

MOROCCO

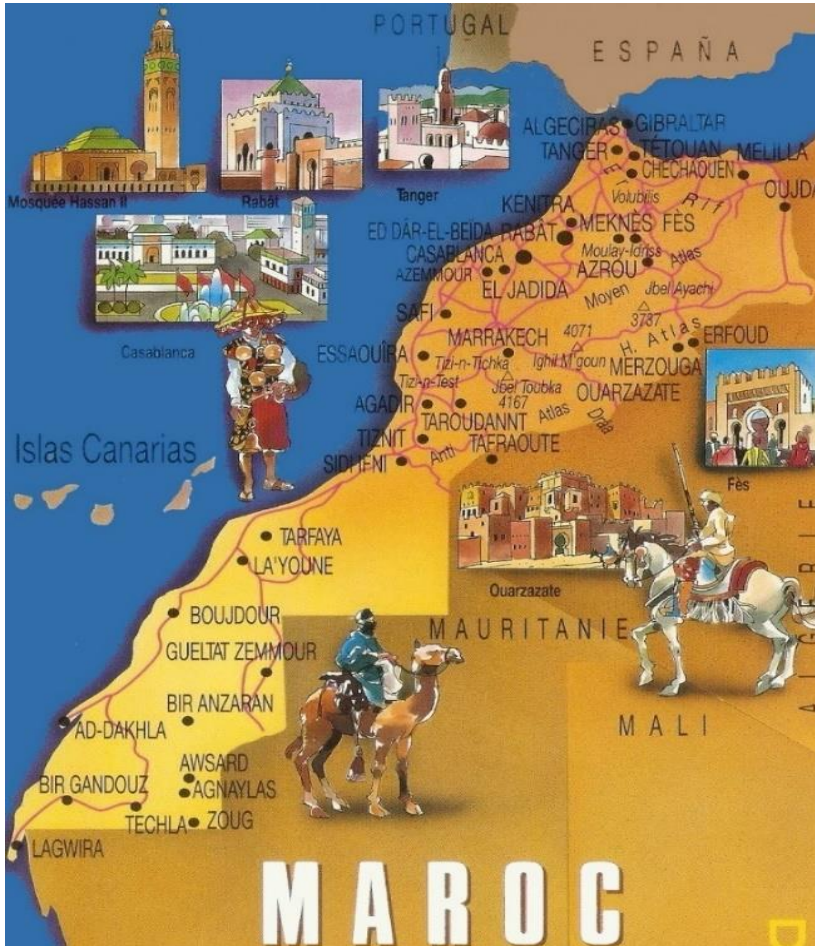
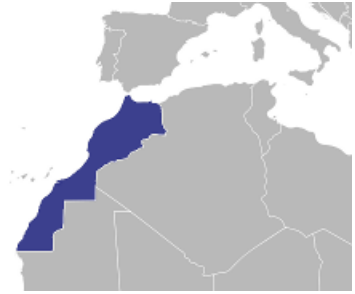
Jalal NOURLIL

9th MENA Influenza Stakeholders Networks Meeting

Copenhagen, Denmark

04-5 October, 2018

Morocco



North-West of Africa

12 regions – 83 provinces

710.850 km²

Population (2014) : **33.848.242**

Mediterranean climate

HIGH
TEMPERATURE



25 °C

LOW
TEMPERATURE



11 °C

SUNSHINE
HOURS



8 HRS

Marrakech - April

National Immunization Programme



Minister of Health, Anas Doukkali

Ceremony hosted by Princess Lalla Meryem,
Chairperson of the National Observatory for
Children Rights
Marrakech, February 2018

Morocco has achieved 95% vaccination coverage, while the immunisation rate increases to 99% for some vaccines.

“Morocco has introduced more than 13 vaccines including 12 vaccines dedicated to children under 5 and another vaccine for women to prevent neonatal tetanus”

National Immunization Programme

* Vaccination against

Viral hepatitis type B

Tuberculosis

Poliomyelitis

Tetanus

Pneumococcus

Measles/Rubella

Rotavirus

Diphtheria, Tetanus and Pertussis and invasive infections due to Haemophilus influenza type B and Viral Hepatitis type B: ***Penta (DTP + HB + Hib)***

* Management of the program : **Directorate of Population/ MoH**

Vaccine supply - Cold chain - Monitoring





Programme National d'Immunisation Calendrier de vaccination 2014

Vaccinations recommandées chez les enfants de moins de 5 ans

Antigènes \ Age	Naissance	Durant le premier mois	2 Mois	3 Mois	4 Mois	9 Mois	12 Mois	18 Mois	5 ans
Vaccin contre l'hépatite B (HB)	HB1n (24h) administrée à la maison d'accouchement ou maternité hospitalière ou clinique privée.								
	Dose non administrée durant les 24 heures	Dose 1							
Vaccin anti BCG (tuberculose)		Dose 1							
Vaccin anti Polio Oral		Dose 0	Dose 1	Dose 2	Dose 3			Dose 4	Dose 5
Vaccin anti Pneumococcique			Dose 1		Dose 2		Dose 3		
Vaccin anti Rotavirus (Série de 3 doses)			Dose 1	Dose 2	Dose 3				
Vaccin anti DTC-Hib-HB (Vaccin Pentavalent)			Dose 1	Dose 2	Dose 3				
Vaccin anti DTC								Rappel 1	Rappel 2
Vaccin combiné RR						Dose 1			
Vaccin Anti-Rougeoleux (VAR)								Dose 1	

- **DTC**: Diphtérie-Tétanos- Coqueluche. **Hib**: Haemophilus Influenzae de type b. **RR**: Rougeole-Rubéole.
- Vaccination supplémentaire à 10 ans puis tous les 10 ans par le DTC et le vaccin anti-Polio oral.

Influenza Surveillance implementation

1995: virological surveillance / NIH

2004 : Clinical surveillance / DELM

2006: Healthcare Workers vaccination

2007: SARI Sentinel surveillance / DELM-NIH-CDC

2008 : Virological Surveillance / IPM Casablanca

2009 : H1N1 pdm – PCC (*Crisis Coordination Centre*) coordinate the response to potential public health emergencies of international concern between different sectors

2013: Cooperation agreement on vaccination / CDC



**National Program for Influenza
Prevention and Control
2015**

National Program for Influenza Prevention and Control

Areas of intervention

1. Strengthening the surveillance of influenza
2. Promotion of prevention, including vaccination
3. Strengthening the medical care of ILI / SARI
4. Strengthening pandemic preparedness and response capabilities
5. Governance / Monitoring / Evaluation
6. Operational research

Virological Influenza surveillance

* 1995 : NIH Rabat (national level)

- Population : consultations in private clinics or medical offices
- WHO case definition ILI
- Epidemiological and virological investigations

* 2008 : Casablanca Region (IPM)

Surveillance for the seasonal human influenza A and B viruses including antigenic characterisation and genetic sequencing

Surveillance for novel emerging human and avian influenza A viruses

Influenza surveillance system

Laboratory Network

* 8 Regional Laboratories / HC

Detection and identification by RT-PCR

1. L'Oriental
2. Tadla-Azilal
3. Fès-Boulman
4. Tanger-Tétouan
5. Meknès-Tafilalet
6. Sous-Massa-Draa
7. Rabat-Salé-Zemmour-Zaer
8. Marrakech-Tensift-Al Haouz

* INH NIC - Rabat

Confirmation RT-PCR, culture, sequencing, antiviral resistance, Reporting Flunet

* Pasteur Institute - Casablanca

Confirmation RT-PCR, culture, sequencing, antiviral resistance, BSL-3 ...



Influenza Surveillance Morocco



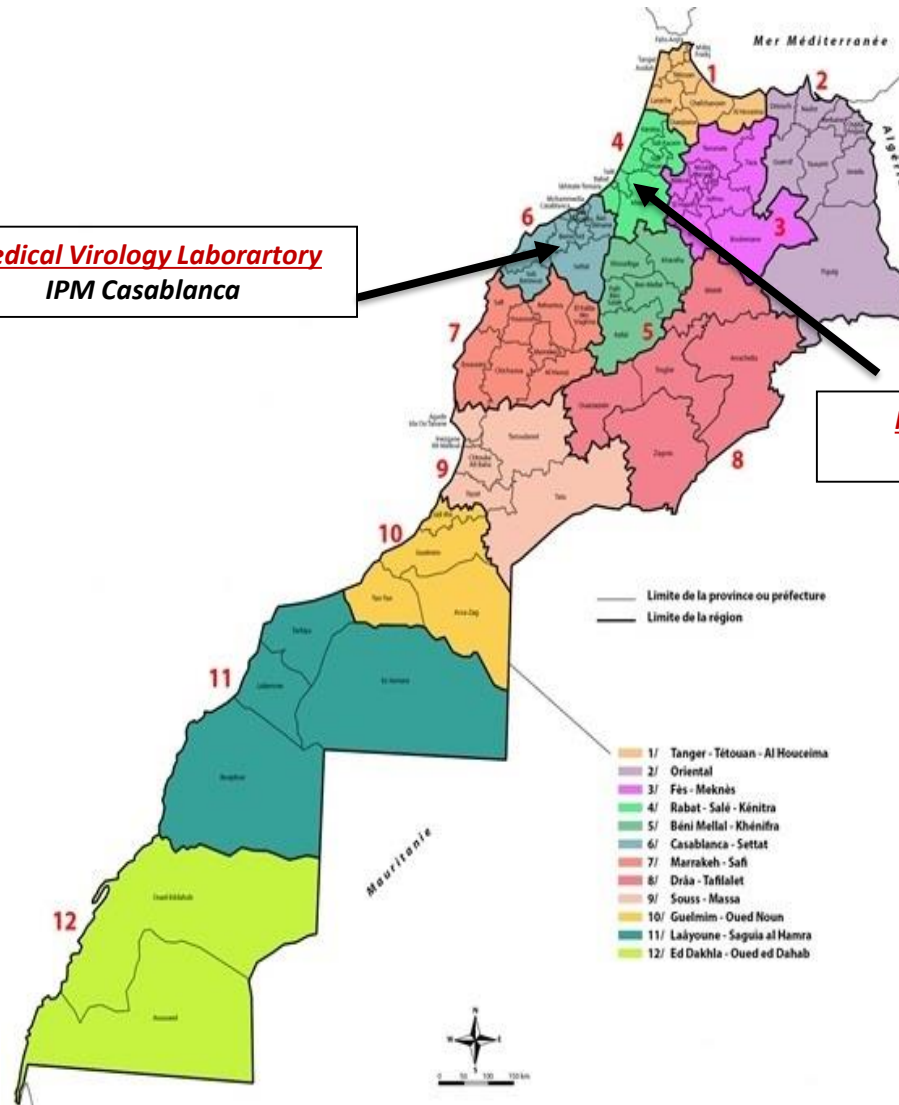
Medical Virology Laboratory
IPM Casablanca



National Influenza Center
INH Rabat



Clinical Surveillance





BSL-2 LAB



Molecular Biology



Cell Culture



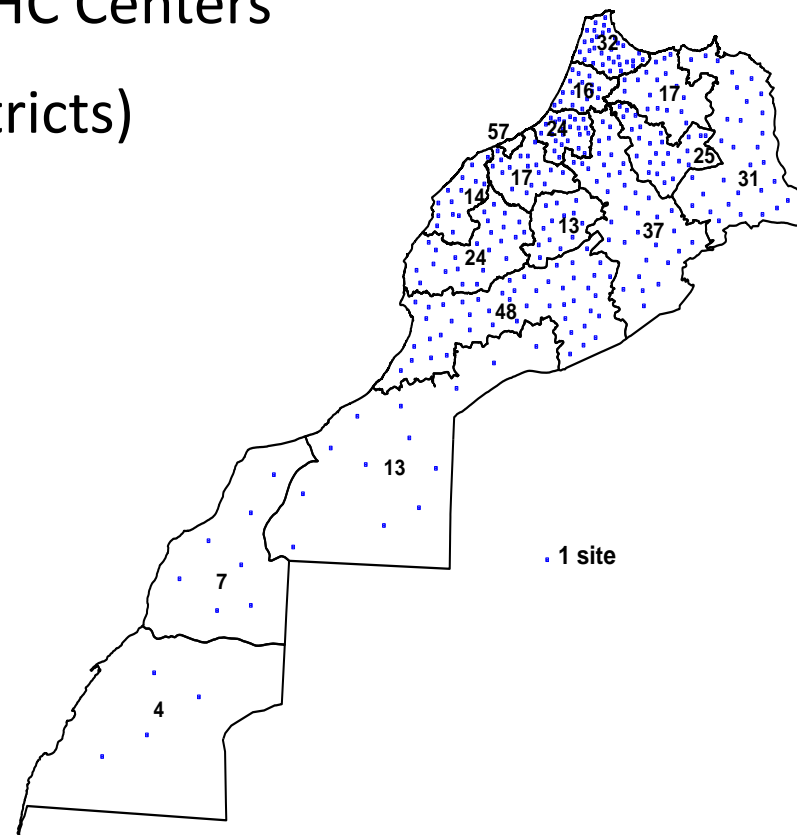
BSL-3+ LAB



Clinical Influenza surveillance

* 2004 : Public sector

- Population: consultations in HC Centers
- 380 Health centers (in all districts)
- WHO case definition ILI



Influenza surveillance system

2007

SARI virological surveillance hospital network

- Population: SARI hospitalized patients
- WHO case definition
- 8 regional hospitals (Pediatric, Pneumology and ICU)

ILI virological surveillance HCS network

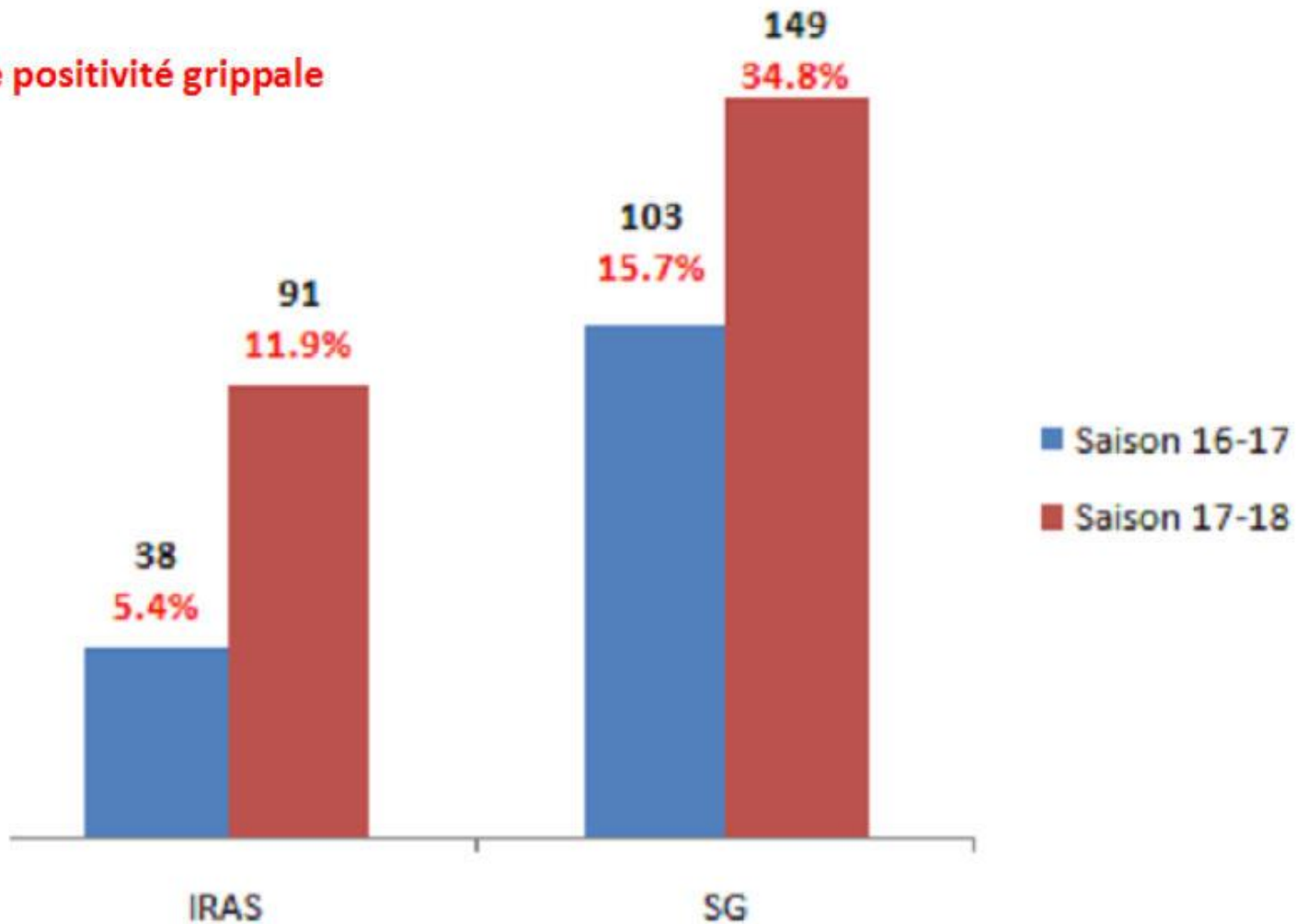
- Population: ILI ambulatory patients
- WHO case definition
- 8 sentinel primary health centers (1 Health center by region)

Influenza Surveillance SARI - ILI

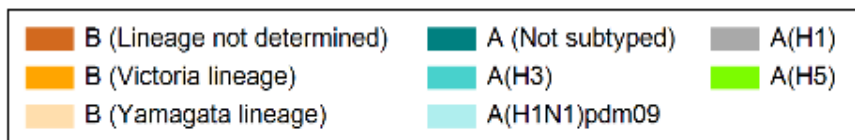
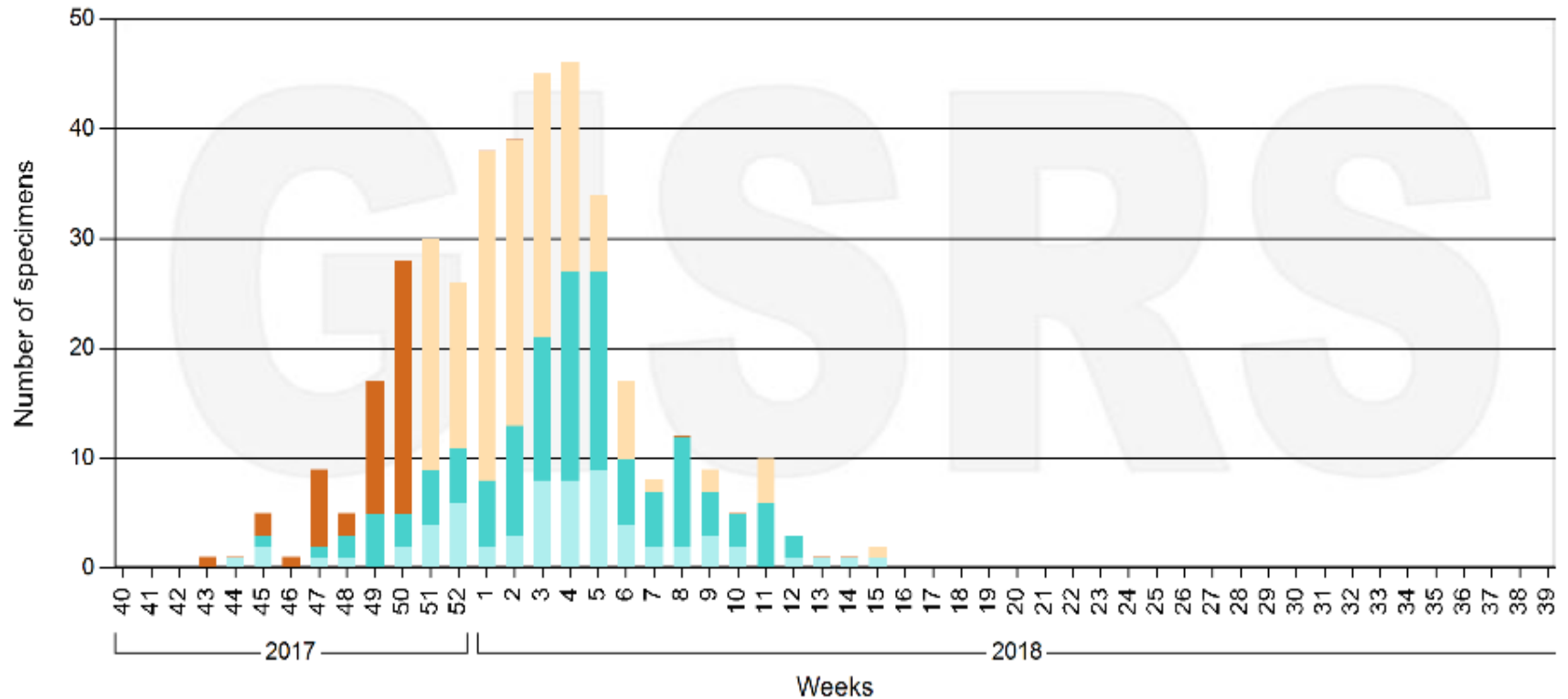
Positivity rate

NB

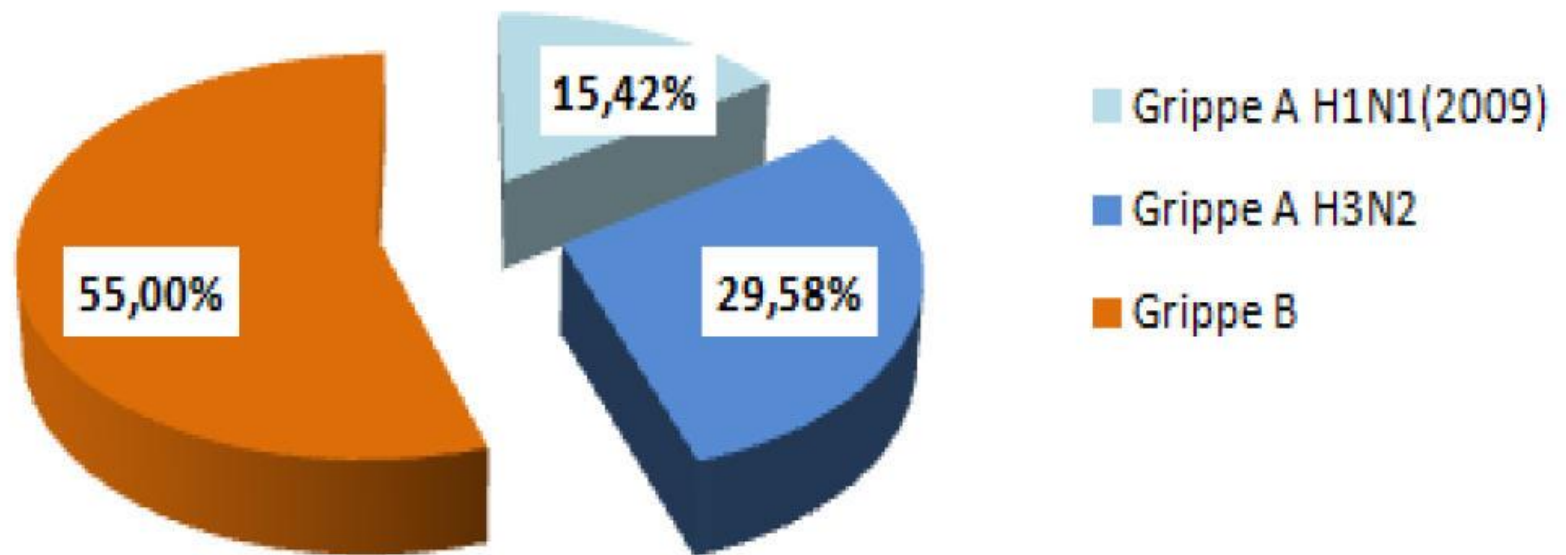
Taux de positivité grippale



Number of specimens positive for Influenza by subtype



Virological Influenza Surveillance 2017 - 2018



National Technical and Scientific Advisory Committee on Vaccination

- * Officially institutionalized by MoH
- * Consultatif experts that help MoH to make effective policy decisions about vaccines implementation.
- * Presentation of Influenza vaccination campaigns
 - 2014 : diabetics & elderly people vaccination
 - 2016 : PW vaccination

***Need of more Epidemiological Evidence on burden disease
in target populations***

Burden disease: Incidence of influenza virus-associated SARI

Incidence des influenza SARI / 100 000 Habitant during 2011-2012 season

Age group in years	Incidence of influenza SARI (/100 000 Hab)	inférieur value IC (95%) (/100 000 Hab)	Superior value IC (95%) (/100 000 Hab)	Proportion of SARI mortality associated with influenza	Proportion of SARI mortality any causes
0<2	235,17	98,81	559,71	0%	2%
2<5	73,58	49,38	109,63	0%	1%
5<15	0	-	-	50%	5%
15<50	3,64	0,51	25,84	0%	16%
50<65	0	-	-	-	0%
=65	0	-	-	-	16%

Burden disease study in high risk group

- Ibn Sina University Hospital - Rabat
- 140 SARI patients admitted to ICU between ***July 2014 and August 2016***.
 - Average age of 49.5 years ± 18.4 years
 - Sex Ratio: 80 H, 60 F
 - Comorbidity > 90 %
- **Prevalence rate of influenza SARI: 20.0%**
 - Influenza A (8.6%)
 - Influenza B (2.1%)
 - Other viruses (9.3%)
- **Influenza-related mortality**
 - Overall mortality rate of all SARI : **37%**
 - Mortality rate of viral SARI cases: **28.6%**
 - Mortality rate of influenza H1N1 SARI: **50%**

Co-morbidities associated with Influenza

2017-2018

RF Categories	At least 1 RF (***)	Asthma (***)	Diabetis (**)	Chro. Respi Dis. (***)	Chro. Ren. Fail. (***)	Card. Dis. (*)	Hémato. Dis. (*)	Neuro. DiS. (*)	Pregnancy (*)	Total
Prim. Care U ILI	31	4	12	2	0	12	0	0	1	364
	8,50%	1,10%	3,30%	0,50%	0,00%	3,30%	0,00%	0,00%	0,30%	
Hospital SARI	176	41	33	49	20	22	5	3	3	569
	30,90%	7,20%	5,80%	8,60%	3,50%	3,90%	0,90%	0,50%	0,50%	
Total	207	45	45	51	20	34	5	3	4	933

(*) Non significatif

(**) Signification limite

(***) Hautement significatif

Influenza vaccination in Morocco

NO OBLIGATION FOR FLU VACCINATION IN PUBLIC SECTOR

Since 2006, A MoH circular is established for the purpose of proposing the flu vaccine to HCW from public sectors and health students in medical and nurse schools (# 60 000 doses)

Influenza vaccination is recommended for pilgrims traveling to Islamic holy places (# 40 000 doses).

Flu vaccination in Morocco

NO OBLIGATION FOR FLU VACCINATION IN PRIVATE SECTOR

Seasonal influenza vaccine is available for purchase in pharmacies (# 215.000 doses)

Pasteur Institute of Morocco is vaccinating personal of private societies on request (# 85.000 doses)

Influenza vaccination in Morocco

* **2009:** Vaccination during the pandemic

- 4.050.000 doses of pandemic A (H1N1) 2009 vaccine,
- Target population:
 - pilgrims, HCW, Pregnant women
 - children from 6 to 23 months
 - People living in institutions - Patients with chronic diseases

* **2014-2015 :**

- Support from CDC and TFGH / PIVI
- Donation of 123.310 doses of PQ flu vaccine
- Pilot campaign for diabetics & elderly people
- Organized with support of Moroccan NGOs



Pilot flu vaccination campaign 2014/2015

Communication Campaign

Type of document	Quantity
Diabetics Registry	100
HCWs Registry	200
HCW vaccination card	62500
Poster for diabetics and elderly subjects	1250
Poster for HCWs	10000
Flyer for diabetics in french	40000
Flyer for diabetics in arabic	80000
Flyer for HCWs in french	120000

Pilot flu vaccination campaign 2014/2015

Royaume du Maroc
Ministère de la Santé



المملكة المغربية
وزارة الصحة

Campagne de vaccination contre la grippe saisonnière



**Chez les Personnes Diabétiques et les Personnes âgées,
la grippe peut entraîner des complications sérieuses**

Vaccinez-vous !



Pilot flu vaccination campaign 2014 - 2015

TARGETED HIGH RISK GROUP	Total number to be vaccinated A	Number of doses received B	Number of people vaccinated C	% Vaccinated (%) C/B	Vaccine Coverage (%) C/A
Health Care Workers	37875	35235	18997	53,9%	50,2%
Students in Medical Schools	15261	10942	564	5,2%	3,7%
Students in Nursing Schools	6593	7114	4307	60,5%	65,3%
Diabetics vaccinated at association sites	47505	27229	17195	63,1%	
Diabetics vaccinated at Health Centers sites		30310	21764	71,8%	
Total diabetics	47505	57539	38959	67,7%	82,0%
Elderly people	3389	5825	5674	97,4%	167,4%
Total	110623	116655	68501	58,7%	61,9%

Influenza vaccination in Morocco

2015-2016:

- Purchase of 20.000 doses (CDC) of PQ flu vaccine
- Rabat Region pilot immunization campaign
- All 60 years and more (diabetics program) at health centers

2016-2017:

Attempt to organize a pilot immunization campaign targeting 7.287 pregnant women in 3 provinces of the Region of Rabat by flu vaccine provided by the MoH. The vaccination campaign was stopped at the beginning due to rumors and negative media campaign

Regional flu vaccination campaign 2015 - 2016

Diabetics 60 years and over

Health delegation	Total to be vaccinated (A)	Number of vaccinated (B)	Vaccination coverage %
Rabat	8073	2616	32 %
Salé	8342	4478	54 %
Temara	3771	2868	76 %
Khémissat	6000	3062	51 %



Influenza vaccination in Morocco

2015-2016:

- Purchase of 20.000 doses (CDC) of PQ flu vaccine
- Rabat Region pilot immunization campaign
- All 60 years and more (diabetics program) at health centers

2016-2017:

Attempt to organize a pilot Flu immunization campaign targeting 7.287 pregnant women in 3 provinces of the Region of Rabat by flu vaccine provided by the MoH.

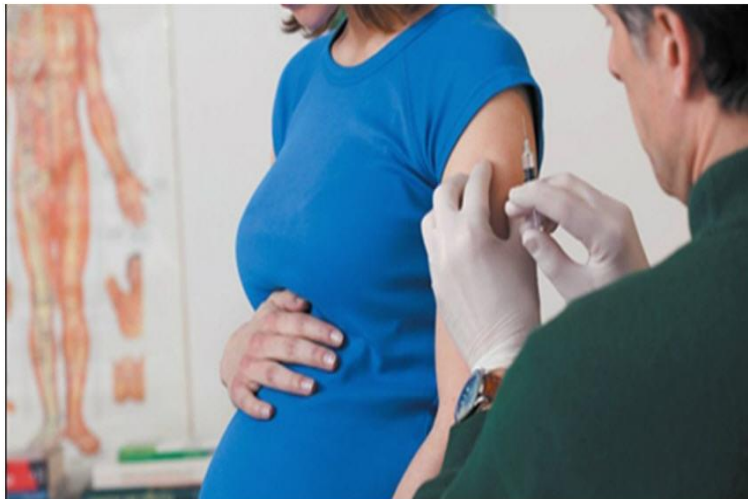
The vaccination campaign was stopped at the beginning due to rumors and negative media campaign

Press release : pilot vaccination campaign for PW vaccination 2016-2017



Vaccins pour femmes enceintes: les explications du ministère

Maroc | h24info.ma | Publié le 14/01/2017 | 10h15 | H24info



Partager 21 | Tweeter | G+ | 0 | Share | 0 | Pin it | Partager | 1

L'étude "expérimentale" portant sur le vaccin de grippe saisonnière pour femmes enceintes n'a aucun lien avec une quelconque transaction commerciale, a affirmé le ministère de la Santé.

avril 04, 2017 | Publicité | Qui sommes nous ? | Contactez nous | Charte des commentaires | Archives | Mentions légales

Aujourd'hui LE MAROC

ACTUALITÉ | POLITIQUE | SOCIÉTÉ | ECONOMIE | CULTURE | SPORTS | FAITS-DIVERS | MONDE

FLASH INFO : iger: 19 films en lice au 4ème Cap Spartel Film Festival | Mawazine : Rod Stewart sera en concert à OLM Souissi | Nador : Saïd

Accueil | Société

Vaccin pour femmes enceintes : Le ministère s'explique

Publié par ALM | Date : janvier 16, 2017 | dans: Société | Laisser un commentaire

Partage | f 0 | 0 | 0 | 0 | 0 | 0 | 0



«Il n'y a pas d'expérimentation d'un nouveau vaccin contre la grippe saisonnière pour femmes enceintes.»

Influenza vaccination in Morocco

* **April 2017:** Joint WHO/US CDC mission for the purpose to review of the Implementation of the National Plan for Influenza Prevention and Control

* **November 2017:** Establishment of the first recommendations for flu vaccination of high risk groups by the MoH through a press release widely publicized by national media

Communication day for HCW : MoH - IPM

ROYAUME DU MAROC

Ministère de la Santé



المملكة المغربية
+ⵍⵎⴰⵔⴰⵏ | ⵎⵏⵉⵙⵜ
وزارة الصحة
+ⵍⵎⴰⵔⴰⵏ | +ⵏⵓⵙⵜ

A l'occasion du lancement de la campagne nationale de vaccination de son personnel contre la grippe saisonnière, à partir du 14 octobre 2016

Le Ministère de la Santé organise une table ronde sous le thème :

**Je suis professionnel de soins,
je me protège contre la grippe,
je protège mes patients et mon entourage**

AL Berramini - Inaart

زارق البقال المغربية على التلقيح ضد الأنفلونزا الموسمية ضعيفا 51 بتجاوز 2 في المائة، فيما تجاوز النسبة 40 فقط من مهربي الصحة ورغم أن التلقيح قد يجلب المستفيدين منه أسوأ احتمالات المرض التي قد تحدث ضد الوباء

2 في المائة فقط من المغاربة يلقحون أنفسهم ضد الداء

70 درهما تكفي للوقاية من الأنفلونزا



من النص

في المائة فقط من المغاربة يلقحون أنفسهم ضد الأنفلونزا الموسمية، و40 فقط من مهربي الصحة ورغم أن التلقيح قد يجلب المستفيدين منه أسوأ احتمالات المرض التي قد تحدث ضد الوباء

رغم أن التلقيح ضد الأنفلونزا الموسمية يكلف 70 درهما فقط، فإن نسبة من يلقحون أنفسهم ضد الداء لا تتجاوز 2 في المائة فقط، فيما تجاوزت النسبة 40 فقط من مهربي الصحة ورغم أن التلقيح قد يجلب المستفيدين منه أسوأ احتمالات المرض التي قد تحدث ضد الوباء

ومن جملة أسباب عدم التلقيح هو عدم توفر المعلومات الكافية عن المرض، إضافة إلى عدم توفر المراكز الصحية التي توفر التلقيح في جميع المناطق المغربية

Abonnement Vidéos

Activités Royales Nation Monde **Economie** Sports Automobile Société Culture Emploi Rég

SOCIÉTÉ

Santé

Lancement de la campagne de vaccination contre la grippe saisonnière

LE MATIN 25 Novembre 2016 757

Facebook Twitter Google+



Jalal Nourill et Abdelfettah Chahib, Pr. Saout

Par **Hayat Kamal Idrissi**

23 Déc 2016

Partager

Twitter

Grippe, à vos vaccins !



Souvent sous-estimée, la grippe peut entraîner de graves complications et peut même sauver la mort. Mais, il y a moyen d'éviter ces risques.

Alors que le lancement de la campagne de vaccination contre la grippe saisonnière, une conférence avec sur « Le poids de la maladie et l'intérêt de la vaccination » s'est tenue à Casablanca à l'initiative de Sanofi Pasteur en collaboration avec le ministère de la Santé.

Animée par Pr Abdelfettah Chahib, du service des maladies infectieuses du CHU Ibnou Rochd et Dr Jalal Nourill, chef du laboratoire de virologie de l'Institut Pasteur, cette rencontre a été l'occasion pour ces spécialistes d'apporter des éclairages sur l'épidémiologie de la grippe, ses symptômes, ses effets sur la santé, notamment chez les personnes les plus vulnérables.

D'après Pr Nourill, la surveillance virologique, menée auprès des centres de santé, de l'hôpital pédiatrique et auprès de quelques médecins privés sur la période 2015-2016, a démontré que 79,77% de la population est positive à la grippe A et 20,22% sont positifs à la Grippe B. Cette surveillance a pour principal objectif de mieux connaître l'épidémiologie des virus grippaux en circulation, d'identifier les souches virales et d'évaluer leur parenté.



GRIPPE SAISONNIÈRE

Lancement d'une campagne nationale dédiée

Sanofi Pasteur, en collaboration avec le ministère de la Santé, a procédé au lancement de la campagne nationale de vaccination contre la grippe saisonnière.

A cette occasion, ils ont organisé une conférence de presse dédiée à la sensibilisation à l'importance de la vaccination de la population contre la grippe saisonnière. Animée par le Pr Abdelfettah Chahib, du service des maladies infectieuses du CHU Ibn Rochd et le Dr Jalal Nourill, chef du laboratoire de virologie de l'Institut Pasteur, elle a été l'occasion de souligner le rôle du vaccin dans la protection contre les nombreuses complications dues au virus, surtout chez les personnes vulnérables. Ils ont par ailleurs indiqué que le taux de vaccination contre la grippe saisonnière reste très faible au Maroc appelant les différents acteurs concernés à réinsister sur l'intérêt majeur du vaccin anti-grippe qui constitue le meilleur moyen de protection contre le virus.

Annahar Al Maghribia

اليومية مستقلة

النهار المغربية



AEFI surveillance in Morocco



- * Adverse events following immunization : Performed by the National Poison Control and Pharmacovigilance Centre
- * Independent technical committee reviewing severe AEFI based on a standard reporting system following the use of medicines and vaccines
- * About 150 AEFI were reported in 2016, the majority of which were generally mild.
- * Only 25 % of health facilities provide regular reports in this system



**NOTIFICATION DES EVENEMENTS INDESIRABLES AUX
MEDICAMENTS, VACCINS ET AUTRES PRODUITS DE SANTE**

Patient :

Fiche n°.....

Nom et prénom : Âge : Sexe : M / <input type="checkbox"/> F / <input type="checkbox"/> Poids en Kg : Si grossesse ; âge gestationnel : Localité ou ville : Tél :	Antécédents et terrain :
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Evénement(s) indésirable(s) :

Description clinique et para clinique de l'événement indésirable :

Date d'apparition : / / / Si non **Délai d'apparition :** Heures / / Jours / / Mois / /

Diagnostics différentiels éliminés :

Conduite adoptée : Arrêt du médicament / Réduction de la dose / Traitement correcteur, précisez.....
 Hospitalisation / Prolongation d'hospitalisation /

Evolution de l'événement : Guérison sans séquelles / séquelles / Sujet non encore rétabli / Décès /
 Inconnue /

Médicaments, vaccins et autres produits de santé (PS) pris par le patient : (par ordre de suspicion décroissant)

Nom la spécialité et présentation	Posologie et voie d'administration	N° de lot	Date de début	Date d'arrêt	Indication	Modalités de dispensation et de prise(*)

(*) précisez si, prescription médicale : 1 Auto médication : 2 Erreur médicamenteuse : 3 Produit défectueux : 4

Si vaccin : Nombre de prise : Lieu de vaccination : Secteur Public / Privé / Campagne de vaccination /

Si plante médicinale : Quantité..... Partie utilisée..... Prise en : Infusion / Décoction / Macération /
 Autres /

Médicament ré administré : Oui / Non / lequel :

Réapparition de l'événement : Oui / Non / décrivez :

Observation relevée par :

Nom et prénom : Tél : Email :

Médecin / Spécialité Pharmacien / Infirmier / Autre :

Lieu d'exercice : CHU / Public / Privé / Ville :

Signature

Operational research on flu vaccination (1)

OPEN ACCESS Freely available online



A Qualitative Study of Vaccine Acceptability and Decision Making among Pregnant Women in Morocco during the A (H1N1) pdm09 Pandemic

Anna-Leena Lohiniva^{1*}, Amal Barakat², Erica Dueger³, Suzanne Restrepo¹, Rajae El Aouad²

1 Global Disease Detection Center–Egypt, US Naval Medical Research Unit no. 3, Cairo, Egypt, **2** Centre National de référence Grippe–Institut National d'Hygiène–Ministry of Health, Rabat, Morocco, **3** Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America; and Global Disease Detection Center–Egypt, US Naval Medical Research Unit no. 3, Cairo, Egypt

2009 - CDC support

Operational research on flu vaccination (2)

- * KAP study among HCW & University students on H1N1 pandemic influenza and its vaccine
 - 2011 : WHO support
 - Submitted
- * Qualitative study on flu seasonal vaccine acceptability among all high risk groups
 - PW, NCD, elderly people, public & private HCW
 - CDC support
 - Validation in process
- * KAP study on flu seasonal vaccine among PW
 - Planned : CDC support

Operational research

East Mediterr Health J. 2016 Oct 2;22(7):483-490.

Circulation of Respiratory Syncytial Virus in Morocco during 2014-2016: Findings from a sentinel-based virological surveillance system for influenza.

Bimouhen A¹, El Falaki F¹, Ihazmad H¹, Regragui Z¹, Benkerroum S¹, Barakat A¹.

⊕ Author information

Abstract in [English](#), [Arabic](#), [French](#)

Respiratory syncytial virus (RSV) is a leading cause of mortality and morbidity in young infants, little was known on its circulation types and patterns in Morocco. We conducted a prospective study using sentinel-based influenza surveillance to detect RSV by real time PCR in patients with acute respiratory infections, enrolled during two seasons (2014/15, 2015/16). During September 2014-April 2016, we obtained 1450 specimens, of which 267(18.4%) tested positive for RSV. The proportion of positive RSV infection was higher in patients hospitalized with acute respiratory infection compared to those with mild symptoms in out-patient clinics. The proportion of RSV infection was highest in children aged 0-6 months (45%; $P < 0.001$). Higher positivity rate was observed between months of December and March. RSV remains important viral etiological agent causing influenza-like illness and severe acute respiratory infections especially among infants in Morocco. Further surveillance, is required to understand better the risk factors of RSV infections.

Operational research

East Mediterr Health J. 2016 Oct 2;22(7):453-459.

Detection of influenza B viruses with reduced sensitivity to neuraminidase inhibitor in Morocco during 2014/15 season.

Elfalki F¹, Ihazmad H², Bimouhen A², Regragui Z², Benkaroum S², Bakri Y³, Barakat A².

⊕ **Author information**

Abstract in [English](#), [Arabic](#), [French](#)

We monitored phenotypic and genotypic susceptibility of influenza viruses circulating in Morocco during 2014-2015 to oseltamivir and zanamivir. Throat and nasal swab specimens were collected from outpatients (with influenza-like illness) and inpatients (with severe acute respiratory illness) and tested for influenza viruses using real-time reverse transcription polymerase chain reaction. Positive samples were inoculated in MDCK cells and virus phenotypic susceptibility to neuraminidase inhibitors (NAIs) was assessed using fluorescent NA inhibition. Of 440 specimens, 135 were positive for influenza B Yamagata-like virus, 38 were A(H1N1)pdm09 and 25 were A(H3N2). Sixty influenza B viruses isolated from MDCK cells showed no significant resistance to NAIs. However, two of these strains, B/Morocco/176H/2015 and B/Morocco/CP10/2015, showed reduced susceptibility to oseltamivir. The two influenza B viruses with reduced susceptibility to oseltamivir show that ongoing NAI susceptibility surveillance is essential.

Screening of nasal swabs from children in Casablanca with respiratory symptoms

- * **Type of samples:** nasal swabs from 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



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.

168 samples: in progress

Next Generation Sequencing – Respiratory Infections

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)

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**+ Cost equipment and Reagents +
+++ Bioinformatics analysis +++**

■ Surveillance, prévision et action

WHO conducts virus detection workshop to limit epidemic and pandemic influenza

2 November 2017 – WHO conducted a 5-day workshop in Rabat, Morocco, on influenza virus identification and handling mechanisms to enhance the capacities of national influenza centres in the Eastern Mediterranean Region for timely and effective detection of seasonal and pandemic influenza.

The workshop was attended by laboratory managers and technicians from 16 countries in the Region. It focused on detection and identification of seasonal influenza virus sub-types, using cell culture and hemagglutination – steps that are essential for identifying viruses to make vaccines.



Laboratory technician identifies the type of virus using WHO standard influenza kits during influenza virus identification workshop held from 31 October to 2 November in Rabat, Morocco. Photo: Greta Isac



World Health Organization



16 – 20 April 2018



Next steps

- * Computerization of influenza surveillance / Real time data analysis
- * Reinforce the progress made for the present target groups and increase vaccination coverage for HCW
- * Continue efforts to target pregnant women and children :
 - Indicators and data PW in the national influenza surveillance system
 - Work with obstetrics departments
 - Specific communication plan for PW, integrated with pregnancy monitoring program
- * Develop a national communication plan and strategy, to increase the acceptability and uptake of influenza vaccination
- * Promotion of Influenza vaccination in private sector
- * Establishment of insurance financing support

شكراً

Thank you