

## Appendix

### Data sources

The BC COVID-19 Cohort (BCC19C) was established as a public health surveillance platform under BCCDC's public health mandate. The BCC19C includes provincial registries and administrative healthcare databases. These datasets are integrated through the combination of enterprise-level probabilistic and deterministic algorithms, which have been established over many years and validated for surveillance use in British Columbia. Each dataset integrated into the BCC19C is de-identified, but datasets can be linked using an anonymized patient master key (PMK). This PMK allows the linkage of records from the individual across the datasets. Authorized users can access the datasets through a secure cloud-based environment.

Within the BCC19C, our study used the Discharge Abstract Database (DAD), the National Ambulatory Care Reporting System (NACRS) data from health authorities (HA) and the Ministry of Health (MOH), and the COVID-19 vaccine data. NACRS and DAD are updated weekly; however, there is a lag of 4-5 months in the data between the actual hospitalization/visit date and data update. Due to a lag in data, we have updated the results with the data to March 31, 2022. The COVID-19 vaccine data is refreshed daily, and there is only 1–2-day lag from vaccine administration to the data integration.

**Table S1. Data Sources integrated within the BC COVID-19 Cohort (BCC19C)**

<b>British Columbia Centre for Disease Control (BCCDC), Provincial Health Services Authority (PHSA) and Regional Health Authority data sources:</b>	<b>Data Date Ranges:</b>
Integrated COVID-19 laboratory dataset (SARS-CoV2 tests from private/public labs) <sup>S1</sup>	Jan,2020-onward
COVID-19 surveillance case data (information collected on all probable/confirmed cases as part of public health follow up) <sup>S2</sup>	Jan,2020-onward
Provincial COVID-19 Monitoring Solution (critical and non-critical care hospital census data) <sup>S3</sup>	Jan,2020-onward
Provincial Immunizations Registry (COVID-19 vaccination data) <sup>S4</sup>	Dec,2020-onward
Provincial Laboratory Information Solution (laboratory tests from private/public labs) <sup>S5</sup>	Jan,2020-onward
Public Health Reporting Data warehouse (Influenza laboratory tests) <sup>S6</sup>	Jan,2008-onward
Emergency department visits (hospital-based and community-based ambulatory care)	Mar,2020-onward
<b>Ministry of Health (MoH) Administrative Data Sources:</b>	<b>Data Date Ranges:</b>
Client Roster (CR) (registry of enrollment in the universal public health insurance plan including residential history) <sup>S7</sup>	2008/9-onward
Discharge Abstracts Database (DAD) (hospital discharge records) <sup>S8</sup>	2008/9-onward
Medical Services Plan (MSP) (physician diagnostic and billing data for services provided through universal public health insurance plan) <sup>S9</sup>	2008/9-onward

PharmaNet (Pharma) (prescription drugs dispensed from community pharmacies, includes medications covered by public and private insurance plans) <sup>S10</sup>	2008/9-onward
BC Vital Statistics (VS) (deaths registry) <sup>S11</sup>	2008/9-onward
National Ambulatory Care Reporting System (NACRS) (hospital-based and community-based ambulatory care) <sup>S12</sup>	2011/12–onward
Chronic Disease Registry <sup>S13</sup>	2008/9-2018/19
811 Calls (respiratory calls only) <sup>S14*</sup>	2014-onward
Health System Matrix <sup>S15</sup>	2018/19-onward
Population Grouper Methodology <sup>S16</sup>	2008/9-onward

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\* A free-of-charge provincial health information and advice phone line operated by HealthLink BC, which is part of the Ministry of Health. The service can connect the caller directly with a registered nurse, a registered dietitian, a qualified exercise professional, or a pharmacist.

## Administrative codes

There are very little data on the validation of myocarditis ICD-10 codes in the literature. The only validation study<sup>S17</sup> validated a much broader definition of myocarditis (including where a specific cause is known, such as viruses) that does not apply to vaccine-related myocarditis. In our study, we have used a very specific set of codes. An expert consensus on these codes was arrived at through the Global Vaccine Data Network (GVDN), a multi-country collaboration on vaccine safety and effectiveness (<https://www.globalvaccinatedatanetwork.org/>). GVDN comprises subject experts, epidemiologists, and biostatisticians. We used the same codes as being used in the GVDN COVID-19 vaccine safety evaluation collaboration project, which we are part of.

In addition to diagnostic codes, we used laboratory data to assess whether a test for troponin levels was performed within 30 days of vaccination for our cases. We found that 98% of myocarditis cases identified through the ICD codes within 21-days of vaccination had at least one troponin test. Among those, 91% had troponin levels higher than normal.

## Supplementary References:

- S1. British Columbia Centre for Disease Control [creator]. Integrated COVID-19 laboratory dataset (SARS-CoV2 tests from private/public labs). Public Health Reporting Data Warehouse, British Columbia Centre for Disease Control [publisher] (2020). 2021.
- S2. British Columbia Centre for Disease Control [creator]. COVID-19 surveillance case data. British Columbia Centre for Disease Control [publisher]. (2020). 2021.
- S3. Provincial Health Services Authority [creator]. Provincial COVID-19 Monitoring Solution. Provincial Health Services Authority [publisher]. (2020). 2021.
- S4. Provincial Health Services Authority [creator]. COVID-19 vaccination data. Provincial Immunizations Registry, Provincial Public Health Information Systems [publisher]. (2020). 2021.
- S5. Provincial Health Services Authority [creator]. Provincial Public Health Information Systems [publisher]. (2020). 2021.
- S6. British Columbia Centre for Disease Control [creator]. Respiratory datamart, Public Health Reporting Data Warehouse, British Columbia Centre for Disease Control [publisher] (2020). 2021.
- S7. British Columbia Ministry of Health [creator]. Client Roster (Client Registry System/Enterprise Master Patient Index). British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S8. British Columbia Ministry of Health [creator]. Discharge Abstract Database (Hospital Separations). British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S9. British Columbia Ministry of Health [creator]. Medical Services Plan (MSP) Payment Information File. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S10. British Columbia Ministry of Health [creator]. PharmaNet. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S11. BC Vital Statistics Agency [creator]. Vital Statistics Deaths. BC Vital Statistics Agency [publisher]. Data Extract. BC Vital Statistics Agency (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S12. British Columbia Ministry of Health [creator]. National Ambulatory Care Reporting System. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S13. British Columbia Ministry of Health [creator]. Chronic Disease Registry. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2020. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S14. British Columbia Ministry of Health [creator]. 811 calls. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S15. British Columbia Ministry of Health [creator]. Health System Matrix. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S16. British Columbia Ministry of Health [creator]. Population Grouper Methodology. British Columbia Ministry of Health [publisher]. Data Extract. MOH (2020). 2021. <https://www2.gov.bc.ca/gov/content/health/health-forms/online-services>
- S17. Sundboll J, Adelborg K, Munch T, et al. Positive predictive value of cardiovascular diagnoses in the Danish National Patient Registry: a validation study. *BMJ Open* 2016;6:e012832.

**Table S2: Ratio of observed versus expected rates of myocarditis among females following mRNA Covid-19 vaccination in British Columbia\***

7-DAY RISK WINDOW				
Age Groups (Years)	Pfizer			
	OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	24.28 (2.94-87.71)	0.00 (0.00-103.41)	58.92 (7.14-212.84)	0.00 (0.00-315.53)
18-29	9.81 (2.02-28.68)	0.00 (0.00-26.93)	23.35 (4.81-68.23)	0.00 (0.00-61.19)
30-39	0.00 (0.00-15.03)	0.00 (0.00-31.01)	0.00 (0.00-32.92)	0.00 (0.00-104.73)
40-49	4.23 (0.11-23.59)	0.00 (0.00-30.51)	8.82 (0.22-49.13)	0.00 (0.00-92.92)
50-59	5.21 (0.13-29.01)	0.00 (0.00-36.80)	10.91 (0.28-60.81)	0.00 (0.00-104.20)
60-69	13.32 (2.75-38.92)	0.00 (0.00-31.92)	9.86 (0.25-54.94)	44.23 (5.36-159.78)
70-79	0.00 (0.00-9.77)	0.00 (0.00-20.90)	0.00 (0.00-22.76)	0.00 (0.00-45.22)
80+	0.00 (0.00-68.7)	0.00 (0.00-124.44)	0.00 (0.00-132.10)	0.00 (0.00-280.33)
Age Groups (Years)	Moderna			
	OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA
18-29	8.79 (0.22-48.98)	0.00 (0.00-78.82)	20.69 (0.52-115.28)	0.00 (0.00-198.13)
30-39	22.44 (4.63-65.59)	0.00 (0.00-89.60)	45.30 (5.49-163.65)	20.68 (0.52-115.24)
40-49	0.00 (0.00-27.49)	0.00 (0.00-98.04)	0.00 (0.00-87.73)	0.00 (0.00-67.68)
50-59	8.07 (0.20-44.97)	0.00 (0.00-114.96)	26.25 (0.66-146.23)	0.00 (0.00-68.68)
60-69	12.93 (1.57-46.71)	0.00 (0.00-105.71)	0.00 (0.00-79.52)	27.25 (3.30-98.43)
70-79	4.81 (0.12-26.80)	0.00 (0.00-92.35)	18.86 (0.48-105.07)	0.00 (0.00-32.09)
80+	25.81 (0.65-143.81)	0.00 (0.00-463.01)	0.00 (0.00-386.02)	47.13 (1.19-262.57)
21-DAY RISK WINDOW				
Age Groups (Years)	Pfizer			
	OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	8.09 (0.98-29.24)	0.00 (0.00-34.47)	19.64 (2.38-70.95)	0.00 (0.00-105.18)
18-29	4.36 (1.19-11.17)	2.43 (0.06-13.56)	7.78 (1.60-22.74)	0.00 (0.00-20.40)
30-39	4.07 (0.84-11.91)	5.61 (0.68-20.25)	2.97 (0.08-16.58)	0.00 (0.00-34.91)
40-49	2.82 (0.34-10.20)	0.00 (0.00-10.17)	2.94 (0.07-16.38)	8.40 (0.21-46.78)
50-59	5.21 (1.07-15.22)	0.00 (0.00-12.27)	10.91 (2.25-31.90)	0.00 (0.00-34.73)
60-69	7.40 (2.40-17.27)	2.88 (0.07-16.07)	6.57 (0.80-23.75)	14.74 (1.79-53.26)
70-79	0.88 (0.02-4.92)	0.00 (0.00-6.97)	2.06 (0.05-11.46)	0.00 (0.00-15.07)
80+	18.62 (3.84-54.43)	11.24 (0.28-62.65)	11.94 (0.30-66.51)	25.33 (0.64-141.13)
Age Groups (Years)	Moderna			
	OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA
18-29	5.86 (0.71-21.17)	0.00 (0.00-26.27)	13.79 (1.67-49.83)	0.00 (0.00-66.04)
30-39	9.97 (2.72-25.54)	0.00 (0.00-29.87)	22.65 (4.67-66.20)	6.89 (0.17-38.41)
40-49	0.00 (0.00-9.16)	0.00 (0.00-32.68)	0.00 (0.00-29.24)	0.00 (0.00-22.56)
50-59	2.69 (0.07-14.99)	0.00 (0.00-38.32)	8.75 (0.22-48.74)	0.00 (0.00-22.89)
60-69	6.46 (1.33-18.89)	0.00 (0.00-35.24)	0.00 (0.00-26.51)	13.62 (2.81-39.82)
70-79	3.21 (0.39-11.58)	8.35 (0.21-46.50)	6.29 (0.16-35.02)	0.00 (0.00-10.70)
80+	8.60 (0.22-47.94)	0.00 (0.00-154.34)	0.00 (0.00-128.67)	15.71 (0.40-87.52)

NA = Not applicable as no doses were administered. OE = observed versus expected.

\*Observed rates of myocarditis were calculated per 100 000 vaccine doses. Expected rates of myocarditis were expressed per 100 000 population.

**Table S3: Descriptive statistics for the post-vaccination myocarditis cases**

Variable	7-day risk window		21-day risk window	
	Male	Female	Male	Female
<b>Number of myocarditis cases</b>	127	52	205	103
<b>Age</b>				
Range	12 – 95	15 – 90	12 – 95	15 – 92
Mean (SD)	31 (19.12)	46 (21.85)	39 (21.52)	50 (21.69)
Median (IQR)	23 (18-36)	49 (26-61.5)	31 (21-56)	53 (30-68)
<b>Vaccine type</b>				
<b>Pfizer</b>				
<i>Dose 1</i>	12	6	37	21
<i>Dose 2</i>	47	18	61	34
<i>Dose 3</i>	12	4	22	12
<b>Moderna</b>				
<i>Dose 1</i>	5	2	14	5
<i>Dose 2</i>	44	12	55	17
<i>Dose 3</i>	7	10	16	14

**Table S4: Expected and observed myopericarditis rates with observed vs expected ratios using 7-day risk window**

	Observed <sup>1</sup>			Expected <sup>2</sup>			OE Ratio (95% CI)
	Number of cases	Vaccine doses	Rate per 100,000 (95% CI)	Number of cases	Population	Rate per 100,000 (95% CI)	
<b>Overall</b>	179	10253670	1.75 (1.50-2.02)	34.6	5090955	0.68 (0.48-0.96)	5.18 (4.45-5.99)
<b>SEX</b>							
Male	127	4890010	2.6 (2.17-3.09)	20.5	2571779	0.8 (0.51-1.25)	6.2 (5.17-7.38)
Female	52	5363660	0.97 (0.72-1.27)	13.8	2519176	0.55 (0.30-0.93)	3.77 (2.81-4.94)
<b>AGE</b>							
12-17	27	644677	4.19 (2.76-6.09)	1.0	300573	0.33 (0.01-1.85)	27.35 (18.02-39.79)
18-29	75	1784793	4.2 (3.31-5.27)	5.9	822028	0.71 (0.27-1.59)	12.77 (10.05-16.01)
30-39	24	1623945	1.48 (0.95-2.20)	5.4	721055	0.75 (0.31-1.81)	4.45 (2.85-6.61)
40-49	7	1340577	0.52 (0.21-1.08)	5.1	647731	0.79 (0.25-1.80)	1.37 (0.55-2.82)
50-59	11	1420422	0.77 (0.39-1.39)	5.1	725412	0.7 (0.22-1.61)	2.17 (1.08-3.88)
60-69	18	1551893	1.16 (0.69-1.83)	6.7	660685	1.02 (0.43-2.18)	2.68 (1.59-4.24)
70-79	9	1227776	0.73 (0.34-1.39)	6.8	413888	1.64 (0.68-3.49)	1.33 (0.61-2.52)
80+	8	659587	1.21 (0.52-2.39)	3.4	229260	1.49 (0.48-4.47)	2.34 (1.01-4.61)
<b>VACCINE</b>							
Pfizer	99	6988808	1.42 (1.15-1.73)	23.6	5090955	0.46 (0.30-0.70)	4.20 (3.41-5.12)
Moderna	80	3264862	2.45 (1.94-3.05)	11.0	5090955	0.22 (0.11-0.39)	7.27 (5.76-9.05)
<b>DOSE</b>							
Dose 1	25	3993716	0.63 (0.41-0.92)	13.5	5090955	0.26 (0.15-0.46)	1.86 (1.2-2.74)
Dose 2	121	3884326	3.12 (2.59-3.72)	13.1	5090955	0.26 (0.14-0.44)	9.24 (7.67-11.04)
Dose 3	33	2375628	1.39 (0.96-1.95)	8.0	5090955	0.16 (0.07-0.31)	4.12 (2.84-5.79)

<sup>1</sup> Myopericarditis cases recorded 7 days post vaccination between December 15, 2020, and March 31, 2022

<sup>2</sup> The background rates from 2019 were used to calculate the expected numbers

**Table S5: Expected and observed myopericarditis rates with observed vs expected ratios using 21-day risk window**

	Observed <sup>1</sup>			Expected <sup>2</sup>			OE Ratio (95% CI)
	Number of cases	Vaccine doses	Rate per 100,000 (95% CI)	Number of cases	Population	Rate per 100,000 (95% CI)	
<b>Overall</b>	308	10253670	3.00 (2.68-3.36)	103.7	5090955	2.04 (1.67-2.48)	2.97 (2.65-3.32)
<b>SEX</b>							
Male	205	4890010	4.19 (3.64-4.81)	61.4	2571779	2.39 (1.85-3.09)	3.34 (2.9-3.83)
Female	103	5363660	1.92 (1.57-2.33)	41.4	2519176	1.64 (1.20-2.25)	2.49 (2.03-3.02)
<b>AGE</b>							
12-17	32	644677	4.96 (3.40-7.01)	3.0	300573	0.99 (0.21-2.92)	10.8 (7.39-15.25)
18-29	95	1784793	5.32 (4.31-6.51)	17.6	822028	2.14 (1.30-3.46)	5.39 (4.36-6.59)
30-39	47	1623945	2.89 (2.13-3.85)	16.2	721055	2.25 (1.27-3.60)	2.90 (2.13-3.86)
40-49	17	1340577	1.27 (0.74-2.03)	15.4	647731	2.37 (1.41-4.01)	1.11 (0.64-1.77)
50-59	31	1420422	2.18 (1.48-3.10)	15.2	725412	2.1 (1.26-3.58)	2.04 (1.38-2.89)
60-69	41	1551893	2.64 (1.90-3.58)	20.1	660685	3.05 (1.85-4.68)	2.04 (1.46-2.76)
70-79	25	1227776	2.04 (1.32-3.01)	20.3	413888	4.91 (3.14-7.76)	1.23 (0.80-1.82)
80+	20	659587	3.03 (1.85-4.68)	10.3	229260	4.48 (2.40-8.59)	1.95 (1.19-3.01)
<b>VACCINE</b>							
Pfizer	187	6988808	2.68 (2.31-3.09)	70.7	5090955	1.39 (1.09-1.76)	2.65 (2.28-3.05)
Moderna	121	3264862	3.71 (3.08-4.43)	33.0	5090955	0.65 (0.45-0.91)	3.66 (3.04-4.38)
<b>GENDER</b>							
Dose 1	77	3993716	1.93 (1.52-2.41)	40.4	5090955	0.79 (0.58-1.09)	1.91 (1.5-2.38)
Dose 2	167	3884326	4.3 (3.67-5.00)	39.3	5090955	0.77 (0.56-1.07)	4.25 (3.63-4.95)
Dose 3	64	2375628	2.69 (2.08-3.44)	24.0	5090955	0.47 (0.30-0.70)	2.66 (2.05-3.4)

<sup>1</sup> Myopericarditis cases recorded 21 days post vaccination between December 15, 2020, and March 31, 2022

<sup>2</sup> The background rates from 2019 were used to calculate the expected numbers

**Table S6: Myopericarditis rates following mRNA COVID-19 vaccination using 7-day and 21-day risk windows by vaccine type, sex, and age, in British Columbia\***

7-DAY RISK WINDOW						
Age Groups (Years)	Pfizer Rate/100,000 doses (95% CI)					
	Male			Female		
	Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
12-17	2.8 (0.8-7.3)	9.0 (4.6-15.7)	11.7 (3.8-27.3)	0.7 (0.0-4.1)	3.1 (0.8-7.8)	0.0 (0.0-8.2)
18-29	1.1 (0.2-3.2)	7.8 (4.8-12.0)	4.0 (1.1-10.2)	0.0 (0.0-1.3)	2.6 (1.1-5.4)	0.0 (0.0-3.0)
30-39	0.4 (0.0-2.4)	1.8 (0.5-4.7)	1.6 (0.0-9.1)	0.0 (0.0-1.5)	0.9 (0.1-3.1)	0.0 (0.0-5.0)
40-49	0.0 (0.0-2.0)	1.2 (0.1-4.2)	1.9 (0.0-10.3)	0.0 (0.0-1.8)	1.0 (0.1-3.7)	0.0 (0.0-5.4)
50-59	0.0 (0.0-2.0)	1.8 (0.4-5.2)	0.0 (0.0-6.0)	0.5 (0.0-2.6)	0.5 (0.0-2.8)	1.3 (0.0-7.3)
60-69	1.5 (0.3-4.4)	0.6 (0.0-3.2)	1.3 (0.0-7.4)	1.3 (0.3-3.8)	0.5 (0.0-2.8)	2.2 (0.3-8.1)
70-79	0.6 (0.0-3.4)	2.0 (0.4-5.9)	0.0 (0.0-5.0)	0.0 (0.0-2.0)	0.6 (0.0-3.4)	0.0 (0.0-4.4)
80+	0.0 (0.0-4.8)	2.8 (0.3-10.0)	0.0 (0.0-10.3)	1.0 (0.5-5.0)	0.0 (0.0-3.8)	2.2 (0.1-12.3)
Age Groups (Years)	Moderna Rate/100,000 doses (95% CI)					
	Male			Female		
	Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA	NA	NA
18-29	2.7 (0.6-7.9)	30.3 (20.9-42.6)	4.0 (0.1-22.0)	0.0 (0.0-3.8)	3.0 (0.6-8.8)	2.6 (0.1-14.5)
30-39	0.0 (0.0-3.8)	8.0 (3.4-15.7)	2.3 (0.3-8.4)	0.0 (0.0-4.3)	4.4 (1.2-11.2)	2.0 (0.2-7.2)
40-49	0.0 (0.0-5.2)	2.6 (0.3-9.5)	0.0 (0.0-4.6)	0.0 (0.0-5.7)	0.0 (0.0-5.1)	0.0 (0.0-3.9)
50-59	1.4 (0.0-7.8)	0.0 (0.0-4.5)	0.0 (0.0-3.8)	1.4 (0.0-8.1)	2.4 (0.3-8.8)	0.9 (0.0-4.8)
60-69	0.0 (0.0-5.5)	0.0 (0.0-4.2)	0.8 (0.0-4.4)	0.0 (0.0-5.3)	1.1 (0.0-6.1)	3.4 (1.1-8.0)
70-79	0.0 (0.0-9.1)	1.9 (0.0-10.5)	1.8 (0.2-6.6)	0.0 (0.0-9.1)	1.8 (0.0-10.3)	0.0 (0.0-3.1)
80+	5.0 (0.1-27.7)	0.0 (0.0-14.9)	0.0 (0.0-6.8)	3.7 (0.1-20.3)	3.0 (0.1-17.0)	1.4 (0.0-7.6)
21-DAY RISK WINDOW						
Age Groups (Years)	Pfizer Rate/100,000 doses (95% CI)					
	Male			Female		
	Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
12-17	3.6 (1.2-8.3)	9.0 (4.6-15.7)	14.0 (5.1-30.5)	2.2 (0.5-6.4)	3.1 (0.8-7.8)	2.2 (0.1-12.4)
18-29	2.6 (1.0-5.3)	9.3 (6.0-13.9)	6.0 (2.2-13.0)	0.4 (0.0-2.0)	3.0 (1.3-5.9)	0.8 (0.0-4.5)
30-39	3.4 (1.5-6.8)	2.8 (1.0-6.0)	3.3 (0.4-11.8)	1.2 (0.3-3.5)	1.7 (0.5-4.4)	1.4 (0.0-7.6)
40-49	1.6 (0.3-4.8)	1.8 (0.4-5.1)	1.9 (0.0-10.3)	1.0 (0.1-3.5)	1.0 (0.1-3.7)	1.5 (0.0-8.1)
50-59	2.2 (0.6-5.5)	2.4 (0.7-6.1)	3.3 (0.4-11.8)	0.5 (0.0-2.6)	2.5 (0.8-5.9)	1.3 (0.0-7.3)
60-69	2.5 (0.8-5.9)	2.3 (0.6-6.0)	6.6 (2.2-15.5)	2.6 (1.0-5.7)	2.0 (0.5-5.1)	4.5 (1.2-11.4)
70-79	1.2 (0.1-4.4)	3.4 (1.1-7.9)	0.0 (0.0-5.0)	1.7 (0.3-4.9)	3.6 (1.3-7.9)	0.0 (0.0-4.4)
80+	3.9 (0.8-11.4)	4.2 (0.9-12.2)	0.0 (0.0-10.3)	2.0 (0.2-7.1)	1.0 (0.0-5.8)	6.6 (1.4-19.4)
Age Groups (Years)	Moderna Rate/100,000 doses (95% CI)					
	Male			Female		
	Dose 1	Dose 2	Dose 3	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA	NA	NA
18-29	4.5 (1.5-10.5)	32.2 (22.4-44.7)	7.9 (1.0-28.6)	0.0 (0.0-3.8)	5.0 (1.6-11.7)	2.6 (0.1-14.5)
30-39	1.0 (0.0-5.8)	11.0 (5.5-19.6)	3.5 (0.7-10.2)	0.0 (0.0-4.3)	6.5 (2.4-14.2)	2.0 (0.2-7.2)
40-49	1.4 (0.0-7.9)	3.9 (0.8-11.5)	0.0 (0.0-4.6)	0.0 (0.0-5.7)	1.4 (0.0-7.7)	0.0 (0.0-3.9)
50-59	5.6 (1.5-14.4)	1.2 (0.0-6.8)	2.0 (0.2-7.4)	2.9 (0.4-10.5)	2.4 (0.3-8.8)	2.6 (0.5-7.6)
60-69	1.5 (0.0-8.3)	1.1 (0.0-6.4)	2.4 (0.5-6.9)	0.0 (0.0-5.3)	1.1 (0.0-6.1)	4.8 (1.9-9.9)
70-79	2.5 (0.1-13.8)	5.6 (1.2-16.5)	2.7 (0.6-8.0)	2.5 (0.1-13.7)	1.8 (0.0-10.3)	0.0 (0.0-3.1)
80+	5.0 (0.1-27.7)	4.0 (0.1-22.5)	3.7 (0.4-13.4)	7.3 (0.9-26.4)	3.0 (0.1-17.0)	1.4 (0.0-7.6)

NA = Not applicable as no doses were administered. OE = observed versus expected.

\*Rates of myopericarditis were calculated per 100,000 vaccine doses.



**Table S7: Ratio of observed versus expected rates of myopericarditis among males following mRNA Covid-19 vaccination in British Columbia\***

7-DAY RISK WINDOW				
Age Groups (Years)	Pfizer OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	35.69 (22.09-54.55)	15.13 (4.12-38.74)	47.75 (24.67-83.41)	62.13 (20.17-145.00)
18-29	8.81 (5.81-12.82)	2.40 (0.50-7.02)	17.12 (10.45-26.43)	8.72 (2.38-22.33)
30-39	2.38 (0.87-5.18)	0.95 (0.02-5.27)	4.05 (1.10-10.38)	3.58 (0.09-19.94)
40-49	1.30 (0.27-3.81)	0.00 (0.00-4.13)	2.41 (0.29-8.72)	3.83 (0.10-21.32)
50-59	1.45 (0.30-4.23)	0.00 (0.00-4.71)	4.24 (0.87-12.40)	0.00 (0.00-14.23)
60-69	1.74 (0.57-4.07)	2.73 (0.56-7.97)	1.05 (0.03-5.86)	2.40 (0.06-13.40)
70-79	1.56 (0.43-4.00)	1.03 (0.03-5.74)	3.39 (0.70-9.90)	0.00 (0.00-8.27)
80+	1.27 (0.15-4.57)	0.00 (0.00-7.40)	4.27 (0.52-15.43)	0.00 (0.00-15.87)
Age Groups (Years)	Moderna OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA
18-29	33.22 (23.39-45.79)	5.96 (1.23-17.41)	66.64 (45.87-93.58)	8.69 (0.22-48.39)
30-39	7.77 (3.72-14.28)	0.00 (0.00-8.39)	17.54 (7.57-34.56)	5.11 (0.62-18.45)
40-49	1.82 (0.22-6.57)	0.00 (0.00-10.74)	5.42 (0.66-19.59)	0.00 (0.00-9.53)
50-59	0.94 (0.02-5.25)	3.33 (0.08-18.55)	0.00 (0.00-10.65)	0.00 (0.00-8.92)
60-69	0.64 (0.02-3.58)	0.00 (0.00-9.97)	0.00 (0.00-7.60)	1.43 (0.04-7.96)
70-79	2.47 (0.51-7.23)	0.00 (0.00-15.27)	3.14 (0.08-17.50)	3.06 (0.37-11.07)
80+	1.56 (0.04-8.68)	7.64 (0.19-42.56)	0.00 (0.00-22.89)	0.00 (0.00-10.54)
21-DAY RISK WINDOW				
Age Groups (Years)	Pfizer OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	13.03 (8.26-19.55)	6.31 (2.05-14.71)	15.92 (8.22-27.80)	24.85 (9.12-54.09)
18-29	4.03 (2.99-5.73)	1.87 (0.75-3.85)	6.85 (4.39-10.19)	4.36 (1.60-9.49)
30-39	2.12 (1.29-3.51)	2.52 (1.09-4.97)	2.03 (0.74-4.41)	2.39 (0.29-8.62)
40-49	1.01 (0.66-2.57)	1.12 (0.23-3.27)	1.21 (0.25-3.53)	1.28 (0.03-7.11)
50-59	1.61 (0.86-3.09)	1.70 (0.46-4.36)	1.89 (0.51-4.83)	2.57 (0.31-9.29)
60-69	1.63 (0.99-2.89)	1.52 (0.49-3.54)	1.40 (0.38-3.59)	4.01 (1.30-9.35)
70-79	0.91 (0.40-1.90)	0.69 (0.08-2.48)	1.88 (0.61-4.39)	0.00 (0.00-2.76)
80+	1.27 (0.60-3.27)	2.01 (0.41-5.86)	2.14 (0.44-6.24)	0.00 (0.00-5.29)
Age Groups (Years)	Moderna OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
12-17	NA	NA	NA	NA
18-29	12.57 (9.06-16.99)	3.31 (1.07-7.73)	23.56 (16.41-32.76)	5.79 (0.7-20.92)
30-39	3.88 (2.17-6.41)	0.76 (0.02-4.22)	8.04 (4.01-14.39)	2.55 (0.53-7.46)
40-49	1.21 (0.33-3.11)	0.97 (0.02-5.41)	2.71 (0.56-7.93)	0.00 (0.00-3.18)
50-59	2.20 (0.88-4.53)	4.44 (1.21-11.37)	0.96 (0.02-5.36)	1.61 (0.20-5.82)
60-69	1.07 (0.35-2.50)	0.90 (0.02-5.02)	0.69 (0.02-3.83)	1.43 (0.29-4.17)
70-79	1.92 (0.77-3.96)	1.38 (0.03-7.69)	3.14 (0.65-9.18)	1.53 (0.32-4.48)
80+	2.08 (0.57-5.32)	2.55 (0.06-14.19)	2.07 (0.05-11.52)	1.90 (0.23-6.88)

NA = Not applicable as no doses were administered. OE = observed versus expected.

\*Observed rates of myopericarditis were calculated per 100 000 vaccine doses. Expected rates of myopericarditis were expressed per 100 000 population.

**Table S8: Ratio of observed versus expected rates of myopericarditis among females following mRNA Covid-19 vaccination in British Columbia\***

7-DAY RISK WINDOW				
Age Groups (Years)	Pfizer OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
	12-17	13.49 (4.38-31.48)	6.23 (0.16-34.71)	26.19 (7.14-67.05)
18-29	5.73 (2.30-11.80)	0.00 (0.00-6.73)	13.62 (5.48-28.06)	0.00 (0.00-15.30)
30-39	1.88 (0.23-6.79)	0.00 (0.00-7.16)	4.12 (0.50-14.88)	0.00 (0.00-24.17)
40-49	1.73 (0.21-6.24)	0.00 (0.00-6.23)	3.60 (0.44-13.00)	0.00 (0.00-18.96)
50-59	2.47 (0.51-7.21)	1.57 (0.04-8.78)	1.72 (0.04-9.60)	4.46 (0.11-24.85)
60-69	4.21 (1.54-9.15)	4.10 (0.85-11.98)	1.56 (0.04-8.68)	6.98 (0.85-25.23)
70-79	0.51 (0.01-2.85)	0.00 (0.00-4.03)	1.19 (0.03-6.63)	0.00 (0.00-8.73)
80+	2.57 (0.31-9.28)	2.33 (0.06-12.96)	0.00 (0.00-9.11)	5.24 (0.13-29.20)
Age Groups (Years)	Moderna OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
	12-17	NA	NA	NA
18-29	8.79 (2.40-22.51)	0.00 (0.00-19.71)	15.52 (3.20-45.35)	13.43 (0.34-74.81)
30-39	10.36 (3.80-22.55)	0.00 (0.00-20.68)	20.91 (5.70-53.53)	9.55 (1.16-34.48)
40-49	0.00 (0.00-5.61)	0.00 (0.00-20.01)	0.00 (0.00-17.9)	0.00 (0.00-13.81)
50-59	5.10 (1.39-13.05)	4.92 (0.12-27.42)	8.29 (1.00-29.94)	2.94 (0.07-16.38)
60-69	6.12 (2.25-13.33)	0.00 (0.00-16.69)	3.40 (0.09-18.96)	10.76 (3.49-25.10)
70-79	0.93 (0.02-5.17)	0.00 (0.00-17.82)	3.64 (0.09-20.28)	0.00 (0.00-6.19)
80+	5.34 (1.10-15.61)	8.66 (0.22-48.23)	7.22 (0.18-40.21)	3.25 (0.08-18.11)
21-DAY RISK WINDOW				
Age Groups (Years)	Pfizer OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
	12-17	7.19 (3.11-14.18)	6.23 (1.28-18.21)	8.73 (2.38-22.35)
18-29	2.73 (1.31-5.01)	0.61 (0.02-3.39)	5.19 (2.24-10.22)	1.38 (0.03-7.70)
30-39	2.51 (1.08-4.94)	1.94 (0.40-5.67)	2.75 (0.75-7.03)	2.18 (0.06-12.17)
40-49	1.44 (0.47-3.36)	1.13 (0.14-4.06)	1.20 (0.15-4.33)	1.71 (0.04-9.55)
50-59	1.92 (0.77-3.95)	0.52 (0.01-2.93)	2.87 (0.93-6.70)	1.49 (0.04-8.28)
60-69	3.27 (1.79-5.49)	2.73 (1.00-5.95)	2.08 (0.57-5.32)	4.66 (1.27-11.92)
70-79	1.53 (0.70-2.91)	1.09 (0.23-3.19)	2.38 (0.87-5.18)	0.00 (0.00-2.91)
80+	2.57 (0.94-5.59)	1.55 (0.19-5.60)	0.82 (0.02-4.59)	5.24 (1.08-15.32)
Age Groups (Years)	Moderna OE Ratio (95% CI)			
	All doses	Dose 1	Dose 2	Dose 3
	12-17	NA	NA	NA
18-29	4.40 (1.61-9.57)	0.00 (0.00-6.57)	8.62 (2.80-20.12)	4.48 (0.11-24.94)
30-39	4.60 (1.99-9.07)	0.00 (0.00-6.89)	10.45 (3.84-22.75)	3.18 (0.39-11.49)
40-49	0.51 (0.01-2.82)	0.00 (0.00-6.67)	1.62 (0.04-9.01)	0.00 (0.00-4.60)
50-59	2.97 (1.20-6.13)	3.28 (0.40-11.85)	2.76 (0.33-9.98)	2.94 (0.61-8.59)
60-69	2.72 (1.18-5.36)	0.00 (0.00-5.56)	1.13 (0.03-6.32)	5.02 (2.02-10.34)
70-79	0.62 (0.07-2.24)	1.61 (0.04-8.97)	1.21 (0.03-6.76)	0.00 (0.00-2.06)
80+	2.37 (0.65-6.08)	5.77 (0.70-20.85)	2.41 (0.06-13.40)	1.08 (0.03-6.04)

NA = Not applicable as no doses were administered. OE = observed versus expected.

\*Observed rates of myopericarditis were calculated per 100 000 vaccine doses. Expected rates of myopericarditis were expressed per 100 000 population.

**Table S9: Number of doses, observed, and expected numbers of myocarditis cases among males following mRNA Covid-19 vaccination, British Columbia**

7-DAY RISK WINDOW									
Age Groups (Years)	Pfizer								
	Dose1			Dose2			Dose3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
12-17	140557	3 (0.6-8.8)	0.07	133633	9 (4.1-17.1)	0.07	42791	3 (0.6-8.8)	0.02
18-29	274238	1 (0-5.6)	0.41	256767	13 (6.9-22.2)	0.38	100783	3 (0.6-8.8)	0.15
30-39	232061	1 (0-5.6)	0.32	216725	1 (0-5.6)	0.30	61389	1 (0-5.6)	0.08
40-49	183934	0 (0-3.7)	0.13	170626	1 (0-5.6)	0.12	53848	1 (0-5.6)	0.04
50-59	185172	0 (0-3.7)	0.11	167180	2 (0.2-7.2)	0.10	61289	0 (0-3.7)	0.04
60-69	198794	0 (0-3.7)	0.10	171902	1 (0-5.6)	0.08	75198	0 (0-3.7)	0.04
70-79	162393	0 (0-3.7)	0.13	148009	0 (0-3.7)	0.11	74518	0 (0-3.7)	0.06
80+	76756	0 (0-3.7)	0.06	72050	2 (0.2-7.2)	0.06	35770	0 (0-3.7)	0.03
Moderna									
Age Groups (Years)	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
	12-17	NA	NA	NA	NA	NA	NA	NA	NA
18-29	110631	1 (0-5.6)	0.16	108820	24 (15.4-35.7)	0.16	25300	1 (0-5.6)	0.04
30-39	96605	0 (0-3.7)	0.13	100185	7 (2.8-14.4)	0.14	86027	1 (0-5.6)	0.12
40-49	70735	0 (0-3.7)	0.05	75966	1 (0-5.6)	0.06	79704	0 (0-3.7)	0.06
50-59	71013	1 (0-5.6)	0.04	81891	0 (0-3.7)	0.05	97756	0 (0-3.7)	0.06
60-69	66889	0 (0-3.7)	0.03	87711	0 (0-3.7)	0.04	126623	0 (0-3.7)	0.06
70-79	40384	0 (0-3.7)	0.03	53204	0 (0-3.7)	0.04	109122	2 (0.2-7.2)	0.08
80+	20148	0 (0-3.7)	0.02	24807	0 (0-3.7)	0.02	53882	0 (0-3.7)	0.04
21-DAY RISK WINDOW									
Age Groups (Years)	Pfizer								
	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
12-17	140557	4 (1.1-10.2)	0.21	133633	9 (4.1-17.1)	0.20	42791	4 (1.1-10.2)	0.06
18-29	274238	2 (0.2-7.2)	1.22	256767	15 (8.4-24.7)	1.15	100783	3 (0.6-8.8)	0.45
30-39	232061	6 (2.2-13.1)	0.96	216725	3 (0.6-8.8)	0.89	61389	2 (0.2-7.2)	0.25
40-49	183934	1 (0-5.6)	0.40	170626	2 (0.2-7.2)	0.37	53848	1 (0-5.6)	0.12
50-59	185172	2 (0.2-7.2)	0.33	167180	2 (0.2-7.2)	0.30	61289	1 (0-5.6)	0.11
60-69	198794	0 (0-3.7)	0.29	171902	1 (0-5.6)	0.25	75198	1 (0-5.6)	0.11
70-79	162393	0 (0-3.7)	0.38	148009	0 (0-3.7)	0.34	74518	0 (0-3.7)	0.17
80+	76756	0 (0-3.7)	0.18	72050	2 (0.2-7.2)	0.17	35770	0 (0-3.7)	0.08
Moderna									
Age Groups (Years)	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
	12-17	NA	NA	NA	NA	NA	NA	NA	NA
18-29	110631	1 (0-5.6)	0.49	108820	25 (16.2-36.9)	0.49	25300	1 (0-5.6)	0.11
30-39	96605	2 (0.2-7.2)	0.40	100185	7 (2.8-14.4)	0.41	86027	1 (0-5.6)	0.36
40-49	70735	0 (0-3.7)	0.15	75966	1 (0-5.6)	0.17	79704	0 (0-3.7)	0.17
50-59	71013	2 (0.2-7.2)	0.13	81891	0 (0-3.7)	0.15	97756	0 (0-3.7)	0.17
60-69	66889	0 (0-3.7)	0.10	87711	0 (0-3.7)	0.13	126623	1 (0-5.6)	0.18
70-79	40384	0 (0-3.7)	0.09	53204	0 (0-3.7)	0.12	109122	2 (0.2-7.2)	0.25
80+	20148	0 (0-3.7)	0.05	24807	0 (0-3.7)	0.06	53882	1 (0-5.6)	0.13

No. = Number

Obs = Observed

Exp = Expected

NA = Not applicable as doses were administered

**Table S10: Number of doses, observed, and expected numbers of myocarditis cases among females following mRNA Covid-19 vaccination, British Columbia**

7-DAY RISK WINDOW									
Age Groups (Years)	Pfizer								
	Dose1			Dose2			Dose3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
12-17	137281	0 (0-3.7)	0.04	130628	2 (0.2-7.2)	0.03	44991	0 (0-3.7)	0.01
18-29	283089	0 (0-3.7)	0.14	265600	3 (0.6-8.8)	0.13	124611	0 (0-3.7)	0.06
30-39	247214	0 (0-3.7)	0.12	232886	0 (0-3.7)	0.11	73207	0 (0-3.7)	0.04
40-49	209114	0 (0-3.7)	0.12	196125	1 (0-5.6)	0.11	68654	0 (0-3.7)	0.04
50-59	215932	0 (0-3.7)	0.10	197347	1 (0-5.6)	0.09	76252	0 (0-3.7)	0.04
60-69	228753	0 (0-3.7)	0.12	200719	1 (0-5.6)	0.10	89502	2 (0.2-7.2)	0.05
70-79	180032	0 (0-3.7)	0.18	165274	0 (0-3.7)	0.16	83199	0 (0-3.7)	0.08
80+	101901	0 (0-3.7)	0.03	95991	0 (0-3.7)	0.03	45236	0 (0-3.7)	0.01
Moderna									
Age Groups (Years)	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
	12-17	NA	NA	NA	NA	NA	NA	NA	NA
18-29	96733	0 (0-3.7)	0.05	99895	1 (0-5.6)	0.05	38483	0 (0-3.7)	0.02
30-39	85577	0 (0-3.7)	0.04	91762	2 (0.2-7.2)	0.04	100495	1 (0-5.6)	0.05
40-49	65072	0 (0-3.7)	0.04	72715	0 (0-3.7)	0.04	94253	0 (0-3.7)	0.05
50-59	69115	0 (0-3.7)	0.03	82065	1 (0-5.6)	0.04	115679	0 (0-3.7)	0.05
60-69	69075	0 (0-3.7)	0.03	91825	0 (0-3.7)	0.05	145284	2 (0.2-7.2)	0.07
70-79	40734	0 (0-3.7)	0.04	54077	1 (0-5.6)	0.05	117216	0 (0-3.7)	0.11
80+	27388	0 (0-3.7)	0.01	32850	0 (0-3.7)	0.01	72944	1 (0-5.6)	0.02
21-DAY RISK WINDOW									
Age Groups (Years)	Pfizer								
	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
12-17	137281	0 (0-3.7)	0.11	130628	2 (0.2-7.2)	0.10	44991	0 (0-3.7)	0.04
18-29	283089	1 (0-5.6)	0.41	265600	3 (0.6-8.8)	0.39	124611	0 (0-3.7)	0.18
30-39	247214	2 (0.2-7.2)	0.36	232886	1 (0-5.6)	0.34	73207	0 (0-3.7)	0.11
40-49	209114	0 (0-3.7)	0.36	196125	1 (0-5.6)	0.34	68654	1 (0-5.6)	0.12
50-59	215932	0 (0-3.7)	0.30	197347	3 (0.6-8.8)	0.27	76252	0 (0-3.7)	0.11
60-69	228753	1 (0-5.6)	0.35	200719	2 (0.2-7.2)	0.30	89502	2 (0.2-7.2)	0.14
70-79	180032	0 (0-3.7)	0.53	165274	1 (0-5.6)	0.49	83199	0 (0-3.7)	0.24
80+	101901	1 (0-5.6)	0.09	95991	1 (0-5.6)	0.08	45236	1 (0-5.6)	0.04
Age Groups (Years)	Moderna								
	Dose 1			Dose 2			Dose 3		
	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp	No.	Obs (95%CI)	Exp
12-17	NA	NA	NA	NA	NA	NA	NA	NA	NA
18-29	96733	0 (0-3.7)	0.14	99895	2 (0.2-7.2)	0.14	38483	0 (0-3.7)	0.06
30-39	85577	0 (0-3.7)	0.12	91762	3 (0.6-8.8)	0.13	100495	1 (0-5.6)	0.15
40-49	65072	0 (0-3.7)	0.11	72715	0 (0-3.7)	0.13	94253	0 (0-3.7)	0.16
50-59	69115	0 (0-3.7)	0.10	82065	1 (0-5.6)	0.11	115679	0 (0-3.7)	0.16
60-69	69075	0 (0-3.7)	0.10	91825	0 (0-3.7)	0.14	145284	3 (0.6-8.8)	0.22
70-79	40734	1 (0-5.6)	0.12	54077	1 (0-5.6)	0.16	117216	0 (0-3.7)	0.34
80+	27388	0 (0-3.7)	0.02	32850	0 (0-3.7)	0.03	72944	1 (0-5.6)	0.06

No. = Number

Obs = Observed

Exp = Expected

NA = Not applicable as doses were administered