



## COVID-19 Pandemic Impacts on Adults with Developmental Disabilities

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This summary was prepared by Reena and is based on the Applied Health Research Question Report completed at ICES, ICES Project No. 2021-0950-103-000 for Reena. Questions about this summary can be directed to Bryan Keshen at [bkeshen@reena.org](mailto:bkeshen@reena.org)

The ICES team involved in preparing the ICES AHRQ is:

Luis Palma, Research Analyst  
Diana An, Research Project Manager  
Lisa Ishiguro, Research Program Manager  
Lesley Plumptre, AHRQ Staff Scientist  
Anna Durbin, Scientist at Li Ka Shing Knowledge Institute at St. Michael's Hospital  
Elizabeth Lin, ICES Senior Adjunct Scientist  
Robert Balogh, ICES Adjunct Scientist  
Yona Lunsky, ICES Adjunct Scientist

The corresponding author for the AHRQ report is Lesley Plumptree, ICES.

To learn more about the AHRQ program, contact [ahrq@ices.on.ca](mailto:ahrq@ices.on.ca)

### A Few Highlights

**This report explored the experience of Ontario adults with developmental disabilities compared to other Ontario adults. It describes individuals with and without developmental disabilities who were tested, as well as the group of individuals whose tests were confirmed positive for COVID-19 between January 15th, 2020 and January 10th, 2021. It also considers hospitalization and mortality outcomes for adults with Down syndrome.**

- **Testing rates are slightly higher for those with developmental disabilities relative to those without developmental disabilities**
- **The pattern of positive tests in those with developmental disabilities is similar to those without developmental disabilities**
- **Amongst those who tested positive, the percentage of emergency department use was slightly higher for adults with developmental disabilities than for those without developmental disabilities (18.1% vs. 14.7%)**
- **Amongst those who tested positive, adults with developmental disabilities were hospitalized at twice the rate of those without developmental disabilities (10% vs 4.5%)**
- **Once hospitalized, adults with developmental disabilities were slightly less likely to be treated in the ICU (19.9% vs. 23.9%)**
- **Amongst those who tested positive, adults with developmental disabilities were more than twice as likely to die than those without developmental disabilities (6.1% vs. 2.8%)**

### **Down syndrome**

- Overall, COVID + adults with Down syndrome were 3.6 times more likely to be hospitalized than adults without Down syndrome (16.5% vs 4.6%)
- Overall, COVID + adults with Down syndrome were 6.5 times more likely to die than those without Down syndrome (18.2% vs. 2.8%)

## **NOTES**

Tested individuals and positive cases identified using the Ontario Laboratory Information System (OLIS). Although most COVID-19 lab results in Ontario are entered into OLIS, there are under reporting issues and thus, case and test counts determined from OLIS are expected to be lower than what is publicly reported. Rates expressed with 95% Confidence Interval (The true rate has a 95% chance of being within the stated CI range).

Rate denominators for ED visits, hospitalizations and mortality are number of positive cases within time period. Rate denominator for ICU is number of hospitalized cases within time period. Rate denominators for age groups are the number of positive cases within the corresponding age group and population (with DD or without DD).

All hospitalizations and ED visits included (any reason for visit/admission). All data available is included however data lags exist: Hospitalization and ED visit data are complete up to December 2020.

Death date is available until December 2020, but it is considered complete until July 2020.

## **Information Derived from Table 1a. Demographic characteristics for Ontario adults (18+) tested for COVID-19 (using OLIS only) with and without developmental disabilities (DD) (Jan 15, 2020 to Jan 10, 2021 cumulative)**

### **Demographic highlights**

- Among adults with developmental disabilities, a greater proportion of older adults have been tested for COVID than younger adults
- Adults with developmental disabilities are younger on average than adults without developmental disabilities
- A greater proportion of females with developmental disabilities have been tested for COVID than males, similar to what has happened in people without developmental disabilities

### **How does COVID testing vary across the province?**

- Overall, testing rates are slightly higher in adults with developmental disabilities than without developmental disabilities
- The proportion of people tested varies by public health unit, with as few as 21.7% (Algoma) of people with developmental disabilities tested to as many as 40.2 % (Wellington-Dufferin-Guelph)
- The breakdown of where people with developmental disabilities live who have and who have not been tested may also be helpful information for public health units as they plan for vaccine rollout (these individuals have been prioritized within Phase 2 across Ontario)

## **Information Derived from Table 1b. Demographic and clinical characteristics for Ontario adults (18+) confirmed positive for COVID-19 (using OLIS only) with and without developmental disabilities (DD) (Jan 15, 2020 to Jan 10, 2021 cumulative)**

### **Demographic highlights**

- Adults with developmental disabilities confirmed as COVID+ are older than those not confirmed as positive (47.5 yrs vs. 42.5 yrs)
- Same pattern is not observed in those without developmental disabilities
- Half of adults with developmental disabilities confirmed as COVID+ are under 50 (vs 57% in those without these disabilities)

### **How do COVID+ rates vary across the province?**

- There are 34 PHUs
  - 13 PHUs reported 10 or fewer adults with developmental disabilities confirmed as COVID+
  - 11 PHU had 50 or more adults with developmental disabilities confirmed as COVID+. Of them, York, Toronto, Ottawa, Peel, Windsor had over 100 adults with developmental disabilities confirmed as COVID+

### **What are the clinical profiles of adults with DD confirmed as COVID+?**

- Amongst those confirmed as COVID+, adults with developmental disabilities have higher rates of asthma (21.5% vs 15.3%), diabetes (22.2% vs. 16.4%), COPD (13% vs. 6.9%), dementia (23.2% vs. 7.0%), cerebral palsy (11.4% vs. 0.1%), epilepsy (19.3 vs. 0.9%), and mental illness and/or addiction (60.3% vs. 30.9%) than other adults

## **Information Derived from Table 1c. Proportion of Ontario adults (18+) who were tested for COVID-19 and the proportion who tested positive for COVID-19 among those tested (bottom figure), by month, for adults with developmental disabilities (DD) and for adults without developmental disabilities (Jan 15, 2020 to Jan 10, 2021, N (%))**

### **Testing rates**

- Testing rates are slightly higher for those with developmental disabilities relative to those without developmental disabilities
- The pattern of positive tests in those with developmental disabilities is similar to those without developmental disabilities

## **Information Derived from Table 2a.30-d Outcomes in confirmed COVID positive adults with and without Developmental Disability (Jan 15, 2020 to Jan 10, 2021 cumulative)**

### **How did adults with developmental disabilities compare to adults without developmental disabilities in terms of ED use within 30 days post COVID-19 positive result?**

- Amongst those who tested positive, the percentage of emergency department use was slightly higher for adults with developmental disabilities than for those without developmental disabilities (18.1% vs. 14.7%)

### **How did adults with developmental disabilities compare to other adults in terms of hospitalizations within 30 days post COVID-19 positive result?**

- Amongst those who tested positive, adults with developmental disabilities were hospitalized at twice the rate of those without developmental disabilities (10% vs 4.5%).

- Individuals with developmental disabilities ages 18-64y were more likely to be hospitalized compared to those without DD, yet those 65+ had similar hospitalization rates.
- Once hospitalized, adults with developmental disabilities were slightly less likely to be treated in the ICU (19.9% vs. 23.9%).
- At the youngest ages, the likelihood of being admitted to the ICU for those with and without developmental disabilities was similar.
- However, adults over 55 with developmental disabilities were less likely to be admitted to the ICU.

### **How did adults with developmental disabilities compare to other adults in terms of mortality within 30 days post COVID-19 positive result?**

- Amongst those who tested positive, adults with developmental disabilities were more than twice as likely to die than those without developmental disabilities (6.1% vs. 2.8%).
- When looking at the entire population, adults with developmental disabilities were three times as likely to die than other adults (1.2/1000 vs. 0.4/1000).
- Amongst those who tested positive, adults with developmental disabilities under age 65 were almost ten times more likely to die than their counterparts without developmental disabilities.

### **Information Derived from Table 2b. 30-d Outcomes in confirmed COVID-19 positive adults with and without Down Syndrome (Jan 15, 2020 to Jan 10, 2021 cumulative)**

#### **How did adults with Down Syndrome compare to other adults in terms of ED use within 30 days post COVID-19 positive result?**

- Overall, the percentage of emergency department use was slightly higher for COVID + adults with Down syndrome than for those without Down syndrome (22.3% vs. 14.7%).

#### **How did adults with Down Syndrome compare to other adults in terms of hospitalizations within 30 days post COVID-19 positive result?**

- Overall, COVID + adults with Down syndrome were 3.6 times more likely to be hospitalized than adults without Down syndrome (16.5% vs 4.6%).

#### **How did adults with Down Syndrome compare to adults without Down syndrome in terms of mortality within 30 days post COVID-19 positive result?**

- Overall, COVID + adults with Down syndrome were 6.5 times more likely to die than those without Down syndrome (18.2% vs. 2.8%).
- When looking at the entire population, adults with Down syndrome were almost 10 times more likely to die than other adults (3.9/1000 vs. 0.4/1000).

**Table 1a. Demographic characteristics for Ontario adults (18+) tested for COVID-19 (using OLIS only) with and without developmental disabilities (DD) (Jan 15, 2020 to Jan 10, 2021 cumulative)**

		Adults with DD tested for COVID-19 N=28,342		Adults without DD tested for COVID-19 N=3,111,198	
		Number	%	Number	%
<b>DEMOGRAPHIC CHARACTERISTICS</b>					
Age	Mean (SD)	42.82	(19.17)	47.85	(19.25)
	Median (Q1-Q3)	39	(26-58)	46	(31-61)
Age group	01. 18-29 - n (%)	9,948	(22.8%)	656,975	(29.0%)
	02. 30-39 - n (%)	4,465	(25.7%)	578,260	(26.7%)
	03. 40-49 - n (%)	3,281	(31.1%)	486,977	(24.4%)
	04. 50-59 - n (%)	4,104	(38.0%)	515,100	(23.8%)
	05. 60-69 - n (%)	3,654	(45.0%)	407,691	(21.9%)
	06. 70-79 - n (%)	1,877	(50.9%)	247,040	(20.3%)
	07. 80-89 - n (%)	780	(57.3%)	151,920	(25.9%)
	08. 90+ - n (%)	233	(59.9%)	67,235	(38.8%)
Sex	F - n (%)	12,381	(34.7%)	1,743,118	(27.4%)
	M - n (%)	15,961	(26.4%)	1,368,080	(22.5%)
Public health unit of residence (PHU)	Missing Data - n (%)	347	(44.8%)	9,805	(23.9%)
	2226 Algoma Public Health - n (%)	243	(21.7%)	23,462	(23.2%)
	2227 Brant County Health Unit - n (%)	522	(33.2%)	32,987	(25.0%)
	2230 Durham Region Health Department - n (%)	1,217	(27.4%)	137,966	(23.5%)
	2233 Grey Bruce Health Unit - n (%)	397	(27.1%)	32,665	(22.2%)
	2234 Haldimand-Norfolk Health Unit - n (%)	289	(33.9%)	21,754	(22.3%)
	2235 Haliburton, Kawartha, Pine Ridge District Health Unit - n (%)	493	(30.6%)	45,102	(26.7%)
	2236 Halton Region Health Department - n (%)	869	(29.6%)	123,155	(24.7%)

2237 City of Hamilton - Public Health & Social Services - n (%)	1,291	(27.2%)	123,000	(25.4%)
2238 Hastings and Prince Edward Counties Health Unit - n (%)	558	(28.5%)	38,157	(25.6%)
2239 & 2254 Huron Perth Health Unit - n (%)	360	(32.8%)	27,122	(22.9%)
2240 Chatham-Kent Health Unit - n (%)	359	(34.4%)	24,937	(27.5%)
2241 Kingston, Frontenac and Lennox & Addington Health Unit - n (%)	650	(28.2%)	47,273	(27.2%)
2242 Lambton Health Unit - n (%)	382	(34.9%)	30,239	(26.7%)
2243 Leeds, Grenville and Lanark District Health Unit - n (%)	385	(25.7%)	39,235	(25.0%)
2244 Middlesex-London Health Unit - n (%)	922	(27.5%)	103,054	(24.7%)
2246 Niagara Region Public Health Department - n (%)	1,119	(23.0%)	96,373	(23.3%)
2247 North Bay Parry Sound District Health Unit - n (%)	302	(25.7%)	26,406	(22.9%)
2249 Northwestern Health Unit - n (%)	236	(34.7%)	21,275	(30.1%)
2251 Ottawa Public Health - n (%)	1,992	(30.5%)	222,094	(25.2%)
2253 Peel Public Health - n (%)	1,419	(24.2%)	306,981	(24.1%)
2255 Peterborough County-City Health Unit - n (%)	476	(32.7%)	37,637	(29.7%)
2256 Porcupine Health Unit - n (%)	205	(27.7%)	17,870	(25.0%)
2257 Renfrew County and District Health Unit - n (%)	327	(34.7%)	21,060	(23.6%)
2258 Eastern Ontario Health Unit - n (%)	673	(33.2%)	50,091	(27.1%)
2260 Simcoe Muskoka District Health Unit - n (%)	1,441	(29.7%)	134,889	(26.5%)
2261 Sudbury and District Health Unit - n (%)	604	(32.7%)	49,626	(28.6%)
2262 Thunder Bay District Health Unit - n (%)	372	(31.0%)	38,444	(28.6%)
2263 Timiskaming Health Unit - n (%)	119	(38.3%)	7,331	(25.1%)
2265 Region of Waterloo Public Health - n (%)	974	(27.1%)	116,078	(24.0%)
2266 Wellington-Dufferin-Guelph Health Unit - n (%)	743	(40.2%)	72,085	(28.0%)
2268 Windsor-Essex County Health Unit - n (%)	866	(31.4%)	89,779	(24.0%)
2270 York Region Public Health Services - n (%)	1,841	(32.8%)	243,357	(23.6%)
2275 Southwestern Health Unit - n (%)	528	(33.7%)	45,695	(25.4%)
3895 Toronto Public Health - n (%)	4,821	(29.7%)	654,214	(25.6%)

**Table 1b. Demographic and clinical characteristics for Ontario adults (18+) confirmed positive for COVID-19 (using OLIS only) with and without developmental disabilities (DD) (Jan 15, 2020 to Jan 10, 2021 cumulative)**

		Adults with Developmental Disability confirmed positive for COVID-19 N=1,858		Adults without Developmental Disability confirmed positive for COVID-19 N=187,290	
		Number	%	Number	%
<b>DEMOGRAPHIC CHARACTERISTICS</b>					
Age	Mean (SD)	47.5	(20.25)	47.2	(19.86)
	Median (Q1-Q3)	49	(28-64)	45	(30-60)
Age group	01. 18-29 - n (%)	534	(5.4%)	43,961	(6.7%)
	02. 30-39 - n (%)	220	(4.9%)	33,059	(5.7%)
	03. 40-49 - n (%)	190	(5.8%)	30,487	(6.3%)
	04. 50-59 - n (%)	291	(7.1%)	32,033	(6.2%)
	05. 60-69 - n (%)	337	(9.2%)	20,456	(5.0%)
	06. 70-79 - n (%)	182	(9.7%)	11,179	(4.5%)
	07. 80-89 - n (%)	79	(10.1%)	9,892	(6.5%)
	08. 90+ - n (%)	25	(10.7%)	6,223	(9.3%)
Sex	F - n (%)	777	(6.3%)	97,949	(5.6%)
	M - n (%)	1,081	(6.8%)	89,341	(6.5%)
Public health unit of residence	Missing Data - n (%)	13	(3.7%)	623	(6.4%)
	2226 Algoma Public Health - n (%)	*1-5	(S)	152	(0.6%)
	2227 Brant County Health Unit - n (%)	17	(3.3%)	1,201	(3.6%)
	2230 Durham Region Health Department - n (%)	92	(7.6%)	8,285	(6.0%)
	2233 Grey Bruce Health Unit - n (%)	6	(1.5%)	556	(1.7%)
	2234 Haldimand-Norfolk Health Unit - n (%)	8	(2.8%)	966	(4.4%)
	2235 Haliburton, Kawartha, Pine Ridge District Health Unit - n (%)	12	(2.4%)	699	(1.5%)
	2236 Halton Region Health Department - n (%)	54	(6.2%)	6,092	(4.9%)

2237 City of Hamilton - Public Health & Social Services - n (%)	74	(5.7%)	6,675	(5.4%)
2238 Hastings and Prince Edward Counties Health Unit - n (%)	*1-5	(S)	335	(0.9%)
2239 & 2254 Huron Perth Health Unit - n (%)	14	(3.9%)	844	(3.1%)
2240 Chatham-Kent Health Unit - n (%)	14	(3.9%)	819	(3.3%)
2241 Kingston, Frontenac and Lennox & Addington Health Unit - n (%)	6	(0.9%)	471	(1.0%)
2242 Lambton Health Unit - n (%)	11	(2.9%)	1,314	(4.3%)
2243 Leeds, Grenville and Lanark District Health Unit - n (%)	7	(1.8%)	720	(1.8%)
2244 Middlesex-London Health Unit - n (%)	34	(3.7%)	3,719	(3.6%)
2246 Niagara Region Public Health Department - n (%)	65	(5.8%)	5,178	(5.4%)
2247 North Bay Parry Sound District Health Unit - n (%)	*1-5	(S)	193	(0.7%)
2249 Northwestern Health Unit - n (%)	*1-5	(S)	180	(0.8%)
2251 Ottawa Public Health - n (%)	154	(7.7%)	8,952	(4.0%)
2253 Peel Public Health - n (%)	171	(12.1%)	36,145	(11.8%)
2255 Peterborough County-City Health Unit - n (%)	12	(2.5%)	439	(1.2%)
2256 Porcupine Health Unit - n (%)	*2-6	(S)	172	(1.0%)
2257 Renfrew County and District Health Unit - n (%)	*1-5	(S)	238	(1.1%)
2258 Eastern Ontario Health Unit - n (%)	23	(3.4%)	1,594	(3.2%)
2260 Simcoe Muskoka District Health Unit - n (%)	52	(3.6%)	3,998	(3.0%)
2261 Sudbury and District Health Unit - n (%)	*1-5	(S)	314	(0.6%)
2262 Thunder Bay District Health Unit - n (%)	*1-5	(S)	581	(1.5%)
2263 Timiskaming Health Unit - n (%)	*1-5	(S)	88	(1.2%)

	2265 Region of Waterloo Public Health - n (%)	74	(7.6%)	6,521	(5.6%)
	2266 Wellington-Dufferin-Guelph Health Unit - n (%)	28	(3.8%)	2,988	(4.1%)
	2268 Windsor-Essex County Health Unit - n (%)	116	(13.4%)	8,945	(10.0%)
	2270 York Region Public Health Services - n (%)	212	(11.5%)	18,188	(7.5%)
	2275 Southwestern Health Unit - n (%)	14	(2.7%)	1,717	(3.8%)
	3895 Toronto Public Health - n (%)	554	(11.5%)	57,388	(8.8%)
Rurality	Missing information - n (%)	13	(3.7%)	623	(6.4%)
	Rural - n (%)	77	(2.4%)	7,052	(2.3%)
	Urban - n (%)	1,768	(7.2%)	179,615	(6.4%)
<b>CLINICAL CHARACTERISTICS</b>					
Asthma	n (% with condition)	400	(21.5%)	28,691	(15.3%)
	(% COVID+)		(5.3%)		(5.1%)
Diabetes	n (% with condition)	413	(22.2%)	30,661	(16.4%)
	(% COVID+)		(8.0%)		(7.7%)
Chronic obstructive pulmonary disease	n (% with condition)	242	(13.0%)	12,887	(6.9%)
	(% COVID+)		(7.4%)		(4.6%)
Hypertension	n (% with condition)	519	(27.9%)	52,338	(27.9%)
	(% COVID+)		(8.0%)		(6.4%)
Dementia	n (% with condition)	431	(23.2%)	13,123	(7.0%)
	(% COVID+)		(13.9%)		(11.8%)
Epilepsy	n (% with condition)	359	(19.3%)	1,613	(0.9%)
	(% COVID+)		(9.1%)		(5.3%)
Cerebral Palsy	n (% with condition)	212	(11.4%)	249	(0.1%)
	(% COVID+)		(9.3%)		(6.0%)
Down Syndrome	n (% with condition)	121	(6.5%)	0	(0.0%)
	(% COVID+)		(7.9%)		(0.0%)
Mental Illness and/or Addiction	n (% with condition)	1,120	(60.3%)	57,839	(30.9%)
	(% COVID+)		(6.3%)		(5.4%)

**Table 1c. Proportion of Ontario adults (18+) who were tested for COVID-19 and the proportion who tested positive for COVID-19 among those tested (bottom figure), by month, for adults with developmental disabilities (DD) and for adults without developmental disabilities (Jan 15, 2020 to Jan 10, 2021, N (%))**

		<April 2020		April 2020		May 2020		June 2020	
Age group	Population	Tested	Positive cases	Tested	Positive cases	Tested	Positive cases	Tested	Positive cases
18+	Adult with DD	581 (0.61%)	15 (2.6%)	3,648 (3.84%)	398 (10.9%)	3,992 (4.20%)	123 (3.1%)	3,808 (4.00%)	36 (0.9%)
	Adults without DD	60,624 (0.49%)	3,825 (6.3%)	195,290 (0.16%)	14,088 (7.2%)	266,109 (0.21%)	9,287 (3.5%)	386,588 (0.31%)	4,904 (1.3%)

		July 2020		August 2020		September 2020		October 2020	
Age group	Population	Tested	Positive cases	Tested	Positive cases	Tested	Positive cases	Tested	Positive cases
18+	Adult with DD	2,724 (2.86%)	15 (0.6%)	2,301 (2.41%)	18 (0.8%)	2,576 (2.69%)	64 (2.5%)	2,569 (2.68%)	201 (7.8%)
	Adults without DD	345,791 (0.28%)	3,262 (0.9%)	296,421 (0.24%)	2,507 (0.8%)	382,079 (0.31%)	9,852 (2.6%)	344,859 (0.28%)	19,395 (5.6%)

		November 2020		December 2020		<=January 10, 2021	
Age group	Population	Tested	Positive cases	Tested	Positive cases	Tested	Positive cases
18+	Adult with DD	2,417 (2.52%)	263 (10.9%)	2,770 (2.89%)	499 (18.0%)	956 (1.01%)	226 (23.6%)
	Adults without DD	332,034 (0.27%)	35,190 (10.6%)	380,615 (0.31%)	58,251 (15.3%)	120,788 (0.10%)	26,729 (22.1%)

**Table 2a.30-d Outcomes in confirmed COVID positive adults with and without Developmental Disability  
(Jan 15, 2020 to Jan 10, 2021 cumulative)**

	Adults with Developmental Disability N=1,858		Adults without Developmental Disability N=187,290	
	Frequency N (%)	Rate per 1,000 cases (95% CI)	Frequency N (%)	Rate per 1,000 cases (95% CI)
<b>Outcomes within 30 days post COVID positive test N(%)</b>				
ED visit - any reason, all ages	336 (18.1%)	180.8 (162, 201.2)	27,465 (14.7%)	146.6 (144.9, 148.4)
18-54 years	174 (16.3%)	162.9 (139.6, 189)	14,894 (12.0%)	120.4 (118.5, 122.3)
55-64 years	79 (22.1%)	221.3 (175.2, 275.8)	5,027 (17.8%)	177.8 (173, 182.8)
65+ years	83 (19.2%)	191.7 (152.7, 237.6)	7,544 (21.4%)	213.6 (208.8, 218.5)
Hospitalization, all ages	186 (10.0%)	100.1 (86.2, 115.6)	8,473 (4.5%)	45.2 (44.3, 46.2)
18-54 years	78 (7.3%)	73 (57.7, 91.1)	1,965 (1.6%)	15.9 (15.2, 16.6)
55-64 years	48 (13.4%)	134.5 (99.1, 178.3)	1,521 (5.4%)	53.8 (51.1, 56.6)
65+ years	60 (13.9%)	138.6 (105.7, 178.4)	4,987 (14.1%)	141.2 (137.3, 145.2)
In those hospitalized, proportion in ICU, all ages	37 (19.9%)	N/A	2,027 (23.9%)	N/A
18-54 years	19 (24.4%)		468 (23.8%)	
55-64 years	10 (20.8%)		512 (33.7%)	
65+ years	8 (13.3%)		1,047 (21.0%)	
Mortality (Fact of death), all ages	114 (6.1%)	61.4 (50.6, 73.7)	5,170 (2.8%)	27.6 (26.9, 28.4)
18-54 years	11 (1.0%)	10.3 (5.1, 18.4)	76 (0.1%)	0.6 (0.5, 0.8)
55-64 years	28 (7.8%)	78.4 (52.1, 113.4)	240 (0.8%)	8.5 (7.4, 9.6)
65+ years	75 (17.3%)	173.2 (136.2, 217.1)	4,854 (13.7%)	137.5 (133.6, 141.4)

**Table 2b. 30-d Outcomes in confirmed COVID-19 positive adults with and without Down Syndrome  
(Jan 15, 2020 to Jan 10, 2021 cumulative)**

	Adults with Down Syndrome N=121		Adults without Down Syndrome N=189,027	
	Frequency N (%)	Rate per 1,000 cases (95% CI)	Frequency N (%)	Rate per 1,000 cases (95% CI)
<b>Outcomes within 30 days post COVID positive test, N(%)</b>				
ED visit - any reason, all ages	27 (22.3%)	223.1 (147.1, 324.7)	27,774 (14.7%)	146.9 (145.2, 148.7)
Hospitalization, all ages	20 (16.5%)	165.3 (101, 255.3)	8,639 (4.6%)	45.7 (44.7, 46.7)
Mortality (Fact of death), all ages	22 (18.2%)	181.8 (113.9, 275.3)	5,262 (2.8%)	27.8 (27.1, 28.6)

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These datasets were linked using unique encoded identifiers and analyzed ICES.

This study made use of the Johns Hopkins ACG® System (Version 10).

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