



**Global Influenza
Hospital Surveillance
Network**



GIHSN 9TH ANNUAL MEETING

26 October 2021 - Regional Session 1



**Foundation for
Influenza
Epidemiology**

Sous l'égide de

**Fondation
de
France**



Global Influenza
Hospital Surveillance
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www.gihsn.org



ANNUAL MEETING, 25-26 OCTOBER 2021

WELCOME & INTRODUCTION TO THE SESSION

Catherine COMMAILLE-CHAPUS, GIHSN Coordination



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26 OCTOBER: REGION SPECIFIC SESSION 1 - AGENDA

TUESDAY 26th OCT **9am - 12am CET: REGION SPECIFIC SESSION 1*** **(EASTERN COUNTRIES)**

9:00 - 9:05 **Welcome & Introduction to the Session** C Commaille-Chapus

9:05 - 10:20 **GIHSN Past Season: Results by site** Site investigators
Presentation by each site and discussion

Moderated by John Paget

10:20 - 10:30 **Coffee break**

10:30 - 11:40 **Implementation 2021-2022** S Chaves
Year-round surveillance, Case definition, Sampling & testing strategy ...
Presentation & discussion

11:40 - 11:55 **Publication Update** Pr B Lina
Call for Research Projects Process L Torcel-Pagnon
Presentation & discussion






11:55 - 12:00 **Closing**

SITES SESSION 1

China-Fudan
Nepal
India-Kashmir
Lebanon
Turkey
Russia-St Petersburg
Russia-Moscow
Ukraine
Romania



WEBINAR RULES

-  All attendees are encouraged to participate in the discussion.
-  Please ask your questions directly or use the chat/discussion button
-  Do not forget to mute when you don't speak.
-  Site speakers are kindly asked to stick to the speaking time allotted!
-  Please note that the session will be recorded.

Thank you for your cooperation!



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ANNUAL MEETING, 25-26 OCTOBER 2021

GIHSN 2020-2021: RESULTS BY SITE

All Sites - Moderated by John PAGET



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GIHSN 2020-2021: RESULTS BY SITE

Site: CHINA - Fudan University

Name of the Site Speaker: Tao Zhang



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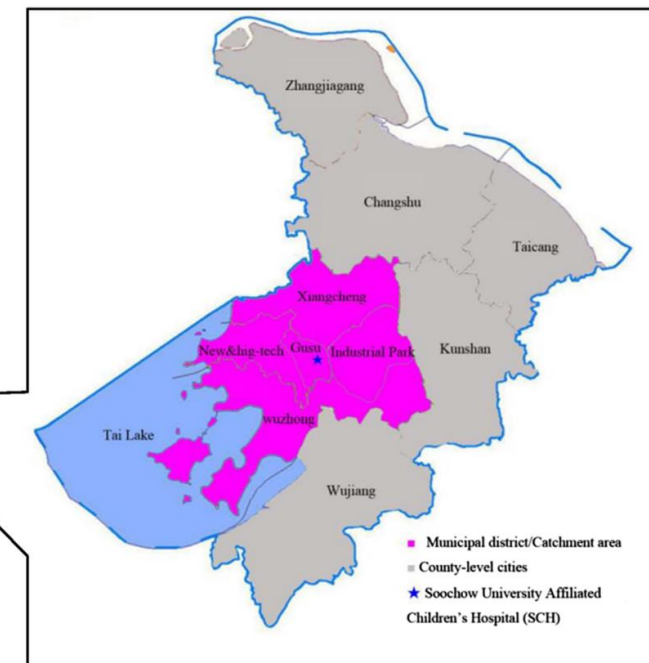
CHINA



Fudan University

Site description *(hospitals participating in the GIHSN)*

- The surveillance was conducted at Suzhou University Affiliated Children's Hospital (SCH), the single tertiary children hospital serving most young children in Suzhou.
- Suzhou, a city with a population of approximately 12 million people, is located in Jiangsu Province, southeast China.
- SCH has a capacity of approximately 1400 beds. There are about 1.9 million outpatient visits and 45,000 hospitalizations at SCH annually.



Methods

- Active surveillance for influenza infection in children was conducted from **October 7th, 2020 to September 30th, 2021**
 - Children who were hospitalized at SCH with acute respiratory infection had nasal aspirate specimens collected within 24 hours after admission.
 - All specimens tested for influenza A & B, parainfluenza virus (PIV) 1-3, respiratory syncytial virus (RSV), adenovirus(ADV) by direct immuno-fluorescent testing; human metapneumovirus (HMPV), human rhinovirus (HRV) by RT-PCR and human bocavirus (HBoV) by PCR at SCH;
 - Influenza virus A subtype identification and B lineage characterization were performed at Suzhou Center for Disease Control and Prevention (CDC) by using real time reverse-transcription polymerase chain reaction (rRT-PCR) kit.
 - Demographic and clinical information was also collected, including information about chronic conditions, symptoms, radiological findings, laboratory results and medications.
 - Influenza vaccination records were verified through the electronic immunization information system maintained by Suzhou CDC, which records immunization information on all resident children and 90% of the migrant children including date of vaccination, dose and type of vaccine.
 - Influenza positive cases matched to influenza-test negative controls on admission date, age stratum to calculate influenza vaccine effectiveness (VE) using conditional logistic regression. VE calculation is pending for this season.

$$VE = (1-aOR) \times 100\%, \text{ with } 95\% \text{ CI (Confidence Intervals)}$$



Results *(From Oct 2020 to Aug 2021)*

	Included Cases no.	Flu+ (LCI)	RSV+	HRV+	HMPV+	Boca+	PIV-1+	PIV-2+	PIV-3+	ADV+	SARS-CoV-2+
Patients < 5 yrs	1450	3 (B/V)	178	184	59	144	28	2	47	10	0
Patients 5+ yrs	185	2 (B no lineage)	7	25	6	10	2	0	0	0	0
Total	1635	5	185	209	65	154	30	2	47	10	0

Results--Respiratory Virus Test Results, From October 2020 to August 2021 (N = 1635)

Viral type	Number of positive cases	Positive rate (%)
Influenza virus	5	0.31
RSV	185	11.31
PIV	79	4.83
HMPV	65	3.98
ADV	10	0.61
HBoV	154	9.42
HRV	209	12.78
HCoV	0	0
At least one virus detected	649	39.69
Co-infection	56	3.43

Top 4

- HBoV + HMPV: 14/56
- HBoV + RSV: 10/56
- HBoV + HRV: 10/56
- HBoV + PIV: 8/56

Results--Characteristics of enrolled patients by virus positive/negative, 2020-2021 season [n (%)]

		Virus(+)(n=649)	Virus(-) (n=986)	Total (n=1635)	p-value
Gender*	Male	416(64.1)	556(56.4)	972(59.4)	0.002
	Female	233(35.9)	430(43.6)	663(40.6)	
Age*	<6m	119(18.3)	190(19.3)	309(18.9)	<0.001
	6-23m	233(35.9)	275(27.9)	508(31.1)	
	24-35m	98(15.1)	127(12.9)	225(13.8)	
	36-59m	149(23.0)	259(26.2)	408(24.9)	
	≥60m	50(7.7)	135(13.7)	185(11.3)	
Underlying condition	Yes	33(5.1)	42(4.3)	75(4.6)	0.435
Influenza vaccination status ^a	Vaccinated	27(5.2)	29(3.7)	56(4.3)	0.398

The proportion of cases testing positive for RSV decreased with age, from 20.4% in <6 months children to 3.8% in ≥60 months children. Sixty-nine percent of the RSV-infected children were 2 years old and younger.

All influenza-positive patients were not vaccinated either in the current season or in the preceding season.

Notes: *p<0.01

a: The vaccination records were available for 1294(79.1%) children.

CHINA



Fudan University

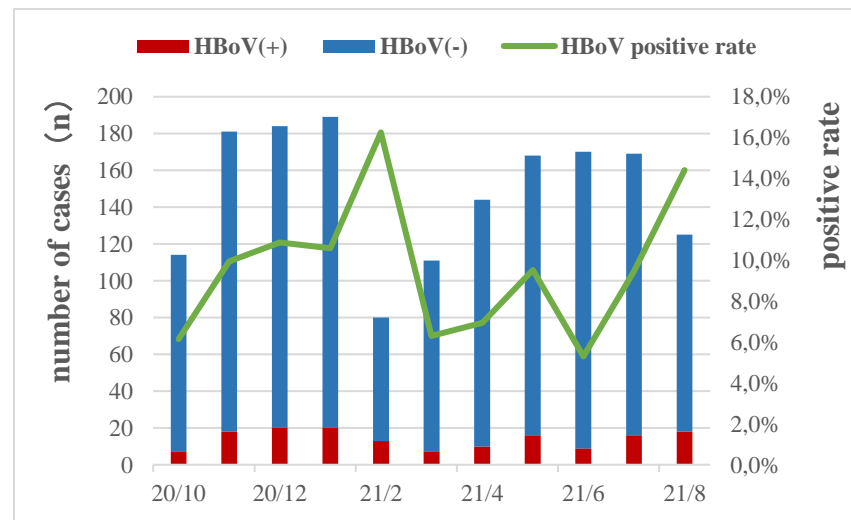
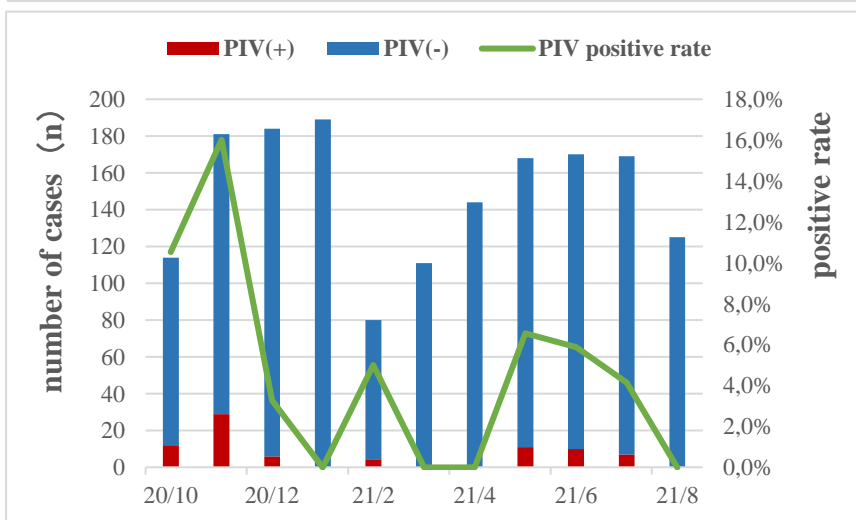
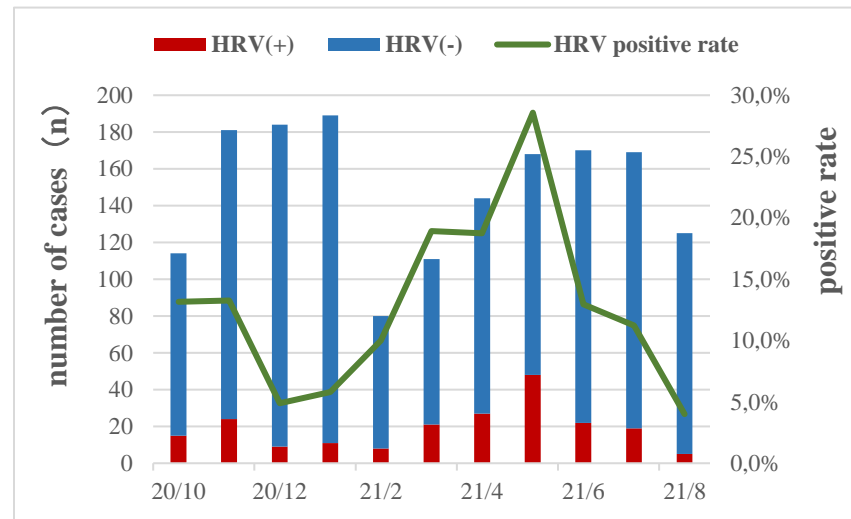
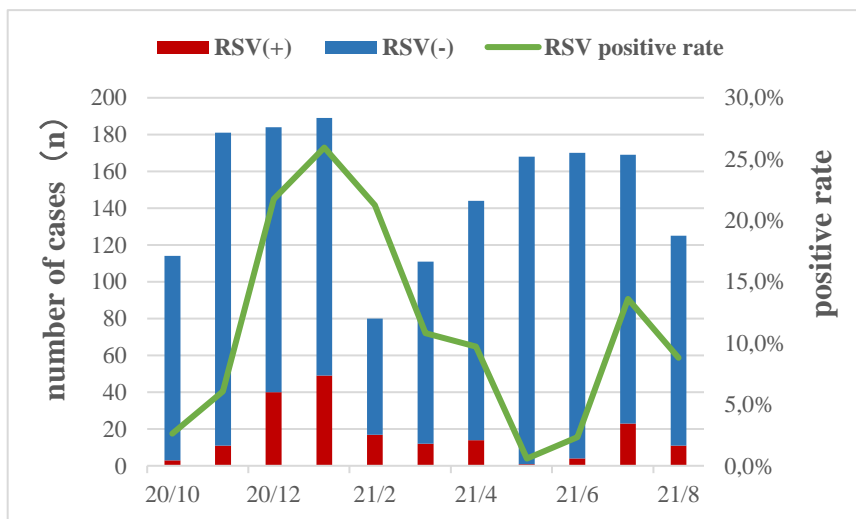


Fig.1. Monthly distribution of respiratory virus detection in five most commonly detected viruses among children

CHINA



Fudan University

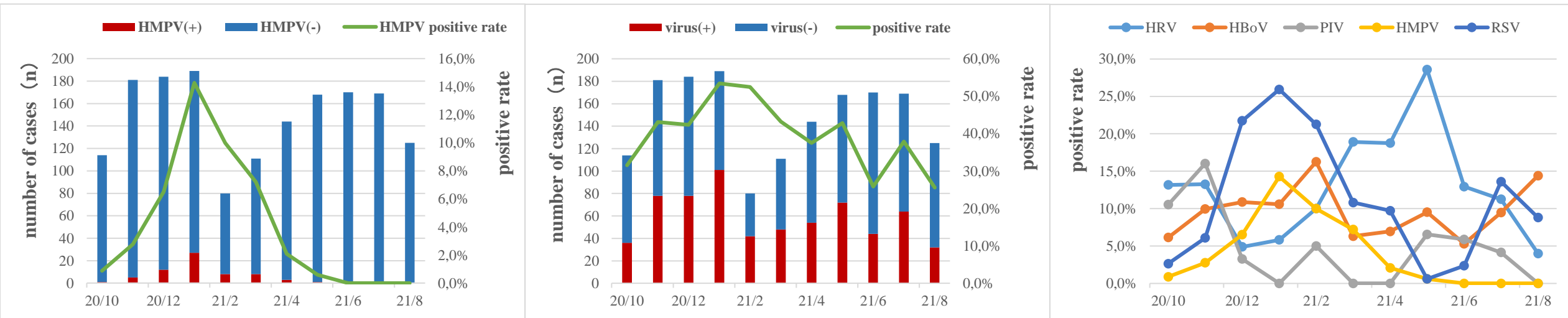


Fig. 1. Monthly distribution of respiratory virus detection in five most commonly detected viruses among children

Conclusion & Challenges

CONCLUSIONS:

- Influenza incidence decreased under COVID-19 control measures
- RSV infections mostly occurred in young children
- Seasonal pattern of RSV was different from that of HRV
- RSV positive cases were more likely to present with wheezing and more likely to require oxygen treatment while PIV positive cases were more likely to present with fever and gastrointestinal symptoms

CHALLENGES:

- Reduced influenza circulation with the COVID-19 control measures;
- Low coverage of influenza vaccination among children aged 6–59 months in Suzhou;
- Whole genome sequencing (WGS) of influenza and SARS-CoV-2 viruses.



GIHSN 2020-2021: RESULTS BY SITE

Site: NEPAL

Name of the Site Speaker: Kedar Prasad Baral



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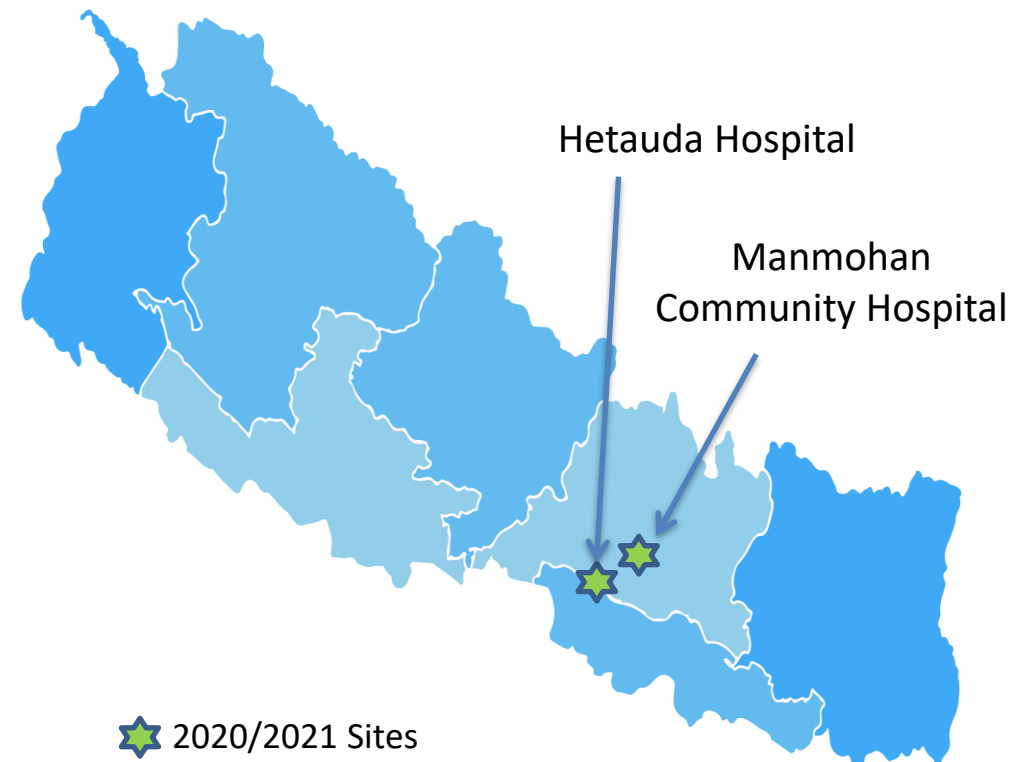
NEPAL



Patan Academy of Health Sciences

Site description *(hospitals participating in the GIHSN)*

- Two sites in Bagmati Province : District hospital and Community hospital.
- A sanctioned 100 but functional 200 bedded provincial hospital serving ~ 300-500 out-patients daily depending upon the seasons
- Community hospital is a 25 bedded hospital serving around 50 out-patients per day
- Both sites serve disadvantaged and poor population of rural and suburb areas.
- Around $\frac{3}{4}$ of the less than five years patients enrolled in district hospital with respiratory illness were of less than five years
- Influenza season in Nepal is similar to tropics and circulate round the year with two peaks – Winter and Summer.



Results *(data shared in the GIHSN)*

	#Samples	#Influenza	#LCI	#tested for RSV	#RSV +	#tested for Covid	Covid+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	101	12				18					
Patients 5+ yrs	148	25				49	4				
Total	249	37				67	4				

Note: 182 samples uploaded in database, 67 samples remained to upload

- Around 60% of the enrolled patients were of age 5+ years.
- More than half of the participants (51%) were male.
- **None of the participants were vaccinated against Influenza.**
- Major co-morbidities of patients less than 5 years were pneumonia followed by LRTI and non-specific febrile illness whereas in case of patients 5+years, major co-morbidities were COPD followed by asthma and LRTI.
- **There were no severe outcomes reported.**

COVID-19	2020	2021
Total test	30439	36456
Positive	7273	11685
% Positivity	23.89	32.05

COVID-19 kits are supported by MOPH Nepal

Conclusion & Challenges

CONCLUSIONS:

- There was drastically decreased influenza circulation due public health and social measures implemented throughout the country including borders closure to control transmission of circulating COVID-19 virus.

CHALLENGES:

- Disruption in regular collection of samples during the first and second waves of COVID-19. All the respiratory cases were seen under fever clinic.
- Since priority was given to the COVID samples, it delayed timely testing of samples for Influenza.
- Nationwide lockdown and prohibitory measures also imposed challenges in collection of samples, import of reagents and diagnostic kits.



GIHSN 2020-2021: RESULTS BY SITE

Site: INDIA - SKIMS

Name of the Site Speaker: Rafi A Jan



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GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK

India Report

Dr. Rafi A. Jan

Professor & Head Department of Internal and Pulmonary Medicine
Sheri-Kashmir Institute of Medical Sciences, Kashmir

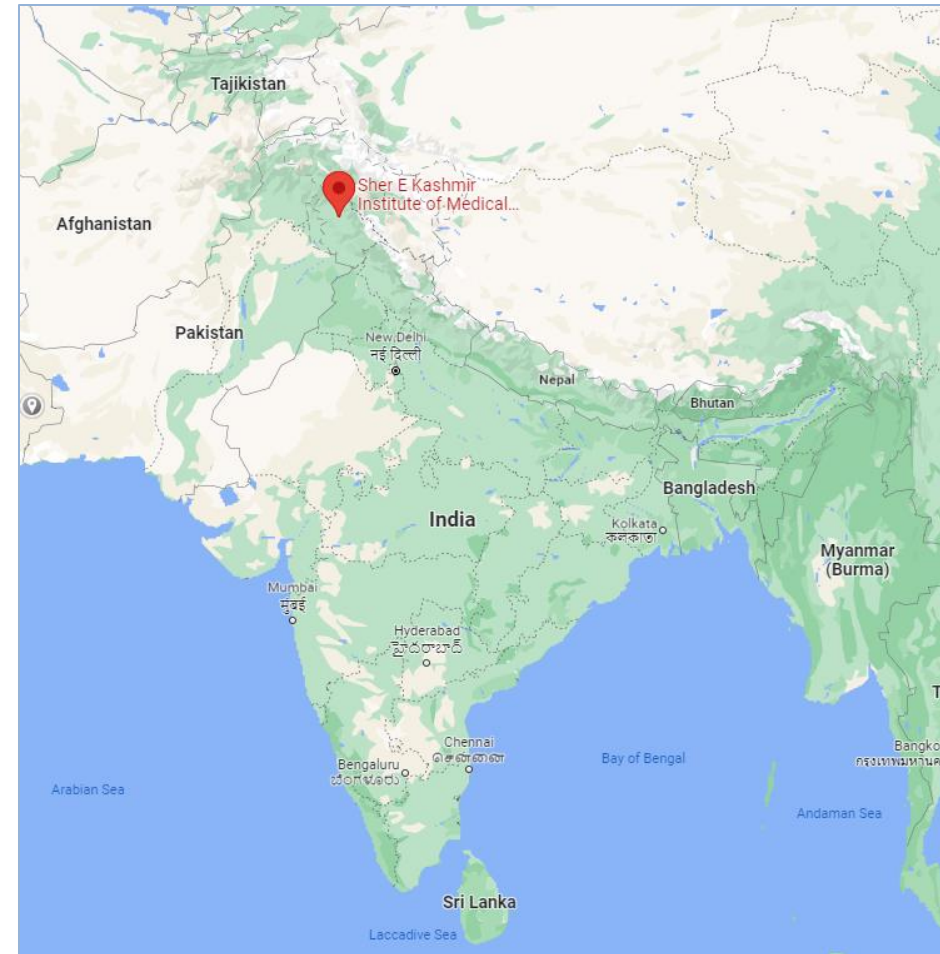
Hospital site for Severe Acute Respiratory Syndrome (SARI)



Sher-i-Kashmir Institute of Medical Sciences (SKIMS)

Sher-i-Kashmir Institute of Medical Sciences (SKIMS)

- Largest medical Institute in Jammu and Kashmir
- Beds: 1100
- In 2020, 4392 individuals were seen in the OPD and 725 were admitted to the medical ward with complications such as COPD, CA Lung, Pleural effusion, and Tuberculosis.



GIHNS Site Laboratory and Staff



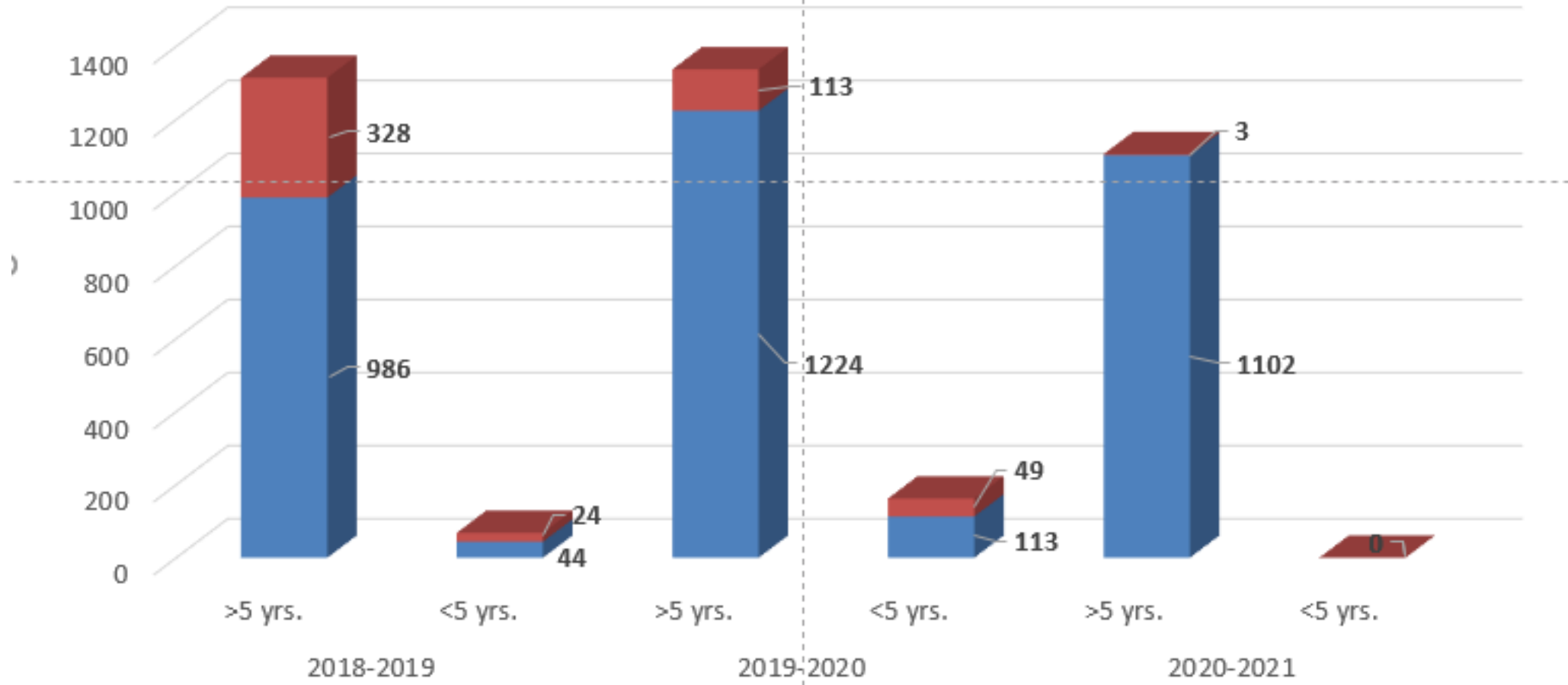
Methods

- From October 2020 to March 2021, all patients underwent active surveillance for influenza infection.
- NP and OP Swabs obtained from all patients with an admitting diagnosis of CAP, exacerbation of COPD/asthma unexplained sepsis, any respiratory diagnosis or symptom.
- All NP and OP swabs tested for influenza A and B by RT-PCR, sub-typing of other respiratory viruses was also done.
- Other clinical and other demographic information was also collected including information about co-morbidities, medications and frailty.
- Only those cases were recruited for the study who met eligibility criteria as per ECDC-ILI case definition.

GIHNS Site Laboratory

Chart Title

■ Total ■ Pos



Results

- From October 2020 to April 2021, a total of 1102 patients with suspected respiratory infections were assessed. Of these, 1102 (100%) met the ECDC- ILI case definition
 - 655 (59.44%) males
 - 447(40.56) females
- Comorbidities
 - Diabetes Mellitus (25.4%)
 - CVD (19.40%)
 - COPD=(10.8%)
 - Neoplasm(7.9%); CKD(6.6%); Neuromuscular(2.5%); Liver disease(1.3%); Rheumatologic disease(0.9%); Asthma(0.5%); Others (21.8%) .
- Vaccination rate among the patients - 4.71%.
- During the study period, 101 in-hospital deaths were recorded, with only one death being confirmed as A/H3N2 positive.

Conclusion and Challenges

- The reduced influenza circulation was observed in spite of rather high tourist traffic to the region with tourists from all over the country and outside flocking to Kashmir for the winter months
- Adoption of COVID-19 mitigation measures such as use of masks likely contributed to the significant drop in influenza virus circulation as both of the infections are mainly transmitted by respiratory droplets.
- Other measures such as closure of schools for most of the year, intermittent lockdowns, and curbs on mass gatherings, social distancing, etc., also likely contributed to reduced influenza circulation.
- Continued surveillance of influenza viruses is warranted as COVID-19 situation is getting controlled



GIHSN 2020-2021: RESULTS BY SITE

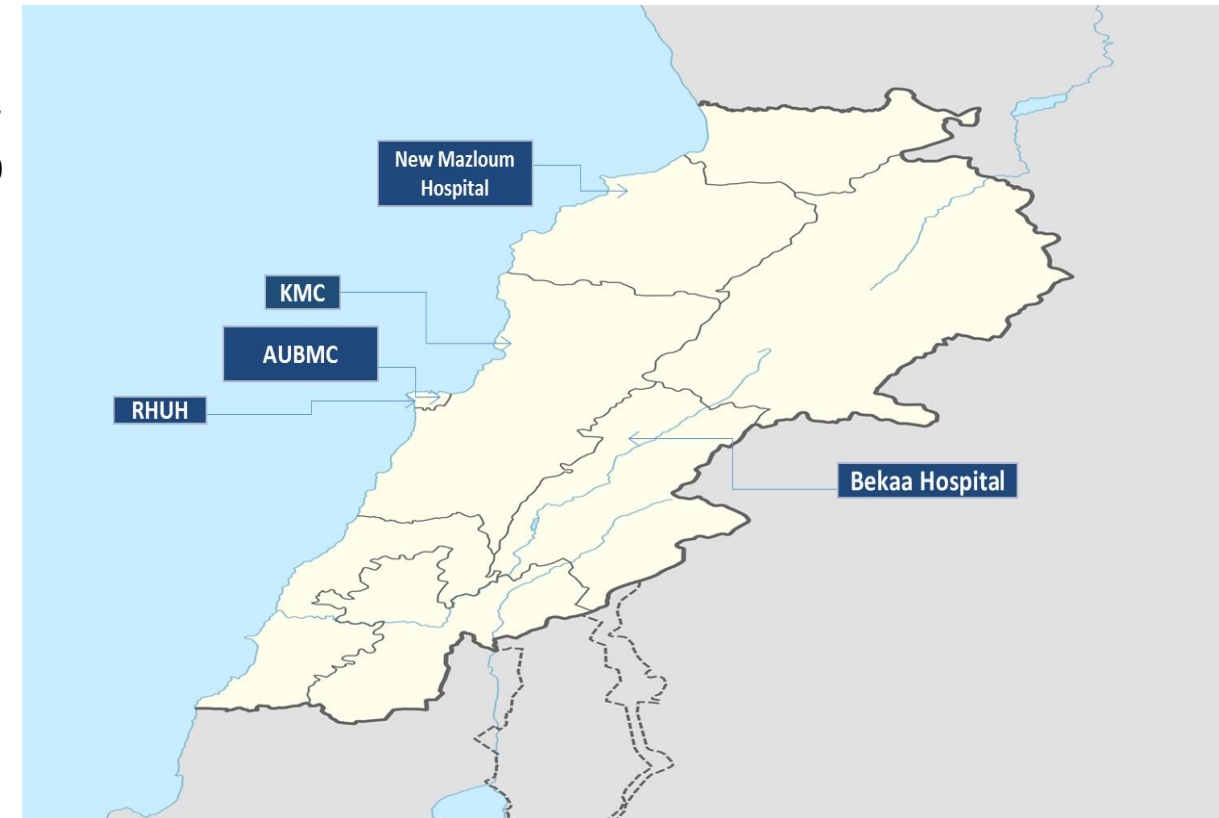
Sarah Khafaja, MD
CIDR – AUBMC - Lebanon



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Lebanon – Multicenter Surveillance Network

- Five hospitals from different governorates in Lebanon : Beirut, Mount Lebanon, Bekaa and North Lebanon, representing ≈1500 patient-beds
- Population:
 - ❖ All age groups
 - ❖ Acute process
 - ❖ Admission in the previous **24-72** hours
 - ❖ Admission diagnosis meeting the predefined conditions



LEBANON

AMERICAN UNIVERSITY OF BEIRUT MEDICAL CENTER

#Screened= **64,194**

#Eligible= **3,523**

#Included = **926**

	SARS-CoV-2	Influenza	RSV	ORV	Mixed viruses
Tested	922	617	617	617	617
Positive result	345 (+33 mixed infections)	52 (+33 mixed infections)	10	5	36

- Virus distribution: SARS-CoV-2 (37.4%), RSV (1.6%), A/NT (8.3%), ORV (Parainfluenza, Rhinovirus) (0.8%) and Mixed viruses (32 SARS-CoV-2 & A/NT, 1 SARS-CoV-2 & B/NT, 1 Parainfluenza & Rhinovirus, 1 RSV & Flu A/NT, and 1 RSV & Adenovirus & Rhinovirus) (5.8%)
- The peaks of the reported LCI and RSV were in June and July, respectively. Subjects < 5 years showed the highest incidences (18.1% (36/199) and 2.5% (5/199), respectively)
- SARS-CoV-2 was seen across different age groups with the largest population between 45-<65 years (60.3%)
- Co-Infection of SARS-CoV-2 and Influenza was found only at 2 sites between April and June
- Males were more affected by SARS-CoV-2 than females (64.6% versus 34.1%)
- Subjects with positive SARS-CoV-2, positive Flu and positive RSV were more likely to have CVD as a pre-existing condition (44.2%, 15.7% and 33.3% respectively), followed by DM (31.4%, 9.8%, and 10% respectively)
- SARS-CoV-2 infection occurred in 10/85 subjects who received 2 doses of vaccine against SARS-CoV-2 (11.8%) versus 177/335 (52.8%) who received only single dose
- Almost half of the subjects infected by SARS-CoV-2 aged 65 - <80 years old (51.8%) were admitted to ICU and 30.1% required mechanical ventilation
Among those aged ≥ 80 years old, 52% were on vasopressors and the mortality rate was 45.5%
- Among subjects with positive Flu aged <5 years old, 38.9% required oxygen supplementation and 44.4% were admitted to ICU.



Conclusion & Challenges

Conclusion:

- COVID-19 pandemic caused a major shift in the epidemiology of respiratory diseases
- SARS-CoV-2 was the most commonly detected virus among hospitalized patients with ILI symptoms during 2020-2021 season in Lebanon
- The subjects aged < 5 years showed the highest incidences of LCI and RSV
- The peak of the reported LCI was in June during this season as opposed to January during the previous season. The lockdown resulted in an apparent abrupt ending of the influenza season as we stopped seeing cases for few months, then the cases reappeared after the relaxation of public health measures.

Conclusion & Challenges

Challenges:

- During 2020-2021 season we had limited capturing of all the positive cases for the following reasons:
 - ❖ During the lockdown, from January till March we were not recruiting any patient since the IRB did not approve it in order to mitigate transmission of SARS-CoV-2 to research staff and others. In addition, after the mitigation measures were eased, a face-to-face approach with a patient who tested positive for SARS-CoV-2 was not allowed as per IRB request
 - ❖ Decline in routine health care seeking for respiratory illness as well as real change in influenza virus circulation
In times of COVID-19 pandemic, the influenza cases decreased during the period of the year when influenza activity usually increases. This is due to the public health measures that were adapted including: mask wearing, social distancing, handwashing, stopping the international travel and school closure
 - ❖ Facing a Low number of admissions in all sites due to the COVID-19 pandemic and the fear and hesitation of people to go to the hospitals, in addition to the economic crisis in Lebanon
 - ❖ Decreased testing - persons with respiratory symptoms were preferentially referred for SARS-CoV-2 assessment and testing
 - ❖ Delay in receiving the PCR kits from the supply company due to the economic collapse in Lebanon and the devaluation of our currency, which caused a delay in PCR processing and results.

Future directions:

- Providing better epidemiological and virologic data on negative and positive influenza virus in Lebanon, estimating the influenza and other respiratory viruses, including COVID-19 related hospitalization burden of disease
- Estimating influenza and COVID-19 vaccine effectiveness in the country
- Enhancing the Middle East and North Africa regional representation in GIHSN
- Sequencing the selected samples in the coming few weeks
- A face-to-face approach with patients infected with SARS-CoV-2 in the next season.



GIHSN 2020-2021: RESULTS BY SITE

Site: Turkey

Name of the Site Speaker: Mine Durusu Tanriover



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Site description

- Study was conducted in Ankara, capital city of Turkey with which hosts 5.5 million people (6.7% of the country population)
- 3 hospitals participated
- 773 adult and pediatric beds were screened for eligible patients inline with the core protocol
- Samples were tested for 13 different viruses (including influenza A, influenza B, RSV, coronavirus) for 41 different strains on Illumina Respiratory Virus Oligo Panel V2
- Sequence data were submitted according to the GISAID protocol



Results

	#included	#LCI	#tested for RSV	#RSV+	#tested for Covid	Covid+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	13	0	13	0	13	0	13	0	0	0
Patients 5+ yrs	130	0	130	0	130	70	130	0	0	55
Total	143	0	143	0	143	70	143	0	0	55

Key messages

- 65% male, mean age among ≥ 5 years old was 52.4 (18.7 SD), 66.4% had at least one chronic condition (the most prevalent one being cardiovascular disease in 34.3%), overall influenza VCR was 13.3%
- ICU admission was more frequent among SARS-CoV-2 positive patients compared to negative ones in the adult cohort (25% vs 10.5%, respectively, $p=0.03$)
- Worse outcomes were noted for those ≥ 65 years old compared to younger adults patients
 - Admission to ICU (28.6% vs 13.3%, $p=0.03$); death (14% vs 2.4%, $p=0.01$)
- Alpha ($n=24$) and beta ($n=1$) VOCs were detected among 55 sequenced specimens

Conclusion & Challenges

CONCLUSIONS:

- The 2020-21 season was dominated exclusively by SARS-CoV-2, the network was successfully utilized
- The project revealed very valuable results to demonstrate the lack of circulation of influenza and other viruses in a time when the sentinel and SARI surveillance were totally disrupted in Turkey
- Elderly patients had worse outcomes
- The emergence of new VOCs in Turkey was evident in the surveillance study

CHALLENGES:

- The organizational structure of the hospitals and the patient flow process changed
- There was no other virus in the circulation, probably as a result of the strict social distancing precautions, mask use and lockdowns (including schools)
- ILI criteria were of course not tailored to detect COVID-19 patients
- Severe COVID-19 patients were admitted in later stages precluding their enrolment for swabbing
- Enrolment was closed before the surge of the delta variant and the recirculation of ORV

Submitted to 20th European Congress of Internal Medicine, 2022



GIHSN 2020-2021: RESULTS BY SITE

Site: St. Petersburg, Russia

Name of the Site Speaker: Daria Danilenko



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Site description: (hospitals participating in the GIHSN)

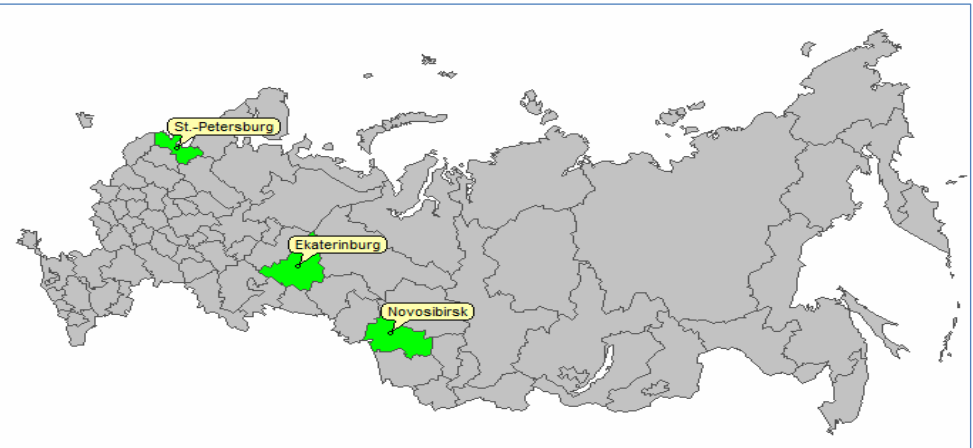
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 285 adults+2213
 children

LCI = 2
 # LC ORV= 1464

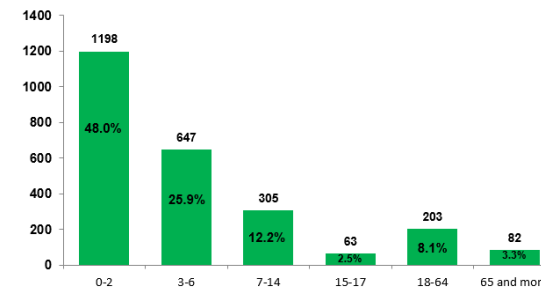
#sequenced =
2 influenza B
101 SARS-CoV-2

Smorodintsev Research Institute of Influenza (Coordinating Centre):

1. St. Petersburg RII (3 hospitals): 1073 patients, 0 LCI cases;
2. Ekaterinburg Research Institute of Viral Infections (2 hospitals): 418 patients, 2 LCI cases;
3. Novosibirsk, Federal Research Centre for Fundamental and Translational Medicine (3 hospitals): 1007 patients, 0 LCI cases.

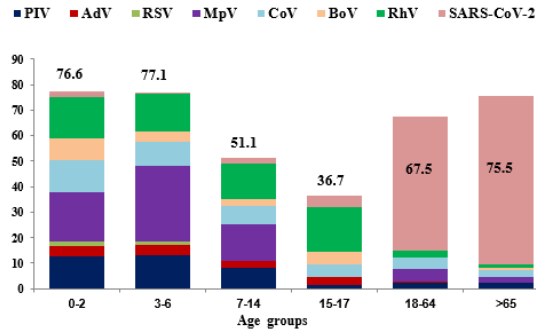


ILI patients of all age groups were selected by criteria of inclusion/exclusion in study. All procedures were performed according to GIHSN standardized protocol and Core Questionnaires. The study was approved by the Local Ethics Committees and conducted in accordance with the principles of GCP. Clinical specimens were tested by rRT-PCR using “AmpliSens” kits (Interlabservice, Russia) for influenza A&B as well as for subtyping of H1N1pdm09, H3N2 and ORV viruses and Charité protocol for SARS-CoV-2. NGS for influenza was performed using Nextera XT sample preparation kit, for SARS-CoV-2 using ARTIC v3 protocol, Illumina MiSeq and MinION. All sequences were submitted to EpiFlu and EpiCoV GISAID database.

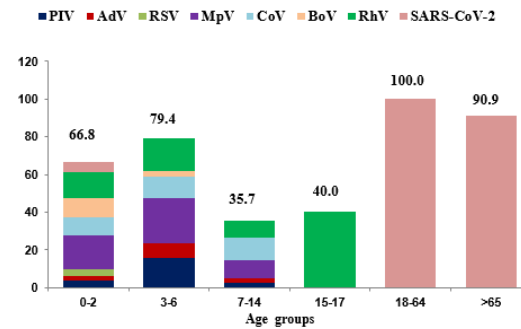


Age specific distribution as a percentage of hospitalized patients included in the study, 2020-2021 season



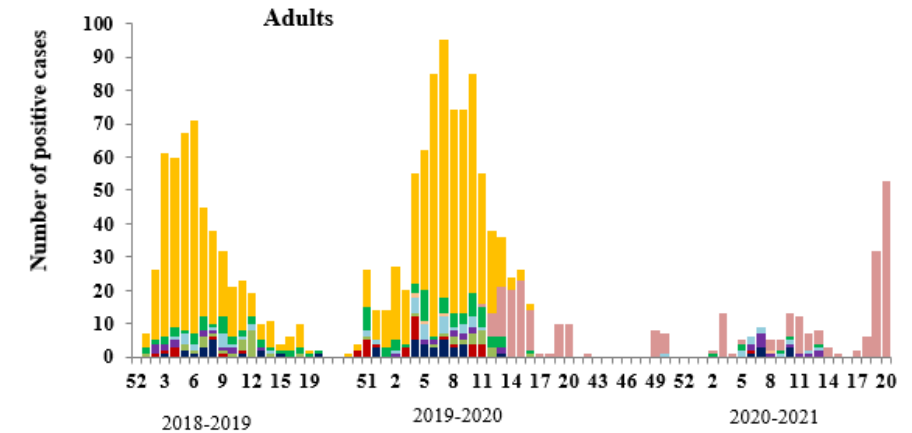
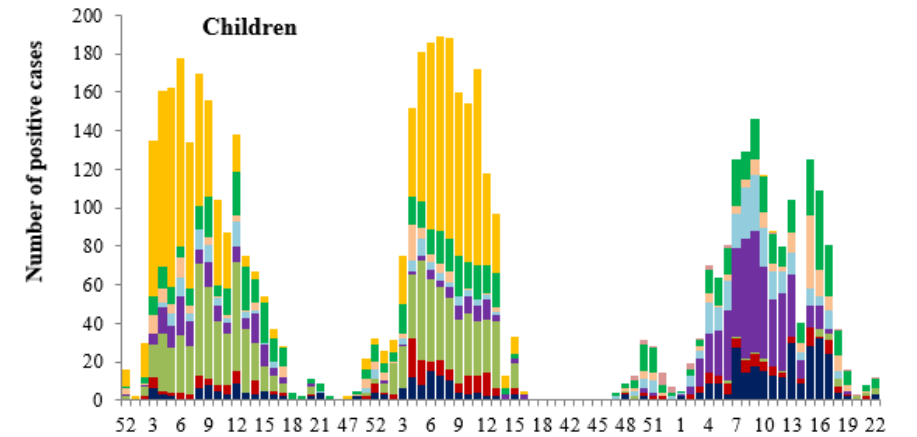


Age specific etiology of SARI in hospitalized patients and percentage of respiratory viruses detection

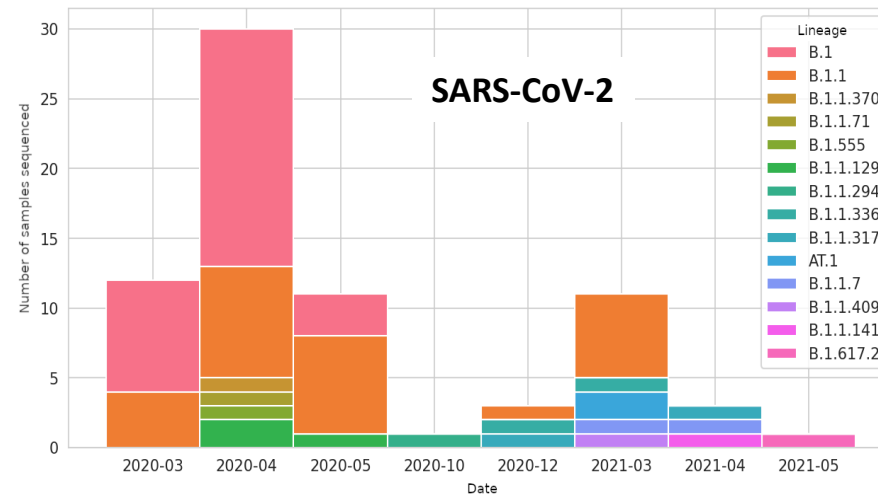
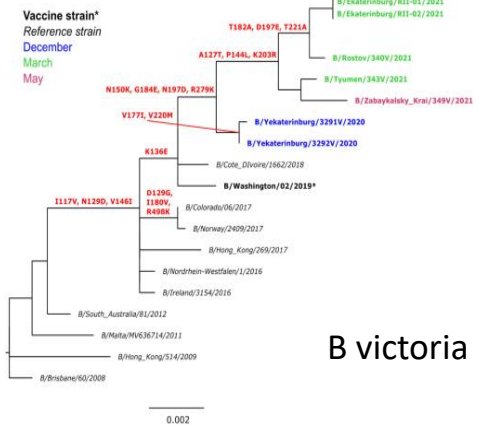


Age specific rate of SARS-CoV-2 and other SARI agents detection among ICU patients

Legend for SARI agents: PIV, AdV, RSV, MpV, CoV, BoV, RhV, SARS-CoV-2, Influenza



The changes in etiology of ARI as result of weekly monitoring of influenza and other respiratory viruses in admitted children and adults for 3 last seasons



Conclusion & Challenges

CONCLUSIONS:

- Influenza circulation in season 2020-2021 was minimal, displaced by the circulation of SARS-CoV-2;
- Circulation of other respiratory pathogens was registered mainly in children but the etiological structure differed from previous seasons (possible interference with SARS-CoV-2);
- Adults hospitalized with SARI mostly had COVID-19. SARS-CoV-2 was the only agent causing ICU placement in adults; metapneumovirus and rhinoviruses were more often in pediatric patients. RSV has been reported extremely rarely.

CHALLENGES:

- Hospitals were repurposed for COVID-19 patients; not many adult patients were eligible due to 7-day eligibility criteria;
- High workload for clinicians due to COVID-19.

Publications

"AGE SPECIFIC ETIOLOGY OF SEVERE ACUTE RESPIRATORY INFECTIONS AND INFLUENZA VACCINE EFFECTIVENESS IN PREVENTION OF HOSPITALIZATION IN RUSSIA, 2018-2019 SEASON", has been accepted for publication in Journal of Epidemiology and Global Health





GIHSN 2020-2021: RESULTS BY SITE

Site: Moscow, Russia

Name of the Site Speakers: Svetlana Trushakova, Elena Burtseva

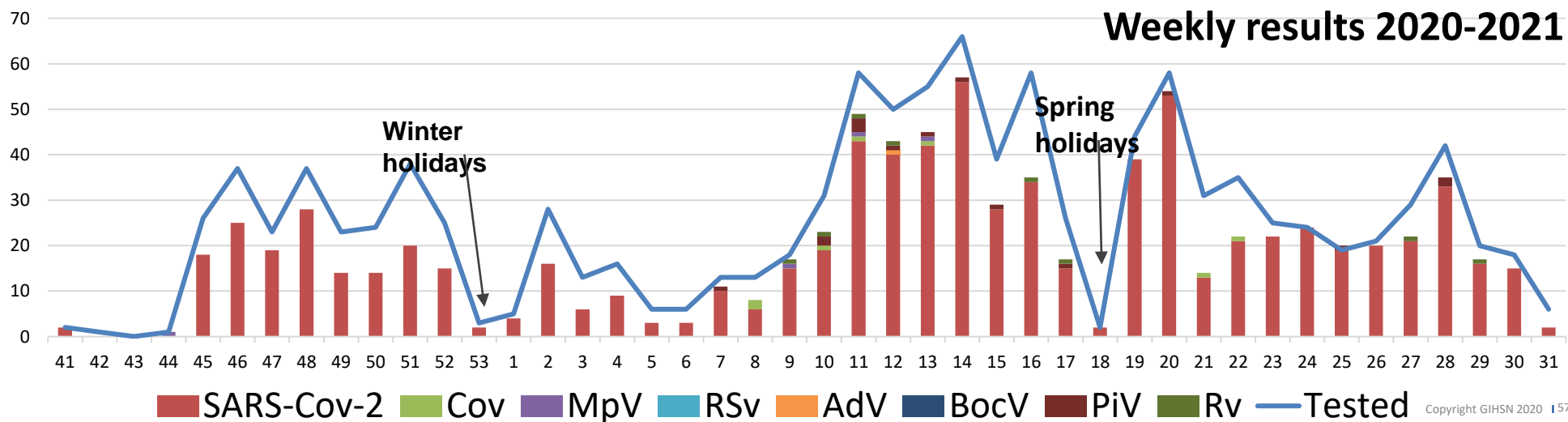


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Participants: FSBI "National Center of Epidemiology and Microbiology named after N.F. Gamaleya", MoPH, Moscow Hospitals for Infectious Diseases #1 and #2, Moscow

Site presentation

- Two hospitals for infectious diseases representing 120 beds and ICU ward - 12 beds (in Hospital N.1) and 80 beds for pregnant women (in Hospital N.2). **Total screened – 1119 patients.**
- No children
- Study period: October 2020 - August 2021



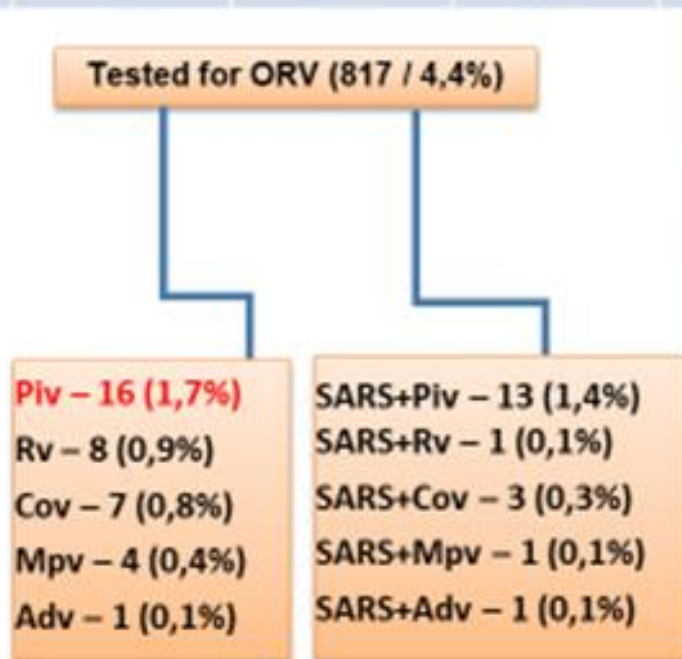
Moscow, Russia

FSBI "National Center of Epidemiology and Microbiology named after N.F. Gamaleya"

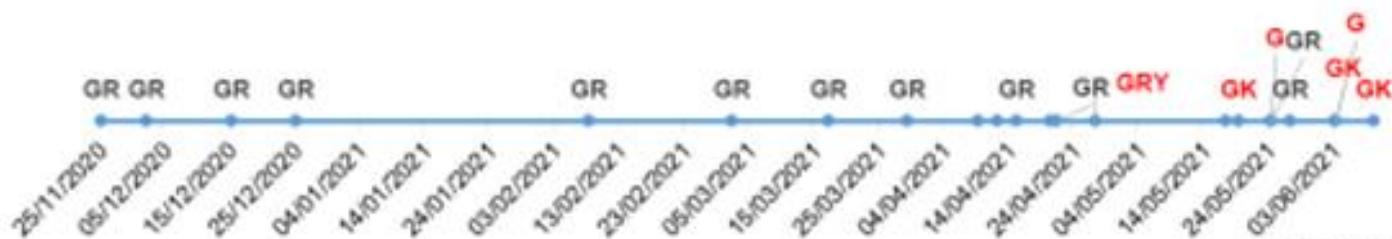
Results

	#Included	#LCI	#tested for RSV	#RSV+	#tested for Covid	Covid+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients 5+ yrs	1119	0	817	0	1119	833	817	36	0	23

Characteristics	Screened 1119	SARS-CoV-2 833 (74%)
Adults (15-64)	484	356 (74%)
Elderly 65+	548	443 (81%)
Pregnants	87	34 (39%)
Males	406	297 (73%)
Females (no pregnant)	626	499 (80%)
Comorbidities: CVD	784	616 (79%)
Comorbidities: Obesity	337	267 (79%)
Comorbidities: Diabetes	225	178 (79%)
ICU	97	94 (97%)
Mech	79	76 (96%)
Death	72	70 (97%)
First dose vaccination	71	53 (75%)
Second dose vaccination	26	20 (77%)
FLU vaccination 2020-2021	77	59 (77%)



Sequenced (23)	Antigenic group	Pango lineage
2	G	B.1.1
5	GK	B.1.617.2 (Delta)
15	GR	B.1.1.317 (4) B.1.1. (2) B.1.1.141 (1) B.1.1.136 (1) B.1.1.254 (3) B.1.1.523 (3) B.1.1.525 (1)
1	GRY	B.1.1.7 (Alpha)



Conclusion&Challenges

- The study period lasted 41 weeks - from October 2020 to August 2021, and during this period the dominant activity of SARS-CoV-2 was found.
- The number of other ORV as well as co-infection with SARS-CoV-2 were low. There was no any influenza cases.
- There were no significant differences in age distributions among hospitalized patients with SARS-CoV-2 infection, but females were slightly prevalent.
- Pregnant women are less exposed to SARS-Cov-2 compare to influenza infection in the previous seasons.
- CVD, diabetes and obesity were the main comorbidity in patients with SARS-Cov-2.
- The rate of mortality among hospitalized patients due to SARS-CoV-2 was 8,0%.
- Among hospitalized patients the number of vaccinated by SARS-Cov-2 vaccines were low (6,4%). The number cases of SARS-CoV-2 was lower in patients vaccinated by 2 doses.
- Full genome sequencing of 23 cases showed that most of them belonged to the clade GR - genetic subliniges, originated most likely from Russia. The clades G, GK and GRY were detected from spring 2021.



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ANNUAL MEETING, 25-26 OCTOBER 2021

GIHSN 2020-2021: RESULTS BY UKRAINE

Name of the Site Speaker: Nataliia Teteriuk



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France

UKRAINE

L.V.Gromashevsky Institute of Epidemiology & Infectious Diseases NAMS of Ukraine

Study conducted in 5 hospitals in 3 cities of Ukraine

- Kyiv – 3 hospitals
- Dnipro -1 hospital
- Khmelnytsky – 1 hospital

1210 adult and pediatrics in-patient beds



Population enrolled is approximately 35% older adults ≥ 65 years of age, admitted to hospitals with an acute respiratory illness

Results *(data shared in the GIHSN)*

	#included	#LCI	#tested for RSV	#RSV+	#tested for Covid	Covid+	#tested for ORV	#ORV+	#WGS LCI	#WGS SARS-Cov2
Patients < 5 yrs	25	0	0	0	25	9	0	0	0	3
Patients 5+ yrs	51	0	0	0	51	45	0	0	0	37
Total	76	0	0	0	76	54	0	0	0	40

Key messages

- Characteristics of enrolled patients: 51% - male and 49% - female; 33% - age <5 yrs, 34% - age 65+. The most frequent co-morbidity was cardiovascular diseases – 45%. The other co-morbidity conditions were: diabetes, asthma, COPD, obesity, renal impairment, rheumatologic diseases, liver diseases, pregnancy, neoplasm. Nobody from the patients was vaccinated against COVID-19.
- There were 8 lethal cases from all patients. All of them were in age group 57-79 years.

Conclusion & Challenges

CONCLUSIONS:

- The ongoing COVID-19 pandemic has influenced to varying extents health seeking behaviors, staffing/routines in sentinel sites.
- There was no circulation of influenza viruses in 2020/21 season in Ukraine. All SARI cases were associated with SARS-CoV-2 virus. WGS of SARS-CoV-2 viruses demonstrated the dynamic of changes variants of viruses according the global circulation.

CHALLENGES:

- The process of receiving sequencing on the local level is not established yet. As a consequences – delay of loading to GISAID. But we work towards increasing this capacity.
- Influenza screening has been impacted by COVID-19; reduced influenza circulation with the COVID control measures, and prioritization of personnel issues at busy COVID-19 sites.

COFFEE BREAK





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ANNUAL MEETING, 25-26 OCTOBER 2021

GIHSN PROTOCOL IMPLEMENTATION 2021/22

Sandra CHAVES, MD, MSc, Scientific Officer Foundation for Influenza Epidemiology

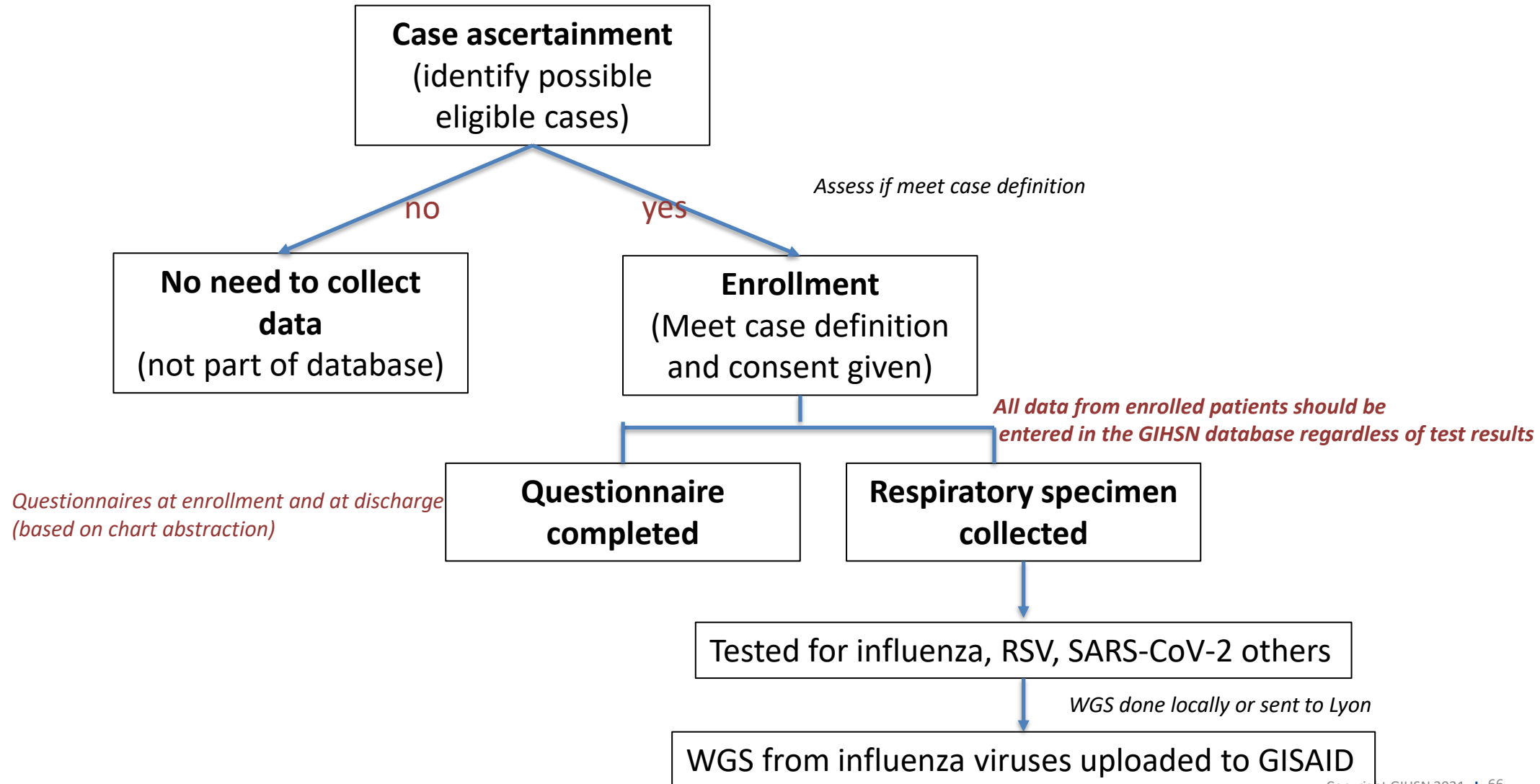


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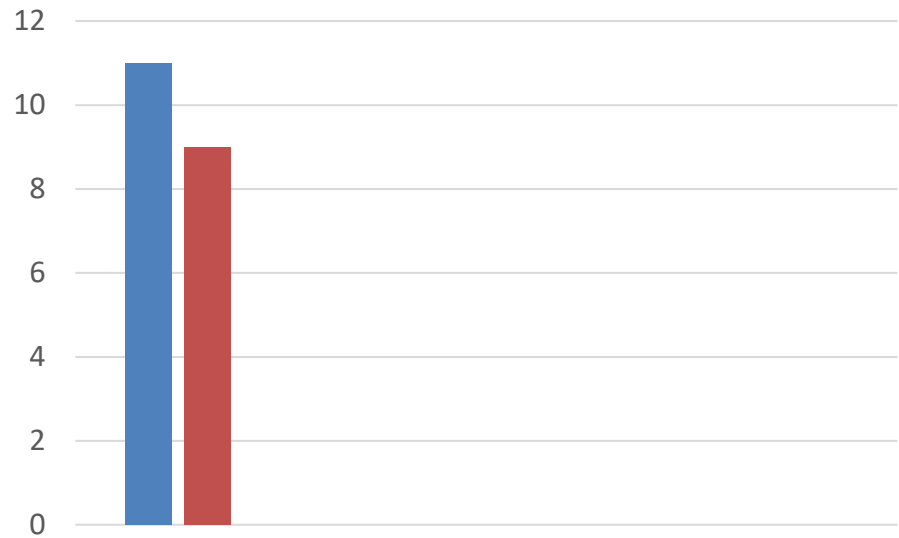
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PROCESS FOR IDENTIFICATION OF CASES AND DATA COLLECTION - GIHSN



CASE ASCERTAINMENT VARIES BY SITE – COULD THAT BE HARMONIZED?

Case ascertainment



- Expanded list of acute disease events (based on broad ICD-10 list)
- Hospital admission logs or electronic boards for acute respiratory illness

Proposal: to identify cases that are hospitalized due to respiratory illness (this can be indicated in the admission logs, infection control logs or in electronic boards in the emergency rooms.

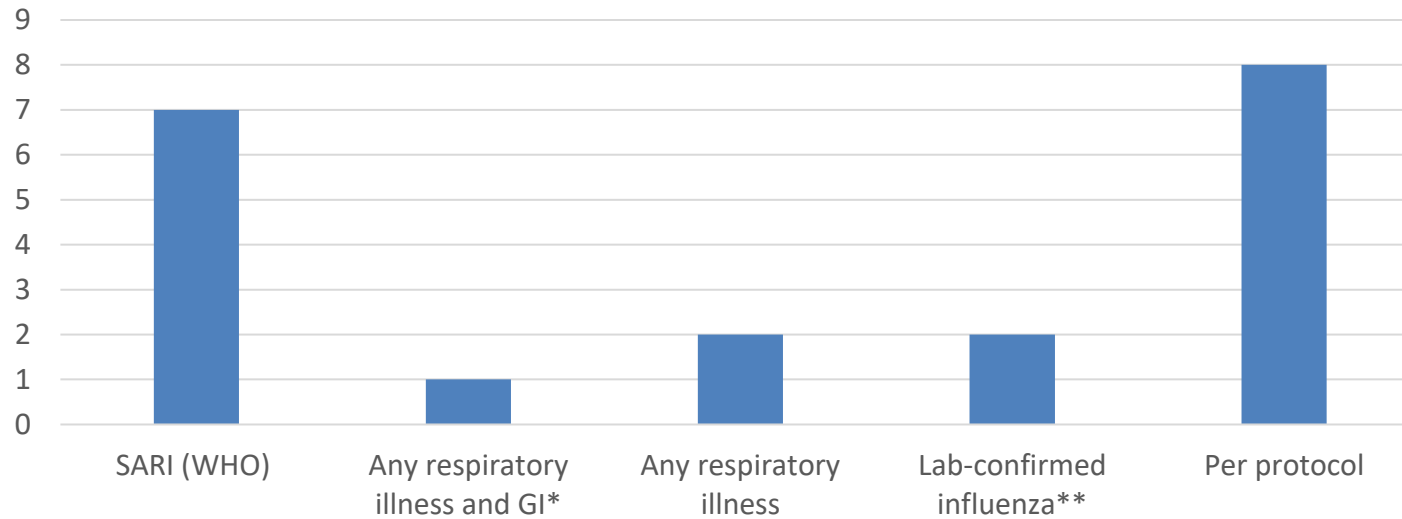
The case finding strategy will vary by hospital setting, but the cases to be approached will all relate to respiratory illnesses

For patients less than 5 years	ICD 9 Codes	ICD 10 Codes	For patients 5 years and older	ICD 9 Codes	ICD 10 Codes
Acute upper or lower respiratory disease	382.9; 460 to 466	J00	Acute upper or lower respiratory disease	382.9; 460-466	J00-J06, J20-J22, H66.90
Dyspnea, breathing anomaly, shortness of breath, tachypnea (polypnea)	786.0; 786.00; 786.05-786.07; 786.09; 786.9	R00 R01 R02 R03	Acute myocardial infarction or acute coronary syndrome	410-411 and 413-414	I20-I25.9
Acute asthma or exacerbation	493.92	J44	Acute asthma or exacerbation	493.92	J45.901
Pneumonia and influenza	480 to 488	J01	Acute heart failure	428-429.0	I50-I50.9; I51.4
Acute respiratory failure	518.82	J96	Pneumonia and influenza	480-488	J09-J18
Acute heart failure	428-429.0	I51	Bronchitis and exacerbations of Chronic Pulmonary Obstructive disease	490, 491.21 and 491.22	J40; J44.0; J44.1
Myalgia	729.1	M79	Acute respiratory failure	518.82	J96
Altered consciousness, convulsions, febrile convulsions	780.01-780.02; 780.09; 780.31-780.32	R40 R41 R42 R43	Myalgia	729.1	M79.1
Fever or fever unknown origin or non specified	780.6-780.60	R50	Acute metabolic failure (diabetic coma, renal dysfunction, acid-base disturbances, alterations to the water balance)	250.1- 250.3; 584-586; 276-277	E11.9, E10.9, E11.65, E10.65, E10.11, E11.01, E10.641, E11.641, E10.69, E11.00, E10.10, E11.69, N17.0, N17.1, N17.2, N17.8, N17.9, N18.1, N18.2, N18.3, N18.4, N18.5, N18.6M, N18.9, N19, E87.0, E87.1, E87.2, E87.3, E87.4, E87.5, E87.6, E87.70, E87.71, E87.79, E86.0, E86.1
Cough	786.2	R05	Altered consciousness, convulsions, febrile convulsions, syncope and collapse	780.01-780.02; 780.09; 780.2; 780.14-780.2	R40.20, R40.4, R40.0, R40.1, R55, R56
Gastrointestinal manifestations	009.0; 009.3	A00			
Sepsis, Systemic inflammatory response syndrome, not otherwise specified	995.90-995.94	R60 R61			
Nausea and vomiting	078.82; 787.0; 787.01-787.03	R10 - R			



CASE DEFINITION

Case definitions for enrollment



*South Africa
**Paris and New York

SARI case definition (WHO)

An acute respiratory infection with:

- history of fever or measured fever of $\geq 38^{\circ}\text{C}$
- and cough;
- with onset within the **last 10 days**.
- and requires hospitalization

Per protocol - Modified ECDC definition of influenza like-illness (ILI) in **last 7 days**

Combination of:

- at least **one of the following four** systemic symptoms: fever or feverishness, headache, myalgia, or malaise;
- at least **one of the following three** respiratory symptoms: cough, sore throat or shortness of breath

CASE DEFINITION IN QUESTIONNAIRE

If the answers to questions 1 and 8 are Yes and the conditions for inclusion described at the top of the page are fulfilled, please proceed with swabbing and laboratory testing by RT-PCR followed by sequencing of selected positive specimens and continue filling in the questionnaire. If no capacities to generate genetic sequence data (GSD) are available onsite, the site may ship its specimens to the GIHSN sequencing platform in Lyon.

If No. to these two questions, then please consider this questionnaire closed.

- Current questionnaire “forces” sites to use protocol case definition
- We should consider changing the questionnaire – allow capturing more clinical information and onset of illness but allow to continue the questionnaire

Screening

- 1) Does the patient comply with any of the admission diagnosis listed in Annex 1? Yes No
- a. Admission diagnosis (letter/code.subcode) [][][][] | [][][][]
- b. ICD used ICD-9 ICD-10
- 2) Date of admission (yyyy-mm-dd) [][][][] - [][][] - [][][]
- 3) What is the hospital ID? [][][][][][][][]
- 4) Patient study identification number [][][][][][][][][][][][]
- 5) Sex Female Male
- 6) Age (Years) [][][]

- 7) Has the patient had one of these symptoms in the last 7 days prior to admission?
- a) ILI systemic symptoms
- ✓ Fever Yes No
 - ✓ Malaise/fatigue Yes No
 - ✓ Headache Yes No
 - ✓ Myalgia/muscle ache Yes No
- b) ILI respiratory symptoms
- ✓ Cough Yes No
 - ✓ Sore throat Yes No
 - ✓ Shortness of breath/difficult breathing Yes No
 - ✓ Nasal congestion Yes No

GIHSN Core questionnaire (Patients 5 years of age or more)

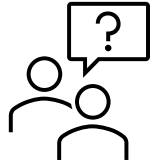
Page 1

- 8) Does the patient comply with the GIHSN ILI case definition* and the timing of symptom onset criteria? Yes No

*GIHSN ILI case definition: at least one of the symptoms listed in question 7a AND one of the symptoms listed in question 7b.



WHAT CAN WE DO TO HARMONIZE CASE ASCERTAINMENT AND DEFINITION?



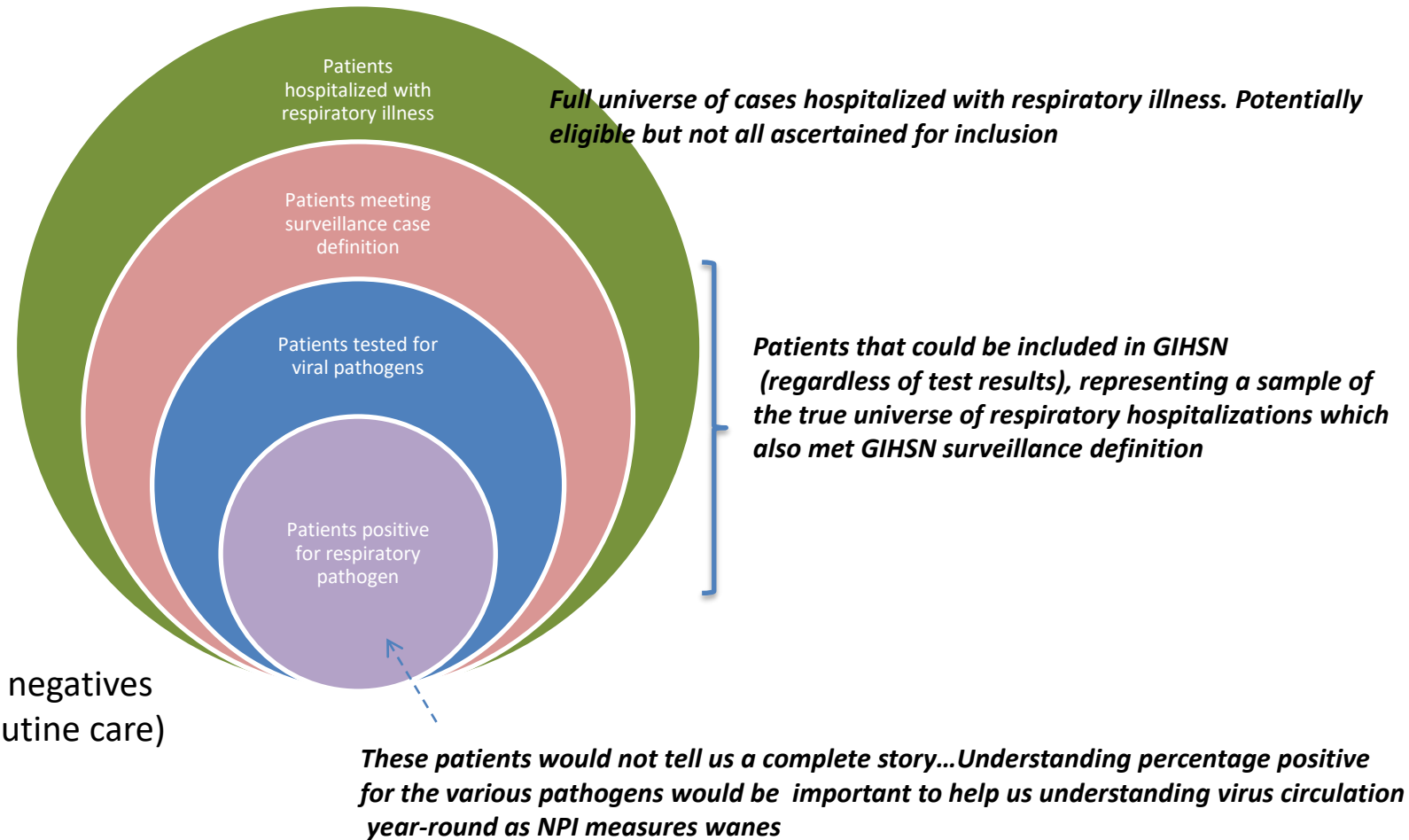
Sites' feedback on case ascertainment and case definition

- Shall we focus on identifying respiratory cases?
(instead of list of acute events)
- Would be possible to systematically collect signs and symptoms at presentation for children and adults? And days of onset?
- Shall we stop restricting data entry to protocol case definition?
- Can we combine questionnaires (kids+adults)?

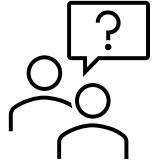
SAMPLING STRATEGY

Sites' feedback:

- Weeklong case finding, enrollment and sample collection – 8 sites
- Pre-defined numbers of samples
 - 10/week – India
 - 30/week – Ukraine
 - First 20/week – Romania
- Defined day for case finding, enrollment and sample collection
 - 3 days/week – Moscow and Turkey
 - 2 days/week – Brazil
- Unclear proposal: China, Paris and Spain
- Need further clarifications
 - Canada – all positives and matched sample of negatives
 - USA – all positives (from residual swabs for routine care)



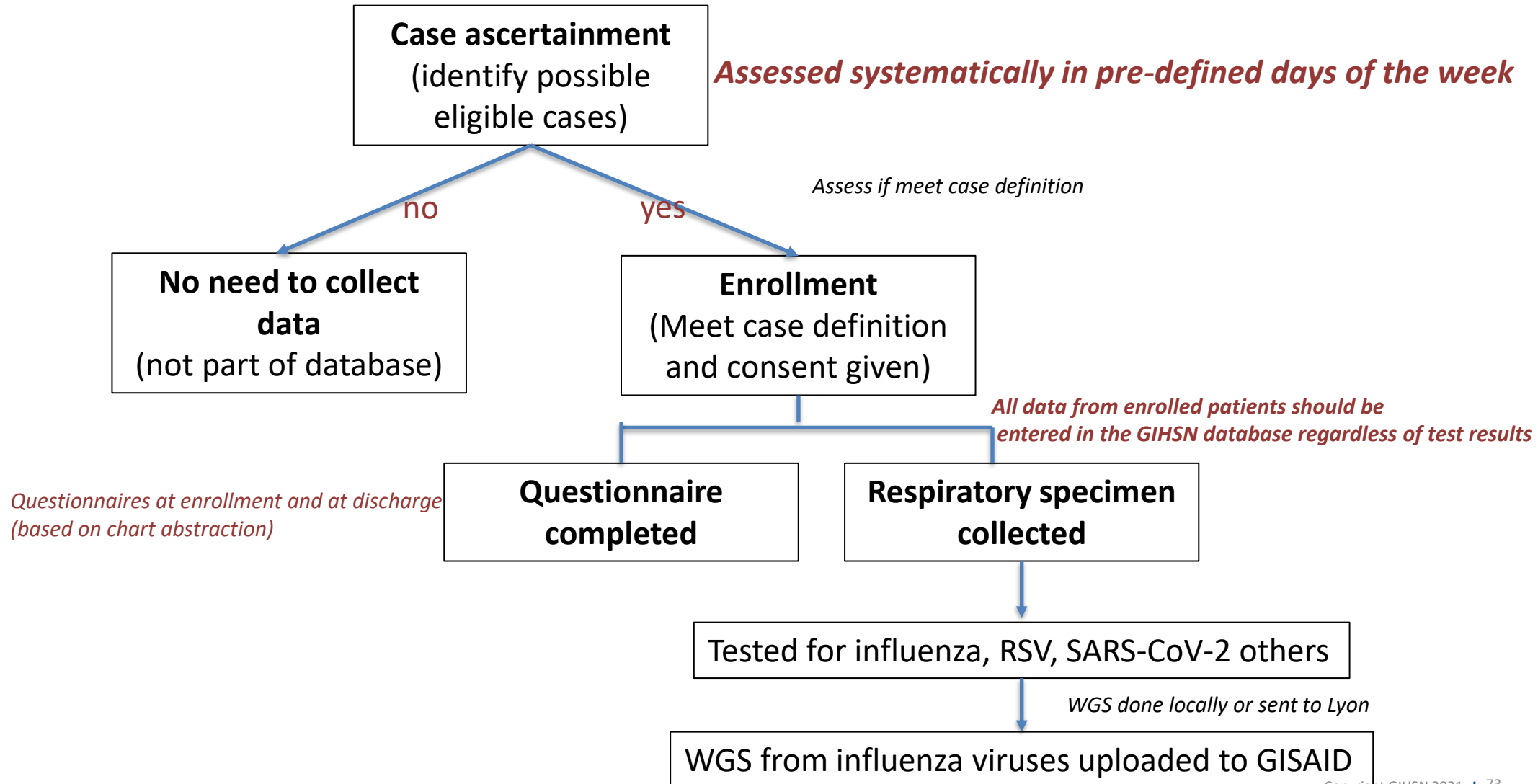
WHAT CAN BE DONE TO MAKE SURE WE HAVE SYSTEMATIC ENROLLMENT, MINIMIZING BIASES?



Sites' feedback on sampling strategy

- Could sites using a sampling approach be able to implement case ascertainment, enrollment and specimen collection in Pre-defined 2-3days/week?
- What should be our time for year-round enrollment?
 - ✓ Nov-Oct?
 - ✓ Sept-Sept? (allowing retrospective data upload)
 - ✓ Dec-Nov?

PROCESS FOR IDENTIFICATION OF CASES AND DATA COLLECTION WHEN USING SAMPLING STRATEGY



RESPIRATORY VIRAL TESTING PLANS FOR YEAR-ROUND SURVEILLANCE NOVEMBER 2021 THROUGH OCTOBER 2022

Site reference			Tested virus			
Worldwide regions	Zone	Country	Flu	Sars-cov-2	RSV	ORV
Africa	Southern Hemisphere	Kenya	Yes	Yes	No	No
Africa	Southern Hemisphere	Ivory Coast	Yes	Yes	Yes	Yes
Africa	Southern Hemisphere	Senegal	Yes	Yes	Yes	Yes
Africa	Southern Hemisphere	Central African Republic	Yes	Yes	Yes	Yes
Africa	Southern Hemisphere	South Africa	Yes	Yes	Yes	Yes
Asia	Northern Hemisphere	China - Shanghai	Yes	Yes	Yes	No
Asia	Intertropical	India	Yes	Yes	Yes	Yes
Asia	Intertropical	Nepal	Yes	Yes	Yes	No
Europe	Northern Hemisphere	Russia - Saint Petersburg	Yes	Yes	Yes	Yes
Europe	Northern Hemisphere	Russia - Moscow	Yes	Yes	Yes	Yes
Europe	Northern Hemisphere	Ukraine	Yes	Yes	No	No
Europe	Northern Hemisphere	Spain	Yes	Yes	Yes	Yes
Europe	Northern Hemisphere	Romania	Yes	Yes	Yes	Yes
Europe	Northern Hemisphere	France - Paris	Yes	Yes	Yes	Yes
Latin America	Southern Hemisphere	Brazil - Curitiba	Yes	Yes	Yes	Yes
Latin America	Intertropical	Peru	Yes	Yes	Yes	Yes
Middle East	Northern Hemisphere	Turkey - Ankara	Yes	Yes	Yes	Yes
Middle East	Northern Hemisphere	Lebanon	Yes	Yes	Yes	Yes
North America	Northern Hemisphere	Canada	Yes	Yes	Yes	Yes
North America	Northern Hemisphere	USA	Yes	Yes	Yes	No

QUESTIONNAIRES – WHAT WAS NEW IN 2020? HOW COMPLETE ARE THE QUESTIONNAIRES?

- Two questionnaires available (children <5 years vs. those ≥5 years) in previous years
- Capture information on testing for specific pathogens (including SARS-COV-2)
- **In the ≥5 years questionnaire**
 - ✓ Added few extra variables to assess clinical presentation (nausea and vomiting, diarrhea, new loss of taste or smell, chest pain)
 - ✓ COVID-19 vaccination
 - ✓ Clarify severity questions to be captured at admission and frailty score to be done in all patients 50 years and older
- **In the <5 years questionnaire**
 - ✓ Added signs and symptoms for acute episode (not collected before), accommodating also those associated with COVID-19



OVERALL MISSING VARIABLES

Questionnaire for those >5 years

Date of swabbing	38,15%	
Does the patient have a positive result?	15,44%	
Did you test for other respiratory viruses ?	15,21%	
Vaccination status COVID-19: at least first dose COVID-19 vaccine received	20,03%	Added 19 March (% post variable added is 12,80%)
Fully vaccinated (2 doses or 1 dose depending on product) more than 14 days before onset of the ILI symptoms	29,89%	Added 19 March (% post variable added is 27,12%)
If known, indicate which COVID-19 vaccine the patient received	96,25%	Added 19 March (% post variable added is 91,93%)
Respiratory rate at admission (<i>breaths per minute</i>)	11,92%	
Supplemental oxygen without mechanical ventilation	34,63%	Spain and Paris do not collect this variable in their study
Vasopressor support	17,69%	Paris does not collect this variable in its study
What is the baseline frailty score of the patient (for all patients 50 years and older), prior to onset of the current illness?	36,74%	Spain does not collect this variable in its study, and Paris uses another index
Discharge/death date	24,14%	
Main diagnose at discharge/death (letter/code.subcode)	19,76%	Kenya and Paris do not collect this variable in the GIHSN format and therefore leave the cell empty
What is the frailty score of the patient at discharge (for all patients 50 years and older) ?	44,16%	Spain does not collect this variable in its study, and Paris uses another index

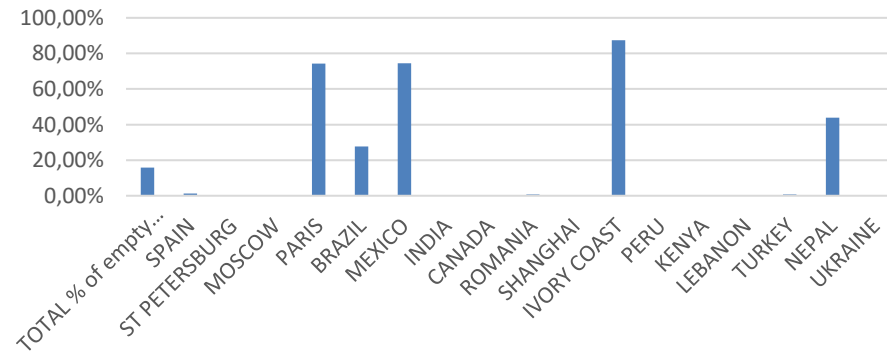
Questionnaire for those ≤5 years

Does the patient have a positive result? If yes, which virus(es)	11,46%	
Did you test for other respiratory viruses ?	11,46%	
Height (Round up to the nearest integer)	15,42%	
Weight (Round up to the nearest integer)	21,69%	
Respiratory rate at admission (<i>breaths per minute</i>)	11,82%	
Main diagnose at discharge/death (letter/code.subcode)	19,22%	Kenya and Paris do not collect this variable in the GIHSN format and therefore leave the cell empty

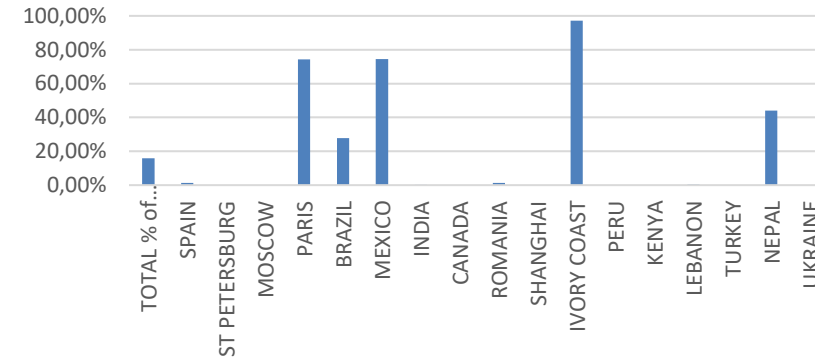
Key to assess severity

COVID-19 RELATED QUESTIONS ADDED LAST YEAR: MISSING DATA

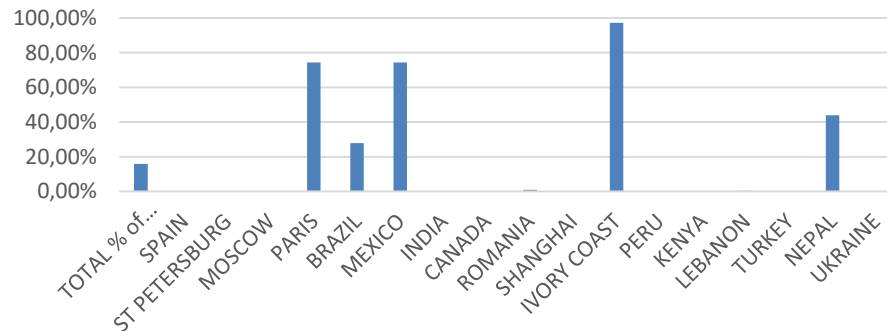
Has the patient had one of these symptoms in the last 7 days prior to admission? **Nausea or vomiting**



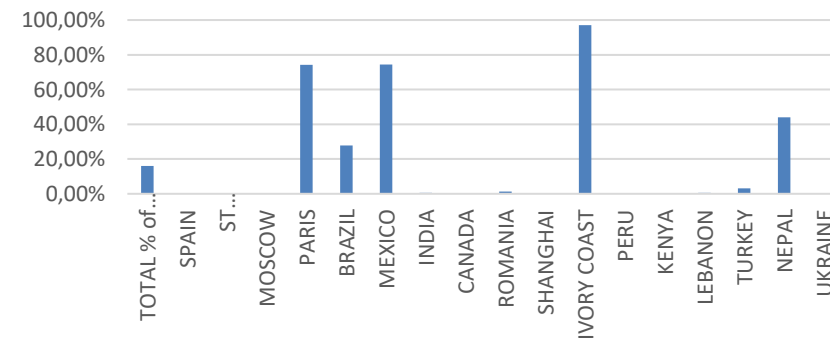
Has the patient had one of these symptoms in the last 7 days prior to admission? **Diarrhea**



Has the patient had one of these symptoms in the last 7 days prior to admission? **Loss or change to sense of smell or taste**

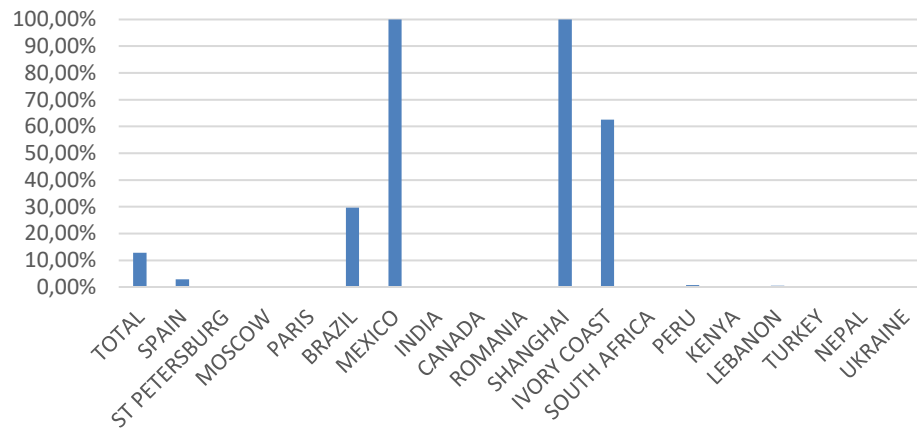


Has the patient had one of these symptoms in the last 7 days prior to admission? **Chest pain**

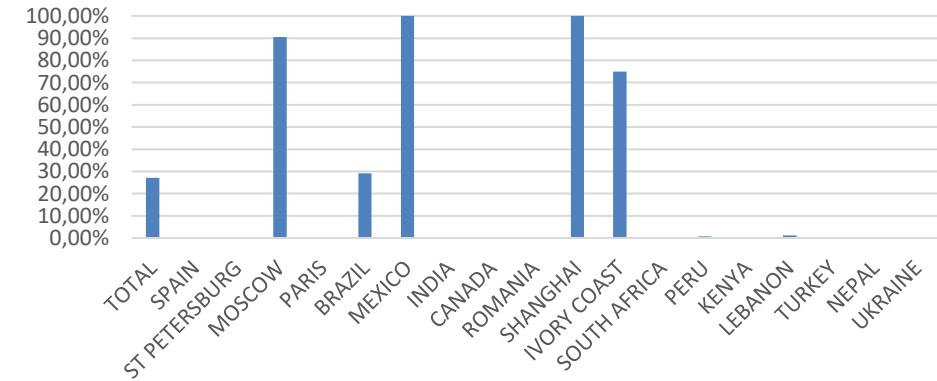


COVID-19 VACCINATION QUESTIONS ADDED LAST YEAR: MISSING DATA

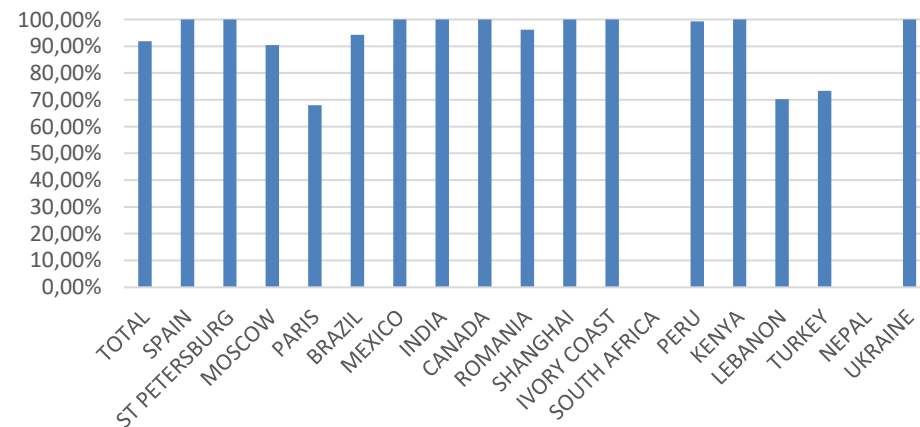
Vaccination status COVID-19: at least first dose COVID-19 vaccine received



Fully vaccinated (2 doses or 1 dose depending on product) more than 14 days before onset of the ILI symptoms

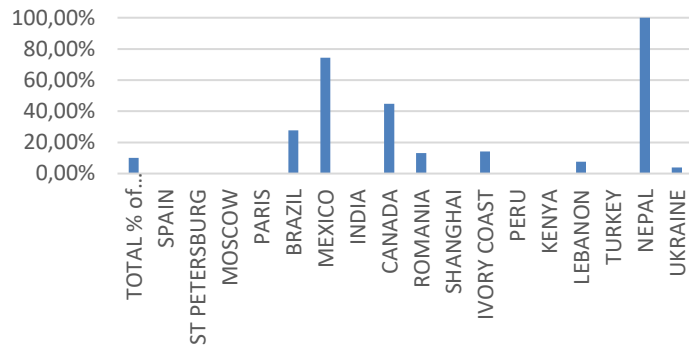


If known, indicate which COVID-19 vaccine the patient received

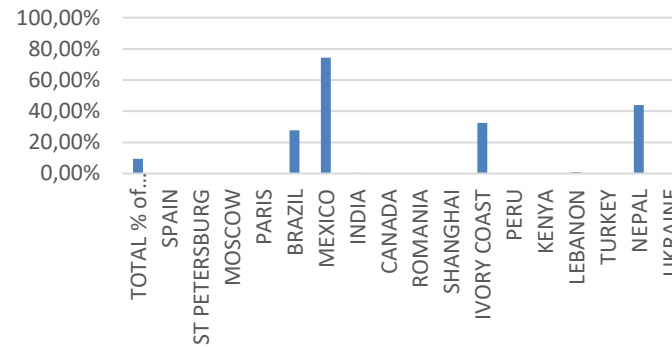


SELECTED SEVERITY VARIABLES WITH HIGH % MISSING DATA

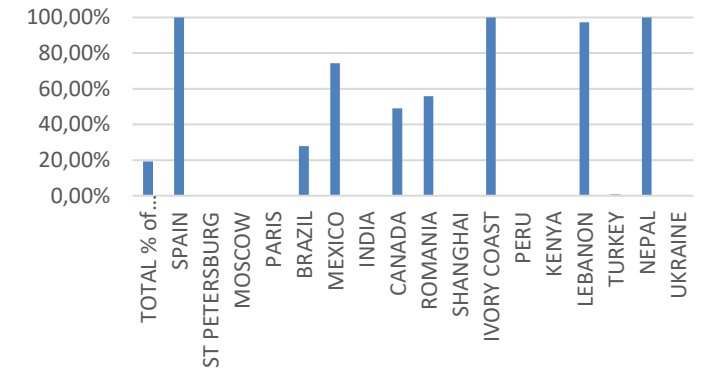
Respiratory rate at admission
(breaths per minute)



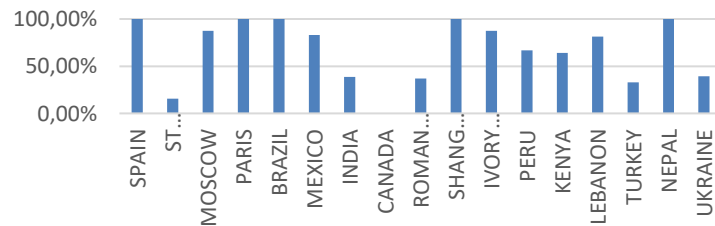
Supplemental oxygen without
mechanical ventilation



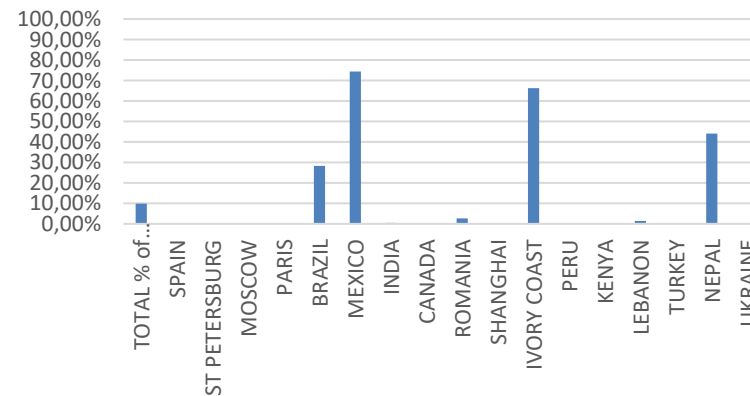
Oxygen saturation value on ambient
air (%)



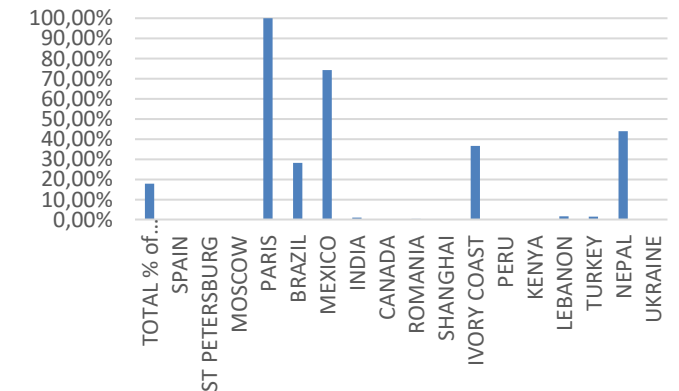
What is the baseline frailty score of
the patient (for all patients 50 years
and older), prior to onset of the
current illness?



ICU admission

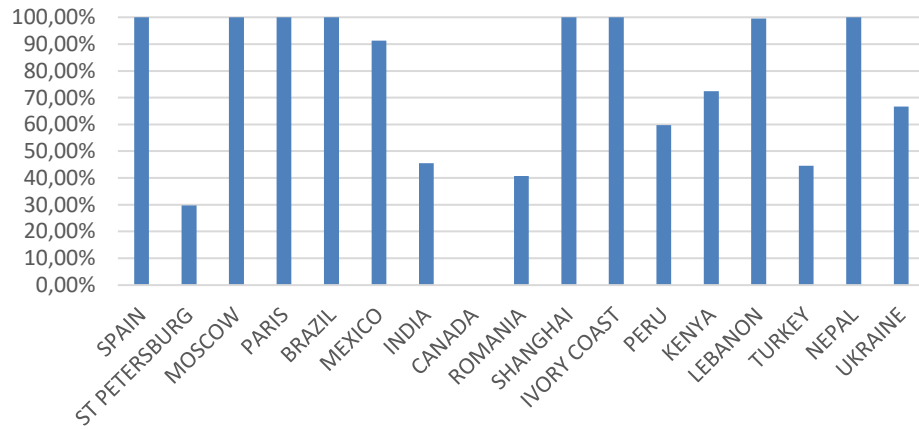


Vasopressor support

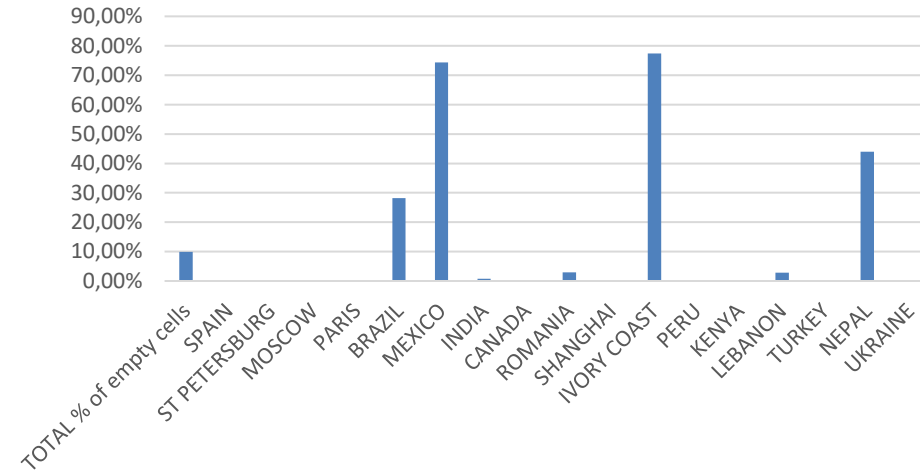


SELECTED SEVERITY VARIABLES WITH HIGH % MISSING DATA (CONT.)

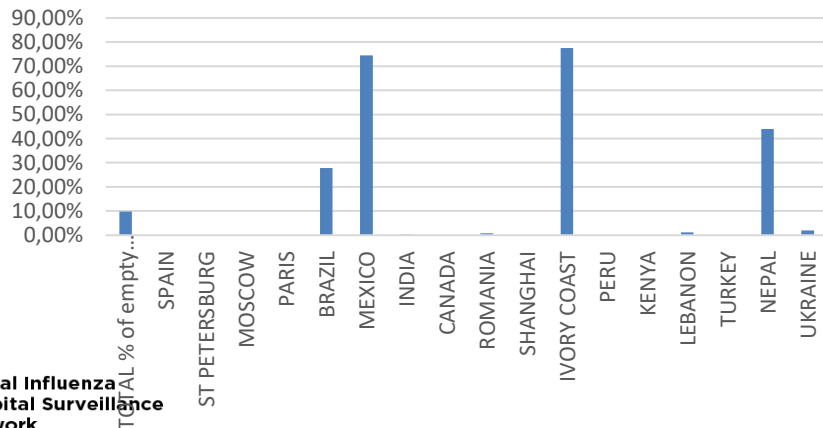
What is the frailty score of the patient at discharge (for all patients 50 years and older) ?



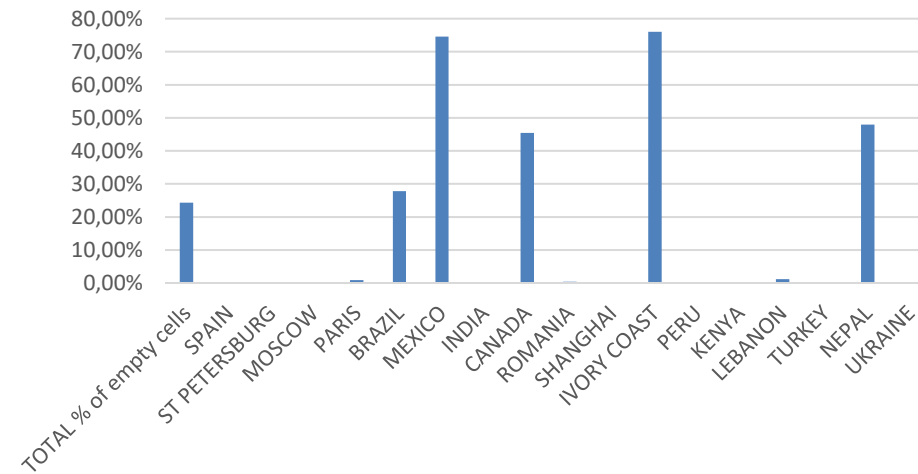
Mechanical ventilation



Death while hospitalized

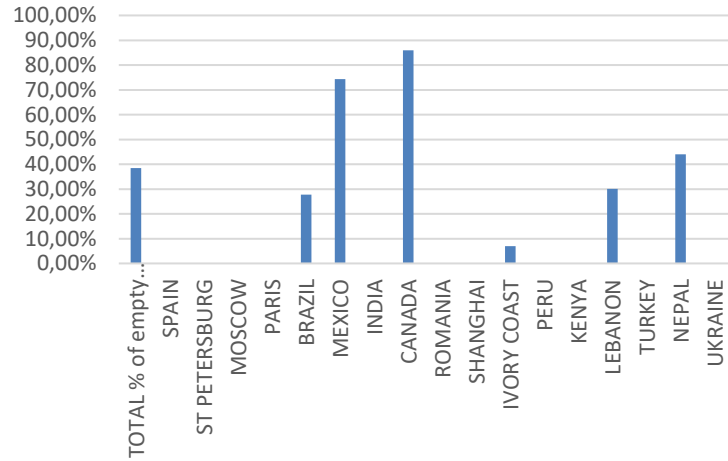


Discharge/death date

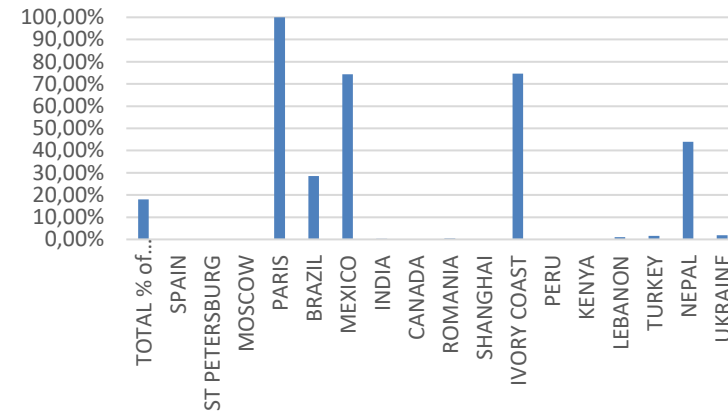


OTHER KEY VARIABLES WITH MISSING DATA

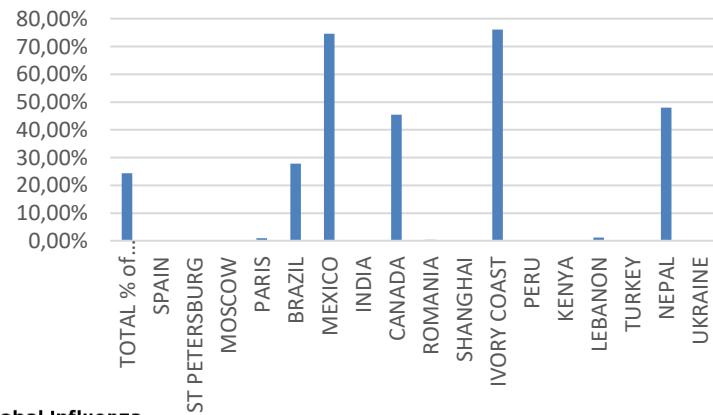
Date of swabbing



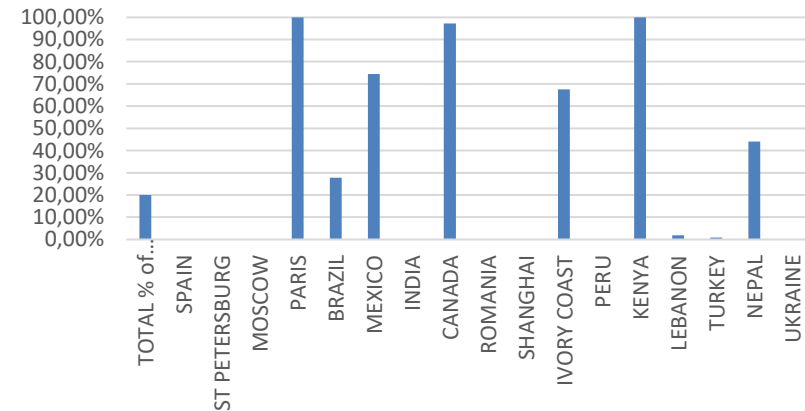
ICD used



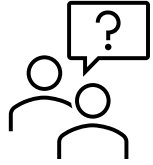
Discharge/death date



Main diagnose at discharge/death



WHAT CAN BE DONE TO IMPROVE COMPLETENESS OF DATA?



Sites' feedback on questionnaire

- Completeness – what to do to improve it?
- Shall we revisit required variables? Shorten the questionnaire
- What are key information we would like to gather?

NEXT STEPS

- Revised protocol and questionnaire(s) for next season with site's input (within next 2 weeks?)
- Get feedback from ISC and sites simultaneously to speed the process
- Adjust database to reflect new questionnaire
- Thoughts?



THANK YOU!



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ANNUAL MEETING, 25-26 OCTOBER 2021

MANUSCRIPT ON GIHSN ACTIVITIES 2019-2020

Prof Bruno LINA, University of Lyon



Foundation for
Influenza
Epidemiology

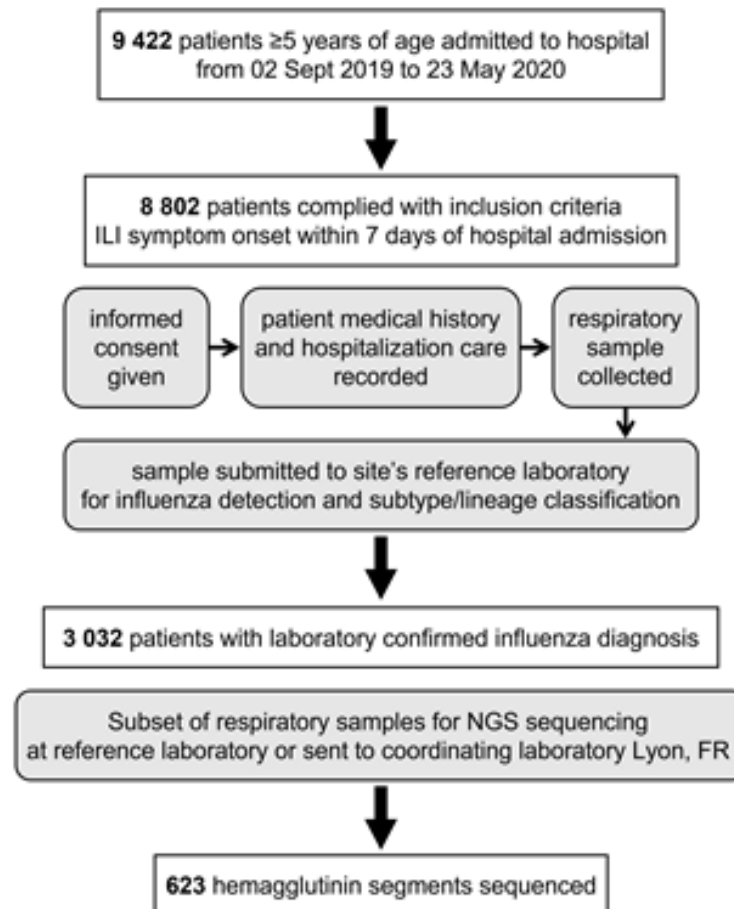
Sous l'égide de

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de
France

2019-2020 GIHSN PUBLICATION

TITLE: CLINICAL AND PHYLOGENETIC INFLUENZA DYNAMICS FOR THE 2019-20 SEASON IN THE GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK (GIHSN)

Inclusions



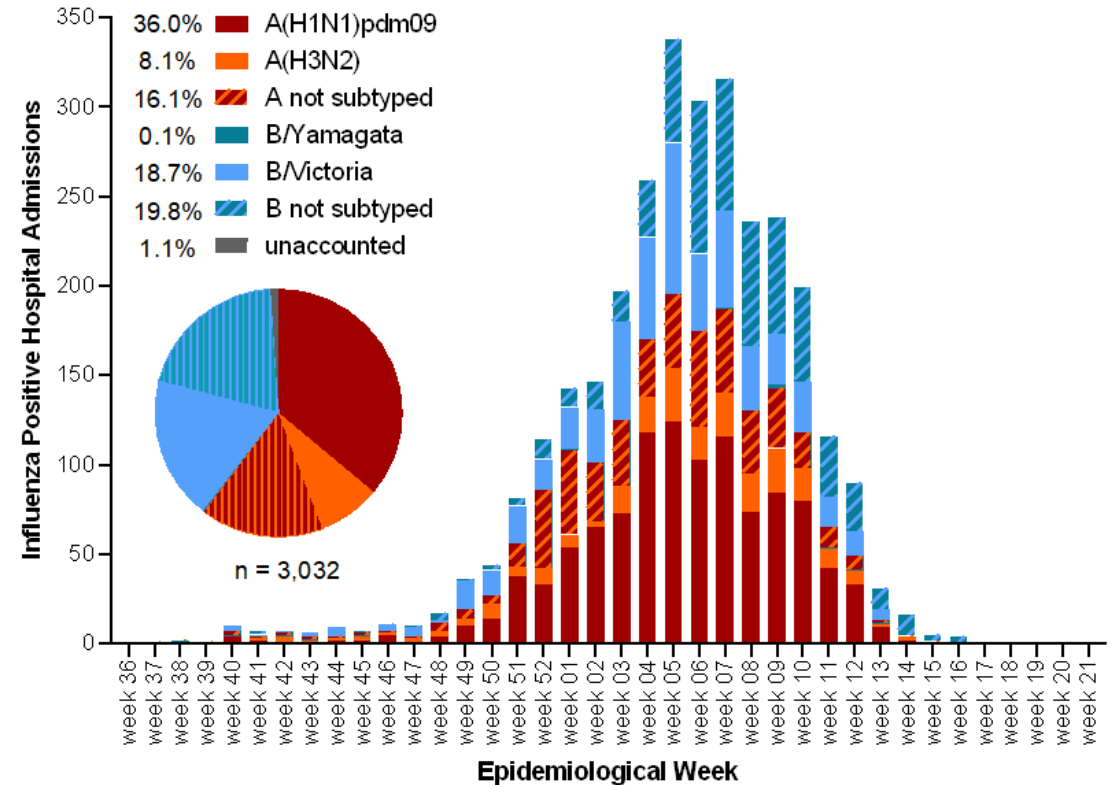
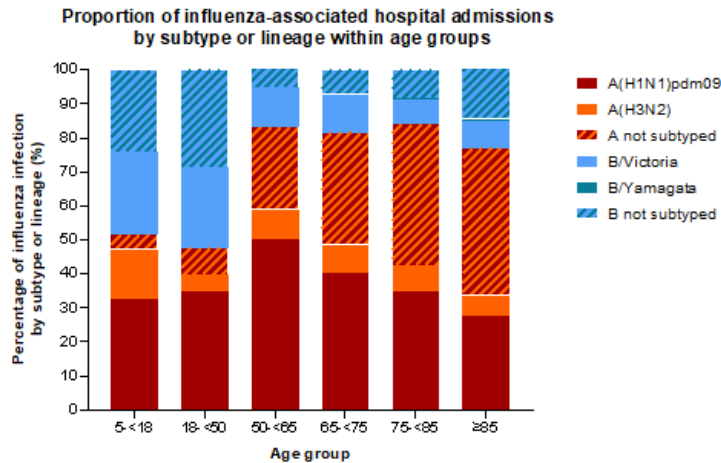
2019-2020 GIHSN PUBLICATION

CLINICAL AND PHYLOGENETIC INFLUENZA DYNAMICS FOR THE 2019-20 SEASON IN THE GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK (GIHSN)

Results (1)

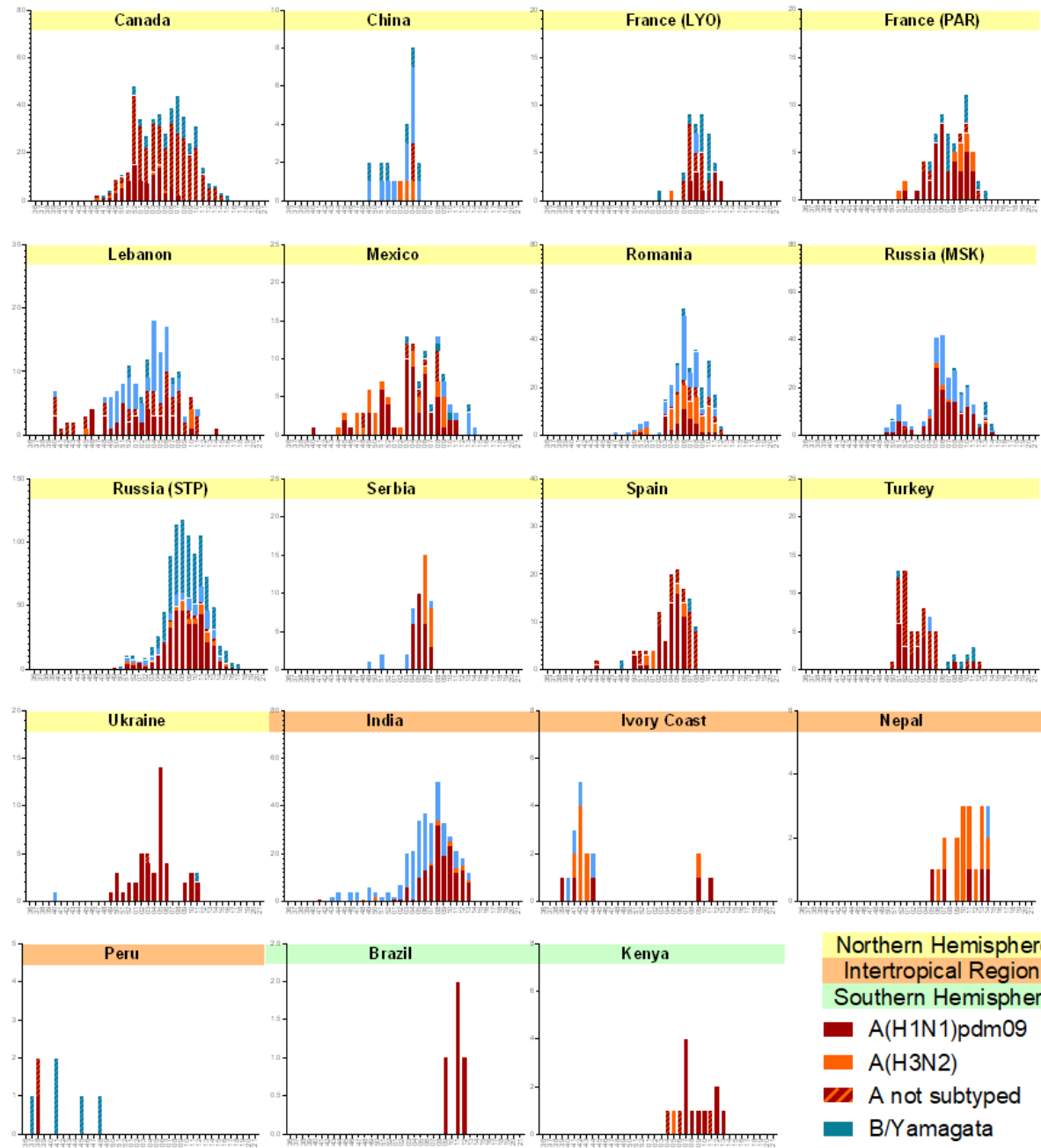
- 14,221 patients were screened across 19 participating sites, for which 8,844 complied with the study inclusion criteria.

- 3,302 has a laboratory-confirmed influenza diagnosis. Influenza A dominated the season for all age groups, while B/Victoria accounted for over half of the younger patients aged 5 to 50 years.

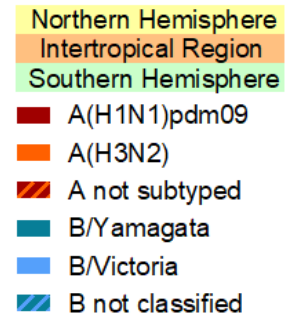


DATA SET from the sites
Positive detection

Influenza Positive Hospital Admissions



Epidemiological Week

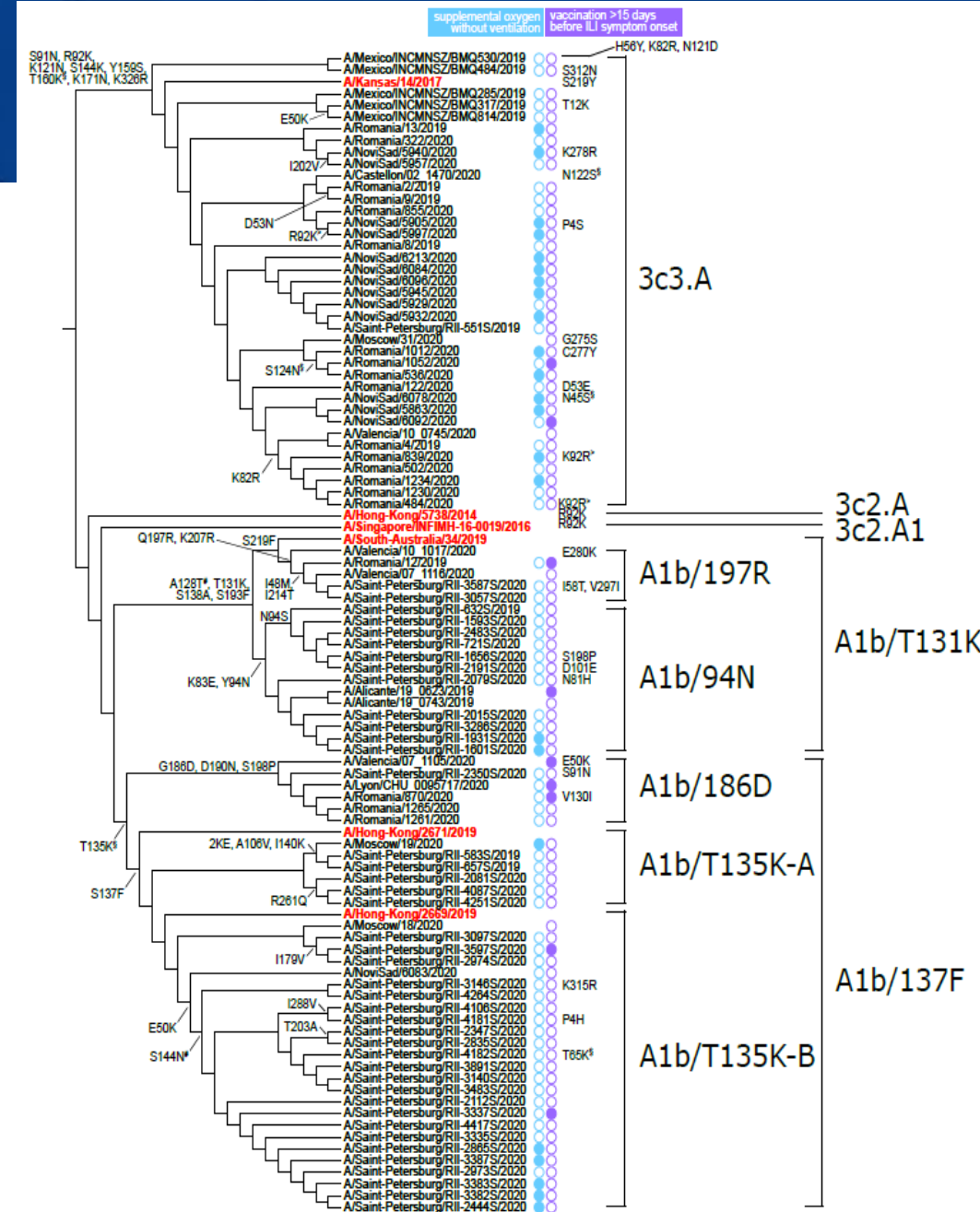


2019-2020 GIHSN PUBLICATION

CLINICAL AND PHYLOGENETIC INFLUENZA DYNAMICS FOR THE 2019-20 SEASON IN THE GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK (GIHSN)

Results (2)

- HA segment was sequenced for 624 patient samples showing similar influenza clade frequency among severe influenza hospitalizations and community infections.
- No phylogenetic clustering was observed between hemagglutinin substitutions and the primary clinical parameter of supplemental oxygen requirement or with vaccine failure (ie A(H1N1)pdm09).



2019-2020 GIHSN PUBLICATION

CLINICAL AND PHYLOGENETIC INFLUENZA DYNAMICS FOR THE 2019-20 SEASON IN THE GLOBAL INFLUENZA HOSPITAL SURVEILLANCE NETWORK (GIHSN)

Pending :

- 1 – complete finalization of the manuscript by Gregory QUEROMES (1st week Nov)
- 2 – agreement on the author's list (2nd week Nov)
- 3 – submission to Clinical Microbiology and Infections (2020 IF 8.067)

10/28/2021





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ANNUAL MEETING, 25-26 OCTOBER 2021

CALL FOR RESEARCH PROJECTS PROCESS

Laurence TORCEL-PAGNON, Foundation for Influenza Epidemiology



Foundation for
Influenza
Epidemiology

Sous l'égide de

Fondation
de
France

BACKGROUND AND RATIONALE

- ❖ The Foundation wishes to support **research projects and analytical proposals focused on influenza and others respiratory virus that leverage on the GIHSN platform.**
- ❖ Projects and proposals could include **novel analysis of existing data, the use of respiratory samples (from selected participating sites) for pathogen discovery or other relevant studies, or study proposals that engage site specific investigators (one or more sites)** to further improve our understanding of influenza and other respiratory viruses (which could involve collection of new data), among other initiatives.



ELIGIBILITY CRITERIA (1)

- ❖ **Any GIHSN site investigators, not for profit stakeholders/institutions would be eligible for the call for research projects.** Applicant should submit a proposal which presents the idea for the research project or analytical proposal in detail, including:
 - requester capacity and experience and affiliation
 - research question, rationale, objectives and expected outcomes,
 - define whether the request is for having access to dataset (if analytical proposal), use of specimen bank, or for collection of new data in collaboration with site investigators to complement already existent information
 - description of the planned analysis,
 - expected impact of the research /public disclosure-publication,
 - timelines and status of the project preparation (e.g. full protocol, IRB, funding, training,)
 - *The Foundation for Influenza Epidemiology may be able to provide grants to partially supplement the research project proposal funding. The applicant needs to provide a detail budget, indicating other sources of support.*

SELECTION PROCESS

- ❖ Applications meeting the eligibility criteria will be reviewed and evaluated by the **Independent Scientific Committee of the Foundation who will assess the scientific value and ethical aspect of the research projects proposals.**
- ❖ If needed a feasibility evaluation will be conducted by Impact Healthcare who is the company mandated by the Foundation to coordinate the network and host the database.
- ❖ The **Executive committee of the Foundation will then select the research projects proposals based on strategic relevance and eventually budget availability and authorise for dataset access** (through a secured GDPR compliant IT system).
- ❖ Sites remain owners of their data and they will be informed of the selected proposals and invited to contribute. Sites will also weigh in the final approval.
- ❖ Applications that involve request for access to respiratory samples or need new data collected should preferably engage with specific sites in advance and involve the local investigators and/or have their support letter included in the submission package.

The yearly maximum envelop for optional grant support across all projects is **200,000 euros.**

HOW TO APPLY

- ❖ **Applications to this call are welcomed all year long.** All applications must be submitted on-line on the GIHSN website via the application template. **The formal review outcome will be communicated twice a year (April and October).** It is advised to submit proposals 1 month before the review months to be considered:
 - ❖ 4 applications have been received so far, to be submitted to the ISC
 - 1/ Influenza rebound after COVID-19 and shifts in subtype dominance ; Cécile Viboud, Fogarty International Center, National Institutes of Health*
 - 2/ GIHSN Severity Scale (GIHSN SevScale), aims to develop a scientifically-developed severity scale for influenza cases reported to GIHSN ; John Paget, Saverio Caini, Peter Spreeuwenberg, Nivel, Utrecht, the Netherlands*
 - 3/ Epidemiology, clinical characteristics and outcomes of ARVI in hospitalized pregnant women and postponed effect in their babies during 2018-2022 (4 seasons) ; Elena Burtseva & Svetlana Trushakova (Moscow site)*
 - 4/ Experience of older adults hospitalized with influenza and acute respiratory illness in relation to function in Activities of Daily Living: a report from the GIHSN ; Melissa Andrew and Shelly McNeil (Canada site)*
- ❖ A formal letter from the Foundation describing research modalities and optional grant payment milestones will be sent to the selected applicants.

Launched in July and considered as a pilot year

Questions & feedbacks from sites are welcomed





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ANNUAL MEETING, 25-26 OCTOBER 2021

CLOSING



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Epidemiology**

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