Using Healthcare Big Data in Pandemic Response by Characterizing Disease Natural History and Predicting Patient Outcomes (Project CHARYBDIS)

Kristin Kostka, MPH
Associate Director, IQVIA OMOP Data Network
IQVIA

Snapshot of the OHDSI COVID-19 Data Network

USA (11)	EUROPE (8)	ASIA-PACIFIC (3)
Columbia University (NY – EHR)	CPRD (UK – EHR)	HIRA (South Korea – Administrative Claims)
Department of Veterans Affairs (National – EHR)	DA Germany (Germany – EHR)	DCMC (South Korea – EHR)
HealthVerity (Claims linked to diagnostic testing)	HM Hospitales (Spain – Hospital Billing)	Nanfang Hospital (China – EMR)
IQVIA Open Claims (National – Administrative Claims)	IPCI (Netherlands – EHR)	
Optum EHR (National – EHR)	LPD France (France – EHR)	
Optum SES (National – EHR linked to Socio-economic data)	LPD Italy (Italy – EHR)	
Premier (National – Hospital Billing)	SIDIAP (Spain – EHR)	
Stanford University (CA – EHR)	SIDIAP-H (Spain – EHR Hospital linkage)	
Tufts University (MA – EHR)		
University of Colorado Anschutz Medical Campus (CO – EHR)		
University of Washington Medicine COVID Research Dataset (WA – EHR)		

Together, OHDSI has studied:

- **>7.4m** patients tested for SAR-COV-2
- **>1.6m** patients diagnosed or tested positive for COVID-19
- **>300k** patients hospitalized with COVID-19

EHR = Electronic Health Records, EMR = Electronic Medical Records

As of 12Oct2020

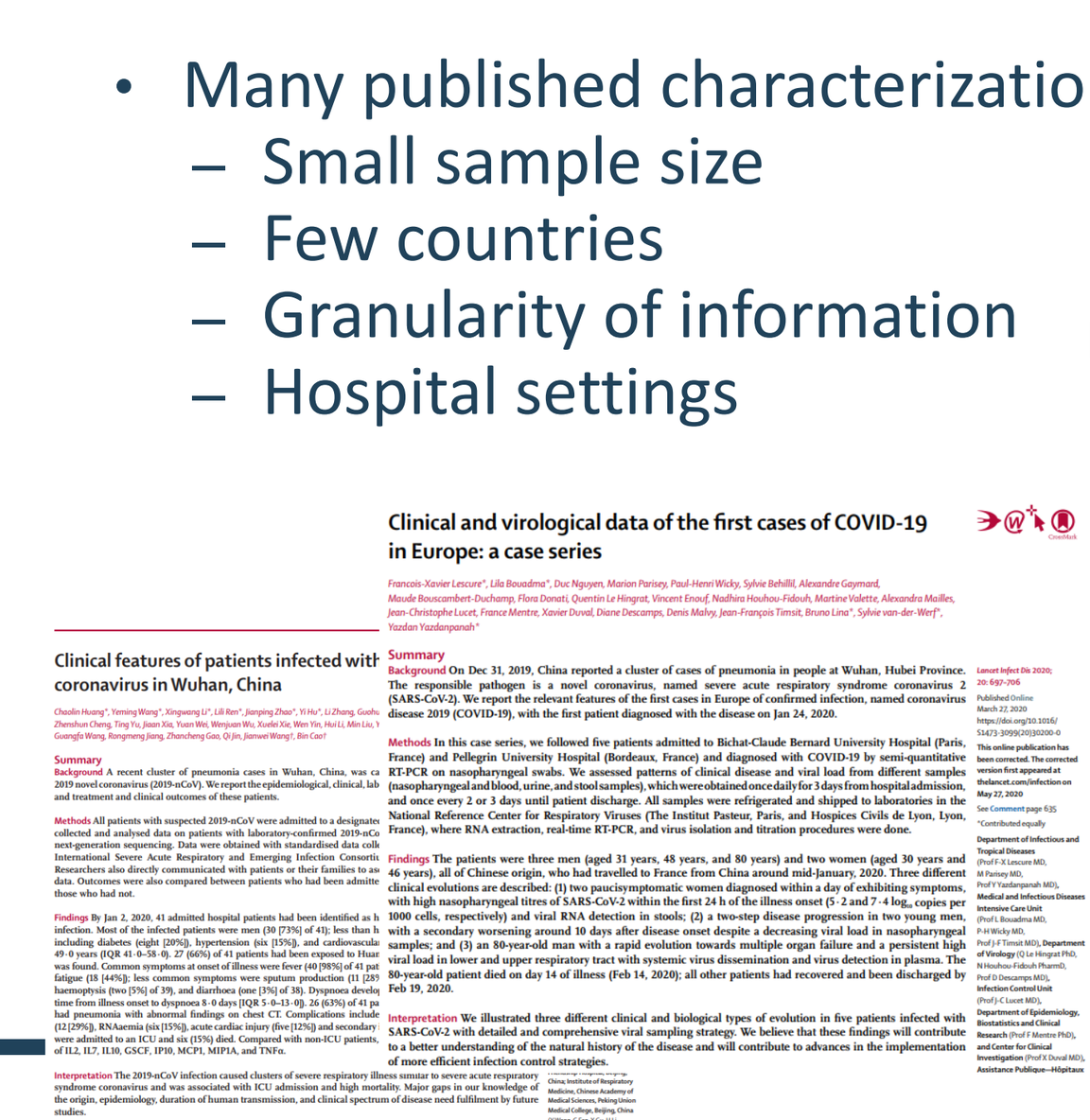
Characterizing Health Associated Risks, and Your Baseline Disease In SARS-COV-2 (CHARYBDIS)

1) Describe the baseline demographic, clinical characteristics, treatments, symptoms and outcomes of interest among individuals with COVID-19 overall and stratified by sex, age and specific comorbidities

2) Describe characteristics and outcomes of influenza patients between September 2017 and April 2018 compared to the COVID-19 population

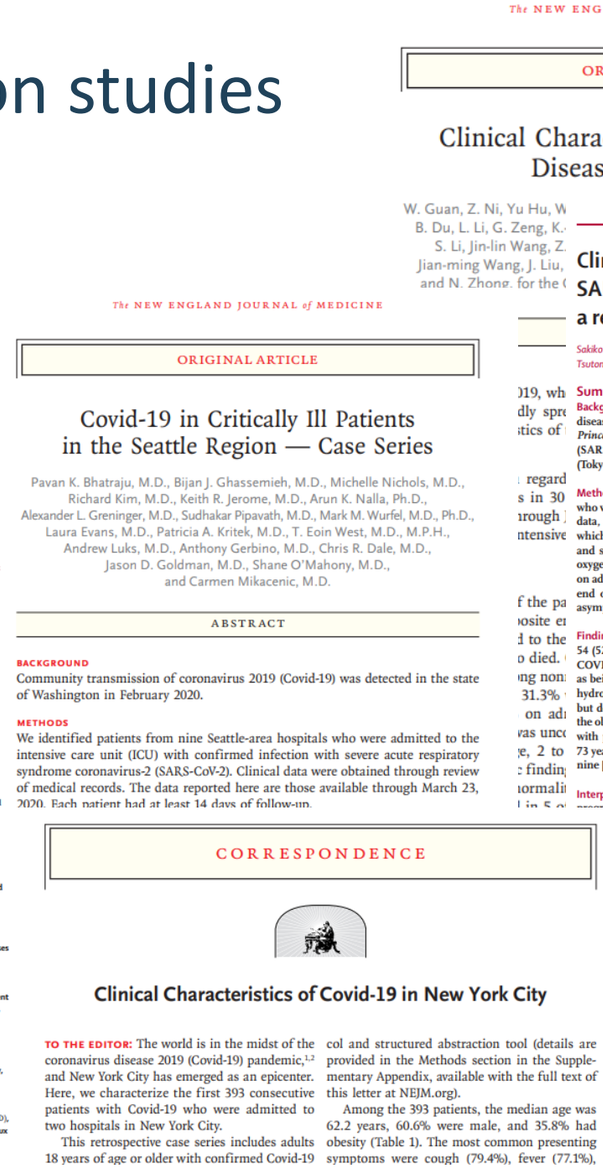
Why CHARYBDIS?

- Many published characterization studies
  - Small sample size
  - Few countries
  - Granularity of information
  - Hospital settings



Clinical features of patients infected with coronavirus in Wuhan, China

Clinical and virological data of the first cases of COVID-19 in Europe: a case series



The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Covid-19 in Critically Ill Patients in the Seattle Region — Case Series

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Clinical Characteristics of Coronavirus Disease 2019 in China

Clinical characteristics of COVID-19 in 104 people with SARS-CoV-2 infection on the *Diamond Princess* cruise ship: a retrospective analysis

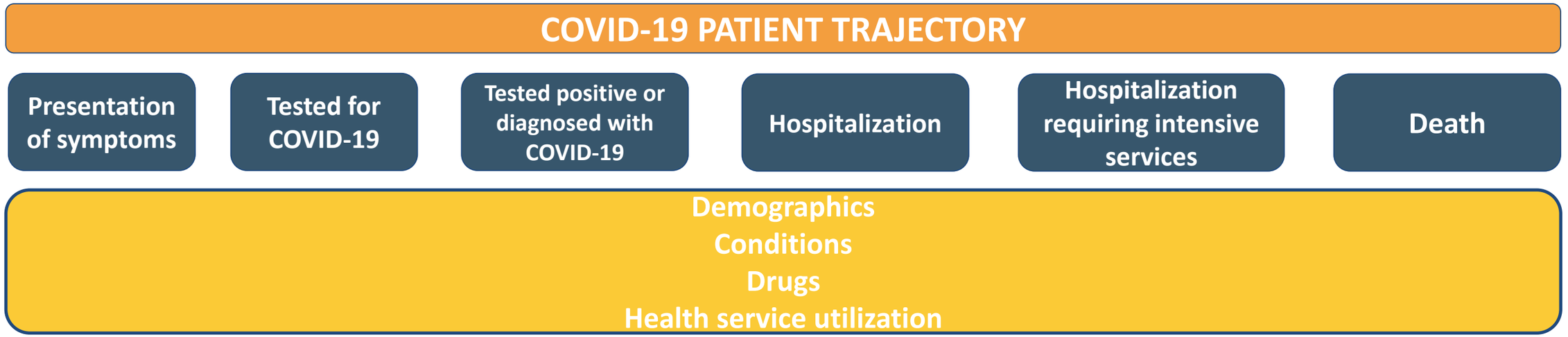
Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study

CORRESPONDENCE

Clinical Characteristics of Covid-19 in New York City

Why CHARYBDIS?

- But many unanswered questions:
  - Who gets tested, infected and hospitalized?
    - Age and gender
    - Most frequent comorbidities
    - Treatment history
  - What are their symptoms and outcomes?
  - How different is COVID-19 from influenza?



CHARYBDIS – Target cohorts

COVID-19

- Persons tested for SARS-CoV-2
- Persons tested positive for SARS-CoV-2
- Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test
- Persons hospitalized with a COVID-19 diagnosis record or a SARS-CoV-2 positive test
- Persons hospitalized and requiring intensive services with a COVID-19 diagnosis record or a SARS-CoV-2 positive test

Influenza

- Persons with influenza diagnosis or positive test 2017-2018
- Persons hospitalized with influenza diagnosis or positive test 2017-2018
- Persons hospitalized with influenza diagnosis or positive test and requiring intensive services 2017-2018

COHORT DEFINITIONS AVAILABLE AT:
https://atlas.ohdsi.org/

CHARYBDIS – Stratification factors

COVID-19 and…

- Asthma
- Cancer
- Cardiac Outcomes
- Chronic Kidney Disease
- COPD
- Elderly
- End-Stage Renal Disease
- Gender Differences
- Heart Disease
- Hepatitis C
- HIV infection
- Hypertension
- Immune Disorders
- Obesity
- Pediatrics
- Pregnant Women
- Tuberculosis
- Type 2 Diabetes
- Dementia
- Gender

… And more!

OHDSI
Observational Health Data Sciences and Informatics

PHENOTYPE DEFINITIONS AVAILABLE AT:
https://atlas.ohdsi.org/

CHARYBDIS – Findings to Date on COVID-19

- COVID-19 diagnosis/tested positive more common in women
- Hospitalization with COVID-19 more common in men

European Data Partners

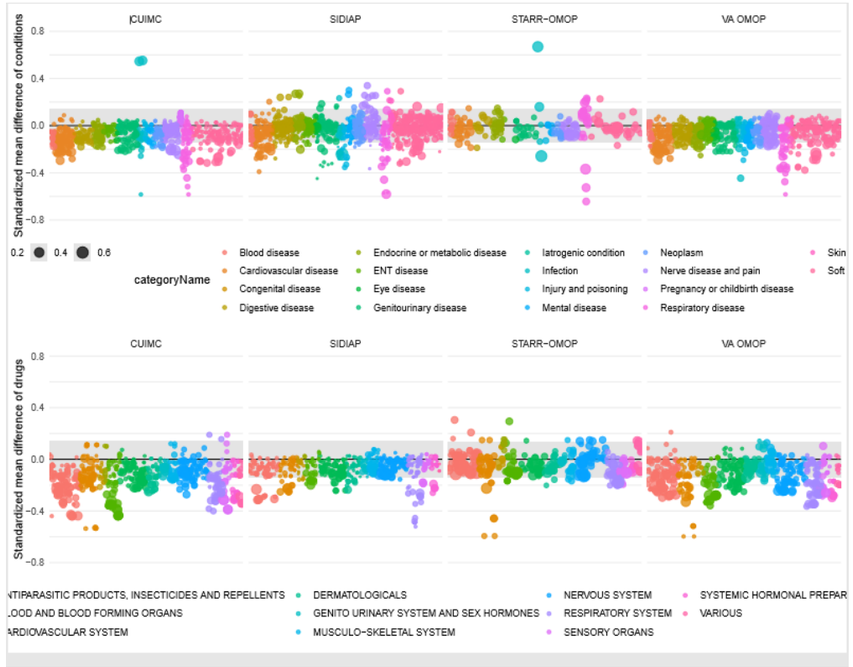
CHARYBDIS – Findings to Date on COVID-19

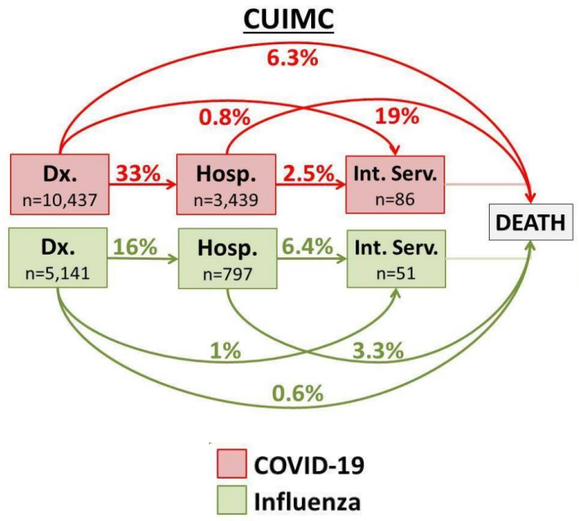
- COVID-19 diagnosis/tested positive more common in women
- Hospitalization with COVID-19 more common more common in men
- Amongst age groups, hospitalized with COVID-19 are older than diagnosed/tested positive

USA Data Partners

CHARYBDIS – Findings to Date on COVID-19

- COVID is no flu
- COVID patients tend to be healthier
- Less history of drug use
- Worse outcomes





CHARYBDIS – Findings to Date on COVID-19

CHARYBDIS

About
Cohorts
Cohort Counts
Cohort Characterization
Compare Cohort Char.
Database information
Database: HealthVerity, CDM_Premier,
Cohort: Persons with a COVID-19 dia
Strata: All, with Full 30-day follow u

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Show 100 entries Search:

Cohort	Strata	HealthVerity Subjects	CDM_Premier_COVID_v1240 Subjects	CPRD_COVID Subjects	DCMC Subjects	HIRA Subjects	HM Hospitals Subjects	NFHCRD Subjects	optum_ehr_covid_v1239 Subjects	SIDIAP_H Subjects	SIDIAP Subjects	STARR-OMOP Subjects	TRDW Subjects	VA-OMOP Subjects	IPCI Subjects	IQVIA_OpenClaims Subjects
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	All	371,153	66,132	2,679	559	7,603	2,089	403	45,508	43,411	124,221	4,788	1,250	25,538	1,417	493,949
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Full 30-day follow up	22,440	3,902	894	162	7,348	17	276	13,690	28,570	81,896	2,703	641	19,196	1,009	243,316
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with < 30-day follow up	348,713	62,230	1,785	397	255	2,072	127	31,818	14,841	42,325	2,085	605	6,340	408	250,633
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Sex = Female	203,731	33,271	1,527	314	4,502	843	197	24,717	24,891	71,680	2,388	1,199	4,374	859	267,537
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Sex = Male	167,422	32,861	1,152	245	3,101	1,246	206	20,791	18,520	52,541	2,398	234	21,163	558	226,333
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Age >= 18	356,610	63,572	2,647	552	7,351	2,078	396	44,480	41,474	119,188	4,603		25,535	1,394	476,331
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Age < 18	14,543	2,560	32	7	251	11	7	1,028	1,937	5,033	185		<5	23	17,618
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Age >= 65	72,735	22,579	1,315	98	1,373	1,257	81	13,332	11,966	31,473	1,380		10,999	483	174,479
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Age < 65	298,418	43,553	1,364	461	6,229	832	322	32,176	31,445	92,748	3,408		14,536	934	319,470
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Black or African American		14,306						10,701			120		8,012		
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with White		28,556						22,674			2,026		13,246		
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: Jan 2020	23	2,380	8		12	<5	<5	6	34	80	51		110	<5	4,063
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: Feb 2020	37	2,560	6	277	1,899	5	261	12	82	241	223		87	<5	3,246
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: Mar 2020	48,024	21,729	404	282	5,263	1,446	139	10,735	23,791	67,452	852		2,124	561	69,665
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: Apr 2020	132,103	32,530	1,884		425	636	<5	20,045	18,294	52,958	1,582		9,881	591	314,366
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: May 2020	190,943	6,081	377		<5			13,746	1,187	3,452	1,454		6,265	170	100,026
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Index date: Jun 2020								960			570		7,024	89	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Type 2 Diabetes Mellitus	10,115	10,783	392	108	1,765	271	9	1,091	4,999	9,840	555	179	9,325	248	171,826
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Type 2 Diabetes Mellitus	361,038	55,349	2,287	451	5,838	1,818	394	44,417	38,412	114,381	4,233	1,071	16,213	1,169	322,323
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent hypertension	16,294	19,008	544	154	1,950	712	19	2,068	11,175	20,995	1,319	307	16,474	379	281,426
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent hypertension	354,859	47,124	2,135	405	5,653	1,377	384	43,440	32,236	103,226	3,469	943	9,064	1,038	212,523
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent chronic kidney disease	2,511	1,180	122	155	243			319	1,498	505	289	107	4,104	102	64,604
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent chronic kidney disease	368,642	64,952	2,557	404	7,560			45,189	41,913	123,716	4,499	1,143	21,434	1,315	429,345
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent end stage renal disease	865	955	7	155	28			409	134		73	70	1,032		18,232
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent end stage renal disease	370,288	65,177	2,672	404	7,577			45,099	43,277		4,715	1,180	24,506		475,717
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent heart disease	9,516	11,533	504	106	1,319	331	7	1,217	8,142	17,718	977	245	12,310	268	220,786
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent heart disease	361,637	54,599	2,175	453	6,284	1,758	396	44,291	35,269	106,503	3,811	1,005	13,228	1,149	273,163
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent malignant neoplasm excluding non-melanoma skin cancer	2,970	3,157	220	32	412	174		460	4,307	8,805	887	106	5,551	152	73,444
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent malignant neoplasm excluding non-melanoma skin cancer	368,183	62,975	2,459	527	7,191	1,915		45,048	39,104	115,416	3,901	1,144	19,987	1,265	420,505
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Human immunodeficiency virus infection	266	128							82	56	19	14	408		4,653
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Human immunodeficiency virus infection	370,887	66,004							43,329	124,165	4,769	1,236	25,130		489,296
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Hepatitis C	374	410			61	8		38	407	647	61	35	1,680		9,905
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Hepatitis C	370,779	65,722			7,542	2,081		45,470	43,004	123,574	4,727	1,215	23,858		484,044
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent obesity	6,658	7,298	1,011	29	18	92		22,350	14,136	36,527	1,246	325	11,586	283	155,436
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent obesity	364,495	58,834	1,668	530	7,587	1,997		23,158	29,275	87,694	3,542	925	13,952	1,134	338,513
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Dementia	2,587	3,697	198	6	438	47		225	2,421	6,007	38	29	2,314	48	57,998
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Dementia	368,566	62,435	2,481	553	7,165	2,042		45,283	40,990	118,214	4,750	1,221	23,224	1,369	435,951
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent tuberculosis				8	24				40	85			27		89
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent tuberculosis				551	7,579				43,371	124,136			25,511		493,860
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Autoimmune condition	3,478	1,678	285	49	815	81		381	3,556	8,255	418	133	5,142	244	105,239
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Autoimmune condition	367,675	64,454	2,394	510	6,788	2,008		45,127	39,855	115,966	4,370	1,117	20,396	1,173	388,710
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent chronic obstructive pulmonary disease (COPD) without asthma	3,949	3,335	212		149	113		5,800	6,764	15,811	231	89	6,667	121	68,854
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent chronic obstructive pulmonary disease (COPD) without asthma	367,204	62,797	2,467		7,454	1,976		39,708	36,647	108,410	4,557	1,161	18,871	1,296	425,095
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent Asthma without COPD	4,646	3,972	349	17	1,566	82		2,934	3,134	7,561	521	112	2,970	165	87,164
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	without Prevalent Asthma without COPD	366,507	62,160	2,330	542	6,037	2,007		42,574	40,277	116,660	4,267	1,138	22,566	1,252	406,765
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	with Prevalent pre-existing condition of COVID risk factor	17,304	18,402	985	197	2,694	609	18	2,052	14,044	32,850	1,762	353	16,578	471	296,641

https://data.ohdsi.org/Covid19CharacterizationCharybdis/

CHARYBDIS – Findings to Date on COVID-19

nature COMMUNICATIONS

ARTICLE

https://doi.org/10.1038/s41467-020-18849-z OPEN

Deep phenotyping of 34,128 adult patients hospitalised with COVID-19 in an international network study

Edward Burn et al.#

Comorbid conditions appear to be common among individuals hospitalised with coronavirus disease 2019 (COVID-19) but estimates of prevalence vary and little is known about the prior medication use of patients. Here, we describe the characteristics of adults hospitalised with COVID-19 and compare them with influenza patients. We include 34,128 (US: 8362, South Korea: 7341, Spain: 18,425) COVID-19 patients, summarising between 4811 and 11,643 unique aggregate characteristics. COVID-19 patients have been majority male in the US and Spain, but predominantly female in South Korea. Age profiles vary across data sources. Compared to 84,585 individuals hospitalised with influenza in 2014-19, COVID-19 patients have more typically been male, younger, and with fewer comorbidities and lower medication use. While protecting groups vulnerable to influenza is likely a useful starting point in the response to COVID-19, strategies will likely need to be broadened to reflect the particular characteristics of individuals being hospitalised with COVID-19.

HIGHLIGHT: Compared to individuals hospitalized with influenza, patients admitted with COVID-19 were more likely male, younger, and, in the US, had fewer comorbidities and lower medication use.

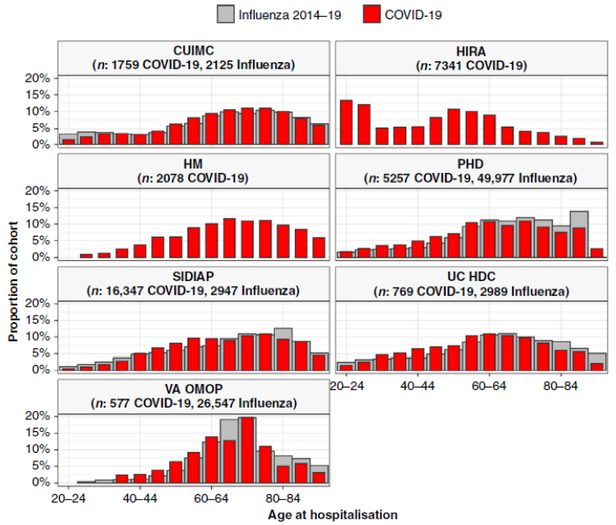

Fig. 1 Age of patients hospitalised with COVID-19 and of patients hospitalised with influenza. Individuals hospitalised with COVID-19 between December 2019 and April 2020 compared with those hospitalised with influenza between September 2014 to April 2019 (where available). Proportion of cohorts by 5-year age groups, with groups with counts of <10 omitted. CUIMC: Columbia University Irving Medical Center; HIRA: Health Insurance Review & Assessment; HM: HM Hospitales; PHD: Premier Healthcare Database; SIDIAP: The Information System for Research in Primary Care; UC HDC: University of Colorado Health Data Compass; VA OMOP: Department of Veterans Affairs. Influenza data for SIDIAP was only available from 2014 to 2017.

Interactive Shiny Application available at: http://data.ohdsi.org/Covid19CharacterizationCharybdis/

CHARYBDIS – Findings to Date on COVID-19

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Comment on this paper

Characteristics and outcomes of 627 044 COVID-19 patients with and without obesity in the United States, Spain, and the United Kingdom

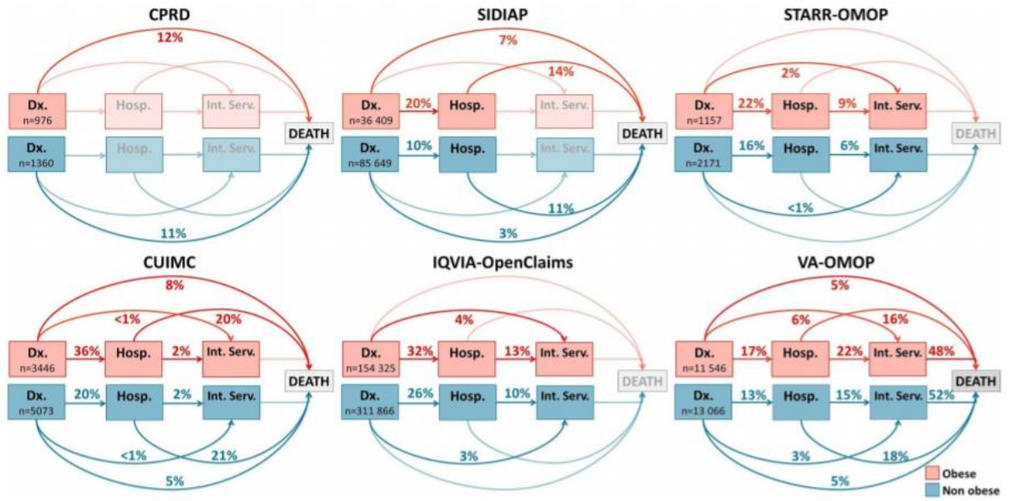
Martina Recalde, Elena Roel, Andrea Pistillo, Anthony G Sena, Albert Prats-Uribe, Waheed Ul-Rahman Ahmed, Heba Alghoul, Thamir M Alshammari, Osaid Alser, Carlos Areia, Edward Burn, Paula Casajust, Dalia Dawoud, Scott L DuVall, Thomas Falconer, Sergio Fernandez-Bertolin, Asieh Golozar, Mengchun Gong, Lana Yin Hui Lai, Jennifer C.E Lane, Kristine E Lynch, Michael E Matheny, Paras P Mehta, Daniel R Morales, Karthik Natarjan, Fredrik Nyberg, Jose D Posada, Christian G Reich, Lisa M Schilling, Karishma Shah, Nigham H Shah, Vignesh Subbian, Lin Zhang, Hong Zhu, Patrick Ryan, Daniel Prieto-Alhambra, Kristin Kostka, Talita Duarte-Salles

doi: https://doi.org/10.1101/2020.09.02.20185173

HIGHLIGHT: We show that obesity is more common amongst COVID-19 than influenza patients, and that obese patients present with more severe forms of COVID-19 with higher hospitalization, intensive services, and fatality than non-obese patients. These data are instrumental for guiding preventive strategies of COVID-19 infection and complications.

Figure 2: Main outcomes: a comparison between obese and non-obese patients with COVID-19 and obese influenza patients.

A. Obese and non-obese COVID-19 patients



Interactive Shiny Application available at: http://data.ohdsi.org/Covid19CharacterizationCharybdis/

CHARYBDIS – Findings to Date on COVID-19

Clinical characteristics, symptoms, management and health outcomes in 8,598 pregnant women diagnosed with COVID-19 compared to 27,510 with seasonal influenza in France, Spain and the US: a network cohort analysis

Lana Yin Hui Lai, Asieh Golozar, Anthony G Sena, Andrea V Margulis, Nuria Haro, Paula Casajust, Neus Valveny, Albert Prats-Uribe, Evan P Minty, Waheed -Ul-Rahman Ahmed, Thamir M Alshammari, Daniel R Morales, Heba Alghoul, Osaid Alser, Dalia Dawoud, Lin Zhang, Jose D Posada, Nigam Shah, Clair Blacketer, Carlos Areia, Vignesh Subbian, Fredrik Nyberg, Jennifer C.E Lane, Marc A Suchard, Mengchun Gong, Martina Recalde, Jitendra Jonnagaddala, Karishma Shah, Elena Roel, David Vizcaya, Stephen Fortin, Ru-fong Joanne Cheng, Christian Reich, George Hripcsak, Peter Rijnbeek, Patrick B Ryan, Kristin Kostka, Talita Duarte-Salles, DANIEL PRIETO-ALHAMBRA

doi: https://doi.org/10.1101/2020.10.13.20211821

HIGHLIGHT: Comorbidities that were more prevalent with COVID-19 hospitalization (compared to COVID-19 diagnosed) in pregnancy included renal impairment and anemia. Multiple medications were used to treat pregnant women hospitalized with COVID-19, some with little evidence of benefit. Anosmia and dyspnea were indicative symptoms of COVID-19 in pregnancy compared to influenza, and may aid differential diagnosis. Despite low fatality, pregnancy and maternal outcomes were worse in COVID-19 than influenza.

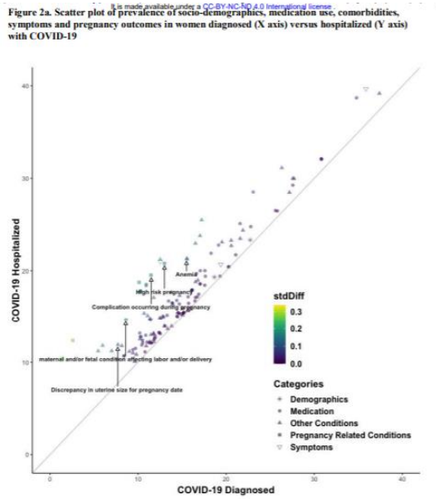


Figure 2a. Scatter plot of prevalence of socio-demographics, medication use, comorbidities, symptoms and pregnancy outcomes in women diagnosed (X axis) versus hospitalized (Y axis) with COVID-19

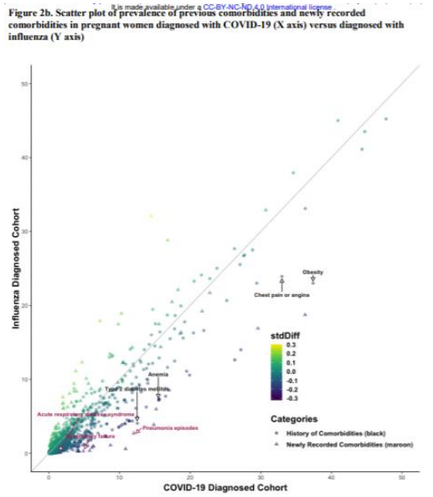


Figure 2b. Scatter plot of prevalence of previous comorbidities and newly recorded comorbidities in pregnant women diagnosed with COVID-19 (X axis) versus diagnosed with influenza (Y axis)

Interactive Shiny Application available at: http://data.ohdsi.org/Covid19CharacterizationCharybdis/

CHARYBDIS – Findings to Date on COVID-19

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Comment on this paper

"Clinical characteristics, symptoms, management and health outcomes in 8,598 pregnant women diagnosed with COVID-19 compared to 27,510 with seasonal influenza in France, Spain and the US: a network cohort analysis"

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doi: https://doi.org/10.1101/2020.10.13.20211821

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should *not* be used to guide clinical practice.

HIGHLIGHT: Comorbidities that were more prevalent with COVID-19 hospitalization (compared to COVID-19 diagnosed) in pregnancy included renal impairment and anemia. Multiple medications were used to treat pregnant women hospitalized with COVID-19, some with little evidence of benefit. Anosmia and dyspnea were indicative symptoms of COVID-19 in pregnancy compared to influenza, and may aid differential diagnosis. Despite low fatality, pregnancy and maternal outcomes were worse in COVID-19 than influenza.

Figure 2a. Scatter plot of prevalence of socio-demographics, medication use, comorbidities, symptoms and pregnancy outcomes in women diagnosed (X axis) versus hospitalized (Y axis) with COVID-19

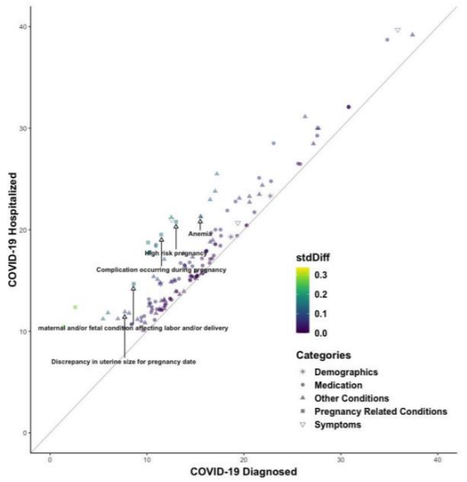


Figure 3a. COVID-19 symptoms at index date amongst pregnant women diagnosed versus hospitalized with COVID-19

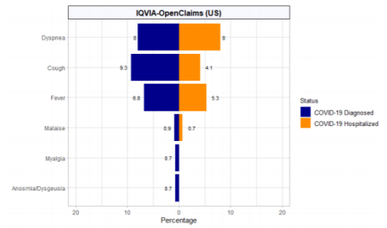
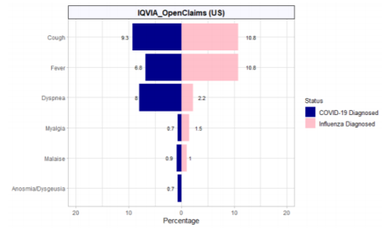


Figure 3b. COVID-19 symptoms at index date amongst pregnant women diagnosed with COVID-19 versus diagnosed with influenza



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CHARYBDIS – Findings to Date on COVID-19

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Comment on this paper

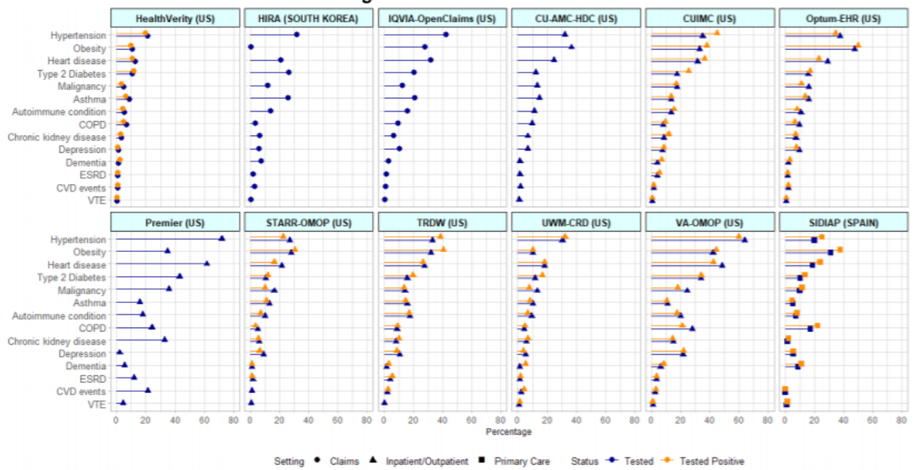
Baseline phenotype and 30-day outcomes of people tested for COVID-19: an international network cohort including >3.32 million people tested with real-time PCR and >219,000 tested positive for SARS-CoV-2 in South Korea, Spain and the United States

Asieh Golozar, Lana YH Lai, Anthony G. Sena, David Vizcaya, Lisa M. Schilling, Vojtech Huser, Fredrik Nyberg, Scott L. Duvall, Daniel R. Morales, Thamir M Alshammari, Hamed Abedtash, Waheed-Ul-Rahman Ahmed, Osaid Alser, Heba Alghoul, Ying Zhang, Mengchun Gong, Yin Guan, Carlos Areia, Jitendra Jonnagaddala, Karishma Shah, Jennifer C.E. Lane, Albert Prats-Uribe, Jose D. Posada, Nigam H. Shah, Vignesh Subbian, Lin Zhang, Maria Tereza Fernandes Abrahão, Peter R. Rijnbeek, Seng Chan You, Paula Casajust, Elena Roel, Martina Recalde, Sergio Fernández-Bertolín, Alan Andryc, Jason A. Thomas, Adam B. Wilcox, Stephen Fortin, Clair Blacketer, Frank DeFalco, Karthik Natarajan, Thomas Falconer, Matthew Spotnitz, Anna Ostropolets, George Hripcsak, Marc Suchard, Kristine E. Lynch, Michael E. Matheny, Andrew Williams, Christian Reich, Talita Duarte-Salles, Kristin Kostka, Patrick B. Ryan, Daniel Prieto-Alhambra

doi: https://doi.org/10.1101/2020.10.25.20218875

HIGHLIGHT: Observed disparity in testing practices led to variable baseline characteristics and outcomes, both nationally (US) and internationally. Our findings highlight the importance of large scale characterization of COVID-19 international cohorts to inform planning and resource allocation including testing as countries face a second wave.

Figure 1: Baseline comorbidities 30-days prior to index date among SARS-CoV-2 *tested* and *tested+* cohorts across databases of various setting



COPD = Chronic obstructive pulmonary disease; ESRD = End stage renal disease; CVD = Cardiovascular disease; VTE = Venous thromboembolism events; US= United States

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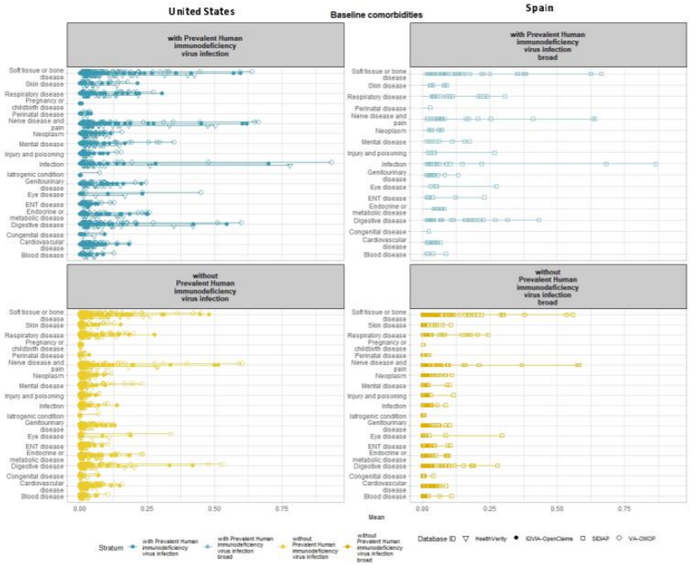
Comment on this paper

Using Real World Data to Understand HIV and COVID-19 in the U.S.A. and Spain: Characterizing Co-Infected Patients Across the Care Cascade

Julianna Kohler, Kristin Kostka, Rupa Makadia, Roger Paredes, Talita Duarte-Salles, Scott Duvall, Alison Cheng, Asieh Golozar, Jennifer C. E. Lane, Anthony G. Sena, Peter R. Rijnbeek, Daniel R. Morales, Patrick B. Ryan, Christian Reich, Michael E. Matheny, Kristine E. Lynch, George K. Siberry, Daniel Prieto-Alhambra

doi: https://doi.org/10.1101/2020.11.10.20229401

HIGHLIGHT: We found that HIV and COVID-19 coinfected patients have higher prevalence of underlying comorbidities such as cardiovascular and respiratory disease as compared to HIV-negative COVID-19 infected patients. We also found that, across the care cascade, co-infected patients who received intensive services were more likely to have more serious underlying disease or a history of more serious events as compared to PLHIV who were diagnosed with COVID-19.



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Comment on this paper

Baseline characteristics, management, and outcomes of 55,270 children and adolescents diagnosed with COVID-19 and 1,952,693 with influenza in France, Germany, Spain, South Korea and the United States: an international network cohort study

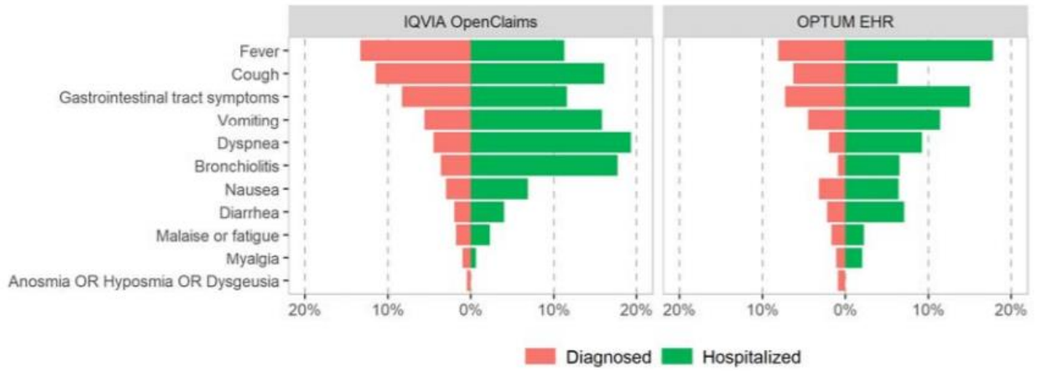
Talita Duarte-Salles, David Vizcaya, Andrea Pistillo, Paula Casajust, Anthony G. Sena, Lana Yin Hui Lai, Albert Prats-Uribe, Waheed-Ul-Rahman Ahmed, Thamir M Alshammari, Heba Alghoul, Osaid Alser, Edward Burn, Seng Chan You, Carlos Areia, Clair Blacketer, Scott DuVall, Thomas Falconer, Sergio Fernandez-Bertolin, Stephen Fortin, Asieh Golozar, Mengchun Gong, Eng Hooi Tan, Vojtech Huser, Pablo Iveli, Daniel R. Morales, Fredrik Nyberg, Jose D. Posada, Martina Recalde, Elena Roel, Lisa M. Schilling, Nigam H. Shah, Karishma Shah, Marc A. Suchard, Lin Zhang, Ying Zhang, Andrew E. Williams, Christian G. Reich, George Hripcsak, Peter Rijnbeek, Patrick Ryan, Kristin Kostka, Daniel Prieto-Alhambra

doi: https://doi.org/10.1101/2020.10.29.20222083

HIGHLIGHT: Despite negligible fatality, complications including pneumonia, ARDS and MIS-C were more frequent in children/adolescents with COVID-19 than with influenza. Dyspnea, anosmia and gastrointestinal symptoms could help differential diagnosis. A wide range of medications were used for the inpatient management of pediatric COVID-19.

Figure 3. Symptoms recorded at index date among children/adolescents (<18 years of age)

A. Diagnosed compared to hospitalized with COVID-19



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Comment on this paper

Use of dialysis, tracheostomy, and extracorporeal membrane oxygenation among 240,392 patients hospitalized with COVID-19 in the United States

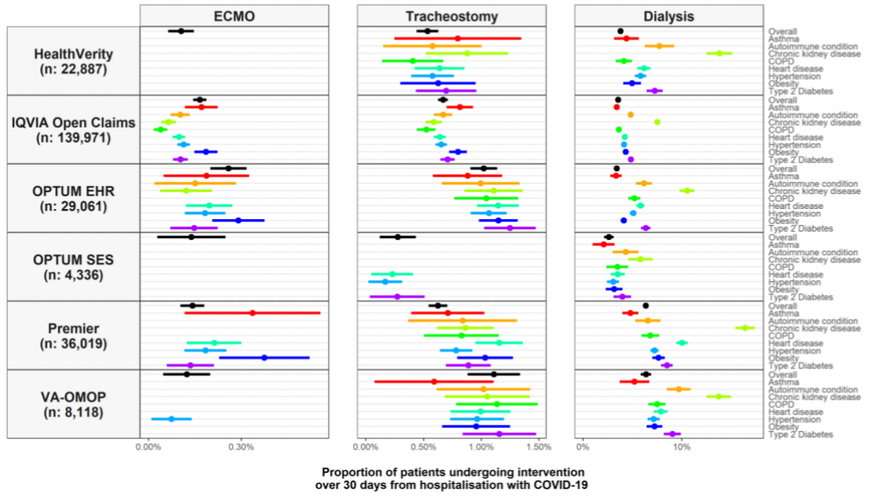
Edward Burn, Anthony G. Sena, Albert Prats-Uribe, Matthew Spotnitz, Scott DuVall, Kristine E. Lynch, Michael E. Matheny, Fredrik Nyberg, Waheed-Ul-Rahman Ahmed, Osaid Alser, Heba Alghoul, Thamir Alshammari, Lin Zhang, Paula Casajust, Carlos Areia, Karishma Shah, Christian Reich, Clair Blacketer, Alan Andryc, Stephen Fortin, Karthik Natarajan, Mengchun Gong, Asieh Golozar, Daniel Morales, Peter Rijnbeek, Vignesh Subbian, Elena Roel, Martina Recalde, Jennifer C.E. Lane, David Vizcaya, Jose D. Posada, Nigam H. Shah, Jitendra Jonnagaddala, Lana Yin Hui Lai, Francesc Xavier Avilés-Jurado, George Hripcsak, Marc A. Suchard, Otavio T. Ranzani, Patrick Ryan, Daniel Prieto-Alhambra, Kristin Kostka, Talita Duarte-Salles

doi: https://doi.org/10.1101/2020.11.25.20229088

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should *not* be used to guide clinical practice.

HIGHLIGHT: Use of dialysis among those hospitalized with COVID-19 is high at around 4%. Although less than one percent of patients undergo tracheostomy and ECMO, the absolute numbers of patients who have undergone these interventions is substantial and can be expected to continue grow given the continuing spread of the COVID-19.

Figure 2. Proportion of patients hospitalized with COVID-19 who underwent ECMO, tracheostomy, or dialysis, overall and stratified by comorbidities of interest. Point estimates with 95% confidence intervals (counts of less than 10 have been omitted).



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Comment on this paper

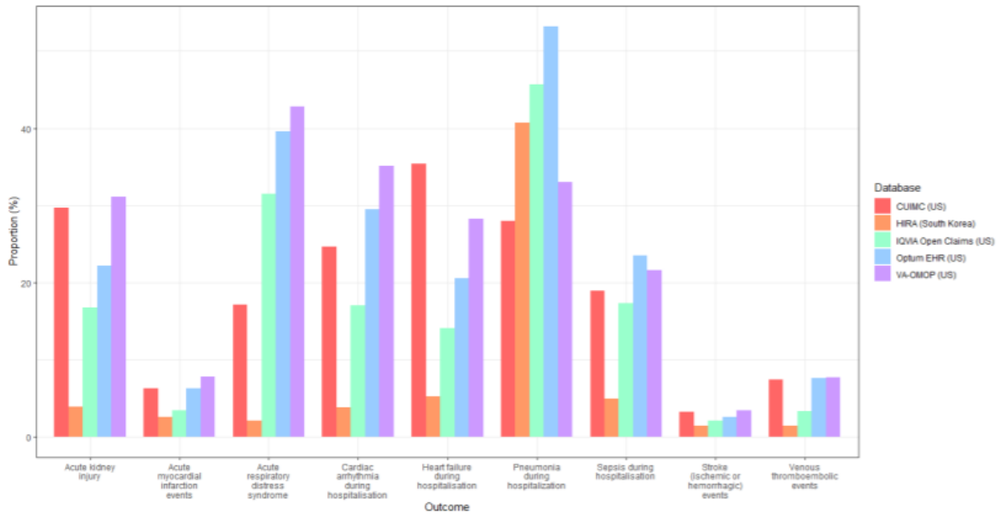
Characteristics, outcomes, and mortality amongst 133,589 patients with prevalent autoimmune diseases diagnosed with, and 48,418 hospitalised for COVID-19: a multinational distributed network cohort analysis

Eng Hooi Tan, Anthony G. Sena, Albert Prats-Uribe, Seng Chan You, Waheed-Ul-Rahman Ahmed, Kristin Kostka, Christian Reich, Scott L. Duvall, Kristine E. Lynch, Michael E. Matheny, Talita Duarte-Salles, Sergio Fernandez Bertolin, George Hripcsak, Karthik Natarajan, Thomas Falconer, Matthew Spotnitz, Anna Ostropolets, Clair Blacketer, Thamir M Alshammari, Heba Alghoul, Osaid Alser, Jennifer C.E. Lane, Dalia M Dawoud, Karishma Shah, Yue Yang, Lin Zhang, Carlos Areia, Asieh Golozar, Martina Relcade, Paula Casajust, Jitendra Jonnagaddala, Vignesh Subbian, David Vizcaya, Lana YH Lai, Fredrik Nyberg, Daniel R Morales, Jose D. Posada, Nigam H. Shah, Mengchun Gong, Arani Vivekanantham, Aaron Abend, Evan P Minty, Marc Suchard, Peter Rijnbeek, Patrick B Ryan, Daniel Prieto-Alhambra

doi: https://doi.org/10.1101/2020.11.24.20236802

HIGHLIGHT: Patients with autoimmune diseases had high rates of respiratory complications and 30-day mortality following a hospitalization with COVID-19. Compared to influenza, COVID-19 is a more severe disease, leading to more complications and higher mortality. Future studies should investigate predictors of poor outcomes in COVID-19 patients with autoimmune diseases.

Figure 3a. Severe outcomes in 30 days post hospital admission with COVID-19 in patients with prevalent autoimmune diseases, stratified by database



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Thank you!

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