

# Diagnosis of respiratory pathogens in patients with acute respiratory illness using Multiplex Polymerase Chain Reaction in Rwanda, 2012-2013

By **KABANDA Alice**

**5th African Network for Influenza Surveillance and Epidemiology (ANISE) Meeting**

**Kigali, SERENA Hotel ▪ 9-11 March 2016**



# Outlines

1. Introduction
2. Methods
3. Results
4. Conclusion
5. Recommendations
6. Acknowledgements



# Introduction1/2

## Background

- Acute respiratory infections are caused by many different bacteria and viruses
- second as causes of adult and pediatric morbidity and mortality worldwide
- In Rwanda, influenza viruses were identified as an important cause of acute respiratory infection
- The causes of ARI in the cases who tested negative for Influenza virus was unknown
- An accurate, rapid diagnostic test is necessary to ensure the best clinical management



# Introduction2/2

## General Objective

- To determine the major causes of ARI using PCR Multiplex assay.

## Specific Objectives

- To identify major viral and bacterial etiologies of ARI
- To assess the contribution of respiratory pathogens to ARI as mono or co-infection



# Methods 1/1

## Study Design

- cross sectional study

## Settings

- 6 influenza sentinel sites

## Study Population

- Patients with Severe Acute Respiratory Illness (SARI) and Influenza like illness (ILI).

## Laboratory Methods

- Real time respiratory Multiplex PCR for detection of 33 respiratory pathogens (21 viruses and 12 bacteria)



# Results 1/4

**Table 4.1: Demographic characteristics of case-patients - Rwanda, Sept 2012-Sept 2013**

Characteristics	n	%
Total number of patients enrolled	1426	100
Number of patients enrolled by sentinel hospital	1419	100
CHUB	142	10
CHUK	127	9
Gihundwe	308	22
Kibagabaga	162	11
Kibungo	263	19
Ruhengeri	417	29
Case-Patients classification	1426	100
ILI	288	20
SARI	1138	80
Laboratory testing results	1368	100
Negative	200	15
Positive	1168	85
Sex	1424	100
Male	710	49.9
Female	714	50.1
Age	1419	100
Median,[Range]	2.4y [0.1y-91y]	
<1 y	423	30
1-4 y	468	33
5-17y	173	12
18-49y	259	18
50-64y	56	4
≥65y	40	3



# Results 2/4

## Viral Results

The most common respiratory viruses identified were

- Cytomegalovirus, [259 (19%)]
- Rhinovirus [225 (16%)],
- RSV [(173(13%))],
- Adenovirus [(173 (13%))], and
- Influenza virus [127 (9%)].



# Results 3/4

## Bacteria Results

The most common bacteria detected were

- *Streptococcus pneumonia* [(427(31%)]
- *Klebsiella pneumonia* [(420 (30%)]
- Moraxella [304 (22%)]
- *Haemophilus influenza* [134 (10%)]





# Results 4/4

- 1368 specimens tested 15 % were negative
- 85 % were positive with 70% of co-infections

The most co infections detected were

- rhinovirus and enterovirus
- Moraxella and streptococcus
- streptococcus and rhinovirus



# Conclusion

- A very high percentage of the samples were positive giving a pathogen signature in nearly 85% of cases
- Cytomegalovirus, Respiratory Syncytial Virus Rhinovirus, *Streptococcus pneumonia* and *Haemophilis influenza* were the most prominent pathogens detected



# Recommendations

To the National Reference Laboratory and Epidemics Surveillance Response Division

- further studies based on serology and virus isolation are needed to properly distinguish between infection and colonization

To Ministry of Health/Clinical Services Unit

- The Respiratory Multiplex PCR test could be included in the laboratory package at district level for quick diagnosis



# Acknowledgement

- Rwanda Ministry of Health
- RBC/ESR
- RBC/NRL
- CDC-Rwanda
- University Of Rwanda/ School of Public Health



THANK YOU

MURAKOZE

