GIHSN 10TH ANNUAL MEETING

18 October 2022 - Regional Session 1

Foundation for
Influenza
Epidemiology

Sous l'égide de

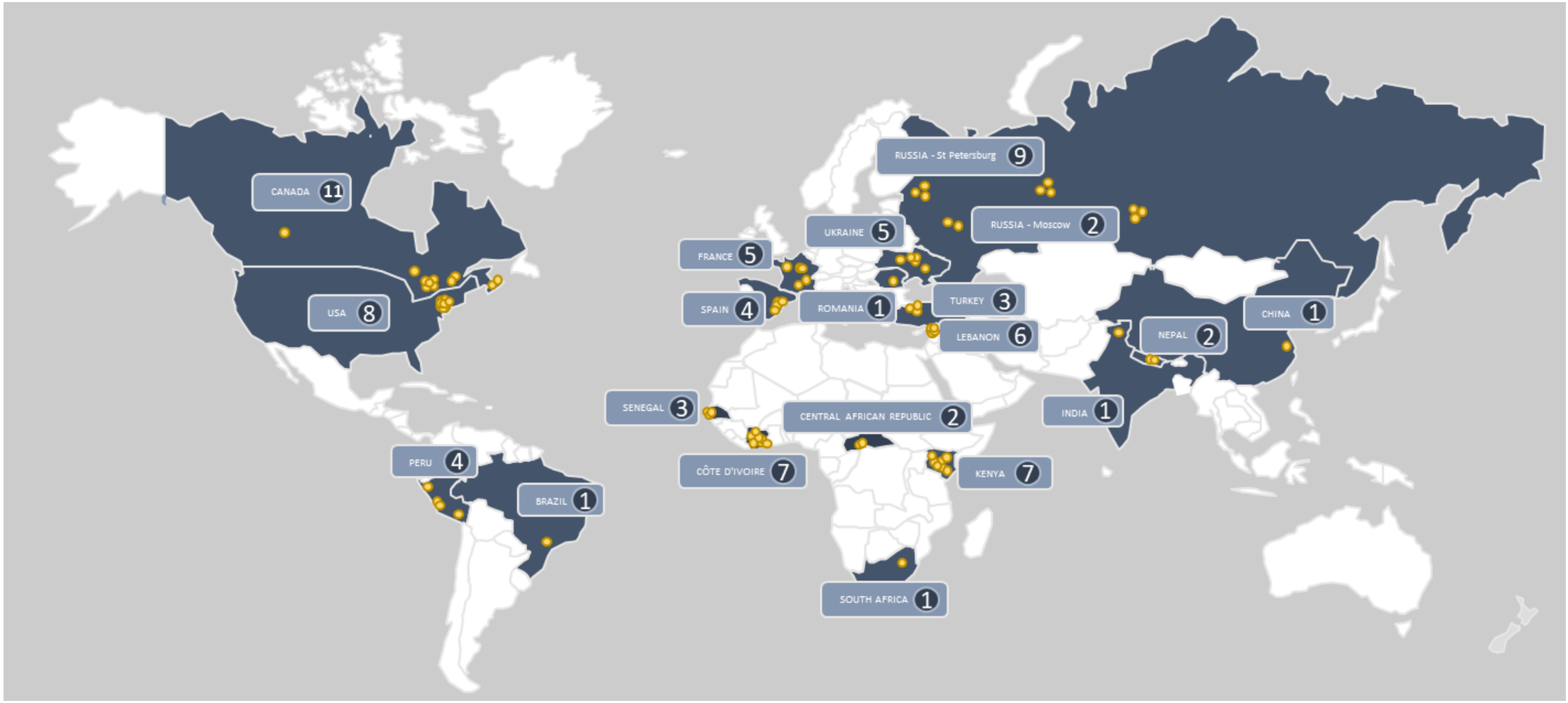
Fondation
de
France

WELCOME TO THE GIHSN 10TH ANNUAL MEETING!

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

20 SITES WORLDWIDE CONTRIBUTING DATA BASED ON A CORE PROTOCOL AND CONSISTENT CASE DEFINITIONS



Global Influenza Hospital Surveillance Network

10 YEARS OF GLOBAL, PATIENT-LEVEL DATA ON SEVERE, INFLUENZA-LIKE ILLNESS

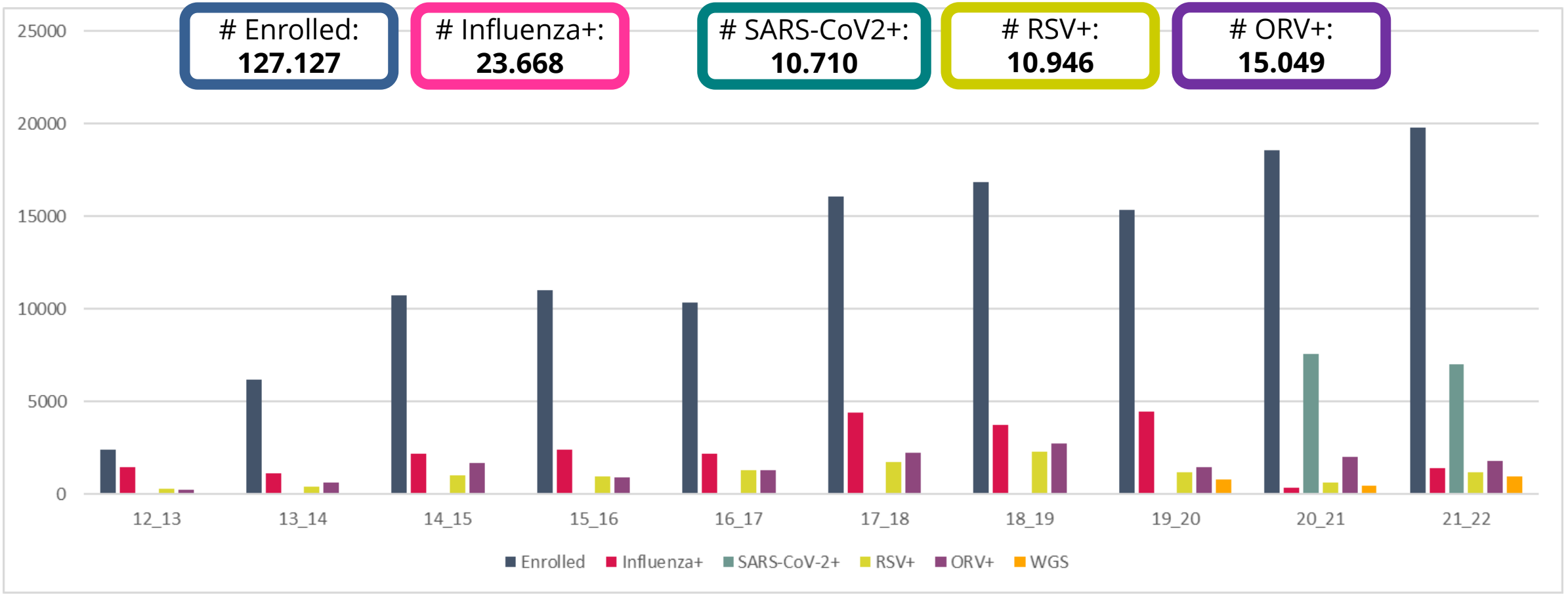
Enrolled: **127.127**

Influenza+: **23.668**

SARS-CoV2+: **10.710**

RSV+: **10.946**

ORV+: **15.049**



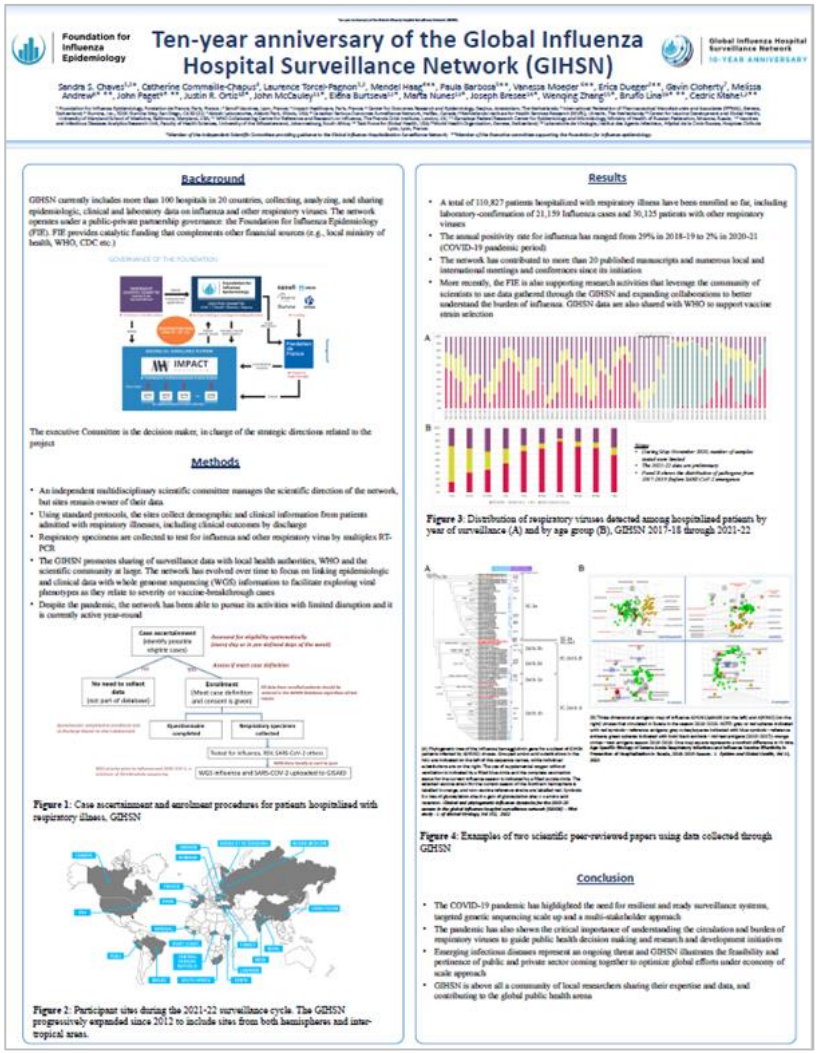
LINKING CLINICAL OUTCOMES & VIRUS GENOME SEQUENCING

WGS: **2.210**

Global Influenza Hospital Surveillance Network

CONTRIBUTING TO A BETTER UNDERSTANDING OF INFLUENZA & ORV CIRCULATION AND IMPACT

OPTIONS XI for the Control of INFLUENZA



Foundation for Influenza Epidemiology

Ten-year anniversary of the Global Influenza Hospital Surveillance Network (GIHSN)

Global Influenza Hospital Surveillance Network — 10-YEAR ANNIVERSARY

Sandra S. Chaves[1,2*], Catherine Commaille-Chapus[3], Laurence Torcel-Pagnon[3,4], Mendel Haag[5**], Paula Barbosa[5**], Vanessa Moeder[5**], Erica Dueger[5**], Gevin Doherty[5], Melissa Andrew[6**], John Paget[6**], Justin R. Ortiz[1,2], John McCauley[1,2], Elena Burtseva[1,2], Marta Nunes[1,2], Joseph Bresee[1,2], Wenqing Zhang[1,2], Brunilo Lina[1,2**], Cedric Mahe[1,2**]

Background

GIHSN currently includes more than 100 hospitals in 20 countries, collecting, analyzing, and sharing epidemiologic, clinical and laboratory data on influenza and other respiratory viruses. The network operates under a public-private partnership governance: the Foundation for Influenza Epidemiology (FIE). FIE provides catalytic funding that complements other financial sources (e.g., local ministry of health, WHO, CDC etc.)

GOVERNANCE OF THE FOUNDATION

IMPACT

The executive Committee is the decision maker, in charge of the strategic directions related to the project

Methods

- An independent multidisciplinary scientific committee manages the scientific direction of the network, but sites remain owner of their data
- Using standard protocols, the sites collect demographic and clinical information from patients admitted with respiratory illnesses, including clinical outcomes by discharge
- Respiratory specimens are collected to test for influenza and other respiratory virus by multiplex RT-PCR
- The GIHSN promotes sharing of surveillance data with local health authorities, WHO and the scientific community at large. The network has evolved over time to focus on linking epidemiologic and clinical data with whole genome sequencing (WGS) information to facilitate exploring viral phenotypes as they relate to severity or vaccine-breakthrough cases
- Despite the pandemic, the network has been able to pursue its activities with limited disruption and it is currently active year-round

Case ascertainment (identify possible eligible cases)

Assessed for eligibility systematically (twice a day or on pre-defined days of the week)

Assess if meet case definition

No need to collect data (not part of database)

Enrollment (Meet case definition and consent is given)

Questionnaire completed

Respiratory specimen collected

Tested for influenza, RSV, SARS-CoV-2 (+/other)

WGS influenza and SARS-CoV-2 uploaded to GISAID

Figure 1: Case ascertainment and enrolment procedures for patients hospitalized with respiratory illness, GIHSN

Figure 2: Participant sites during the 2021-22 surveillance cycle. The GIHSN progressively expanded since 2012 to include sites from both hemispheres and inter-tropical areas.

Results

- A total of 110,827 patients hospitalized with respiratory illness have been enrolled so far, including laboratory-confirmation of 21,139 Influenza cases and 30,125 patients with other respiratory viruses
- The annual positivity rate for influenza has ranged from 29% in 2018-19 to 2% in 2020-21 (COVID-19 pandemic period)
- The network has contributed to more than 20 published manuscripts and numerous local and international meetings and conferences since its initiation
- More recently, the FIE is also supporting research activities that leverage the community of scientists to use data gathered through the GIHSN and expanding collaborations to better understand the burden of influenza. GIHSN data are also shared with WHO to support vaccine strain selection

Figure 3: Distribution of respiratory viruses detected among hospitalized patients by year of surveillance (A) and by age group (B), GIHSN 2017-18 through 2021-22

Figure 4: Examples of two scientific peer-reviewed papers using data collected through GIHSN

Conclusion

- The COVID-19 pandemic has highlighted the need for resilient and ready surveillance systems, targeted genetic sequencing scale up and a multi-stakeholder approach
- The pandemic has also shown the critical importance of understanding the circulation and burden of respiratory viruses to guide public health decision making and research and development initiatives
- Emerging infectious diseases represent an ongoing threat and GIHSN illustrates the feasibility and pertinence of public and private sector coming together to optimize global efforts under economy of scale approach
- GIHSN is above all a community of local researchers sharing their expertise and data, and contributing to the global public health arena

Increased severity of influenza-related hospitalizations in **resource-limited settings**: Results from the Global Influenza Hospital Surveillance Network (GIHSN)

Lily Cohen
Ready2Respond
The Task Force for Global Health
September 29, 2022

Global Influenza Hospital Surveillance Network

AN EMPOWERED SCIENTIFIC COMMUNITY

Let's continue together and bring the network to the next level!

Global Influenza Hospital Surveillance Network

18 OCTOBER: REGION SPECIFIC SESSION 1 - AGENDA

TUESDAY 18th OCT	9am - 12am CET: REGION SPECIFIC SESSION 1*	
9:00 - 9:05	**Welcome & Introduction to the Session**	C Commaille-Chapus
9:05 - 9:15	**GIHSN 10th Anniversary: Update & Perspectives**	C Mahe L Torcel-Pagnon
9:15 - 9:25	**GIHSN Seasonal Results 2021_22: Overview**	C Commaille-Chapus B Lina
9:25 - 10:25	**GIHSN Seasonal Surveillance 2021_22 by site** *Presentation by each site and discussion*	Site investigators
10:25 - 10:35	**Coffee break**	
10:35 - 11:35	**GIHSN Seasonal Surveillance 2021_22 by site (cont'd)** *Presentation by each site and discussion*	Site investigators
11:35 - 11:45	**GIHSN 2022_23: Selected Sites & Protocol Highlights** (Year-round surveillance, Case definition, Sampling & testing strategy ...) *Presentation & discussion*	L Torcel Pagnon S Chaves
11:45 - 11:55	**Publication/Congress Update** *Presentation & discussion*	S Chaves
11:55 - 12:00	**Closing**	

SITES SESSION 1

South Africa
Kenya
Senegal
Côte d'Ivoire
Centre Afrique
Russia - St Petersburg
Russia - Moscow
China
India
Nepal

Global Influenza Hospital Surveillance Network

www.gihsn.org

coordination

IMPACT Healthcare

ANNUAL MEETING, 18 OCTOBER 2022

GIHSN UPDATE & PERSPECTIVES

Cedric MAHE & Laurence TORCEL-PAGNON

Foundation for Influenza Epidemiology

Sous l'égide de

Fondation de France

UPDATES

Global Influenza Hospital Surveillance Network
10-YEAR ANNIVERSARY

The GIHSN offers a **capable surveillance platform** and an effective **Public-private partnership community**

- Empowered and motivated sites combining existing surveillances with capacity building
- Expanding the severe respiratory diseases surveillance beyond Flu to account for virus circulation interconnexion (SARS-COV2, RSV and ORV)
- Increasing virus genome sequencing capacity and linkage with clinicals outcome
- Leveraging the scientific community and historical dataset (publications/congress, research projects)
- Welcoming more partners to support the Foundation (Abbott)
- Engaging with key stakeholders and networks (WHO, IVI, APDC)

SHORT TERM PERSPECTIVES

- Ensure network sustainability and lean sites selection process
  - 3 years collaboration offer to relevant sites with annual grants
- Support network expansion
  - Develop synergies with other networks to cover the 18 WHO Influenza transmission Zones
- Reinforce scientific collaboration and exchanges
  - Monthly communication, sites meeting, face to face annual meeting (Spring-summer 2023)
- Increase visibility of the GIHSN and transparency of the foundation activities
  - Annual report presenting scientific activities and financial status (available in January 2023)

Global Influenza Hospital Surveillance Network

ANNUAL MEETING, 18 OCTOBER 2022

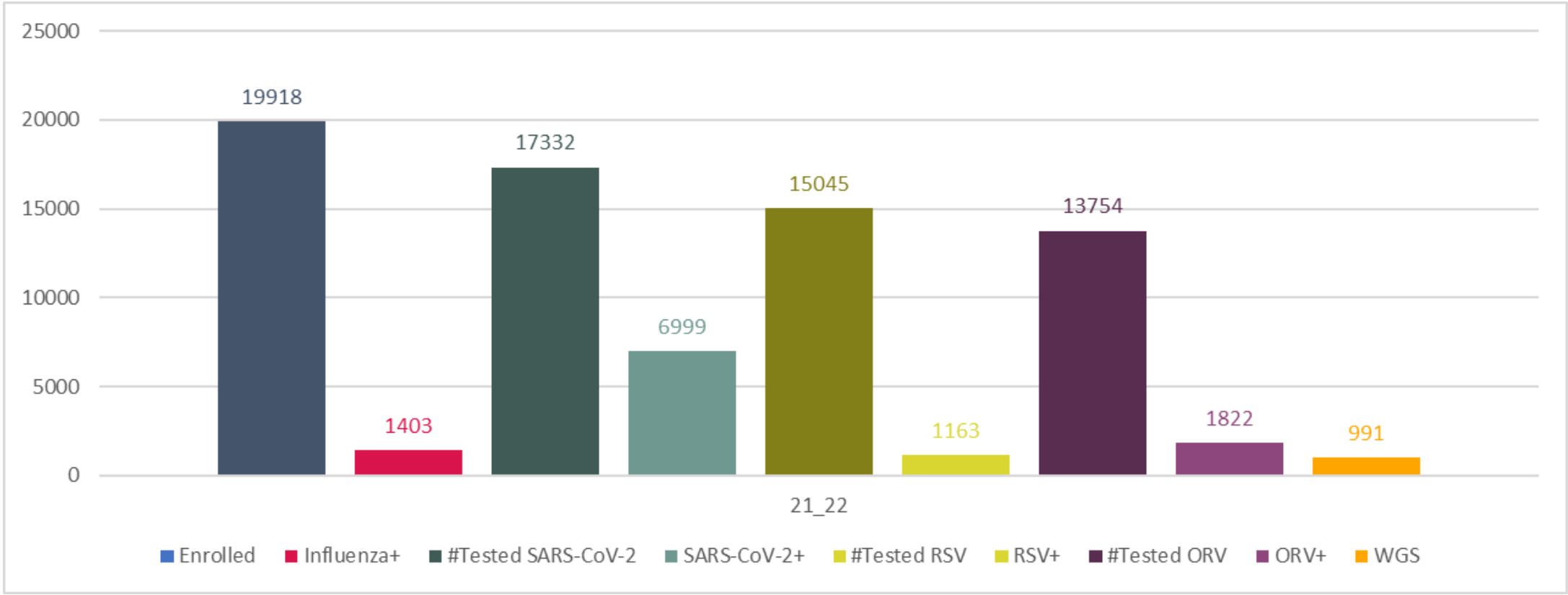
GIHSN 2021_22 SEASON RESULTS: OVERVIEW

Catherine COMMAILLE-CHAPUS, GIHSN Coordination

Foundation for Influenza Epidemiology

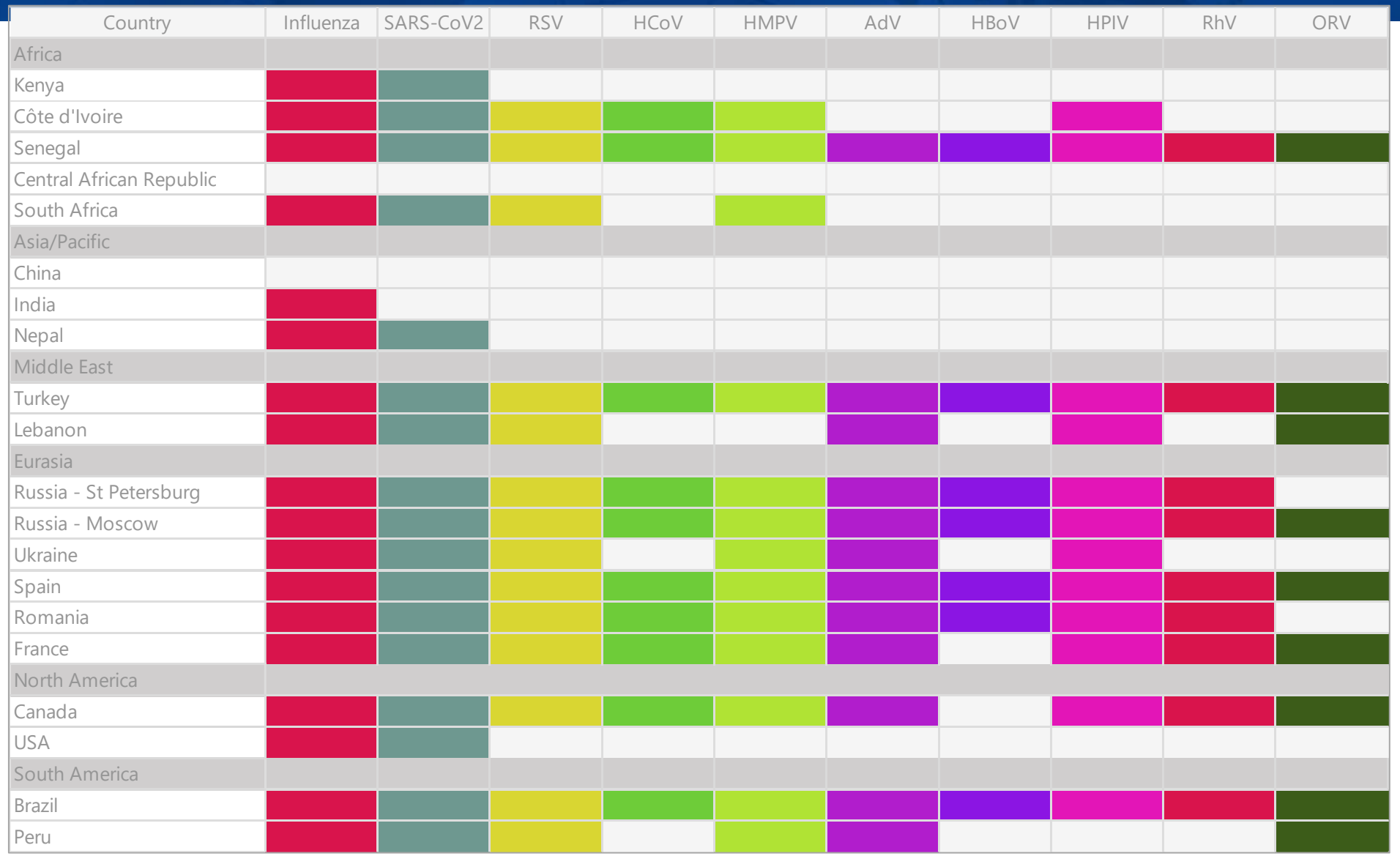
Sous l'égide de Fondation de France

OVERVIEW OF THE GIHSN COHORT 2021_22 (PRELIMINARY DATA AS OF 15 OCT 2022)



Global Influenza Hospital Surveillance Network

VIRUSES TESTED (2021_22)

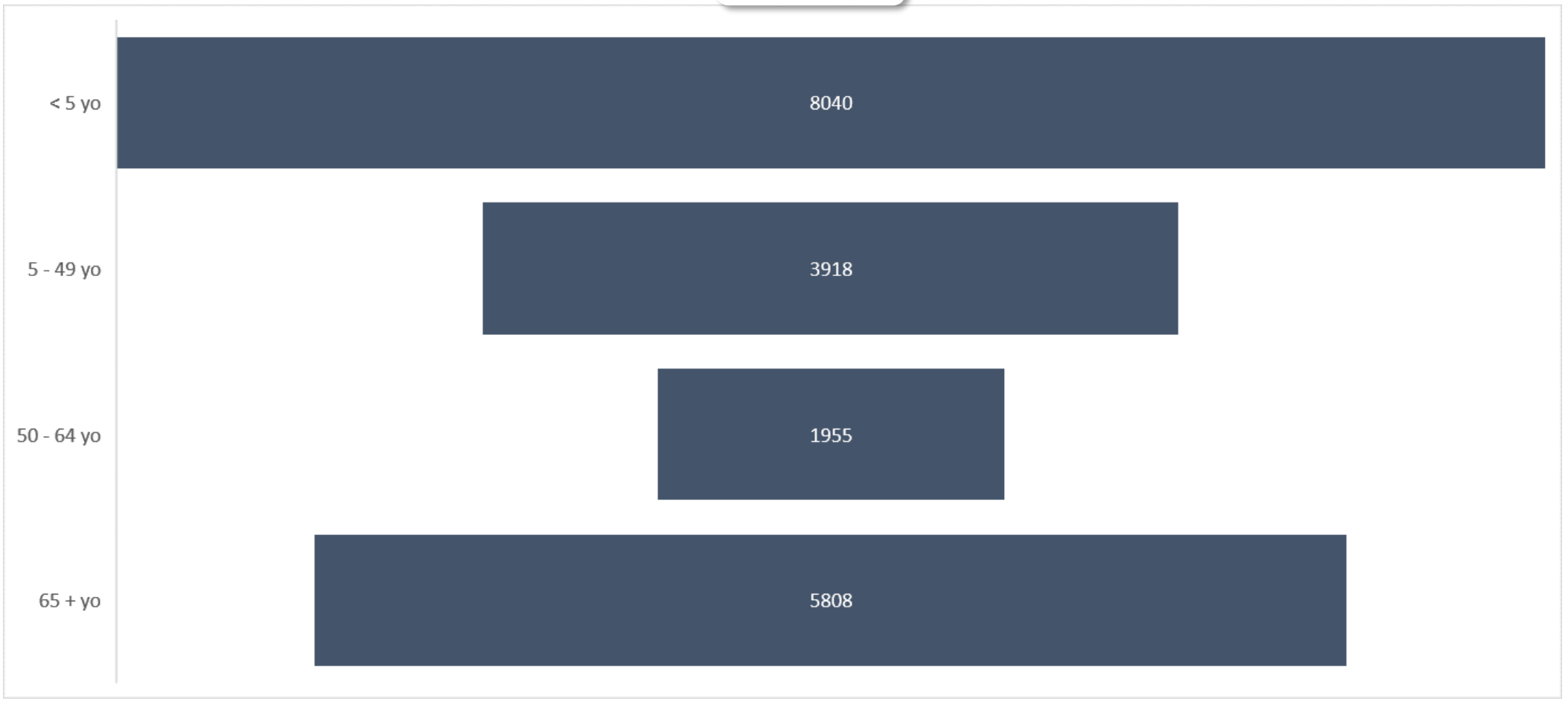


Country	Influenza	SARS-CoV2	RSV	HCoV	HMPV	AdV	HBoV	HPIV	RhV	ORV
Africa										
Kenya										
Côte d'Ivoire										
Senegal										
Central African Republic										
South Africa										
Asia/Pacific										
China										
India										
Nepal										
Middle East										
Turkey										
Lebanon										
Eurasia										
Russia - St Petersburg										
Russia - Moscow										
Ukraine										
Spain										
Romania										
France										
North America										
Canada										
USA										
South America										
Brazil										
Peru										

Global Influenza Hospital Surveillance Network

PATIENT DISTRIBUTION BY AGE GROUP (2021_22) (#)
(PRELIMINARY DATA AS OF 15 OCT 2022)

N= 19.918



40%

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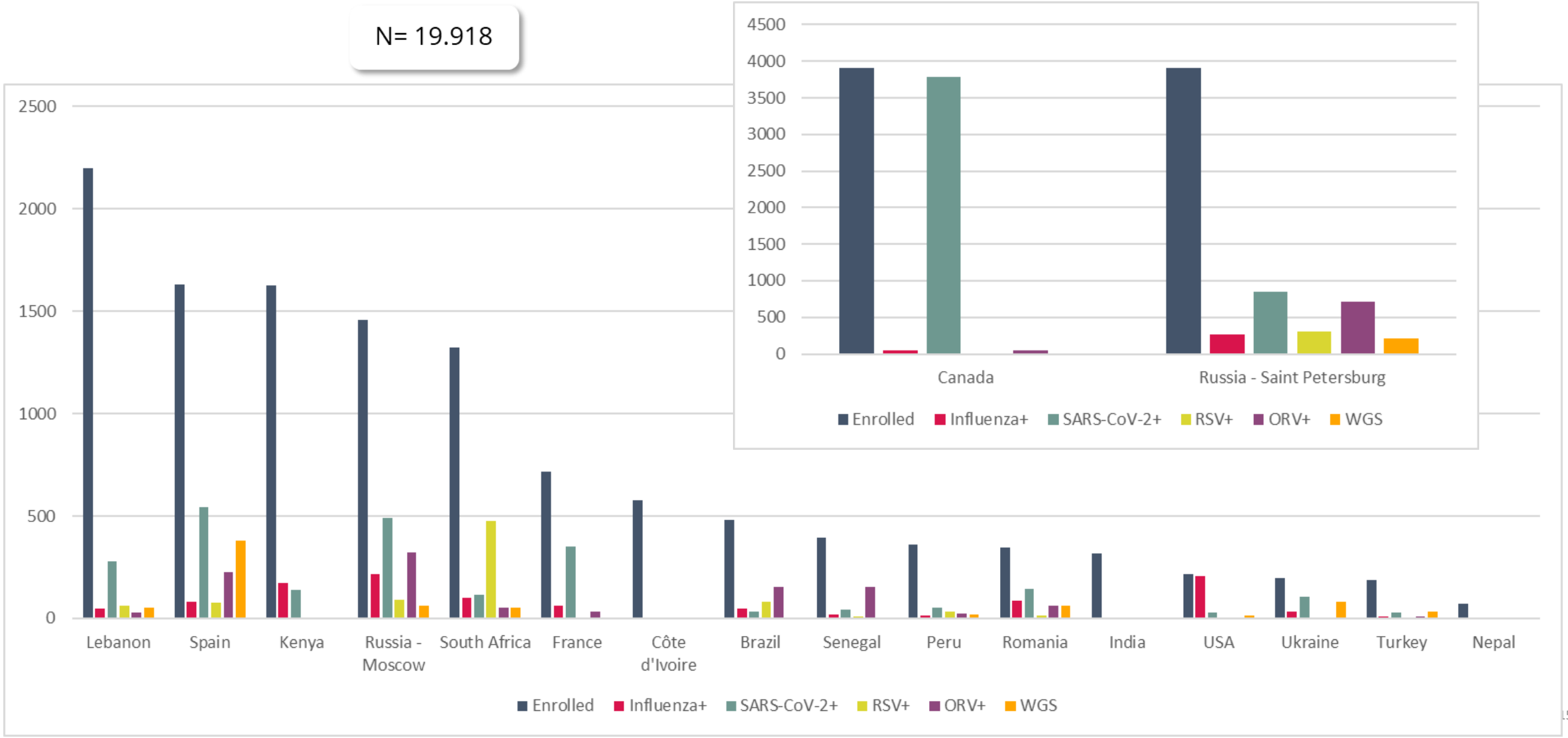
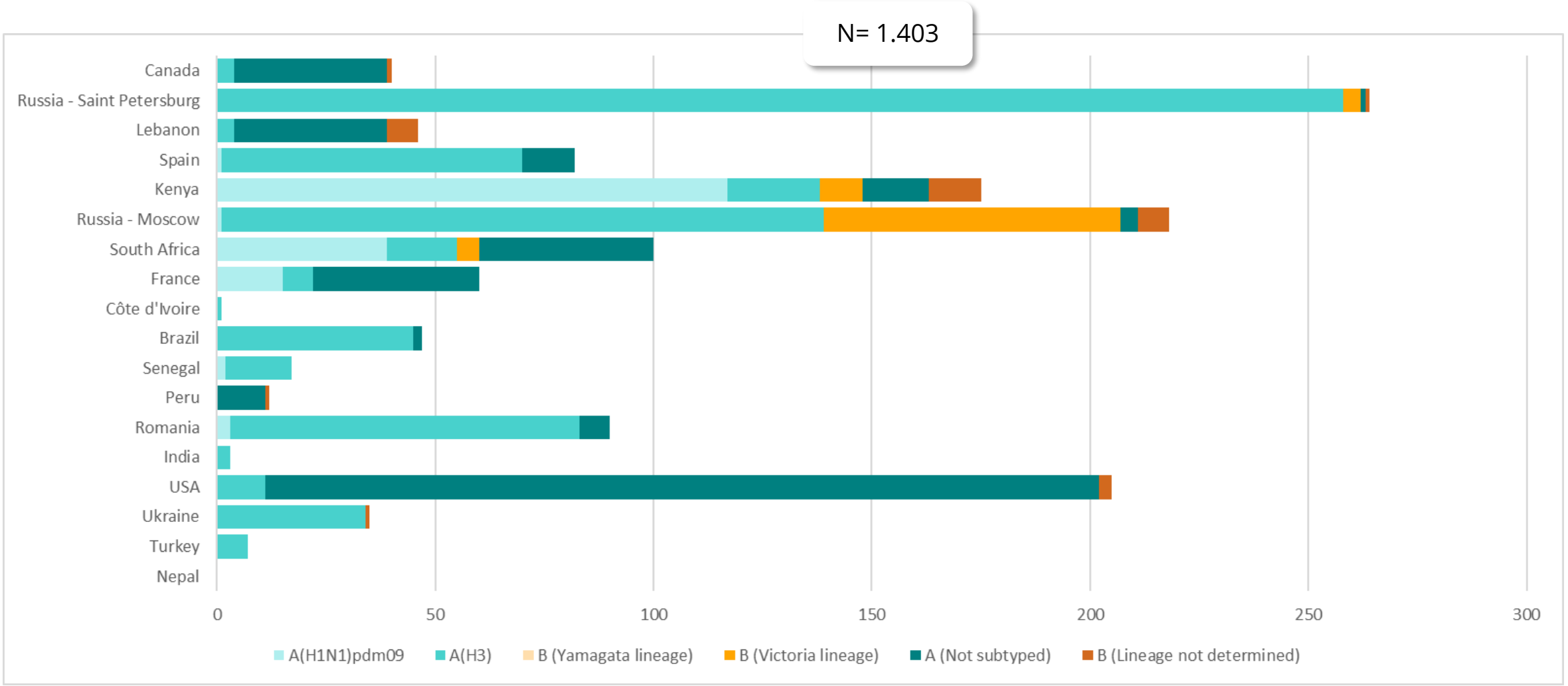
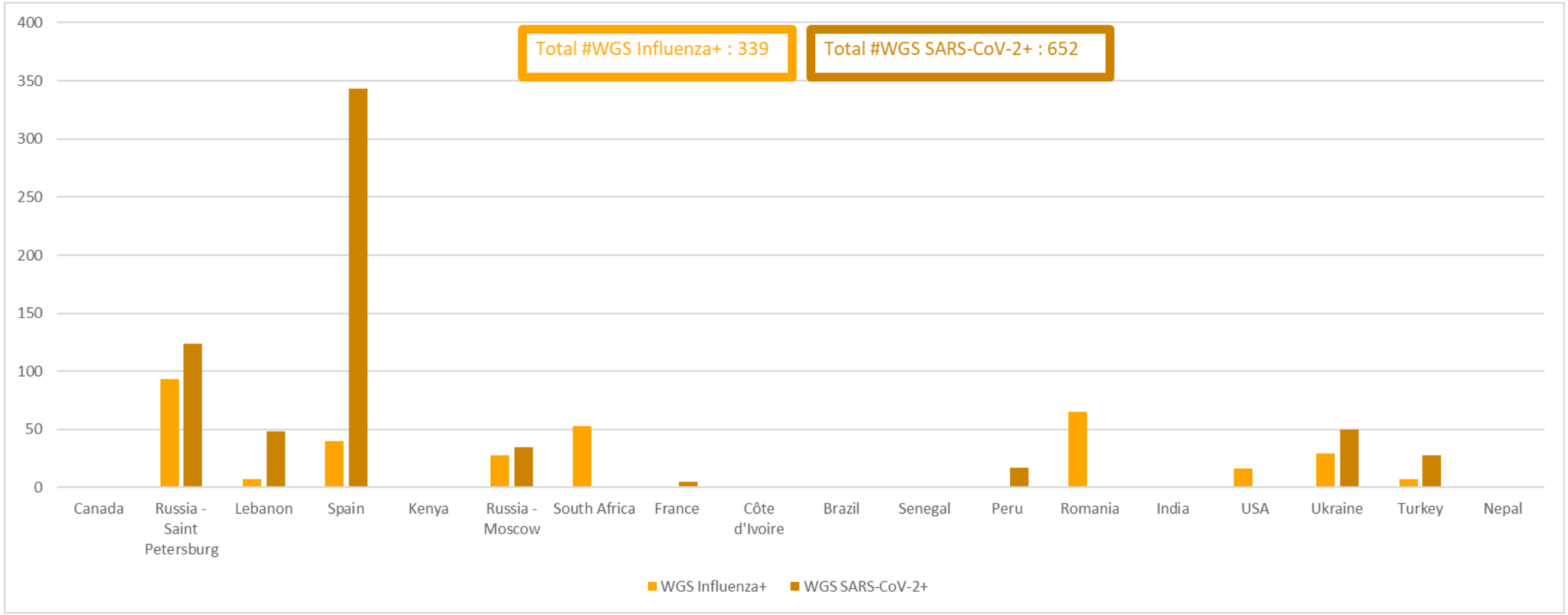
PATIENT DISTRIBUTION BY SITE (2021_22) (#)
(PRELIMINARY DATA AS OF 15 OCT 2022)



INFLUENZA+ - STRAIN DISTRIBUTION BY SITE (21_22) (#) (PRELIMINARY DATA AS OF 15 OCT 2022)



WGS BY SITE (2021_22) (#)
(PRELIMINARY DATA AS OF 15 OCT 2022)



EC MEETING, 8 SEPTEMBER 2022

GIHSN 2021_22 SEASON: SEQUENCING UPDATE

Bruno Lina, Central Laboratory (Lyon-France)

Foundation for Influenza Epidemiology

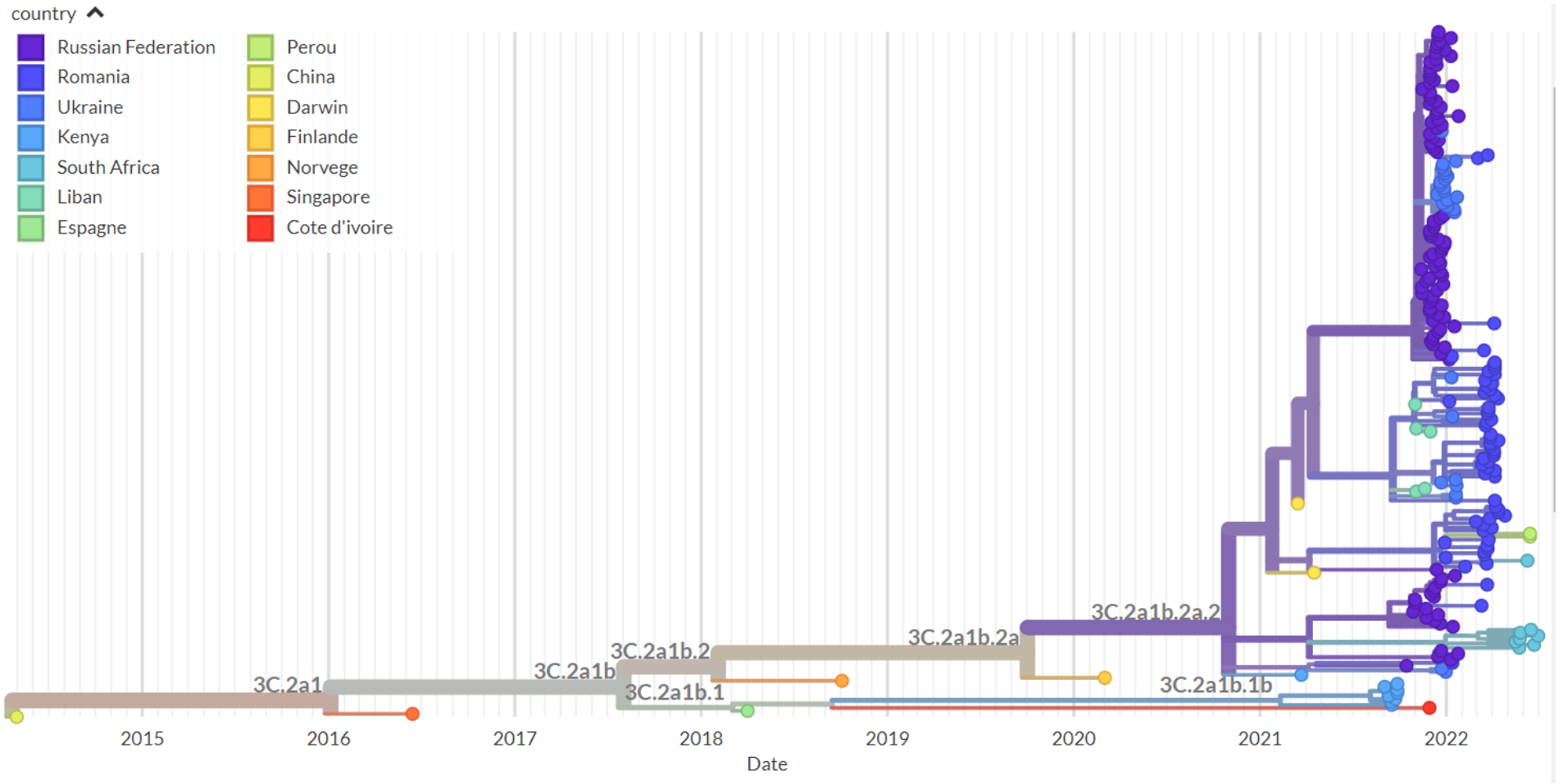
Sous l'égide de Fondation de France

SEQUENCING UPDATE

Pays d'origine	date reception	Nombre echantillons recus (ARN)						nombre de sequences validées au CNR						Nombre echantillons non séquencés / échec					GISAID				EN COURS	Nombre echantillons recus (ARN)	nombre de sequences validées au CNR	Nombre echantillons non séquencés / échec	GISAID	EN COURS	total Grippe COVID	observations
		GRIPPE																						COVID					
		H3	H1	A	B	coinf AB	total	H3	H1	A	B	AB	total	H3	H1	A	B	total	H3	H1	B	total	total							
Perou (Po et ARN)	**19/10/2021**			6			**6**	2					**2**			3		3					1	**28**	21	7			34	
ukraine	**11/02/2022**	**29**		**0**	**0**		**29**	**21**					**21**					0					8	**10**	**9**	1			39	8 Grippe encours a voir avec hadrien
				5	0		**5**	3					**3**			1		1						48	**36**	5			53	recu 2 co-infection COVIDGrippe
Liban	**12/05/2022**																						3					7		En cours 2 grippe H3 et 1 coinfection Covid+Grippe B 6 COVID
Cote d'ivoire (Po)	**09/06/2022**	1	2				**3**	1	2				**3**					0						4	**2**	2			7	
kenya	**11/04/2022**	**63**	**1**	**11**	**37**	**7**	**119**						**0**					0					119						119	15 premieres grippe A seq 12/7
Fluvac Montpellier (Po)	**12/05/2022**												**0**					0						**6**	**0**	6			6	
Fluvac Rennes (Po)	**11/05/2022**												**0**					0						**17**	**1**	16			17	COVID 15 inint et 1 quantité insuffisante
Fluvac Paris Bichat (Po)	**12/05/2022**												**0**					0						**9**	**8**	1			9	
Fluvac Paris Cochin (Po)	**15/06/2022**												**0**					0						**35**	**35**	0			35	
Bresil	**12/10/2022**						16																						16	
Liban (TBC)							27																						27	
total échantillons							**205**																	**157**						
total sequences validés CNR													**29**												112				362 141	
total echec CNR																		4								38			42	
total soumis GISAID																											0		0	
total sequences en cours de traitement																							131					7	138	

bilan 17/10/2022

GIHSN 2021-2022 INFLUNZA A(H3N2) (to be completed)



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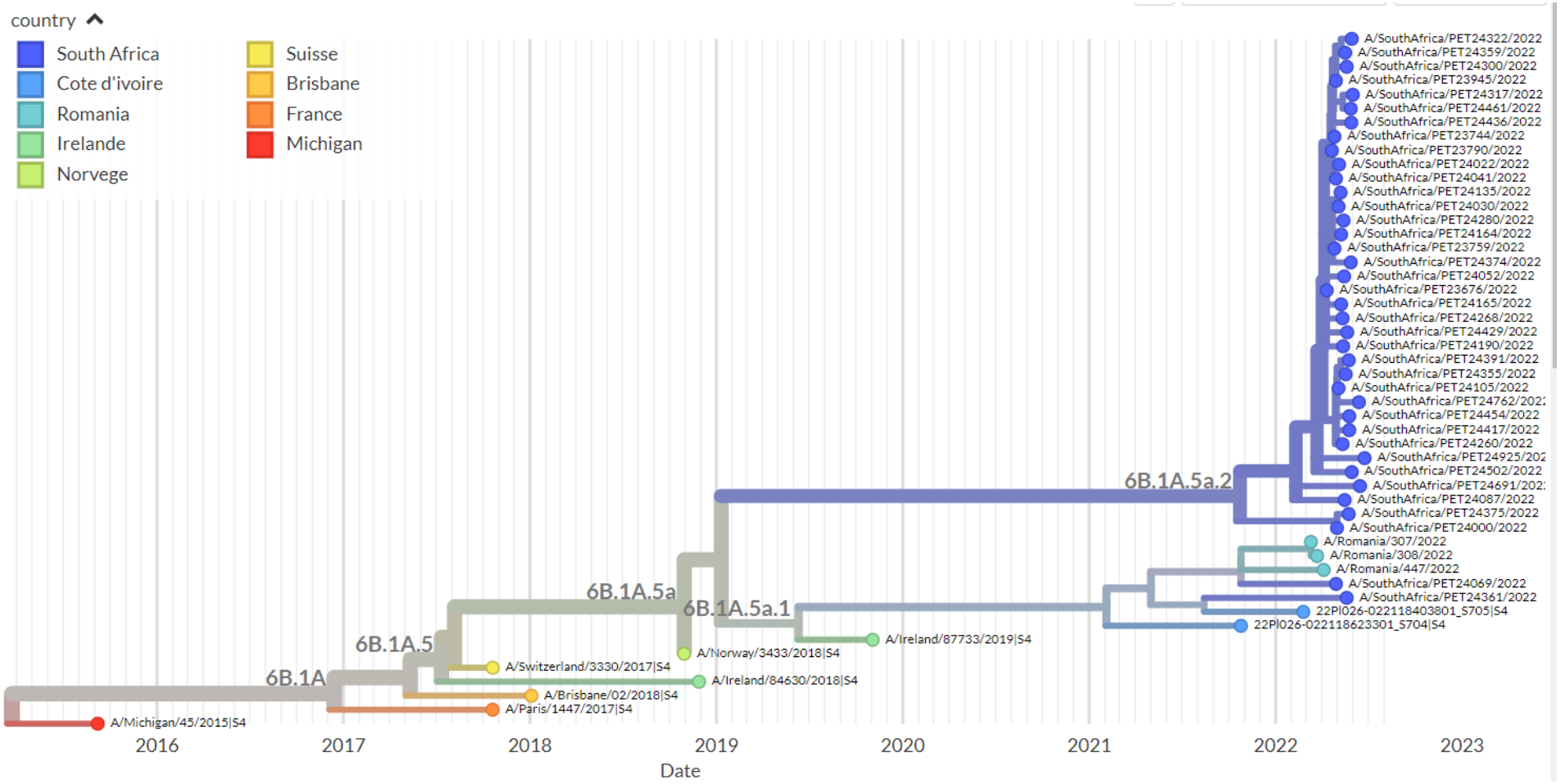
GIHSN 2021-2022 INFUENZA A(H1N1)pdm09 (To be completed)



Global Influenza Hospital Surveillance Network

ANNUAL MEETING, 18 OCTOBER 2022

GIHSN 2021_22: RESULTS BY SITE

Site Investigators

Foundation for
Influenza
Epidemiology

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ANNUAL MEETING, 18 OCTOBER 2022

Wits VIDA - University of the Witwatersrand – SOUTH AFRICA

Marta Nunes

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

SOUTH AFRICA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Site description

- The largest hospital in Africa, in Soweto (total population approx. 1.3 million people) is part of our network. Chris Hani Baragwanath Academic Hospital (CHBAH): 3,400 beds.
- Viral testing is not part of the standard of care and all enrolled participants were tested under our surveillance study at the Wits Vaccines & Infectious Diseases Analytics Research Unit laboratory. The HIV prevalence among pregnant women in Soweto is approx. 28%.
- Only pediatric admissions are included in the surveillance.
- Influenza season in South Africa normally peaks between *June and August*.
- At the end of 2021 a few influenza-A cases were detected.
- According to the National Institute for Communicable Diseases, the 2022 influenza season started in week 17 (week starting 25 April 2022) and is still ongoing.

SOUTH AFRICA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

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UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Methods

- Active surveillance for influenza infection in the pediatric wards is ongoing since November 1st 2021.
- Due to the COVID-19 pandemic, the hospital attending doctors screened and collected samples from admitted patients 7-days a week, until June 2022, after which study staff was responsible of sample collection. Study-staff completes study logs of all eligible children. Nasopharyngeal flocked swabs were collected.
- Any child with diagnosis of suspected sepsis or physician diagnosed LRTI irrespective of signs and symptoms is enrolled.
- Nucleic acids were extracted using a NucliSENS easyMAG platform and testing for influenza virus was undertaken by an in-house qualitative real-time PCR assay that has been established and validated at our Unit. Samples were also tested by an in-house PCR assay for metapneumovirus and RSV-A and RSV-B, and for SARS-CoV-2 using the CDC protocol.
- A hospital generic informed consent was signed by all parents / care-givers at the time of presentation to hospital; this process allows our research Unit to abstract clinical and demographic data from the hospitalized patients.

SOUTH AFRICA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

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UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Results

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	1254	95	1254	474	1253	97	1254	48	50	0
Patients 5+ yrs	68	5	68	2	68	19	68	2	0	0
Total	1322	100	1322	476	1321	116	1322	50	50	0

	All tested children N=1322	Influenza+ children N=100	SARS-CoV-2+ children N=116
Mean age in months (SD)	13.7 (24.3)	19.5 (23.8)	24.5 (42.8)
Females	592 (45%)	42 (42%)	50 (43%)
HIV-exposed	276/814 (21%)	25/85 (25%)	29/89 (25%)
Died in hospital	24 (2%)	0	6 (5%)

Influenza-A co-infections: 3 with RSV, 1 with SARS-CoV-2, 1 with hMPV.

Global Influenza Hospital Surveillance Network

SOUTH AFRICA

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

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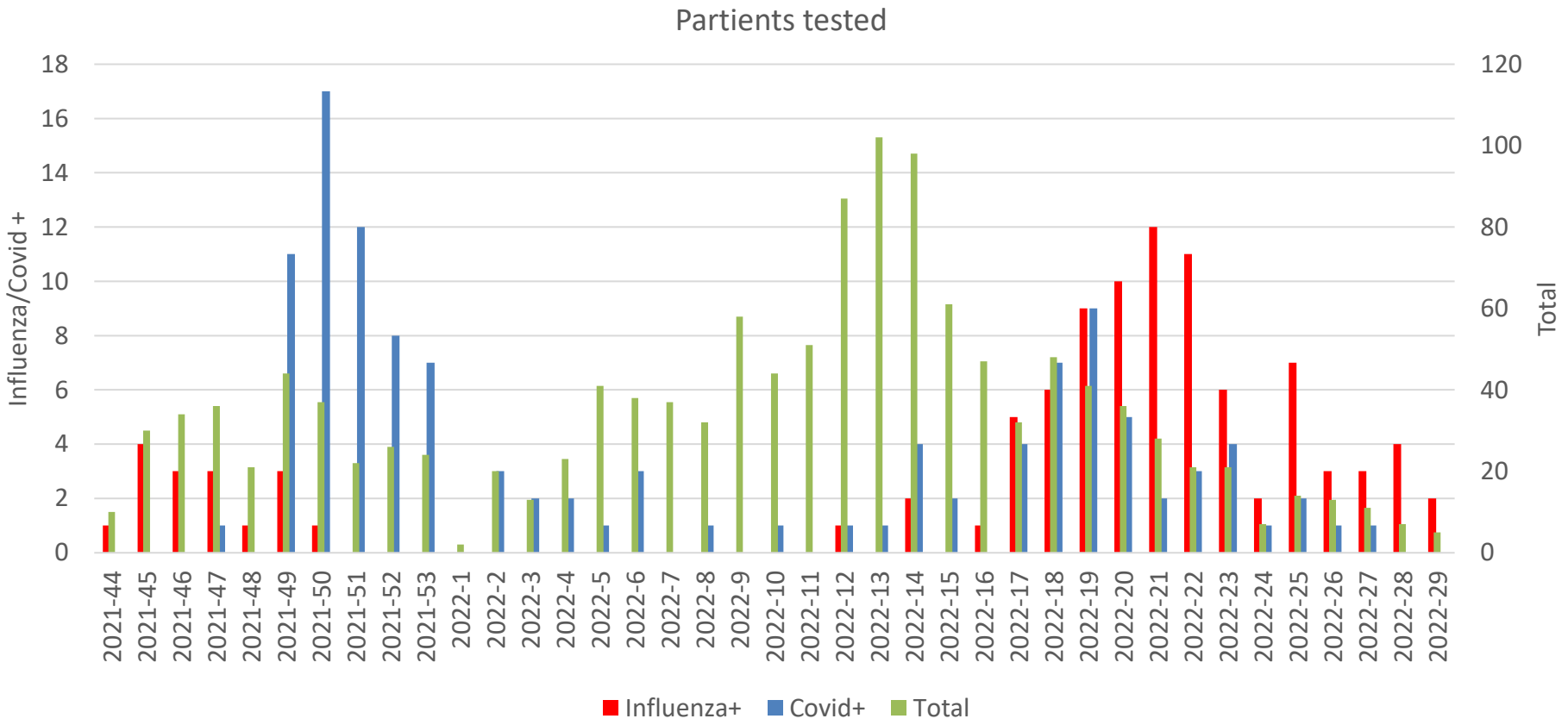
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Detailed results

Influenza Results	Total
Flu A, not typable	39
H1N1pdm09	38
H3N2	17
Flu B Victoria	6



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VACCINES & INFECTIOUS DISEASES ANALYTICS

Conclusion & Challenges

CONCLUSIONS:

- In 2022 influenza has been circulating since end of April. A first peak was detected in end of May beginning of June.
- Influenza infections are still being detected in October 2022.
- Influenza A circulated earlier, and both influenza A and B (predominant) are circulating at the moment.

CHALLENGES:

- Due to COVID-19 restrictions, study-staff has not been allowed consistently in the pediatric wards. Attending pediatrician collected samples and data in paper CRFs.
- Influenza sequencing is ongoing in our laboratory. Nonetheless approx. 50% of the PCR confirmed influenza cases have Ct-values >35, making sequencing challenging in these samples. Also, for sequencing to be less costly samples are batched.
- Due to the large volume of enrolments data management has been challenging.

ANNUAL MEETING, 18 OCTOBER 2022

SITE: KENYA

PI/Speaker: Nancy A. Otieno

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

Site description

- Surveillance conducted in 7 sites in diverse geographical locations. Surveillance hospitals include; Coast General Teaching and Referral Hospital, Nyeri County Referral Hospital (CRH), Kenyatta National Hospital, Nakuru CRH, Kakamega CRH, Siaya CRH and Marsabit CRH

- Total of 4,100 bed capacity for adults and pediatrics
  - Bed occupancy vary by site, range between 20-120%

- Surveillance enrolls patients of all ages with Severe Acute Respiratory Illness
  - Children <5 years make up approximately 90% of the surveillance population

Figure 1: Location of GIHSN sites in Kenya for 2021-2022 season.

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

Methods

1. Screening of admitted patients

- Daily screening for newly admitted patients (Mon-Fri); weekend admissions screened on Mondays
- Criteria for cases
  - hospitalized with acute onset of illness (< 10 days – routine SARI, <7 days – GIHSN)
  - with cough
  - reported fever or documented temp. ≥38°C

2. Data collection

- Electronic data collection
  - Demographics, Clinical presentation, Risk factor, Underlying medical condition, Outcome data
- Daily uploading to KEMRI server

3. Specimen collection

- Nasopharyngeal and oropharyngeal swabs collected from all patients
  - Stored at 2-8°C at the site
  - Transported 2 times a week to the National Influenza Center in Nairobi

4. Specimen processing

- Aliquoting and storage at -70°C
- Tested for by real-time RT–PCR within 72 hours
  - Influenza and SARS-CoV-2

5. Data processing and analysis

- Clinical data linked with lab testing data once a week
- Weekly reports generated and shared with stakeholders

Figure 2: Study Flow Diagram

Recruitment period for 2021-2022 season:

December 1, 2021 – September 30, 2022

Global Influenza Hospital Surveillance Network

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

Results

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	1493	158	0	0	1464	123	0	0	0	0
Patients 5+ yrs	133	17	0	0	125	17	0	0	0	0
Total	1626	175	0	0	1589	140	0	0	0	0

Key messages

- 1493 (92%) of patients enrolled <5 years of age; elderly (≥65 years) only 1 %
- 937 (58%) of the patients were males; only 4/16 elderly being males
- 519 (32%) had underlying medical conditions: 233 (16%) of <5 years malnourished.
- 19/48 (39.6%) Covid-19 vaccination- KMOH regulation as at May 2022 to expand vaccination group to 12 years
- 1 (0.1%) flu vaccination
- Influenza+ patients; 78 (45%) oxygen support, 49 (28%) ICU admissions, 4 (2%) deaths and 1 (0.6 %) HDU admissions
- SARS-CoV-2+ patients; 71 (51%) oxygen support, 45 (32%) ICU admissions, 8 (6%) deaths and 2 (1%) HDU admissions
- 10 (1%) Influenza and SARS-CoV-2 co-infection resulting in 3 ICU admissions, 6 oxygen support, 1 HDU but no death.

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

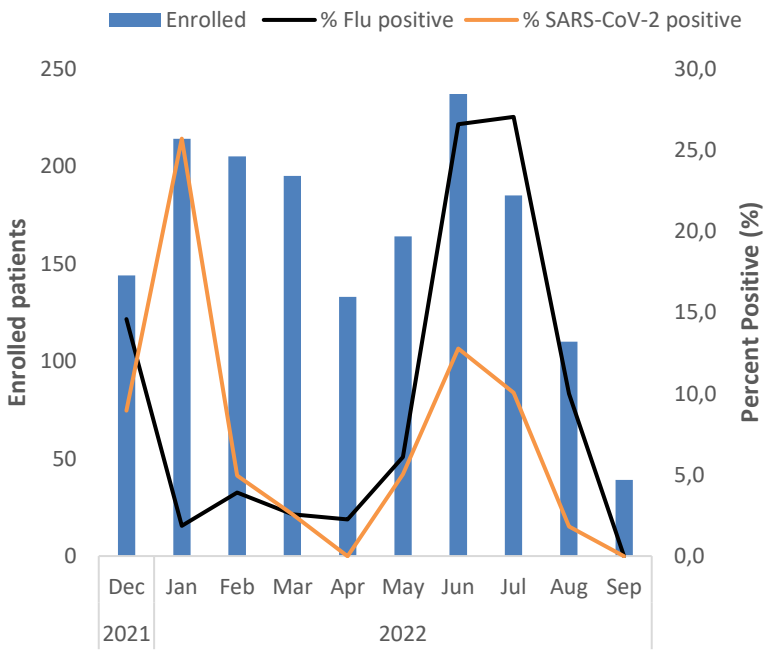
Detailed results

Table 1: Distribution of the cases enrolled by site and age

Variable	Enrolled	Influenza positive	SARS-CoV-2 positive
		n (%)	n (%)
All	1626	175 (10.8)	140 (8.8)
Site			
Coast PGH	219	20 (9.1)	18 (8.5)
Nyeri PGH	169	20 (11.8)	21 (12.7)
Kenyatta NH	505	50 (9.9)	37 (7.5)
Nakuru CRH	314	44 (14.0)	39 (12.7)
Kakamega CRH	83	11 (13.3)	3 (3.7)
Siaya CRH	319	27 (8.5)	22 (7.0)
Marsabit CRH	17	3 (17.7)	0 (0.0)
Age			
<2 years	1173	104 (8.9)	98 (8.5)
2-4 years	320	54 (16.9)	25 (7.9)
5-17 years	89	13 (14.6)	7 (8.4)
18-49 years	22	2 (9.1)	5 (23.8)
50-64 years	6	1 (16.7)	2 (33.3)
≥65 years	16	1 (6.3)	3 (20.0)
<5 years	1493	158 (10.6)	123 (8.4)
≥5 years	133	17 (12.8)	17 (13.6)
Underlying condition			
Any	519	49 (9.4)	57 (11.3)

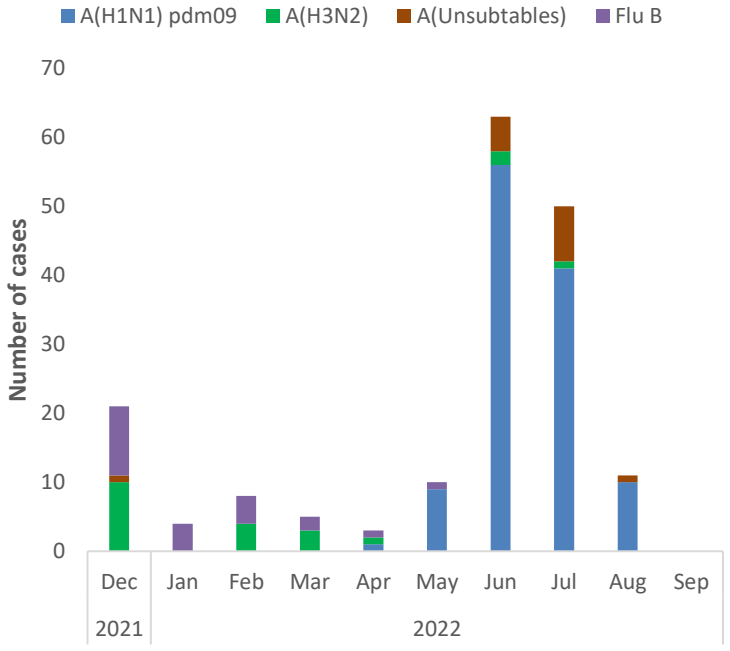
- The majority of cases enrolled were children <5 years
- Very few cases among elderly ≥50; 2 flu cases detected but more SARS-CoV-2 cases detected

Figure 3: Monthly no. of cases enrolled and % influenza and SARS-CoV-2 positive



- Influenza detected throughout the year from January 2022, peak of Omicron variant wave in Jan 2022.

Figure 4: Circulating influenza types and subtypes by month



- A(H1N1) pdm09 (66.9%) dominant, 10/22 (45.5%) Flu B were of Victoria lineage.

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

Conclusion & Challenges

CONCLUSIONS:

- More than 90% of patients enrolled were <5 years of age
- Detected influenza throughout the year; the first half of the season Influenza A (H3N2) and B co-circulated, later in the season A (H1N1)pdm 09 was predominant
- 72% of influenza cases on oxygen support and 80% of ICU admissions had influenza A (H1N1)pdm 09
- Vaccine uptake for COVID-19 at 40%, an improvement from last season.

CHALLENGES:

- Low enrollment of the elderly population (≥65 years only 1%)
- Uptake of influenza vaccine still remains low
- Getting government clearance to share SARS-CoV-2 sequence data still challenging. However, publication allowed.

ANNUAL MEETING, 18 OCTOBER 2022

SITE: INSTITUT PASTEUR DAKAR

PI/Speaker: Dr Ndongo Dia

Global Influenza Hospital Surveillance Network

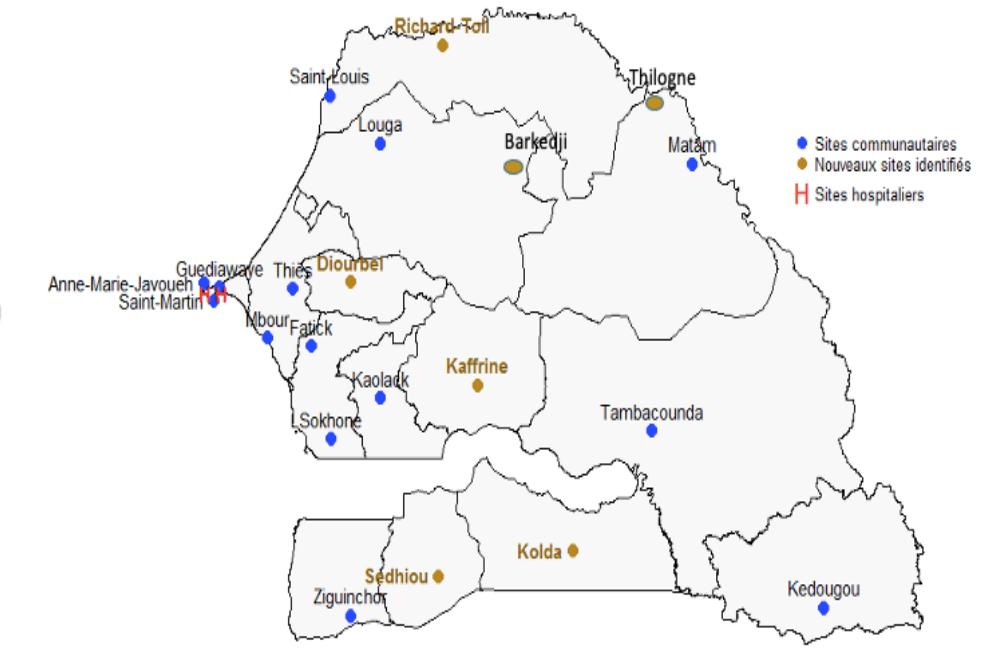
10-YEAR ANNIVERSARY

SENEGAL

Institut Pasteur de Dakar

Site description *(hospitals participating in the GIHSN)*

- 4 adult and pediatric academic and community hospital sites, all located in Dakar (Senegal Capital City) representing ~750 acute care beds
- 76.8% of enrolled patients were children under 5 years of age, admitted to hospitals with an acute respiratory illness
- Influenza seasons in Senegal typically begin with rainy seasons



Global Influenza Hospital Surveillance Network

SENEGAL

Institut Pasteur de Dakar

Methods

Active surveillance for acute respiratory infections was conducted November, 2021 to September, 2022

- NP swab obtained from all patients with an admitting diagnosis of ARI, CAP, exacerbation of COPD/asthma, any respiratory diagnosis or symptom
- All NP swabs were tested for influenza A & B, SARS-CoV-2 by qRT-PCR
- All NP were secondary tested for non-flu and non-SARS-CoV-2 respiratory viruses (RSV, HMPV, RV etc..)
- Influenza and SARS-CoV-2 sequencing performed locally at IPD
- Clinical and demographic information was also collected, including information about comorbidities
- Weekly reporting via FluID

SENEGAL

Institut Pasteur de Dakar

Results *(data shared in the GIHSN)*

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	519	31	519	88	519	31	519	154	19	17
Patients 5+ yrs	172	13	172	11	172	22	172	19	8	27
Total	691	44	691	99	691	53	691	173	27	44

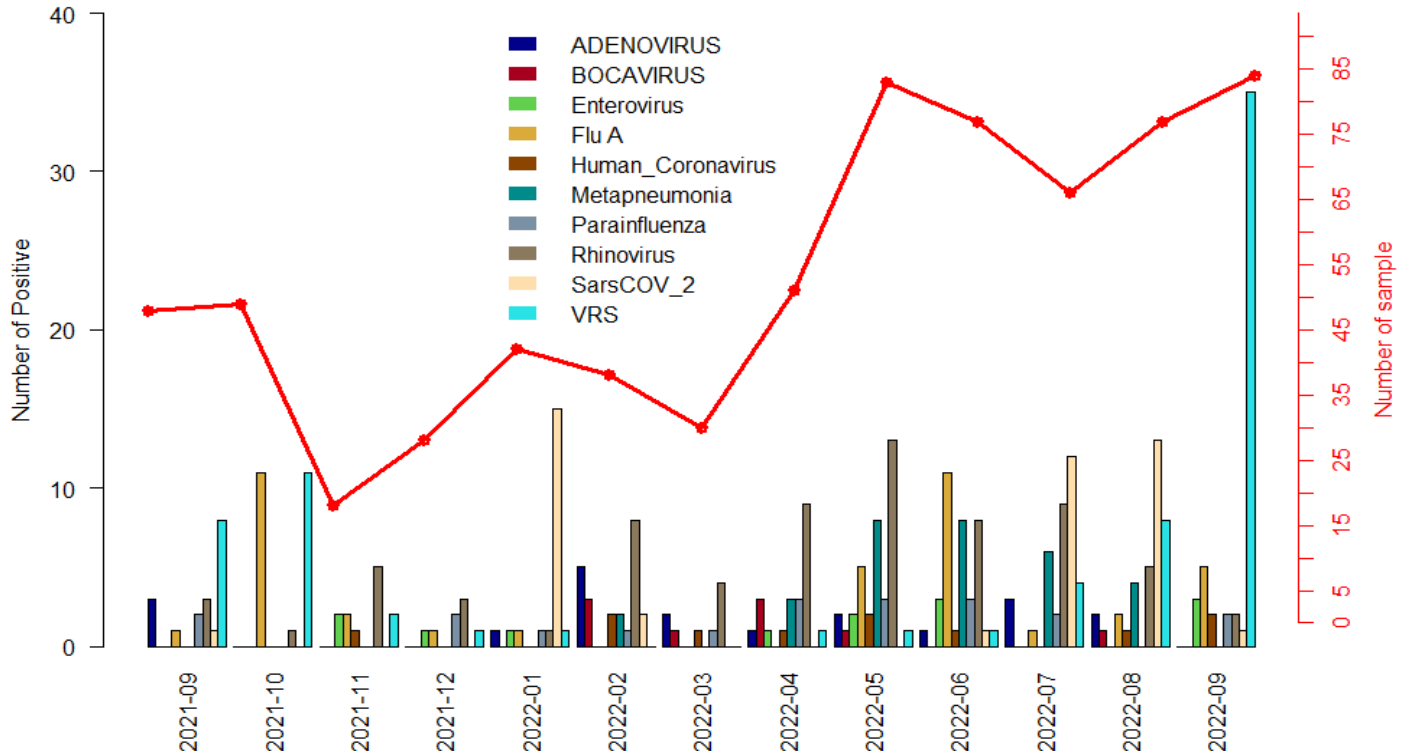
Key messages

- Enrolled patients are mainly pediatric (87.3% ≤ 15), sex ratio M/F of 1.1, no flu vaccine policy in Senegal
- SARS-CoV-2 burden slightly higher than flu one and both viruses were detected with same proportions in children under 5 years old.
- RSV is the most detected virus in children under 5 years old (88.9% of RSV cases)
- Regarding ORV, children under 5 years were also most exposed to infections
- …

SENEGAL

Institut Pasteur de Dakar

Detailed results



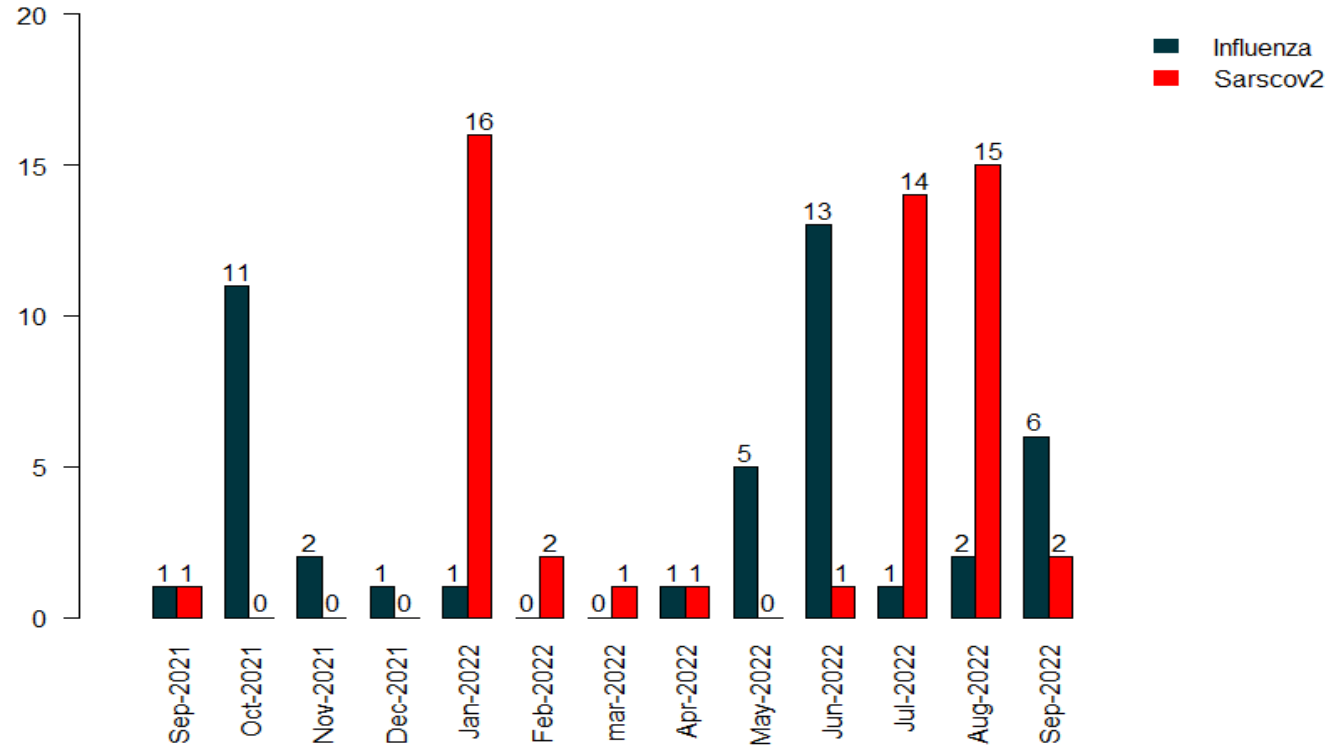
Circulation profiles of RV in patients with SARI in Senegal

Global Influenza Hospital Surveillance Network

SENEGAL

Institut Pasteur de Dakar

Detailed results



Global Influenza Hospital Surveillance Network

Co-circulation of flu and SARS-CoV-2 in patients with SARI in Senegal

SENEGAL

Institut Pasteur de Dakar

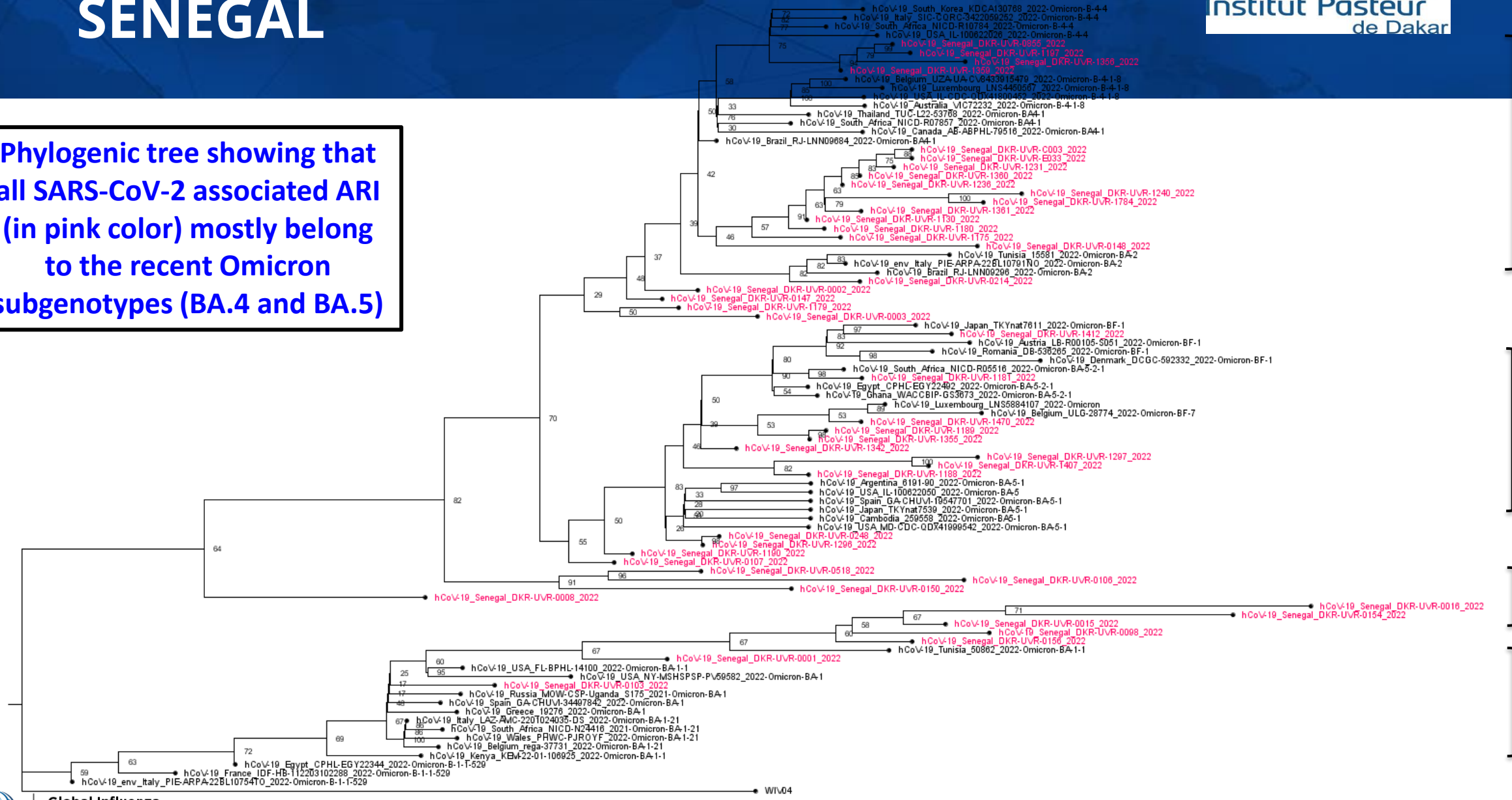
Detailed results

	2021-Sep	2021-Oct	2021-Nov	2021-Dec	2022-Jan	2022-Feb	2022-Mar	2022-Apr	2022-May	2022-Jun	2022-Jul	2022-Aug	2022-Sep	Total
Tested	48	49	18	28	42	38	30	51	83	77	66	77	84	691
Adenovirus	4	0	0	0	1	6	3	1	5	4	3	3	3	33
Bocavirus	0	0	0	0	0	3	3	5	2	2	0	1	0	16
Enterovirus	0	2	2	1	2	0	0	2	2	6	0	1	5	23
Human_Coronavirus	0	0	1	0	0	2	1	2	2	1	0	1	3	13
Influenza B	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza A	1	11	2	1	1	0	0	1	5	13	1	2	5	44
Metapneumovirus	0	1	0	0	0	2	0	3	9	16	6	5	1	43
ParaInfluenza	2	2	0	2	1	1	1	4	4	8	2	1	2	30
Rhinovirus	**5**	**13**	**5**	**4**	**1**	**9**	**5**	**13**	**13**	**23**	**9**	**7**	**9**	**116**
SarsCov-2	1	0	0	0	16	2	1	1	0	1	14	15	2	53
VRS	10	22	2	1	1	0	0	2	1	2	6	10	42	99

Rhino (116) and RSV (99) are the most detected virus

SENEGAL

Phylogenic tree showing that all SARS-CoV-2 associated ARI (in pink color) mostly belong to the recent Omicron subgenotypes (BA.4 and BA.5)



Global Influenza Hospital Surveillance Network

SENEGAL

Institut Pasteur de Dakar

Conclusion & Challenges

CONCLUSIONS:

- Diversity of viral pathogens in ARI
- Influenza A and SARS-CoV-2 co-circulated, with a slightly higher morbidity for SARS-CoV-2
- SARS-CoV-2 is well associated in severe acute respiratory infection in children under 5
- RSV burden very higher in children under 5 years

CHALLENGES:

- Strengh dry lab capacities locally
- Sequencing of all SARS-CoV-2 and flu positives with deposit in GISAID before end of October
- Implement the GIHSN eCRF in sites
- Extend the study to other hospital sites in order to be more exhaustive
- Improve data qualities

ANNUAL MEETING, 18 OCTOBER 2022

COTE D'IVOIRE

Daouda COULIBALY

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

COTE D'IVOIRE

INSTITUT NATIONAL D'HYGIENE PUBLIQUE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results and perspectives

Site description *(hospitals participating in the GIHSN)*

- 7 sentinel sites including 3 university hospitals, in 5 health regions (General & Pediatrics)
- 3 sites in Abidjan the capital and 4 in the other cities of the country
- Two season: First: Dec to Feb (dry season), Influenza activity is less intense, Second: April to July (rainy season, Flu activity is more intense,

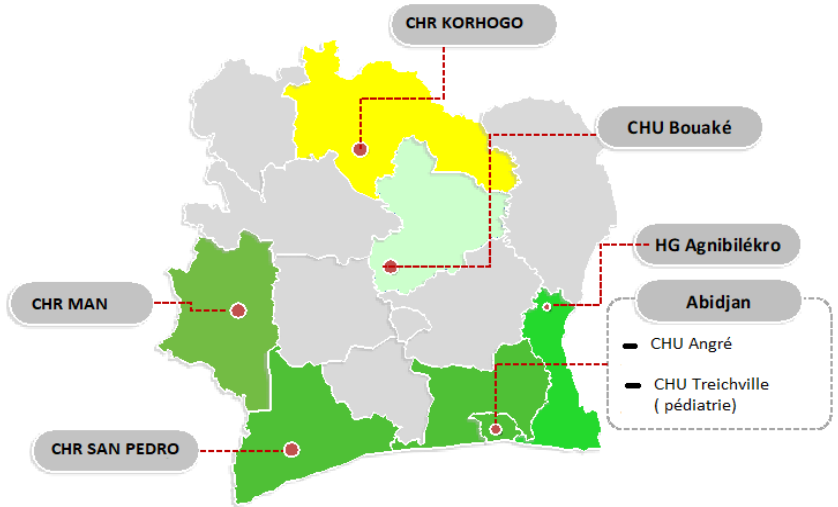


Fig 1:Distribution of influenza surveillance site GIHSN study, 2022, CI

Global Influenza Hospital Surveillance Network

COTE D'IVOIRE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results ans perspectives

Methods

- **Enrollment:** SARI + Hospitalization
- **Type of specimens:** Nasopharyngeal,
- **Sampling**: SARI: All cases detected shall be sampled

- **Conservation**: Viral Transport Med.; T°+4 and +8. Samples are kept at -80 for the long term. All samples from the current year and previous years are also kept at -80°C in the laboratories and aliquots are kept in the Institute's biobank
- **Shipment:** Cool Box, biosafety, contract with transport companies for the delivery
- **Notification** on the GIHSN electronic platform or on the paper form:: clinical and demographic information, comorbidities, vaccination
- **Feedback:** sentinel sites, weekly epidemiological bulletin, WHO (FLUNET)
- **Testing Algorithm:** Multiplex RT-PCR Influenza A,B, Sars-Cov-2;
  - Positive Sars-Cov-2: single RT-PCR Sars-CoV-2
  - Positive Influenza A&B: subtyping H1, H3 or B Victoria, Yamagata
  - Negative Influenza, Sars-Cov-2: RT-PCR RSV, hMPV, Para inf

COTE D'IVOIRE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results ans perspectives

Results *(data shared in the GIHSN)*

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	214	1	209	2	214	4	1	1
Patients 5+ yrs	360	5	353	3	360	2	2	1
Total	574	6	562	5	574	6	3	2

Key messages

Characteristics of enrolled patients:

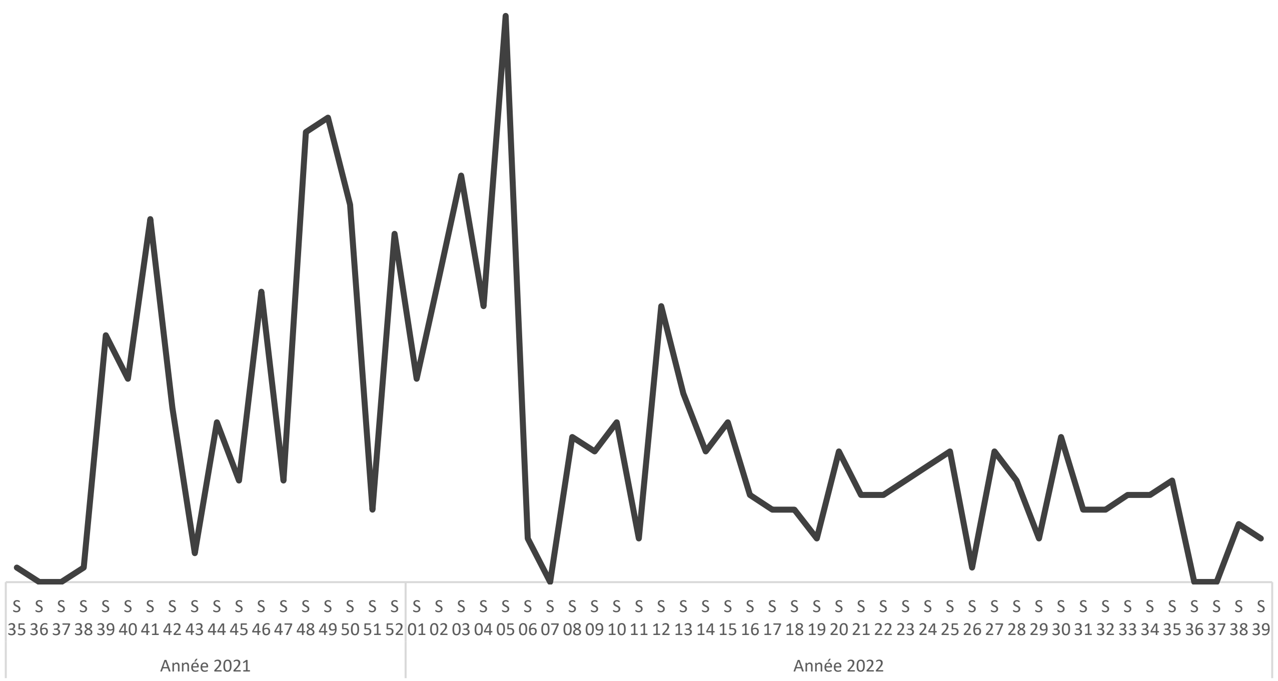
- Male: n=308 (53,7%)
- Comorbidities: n=103 (17,9%)
- Flu vaccination:: n=3 (0,5%)
- Fever: n=495 (86,2%)
- Cough: n=560 (97,6%)
- shortness of breath: n=357 (62,2%)

Global Influenza Hospital Surveillance Network

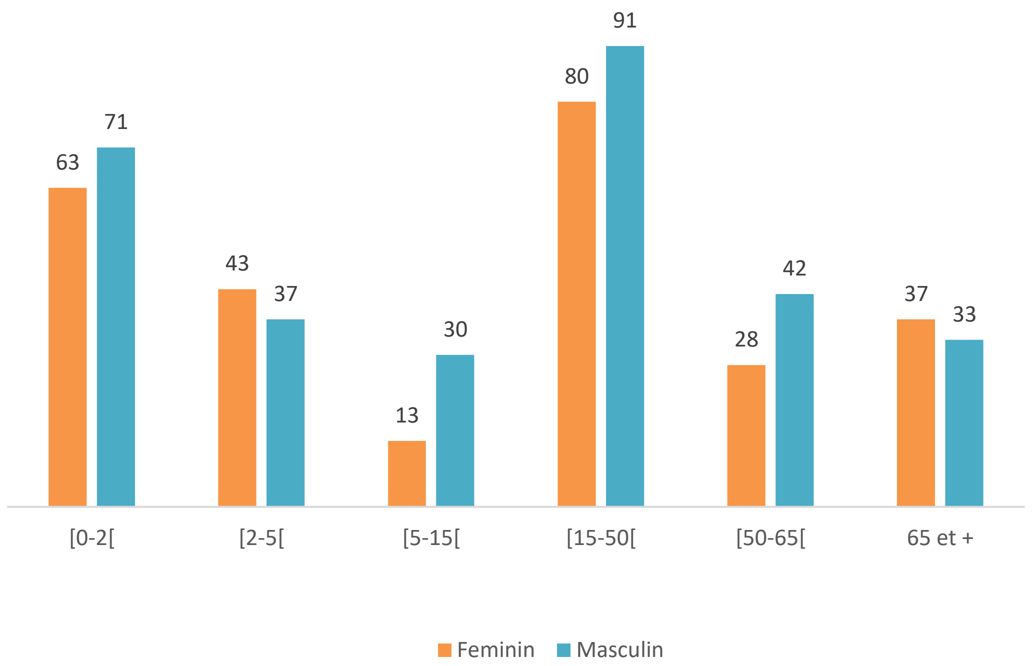
COTE D'IVOIRE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results ans perspectives

Detailed results *(data shared in the GIHSN)*



Distribution of SARI cases, 2021-2022, CI



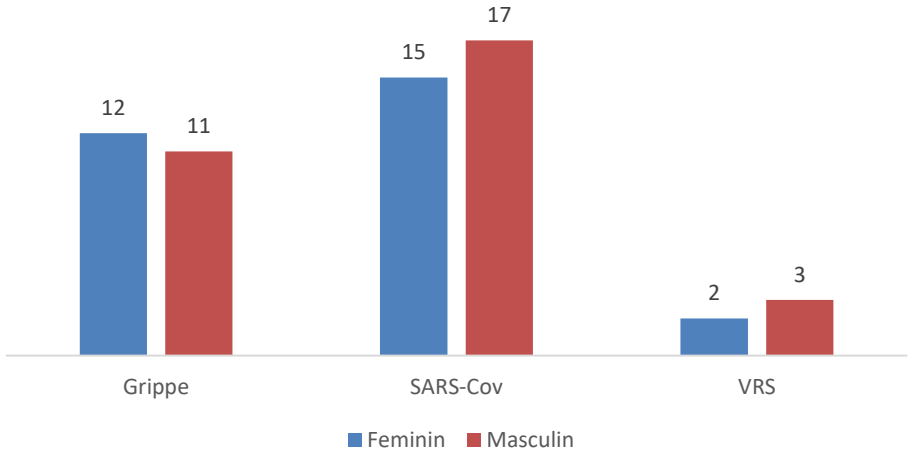
SARI cases by age and sex, 2022, CI

Global Influenza Hospital Surveillance Network

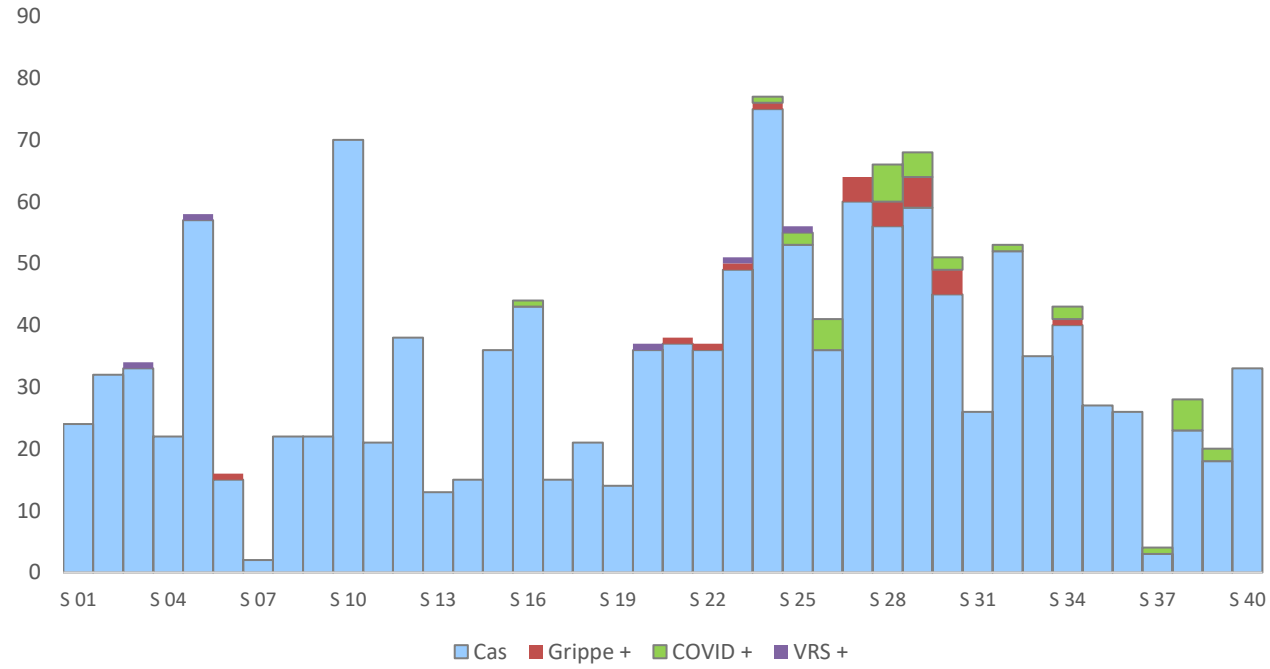
COTE D'IVOIRE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results ans perspectives

Detailed results *(data being transmitted in GIHSN)*



Age (ans)	Grippe	SARS-Cov	VRS
[0-2[	9	14	1
[2-5[	3	1	1
[5-15[	5	3	0
[15-50[	5	9	1
[50-65[	1	1	1
65 et +	0	4	1
Total	23	32	5



#WGS LCI& Sars-Cov-2: 11

Global Influenza Hospital Surveillance Network

COTE D'IVOIRE

Influenza Surveillance Network in Côte d'Ivoire in 2022: results ans perspectives

Conclusion & Challenges

CONCLUSION:

- Co-circulation of influenza viruses and Sars-CoV-2 During the 2021/2022 season
- Influenza viruses cause severe respiratory infections

CHALLENGES:

- Sustain Covid-19 surveillance through the influenza surveillance network because with the reduction in Covid-19 cases, the Covid-19 surveillance sites are closed
- Strengthen the sequencing capacities of the strains by the reference laboratory for the rapid detection of variants
- Regularly estimate the burden of influenza in order to promote the implementation of preventive measures

COFFEE BREAK

ANNUAL MEETING, 18 OCTOBER 2022

SITE: RUSSIA, SAINT PETERSBURG

PI/Speaker: Daria Danilenko

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

RUSSIA

WHO NATIONAL INFLUENZA CENTRE, WHO REFERENCE CENTRE FOR SARS-CoV-2, SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Site description *(hospitals participating in the GIHSN)*

- 8 Infectious Hospitals for adults and children in 3 Federal Districts: North-western (Saint Petersburg), Ural (Ekaterinburg), Siberian (Novosibirsk) representing ~1150 acute care beds;
- Population of three cities - 8,5 mln. people;
- Population enrolled: **3915** patients, including **944** adults and **2971** children, admitted to hospitals with an acute respiratory illness;
- Influenza season in Russia began early with influenza A activity, followed by a later influenza B sporadic detection.
- Influenza A(H1N1)pdm09 virus was not detected among SARI patients.

RUSSIA

WHO NATIONAL INFLUENZA CENTRE, WHO REFERENCE CENTRE FOR SARS-CoV-2, SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Methods

- Active **year-round surveillance** for influenza and SARS-CoV-2 infection in adults (≥18 years of age) and children (0 -17 years of age) was conducted from October 4th, 2021 to October 2th, 2022;
- **Case definition** – according to the GIHSN Core Protocol 2021-11-07
- **NP swabs** were obtained from **all patients** with diagnosis at admission of influenza, ARI, COVID-19, pneumonia, laryngeal stenosis, exacerbation of COPD/asthma, myocardial infarction, unexplained sepsis;
- **All swabs** were collected **in VTM** and **tested in multiplex PCR** for influenza A & B, SARS-CoV-2, RSV, rhinoviruses, parainfluenza, adenoviruses, metapneumovirus, seasonal coronavirus and bocavirus by PCR;
- Influenza subtyping and B lineage characterization were performed locally or at the National Influenza Centre at the Smorodintsev Research Institute of Influenza;
- Other clinical and demographic information was also collected, including information about comorbidities, medications, vaccination status, pregnancy and frailty (*see clinical frailty scale);
- Sequencing results of full genomes of influenza and SARS-CoV-2 were submitted to GISAID.

RUSSIA

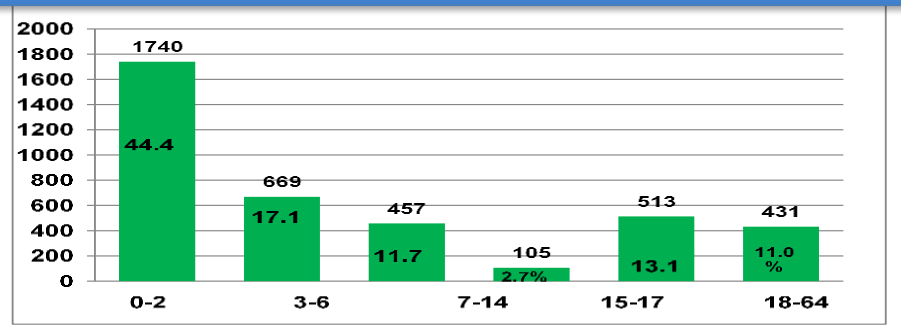
WHO NATIONAL INFLUENZA CENTRE, WHO REFERENCE CENTRE FOR SARS-CoV-2, SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Results *(data shared in the GIHSN)*

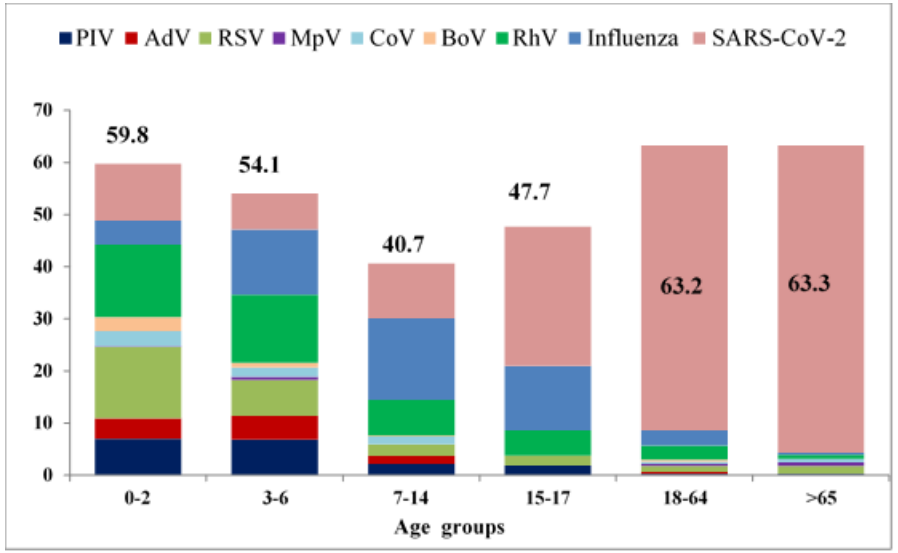
Patient's age	#included and tested	#LCI	#RSV +	SARS-CoV-2 +	#ORV +	#WGS LCI	#WGS SARS-CoV-2
< 5 yrs	2169	127	274	215	943	44	6
≥ 5 yrs	1746	140	36	630	177	62	119
Total	3915	267	310	845	1120	106	125

All included patients were swabbed & tested for influenza, SARS-CoV-2, RSV and ORV

Patients age	Sex		Influenza		RSV		SARS-Cov-2		ORV	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
< 5 yrs	903	1266	53	74	122	152	84	131	365	578
≥5 yrs	925	821	63	77	16	20	360	270	95	82
Total	1828	2087	116	151	138	172	444	401	460	660



Enrolled patients by age



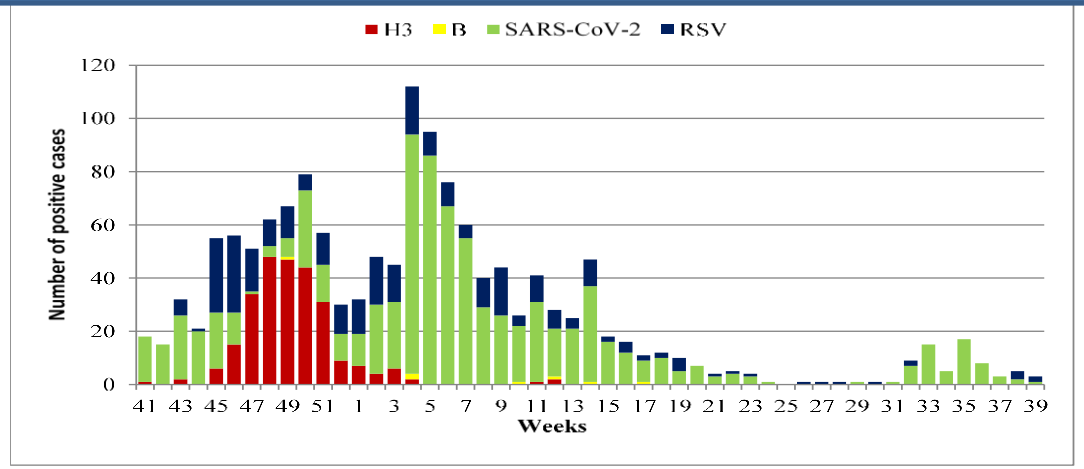
Age dependent etiology of respiratory infections among all admitted pati

COUNTRY

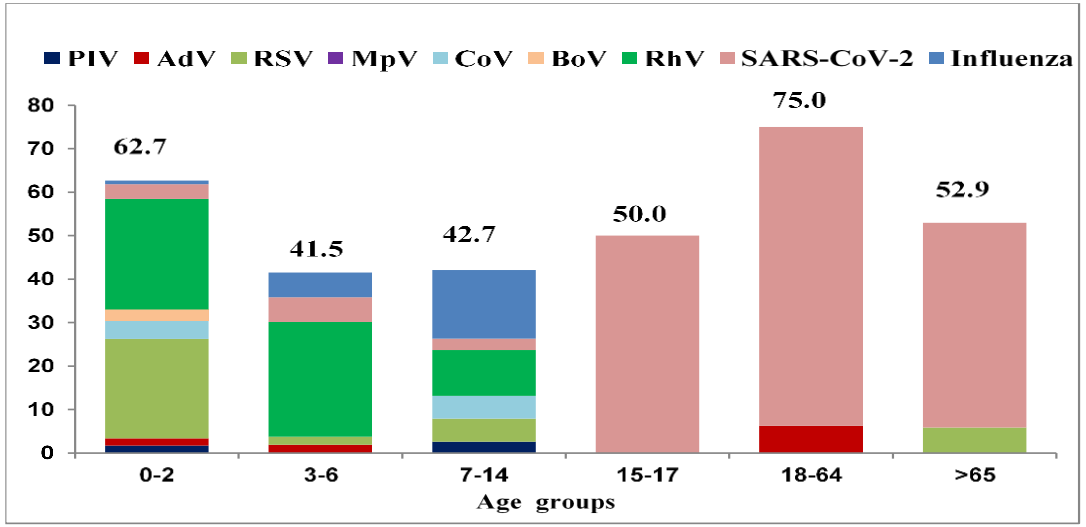
WHO NATIONAL INFLUENZA CENTRE, WHO REFERENCE CENTRE FOR SARS-CoV-2, SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Detailed results

Co-morbidities and severe outcomes	Total #	LCI #		RSV #		SARS-CoV-2 #		ORV #	
		#	%	#	%	#	%	#	%
CVD	650	3	0,46%	9	1,4%	371	57,1%	27	4,15%
Diabetes	184	0	0,0%	2	1,1%	126	68,5%	6	3,3%
COPD	105	1	0,95%	4	3,8%	50	47,6%	14	13,3%
NMD	348	8	2,3%	6	1,7%	176	50,6%	27	7,8%
ICU	250	10	4,0%	31	12,4%	31	12,4%	96	38,4%
MLV	15	0	0,0%	0	0,0%	9	60%	0	0,0%
Death	43	0	0,0%	1	2,3%	23	53,5%	0	0,0%



Monitoring of influenza, SARS-CoV-2 and RSV detection among hospitalized patients



Age dependent etiology of respiratory infections among ICU patients

Global Influenza Hospital Surveillance Network

RUSSIA

WHO NATIONAL INFLUENZA CENTRE,
WHO REFERENCE CENTRE FOR SARS-CoV-2,
SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Vaccination status

Target virus vaccination type	Age group (years)	Number of vaccinated patients	Vaccinated		Not vaccinated	
			virus (+)	virus (-)	virus (+)	virus (-)
Influenza	Children aged 3 yrs and more	51	6	45	246	2600
	Adults	9	0	9	17	918
	Total	60	6	54	260	3521
COVID-19	18-64	14	9	5	148	144
	65 and more	4	3	1	132	111
	Total	18	12	6	280	255

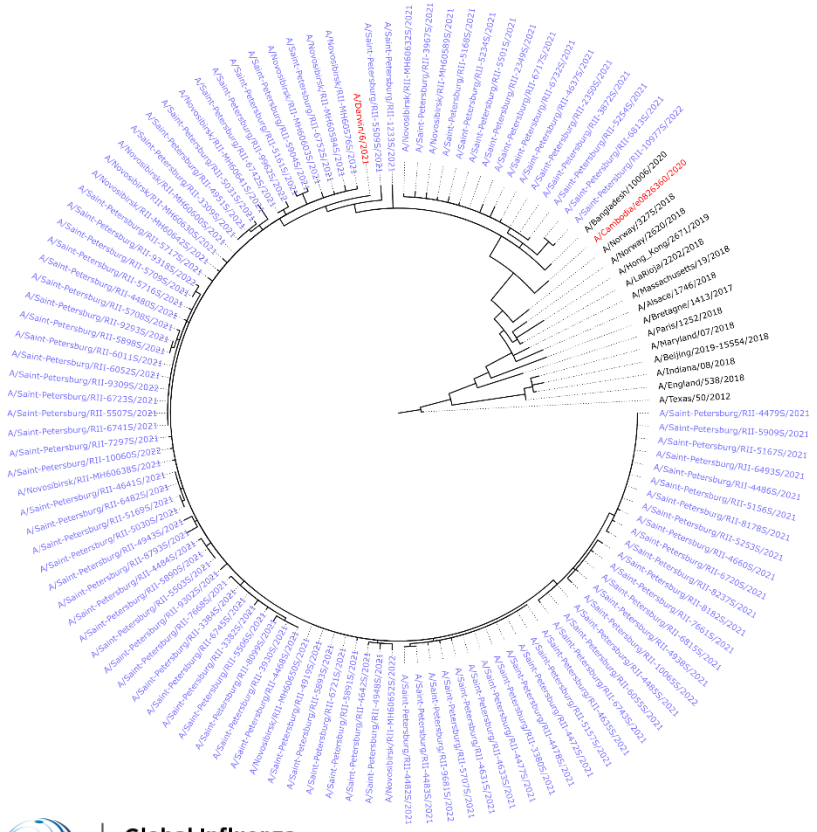
- The percentage of patients vaccinated against influenza among those hospitalized was about 1%, the percentage of patients vaccinated against COVID-19 was 3.25%.
- A small number of vaccinated did not allow an objective assessment of the effectiveness of the vaccines.

RUSSIA

WHO NATIONAL INFLUENZA CENTRE, WHO REFERENCE CENTRE FOR SARS-CoV-2, SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

NGS sequencing of influenza and SARS-CoV-2 viruses

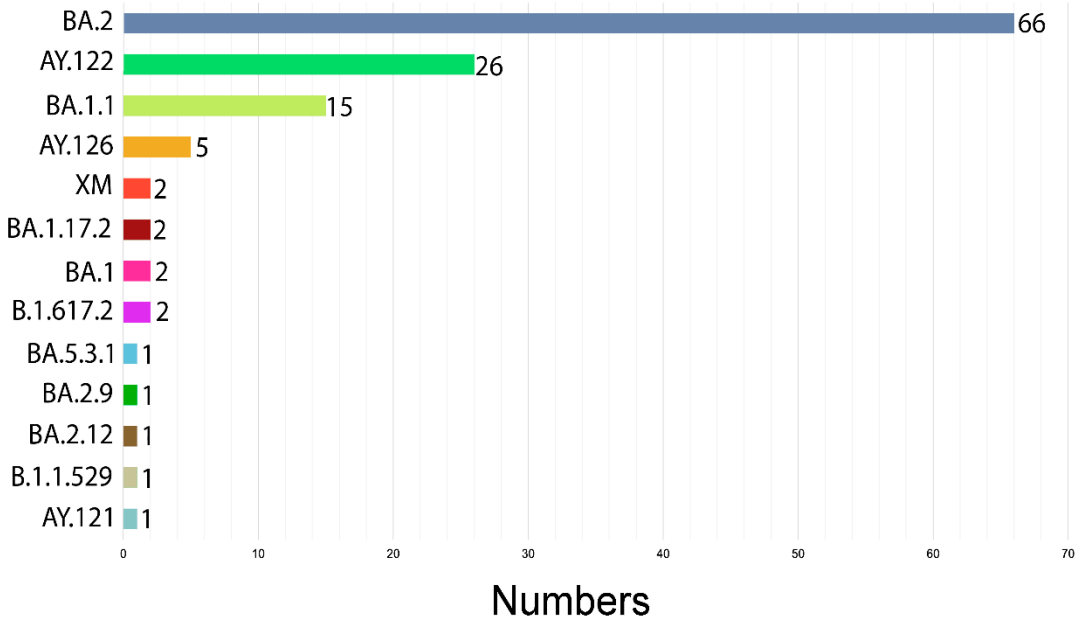
Influenza H3N2



- Most influenza A(H3N2) viruses were genetically homogenous and belonged to the clade 3C.2a1b.2a.2 (with AA substitutions K83E, Y94N, T131K (-CHO), F193S, Y195F, I522M. More than 80% belonged to the subgroup A/Darwin/9/2021 with AA substitution H156S.
- None of the viruses had substitutions known to alter susceptibility to NA inhibitors.

SARS-CoV-2

Pangolin lineage



A high wave of COVID-19 incidence peaking in week 4, 2022 was caused by the spread of the Omicron variant, which replaced the Delta variant of SARS-CoV-2 previously circulated.

Global Influenza Hospital Surveillance Network

RUSSIA

WHO NATIONAL INFLUENZA CENTRE,
WHO REFERENCE CENTRE FOR SARS-CoV-2,
SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Conclusion & Challenges

CONCLUSIONS:

- COVID-19 was the major cause of hospitalizations in adults and adolescents aged 15-17; influenza was the most frequent cause of hospitalisations for schoolchildren aged 7-14 and the second frequent cause for adolescents 15-17; RSV and rhinoviruses were most frequent causes for hospitalization of newborns and infants aged 0-2, including ICU cases; in age group 3-6 influenza and rhinoviruses were dominant cause of hospitalization.
- The dominant influenza subtype in Russia was A(H3N2) as elsewhere in Europe and it prevailed among hospitalized patients; only single cases of influenza B were registered among SARI patients, however no influenza A(H1N1)pdm09 virus was detected;
- Most influenza A(H3N2) viruses belonged to the clade 3C.2a1b.2a.2 and were closely related to the vaccine strains recommended by WHO for the 2022-2023 season for the Northern Hemisphere;
- All WGS of 106 tested influenza viruses and 125 SARS CoV-2 have been input in GISAID timely;
- The sequences of early influenza virus HA presented to the WHO at the beginning of February (before VCM) in the Interim Report “Start of Influenza Activity in Russia, season 2021-2022”;
- Low influenza and COVID-19 vaccination among hospitalized patients was registered;
- Increased COVID-19 hospitalization and mortality was observed among the patients with CVD, diabetes, COPD and neuro-muscular diseases.

CHALLENGES:

- Incomplete funding which was necessary for support of influenza and SARS-CoV-2 sequencing and active surveillance

ORAL PRESENTATION AT ANNUAL MEETING 2022

Site: Moscow, Russia

Name of the Site Speaker: Svetlana Trushakova

Foundation for Influenza Epidemiology

Moscow, Russia

FSBI National Center of Epidemiology and Microbiology by N.F.Gamaleya
Hospitals for Infectious Diseases #1 and #2

Site description

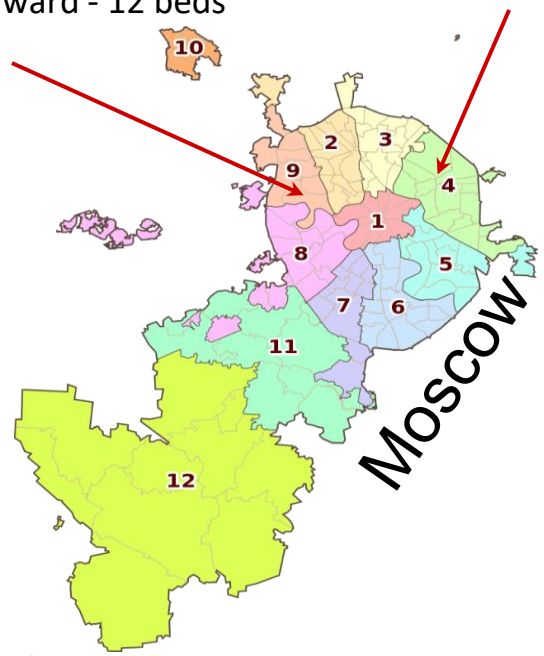
Included = **1456**

FLU = **218 (15%)**
SARS-CoV-2 **= 489 (35%)**

Sequenced = **61**

Hospital #1
Children ward -75 beds
Adult ward - 120 beds
ICU ward - 12 beds

Hospital #2
Obstetric ward - 80 beds

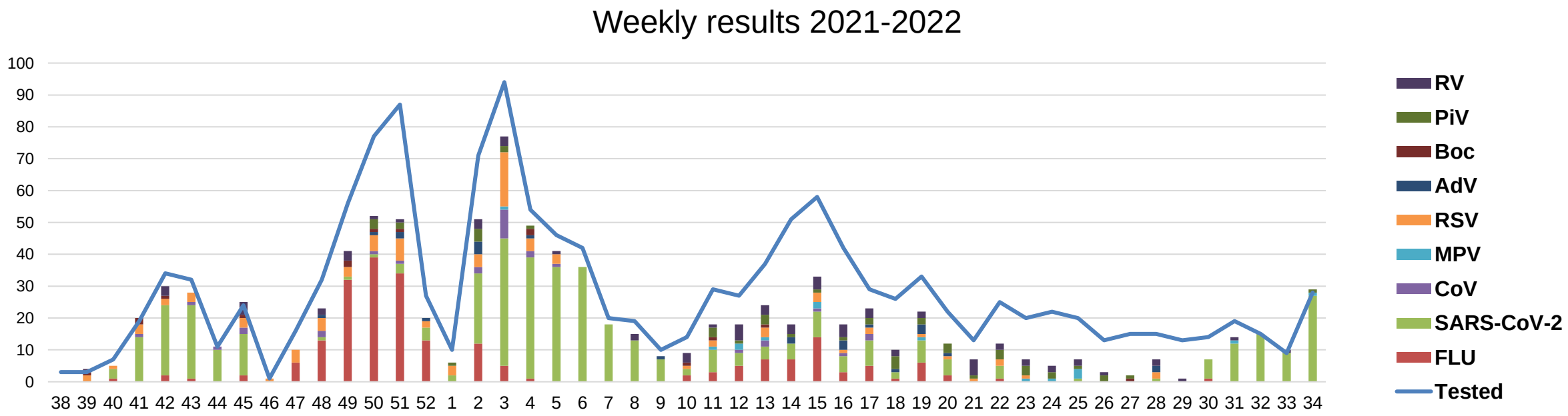


- A study conducted at the laboratory of Influenza etiology and epidemiology
- Population – 12 655 050 (2022) of residents and guests from 0 to 90 y.o.
- Patients – adults, children and pregnant women
- Acute respiratory illness cases up to 10 days of onset were included in the study
- Screening was conducted for 3 days per week (Tue, Wed, Thu)
- Nasal swabs were taken in Eppendorf tubes with 1,5 ml medium, frozen or sent to the laboratory immediately
- Laboratory testing was done as soon as swabs received
- Questionnaires were closed after patients discharge
- Excel files manually fulfilled were submitted to gihsn.org
- All samples have been frozen and store at -70C

Global Influenza Hospital Surveillance Network

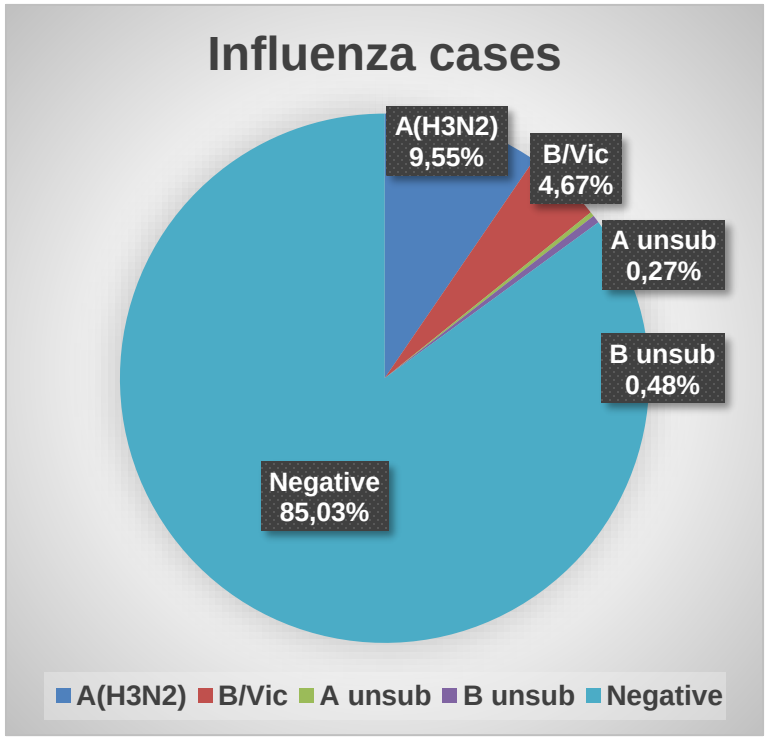
Results 2021-2022

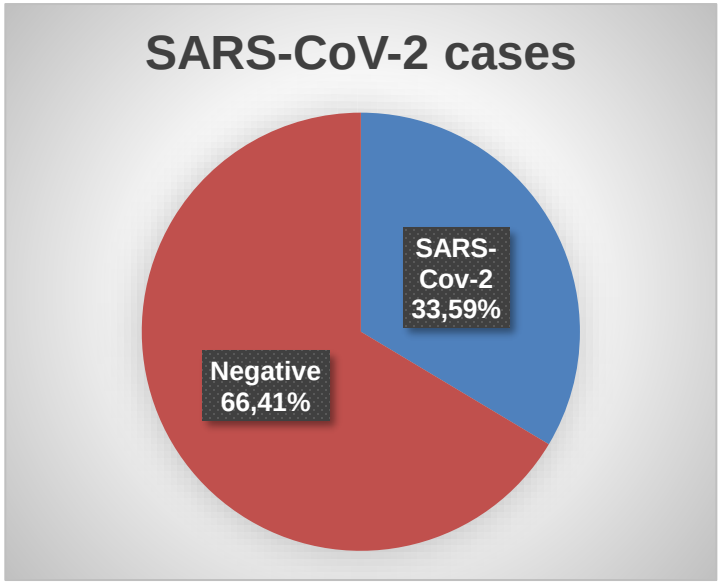
Patients	Included	FLU +	Tested for SARS-CoV-2	SARS-CoV-2 +	Tested for ORV	ORV +	Tested for RSV	RSV +	Sequenced FLU	Sequenced SARS-Cov-2
Total	1456	218 (15%)	1456	489 (34%)	1121	302 (27%)	1121	92 (8%)	26	35
5+ yrs	1010	180 (18%)	1010	354 (35%)	745	120 (16%)	745	27 (3,6%)	18	24
5- yrs	446	38 (8,5%)	446	135 (30%)	376	182 (48%)	376	65 (17%)	8	11



Global Influenza Hospital Surveillance Network

Positive cases

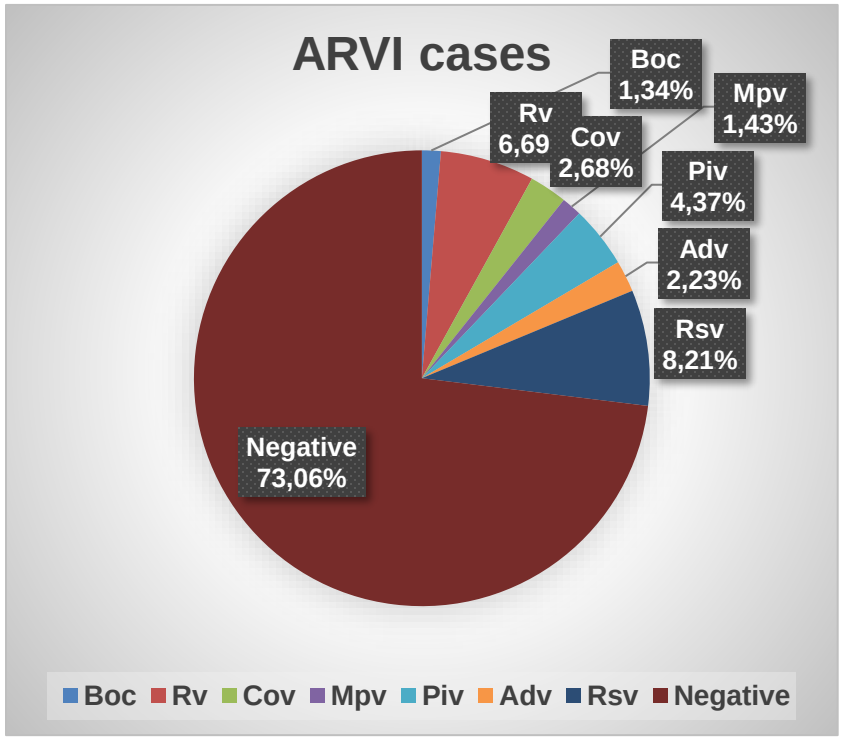




Coinfections

N=16 (7.4%)
FLU+SARS – 3
FLU+ Rv – 3
FLU+ RSv – 3
FLU+ PiV – 4
FLU+ Cov – 1
FLU+ Mpv – 1
FLU+ Boc – 1

N=49 (10%)
SARS+ Rv – 10
SARS+ RSv – 10
SARS+ PiV – 10
SARS+ CoV – 10
SARS+ Mpv – 4
SARS+ Adv – 3
SARS+ Boc – 2



Global Influenza Hospital Surveillance Network

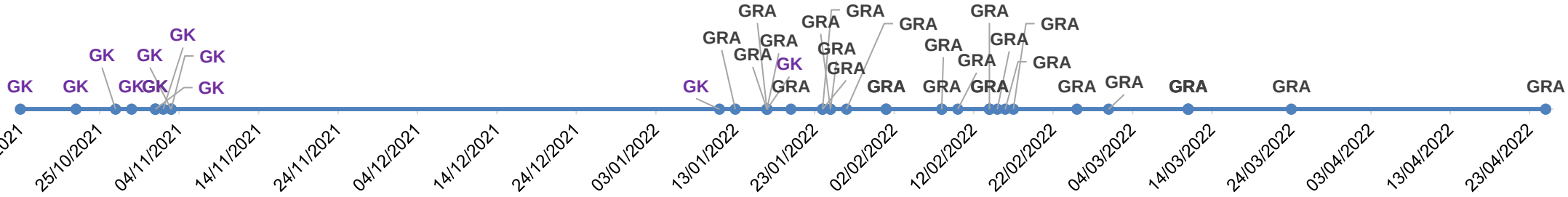
Characteristics of positive patients

Characteristics	Influenza N = 218 (15%)	SARS-Cov-2 N = 489 (34%)
Adults (15-64)	51 (23.4)	142 (29.0)
Children (5-14)	27 (12.4)	16 (3.3)
Children (0-5)	38 (17.4)	135 (27.6)
Pregnants	55 (25.2)	79 (16.2)
Elderly 65+	23 (10.6)	141 (28.8)
Comorbidities: CVD	33 (15.1)	181 (37.0)
Comorbidities: Obesity	12 (5.5)	85 (17.4)
Comorbidities: Diabetes	11 (5.0)	63 (12.9)
ICU treatment	4 (1.8)	29 (5.9)
Mechanical ventilation	2 (0.9)	14 (2.9)
Support oxygen in adults	10 (4.6)	80 (16.4)
Death	0	12 (2.5)
SARS vaccination	62/270 (23.0)	72/270 (26.7)
FLU vaccination	7/39 (17.9)	20/39 (51.3)

Genetic characteristics of sequenced viruses

Sequenced SARS-CoV-2	Antigenic group	Pango lineage
10	GK (Delta)	B.1.617.2 – 2 AY.122 – 6 AY.43 – 1 AY.25 – 1
25	GRA (Omicron)	BA.1 – 2 BA.1.1 – 16 BA.1.14 – 1 BA.1.15 – 1 BA.1.17.2 – 1 BA.2 – 4

Genetic groups of sequenced Influenza strains	
A(H3N2) N=20	B/Victoria N=6
3C.2a1b.2a2	V1A.3a.2



Global Influenza Hospital Surveillance Network

Summary

- Reemerging of Influenza in continuing SARS-Cov-2 circulation was observed in the 2021-2022 season.
- SARS-CoV-2 was dominant and accounted for 34% oppose to influenza (15%) and other respiratory viruses – 27%.
- Influenza cases were represented subtypes of A(H3N2) – 64% and B/Victoria – 31%.
- RSv (9%), Rv (8%) and Piv (5%) were most frequent infection among ARVI .
- The groups of patients and severity of illness were differed when comparing influenza and SARS-CoV-2 viruses.
- Children 5-14 yo and pregnant women were more exposed by influenza than SARS-CoV-2 infection. Children under 5 and elderly patients were most suffering with SARS-CoV-2.
- CVD, diabetes and obesity were prevalent in both groups of patients.
- ICU treatment, mechanical ventilation and oxygen support were more frequent in SARS-Cov-2 cases.
- Mortality due to SARS-CoV-2 was 2,5%. It is less than in the previous season - 8,5%.
- Patients vaccinated against SARS-Cov-2 were more numerous (27%) than against influenza (4%).
- There was circulation of two antigenic variants of SARS-Cov-2. Clade GK (Delta variant) changed of clade GRA (Omicron variant) in January 2022.
- Influenza B viruses were assigned to the B/Victoria lineage clade V1A.3a.2. Influenza A(H3N2) viruses belonged to subclade 3C.2a1b.2a.2. All of them had antigenic differences from the vaccine component recommended to the 2021/2022 season.

ANNUAL MEETING, 18 OCTOBER 2022

SITE: INDIA-SRINAGAR

PI/Speaker: Dr PARVAIZ A KOUL

Global Influenza Hospital Surveillance Network

10-YEAR ANNIVERSARY

INDIA

Sheri Kashmir Institute of Medical Sciences

Site description

- Hospital-based surveillance for severe acute respiratory infection (SARI) cases was conducted in Sheri Kashmir Institute of Medical Sciences (SKIMS).
- Sheri Kashmir Institute of Medical Sciences is a 1200 bedded tertiary care University hospital cum referral center in capital Srinagar of the northern most Indian state of Jammu and Kashmir.
- Kashmir has a population of 7 million and SKIMS form the main referral center for respiratory cases of the valley.
- The Influenza laboratory of SKIMS caters to the hospital needs and apart from surveillance activities also provides outbreak investigation facilities to the state.

INDIA

Sheri Kashmir Institute of Medical Sciences

Methods

- During the study period from November 2021 till March 2022, all inpatients with suspected respiratory infections who were admitted overnight to the study hospitals were screened daily. (with intermittent break due to change of dispensation). Voluntary recruitment.
- Patients who met the European Center for Disease Control (ECDC) ILI case definition were recruited in the study.
- Nasopharyngeal and throat swabs were collected from recruited participants.
- Respiratory specimen was tested for Influenza A and B.
- Samples positive for Influenza A were subtyped into A/H1N1 and A/H3N2.
- A case report form captured demographics, history of presenting illness, co-morbidities, disease course and outcome. Nasal and throat swabs were tested on real-time RT PCR to access the prevalence of influenza and other respiratory viruses.

INDIA

Sheri Kashmir Institute of Medical Sciences

Results

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	07	0	No	-	No	-	No	-	-	-
Patients 5+ yrs	312	03	No	-	No	-	-	-	-	-
Total	319	03	-	-	-	-	-	-	-	-

- Of 319 patients, 171 were males (53.6%), median age= 52 yrs (IQR 32-65.5). Patients with co-morbidities accounted for 73.5% admissions (n=235) and 42 (13.1%) patients were vaccinated against influenza.
- 12 patients were prescribed anti-viral during their admission.
- 18 patients required ICU admissions and 12 patients required mechanical ventilation.
- A total of 30 deaths were observed during the study period.
- All A/H3N2 (n=03) patients had an uneventful recovery

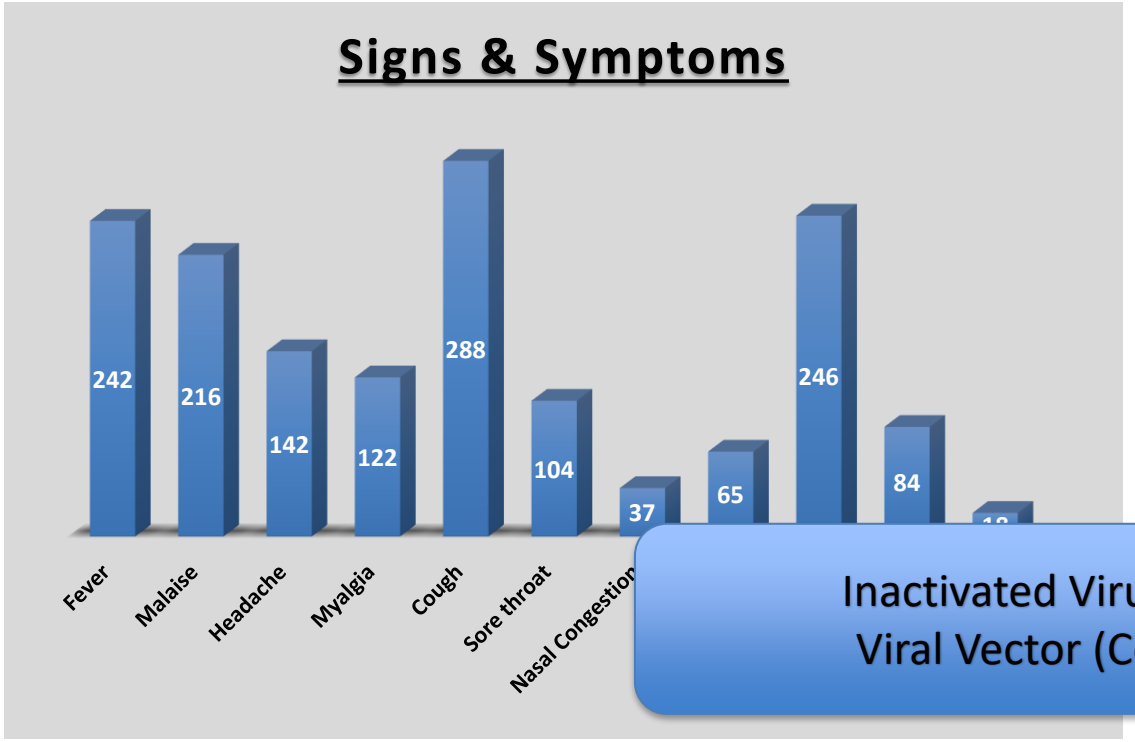
INDIA

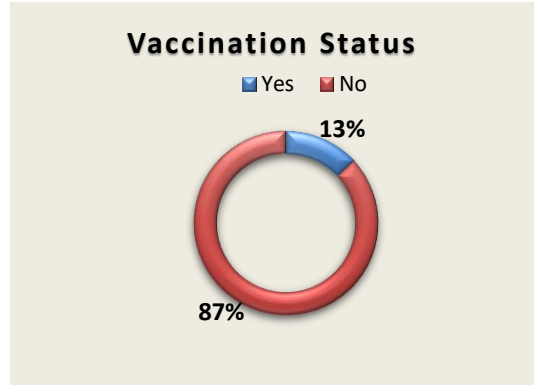
Sheri Kashmir Institute of Medical Sciences

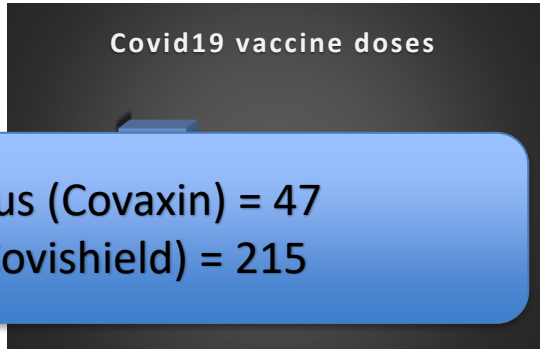
Detailed Results

Chronic Conditions

CVD	142
COPD	56
Asthma	4
Diabetes	67
Immunodeficiency	6
Renal Impairment	30
Autoimmune	3
Neuromuscular	19
Liver disease	3
Neoplasm	44
CVD	142
COPD	56







Inactivated Virus (Covaxin) = 47
Viral Vector (Covishield) = 215

Global Influenza Hospital Surveillance Network

INDIA

Sheri Kashmir Institute of Medical Sciences

Conclusion & Challenges

CONCLUSIONS:

- Of 319 recruited cases, only 03 patients were positive for Influenza (A/H3N2)
- The vaccination rate among the patients was found to be 13.1%

CHALLENGES:

- Getting the respiratory specimen from the patients who were already swabbed for Covid19 was quite challenging.

ANNUAL MEETING, 18 OCTOBER 2022

SITE: NEPAL

PI/Speaker: Kedar Prasad Baral

Global Influenza Hospital Surveillance Network

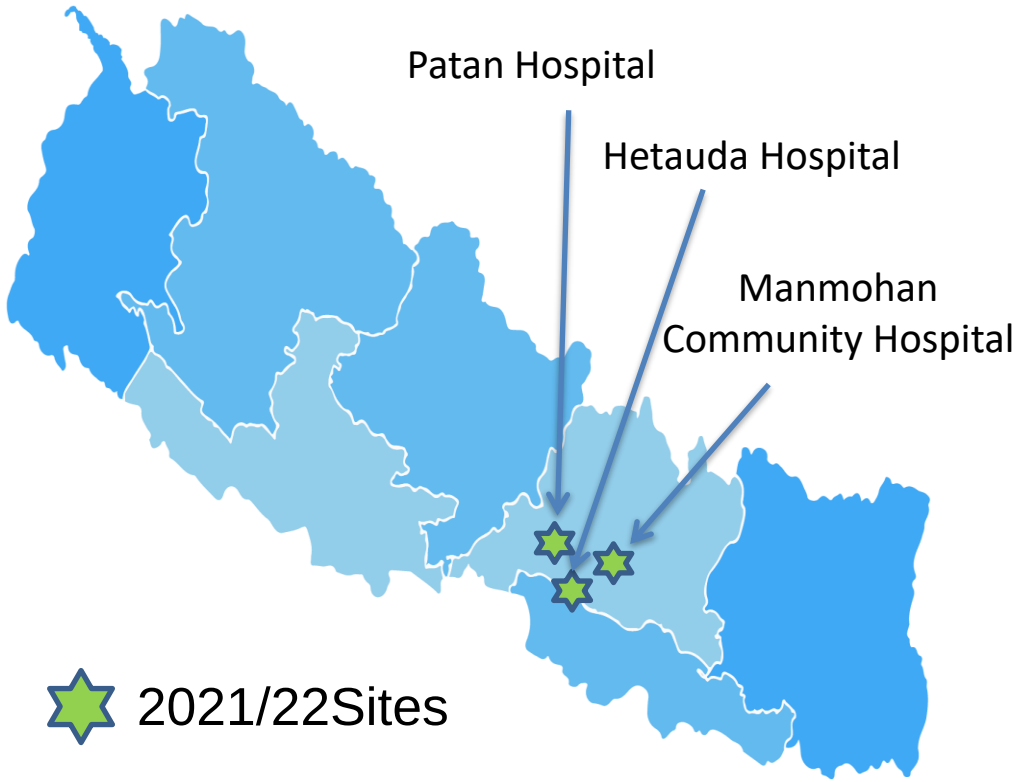
10-YEAR ANNIVERSARY

NEPAL

Patan Academy of Health Sciences

Site description *(hospitals participating in the GIHSN)*

- Influenza surveillance from two sites in Bagmati Province: One provincial hospital and one community hospital (in 2021)
- Provincial Hospital:100 bedded, serving ~ 300-500 out-patients daily depending upon the seasons
- Community hospital: 25 bedded, serving around 50 out-patients per day
- However, in 2022, we dropped Provincial Hospital and started influenza surveillance from Patan Hospital, teaching hospital of Patan Academy of Health Sciences.
- All the sites serve disadvantaged and poor population of rural and suburb areas.
- Majority of the enrolled patients presenting with respiratory symptoms are 5+ years since we drop one of the sentinel site this year (Provincial Hospital- serving larger proportion of <5years patients)
- Influenza season in Nepal is similar to tropics and circulate round the year with two peaks – Winter and Summer, however, change in the influenza seasonal pattern has been observed after COVID pandemic.



Global Influenza Hospital Surveillance Network

NEPAL

Patan Academy of Health Sciences

- Surveillance of influenza started since third week of Jan, 2020.
- Year-round surveillance is done among pediatric and adult population.
- Patient is identified from the admission diagnosis using SARI case definition.
- Consent is taken from the patient before collection of the sample.
- Questionnaires are administered to those who meet case definition.
- Throat or nasopharyngeal swab is taken from patients admitted in the hospital with respiratory conditions such as pneumonia, URTI, LRTI, COPD, Asthma or presenting with respiratory symptoms up to 10 days prior to the hospital admission.
- Demographic information, clinical history, co-morbidities are collected along with the clinical sample.
- All the samples are tested for influenza A, B and SARS-CoV2 by PCR.
- Samples tested for positive and whose CT value lass than 30 are given for Whole Genome Sequencing.
- Back-up aliquot and extracted RNA are appropriately stored.
- All the samples and aliquots are stored at -70^{0C} and temperature is monitored daily.
- Data is reported in the GIHSN database.

NEPAL

PATAN ACADEMY OF HEALTH SCIENCES

Results *(data shared in the GIHSN)*

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV2	SARS-CoV2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	13	0			13					
Patients 5+ yrs	130	O			130	4				
Total	143	0			143					

Note: 73 samples uploaded in database, 70 samples are remained to upload in database.

- 90.91% of the enrolled patients were of age 5+ years.
- More than half of the participants (51.75%) were female.
- None of the participants were vaccinated against Influenza.
- Majority of the patients had vaccinated with at least one dose of COVID vaccine (any type).
- Cough, fever and sore throat were the common symptoms. SOB was common in patients less than 5 yrs.
- Pneumonia was the major disease condition in less than 5 yrs patients, whereas COPD was common co-morbidities among patients 5+years.
- No severe outcomes were noticed.

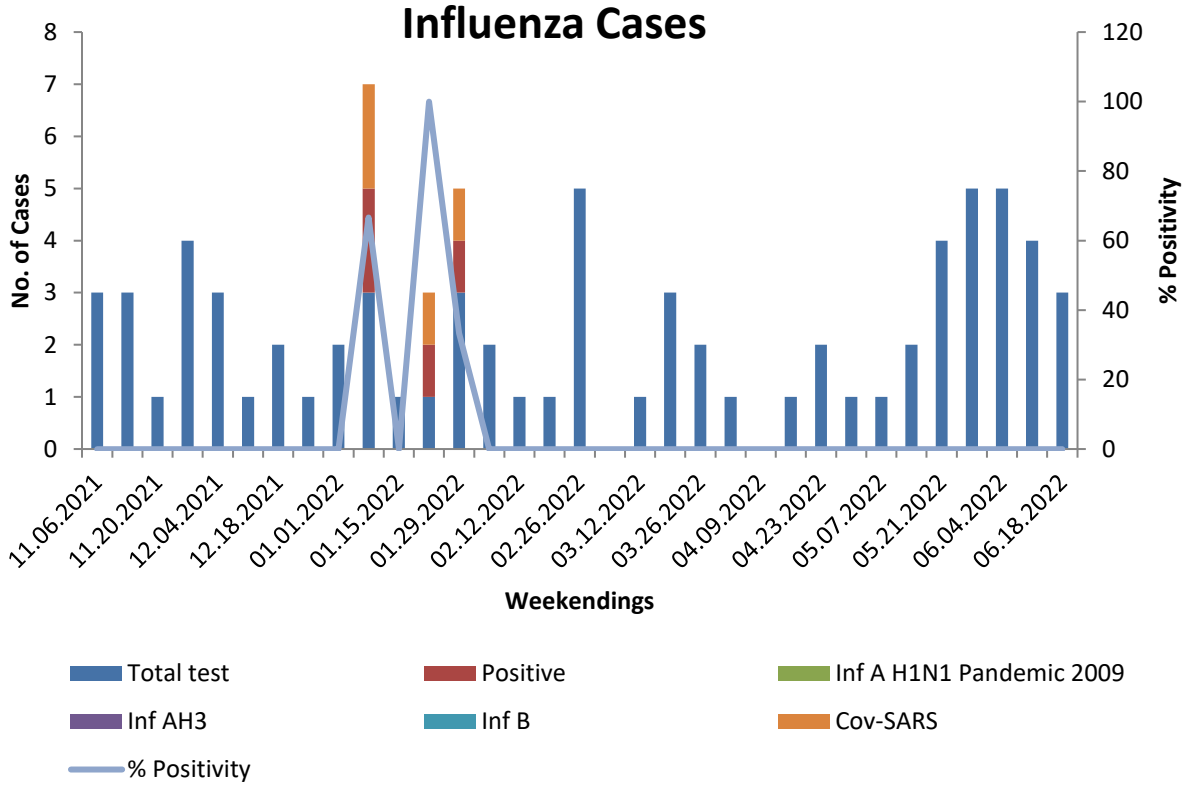
Nov, 2021 till October, 2022 in Patan Hospital, PAHS	
Total COVID Test	19216
Positive	4980
% Positivity	25.92

Global Influenza Hospital Surveillance Network

NEPAL

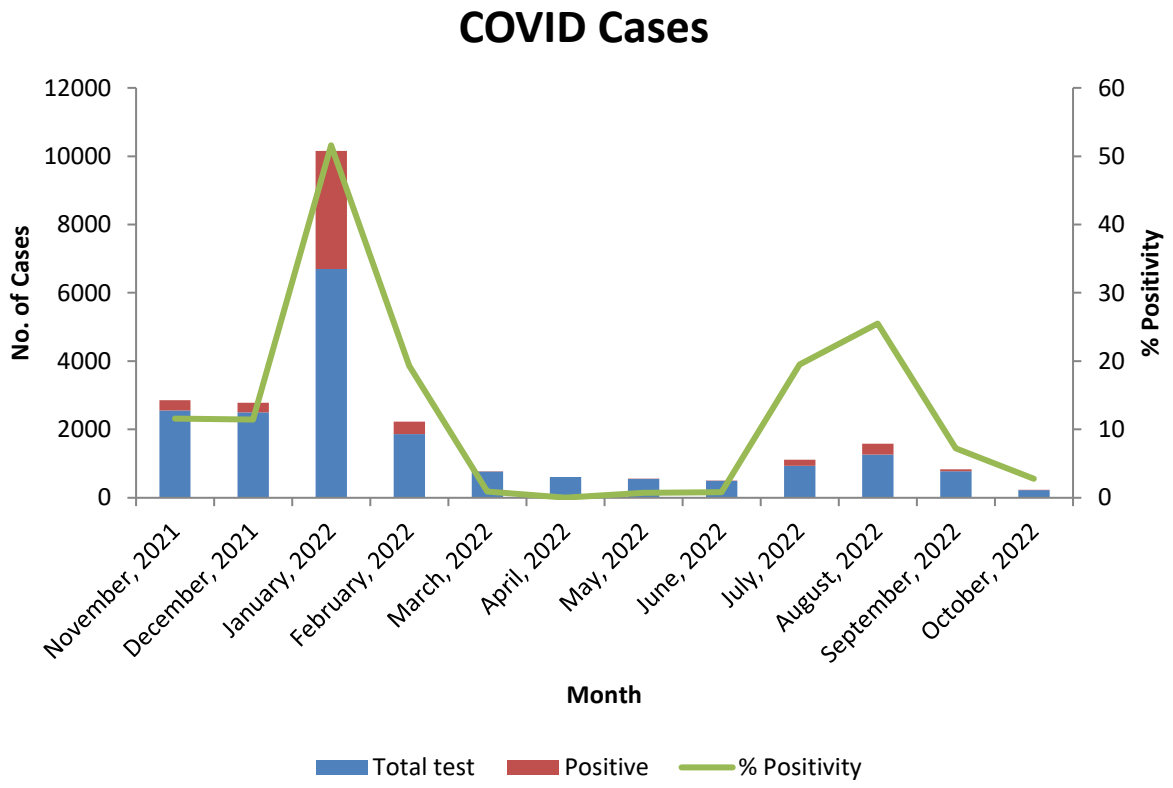
PATAN ACADEMY OF HEALTH SCIENCES

Detailed results



Total test: 73 Positive: 4 % Positivity = 5.48% Subtype: SARS-CoV2+ = 4

Fig: Weekly influenza epidemiological surveillance and positivity rate of 2021-2022



Total test: 19216 Positive: 4980 % Positivity = 25.92%

Fig: Monthly COVID epidemiological surveillance and positivity rate

Global Influenza Hospital Surveillance Network

NEPAL

Patan Academy of Health Sciences

Conclusion & Challenges

CONCLUSIONS:

- Almost none influenza cases (A and B) was found in the collected sampes. This is mostly due to social and public health measures taken to prevent COVID-19. But there were circulating COVID-19 virus.

CHALLENGES:

- Priority given to the COVID samples delayed timely testing of influenza samples.
- Shortage of reagents and diagnostic kits challenged influenza testing.
- Changes in national policy-caused complication to send positive samples to Lyon for whole Genome Sequencing.
- Challenges in finding local setting for WGS.

ANNUAL MEETING, 18 OCTOBER 2022

GIHSN 2022_23: PARTICIPATING SITES & PROTOCOL HIGHLIGHTS

Laurence TORCEL-PAGNON & Sandra CHAVES, Foundation for Influenza Epidemiology

Foundation for Influenza Epidemiology

Sous l'égide de
Fondation de France

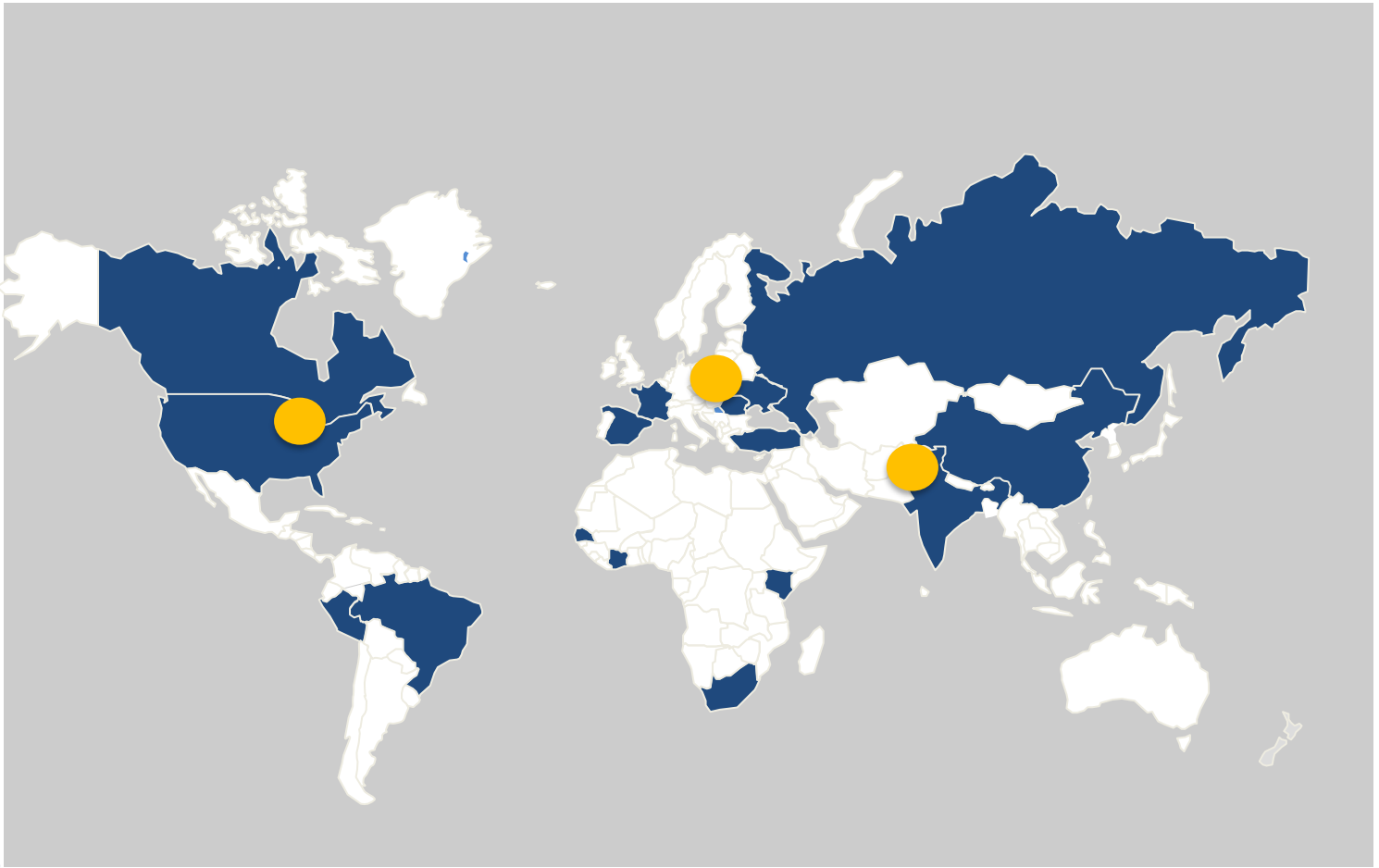
22 SITE APPLICATIONS FOR THE 2022/23 SEASON
17 SELECTED, 4 IN DISCUSSION

North America
Canada
*USA-NYC**
*USA-Marshfield**

South America
Brazil-Curitiba
Peru-Lima

W Europe
France
Spain

East. Europe
Romania
Russia-Moscow
Russia-St Petersburg
Ukraine
Poland



2021-2022 New sites **Pending*

Africa
Kenya
South Africa
*Côte d'Ivoire**
Senegal-Dakar

Middle East
Lebanon
Turkey

Asia/Pacific
*China-Fudan**
India-Srinagar
Pakistan

Grant proposals sent to selected sites end of September

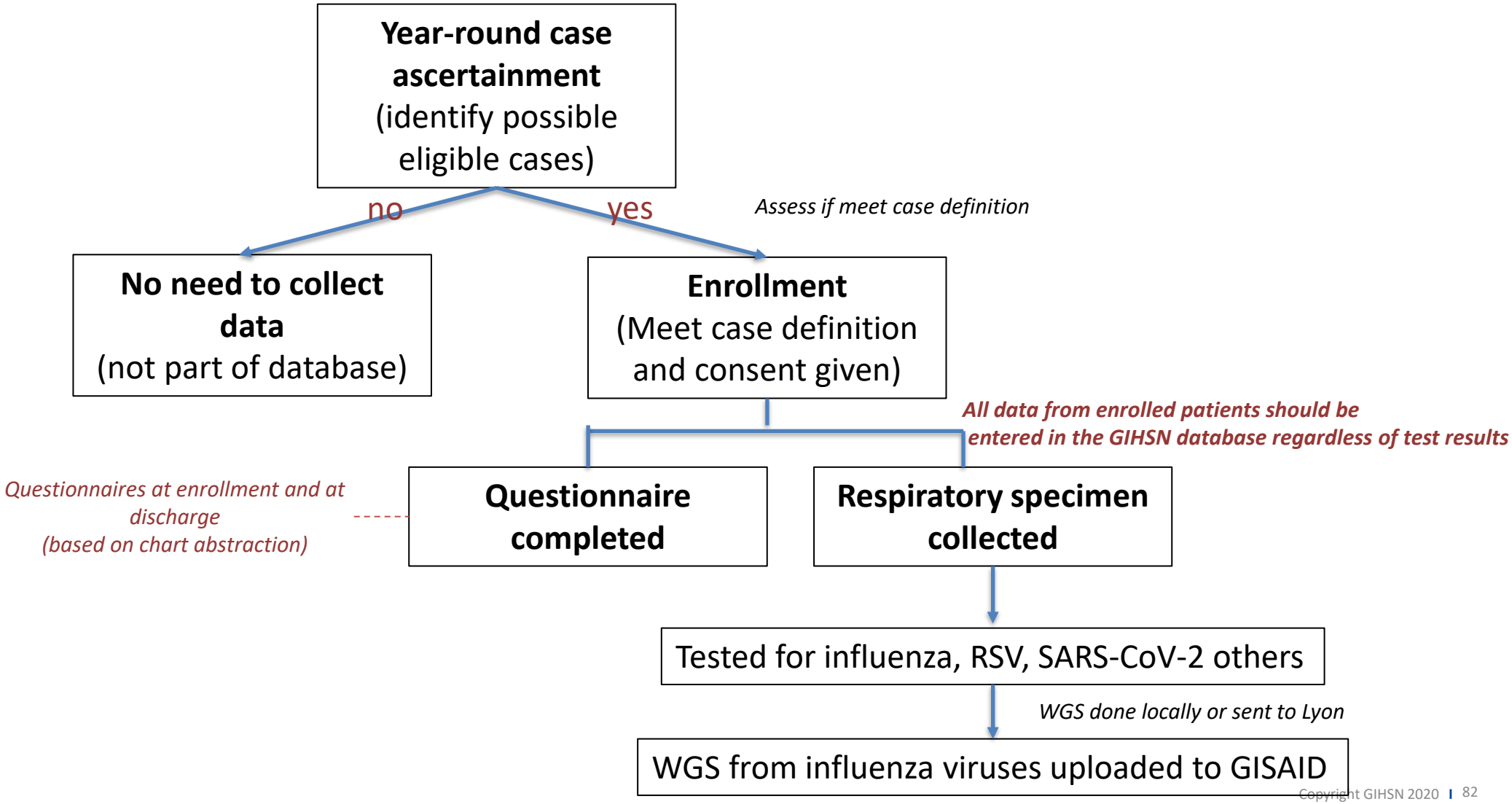
Same protocol as last year!

- Screening and inclusion of hospitalized patients with respiratory illness meeting protocol case definition year-round (**November 2022 to October 2023**)
- Collection of epidemiologic and clinical data for all participating patients (i.e., those who meet case definition and consent to participate), with a standardized questionnaire administered at enrolment and a chart abstraction at patient discharge/death
- Enrolled patients would have respiratory specimen collected shortly after hospital admission (within first 72 hours) and sent for testing at the local and/or reference laboratory or National Influenza Centre

Laboratory

- PCR test for influenza and SARS-CoV2 (priority) and for other respiratory viruses (when possible, e.g., available multiplex)
- Storage (-20C or -70C) of respiratory samples (swabs) from **all swabbed patients for a minimum of one year**. This can facilitate retrospective investigations on pathogen discovery, or evaluation of new diagnostic tools
- WGS for a minimum of **50 to 100 influenza viruses** will be expected. **If number of influenza positive cases are low, site is encouraged to complete WGS of SARS-COV-2**
    - WGS for influenza is a priority. If WGS data available for other respiratory viruses (e.g., SARS-Cov2, RSV) it would be beneficial to share in GISAID with the link to clinical data
    - WGS data uploaded to GISAID by site in a reasonable timeframe, so results are available for the WHO Vaccine Composition Meeting
    - Link between WGS data uploaded in GISAID and clinical data in GIHSN required

PROCESS FOR IDENTIFICATION OF CASES AND DATA COLLECTION: SAME AS LAST YEAR



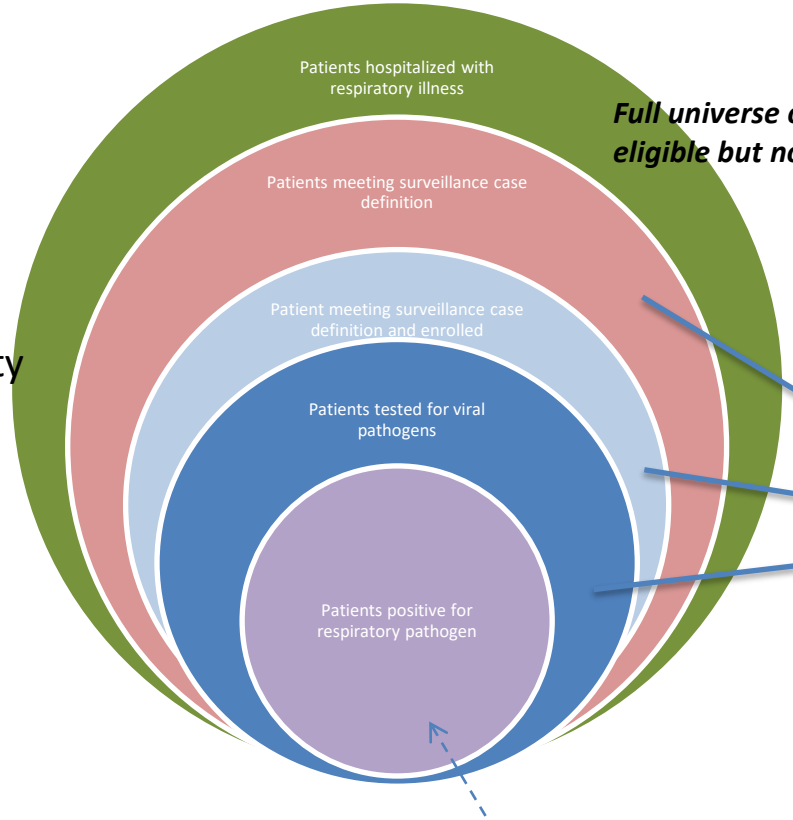
SAMPLING STRATEGY

Enrollment strategy:

1st option: Weeklong case finding, enrollment and sample collection

2nd option: Defined days/week for case finding, enrollment and sample collection

e.g., 3 days/week all patients meeting eligibility would be approached for enrollment and specimen collected for testing

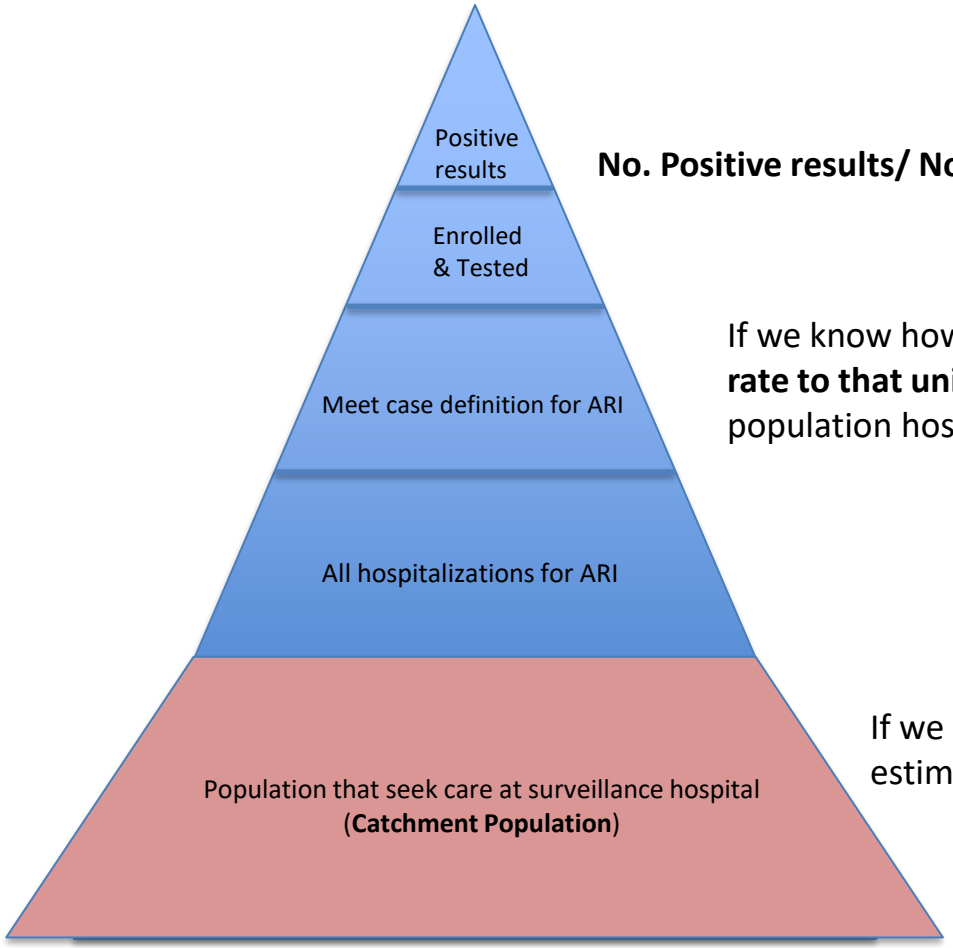


Full universe of cases hospitalized with respiratory illness. Potentially eligible but not all ascertained for inclusion

Ideally all patients meeting case definition would be enrolled and tested…

These patients would not tell us a complete story…Understanding percentage positive for the various pathogens would be important to help us understand virus circulation In different settings

WHAT WE CAN SAY ABOUT INFLUENZA AND OTHER RESPIRATORY VIRUSES BASED ON THE DATA WE COLLECT



No. Positive results/ No. Tested = Percentage positive by country or region for various pathogens

If we know how many hospitalized cases met case definition, **we could apply positivity rate to that universe of patients to estimate the impact of a certain pathogen** in a population hospitalized with ARI

If we know the catchment area of surveillance hospitals, we can estimate incidence of hospitalizations by country or region for various pathogens

ANNUAL MEETING, 18 OCTOBER 2022

PUBLICATIONS & CONGRESS UPDATE

Sandra CHAVES, Foundation for Influenza Epidemiology

Foundation for Influenza Epidemiology

Sous l'égide de Fondation de France

SCIENTIFIC PAPERS - UPDATE

Scientific papers

Title	1st author	Journal	Status
Clinical and phylogenetic influenza dynamics for the 2019-20 season in the global influenza hospital surveillance network (GIHSN) - Pilot study	B Lina	Journal of Clinical Virology	Published May 2022
Age differences in comorbidities, presenting symptoms and outcomes of influenza illness requiring hospitalization: a global perspective from the GIHSN 2018-19	M K Andrew	Journal of Infectious Diseases	To be submitted
Increased severity of influenza-related hospitalizations in resource-limited settings: Results from the Global Influenza Hospital Surveillance Network (GIHSN)	C Viboud S Chaves	Lancet Global Health (target)	To be submitted

To be discussed with ISC: who will lead the 2020-21 & 2021-22 2-year analysis?

ORAL PRESENTATIONS & POSTERS - UPDATE

Options XI for the control of influenza, 26-29 September 2022, Belfast, UK

Title	Presenting author	Poster/Oral presentation
Ten-year anniversary of the Global Influenza Hospital Surveillance Network (GIHSN)	S Chaves	Poster
Age differences in comorbidities, presenting symptoms and outcomes of influenza illness requiring hospitalization: a global perspective from the Global Influenza Hospital Surveillance Network	M K Andrew	Poster
Increased severity of influenza-related hospitalizations in resource-limited settings: results from the Global Influenza Hospital Surveillance Network (GIHSN)	C Viboud/S Chaves	Oral presentation

20th European Congress of Internal Medicine, 9-11 June 2022, Malaga, Spain

Title	Presenting author	Poster/Oral presentation
Global Influenza Hospital Surveillance Network (GIHSN) 2020-21 season project in Turkey: Utilization of influenza surveillance for tackling SARS-CoV2	S Unal / M Durusu Tanriover	Poster

RESEARCH PROJECTS - UPDATE

Research projects validated by the EC of March 24th, 2022

Title	Leading author	Status
Experience of older adults hospitalized with influenza and acute respiratory illness in relation to function in Activities of Daily Living: a report from the GIHSN	M K Andrew	Ready to start, pending some internal confirmation
GIHSN Severity Scale (GIHSN SevScale), aims to develop a scientifically-developed severity scale for influenza cases reported to GIHSN	J Paget	Researcher hired, work should start soon

Global Influenza Hospital Surveillance Network

www.gihsn.org

coordination

IMPACT Healthcare

ANNUAL MEETING, 18 OCTOBER 2022

CLOSING

Foundation for Influenza Epidemiology

Sous l'égide de

Fondation de France

NEXT MEETINGS

- Kick-off meetings 2022_23 (new & recent sites) – *In the coming weeks*
- Lab webinar / WGS protocol (all sites) – *In the coming weeks*
- Face-to-face Annual Meeting (to be confirmed) – *Spring-summer 2023*

THANK YOU!

Global Influenza Hospital Surveillance Network

