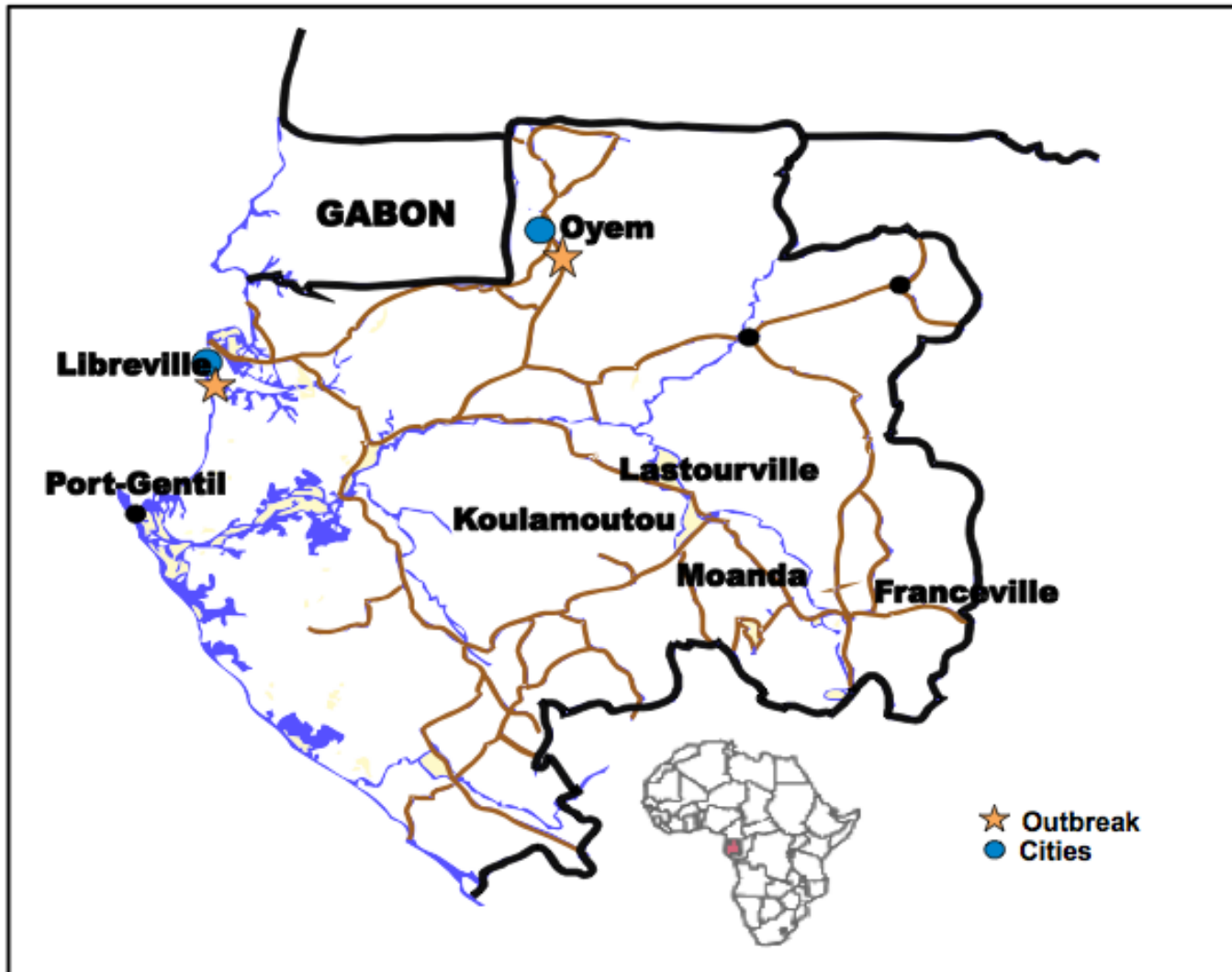


Fig 1. Geographical location of the outbreak, Gabon, March-May 2016 ($N = 79$)

Results
Of



Measles outbreak...

Results...(1)

➤ 79 suspects cases

Descriptive analysis
27 March – 10 May 2016

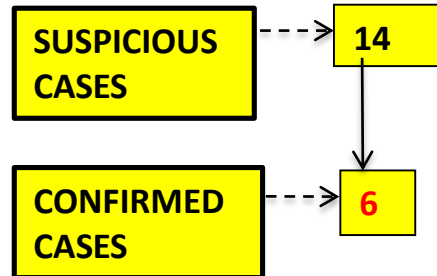
Middle age: 41,75 months

Sex ratio (H/F): 0,88

Confirmed measles/PCR: 16/30

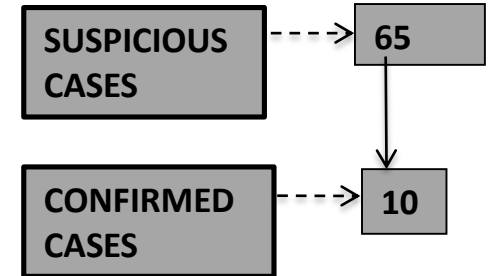
Libreville

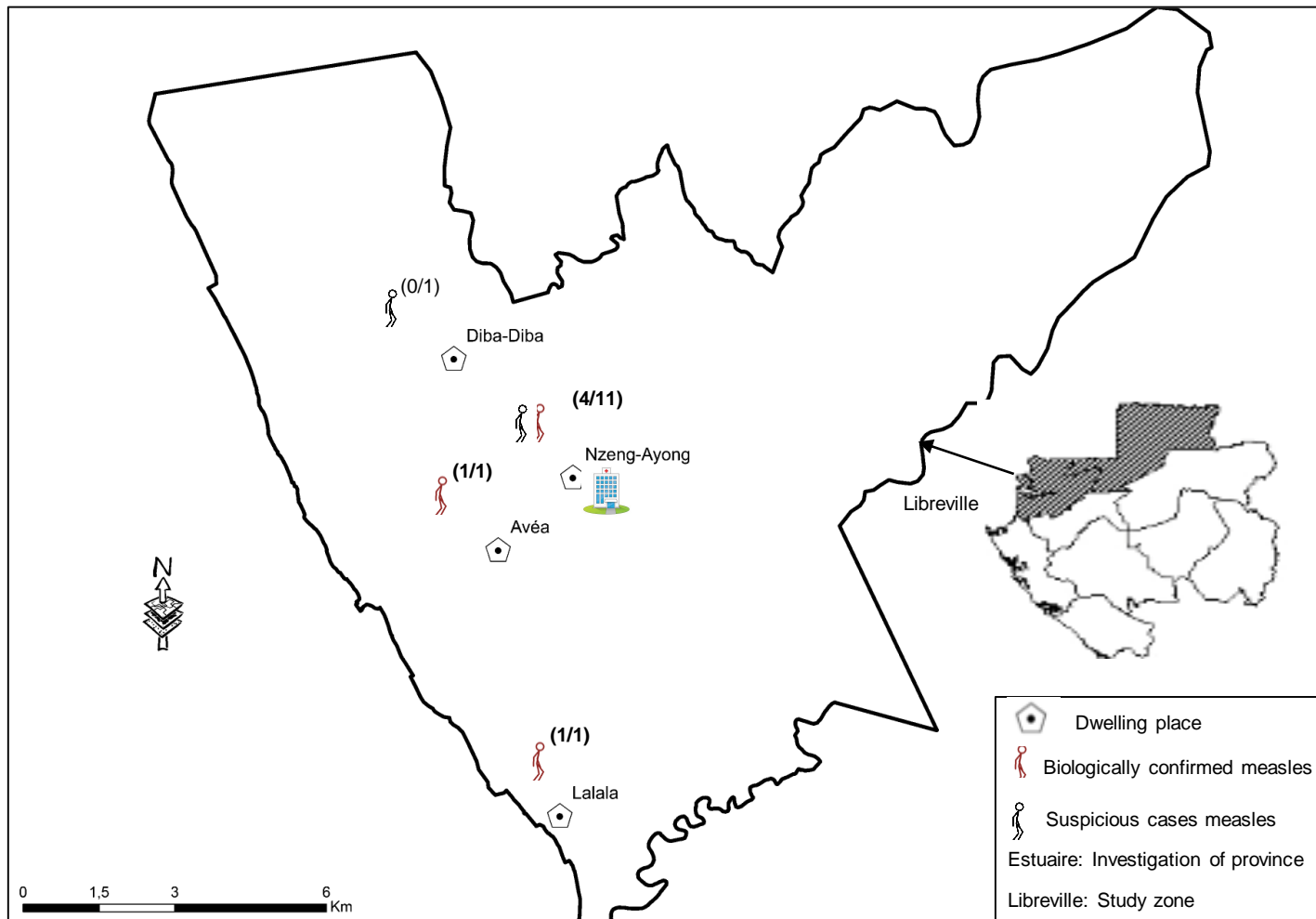
CSNA



Oyem

CHRO





Source: INC 2013

Conception: Pater Noster SIR ONDO E./SESSTIM/UNEEREP-CIRMF/2017

Fig 1a. Distribution of notified measles cases, by health sectors: Libreville of March - May 2016 (N=79).

Results...(1)

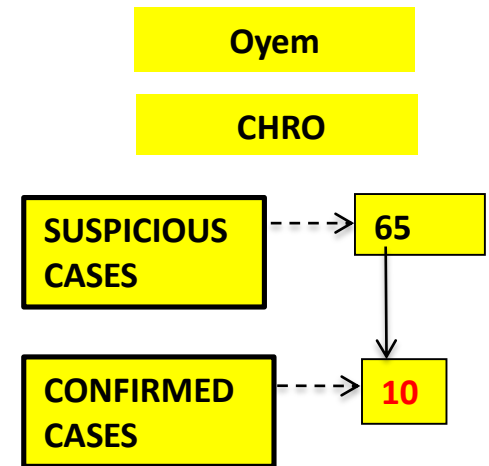
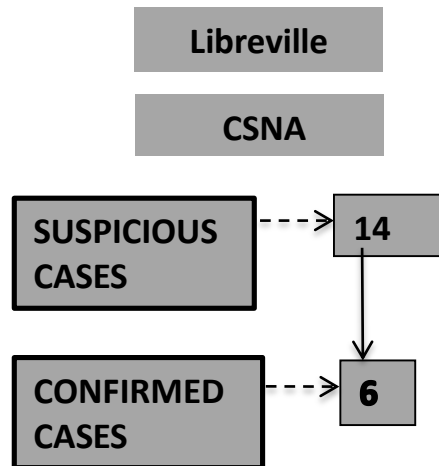
➤ 79 suspects cases

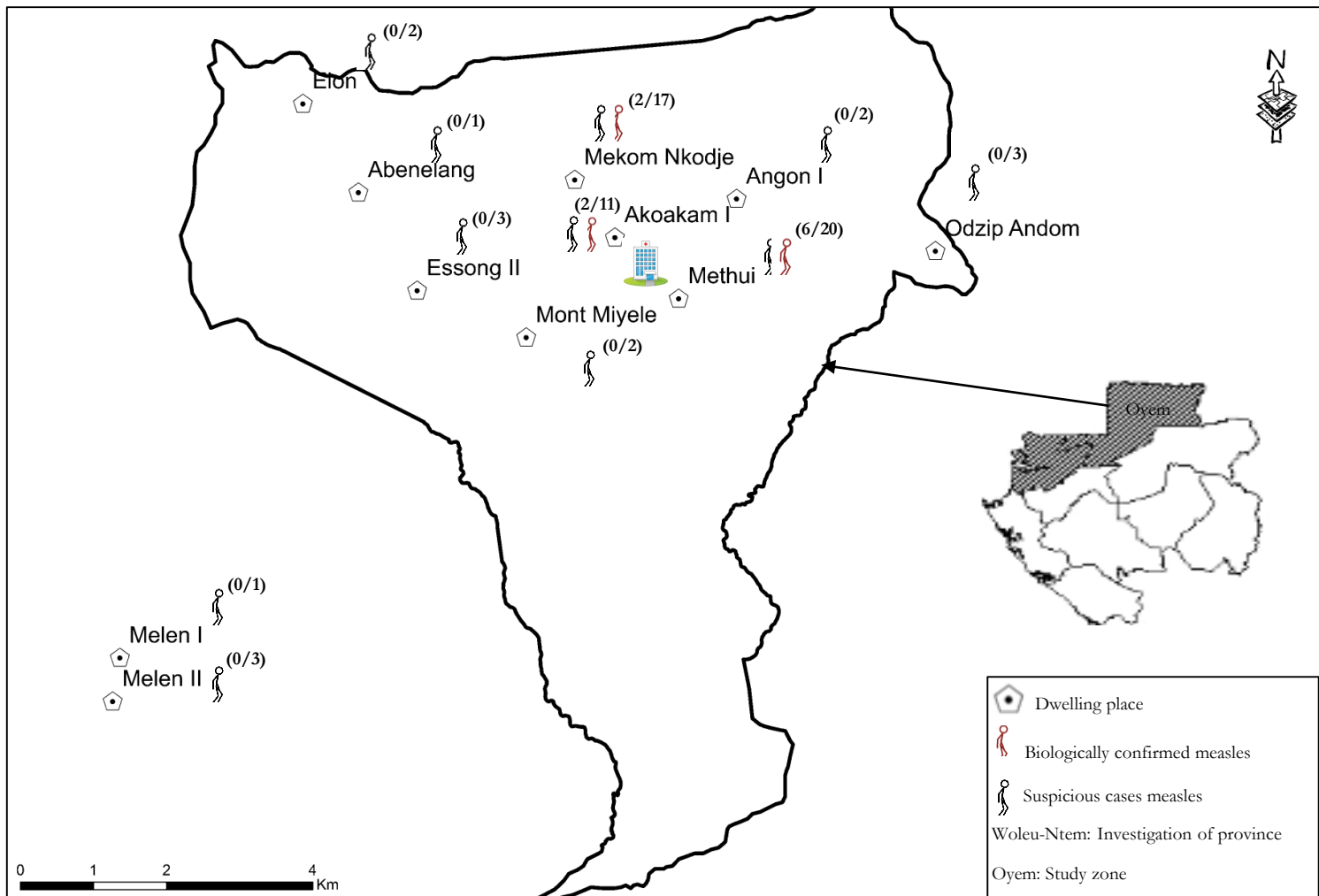
7 descriptive analysis
28 March – 10 May 2016

Middle age: 41,75 months

Sex ratio (H/F): 0,88

Confirmed measles/PCR: 16/30





Source: INC 2013

Conception: Pater Noster SIR ONDO E./SESSTIM/UNEEREP-CIRMF/2017

Fig 1b. Distribution of notified measles cases, by health sectors: Oyem of March - May 2016 (N=79).

Results... (2)

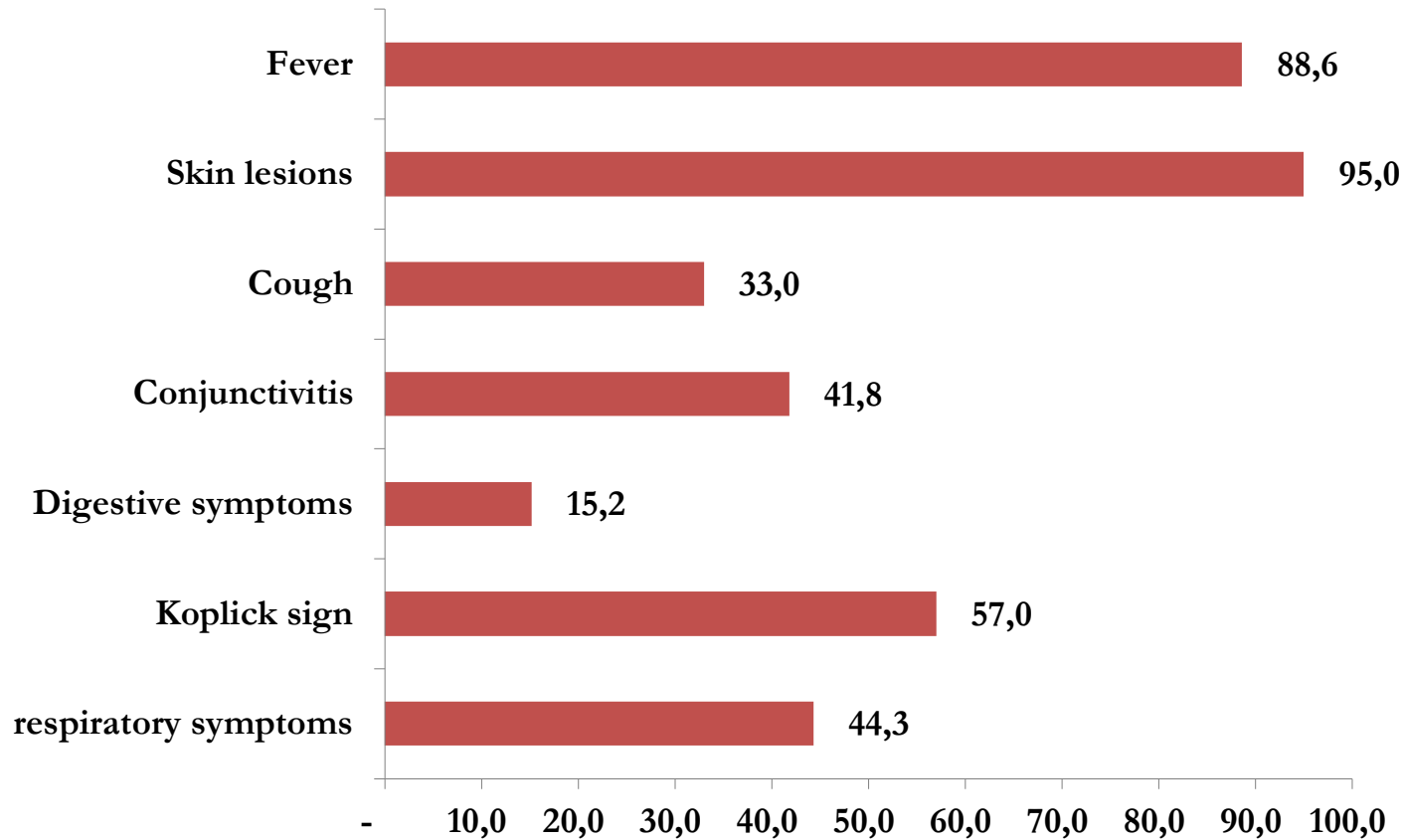


Fig 2. Proportion of symptom follow-up reported during the Measles outbreak, Libreville and Oyem de March - May 2016 ($N=79$).

Results... (3)

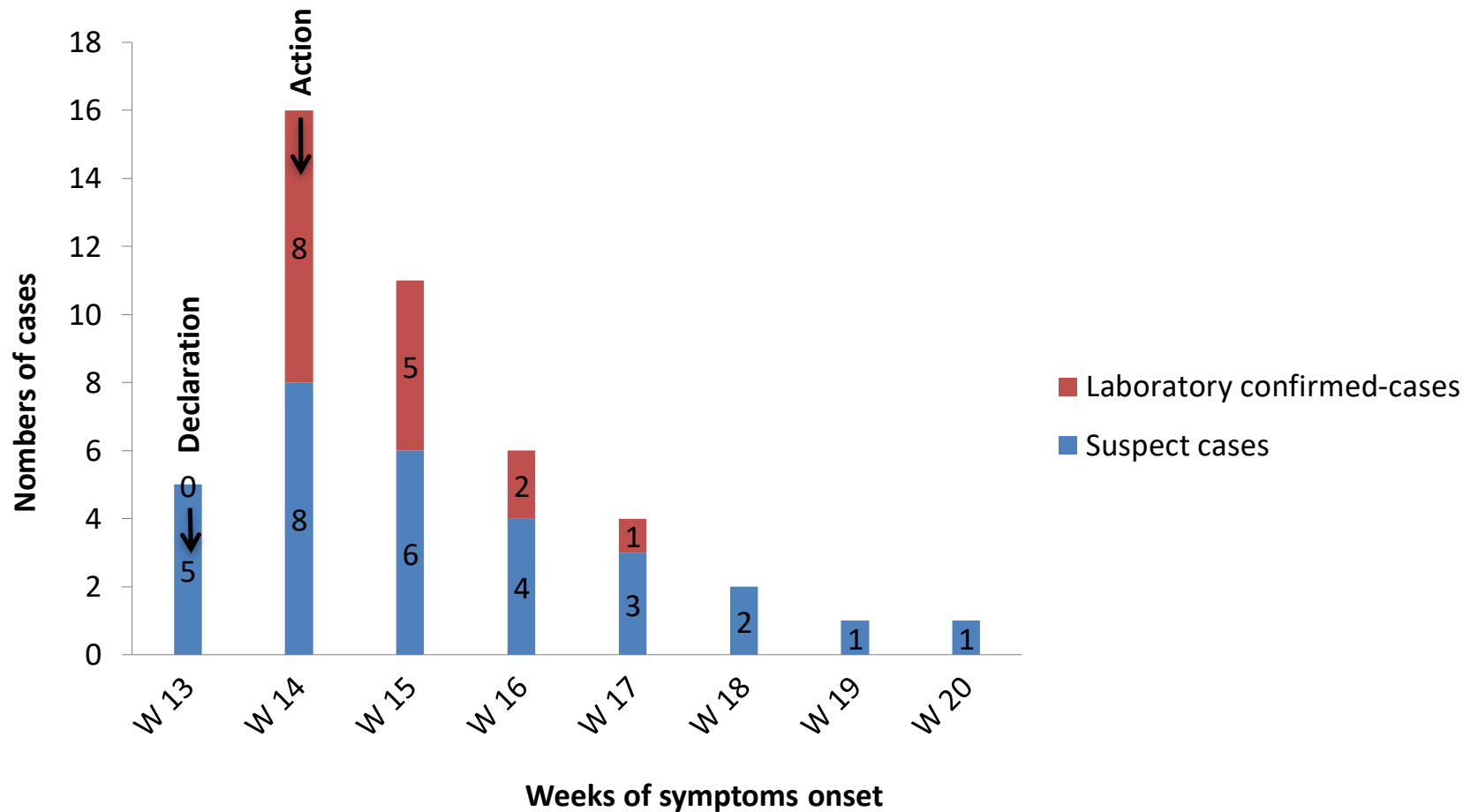


Fig 3. Notified Measles cases, by week of symptoms onset: Libreville and Oyem of March - May 2016 ($N=30$).

Discussion & conclusion (3)

- This monitoring by health facilities:
 - Provides information in near real time to estimate the impact of a local health event;
 - Exemple: measles outbreak detection case in 2016;
- The sustainability of this monitoring system will allow:
 - have a history being enough to compare the services business with regard to compared with the previous years;
 - Improve the definition of warning levels.

Discussion & conclusion (4)

Limits of the study

- Data absence over the hospitalizations;
- To develop this network where only four medical institutions participate for the moment;
- However, the current system let establish a regular contact by the constitutions and position CIRMF for that much besides all receptor happening signalement usual and unusual.

Conclusion/Perspectives (5)

- Recent and unique monitoring system;
- Complementary sources of information;
- Using mobile telephony for surveillance
- Important and necessary to **implemente** this network on all the national territory;
- A throtough assessment

Publications (1)

- Pater N. Sir-Ondo-Enguier^{1,2}, Larson Boundenga², Edgard Ngoungou³, Xavier Deparis¹, Jean-Bernard. Lékana-Douki^{2,*}. **Syndromic surveillance of infectious diseases with epidemic potential: detection of a measles epidemic in two health centers in Gabon, Central Africa.** Publication prévue dans Infectious disease reports
- Pater N. Sir-Ondo-Enguier^{1,2}, Edgard Ngoungou³, Xavier Deparis¹, Jean-Bernard. Lékana-Douki^{2,*}. **Développement et mise en place d'un réseau de surveillance syndromique pour les maladies infectieuses à potentiel épidémique dans quatre structures sanitaires, Gabon, Afrique Centrale.** Soumission prévue dans Médecine et Santé Tropicales

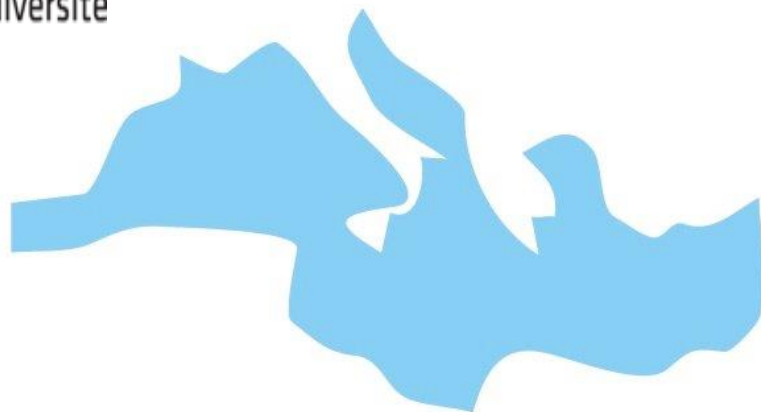
Publications (2)

- S. Lékana^{3#}, Pater N. Sir-Ondo-Enguier^{1,2#}, GD Maganga³, Xavier Deparis¹, Jean-Bernard. Lékana-Douki². **Emergence of Measles Virus in children and adults in Franceville, Gabon.** Soumis dans BMC Infectious diseases
- Pater N. Sir-Ondo-Enguier^{1,2}, RK Imboumy², Edgard Ngoungou³, Xavier Deparis¹, Jean-Bernard. Lékana-Douki^{2,*}. **Real-time epidemiological surveillance of febrile syndrome in South-East Gabon.** Soumission prévue à PanAfrican Medical Journal



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Thank you !