MOROCCO

7th Mena Influenza Stakeholders Meeting

Organized by Fondation Mérieux

Riga, Latvia
9-10 September 2017

Reminder of
COUNTRY OBJECTIVES FOR THE UPCOMING 3 YEARS

- Promotion of influenza vaccination

- Increase Influenza vaccine coverage rate (HCWs)

- Strengthening Influenza surveillance

- Strengthening pandemic preparedness and response capacities

- Conducting public health research

ACTION PLAN YEAR 2018 (1)

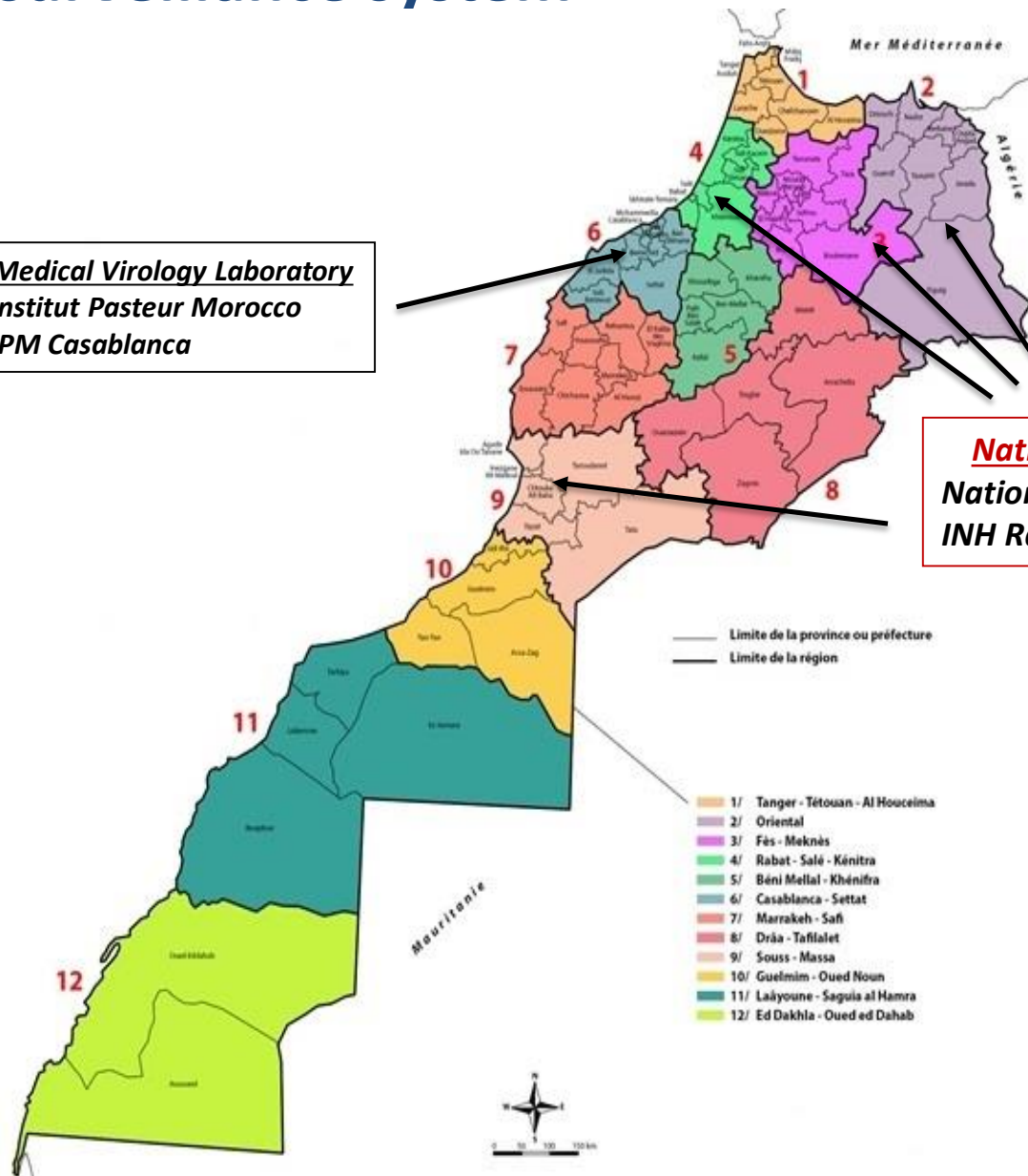| COMPONENTS	Objectives /Activities	Timetable 2018				Challenges
		Q1	Q2	Q3	Q4	
SURVEILLANCE	**Strengthening surveillance of influenza and SARI** : * Development of a comprehensive SARI monitoring manual * Staff training (workshops in regional hospitals) * Implementation of an electronic database for surveillance * National disease burden estimates of Influenza (morbidity and mortality – specific risk groups) **S**trengthening Virological Diagnostic Capacities * Decentralization of molecular diagnostic of Influenza in 4 additional regional labs* * Enhancing lab management (Biosafety, Biosecurity, Shipment and transport of specimens) * Update of the virological surveillance guide * Sending representative virus isolates to one of the WHO CCs for further characterization *in a timely manner.* * Conduct routine antiviral resistance testing	X X X X X X	X X	X		Involvement of the regions Stable and long term funding

Influenza surveillance system

Medical Virology Laboratory
Institut Pasteur Morocco
IPM Casablanca

National Influenza Center
National Institute of Hygiene
INH Rabat

1/ Tanger - Tétouan - Al Houceima
2/ Oriental
3/ Fès - Meknès
4/ Rabat - Salé - Kénitra
5/ Béni Mellal - Khénifra
6/ Casablanca - Settat
7/ Marrakeh - Safi
8/ Drâa - Tafilalet
9/ Souss - Massa
10/ Guelmim - Oued Noun
11/ Laâyoune - Saguia al Hamra
12/ Ed Dakhla - Oued ed Dahab

Influenza surveillance system
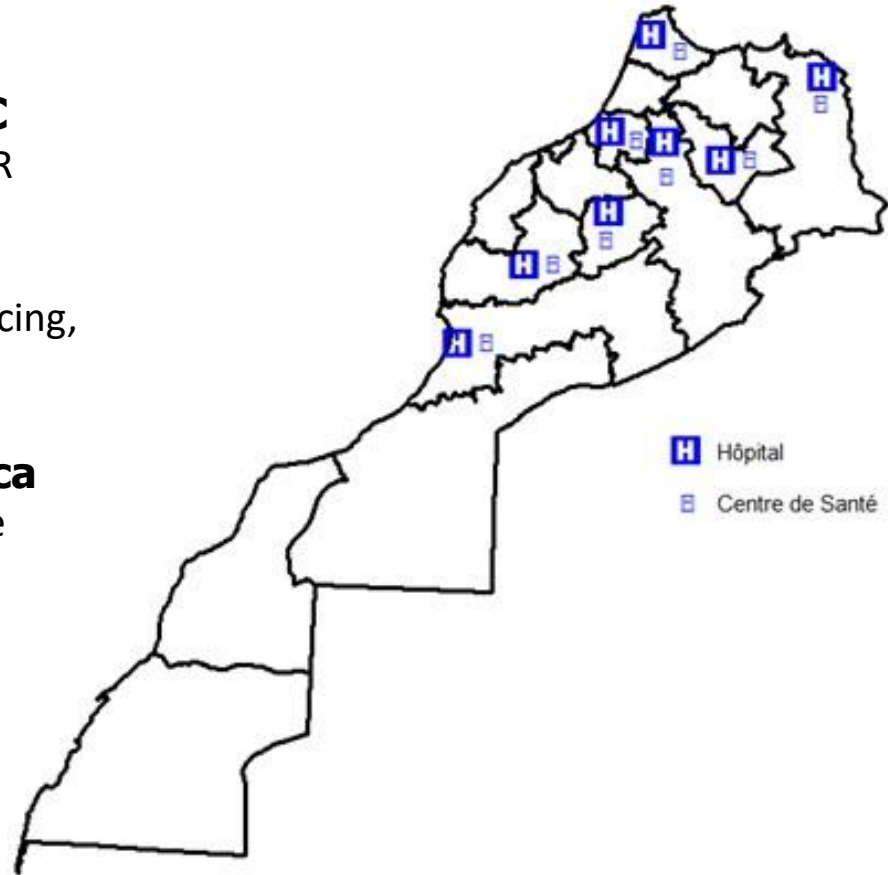## *Laboratory Network*

* 8 Regional Laboratories / HC
Detection and identification by RT-PCR

* NIC – INH Rabat
Confirmation RT-PCR, culture, sequencing, antiviral resistance

* Pasteur Institute - Casablanca
Detection & Confirmation, Cell culture
Sequencing, antiviral resistance

H Hôpital

B Centre de Santé

BSL-2

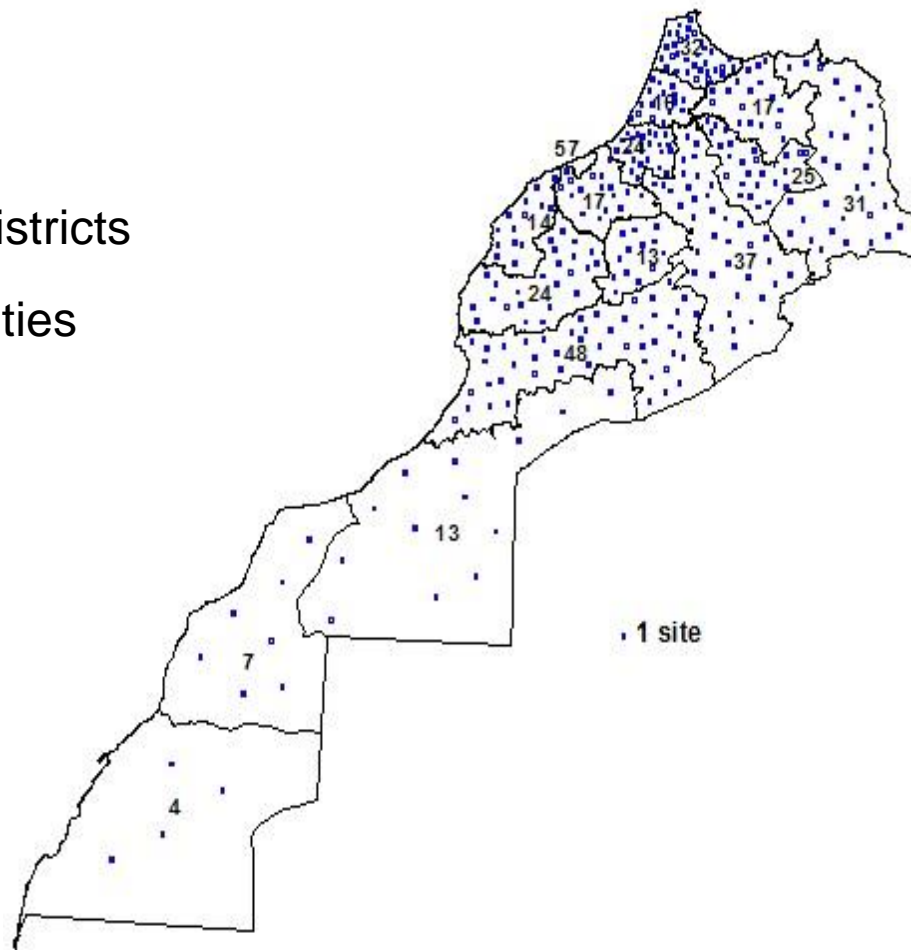# Molecular Biology

Cell Culture

BSL-3+

Influenza surveillance system
ILI Surveillance (2004)

– **378** Health Centers in all districts

– **80** private physicians : 9 Cities

ACTION PLAN YEAR 2018 (1)

COMPONENTS	Objectives /Activities	Timetable 2018				Challenges
		Q1	Q2	Q3	Q4	
SURVEILLANCE	**Strengthening surveillance of influenza and SARI** : * Development of a comprehensive SARI monitoring manual	X				Involvement of the regions
	* Staff training (workshops in regional hospitals) * Implementation of an electronic database for surveillance	X	X			
	* National disease burden estimates of Influenza (morbidity and mortality)			X		
	Strengthening Virological Diagnostic Capacities * Decentralization of molecular diagnostic of Influenza in 4 additional regional labs	X				Stable and long term funding
	* Enhancing lab management (Biosafety, Biosecurity, shipment and transport of specimens)	X				
	* Update of the virological surveillance guide	X				
	* Sending more representative virus isolates to one of the WHO CCs *in a timely manner,* for further characterization	X				
	* Conduct routine antiviral resistance testing		X			

Number of specimens positive for influenza by subtype

Morocco

07/09/2017
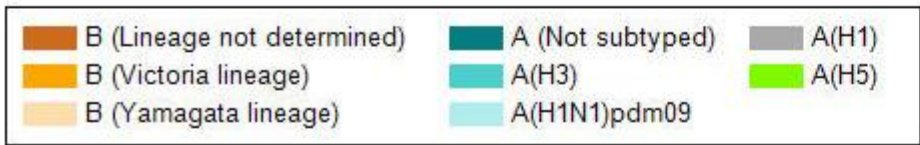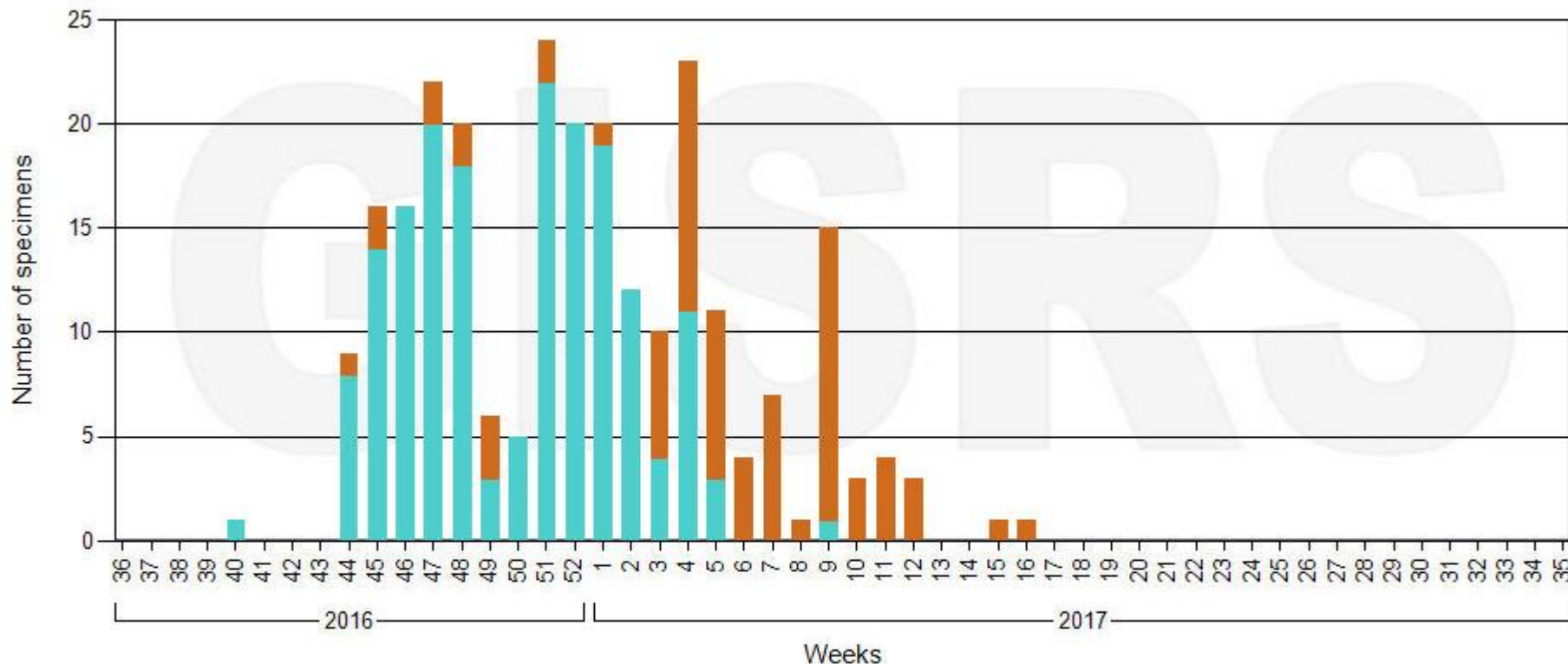
Data source: FluNet (www.who.int/flunet), GISRS

© World Health Organization 2017

* 178 samples : **24.71 %** Influenza virus detection

Flu A 95.45 % - Flu B 4.54 %

Influenza type A viruses have prevailed over type B, with A(H3N2) viruses and Victoria B lineage

Influenza B 4%

Influenza A 96%

Influenza A
Influenza B
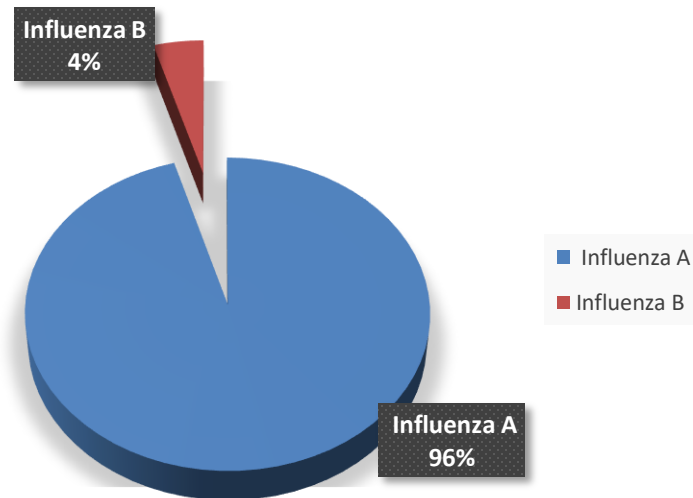
Multiplex RT-PCR - Respiratory Samples

* Type of samples: nasal swabs form patients with ILI

* Collection period: 2014-2016

* Collection location: health care units in Casablanca participating in surveillance of ILI

* Amount of samples analyzed: 200

* Method of analysis:

RespiFinder® 2SMART kit from PathoFinder # Pathogen specific in-house real-time PCR

Patho Finder

16 RNA virus
2 DNA virus
4 bacteria

Next Generation Sequencing – Respiratory Infections

32 patient samples (nasal swabs) sequenced on a Illumina HiSeq
15 DNA and 15 corresponding RNA samples + 2 negative controls

In order to determine the causative agents of the respiratory symptoms, the NGS data were screened for sequences related to known viral, bacterial and fungal pathogens.

The pathogen detection pipeline used in this study only checks for similarities between reads and known reference sequences (NCBI nt)

For several samples, Bacteria or Virus species which might be related to infections or diseases causing respiratory symptoms, could be identified

Influenza A virus (sample 130)
Rhinovirus C (sample 158)
Haemophilus parainfluenzae (Sample 105, 138 and 144)

+ Cost equipement and Reagents +
+++ Bioinformatics analysis +++

ACTION PLAN YEAR 2018 (2)

COMPONENTS	Objectives /Activities	Timetable 2018				Challenges
		Q1	Q2	Q3	Q4	
VACCINATION	**Produce the evidence based studies** * Conduct the KAP study for Pregnant women (collaboration with CDC)	X	X			Low level of vaccine acceptability
	Increase the vaccine coverage rate among * Health professionals (60 000, < 40 %) * People with chronic diseases (20 000 diabetics)	X			X	Communication strategy
	Expanding immunization for other risk groups * Pregnant women, Children, elderly				X	Financial barriers

ACTION PLAN YEAR 2018 (3)

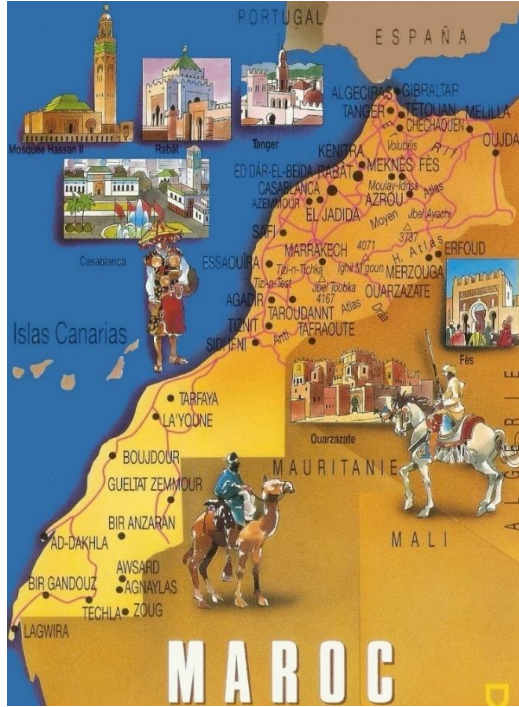| COMPONENTS	Objectives /Activities	Timetable 2018				Challenges
		Q1	Q2	Q3	Q4	
SOCIAL MOBILIZATION / EDUCATION / AWARENESS	**Improve the communication for the general public** * Flyers with key messages on influenza and vaccination * TV spot during the flu vaccination campaign * Prevention messages in the print media **Educational efforts among HCWs** * Awareness posters * Seminars during the immunization campaign	X X	X X	X		Vaccine acceptability Perceptions and beliefs difficult to change
ADVOCACY & POLICY	* Conferences, press release : starting of Flu Season MoH, Pasteur Institute * * Policy required to introduce influenza vaccines into the national immunization schedules * Involve scientific societies (Pediatrics, obstetrics, Cardiology) and NGOs	X			X	Financial barrier

2016-2017

ACTION PLAN YEAR 2018 (3)

COMPONENTS	Objectives /Activities	Timetable 2018				Challenges
		Q1	Q2	Q3	Q4	
SOCIAL MOBILIZATION / EDUCATION / AWARENESS	**Improve the communication for the general public** * Flyers with key messages on influenza and vaccination * TV spot during the flu vaccination campaign * Prevention messages in the print media **Educational efforts among HCWs** * Awareness posters * Seminars during the immunization campaign	 X X	 X X	 X		Vaccine acceptability Perceptions and beliefs difficult to change
ADVOCACY & POLICY	* Conferences, press release : starting of Flu Season MoH, Pasteur Institute * Policy required to introduce influenza vaccines into the national immunization schedules ? * Involve scientific societies (Pediatrics, obstetrics, Cardiology) and NGOs	 X			X	Financial barrier

CONCLUSIONS / HIGHLIGHTS

* Influenza one of MoH priorities;

* Sentinel surveillance since 1995;

* Some gaps need to be improved:

  - Estimate of the burden disease of influenza

  - Establish a communication startegy

  - Implementation of vaccination for risk groups

Thank you