



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

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 #OHDSICOVID19
Characterization Study Group



AGENDA

- Why CHARYBDIS?
- Aims & Methods
- Data sources
- Findings to date



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- **Why CHARYBDIS?**
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Why CHARYBDIS?

COVID-19 -> new disease -> need to understand its natural history

COVID-19 Patient trajectory

Presentation
of symptoms

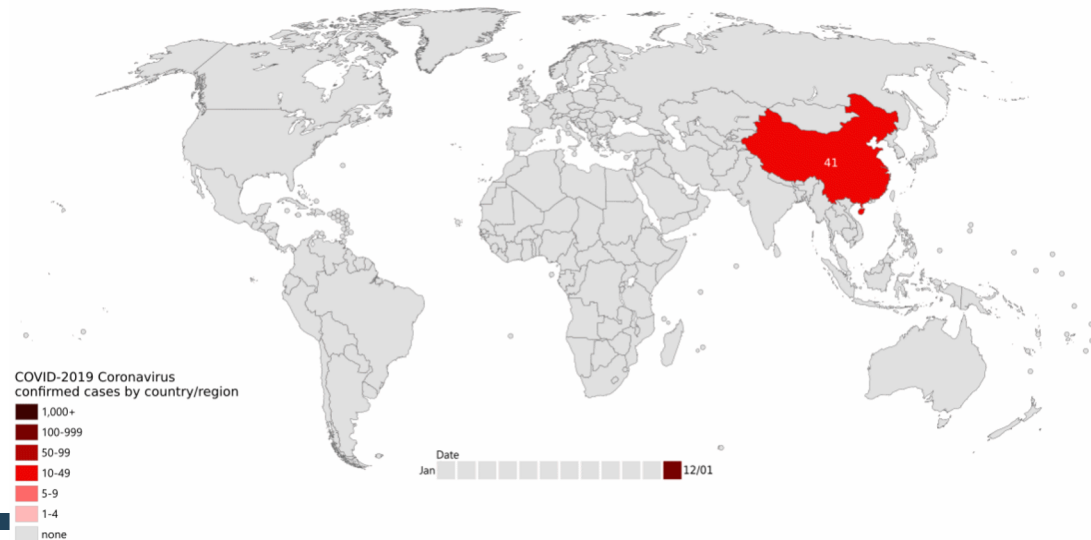
Tested for
COVID-19

Tested positive or
diagnosed with
COVID-19

Hospitalization

Hospitalization
requiring intensive
services

Death





Why CHARYBDIS?

• Many published characterization studies

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

François-Xavier Lescure*, Lila Bouadma*, Duc Nguyen, Marion Parisey, Paul-Henri Wicky, Sylvie Behillil, Alexandre Gaymand, Maude Bouscambert-Duchamp, Flora Donati, Quentin Le Hingrat, Vincent Enouf, Nadhira Houhou-Fidouh, Martine Valette, Alexandra Mailles, Jean-Christophe Lucet, France Mentre, Xavier Duval, Diane Descamps, Denis Mahy, Jean-François Timits, Bruno Lina*, Sylvie van-der-Werf*, Yazdan Yazdanzadeh*

Summary
Background On Dec 31, 2019, China reported a cluster of cases of pneumonia in people at Wuhan, Hubei Province. The responsible pathogen is a novel coronavirus, named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). We report the relevant features of the first cases in Europe of confirmed infection, named coronavirus disease 2019 (COVID-19), with the first patient diagnosed with the disease on Jan 24, 2020.

Methods In this case series, we followed five patients admitted to Bichat-Claude Bernard University Hospital (Paris, France) and Pellegrin University Hospital (Bordeaux, France) and diagnosed with COVID-19 by semi-quantitative RT-PCR on nasopharyngeal swabs. We assessed patterns of clinical disease and viral load from different samples (nasopharyngeal and blood, urine, and stool samples), which were obtained once daily for 3 days from hospital admission, and once every 2 or 3 days until patient discharge. All samples were refrigerated and shipped to laboratories in the National Reference Center for Respiratory Viruses (The Institut Pasteur, Paris, and Hospices Civils de Lyon, Lyon, France), where RNA extraction, real-time RT-PCR, and virus isolation and titration procedures were done.

Findings The patients were three men (aged 31 years, 48 years, and 80 years) and two women (aged 30 years and 46 years). All of Chinese origin, who had travelled to France from China around mid-January, 2020. Three different clinical evolutions are described: (1) two paucisymptomatic women diagnosed within 5 days of exhibiting symptoms, with high nasopharyngeal titres of SARS-CoV-2 within the first 24 h of the illness onset (5·2 and 7·4 log₁₀ copies per 1000 cells, respectively) and viral RNA detection in stools; (2) a two-step disease progression in two young men, with a secondary worsening around 10 days after disease onset despite a decreasing viral load in nasopharyngeal samples; and (3) an 80-year-old man with a rapid evolution towards multiple organ failure and a persistent high viral load in lower and upper respiratory tract with systemic virus dissemination and virus detection in plasma. The 80-year-old patient died on day 14 of illness (Feb 14, 2020); all other patients had recovered and been discharged by Feb 19, 2020.

Interpretation We illustrated three different clinical and biological types of evolution in five patients infected with SARS-CoV-2 with detailed and comprehensive viral sampling strategy. We believe that these findings will contribute to a better understanding of the natural history of the disease and will contribute to advances in the implementation of more efficient infection control strategies.

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Clinical features of patients infected with coronavirus in Wuhan, China

Chaolin Huang*, Yeming Wang*, Xingwang Li*, Lili Ren*, Jiangping Zhao*, Yi Hu*, Li Zhang, Guangshu Chen, Ting Yu, Jian Xu, Yuan Wei, Wenjuan Wu, Xueli Gu, Wen Yin, Hu Li, Min Liu, Guangfa Wang, Rongrong Jiang, Zhancheng Gao, Qi Jin, Jianwei Wang*, Bin Cao*

Summary
Background A recent cluster of pneumonia cases in Wuhan, China, was caused by a novel coronavirus (2019-nCoV). We report the epidemiological, clinical, laboratory, and treatment and clinical outcomes of these patients.

Methods All patients with suspected 2019-nCoV were admitted to a designated clinic at the Wuhan General Hospital. Data were obtained with standardized data collection forms. All patients were followed up daily to obtain their clinical course, laboratory results, treatment, and clinical outcomes. Outcomes were also compared between patients who had been admitted to the clinic and those who had not.

Findings By Jan 2, 2020, 41 admitted hospital patients had been identified as having 2019-nCoV. Most of the infected patients were men (30 [73%] of 41); less than half had underlying diseases (eight [20%]), hypertension (six [15%]), and cardiovascular disease (four [10%]). Common symptoms at onset of illness were fever (40 [98%] of 41 patients), fatigue (18 [44%]), less common symptoms were sputum production (11 [27%]), haemoptysis (two [5%] of 39), and diarrhoea (one [3%] of 38). Dyspnoea developed within 19 days of illness onset to dyspnoea 8·0 days [IQR 5·0–13·0]. 26 (63%) of 41 patients had pneumonia with abnormal findings on chest CT. Complications included renal failure (two [5%]), and acute cardiac injury (five [12%]) and secondary bacterial pneumonia (one [2%]). All patients were followed up to 14 days after onset of illness. All patients were discharged or died. Compared with non-ICU patients, ICU patients had higher rates of death (10 [23%] of 41 vs 0 [0%] of 0).

Interpretation The 2019-nCoV infection caused clusters of severe respiratory illness similar to severe acute respiratory syndrome coronavirus and was associated with ICU admission and high mortality. Major gaps in our knowledge of the origin, epidemiology, duration of human transmission, and clinical spectrum of disease need fulfillment by future studies.

ORIGINAL ARTICLE

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

Pavan K. Bhatraju, M.D., Bijan J. Ghassemieh, M.D., Michelle Nichols, M.D., Richard Kim, M.D., Keith R. Jerome, M.D., Arun K. Nalla, Ph.D., Alexander L. Greninger, M.D., Sudhakar Pipavath, M.D., Mark M. Wurfl, M.D., Ph.D., Laura Evans, M.D., Patricia A. Kritek, M.D., T. Eoin West, M.D., M.P.H., Andrew Luks, M.D., Anthony Gerbino, M.D., Chris R. Dale, M.D., Jason D. Goldman, M.D., Shane O'Mahony, M.D., and Carmen Mikacenic, M.D.

ABSTRACT

BACKGROUND Community transmission of coronavirus 2019 (Covid-19) was detected in the state of Washington in February 2020.

METHODS We identified patients from nine Seattle-area hospitals who were admitted to the intensive care unit (ICU) with confirmed infection with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Clinical data were obtained through review of medical records. The data reported here are those available through March 23, 2020. Each patient had at least 14 days of follow-up.

CORRESPONDENCE



Clinical Characteristics of Covid-19 in New York City

TO THE EDITOR: The world is in the midst of the coronavirus disease 2019 (Covid-19) pandemic.^{1,2} New York City has emerged as an epicenter. Here, we characterize the first 393 consecutive patients with Covid-19 who were admitted to two hospitals in New York City.

This retrospective case series includes adults 18 years of age or older with confirmed Covid-19

THE NEW ENGLAND JOURNAL of MEDICINE

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

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Background Since December 2019, Wuhan, China, has experienced an outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Epidemiological and clinical characteristics of patients with COVID-19 have been reported but risk factors for mortality and a clinical course of illness, including viral shedding, have not been well described.

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Methods In this retrospective, multicentre cohort study, we included all adult inpatients (≥18 years old) with laboratory-confirmed COVID-19 from Jinyintan Hospital and Wuhan Pulmonary Hospital (Wuhan, China) who had been discharged or had died by Jan 31, 2020. Demographic, clinical, treatment, and laboratory data, including samples for viral RNA detection, were extracted from electronic medical records and compared between survivors and non-survivors. We used univariable and multivariable logistic regression methods to explore the risk factors associated with in-hospital death.

Findings 191 patients (135 from Jinyintan Hospital and 56 from Wuhan Pulmonary Hospital) were included in our study, of whom 137 were discharged and 54 died in hospital. 91 (48%) patients had a comorbidity, with hypertension being the most common (58 [30%] patients), followed by diabetes (36 [19%] patients) and coronary heart disease (15 [8%] patients). Multivariable regression showed increasing odds of in-hospital death associated with older age (odds ratio 1·10, 95% CI 1·03–1·17, per year increase; p=0·0043), higher Sequential Organ Failure Assessment (SOFA) score (5·65, 2·61–12·23; p<0·0001), and d-dimer greater than 1 µg/mL (18·42, 2·64–128·55; p=0·0033) on admission. Median duration of viral shedding was 20·0 days (IQR 17·0–24·0) in survivors, but SARS-CoV-2 was detectable in non-survivors. The longest observed duration of viral shedding in survivors was 37 days.

Interpretation The potential risk factors of older age, high SOFA score, and d-dimer greater than 1 µg/mL could be used by clinicians to identify patients with poor prognosis at an early stage. Prolonged viral shedding provides the rationale for a strategy of isolation of infected patients and optimal antiviral interventions in the future.

Funding Chinese Academy of Medical Sciences Innovation Fund for Medical Sciences; National Science Foundation of China; Distinguished Young Scholars; National Key Research and Development Program of China; The Beijing Science and Technology Project; and Major Projects of National Science and Technology on New Drug Creation and Development.



Why CHARYBDIS?

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

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

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Findings The patients were three men (aged 31 years, 48 years, and 80 years) and two women (aged 30 years and 46 years), all of Chinese origin, who had travelled to France from China around mid-January, 2020. Three different clinical evolutions are described: (1) two paucisymptomatic women diagnosed within 5 days of exhibiting symptoms, with high nasopharyngeal titres of SARS-CoV-2 within the first 24 h of the illness onset (5·2 and 7·4 log₁₀ copies per 1000 cells, respectively) and viral RNA detection in stools; (2) a two-step disease progression in two young men, with a secondary worsening around 10 days after disease onset despite a decreasing viral load in nasopharyngeal samples; and (3) an 80-year-old man with a rapid evolution towards multiple organ failure and a persistent high viral load in lower and upper respiratory tract with systemic virus dissemination and virus detection in plasma. The 80-year-old patient died on day 14 of illness (Feb 14, 2020); all other patients had recovered and been discharged by Feb 19, 2020.

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Findings By Jan 2, 2020, 41 admitted hospital patients had been identified as having COVID-19. Most of the infected patients were men (30 [73%] of 41); less than 10% were older than 60 years (eight [20%]), hypertension (six [15%]), and cardiovascular disease (four [10%]). Common symptoms at onset of illness were fever (40 [98%] of 41 patients), fatigue (38 [93%]), and cough (33 [80%]). Other common symptoms included sputum production (11 [27%]), diarrhoea (one [3%] of 38), and dyspnoea (developed within 11 days of illness onset to dyspnoea 8·0 days [IQR 5·0–13·0]; 26 [63%] of 41 patients). Complications included pneumonia (37 [90%]), acute cardiac injury (five [12%]) and secondary bacterial pneumonia (one [2%]). All patients were discharged or died. Compared with non-COVID-19 patients, COVID-19 patients had a higher median age (median 59 years [IQR 41–67] vs 49 years [IQR 35–58]), higher median duration of illness (median 5 days [IQR 3–7] vs 4 days [IQR 2–6]), and higher median duration of hospital stay (median 10 days [IQR 7–14] vs 8 days [IQR 5–10]).

Interpretation The 2019-nCoV infection caused clusters of severe respiratory illness similar to severe acute respiratory syndrome coronavirus and was associated with ICU admission and high mortality. Major gaps in our knowledge of the origin, epidemiology, duration of human transmission, and clinical spectrum of disease need fulfillment by future studies.

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

Fei Zhou*, Ting Yu*, Ranghui Du*, Guohui Fan*, Ying Liu*, Zhibo Liu*, Jie Xiang*, Yeming Wang, Bin Song, Xiaoying Gu, Lulu Guan, Yuan Hui Li, Xudong Wu, Jiyang Xu, Shengjin Tu, Yi Zhang, Hua Chen, Bin Cao

Summary
Background Since December, 2019, Wuhan, China, has experienced an outbreak of coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Epidemiological and clinical characteristics of patients with COVID-19 have been reported but risk factors for mortality and a clinical course of illness, including viral shedding, have not been well described.

Methods In this retrospective, multicentre cohort study, we included all adult inpatients (≥18 years old) with laboratory-confirmed COVID-19 from Jinyintan Hospital and Wuhan Pulmonary Hospital (Wuhan, China) who had been discharged or had died by Jan 31, 2020. Demographic, clinical, treatment, and laboratory data, including serial samples for viral RNA detection, were extracted from electronic medical records and compared between survivors and non-survivors. We used univariable and multivariable logistic regression methods to explore the risk factors associated with in-hospital death.

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Interpretation The potential risk factors of older age, high SOFA score, and d-dimer greater than 1 µg/mL could help clinicians to identify patients with poor prognosis at an early stage. Prolonged viral shedding provides the rationale for a strategy of isolation of infected patients and optimal antiviral interventions in the future.

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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?

Health pre-COVID-19

COVID-19 Patient trajectory

Presentation
of symptoms

Tested for
COVID-19

Tested positive or
diagnosed with
COVID-19

Hospitalization

Hospitalization
requiring intensive
services

Death

Demographics
Conditions
Drugs
Health service utilization

Why CHARYBDIS?

A global pandemic requires a global response



OHDSI Collaborators:

- 2,770 users
- 25 workgroups
- 18,700 posts on 3,250 topics

OHDSI Network:

- 152 databases
- 18 countries
- approx. 600M patient records



AGENDA

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- Data sources
- Findings to date



CHARYBDIS – Aims

- 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

FULL STUDY PROTOCOL AVAILABLE AT <https://github.com/ohdsi-studies/Covid19CharacterizationCharybdis>



CHARYBDIS – Target cohorts

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

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!



PHENOTYPE DEFINITIONS AVAILABLE AT:

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CHARYBDIS – Features

Pre-index characteristics (the last 30 days and the year prior to index):

- **Conditions** groups (SNOMED + descendants)
- **Drug** groups (ATC/RxNorm + descendants)

Post-index characteristics (at index date and in the 30 days from index date):

- **Demographics:** Age, Sex, Race
- **Conditions** groups (SNOMED + descendants)
- **Symptoms**
- **Outcomes**
- **Procedural treatments**
- **Drug** groups (ATC/RxNorm + descendants)

R PACKAGE TO RUN AVAILABLE AT <https://github.com/ohdsi-studies/Covid19CharacterizationCharybdis>



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CHARYBDIS - 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)	<div>Together, OHDSI has studied:</div> <ul style="list-style-type: none">• >7.4m patients tested for SAR-COV-2• >1.6m patients diagnosed or tested positive for COVID-19• >300k patients hospitalized with COVID-19
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)		



AGENDA

- Why CHARYBDIS?
- Aims & Methods
- Data sources
- Findings to date



CHARYBDIS – web app

data.ohdsi.org/Covid19CharacterizationCharybdis/

CHARYBDIS

About

Cohorts

Cohort Counts

Cohort Characterization

Compare Cohort Char.

Database information

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

PLEASE NOTE: All results are preliminary and subject to change

Terms of Use:

These results are being shared as part of OHDSI's open science community efforts to characterize disease natural history of COVID-19, for the purposes of enabling collaborative research within the community. Synthesis of the results and interpretation of the findings is underway and manuscripts are being prepared. All manuscripts must be reviewed and approved by all co-authors and data partner contributors prior to submission. Until final publication, all results are to be considered preliminary and subject to change, and may only be used under the terms of use of the respective data partner contributors.

Objectives:

1) Describe the baseline demographic, clinical characteristics, treatments and outcomes of interest among individuals tested for SARS-CoV-2 and/or diagnosed with COVID-19 overall and stratified by sex, age and specific comorbidities;

2) Describe characteristics and outcomes of patients diagnosed/tested positive for influenza as well as patients hospitalized with influenza between September 2017 and April 2018 compared to the COVID-19 population.

Resources:

The study protocol is available [here](#)

All analytic code is available at [GitHub](#)

Cohort Diagnostics:

COVID cohorts

Influenza cohorts

Strata cohorts

Feature cohorts



Findings to date – COVID-19

- Diagnosed -> more frequently females
- Hospitalized -> more frequently male

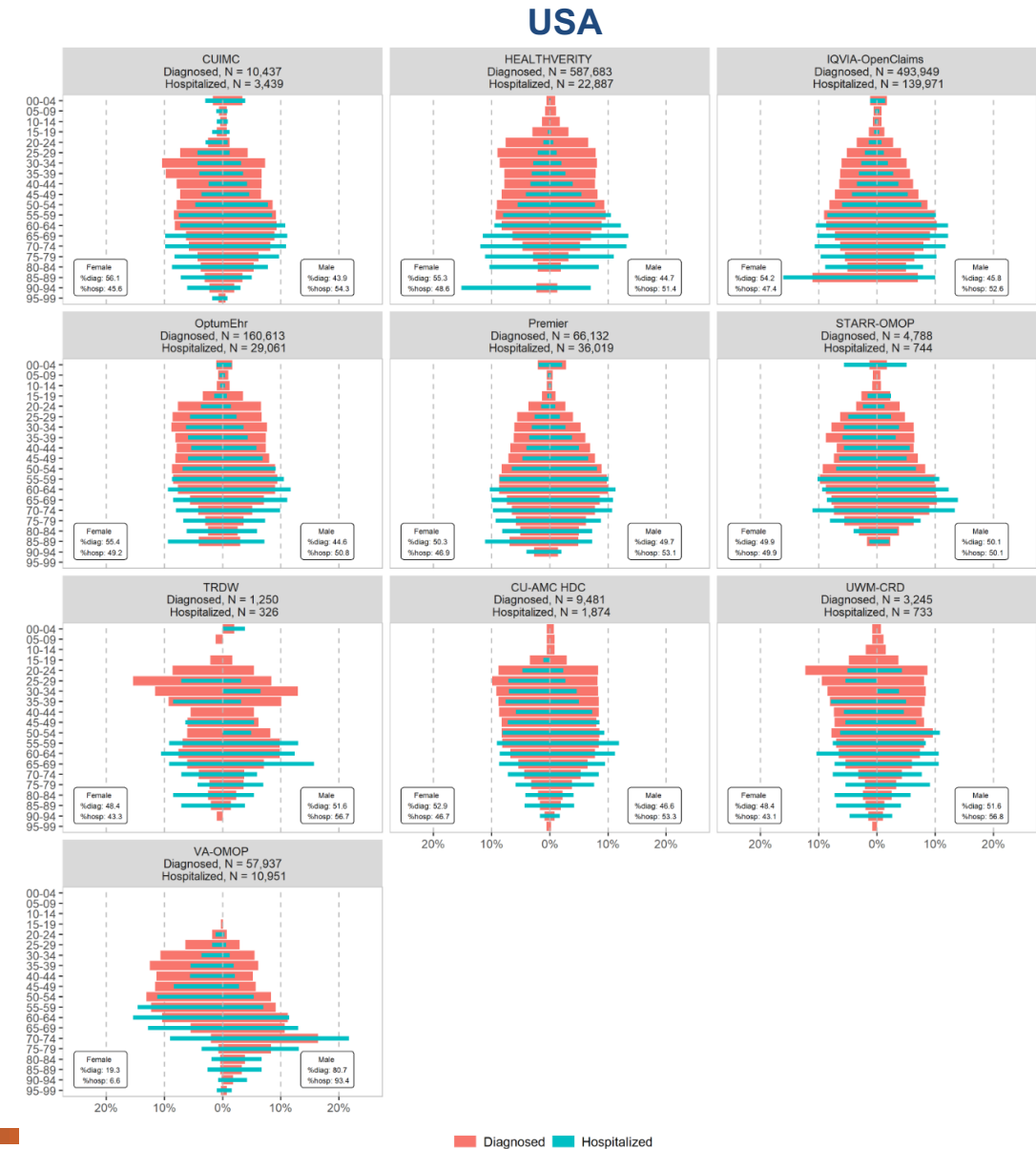
Europe





Findings to date – COVID-19

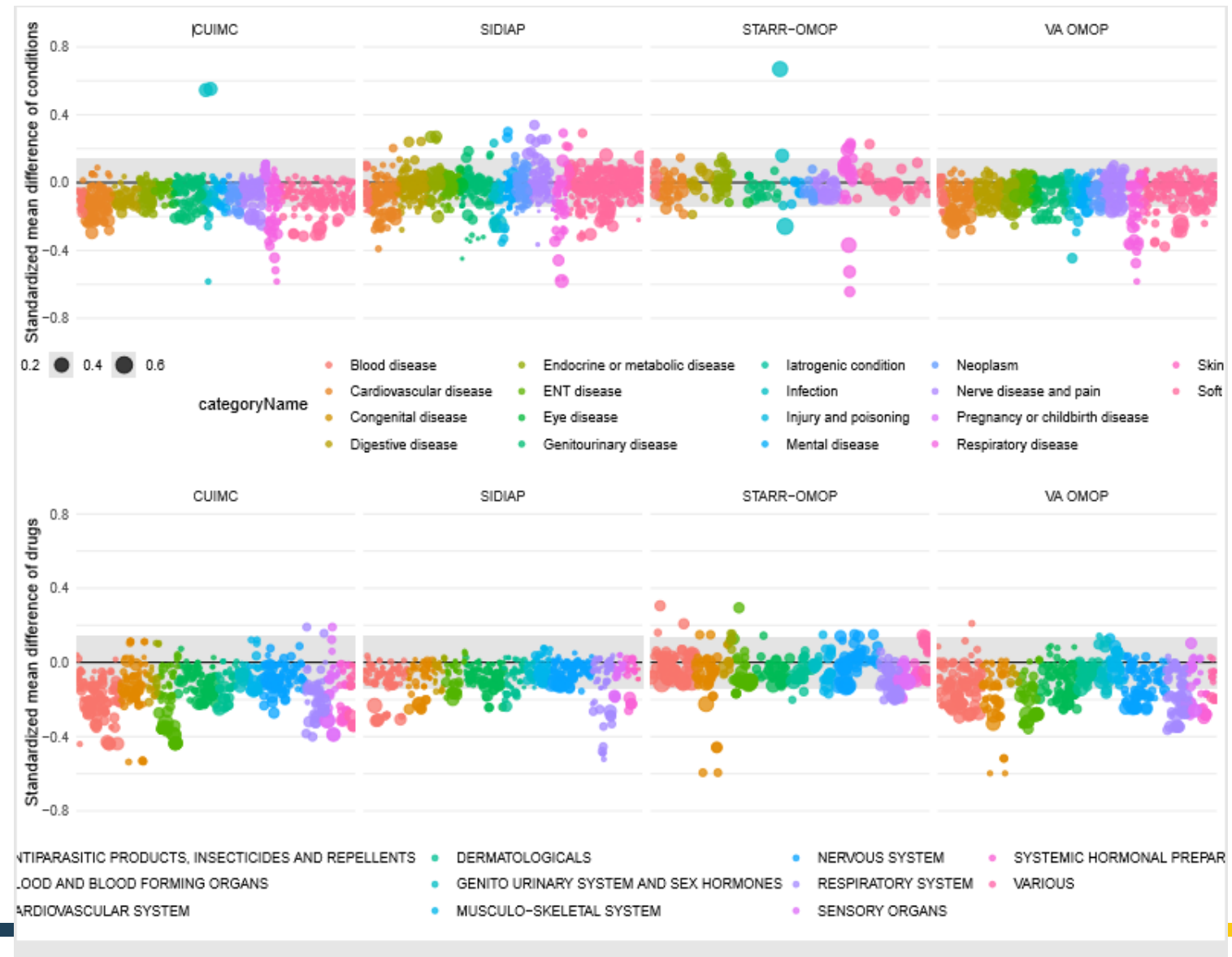
- Diagnosed -> more frequently females
- Hospitalized -> more frequently male
- Age differences -> hospitalized older than diagnosed





Findings to date – COVID vs Flu

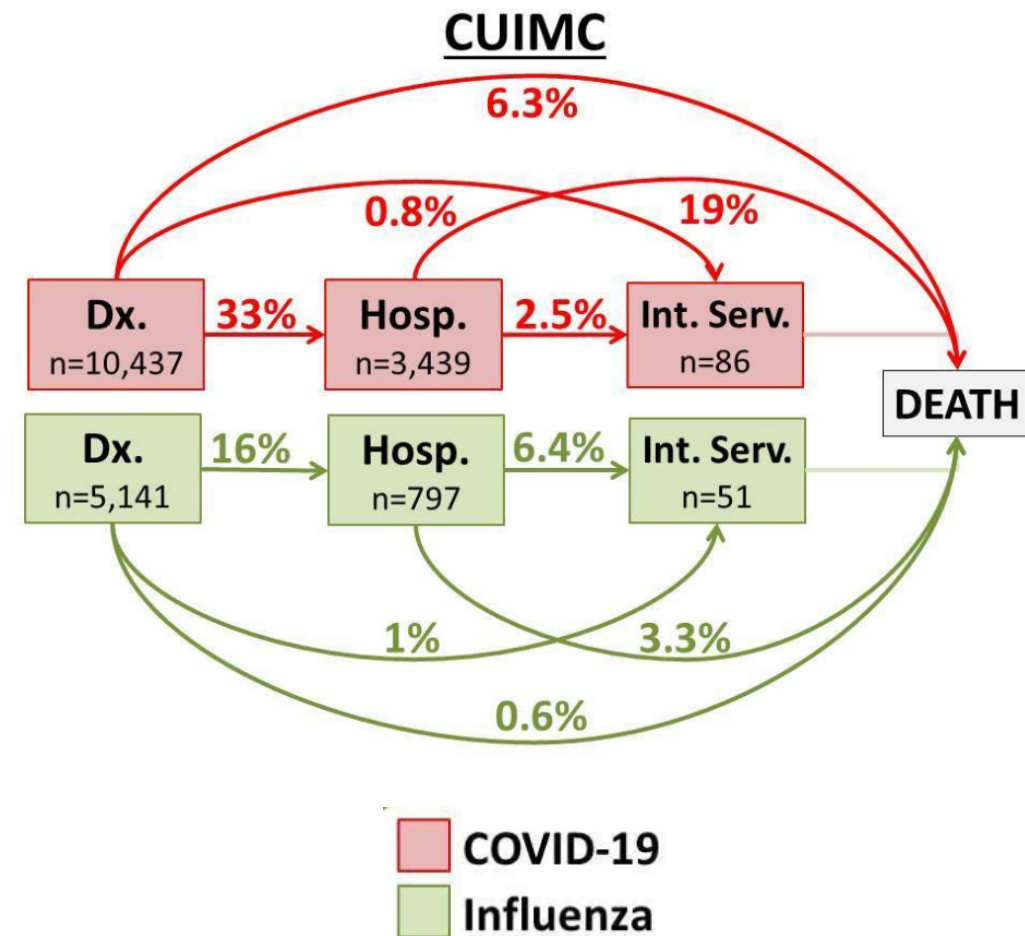
- COVID is no flu
- Healthier
- Less history of drug use





Findings to date – COVID vs Flu

- COVID is no flu
- Healthier
- Less history of drug use
- Worse outcomes





Publications to date



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.

[Comment on this paper](#)

Heterogeneity and temporal variation in the management of COVID-19: a multinational drug utilization study including 71,921 hospitalized patients from China, South Korea, Spain, and the United States of America

Albert Prats-Urbe, Anthony G. Sena, Lana Yin Hui Lai, Waheed-UI-Rahman Ahmed, Heba Alghoul, Osaid Alser, Thamir M Alshammari, Carlos Areia, William Carter, Paula Casajust, Dalia Dawoud, Asieh Golozar, Jitendra Jonnagaddala, Paras Mehta, Gong Menchung, Daniel R Morales, Fredrik Nyberg, Jose D Posada, Martina Recalde, Elena Roel, Karishma Shah, Nigam Shah, Lisa M Schilling, Vignesh Subbian, David Vizcaya, Andrew Williams, Lin Zhang, Ying Zhang, Hong Zhu, Li Liu, Peter Rijnbeek, George Hripcsak, Jennifer C.E Lane, Edward Burn, Christian Reich, Marc A Suchard, Talita Duarte-Salles, Kristin Kostka, Patrick B Ryan, DANIEL PRIETO-ALHAMBRA

doi: <https://doi.org/10.1101/2020.09.15.20195545>

[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-Urbe, Waheed UI-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, Nigam 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>



CHARYBDIS - Papers in preparation

Paper Topic	Title	Study Lead(s)
Autoimmune	Characteristics, outcomes and mortality amongst 45,576 patients with prevalent autoimmune disease hospitalized with COVID-19: a multinational distributed network cohort analysis	Eng Hooi Tan (Cheryl), Daniel Prieto-Alhambra
Pregnancy	Clinical characteristics, symptoms, management and health outcomes in 8,598 pregnant women diagnosed with COVID-19 compared to 27,510 with seasonal influenza in 2017-2018 in France, Spain and the US: a distributed cohort analysis	Lana Lai, Asieh Golozar, Talita Duarte-Salles and Daniel Prieto-Alhambra
Pediatrics	Baseline characteristics, hospital treatments, and outcomes of 55,270 children and adolescents diagnosed (3,693 hospitalized) with COVID-19 in France, Germany, Spain, South Korea and the United States: an international network cohort study	Talita Duarte-Salles, Daniel Prieto-Alhambra
HIV	Using Real World Data to Understand HIV and COVID-19 Co-Infection in Two Countries: Characterizing HIV-COVID-19 Co-Infected Patients Across the Care Cascade	Julianna Kohler, Kristin Kostka, Rupa Makadia, Daniel Prieto-Alhambra
Asthma	Characteristics and outcomes of 674,532 COVID-19 patients with and without asthma in the United States, Spain, and the United Kingdom	Daniel Morales
Testing	Baseline characteristics, symptoms and outcomes among people tested for COVID-19: an international network cohort analysis including >1.9 million people tested and >111,000 tested positive for SARS-CoV-2 in South Korea, Spain and the USA	Lana Lai, Asieh Golozar and Daniel Prieto-Alhambra
Racial disparities	Characterizing COVID-19 disease natural history differences between Blacks and Whites	Patrick Ryan, Shawn Baldry
Interventions	Use of dialysis, tracheostomy, and extracorporeal membrane oxygenation among 240,151 patients hospitalised with COVID-19 in the United States	Edward Burn, Kristin Kostka, Talita Duarte-Salles
General - Clinical Paper	Characterizing Health Associated Risks, and Your Baseline Disease In SARS-COV-2 (CHARYBDIS): an international network cohort including 1.2 Million COVID-19 cases from 8 countries	Talita Duarte-Salles, Albert Prats-Urbe, Kristin Kostka
General - Informatics Paper	TBD	Talita Duarte-Salles, Albert Prats-Urbe, Kristin Kostka, Patrick Ryan
Gender differences	TBD	Kristin Kostka, Maura Beaton, Noemie Elhdad, Ru-fong Cheng
VTE	TBD	Kristin Kostka, Daniel Prieto-Alhambra, Evan Minty
Cancer	Characteristics and outcomes of 118,155 COVID-19 individuals with cancer in the United States and Spain: a network cohort study	Elena Roel, Talita Duarte-Salles
Follow-Up Time / Repeated Testing	TBD	Vojtech Huser



CHARYBDIS

Only a monster can beat another monster





CHARYBDIS

CHARYBDIS																
About																
Cohorts																
Cohort Counts																
Cohort Characterization																
Compare Cohort Char.																
Database information																
Database																
HealthVerity, CDM_Premier, ...																
Cohort																
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation																
Strata																
All, with Full 30-day follow up																
Search: <input type="text"/>																
Cohort	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects	Subjects
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	371,153	66,132	2,679	559	7,603	2,069	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	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	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	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	167,422	32,861	1,152	245	3,101	1,248	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	356,610	65,572	2,647	552	7,351	2,078	396	44,480	41,474	119,188	4,803		25,538	1,394	476,331	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	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	288,418	43,553	1,364	461	6,229	832	322	32,176	31,445	92,748	3,408		14,538	934	319,470	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation		14,308						10,701				120		8,012		
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation		28,558						22,674			2,026		13,248			
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	23	2,360	8		12		<5	6	34	80	51		110	<5	4,083	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	37	2,580	6	277	1,899	5	261	12	82	241	223		87	<5	3,248	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	132,103	32,530	1,884	425	636		<5	20,045	16,294	52,958	1,982		9,881	591	314,366	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	190,943	6,081	377		<5			13,746	1,187	3,452	1,434		6,265	170	100,026	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation								960			970		7,024	89		
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	10,115	10,783	392	108	1,765		271	1,091	4,999	9,840	555	179	9,325	248	171,626	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	16,294	19,008	544	154	1,950		712	2,088	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	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	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	368,642	64,952	2,557	404	7,360			45,189	41,913	123,718	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	865	955	7	155	26			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	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	9,516	11,533	504	106	1,319		331	1,217	8,142	17,718	977	245	12,310	268	220,768	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	2,970	3,157	220	32	412	174		480	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	368,183	62,975	2,459	527	7,191	1,915		45,048	39,104	115,416	3,901	1,144	19,987	1,285	420,505	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	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	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	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	6,658	7,298	1,011	29	16		92	22,350	14,136	36,527	1,248	325	11,588	283	155,436	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	364,495	58,834	1,668	330	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	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	366,566	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					8	24			40	85			27		69	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation					551	7,579		43,371	124,136				25,511		493,880	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	367,675	64,454	2,394	510	6,788	2,008		45,127	39,855	115,986	4,370	1,117	20,396	1,173	338,710	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	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	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	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	366,507	62,160	2,330	542	6,037	2,007		42,574	40,277	116,860	4,267	1,138	22,568	1,252	406,785	
Persons with a COVID-19 diagnosis or a SARS-CoV-2 positive test with no required prior observation	17,304	18,402	985	197	2,694		18	2,052	14,404	32,850	1,762	353	16,578	471	296,641	

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



JOIN the CHARYBDIS team



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Thank you!

