GIHSN 11TH GLOBAL ANNUAL MEETING

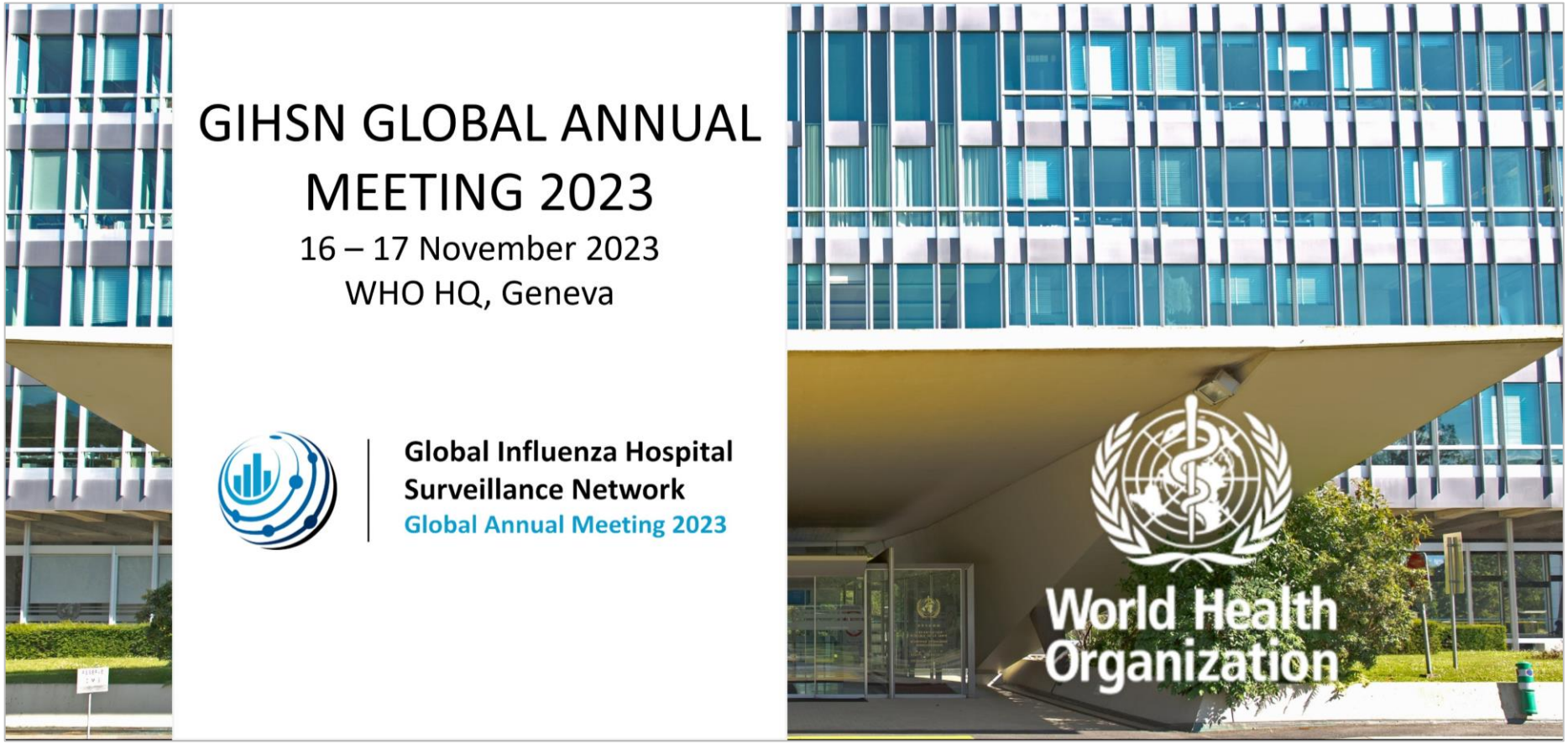
16-17 November 2023

Foundation for
Influenza
Epidemiology

Sous l'égide de

Fondation
de
France

WELCOME TO THE GIHSN GLOBAL ANNUAL MEETING 2023



WEBINAR RULES

Please do not forget to switch off your microphone when you are not speaking.

Questions will be discussed after the presentations. Please raise your hand or use the chat/discussion button.

A dedicated on-boarding meeting will be proposed to new sites to answer all their questions.

Speakers are kindly asked to stick to the speaking time allotted!

Please note that the meeting will be recorded.

Thank you all for cooperation.

Global Influenza Hospital Surveillance Network

AGENDA DAY 1 AM

Time	Topic	Speaker
8:30 - 9:00	**Registration**	
9:00 - 9:10	**Welcome from the Host & Opening of the Meeting**	M Ryan, WHO A Giraud, Fondation de France
9:10 - 9:40	**GIHSN ecosystem update** *Presentation & discussion* - **Current status and next steps** - **Collaboration with WHO**	C Mahé, FIE W Zhang, WHO
9:40 - 11:00	**Site presentations & key findings 2022-23** *Presentations & discussion* *(3'per site followed by 5' Q&A after each session of 2-4 sites)* - **Africa (Kenya - Côte d'Ivoire - Senegal - South Africa)** - **Americas (Canada - USA - Brazil - Peru)** - **Asia (Pakistan - India - Nepal)** - **Europe (Romania - Spain)** - **Eurasia (Russia Moscow - St-Petersburg)** Zoom - **Middle East (Lebanon - Türkiye)**	Moderator: M Nunes, CERP Site investigators
11:00 - 11:30	Coffee break	
11:30 - 12:05	**GIHSN pooled results 2022-23: Overview** *Presentation (20') & Discussion (15')*	C Commaille-Chapus, IH
12:05 - 12:30	**Season 2023-24: presentation of new sites**	L Torcel-Pagnon, FIE
12:30 - 13:30	Sandwich break	

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GIHSN: CURRENT STATUS AND NEXT STEPS

Cédric MAHE, Foundation for Influenza Epidemiology

Foundation for Influenza Epidemiology

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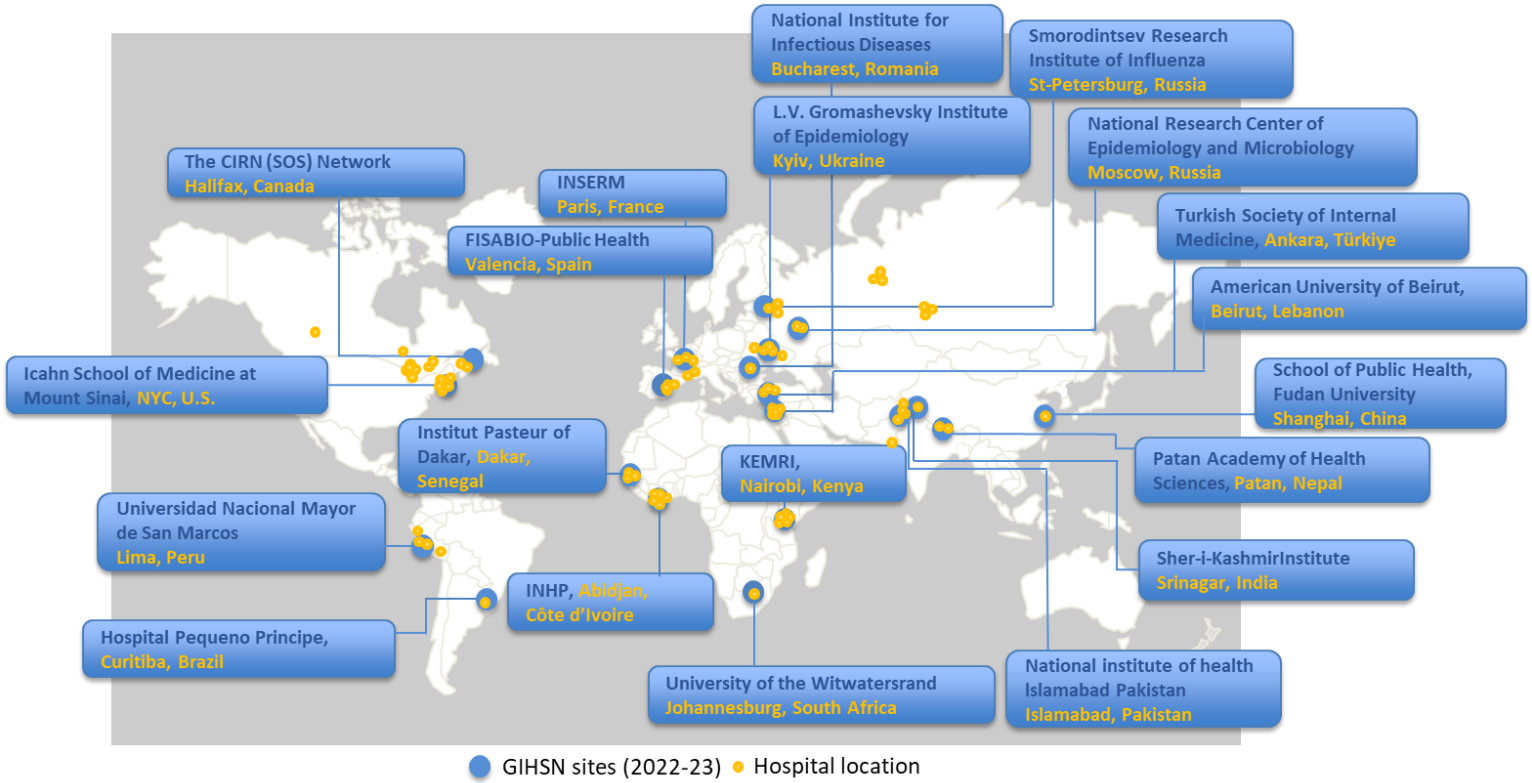
GIHSN infrastructures

- Network of 100+ hospitals in 25+ sites worldwide co-funded by local authorities and by the Foundation for Influenza Epidemiology
- Active, prospective hospital-based sentinel surveillance among people of all ages, with a common protocol and consistent case definition
- Collection of respiratory specimens (>22,000 last year), test by PCR followed by genome sequencing. Clinical information captured using standardized questionnaires.



Global Influenza Hospital Surveillance Network

Scientific value

- Generation of robust data on respiratory virus pathogens: circulation, serotype/strains distribution, at risk population, drivers of disease severity
- Better understanding of virus evolution by linking genome sequencing and severity/vaccine failure
- Ability to detect emerging viruses (preparedness environment)
- Capable research platform for pathogen discovery/assessment and other research projects

The SARS-Cov2 pandemic further demonstrated the need for such platform

Recent evolution of the GISHN

- Extension to other respiratory viruses (SARS-Cov2, RSV and ORVs)
- Move to a year-round surveillance
- Consolidation the network:
  - Sustainability of long-term members
  - Targeted recruitment of sites where there are regional gaps

Perspectives

- Strong synergies with WHO/GIP and GISRS ecosystem
- Broader collaboration with WHO (MOSAIC)
- Engagement with the broader vaccines manufacturers ecosystem (and private sector in general) to scale up the GIHSN

Aspirational target by end 2026: Global Catalytic Fund for Surveillance (GCSF)

- 10M$ funding/year; 50 sites ; >50,000 ILI+; testing & WGS for all respiratory viruses; geographical representativeness; timelinesss

Opportunity to become a catalytic funding instrument enabling a private sector contribution to global health

Agenda of the annual meeting at glance

Today

- Site key findings presentations 2022-23
- Pooled descriptive analysis 2022-23
- Introduction of the 5 new sites for season 2023-24,
- Contribution to flu strain selection
- Leveraging of the GIHSN database & network for research projects
- Workshop on collaboration with WHO/GIP

Tomorrow

- Routable on collaborations across networks to improve respiratory surveillance
- Workshop on excellence in implementation

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THANK YOU !

Foundation for Influenza Epidemiology

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COLLABORATION OF GISRS & GIHSN

Dr Wenqing ZHANG, Head of Global Influenza Program, WHO

Foundation for Influenza Epidemiology

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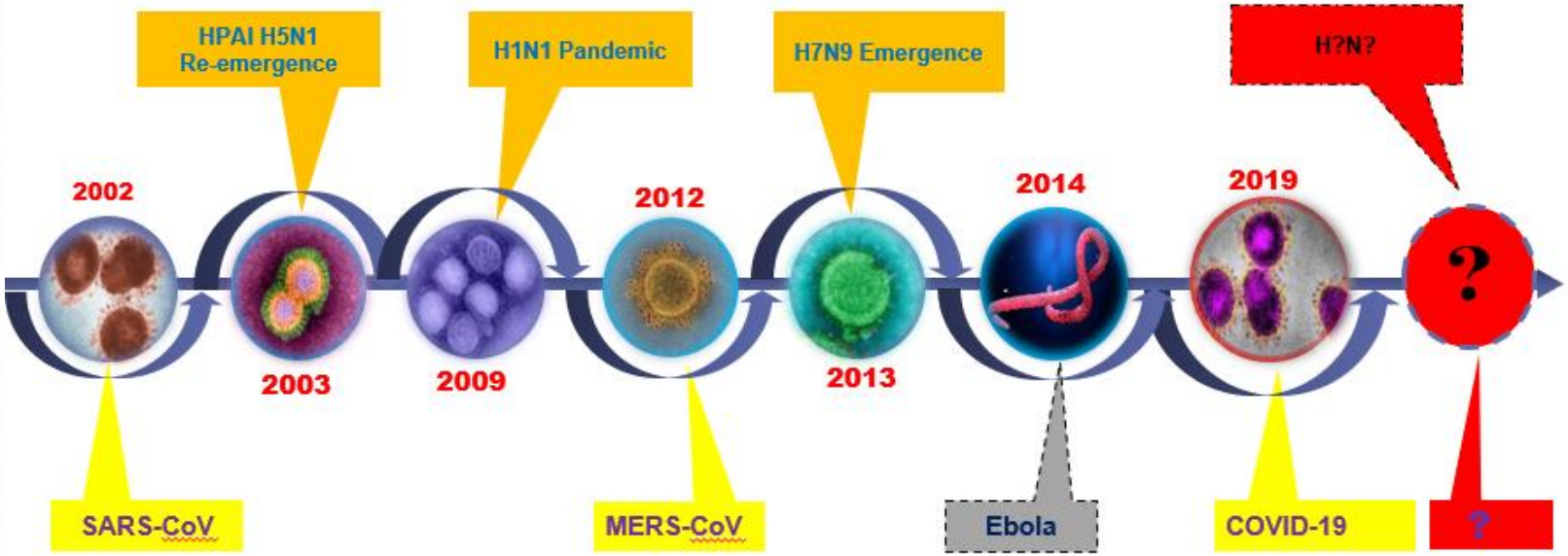
Fondation de France

Ecosystem update
- Collaboration of GISRS & GIHSN

Wenqing Zhang
Global Influenza Programme, WHO

GIHSN Global Annual Meeting
16 – 17 November 2023, WHO HQ

Starting point



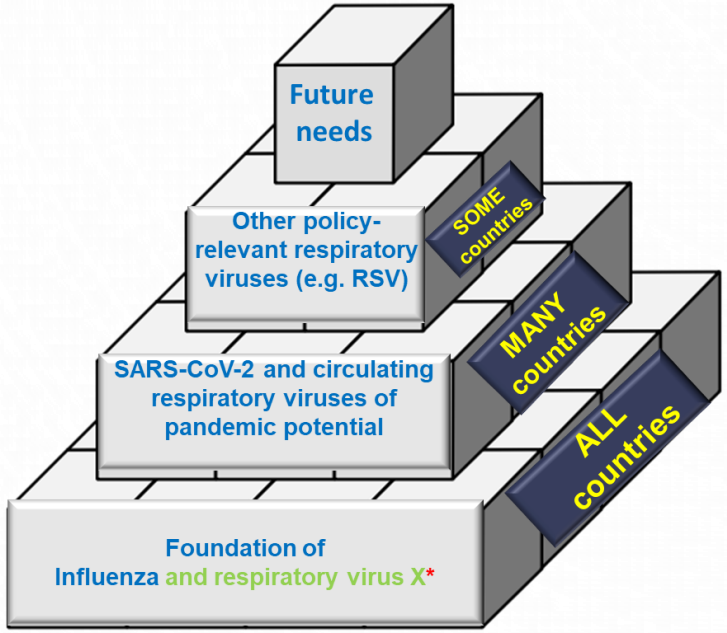
- **Influenza strategic approach:**
  - **Prepare for influenza; apply for pan-respiratory pandemics**
  - **From pan-respiratory pandemic preparedness to further strengthen influenza**

Influenza strategic areas

- Influenza pandemic response
- Surveillance
- Laboratory response
- Vaccine response
- Clinical management and antivirals
- PHSM and R&D
- Policies and communications

GISRS strategic approach to surveillance

- **Pathogens (viruses):**
  - **Integrated surveillance**



Modular approach

- **Players, partners**
  - **Collaborative surveillance**

Expanding GISRS

Recap GISRS 70th anniversary conclusion in 2022

- Enhance **influenza** surveillance, preparedness and response
- Advance ongoing integrated GISRS surveillance and develop **GISRS Plus**: **Influenza, SARS-CoV-2, RSV, … , X**
  - Complemented with other surveillance modules/systems/projects
- Strengthen **GISRS system**

Global GISRS meeting – 24-25 Sept 2022, Belfast UK

GISRS Plus
&
Engagement with external resources

Future GISRS: the approach

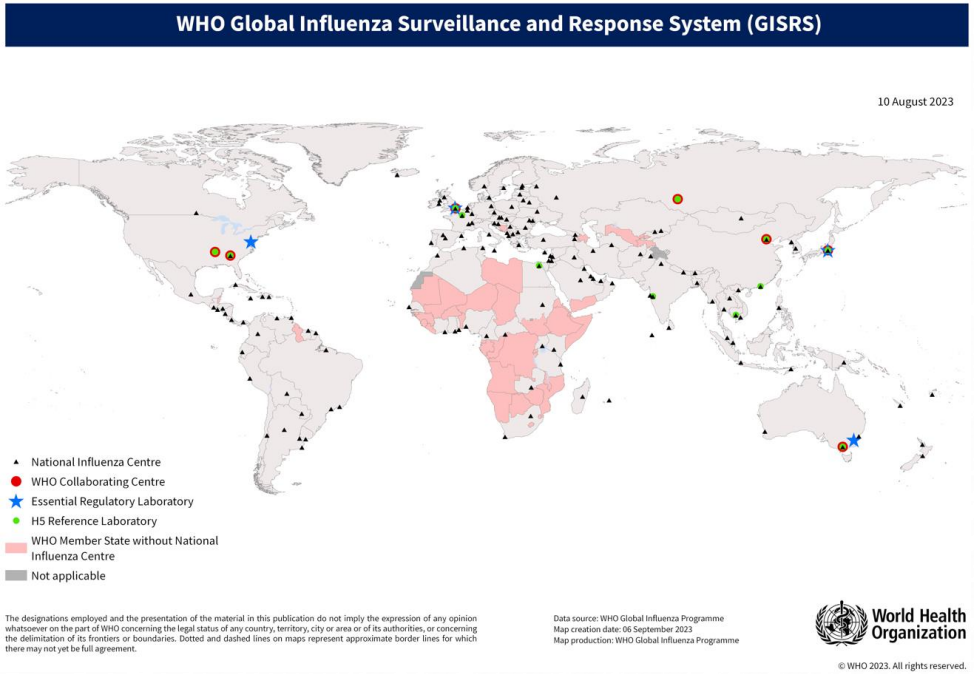
- Enhance **influenza** surveillance, preparedness and response
- Advance ongoing integrated GISRS surveillance and develop Expanded GISRS ~~Plus~~: **Influenza, SARS-CoV-2, RSV, … , X**

  - Complemented with other surveillance modules/systems/projects
- Strengthen **GISRS system**

- **Addressing occurring public health issues – build on current needs for future**
  - Influenza pandemic – a certainty, influenza epidemics – a reality
    - Other reparatory virus pandemic – a probability
  - Advancing integrated surveillance of GISRS – influenza + ……
- **Constant GISRS capacity building**
  - Learn/be benefited from non-influenza viruses, emergencies, technologies
- **Building & exercising connections with collaborator projects, institutions, systems and networks etc. via true operations**
- **Support the capacity building of external collaborators**

Priority areas of GISRS strengthening globally

- **Better coverage**
  - Global coverage of GISRS by 2030
- **Quality of surveillance**
  - Sentinel sites, sampling, strategy including sizing
  - Representativeness, timeliness, continuity
- **Genomic surveillance**
  - Right-sizing, strategy, sustainability
- **Data, data technology**
  - Data utilizations, case-based data collection & reporting
- **Connecting clinical networks, and other "mosaics" of surveillance**
- **Operations of GISRS surveillance during a pandemic**
  - An influenza pandemic
  - A pandemic of non-influenza



Global Influenza Programme three priorities 2024-25

Being the global technical leader and convener to:

- Advancing **integrated surveillance** of influenza and ORVs using GISRS platform (better coverage, relative monitoring & assessment)
- Advancing **influenza** surveillance, preparedness and response, including GISRS capacity, data operations including collection, analysis, output, distribution, harness modern data technology, as well as non-traditional areas
- Update of **research agenda on influenza and beyond**, and through this process connect with research academia, vet and other sectors.

Memorandum of Understanding

between WHO and Fondation de France

- **Fondation**
  - Share **clinical & lab data** to support VCM via GISRS
  - Collaborate on GISRS **pilot initiatives**
  - Support **burden of disease** exercise and support **policy development**
  - Support WHO in strengthening the **connection of clinical management with epi & lab surveillance**
  - Promote **scientific exchange** and leverage network for scientific and programmatic projects

- **WHO**
  - Engage GIHSN in relevant **WHO activities**
  - Provide **technical expertise**
  - Provide field and lab **training** with the goal to improve GISRS capacity and capability
  - Provide support to GIHSN labs with **reagents via GISRS**
  - Facilitate to **maximize synergies** between GIHSN and national, regional and global efforts for influenza surveillance

Acknowledgement

- **WHO GISRS** (Global Influenza Surveillance and Response System)
- GISRS associated **national/sub-national surveillance systems**
- **Countries** hosting GISRS institutions
- GISRS **partners, GIHSN**

- **WHO Global Influenza Programme HQ, WHO Regional Offices**

Thank You

World Health Organization

IN MEMORY OF DR JOHN PAGET

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SITE PRESENTATIONS & KEY FINDINGS 2022-23

Moderator: Dr Marta NUNES, CERP, Lyon University

Foundation for Influenza Epidemiology

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Fondation de France

- **Africa (Kenya - Côte d’Ivoire - Senegal - South Africa)**
- Americas (Canada - USA - Brazil - Peru)
- Asia (Pakistan - India)
- Europe (Romania - Spain)
- Eurasia (Russia Moscow - St-Petersburg) Zoom
- Middle East (Türkiye - Lebanon)

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KENYA

Nancy A. Otieno, Kenya Medical Research Institute

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023

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 (TRH), 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 2022-2023 season.

Global Influenza Hospital Surveillance Network

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 2022-2023 season:

November 1, 2022 – September 30, 2023

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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	1623	112	0	0	1618	57	0	0	66	0
Patients 5+ yrs	218	30	0	0	218	19	0	0	12	0
Total	1841	142	0	0	1836	76	0	0	78	0

Key messages

- 1623 (88%) of patients enrolled <5 years of age; elderly (≥65 years) only 1%
- 1038 (56%) of the patients were males; only 5/23 elderly being males
- 562 (30%) had underlying medical conditions: 238 (15%) of <5 years malnourished.
- 142/1841 (7.7%) positive for influenza; A/H3N2 pdm09 (50.7%) dominant, 22/32 (68.8%) Flu B of Victoria lineage
- Influenza +ve patients; 40 (28%) oxygen support, 34 (24%) ICU admissions, 5 (4%) deaths and 2 (1%) HDU admissions
- No flu vaccination
- 76/1836 (4.1%) positive for SARS-CoV-2
- SARS-CoV-2 +ve patients; 30 (39%) oxygen support, 19 (25%) ICU admissions, 7 (9%) deaths and No HDU admissions
- 31/92 (34%) Covid-19 vaccination - KMOH regulation as of May 2022 to expand vaccination group to 12 years
- 5 (0.3 %) Influenza and SARS-CoV-2 co-infection resulting in 3 ICU admissions, 1 oxygen support, no HDU or deaths.

KENYA

KENYA MEDICAL RESEARCH INSTITUTE

Conclusion & Challenges

CONCLUSIONS:

- More than 85% of patients enrolled were <5 years of age
- Detected influenza throughout the year; Influenza A (H3N2) and B co-circulated, low A (H1N1)pdm 09 viruses detected.
- 48% of influenza cases on oxygen support and 53% of ICU admissions had influenza A (H3N2)
- Vaccine uptake for COVID-19 at 34%, a slight drop from last season (≈40%).

CHALLENGES:

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

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COTE D'IVOIRE

Daouda COULIBALY, Institut National d'Hygiène Publique

Global Influenza Hospital Surveillance Network
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COTE D'IVOIRE

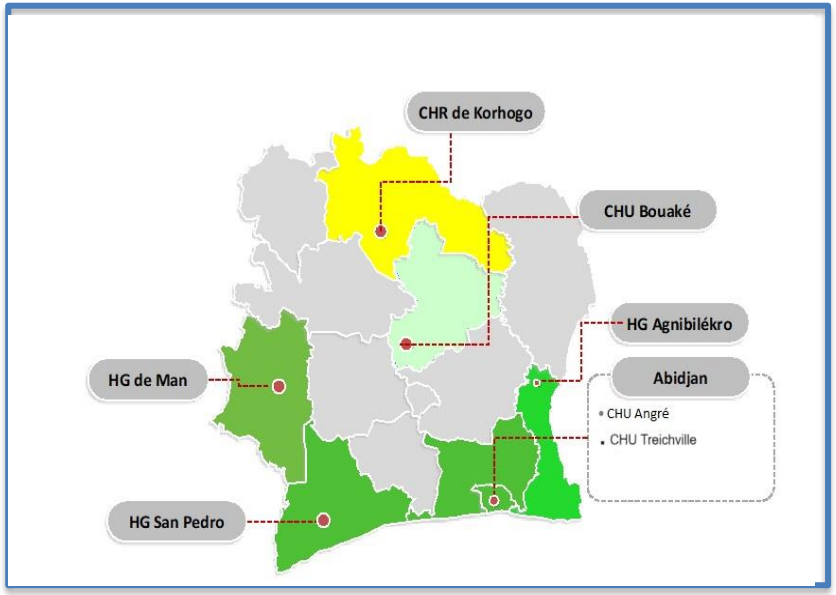
INSTITUT NATIONAL D'HYGIENE PUBLIQUE

Site description

- **GIHSN Sentinel Surveillance Network:**

7 SARI urban sites (General & Pediatrics)

- 2 University Hospital (Pediatrics)
- 1 University Hospital (General & Pediatrics)
- 4 General Hospitals (General)



- **Strategic Pillars**

- Coordination: National Institute of Public Hygiene
- Sentinel Sites: Focal Points (Medical Doctors)
- Laboratory: Institut Pasteur de Côte d'Ivoire (NIC)

COTE D'IVOIRE

INSTITUT NATIONAL D'HYGIENE PUBLIQUE

Implementation

- **Type of specimens**

Nasopharyngeal swabs

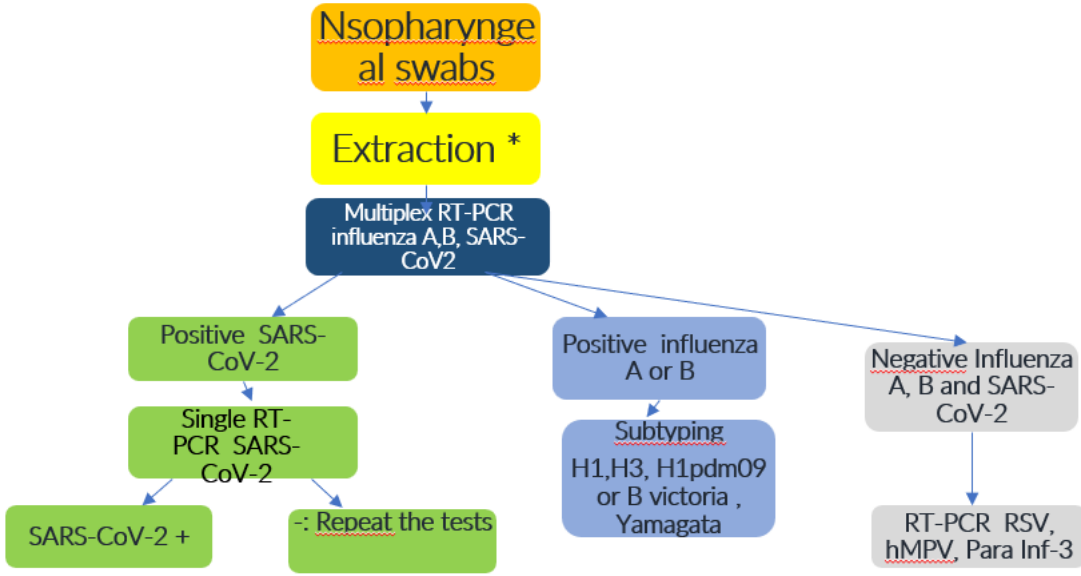
- **Quality of specimens**

All SARI cases that meet the case definition are recruited and sampled.

Conservation (Viral Transport Med.; T° +4 and +8)

Shipment (Cool Box, biosafety, contract with transport companies for the delivery)

Testing Algorithm



COTE D'IVOIRE

INSTITUT NATIONAL D'HYGIENE PUBLIQUE

Key findings and challenges

Sites	Samples	A (H1N1)	A (H3N2)	B Victoria	Covid-19
CHR_Korhogo	166	3	0	2	1
CHR_Man	429	1	2	1	5
CHR_San pédro	373	0	0	1	4
CHU_Angré	21	0	0	0	1
CHU_Bouaké	272	12	0	0	1
CHU_Treichville	41	1	0	0	2
HG_Agnibilékro	206	4	1	1	9
Total	**1508**	**21**	**3**	**5**	**23**

- Use of the GIHSN platform at sentinel sites level
- Integrated Influenza Surveillance - Covid-19 is effective
- Co-circulation of influenza viruses and Covid-19
- Sars-CoV-2 sequencing capabilities available
- Acquire influenza sequencing capabilities +++
- Strengthening genomic surveillance

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SENEGAL

Ndongo DIA, Institut Pasteur de Dakar

Global Influenza Hospital Surveillance Network

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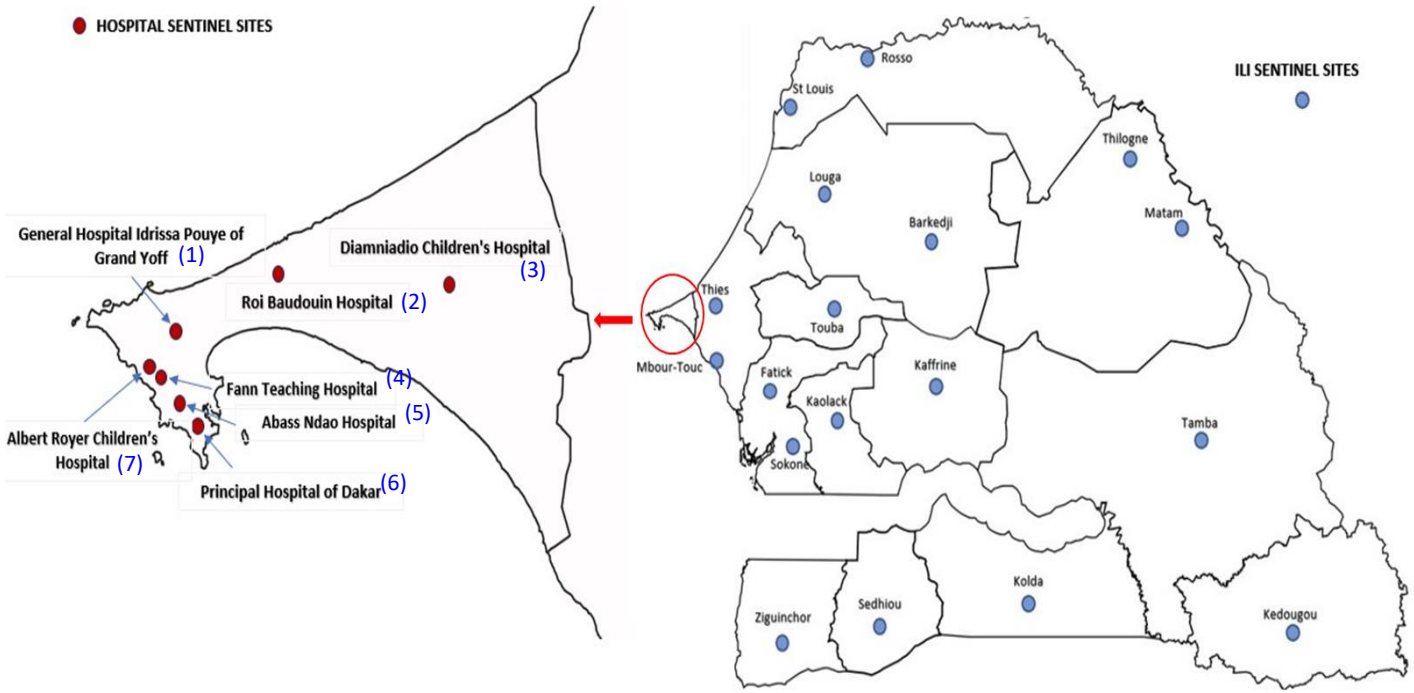
SENEGAL

INSTITUT PASTEUR de Dakar

Site description

- **Coordinating site**: Institut Pasteur Dakar, a Senegalese Non-for-Profit private Foundation of Public Interest
- **Participating hospitals (all in Dakar, capital city)**: 1, 2, 5,6 (urban/ all ages/referral); 3 (rural/ pediatric /referral); 4 (urban/ all ages/ academic); 7 (urban/ pediatric / academic)
- **Population denominators available for the catchment areas?** Data not available



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SENEGAL

INSTITUT PASTEUR de Dakar

Implémentation

- **Screening for eligible participants:** ICD 10 codes used for screening
- **Sampling strategy:** SARI eligible patients enrolled
- **Case definition:** All patients with an admitting diagnosis of ARI, CAP, exacerbation of COPD/asthma, any respiratory diagnosis or symptom
- **Specimens collected :** Naso/oropharyngeal swabs, aspirates (in exceptional cases)
- **Testing strategy:**
  - PCR assay used (commercially available): Seegene Allplex Panels (1-4) et VERI Q (for SC2)
  - Viruses tested in all participants: Influenza A and B, Rhinovirus, Adenovirus, Enterovirus, Parainfluenza virus, Coronavirus, Sars cov2, Respiratory Syncitial Virus, bocavirus, human metapneumovirus
  - Sequencing done at site level

SENEGAL

INSTITUT PASTEUR de Dakar

Implementation

- Data collection issues (missing or not available information) : especially for vaccination status and information regarding antivirals or antibiotics treatment.
- Implement the GIHSN eCRF in sites
- Extend the study to other hospital sites (out of Dakar region for instance) in order to be more exhaustive
- Improve data qualities

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SOUTH AFRICA

Vicky BAILLIE, Wits VIDA - University of the Witwatersrand

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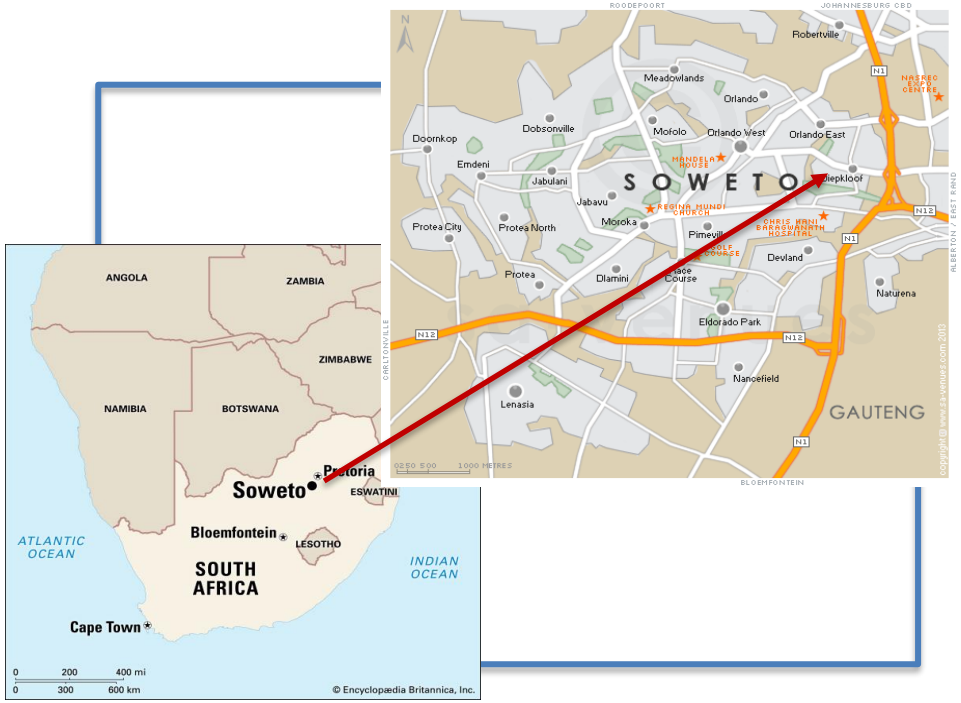
SOUTH AFRICA

WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Site description

- The study takes place at the Chris Hani Baragwanath Academic Hospital (CHBAH) in Soweto, South Africa
  - Large (3,400 beds), secondary-tertiary facility
  - Public hospital
- Soweto has a total population approx. 1.9 million people including 190 000 <5-year-old
  - Rural, low-income population
  - HIV prevalence among pregnant women➔~28%
- Only paediatric patients are enrolled into the study
- Influenza season in South Africa normally peaks between April to September with peak in June
- Pre-pandemic incidence was 54/100 000 children<5years of age



SOUTH AFRICA

WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

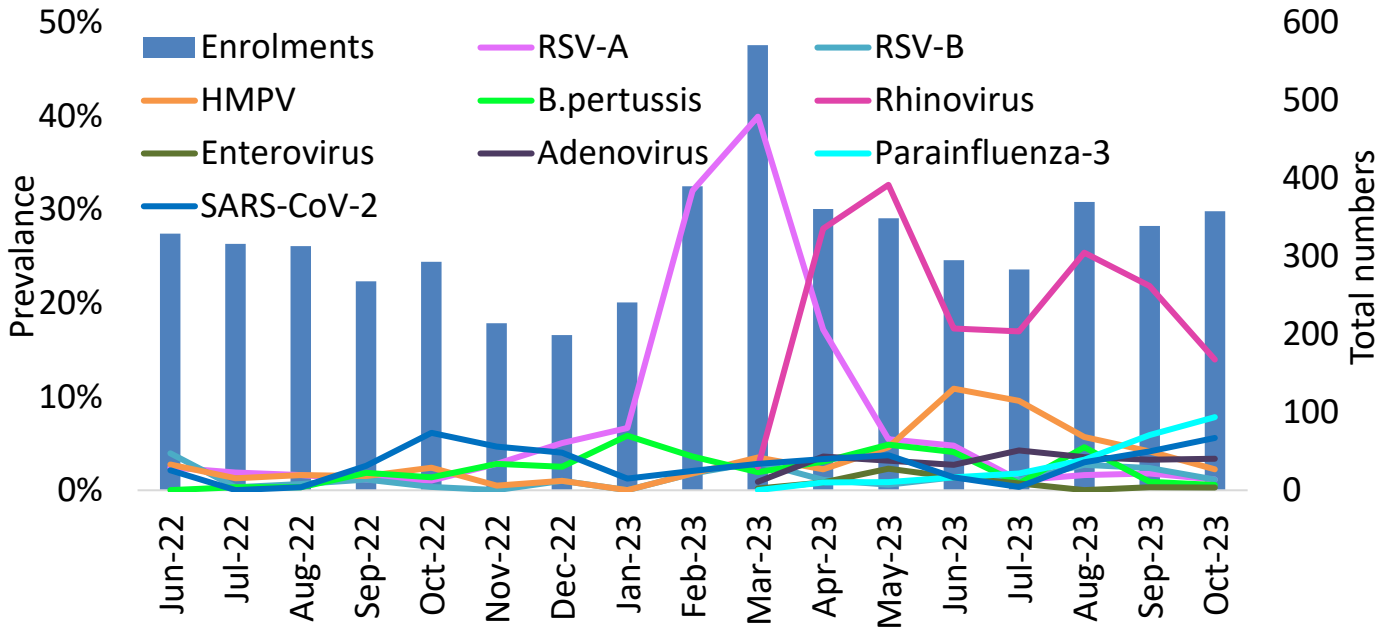
Implementation

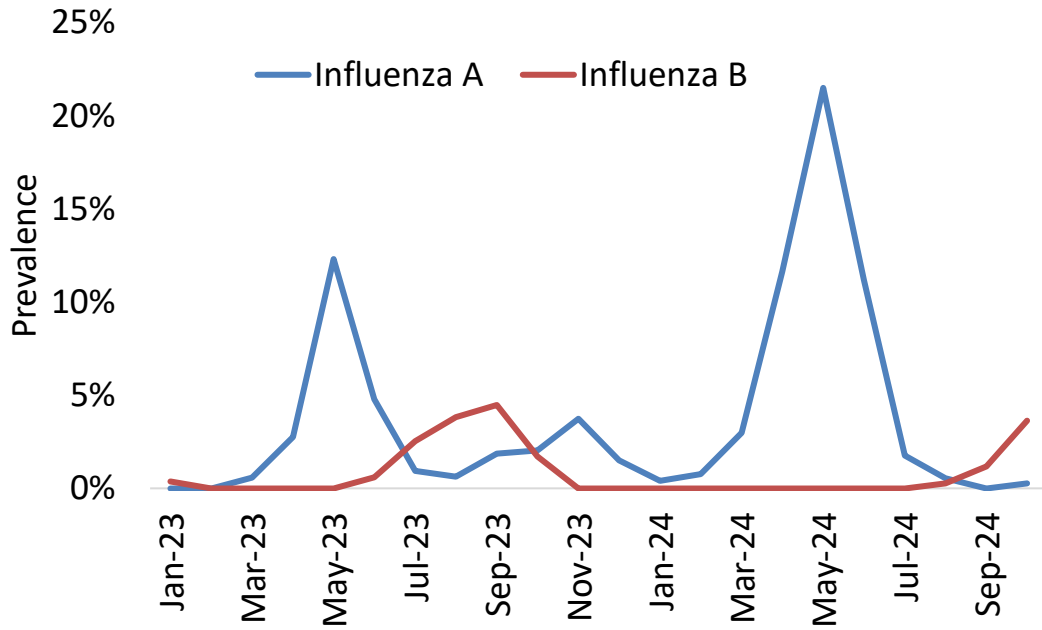
- **Screening for eligible participants**
  - Paediatric admission logs are reviewed each morning to identify all cases meeting criteria
- **Sampling strategy**
  - Legal guardians of all eligible cases are approached for consent
- **Case definition**
  - Any neonate with a diagnosis of suspected sepsis or child with physician-diagnosed LRTI irrespective of signs and symptoms and febrile seizures
- **Specimens collected**
  - NPS in viral transport media
- **Testing strategy**
  - An in-house PCR is used to test all samples for Influenza A and B, RSV A and B, HMPV, and B.pertussis
  - From 2020, all swabs tested for SARS-CoV-2
  - From 2023, all swabs tested for RhinoV, EnteroV, AdenoV and Para3
  - Sequencing of Influenza is done at Wits-VIDA

SOUTH AFRICA

WITS VIDA
UNIVERSITY OF THE WITWATERSRAND
VACCINES & INFECTIOUS DISEASES ANALYTICS

Key findings and challenges





Improvements:

-The unit has moved across to real time data capture for chart abstraction and patient interviews

-Real time QC

Challenges:

-Consenting process

-Linking admission data, medical records and discharge data

-Delays for QC prior to reporting

-Our patients were only pediatric many variables do not apply

Global Influenza Hospital Surveillance Network

- Africa (Kenya - Côte d’Ivoire - Senegal - South Africa)
- **Americas (Canada - USA - Brazil - Peru)**
- Asia (Pakistan - India - Nepal)
- Europe (Romania - Spain)
- Eurasia (Russia Moscow - St-Petersburg) Zoom
- Middle East (Lebanon - Türkiye)

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CANADA

Melissa K ANDREW, Serious Outcomes Surveillance Network

Global Influenza Hospital Surveillance Network

Global Annual Meeting 2023

CANADA

Serious Outcomes Surveillance Network

Site description

- 11 adult academic and community hospital sites in 4 Canadian Provinces (Nova Scotia, Ontario, Quebec, Alberta) representing ~6000 acute care beds
- Urban and suburban, secondary and tertiary care
- All general adult hospitals
- Population enrolled is usually approximately 2/3 older adults >=65 years of age, admitted to hospitals with an acute respiratory illness
- Influenza seasons in Canada typically begin with early influenza A activity, followed by a later influenza B peak; usually November through March

2022/23 Sites

CANADA

Serious Outcomes Surveillance Network

Implementation

- **Screening for eligible participants**

Combination approach: Site monitor reviews list of admitted patients each day (admission diagnoses, acute respiratory illness) and lists of laboratory testing results

- **Sampling strategy**

Historically, SOS Network is designed and resourced to report Burden of Disease and Vaccine Effectiveness to Public health Agency of Canada. All test-positive cases (Influenza and COVID-19) and a matched sample of test-negative patients are enrolled (matching by site, time of admission and age).

- **Case definition**

Only patients meeting GIHSN enrollment criteria are reported to GIHSN. The SOS Network enrolls a broad "acute respiratory illness" definition but does not require ILI or SARI case definitions. Includes atypical presentations.

- **Samples collected**
  - *Nasopharyngeal swabs*

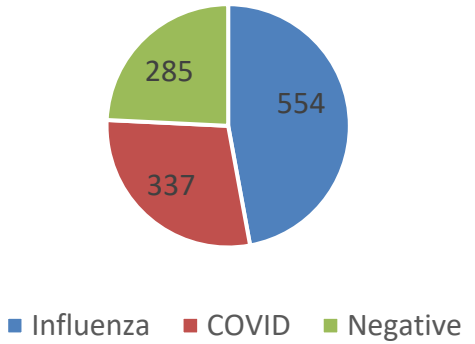
- **Testing strategy**
  - *In house PCR assay for Influenza Influenza A/B, and Influenza A H1/H3 subtyping*
  - *Commercially available: Seegene Allplex repiratory panel*
  - *Testing is done as standard of care with reminders from our site monitors for any patients with acute respiratory illness, including atypical presentations*
  - *Sequencing is done at local-regional laboratory; we continue to work on building this capacity.*
  - *Some sequencing is likely done at site level but we don't necessarily know or have access to this – we are working on this as well*

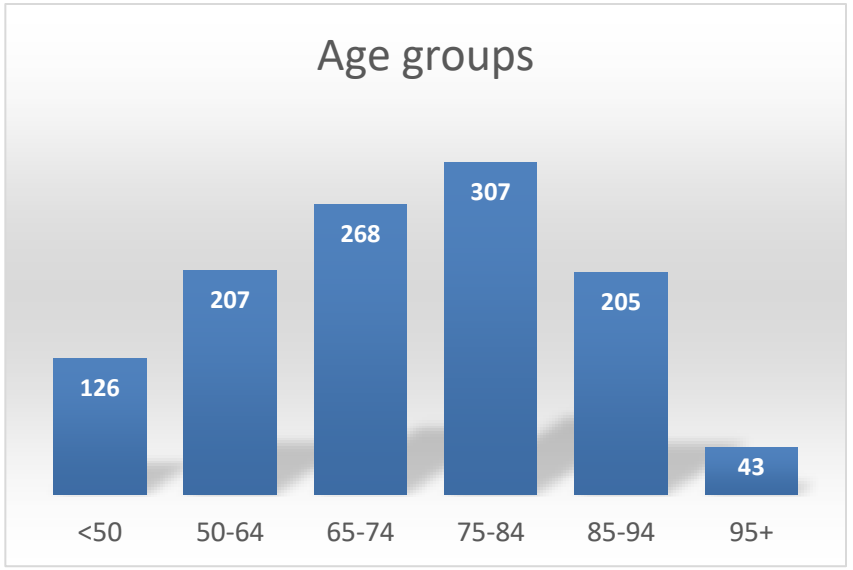
CANADA

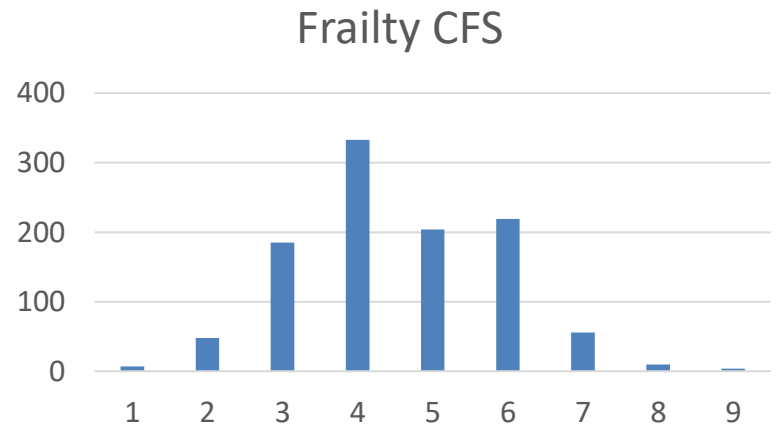
Serious Outcomes Surveillance Network

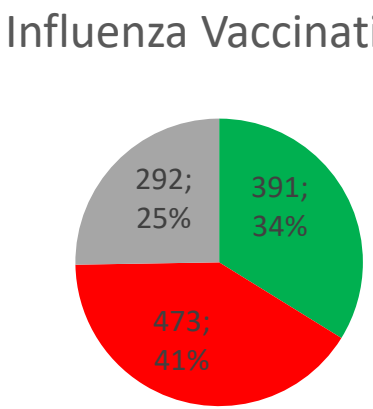
Key findings

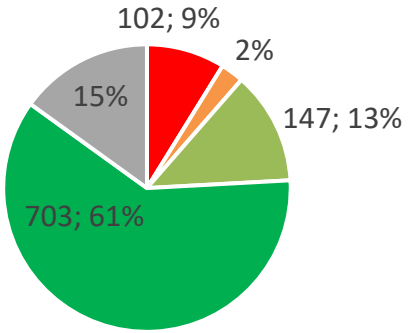
N = 1156











ICU admission: 158 (13.7%)

Death in hospital: 109 (9.4%)

WGS reported: 87

Global Influenza Hospital Surveillance Network

CANADA

Serious Outcomes Surveillance Network

Challenges

- Public Health Agency of Canada funding ceased Dec 31/2022 so the season was incomplete, including catch up on entering negative cases
- Lack of access to vaccine registries makes vaccine status hard to define
- Sites were overwhelmed with COVID positive cases; enrollment limited to 3 days/week to address case volume
- WGS is a new function of SOS Network and processes continue to be refined
- Catchment areas are difficult to define for our sites
- Large Networks are challenging to coordinate (as you well know)

  … these have led to changes in # sites and methods for 2023/24 year

ANNUAL MEETING, 16 NOVEMBER 2023

MOUNT SINAI HEALTH SYSTEM – NEW YORK - USA

Viviana Simon, Harm van Bakel, and Emilia Sordillo

Global Influenza Hospital Surveillance Network

Global Annual Meeting 2023

USA

Icahn School of Medicine at Mount Sinai

Site description

8 Hospitals

~ 42,000 employees

3,815 beds

400+ ambulatory sites

Mount Sinai

Each Year

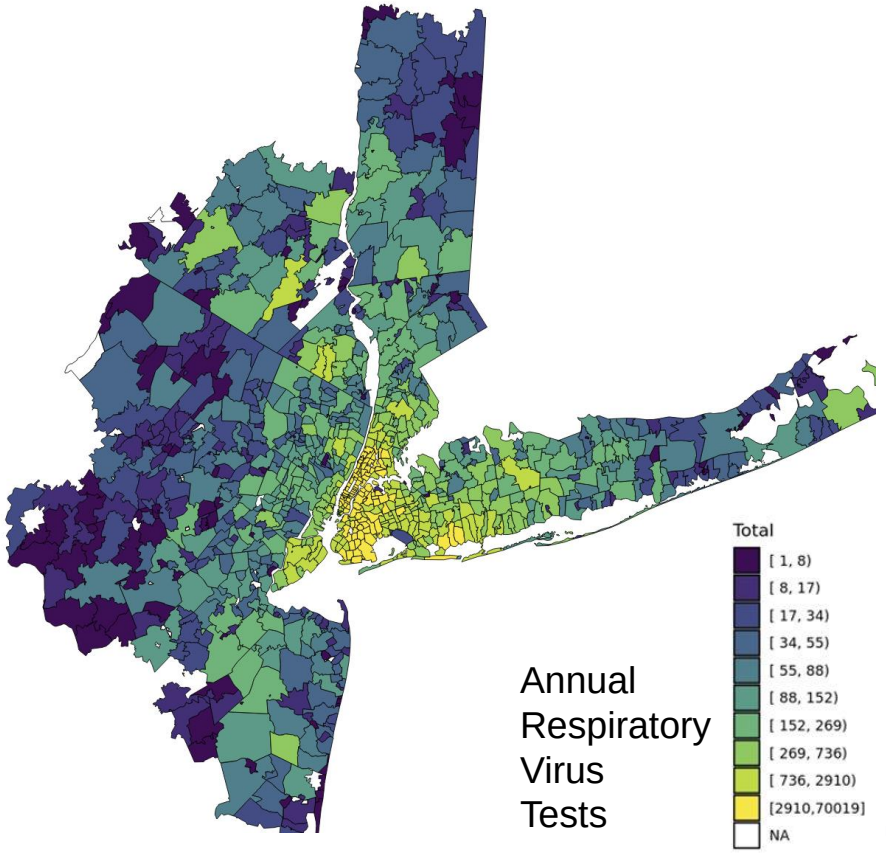
4,000,000 patient visits

150,000 inpatient admissions

16,000 births

- *Coordination at Icahn School of Medicine at Mount Sinai*
- *8 urban academic and tertiary hospitals seeing patients of all ages*
- *Metropolitan catchment area with >8 million inhabitants*

Mount Sinai Health System Catchment Area

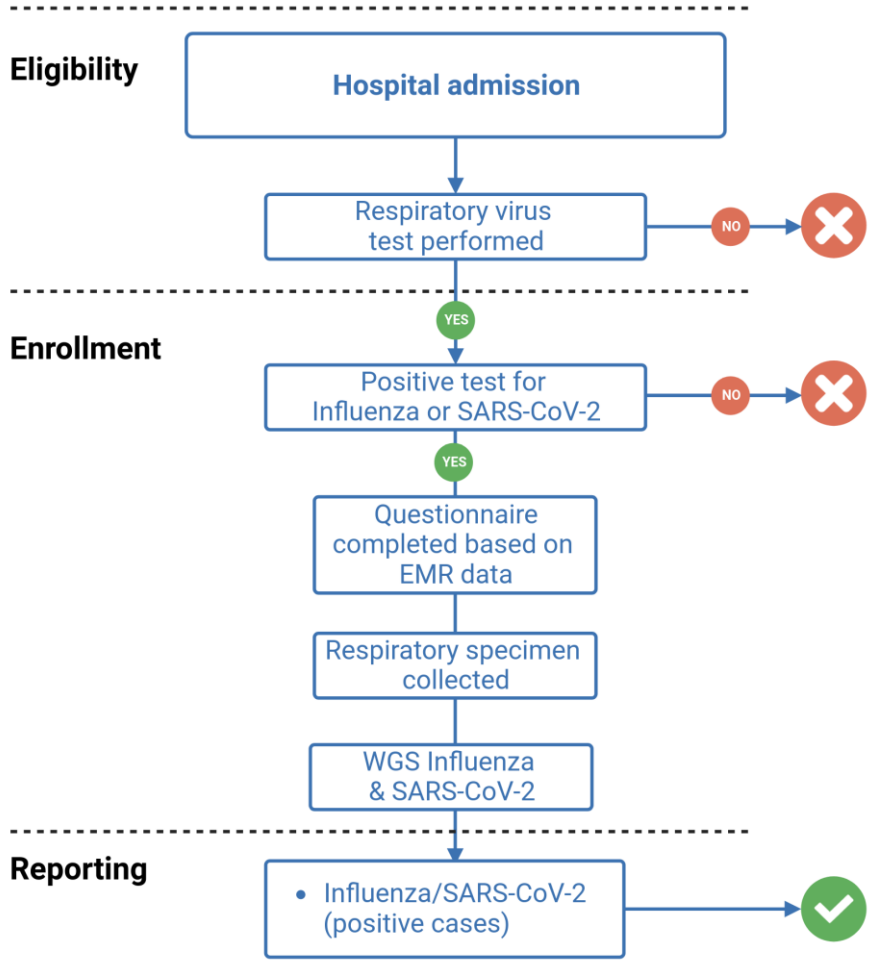


USA

Icahn School of Medicine at Mount Sinai

Implementation (2022-2023 season)

- **Screening for eligible participants**
  - All hospital admissions
- **Sampling strategy**
  - Enrollment of patients tested for respiratory virus infection within +/- 48 hours of admission
- **Case definition**
  - Positive swab from hospital diagnostic test
- **Specimens collected**
  - Nasal swab, Nasopharyngeal swab, saliva
- **Testing strategy**
  - Commercial NAAT assays for Influenza and SARS-CoV-2
  - Follow-up testing for 12 other respiratory viruses when warranted
  - Sequencing performed in-house



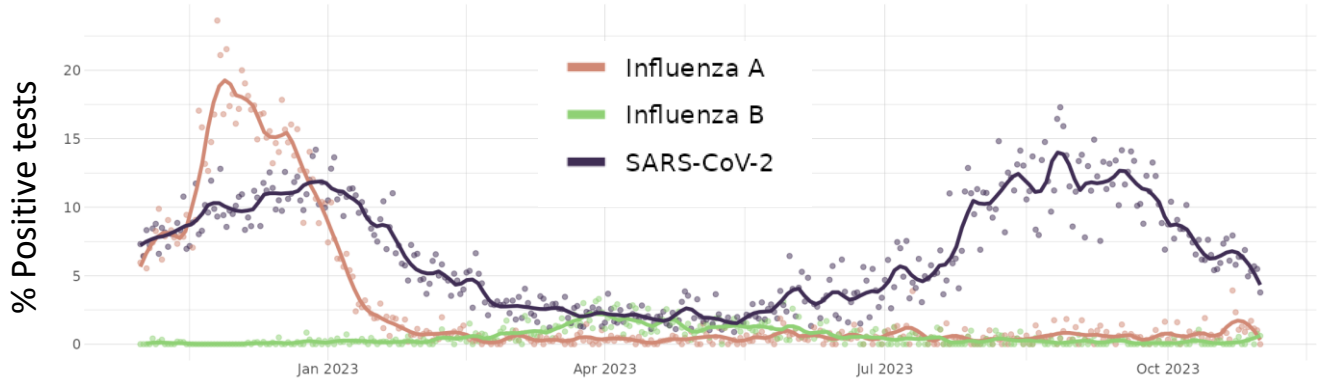
USA

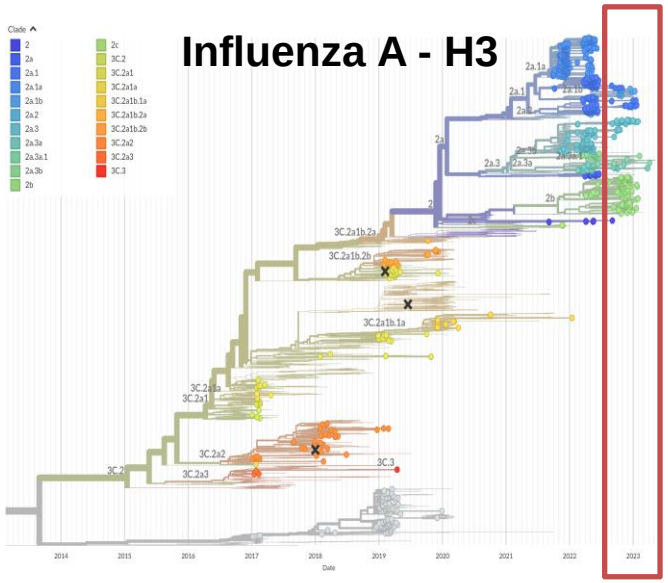
Icahn School of Medicine at Mount Sinai

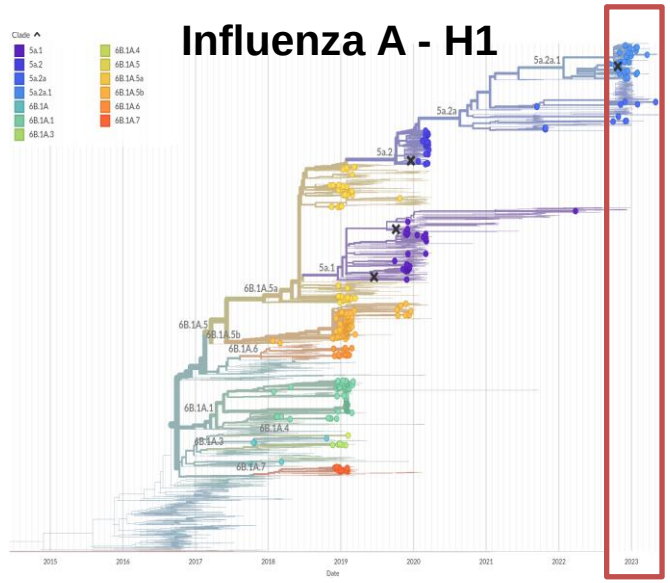
Key findings and challenges

- **Enrollment based on positive admission test for influenza and/or SARS-CoV-2 (Nov 1st 2022 – Oct 31 2023)**
  - 746 Influenza A
  - 48 Influenza B
  - 3,872 SARS-CoV-2
  - 120 sequenced genomes in GISAID

- **Implementation challenges**
  - Include negative test results to better conform with GIHSN generic protocol
  - Revise IRB protocols and data sharing agreement
  - Influenza strain typing







Global Influenza Hospital Surveillance Network

USA

Icahn School of Medicine at Mount Sinai

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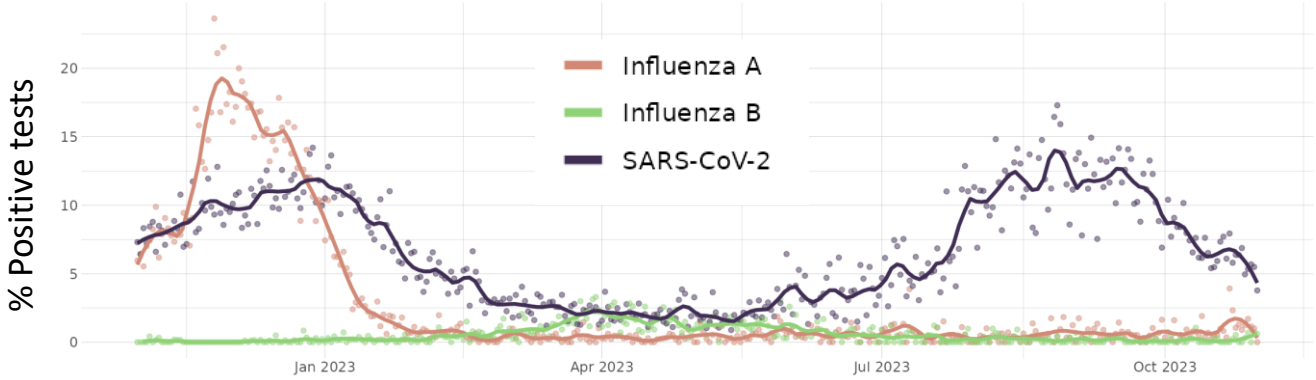

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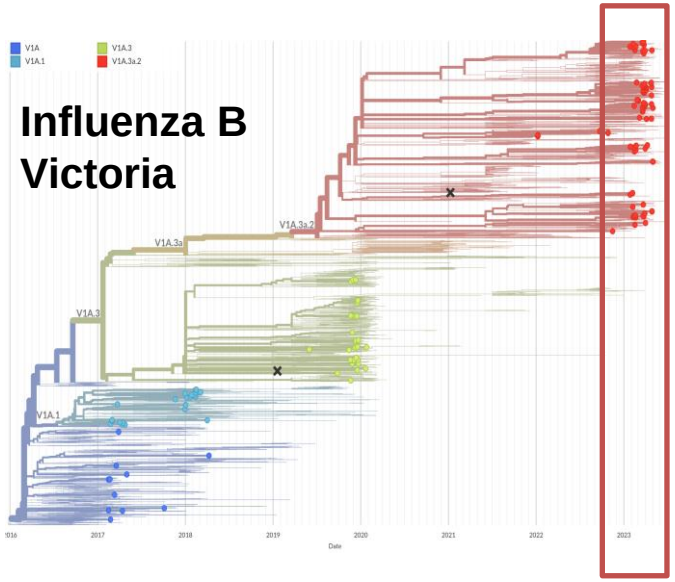
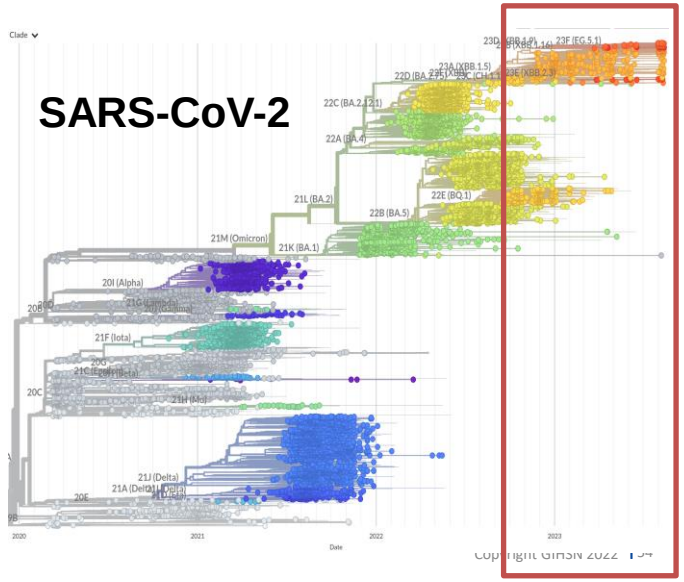




Thank you and please come visit us!

GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

BRAZIL

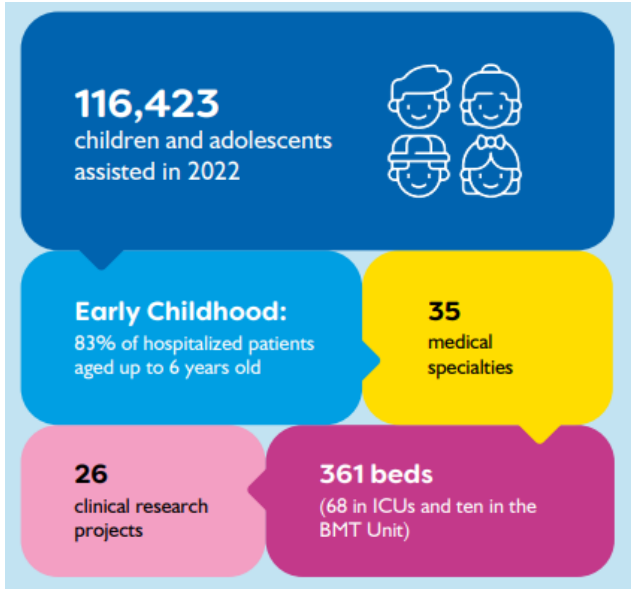
Sonia RABONI & Heloisa GIAMBERARDINO, Pequeno Principe Hospital

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023

BRAZIL

PEQUENO PRINCIPE HOSPITAL, BRAZIL

- **Pediatric referral hospital, Curitiba, Southern Brazil**
- **Sentinel hospital for Severe Acute Respiratory Infection (SARI)**



361 Beds

68 ICU Beds

10 HSTC Beds

61% Public Health System

19546 admissions: Nov 2022_ Sep 2023

Season: Nov/2022- Oct/2023

- Paraná state: 11.444.380 inhabitants/2022
- Curitiba Metropolitan area: 3.2 million/inhabitants (28%)
- Altitute: 932 m (3,058 ft) above sea level
- Climate: Temperate
  - Cold winter and humid summer (~25º.C)
  - Coldest regions in Brazil.

Mission: To promote child and adolescent health through teaching and research

Global Influenza Hospital Surveillance Network

BRAZIL

Study Protocol

Screening for eligible participants

- *Eligible patients*
  - *ICD codes, Influenza testing and oseltamivir use.*
  - *Screening 2x a week*
- *HPP Research Ethics Committee*
  - *#09740619.4.0000.0097*
- **Sampling strategy**
- *- All eligible patients are approached and invited for study participation*
- *Patients are enrolled in the study if parents and/or legal guardian (<6 y) and patients (≥6 y) consent to participate*
- **Specimens collected**
  - *Nasopharyngeal swabs*

Case definition

- *Case definition used is the "**extended SARI case definition**", as per protocol, defined as an acute respiratory infection with cough and onset within 10 days that requires hospitalization (no fever is required)*

Testing strategy

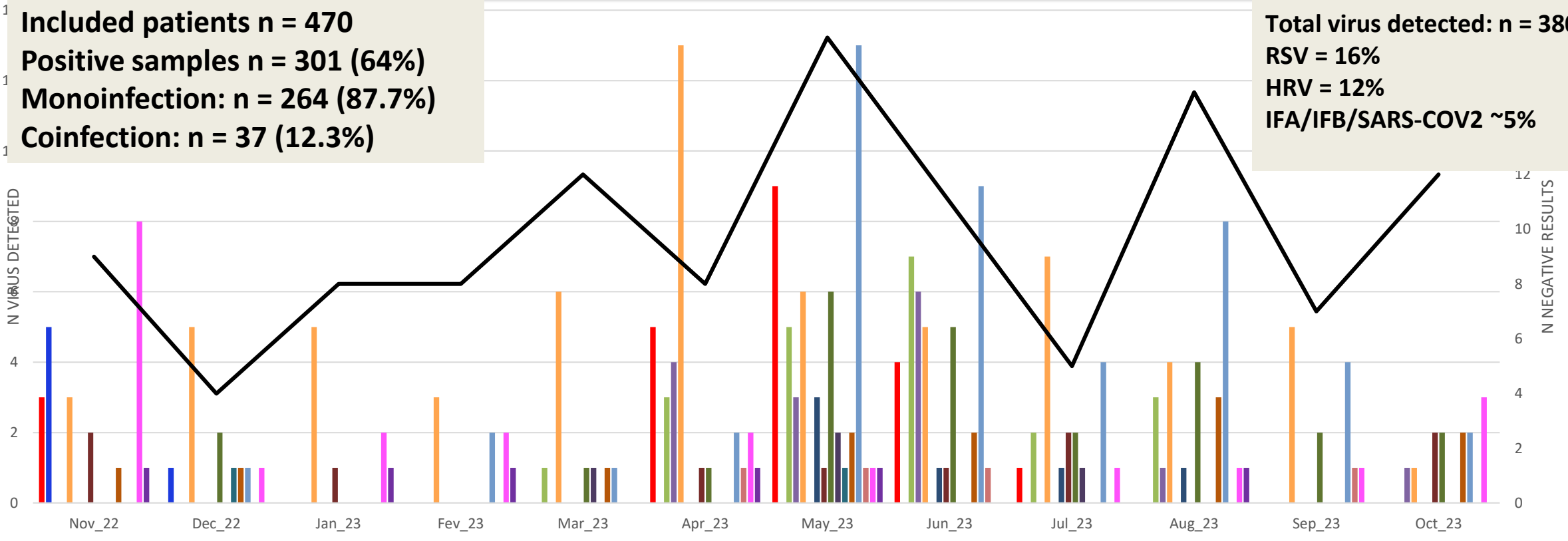
- *All samples were tested*
  - *In-house RT-qPCR assay, primers based on CDC protocol*
  - *16 respiratory viruses: RSV, IFA, HRV, IFB, hMPV, AdV, PIV1, PIV2, PIV3, HCoV 63NL, OC43, HkU, 229 E, hEV (D68) and SARS-CoV2.*
- *IFA and IFB nucleotide sequencing*
  - *Lyon NIC*

BRAZIL

Key findings

Included patients n = 470
Positive samples n = 301 (64%)
Monoinfection: n = 264 (87.7%)
Coinfection: n = 37 (12.3%)

Total virus detected: n = 380
RSV = 16%
HRV = 12%
IFA/IFB/SARS-COV2 ~5%



Global Influenza Hospital Surveillance Network

BRAZIL

Key findings

- *Enterovirus D68 detection: 6 samples (1.6%)*
- *Chronic condition*
  - *49%*
  - *Asthma*
- *Influenza vaccine_current_season*
  - *31.2%*
- *Outcome*
  - *2 deaths*
  - *Neurological disease*
  - *RV results: both negative*

BRAZIL

Challenges

- *Confirmation of vaccination status for SARS-CoV-2 and Influenza*
- *Post-pandemic*
  - *Higher resistance from parents to collect nasopharyngeal swabs* ***(25,1%)***
- *Improve collaboration among the clinical staff*
- *Enterovirus D68 detection: 6 samples (1.6%)*
- *Shortage of reagents and kits*
  - *delivery time around 5 -6 months*

GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

PERU

V. Alberto LAGUNA MD & Ingrid More MD, Tropical Medicine, UNMSM

Global Influenza Hospital Surveillance Network

Global Annual Meeting 2023

V. Alberto Laguna[1,2], Juana del Valle[3], Ingrid More [2], Silvia Mendocilla [4] Estela Ramírez [3], Israel Benavides [4] Sofia Cavalcanti [5], Nora Reyes [1]

1) Tropical Medicine Institute Universidad Nacional M. de San Marcos (UNMSM) **2**) Clínica Internacional, 3) Instituto de Investigación Nutricional. 4) Hospital Carrion, Callao 5) Sofia Cavalcanti, Hospital Piura

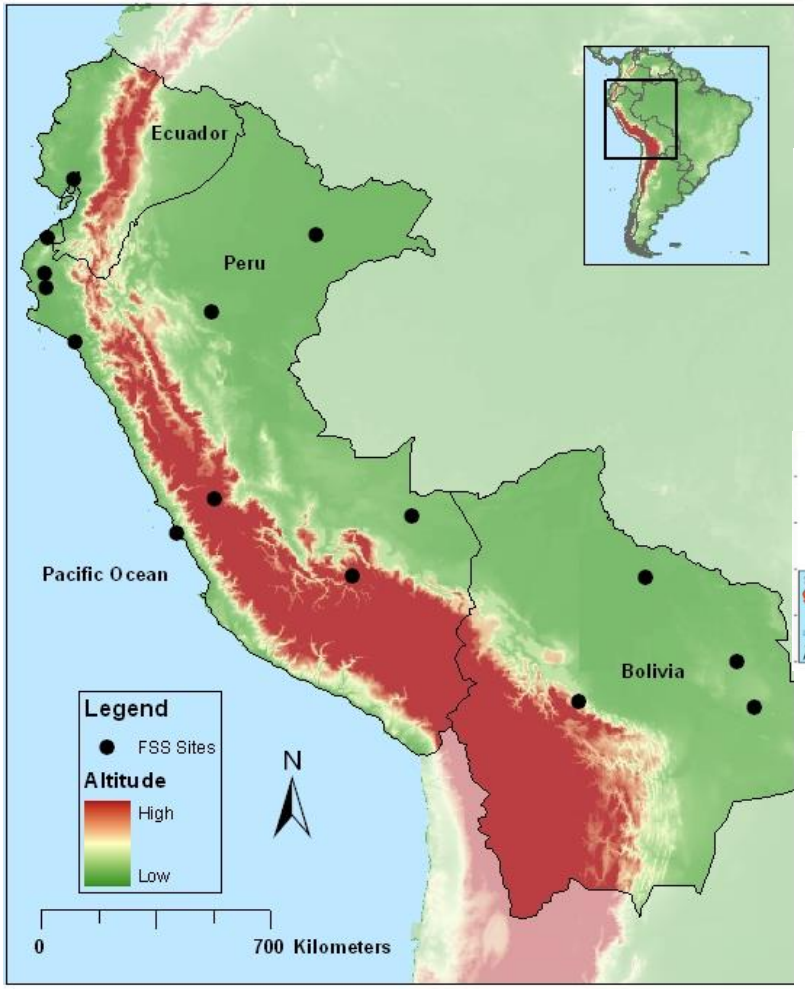
Site description

Population: People of all age groups from three Peruvian hospitals: at Lima (main peruvian city), Callao (central region) and Piura (northern Peru), looking for geographical representativeness of the network for the GIHSN mission.

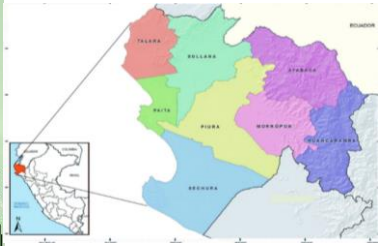
Catchment area. Lima it is the main city of the country with 8.5 million people. Our main site was located at Private Clinica International and covered the whole city of Lima. Has 203 bed and three ICUs, of those, one pediatric.

In Piura, Santa Rosa Ministry of Health Hospital covers the whole city. Has, 152 beds, of those: 22 are pediatrics and 8 beds for adult ICU During this period the 300 beds Ministry of Health (MoH) Hospital at Callao was included.

Seasonality. In Piura influenza cases occur and the end of the year (summer), In Lima and Callao influenza cases occur more often in wintertime (April- August).



Lima (capital city)
Callao (main port)



Piura (northern Peru)

Global Influenza Hospital Surveillance Network

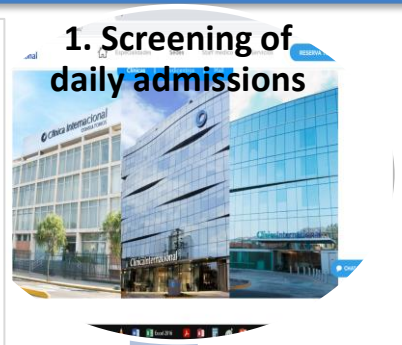
PERÚ

Tropical Medicine Institute Universidad Nacional M. de San Marcos (UNMSM) Instituto de Investigación Nutricional (IIN). Clínica Internacional. Lima

Methods

1. A site coordinator and a field worker searched records every day to identify all eligible inpatients. Electronic case reports were not used. Enrollment was based on primary diagnosis at admission (ICD codes) .

1. Screening of daily admissions



Looking for geographical representativeness, our network was established in **Lima, Callao and Piura.**

5. Data Analysis

Quality control of each patient file, review of compliance with inclusion criteria according to protocol and observations on the main research. Validation and matching of laboratory results, according to the criterion of positivity / periodic report of patients enrolled to the principal investigator. Consolidation of records, database standardization and analysis

2. Enrollment/data collection

2. Patients with clinical symptoms of influenza-like illness during the seven days before admission and hospitalized within the previous 24 hours with any of the eligible diagnoses were included

we store all aliquots at -70C

3. Swabbing

3. Nasopharyngeal, oral or nasal swabs were obtained

4.Sample Processing

Genotyping process: Lyon (France) 50-100 influenza positive samples (annual)

Monthly report to GIHSN

Reporting to INS-MoH

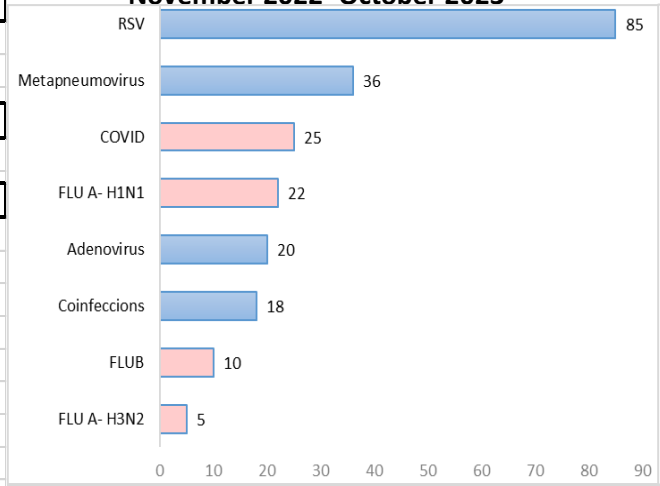
Global Influenza Hospital Surveillance Network

Detailed results

Characteristics of elegible population . November 2022- October 2023

Variable	Participants	Lima	(%)	Callao	(%)	Piura	(%)
Elegible patients	530	141	26.6	333	62.8	56	10.6
Samples taken	530	141	26.6	333	62.8	56	10.6
Gender							
Male	289	75	14.2	183	34.5	31	5.8
Age Group							
Media	2						
Median (range)	10[5-18]						
0-5	369	81	15.3	254	47.9	34	6.4
5-18	83	19	3.6	57	10.8	7	1.3
18-45	28	13	2.5	8	1.5	7	1.3
45-65	22	10	1.9	8	1.5	4	0.8
65-80	17	13	2.5	3	0.6	1	0.2
80+	11	5	0.9	3	0.6	3	0.6
Positive result	185	60	42.6	110	33.0	15	26.8
FLU A- H1N1	22	12	8.5	**8**	2.4	**2**	3.6
FLU A- H3N2	5	3	2.1	**2**	0.6	**0**	0.0
FLUB	10	4	2.8	5	1.5	1	1.8
COVID	25	13	9.2	5	1.5	7	12.5
RSV	85	17	12.1	66	19.8	2	3.6
Adenovirus	20	9	6.4	10	3.0	1	1.8
Metapneumovirus	36	10	7.1	24	7.2	2	3.6
Negative result	345	81	57.4	223	67.0	41	73.2
Coinfeccions	18	8	5.7	10	3.0	0	0.0
FLUA- H1N1/ COVID	4	3	2.1	1	0.3	0	0.0
FLUA- H1N1/ Metapneumovirus	1	1	0.7	0	0.0	0	0.0
FLU B/ COVID	2	2	1.4	0	0.0	0	0.0
FLUA- H3N2/ VRS B	1	0	0.0	1	0.3	0	0.0
COVID/ VRS A	1	0	0.0	1	0.3	0	0.0
COVID/ Adenovirus	1	0	0.0	1	0.3	0	0.0
COVID/ Metapneumovirus	1	1	0.7	0	0.0	0	0.0

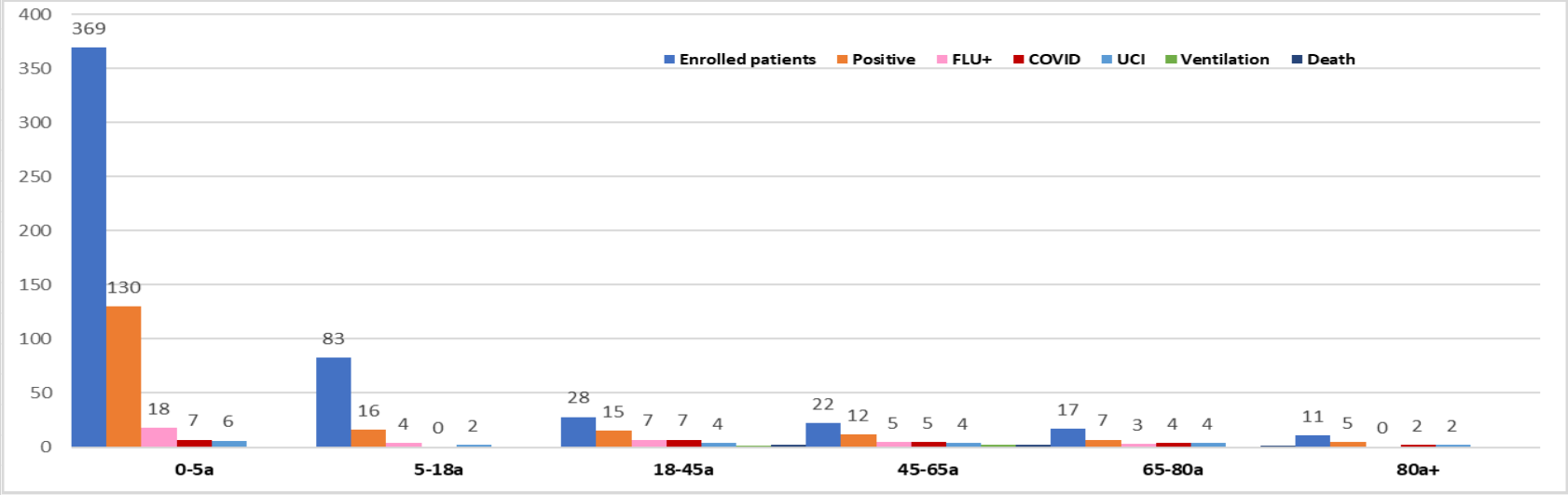
Viral circulation by RT PCR. November 2022- October 2023



Positive samples for any respiratory virus: 185 (35%). More prevalent conditions: asthma (10.2%) cardiovascular diseases (8.3%) born premature (7.6%), neurological disease (3.6%) and diabetes (2.5%), 15% got influenza vaccine in the current season and 19% got the previous one. At least, 32.1% participants have 01 dose of SARSCoV2 vaccine. Only 4.2% were hospitalized at ICU, of those 0.6% needed mechanical ventilation.

Respiratory sintitial virus (RSV) were found in 85 (16%) samples, Influenza virus in 37 (7%), and SARS-COV2 were positive in 25 (5%) all samples were also tested for adenovirus, metaneumovirus and bordetella pertussis . Viral circulation of RSV was 91% predominantly in children under 5 years of age.

Participant distribution by age and severity. November 2022- October 2023



PERÚ

Tropical Medicine Institute Universidad Nacional M. de San Marcos (UNMSM) Instituto de Investigación Nutricional (IIN). Clínica Internacional. Lima

Conclusion & Challenges

Conclusion :

- Influenza vaccination rates were extremely low. In Peru, influenza vaccine is available annually in April/May. In addition, there are high rates of rejection.

- Our pediatric population increased with the inclusion of Carrión Hospital and viral circulation of Respiratory sintitial virus (RSV) was predominant, especially in children under 5 years of age. In addition, there were 37 positive samples for influenza (27 for Flu A and 10 for Flu B) especially in adults. In the current season, SARS COV 2 was less frequent than the previous year.

- Due to the informed consent process was not easy to obtain samples from participants hospitalized at Intensive Care Unit (ICU) and only 4.2% were enrolled there. Of those, 0.6% needed mechanical ventilation.

- Patients with co-morbidities such as asthma, CVs diseases or COPD were positive for at least one virus.

- Getting sequencing established locally it is expensive for us.

Challenges

- Next period we will focus our resources in re-establish the network in Arequipa (Andean site)
- Getting sequencing capacity locally

- Africa (Kenya - Côte d'Ivoire - Senegal - South Africa)
- Americas (Canada - USA - Brazil - Peru)
- **Asia (Pakistan - India)**
- Europe (Romania - Spain)
- Eurasia (Russia Moscow - St-Petersburg) Zoom
- Middle East (Türkiye - Lebanon)

ANNUAL MEETING, 16 NOVEMBER 2023

NATIONAL INSTITUTE OF HEALTH PAKISTAN

Nazish Badar

Global Influenza Hospital Surveillance Network

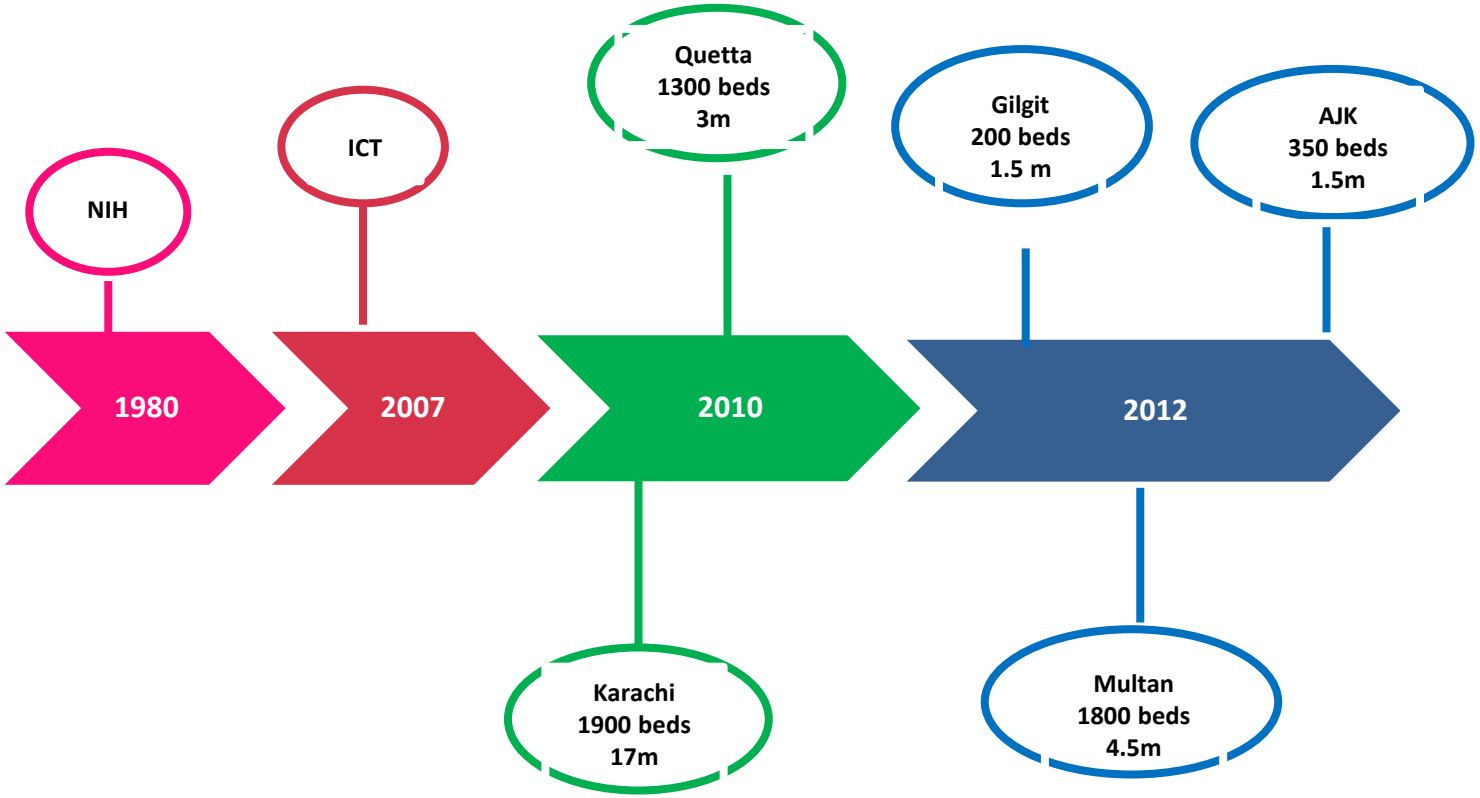
Global Annual Meeting 2023

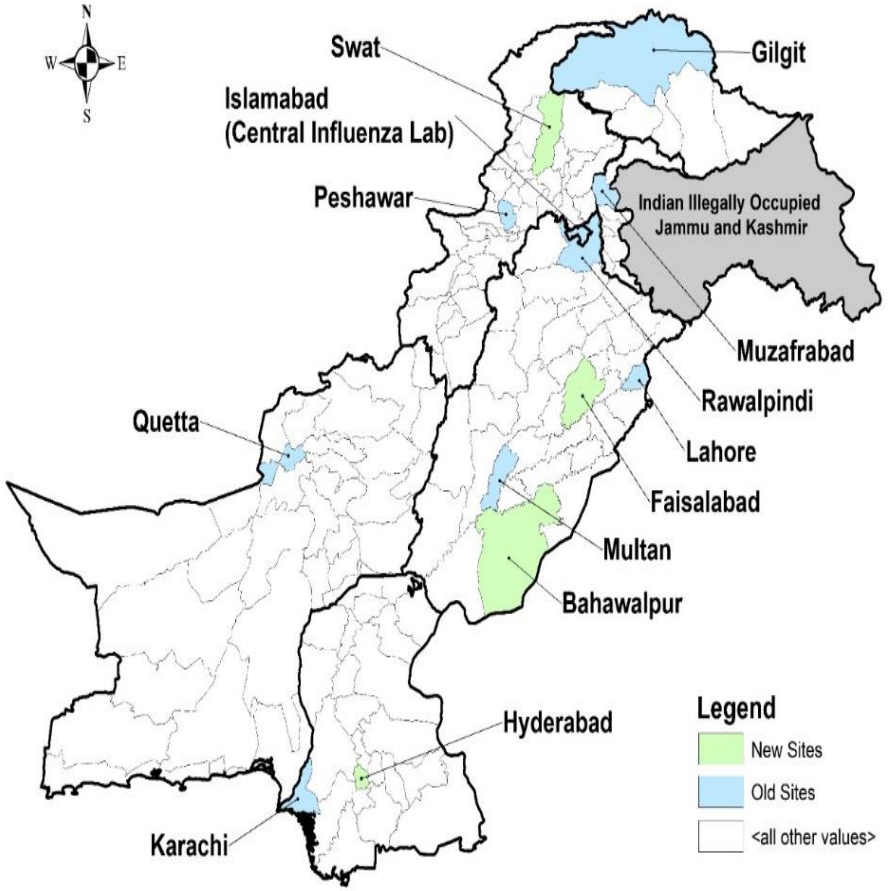
OVERVIEW

- Background
- Respiratory Viruses Sentinel Surveillance Network
- Implementation
- Key findings
- Challenges

PAKISTAN

Profile; Influenza Sentinel surveillance



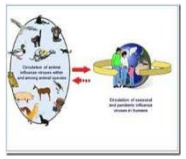


Global Influenza Hospital Surveillance Network

IMPLEMENTATION

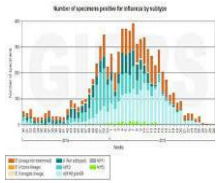
Local Government & NIC

?????

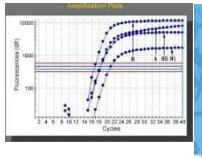


Policy making

National Influenza Centre



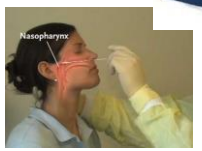
Onsite WGS



Multiplex PCR/ FTD

Tertiary care
Hospitals
Geographic area
Patient turn over

Sentinel Sites



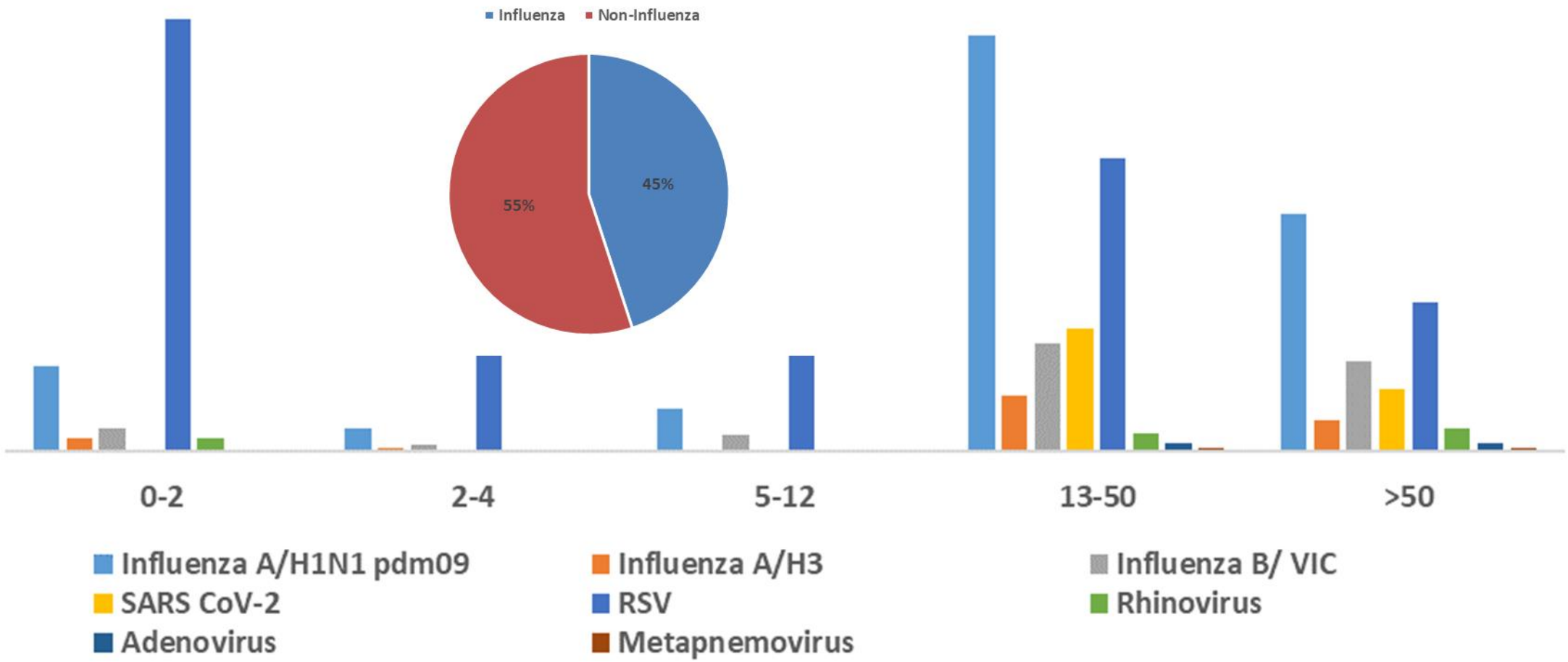
SARI (Fever 38C°, cough,
Onset within 10 days)
ICD 10
Convenient sampling (Mon-Wed)

Global Influenza Hospital Surveillance Network

RESPIRATORY VIRUSES DETECTED 2022-23

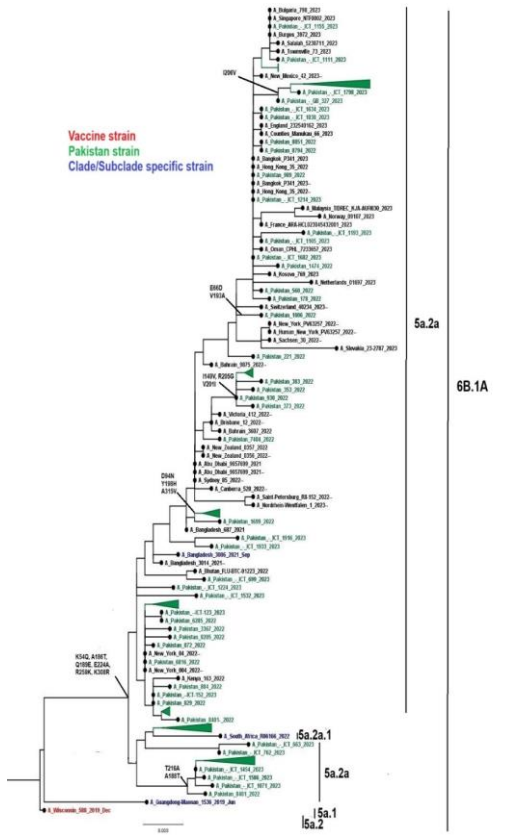
Viral Pathogen	Subtype	Number of positive cases (%)
Influenza Virus	Influenza A/H3	47(4)
	Influenza A/H1N1 Pdm 09	349 (31)
	Influenza B	106 (10)
RSV		480 (44)
HmPV		06 (0.8)
AdenoVirus		09 (1)
RhinoVirus		25 (2)
PIV3		2 (0.2)
SARS CoV-2		80 (7)

AGE DISTRIBUTION OF RESPIRATORY VIRUSES

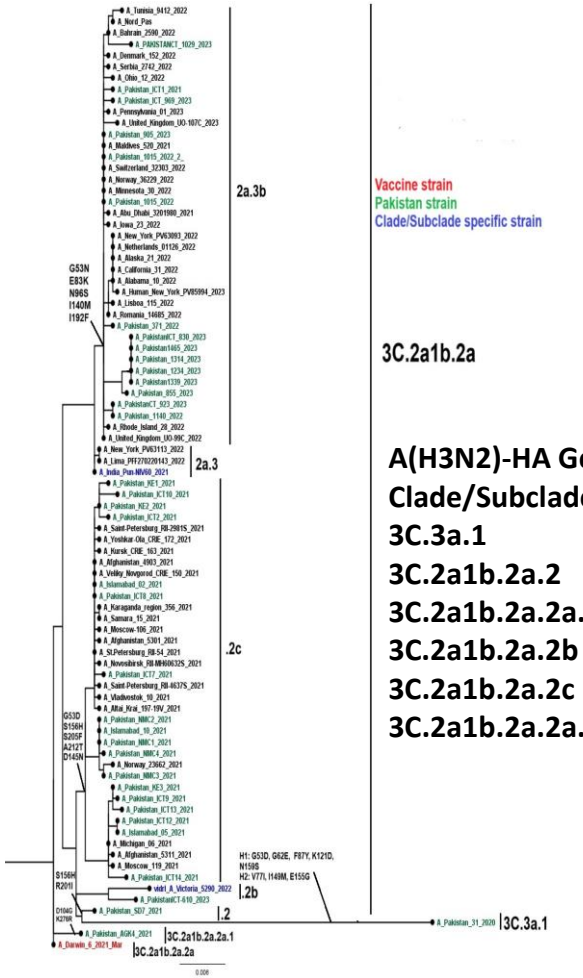


Global Influenza Hospital Surveillance Network

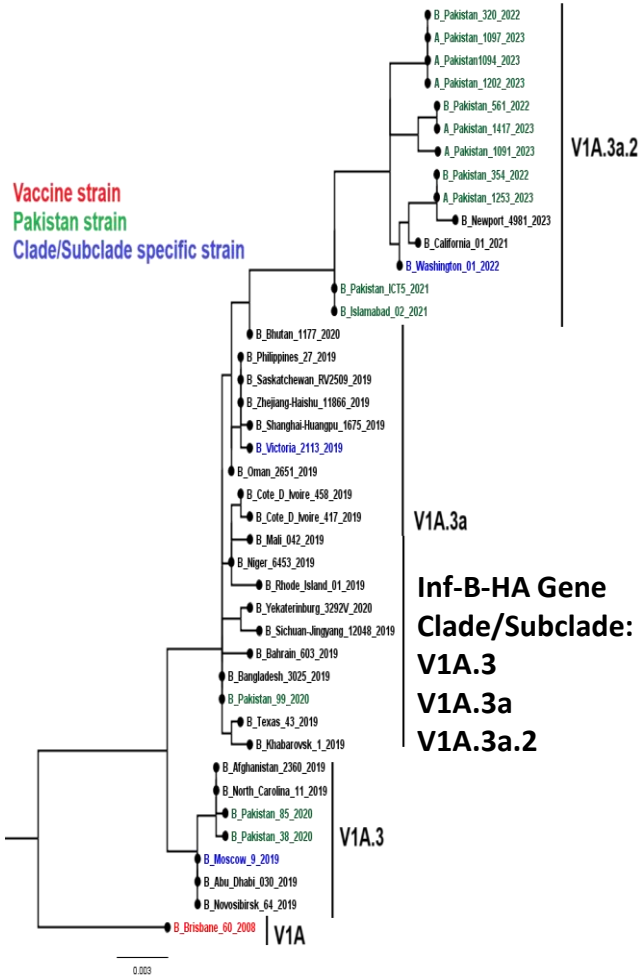
INFLUENZA & SARS COV-2 WHOLE GENOME SEQUENCING



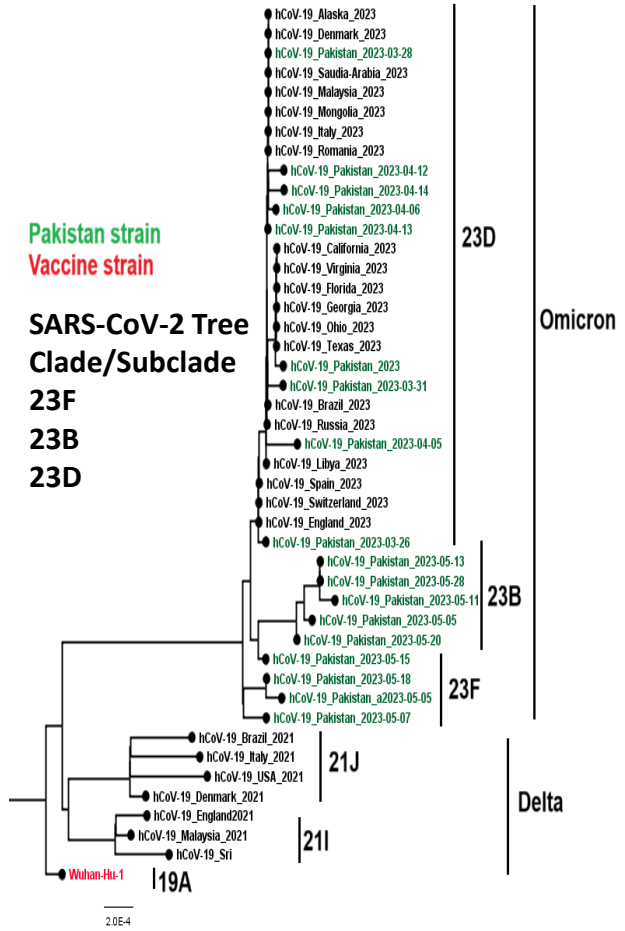
A(H1N1)-HA Gene
Clade/Subclade:
6B.1A.5a.2a



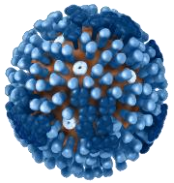
A(H3N2)-HA Gene
Clade/Subclade:
3C.3a.1
3C.2a1b.2a.2
3C.2a1b.2a.2a.1
3C.2a1b.2a.2b
3C.2a1b.2a.2c
3C.2a1b.2a.2a.3b



Inf-B-HA Gene
Clade/Subclade:
V1A.3
V1A.3a
V1A.3a.2



CHALLENGES



Epidemiological

- Compliance/ adherence with case definition; needs physicians/ paramedical staff training
- Ownership to support sustainable long-term funding
- Incomplete questionnaire performa
- Difficulty in getting follow-ups
- Influenza included in national notifiable diseases list – Needs integration in mainstream surveillance system
- Public /private sector partnership

Laboratory

- Timely Reporting
- Commitment by the sentinel sites
- Maintain feedback and liaison with sentinel sites
- Maintaining specialized testing at NIC Sentinel site
- WGS analysis
- Staff turnover

ANNUAL MEETING, 16 NOVEMBER 2023

SHERI-KASHMIR INSTITUTE OF MEDICAL SCIENCES

Parvaiz A. Koul, MD

Global Influenza Hospital Surveillance Network

Global Annual Meeting 2023

INDIA

Location

The institute is located in Kashmir, a northern-most part of India.

Latitude lies between 33° and 35°N, and longitude between 73°and 76°E.

15,520.3 km^2 in area and population is over 69 lakh.

INDIA

Methodology

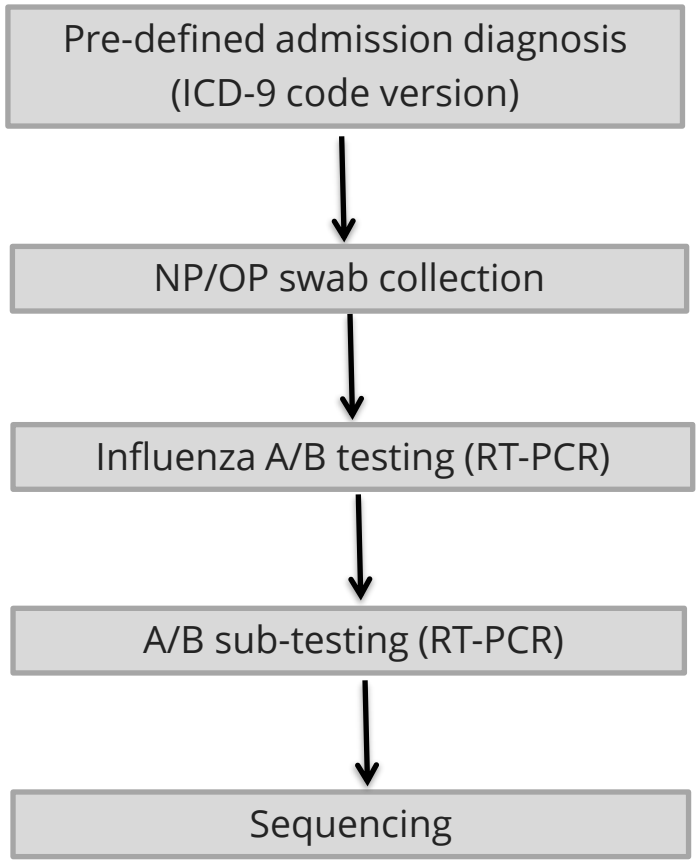
From October 2022 to March 2023, all patients underwent active surveillance for influenza infection.

Screening were done on pre-defined admission diagnosis by using ICD-9 code version.

Nasopharyngeal and oropharyngeal swabs were collected from all eligible patients.

RT-PCR was used to test each swab sample for Influenza A and B. Sub-typing was done for positive cases.

Sequencing of influenza-positive samples was done at Lyon NIC.



INDIA

Results

A total of 1115 patients (age 6 months to 105 years; median 65; 50.6% male) met the ECDC- ILI case definition.

96% adults.

Symptoms ranged in duration from 1 to 5 days, with an average of 3 days.

Table 1. Clinical symptoms of 1115 patients

Symptoms	No. of patients
Fever	565 (50.6%)
Malaise	747 (66.9%)
Headache	391 (35%)
Myalgia	621 (55.6%)
Cough	1032 (92.5%)
Sore Throat	114 (10.2%)
Breathlessness	1030 (92.3%)
Wheezing	501 (44.9%)
Runny Nose	125 (11.2%)

INDIA

Results continue…

About 83% of the patients showed co-morbidities

22.9% subjects were vaccinated for influenza (56.6% of whom had taken vaccination for both previous and current season.)

COVID-19 vaccination was administered to roughly 76.3% of patients; of these, 63% received two doses, 7.6% received three doses, and the remaining 5.6% received only one dose.

Table 2. Co-morbidities of 1115 patients

Co-morbidity	No. of patients
Cardiovascular	779 (69.8%)
COPD	542 (48.6%)
Asthma	15 (1.34%)
Diabetes	289 (25.9%)
Immunodeficiency	22 (1.9%)
Renal	108 (9.6%)
Rheumatologic	70 (6.2%)
Neurological	67 (6%),
Liver Disease	11 (0.98%)
Neoplasm	62 (5.5%)
Obesity	26 (2.3%)

INDIA

Results continued…

Out of 1115 patients, 5.11% were positive for influenza virus.

The remaining 1.4% cases were Victoria strain of influenza B.

Total	H1N1		H3N2		B/Victoria	
57 (5.11%)	20 (35%)		21 (37%)		16 (28%)	
	Vaccinated	Non-vaccinated	Vaccinated	Non-vaccinated	Vaccinated	Non-vaccinated
	3	17	3	18	2	14

Among 1115 subjects, 83 expired during hospitalization.

INDIA

Conclusion

1115 patients were included in this study, in the NH seasonal pattern.

About 83% of patients showed co-morbidities, cardiovascular diseases and COPD being the most.

Nearly 30% patients were vaccinated for influenza and 76.3% of patients were vaccinated for Covid-19.

About 5.11% were positive for influenza virus.

B/Yamagata was not seen since March 2020

- Africa (Kenya - Côte d'Ivoire - Senegal - South Africa)
- Americas (Canada - USA - Brazil - Peru)
- Asia (Pakistan - India)
- **Europe (Romania - Spain)**
- Eurasia (Russia Moscow - St-Petersburg) Zoom
- Middle East (Türkiye - Lebanon)

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: NIID « PROF. DR. MATEI BALS » ROMANIA

PI: Dr. Anca Drăgănescu, Speaker: Dr. Oana Săndulescu

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023

ROMANIA

National Institute for Infectious Diseases "Prof. Dr. Matei Balș" Bucharest, Romania

NATIONAL INSTITUTE OF INFECTIOUS DISEASES "Prof. Dr. MATEI BALȘ"

Site description

- Tertiary care academic infectious diseases hospital
  - Adult wards + Pediatric wards
  - ICU
  - Outpatient department
- Wide patient addressability – catchment 5937382 people, from:
  - Bucharest
  - South Eastern Romania
- On-site molecular genetics with sequencing capacity (GIHSN)
- Reporting of laboratory-confirmed influenza and SARS-CoV-2 cases to the national ILI/SARI surveillance

Global Influenza Hospital Surveillance Network

ROMANIA

National Institute for Infectious Diseases "Prof. Dr. Matei Balș" Bucharest, Romania

NATIONAL INSTITUTE OF INFECTIOUS DISEASES "Prof. Dr. MATEI BALȘ"

Implementation

- **Screening for eligible participants**

Screening of ICD-codes for admission diagnosis

- **Sampling strategy**

All eligible patients are enrolled

- **Case definition**

Case definition and inclusion/exclusion criteria according to the GIHSN study protocol

- **Specimens collected**

Nasopharyngeal swab

- **Testing strategy**

Multiplex PCR respiratory panel (commercially available: SeeGene, Biofire)
If multiplex unavailable: RT-PCR for influenza A/B/RSV, SARS-CoV-2 (commercially available: GeneXpert)
Subtyping/lineage determination for influenza A/B
Whole genome sequencing for influenza and SARS-CoV-2 done on-site

ROMANIA

National Institute for Infectious Diseases "Prof. Dr. Matei Balș"
Bucharest, Romania

NATIONAL INSTITUTE OF INFECTIOUS DISEASES
"Prof. Dr. MATEI BALȘ"

Key findings and challenges

Return to pre-pandemic viral circulation / Changing epidemiological patterns

Alternation between COVID/non-COVID wards

Addressability of patients with ILI during off-season intervals

Multiplex respiratory panel testing (including influenza during off-season intervals)

Viable samples (historically, +, since past 2 seasons, + and -) are stored (-70°C), dating back approximately 12 months – storage space limitations for samples older than >1y

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: FISABIO (SPAIN)

PI/Speaker: F. Xavier López-Labrador

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023

SPAIN

GENERALITAT VALENCIANA

Fundació Fisabio

AIV Área de Investigación en Vacunas

Site description

HOSPITALS	CATCHMENT POPULATION	NUMBER OF BEDS
H. General Universitario de Castellón	282,000	509
H. Universitario y Politécnico La Fe	287,000	975
H. Universitario Doctor Peset	279,000	539
H. La Marina Baixa	170,000	270
TOTAL	**1,018,000**	**2,293**

Global Influenza Hospital Surveillance Network

SPAIN

GENERALITAT VALENCIANA
Fundació Fisabio
AIV Área de Investigación en Vacunas

Implementation

Daily active surveillance for respiratory viruses in patients of all ages has been conducted from November 2nd, 2022 to October 31st, 2023:

- **All patients hospitalized for a respiratory reason** are screened.
- Information on **clinical and sociodemographic characteristics** is obtained by interviewing patients/legal tutors and by consulting medical records.
- **NP and N/P swabs** are obtained **from all patients** meeting the **ILI** case definition.
- All swabs are tested for influenza, SARS-CoV-2, RSV and other respiratory viruses by in-house **real-time RT-PCR**.
- Viral detections and influenza and SARS-CoV-2 whole-genome sequencing (WGS) are performed at Fisabio's Virology laboratory within the Genomics and Health Area.
- **WGS** attempted **in all positive samples with Ct values<32**.

SPAIN

GENERALITAT VALENCIANA | Fundació Fisabio | AIV Área de Investigación en Vacunas

Results

	#included	#LCI	#tested for RSV	#RSV+	#tested for SARS-CoV-2	SARS-CoV-2+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-CoV-2
Patients <5 yrs	83 (100%)	7 (8%)	83 (100%)	29 (35%)	83 (100%)	2 (2%)	83 (100%)	14 (17%)	2/7 (29%)	2/2 (100%)
Patients 5+ yrs	1,980 (100%)	165 (8%)	1,980 (100%)	102 (5%)	1,980 (100%)	242 (12%)	1,980 (100%)	199 (10%)	67/165 (41%)	159/242 (66%)
Total	2,063 (100%)	172* (8%)	2,063 (100%)	131* (6%)	2,063 (100%)	244* (12%)	2,063 (100%)	213* (10%)	69/172** (40%)	161/244 (66%)

*60 pending results **pending sequences

Key messages

8% of total included patients had **influenza** (same % for 5+y.o. and <5 y.o.)
5% of **5+ y.o.** had **RSV vs. 35%** of **<5 y.o.**
12% of hospitalizations in **5+ y.o.** had **SARS-CoV-2** infection vs. **2%** in **<5 y.o.**
36% of **5+ y.o.** were **positive for any respiratory virus** vs. **63%** of **<5 y.o.**

SPAIN

GENERALITAT VALENCIANA | Fundació Fisabio | AIV Área de Investigación en Vacunas

Key findings & Challenges

CONCLUSIONS

- Only **8%** of hospitalizations were positive for **influenza**.
- **Symptoms** were **very similar for influenza and SARS-CoV-2** cases.
- Conversely, **reasons for admission** were **different**.
- Influenza **A(H1N1)pdm09, A(H3N2) and B/Victoria co-circulated** in this season.
- Influenza **B/Yamagata absent**.
- **Among positives, 32%** were **SARS-CoV-2**, **23% influenza, 17% RSV, and 28% ORV.**
- **Winter SARS-CoV-2** cases belonged to **Omicron BA/BQ variants**, shifting in **March to XBB** and derivatives, with appearance of **XBB.1.5 and EG.5.1 in summer**.
- Among all hospitalizations, **83% were vaccinated with at least one dose against COVID-19** and **71% with 3 or more** doses.
- **Influenza vaccine coverage** was **46%** in the **overall population** and **64%** in patients **65+**.

MAIN CHALLENGES:

Active year-round surveillance and Influenza + SARS-CoV-2 WGS -> higher hospital & Lab workloads.

- Africa (Kenya - Côte d'Ivoire - Senegal - South Africa)
- Americas (Canada - USA - Brazil - Peru)
- Asia (Pakistan - India)
- Europe (Romania - Spain)
- **Eurasia (Russia Moscow - St-Petersburg) Zoom**
- Middle East (Lebanon - Türkiye)

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: MOSCOW, RUSSIA

Speaker: Svetlana Trushakova

Global Influenza Hospital
Surveillance Network
Global Annual Meeting 2023

RUSSIA, MOSCOW

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

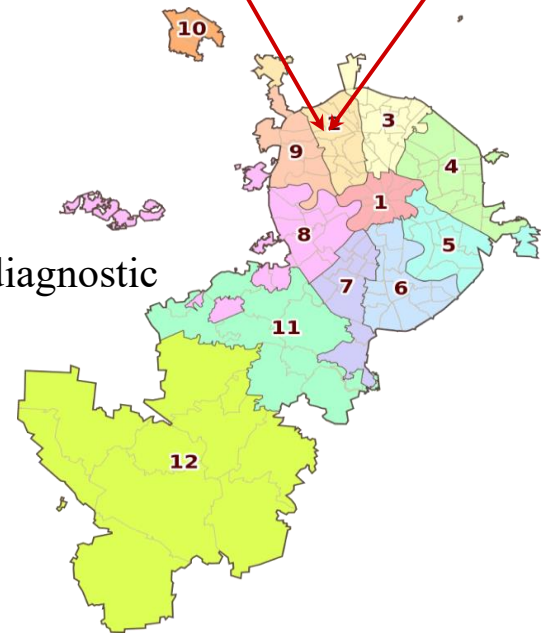
Site description

The coordinating site

FSBI "N.F. Gamaleya NRCEM" Ministry of Health of Russian Federation

Laboratory of influenza etiology and epidemiology

- PCR diagnostic
- Virus isolation
- Sera diagnostic
- Resistant strains diagnostic



The Hospital

The Hospital for infectious diseases

- Catchment area – Moscow
- Population – 12 655 050 (2022)
- Specialty of Hospital – any infectious diseases (except HIV, tuberculosis,
- Patients – Moscow residents and guests from 0 to 90 y.o.
- Hospital capacity – 706 beds
- GIHSN participated beds:120 adults, 75 children, 12 ICU
- The Hospital and the Laboratory are located at the same district in 20 min by car

Global Influenza Hospital Surveillance Network

RUSSIA, MOSCOW

FSBI National Center of Epidemiology and Microbiology by N.F.Gamaleya

Implementation

Screening for eligible participants

-Patients with any diagnosis associated with influenza infection were screened.

-Patients with acute respiratory illness up to 7 days of onset (not 10)

- ICD-codes J01-06, J18-J20, J40-44, R05, U07

-Screening was conducted for 3 days per week (Tue, Wed, Thu)

Sampling strategy

- Patients with fever higher 38, pneumonia, shortness of breath, at ICU were enrolled firstly.
- After that all other patients with influenza-like infection were selected.
- Each doctor has been limited for number patients selection – up to 5 patients for each day of work

Case definition

- We used SARI case definition

Specimens collected

- Nasal swabs were taken in Eppendorf tubes with 1,5 ml of saline solution, frozen or sent to the laboratory immediately

Testing strategy

- Commercial PCR kits (manufactured in Russia) and CDC kits were used for PCR detection
- Influenza and SARS-Cov-2 viruses were tested in all enrolled patients at the laboratory. ORV were tested at the hospital. The ORV result was used from the patient's history if it was available.
- Sequencing was done at site collaborating with colleagues from the other laboratories.

RUSSIA, MOSCOW

FSBI National Center of Epidemiology and Microbiology by N.F.Gamaleya

Key findings and challenges

- *Key findings*

- 558 included patients, 131 LCI, 34 SARS-CoV-2+, 131 ORV+ and 16 WGS.
- Influenza A(H1N1)pdm09 dominated during November-December 2022 and belonged to subclade 6B.1A.5a.2a.
- One case of death was registered (old man with A(H1N1)pdm09).
- Influenza B/Victoria-like virus joined to the epidemic in January-April 2023 and were assigned to the B/Victoria lineage clade V1A.3a.2.
- SARS-CoV-2 virus had low activity during all season (4,2%).
- Other respiratory viruses accounted for 22,3% with prevalence of Rv and RSv.
- Children 5-14 yo and adults at 15-64 yo were more exposed by influenza infection, meantime adults at 65+ yo were more vulnerable to SARS-CoV-2.

- *Challenges*

No financial support, limitation in resources

- One hospital, limited number of staff
- Number of the enrolled patients was also limited.
- Acute respiratory illness cases up to 7 days (not 10) of onset were included in the study
- Short - Questionnaires were used.
- Sequencing capacity is restricted.

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: RUSSIA, SAINT PETERSBURG

PI/Speaker: Andrey Komissarov

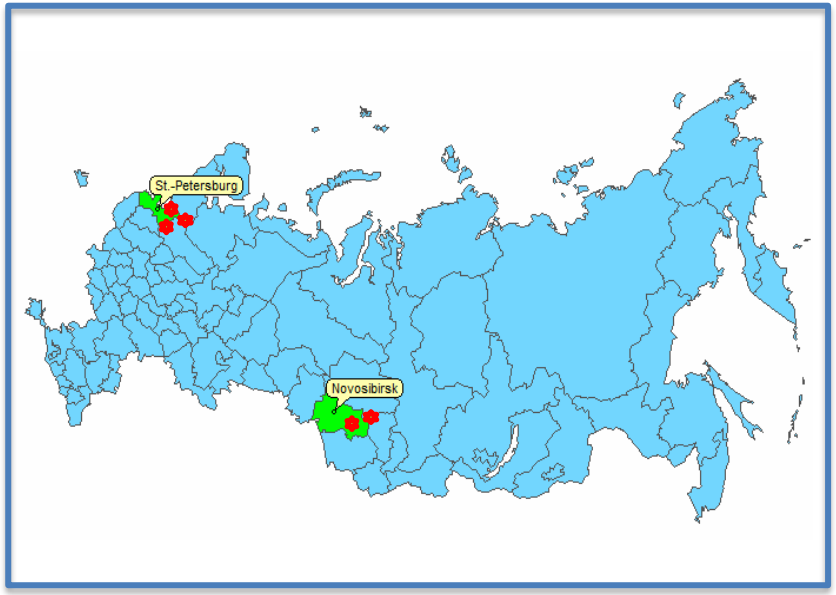
Global Influenza Hospital
Surveillance Network
Global Annual Meeting 2023

RUSSIA

WHO NATIONAL INFLUENZA CENTRE,
WHO REFERENCE CENTRE FOR COVID-19,
SMORODINTSEV RESEARCH INSTITUTE OF INFLUENZA, SAINT PETERSBURG

Site description

- 5 Infectious Hospitals for adults and children in 2 Russian Federal Districts: North-western (Saint Petersburg) and Siberian (Novosibirsk) representing ~1000 acute care beds;
- Population of two cities - 7,1 mln. people;
- Population enrolled: **4707** patients, including 864 adults and 3843 children, admitted to hospitals with an acute respiratory illness



RUSSIA

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

Implementation

Screening for eligible participants, sampling strategy

- The main screening criteria to identify if patient eligible for the study or not is a list of ICD-10 codes. Then if admission diagnosis match with one of ICD-10 codes in the list, the case definitions will be applied. Also patient will be asked for giving consent for participation in the study. Only eligible patients which comply the case definitions and agreed for participation will be swabbed.

Case definition

- Modified ECDC case definition is used: at least one four systemic symptoms (fever, headache, myalgia, malaise) AND at least one of three respiratory symptoms (cough, sore throat, shortness of breath)

Specimens collected

- mainly, nasopharyngeal swabs. Nasal swabs from newborns and infants.

Testing strategy

- PCR assay used (commercially available for SARS-CoV-2, influenza A/B, influenza subtyping (A(H1N1)pd09, A(H3N2), Bvic, B yam); commercial kits for other respiratory viruses (para, rhino, adeno, boca, corona, RSV, MPV)
- All patients enrolled are tested for all pathogens listed above
- Sequencing done at site level (NGS capacity: Illumina MiSeq and NextSeq, Oxford Nanopore MinIon and GridIon, BGI DNBSeq-G400)

RUSSIA

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

Keys findings and challenges

- No challenges in implementing year-round surveillance compared to surveillance from autumn to spring
- Influenza A(H1N1)pdm09 dominated in Russia with influenza B/Victoria co-circulation in the second half of the epidemic. Influenza A(H1N1)pdm09 viruses caused an epidemic of very high intensity.
- According to antigenic and genetic analysis the viruses circulating in Russia were closely related to the vaccine strains recommended for the 2023-2024 season for the Northern Hemisphere.
- All WGS have been input in GISAID timely and in the Interim Report “Start of Influenza Activity in Russia, season 2022-2023”, presented to WHO in February 2023, before WHO Consultation and Information Meeting on the Composition of Influenza Virus Vaccines.

Key challenge: funding form GIHSN currently is not possible

- Africa (Kenya - Côte d’Ivoire - Senegal - South Africa)
- Americas (Canada - USA - Brazil - Peru)
- Asia (Pakistan - India)
- Europe (Romania - Spain)
- Eurasia (Russia Moscow - St-Petersburg) Zoom
- **Middle East (Türkiye - Lebanon)**

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: TURKIYE

PI/Speaker: Serhat Unal/ Mine Durusu Tanriover

Global Influenza Hospital Surveillance Network

Global Annual Meeting 2023

TURKIYE

TURKISH SOCIETY OF INTERNAL MEDICINE

Site description

- Study was conducted in Ankara, capital city of Türkiye, which hosts 5.8 million people (6.8% of the country population)
- 4 hospitals participated, all tertiary care, containing 4680 adult and 900 pediatric beds
- Emergency room, infectious diseases wards screened

Global Influenza Hospital Surveillance Network

TURKIYE

TURKISH SOCIETY OF INTERNAL MEDICINE

Implementation

- ***ICD-10 codes were used to identify eligible participants***
- ***Year-round surveillance was done***
  - *Screening on Monday, Wednesday and Fridays of the week (total number of eligible patients not captured)*
  - *Sampling during working hours (08-19)*
- ***Modified ECDC case definition was used***
  - *Admitted through emergency doors or screened wards for an acute condition, in the previous 72 hours and has stayed in hospital for at least 1 night*
  - *Experiencing symptoms in the last 7 days prior to admission and consented for swabbing*
- ***Aspirates, nasal/oral/nasopharyngeal swabs, were used depending on the age and general condition of the patient***
- ***Tested for 13 different viruses for 41 different strains on Illumina Respiratory Virus Oligo Panel V***

TURKIYE

TURKISH SOCIETY OF INTERNAL MEDICINE

Key findings and challenges

	Samples					
Age group	#included	#Influ+	#SARS-CoV-2+	#RSV+	#ORV+	%posit
< 5 yrs	116	3	6	12	23	35.4
5-17 years	30	2	0	0	5	23.3
≥18 years	370	8	4	10	6	6.8
Total	516	**13**	**10**	**22**	**34**	14.7

#ORV	
Adenovirus	10
Parainfluenza	6
Rhinovirus	6
Bocavirus	3
HMPNV	3
WU Polyoma	2
Enterovirus C109	2
Coronavirus OC43	2

01.11.2022 – 30.09.2023
15.3% lab confirmed infection

Coinfections	
RSV	Influenza A
	WU Polyoma
	Bocavirus
	Coronavirus OC43

CHALLENGES:

- Interruptions during February 6th earthquake, long holidays and leave offs
- Low influenza positivity (2022-2023 SARI surveillance in Turkiye: positivity was only 6.8%, ORVs higher share)
- Long waiting time for lab analysis
- Small amount of genomic material remaining for future studies

ANNUAL MEETING, 16 NOVEMBER 2023

CENTER FOR INFECTIOUS DISEASES RESEARCH – AMERICAN UNIVERSITY OF BEIRUT - LEBANON

PI: Ghassan Dbaibo, MD – Speaker: Celina Boutros, MPH

Global Influenza Hospital Surveillance Network

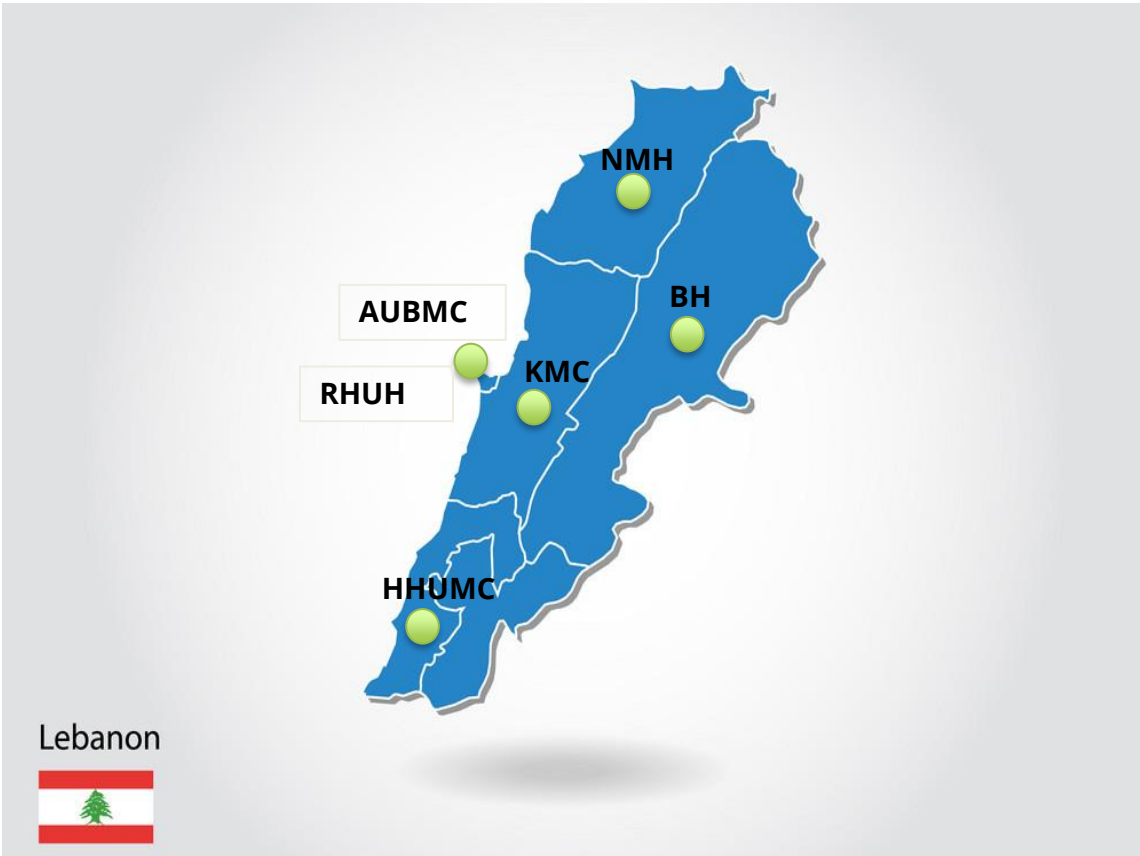
Global Annual Meeting 2023

LEBANON

CIDR
Center for Infectious Diseases Research
American University of Beirut

Site description

Hospital name	Hospital characteristics	Population/catchment area
American University of Beirut Medical Center (AUBMC)	Urban Academic/Tertiary 373 patient-beds	All age groups/2.4 million
Rafic Hariri University Hospital (RHUH)	Urban Academic/General 430 patient-beds	All age groups/2.4 million
Keserwan Medical Center (KMC)	Urban Non-Academic/General 65 patient-beds	All age groups/100,000
Bekaa Hospital (BH)	Rural Academic/General 154 patient-beds	All age groups/200,000
New Mazloum Hospital (NMH)	Urban Non-Academic/General 100 patient-beds	All age groups/500,000
Hammoud Hospital University Medical Center (HHUMC)	Urban Academic/Tertiary 325 patient-beds	All age groups/250,000



LEBANON

Center for Infectious Diseases Research
AMERICAN UNIVERSITY OF BEIRUT

Implementation

Screening of daily admissions list:
- ✓ All age groups
- ✓ Acute process
- ✓ Admission in the previous **24-72** hours
- ✓ Admission diagnosis meeting the predefined set of conditions (<5 years old VERSUS ≥5 years old)

Recruitment of subjects:
Extended SARI case definition

Data collection

Sampling strategy:
- Using remaining PCR sample available upon admission

OR

- Sample collection:
  - ✓<14 years old: nasal sample
  - ✓≥14 years old: NP & P samples

Testing strategy:
Real-Time qPCR for:
- ✓ Influenza A, B (their subtypes)
- ✓ RSV
- ✓ SARS-COV-2

Sequencing in-house for SARS-CoV2 & Influenza cases (if CT-value <28)

Handling of samples
After aliquoting of samples, they are stored at -80°C until further processing

Active year-round surveillance

Global Influenza Hospital Surveillance Network

LEBANON

CIDR
Center for Infectious Diseases Research
American University of Beirut

Results

#Screened= **99,250** → #Eligible= **4,767** → #Enrolled = **2,251**

	SARS-CoV-2	Influenza	RSV	Other Respiratory Viruses (ORV)*	Mixed viruses**
Tested	**2,222 (53 locally sequenced using NGS)**	**2,205 (48 sequenced in Lyon)**	**2,187**	**268**	**2,179**
Positive result	**261 (+25 mixed infections)**	**179 (62 A/NT, 64 AH3N2, 42 AH1N1, 4 B/NT, 7 BVIC) (+37 mixed infections)**	**271 (+58 mixed infections)**	**61 (+56 mixed infections)**	**100**

*ORV: HRV (*20), HAdV (*13), HRV/EV (*9), HMPV A/B (*5), HBoV (*4), HCoV-OC43 (*4), HPIV-3 (*2), HCoV-HKU-1, HPIV-1, HPIV-4, EV.

Mixed viruses: **SARS-CoV-2 & RSV (*16), RSV & HRV (*8), RSV & Flu A/NT (*7), RSV & Flu A/H3N2 (*6), Flu A/H3N2 & Flu A/H1N1 (*5), HRV/EV & HPIV-3 (*3), RSV & HBoV (*3), RSV & HPIV-4, HRV & HPeV, RSV & HCoV-NL63, RSV & HCoV-OC43 (*3), Flu AH1N1 & HBoV, HAdV & HCoV-NL63 (*2), HRV & HCoV-HKU-1 (*2), RSV & Flu B/NT, RSV & HAdV (*2), RSV & Flu A/H1N1 (*2), RSV & HRV/EV (*2), SARS-CoV-2 & Flu A/NT (*2), SARS-CoV-2 & Flu A/H1N1 (*2), SARS-CoV-2 & HRV (*2), Flu A/H1N1 & B/NT & HRV & SARS-CoV-2, Flu A/H1N1 & HAdV, Flu A/H1N1 & HRV, Flu A/H3N2 & HPIV-4, Flu A/H3N2 & HRV, Flu A/NT & Flu B/NT, Flu A/NT & HAdV, Flu A/NT & HRV, HAdV & HCoV-NL63 & HRV/EV & HPIV-3, HAdV & HPIV-3, HAdV& HRV/EV, HBoV & HAdV & EV & HCoV-OC43, HCoV-HKU-1 & HRV/EV, HCoV-NL63 & HPIV-3, HCoV-NL63 & HRV, HPIV-3 & HAdV, HPIV-4 & HAdV, HRV & EV, HRV & HBoV, HRV & HCoV-OC43, RSV & Flu A/H3N2 & HAdV, RSV & Flu A/NT & Flu B/NT, RSV & HAdV & HPIV-3, RSV & HPIV-3, RSV & HRV & EV, SARS-CoV-2 & HBoV, SARS-CoV-2 & HMPV A/B, SARS-CoV-2 & RSV & Flu A/H3N2.

LEBANON

CIDR
Center for Infectious Diseases Research
AMERICAN UNIVERSITY OF BEIRUT

Key findings

- After 2 to 3 years of reduced activity during the COVID-19 pandemic, respiratory virus activity returned. We witnessed an unusual surge of RSV this season. RSV was the predominant respiratory virus requiring hospitalization (271/2187, **12.4%**), followed by SARS-CoV-2 (261/2222, **11.7%**), and Influenza A (168/2205, **7.6%**), specifically the AH3N2 subtype (64 cases, **2.9%**).

- RSV circulated throughout the year, with the highest positivity rate in November (**26%**). Similarly, SARS-CoV-2 circulated throughout the year, with positivity rates somewhat complementing the nadirs of RSV positivity with the highest numbers observed in September (47 cases, positivity rate = **31%**). Influenza A peaked relatively early [November (n=57), December (n=65) and January (n=21)] before ending unusually early in February.

- Notably, there were a substantial number of viral co-infections with RSV (58/100), including 17 RSV & Influenza A cases, 16 RSV & SARS-CoV-2 cases, and 11 RSV & HRV cases, among others.

- Among children under 5 years of age, HRV and HAdV were the most prevalent ORV responsible for hospitalizations, accounting for **44.8%** (13/29) and **55.8%** (7/13) of ORV admissions, respectively.

- RSV-related hospitalizations were significantly higher in children <1 year (151/266, **57%**) ($p<0.001$) while SARS-CoV-2-related hospitalizations were significantly prevalent in those aged 65 years and older (118/238, **49.6%**) ($p<0.001$).

LEBANON

CIDR
Center for Infectious Diseases Research
AMERICAN UNIVERSITY OF BEIRUT

Key findings

- Subjects with underlying health conditions accounted for 979 out of 2118 (**46.2%**) of all acute respiratory infection-associated hospitalizations with SARS-CoV-2-related hospitalizations having the highest rate (176/238, **73.9%**).

- Co-morbidities were common in patients admitted with SARS-CoV-2 & Influenza A where 132/237 (**55.7%**) & 44/161 (**27.3%**), respectively had CVD and 65/236 (**27.5%**) & 30/160 (**18.8%**), respectively, had DM, whereas the rate of co-morbidities in RSV-related hospitalizations was somewhat lower: 35/257 (**13.6%**) had CVD and 17/255 (**7%**) were premature babies or had a history of prematurity indicating that RSV causes more hospitalizations in otherwise healthy patients (mostly children).

- A significant proportion of acute respiratory infection hospitalizations was in unvaccinated individuals for both COVID-19 (1487/2115, **70.3%**) and Influenza virus (1944/2085, **93.2%**).

- More than half of individuals with acute respiratory infection presented with confusion or lethargy upon arrival at the emergency department (ED) (1153/2115, **54.5%**)

- Approximately 1 in 4 patients infected with SARS-CoV-2 or RSV required ICU admission (65/238, **27.3%** & 55/266, **20.7%**, respectively)

- Mortality rate in hospitalized SARS-CoV-2 positive patients (19/238, **8%**) was higher in comparison to RSV and Influenza positive patients (5/266, **2%** versus 6/176, **3%**, respectively). Elderly 65 years and above accounted for **71%** (n=63) of the mortalities (total of 89 mortalities).

LEBANON

CIDR
Center for Infectious Diseases Research
AMERICAN UNIVERSITY OF BEIRUT

Challenges

- **Subject Recruitment**: Sampling inconvenience led to a higher number of potential subjects refusing to participate compared to previous seasons (NP sampling fatigue).
- **Case Definition**: Adherence to the Extended SARI case definition resulted in missing some positive respiratory viral infections, especially those presenting with general symptoms or respiratory symptoms other than cough.
- **Economic Crisis Impact**: A low number of admissions for acute respiratory infections was observed due to the economic crisis, with many patients preferring treatment in the ED for a few hours, even when admission was necessary. Many patients with confirmed positive viruses came to the ED then got discharged in less than 24 hours.
- **Hospital Administration Changes**: One participating site experienced a decrease in admissions due to changes in hospital administration and staffing.
- **Data monitoring**: Challenges in close monitoring of screening and data collection processes at some non-AUBMC sites that require optimization.
- **Data Entry Delays**: Online data entry of non-AUBMC cases is subject to delays, ranging from 2 to 3 weeks after enrollment, due to delays from hospitals, late discharges of some patients, and missing information requiring follow-up with collaborators and revisiting the questionnaires for final completion.
- **Limited funding**: The inability to conduct respiratory panels on all collected samples was due to limited funding.

COFFEE BREAK

GIHSN ANNUAL MEETING 2023

GIHSN DESCRIPTIVE ANALYSIS 2022-23: OVERVIEW

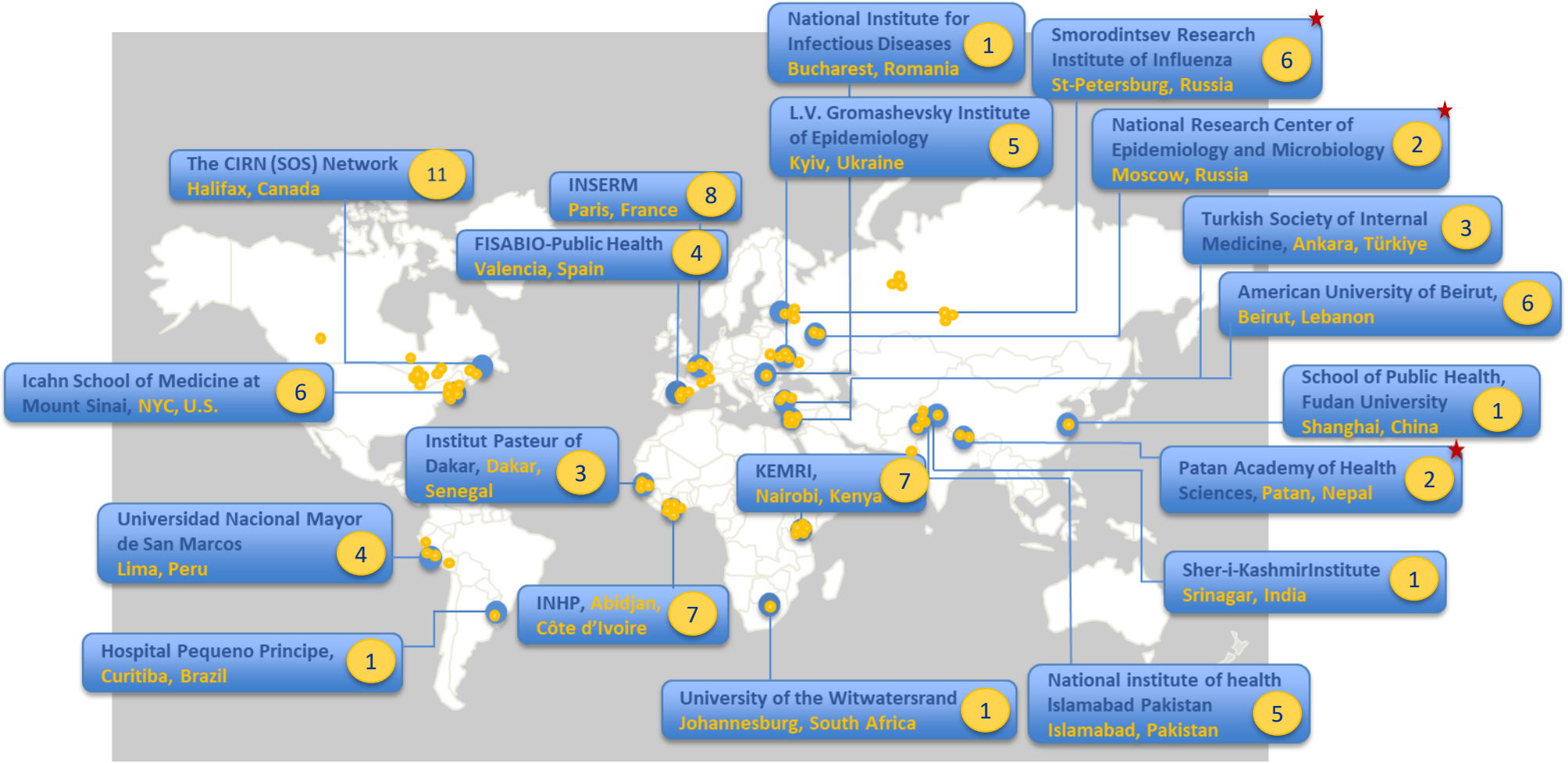
Catherine COMMAILLE-CHAPUS, GIHSN Coordination & Data Management

Foundation for Influenza Epidemiology

Sous l'égide de Fondation de France

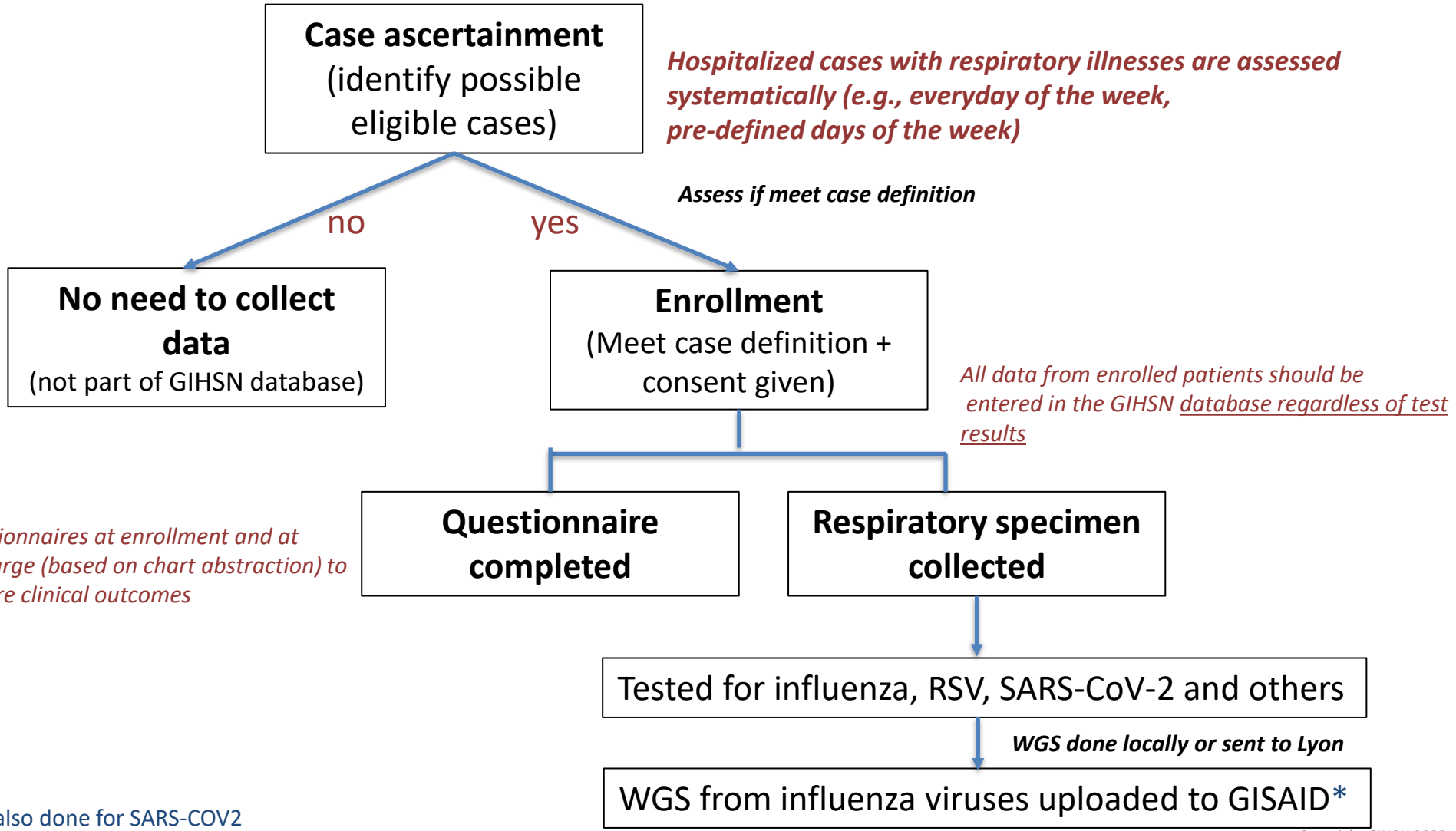
IMPACT Healthcare

18 SITES PARTICIPATED IN THE GIHSN IN 2022_23



Global Influenza Hospital Surveillance Network

PROCESS FOR IDENTIFICATION OF CASES AND DATA COLLECTION - GIHSN



*WGS also done for SARS-COV2

Global Influenza Hospital Surveillance Network

VIRUSES TESTED BY SITES 2022-23

(BASED ON DATA SHARED IN THE GIHSN THIS SEASON)
(*BASED ON DATA SHARED IN THE GIHSN LAST SEASON – CHINA/FRANCE)

		Testing in 2022-23 included :									
Country	Site/Institution	Influenza	SARS-CoV2	RSV	HCoV	HMPV	AdV	HBoV	HPIV	RhV	ORV
Africa											
Kenya	Kenya Medical Research Institute (KEMRI), Nairobi										
Côte d'Ivoire	Institut National d'Hygiène Publique (INHP), Abidjan										
Senegal	Institut Pasteur of Dakar (IPD), Dakar										
South Africa	University of the Witwatersrand, Johannesburg										
Asia/Pacific											
China*	School of Public Health, Fudan University, Shanghai										
India	Sher-i-Kashmir Institute, Srinagar										
Nepal	Patan Academy of Health Sciences										
Pakistan	National institute of health, Islamabad										
Middle East											
Türkiye	Turkish Society of Internal Medicine, Ankara										
Lebanon	American University of Beirut, Beirut										

Global Influenza Hospital Surveillance Network

VIRUSES TESTED BY SITES 2022-23

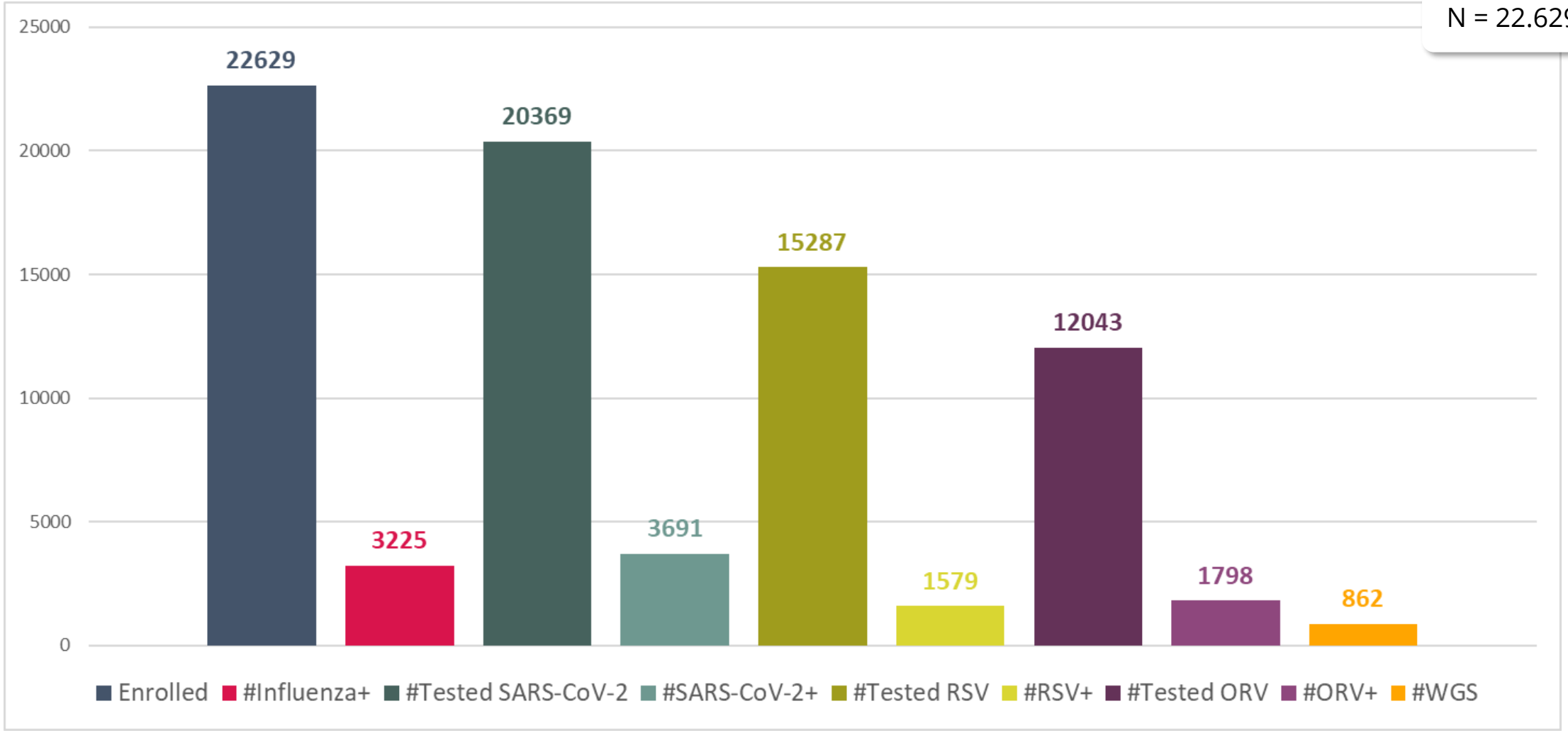
(BASED ON DATA SHARED IN THE GIHSN THIS SEASON)
(*BASED ON DATA SHARED IN THE GIHSN LAST SEASON – CHINA/FRANCE)

		Testing in 2022-23 included :									
Country	Site/Institution	Influenza	SARS-CoV2	RSV	HCoV	HMPV	AdV	HBoV	HPIV	RhV	ORV
Eurasia											
Russia - St Petersburg	Smorodintsev Research Institute of Influenza, St Petersburg, Russia										
Russia - Moscow	FSBI "N.F. Gamaleya NRCEM" Ministry of Health, Moscow										
Ukraine	L.V.Gromashevsky Institute of Epidemiology & Infectious Diseases, Kyiv										
Spain	FISABIO, Valencia										
Romania	National Institute for Infectious Diseases "Prof. Dr. Matei Bals", Bucharest										
France*	I-REIVAC (Innovative clinical research network in vaccinology), Paris										
North America											
Canada	The CIRN Serious Outcomes Surveillance (SOS) Network, Halifax										
USA	Icahn School of Medicine at Mount Sinai, NYC										
South America											
Brazil	Hospital Pequeno Principe, Curitiba										
Peru	Instituto de Medicina Tropical, Lima										

Global Influenza Hospital Surveillance Network

OVERALL NB OF PATIENTS ENROLLED AND POSITIVE CASES OF INFLUENZA, SARS-COV2, RSV AND ORV (2022-23) (#)
(AS OF NOVEMBER 3RD, 2023)

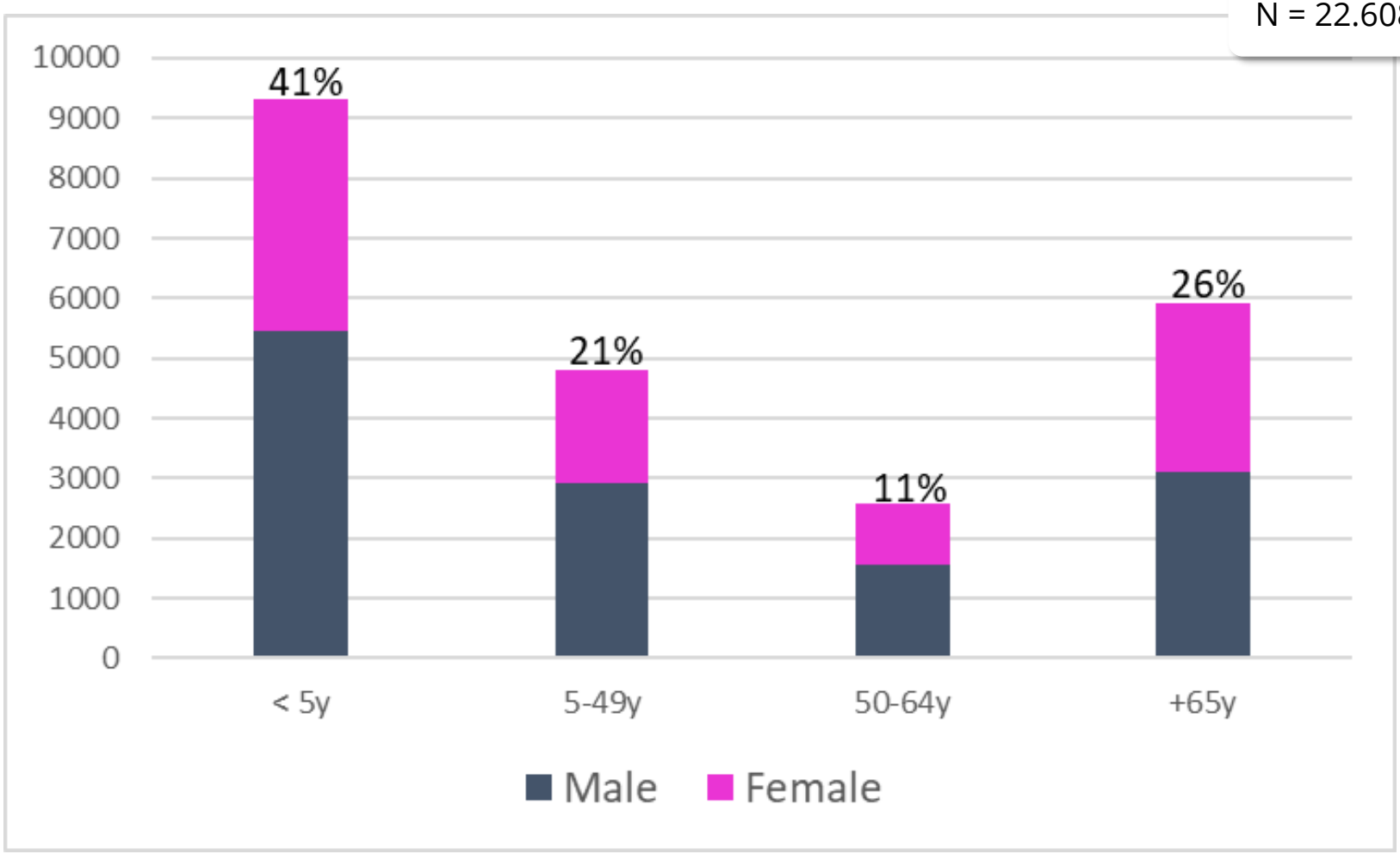
N = 22.629



Global Influenza Hospital Surveillance Network

DISTRIBUTION OF ENROLLED PATIENTS BY AGE GROUP AND SEX – ALL SITES (2022_23) (#)
(AS OF NOVEMBER 3RD, 2023)

N = 22.608*

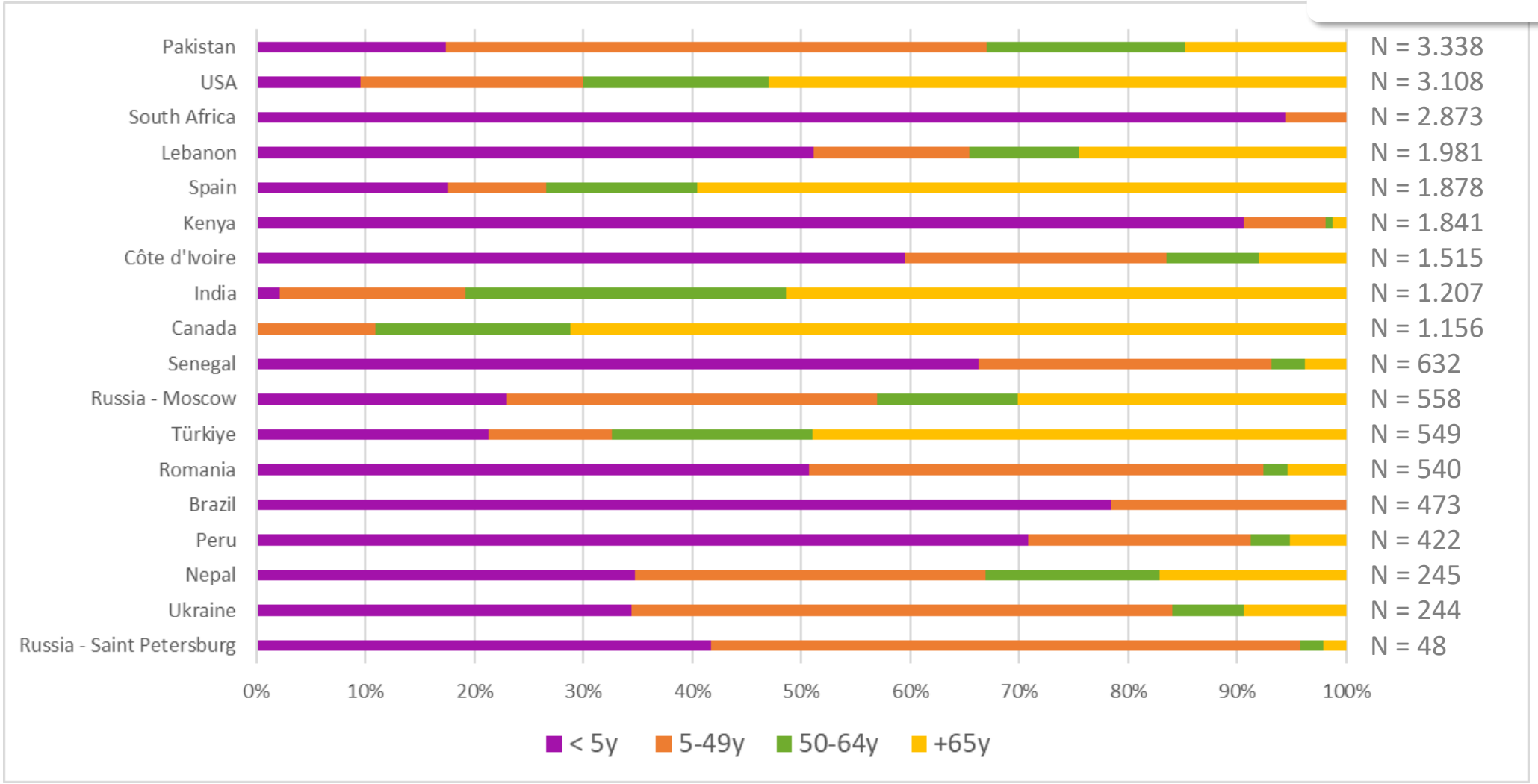


*No age completed for 21 patients

Global Influenza Hospital Surveillance Network

DISTRIBUTION OF ENROLLED PATIENTS BY AGE GROUP – BY SITE (2022_23) (#)
(AS OF NOVEMBER 3RD, 2023)

N total = 22.608*



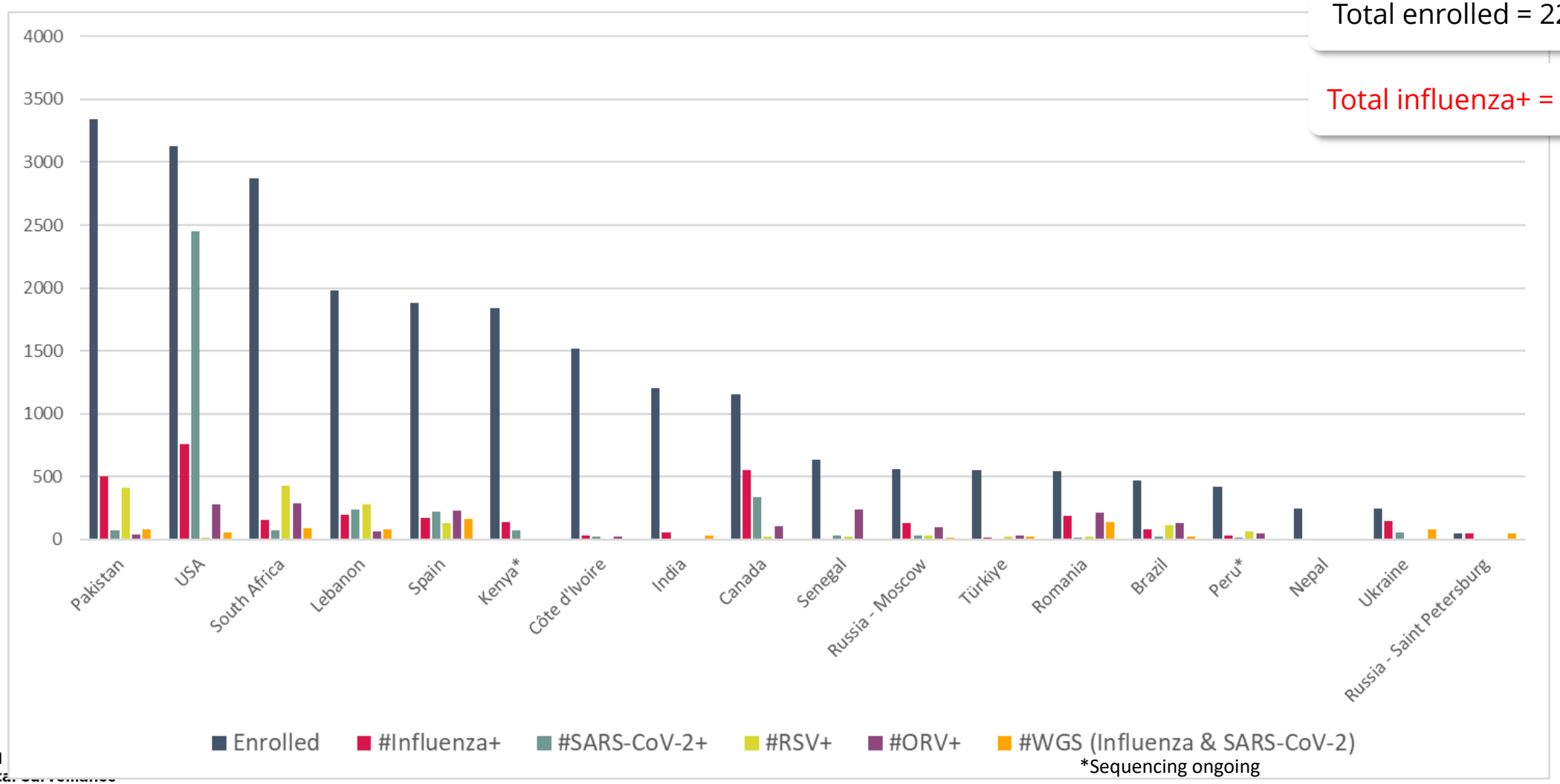
*No age completed for 21 patients

Global Influenza Hospital Surveillance Network

DISTRIBUTION OF PATIENTS BY SITE (2022-23) (#)
(AS OF NOVEMBER 3RD, 2023)

Total enrolled = 22.629

Total influenza+ = 3.225

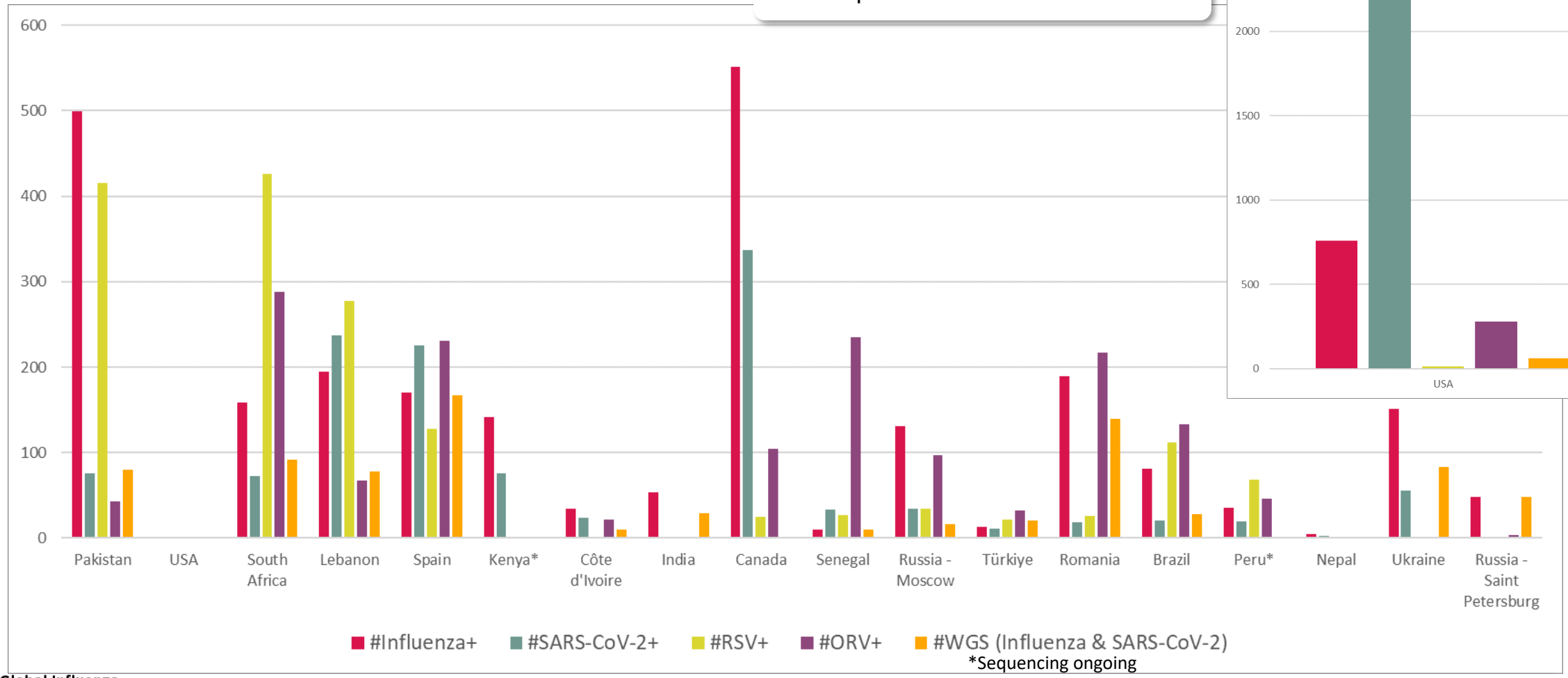


*Sequencing ongoing

Global Hospital Surveillance Network

DISTRIBUTION OF PATIENTS BY SITE (2022-23) (#)
(AS OF NOVEMBER 3RD, 2023)

Total positives to a virus = 9.533



*Sequencing ongoing

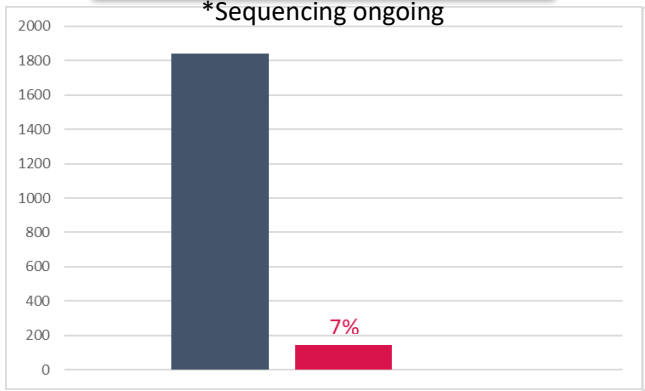
Global Influenza Hospital Surveillance Network

NBER OF ENROLLED PATIENTS, INFLUENZA POSITIVITY (2022-23)
(AS OF NOVEMBER 3RD, 2023)

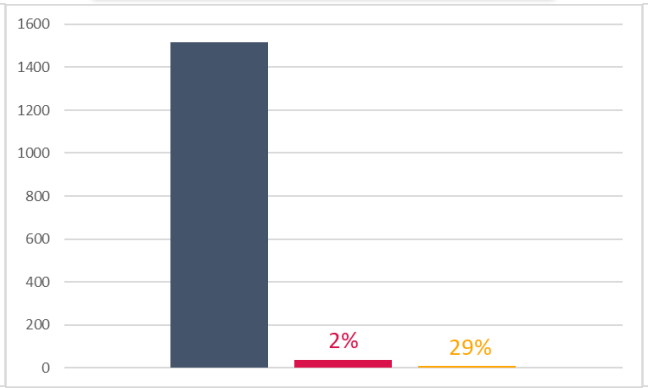
AFRICA

Kenya*

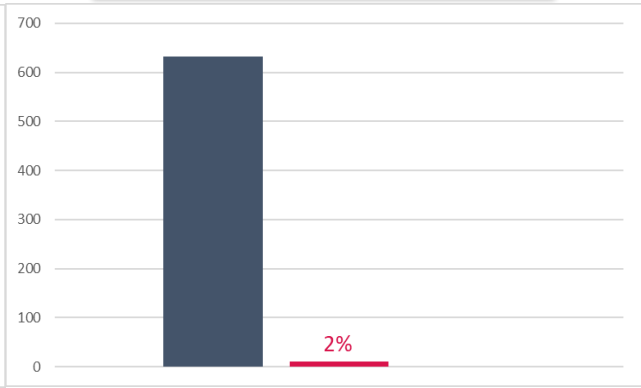
*Sequencing ongoing



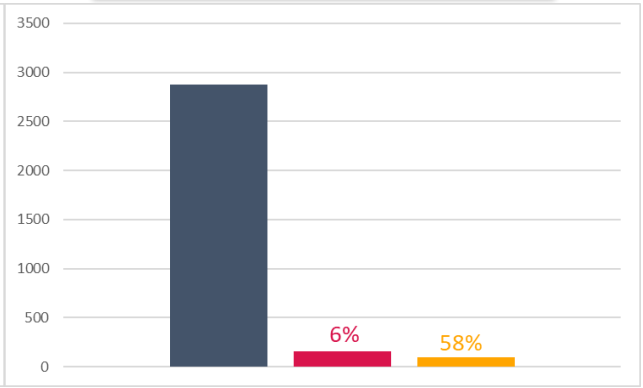
Côte d'Ivoire



Senegal

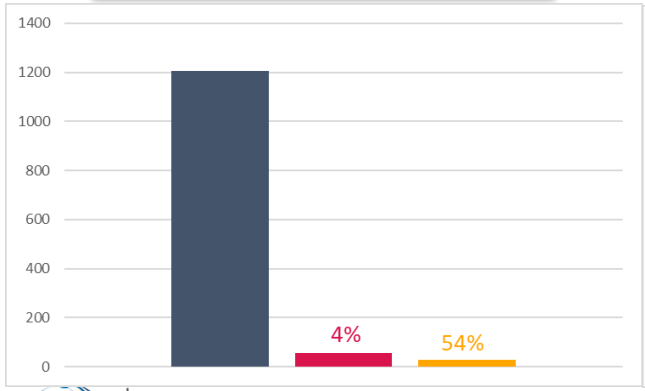


South Africa

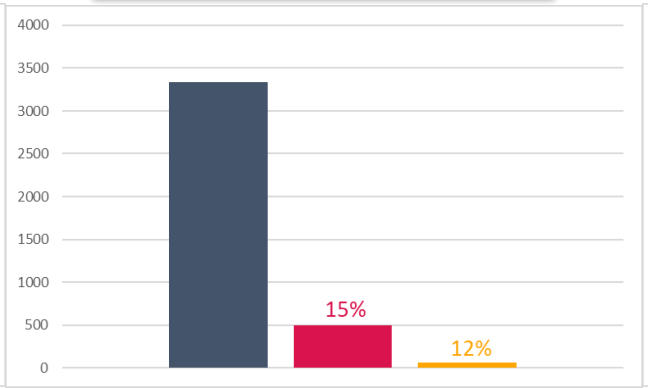


ASIA

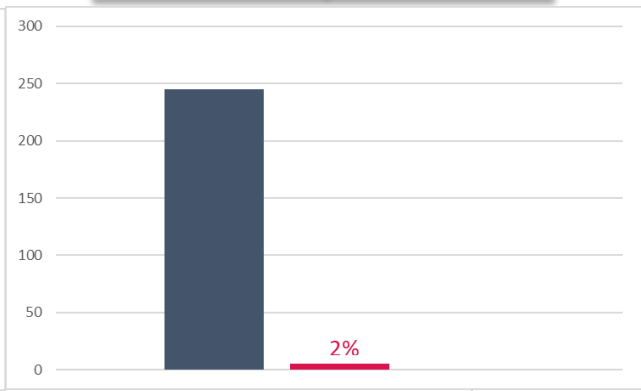
India



Pakistan



Nepal



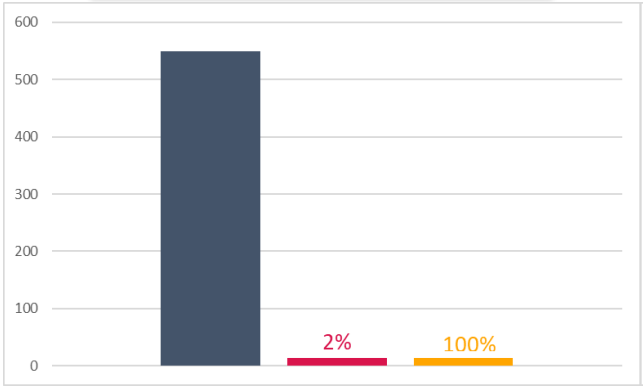
Global Influenza Hospital Surveillance Network

Enrolled #Influenza+ #WGS Influenza

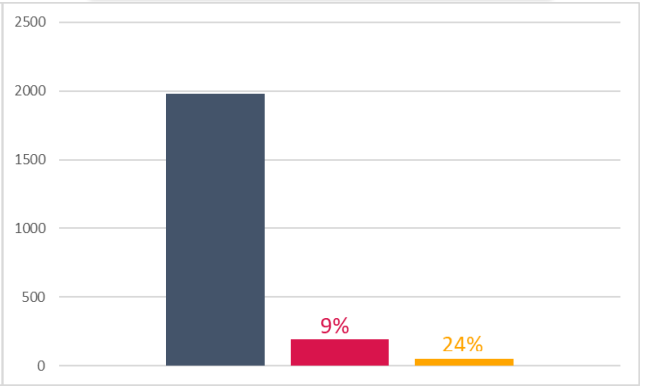
NBER OF ENROLLED PATIENTS, INFLUENZA POSITIVITY (2022-23)
(AS OF NOVEMBER 3RD, 2023)

MIDDLE EAST

Türkiye



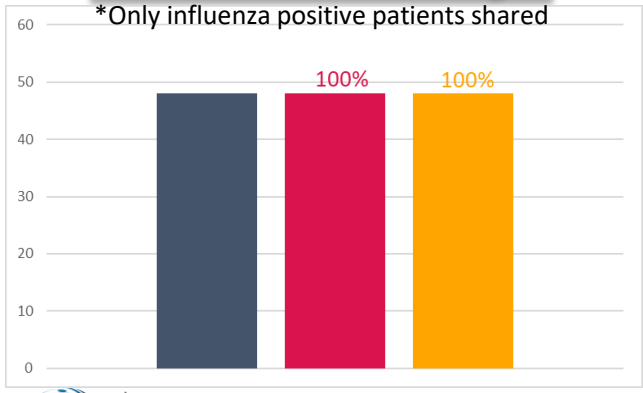
Lebanon



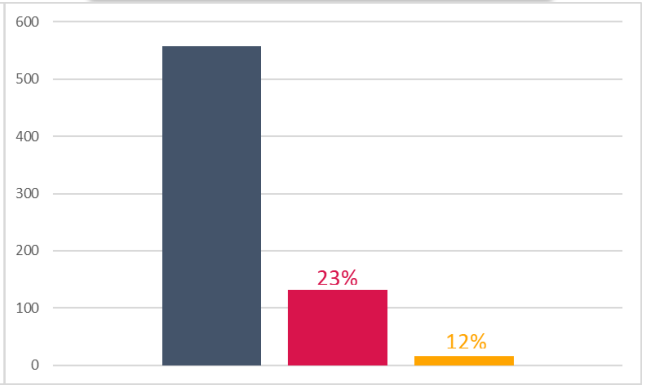
EURASIA

Russia-St Petersburg*

*Only influenza positive patients shared



Russia-Moscow



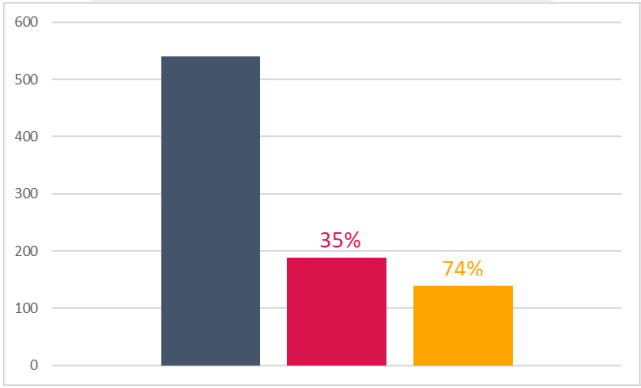
Global Influenza Hospital Surveillance Network

Enrolled #Influenza+ #WGS Influenza

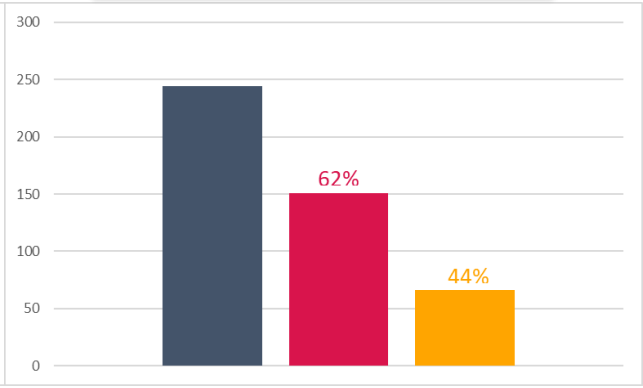
NBER OF ENROLLED PATIENTS, INFLUENZA POSITIVITY (2022-23)
(AS OF NOVEMBER 3RD, 2023)

EUROPE

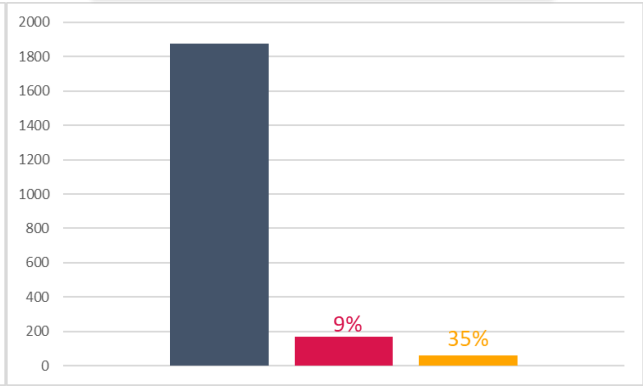
Romania



Ukraine

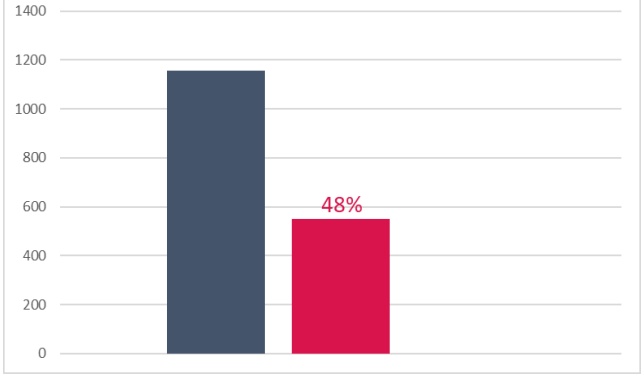


Spain

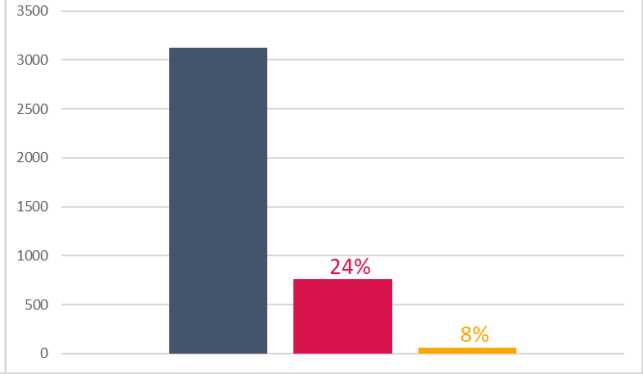


AMERICAS

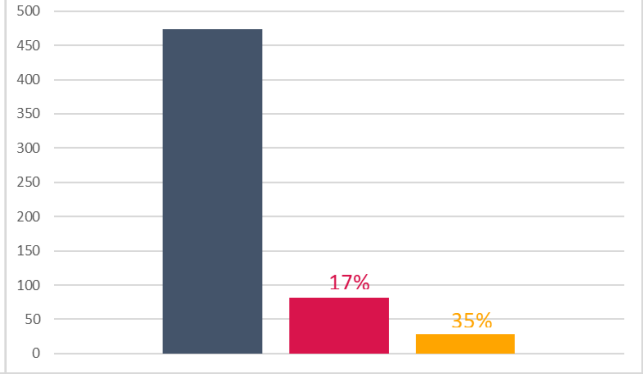
Canada



USA

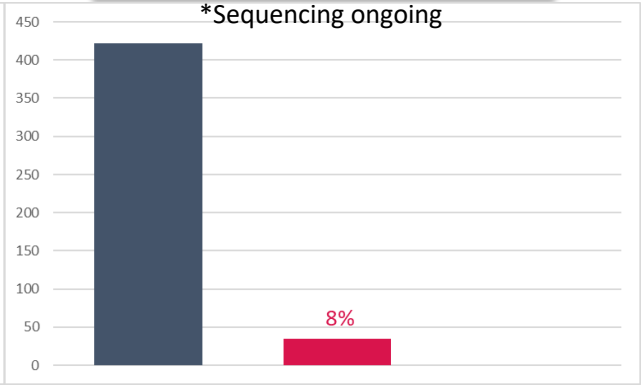


Brazil



Peru*

*Sequencing ongoing



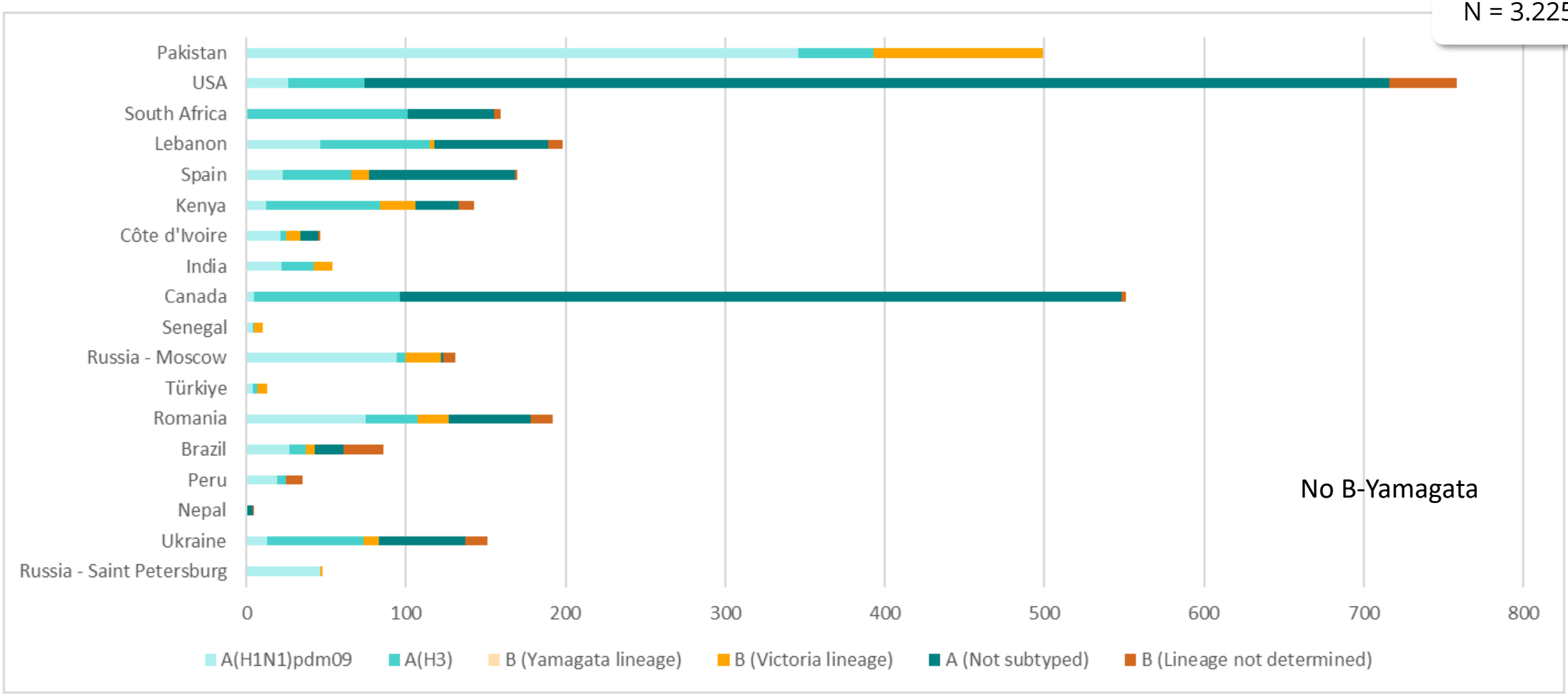
Global Influenza Hospital Surveillance Network

Enrolled #Influenza+ #WGS Influenza

DISTRIBUTION OF LAB CONFIRMED INFLUENZA CASES BY VIRUS SUBTYPE AND LINEAGE (22_23) (#)

(AS OF NOVEMBER 3RD, 2023)

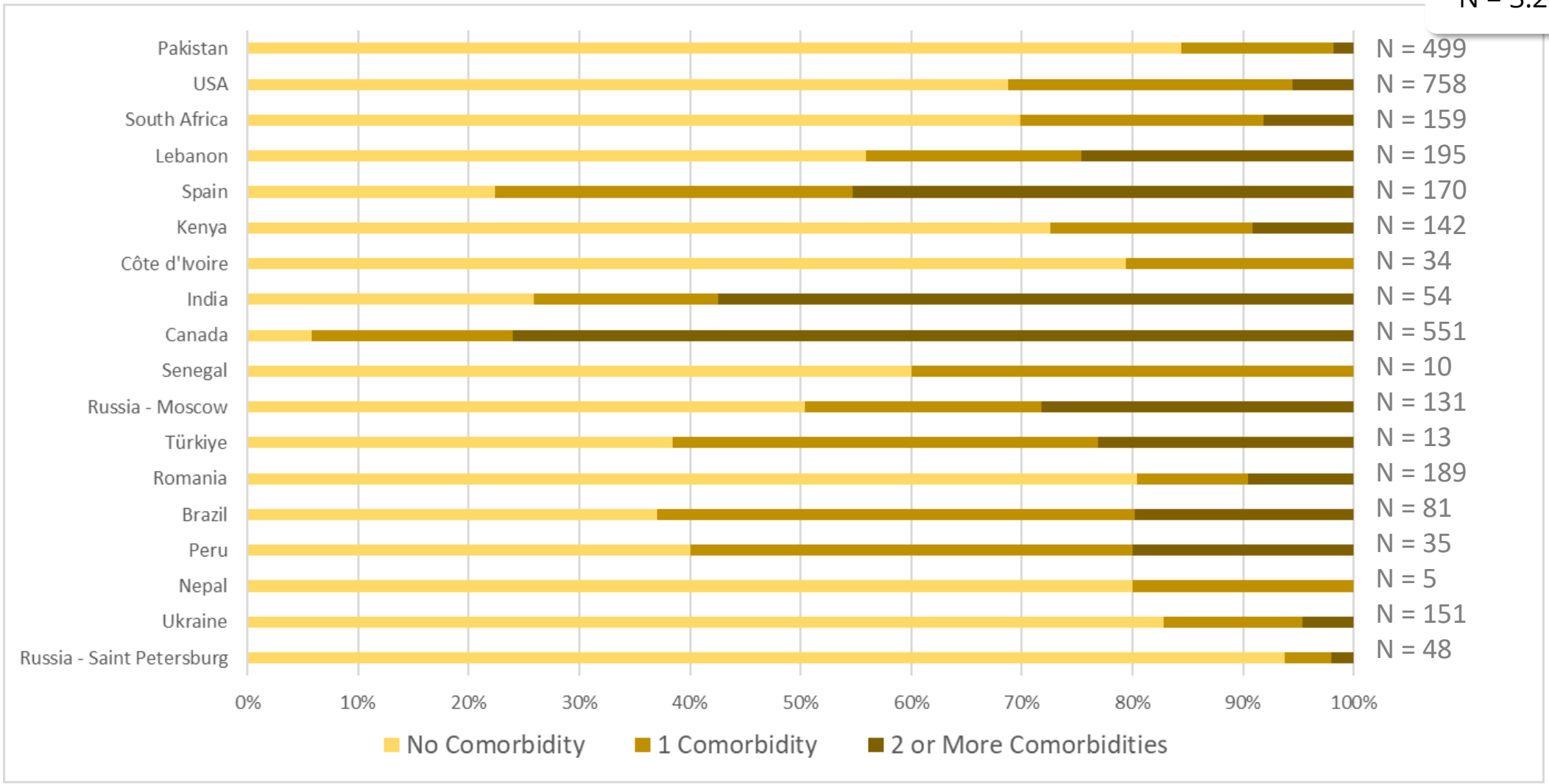
N = 3.225



No B-Yamagata

PRESENCE OF COMORBIDITIES AMONG LAB CONFIRMED INFLUENZA CASES - BY SITE (22_23) (%)
(AS OF NOVEMBER 3RD, 2023)

N = 3.225

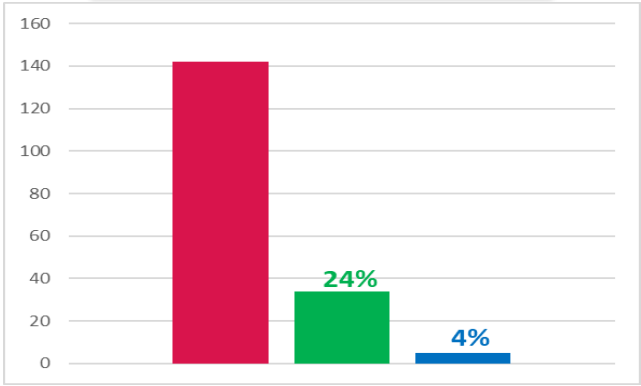


ICU ADMISSIONS AND DEATHS AMONG LAB CONFIRMED INFLUENZA CASES – BY SITE (22_23) (#)

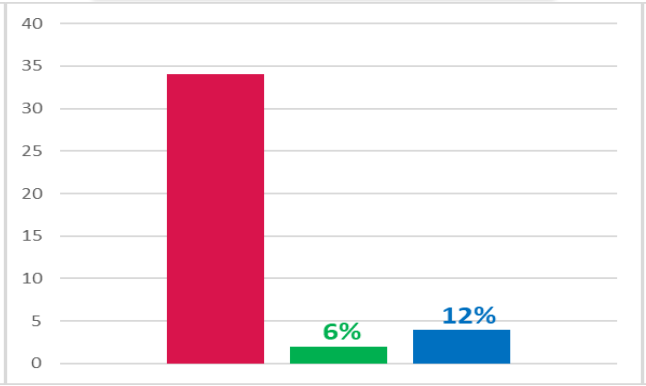
(AS OF NOVEMBER 3RD, 2023)

AFRICA

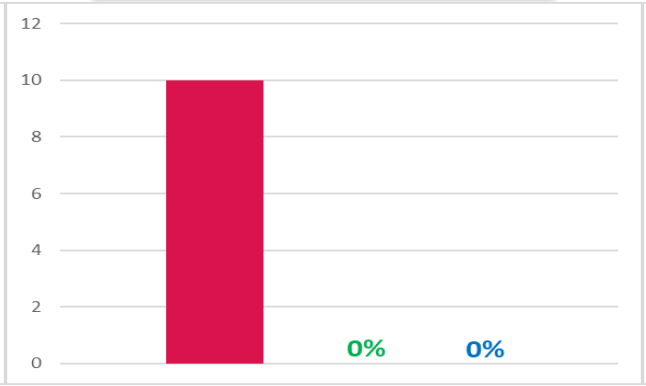
Kenya



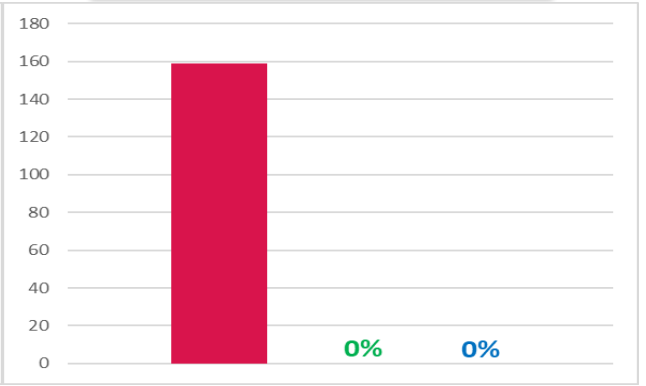
Côte d'Ivoire



Senegal

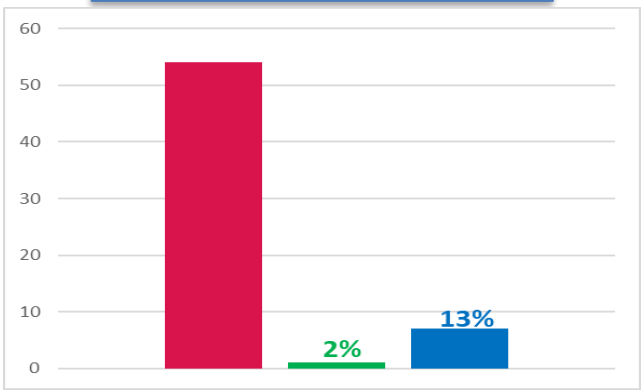


South Africa

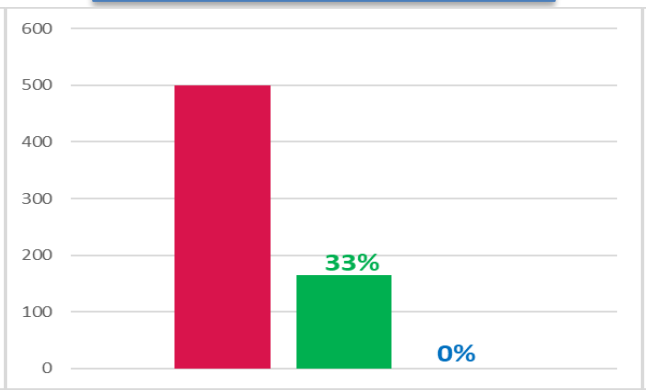


ASIA

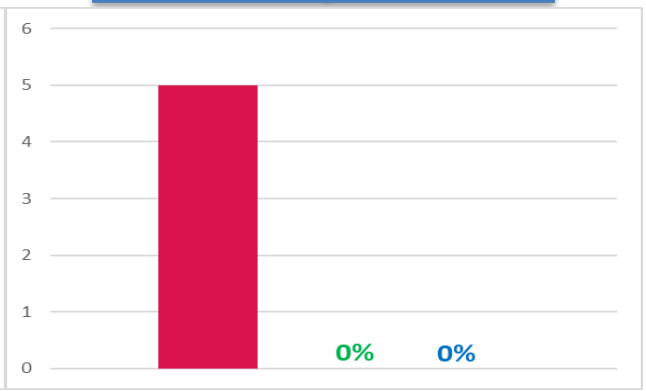
Inde



Pakistan



Nepal



Global Influenza Hospital Surveillance Network

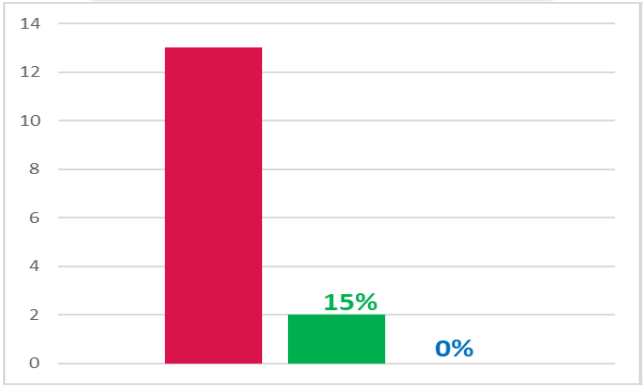
#Influenza+ #ICU admissions #Deaths

ICU ADMISSIONS AND DEATHS AMONG LAB CONFIRMED INFLUENZA CASES – BY SITE (22_23) (#)

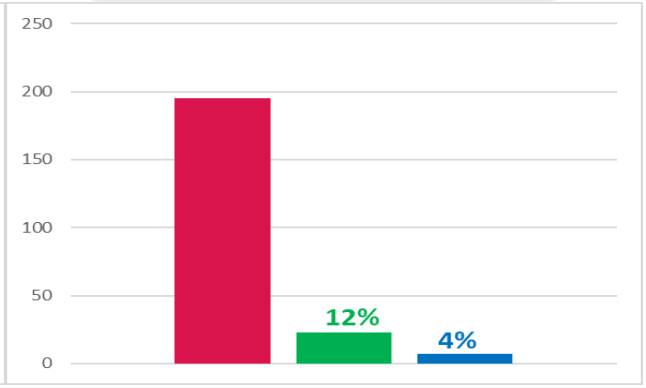
(AS OF NOVEMBER 3RD, 2023)

MIDDLE EAST

Türkiye

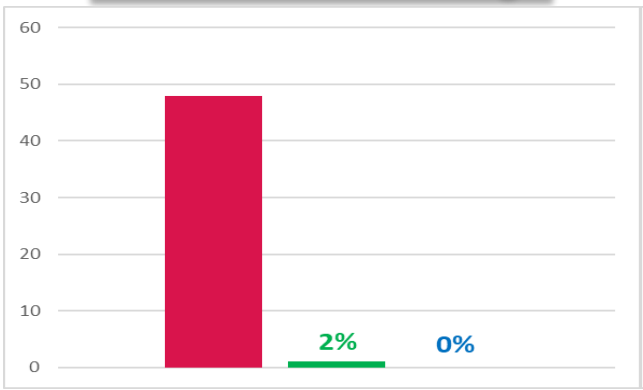


Lebanon

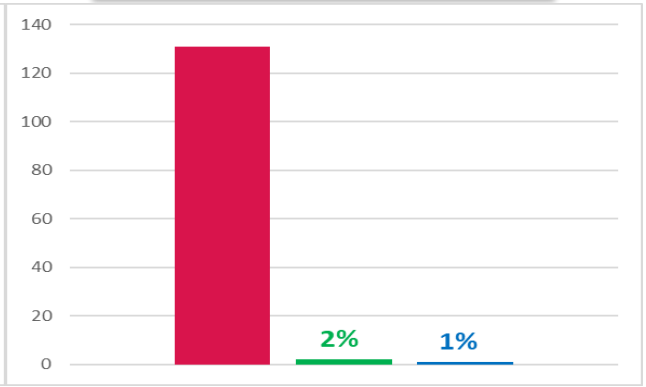


EURASIA

Russia-St Petersburg



Russia-Moscow



Global Influenza Hospital Surveillance Network

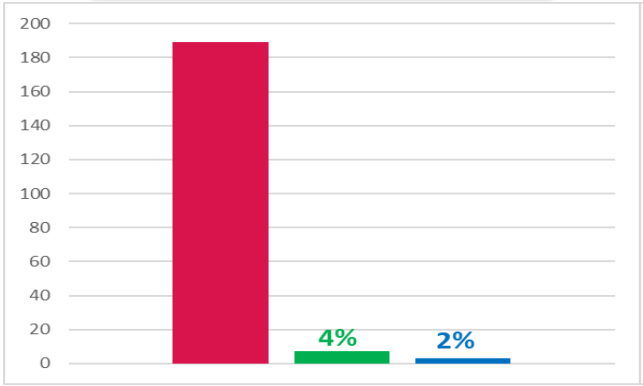
#Influenza+ #ICU admissions #Deaths

ICU ADMISSIONS AND DEATHS AMONG LAB CONFIRMED INFLUENZA CASES – BY SITE (22_23) (#)

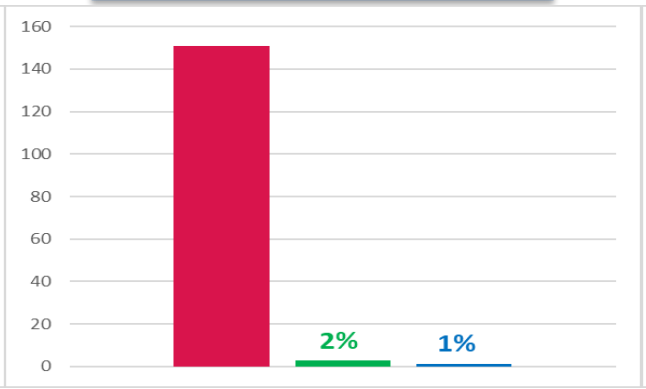
(AS OF NOVEMBER 3RD, 2023)

EUROPE

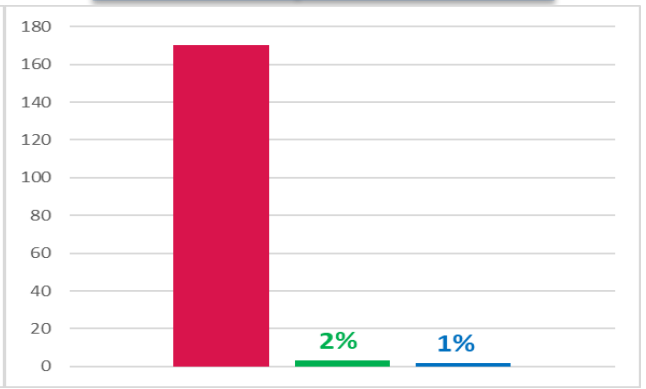
ROMANIA



Ukraine

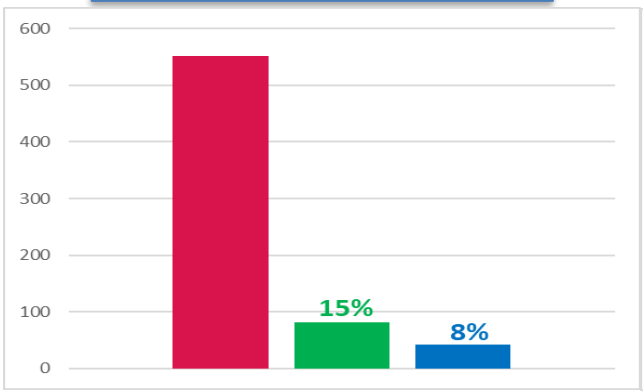


Spain

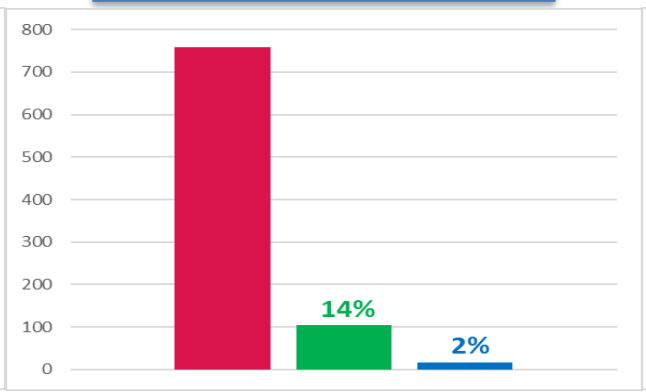


AMERICAS

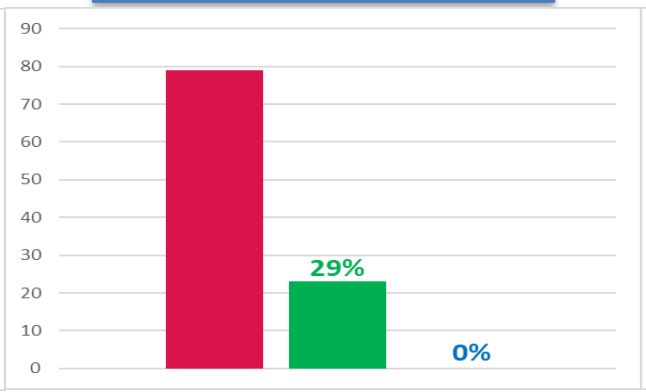
Canada



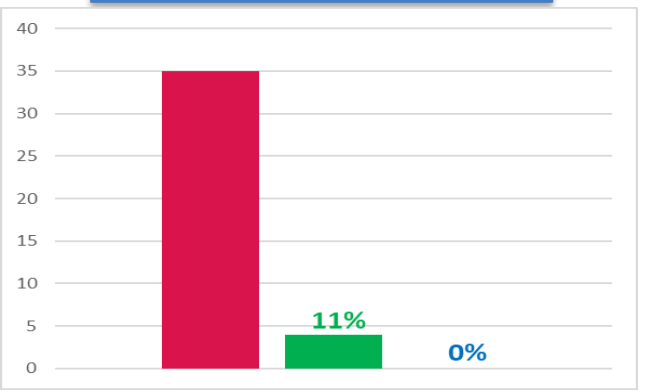
USA



Brazil



Peru



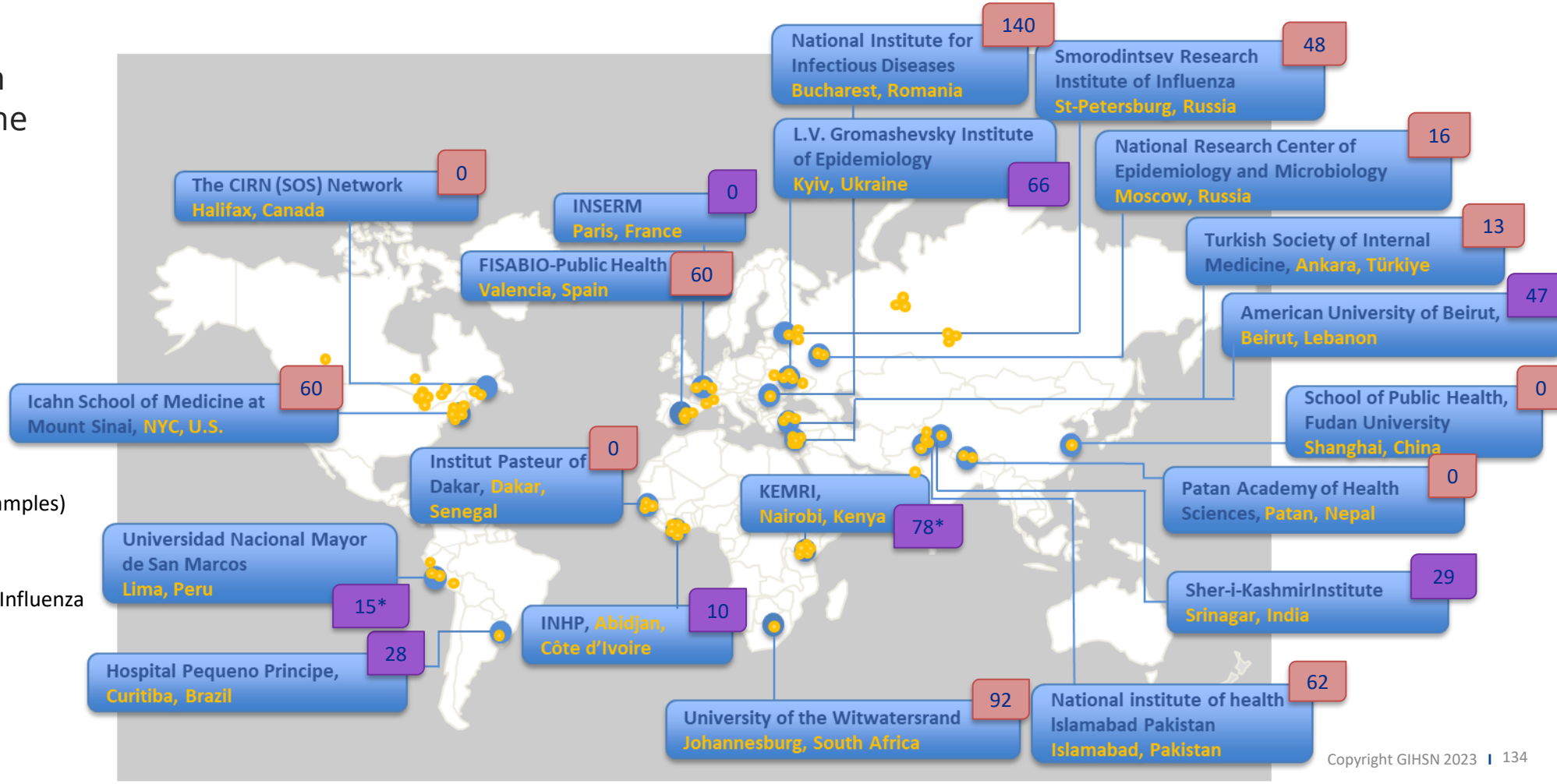
Global Influenza Hospital Surveillance Network

#Influenza+ #ICU admissions #Deaths

OVERVIEW OF INFLUENZA VIRUSES SEQUENCED (22_23) (#)
(AS OF NOVEMBER 3RD, 2023 IN THE GIHSN DATABASE)

764 influenza positive samples were detected and fully sequenced (or sequencing ongoing), either locally by sites (491), or through the GIHSN sequencing platform at the NIC in Lyon, France (273).

Results were shared with WHO in preparation of the Vaccine Composition Meetings of Feb and Sep 2023.



Sequencing done locally (total 491 samples)

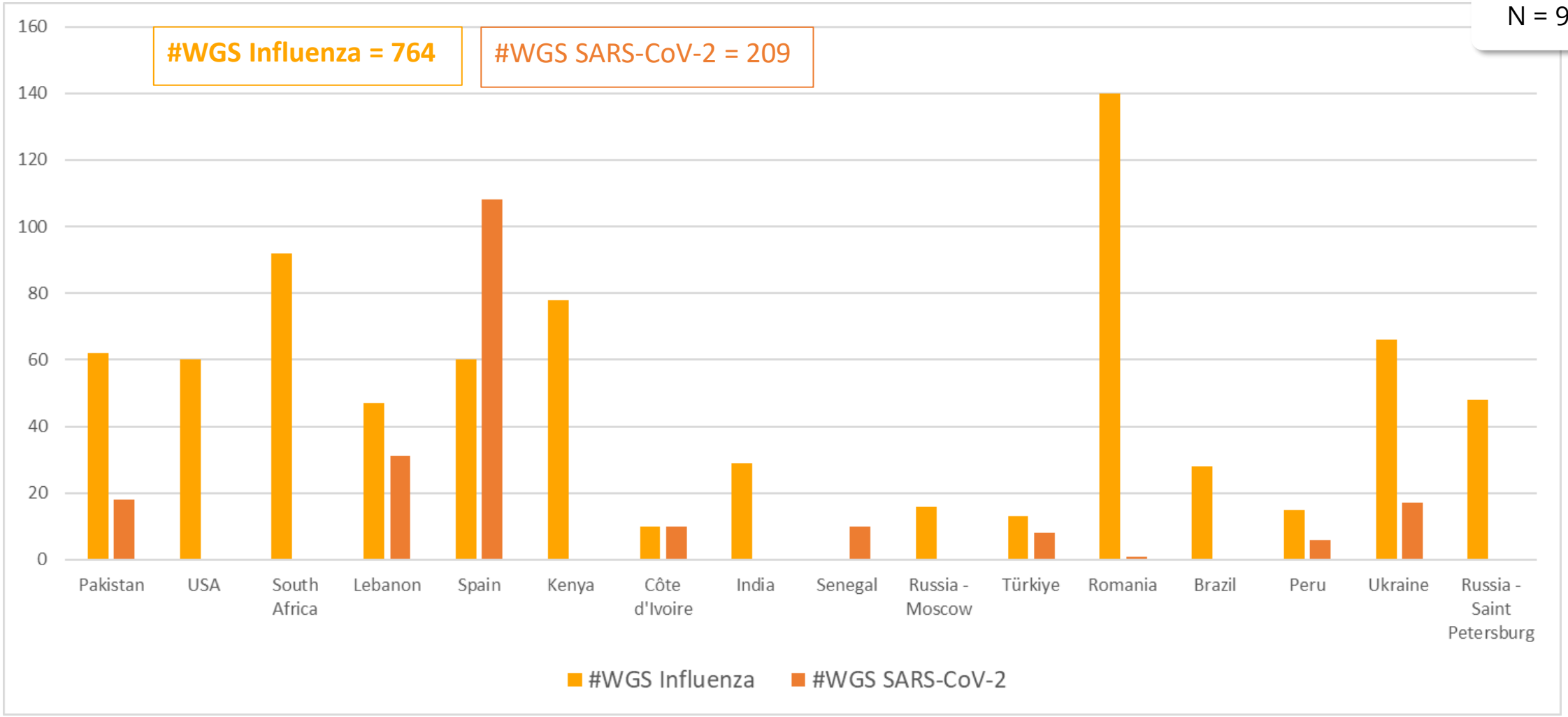
Sequencing done through the GIHSN sequencing platform at the National Influenza center in Lyon (total 273 samples)

* Not yet in the GIHSN database

Global Influenza Hospital Surveillance Network

WGS BY SITE (2022_23) (#)
(AS OF NOVEMBER 3RD, 2023 IN THE GIHSN DATABASE)

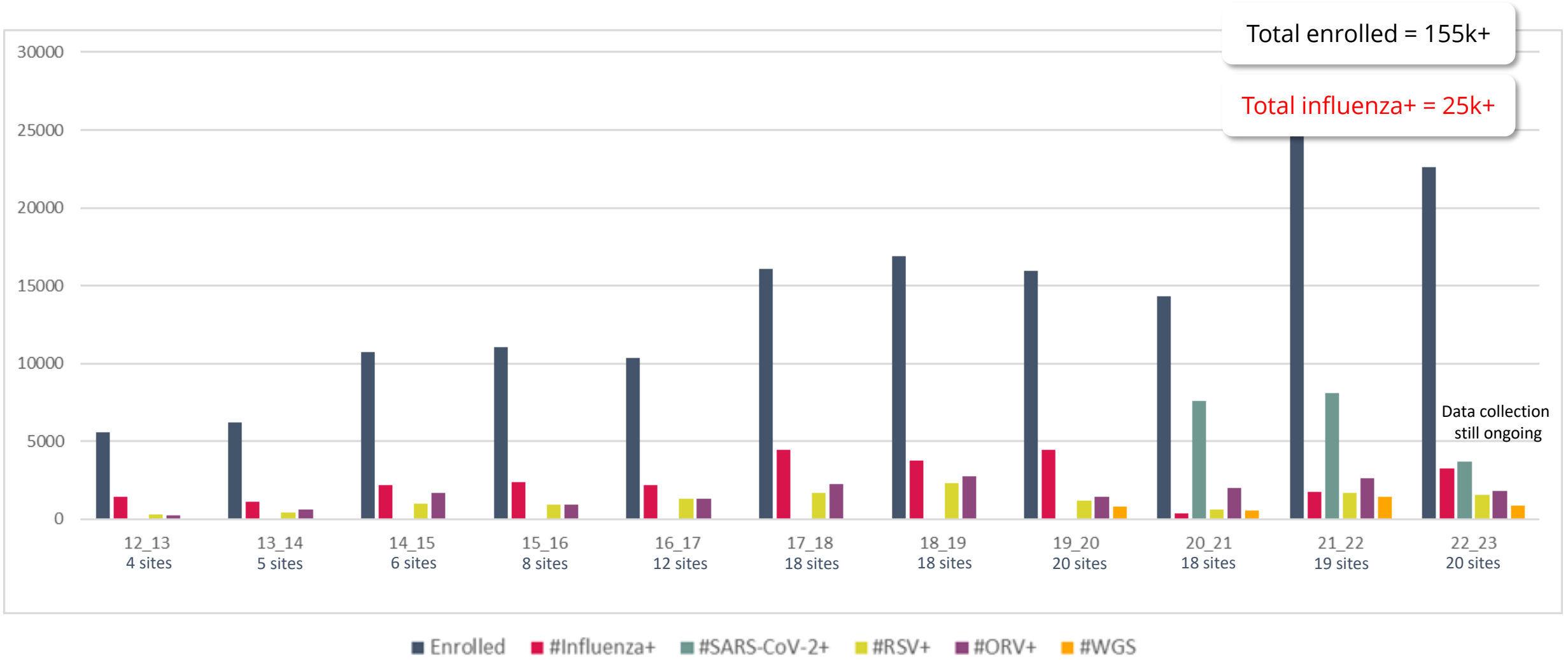
N = 961*



*99 not yet in the GIHSN database

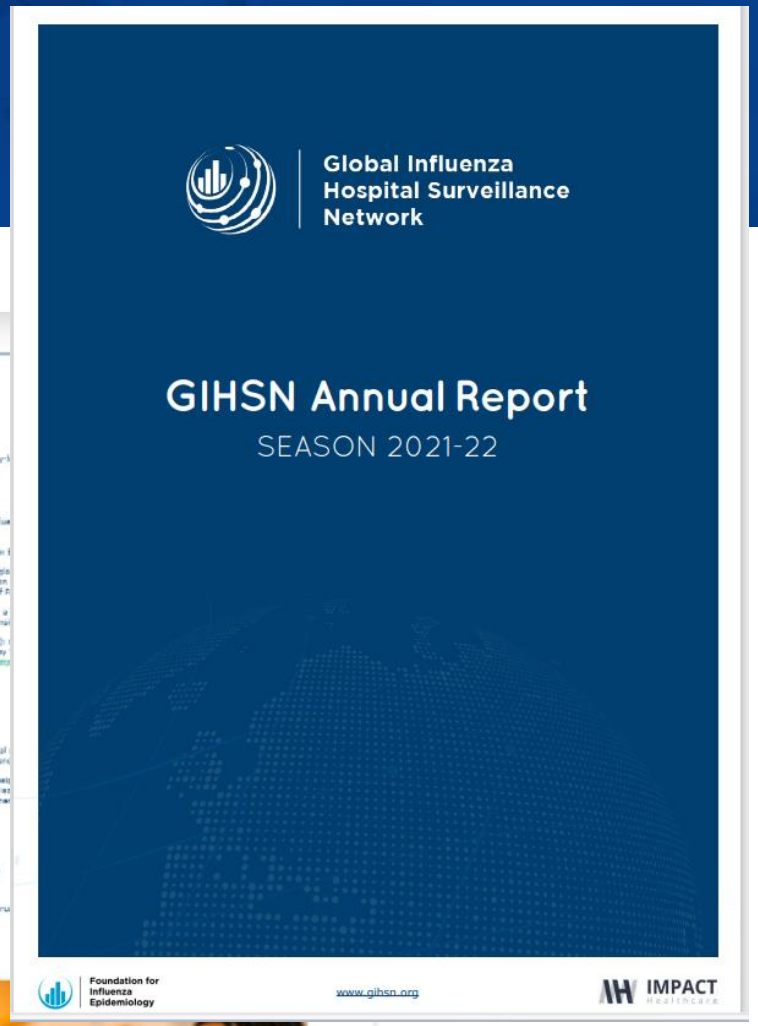
Global Influenza Hospital Surveillance Network

THE GIHSN OVER THE SEASONS
PATIENT DISTRIBUTION BY SEASON (2012-13 TO 2022-23)



Global Influenza Hospital Surveillance Network

ALL RESULTS WILL BE PRESENTED IN THE GIHSN ANNUAL REPORT 2022-23



[Annual Report 2021-2022 - (gihsn.org)]

THANK YOU!

Q&A

ANNUAL MEETING, 16 NOVEMBER 2023

INTRODUCTION TO SEASON 2023-24, PRESENTATION OF NEW SITES

Laurence Torcel-Pagnon, Foundation for Influenza Epidemiology

Foundation for Influenza Epidemiology

Sous l'égide de Fondation de France

CALL FOR 2023-24

CALL FOR PROPOSAL
Year-round surveillance 2023-2024

GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK: LINKING EPIDEMIOLOGICAL AND CLINICAL DATA TO VIROLOGICAL INFORMATION

OBJECTIVE

The Foundation for Influenza Epidemiology seeks to support hospital-based sentinel surveillance sites that can improve our understanding of influenza epidemiology and other respiratory viruses and contribute to the WHO's vaccine strain selection process by monitoring influenza virus circulation and hospital-associated disease burden as part of the Global Influenza Hospital Surveillance Network (GIHSN).

We are looking for non-profit institutions with experience in hospital-based surveillance for influenza and other respiratory viruses that would be willing to participate in the GIHSN using a standardized protocol for case ascertainment and respiratory sample collection.

- Same selection criteria and protocol than 2022-2023
- Targeted approach to reach out potential new sites with the support of the Independent Scientific Committee

The foundation welcome sites with existing surveillances to join the GIHSN network and share data for pooled analysis

Catalytic funding could be allocated by the foundation to support sites implementation (pending to yearly annual budget of the Foundation)

Global Influenza Hospital Surveillance Network

GAPS ANALYSIS FOR 2023-24

WHO INFLUENZA TRANSMISSION ZONES

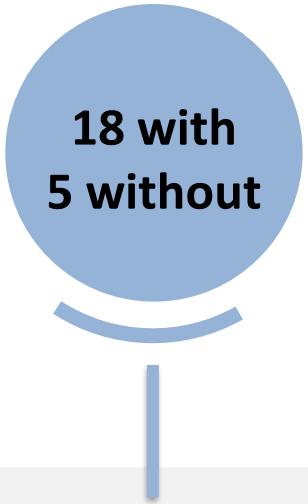
Targeted approach to on-board new sites in some zones (observed gaps):

- Oceania Melanesia and Polynesia -> to collect data
- Africa (Eastern and Western zones -> to increase volume
- Central America Caribbean and Temperate South America -> to increase volume

FINAL SELECTION FOR 2023-24

Selected sites

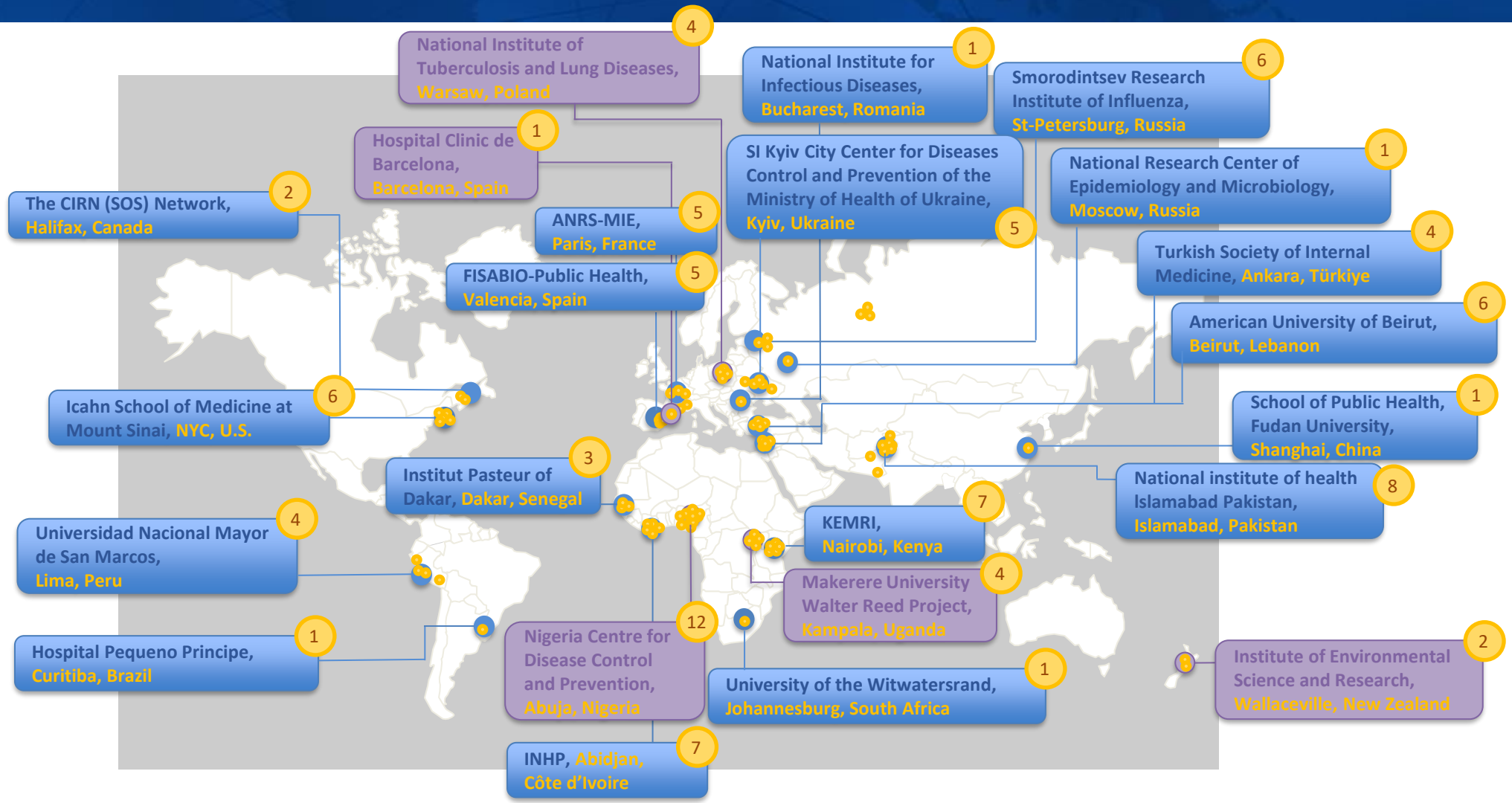
New: New Zealand, Uganda, Nigeria, Poland, Spain Barcelona



Catalytic funding

Without funding (Canada, France, Russia St. Petersburg & Moscow, Spain Barcelona)

GEOGRAPHIC DISTRIBUTION OF THE SITES FOR 2023-24



Global Influenza Hospital Surveillance Network

GIHSN sites (2023-24) New GIHSN sites (2023-24) x Number of hospitals per site Hospital location

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: NEW ZEALAND

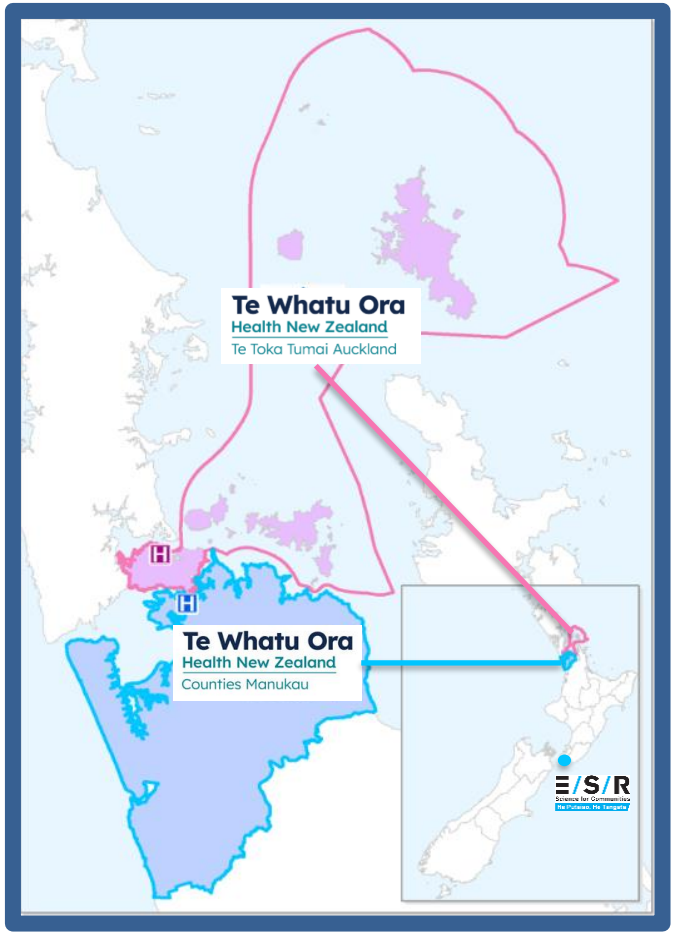
PI: Sue Huang

NEW ZEALAND

SARI and non-SARI Hospital surveillance, Auckland, NZ

- *Coordinating site: ESR, Wallaceville, Upper Hutt, New Zealand*

Participating hospitals:	**Te Whatu Ora Te Toka Tumai Auckland**	**Te Whatu Ora Counties Manukau**
Setting	Urban	Urban
Capacity	Auckland City Hospital 1000 beds Starship Kids Hospital 219 beds	Middlemore Hospital 860 beds Kidz First Children's Hospital 82 beds
Services	Secondary-level (hospital and specialist) care Specialist tertiary services (organ transplants (heart, lung, and liver), acute major airway obstruction transferred for laser or stent placement, massive haemoptysis surgery, hepatic surgery, specialist paediatric services, epilepsy surgery, deep brain stimulation, high-risk obstetrics, intensive care) Affiliated University: Faculty of Medical and Health Sciences, University of Auckland	Secondary-level (hospital and specialist) care Specialist tertiary services (orthopaedics and plastic surgery, burns, spinal injury rehabilitation, renal dialysis, neonatal intensive care) Paediatric inpatient surgical care
Population [1]2018 census [2]ADHB-Annual-Report-202021 [3]Annual-Report-2021-22-Counties-Manukau	Estimated 493,000[1] 8% Maori, 11% Pasifika, 34% Asian, 47% European/Other[2] Second highest life expectancy in New Zealand at 83.4 years[2]	Estimated 567,000[1] 16% Maori, 22% Pasifika, 30% Asian, 31% European/Other[3] 37% of the population, and almost 1 in 2 of the 132,000 children living within Counties Manukau, live in areas of high socioeconomic deprivation[3]



ANNUAL MEETING, 16 NOVEMBER 2023

SITE: UGANDA

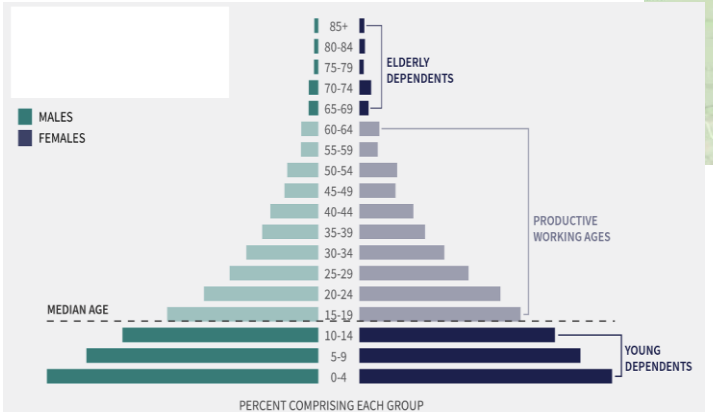
PI: DENIS KARUHIZE BYARUGABA

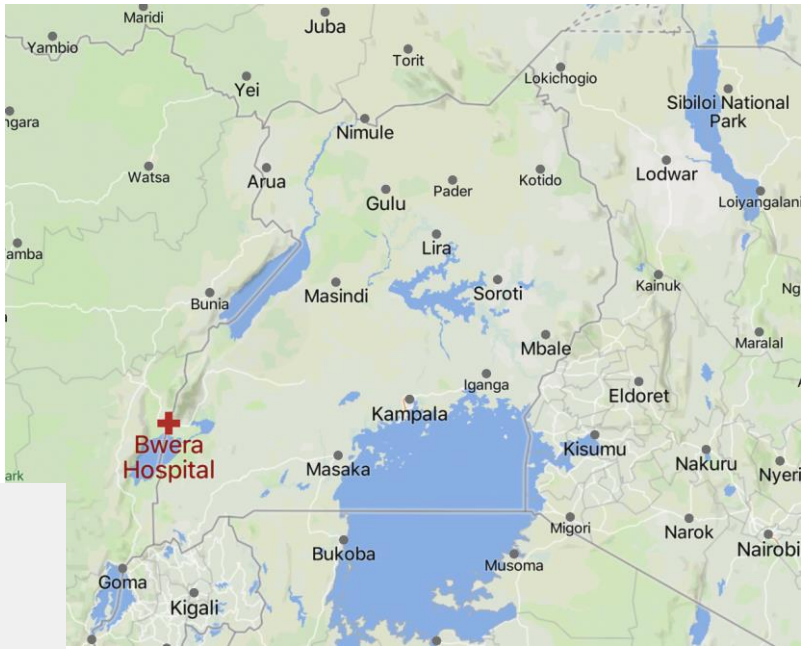
UGANDA

Site description

- **Coordinating site: Makerere University Walter Reed Project (MUWRP)**
  - Established in 2002 as a non-for-profit Organization guaranteed by Makerere University and The Henry M. Jackson Foundation
  - Engaged in Infectious Disease Surveillance, Vaccine Research (HIV, Ebola etc) and Health care support through PEPFAR
- **Participating hospital*: BWERA HOSPITAL***
  - *A public tertiary district hospital owned by the Uganda Ministry of Health.*
  - *Serves Kasese District with patients of all age groups, including from Democratic Republic of the Congo.*
  - *Bed capacity is 100, (may admit up to 300).*
  - *Has a population of about 800,000 inhabitants*

with a largely young population as shown





Hospital location

Global Influenza Hospital Surveillance Network

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: NIGERIA

PI: Sikiru Olanrewaju Badaru

ANNUAL MEETING, 16 NOVEMBER 2023

SITE: POLAND

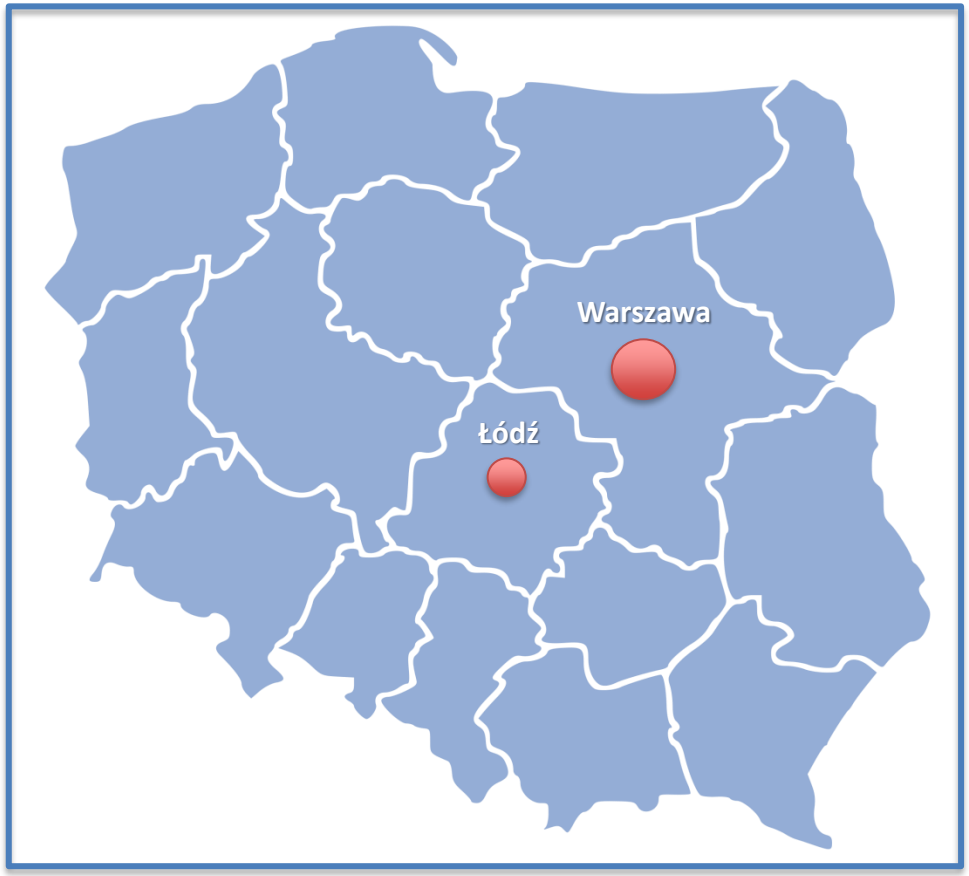
PI: Joanna Chorostowska-Wynimko

POLAND

Site description

- *LEADING CENTER: National Institute of Tuberculosis and Lung Diseases in Warsaw*
  - *tertriary refferal respiratory center (adult/elderly population, urban (rural), 300 beds)*
  - *central molecular lab on-site (full resp viral panel)*
  - *storage facility for samples*
  - *data collection*

- PARTICIPATING CENTER: Clinical Hospital - Central Veteran Hospital in Lódz
  - *tertriary refferal hospital (adult/elderly population, urban, 200 beds)*
  - *sample and data collection*



ANNUAL MEETING, 16 NOVEMBER 2023

HOSPITAL CLINIC DE BARCELONA

Miguel J. Martínez, MD, PhD, Head of Virology

SPAIN

Clínic Barcelona | Universitat de Barcelona

Site description

Hospital Clinic de Barcelona

- *Tertiary level, speciality university hospital*
- *Catchment area 540,000, referral for 1 million people*
- *WHO National Influenza Center, reference diagnostic center for several viral surveillance programs*
- *Microbiology and Epidemiology/Preventive Medicine departments already performing surveillance of hospitalized respiratory viral infections*
- *Multiplex respiratory viruses testing and NGS available*

CURRENT OPPORTUNITIES FOR 2024-25

Central America Caribbean and Temperate South America

First contacts with few sites PI (Mexico, Brazil and Argentina)

China

First contact with Prof. Zifeng Yang from Guangzhou Institute of Respiratory Health

Global Influenza Hospital Surveillance Network

Global Influenza Hospital Surveillance Network

LUNCH TIME!

Foundation for Influenza Epidemiology

Sous l'égide de

Fondation de France