



Global Influenza
Hospital Surveillance
Network

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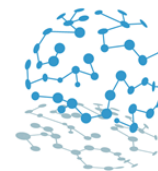
GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

WELCOME & INTRODUCTION

Cédric Mahé, Catherine Commaile-Chapus



Foundation for
Influenza
Epidemiology



Open Health
COMPANY

WELCOME & INTRODUCTION OF PARTICIPANTS

- **55 participants, 25 countries**
- **A growing network:**
 - 18 sites, 60 hospitals this season
 - 21 sites, 90 hospitals for the upcoming season
- **An operational platform for data generation, capacity building and data sharing/valuation:**
 - More than 3,500 documented cases of hospitalizations from influenza per season
 - Already up to 7 seasons of data generated including NH and SH data (>74,000 patients records available)
- **Stronger scientific oversight**



OBJECTIVES OF THE MEETING

- Review the individual and global results of the 2018-2019 season
- Exchange around the new GIHSN protocol and the evolution of the Network
- Present the new sites for the 2019-2020 season
- Discuss the strain sequencing process in order to optimize the GIHSN contribution to the WHO Strain Selection meetings
- Discuss how to value and communicate the generated data



AGENDA: MONDAY 14TH OCTOBER

8:30 – 8:45	Welcome & Introduction to the meeting	C Mahé (FIE) C Commaille (OpenHealth)
8:45 – 10:30	Site results 1 (Poster Session with question-and-answer session) Sites 1 - 10 <i>Moderated by: Elena Burtseva, member of ISC</i>	Site Investigators
10:30 – 11:00	Coffee break	
11:00 – 12:30	Site results 2 (Poster Session with question-and-answer session) Sites 11 - 19 <i>Moderated by: Marta Nunes, member of ISC</i>	Site Investigators
12:30 – 14:00	Buffet Lunch	
14:00 – 14:40	GIHSN Results Season 2018-2019 (presentation followed by discussions)	Dr M Andrew (ISC)
14:40 – 16:00	Round Table Discussion – Strain Selection Process: Current & Future Challenges <i>Moderated by: Cedric Mahé (FIE)</i>	Dr W Zhang (WHO) Dr P Bogner (GISAID) Pr J McCauley (WHO CC) Pr B Lina (Lyon University)
16:00 – 16:30	Coffee break	
16:30 – 17:00	Contribution of the GIHSN to the Strain Selection Meeting – Feedback on the 2018-2019 Season & Prospects for the Next Season	Pr B Lina (Lyon University)
17:00 – 17:45	GIHSN Implementation for the Next Season -Evolution of the Governance of the Foundation -New Design of the GIHSN Implementation -Participating sites for the 2019-2020 Season	C Mahé (FIE)
17.45 – 18:00	Discussion & closure of Day 1	

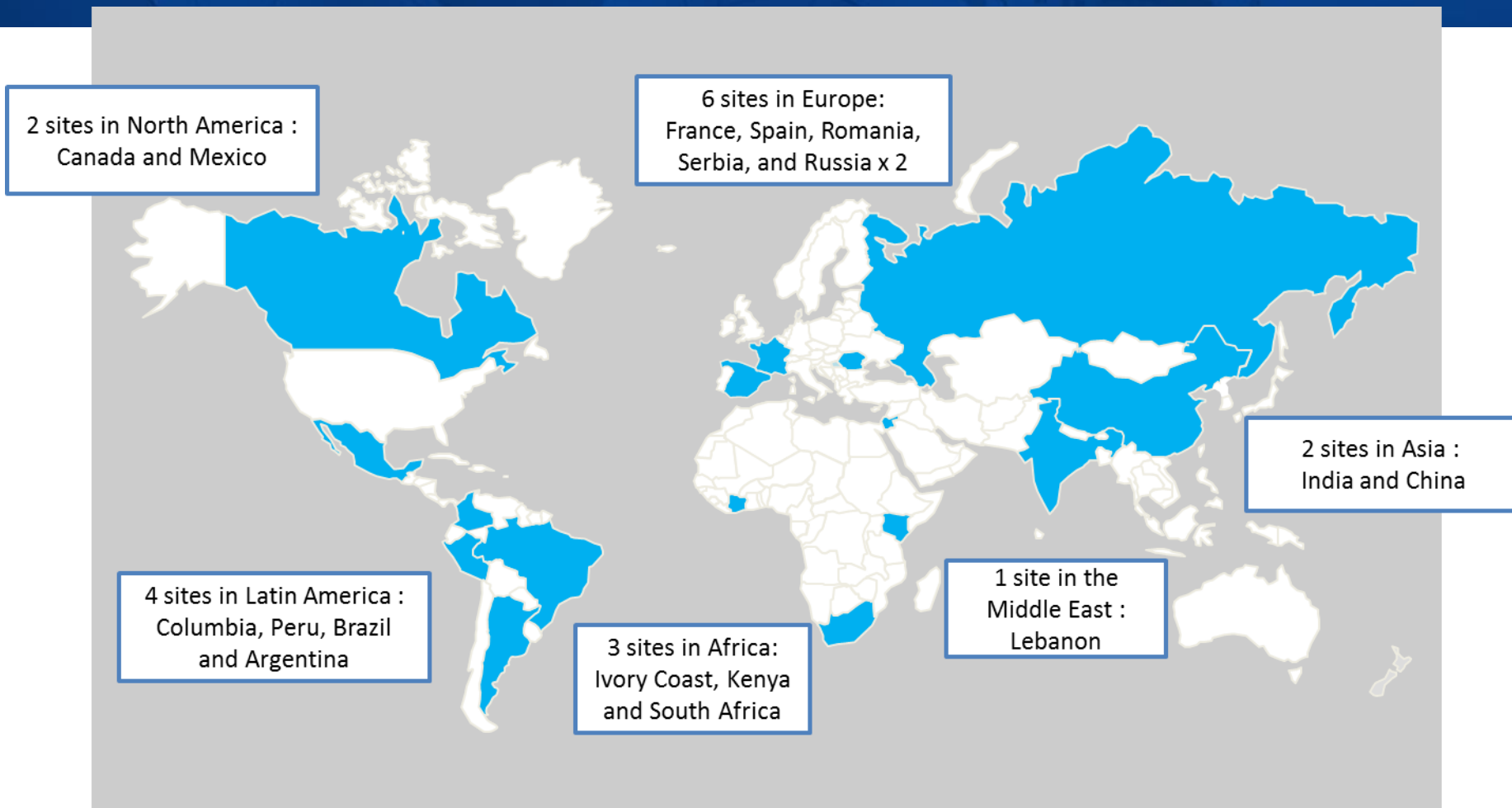


AGENDA: TUESDAY 15TH OCT

8:30 – 8:45	First day wrap-up & objectives of Day 2	C Commaille (OpenHealth)
8:45 – 10:15	Workshop Session 1: New Protocol Implementation -Implementation of the new questionnaire -Data Entry -Need for support <i>Moderated by: Sandra Chaves (FIE)</i>	All sites
10:15 – 10:45	Coffee break	
10:45 – 12:00	Workshop Session 2: Strain Sequencing Process -Timing of sequencing -Strain selection - Strain logistics between sites & Lyon <i>Moderated by: Bruno Lina (ISC)</i>	All sites
12:00 – 12:45	Dissemination & Publications (Globally and Locally) - Update on current manuscript development - Posters presented at Options X - Publication plan & International conferences 2019-2020 - Manuscript writing process 2018-2019 season & rules of authorship	Pr B Lina (ISC)
12:45 – 13:00	Closing	C Mahé (FIE)
13:00 – 14:00	Buffet lunch	



SEASON 2018-2019: 18 SITES, 60 HOSPITALS



Included = **16 424**

LCI+ = **3 505**





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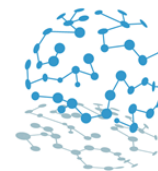
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POSTER SESSIONS: SITES RESULTS

All Site Investigators



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POSTER SESSION 1

Moderator : Dr. Elena Burtseva (Scientific Committee)

Sites : South America – Africa - Asia

Argentina

Peru

Brazil

Columbia

China - Shanghai

India

Ivory Coast

South Africa

Kenya

Tunisia

35 min poster round

*60 min short presentation by each site investigator
& questions and answers*



POSTER SESSION 2

Moderator : Dr. Marta Nunes (Scientific Committee)

Sites : North America - Middle East - Europe

Mexico

Canada

Lebanon

France – Lyon

Romania

Russia – Moscow

Russia – St Petersburg

Serbia

Spain

35 min poster round

*55 min short presentation by each site investigator
& questions and answers*





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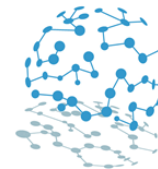
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GIHSN RESULTS SEASON 2018-2019

Dr Melissa K. Andrew (Scientific Committee)



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Study objectives and protocol

- Modifications for 2018-2019 season



GIHSN STUDY OBJECTIVES

Primary objectives

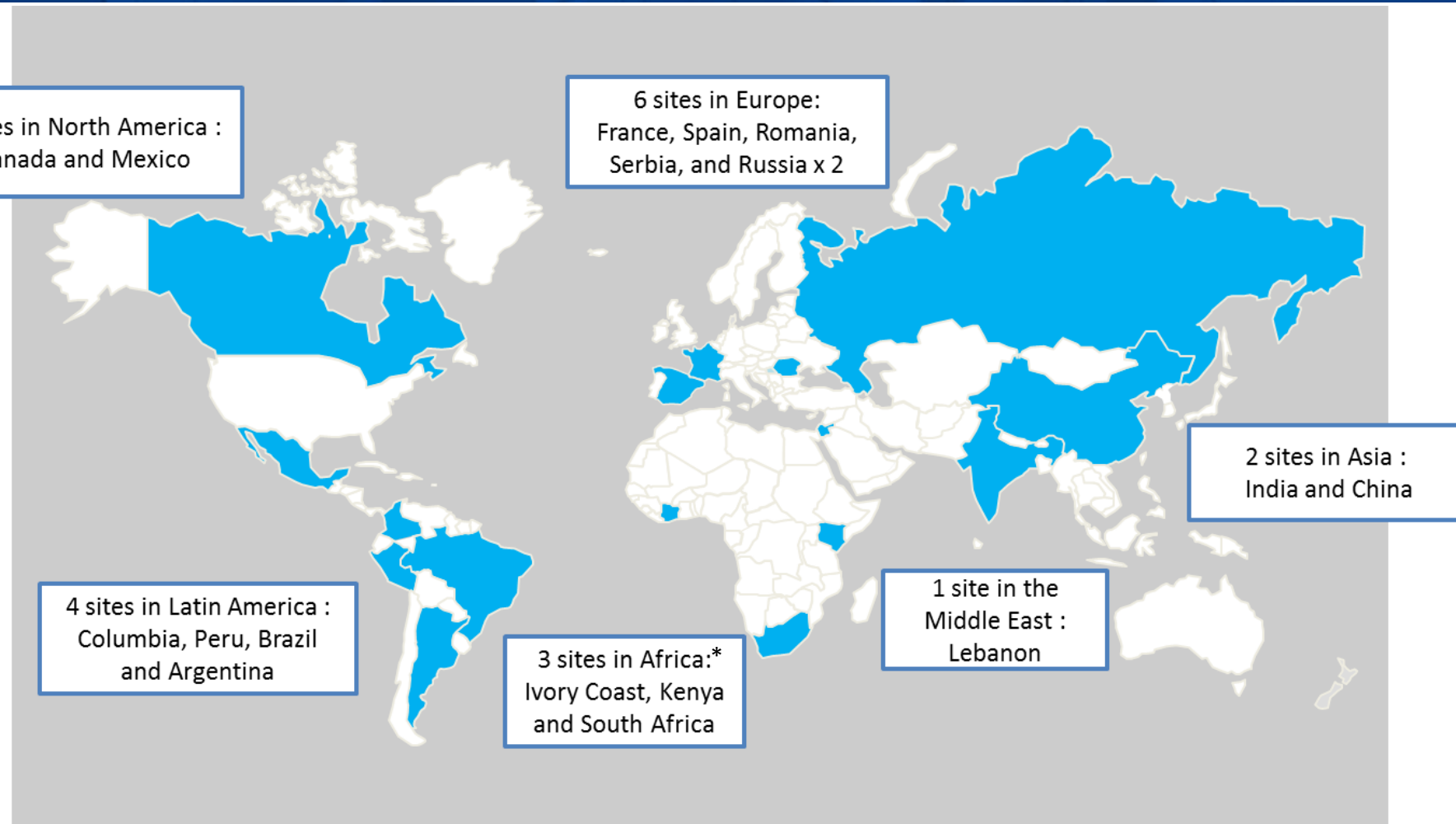
1. To evaluate the burden of severe influenza disease, defined as hospitalization related to community acquired influenza or complications following an influenza infection
2. To quantify the distribution of the different influenza strains (A/H1N1, A/H3N2, B/Yamagata, B/Victoria) among these severe cases

Secondary objectives

1. Notice: the GIHSN goals are related to influenza epidemiology
[Optional: If testing for other respiratory viruses is performed] To estimate the relative incidence of influenza compared to other respiratory viruses
2. *[Optional: If vaccine coverage is sufficient for some age group]* To measure the effectiveness of influenza seasonal vaccines to prevent these hospitalizations using a case control design



GIHSN DATA BASE 2018 – 2019 : 19 SITES ARE SHARING THEIR DATA



*The Tunisian site which was not a part of the Network this year has also shared data



UPDATED PROTOCOL

Changes were implemented for the season 2018-2019 in order to simplify the protocol :

- ✓ A few historical exclusion criteria were removed such as :
 - Resident
 - Hospitalization in the last 30 days
 - Patient living in an institution
- ✓ Variables that were not relevant for analysis were removed and the section « laboratory results » was also simplified
- ✓ Adding the answer « Do not know » for many questions in order to allow for more data collection
- ✓ « Education levels » were replaced by « occupation »
- ✓ Adding of a Severity section – allowing for analysis on severity



NEW SEVERITY SECTION

Severity

26) Hypoxia at admission

☐ Yes ☐ No ☐ Do not know

27) Confusion at admission

☐ Yes ☐ No ☐ Do not know

28) Lethargy at admission

☐ Yes ☐ No ☐ Do not know

29) Oxygen saturation value on ambient air (%)

% ☐ Do not know

30) Blood pressure (systolic/diastolic)

/ mmHg ☐ Do not know

31) Respiratory rate at admission (breaths per minute)

bpm ☐ Do not know

32) Blood Urea Nitrogen (mmol/L units)

mmol/L ☐ Do not know

33) Supplemental oxygen without mechanical ventilation

☐ Yes ☐ No ☐ Do not know

34) Vasopressor support

☐ Yes ☐ No ☐ Do not know

PROTOCOL 2018-2019

Eligible patients

- Admitted through emergency doors or study participating wards for an acute condition.
- Admitted in the previous 48 hours and having stayed in hospital for at least 1 night.
- Main complaint for admission possibly related to influenza infection.

Exclusions

- No communication
- No consent

Included population

- GIHSN ILI onset within the last 7 days for patients ≥ 5 years of age
- Onset of symptoms for patients < 5 years of age

Sample submitted to the lab

Confirmed Influenza

Negative

Positive for other respiratory viruses



CURRENT ELIGIBILITY CRITERIA

Eligibility criteria

Enrolment is based on:

- Patients with an acute process
- Patients whose indication for admission was any of a predefined set of conditions, described as possibly associated with a recent influenza infection*
- In this case, [a study nurse, doctor...] will identify by hospital admission registries, chart review or available records, all eligible patients hospitalized in the previous 48 hours and has stayed in hospital for at least 1 night (therefore a patient admitted before midnight of the previous day).

**Admission diagnoses possibly associated with an influenza infection. International Classification of Diseases Code version 9 and 10. Codes are listed in the protocol and in annex of the questionnaire*



CURRENT INCLUSION CRITERIA

Inclusion criteria

Patients **5 years old and older** will be included in the study if they refer to a **seven days or less** antecedent of a community onset influenza like-illness (see definition in table 2).

Table 2. Modified European Centre for Diseases Control definition of influenza like-illness (ILI)

Combination of:

at least one of the following four systemic symptoms (ICD-9-CM code): Fever or feverishness (780.6), headache (784.0), myalgia, (729.1) or malaise (780.79);
at least one of the following three respiratory symptoms (ICD-9-CM code): a) Cough (786.2), sore throat (787.2) or shortness of breath (786.05).

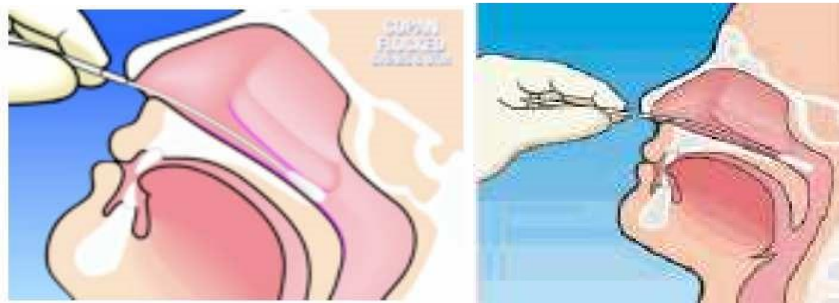
Patients **less than 5 years** will be included if indications for admission, occurred within seven days or less between the beginning of symptoms and admission to hospital.

PROTOCOL SWABBING PROCEDURES

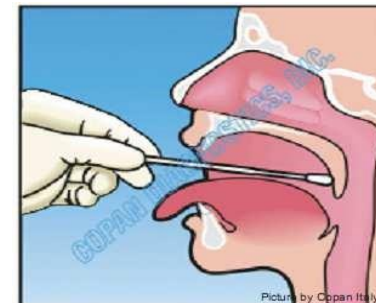
Swabbing procedures :

A nasopharyngeal swab for all patients and a pharyngeal swab for adults (14 years of age or older) and a nasal sample for children (less than 14 years old) will be obtained from each patient in case they comply with inclusion criteria and give consent.

Nasopharyngeal swab



Pharyngeal swab





Data Analysis –

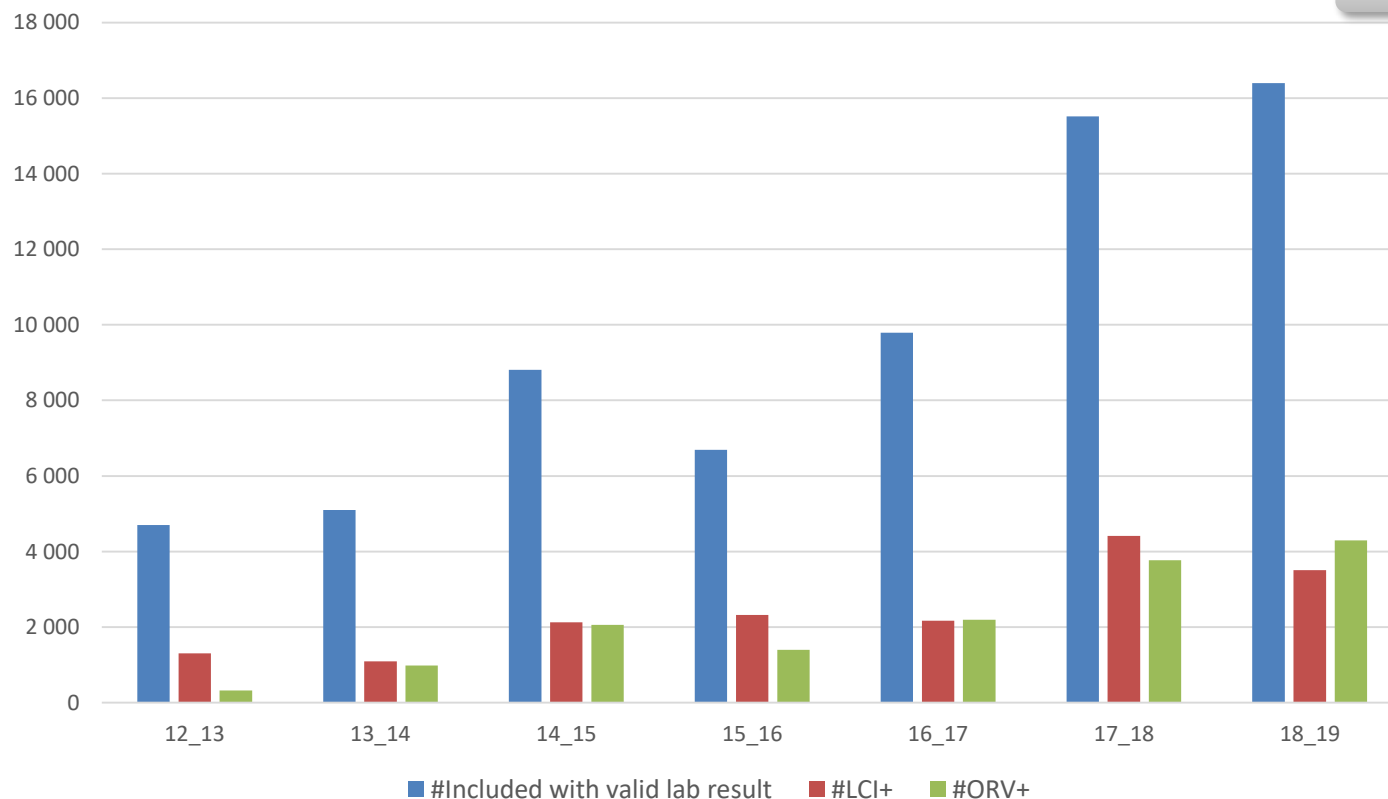
Descriptive analysis and outcomes

(Data as of 25/9)



GLOBAL PATIENT INCLUSION EVOLUTION OVER 7 YEARS

N= 67 026



SITES

4

5

6

8

12

18

16*

LCI+

1309

1094

2128

2325

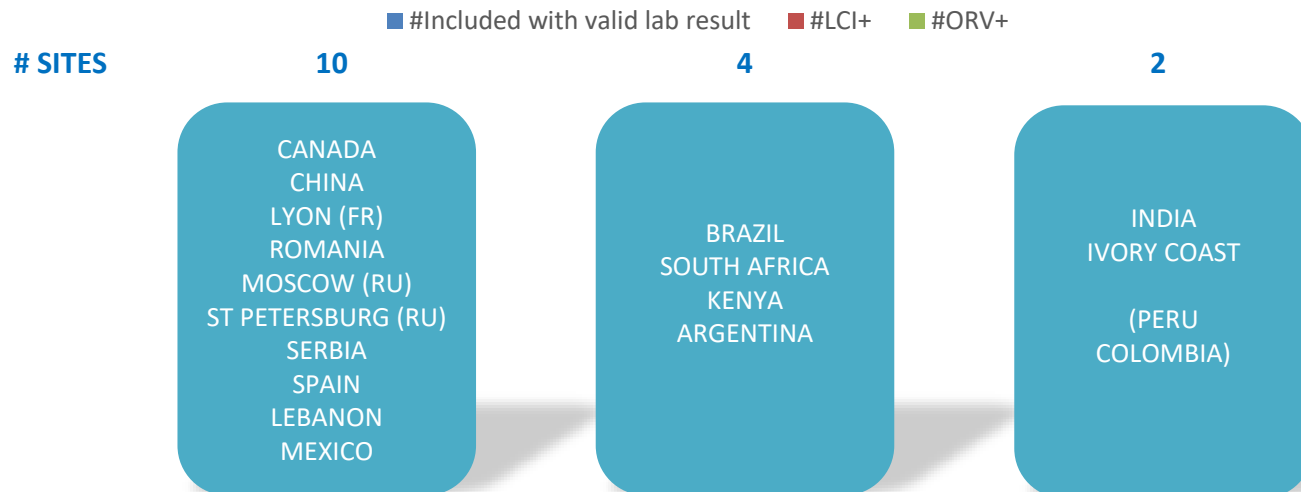
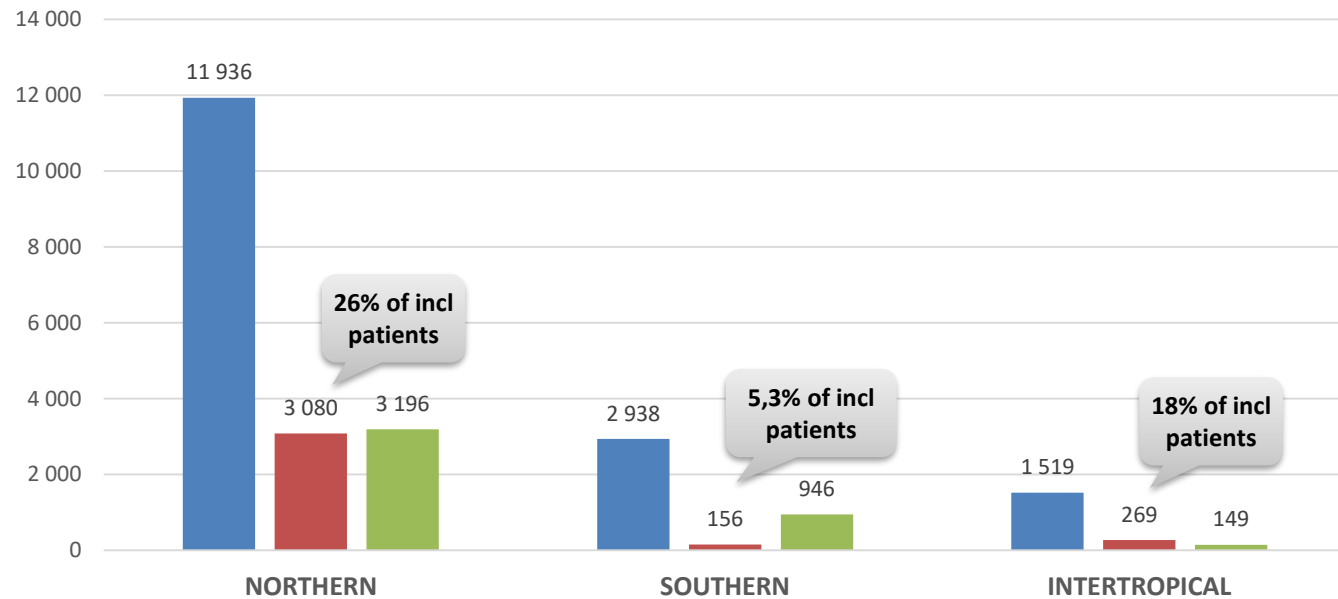
2169

4417

3505

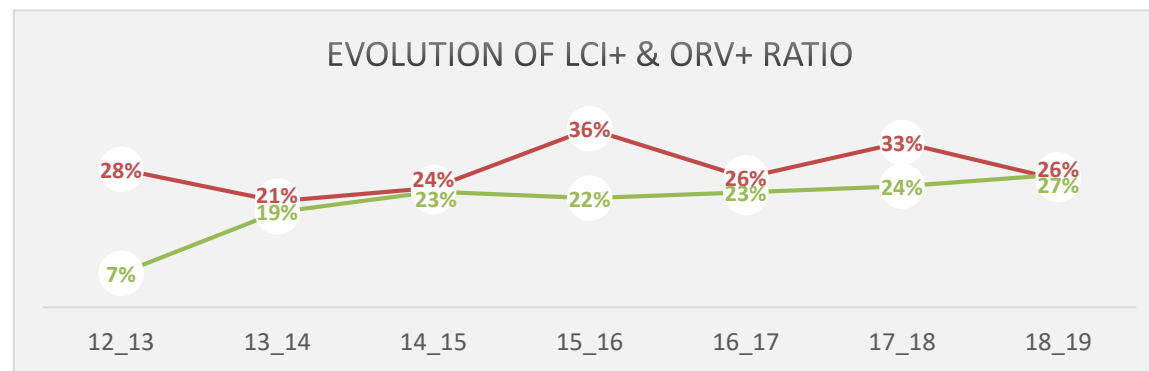
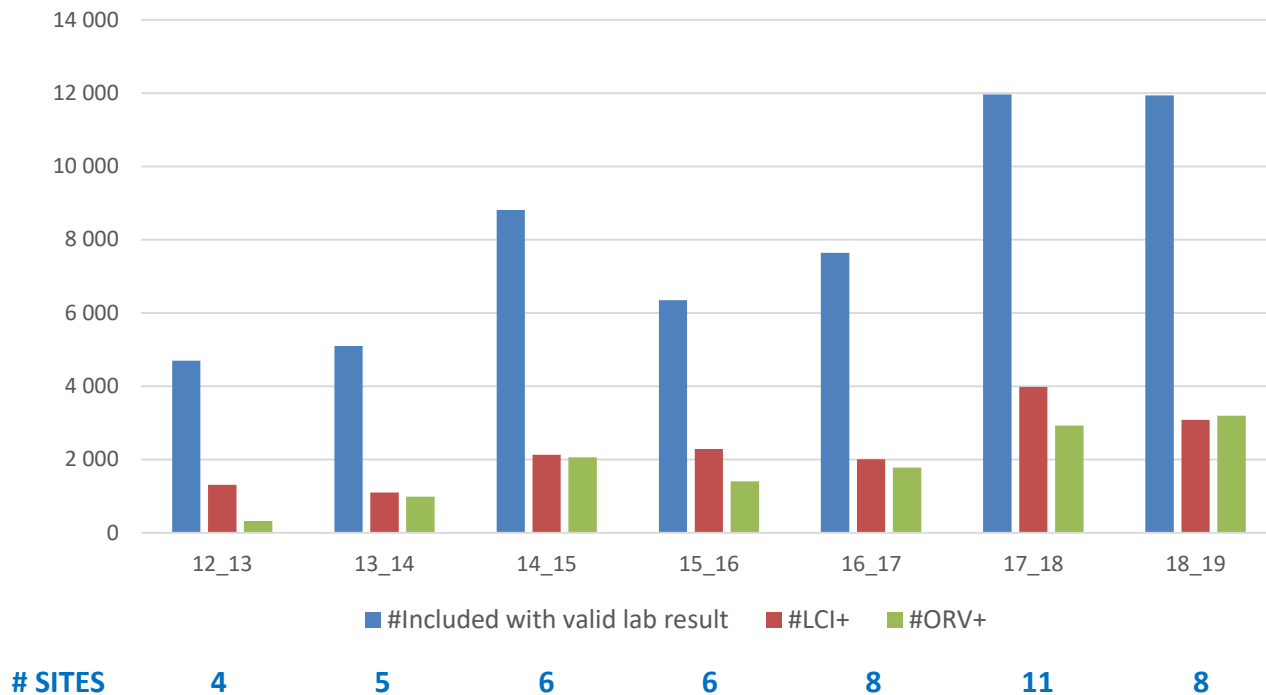


CONTRIBUTION PER ZONE 2018-2019



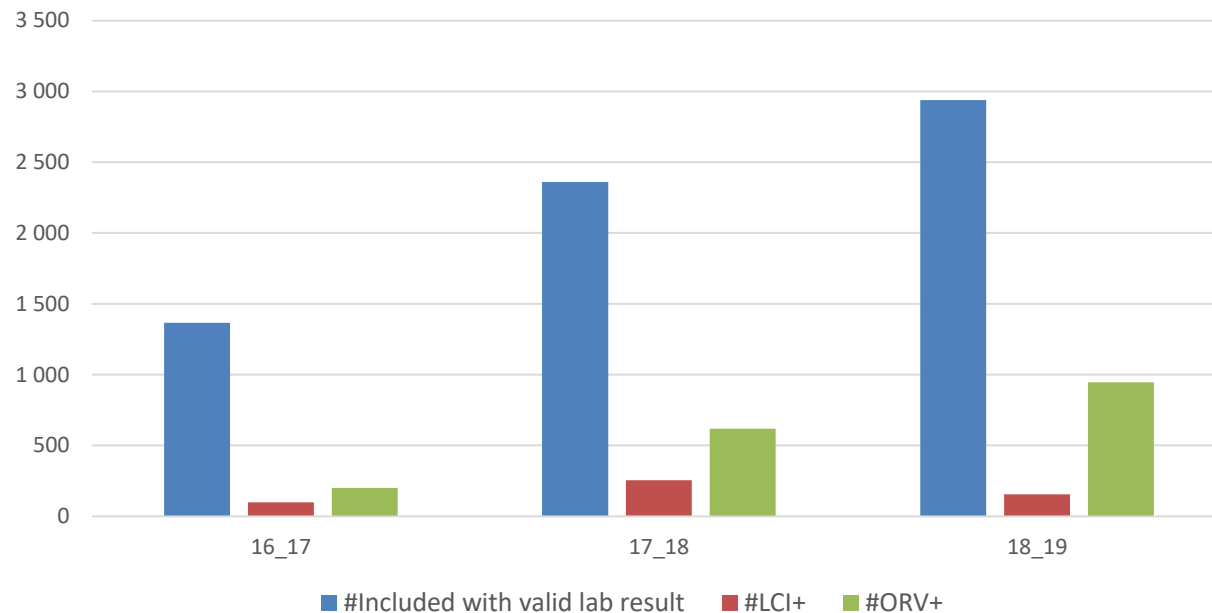
NORTHERN HEMISPHERE – 16 SITES SINCE 2013

N= 56 524



SOUTHERN HEMISPHERE – 5 SITES SINCE 2013

N= 6 665



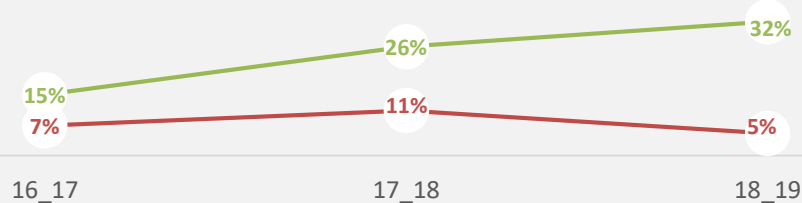
SITES

1

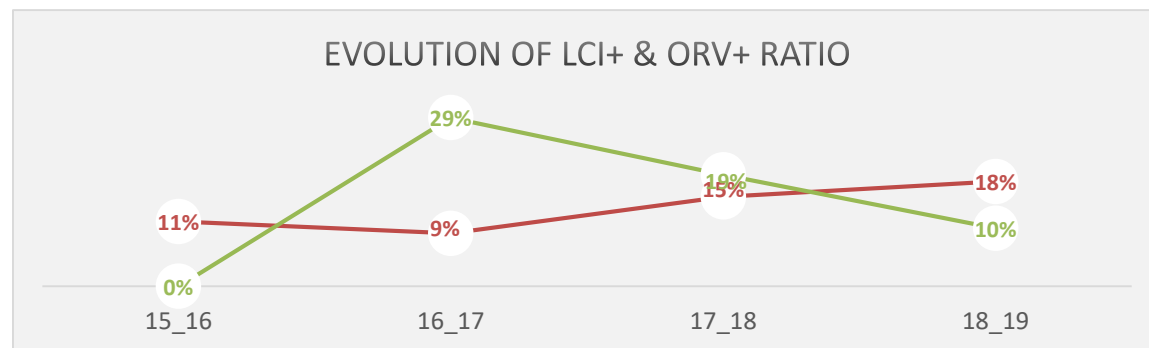
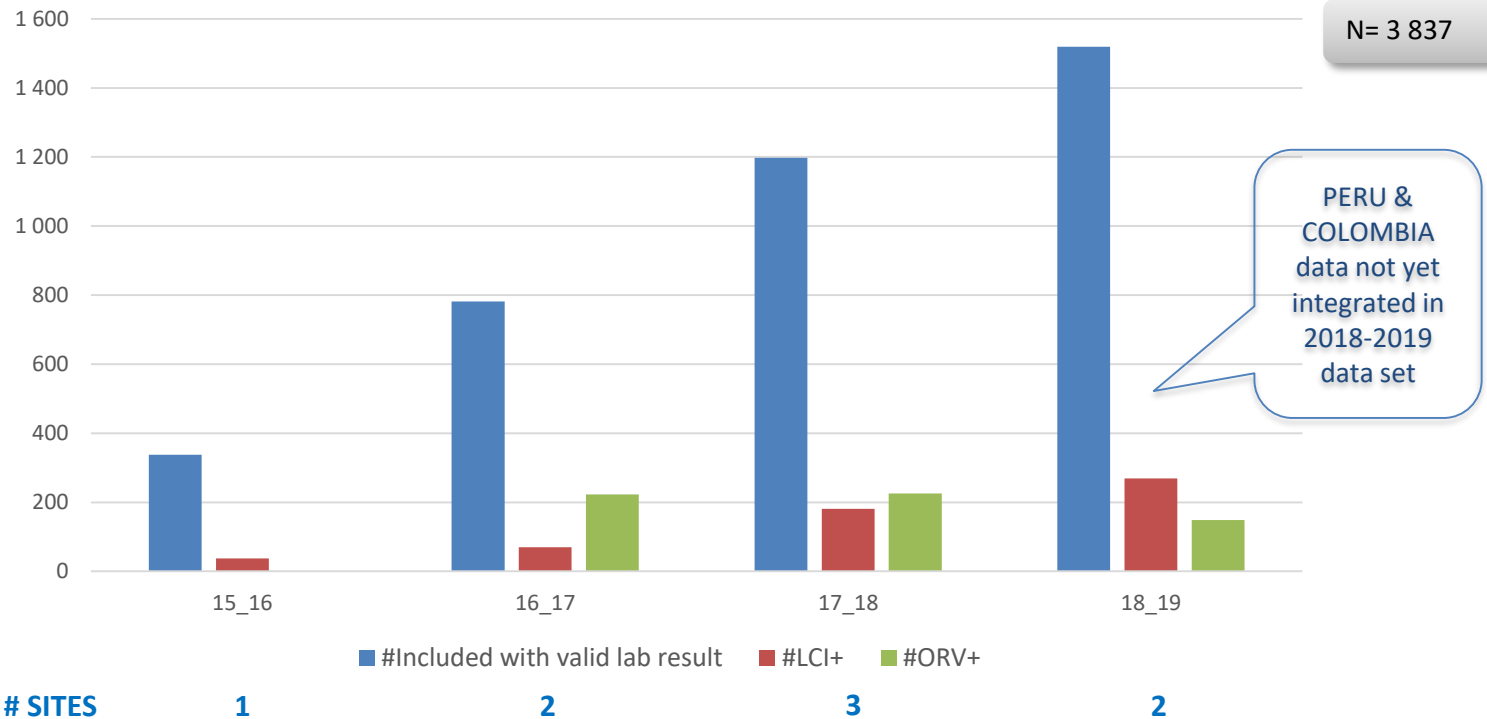
3

4

EVOLUTION OF LCI+ & ORV+ RATIO



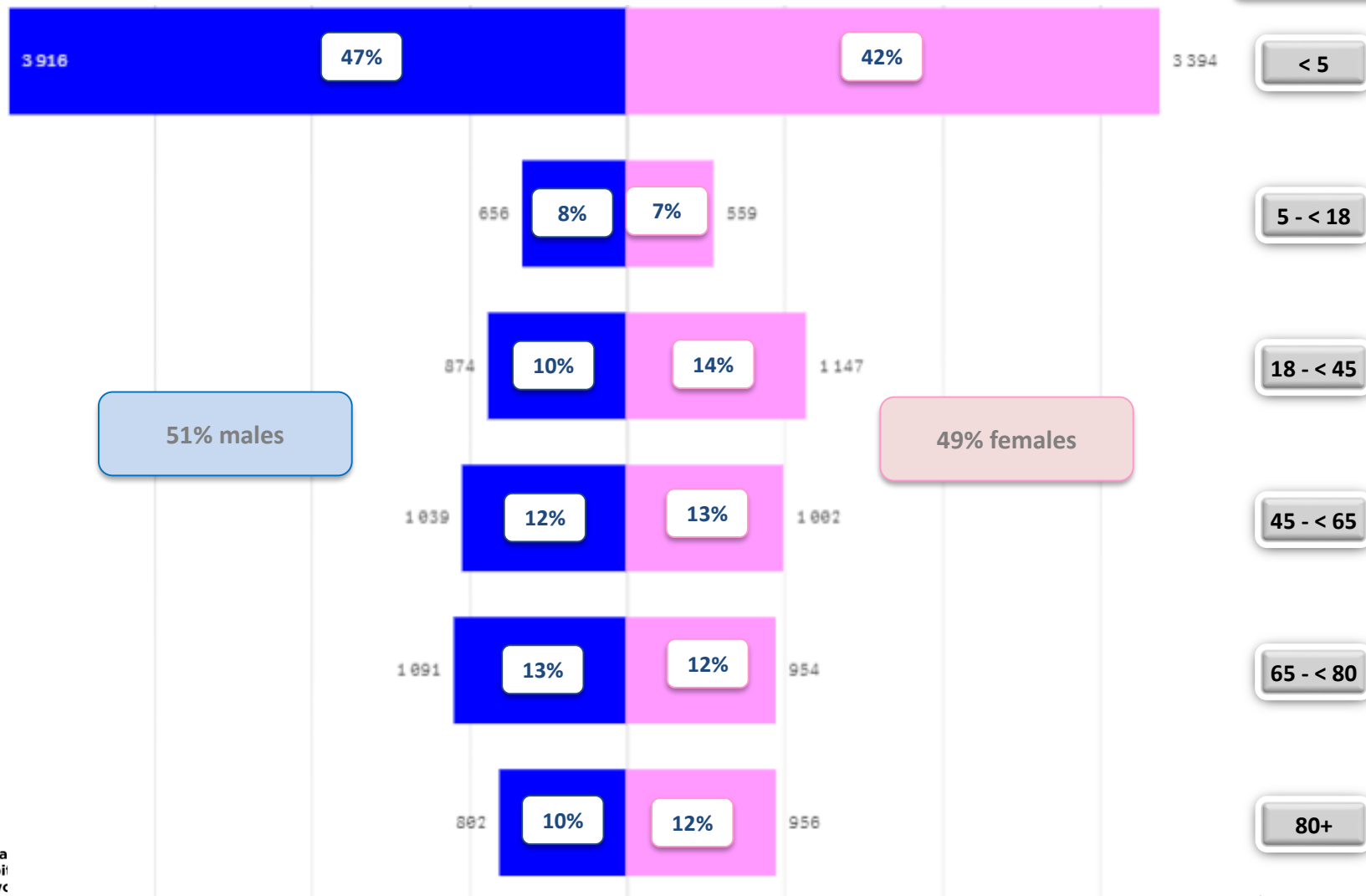
INTERTROPICAL HEMISPHERE – 4 SITES SINCE 2013



GLOBAL AGE & GENDER DISTRIBUTION

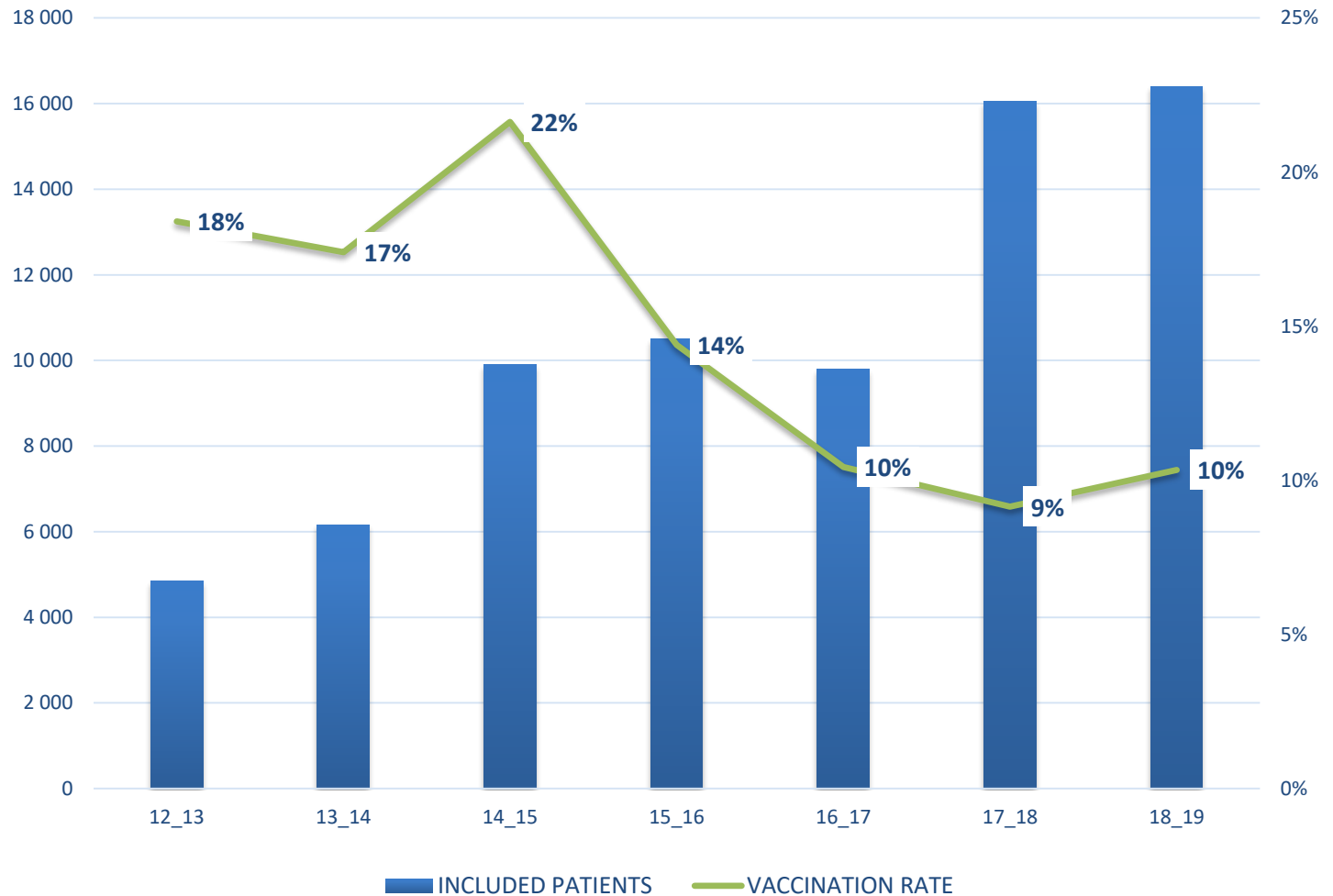
PATIENTS INCLUDED (W/ VALID RESULTS) 2018-2019

N= 16 424



VACCINATION RATE EVOLUTION

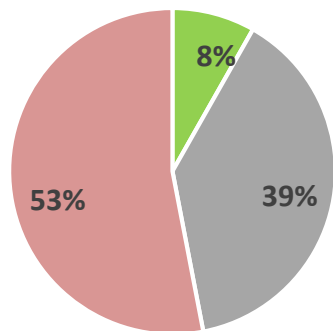
VACCINATION RATE VS INCLUDED PATIENTS



VACCINATION STATUS BY AGE GROUP

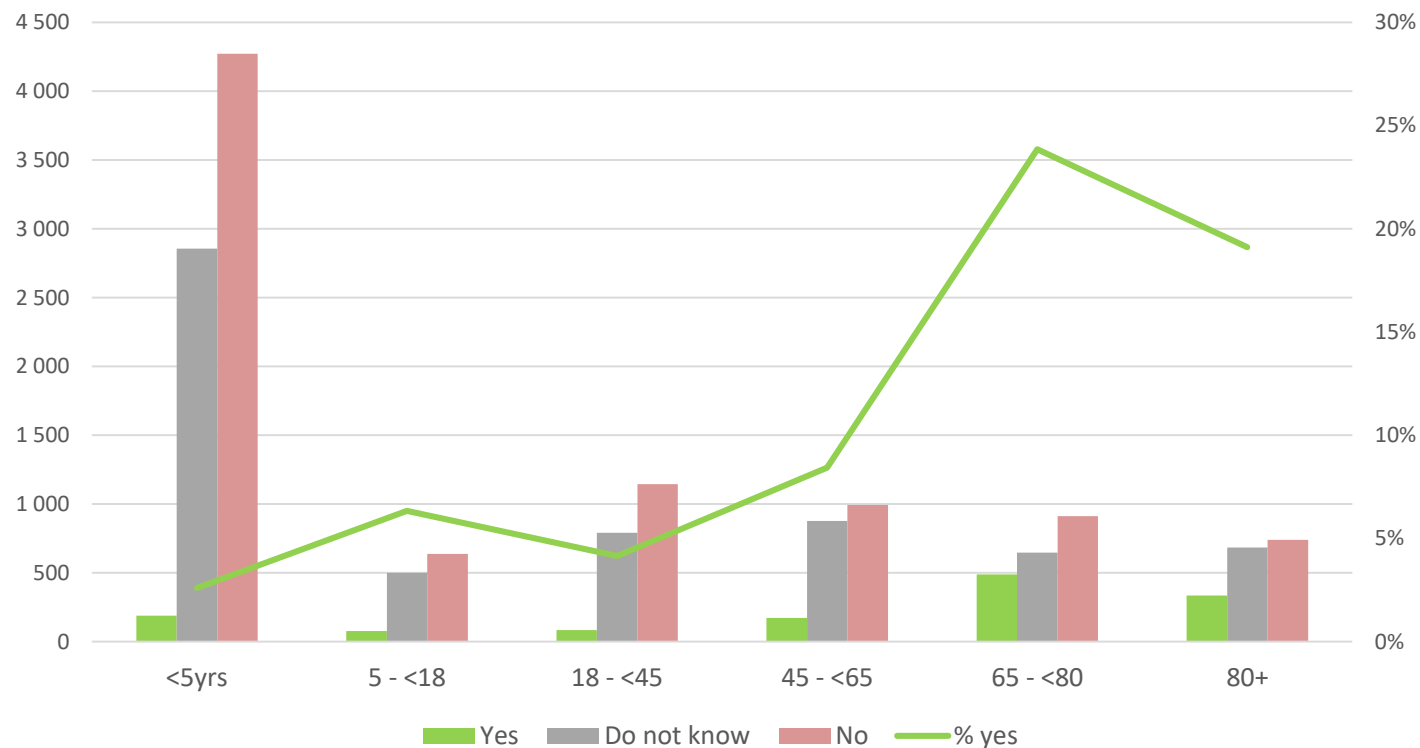
INCLUDED PATIENTS 2018-2019

GLOBAL VACCINATION STATUS



N= 16 401

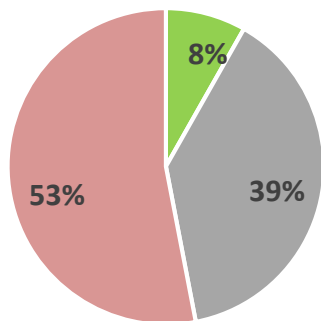
VACCINATION STATUS PER AGE GROUP



VACCINATION STATUS BY AGE GROUP

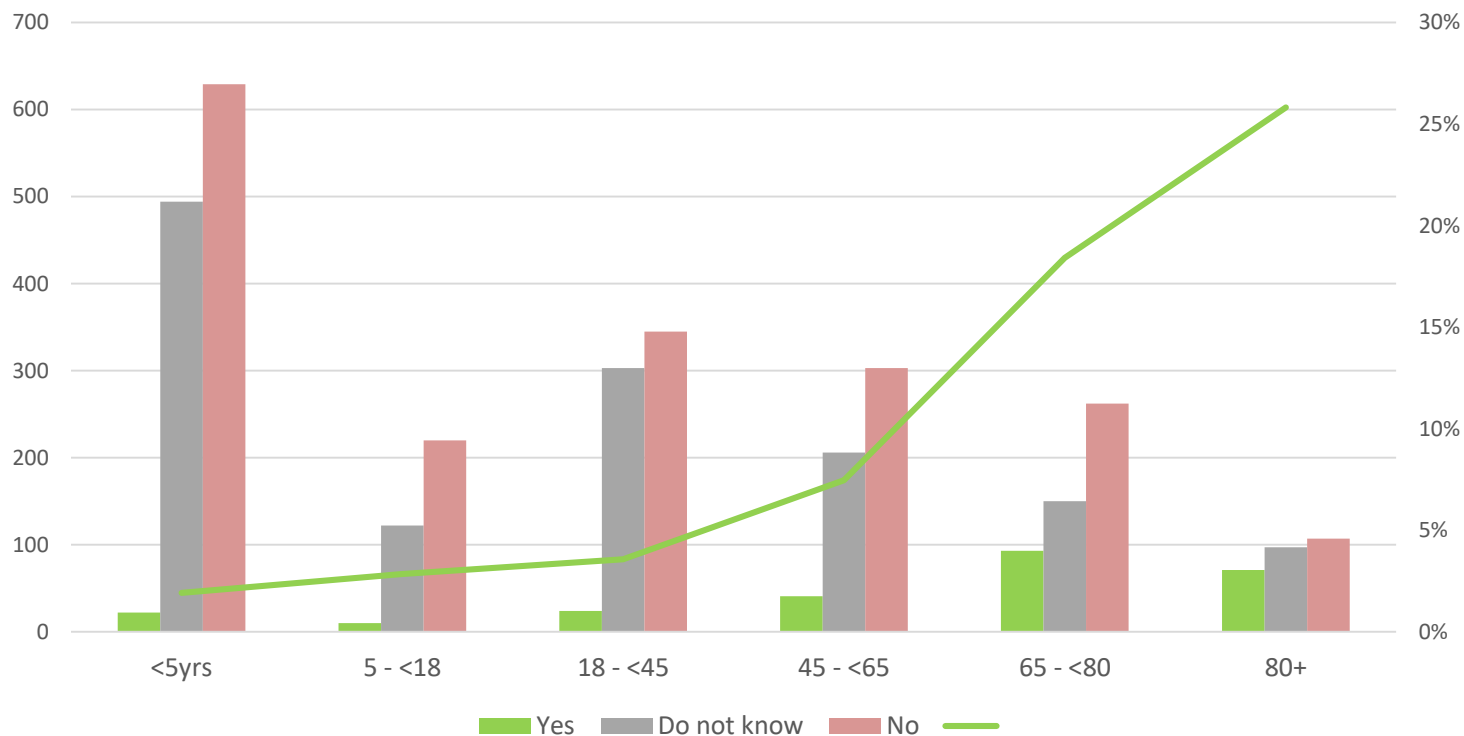
LCI+ PATIENTS 2018-2019

GLOBAL VACCINATION STATUS



N= 3 499

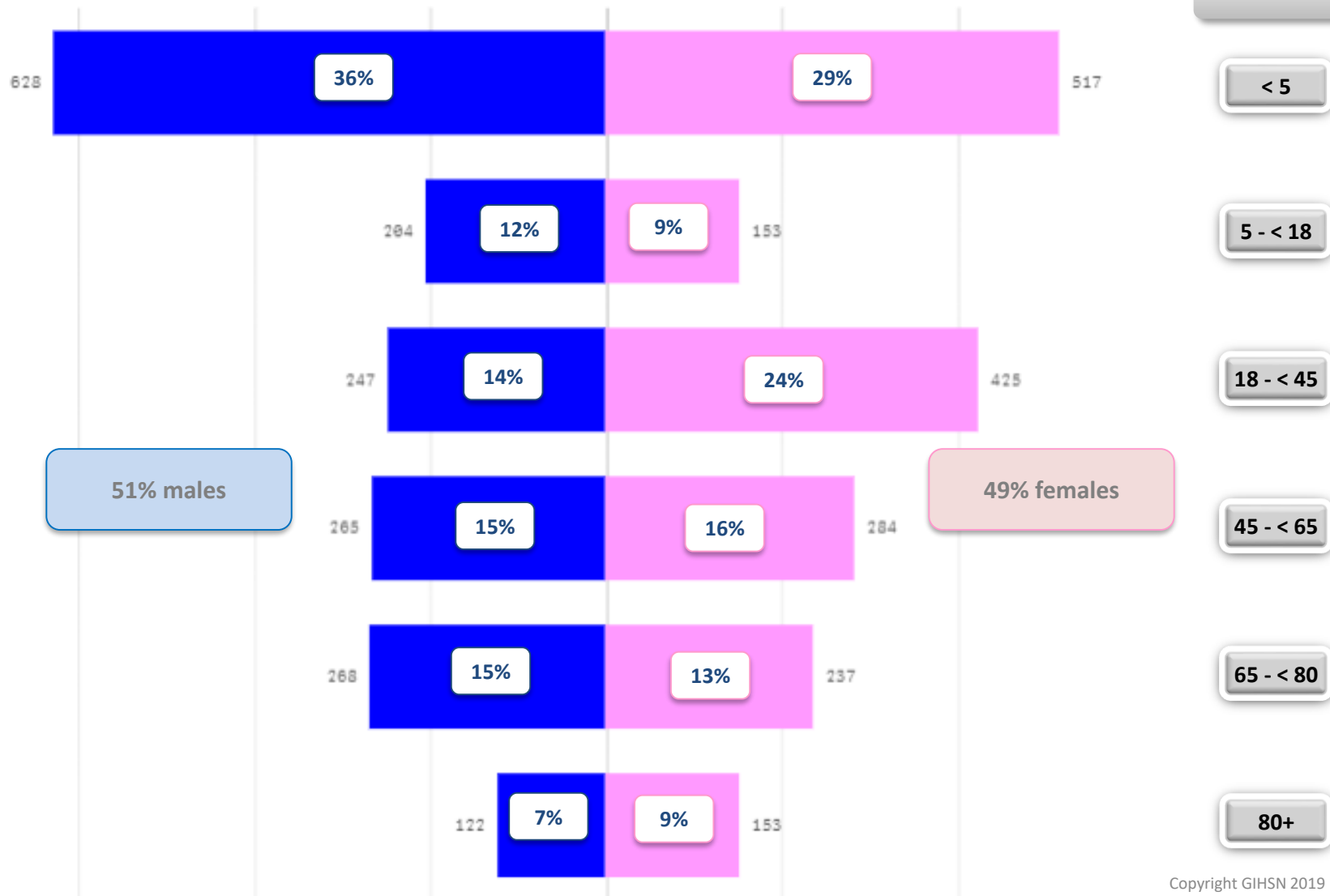
VACCINATION STATUS PER AGE GROUP



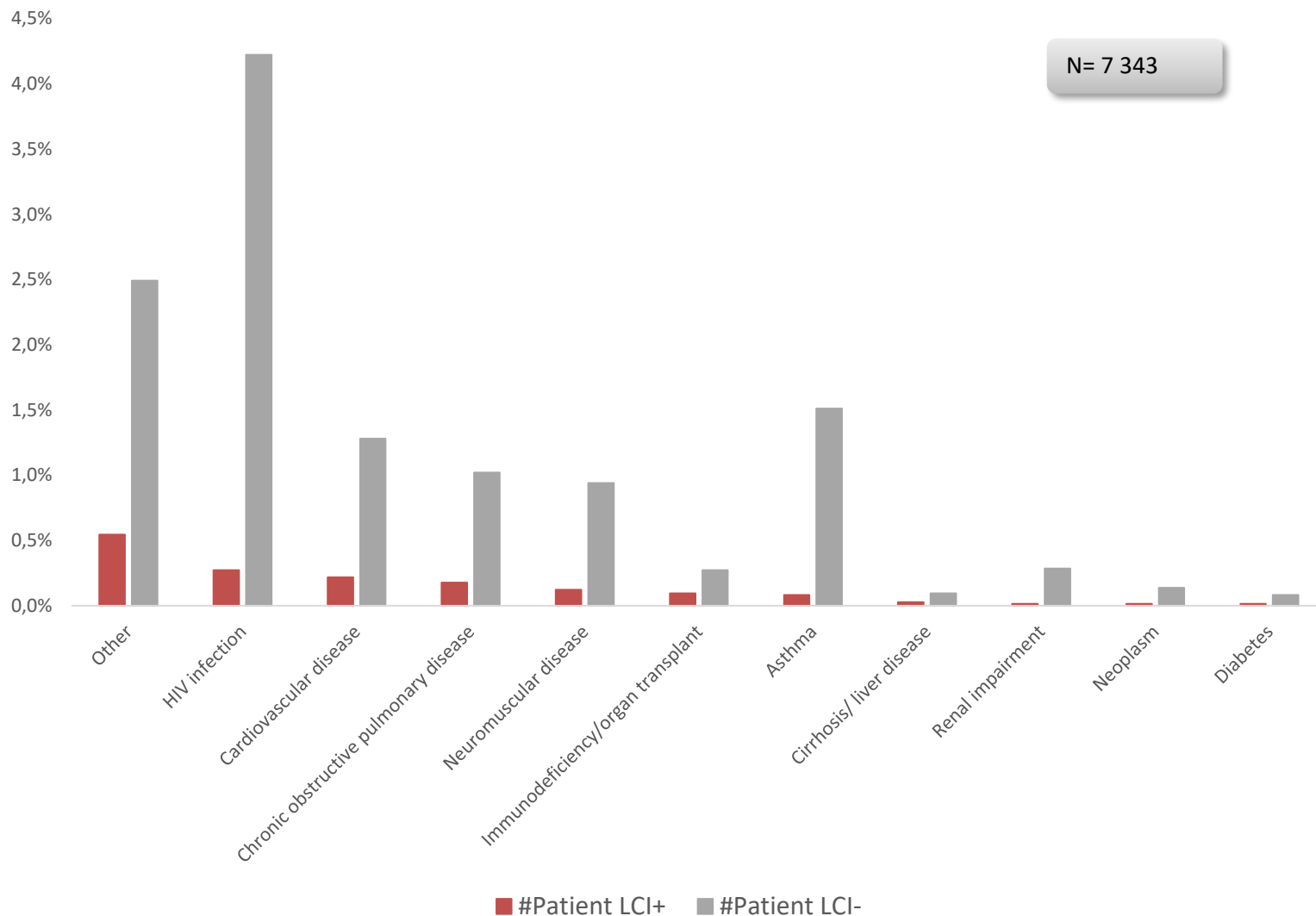
INFLUENZA POSITIVES PER AGE GROUP

LCI+ 2018-2019

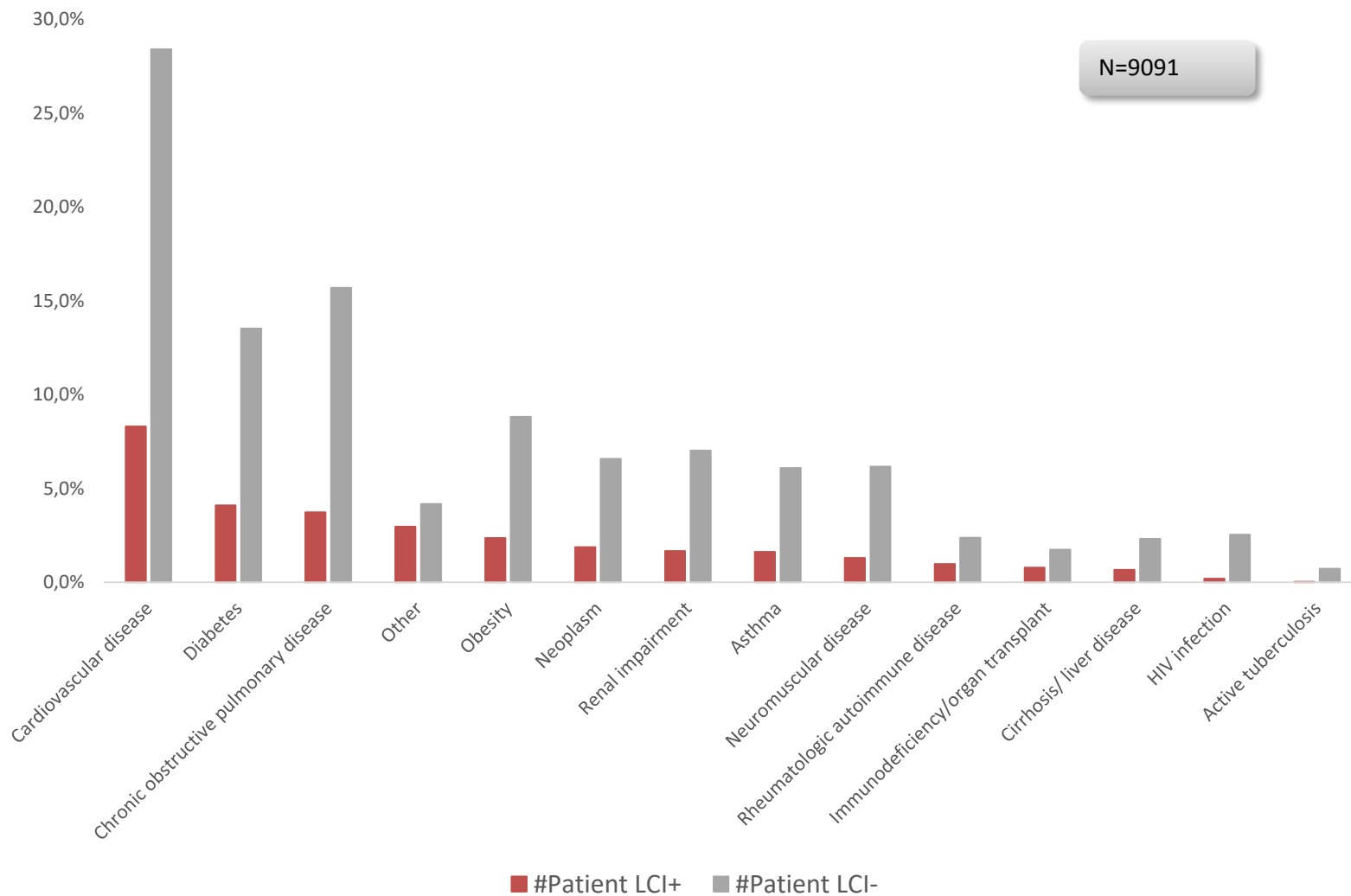
N= 3 512



INFLUENZA STATUS PER CHRONIC CONDITION PATIENTS <5

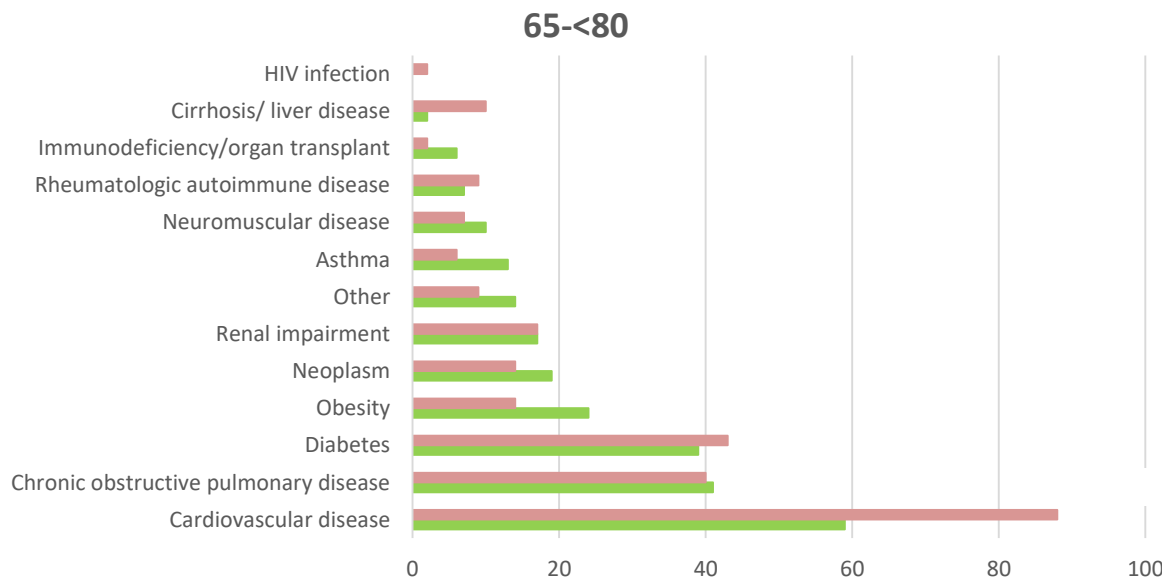
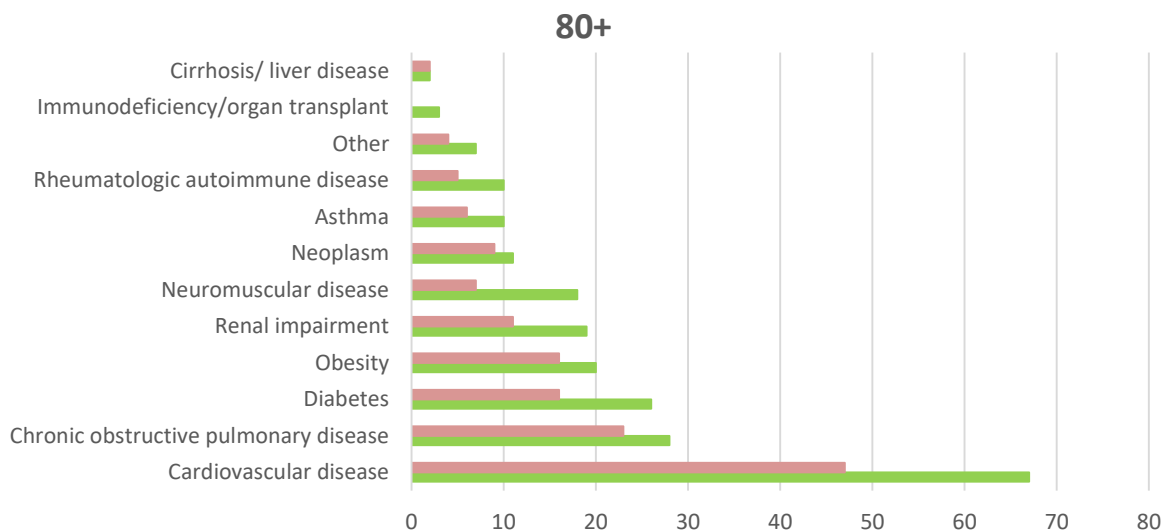


INFLUENZA STATUS PER CHRONIC CONDITION PATIENTS ≥ 5



CHRONIC CONDITIONS IN OLDER AGE GROUPS

LCI+ VACCINATED VS NON VACCINATED



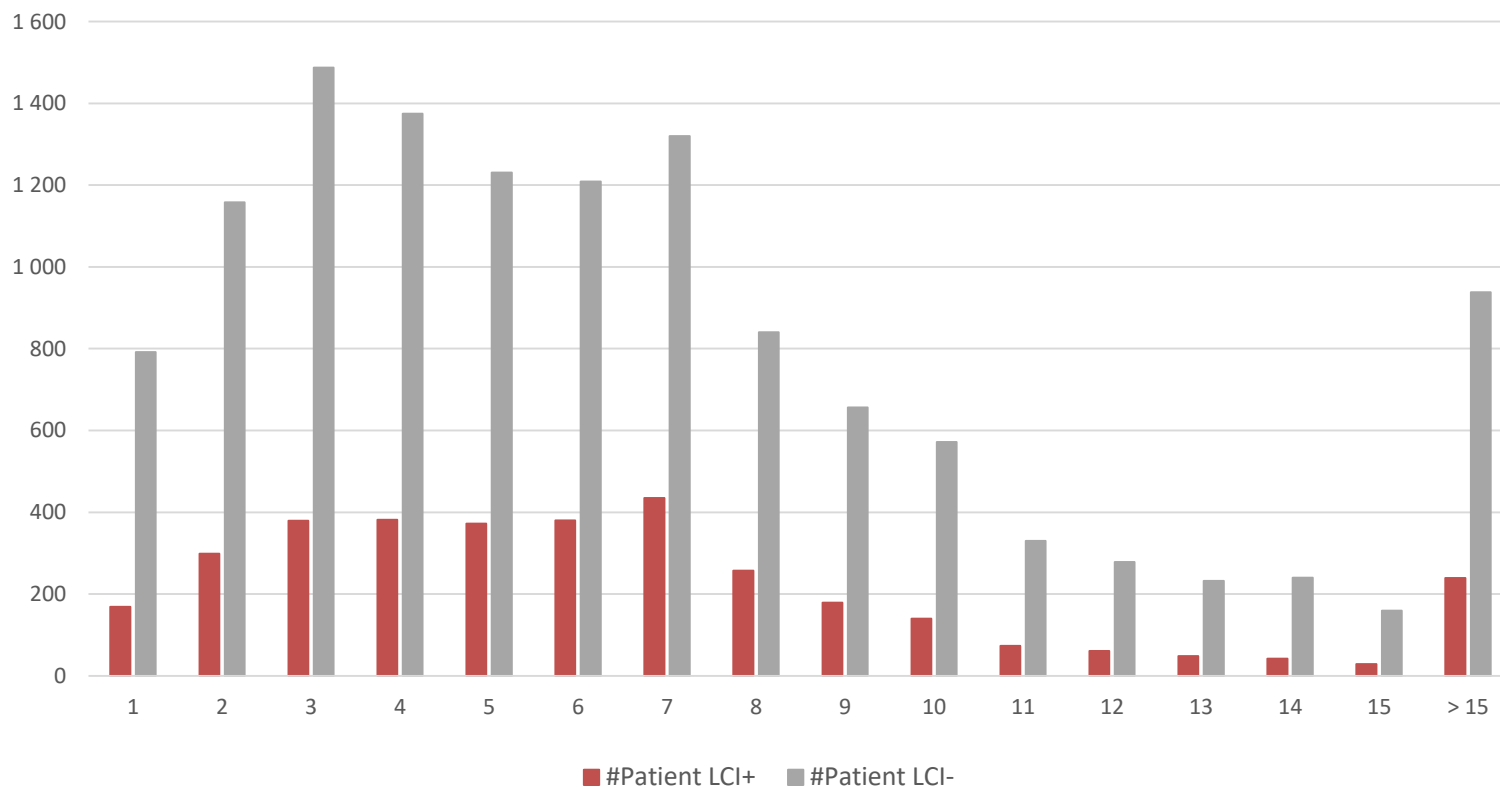
■ NON VACCINATED ■ VACCINATED

LENGTH OF HOSPITAL STAY

LCI+ VS LCI-

Hospital stay in number of days

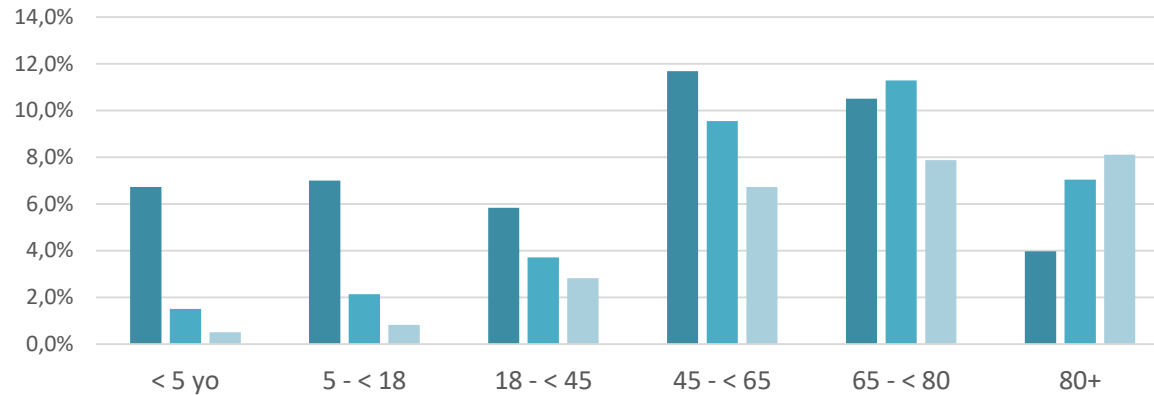
N=16 434



OUTCOME SEVERITY BY AGE GROUP

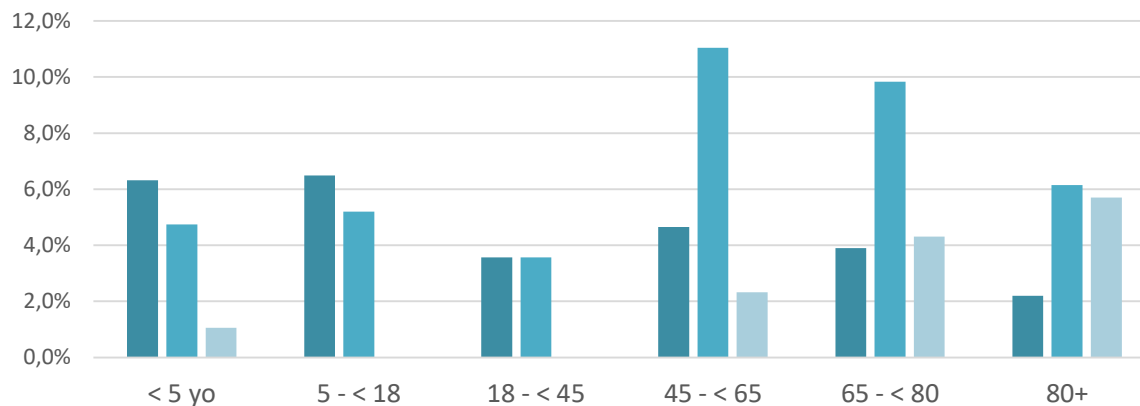
INCLUDED PATIENTS

N=16 434



INCLUDED VACCINATED PATIENTS

N=1 696

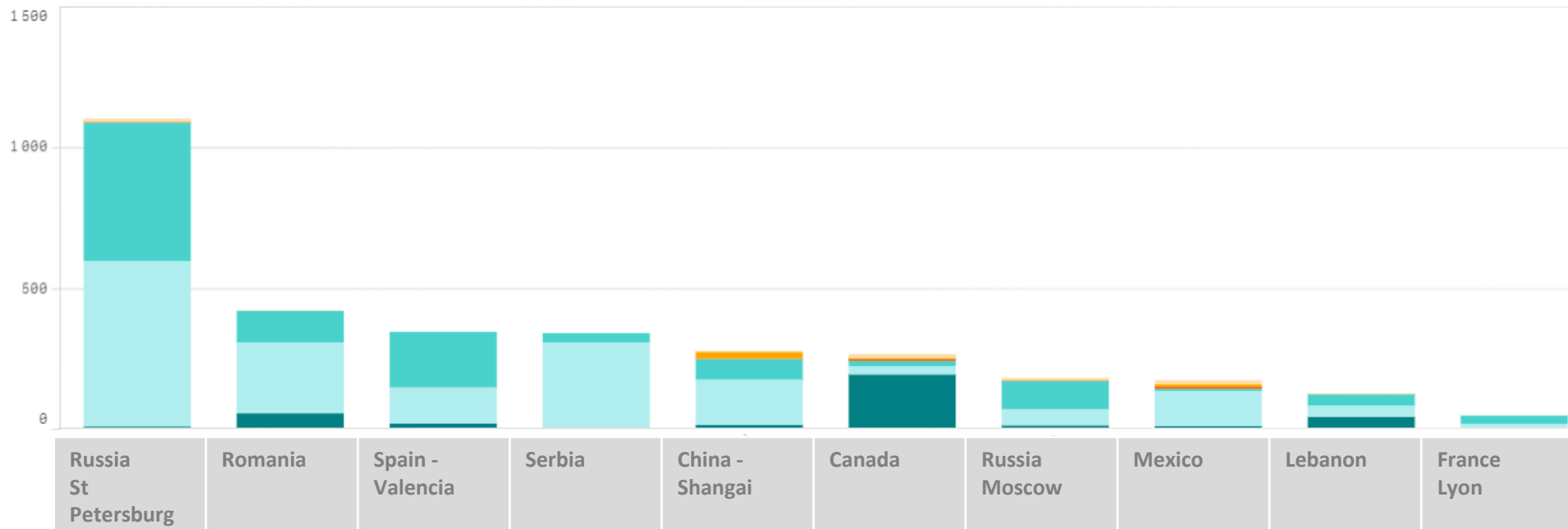
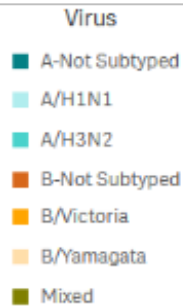


■ %ICU admission ■ %Ventilation ■ %Death

VIRUS DISTRIBUTION NORTHERN HEMISPHERE

N=3 244

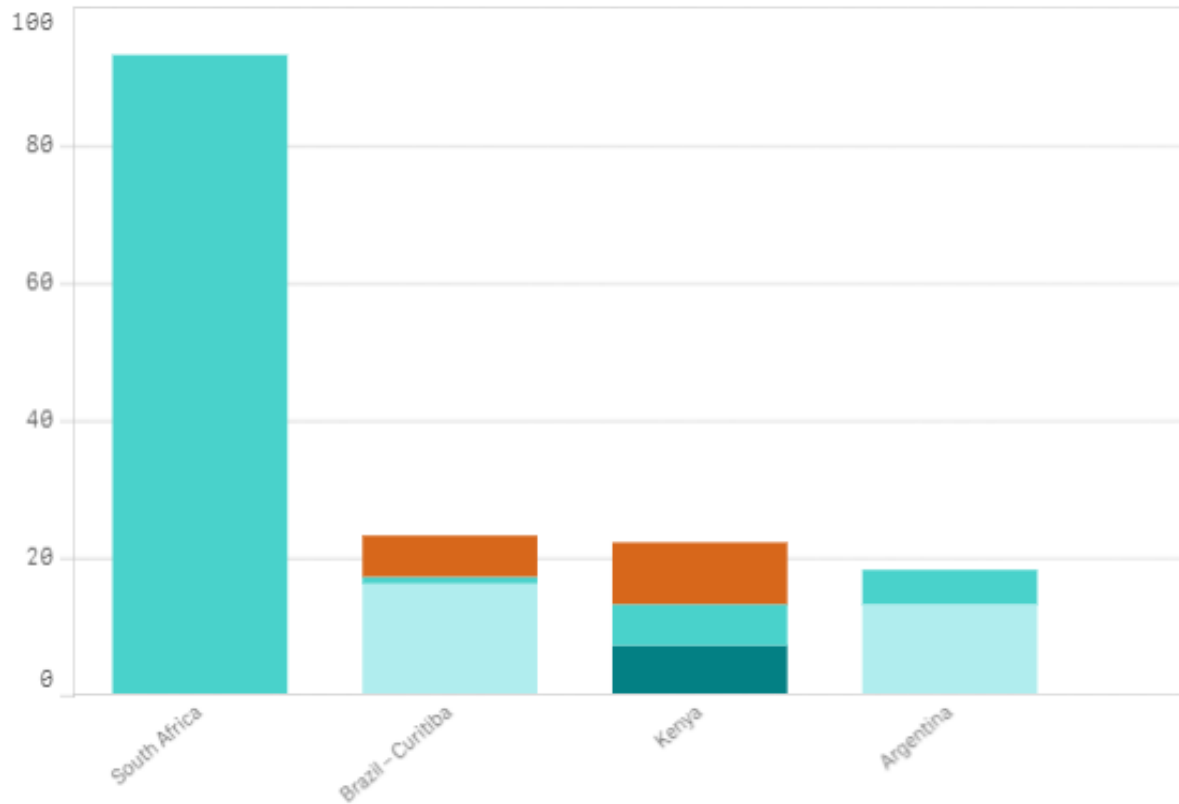
NB PATIENTS



VIRUS DISTRIBUTION SOUTHERN HEMISPHERE

N=156

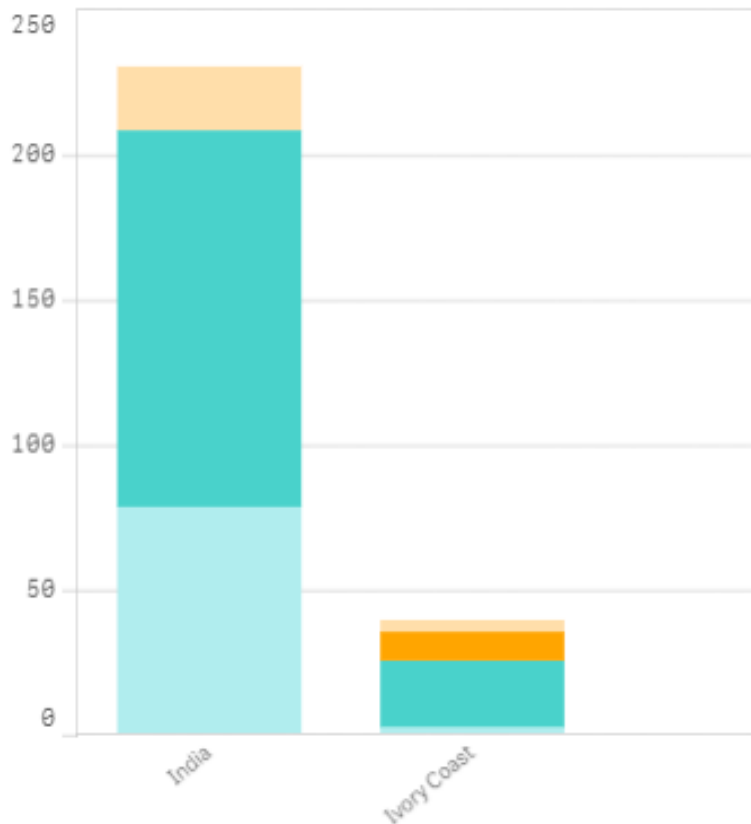
NB PATIENTS



VIRUS DISTRIBUTION INTERTROPICAL HEMISPHERE

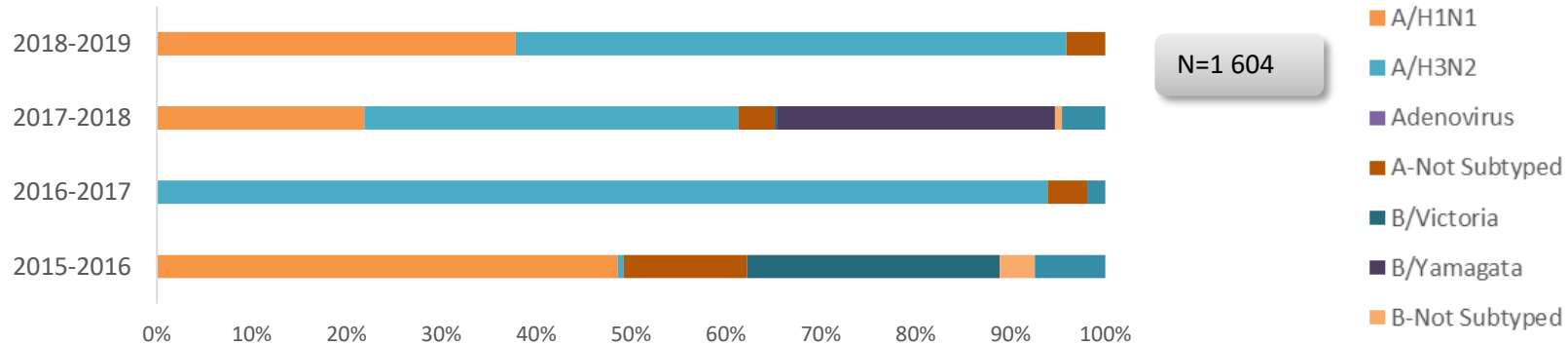
N=269

NB PATIENTS

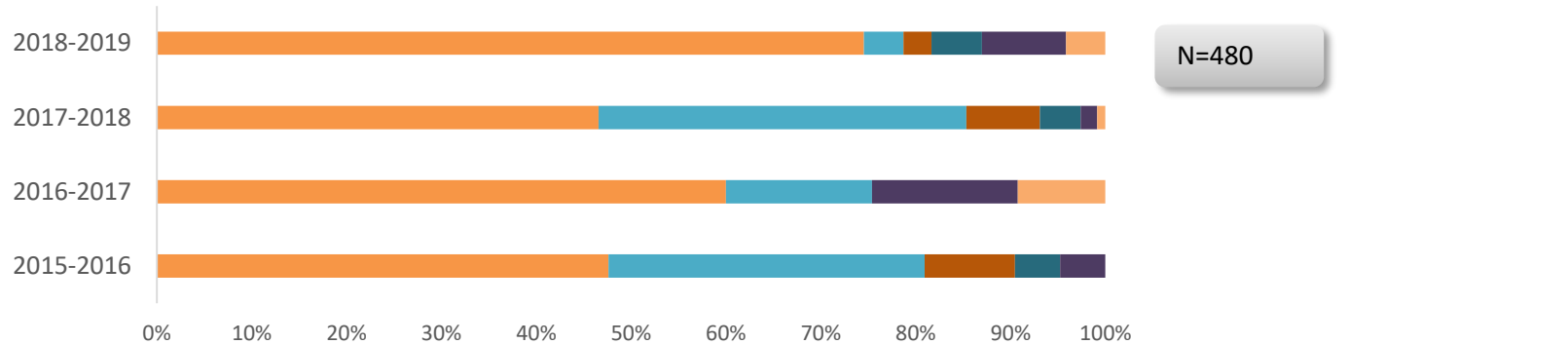


VIRUS DISTRIBUTION OVER 4 SEASONS SITES IN NORTHERN HEMISPHERE

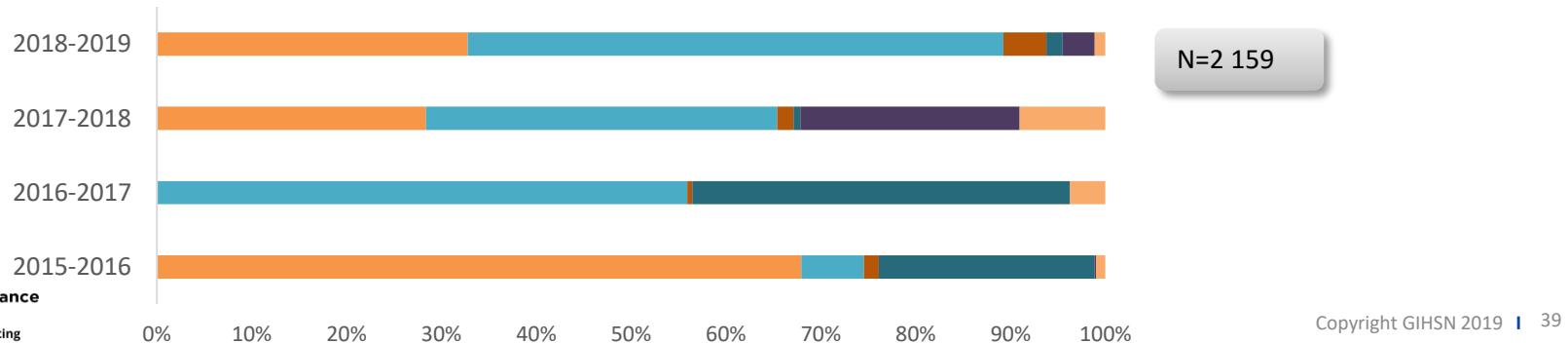
SPAIN



MEXICO



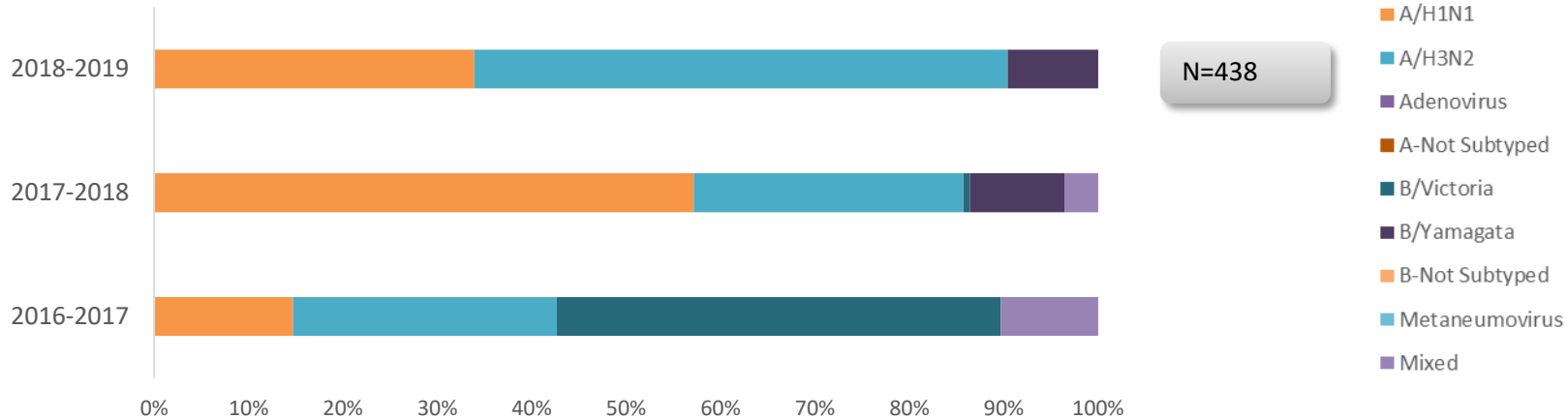
MOSCOW



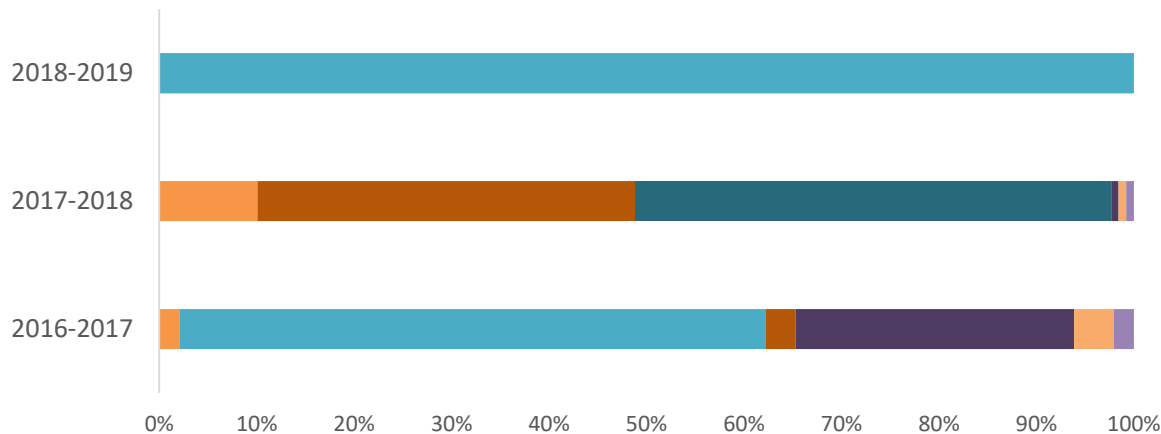
VIRUS DISTRIBUTION OVER 3 SEASONS

SITES IN SOUTHERN & INTERTROPICAL HEMISPHERES

INDIA



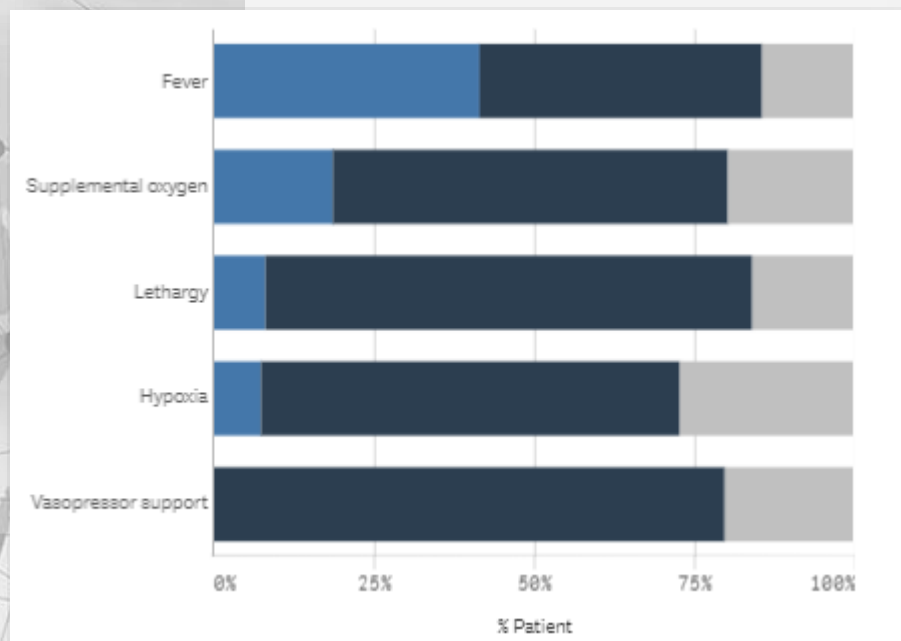
SOUTH AFRICA



SEVERITY INDICATORS INCLUDED PATIENTS

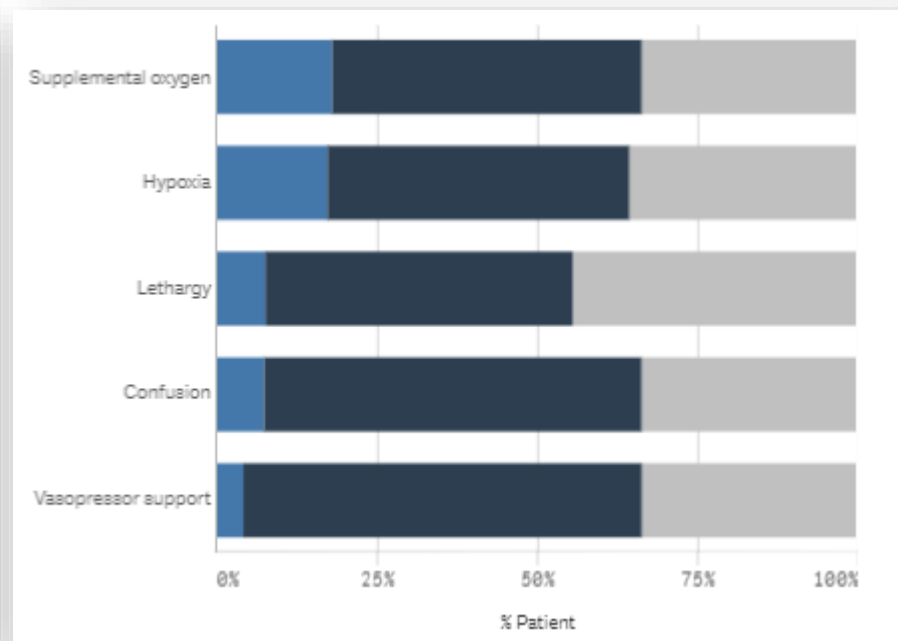
<5 YEARS

N=7 332



>-5 YEARS

N=9 080



Yes

No

Do not know

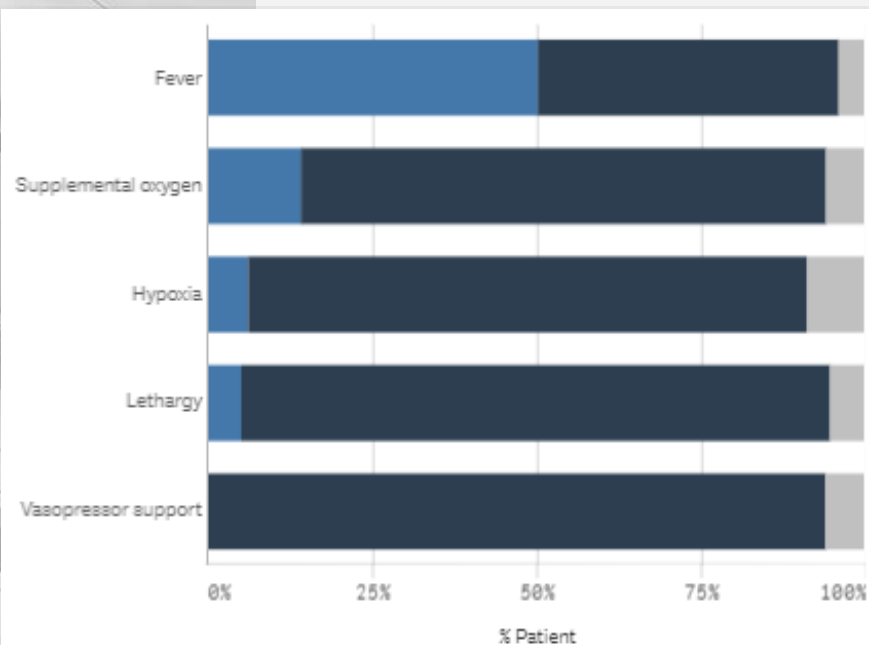


SEVERITY INDICATORS

PATIENTS <5 YEARS

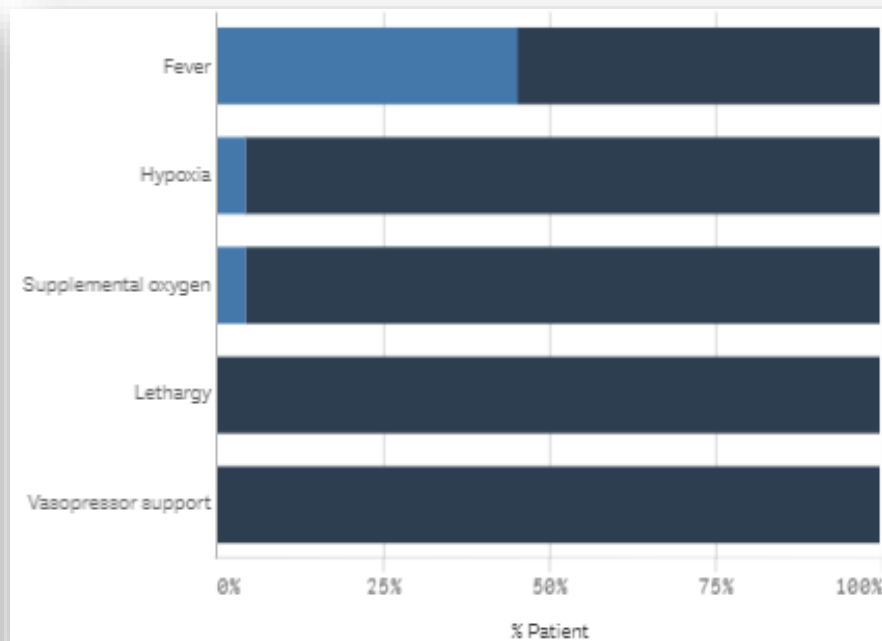
LCI+

N=1 145



LCI+
VACCINATED

N= 22



■ Yes

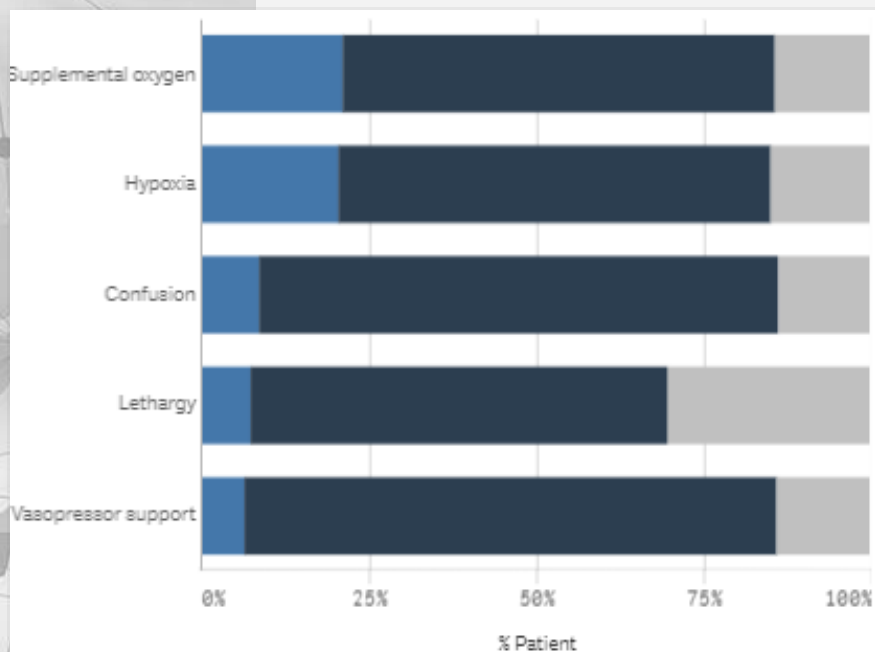
■ No

■ Do not know

SEVERITY INDICATORS PATIENTS >-5 YEARS

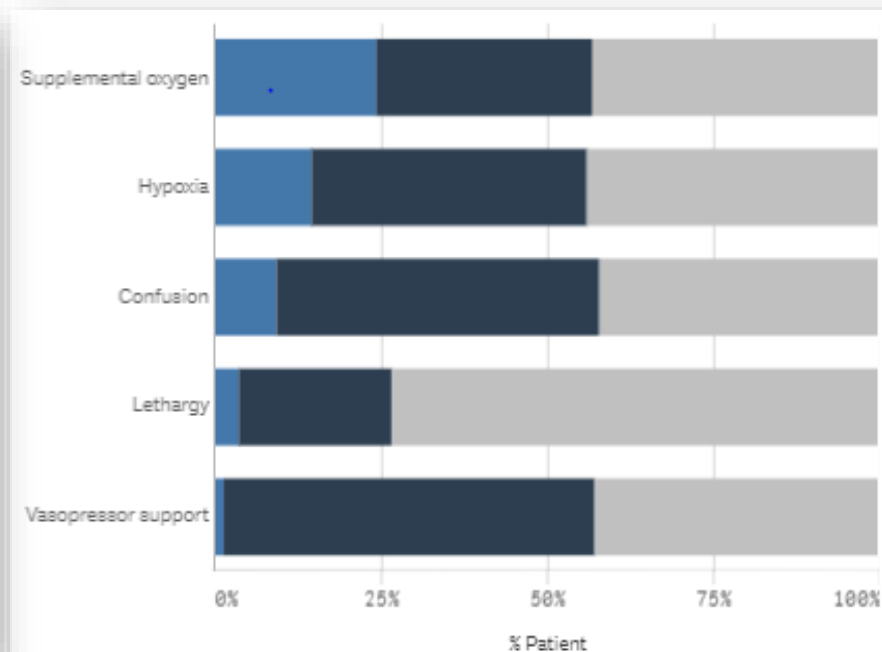
LCI+

N=2 362



LCI+
VACCINATED

N= 265



■ Yes

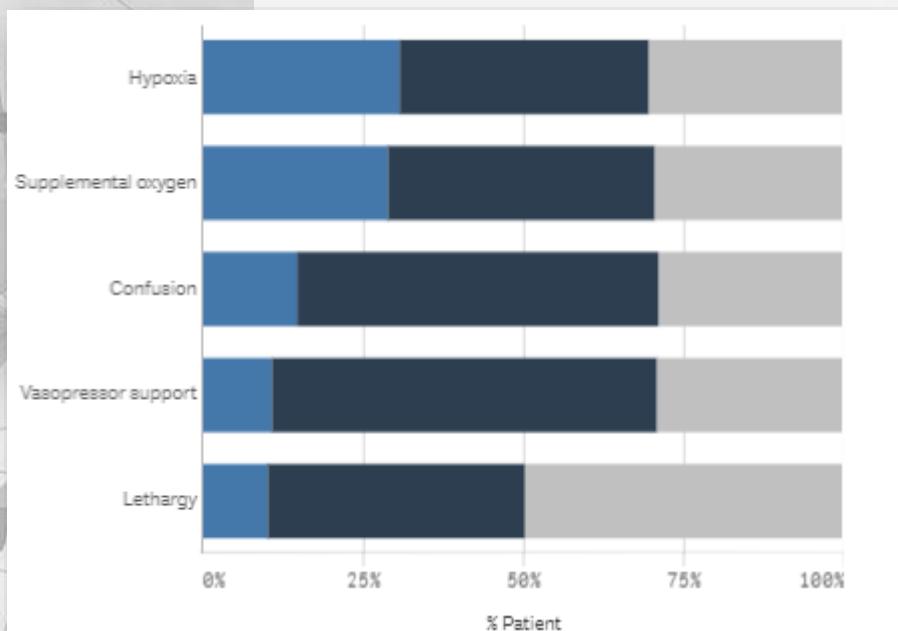
■ No

■ Do not know

SEVERITY INDICATORS OLDER PATIENTS 65+

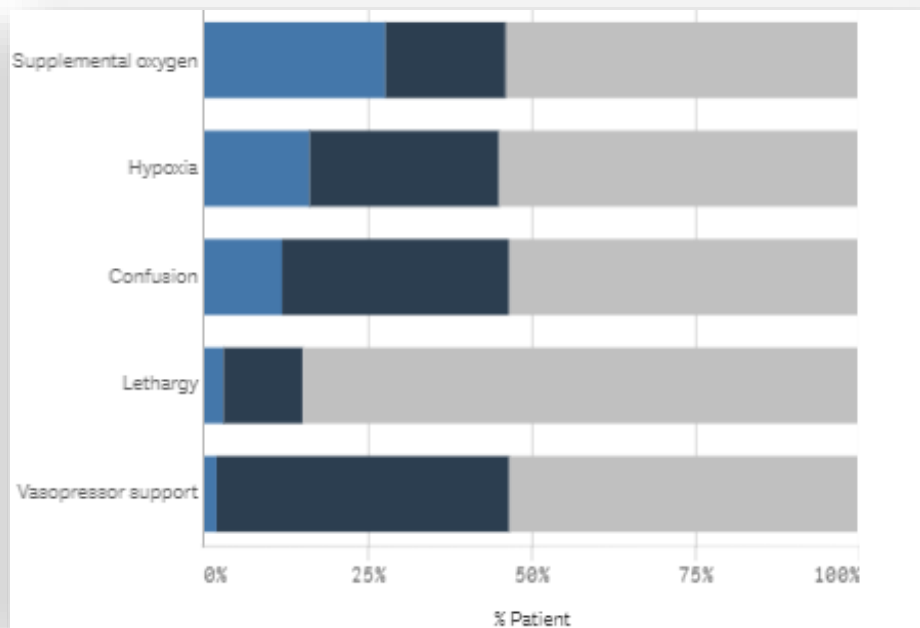
LCI+

N=783



LCI+
VACCINATED

N= 190



■ Yes

■ No

■ Do not know



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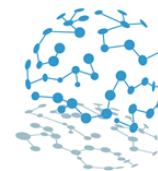


GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

STRAIN SELECTION PROCESS: CURRENT & FUTURE CHALLENGES



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STRAIN SELECTION PROCESS: CURRENT & FUTURE CHALLENGES

ROUND TABLE:

- **Dr. Wenqing ZHANG (WHO)**
- **Dr. Peter BOGNER (GISAID)**
- **Pr. John McCAULEY (WHO CC)**
- **Pr. Bruno LINA (Lyon University)**

- ***Moderated by: Cédric MAHE (FIE)***





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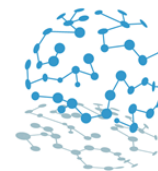


CONTRIBUTION OF THE GIHSN TO THE STRAIN SELECTION MEETING – FEEDBACK ON THE 2018-2019 SEASON & PROSPECTS FOR NEXT SEASON

Pr. Bruno LINA



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Epidemiology**

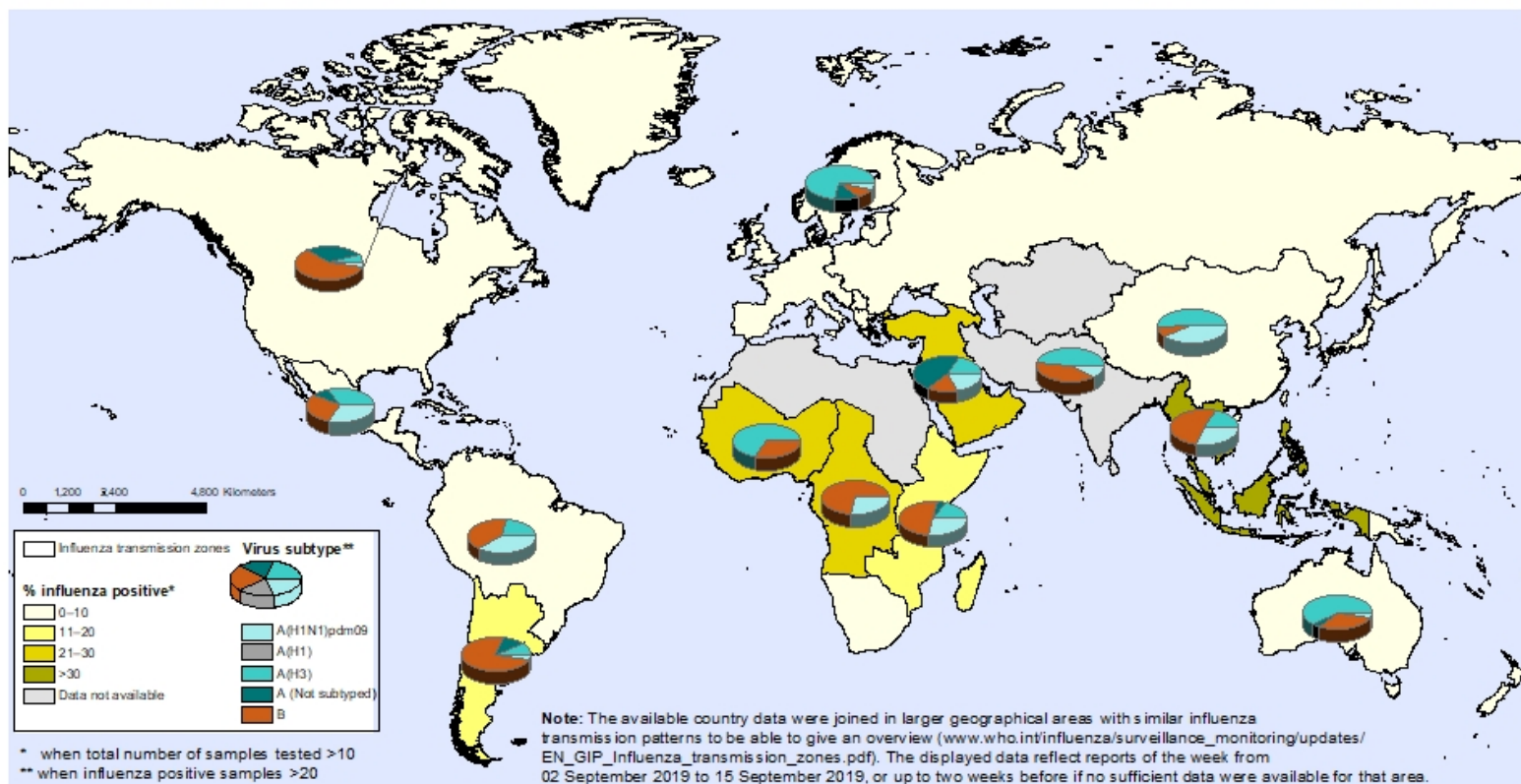


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Influenza surveillance: diversity

Percentage of respiratory specimens that tested positive for influenza By influenza transmission zone

Status as of 27 September 2019

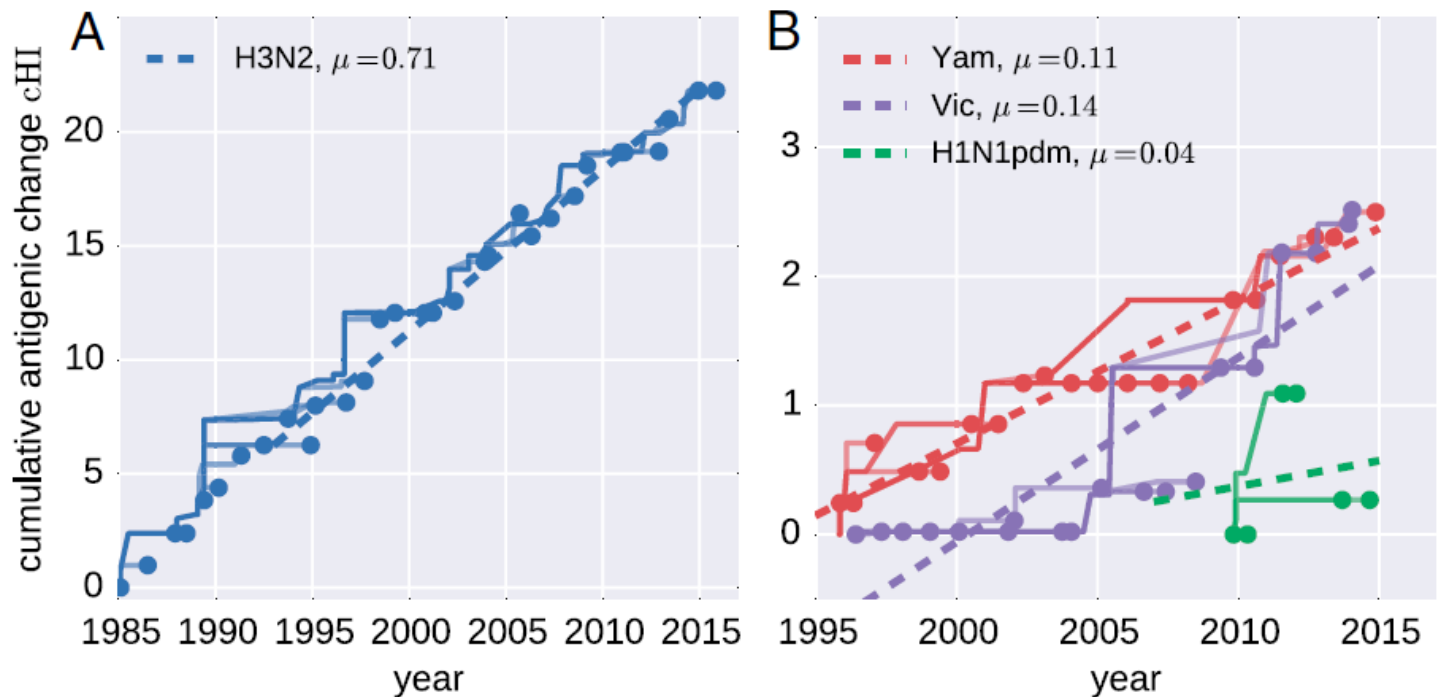


The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source:
Global Influenza Surveillance and Response System (GISRS),
FluNet (www.who.int/flu-net)

 **World Health Organization**
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The evolutive trend of the Influenza viruses is type/sub-type/lineage dependant





Neher RA et al, PNAS 2016



As a consequence: Annual changes in the influenza vaccine composition

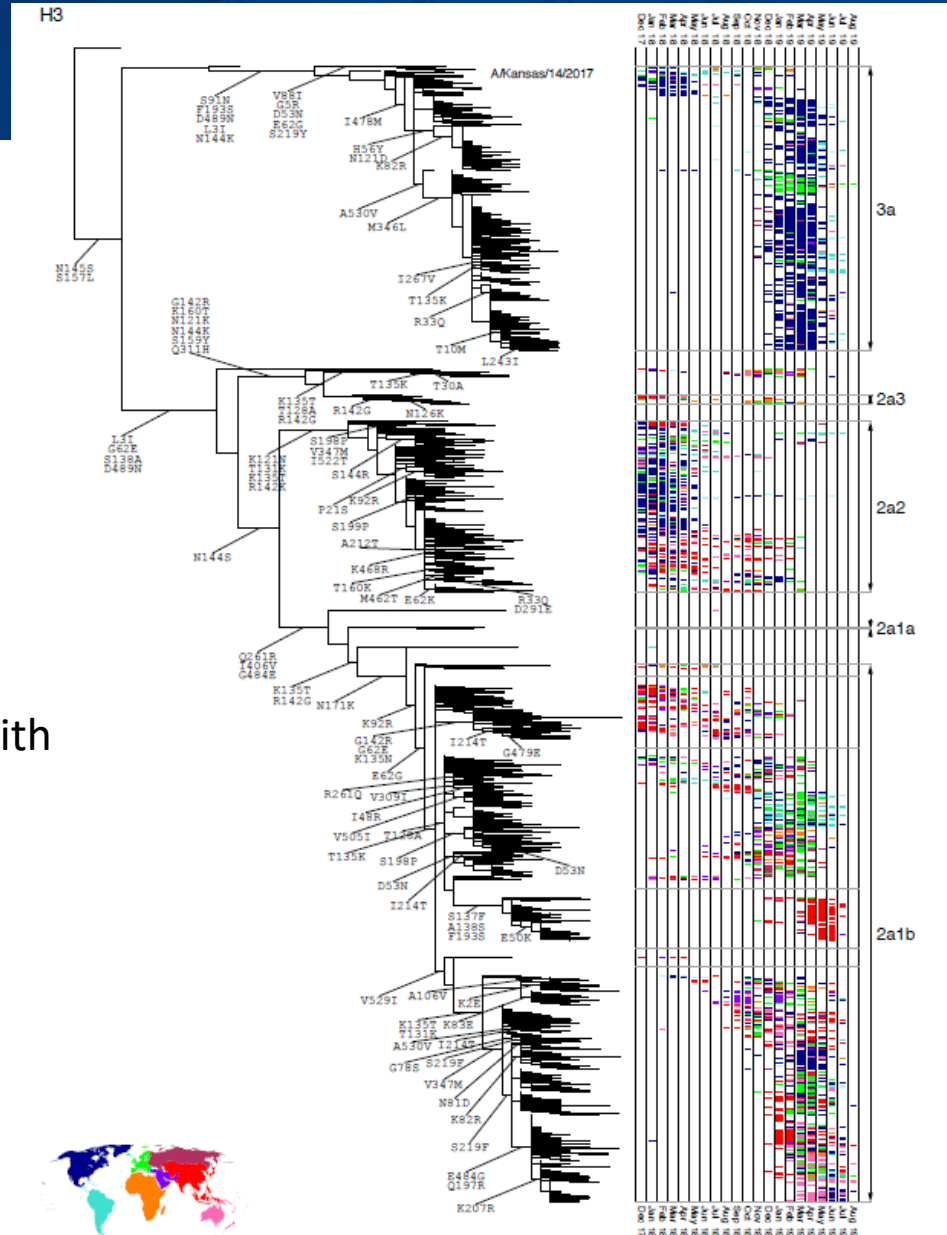
NH vaccine composition

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
A(H3N2)																						
A/Sydney/5/97																						
A/Moscow/10/99																						
A/Fujian/411/2002																						
A/California/7/2004																						
A/Wisconsin/67/2005																						
A/Brisbane/10/2007																						
A/Perth/16/2009																						
A/Victoria/361/2011																						
A/Texas/50/2012																						
A/Switzerland/9715293/2013																						
A/Hong Kong/4801/2014																						
A/Singapore/INFIMH-16-0019/2016																						
A/Switzerland/8060/2017																						
A/Kansas/14/2017																						
A(H1N1)																						
A/Beijing/262/95																						
A/New Caledonia/20/99																						
A/Solomon Islands/3/2006																						
A/Brisbane/59/2007																						
A/California/7/2009																						
A/Michigan/45/2015																						
A/Brisbane/02/2018																						
B																						
B/Beijing/184/93 (Yam)																						
B/Sichuan/379/99 (Yam)																						
B/Hong Kong/330/2001 (Vic)																						
B/Shanghai/361/2002 (Yam)																						
B/Malaysia/2506/2004 (Vic)																						
B/Florida/4/2006 (Yam)																						
B/Brisbane/60/2008 (Vic)																						
B/Wisconsin/1/2010 (Yam)																						
B/Massachusetts/2/2012 (Yam)																						
B/Phuket/3073/2013 (Yam)																						
B/Colorado/06/2017 (Vic Δ-2)																						

 2nd B strain for quadrivalent vaccine if needed
 2nd B strain for quadrivalent vaccine OMS recommendation

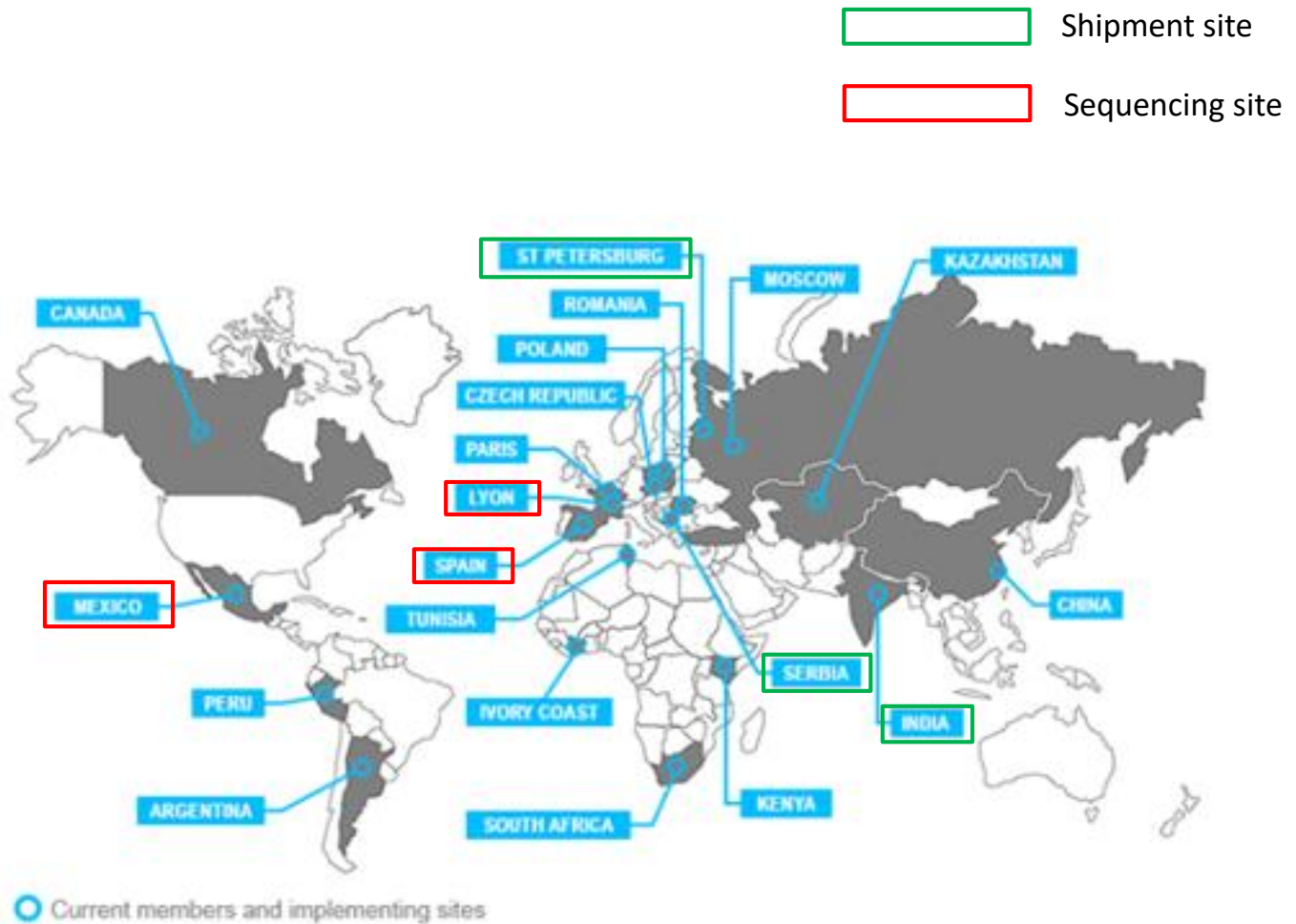
H3N2 current evolution: multiple clades and sub-clades

Courtesy of DJ Smith



Project:

Use GIHSN to provide WGS real-time data to analyse strain variation and evolution.
2018-19 phase 1 feasibility study



Results for the 2018-2019 feasibility study

Summary :

- 1 - 6 sites provided data
- 2 - Overall, approx 200 whole genome sequences have been obtained
- 3 - Shipments have been difficult to organize
- 4 - Difficulty to provide real-time data by the GIHSN sequencing lab
 - For the sequence fasta files
 - For the GISAID upload
 - For the feedback to the originating labs



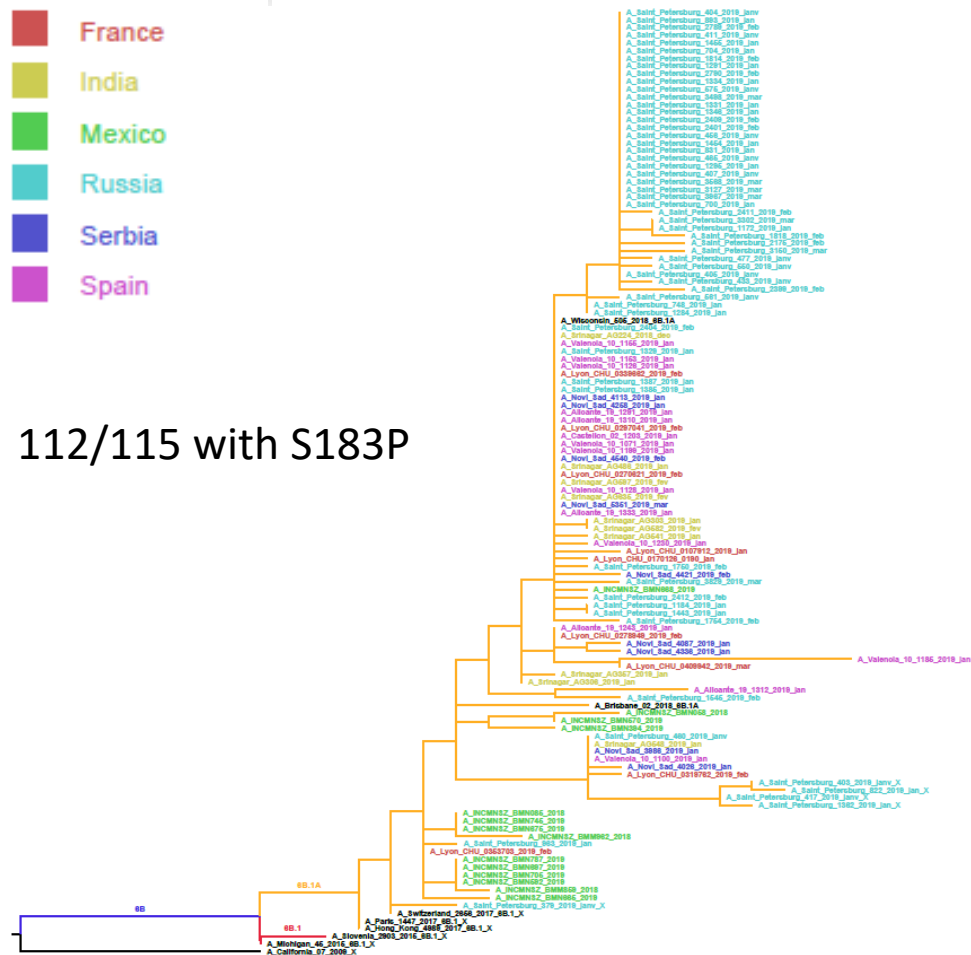
Results for the 2018-2019 feasibility study

Country	date	Nb specimens (ARN)				Nb sequences				Nb validated sequences				Nb non tested specimens Ct>31	Nb non tested specimens / double shipment	Ongoing	seq failure
		H3	H1	B	total	H3	H1	B	total	H3	H1	B	total				
Russia_jan	28/01/2019	8	15	0	23	0	0	0	0	8	15	0	23	0		0	0
Russia_apr	25/04/2019	39	56	0	95	0	0	0	0	30	43	0	73	8	4	1	9
Russia tot		47	71	0	118	0	0	0	0	38	58	0	96	8	4	1	9
France	03/2019	31	13	0	44	0	0	0	0	26	9	0	35	6		0	3
India	18/02/2019	15	10	5	30	0	0	0	0	15	10	4	29			0	1
Spain	02/2019	0	0	0	0	5	15	0	20	5	15	0	20			0	0
Serbie	09/04/2019	10	10		20	0	0	0	0	10	9	0	19			0	1
Mexico (pas de NA)	02/2019	0	0	0	0	0	14	0	14	0	14	0	14			0	0
					0				0				0			0	0
					0				0				0			0	0
					0				0				0			0	0
					0				0				0			0	0
					0				0				0			0	0
					0				0				0			0	0
total specimens					212												
total sequences									34								
total GIHSN									246								
total sequences													213				
														14	4		
total seq failure																	14

H1N1pdm09

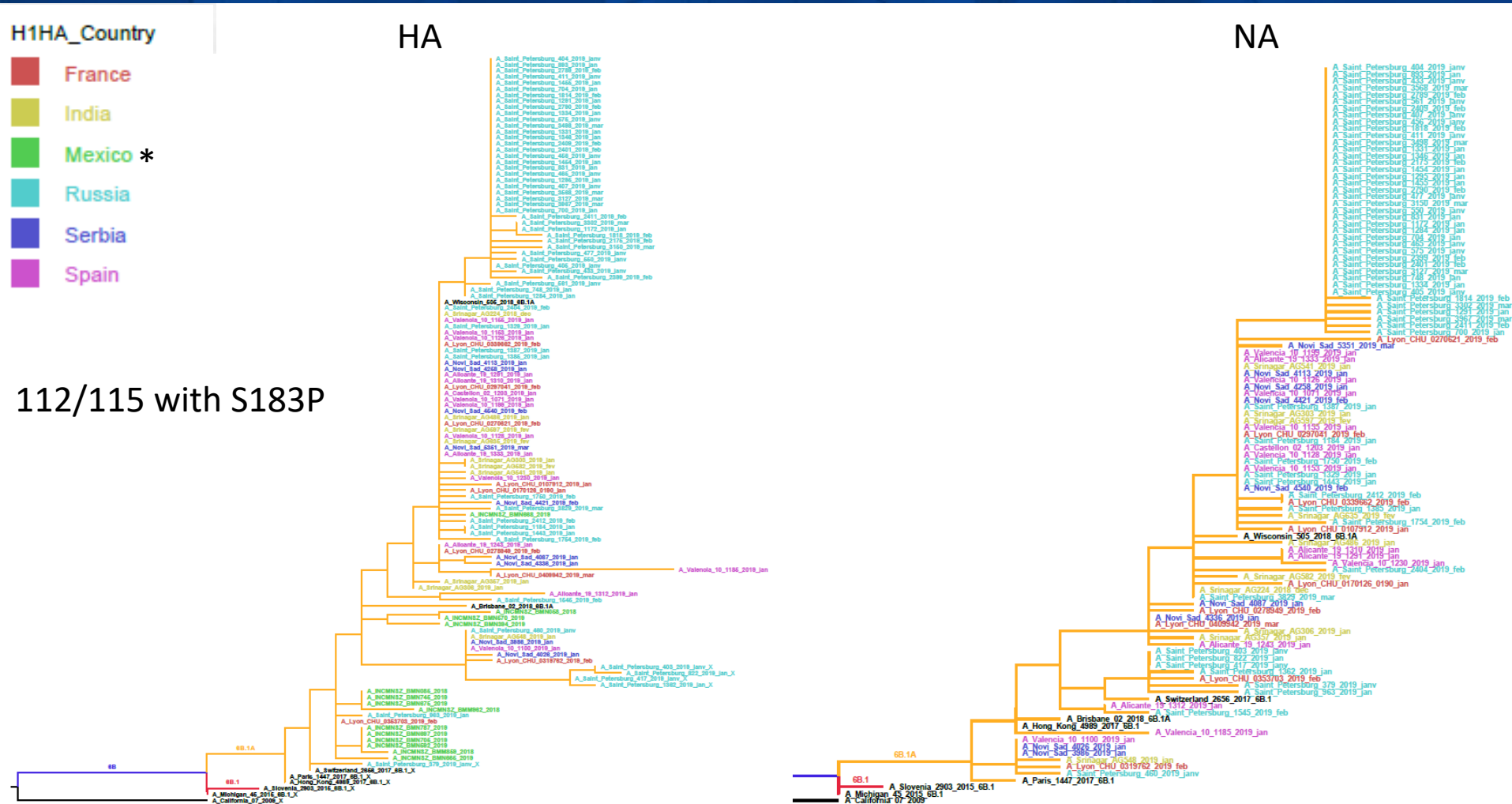
H1HA_Country

HA



0034

H1N1pdm09



H3N2 HA

H1HA_Country

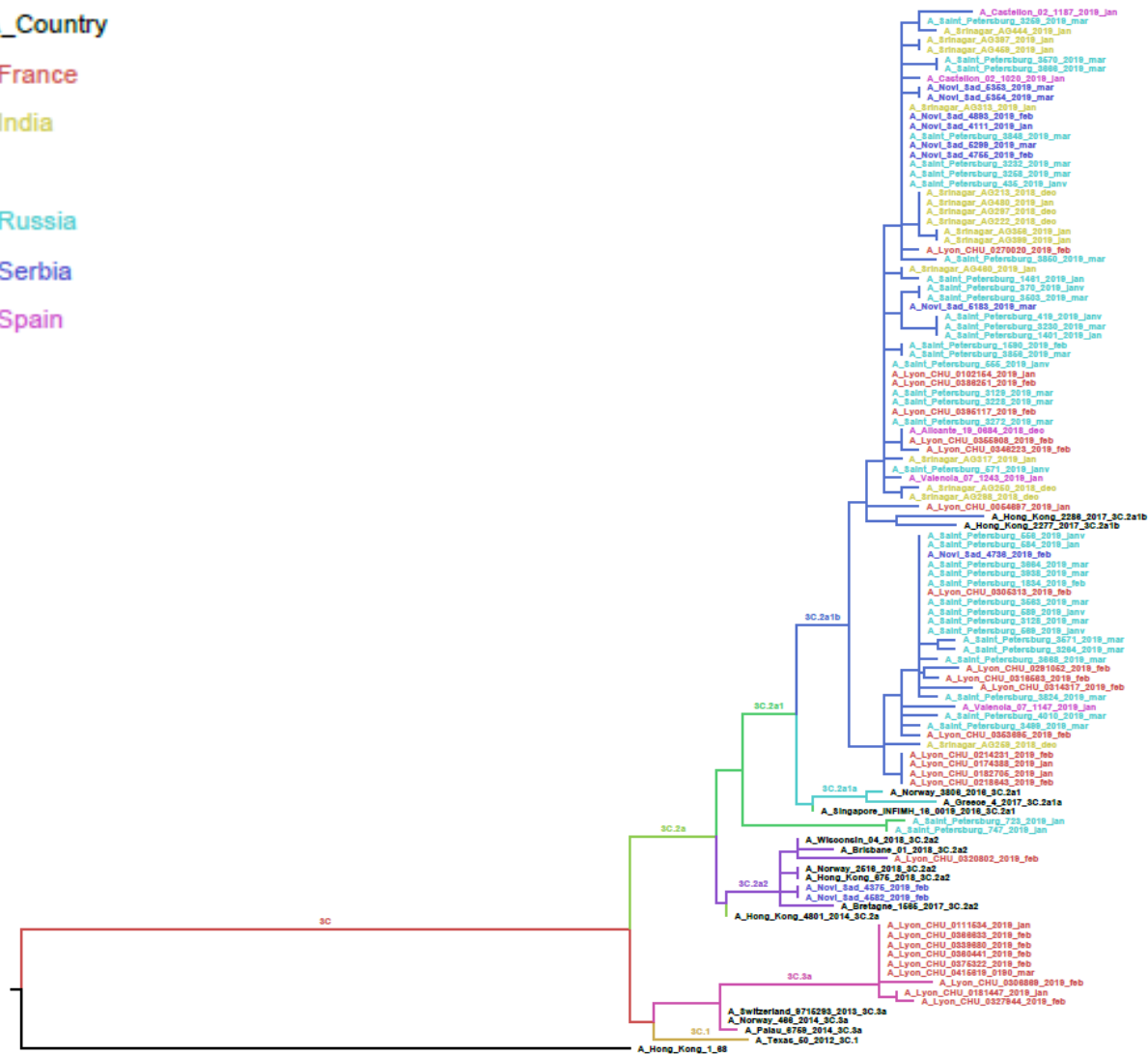
France

India

Russia

Serbia

Spain



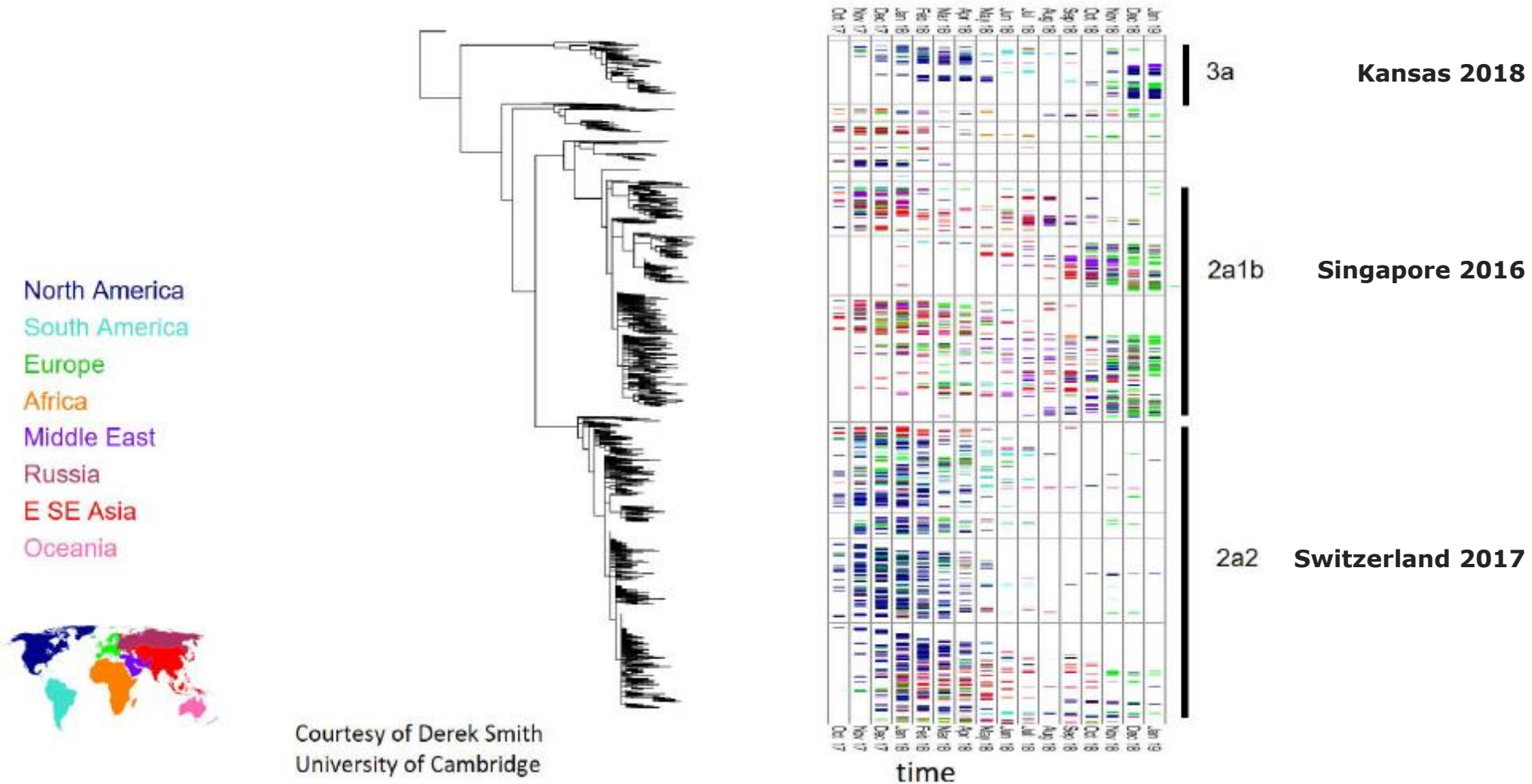
84

1

9



H3N2 clade evolution 2017-2019

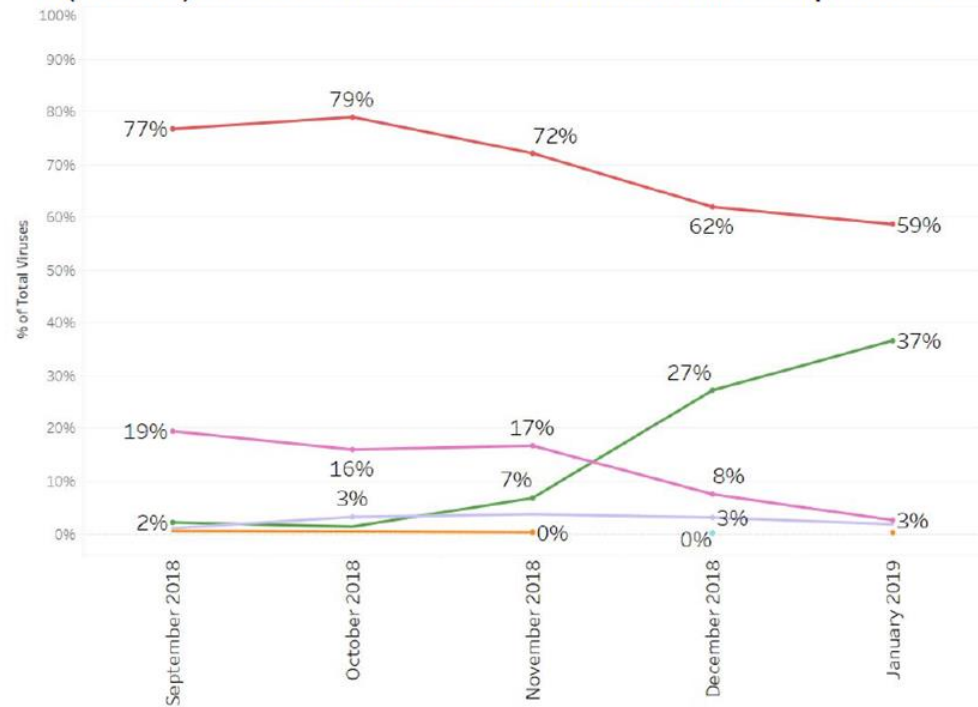


Discrepancies between GIHSN and WHO A(H3N2) clade evolution 2017-2019 (as of feb 2019)

A(H3N2) clades based on available HA sequences

3C Clades

- 2a
- 2a1
- 2a1b
- 2a2
- 2a3
- 2a4
- 3a



But, the extent of the GIHSN data is limited...

H3N2 NA

ry H1HA_Country

France

India

Russia

Serbia

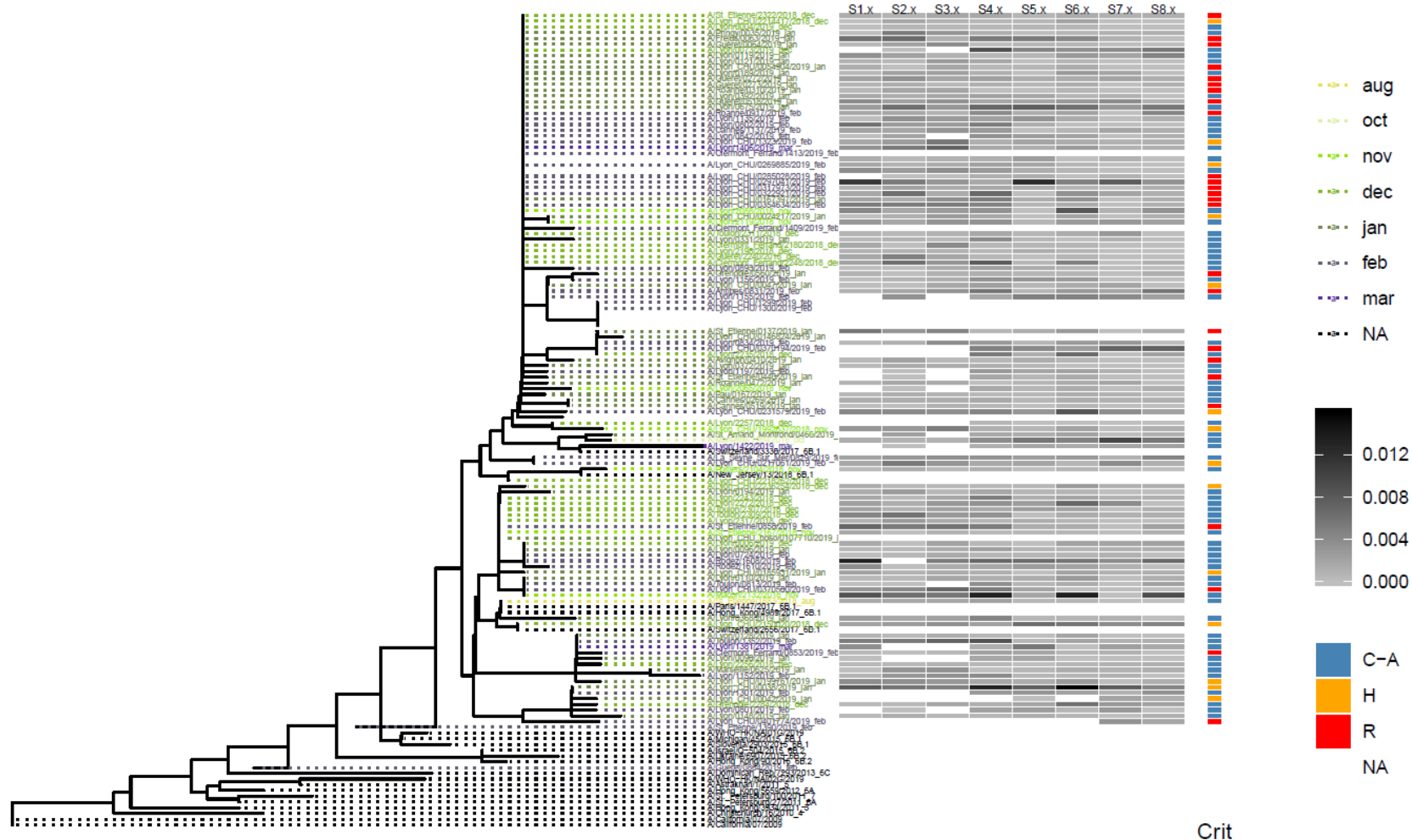
Spain

A_Saint_Petersburg_586_2019_janv
A_Saint_Petersburg_1814_2019_feb
A_Saint_Petersburg_3338_2019_mar
A_Saint_Petersburg_383_2019_janv
A_Lyon_CHU_030513_2019_feb
A_Saint_Petersburg_3664_2019_mar
A_Saint_Petersburg_3485_2019_mar
A_Lyon_CHU_0291082_2019_feb
A_Saint_Petersburg_3271_2019_mar
A_Saint_Petersburg_3583_2019_mar
A_Saint_Petersburg_3624_2019_mar
A_Lyon_CHU_0316853_2019_feb
A_Saint_Petersburg_3158_2019_mar
A_Lyon_CHU_0314317_2019_feb
A_Saint_Petersburg_366_2019_janv
A_Lyon_CHU_0218843_2019_feb
A_Lyon_CHU_0182755_2019_jan
A_Lyon_CHU_0174388_2019_jan
A_Lyon_CHU_0214231_2019_feb
A_Valencia_07_1747_2019_jan
A_Saint_Petersburg_4010_2019_mar
A_Lyon_CHU_0183065_2019_feb
A_Novi_Sad_4718_2019_feb
A_Saint_Petersburg_584_2019_jan
A_Saint_Petersburg_3655_2019_mar
A_Saint_Petersburg_3284_2019_mar
A_Srinagar_AG480_2019_jan
A_Saint_Petersburg_3129_2019_mar
A_Saint_Petersburg_571_2019_janv
A_Saint_Petersburg_364_2019_janv
A_Saint_Petersburg_1590_2019_feb
A_Saint_Petersburg_5505_2019_mar
A_Saint_Petersburg_3272_2019_mar
A_Saint_Petersburg_3228_2019_mar
A_Srinagar_AG213_2019_dec
A_Saint_Petersburg_1481_2019_jan
A_Srinagar_AG287_2019_dec
A_Srinagar_AG285_2019_jan
A_Castellon_02_1187_2019_jan
A_Srinagar_AG255_2019_dec
A_Srinagar_AG285_2019_jan
A_Castellon_02_1030_2019_jan
A_Srinagar_AG481_2019_jan
A_Lyon_CHU_0270020_2019_feb
A_Srinagar_AG222_2019_dec
A_Novi_Sad_4765_2019_feb
A_Novi_Sad_5299_2019_mar
A_Saint_Petersburg_426_2019_janv
A_Novi_Sad_4711_2019_jan
A_Novi_Sad_4882_2019_feb
A_Saint_Petersburg_3645_2019_mar
A_Saint_Petersburg_3232_2019_mar
A_Saint_Petersburg_3255_2019_mar
A_Saint_Petersburg_3270_2019_mar
A_Saint_Petersburg_3665_2019_mar
A_Saint_Petersburg_3585_2019_mar
A_Saint_Petersburg_3585_2019_mar
A_Novi_Sad_5283_2019_mar
A_Novi_Sad_5184_2019_mar
A_Srinagar_AG313_2019_jan
A_Srinagar_AG287_2019_jan
A_Srinagar_AG489_2019_jan
A_Srinagar_AG444_2019_jan
A_Srinagar_AG285_2019_jan
A_Srinagar_AG285_2019_jan
A_Srinagar_AG285_2019_jan
A_Lyon_CHU_0054897_2019_jan
A_Hong_Kong_2277_2017_3C.2a1b
A_Hong_Kong_2286_2017_3C.2a1b
A_Saint_Petersburg_370_2019_janv
A_Saint_Petersburg_410_2019_janv
A_Saint_Petersburg_363_2019_mar
A_Saint_Petersburg_3210_2019_mar
A_Novi_Sad_5183_2019_mar
A_Saint_Petersburg_1401_2019_jan
A_Norway_3006_2016_3C.2a1
A_Lyon_CHU_0115334_2019_jan
A_Lyon_CHU_0308889_2019_feb
A_Lyon_CHU_0327544_2019_feb
A_Lyon_CHU_0305441_2019_feb
A_Lyon_CHU_0415819_2019_mar
A_Lyon_CHU_0338880_2019_feb
A_Lyon_CHU_0181447_2019_jan
A_Lyon_CHU_0371521_2019_feb
A_Lyon_CHU_0388832_2019_feb
A_Saint_Petersburg_723_2019_jan
A_Saint_Petersburg_747_2019_jan
A_Valencia_07_1243_2019_jan
A_Lyon_CHU_0182154_2019_jan
A_Lyon_CHU_0305551_2019_feb
A_Lyon_CHU_0305117_2019_feb
A_Lyon_CHU_0348223_2019_feb
A_Lyon_CHU_0358908_2019_feb
A_Alicante_19_0804_2019_dec
A_Britagne_1986_2017_3C.2a2
A_Britagne_1986_2017_3C.2a2
A_Britagne_01_2018_3C.2a2
A_Hong_Kong_872_2018_3C.2a2
A_Wicomahe_04_2018_3C.2a2
A_Novi_Sad_4375_2019_feb
A_Novi_Sad_4582_2019_feb
A_Oreoca_4_2017_3C.2a1a
A_Singapore_NFIRM_16_0619_2016_3C.2a1
A_Hong_Kong_4881_2014_3C.3a
A_Switzerland_9715203_2013_3C.3a
A_Norway_486_2014_3C.3a
A_Peixin_070_2014_3C.3a
A_Texas_80_2012_3C.1
A_Hong_Kong_51_1985

HA 3C.3a/NA 3C.2a1

HA&NA 3C.3a

Sequence variability and severity: H1N1pdm09





Conclusions

This first year confirmed the potential of GIHSN to provide a complementary set of data for WHO and other stakeholders

- consensus sequence
- minority variants

Need for better organisation (see project)

- better integration into GISRS
- define the reporting procedure (who does what)



Acknowledgements



NIC & Hospital Lyon:

- Bruno Simon
- Marine Jourdain
- Gwendolyne Burfin
- Estelle Gallice
- Rolf Kramer
- Alexandre Gaymard
- Gregory Destras
- Laurence Josset
- Florence Morfin
- Martine Valette

GIHSN sites and ISC:

- John Paget
- Melissa Andrew
- Luzhao Feng
- Justin Ortiz
- Daria Danilenko
- Xavier Lopez-Labrador
- Robert Steiner
- Marta Numes
- Christine Commaille-Chapus
- Clothilde El Guerche-Seblain



WHOcc Crick Institute :

- John McCauley
- Rod Daniels



WHO cc in Cambridge (Institute of Zoology)

- Derek Smith
- Sarah James





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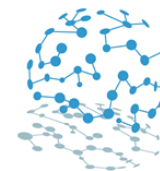
GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

GIHSN IMPLEMENTATION FOR THE NEXT SEASON

Cédric Mahé



**Foundation for
Influenza
Epidemiology**



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FOUNDATION FOR INFLUENZA EPIDEMIOLOGY: GOVERNANCE PRINCIPLES

Dedicated fund created in 2015 under the *Fondation de France* aegis:
Fondation for Influenza Epidemiology

Mandate: Support the epidemiological and virological research on influenza

Governance

- Funding to the GIHSN is allocated through a yearly call for tender
- Selection is made by an Executive Committee

Key principles

- Applicants must be non-for-profit institutions
- Data generated through the projects is owned by sites but contributes to Foundation related projects (yearly pooled analysis)
- Coordination and technical support is provided Open Health Company

THE INDEPENDENT SCIENTIFIC COMMITTEE

9 experts with an increased decision-making ability since last season

- Review and advise on the scientific deliverables such as the protocol, analyses, interpretation of results, report(s), scientific communication and publications
- Advises on technical and scientific topics and provides specific recommendations
- Grading of the proposal to the tender **NEW**
- 3 designated representatives at the Executive Committee **NEW**

Independent experts

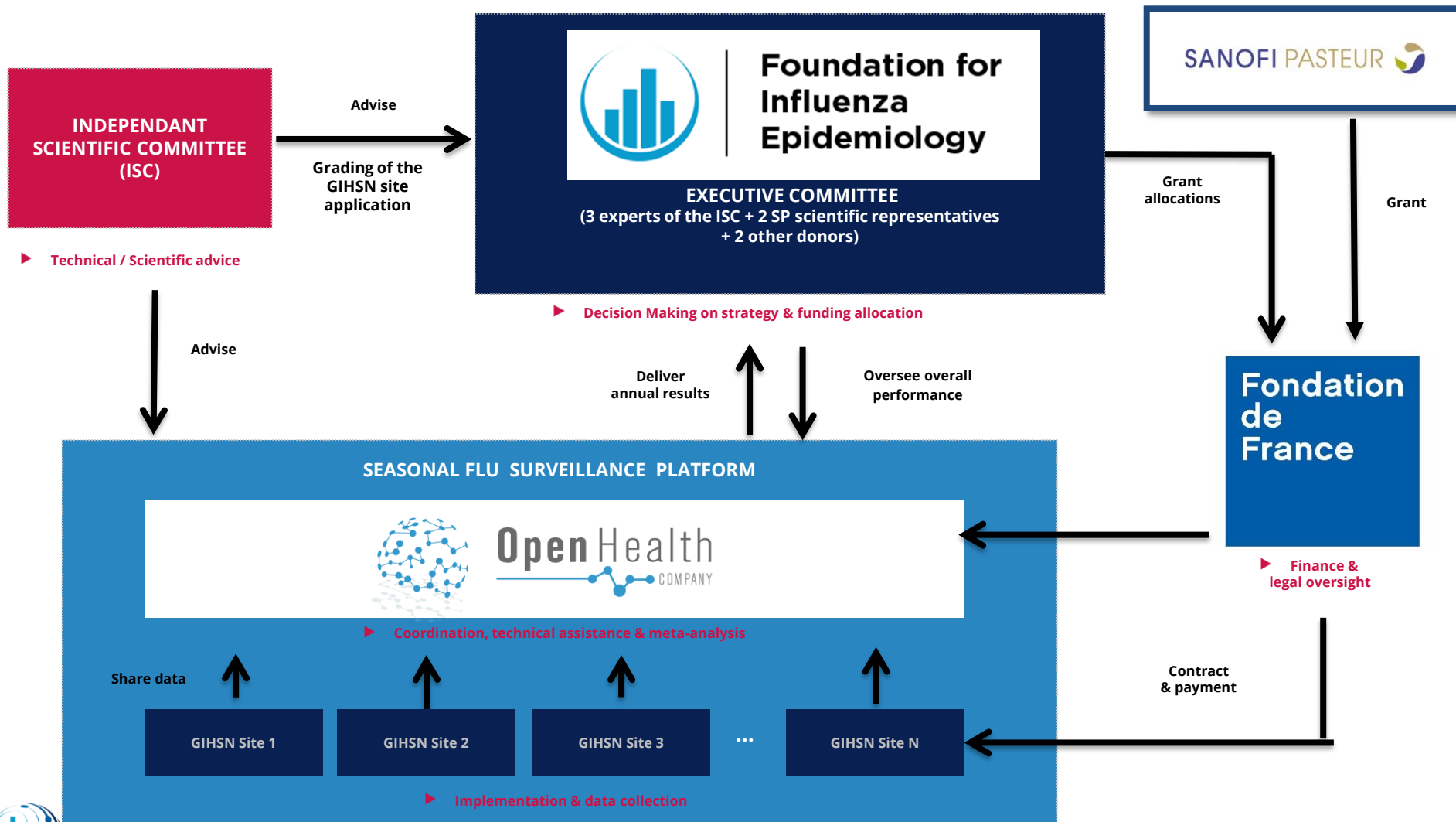
- Jill Ferdinand (CDC, USA)
- Feng Luzhao (CDC, China)
- Bobby Reiner (IHME, USA)
- Bruno Lina (Univ of Lyon, France)
- Justin Ortiz (Univ of Maryland, USA)
- John Paget (NIVEL, Nederland)

Investigators

- Elena Burtseva (Moscow)
- Marta Nunes (South Africa)
- Melissa Andrew (Canada)

- Secretariat is managed by OpenHealth Company

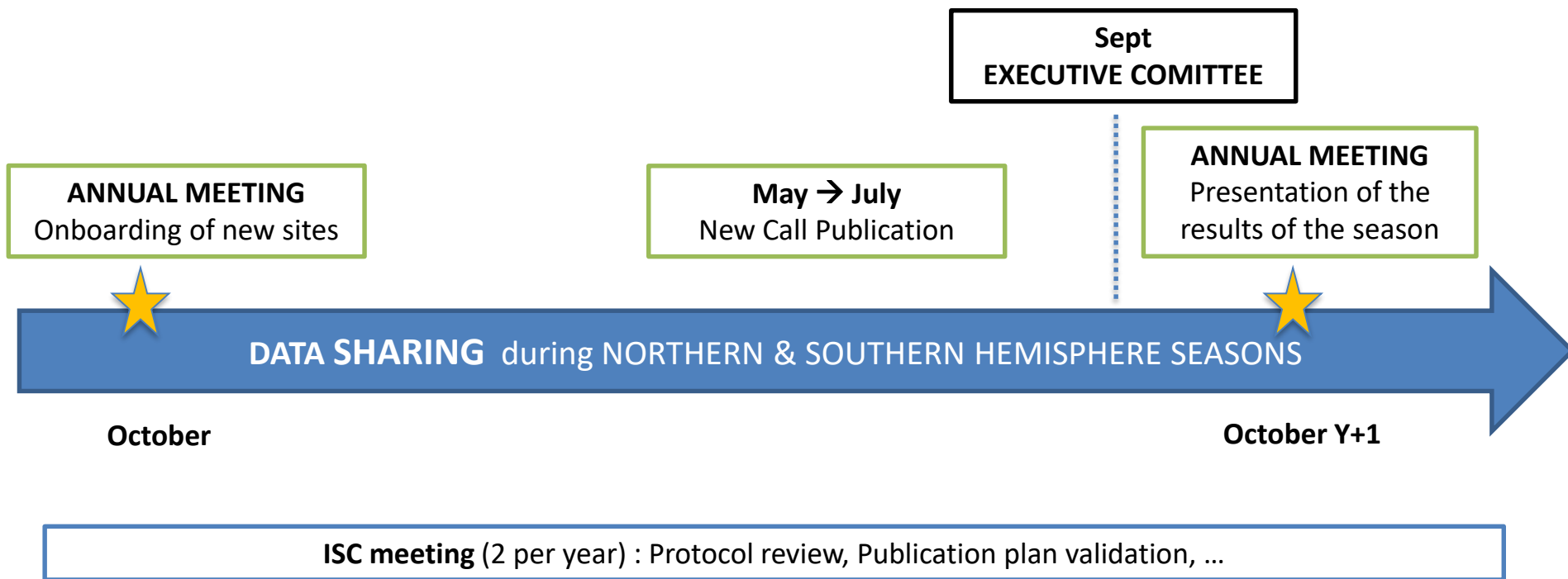
FOUNDATION GOVERNANCE



FOUNDATION FOR INFLUENZA EPIDEMIOLOGY UPDATE

- **GIHSN network:** 60 hospitals in 18 countries in 2018-2019
 - More than 3,500 documented cases of hospitalizations from influenza per season
 - Already up to 7 seasons of data generated including NH and SH data (>74,000 patients records available)
- **Diversification of funding:** small funding from IFPMA/IVS. Discussion ongoing with Seqirus
- **Expansion of the sequencing activities:** strain sequencing platform, GISAID partnership
- **Formal dialog with WHO GIP** and provision of data for the annual vaccine strain selection (NGS + clinical data)

GIHSN TIMELINES



MAP OF GIHSN SITES FOR THE SEASON 2019-2020

(21 SITES - 6 NEW)

North America

Canada
Mexico

South America

Brazil
Argentina
Peru

Eurasia

Romania
Serbia
France (2)
Ukraine
Spain
Russia (2)

Africa

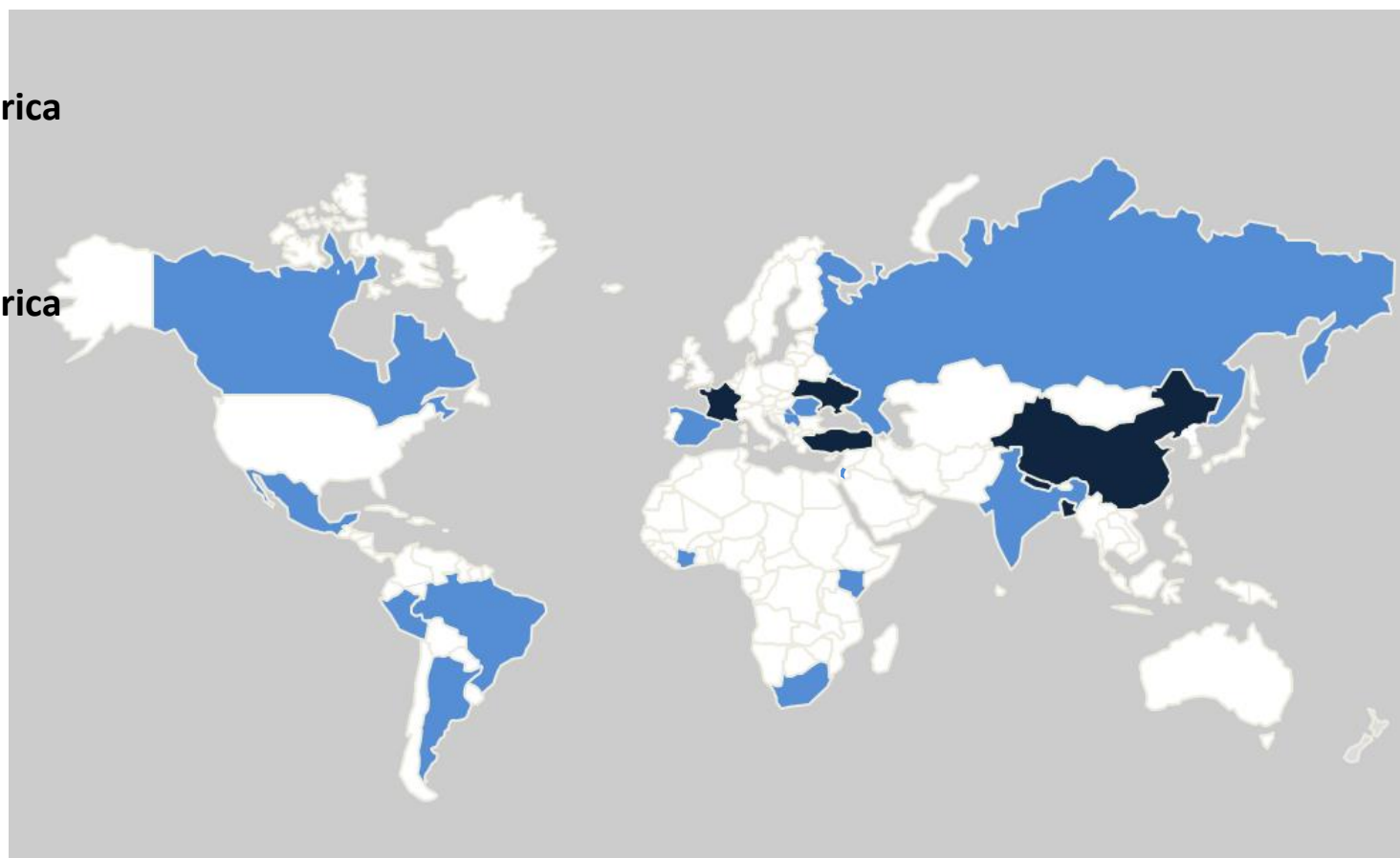
Ivory-Coast
South Africa
Kenya

Middle East

Lebanon
Turkey

Asia/Pacific

China (2)
India
Nepal
Bangladesh



■ New sites

■ Already existing sites

NEXT STEPS

Administrative aspects & funding allocations

Contacts: Foundation for Influenza Epidemiology (Sandra Chaves)

Fondation de France (Charlotte Von Thienen Bardinnet)

- After acceptance of the grant, a letter of engagement including a description of milestones and payment terms is prepared for the site.
- When needed, a contract can be prepared by the institution to be signed by the Foundation

Study implementation & Kick-off TC

Contacts: Open Health Company (Catherine Commaille-Chapus, Maria Morizet)

- Sites are invited to start the seasonal active surveillance in accordance with national surveillance
- Open Health is planning to set individual Kick-off TC to review the study implementation, data collection
- Sites are encouraged to share data on the data web tool, once a week.

EVOLUTION OF THE STRATEGY AND RELATED DATA COLLECTION

- Stronger focus on strain circulation and their clinical significance (disease severity, vaccine failure) – burden and vaccine effectiveness not always feasible in most countries
- Stronger focus on timeliness, geographical representativeness
- Need to reduce cost per sites (for sustainability)
- Engagement of NICs and WHO CCs

Operational considerations

- Data collection for LCI only (with a lower number of variables)
- Linkage between clinical data and virus sequencing
- Timely availability of data (e-crf + GISAID)
- Offer of support for sequencing



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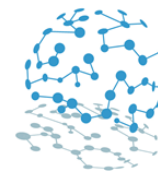


GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

DISCUSSION & CLOSING DAY 1



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DISCUSSION & CLOSING OF DAY 1

- Feedback from sites on the discussed results
- “First reactions” on the new protocol
- Important points to take “home”





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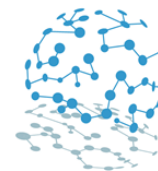
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OPENING DAY 2

Catherine Commaille-Chapus



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OBJECTIVES DAY 2

- Discussion on the implementation of the new protocole – exchange on the site organization and individual challenges
- Practical discussion on the strain sequencing process : sites doing their own sequencing vs sites needing to coordinate with Lyon for sequencing
- Present local and global publications and start discussing the publication plan relating to the 2019-2020 season data



AGENDA: TUESDAY 15TH OCT

8:30 – 8:45	First day wrap-up & objectives of Day 2	C Commaille (OpenHealth)
8:45 – 10:15	Workshop Session 1: New Protocol Implementation -Implementation of the new questionnaire -Data Entry -Need for support <i>Moderated by: Sandra Chaves (FIE)</i>	All sites
10:15 – 10:45	Coffee break	
10:45 – 12:00	Workshop Session 2: Strain Sequencing Process -Timing of sequencing -Strain selection - Strain logistics between sites & Lyon <i>Moderated by: Bruno Lina (ISC)</i>	All sites
12:00 – 12:45	Dissemination & Publications (Globally and Locally) - Update on current manuscript development - Posters presented at Options X - Publication plan & International conferences 2019-2020 - Manuscript writing process 2018-2019 season & rules of authorship	Pr B Lina (ISC)
12:45 – 13:00	Closing	C Mahé (FIE)
13:00 – 14:00	Buffet lunch	





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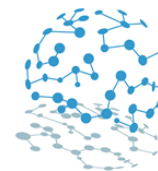


WORKSHOP SESSION 1: NEW PROTOCOL IMPLEMENTATION

Dr. Sandra CHAVES




Foundation for
Influenza
Epidemiology



Open Health
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RESEARCH OBJECTIVE 2019-2020

- 
- I. Support international capacities developed through the Global Influenza Surveillance and Response System (GISRS) of laboratories to increase the availability of clinical information linked with genetic sequencing of influenza virus strains
 - II. Support the biannual vaccine strain selection process of the WHO's formal recommendation for the composition of human influenza vaccines

SIMPLIFIED DATA COLLECTION

- ✓ Data collection for laboratory-confirmed influenza (LCI) cases only
 - ✓ 50 to 100 cases/site
- ✓ **Timely upload of data** (e-crf + GISAID)
 - ✓ Weekly uploads of clinical and lab data
 - ✓ Linkage between clinical data and virus sequencing
- ✓ Support for sequencing capacities – GIHSN center in Lyon, coordination by Open Health company (OHC)



CLINICAL DATA

EPI and CLINICAL VARIABLES TO BE COLLECTED

Smoking habits

Pregnancy status

Chronic medical conditions

Prescriptions of antiviral for the current episode

Influenza vaccination for the current and previous season (self-reported y/n)

Supplemental oxygen without mechanical ventilation

Vasopressor support

ICU admission

Mechanical ventilation

Death while hospitalized

Discharge/death date (yyyy-mm-dd)

GISAID Accession Number (EPI_ISL)



Workshop :

- **Group discussion (6 groups) ~20 min followed by presentations: Only « key » challenges and opportunities**
- **Plenary discussion on identified key issues ~30 min**
- **Live demo of on-line questionnaire ~5 min**



ISSUES TO DISCUSS

1. How these changes would affect your site (pros and cons)?
 - Reduce workload? No change in case finding strategy? Easy to manage?
 - Can leverage on other sites in the country?
2. TIMELY is key!
 - How feasible is to commit to weekly reporting?
3. Capacity for FGS
 - Available in site? Interested in sequencing in-house? Batches _ weekly ?
4. Questionnaire – any thoughts?





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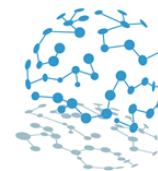


WORKSHOP SESSION 2: STRAIN SEQUENCING PROCESS

Pr. Bruno LINA



Foundation for
Influenza
Epidemiology



Open Health
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STRAIN SEQUENCING CRITERIA – FOR DISCUSSION

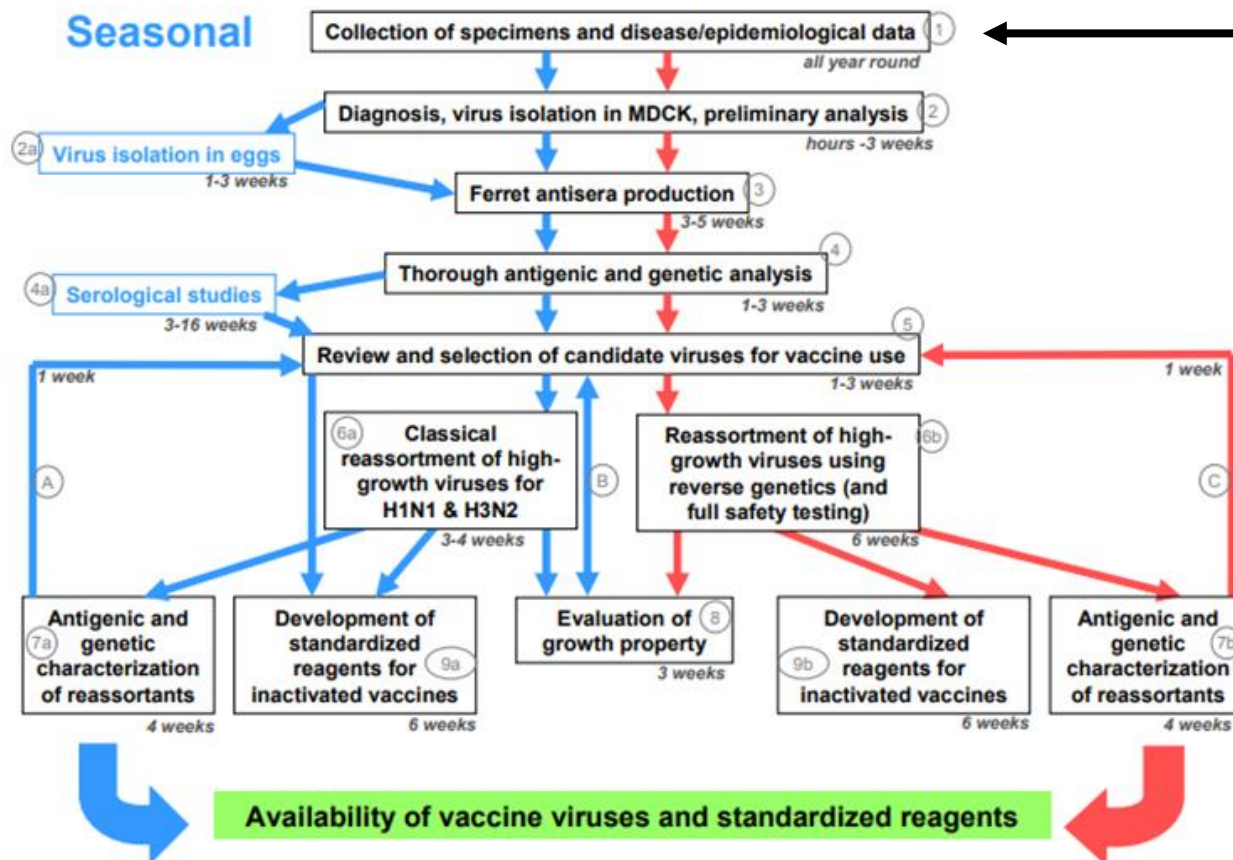
Sample target : 50 – 100 per site

Sample selection criteria for sequencing :

1. All early season samples (before Jan 15), vaccine failure or severe case (ICU admission/ventilation/death)
2. A subset of the other samples collected across the season : 15-25 per months depending on the total number expected (50-100)



Process of influenza vaccine virus selection and development



GIHSN strain sequencing perspectives for 2019-2020

SITES WITH ONSITE SEQUENCING

- ☐ Mexico*
- ☐ Brazil
- ☐ Canada
- ☐ Spain*
- ☐ Lebanon
- ☐ Ivory Coast
- ☐ South Africa
- ☐ Turkey
- ☐ Argentina
- ☐ China X 2
- ☐ Russia–St Petersburg*
- ☐ Romania

SITES USING VIRPATH LAB FOR SEQUENCING

- ☐ India
- ☐ Bangladesh
- ☐ Nepal
- ☐ France - Lyon
- ☐ France - Paris
- ☐ Russia - Moscow
- ☐ Serbia
- ☐ Ukraine
- ☐ Argentina
- ☐ Peru
- ☐ Kenya



GIHSN strain sequencing perspectives for 2019-2020

Better link between the sites and the sequencing platform

Clarification on the circulation of the Data and the specimens from the sites (WHO/GISRS requirements)

Predefine for each site the dates of shipment of material to the GIHSN platform

Use a standardised data set for the shipment



GISAID batch upload facility

GISAID epiflu Uploader: the communication tool

Isolate_Id	Segment_Ids	Isolate_Name	Subtype	Lineage	Passage_History	Location	Location		Host	Host_Additional_info	Sequences											
							province	sub_province			Additional_info	Seq_Id (HA)	Seq_Id (NA)	Seq_Id (PB1)	Seq_Id (PB2)	Seq_Id (PA)	Seq_Id (MP)	Seq_Id (NS)	Seq_Id (NP)	Seq_Id (HE)	Seq_Id (P3)	

Submitting_Sample_Id	Authors	Originating_Lab_Id	Originating_Sample_Id	Collection_Month	Collection_Year	Collection_Date	Antigen_Character	Adamantines_Resistance_genotype	Oseltamivir_Resistance_genotype	Zanamivir_Resistance_genotype	Peramivir_Resistance_genotype	Other_Resistance_genotype	Adamantines_Resistance_phenotype	Oseltamivir_Resistance_phenotype	Zanamivir_Resistance_phenotype	Peramivir_Resistance_phenotype	Other_Resistance_phenotype	Host_Age	Host_Age_Unit	Host_Gender	Health_Status	Note	PMID

Submitting_Sample_Id	Authors	Originating_Lab_Id	Originating_Sample_Id	Collection_Month	Collection_Year	Collection_Date
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GIHSN strain sequencing perspectives for 2019-2020

Better link between the sites and the sequencing platform

Clarification on the circulation of the Data and the specimens from the sites (WHO/GISRS requirements)

Predefine for each site the dates of shipment of material to the GIHSN platform

Use a standardised data set for the shipment

Predefine who is responsible for the upload of sequences (fasta files) in the GISAID database



Prepare 2019-2020 calendar for shipments/data sharing

2019

OCTOBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

NOVEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

2020

JANUARY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

S	M	T	W	T	F	S
					1	2
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

MARCH

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29	30	31				

APRIL

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26	27	28	29	30		

MAY

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24	25	26	27	28	29	30
31						

JUNE

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19	20	21	22	23	24	25
26	27	28	29	30		

JULY

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19	20	21	22	23	24	25
26	27	28	29	30	31	

AUGUST

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24	25	26	27	28	29	30
31						

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER

S	M	T	W	T	F	S
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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

DECEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Conclusions

The GIHSN sequencing platform will provide sequence data for 11 sites

This needs to be organized

- number of specimens per site

- date of shipments

- reporting procedure

- sharing with members (GIHSN/NIC /WHO)

Integration of the data obtained from the other sequencing sites

Work with different stakeholders to address unmet needs



Acknowledgements



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- Luzhao Feng
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- Daria Danilenko
- Xavier Lopez-Labrador
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- Marta Numes
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- Rod Daniels



WHO cc in Cambridge (Institute of Zoology)

- Derek Smith
- Sarah James



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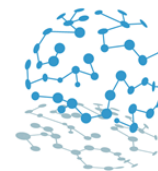
GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

DISSEMINATION & PUBLICATIONS

Pr. Bruno LINA



**Foundation for
Influenza
Epidemiology**



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DATA OWNERSHIP & ACCESS TO THE DATA

- Data collected at site level remains **the proprietary of the site**.
- Each contributing site has full access to the data through a secured platform managed by Open Health Company.
- Open Health Company has access to the raw data for epidemiological research fulfilling the following conditions:
 - Analyses are performed for research purposes in line with the mandate of the Foundation (i.e. surveillance and monitoring of influenza and other respiratory viruses)
 - Analyses are exclusively performed with strictly anonymous and aggregated data
 - Any analyses plan need to be approved beforehand by the Independent Scientific Committee (ISC) of the Foundation



GIHSN PUBLICATION RULES

- All analyzed results need to be submitted to ISC before publication.
- Scientific publications and conference communications mention GIHSN contributing sites with main investigators names in the authorship in line with the ICJME rules.
- Sites will be informed upfront for any additional planned data analysis beyond the annual pooled analysis.
- Sites have the possibility to opt-out.



ORGANIZATION OF WORK PROPOSALS

Seasonal pooled analysis

- 1 manuscript in peer reviewed journal, and conferences, research question to be proposed/defined by the ISC
- **Authors:** ISC & GIHSN group of authors (volunteering GIHSN principal site investigators can be included in the list of authors provided they commit to the ICJME rules and the manuscript development timeframe)
- **Analyses :** OpenHealth

Specific topics publications

- 1 manuscript per year
- **Topics proposed by GIHSN members and validated by the ISC**
i.e severity analyses, Burden of disease in specific populations
- **Authors:** Group of authors including volunteers GIHSN investigators and led by one member of the ISC
- **Analyses :** OpenHealth

Medical Writing supported by the Foundation



SPECIFIC TOPICS ANALYSES RESEARCH PROPOSALS AND ABBREVIATED REPORTS



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Hospital Surveillance
Network

Research Project Proposal

This research proposal should include a detailed description of a proposed study designed to investigate a given problem. It must answer the questions: What you plan to accomplish, why do you want to do it and how are you going to do it?

This proposal will be presented to the Scientific Committee for approval and must be led by a member of this Committee.

The proposal should provide details for the following sections:

1. Project Title

2. Investigator(s)

3. Introduction

a. Background

b. Statement of the research problem

c. Rationale of the proposed study

4. Objectives

This section should contain a general objective of the research and specific objectives presented as primary and secondary objectives.

5. Data variables

Identify the key variables (Independent variables, dependent variables, confounding variables and background variables).

The research proposal includes:

- a detailed description of a proposed study designed to investigate a specific question
- Should explain: rationale to develop the analyses, research questions, identification of variables, data period extraction
- Organisation of work: who will be part of the authors group, roles and responsibilities

The proposal is presented to the ISC for approval and must be led by a member of this Committee.



MANUSCRIPT SEASON 2017-2018 : COMPLICATED HOSPITALIZATION DUE TO INFLUENZA FOR PUBLICATION IN BMC PUBLIC HEALTH

Complicated hospitalization due to influenza: Results from the Global Hospital Influenza Network for the 2017–2018 season

Bruno Lina^{1-3,*}, Alexandre Georges⁴, Elena Burtseva⁵, Marta C. Nunes^{6,7}, Melissa K.
Andrew⁸, Guillermo M. Ruiz-Palacios⁹, Luzhao Feng¹⁰, Jan Kyncl¹¹, Philippe Vanhems¹²⁻¹⁴,
Justin R. Ortiz¹⁵, John Paget¹⁶, and Robert C. Reiner¹⁷ on behalf of the GIHSN 2017–2018
study group†

- ✓ **1st outline June 14th**
- ✓ **Draft 1 July 16th**
- ✓ **Draft 2 September 13th**
- Final version expected for
end of November**

Authorship :

- The main manuscript is developed by the Scientific Committee with Chairman Bruno Lina and sites who have volunteered to write (Czech Republic, Lyon and Mexico)
- In the group authorship are mentioned : main investigators of all sites
- Other investigators or research staff can be mentioned in the acknowledgements



INTERNATIONAL CONFERENCES IN 2020

- IDWeek, 02-06 Oct 20 (abstract deadline 01 May 20; LB abstract deadline 08-Aug-20)
- ECCMID Paris, France 18-21 Apr 20 (abstract deadline 27 Nov 19; LB abstract deadline 20 Feb 20)
- ESPID 06-11 May 20 (abstract deadline 15 Jan 20)
- ISPOR, Orlando, FL, USA 16-20 May 20
- American Diabetes Association 12-16 Jun 20 (abstract deadline 12 Jan 20; LB abstract deadline 16 Mar 20)
- 7th ESWI Valencia, Spain 13-16 September 2020 (abstract deadline 15-May-2020; LB abstract deadline 15-Aug-20)
- International Society for Pharmacoepidemiology (36 ICPE) Berlin, Germany 26-30 Aug 20 (abstract deadline 13 Feb 20)
- AAFP – Family Medicine Experience (FMX 2020) Chicago, IL, USA 13-17 Oct 20 (abstract deadline 03 Apr 20)
- ISPOR-AP, Seoul, S. Korea 12-15 Nov 20 (abstract deadline 18 Mar 20)
- ISPOR-EU, Milan, IT 14-18 Nov 20 (abstract deadline 24 Jun 20)



GIHSN POSTERS PRESENTED AT OPTIONS X

During the **OPTIONS X** (Singapore, August 2019) a poster of the GIHSN network was presented (Scientific Committee represented by Pr Bruno Lina)

Local posters was also presented.



Developments of the global influenza hospital surveillance network to support better monitoring of influenza virus genetic evolution: The GIHSN-SevVIR network

Bruno LINA¹, John Paget², Melissa K Andrew³, Luzhao Feng⁴, Justin R Ortiz⁵, Daria Danilenko⁶, Xavier Lopez-Labrador⁷, Robert C Reiner, Jr.⁸, Maria C Nunes⁹, Catherine Commalle-Chapus¹⁰, Clotilde El Guercio-Seblain¹¹

¹Université de Lyon / Lab virologie, National Influenza Centre, ICL & CIR team Viroph, Inserm U1111, CNRS 5308, INS, UCBL, France; ²Dept Epidemiology, NVL, Netherlands; ³Dalhousie University / Canadian Center for Virology, Canada; ⁴Chinese Center for Disease Control and Prevention, Branch of Respiratory Infectious Disease Division of Infectious Diseases, China; ⁵University of Maryland / School of Medicine, United States; ⁶Genodiriv Research Institute of Influenza, National Influenza Centre, Russian Federation; ⁷ISAID-Public Health, Virology Laboratory, Genomics and Health Area, Spain; ⁸University of Washington, Institute for Health Metrics and Evaluation, Department of Health Metrics Sciences, United States; ⁹Medical Research Council Respiratory and Meningeal Pathogens Research Unit, School of Pathology, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa; ¹⁰Department of Science and Technology/National Research Foundation, Vaccine Preventable Diseases Unit, University of the Witwatersrand, Johannesburg, South Africa; ¹¹OpenHealth Co, OpenHealth, France; ¹²Foundation for Influenza Epidemiology, France.

INTRODUCTION

- After seven seasons of active influenza surveillance, the Global Influenza Hospital Surveillance Network (GIHSN) is leveraging capacities to link clinical and virological data.

OBJECTIVE

- The main objective is to analyze and monitor influenza viruses' characteristics from hospitalized cases, and to provide this information to WHO for vaccine strain composition decisions.

METHODS

- During the 2018-2019 season, a coordinated approach was developed by the French National Reference Laboratory for respiratory viruses (and Influenza) in Lyon.
- GIHSN surveillance sites and associated laboratories were mapped for their sequencing capacities.
- A standardized method was proposed using Whole Genome Sequencing and the sites were invited either to share information on sequenced strains or send material for sequencing in Lyon.
- This sequencing data was linked to detailed epidemiological and clinical information on hospitalized patients collected by GIHSN.

RESULTS

Countries mapping

- All eighteen countries participating in GIHSN have laboratory capacity for influenza typing and subtyping (Figure 1).
- Sixteen laboratories participated in the sequencing data survey, eleven (including nine national reference laboratories) perform strain sequencing and share their sequence data with WHO's GISAID network via the GISAID platform.
- Three laboratories (Melbourne, St. Petersburg, Lyon) shared reports with the WHO ahead of the February Vaccine composition meeting.

Strain sequencing results

- 8 GIHSN sites provided viruses for sequencing.
- 73 A(H3N2), 105 A(H1N1)pdm09 and 4 B Yam were sequenced by these laboratories.
- 70 A(H3N2) belonged to clade 3C.2a1b while only 2 viruses were from clade 3C.2a, and 1 from clade 3C.2a1a (Figure 2).
- All 105 A(H1N1)pdm09 belonged to the 8B.1A clade, and 100/105 had the S183P substitution as described in the A/Brisbane/2/2018 reference strain. (Figure 3)
- Only B Yamagata viruses have been sequenced by the GIHSN lab, close to the B/Phuket/07/2013 virus.

Figure 1. Map of GIHSN laboratory capacities

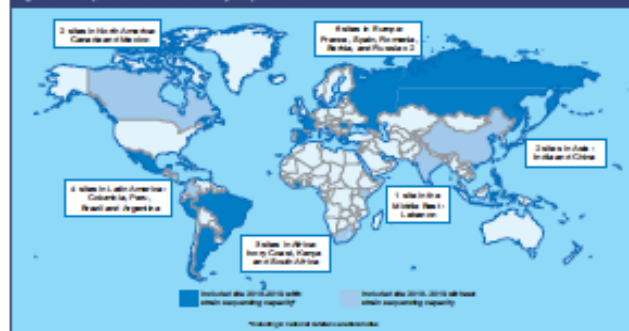
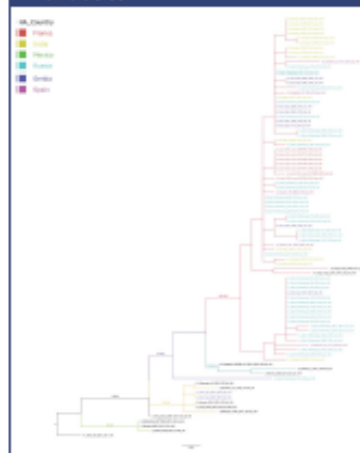


Figure 2. Phylogenetic tree of the GIHSN A(H3N2) strains detected during the 2018-2019 season



Figure 3. Phylogenetic tree of the GIHSN A(H1N1)pdm09 strains detected during the 2018-2019 season. Strains with a X are S183



CONCLUSIONS

- The development of a coordinated approach to link clinical and virological information is key to get a better picture of influenza strain circulation and associated clinical characteristics of patients.
- The first year of the GIHSN sequencing platform development has been promising in terms of capacity building and partnerships developments with GISAID and the WHO GISAID and Vaccine composition meeting.
- As compared to the GISAID data, GIHSN reports similar distributions of the viruses, with limited B viruses. However, as a result of the lack of recent strains, the GIHSN failed to detect the recent A (H3N2) 3C.3a viruses.
- An improved sampling strategy for sequencing (timeliness of sequencing, geographic diversity, time of collection) and further comparison of the sequencing viruses (severe vs non severe, etc...) will provide more valuable data for the influenza surveillance and strain selection.

FUNDING STATEMENT

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CONTACT AUTHOR

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REMINDER OF ICJME RULES

“ Recommendations intended to ensure that contributors who have made substantive intellectual contributions to a paper are given credit as authors, but also that contributors credited as authors understand their role in taking responsibility and being accountable for what is published “

The ICMJE recommends that authorship be based on the following 4 criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.





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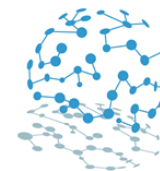
GIHSN 7TH ANNUAL MEETING, PARIS, OCTOBER 13-15TH 2019

CLOSING OF THE MEETING

Thank You All !



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