GIHSN 11TH GLOBAL ANNUAL MEETING
16-17 November 2023

Foundation for Influenza Epidemiology
WELCOME TO THE GIHSN GLOBAL ANNUAL MEETING 2023

GIHSN GLOBAL ANNUAL MEETING 2023
16 – 17 November 2023
WHO HQ, Geneva
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.
# AGENDA DAY 1 AM

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 - 9:00</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>9:00 - 9:10</td>
<td>Welcome from the Host &amp; Opening of the Meeting</td>
<td>M Ryan, WHO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A Giraud, Fondation de France</td>
</tr>
<tr>
<td>9:10 - 9:40</td>
<td>GIHSN ecosystem update</td>
<td>C Mahé, FIE</td>
</tr>
<tr>
<td></td>
<td>Presentation &amp; discussion</td>
<td>W Zhang, WHO</td>
</tr>
<tr>
<td></td>
<td>Current status and next steps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaboration with WHO</td>
<td></td>
</tr>
<tr>
<td>9:40 - 11:00</td>
<td>Site presentations &amp; key findings 2022-23</td>
<td>Moderator:</td>
</tr>
<tr>
<td></td>
<td>Presentations &amp; discussion (3’per site followed by 5’ Q&amp;A after each session of 2-4 sites)</td>
<td>M Nunes, CERP</td>
</tr>
<tr>
<td></td>
<td>- Africa (Kenya - Côte d’Ivoire - Senegal - South Africa)</td>
<td>Site investigators</td>
</tr>
<tr>
<td></td>
<td>- Americas (Canada - USA - Brazil - Peru)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Asia (Pakistan - India - Nepal)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Europe (Romania - Spain)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Eurasia (Russia Moscow - St-Petersburg) zoom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Middle East (Lebanon - Türkiye)</td>
<td></td>
</tr>
<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
<td></td>
</tr>
<tr>
<td>11:30 - 12:05</td>
<td>GIHSN pooled results 2022-23: Overview</td>
<td>C Commaille-Chapus, IH</td>
</tr>
<tr>
<td></td>
<td>Presentation (20’) &amp; Discussion (15’)</td>
<td></td>
</tr>
<tr>
<td>12:05 - 12:30</td>
<td>Season 2023-24: presentation of new sites</td>
<td>Torcel Pagnon, FIE</td>
</tr>
<tr>
<td>12:30 - 13:30</td>
<td>Sandwich break</td>
<td></td>
</tr>
</tbody>
</table>
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

GIHSN: CURRENT STATUS AND NEXT STEPS

Cédric MAHE, Foundation for Influenza Epidemiology
• 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.
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; timeliness

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
THANK YOU!
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

COLLABORATION OF GISRS & GIHSN

Dr Wenqing ZHANG, Head of Global Influenza Program, WHO
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

- **Players, partners**
  - Collaborative surveillance
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
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
IN MEMORY OF DR JOHN PAGET
GIHBN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

SITE PRESENTATIONS & KEY FINDINGS 2022-23

Moderator: Dr Marta NUNES, CERP, Lyon University
❖ 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)
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023
KENYA

Nancy A. Otieno, 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.
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

Recruitment period for 2022-2023 season:
November 1, 2022 – September 30, 2023

Figure 2: Study Flow Diagram
Results

<table>
<thead>
<tr>
<th></th>
<th>#included</th>
<th>#LCI</th>
<th>#tested for RSV</th>
<th>#RSV+</th>
<th>#tested for SARS-CoV2</th>
<th>SARS-CoV2+</th>
<th>#tested for ORV</th>
<th>#ORV+</th>
<th>#WGS LCI</th>
<th>#WGS SARS-CoV2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients &lt; 5 yrs</td>
<td>1623</td>
<td>112</td>
<td>0</td>
<td>0</td>
<td>1618</td>
<td>57</td>
<td>0</td>
<td>0</td>
<td>66</td>
<td>0</td>
</tr>
<tr>
<td>Patients 5+ yrs</td>
<td>218</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>218</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>1841</td>
<td>142</td>
<td>0</td>
<td>0</td>
<td>1836</td>
<td>76</td>
<td>0</td>
<td>0</td>
<td>78</td>
<td>0</td>
</tr>
</tbody>
</table>

- 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.

Key messages
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)pdm09 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.
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

COTE D’IVOIRE

Daouda COULIBALY, Institut National d’Hygiène Publique

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023
**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)
### 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.; $T^\circ +4$ and $+8$)

**Shipment** (Cool Box, biosafety, contract with transport companies for the delivery)
Key findings and challenges

<table>
<thead>
<tr>
<th>Sites</th>
<th>Samples</th>
<th>A (H1N1)</th>
<th>A (H3N2)</th>
<th>B Victoria</th>
<th>Covid-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHR_Korhogo</td>
<td>166</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>CHR_Man</td>
<td>429</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>CHR_San pédro</td>
<td>373</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>CHU_Angré</td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>CHU_Bouaké</td>
<td>272</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>CHU_Treichville</td>
<td>41</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>HG_Agnibilékro</td>
<td>206</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1508</strong></td>
<td><strong>21</strong></td>
<td><strong>3</strong></td>
<td><strong>5</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

- 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
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

SENEGAL

Ndongo DIA, Institut Pasteur de Dakar

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023
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);
  2. 3 (rural/ pediatric /referral);
  3. 4 (urban/ all ages/ academic);
  4. 7 (urban/ pediatric / academic)

- **Population denominators available for the catchment areas?** Data not available
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 Syncitital Virus, bocavirus, human metapneumovirus
  - Sequencing done at site level
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
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023
SOUTH AFRICA

Vicky BAILLIE, Wits VIDA - University of the Witwatersrand

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023
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 <5 years of age
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
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:
- Consent 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
❖ 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)
GIHSN 11TH ANNUAL MEETING, 16-17 NOVEMBER 2023

CANADA

Melissa K ANDREW, Serious Outcomes Surveillance Network

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023
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
**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 ILL 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 respiratory 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
Key findings

N = 1156

- Influenza Vaccination
  - Yes: 292 (25%)
  - No: 391 (34%)
  - Unknown: 473 (41%)

- COVID Vaccination
  - None: 703 (61%)
  - 1 dose: 147 (13%)
  - 2 doses: 102 (9%)
  - >=3 doses: 15 (2%)

Frailty CFS

ICU admission: 158 (13.7%)
Death in hospital: 109 (9.4%)
WGS reported: 87

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
Site description

- 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

### 8 Hospitals
- ~ 42,000 employees
- 3,815 beds
- 400+ ambulatory sites

### Each Year
- 4,000,000 patient visits
- 150,000 inpatient admissions
- 16,000 births
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

---

**Eligibility**
- Hospital admission
- Respiratory virus test performed
- Positive test for Influenza or SARS-CoV-2

**Enrollment**
- Questionnaire completed based on EMR data
- Respiratory specimen collected
- WGS Influenza & SARS-CoV-2

**Reporting**
- Influenza/SARS-CoV-2 (positive cases)
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
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
Thank you and please come visit us!
PEQUENO PRINCIPE HOSPITAL, BRAZIL

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

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

- Beds: 361
- ICU Beds: 68
- HSTC Beds: 10
- Public Health System: 61%

**Season:** Nov/2022- Oct/2023
- Paraná state: 11.444.380 inhabitants/2022
- Curitiba Metropolitan area: 3.2 million/inhabitants (28%)
- Altitude: 932 m (3,058 ft) above sea level
- Climate: Temperate
  - Cold winter and humid summer (~25º.C)
  - Coldest regions in Brazil.

**Early Childhood:**
- 83% of hospitalized patients aged up to 6 years old
- 35 medical specialties

**Global Influenza Hospital Surveillance Network**
- 116,423 children and adolescents assisted in 2022
- 26 clinical research projects
- 361 beds (68 in ICUs and ten in the BMT Unit)
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
**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%

**Virus Detection: 2023**
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
**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 Clínica Internacional 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).
Methods

1. Screening of daily admissions

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

2. Enrollment/data collection

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

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

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).

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.
Detailed results

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 SARS-CoV2 vaccine. Only 4.2% were hospitalized at ICU, of those 0.6% needed mechanical ventilation.

Respiratory sinititial 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, metapneumovirus 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

Characteristics of eligible population. November 2022 - October 2023

<table>
<thead>
<tr>
<th>Variable</th>
<th>Participants Lima (%)</th>
<th>Callao (%)</th>
<th>Piura (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elegible patients</td>
<td>530</td>
<td>141</td>
<td>26.6</td>
</tr>
<tr>
<td>Samples taken</td>
<td>530</td>
<td>141</td>
<td>26.6</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>289</td>
<td>75</td>
<td>14.2</td>
</tr>
<tr>
<td>Female</td>
<td>241</td>
<td>66</td>
<td>12.4</td>
</tr>
<tr>
<td>Age Group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median (range)</td>
<td>10 [5-18]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>369</td>
<td>81</td>
<td>15.3</td>
</tr>
<tr>
<td>5-18</td>
<td>83</td>
<td>19</td>
<td>3.6</td>
</tr>
<tr>
<td>18-45</td>
<td>28</td>
<td>13</td>
<td>2.5</td>
</tr>
<tr>
<td>45-65</td>
<td>22</td>
<td>10</td>
<td>1.9</td>
</tr>
<tr>
<td>65-80</td>
<td>17</td>
<td>13</td>
<td>2.5</td>
</tr>
<tr>
<td>80+</td>
<td>11</td>
<td>5</td>
<td>0.9</td>
</tr>
<tr>
<td>Positive result</td>
<td>185</td>
<td>60</td>
<td>42.6</td>
</tr>
<tr>
<td>FLU A- H1N1</td>
<td>22</td>
<td>12</td>
<td>8.5</td>
</tr>
<tr>
<td>FLU A- H3N2</td>
<td>5</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>FLUB</td>
<td>10</td>
<td>4</td>
<td>2.8</td>
</tr>
<tr>
<td>COVID</td>
<td>25</td>
<td>13</td>
<td>9.2</td>
</tr>
<tr>
<td>RSV</td>
<td>85</td>
<td>17</td>
<td>12.1</td>
</tr>
<tr>
<td>Adenovirus</td>
<td>20</td>
<td>9</td>
<td>6.4</td>
</tr>
<tr>
<td>Metapneumovirus</td>
<td>36</td>
<td>10</td>
<td>7.1</td>
</tr>
<tr>
<td>Negative result</td>
<td>345</td>
<td>81</td>
<td>57.4</td>
</tr>
<tr>
<td>Coinfections</td>
<td>18</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td>FLU A- H1N1/ COVID</td>
<td>4</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>FLU A- H3N2/ Metapneumovirus</td>
<td>1</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>FLU B/ COVID</td>
<td>2</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>FLU A- H1N2/ VRS B</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>COVID/ VRS A</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>COVID/ Adenovirus</td>
<td>1</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>COVID/ Metapneumovirus</td>
<td>1</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

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
Coinfections 18 8 5.7 10 3.0 0 0.0
FLU A- H1N1/ COVID 4 3 2.1 1 0.3 0 0.0
FLU A- H3N2/ Metapneumovirus 1 1 0.7 0 0.0 0 0.0
FLU B/ COVID 2 2 1.4 0 0.0 0 0.0
FLU A- H1N2/ 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
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 sinitial 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)
OVERVIEW

• Background
• Respiratory Viruses Sentinel Surveillance Network
• Implementation
• Key findings
• Challenges
Profile; Influenza Sentinel surveillance

NIH

1980

ICT

2007

Quetta
1300 beds
3m

2010

Gilgit
200 beds
1.5 m

Karachi
1900 beds
17m

2012

AJK
350 beds
1.5m

Multan
1800 beds
4.5m

Profile; Influenza Sentinel surveillance

Legend

- New Sites
- Old Sites
- <all other values>

Copyright GIHSN 2023
IMPLEMENTATION

Local Government & NIC

Policy making

Tertiary care Hospitals
Geographic area
Patient turn over

National Influenza Centre

Sentinel Sites

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

Onsite WGS
Multiplex PCR/FTD
# RESPIRATORY VIRUSES DETECTED 2022-23

<table>
<thead>
<tr>
<th>Viral Pathogen</th>
<th>Subtype</th>
<th>Number of positive cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza Virus</td>
<td>Influenza A/H3</td>
<td>47 (4)</td>
</tr>
<tr>
<td></td>
<td>Influenza A/H1N1 Pdm 09</td>
<td>349 (31)</td>
</tr>
<tr>
<td></td>
<td>Influenza B</td>
<td>106 (10)</td>
</tr>
<tr>
<td>RSV</td>
<td></td>
<td>480 (44)</td>
</tr>
<tr>
<td>HmPV</td>
<td></td>
<td>06 (0.8)</td>
</tr>
<tr>
<td>AdenoVirus</td>
<td></td>
<td>09 (1)</td>
</tr>
<tr>
<td>RhinoVirus</td>
<td></td>
<td>25 (2)</td>
</tr>
<tr>
<td>PIV3</td>
<td></td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>SARS CoV-2</td>
<td></td>
<td>80 (7)</td>
</tr>
</tbody>
</table>
AGE DISTRIBUTION OF RESPIRATORY VIRUSES
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.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

Pakistan strain
Clade/Subclade specific strain

SARS-CoV-2 Tree
Clade/Subclade
23F
23B
23D

Copyright GIHSN 2023
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
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 km² in area and population is over 69 lakh.
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.
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

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

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

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

<table>
<thead>
<tr>
<th>Co-morbidity</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>779 (69.8%)</td>
</tr>
<tr>
<td>COPD</td>
<td>542 (48.6%)</td>
</tr>
<tr>
<td>Asthma</td>
<td>15 (1.34%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>289 (25.9%)</td>
</tr>
<tr>
<td>Immunodeficiency</td>
<td>22 (1.9%)</td>
</tr>
<tr>
<td>Renal</td>
<td>108 (9.6%)</td>
</tr>
<tr>
<td>Rheumatologic</td>
<td>70 (6.2%)</td>
</tr>
<tr>
<td>Neurological</td>
<td>67 (6%)</td>
</tr>
<tr>
<td>Liver Disease</td>
<td>11 (0.98%)</td>
</tr>
<tr>
<td>Neoplasm</td>
<td>62 (5.5%)</td>
</tr>
<tr>
<td>Obesity</td>
<td>26 (2.3%)</td>
</tr>
</tbody>
</table>
Out of 1115 patients, 5.11% were positive for influenza virus.

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

<table>
<thead>
<tr>
<th>Total</th>
<th>H1N1</th>
<th>H3N2</th>
<th>B/Victoria</th>
</tr>
</thead>
<tbody>
<tr>
<td>57 (5.11%)</td>
<td>20 (35%)</td>
<td>21 (37%)</td>
<td>16 (28%)</td>
</tr>
<tr>
<td>Vaccinated</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Non-vaccinated</td>
<td>17</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

Among 1115 subjects, 83 expired during hospitalization.
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 Sândulescu

Global Influenza Hospital Surveillance Network
Global Annual Meeting 2023
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
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
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
## Site description

<table>
<thead>
<tr>
<th>HOSPITALS</th>
<th>CATCHMENT POPULATION</th>
<th>NUMBER OF BEDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>H. General Universitario de Castellón</td>
<td>282,000</td>
<td>509</td>
</tr>
<tr>
<td>H. Universitario y Politécnico La Fe</td>
<td>287,000</td>
<td>975</td>
</tr>
<tr>
<td>H. Universitario Doctor Peset</td>
<td>279,000</td>
<td>539</td>
</tr>
<tr>
<td>H. La Marina Baixa</td>
<td>170,000</td>
<td>270</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,018,000</strong></td>
<td><strong>2,293</strong></td>
</tr>
</tbody>
</table>
Daily active surveillance for respiratory viruses in patients of all ages has been conducted from November 2\textsuperscript{nd}, 2022 to October 31\textsuperscript{st}, 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.
# Results

## Patients <5 yrs

<table>
<thead>
<tr>
<th></th>
<th>#included</th>
<th>#LCI</th>
<th>#tested for RSV</th>
<th>#RSV+</th>
<th>#tested for SARS-CoV-2</th>
<th>SARS-CoV-2+</th>
<th>#tested for ORV</th>
<th>#ORV+</th>
<th>#WGS LCI</th>
<th>#WGS SARS-CoV-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>83</td>
<td>7 (8%)</td>
<td>83</td>
<td>29 (35%)</td>
<td>83</td>
<td>2 (2%)</td>
<td>83</td>
<td>14 (17%)</td>
<td>2/7</td>
<td>2/2</td>
<td>2/2</td>
</tr>
<tr>
<td>1,980</td>
<td>165 (8%)</td>
<td>1,980</td>
<td>102 (5%)</td>
<td>1,980</td>
<td>242 (12%)</td>
<td>1,980</td>
<td>199 (10%)</td>
<td>67/165</td>
<td>159/242</td>
<td>159/242</td>
</tr>
<tr>
<td>2,063</td>
<td>172* (8%)</td>
<td>2,063</td>
<td>131* (6%)</td>
<td>2,063</td>
<td>244* (12%)</td>
<td>2,063</td>
<td>213* (10%)</td>
<td>69/172*</td>
<td>161/244</td>
<td>161/244</td>
</tr>
</tbody>
</table>

*60 pending results **pending sequences

## Patients 5+ yrs

<table>
<thead>
<tr>
<th></th>
<th>#included</th>
<th>#LCI</th>
<th>#tested for RSV</th>
<th>#RSV+</th>
<th>#tested for SARS-CoV-2</th>
<th>SARS-CoV-2+</th>
<th>#tested for ORV</th>
<th>#ORV+</th>
<th>#WGS LCI</th>
<th>#WGS SARS-CoV-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>163</td>
<td>7 (8%)</td>
<td>163</td>
<td>10 (7%)</td>
<td>163</td>
<td>12 (8%)</td>
<td>163</td>
<td>10 (7%)</td>
<td>10 (7%)</td>
<td>10 (7%)</td>
<td>10 (7%)</td>
</tr>
<tr>
<td>1,980</td>
<td>165 (8%)</td>
<td>1,980</td>
<td>102 (5%)</td>
<td>1,980</td>
<td>242 (12%)</td>
<td>1,980</td>
<td>199 (10%)</td>
<td>67/165</td>
<td>159/242</td>
<td>159/242</td>
</tr>
<tr>
<td>2,063</td>
<td>172* (8%)</td>
<td>2,063</td>
<td>131* (6%)</td>
<td>2,063</td>
<td>244* (12%)</td>
<td>2,063</td>
<td>213* (10%)</td>
<td>69/172*</td>
<td>161/244</td>
<td>161/244</td>
</tr>
</tbody>
</table>

## Total

<table>
<thead>
<tr>
<th></th>
<th>#included</th>
<th>#LCI</th>
<th>#tested for RSV</th>
<th>#RSV+</th>
<th>#tested for SARS-CoV-2</th>
<th>SARS-CoV-2+</th>
<th>#tested for ORV</th>
<th>#ORV+</th>
<th>#WGS LCI</th>
<th>#WGS SARS-CoV-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>83</td>
<td>7 (8%)</td>
<td>83</td>
<td>29 (35%)</td>
<td>83</td>
<td>2 (2%)</td>
<td>83</td>
<td>14 (17%)</td>
<td>2/7</td>
<td>2/2</td>
<td>2/2</td>
</tr>
<tr>
<td>1,980</td>
<td>165 (8%)</td>
<td>1,980</td>
<td>102 (5%)</td>
<td>1,980</td>
<td>242 (12%)</td>
<td>1,980</td>
<td>199 (10%)</td>
<td>67/165</td>
<td>159/242</td>
<td>159/242</td>
</tr>
<tr>
<td>2,063</td>
<td>172* (8%)</td>
<td>2,063</td>
<td>131* (6%)</td>
<td>2,063</td>
<td>244* (12%)</td>
<td>2,063</td>
<td>213* (10%)</td>
<td>69/172*</td>
<td>161/244</td>
<td>161/244</td>
</tr>
</tbody>
</table>

*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.
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)
**RUSSIA, MOSCOW**

**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
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.
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

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
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 Gridlon, BGI DNBSeq-G400)
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
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
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**
Key findings and challenges

<table>
<thead>
<tr>
<th>Age group</th>
<th>#included</th>
<th>#Infl+</th>
<th>#SARS-CoV-2+</th>
<th>#RSV+</th>
<th>#ORV+</th>
<th>%posit</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5 yrs</td>
<td>116</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>23</td>
<td>35.4</td>
</tr>
<tr>
<td>5-17 years</td>
<td>30</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>23.3</td>
</tr>
<tr>
<td>≥18 years</td>
<td>370</td>
<td>8</td>
<td>4</td>
<td>10</td>
<td>6</td>
<td>6.8</td>
</tr>
<tr>
<td>Total</td>
<td>516</td>
<td>13</td>
<td>10</td>
<td>22</td>
<td>34</td>
<td>14.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ORV</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adenovirus</td>
<td>10</td>
</tr>
<tr>
<td>Parainfluenza</td>
<td>6</td>
</tr>
<tr>
<td>Rhinovirus</td>
<td>6</td>
</tr>
<tr>
<td>Bocavirus</td>
<td>3</td>
</tr>
<tr>
<td>HMPNV</td>
<td>3</td>
</tr>
<tr>
<td>WU Polyoma</td>
<td>2</td>
</tr>
<tr>
<td>Enterovirus C109</td>
<td>2</td>
</tr>
<tr>
<td>Coronavirus OC43</td>
<td>2</td>
</tr>
</tbody>
</table>

01.11.2022 – 30.09.2023  
15.3% lab confirmed infection

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

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

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

Active year-round surveillance

Data collection

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)

Sampling strategy:
- Using remaining PCR sample available upon admission
  OR
- Sample collection:
  ✓ <14 years old: nasal sample
  ✓ ≥14 years old: NP & P samples
## Results

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

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

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).
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).
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
18 SITES PARTICIPATED IN THE GIHSN IN 2022_23

- National Institute for Infectious Diseases, Bucharest, Romania
- Smorodintsiev Research Institute of Influenza, St-Petersburg, Russia
- L.V. Gromashevsky Institute of Epidemiology and Microbiology, Moscow, Russia
- Turkish Society of Internal Medicine, Ankara, Turkey
- American University of Beirut, Beirut, Lebanon
- School of Public Health, Fudan University, Shanghai, China
- Institut Pasteur of Dakar, Dakar, Senegal
- INHP, Abdihal Côte d'Ivoire
- KEMRI, Nairobi, Kenya
- University of the Witwatersrand, Johannesburg, South Africa
- National Institute of Health, Islamabad, Pakistan

GIHSN sites (2022-23) • Hospital location

Number of hospitals per site • No fund allocated

- The CIRN (SOS) Network, Halifax, Canada
- FISABIO-Public Health, Valencia, Spain
- Icahn School of Medicine at Mount Sinai, NYC, U.S.
- Universidad Nacional Mayor de San Marcos, Lima, Peru
- Hospital Pequeno Príncipe, Curitiba, Brazil

No fund allocated
## PROCESS FOR IDENTIFICATION OF CASES AND DATA COLLECTION - GIHSN

### Case ascertainment
(identify possible eligible cases)

- **No need to collect data**
  (not part of GIHSN database)
- **Enrollment**
  (Meet case definition + consent given)

**Assess if meet case definition**

- **Respiratory specimen collected**
  - Tested for influenza, RSV, SARS-CoV-2 and others
  - WGS done locally or sent to Lyon
  - WGS from influenza viruses uploaded to GISAID*

**Hospitalized cases with respiratory illnesses are assessed systematically (e.g., everyday of the week, pre-defined days of the week)**

**Questionnaires at enrollment and at discharge (based on chart abstraction) to capture clinical outcomes**

---

*WGS also done for SARS-COV2*
## 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:

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

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

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

<table>
<thead>
<tr>
<th>Disease</th>
<th>Enrolled</th>
<th>#Influenza+</th>
<th>#Tested SARS-CoV-2</th>
<th>#SARS-CoV-2+</th>
<th>#Tested RSV</th>
<th>#RSV+</th>
<th>#Tested ORV</th>
<th>#ORV+</th>
<th>#WGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza</td>
<td>22629</td>
<td>3225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARS-CoV2</td>
<td>20369</td>
<td></td>
<td>3691</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSV</td>
<td></td>
<td></td>
<td></td>
<td>15287</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ORV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12043</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>862</td>
</tr>
</tbody>
</table>

N = 22,629
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
DISTRIBUTION OF ENROLLED PATIENTS BY AGE GROUP – BY SITE (2022_23) (#) (AS OF NOVEMBER 3RD, 2023)

*N total = 22,608*

- Pakistan: N = 3,338
- USA: N = 3,108
- South Africa: N = 2,873
- Lebanon: N = 1,981
- Spain: N = 1,878
- Kenya: N = 1,841
- Côte d’Ivoire: N = 1,515
- India: N = 1,207
- Canada: N = 1,156
- Senegal: N = 632
- Russia - Moscow: N = 558
- Türkiye: N = 549
- Romania: N = 540
- Brazil: N = 473
- Peru: N = 422
- Nepal: N = 245
- Ukraine: N = 244
- Russia - Saint Petersburg: N = 48

*No age completed for 21 patients*
DISTRIBUTION OF PATIENTS BY SITE (2022-23) (#)
(AS OF NOVEMBER 3RD, 2023)

Total enrolled = 22,629
Total influenza+ = 3,225
DISTRIBUTION OF PATIENTS BY SITE (2022-23) (#)
(AS OF NOVEMBER 3RD, 2023)

Total positives to a virus = 9,533
NBER OF ENROLLED PATIENTS, INFLUENZA POSITIVITY (2022-23)
(AS OF NOVEMBER 3RD, 2023)

AFRICA

Kenya*
Côte d’Ivoire
Senegal
South Africa

*Sequencing ongoing

ASIA

India
Pakistan
Nepal

Global Influenza Hospital Surveillance Network

Enrolled  #Influenza+  #WGS Influenza
INBER OF ENROLLED PATIENTS, INFLUENZA POSITIVITY (2022-23)
(AS OF NOVEMBER 3RD, 2023)

MIDDLE EAST

Türkiye

Lebanon

EURASIA

Russia-St Petersburg*

Russia-Moscow

*Only influenza positive patients shared
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)

<table>
<thead>
<tr>
<th>Country</th>
<th>No Comorbidity</th>
<th>1 Comorbidity</th>
<th>2 or More Comorbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kenya</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senegal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia - Moscow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Türkiye</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nepal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia - Saint Petersburg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N = 3,225

Copyright GIHSN 2023
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

Key:
- #Influenza+: Red
- #ICU admissions: Green
- #Deaths: Blue
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

#Influenza+  #ICU admissions  #Deaths

15%  0%  12%  4%  2%  0%  2%  1%
ICU ADMISSIONS AND DEATHS AMONG LAB CONFIRMED INFLUENZA CASES – BY SITE (22_23) (#)
(AS OF NOVEMBER 3RD, 2023)

**EUROPE**

- **ROMANIA**
  - #Influenza+: 200
  - #ICU admissions: 160
  - #Deaths: 20

- **Ukraine**
  - #Influenza+: 160
  - #ICU admissions: 140
  - #Deaths: 16

- **Spain**
  - #Influenza+: 180
  - #ICU admissions: 160
  - #Deaths: 18

**AMERICAS**

- **Canada**
  - #Influenza+: 600
  - #ICU admissions: 500
  - #Deaths: 20

- **USA**
  - #Influenza+: 800
  - #ICU admissions: 700
  - #Deaths: 80

- **Brazil**
  - #Influenza+: 50
  - #ICU admissions: 40
  - #Deaths: 5

- **Peru**
  - #Influenza+: 40
  - #ICU admissions: 30
  - #Deaths: 4

- **Copyright GIHSN 2023**
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.

* Not yet in the GIHSN database
WGS BY SITE (2022_23) (#)  
(AS OF NOVEMBER 3RD, 2023 IN THE GIHSN DATABASE)

#WGS Influenza = 764  
#WGS SARS-CoV-2 = 209

N = 961*

*99 not yet in the GIHSN database
THE GIHSN OVER THE SEASONS
PATIENT DISTRIBUTION BY SEASON (2012-13 TO 2022-23)

Total enrolled = 155k+

Total influenza+ = 25k+

Data collection still ongoing
ALL RESULTS WILL BE PRESENTED IN THE GIHSN ANNUAL REPORT 2022-23

Annual Report 2021-2022 - (gihsn.org)
THANK YOU!

Q&A
INTRODUCTION TO SEASON 2023-24, PRESENTATION OF NEW SITES

Laurence Torcel-Pagnon, Foundation for Influenza Epidemiology
CALL FOR 2023-24

The foundation welcomes 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).

- Same selection criteria and protocol than 2022-2023
- Targeted approach to reach out potential new sites with the support of the Independent Scientific Committee
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
SARI and non-SARI Hospital surveillance, Auckland, NZ

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

<table>
<thead>
<tr>
<th>Participating hospitals:</th>
<th>Te Whatu Ora</th>
<th>Te Whatu Ora</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Te Toka Tumai Auckland</td>
<td>Counties Manukau</td>
</tr>
<tr>
<td>Setting</td>
<td>Urban</td>
<td>Urban</td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Auckland City Hospital</td>
<td>1000 beds</td>
</tr>
<tr>
<td></td>
<td>Starship Kids Hospital</td>
<td>219 beds</td>
</tr>
<tr>
<td></td>
<td>Middlemore Hospital</td>
<td>860 beds</td>
</tr>
<tr>
<td></td>
<td>Kidz First Children’s Hospital</td>
<td>82 beds</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Secondary-level (hospital and specialist) care</td>
<td>Secondary-level (hospital and specialist) care</td>
</tr>
<tr>
<td></td>
<td>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)</td>
<td>Specialist tertiary services (orthopaedics and plastic surgery, burns, spinal injury rehabilitation, renal dialysis, neonatal intensive care)</td>
</tr>
<tr>
<td></td>
<td>Paediatric inpatient surgical care</td>
<td>Paediatric inpatient surgical care</td>
</tr>
<tr>
<td>Affiliated University</td>
<td>Faculty of Medical and Health Sciences, University of Auckland</td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>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)</td>
<td>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)</td>
</tr>
</tbody>
</table>
**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**
ANNUAL MEETING, 16 NOVEMBER 2023

SITE: NIGERIA

PI: Sikiru Olanrewaju Badaru
ANNUAL MEETING, 16 NOVEMBER 2023

SITE: POLAND

PI: Joanna Chorostowska-Wynimko
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 Łódź
  - 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
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
LUNCH TIME!