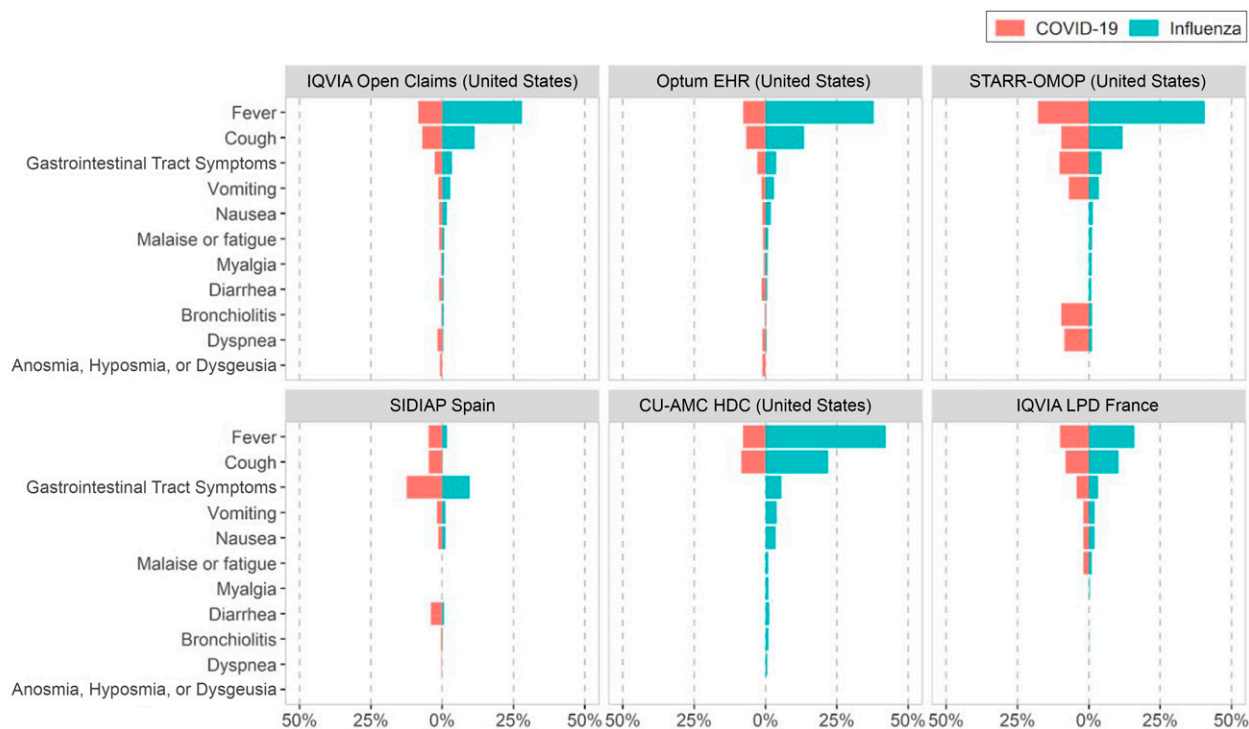
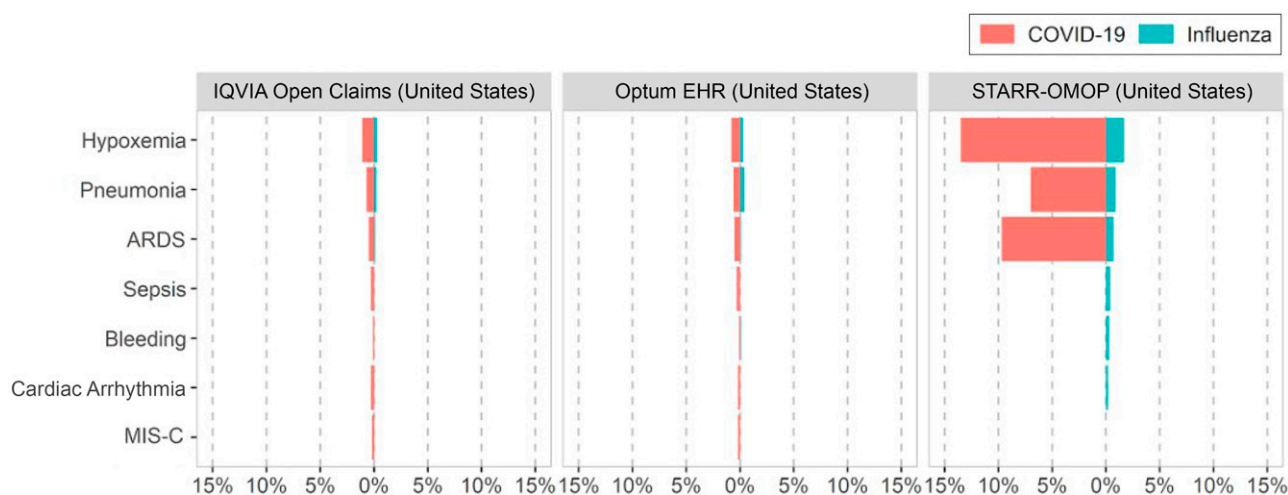


## Supplemental Information



### SUPPLEMENTAL FIGURE 6

Symptoms recorded at the index date among children and adolescents (<18 years of age) diagnosed with COVID-19 compared with those diagnosed with seasonal influenza (2017–2018).



### SUPPLEMENTAL FIGURE 7

Main 30-day outcomes among children and adolescents (<18 years of age) diagnosed with COVID-19 compared with those diagnosed with seasonal influenza (2017–2018).

**SUPPLEMENTAL TABLE 2** Overview of Data Sources Contributing Results

Database Name	Country	Description	Contributed by
CUIMC	United States	This is the clinical data warehouse of New York-Presbyterian Hospital/CUIMC, New York, New York, based on its current and previous EHR systems, with data spanning >30 y and including >6 million patients.	Department of Biomedical Informatics, CUIMC, New York, New York, United States
IQVIA DA	Germany	IQVIA DA Germany is collected from extracts of patient management software used by GPs and specialists practicing in ambulatory care settings. Data coverage includes >34 million distinct person records of the total population of 80 million (42.5%) in the country and collected from 2734 providers. Dates of service include from 1992 through March 2020.	Real World Solutions, IQVIA, Inc, Cambridge, Massachusetts, United States
HealthVerity	United States	The HealthVerity derived data set contains deidentified patient information with an antibody and/or diagnostic test result for COVID-19 linked to all available medical claims and pharmacy data from select private data providers participating in the HealthVerity marketplace.	Janssen Research & Development, Titusville, New Jersey, United States
HIRA	South Korea	This national claim data from a single insurance service from South Korea contains the observational medical records (including both inpatient and outpatient) of a patient while the patient is qualified to get the national medical insurance.	HIRA Service, 60 Hyeoksins-ro (Bangkok-Dong), Wonju-si, Gangwon-do 26465, Korea
IQVIA Open Claims	United States	This is a US database of open, preadjudicated claims from January 2013 to May 2020. Data are reported at anonymized patient level collected from office-based physicians and specialists via office management software and clearinghouse switch sources for the purpose of reimbursement. A subset of medical claims data has adjudicated claims.	Real World Solutions, IQVIA, Inc, Cambridge, Massachusetts, United States
IQVIA LPD	France	LPD France is a computerized network of physicians including GPs who contribute to a centralized database of anonymized patient EMRs. Currently, >1200 GPs from 400 practices are contributing to the database covering 7.8 million patients in France. The database covers a time period from 1994 to the present. Observation time is defined by the first and last consultation dates. Drug	Real World Solutions, IQVIA, Inc, Cambridge, Massachusetts, United States

**SUPPLEMENTAL TABLE 2** Continued

Database Name	Country	Description	Contributed by
Optum EHR	United States	<p>information is derived from GP prescriptions. Drugs obtained over the counter by the patient outside the prescription system are not reported.</p> <p>Optum deidentified COVID-19 EHR data set represents Optum's EHR data, a medical records database for patients receiving a COVID-19 diagnosis record or laboratory test result for SARS-CoV-2. The medical record data include clinical information, inclusive of prescriptions as prescribed and administered, laboratory results, vital signs, body measurements, diagnoses, procedures, and information derived from clinical notes by using NLP.</p>	Janssen Research & Development, Titusville, New Jersey, United States
Premier Healthcare Database	United States	<p>The Premier Healthcare Database contains complete clinical coding, hospital cost, and patient billing data from ~700 hospitals throughout the United States representing 20% of inpatient hospital stays. Premier collects data from participating hospitals in its health care alliance. The Premier health care alliance was formed for hospitals to share knowledge, improve patient safety, and reduce risks. Participation in the Premier health care alliance is voluntary. Although the database excludes federally funded hospitals (eg., Veterans Affairs), the hospitals included are nationally representative on the basis of bed size, geographic region, location (urban or rural), and teaching hospital status. The database contains a date-stamped log of all billed items by cost-accounting department including medications; laboratory, diagnostic, and therapeutic services; and primary and secondary diagnoses for each patient's hospitalization.</p>	Janssen Research & Development, Titusville, New Jersey, United States
SIDIAP	Spain	<p>The SIDIAP (<a href="http://www.sidiap.org">www.sidiap.org</a>) is a primary care records database that covers ~7 million people, equivalent to 80% of the population of Catalonia, northeastern Spain. Health care is universal and taxpayer funded in the region, and primary care physicians are gatekeepers for</p>	Fundació IDIAPJGol, Barcelona, Spain

**SUPPLEMENTAL TABLE 2** Continued

Database Name	Country	Description	Contributed by
STARR-OMOP	United States	all care and are responsible for repeat prescriptions. STARR is a clinical data warehouse containing live Epic data from Stanford Health Care, the Stanford Children's Hospital, the University HealthCare Alliance, and Packard Children's Health Alliance clinics and other auxiliary data from hospital applications such as radiology PACS. The STARR platform is developed and operated by the Stanford Medicine Research IT team and is made possible by the Stanford School of Medicine Research Office.	Department of Medicine, School of Medicine, Stanford University, Redwood City, California
CU-AMC HDC	United States	The HDC is a multiinstitutional data warehouse. The HDC contains inpatient and outpatient electronic medical data including patient, encounter, diagnosis, procedures, medications, laboratory results from 2 electronic medical record systems (UCHealth and Children's Hospital of Colorado), state-level all-payers claims data, and the Colorado death registry. The acknowledgment statement is as follows: supported by the Health Data Compass data warehouse project ( <a href="http://healthdatacompass.org">healthdatacompass.org</a> ).	Data Science to Patient Value Program, Department of Medicine, University of Colorado Anschutz Medical Campus, Aurora, Colorado

EMR, electronic medical record; GP, general practitioner; IDIAPJGol, Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina; IT, information technology; NLP, natural language processing; PACS, picture archiving and communication system.

**SUPPLEMENTAL TABLE 3** Cohort Definitions and Codes

Name	Atlas Link
<b>COVID-19</b>	
Persons tested with a COVID-19 diagnosis record or a SARS-CoV-2 positive test result with at least 365 d of previous observation	<a href="https://atlas.ohdsi.org/#/cohortdefinition/202">https://atlas.ohdsi.org/#/cohortdefinition/202</a>
Persons hospitalized with a COVID-19 diagnosis record or a SARS-CoV-2 positive test result with at least 365 d of previous observation	<a href="https://atlas.ohdsi.org/#/cohortdefinition/197">https://atlas.ohdsi.org/#/cohortdefinition/197</a>
Persons tested with a COVID-19 diagnosis record or a SARS-CoV-2 positive test result with no required previous observation	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/970">http://atlas-covid19.ohdsi.org/#/cohortdefinition/970</a>
Persons hospitalized with a COVID-19 diagnosis record or a SARS-CoV-2 positive test result with no required previous observation	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/974">http://atlas-covid19.ohdsi.org/#/cohortdefinition/974</a>
<b>Influenza</b>	
Persons with influenza diagnosis or positive test result in 2017–2018 with at least 365 d of previous observation	<a href="https://atlas.ohdsi.org/#/cohortdefinition/211">https://atlas.ohdsi.org/#/cohortdefinition/211</a>
Persons hospitalized with influenza diagnosis or positive test result in 2017–2018 with at least 365 d of previous observation	<a href="https://atlas.ohdsi.org/#/cohortdefinition/212">https://atlas.ohdsi.org/#/cohortdefinition/212</a>
Persons with influenza diagnosis or positive test result in 2017–2018 with no required previous observation	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/958">http://atlas-covid19.ohdsi.org/#/cohortdefinition/958</a>
Persons hospitalized with influenza diagnosis or positive test result in 2017–2018 with no required previous observation	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/961">http://atlas-covid19.ohdsi.org/#/cohortdefinition/961</a>
<b>Comorbidities</b>	
Asthma	<a href="https://atlas.ohdsi.org/#/cohortdefinition/218">https://atlas.ohdsi.org/#/cohortdefinition/218</a>
Heart disease	<a href="https://atlas.ohdsi.org/#/cohortdefinition/231">https://atlas.ohdsi.org/#/cohortdefinition/231</a>
Hypertension	<a href="https://atlas.ohdsi.org/#/cohortdefinition/227">https://atlas.ohdsi.org/#/cohortdefinition/227</a>
Malignant neoplasm excluding nonmelanoma skin cancer	<a href="https://atlas.ohdsi.org/#/cohortdefinition/222">https://atlas.ohdsi.org/#/cohortdefinition/222</a>
Obesity	<a href="https://atlas.ohdsi.org/#/cohortdefinition/224">https://atlas.ohdsi.org/#/cohortdefinition/224</a>
Autistic disorder	<a href="https://atlas.ohdsi.org/#/concept/439780">https://atlas.ohdsi.org/#/concept/439780</a>
Neonatal disorder	<a href="https://atlas.ohdsi.org/#/concept/4042220">https://atlas.ohdsi.org/#/concept/4042220</a>
Neurodevelopmental disorder	<a href="https://atlas.ohdsi.org/#/concept/45771096">https://atlas.ohdsi.org/#/concept/45771096</a>
Type 1 diabetes mellitus	<a href="https://atlas.ohdsi.org/#/concept/201254">https://atlas.ohdsi.org/#/concept/201254</a>
Attention-deficit/hyperactivity disorder	<a href="https://atlas.ohdsi.org/#/concept/438409">https://atlas.ohdsi.org/#/concept/438409</a>
Chromosomal disorder	<a href="https://atlas.ohdsi.org/#/concept/4257441">https://atlas.ohdsi.org/#/concept/4257441</a>
Congenital malformation	<a href="https://atlas.ohdsi.org/#/concept/4079975">https://atlas.ohdsi.org/#/concept/4079975</a>
Congenital heart disease	<a href="https://atlas.ohdsi.org/#/concept/312723">https://atlas.ohdsi.org/#/concept/312723</a>
Prematurity of infant	<a href="https://atlas.ohdsi.org/#/concept/36675035">https://atlas.ohdsi.org/#/concept/36675035</a>
<b>Outcomes</b>	
<b>During hospitalization</b>	
Sepsis during hospitalization	<a href="https://atlas.ohdsi.org/#/cohortdefinition/277">https://atlas.ohdsi.org/#/cohortdefinition/277</a>
ARDS during hospitalization	<a href="https://atlas.ohdsi.org/#/cohortdefinition/278">https://atlas.ohdsi.org/#/cohortdefinition/278</a>
Cardiac arrhythmia	<a href="https://atlas.ohdsi.org/#/cohortdefinition/248">https://atlas.ohdsi.org/#/cohortdefinition/248</a>
Bleeding	<a href="https://atlas.ohdsi.org/#/cohortdefinition/238">https://atlas.ohdsi.org/#/cohortdefinition/238</a>
<b>30-d outcomes</b>	
Death	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/166">http://atlas-covid19.ohdsi.org/#/cohortdefinition/166</a>
Hospitalization episodes	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/917">http://atlas-covid19.ohdsi.org/#/cohortdefinition/917</a>
Pneumonia	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/938">http://atlas-covid19.ohdsi.org/#/cohortdefinition/938</a>
MIS-C	<a href="http://atlas-covid19.ohdsi.org/#/cohortdefinition/940">http://atlas-covid19.ohdsi.org/#/cohortdefinition/940</a>

**SUPPLEMENTAL TABLE 4** Demographics, Comorbidities, Symptoms, and Outcomes Among Diagnosed With Seasonal Influenza (2017–2018) Among Children and Adolescents Aged <18 Years

	At Least 1 y of Previous Observation					No Previous Observation Time			
	SIDIAP (Spain)	IQVIA LPD (France)	CU-AMC HDC (United States)	IQVIA Open Claims (United States)	Optum EHR (United States)	CUIMC (United States)	IQVIA DA (Germany)	HealthVerity (United States)	STARR-OMOP (United States)
	<i>n</i> = 26 929	<i>n</i> = 22 425	<i>n</i> = 3339	<i>n</i> = 1874 228		<i>n</i> = 2112	<i>n</i> = 19 864	<i>n</i> = 502	<i>n</i> = 2831
Age, y									
0–4	22.0	20.8	23.7	24.4	23.7	40.2	29.3	21.7	25.3
5–9	36.7	35.3	35.6	37.5	38.2	36.2	35.7	29.7	34.7
10–14	29.2	27.0	27.0	26.3	26.6	17.2	23.3	23.7	27.8
15–19	12.0	17.0	13.6	11.8	11.5	6.5	11.7	24.9	12.2
Sex									
Female	47.5	47.8	49.6	48.5	48.3	48.2	47.4	50.6	46.2
Male	52.5	51.9	50.4	51.5	51.7	51.8	52.6	49.4	53.8
Comorbidities <sup>a</sup>									
Autistic disorder	0.5	0.0	0.9	1.0	0.8	—	—	—	—
Neonatal disorder	2.4	0.0	0.9	0.3	0.4	—	—	—	—
Neurodevelopmental disorder	6.7	0.6	3.5	6.4	6.6	—	—	—	—
Asthma	8.6	16.4	15.9	27.5	23.0	—	—	—	—
Obesity	8.3	1.5	3.4	4.2	12.8	—	—	—	—
Heart disease	1.8	0.4	2.3	4.5	4.1	—	—	—	—
Malignant neoplasm excluding nonmelanoma skin cancer	0.1	0.1	—	0.5	2.6	—	—	—	—
Hypertension	0.1	0.1	0.4	1.1	0.7	—	—	—	—
Type 1 diabetes mellitus	0.1	0.0	—	0.2	0.2	—	—	—	—
Attention-deficit/hyperactivity disorder	2.4	0.0	1.7	4.5	4.7	—	—	—	—
Chromosomal disorder	0.1	0.0	0.4	0.3	0.3	—	—	—	—
Congenital malformation	11.2	0.4	2.5	2.7	2.9	—	—	—	—
Congenital heart disease	0.2	0.0	0.3	0.3	0.2	—	—	—	—
Prematurity of infant	0.6	—	0.4	0.2	0.3	—	—	—	—
Symptoms at the index date									
Fever	1.7	15.9	42.1	27.9	37.9	51.8	9.3	31.3	40.6
Cough	0.2	10.4	21.9	11.4	13.5	16.0	4.1	16.9	11.8
Dyspnea	0.0	0.0	0.6	0.4	0.4	2.2	0.9	—	1.1
Malaise or fatigue	0.0	1.0	0.9	0.7	0.9	0.5	0.4	—	1.1
Myalgia	0.0	0.3	1.0	0.6	0.7	0.5	0.1	—	1.0
Anosmia, hyposmia, or dysgeusia	—	—	—	0.0	—	—	—	—	—
Gastrointestinal tract symptoms	9.6	3.2	5.6	3.4	3.7	6.1	2.3	5.4	4.5
Diarrhea	0.6	0.0	1.3	0.5	0.6	0.9	—	—	0.8
Vomiting	1.1	2.0	3.9	2.8	2.9	4.9	1.9	4.4	3.4
Nausea	1.1	2.0	3.5	1.6	1.9	0.6	2.0	3.2	1.4

**SUPPLEMENTAL TABLE 4** Continued

	At Least 1 y of Previous Observation					No Previous Observation Time			
	SIDIAP (Spain)	IQVIA LPD (France)	CU-AMC HDC (United States)	IQVIA Open Claims (United States)	Optum EHR (United States)	CUIMC (United States)	IQVIA DA (Germany)	HealthVerity (United States)	STARR-OMOP (United States)
	<i>n</i> = 26 929	<i>n</i> = 22 425	<i>n</i> = 3339	<i>n</i> = 1 874 228	<i>n</i> = 131 950	<i>n</i> = 2112	<i>n</i> = 19 864	<i>n</i> = 502	<i>n</i> = 2831
Bronchiolitis	0.2	0.2	1.0	0.5	0.3	0.8	0.0	—	1.1
30-d outcomes									
Death	—	—	—	—	—	—	—	—	—
Hospitalization episodes	—	—	1.6	0.9	10.6	7.4	—	1.4	3.7
Pneumonia	0.7	0.4	2.2	2.4	1.8	3.1	2.0	—	2.4
MIS-C	—	0.0	—	0.0	0.0	—	0.0	—	—
Hypoxemia	—	—	1.7	0.3	0.3	1.5	—	—	1.7

Proportions presented among patients diagnosed with COVID-19 or hospitalized with COVID-19 by database (column percentage). Children aged <1 y were excluded when at least 1 y of previous observation time was required. —, data not available or below the minimum cell count required (5 individuals).

<sup>a</sup> Comorbidities are reported only in those databases with at least 1 y of previous observation time.

**SUPPLEMENTAL TABLE 5** Characteristics of Children and Adolescents Diagnosed and Hospitalized With COVID-19 With No Previous Observation Time in Those Databases With Available Observation Time

	Diagnosed					Hospitalized		
	SIDIAP (Spain)	IQVIA LPD (France)	CU-AMC HDC (United States)	IQVIA Open		HIRA (South Korea)	IQVIA Open Claims (United States)	Optum EHR (United States)
				Claims (United States)	Optum EHR (United States)			
	<i>n</i> = 5037	<i>n</i> = 979	<i>n</i> = 286	<i>n</i> = 201986	<i>n</i> = 13245	<i>n</i> = 251	<i>n</i> = 9142	<i>n</i> = 1193
<b>Comorbidities<sup>a</sup></b>								
Autistic disorder	0.7	—	—	0.3	0.3	—	1.3	1.5
Neonatal disorder	1.7	—	—	0.4	0.6	—	6.3	3.9
Neuro developmental disorder	6.1	—	—	1.3	1.4	—	4.4	7.4
Asthma	—	—	—	0.3	0.6	—	0.9	2.4
Obesity	—	—	—	0.1	0.4	—	0.6	1.8
Heart disease	—	—	—	0.3	0.3	—	3.7	2.9
Malignant neoplasm excluding nonmelanoma skin cancer	—	—	—	0.0	0.1	—	0.4	0.9
Hypertension	—	—	—	0.1	0.1	—	0.7	0.8
Type 1 diabetes mellitus	0.2	—	—	0.2	0.1	—	1.7	0.8
Attention-deficit/hyperactivity disorder	1.8	—	—	0.7	0.9	—	1.5	4.1
Chromosomal disorder	0.3	—	—	0.2	0.2	—	1.8	1.7
Congenital malformation	9.2	—	—	0.7	1.2	—	7.7	7.6
Congenital heart disease	0.2	—	—	0.2	0.2	—	2.2	1.4
Prematurity of infant	0.8	—	—	0.1	0.3	—	1.9	1.9
<b>Symptoms at the index date</b>								
Fever	5.2	9.6	8.7	9.2	8.9	10.0	11.9	19.3
Cough	4.5	7.5	9.1	7.1	6.9	5.6	4.4	7.7
Dyspnea	0.3	—	4.5	1.8	1.3	9.6	7.9	5.4
Malaise or fatigue	—	1.6	—	1.0	0.9	—	1.1	1.3
Myalgia	—	—	—	0.4	0.5	—	0.3	1.0
Anosmia, hyposmia, or dysgeusia	—	—	—	0.8	0.9	—	—	—
Gastrointestinal tract symptoms	11.8	3.7	—	2.9	3.3	8.0	12.2	11.2
Diarrhea	3.7	—	—	1.2	1.5	—	3.6	4.0
Vomiting	1.7	1.6	—	1.5	1.6	2.4	7.9	6.2
Nausea	1.4	1.6	—	1.0	1.1	2.0	3.5	3.4
Bronchiolitis	1.3	—	—	0.8	0.8	—	8.2	6.2
<b>30-d outcomes after hospitalization</b>								
Sepsis	—	—	—	0.4	0.5	—	8.7	6.0
ARDS	—	—	—	0.5	0.7	—	12.3	7.6
Cardiac arrhythmia	—	—	—	0.3	0.3	—	7.0	3.3
Bleeding	—	—	—	0.1	0.2	—	2.9	2.3
<b>30-d outcomes</b>								
Death	—	—	—	—	0.0	—	—	—
Hospitalization episodes	1.5	—	4.2	4.4	9.1	—	—	—
Pneumonia	0.1	—	—	0.8	0.7	6.4	17.1	7.7
MIS-C	—	—	—	0.2	0.3	—	2.8	2.7
Hypoxemia	—	—	—	1.3	1.2	—	22.2	11.1

Proportions presented among patients diagnosed with COVID-19 or hospitalized with COVID-19 by database (column percentage). —, data not available or below the minimum cell count required (5 individuals).

<sup>a</sup> Comorbidities are reported only in those databases with at least 1 y of previous observation time.