# COVID-19 Seroprevalence Report

## June 2, 2023

## Report #32: March 2023 Survey

# Summary

**March 2023** | **March 1 – March 31, 2023 (n = 30,793)**

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00) (based on results from the Spike antibody assay).
- Spike antibody concentrations tend to be higher among those positive for Nucleocapsid antibodies, compared with those positive for Spike antibodies only.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in March was 78.67% (95% CI 78.21, 79.13), only slightly higher than in February (77.59%, 95% CI 77.13, 78.06), P  0.0013). There was a week-to-week variation over March from 77.96% (95% CI 76.88, 79.03) to 78.41% (95% CI 77.49, 79.32) to 79.41% (95% CI 78.42, 80.40) to 78.71% (95% CI 77.92, 79.50).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 89.17% (95% CI 88.17, 90.18) compared to other age groups.
- Also consistent with previous surveys, Black, Indigenous and Racialized groups have a higher seroprevalence rate (84.33% (95% CI 83.38, 85.27)) compared to White donors (77.17% (95% CI 76.63, 77.71)).

**February 2023** **February 1 – February 28, 2023 (n = 31,755)**

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00) (based on results from the Spike antibody assay). This was largely driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. Recently rising values in most age groups may be related to vaccination or infection. February 2023 saw a slight decrease in concentrations among older age groups.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in February was 77.59% (95% CI 77.13, 78.06), higher than in January (76.73%, 95% CI 76.27, 77.20), $P < 0.01$). There was a week-to-week variation over February from 78.48% (95% CI 77.56, 79.40) to 77.22% (95% CI 76.26, 78.19) to 77.01% (95% CI 76.08, 77.93) to 77.49% (95% CI 76.62, 78.37).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 88.40% (95% CI 87.38, 89.42) compared to other age groups. The seroprevalence rate increased in 17-24 and 40-59 age groups compared to January.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (83.52% (95% CI 82.60, 84.44)) compared to White donors (75.92% (95% CI 75.38, 76.46)).

## January 2023

## January 1 – January 31, 2023 (n = 32,062)

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00) (based on results from the Spike antibody assay). This was largely driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. Recently rising values in most age groups may be related to vaccination or infection. January 2023 saw a slight decrease in concentrations among older age groups.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in January was 76.72% (95% CI 76.25, 77.19), higher than in December (73.50%, 95% CI 73.01, 73.98), P < 0.0001). There was a gradual week-to-week change over January from 76.08% (95% CI 75.14, 77.03) to 75.91% (95% CI 74.97, 76.85) to 76.46% (95% CI 75.59, 77.34) to 78.48% (95% CI 77.54, 79.43).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 86.55% (95% CI 85.46, 87.63) compared to other age groups. The seroprevalence rate increased in all age groups, excluding 17-24 year olds, compared to December.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (81.95% (95% CI 80.97, 82.94)) compared to White donors (75.44% (95% CI 74.91, 75.98)).

## December 2022

**December 1 – December 31, 2022 (n = 32,698)**

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. Recently rising values in most age groups may be related to vaccination or infection.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in December was 73.50% (95% CI 73.01, 73.98), higher than in November was 70.78% (95% CI 70.27, 71.30), $P < 0.0001$). There was a gradual week-to-week increase over December from 71.6% (95% CI 70.52, 72.69) to 73.04% (95% CI 72.19, 73.90) to 73.82% (95% CI 72.88, 74.76) to 75.26% (95% CI 74.27, 76.22).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 86.76% (95% CI 85.70, 87.82) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to November.
- Seroprevalence rates increased in December compared to November in all provinces, however the increase was not statistically significant in Nova Scotia and Prince Edward Island.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (79.57% (95% CI 78.56, 80.58)) compared to White donors (71.97% (95% CI 71.41, 72.52)).

## November 2022

**November 1 – November 30, 2022 (n = 31,080)**

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. Recently rising values in most age groups may be related to vaccination or infection.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in November was 70.78% (95% CI 70.27, 71.30), higher than in October was 67.37% (95% CI 66.84, 67.89), $P < 0.0001$). There was week-to-week fluctuation over November from 69.90% (95% CI 68.74, 71.06) to 70.42% (95% CI 69.50, 71.34) to 71.23% (95% CI 70.26, 72.20) to 70.80% (95% CI 69.77, 71.83).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 84.55% (95% CI 83.39, 85.71) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to October.
- Seroprevalence rates increased in November compared to October in all provinces, however the increase was not statistically significant in Saskatchewan, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (78.67% (95% CI 77.65, 79.70)) compared to White donors (68.58% (95% CI 67.99, 69.17)).

## October 2022 — October 1 – October 31, 2022 (n = 31,457)

**Humoral Immunity (Based on results from the Spike antibody assay):**

- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. Recently rising values in most age groups may be related to vaccination or infection.

**Natural Infections (Based on results from the Nucleocapsid antibody assay):**

- Seroprevalence (natural infection) in October was 67.37% (95% CI 66.84, 67.89), higher than in September (63.22% (95% CI 62.69, 63.76), $P < 0.0001$). There was a modest week to-week change over October from 66.37% (95% CI 65.29, 67.44) to 66.12% (95% CI 65.07, 67.16) to 67.79% (95% CI 66.72, 68.86) to 68.47% (95% CI 67.51, 69.42).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate at 81.73% (95% CI 80.50, 82.96) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to September.
- Seroprevalence rates increased in October compared to September in all provinces, however the increase was not statistically significant in Manitoba, New Brunswick, Prince Edward Island and Newfoundland.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (75.25% (95% CI 74.14, 76.35)) compared to White donors (65.33% (95% CI 64.73, 65.94)).

# September 2022

## September 1 - September 30, 2022 (n=31,637)

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration.
- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in September was 63.22% (95% CI 62.69, 63.76), higher than in August (58.54% (95% CI 58.02, 59.06)), $P < 0.0001$). There was a modest week-to-week change over September from 61.14% (95% CI 60.02, 62.26) to 63.43% (95% CI 62.41, 64.46) to 62.85% (95% CI 61.84, 63.86) to 65.38% (95% CI 64.29, 66.48).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (78.26% (95% CI 76.96, 79.57) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to August.
- Seroprevalence rates increased in September compared to August in all provinces, however the increase was not statistically significant in Newfoundland and Prince Edward Island.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (70.14% (95% CI 68.97, 71.31)) compared to White donors (61.75% (95% CI 61.13, 62.37)).

# August 2022

**August 1 - August 31 2022 (n=35,165)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration.
- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in August was 58.54% (95% CI 58.02, 59.06), higher than in July (54.01% (95% CI 53.45, 54.56)), $P < 0.0001$). There was a modest week-to-week change over August from 56.80% (95% CI 55.64, 57.96) to 58.29% (95% CI 57.30, 59.27) to 58.59% (95% CI 57.59, 59.59) to 59.87% (95% CI 58.89, 60.86).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (74.98% (95% CI 73.68, 76.28) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to July.
- Seroprevalence rates increased in August compared to July in all provinces, however the increase was not statistically significant in Saskatchewan and Prince Edward Island.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (67.44% (95% CI 66.30, 68.58)) compared to White donors (56.62% (95% CI 56.02, 57.23)).

# July 2022

**July 1 - July 31 2022 (n=31,275)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. A slight increase in concentration in those over 60 was observed in May and June, consistent with a fourth dose, however this increase levelled off in July.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in July was 54.01% (95% CI 53.45, 54.56), higher than in June (50.7% (95% CI 50.15, 51.26)) $P < 0.0001$). There was a modest week-to-week change over July from 52.32% (95% CI 51.22, 53.42) to 52.70% (95% CI 51.62, 53.77) to 54.68% (95% CI 53.61, 55.74) to 56.51% (95% CI 55.35, 57.67).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (71.15% (95% CI 69.71, 72.59) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to June.
- Seroprevalence rates increased in July compared to June in all provinces except PEI, however the increase was only statistically significant in British Columbia, Ontario, New Brunswick and Newfoundland.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (62.27% (95% CI 61.03, 63.51)) compared to White donors (52.01% (95% CI 51.37, 52.06)).

## June 2022

**June 1 - June 30 2022 (n=32,121)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. An increase in concentration in those over 60 is observed in May and contunued into June consistent with a fourth dose.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in June was 50.7% (95% CI 50.15, 51.26), higher than in May 2022 (46.32% (95% CI 45.77, 46.87) $P < 0.0001$). There was minimal week-to-week change over June from 50.47% (95% CI 49.32, 51.63) to 51.07% (95% CI 50.04, 52.10) to 50.26% (95% CI 49.25, 51.27) to 50.76% (95% CI 49.58, 51.94).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (66.29% (95% CI 64.81, 67.77) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to May.
- Seroprevalence rates increased in June compared to May in all provinces.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (58.03% (95% CI 56.79, 59.27)) compared to White donors (49.01% (95% CI 48.38, 49.65)).

## May 2022

**May 1 - May 31 2022 (n=31,764)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 100.00% (95% CI 100.00, 100.00%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration. An increase in concentration in those over 60 is observed in May.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in May 2022 was 46.32% (95% CI 45.77, 46.87), higher than April 2022 (36.71% (95% CI 36.16, 37.26), $P < 0.0001$). There was a gradual increase over May from 42.74% (95% CI 41.65, 43.84) to 46.11% (95% CI 45.00, 47.21) to 47.03% (95% CI 45.96, 48.10) to 48.96% (95% CI 47.87, 50.06) with the persistence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (64.47% (95% CI 62.96, 65.98) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to April.
- Seroprevalence rates increased in May compared to April in all provinces except PEI.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (54.35% (95% CI 53.12, 55.58)) compared to White donors (44.31% (95% CI 43.67, 44.95)).
- Among repeat tested donors, new infections in unvaccinated donors have increased from June 2021 1.53% (95% CI 1.14, 2.00) to 9.12% (95% CI 8.24, 10.07) in January 2022 and 46.83% ( 95% CI 44.57, 49.10) in May 2022
- Potential breakthrough infections remained low from June 2021 to December 2021, but increased from 5.19% (95% CI 4.68, 5.74) in January 2022 to 31.02% (95% CI 30.17, 31.88) in May 2022.

# April 2022

**April 1 - April 30 2022 (n=29,787)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 99.74% (95% CI 99.60, 99.88%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September 2021, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February 2022 likely due to third vaccine dose administration, but are now declining.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in April 2022 was 36.71% (95% CI 36.16, 37.26), higher than March 2022 (28.70% (95% CI 28.15, 29.26), $P < 0.0001$). There was a gradual increase over April from 32.83% (95% CI 31.67, 33.98) to 35.54% (95% CI 34.47, 36.60) to 37.64% (95% CI 36.62, 38.65) to 40.04% (95% CI 38.90, 41.18) with the persistence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (55.37% (95% CI 53.76, 56.99) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to March.
- Seroprevalence rates increased in April compared to March in all provinces.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (45.06% (95% CI 43.77, 46.34)) compared to White donors (34.78% (95% CI 34.15, 35.42)).
- Among repeat tested donors, new infections in unvaccinated donors have increased from June 2021 1.53% (95% CI 1.14, 2.00) to 9.12% (95% CI 8.24, 10.07) in January 2022 and 37.19% ( 95% CI 35.14, 39.28) in April 2022
- Potential breakthrough infections remained low from June 2021 to December 2021, but increased from 5.19% (95% CI 4.68, 5.74) in January 2022 to 21.99 (95% CI 21.19. 22.80) in April 2022.

## March 2022

### March 1 - March 31 2022 (n=26,026)

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 99.57% (95% CI 99.42, 99.73%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February likely due to third vaccine dose administration, but were starting to decline in March.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in March 2022 was 28.70% (95% CI 28.15, 29.25), higher than February 2022 (23.68% (95% CI 23.18, 24.18).($P < 0.0001$). There was a gradual increase over the 31 day reporting period from 27.02% (95% CI 25.95, 28.09) to 27.54% (95% CI 26.47, 28.61) to 30.68% (95% CI 29.61, 31.75) to 29.52% (95% CI 28.34, 30.69) consistent with the persistence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (44.27% (95% CI 42.54, 46.01) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to February.
- Seroprevalence rates increased in March compared to February in all provinces with the exception of Prince Edward Island and Newfoundland and Labrador where sample sizes are smaller.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (38.58% (95% CI 37.21, 39.95)) compared to White donors (26.27% (95% CI 25.65, 26.89)).
- Among repeat tested donors, new infections in unvaccinated donors have increased from June 1.53% (95% CI 1.14, 2.00) to 9.12% (95% CI 8.24, 10.07) in January and 29.49% ( 95% CI 27.57, 31.48) in March
- Potential breakthrough infections remained low from June to December, but increased from 5.19% (95% CI 4.68, 5.74) in January to 17.50 (95% CI 16.66, 18.37) in March.

## February 2022

**February 1 - February 28 2022 (n=28,616)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 99.60% (95% CI 99.45, 99.75%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by February likely due to third vaccine dose administration.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in February 2022 was 23.68% (95% CI 23.18, 24.18), higher than January 2022 (12.12% (95% CI 11.76, 12.48).($P < 0.0001$). There was a gradual increase over the 28 day reporting period from 21.39% (20.31, 22.48) to 23.43% (22.41, 24.45) to 23.68% (22.77, 24.58) to 25.25% (95% CI 24.30, 26.20) consistent with emergence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (36.27% (95% CI 34.68, 37.86%)) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to January.
- Seroprevalence rates increased in February compared to January in all provinces.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (33.45% (95% CI 32.16, 34.73)) compared to White donors (21.17% (95% CI 20.62, 21.72%)).
- Among repeat tested donors, new infections in unvaccinated donors have increased from June 1.53% (1.14, 2.00) to 9.12% (95% CI 8.24, 10.07) in January, and more than doubled in February (23.71%, 95% CI 22.10, 25.37).
- Potential breakthrough infections remained low from June to December, but increased from 5.19% (95% C I4.68, 5.74) in January to 15.56% (95% CI 14.72, 16.42) in February.

# January 2022

## January 1 - January 31 2022 (n=32,505)

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was 98.89% (95% CI 98.73, 99.06%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September, but gradually decreased. A peak in values followed by decline is expected after vaccination. Concentrations increased in all age groups by January likely due to third vaccine dose administration.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in January 2022 was 12.12% (95% CI 11.76, 12.48), higher than December 2021 at 6.39% (95% CI 6.01, 6.76) ($P < 0.001$). There was a gradual increase over the 31 day reporting period from 7.16% (6.62, 7.71) to 10.09% (9.46, 10.71) to 12.65% (11.84, 13.45) to 16.30% (95% CI 15.51, 17.09) consistent with emergence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (22.22% (95% CI 20.93, 23.51%)) compared to other age groups. However, the seroprevalence rate increased in all age groups compared to December.
- Seroprevalence rates increased in January compared to December in almost all provinces.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (18.29% (95% CI 17.27, 19.32)) compared to White donors (10.73% (95% CI 10.34, 11.12%)).
- Among repeat tested donors, new infections in unvaccinated donors have increased from June 1.53% (1.14, 2.00) to 3.91% (3.11, 4.83%) in December and more than doubled in January to 9.012% (95% CI 8.24, 10.07).
- Potential breakthrough infections remained low from June to December, but increased from 0.74% (95% CI 0.48, 1.10) in December to 5.19% (95% CI 4.68, 5.74) in January.

## December 2021

### December 14 - December 30 2021 (n=16,816)

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 98.58% (95% CI 98.34, 98.82%) (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were high by September, but gradually decreased. A peak in values followed by decline is expected after vaccination. By December, concentrations increased in older age groups likely due to administration of third doses consistent with policies to vaccinate older age groups earlier.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in December was 6.39% (95% CI 6.01, 6.76), higher than November at 5.08% (95% CI 4.58, 5.50) ($P < 0.001$). There was a gradual increase over the 17 day reporting period from 5.60% (5.03, 6.18) to 6.55% (5.95, 7.15) to 7.51% (6.63, 8.39) consistent with emergence of the Omicron variant.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (11.37% (95% CI 9.99, 12.75%)) compared to other age groups.
- Seroprevalence rates remained similar to November in most provinces, however, rates increased in December in Alberta (12.94% (95% CI 11.62, 14.27%), $P < 0.001$) and Ontario (5.43% (95% CI 4.94, 5.92%), $P < 0.001$) compared to November.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (10.40% (95% CI 9.32, 11.48%)) compared to White donors (5.21% (95% CI 4.81, 5.61%)).
- Among repeat tested donors, new infections in unvaccinated donors have increased since June 1.53% (1.14, 2.00) to 3.91% (3.11, 4.83%) in December but vaccine breakthrough infections are low, 0.74% (0.48, 1.10%).

# November 2021

## November 13 - November 24 2021 (n=9,018)

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The (adjusted) proportion of blood donors with humoral immunity for SARS-CoV-2 was was 98.52% (95% CI 98.18, 98.86%), slightly higher than October (based on results from the Spike antibody assay*)(P* = 0.039). This was predominantly driven by vaccination.
- Spike antibody concentrations were very high (>2500 U/mL) by July, but gradually decreasing in almost all age groups as the months progress with the greatest decrease in older age groups. A peak in values followed by decline is expected after vaccination. These results are consistent with policies to vaccinate older age groups earlier.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in November was 5.08% (95% CI 4.58, 5.50), higher than October at 4.26% (95% CI 3.85, 4.68%) *(P* = 0.014).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (9.35% (95% CI 7.62, 11.07%)) compared to other age groups.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (8.28% (95% CI 6.82, 9.74%)) compared to White donors (4.56% (95% CI 4.05, 5.07%)).
- Among repeat tested donors, new infections in unvaccinated donors have increased since June 1.53% (1.14, 2.00) to 3.19% (2.42, 4.13) in November but vaccine breakthrough infections are low, 0.6% (0.37, 0.93).

## October 2021

**October 14 - October 23 2021 (n=9,627)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 98.01% (95% CI 97.65, 98.36%), slightly higher than September (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were very high (>2500 AU/mL) by July, but began to decrease in older individuals by September. In October values are still very high but gradually decreasing in all age groups. A peak in values followed by decline is expected after vaccination. These results are consistent with policies to vaccinate older age groups earlier.
- Similar to past reports, donors living in affluent neighbourhoods had higher seroprevalence rates, 99.25% (95% CI 98.72, 99.79%) compared to those living in the most materially deprived neighbourhoods, 97.13% (95% CI 95.64, 98.61%).
- Of 25,100 donors tested on 2 or more occasions since January 2021, the most common (55.2%) test profile was presumed unvaccinated to vaccinated (N negative S negative on their first tested donation and N negative S positive on their last tested donation). There were 15 presumed breakthrough infections (donors who were N negative S positive on their first tested donation and N positive S positive on their last tested donation).

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in October was 4.26% (95% CI 3.85, 4.68%) similar to September, 2021 at 4.38% (95% CI 3.96, 4.81%).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (7.50% (95% CI 5.98, 9.01%) compared to other age groups.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (6.18% (95% CI 4.92, 7.45%)) compared to White donors (3.85% (95% CI 3.40, 4.31%)).

## September 2021

**September 14 - September 24 2021 (n=9,363)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 97.03% (95% CI 96.62, 97.44%), slightly higher than August (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Spike antibody concentrations were very high (>2500 AU/mL) by July, but are beginning to decrease in older individuals by September. A peak in values followed by decline is expected after vaccination. These results are consistent with policies to vaccinate older age groups earlier.
- Similar to past reports, donors living in affluent neighbourhoods had higher seroprevalence rates, 97.56% (95% CI 96.83, 98.28%) compared to those living in the most materially deprived neighbourhoods, 94.72% (95% CI 92.93, 96.51%).
- Of 21,727 donors tested on 2 or more occasions since January 2021, the most common (54.0%) test profile was presumed unvaccinated to vaccinated (N negative S negative on their first tested donation and N negative S positive on their last tested donation). There were 12 presumed breakthrough infections (donors who were N negative S positive on their first tested donation and N positive S positive on their last tested donation).

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in September was 4.38% (95% CI 3.96, 4.81%) similar to August, 2021 at 4.43% (95% CI 3.99, 4.86%).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (8.70% (95% CI 7.06, 10.34%) compared to other age groups. Rates in the 60+ age group increased significantly in September (2.78% (95% CI 2.13, 3.43%)) compared to August (1.61% (95% CI 1.09, 2.12%)) while other age groups did not change.
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (7.61% (95% CI 6.24, 8.97%)) compared to White donors (3.65% (95% CI 3.20, 4.10%)).

## August 2021

**August 15 - August 26 2021 (n=9,109)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 96.09% (95% CI 95.63, 96.54) slightly up from July (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Median spike antibody concentrations increased in July compared to previous months ($P < 0.001$) but increased even further in August ($P < 0.001$).
- Similar to past reports, donors living in affluent neighbourhoods had higher seroprevalence rates, 98.25% (95% CI 97.56, 98.95%) compared to those living in the most materially deprived neighbourhoods, 93.41% (95% CI 91.45, 95.37%).
- Of 17,762 donors tested on 2 or more occasions since January 2021, the most common (52.9%) test profile was presumed unvaccinated to vaccinated (N negative S negative on their first tested donation and N negative S positive on their last tested donation). There were 11 presumed breakthrough infections (donors who were N negative S positive on their first tested donation and N positive S positive on their last tested donation).

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in August was 4.43% (95% CI 3.99, 4.86%) similar to July, 2021 at 4.08% (95% CI 3.65, 4.51%).
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (8.44% (95% CI 6.80, 10.09%) compared to other age groups. Rates in this age group were highest in Manitoba at 24.95% (95% CI 13.53, 36.37%).
- Black, Indigenous and Racialized groups have a higher seroprevalence rate (11.14% (95% CI 9.14, 13.15%)) compared to White donors (3.30% (95% CI 2.86, 3.74%)). Natural infection rates in Black, Indigenous and Racialized donors also increased significantly compared to July. Compared to previous reports, the gap between those in materially deprived vs. affluent neighbourhoods has begun to widen likely due to the 4th wave, 7.85% (95% CI 5.87, 9.83%) vs 3.27% (95% CI 2.52, 4.02%).

## July 2021

**July 14 - July 23 2021 (n=8,457)**

- **Humoral Immunity (Based on results from the Spike antibody assay):**
- Spike antibody results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Nucleocapsid and Spike antibody positive results together likely have been infected and may or may not have been vaccinated.
- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 94.69% (95% CI 94.16, 95.22) a significant increase from June (based on results from the Spike antibody assay). This was predominantly driven by vaccination.
- Median Spike antibody concentrations increased in June compared to previous months ($P < 0.001$) but increased more in July ($P < 0.001$).
- The seroprevalence of White donors (95.04% (95% CI 94.44, 95.64%) was not different from Black, Indigenous and Racialized groups (93.82% (95% CI 92.48, 95.15%)), this gap has closed compared to earlier surveys. Similar to past reports, donors living in affluent neighbourhoods had higher seroprevalence rates, 96.72% (95% CI 95.82, 97.61%) compared to those living in the most materially deprived neighbourhoods, 92.94% (95% CI 90.89, 95.00%).
- Of 14, 201 donors tested on 2 or more occasions since January 2021 the most common (51.2%) test profile was N negative S negative on their first tested donation and N negative S positive on their last tested donation, most likely due to vaccination. There were 5 donors who were N negative S positive on their first tested donation and N positive S positive on their last tested donation, potentially breakthrough infections.

- **Natural Infections (Based on results from the Nucleocapsid antibody assay):**
- Seroprevalence (natural infection) in July was 4.08% (95% CI 3.65, 4.51%), decreased from June, 2021.
- Natural seroprevalence in most provinces except Alberta plateaued, likely due to widescale vaccination and social restrictions.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (6.71% (95% CI 5.17, 8.25%)) compared to other age groups, however, this number has decreased since June, 2021.
- Rates in this age group were highest in Alberta at 11.88% (95% CI 6.80, 16.97%) and British Columbia at 9.91% (95% CI 5.44, 14.37%). Since June, 2021 these rates have decreased or stayed very similar in almost every province with the exception of British Columbia where they have increased.
- Black, Indigneous and Racialized groups had a higher seroprevalence rate (7.29% (95% CI 5.95, 8.63%)) compared to White donors (3.33% (95% CI 2.87, 3.78%)). Compared to previous reports, the gap between those in materially deprived vs. affluent neighbourhoods is closing, 4.62% (95% CI 3.03, 6.22%) vs 3.87% (95% CI 3.02, 4.71%). However, those living in more socially deprived settings (had lower social contact) had lower seroprevalence rates compared to those that were least deprived, 3.35% (95% CI 2.39, 4.30%) vs. 5.63% (95% CI 4.47, 6.80%).

## June 2021

**June 14 - June 29 2021 (n=16,884)**

- **Humoral Immunity (Based on results from the Roche S assay):**
- Roche S results indicate a SARS-CoV-2 humoral response to vaccination or natural infection. Because people are advised to be vaccinated irrespective of past infection, those with Roche N and S positive results together likely have been infected and may or may not have been vaccinated.
- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 90.78% (95% CI 90.32, 91.25) a significant increase from May (based on results from the Roche S assay). This was predominantly driven by vaccination.
- The proportion of blood donors with presumed vaccine-induced humoral immunity to SARS-CoV-2 was 86.05% (95% CI 85.50, 86.59%), a significant increase from May (based on results from the Roche S-only assay).
- White donors did not have different seroprevalence rates (Roche S, primarily vaccine-induced) (90.81% (95% CI 90.25, 91.35%) compared to Black, Indigenous and Racialized groups (91.37% (95% CI 90.27, 92.47%)), this gap has closed compared to previous surveys. However, White donors had higher seroprevalence rates (Roche S-only, presumed vaccine induced) (86.87% (95% CI 86.26, 87.49%)), compared to Black, Indigenous and Racialized groups (83.14% (95% CI 81.72, 84.56%)) with a decreased difference between these two groups compared to May. Similarly, donors living in affluent neighbourhoods had higher seroprevalence rates (Roche S, primarily vaccine-induced), 93.68% (95% CI 92.90, 94.46%) compared to those living in the most materially deprived neighbourhoods, 88.33% (95% CI 86.60, 90.06%).

- **Natural Infections (Based on results from the Roche N assay):**
- Seroprevalence (natural infection) in June was 4.5% (95% CI 4.19, 4.83%), increased from May, 2021.
- Natural infections in most provinces except Alberta plateaued, likely due to widescale vaccination.
- Consistent with previous surveys, donors aged 17-24 years old had the highest seroprevalence rate (9.3% (95% CI 8.04, 10.57%)) compared to other age groups.
- Rates in this age group were highest in Alberta at 17.53% (95% CI 13.23, 21.82%), Saskatchewan at 14.26% (95% CI 6.66, 21.87%), and Manitoba at 15.56% (95% CI 8.46, 22.65%).
- Black, Indigenous and Racialized groups had a higher seroprevalence rate (7.95% (95% CI 6.95, 8.95%)) compared to White donors (3.72% (95% CI 3.38, 4.06%)). Those living in materially deprived vs. affluent neighbourhoods had a higher rate of natural infections, 6.95% (95% CI 5.62, 8.27%) vs 4.26% (95% CI 3.66, 4.87%).

## May 2021

**May 22 -June 4 2021 (n=17,001)**

- The proportion of blood donors with humoral immunity for SARS-CoV-2 was 63.9% (95% CI 63.2, 64.6) a significant increase from April (based on results from the Roche S assay). This was predominantly driven by vaccination.

- **Vaccine-Induced Humoral Immunity (Reactive to Roche S-only):**
- The proportion of blood donors with vaccine-induced humoral immunity to SARS-CoV-2 was 59.8% (95% 59.1, 60.6), a significant increase from April.
- White donors had higher seroprevalence rates (vaccine-induced) (61.8% (95% CI 60.9, 62.7) compared to Black, Indigenous and Racialized groups (48.9% (95% CI 47.1, 50.7%). Similarly, donors living in affluent neighbourhoods also had higher seroprevalence rates 64.8% (95% CI 63.4, 66.2%) compared to those living in the most materially deprived neighbourhoods, 56.6% (95% CI 54.0, 59.1%).

- **Natural Infections (Based on results from the Roche N assay):**
- Seroprevalence (natural infection) in May was 4.0% (95% CI 3.7, 4.3), increased from April, 2021.
- Natural infections in most provinces except Ontario and Alberta plateaued, likely due to widescale vaccination.
- Consistent with previous surveys donors aged 17-24 years old had the highest seroprevalence rate (7.0% (95% CI 5.9, 8.1)) compared to other age groups.
- Rates in this age group were highest in Alberta 12.7% (95% CI 9.0, 16.4) and Manitoba 11.3% (95% CI 5.2, 17.4).
- Black, Indigenous and Racialized groups had a higher seroprevalence rate (7.4% (95% CI 6.5, 8.3)) compared to White donors (3.3% (95% CI 2.9, 3.6)). Those living in materially deprived vs. affluent neighbourhoods had a higher rate of natural infections 5.7% (95% CI 4.5, 6.8) vs 3.1% (95% CI 2.6, 3.6).

# April 2021

## April 13-April 30 2021 (n=16,931)

- The proportion of blood donors with humoral immunity to SARS-CoV-2 was 26.9% (95% CI 26.2, 27.6) a significant increase from March (based on results from the Roche S assay). This was predominantly driven by vaccination.
- **Vaccine-Induced Humoral Immunity (Reactive to Roche S-only):**
- The proportion of blood donors with vaccine-induced humoral immunity to SARS-CoV-2 was 23.6% (95% 23.0, 24.3), a significant increase from March.
- Vaccine inequity emerged in April 2021.
- White donors had higher seroprevalence rates (vaccine-induced) (25.0% (95% CI 24.3, 25.8) compared to Black, Indigenous and Racialized groups (17.9% (95% CI 16.5, 19.3%). Similarly, donors living in affluent neighbourhoods also had higher seroprevalence rates 26.9% (95% CI 25.6, 28.2%) compared to those living in the most materially deprived neighbourhoods, 20.9% (95% CI 18.8, 23.0%).

- **Natural Infections (Based on results from the Roche N assay):**
- Seroprevalence (natural infection) in April was 3.2% (95% CI 3.0, 3.5), similar to March 2021.
- Natural infections in most provinces except Ontario decreased or plateaued, likely due to widescale vaccination.
- Consistent with previous surveys donors aged 17-24 years old had the highest seroprevalence rate (5.4% (95% CI 4.4, 6.3)) compared to other age groups.
- Rates in this age group were significantly higher in Alberta 8.9% (95% CI 5.7, 12.0) and Manitoba 15.0% (95% CI 7.9, 22.0) compared to the full sample.
- Black, Indigenous and Racialized groups had a higher seroprevalence rate (5.3% (95% CI 4.4, 6.1)) compared to White donors (2.8 (95% CI 2.5, 3.1)). Those living in materially deprived vs. affluent neighbourhoods had a higher rate of natural infections 4.6% (95% CI 3.5, 5.7) vs 2.7% (95% CI 2.2, 3.2).

## March 2021

**February 27-March 13, 2021 (n=16,873)**

- Serological testing using the Roche nucleocapsid (N) and the Roche spike (S) total antibody assays allows us to monitor trends in natural infection transmission and vaccine-induced seropositivity.
- Overall, as of March 2021 adjusted seroprevalence by the Roche S assay (proxy for humoral immunity, vaccine or natural infection immunity) was 9.9% (95% CI 9.4, 10.3). The fraction of the population naturally exposed as opposed to developing immunity post-vaccination varied across Canada.
- Adjusted seroprevalence by the Roche S assay alone (N negative, proxy for vaccine-induced immunity) was 6.8% (95% 6.4, 7.16) a significant increase from January.
- Using self-reported vaccine history the Roche S assay alone had a sensitivity of 96.1% to identify vaccination (after 2 weeks)
- Despite broader access to COVID-19 vaccines, seroprevalence by the Roche N assay (proxy for natural infections) continued to increase from January (2.2% (95% 2.1, 2.4) to March (3.3% (95% CI 3.0, 3.5))
- Consistent with previous surveys, donors aged 17-24 years old demonstrated the highest seroprevalence rate (natural infection immunity) 6.37% (5.31, 7.44) compared to other age groups. Rates in this age group were significantly higher in Alberta 14.7% (95% CI 10.8, 18.6) and Manitoba 20.8% (95% CI 12.3, 28.0) than for the full sample.
- The disparities in natural infection immunity seroprevalence rates between Black, Indigenous and Racialized groups and White donors and those living in materially deprived vs. affluent neighbourhoods narrowed for the first time since November 2020 when disparities began to widen.

## January 2021 (Roche)

**January 1-27, 2021 (n=33,400 Roche)**

- In order to evaluate seroprevalence in the vaccine era, residual blood is now tested using the Roche Elecsys ® Anti-SARS-CoV-2 Spike (S) (semi-quantitative) and N (qualitative) assays. All vaccines will produce antibodies to S but not N, and natural infection will usually produce antibodies to S and N.
- In January 2021, seroprevalence estimates were higher by the Roche S assay (2.78% (95% CI 2.58, 2.97%) compared to either nucleocapsid assays. Seroprevalance by the Roche N assay was 2.24% (95% CI 2.08, 2.41) comparable to the Abbott N (1.99% (95% CI 1.84, 2.15).
- **New:** 511 (1.5%) of donors self-reported vaccination against COVID-19 in the last 3 months in January 2021.

## January 2021

**January 1-27, 2021 (n=34,921)**

- Seroprevalence in January was 1.99% (95% CI 1.84, 2.15)
- Across Canada seroprevalence remained the highest in Manitoba (3.92% (95% CI 2.92, 4.93)) and lowest in PEI (0%)
- Seroprevalence increased significantly in Ontario (1.16% vs 1.82%) and in Alberta (2.12% to 3.41%) from December 2020 until January 2021
- Consistent with previous surveys, donors aged 17-24 years old the highest seroprevalence rate (3.45% (95% CI 2.87, 4.02).
- Disparities by socioeconomic status and Black, Indigenous and Racialized groups widened. Donors living in the most materially deprived neighbourhoods were nearly 4-times more likely to be positive than those living in affluent neighbourhoods (4.04% compared with 1.17%) . Black, Indigenous and Racialized groups of donors were two time more likely to be positive than self identified White donors (3.37% compared to 1.66%)
- Detailed comparison with the previous survey (December 2020) is included.

## December 2020

**December 10-23, 2020 (n=16,961)**

- Seroprevalence in December was 1.37% (95% CI 1.18, 1.56)
- Regional variation: Across Canada seroprevalence remained the highest in Manitoba (3.02% (95% CI 1.75, 4.29) however this was a significant decrease from the last report.
- Donors aged 17-24 years old remained the age group with the highest seroprevalence (2.75% (95% CI 2.01, 3.49)
- Disparities by socioeconomic status widened, donors living in the most materially deprived neighbourhoods were 3-times more likely to be positive than those living in affluent neighbourhoods (2.2% compared with 0.72%)
- **New:** Longitudinal data on repeat donors illustrating waning S/co ratios over time

## November 2020

**November 7-25, 2020 (n=17,049)**

- Seroprevalence in November was 1.51% (95% CI 1.31, 1.71)
- Regional variation: Seroprevalence increased mostly in Western Canada. Highest rates were observed in the Prairies; Manitoba's rate increased to 8.56% (95% CI 6.51, 10.62) and Saskatchewan's rate increased to 4.2% (95% CI 2.3, 5.8). There was a slight decrease in Ontario to 0.77% (95% CI 0.56, 0.97%) and PEI remained at 0.
- Donors aged 17-24 years old had the highest seroprevalence rates 2.97% (95% CI 2.20, 3.37%) while donors 40-59 years old 1.09% (95% CI 0.80, 1.38%) had the lowest rates.
- New: Revised time series (Additional data from the correlates of immunity study from April until Aug 31, 2020 are included in this report)
- Comparison of Wave 1 (May-July) to November 2020

## October 2020

**October 12-31, 2020 (n=16,811)**

- Seroprevalence increased significantly in October to 0.88% (95% CI 0.73, 1.04) (p=0.04).
- Regional variation: Manitoba's seroprevalence rate increased to 2.96% (95% CI 1.70, 4.23), the highest in Canada. Ontario remained stable at 0.87% (0.65, 1.08)
- New: Heat maps to illustrate inter-provincial variation (by economic regions)
- Disparities widen: Donors that self-identified as White (0.75%; 95% CI 0.61, 0.92) had significantly lower seroprevalence compared to Black, Indigenous and Racialized groups (1.82%; 95% CI 1.21, 2.62)

## Wave 1

**May 9, 2020- July 21, 2020 (n=74,642)**

- Seroprevalence was estimated at 0.70% (95% CI 0.63, 0.77)
- Regional variation: Ontario, 0.88% (95% CI 0.78, 0.99) had the highest seroprevalence, very low seroprevalence in Atlantic provinces.
- Disparities: Donors that self-identified as White (0.66%; 95% CI 0.59, 0.74) had lower seroprevalence compared to Black, Indigenous and Racialized groups (1.09%; 95% CI 0.84, 1.34)

## Introduction

SARS-CoV-2 is responsible for the respiratory illness, coronavirus infection disease 2019 (COVID-19). Some people become extremely ill and can die from complications, while others experience mild symptoms or may not be aware of their infection at all. Early in the pandemic (by late March 2020) strict physical distancing measures were implemented. As a result, the first wave of the epidemic in Canada peaked by the end of April 2020 and plateaued during the summer. A resurgence of cases began in late September 2020, peaking in January 2021 (the second wave) which was followed by additional waves. As of April 1, 2023, 4,641,876 cases of COVID-19 had been reported in Canada.

Beginning in January 2021, Alpha (B.1.1.7) began to establish itself as the primary variant of concern (VOC). In late June 2021, Delta (B.1.617.2) was transitioning to be the primary VOC. In mid-December 2021, a new more contagious VOC, Omicron (B.1.1.529) began to establish itself as a primary VOC followed by subvariants. At the end of March, 2023 variant XBB 1.5 made up approximately half of cases in Canada. Peak timepoints when each VOC became dominant varied between provinces. By late December 2021 public health testing facilities were overwhelmed by a surge in Omicron variant cases. Omicron infections tended to have milder symptoms and in many jurisdictions testing was increasingly focused on high risk individuals. Because many people with symptoms were not being tested, as well as those infected but without symptoms, the reported cases underestimate the infection rate. Many regions relaxed public health restrictions by 2022. Surveillance studies that monitor SARS-CoV-2 antibodies are important to understand what proportion of the population have detectable antibodies (the seroprevalence) and to monitor trajectories over the course of the pandemic. These data improve mathematical models to predict the course of infection and inform public health policies.

Antibody concentrations typically peak within a month of vaccination and then gradually decrease. Antibody concentrations can be much higher after a subsequent dose of vaccine, or when an infection occurs pre- or post-vaccination. More than 89% of the people in Canada aged 18 and older had received a primary vaccine series as of March 26, 2023. Starting in November 2021, some Canadians became eligible for a third dose. A fourth dose was encouraged in risk groups and older individuals and bi-valent vaccines became widely available in August 2022. By fall of 2022 the additional dose was encouraged for all age groups.  Monitoring spike (vaccine) antibody concentrations and the proportion of people with Omicron variant infection provides data for mathematical models to estimate the status of humoral immunity.

In partnership with the COVID-19 Immunity Task Force, Canadian Blood Services is testing residual blood for SARS-CoV-2 antibodies from blood donors. This report tracks SARS-CoV-2 seroprevalence distinguishing natural and vaccine induced humoral immunity. We present seroprevalence rates based on two Roche total Ig- assays that detect Spike (S) and Nucleocapsid (N) antibodies and monitor the concentration of S antibodies. We assess temporal changes and evaluate differences by geographical regions, age groups, Black, Indigenous and Racialized groups, and socioeconomic status.

# Methods

### Population

Canadian Blood Services has blood collection sites in all large cities and many smaller urban centres in all provinces except Quebec. People in rural areas may have less opportunity to donate and donations are not collected in the northern territories. Blood donors are reasonably representative of healthy Canadians between the ages of 17 and about 60.

### Blood donor eligibility

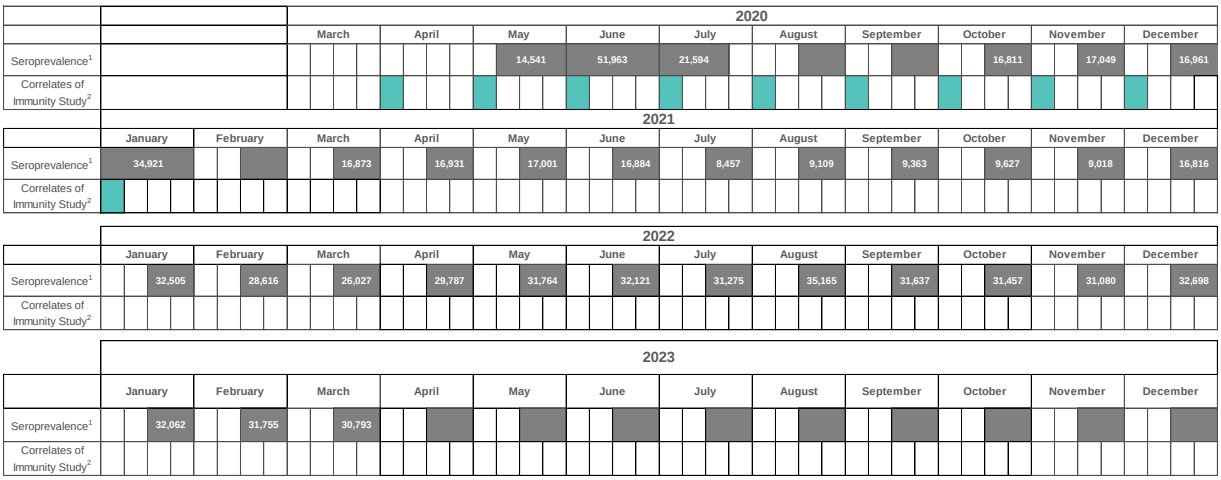
Before each donation, blood donors must answer screening questions to ensure that they are in good health and do not have risk factors for infections that may be transmitted to blood recipients. There is no evidence that SARS-CoV-2 can be transmitted through blood transfusion, but it is important to ensure other donors and staff are safe while in the blood clinic. Donors are asked if they have had COVID-19 or been in contact with someone who has. Donors are deferred for 2 weeks after symptoms disappear (3 weeks if hospitalized) if they have been in contact with someone who was infected or if they have had the infection. Donors also have their temperature and their hemoglobin level checked before they can donate.

### Blood samples

Just before a donor gives their blood donation, several small tubes of blood are collected for infectious disease screening. An extra sample is taken, known as the retention sample, in case extra testing is required (80% of these retention samples are not needed for operational testing). For this study retention samples were aliquoted and frozen at -20$^{o}$C or colder, starting on May 9, 2020.

### Periodicity

All retention samples were tested for SARS-CoV-2 antibodies until July 21, 2020 (Wave 1). From August 2020 until December 2020, only samples from approximately the last two weeks of each month were tested (except samples from August and September which were not tested). In January 2021 a larger sample was tested and in February 2021 samples were not tested. As of March 2021, testing of approximately 2 weeks per month resumed. Beginning in July 2021 the sample size was reduced to include about 300 samples per age/region grouping plus extra repeat tested donors. In December 2021 samples from 2 weeks were tested without sorting in order to be able to report more quickly, and as of January 2022 samples from all weeks of the month were tested. Seroprevalence estimates also include an additional 1,500 residual blood tests from the correlates of immunity study from April 2020 to January 2021. These were tested on a battery of assays (orthogonal testing) including the Abbott IgG Assay.




[1] Samples tested with the **Abbott SARS-CoV-2 IgG Assay until January 2021** (residual blood from August 2020, September 2020 and February 2021 are aliquoted but have not been tested). As of January 2021, all samples were tested using the Roche Elecsys ® Anti-SARS-CoV-2 assays (S and N).

[2] Orthogonal Testing (PI: S. Drews (CIHR 2020) sampling 1,500 samples per month until and including January 2021 (Abbott tested); this study is known as the "Correlates of Immunity Study"

## SARS-CoV-2 antibody testing

Two assays were used. The Roche Elecsys ® Anti-SARS-CoV-2 spike semi-quantitative immunoassay detects total antibodies (including IgA, IgM and IgG) to the SARS-CoV-2 spike (S) protein (**Spike antibody**). The Elecsys® Anti-SARS-CoV-2 qualitative immunoassay detects total antibodies (including IgA, IgM and IgG) to SARS-CoV-2 using a recombinant protein, nucleocapsid (N) antigen (**Nucleocapsid antibody).** At a concentration of ≥ 0.8 U/mL, the Spike antibody assay was assumed to have sensitivity of 98.8% and specificity of 99.6%. At a concentration of ≥ 1.0 U/mL, the Nucleocapsid antibody assay was assumed to have sensitivity of 99.5% and specificity of 99.8%[1]. All testing was conducted at Canadian Blood Services laboratories in Ottawa.

Samples from January 2021 to August 2021 were tested neat and at a 1:10 dilution for Spike antibody, however, by June 2021 many samples were above the maximum detection level when diluted. From September 2021 onwards samples were tested up to a 1:400 dilution.

Serological testing using the Nucleocapsid, and Spike antibody assay allows trends in natural infection transmission and vaccine-induced seropositivity to be monitored[2]. In this report the dual terms Spike antibody/ humoral immunity (by vaccine or natural infection) and Nucleocapsid antibody/proxy for natural infection will be used interchangeably. This is to ease interpretation for readers, with the caveat that these interpretations do not reflect the complexity of adaptive immunity.

## Ethical issues

All data were de-identified by the information technology team at Canadian Blood Services by providing a random identification number. Demographic variables and vaccination history were

extracted from the Canadian Blood Services donor database (e.g., donation date, birth year, sex, self-reported ethnicity, Forward Sortation Area of residential postal code) and linked to the test data. In the donor pamphlet “What you must know to donate blood” which donors must read before each donation, and in the pamphlet entitled “What happens to your blood donation?” donors were informed that their blood will be tested for routine infectious disease markers and other tests as required. Information about the study was made available on the website in late June 2020 prior to commencing testing. Donors were not informed of their results because confirmatory/supplemental testing was not carried out. This study was approved by the Canadian Blood Services Research Ethics Board.

### Data management and analysis

De-identified demographic data were analysed by the Canadian Blood Services Epidemiology & Surveillance Department. Socioeconomic status was estimated by quintiles of the Pampalon Material and Social Deprivation Indices (MSDI). MSDI was derived from 2016 Statistics Canada census, aggregated from postal codes to the dissemination area (DA) level (the smallest geographic unit available in the Canadian census, consisting of 400–700 persons). Because blood donors tend to live in areas close to a blood clinic there will be higher concentrations of donors in certain areas compared with the general population, and lower concentrations in other areas. To make inference to the general population, weighting factors were applied based on the donor’s residential Forward Sortation Area (FSA), age group and sex. Data were weighted based on Statistics Canada data (catalogue # 98-400-X2016008). For FSAs with few donors, several FSAs were combined, generally to include at least 500 donors. For data with no FSA recorded or if not in a province where blood is collected (0.2% of samples) weighting was based on FSA of the blood centre.

The seroprevalence was calculated as the number of positive samples divided by all samples tested. Ninety-five percent confidence intervals were calculated based on the Exact method. The adjusted seroprevalence and confidence intervals present the weighted data adjusted for sensitivity and specificity of the assay using the Rogan-Gladen equation[3]. SARS-CoV-2 seroprevalence was stratified by geography (regions, province and selected metropolitan cities), sex, age groups, self-reported ethnicity, and social and material deprivation indices.

Temporal trends by monthly intervals were evaluated by demographic variables. Statistical comparisons between groups were carried out using logistic regression.

## Results

Between March 1 and March 31, 2023 a total of 30,793 unique donors were tested for SARS-CoV-2 antibodies.

Table 1 compares adjusted seroprevalence rates by different assays (**Nucleocapsid and Spike antibody)** by sociodemographic variables for all Canadian provinces (except Quebec and territories). Overall adjusted seroprevalence by Spike antibody (a proxy of humoral immunity) was 100.00% (95% CI 100.00, 100.00%). The adjusted seroprevalence by Nucleocapsid antibody (proxy for natural infection) was 78.67% (95% CI 78.21, 79.13) (please refer to points

of interpretation). There was week-to-week variability over the 31-day reporting period from 77.97% (95% CI 76.89, 79.04) to 78.41% (95% CI 77.49, 79.32) to 79.41% (95% CI 78.42, 80.40) to 78.71% (95% CI 77.92, 79.50) (Table A2.1).

Figure 1 illustrates temporal trends of SARS-CoV-2 seroprevalence from April 4, 2020, until March 31, 2023, by monthly intervals. The discontinuation of the line in January 2021 represents the transition from the Abbott assay to the Roche assay. The largest increase in seroprevalence was seen in the Roche S assay, from early-March 2021 to July 2021, mirroring wider first and second dose vaccine roll out. Figure 2 stratifies seroprevalence by regions. Much of the humoral immunity was induced by vaccines (compared to natural infections) across the country. The largest increase in seroprevalence using Roche N began in February 2022 and increased consistent with the Omicron variant wave. Appendix Tables A1.1-A1.6 compare seroprevalence rates by sex, age groups and material deprivation in different regions.

Table 2 compares temporal changes in seroprevalence rates by natural infection (**Nucleocapsid antibody** between January 2022 and March 2023. Overall, the seroprevalence rate for natural infections was higher in March (78.67 (95% CI 78.21, 79.13) compared to February (77.59 (95% CI 77.13, 78.06).Donors aged 17-24 years old continued to have the highest seroprevalence rate at 89.17% (95% CI 88.17, 90.18) compared to other age groups.

After vaccination an increase in antibody concentration followed by gradual decline is expected. From September 2021 to March 2023 dilution of high concentration spike antibody samples permitted measurement of antibody concentrations as high as 100,000 U/mL. Figure 3 illustrates distributions of log transformed Spike antibody concentrations from September 2021 to February 2023, stratified by donors seropositive for Spike antibodies only and donors seropositive for Spike antibodies and Nucleocapsid antibodies. Donors with both Spike and Nucleocapsid antibodies tended to have higher concentrations of Spike antibodies than those with only Spike antibodies.

Figure 4 shows regional weekly trends since December 2021 for Nucleocapsid by age group. Figures 5A-H illustrate temporal trends of seroprevalence by Nucleocapsid and Spike antibody results by sociodemographic variables (self-reported ethnicity, age, material deprivation, and social deprivation) from January 2021 to March 2023. Differences in natural infections between White and Black, Indigenous and Racialized groups were seen from January 2021 to March 2023 with Black, Indigenous and Racialized groups having higher natural infection rates. Other sociodemographic variables had significant differences at various months corresponding to the vaccine roll out across Canada with evident trends in certain groups having increased Spike and/or Nucleocapsid antibodies compared to others. Tables A 1.1 to A 1.6 show selected demographic results for March by region (Nucleocapsid and Spike), and additional weekly breakdown of Nucleocapsid antibody results are shown in Tables A 2.1 and A 2.2.

## Conclusion

As of March 2023 adjusted seroprevalence by the Spike antibody assay (proxy for humoral immunity) was 100.00% (95% CI 100.00, 100.00%). While humoral immunity was largely driven

by vaccination in 2021, most people have now also been naturally exposed (with hybrid immunity) since the arrival of the Omicron variant and subsequent subvariants.

## Points for Interpretation

1. Blood donors are a healthy sub-set of the adult Canadian population. Important points to keep in mind with regard to representativeness of the sample are:
    - blood donors self-select to donate blood therefore those who choose not to donate blood for whatever reason are not included in the sample.
    - Blood donations are collected from people aged 17 years and older, however there are relatively few donations from elderly donors.
    - Blood donations are collected in larger cities and many smaller urban areas, but people in rural areas may be under-sampled. Canadian Blood Services does not collect blood in the northern territories or the province of Quebec.
2. Data were weighted for age, sex, and location to more closely reflect the Canadian population. For example, the Nucleocapsid antibody assay unweighted SARS-CoV-2 seroprevalence for the full sample was 77.27% (95% CI 76.80, 77.74), and after weighting factors applied it was 78.32% (95% CI 77.85, 78.78), then after the weighted seroprevalence was adjusted for sensitivity and specificity, 78.67% (95% 78.21, 79.13). Using the Spike antibody assay, the unweighted SARS-CoV-2 seroprevalence for the full sample was 99.65% (95% CI 99.57, 99.71), and after weighting factors applied it was 99.70% (95% CI 99.64, 99.76), then after the weighted seroprevalence was adjusted for sensitivity and specificity, 100% (95% CI 100.00, 100.00).
3. The sensitivity and specificity of the Roche assays are very good, but it is still possible that some true positives may be missed, and some positive results may be false. Confirmatory testing has not been performed. The seroprevalence was adjusted for sensitivity and specificity using a well-established mathematical formula.
4. Different seroprevalence rates by the assays reflect different isotypes being measured. The Roche assay identifies IgA, IgG and IgM antibodies. The Abbott assay measured IgG. Detection of Nucleocapsid antibodies is likely a marker of natural infection while Spike antibodies can be induced by either natural infection or by vaccines.
5. Seroprevalence results reflect measurement of humoral immunity. The exact mechanisms of protective immunity against SARS-CoV-2 remains unknown. The protection at particular levels of Spike antibody is unknown. Quantitative results from the Spike antibody assay will be valuable to inform policy regarding booster shots as the science evolves.
6. As of September 2021, the dilution for higher concentration (>250 U/mL) was increased from 1:10 to 1:400. This allows antibody concentration to be measured as high as 100,000 U/mL rather than 2,500 U/mL. It is possible that values between 160 and 320 U/mL may be less accurate because they are at the lower end of sensitivity of the assay.

7. SARS-CoV-2 antibody signals wane over time.

8. Spike antibodies reflect SARS-CoV-2 humoral response. Many Spike antibody positive results are related to vaccination. However, Spike antibody positives are also due to natural infection (with or without N antibodies). Donors with both Spike and Nucleocapsid antibodies are assumed to have had a natural infection; however, they may have also been vaccinated before or after the infection.

   Due to a variety of biological factors, donors may have variable antibody responses to different binding sites on the SARS-CoV-2 virus (e.g., Spike, receptor binding domain of Spike, nucleocapsid protein). In March 2023 the two most common positive antibody profile was positive on Spike antibody/positive on Nucleocapsid antibody (77.16%) followed by positive on Spike antibody/negative on Nucleocapsid antibody (22.47%) (see below).

**Diagnostic phenotypes in March 2023 (unadjusted)**

| | Nucleocapsid Antibody | Spike Antibody | Total N (%) |
|---|---|---|---|
| | Negative | Negative | 78 (0.25) |
| | Negative | Positive | 6,920 (22.47) |
| | Positive | Negative | 31 (0.10) |
| | Positive | Positive | 23,762 (77.16) |
| Total | | | 30,792 |

Note: samples missing anti-N or anti-S results not included in the above



## References

1. https://diagnostics.roche.com/global/en/products/params/elecsys-anti-sars-cov-2-s.html
2. Whitaker HJ, Elgohari S, Rowe C, Otter AD, Brooks T, Linley E, et al., Impact of COVID-19 vaccination program on seroprevalence in blood donors in England, 2021, Journal of Infection (2021), doi: https://doi.org/10.1016/j.jinf.2021.04.037
3. Lang Z, Reiczigel J. Confidence limits for prevalence of disease adjusted for estimated sensitivity and specificity. Preventive Veterinary Medicine. 2014:113;13-2

**Table 1.** Comparing SARS-CoV-2 seroprevalence by sociodemographic variables by Nucleocapsid and Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 12,116 | 9,520 | 79.06 | 78.42, 79.70 | 12,115 | 12,085 | 100.00 | 100.00, 100.00 |
| Male | 18,677 | 14,275 | 78.25 | 77.58, 78.92 | 18,677 | 18,598 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 2,197 | 1,959 | 89.17 | 88.17, 90.18 | 2,197 | 2,197 | 100.00 | 100.00, 100.00 |
| 25-39 | 7,095 | 5,920 | 84.56 | 83.73, 85.39 | 7,096 | 7,083 | 100.00 | 100.00, 100.00 |
| 40-59 | 11,533 | 9,196 | 79.92 | 79.15, 80.68 | 11,532 | 11,487 | 100.00 | 100.00, 100.00 |
| 60+ | 9,968 | 6,720 | 67.40 | 66.40, 68.39 | 9,967 | 9,916 | 100.00 | 100.00, 100.00 |
| **Province** | | | | | | | | |
| British Columbia | 5,340 | 3,953 | 76.00 | 74.85, 77.14 | 5,339 | 5,320 | 100.00 | 100.00, 100.00 |
| Alberta | 6,366 | 5,155 | 82.53 | 81.41, 83.65 | 6,366 | 6,339 | 100.00 | 100.00, 100.00 |
| Saskatchewan | 1,155 | 883 | 80.37 | 78.09, 82.64 | 1,155 | 1,149 | 100.00 | 99.54, 100.00 |
| Manitoba | 1,344 | 1,034 | 80.38 | 78.28, 82.48 | 1,344 | 1,342 | 100.00 | 99.62, 100.00 |
| Ontario | 14,596 | 11,273 | 78.35 | 77.69, 79.01 | 14,596 | 14,543 | 100.00 | 100.00, 100.00 |
| New Brunswick | 747 | 569 | 78.47 | 75.71, 81.23 | 747 | 747 | 100.00 | 100.00, 100.00 |
| Nova Scotia | 627 | 451 | 74.57 | 71.95, 77.20 | 627 | 625 | 100.00 | 100.00, 100.00 |
| Prince Edward Island | 63 | 47 | 90.66 | 86.09, 95.23 | 63 | 63 | 98.92 | 95.73, 100.00 |
| Newfoundland | 555 | 430 | 78.55 | 75.24, 81.87 | 555 | 555 | 100.00 | 99.66, 100.00 |
| **Metro area** | | | | | | | | |
| Vancouver | 2,832 | 2,190 | 78.28 | 76.83, 79.73 | 2,832 | 2,824 | 100.00 | 100.00, 100.00 |
| Calgary | 2,321 | 1,858 | 81.45 | 79.41, 83.49 | 2,321 | 2,314 | 100.00 | 100.00, 100.00 |
| Edmonton | 1,923 | 1,538 | 81.55 | 79.62, 83.49 | 1,923 | 1,918 | 100.00 | 99.86, 100.00 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ottawa | 1,744 | 1,278 | 73.99 | 71.33, 76.66 | 1,744 | 1,743 | 100.00 | 100.00, 100.00 |
| Toronto | 4,295 | 3,416 | 80.03 | 79.05, 81.01 | 4,294 | 4,277 | 100.00 | 100.00, 100.00 |
| Winnipeg | 815 | 613 | 78.52 | 75.69, 81.36 | 815 | 815 | 100.00 | 100.00, 100.00 |
| **Ethnicity[1,2]** | | | | | | | | |
| White | 24,648 | 18,726 | 77.17 | 76.63, 77.71 | 24,646 | 24,555 | 100.00 | 100.00, 100.00 |
| Indigenous | 403 | 311 | 79.84 | 75.86, 83.82 | 403 | 403 | 100.00 | 98.95, 100.00 |
| Asian | 2,754 | 2,299 | 84.58 | 83.30, 85.86 | 2,754 | 2,751 | 100.00 | 100.00, 100.00 |
| Other Racialized groups | 2,225 | 1,857 | 84.75 | 83.27, 86.22 | 2,226 | 2,216 | 100.00 | 100.00, 100.00 |
| **Social Deprivation[3]** | | | | | | | | |
| 1 (least deprived) | 5,951 | 4,657 | 79.76 | 78.71, 80.80 | 5,951 | 5,930 | 100.00 | 100.00, 100.00 |
| 2 | 5,787 | 4,443 | 78.32 | 77.23, 79.41 | 5,786 | 5,771 | 100.00 | 100.00, 100.00 |
| 3 | 5,396 | 4,086 | 76.92 | 75.79, 78.06 | 5,396 | 5,371 | 100.00 | 100.00, 100.00 |
| 4 | 4,989 | 3,868 | 78.55 | 77.41, 79.69 | 4,989 | 4,972 | 100.00 | 100.00, 100.00 |
| 5 (most deprived) | 4,725 | 3,592 | 77.44 | 76.25, 78.62 | 4,725 | 4,709 | 100.00 | 100.00, 100.00 |
| **Material Deprivation[3]** | | | | | | | | |
| 1 (least deprived) | 7,884 | 6,007 | 77.53 | 76.59, 78.47 | 7,883 | 7,863 | 100.00 | 100.00, 100.00 |
| 2 | 6,534 | 4,954 | 77.05 | 76.00, 78.10 | 6,534 | 6,503 | 100.00 | 100.00, 100.00 |
| 3 | 5,667 | 4,425 | 79.04 | 77.97, 80.12 | 5,667 | 5,649 | 100.00 | 100.00, 100.00 |
| 4 | 4,320 | 3,341 | 78.98 | 77.76, 80.19 | 4,320 | 4,305 | 100.00 | 100.00, 100.00 |
| 5 (most deprived) | 2,443 | 1,919 | 80.13 | 78.60, 81.65 | 2,443 | 2,433 | 100.00 | 99.91, 100.00 |
| **Total** | 30,793 | 23,795 | 78.67 | 78.21, 79.13 | 30,792 | 30,683 | 100.00 | 100.00, 100.00 |

[1]Self reported ethnicity was missing for 763 (2.5%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 82.06% (95% CI 79.30, 84.82); and Spike antibody was 100.00% (95% CI 98.92, 100,00).

[2]Combining all Racialized groups together resulted in adjusted SARS-CoV-2 seroprevalence of 84.33% (95% CI 83.38, 85.27) by the Nucleocapsid antibody assay, and 100.00% (95% CI 100.00, 100.00) by Spike antibody.

[3]Postal codes were missing for 3,945 (12.8%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 81.67% (95% CI 80.44, 82.90) and Spike antibody was 100.00% (95% CI 100.00, 100.00).

**Table 2.** Changes in SARS-CoV-2 seroprevalence by **Nucleocapsid Antibody assay (proxy for natural infection)** by sociodemographic variables between February and March 2023

| | February 2023 (crude) | | February 2023 (adjusted) | | March 2023 (crude) | | March 2023 (adjusted) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | P-Value* |
| **Sex** | | | | | | | | | |
| Female | 12,865 | 9,949 | 77.20 | 76.55, 77.85 | 12,116 | 9,520 | 79.06 | 78.42, 79.70 | <0.0001 |
| Male | 18,889 | 14,425 | 78.00 | 77.34, 78.66 | 18,677 | 14,275 | 78.25 | 77.58, 78.92 | 0.6026 |
| **Age** | | | | | | | | | . |
| 17-24 | 2,438 | 2,136 | 88.40 | 87.38, 89.42 | 2,197 | 1,959 | 89.17 | 88.17, 90.18 | 0.2927 |
| 25-39 | 8,206 | 6,832 | 84.02 | 83.19, 84.85 | 7,095 | 5,920 | 84.56 | 83.73, 85.39 | 0.3717 |
| 40-59 | 11,990 | 9,472 | 79.48 | 78.72, 80.24 | 11,533 | 9,196 | 79.92 | 79.15, 80.68 | 0.4265 |
| 60+ | 9,120 | 5,934 | 64.92 | 63.93, 65.92 | 9,968 | 6,720 | 67.40 | 66.40, 68.39 | 0.0006 |
| **Province** | | | | | | | | | . |
| British Columbia | 5,201 | 3,887 | 76.01 | 74.88, 77.14 | 5,340 | 3,953 | 76.00 | 74.85, 77.14 | 0.9875 |
| Alberta | 5,878 | 4,753 | 82.46 | 81.36, 83.56 | 6,366 | 5,155 | 82.53 | 81.41, 83.65 | 0.9281 |
| Saskatchewan | 1,320 | 1,006 | 77.75 | 75.41, 80.09 | 1,155 | 883 | 80.37 | 78.09, 82.64 | 0.1162 |
| Manitoba | 1,470 | 1,175 | 79.60 | 77.50, 81.70 | 1,344 | 1,034 | 80.38 | 78.28, 82.48 | 0.6061 |
| Ontario | 14,701 | 11,142 | 76.70 | 76.04, 77.37 | 14,596 | 11,273 | 78.35 | 77.69, 79.01 | 0.0006 |
| New Brunswick | 1,300 | 987 | 77.20 | 74.43, 79.97 | 747 | 569 | 78.47 | 75.72, 81.23 | 0.5227 |
| Nova Scotia | 1,298 | 968 | 73.86 | 71.26, 76.46 | 627 | 451 | 74.57 | 71.95, 77.20 | 0.7049 |
| Prince Edward Island | 146 | 111 | 80.19 | 74.12, 86.27 | 63 | 47 | 90.66 | 86.09, 95.23 | 0.0078 |
| Newfoundland | 440 | 345 | 79.16 | 75.93, 82.39 | 555 | 430 | 78.55 | 75.24, 81.87 | 0.7952 |
| **Metro area** | | | | | | | | | . |
| Vancouver | 2,661 | 2,069 | 78.36 | 76.90, 79.81 | 2,832 | 2,190 | 78.28 | 76.83, 79.73 | 0.9405 |
| Calgary | 2,137 | 1,741 | 82.47 | 80.51, 84.44 | 2,321 | 1,858 | 81.45 | 79.41, 83.49 | 0.4771 |
| Edmonton | 1,891 | 1,505 | 81.13 | 79.22, 83.03 | 1,923 | 1,538 | 81.55 | 79.62, 83.49 | 0.7574 |
| Ottawa | 1,435 | 1,039 | 73.76 | 71.10, 76.42 | 1,744 | 1,278 | 73.99 | 71.33, 76.66 | 0.9032 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Toronto | 4,658 | 3,681 | 79.08 | 78.10, 80.07 | 4,295 | 3,416 | 80.03 | 79.05, 81.01 | 0.1816 |
| Winnipeg | 919 | 714 | 77.57 | 74.80, 80.34 | 815 | 613 | 78.52 | 75.69, 81.36 | 0.6376 |
| **Ethnicity[1,2]** | | | | | | | | | . |
| White | 25,242 | 19,024 | 75.92 | 75.38, 76.46 | 24,648 | 18,726 | 77.17 | 76.63, 77.71 | 0.0013 |
| Indigenous | 436 | 336 | 77.73 | 73.81, 81.65 | 403 | 311 | 79.84 | 75.86, 83.82 | 0.4609 |
| Asian | 3,045 | 2,534 | 84.27 | 83.03, 85.50 | 2,754 | 2,299 | 84.58 | 83.30, 85.86 | 0.7291 |
| Other Racialized groups | 2,409 | 1,986 | 83.51 | 82.05, 84.98 | 2,225 | 1,857 | 84.75 | 83.27, 86.22 | 0.2461 |
| **Social Deprivation[3]** | | | | | | | | | . |
| 1 (least deprived) | 6,031 | 4,722 | 79.35 | 78.32, 80.38 | 5,951 | 4,657 | 79.76 | 78.71, 80.80 | 0.5909 |
| 2 | 6,006 | 4,609 | 77.10 | 76.02, 78.17 | 5,787 | 4,443 | 78.32 | 77.23, 79.41 | 0.1175 |
| 3 | 5,566 | 4,202 | 76.70 | 75.58, 77.83 | 5,396 | 4,086 | 76.92 | 75.79, 78.06 | 0.7893 |
| 4 | 5,189 | 3,953 | 77.10 | 75.94, 78.26 | 4,989 | 3,868 | 78.55 | 77.41, 79.69 | 0.0795 |
| 5 (most deprived) | 5,176 | 3,913 | 75.98 | 74.81, 77.16 | 4,725 | 3,592 | 77.44 | 76.25, 78.62 | 0.0882 |
| **Material Deprivation[3]** | | | | | | | | | . |
| 1 (least deprived) | 7,941 | 6,083 | 76.81 | 75.87, 77.76 | 7,884 | 6,007 | 77.53 | 76.59, 78.47 | 0.2905 |
| 2 | 6,980 | 5,317 | 77.10 | 76.08, 78.11 | 6,534 | 4,954 | 77.05 | 76.00, 78.10 | 0.9511 |
| 3 | 5,887 | 4,485 | 76.76 | 75.67, 77.86 | 5,667 | 4,425 | 79.04 | 77.97, 80.12 | 0.0036 |
| 4 | 4,474 | 3,427 | 78.05 | 76.84, 79.26 | 4,320 | 3,341 | 78.98 | 77.76, 80.19 | 0.289 |
| 5 (most deprived) | 2,686 | 2,087 | 79.00 | 77.50, 80.50 | 2,443 | 1,919 | 80.13 | 78.60, 81.65 | 0.3032 |
| **Total** | 31,754 | 24,374 | 77.59 | 77.13, 78.06 | 30,793 | 23,795 | 78.67 | 78.21, 79.13 | 0.0013 |

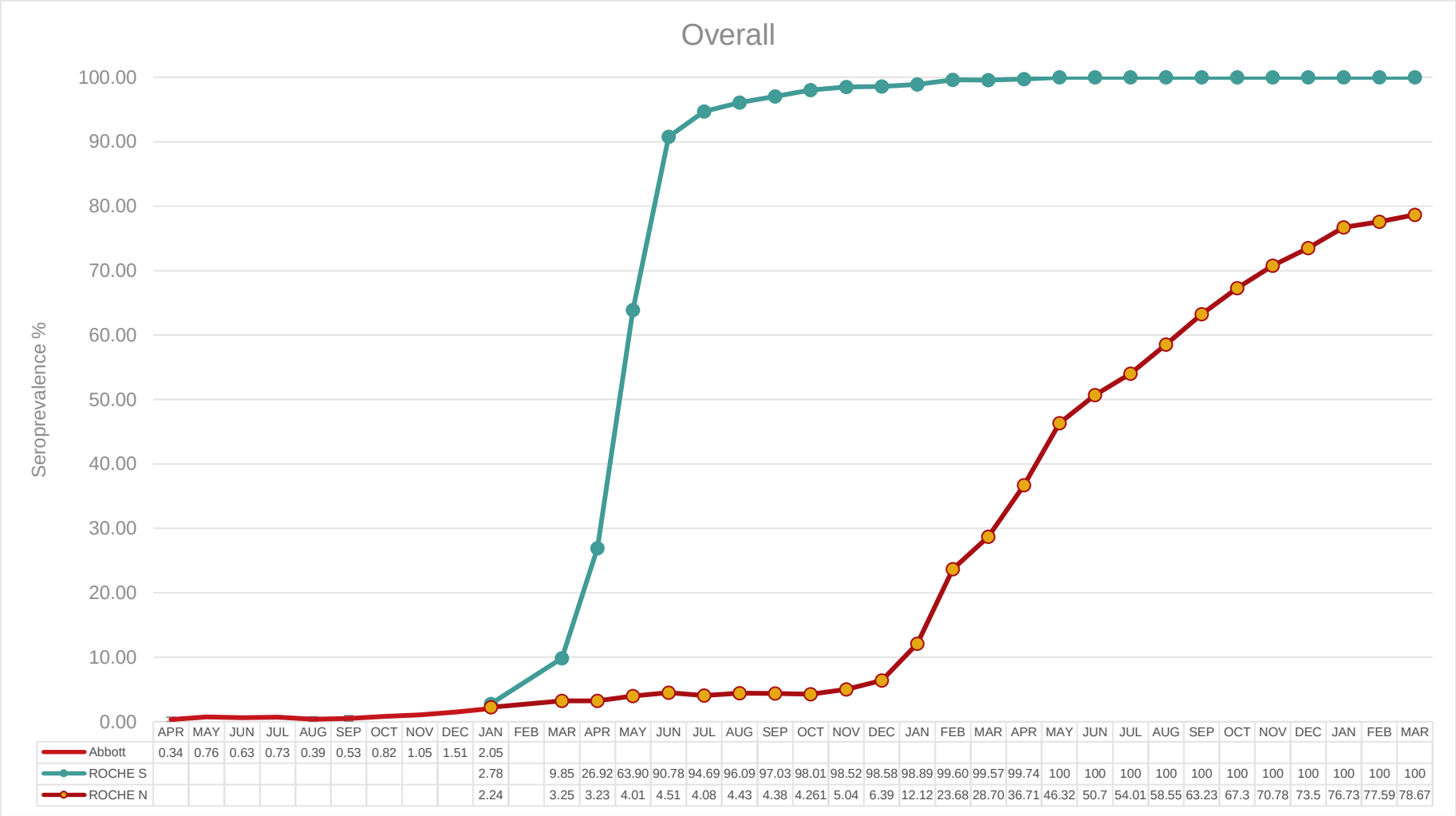
*P-value reflects the difference between February and March results.

[1] In February, self reported ethnicity was missing for 622 (2.0%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 82.70% (95% CI 79.69, 85.71); and Spike antibody was 99.85% (95% CI 98.94, 100,00). In March, self reported ethnicity was missing for 763 (2.5%) donors. Adjusted seroprevalence by the Nucleocapsid antibody was 82.06% (95% CI 79.30, 84.18).

[2] In February, combining all Racialized groups together resulted in adjusted SARS-CoV-2 seroprevalence of 83.52% (95% CI 82.60, 84.44) by the Nucleocapsid antibody assay, and 100.00% (95% CI 100.00, 100.00) by Spike antibody. In March, combining all Racialized groups together resulted in adjusted SARS-CoV-2 seroprevalence of % 84.33 (95% CI 83.38, 85.27).

[3] In February, postal codes were missing for 3,786 (11.9%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 79.76% (95% CI 78.46, 81.07) and Spike antibody was 100.00% (95% CI 100.00, 100.00). In March, postal codes were missing for 3,945 (12.8%) of donors. Adjusted seroprevalence by the Nucleocapsid antibody assay was 81.67% (95% CI 80.44, 82.90).

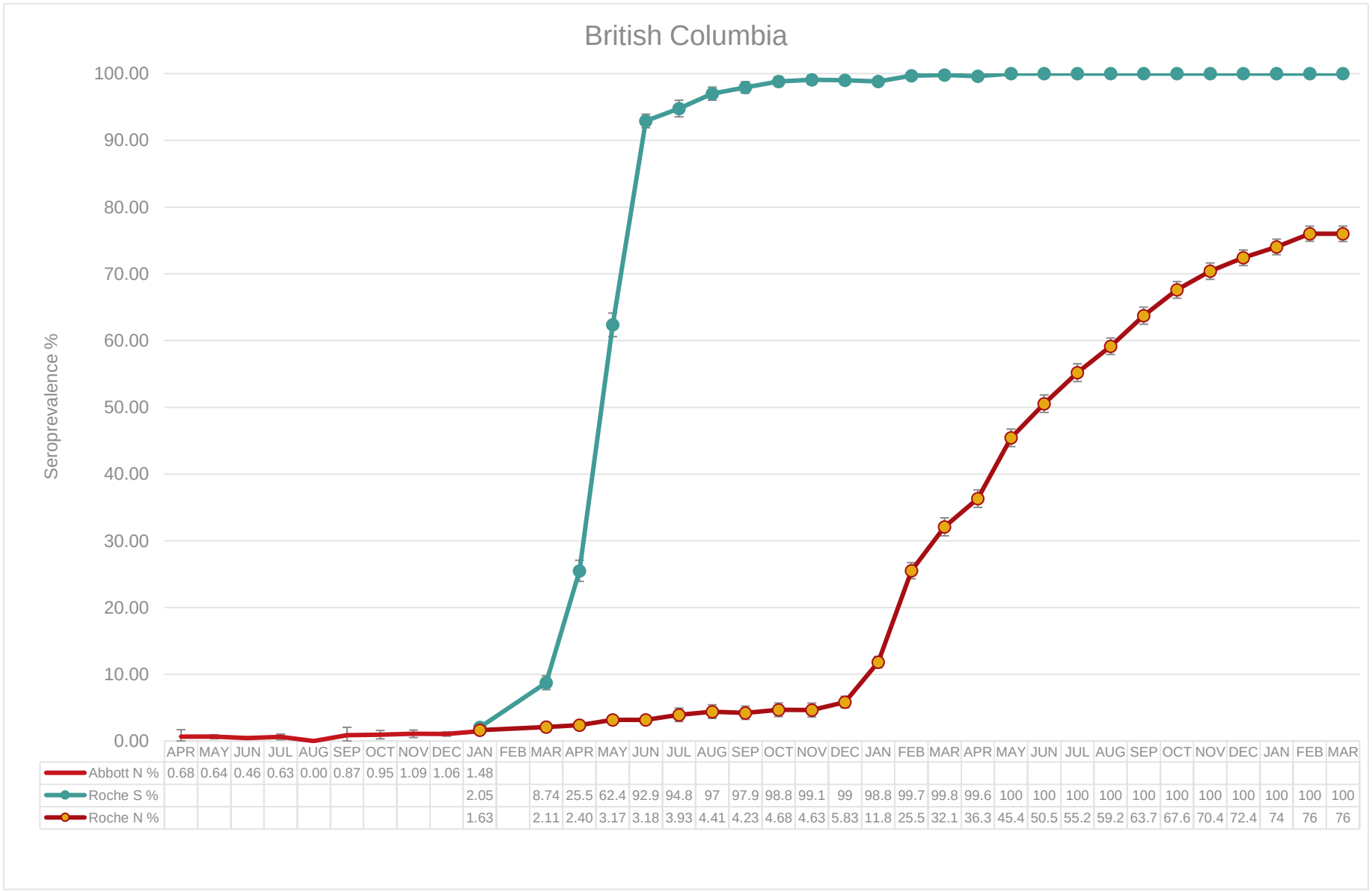
**Figure 1.** Overall temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from April 2020 - March 2023 (comparing results from Abbott N (until January 2021) followed by seroprevalence estimated by Roche N and Roche S results.



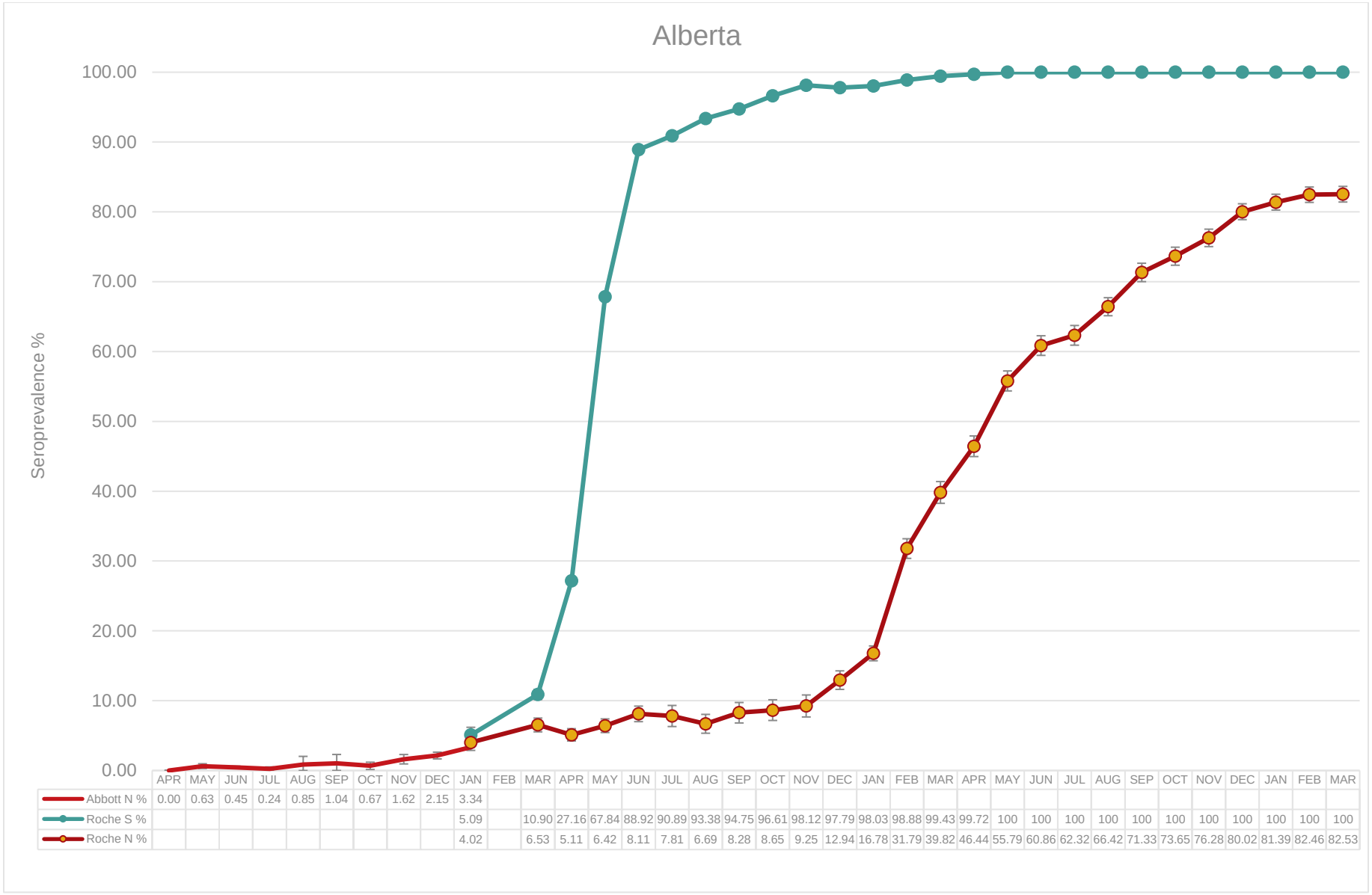

| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott | 0.34 | 0.76 | 0.63 | 0.73 | 0.39 | 0.53 | 0.82 | 1.05 | 1.51 | 2.05 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROCHE S | | | | | | | | | | 2.78 | | 9.85 | 26.92 | 63.90 | 90.78 | 94.69 | 96.09 | 97.03 | 98.01 | 98.52 | 98.58 | 98.89 | 99.60 | 99.57 | 99.74 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| ROCHE N | | | | | | | | | | 2.24 | | 3.25 | 3.23 | 4.01 | 4.51 | 4.08 | 4.43 | 4.38 | 4.261 | 5.04 | 6.39 | 12.12 | 23.68 | 28.70 | 36.71 | 46.32 | 50.7 | 54.01 | 58.55 | 63.23 | 67.3 | 70.78 | 73.5 | 76.73 | 77.59 | 78.67 |

Notes: SARS-CoV-2 seroprevalence rates (95% CI), that have been weighted and adjusted for test characteristics. Data from the CIHR funded study (Correlates of Immunity) from April 9, 2020 - January 31, 2021, have been included.

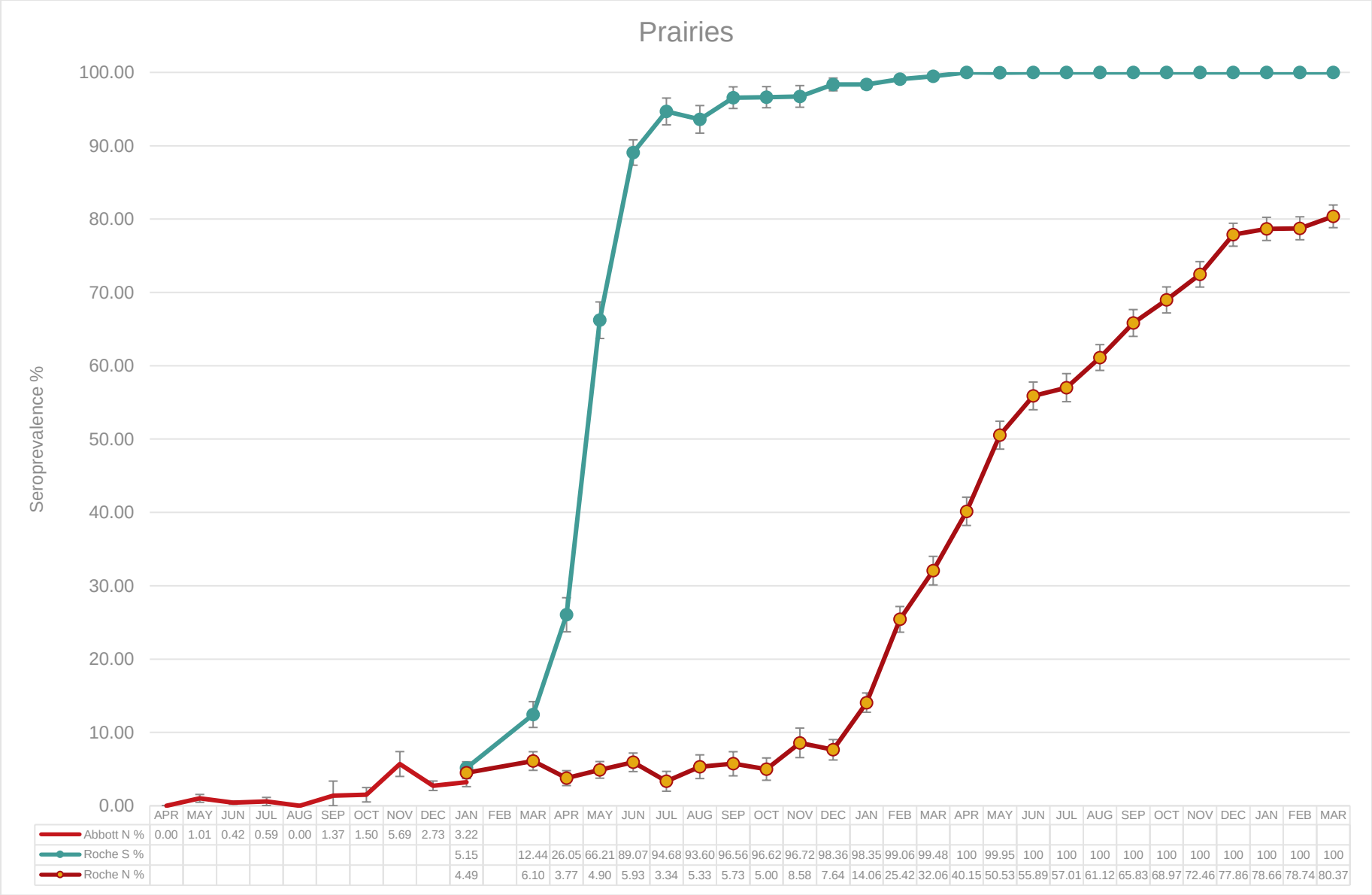
**Figure 2.** Regional temporal trends of SARS-CoV-2 seroprevalence monthly from April 2020 - March 2023 (by Abbott N, Roche N and Roche S assays)



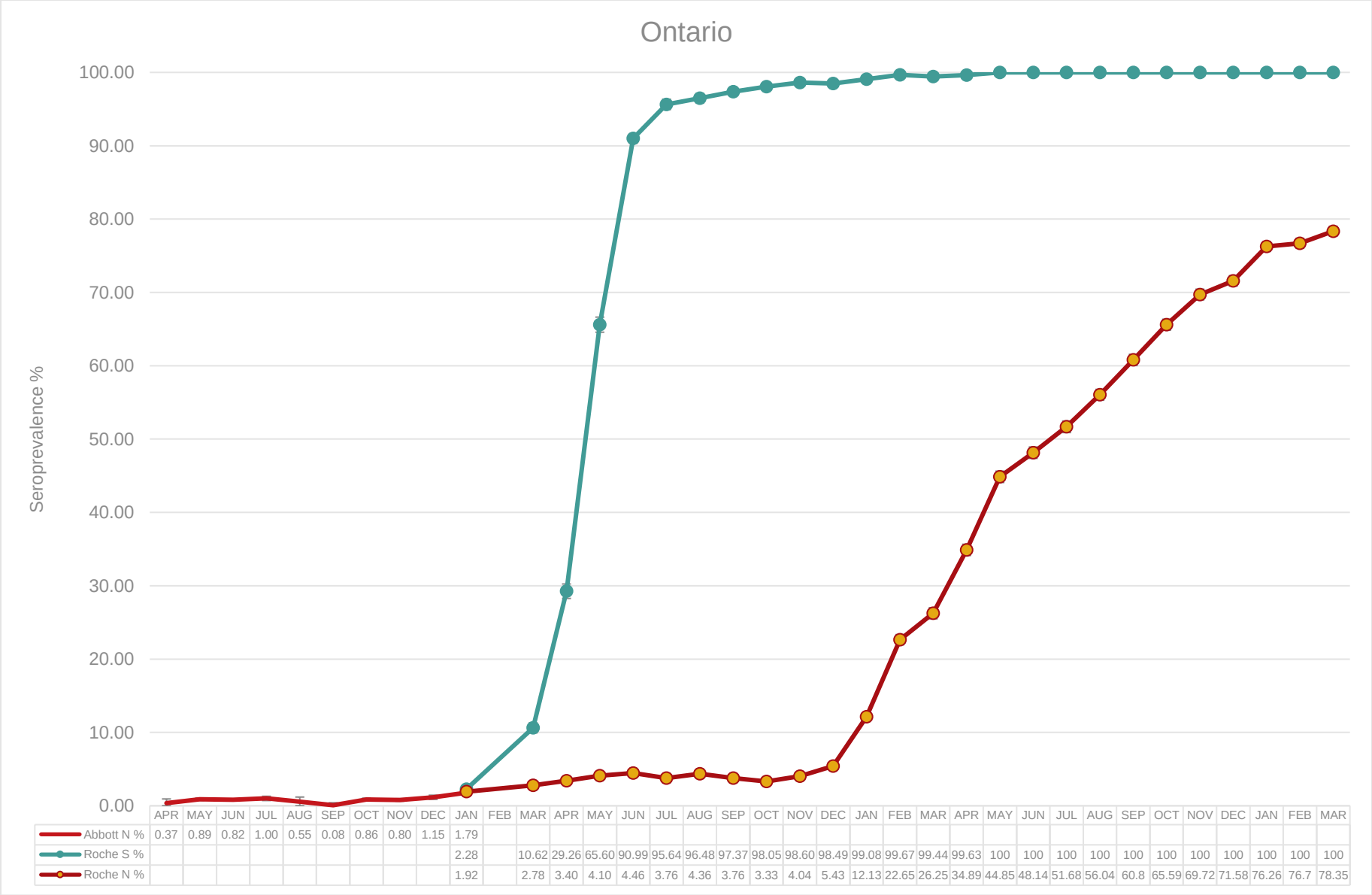

| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott N % | 0.68 | 0.64 | 0.46 | 0.63 | 0.00 | 0.87 | 0.95 | 1.09 | 1.06 | 1.48 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roche S % | | | | | | | | | | 2.05 | | 8.74 | 25.5 | 62.4 | 92.9 | 94.8 | 97 | 97.9 | 98.8 | 99.1 | 99 | 98.8 | 99.7 | 99.8 | 99.6 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Roche N % | | | | | | | | | | 1.63 | | 2.11 | 2.40 | 3.17 | 3.18 | 3.93 | 4.41 | 4.23 | 4.68 | 4.63 | 5.83 | 11.8 | 25.5 | 32.1 | 36.3 | 45.4 | 50.5 | 55.2 | 59.2 | 63.7 | 67.6 | 70.4 | 72.4 | 74 | 76 | 76 |



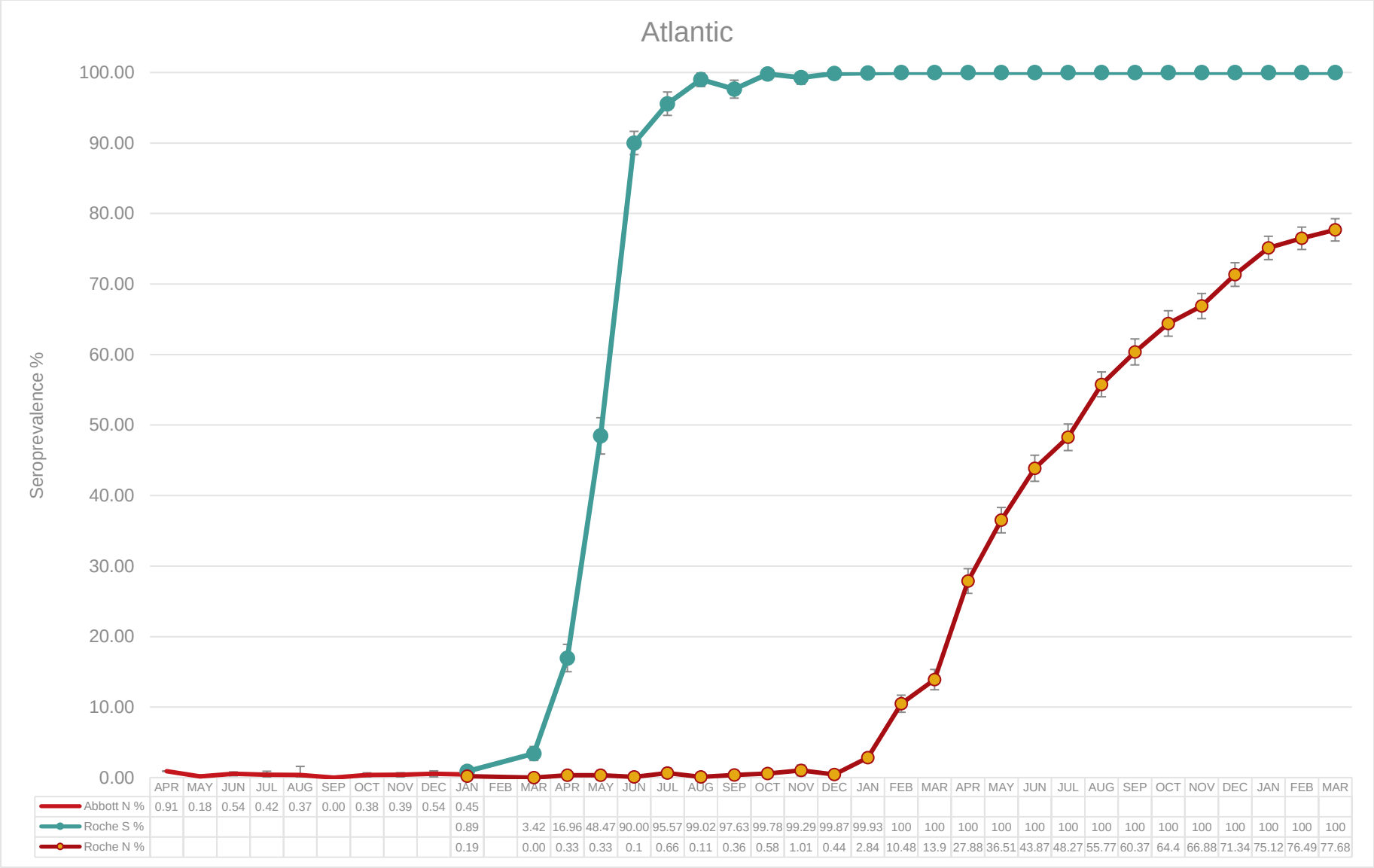

| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott N % | 0.00 | 0.63 | 0.45 | 0.24 | 0.85 | 1.04 | 0.67 | 1.62 | 2.15 | 3.34 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roche S % | | | | | | | | | | 5.09 | | 10.90 | 27.16 | 67.84 | 88.92 | 90.89 | 93.38 | 94.75 | 96.61 | 98.12 | 97.79 | 98.03 | 98.88 | 99.43 | 99.72 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Roche N % | | | | | | | | | | 4.02 | | 6.53 | 5.11 | 6.42 | 8.11 | 7.81 | 6.69 | 8.28 | 8.65 | 9.25 | 12.94 | 16.78 | 31.79 | 39.82 | 46.44 | 55.79 | 60.86 | 62.32 | 66.42 | 71.33 | 73.65 | 76.28 | 80.02 | 81.39 | 82.46 | 82.53 |




| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott N % | 0.00 | 1.01 | 0.42 | 0.59 | 0.00 | 1.37 | 1.50 | 5.69 | 2.73 | 3.22 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roche S % | | | | | | | | | | 5.15 | | 12.44 | 26.05 | 66.21 | 89.07 | 94.68 | 93.60 | 96.56 | 96.62 | 96.72 | 98.36 | 98.35 | 99.06 | 99.48 | 100 | 99.95 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Roche N % | | | | | | | | | | 4.49 | | 6.10 | 3.77 | 4.90 | 5.93 | 3.34 | 5.33 | 5.73 | 5.00 | 8.58 | 7.64 | 14.06 | 25.42 | 32.06 | 40.15 | 50.53 | 55.89 | 57.01 | 61.12 | 65.83 | 68.97 | 72.46 | 77.86 | 78.66 | 78.74 | 80.37 |




| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott N % | 0.37 | 0.89 | 0.82 | 1.00 | 0.55 | 0.08 | 0.86 | 0.80 | 1.15 | 1.79 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roche S % | | | | | | | | | | 2.28 | | 10.62 | 29.26 | 65.60 | 90.99 | 95.64 | 96.48 | 97.37 | 98.05 | 98.60 | 98.49 | 99.08 | 99.67 | 99.44 | 99.63 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Roche N % | | | | | | | | | | 1.92 | | 2.78 | 3.40 | 4.10 | 4.46 | 3.76 | 4.36 | 3.76 | 3.33 | 4.04 | 5.43 | 12.13 | 22.65 | 26.25 | 34.89 | 44.85 | 48.14 | 51.68 | 56.04 | 60.8 | 65.59 | 69.72 | 71.58 | 76.26 | 76.7 | 78.35 |




| | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | JAN | FEB | MAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott N % | 0.91 | 0.18 | 0.54 | 0.42 | 0.37 | 0.00 | 0.38 | 0.39 | 0.54 | 0.45 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Roche S % | | | | | | | | | | 0.89 | | 3.42 | 16.96 | 48.47 | 90.00 | 95.57 | 99.02 | 97.63 | 99.78 | 99.29 | 99.87 | 99.93 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Roche N % | | | | | | | | | | 0.19 | | 0.00 | 0.33 | 0.33 | 0.1 | 0.66 | 0.11 | 0.36 | 0.58 | 1.01 | 0.44 | 2.84 | 10.48 | 13.9 | 27.88 | 36.51 | 43.87 | 48.27 | 55.77 | 60.37 | 64.4 | 66.88 | 71.34 | 75.12 | 76.49 | 77.68 |

Note: SARS-CoV-2 seroprevalence rates (95% CI), that have been weighted and adjusted for test characteristics. Data from the CIHR funded study (Correlates of Immunity) from April 9, 2020 - January 31, 2021, have been included.

**Figure 3.** Distributions of log transformed Spike antibody concentration results (U/mL) (circle represents the median and the lighter shaded area represents the IQR) in spike antibody seropositive donations from September 2021 – March 2023 stratified by anti-spike positive only and anti-spike and anti-nucleucapsid positive donors.

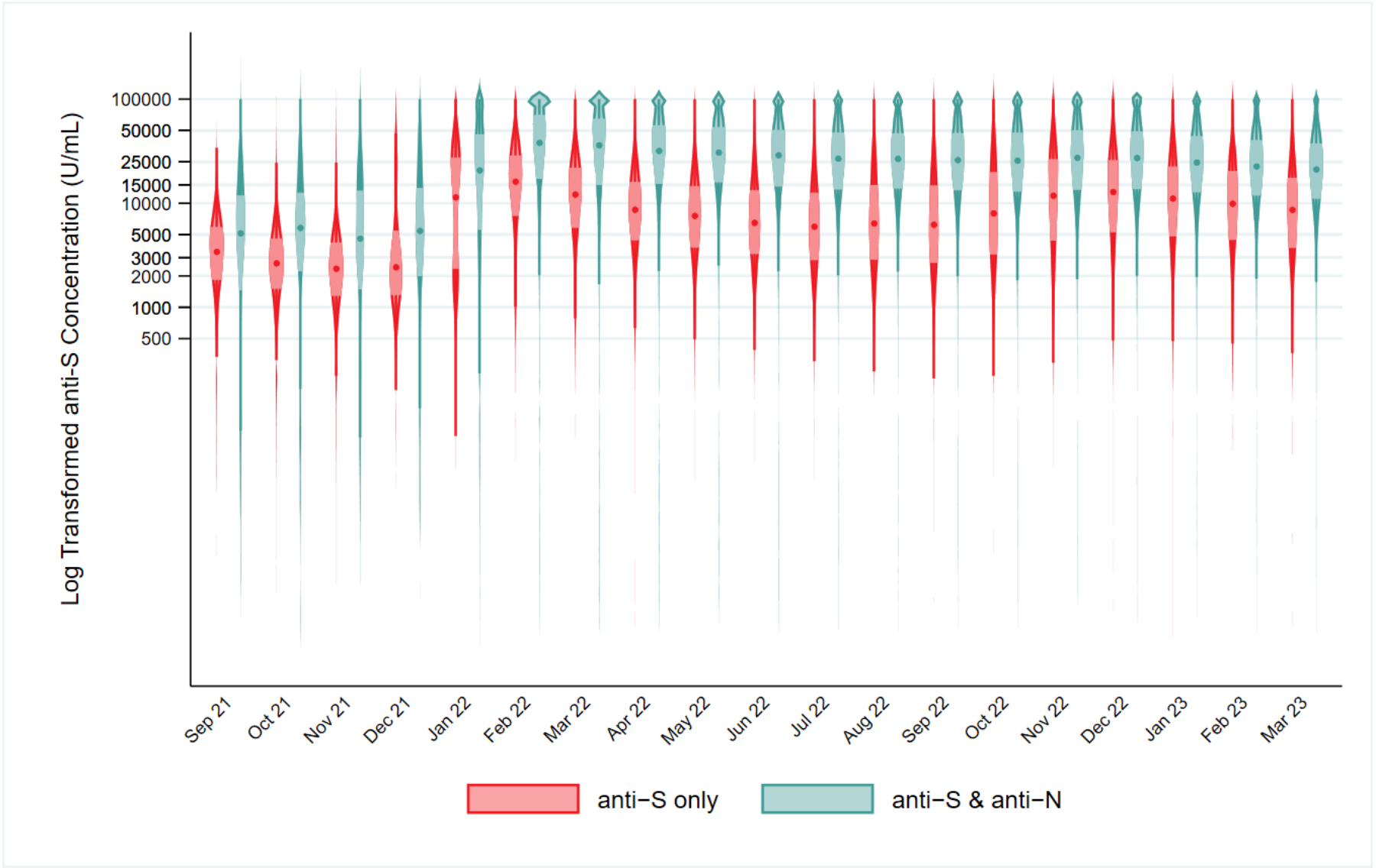
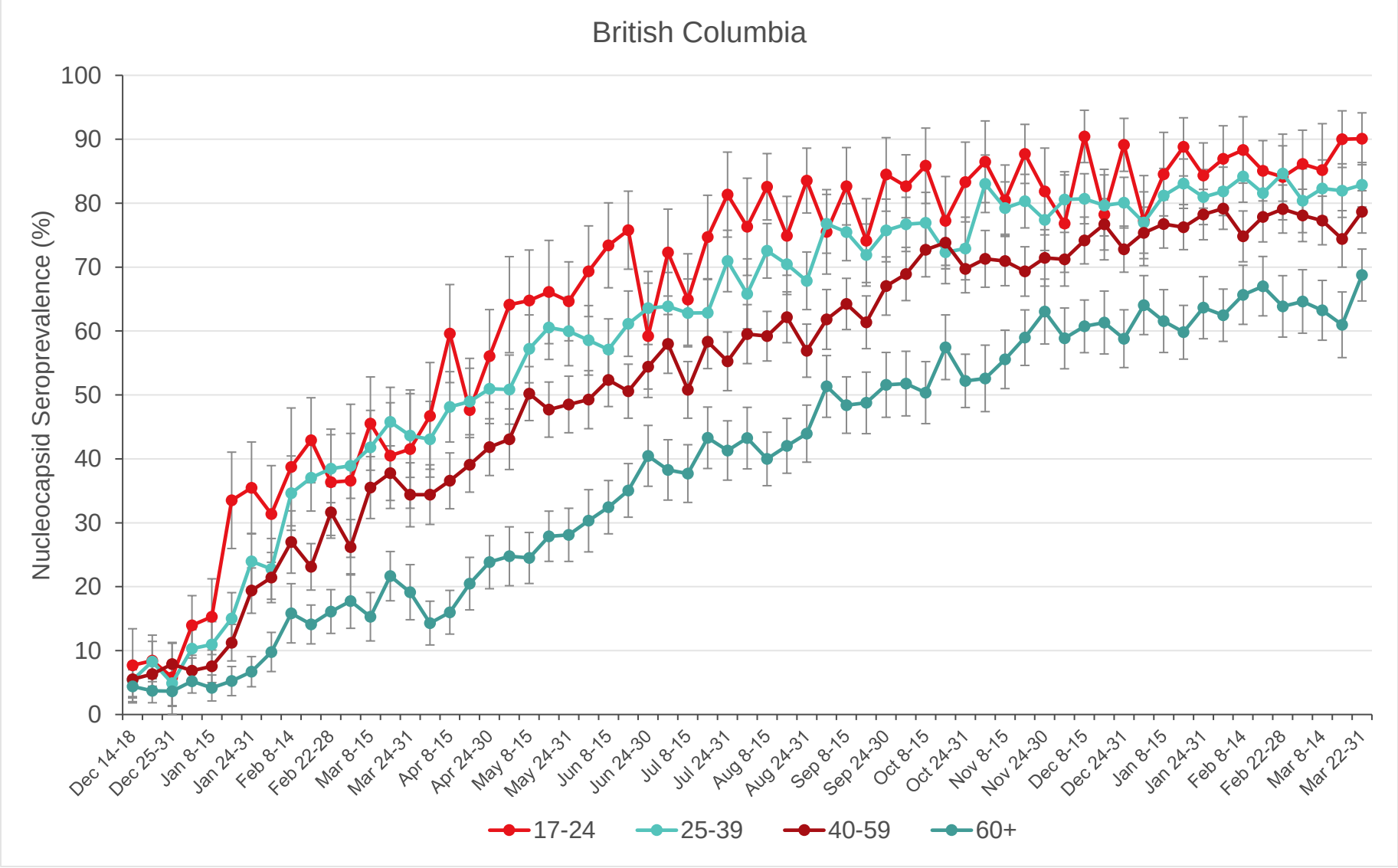
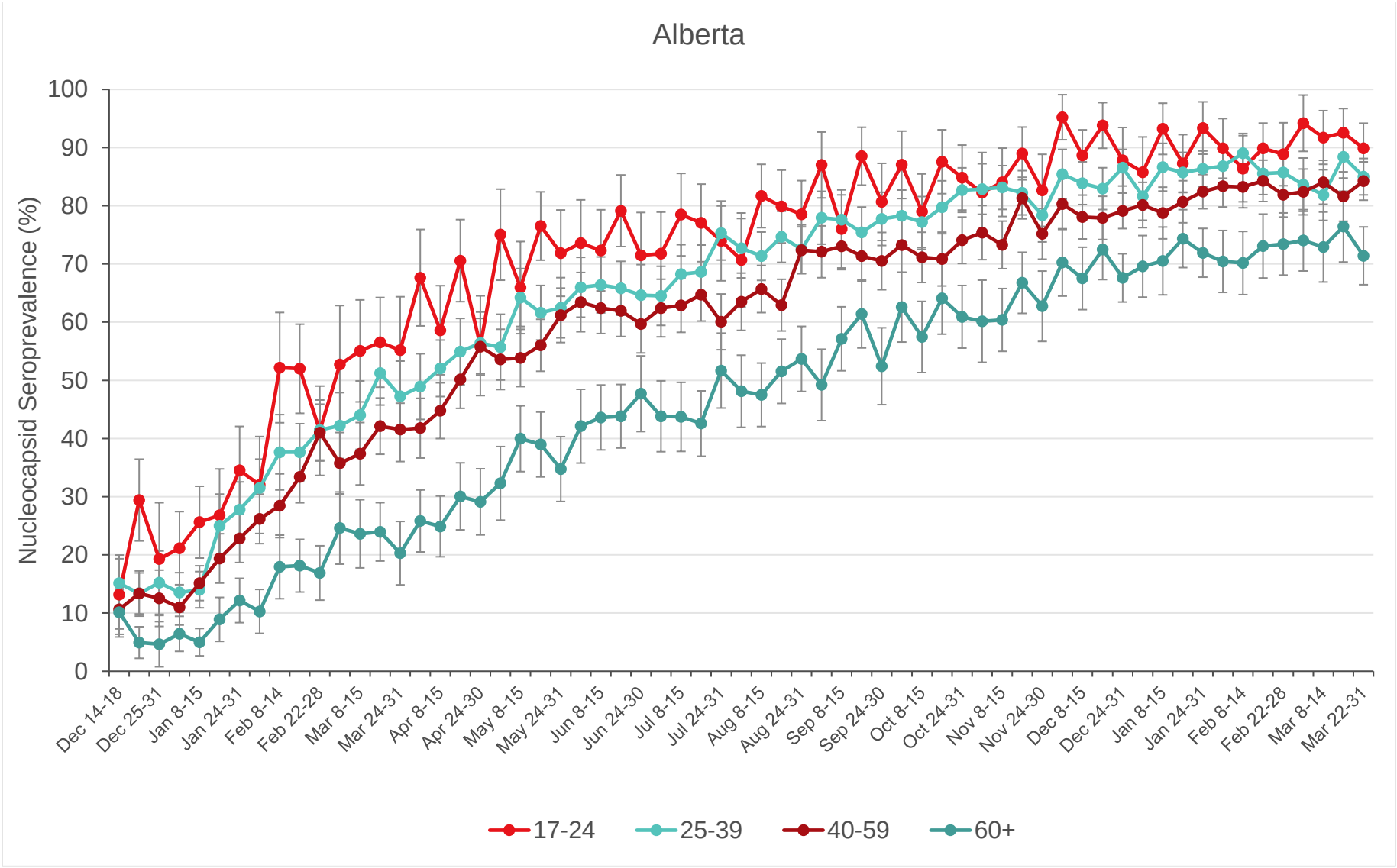
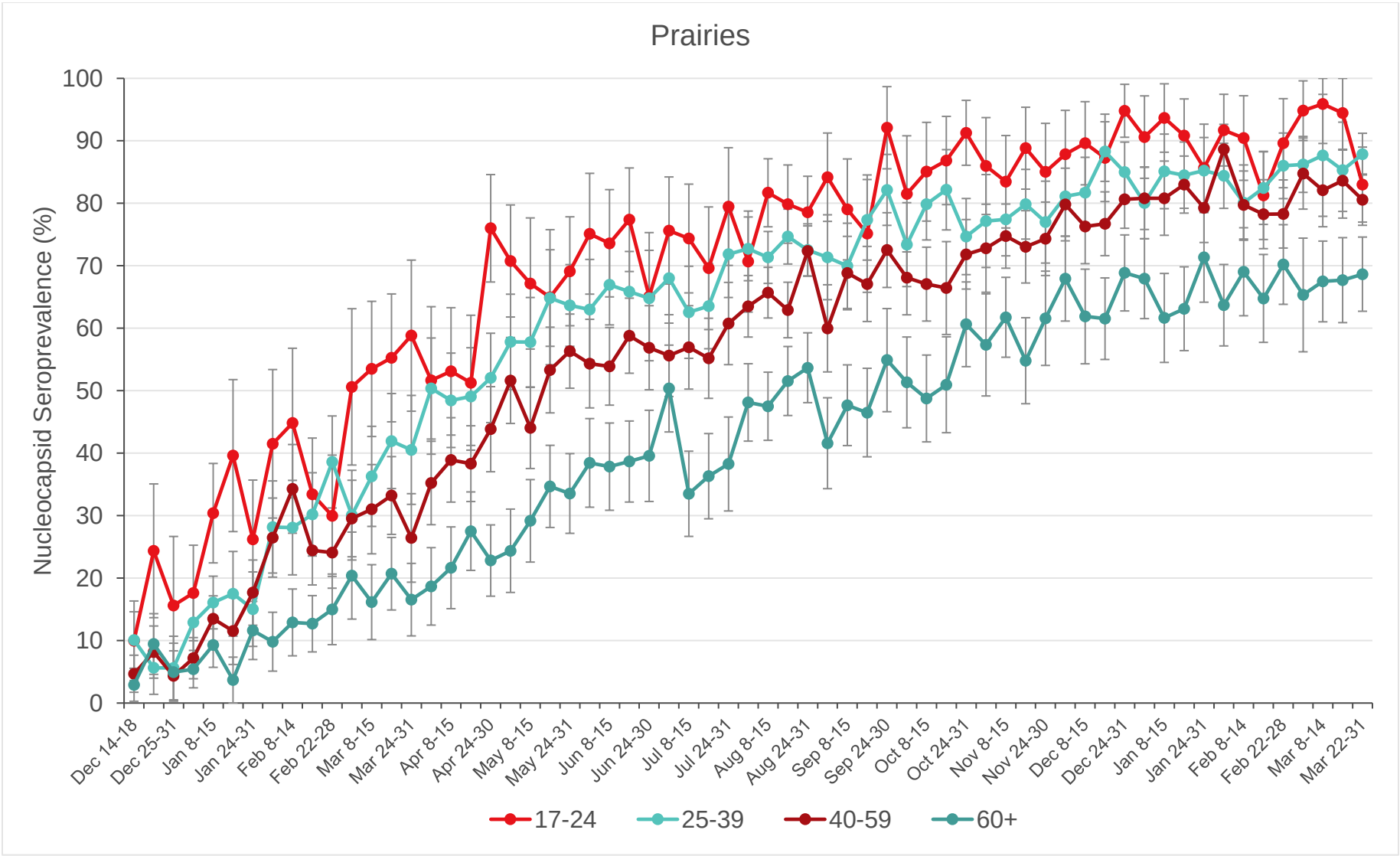
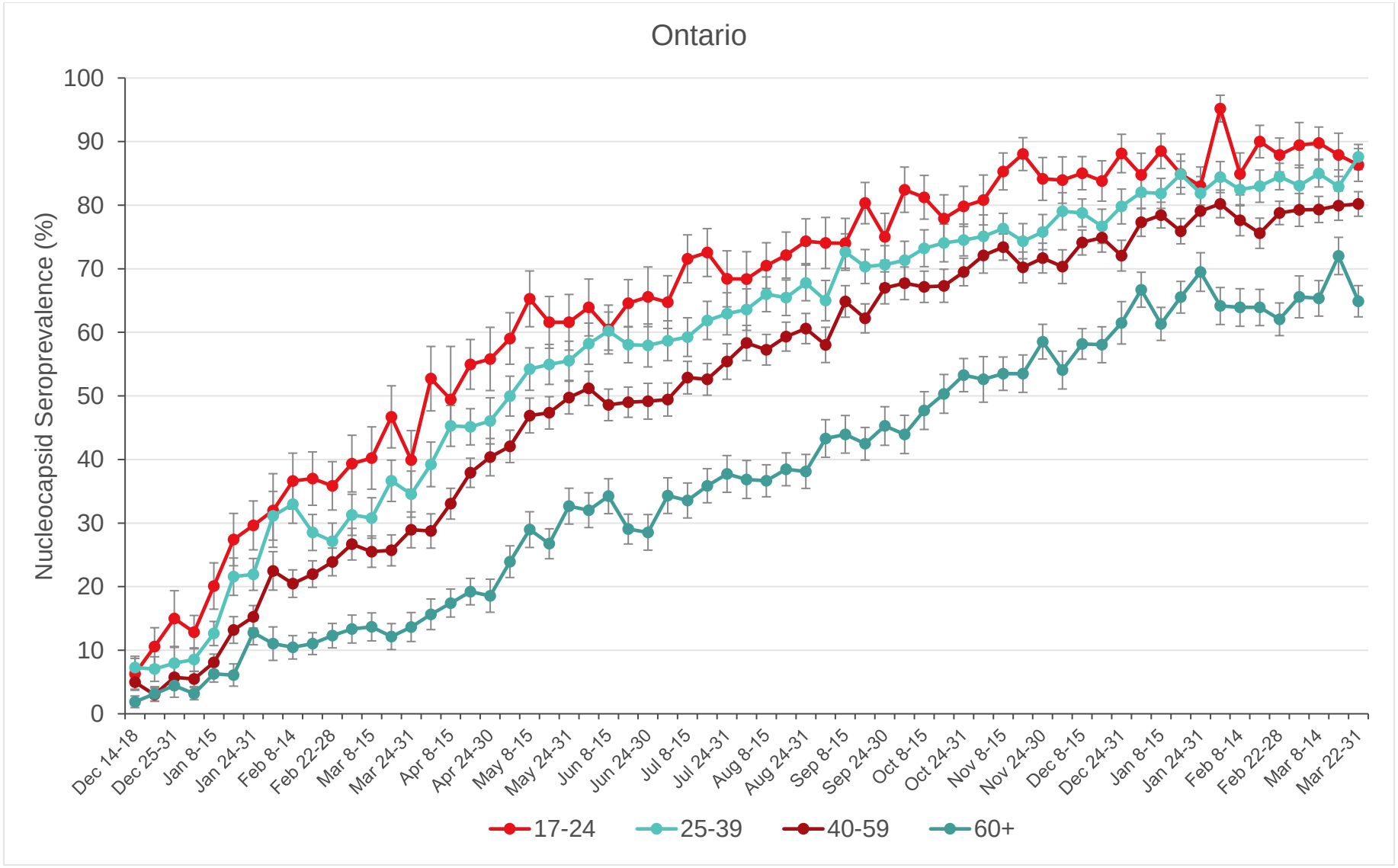


**Figure 4.** Regional temporal trends of SARS-CoV-2 Nucleocapsid (infection) seroprevalence by age group weekly from December 2021 – March 2023




Alberta
Nucleocapsid Seroprevalence (%)
100
90
80
70
60
50
40
30
20
10
0
Dec 14-18
Dec 25-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-15
Mar 24-31
Apr 8-15
Apr 24-30
May 8-15
May 24-31
Jun 8-15
Jun 24-30
Jul 8-15
Jul 24-31
Aug 8-15
Aug 24-31
Sep 8-15
Sep 24-30
Oct 8-15
Oct 24-31
Nov 8-15
Nov 24-30
Dec 8-15
Dec 24-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-14
Mar 22-31
17-24
25-39
40-59
60+


Prairies
Nucleocapsid Seroprevalence (%)
100
90
80
70
60
50
40
30
20
10
0
Dec 14-18
Dec 25-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-15
Mar 24-31
Apr 8-15
Apr 24-30
May 8-15
May 24-31
Jun 8-15
Jun 24-30
Jul 8-15
Jul 24-31
Aug 8-15
Aug 24-31
Sep 8-15
Sep 24-30
Oct 8-15
Oct 24-31
Nov 8-15
Nov 24-30
Dec 8-15
Dec 24-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-14
Mar 22-31
17-24
25-39
40-59
60+


Ontario
Nucleocapsid Seroprevalence (%)
100
90
80
70
60
50
40
30
20
10
0
Dec 14-18
Dec 25-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-15
Mar 24-31
Apr 8-15
Apr 24-30
May 8-15
May 24-31
Jun 8-15
Jun 24-30
Jul 8-15
Jul 24-31
Aug 8-15
Aug 24-31
Sep 8-15
Sep 24-30
Oct 8-15
Oct 24-31
Nov 8-15
Nov 24-30
Dec 8-15
Dec 24-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-14
Mar 22-31
17-24
25-39
40-59
60+

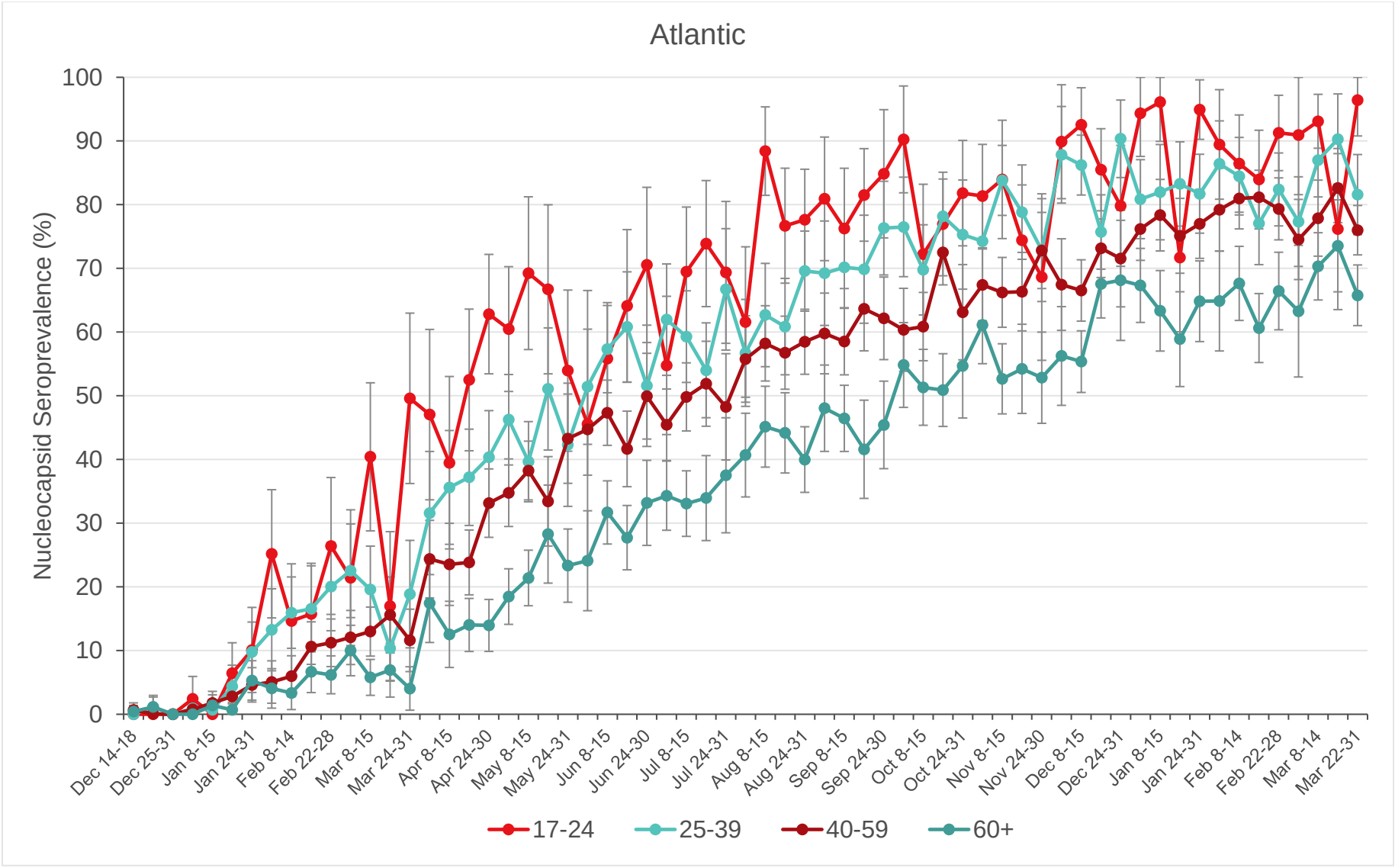

Atlantic
Nucleocapsid Seroprevalence (%)
100
90
80
70
60
50
40
30
20
10
0
Dec 14-18
Dec 25-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-15
Mar 24-31
Apr 8-15
Apr 24-30
May 8-15
May 24-31
Jun 8-15
Jun 24-30
Jul 8-15
Jul 24-31
Aug 8-15
Aug 24-31
Sep 8-15
Sep 24-30
Oct 8-15
Oct 24-31
Nov 8-15
Nov 24-30
Dec 8-15
Dec 24-31
Jan 8-15
Jan 24-31
Feb 8-14
Feb 22-28
Mar 8-14
Mar 22-31
17-24
25-39
40-59
60+

**Figure 5A.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Nucleocapsid antibody results by ethnicity.

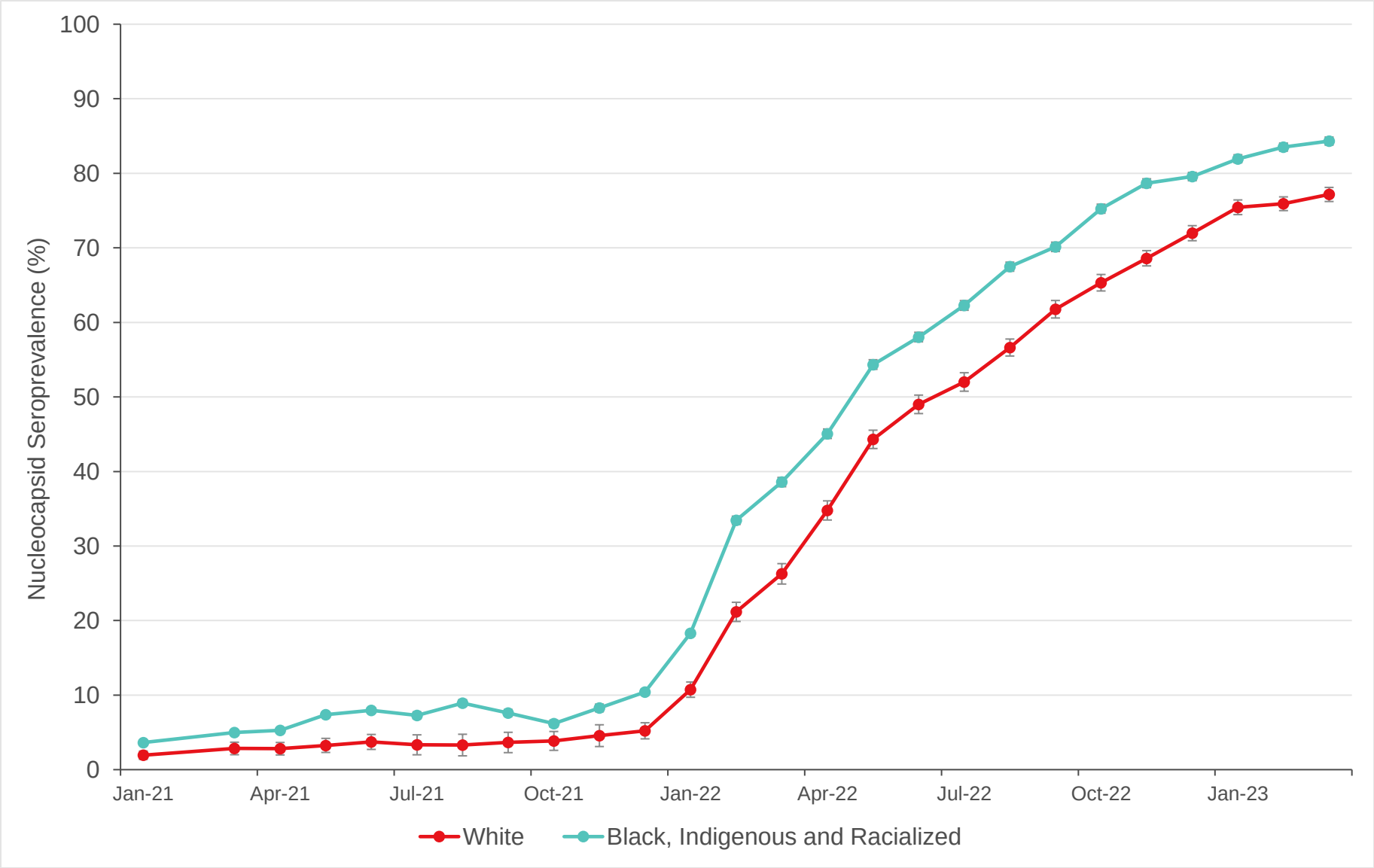


**Figure 5B.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Spike antibody results by ethnicity.

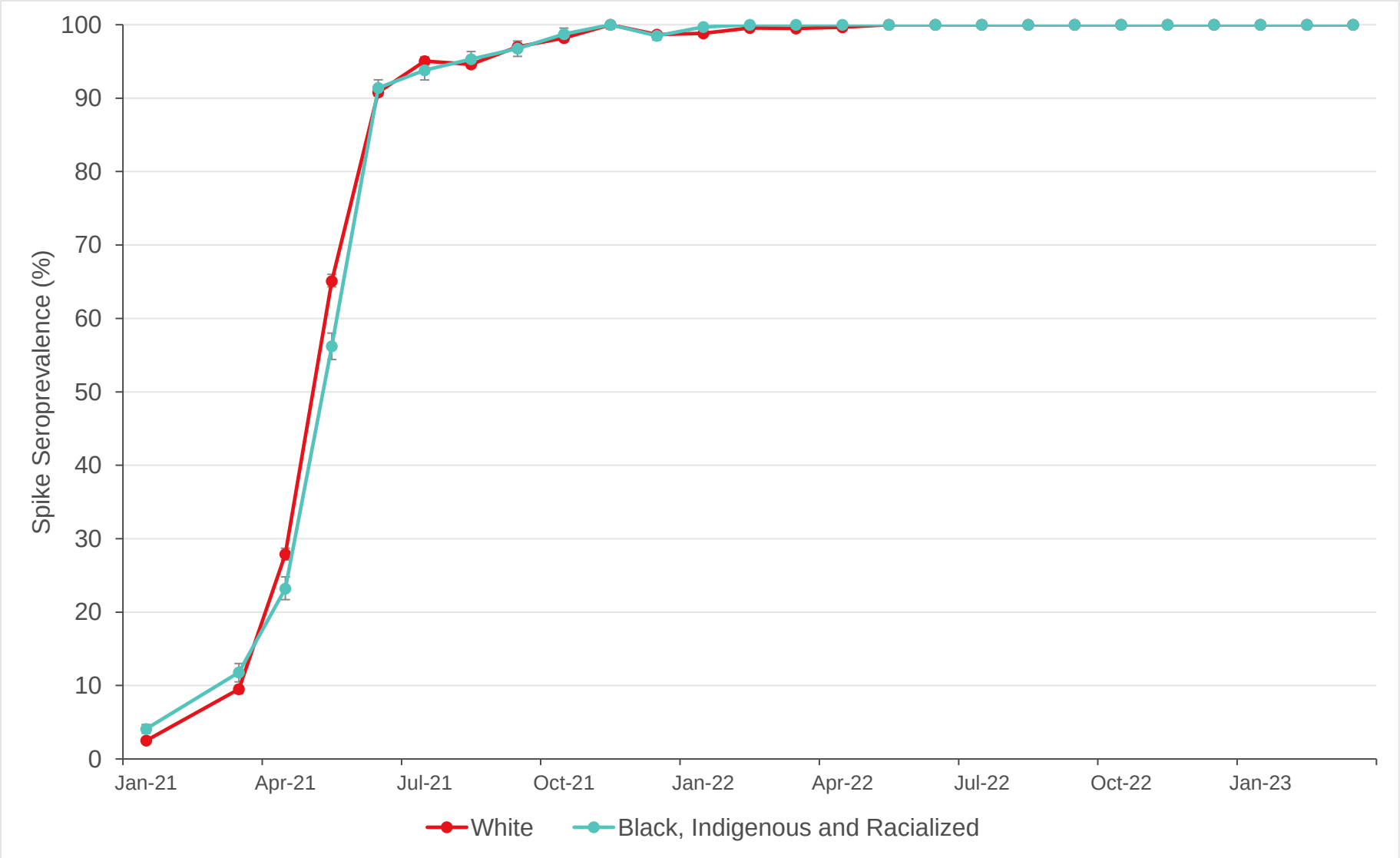


**Figure 5C.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Nucleocapsid antibody results by age group.

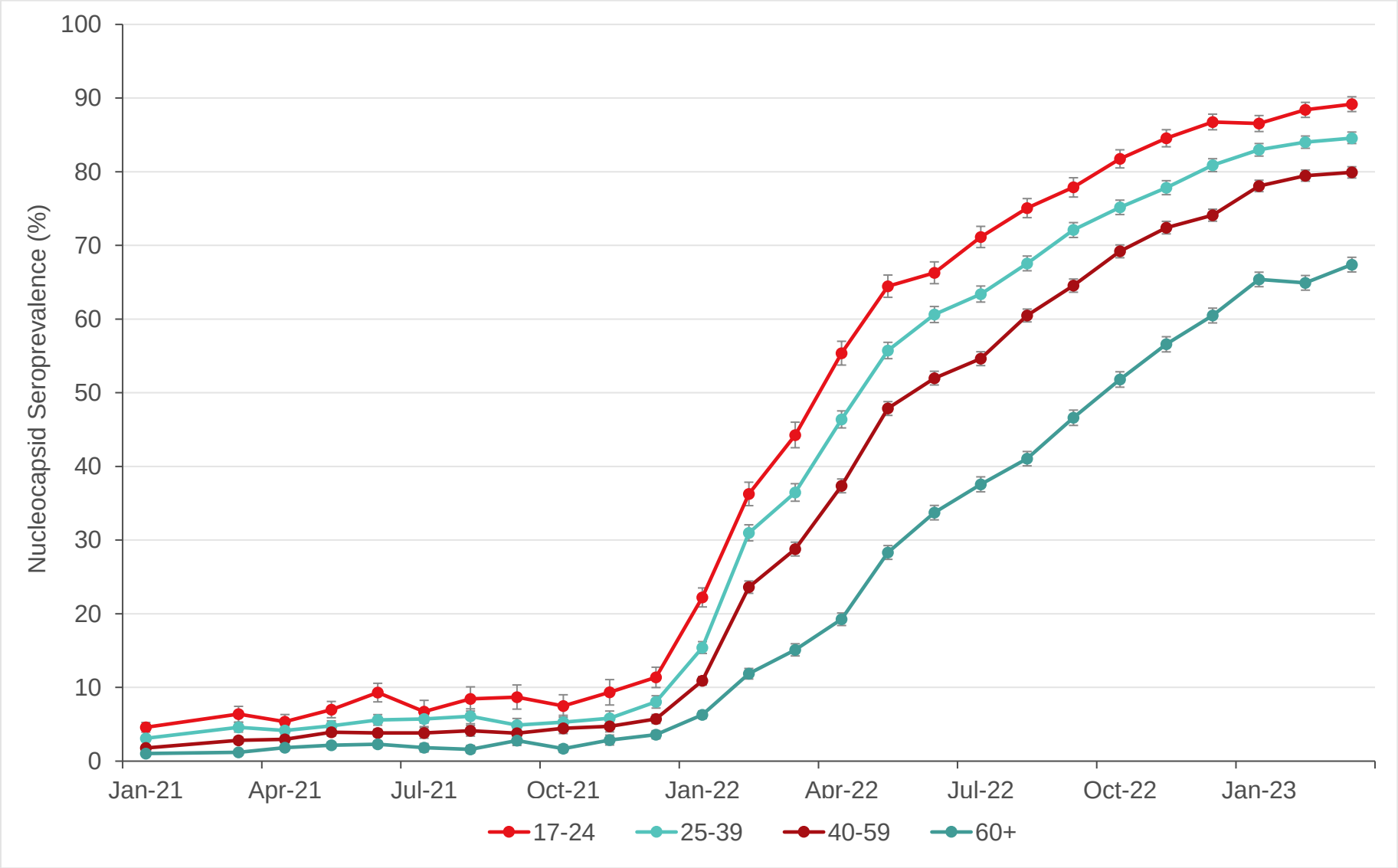


**Figure 5D.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Spike antibody results by age group.

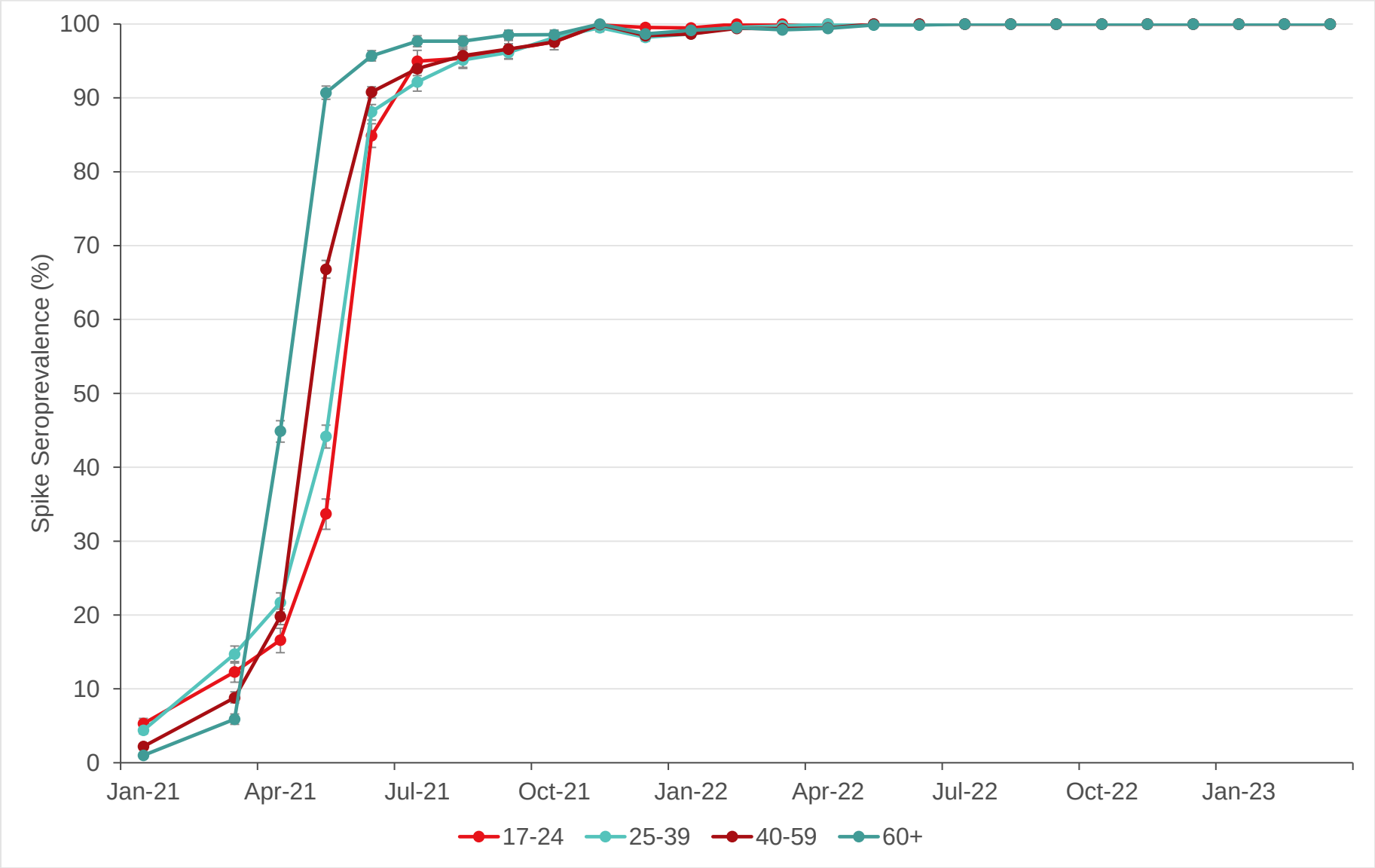


**Figure 5E.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Nucleocapsid antibody results by material deprivation level (1 = least deprived and 5 = most deprived).

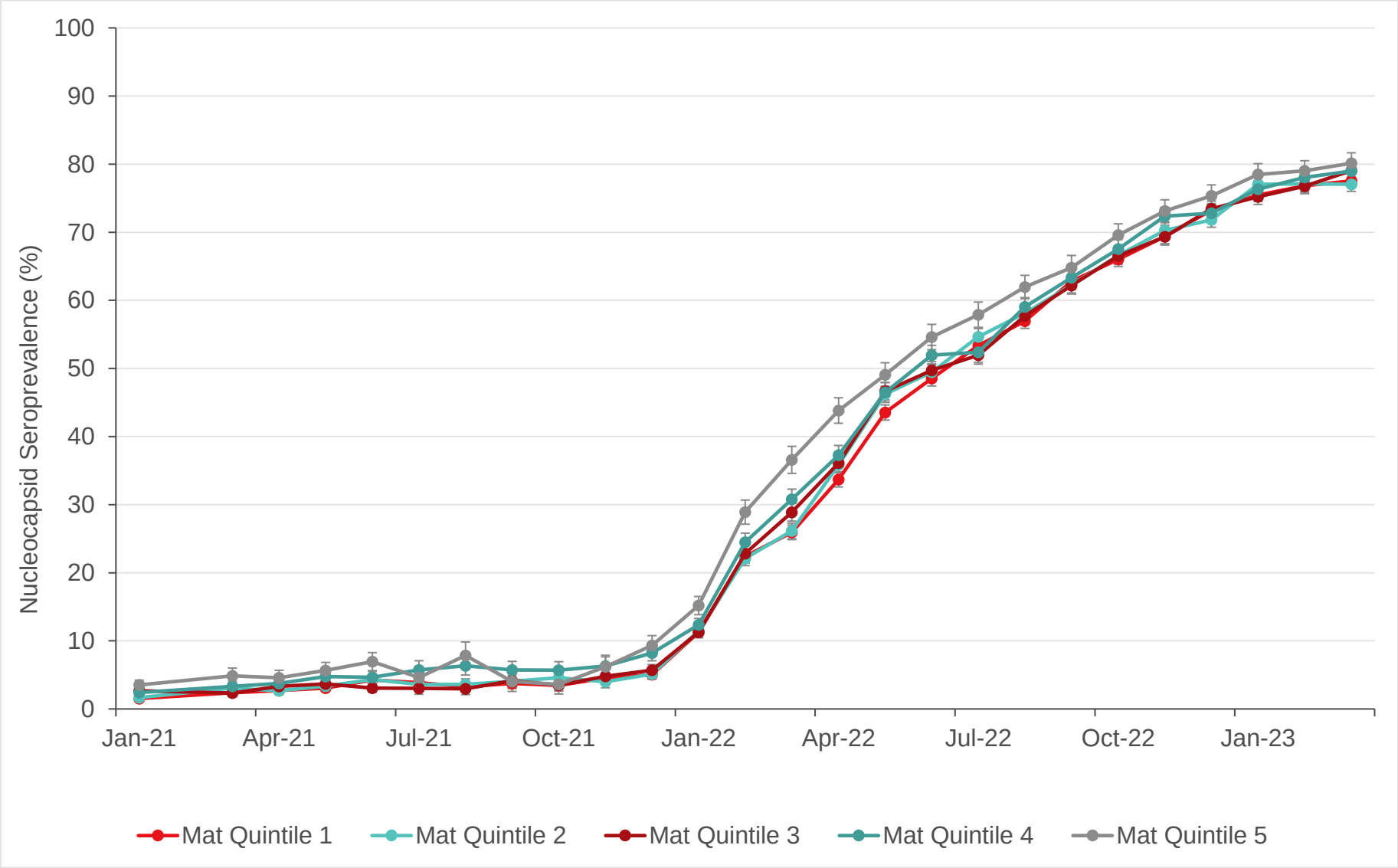


**Figure 5F.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 – March 2023 estimated by Spike antibody results by material deprivation level (1 = least deprived and 5 = most deprived).

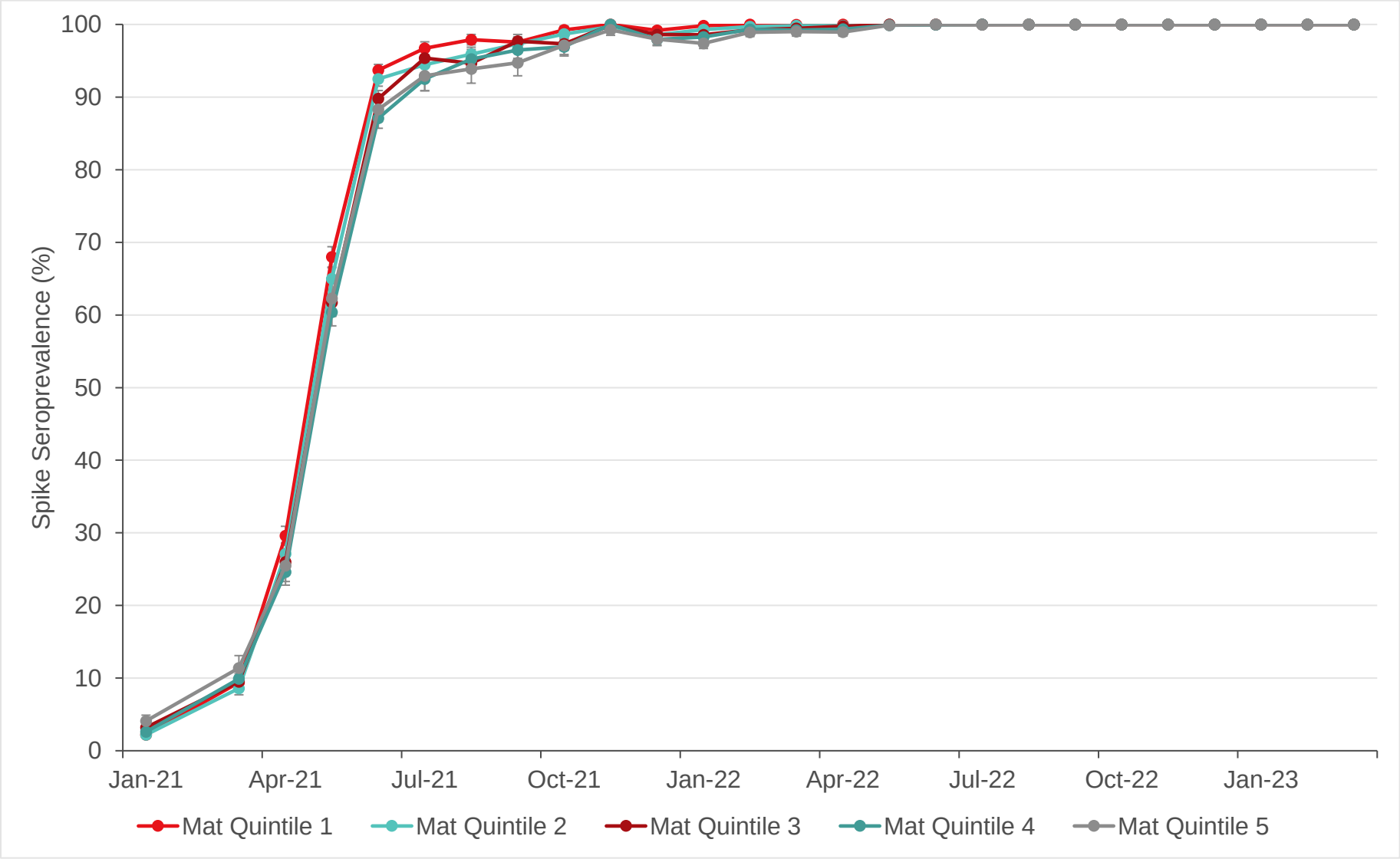


**Figure 5G.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 – March 2023 estimated by Nucleocapsid antibody results by social deprivation level (1 = least deprived and 5 = most deprived).

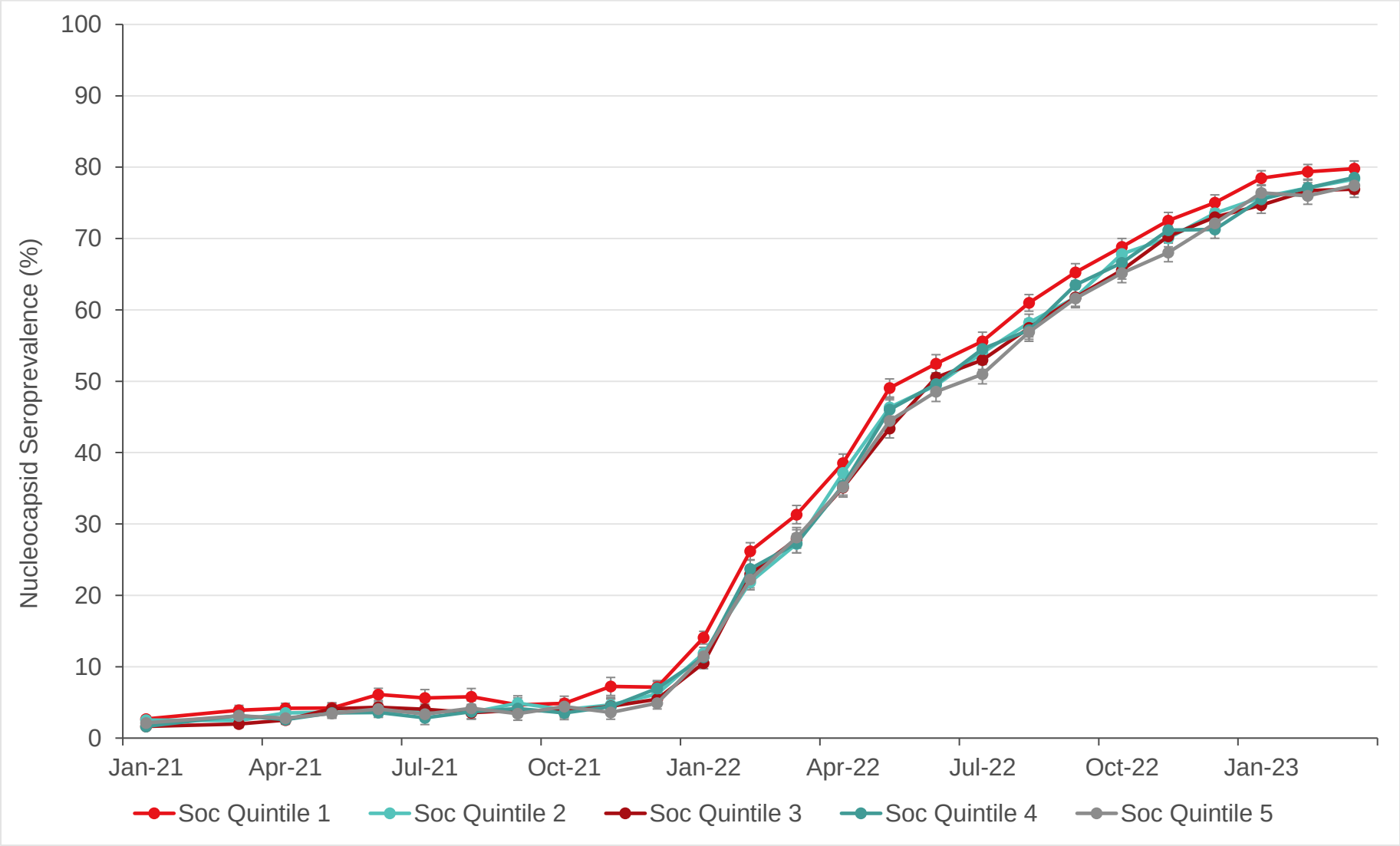


**Figure 5H.** Temporal trends of SARS-CoV-2 seroprevalence by monthly intervals from January 2021 - March 2023 estimated by Spike antibody results by social deprivation level (1 = least deprived and 5 = most deprived).

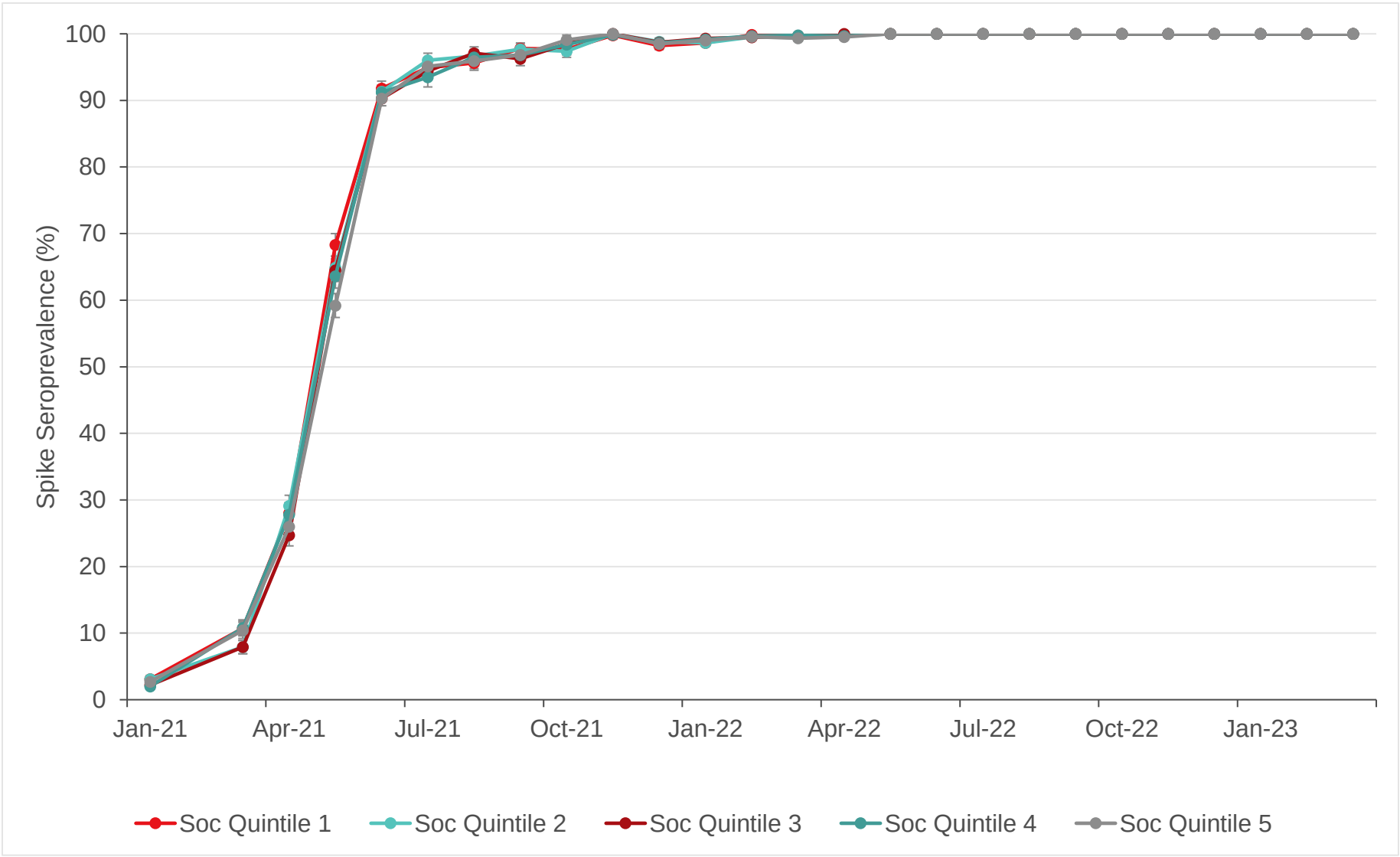


**Table A1.1** British Columbia SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 2,261 | 1,720 | 77.00 | 75.43, 78.58 | 2,261 | 2,254 | 100.00 | 100.00, 100.00 |
| Male | 3,079 | 2,233 | 74.94 | 73.27, 76.60 | 3,078 | 3,066 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 318 | 280 | 88.93 | 86.43, 91.43 | 318 | 318 | 100.00 | 100.00, 100.00 |
| 25-39 | 1,338 | 1,089 | 81.99 | 79.86, 84.12 | 1,338 | 1,338 | 100.00 | 100.00, 100.00 |
| 40-59 | 1,878 | 1,441 | 77.37 | 75.45, 79.28 | 1,878 | 1,868 | 100.00 | 100.00, 100.00 |
| 60+ | 1,806 | 1,143 | 64.85 | 62.54, 67.17 | 1,805 | 1,796 | 100.00 | 100.00, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 1,266 | 921 | 73.95 | 71.55, 76.34 | 1,265 | 1,261 | 100.00 | 100.00, 100.00 |
| 2 | 1,241 | 898 | 74.73 | 72.30, 77.17 | 1,241 | 1,234 | 100.00 | 100.00, 100.00 |
| 3 | 1,014 | 763 | 76.98 | 74.35, 79.60 | 1,014 | 1,010 | 100.00 | 100.00, 100.00 |
| 4 | 741 | 552 | 76.69 | 73.62, 79.75 | 741 | 740 | 100.00 | 100.00, 100.00 |
| 5 (most) | 373 | 279 | 77.51 | 73.45, 81.58 | 373 | 373 | 100.00 | 100.00, 100.00 |
| **Total** | 5,340 | 3,953 | 76.00 | 74.85, 77.14 | 5,339 | 5,320 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 705 (13.2%) of donors which could not be included in the quintiles of Material Deprivation; 540/705 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 79.03% (95% CI 76.00, 82.05); and 702/705 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 100.00% (95% CI 99.60, 100.00).

**Table A1.2** Alberta SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 2,490 | 2,032 | 82.10 | 80.51, 83.70 | 2,490 | 2,481 | 100.00 | 100.00, 100.00 |
| Male | 3,876 | 3,123 | 82.96 | 81.39, 84.53 | 3,876 | 3,858 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 482 | 440 | 91.57 | 89.25, 93.88 | 482 | 482 | 100.00 | 100.00, 100.00 |
| 25-39 | 1,577 | 1,325 | 84.98 | 83.06, 86.91 | 1,577 | 1,573 | 100.00 | 100.00, 100.00 |
| 40-59 | 2,436 | 2,021 | 83.23 | 81.37, 85.10 | 2,436 | 2,426 | 100.00 | 100.00, 100.00 |
| 60+ | 1,871 | 1,369 | 73.10 | 70.37, 75.83 | 1,871 | 1,858 | 100.00 | 99.76, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 2,236 | 1,787 | 81.76 | 79.80, 83.72 | 2,236 | 2,230 | 100.00 | 100.00, 100.00 |
| 2 | 1,274 | 1,022 | 82.06 | 79.53, 84.60 | 1,274 | 1,266 | 100.00 | 99.81, 100.00 |
| 3 | 861 | 714 | 83.49 | 80.52, 86.45 | 861 | 860 | 100.00 | 100.00, 100.00 |
| 4 | 642 | 524 | 83.54 | 80.25, 86.82 | 642 | 638 | 100.00 | 99.57, 100.00 |
| 5 (most) | 256 | 209 | 82.21 | 76.66, 87.75 | 256 | 255 | 99.81 | 98.14, 100.00 |
| **Total** | 6,366 | 5,155 | 82.53 | 81.41, 83.65 | 6,366 | 6,339 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 1097 (17.2%) of donors which could not be included in the quintiles of Material Deprivation. 899/1,097 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 83.23% (95% CI 80.63, 85.84); 1,090/1,097 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 100% (95% CI 100.00, 100.00).

**Table A1.3** Saskatchewan SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 402 | 319 | 81.98 | 78.89, 85.07 | 402 | 400 | 100.00 | 99.83, 100.00 |
| Male | 753 | 564 | 78.70 | 75.37, 82.04 | 753 | 749 | 100.00 | 99.84, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 52 | 45 | 87.04 | 81.66, 92.43 | 52 | 52 | 99.98 | 98.26, 100.00 |
| 25-39 | 168 | 145 | 87.52 | 83.82, 91.22 | 168 | 168 | 100.00 | 99.75, 100.00 |
| 40-59 | 474 | 392 | 83.36 | 79.63, 87.10 | 474 | 472 | 100.00 | 99.26, 100.00 |
| 60+ | 461 | 301 | 66.95 | 61.87, 72.03 | 461 | 457 | 99.83 | 98.58, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 423 | 308 | 78.57 | 74.69, 82.45 | 423 | 422 | 100.00 | 99.74, 100.00 |
| 2 | 238 | 181 | 79.55 | 74.42, 84.69 | 238 | 237 | 100.00 | 98.89, 100.00 |
| 3 | 188 | 149 | 78.86 | 73.10, 84.62 | 188 | 186 | 99.72 | 98.03, 100.00 |
| 4 | 113 | 90 | 84.21 | 77.57, 90.85 | 113 | 112 | 98.57 | 95.73, 100.00 |
| 5 (most) | 24 | 15 | 72.52 | 53.86, 91.18 | 24 | 24 | 93.78 | 83.67, 100.00 |
| **Total** | 1,155 | 883 | 80.37 | 78.09, 82.64 | 1,155 | 1,149 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 169 (14.6%) of donors which could not be included in the quintiles of Material Deprivation 140/169 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 85.94% (95% CI 80.77, 91.11); 168/169 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 99.86% (95% CI 98.18, 100.00).

**Table A1.4** Manitoba SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 487 | 378 | 80.79 | 77.87, 83.70 | 487 | 486 | 100.00 | 100.00, 100.00 |
| Male | 857 | 656 | 79.96 | 76.93, 82.99 | 857 | 856 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 96 | 87 | 91.03 | 86.88, 95.19 | 96 | 96 | 100.00 | 98.81, 100.00 |
| 25-39 | 198 | 168 | 86.78 | 83.20, 90.37 | 198 | 197 | 100.00 | 99.31, 100.00 |
| 40-59 | 500 | 407 | 81.02 | 77.44, 84.61 | 500 | 500 | 100.00 | 100.00, 100.00 |
| 60+ | 550 | 372 | 68.48 | 63.82, 73.14 | 550 | 549 | 100.00 | 99.56, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 314 | 233 | 77.61 | 72.95, 82.27 | 314 | 314 | 100.00 | 99.73, 100.00 |
| 2 | 258 | 199 | 78.99 | 73.96, 84.01 | 258 | 258 | 100.00 | 99.42, 100.00 |
| 3 | 269 | 209 | 80.58 | 75.96, 85.20 | 269 | 269 | 100.00 | 99.61, 100.00 |
| 4 | 188 | 135 | 76.46 | 70.51, 82.42 | 188 | 188 | 100.00 | 98.90, 100.00 |
| 5 (most) | 100 | 85 | 88.62 | 82.53, 94.71 | 100 | 98 | 98.98 | 96.19, 100.00 |
| **Total** | 1,344 | 1,034 | 80.38 | 78.28, 82.48 | 1,344 | 1,342 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 215 (16.0%) of donors which could not be included in the quintiles of Material Deprivation; 173/215 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 84.83% (95% CI 80.20, 89.46); 215/215 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 100.00% (95% CI 99.27, 100.00).

**Table A1.5** Ontario SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 5,750 | 4,505 | 78.65 | 77.74, 79.56 | 5,749 | 5,738 | 100.00 | 100.00, 100.00 |
| Male | 8,846 | 6,768 | 78.03 | 77.08, 78.99 | 8,847 | 8,805 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 1,115 | 985 | 88.26 | 86.80, 89.71 | 1,115 | 1,115 | 100.00 | 100.00, 100.00 |
| 25-39 | 3,589 | 3,006 | 85.04 | 83.86, 86.22 | 3,590 | 3,582 | 100.00 | 100.00, 100.00 |
| 40-59 | 5,496 | 4,348 | 79.70 | 78.61, 80.78 | 5,495 | 5,473 | 100.00 | 100.00, 100.00 |
| 60+ | 4,396 | 2,934 | 66.65 | 65.24, 68.06 | 4,396 | 4,373 | 100.00 | 100.00, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 3,352 | 2,547 | 77.31 | 75.95, 78.67 | 3,352 | 3,343 | 100.00 | 100.00, 100.00 |
| 2 | 3,155 | 2,372 | 75.88 | 74.37, 77.39 | 3,155 | 3,140 | 100.00 | 100.00, 100.00 |
| 3 | 2,977 | 2,299 | 77.80 | 76.30, 79.30 | 2,977 | 2,966 | 100.00 | 100.00, 100.00 |
| 4 | 2,235 | 1,753 | 79.84 | 78.17, 81.50 | 2,235 | 2,226 | 100.00 | 100.00, 100.00 |
| 5 (most) | 1,301 | 1,043 | 81.40 | 79.40, 83.40 | 1,301 | 1,296 | 100.00 | 100.00, 100.00 |
| Total | 14,596 | 11,273 | 78.35 | 77.69, 79.01 | 14,596 | 14,543 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 1,576 (10.8%) of donors which could not be included in the quintiles of Material Deprivation.1,259/1,576 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 81.57% (95% CI 79.70, 83.45); 1,572/1,576 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 100.00% (95% CI 100.00, 100.00).

**Table A1.6** Atlantic Region SARS-CoV-2 seroprevalence, Nucleocapsid vs. Spike antibody results in March 2023

| | Nucleocapsid Antibody Results (proxy for natural infection) | | | | Spike Antibody Results (proxy for humoral immunity by either natural infection or vaccination) | | | |
|---|---|---|---|---|---|---|---|---|
| | Crude | | Adjusted | | Crude | | Adjusted | |
| | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval | Number Tested | Number Positive | Percent Positive | 95% Confidence Interval |
| **Sex** | | | | | | | | |
| Female | 726 | 566 | 78.40 | 76.22, 80.57 | 726 | 726 | 100.00 | 100.00, 100.00 |
| Male | 1,266 | 931 | 76.91 | 74.60, 79.22 | 1,266 | 1,264 | 100.00 | 100.00, 100.00 |
| **Age** | | | | | | | | |
| 17-24 | 134 | 122 | 90.94 | 87.59, 94.30 | 134 | 134 | 100.00 | 99.64, 100.00 |
| 25-39 | 225 | 187 | 83.14 | 79.97, 86.30 | 225 | 225 | 100.00 | 100.00, 100.00 |
| 40-59 | 749 | 587 | 78.70 | 76.09, 81.31 | 749 | 748 | 100.00 | 100.00, 100.00 |
| 60+ | 884 | 601 | 68.85 | 65.79, 71.90 | 884 | 883 | 100.00 | 100.00, 100.00 |
| **Material Deprivation[1]** | | | | | | | | |
| 1 (least) | 293 | 211 | 74.12 | 69.84, 78.40 | 293 | 293 | 100.00 | 100.00, 100.00 |
| 2 | 368 | 282 | 78.80 | 75.27, 82.33 | 368 | 368 | 100.00 | 100.00, 100.00 |
| 3 | 358 | 291 | 84.60 | 81.33, 87.87 | 358 | 358 | 100.00 | 100.00, 100.00 |
| 4 | 401 | 287 | 74.16 | 70.50, 77.82 | 401 | 401 | 100.00 | 100.00, 100.00 |
| 5 (most) | 389 | 288 | 76.01 | 72.13, 79.89 | 389 | 387 | 100.00 | 99.50, 100.00 |
| **Total** | 1,992 | 1,497 | 77.68 | 76.10, 79.26 | 1,992 | 1,990 | 100.00 | 100.00, 100.00 |

[1]Postal codes were missing for 183 (9.2%) of donors which could not be included in the quintiles of Material Deprivation; 138/183 were positive by the Nucleocapsid antibody, adjusted SARS-CoV-2 seroprevalence among missing postal codes was 78.81% (95% CI 73.81, 83.81); 183/183 were positive by the Spike antibody, adjusted SARS-CoV-2 seroprevalence was 100.00% (95% CI 99.45, 100.00).

**Table A2.1.** Weekly SARS-CoV-2 seroprevalence by sociodemographic variables by Nucleocapsid results in March 2023

| | March 1-7 | | | March 8-14 | | | March 15-21 | | | March 22-31 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Crude | Adjusted | | Crude | Adjusted | | Crude | Adjusted | | Crude | Adjusted | |
| | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI |
| **Sex** | | | | | | | | | | | | |
| Female | 2,227 (1,736) | 78.57 | 77.07, 80.07 | 3,093 (2,433) | 79.22 | 77.93, 80.50 | 2,587 (2,046) | 79.88 | 78.50, 81.25 | 4,209 (3,305) | 78.72 | 77.64, 79.80 |
| Male | 3,743 (2,818) | 77.34 | 75.79, 78.89 | 5,015 (3,788) | 77.61 | 76.30, 78.92 | 4,083 (3,155) | 78.92 | 77.49, 80.35 | 5,836 (4,514) | 78.70 | 77.53, 79.87 |
| **Age** | | | | | | | | | | | | |
| 17-24 | 387 (348) | 90.18 | 87.90, 92.47 | 594 (536) | 90.37 | 88.50, 92.23 | 482 (428) | 89.18 | 87.02, 91.35 | 734 (647) | 87.55 | 85.74, 89.37 |
| 25-39 | 1,203 (980) | 82.68 | 80.69, 84.68 | 1,895 (1,572) | 84.27 | 82.61, 85.92 | 1,597 (1,334) | 84.24 | 82.44, 86.04 | 2,400 (2,034) | 85.94 | 84.59, 87.30 |
| 40-59 | 2,319 (1,829) | 79.67 | 77.92, 81.43 | 2,988 (2,383) | 79.69 | 78.16, 81.21 | 2,520 (2,013) | 79.84 | 78.18, 81.49 | 3,706 (2,971) | 79.96 | 78.64, 81.28 |
| 60+ | 2,061 (1,397) | 66.67 | 64.37, 68.96 | 2,631 (1,730) | 66.51 | 64.55, 68.48 | 2,071 (1,426) | 70.00 | 67.86, 72.14 | 3,205 (2,167) | 66.71 | 64.99, 68.43 |
| **Province** | | | | | | | | | | | | |
| British Columbia | 1,145 (841) | 75.50 | 73.00, 77.99 | 1,271 (925) | 74.43 | 72.01, 76.85 | 1,185 (857) | 74.95 | 72.52, 77.37 | 1,739 (1,330) | 78.32 | 76.40, 80.25 |
| Alberta | 1,477 (1,170) | 81.53 | 79.09, 83.97 | 1,472 (1,183) | 82.18 | 79.82, 84.53 | 1,363 (1,128) | 84.53 | 82.26, 86.81 | 2,054 (1,674) | 82.49 | 80.56, 84.43 |
| Saskatchewan | 197 (157) | 83.47 | 79.29, 87.64 | 243 (174) | 76.53 | 70.49, 82.57 | 257 (191) | 78.00 | 72.70, 83.29 | 458 (361) | 81.31 | 77.83, 84.79 |
| Manitoba | 169 (131) | 83.46 | 78.98, 87.94 | 307 (229) | 78.09 | 73.10, 83.08 | 330 (257) | 81.28 | 76.94, 85.62 | 538 (417) | 80.53 | 77.45, 83.62 |
| Ontario | 2,747 (2,077) | 76.94 | 75.31, 78.57 | 4,222 (3,256) | 78.57 | 77.34, 79.80 | 3,157 (2,471) | 79.35 | 77.95, 80.76 | 4,470 (3,469) | 78.18 | 77.02, 79.35 |
| New Brunswick | 70 (46) | 65.15 | 58.37, 71.93 | 103 (77) | 80.96 | 74.17, 87.74 | 185 (152) | 84.88 | 79.88, 89.89 | 389 (294) | 76.98 | 72.75, 81.21 |
| Nova Scotia | 54 (44) | 80.13 | 72.81, 87.45 | 216 (159) | 77.54 | 72.91, 82.18 | 56 (39) | 72.49 | 63.68, 81.30 | 301 (209) | 71.63 | 67.79, 75.46 |
| Prince Edward Island | 21 (19) | 95.08 | 89.21, 100.00 | 12 (8) | 82.84 | 69.66, 96.02 | 1 (1) | 59.43 | 14.73, 100.00 | 29 (19) | 84.20 | 74.27, 94.13 |
| Newfoundland | 90 (69) | 78.31 | 68.73, 87.89 | 262 (210) | 80.77 | 76.13, 85.41 | 136 (105) | 79.09 | 72.51, 85.67 | 67 (46) | 69.09 | 58.48, 79.70 |
| **Metro area** | | | | | | | | | | | | |
| Vancouver | 584 (438) | 75.99 | 72.45, 79.54 | 751 (582) | 77.79 | 74.91, 80.67 | 600 (455) | 77.38 | 74.22, 80.55 | 897 (715) | 81.03 | 78.62, 83.45 |
| Calgary | 474 (376) | 82.13 | 77.71, 86.56 | 577 (469) | 83.18 | 79.25, 87.11 | 481 (387) | 81.13 | 76.64, 85.61 | 789 (626) | 80.06 | 76.55, 83.56 |
| Edmonton | 483 (369) | 77.36 | 72.85, 81.86 | 411 (322) | 80.13 | 75.82, 84.44 | 406 (337) | 85.43 | 81.65, 89.21 | 623 (510) | 82.64 | 79.34, 85.95 |
| Ottawa | 351 (253) | 73.24 | 67.27, 79.22 | 524 (383) | 74.59 | 69.73, 79.44 | 375 (281) | 76.63 | 71.05, 82.22 | 494 (361) | 72.63 | 67.56, 77.71 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Toronto | 607 (480) | 80.66 | 78.08, 83.24 | 1,318 (1,045) | 79.92 | 78.12, 81.72 | 1,022 (818) | 80.16 | 78.11, 82.22 | 1,348 (1,073) | 79.51 | 77.79, 81.22 |
| Winnipeg | 74 (55) | 76.49 | 68.80, 84.18 | 224 (162) | 75.88 | 69.76, 82.00 | 199 (158) | 83.54 | 78.14, 88.94 | 318 (238) | 77.66 | 73.38, 81.93 |
| **Ethnicity[1]** | | | | | | | | | | | | |
| White | 4,887 (3,671) | 76.49 | 75.26, 77.71 | 6,433 (4,851) | 76.79 | 75.72, 77.86 | 5,253 (4,022) | 77.87 | 76.71, 79.03 | 8,075 (6,182) | 77.34 | 76.43, 78.25 |
| Indigenous | 82 (62) | 79.17 | 70.58, 87.77 | 106 (80) | 78.37 | 70.44, 86.29 | 97 (77) | 83.59 | 75.92, 91.27 | 118 (92) | 79.64 | 72.30, 86.99 |
| Asian | 476 (388) | 84.54 | 81.35, 87.73 | 774 (642) | 83.71 | 81.25, 86.17 | 629 (527) | 84.74 | 82.05, 87.43 | 875 (742) | 85.22 | 83.01, 87.42 |
| Other Racialized groups | 385 (321) | 86.09 | 82.59, 89.59 | 609 (505) | 85.58 | 82.82, 88.33 | 511 (432) | 85.52 | 82.51, 88.52 | 720 (599) | 83.03 | 80.36, 85.70 |
| **Social Deprivation[2]** | | | | | | | | | | | | |
| 1 (least deprived) | 1,194 (909) | 78.83 | 76.42, 81.25 | 1,500 (1,176) | 80.31 | 78.25, 82.36 | 1,310 (1,017) | 78.93 | 76.64, 81.21 | 1,947 (1,555) | 80.37 | 78.63, 82.11 |
| 2 | 1,052 (802) | 77.38 | 74.77, 79.98 | 1,603 (1,222) | 76.09 | 73.92, 78.26 | 1,284 (973) | 77.59 | 75.23, 79.96 | 1,848 (1,446) | 80.90 | 79.09, 82.72 |
| 3 | 1,018 (768) | 76.88 | 74.16, 79.59 | 1,416 (1,060) | 77.14 | 74.90, 79.37 | 1,119 (862) | 78.48 | 76.05, 80.91 | 1,843 (1,396) | 76.20 | 74.29, 78.12 |
| 4 | 996 (762) | 77.90 | 75.34, 80.47 | 1,321 (1,016) | 78.76 | 76.51, 81.02 | 1,069 (850) | 80.98 | 78.59, 83.37 | 1,603 (1,240) | 77.23 | 75.23, 79.24 |
| 5 (most deprived) | 950 (711) | 75.79 | 73.05, 78.52 | 1,237 (934) | 78.74 | 76.44, 81.03 | 1,025 (790) | 78.04 | 75.46, 80.63 | 1,513 (1,157) | 76.51 | 74.44, 78.58 |
| **Material Deprivation[2]** | | | | | | | | | | | | |
| 1 (least deprived) | 1,514 (1,138) | 77.01 | 74.84, 79.19 | 2,067 (1,561) | 77.56 | 75.71, 79.41 | 1,680 (1,289) | 78.32 | 76.28, 80.35 | 2,623 (2,019) | 77.66 | 76.07, 79.24 |
| 2 | 1,206 (907) | 77.01 | 74.51, 79.52 | 1,698 (1,265) | 74.74 | 72.56, 76.91 | 1,476 (1,119) | 76.91 | 74.69, 79.12 | 2,154 (1,663) | 78.85 | 77.14, 80.57 |
| 3 | 1,171 (908) | 79.13 | 76.79, 81.48 | 1,416 (1,119) | 81.12 | 79.03, 83.20 | 1,252 (971) | 77.77 | 75.39, 80.16 | 1,828 (1,427) | 77.94 | 76.06, 79.83 |
| 4 | 872 (655) | 76.64 | 73.77, 79.50 | 1,151 (872) | 77.52 | 75.06, 79.98 | 889 (709) | 82.56 | 80.04, 85.08 | 1,408 (1,105) | 78.67 | 76.60, 80.74 |
| 5 (most deprived) | 447 (344) | 76.65 | 72.75, 80.54 | 745 (591) | 82.06 | 79.43, 84.69 | 510 (404) | 81.01 | 77.67, 84.34 | 741 (580) | 79.29 | 76.51, 82.08 |
| Total | 5,970 (4,554) | 77.97 | 76.89, 79.04 | 8,108 (6,221) | 78.41 | 77.49, 79.32 | 6,670 (5,201) | 79.41 | 78.42, 80.40 | 10,045 (7,819) | 78.71 | 77.92, 79.50 |

[1]In Week 1, self reported ethnicity was missing for 140 (2.3%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 80.51% (95% CI 73.49, 87.54).
In Week 2, self reported ethnicity was missing for 186 (2.3%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 81.07% (95% CI 75.45, 86.69).
In Week 3, self reported ethnicity was missing for 180 (2.7%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 80.68% (95% CI 74.85, 86.51).
In Week 4, self reported ethnicity was missing for 257 (2.6%) donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 83.01% (95% CI 78.46, 87.56).

[2]In Week 1, postal codes were missing for 760 (12.7%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 81.76% (95% CI 78.94, 84.58).
In Week 2, postal codes were missing for 1,031 (12.7%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 80.01% (95% CI 77.51, 82.51).
In Week 3, postal codes were missing for 863 (12.9%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 83.49% (95% CI 80.99, 85.98).
In Week 4, postal codes were missing for 1,291 (12.8%) of donors; Adjusted seroprevalence by the Nucleocapsid antibody assay was 81.52% (95% CI 79.35, 83.68).

**Table A2.2.** Weekly SARS-CoV-2 seroprevalence by province and age group by Nucleocapsid results in March 2023

| | March 1-7 | | | March 8-14 | | | March 15-21 | | | March 22-31 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Adjusted | | | Adjusted | | | Adjusted | | | Adjusted | | |
| | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI | N Tested (N Positive) | Percent Positive | 95% CI |
| **British Columbia** | | | | | | | | | | | | |
| 17-24 | 77 (67) | 86.15 | 80.88, 91.42 | 52 (45) | 85.16 | 77.89, 92.44 | 86 (76) | 90.02 | 85.59, 94.45 | 103 (92) | 90.07 | 86.01, 94.13 |
| 25-39 | 219 (173) | 80.39 | 75.39, 85.39 | 302 (246) | 82.29 | 77.81, 86.77 | 332 (270) | 81.97 | 77.78, 86.16 | 485 (400) | 82.88 | 79.40, 86.36 |
| 40-59 | 420 (325) | 78.08 | 73.99, 82.18 | 476 (363) | 77.29 | 73.49, 81.09 | 388 (288) | 74.41 | 69.99, 78.83 | 594 (465) | 78.64 | 75.33, 81.95 |
| 60+ | 429 (276) | 64.62 | 59.66, 69.59 | 441 (271) | 63.24 | 58.56, 67.92 | 379 (223) | 60.97 | 55.84, 66.11 | 557 (373) | 68.76 | 64.70, 72.82 |
| Total | 1,145 (841) | 75.61 | 73.14, 78.09 | 1,271 (925) | 74.43 | 72.01, 76.85 | 1,185 (857) | 74.95 | 72.52, 77.37 | 1,739 (1,330) | 78.32 | 76.40, 80.25 |
| **Alberta** | | | | | | | | | | | | |
| 17-24 | 68 (63) | 94.19 | 89.35, 99.03 | 119 (108) | 91.74 | 87.13, 96.35 | 136 (126) | 92.54 | 88.38, 96.71 | 159 (143) | 89.87 | 85.54, 94.19 |
| 25-39 | 257 (213) | 83.63 | 79.05, 88.21 | 359 (292) | 81.84 | 77.49, 86.19 | 371 (323) | 88.38 | 84.77, 92.00 | 590 (497) | 85.00 | 81.87, 88.13 |
| 40-59 | 607 (497) | 82.38 | 78.44, 86.32 | 574 (479) | 84.04 | 80.27, 87.81 | 512 (418) | 81.60 | 77.35, 85.84 | 743 (627) | 84.25 | 80.96, 87.55 |
| 60+ | 545 (397) | 74.06 | 68.79, 79.33 | 420 (304) | 72.91 | 66.90, 78.93 | 344 (261) | 76.42 | 70.34, 82.50 | 562 (407) | 71.40 | 66.44, 76.37 |
| Total | 1,477 (1,170) | 81.60 | 79.16, 84.03 | 1,472 (1,183) | 82.18 | 79.82, 84.53 | 1,363 (1,128) | 84.53 | 82.26, 86.81 | 2,054 (1,674) | 82.49 | 80.56, 84.43 |
| **Saskatchewan** | | | | | | | | | | | | |
| 17-24 | 23 (21) | 91.71 | 84.44, 98.98 | 5 (5) | 90.11 | 76.18, 100.00 | 7 (7) | 92.65 | 81.99, 100.00 | 17 (12) | 71.33 | 58.78, 83.87 |
| 25-39 | 54 (47) | 87.26 | 81.24, 93.27 | 10 (8) | 87.06 | 72.77, 100.00 | 26 (20) | 79.30 | 66.87, 91.73 | 78 (70) | 90.73 | 85.91, 95.56 |
| 40-59 | 70 (57) | 84.09 | 76.21, 91.98 | 104 (87) | 84.45 | 76.05, 92.85 | 109 (87) | 81.26 | 73.15, 89.36 | 191 (161) | 84.12 | 78.55, 89.69 |
| 60+ | 50 (32) | 60.30 | 46.72, 73.88 | 124 (74) | 62.40 | 51.90, 72.91 | 115 (77) | 68.51 | 58.64, 78.39 | 172 (118) | 70.66 | 62.66, 78.66 |
| Total | 197 (157) | 82.93 | 78.73, 87.13 | 243 (174) | 76.53 | 70.49, 82.57 | 257 (191) | 78.00 | 72.70, 83.29 | 458 (361) | 81.31 | 77.83, 84.79 |
| **Manitoba** | | | | | | | | | | | | |
| 17-24 | 8 (8) | 95.14 | 87.77, 100.00 | 14 (13) | 93.45 | 83.90, 100.00 | 22 (20) | 91.62 | 83.20, 100.00 | 52 (46) | 88.69 | 82.48, 94.91 |
| 25-39 | 30 (24) | 85.10 | 78.44, 91.76 | 12 (11) | 88.26 | 74.94, 100.00 | 29 (26) | 91.21 | 82.47, 99.96 | 127 (107) | 86.11 | 81.62, 90.59 |
| 40-59 | 46 (39) | 85.54 | 77.34, 93.74 | 111 (87) | 80.29 | 72.26, 88.32 | 141 (122) | 85.22 | 79.10, 91.34 | 202 (159) | 77.51 | 71.60, 83.41 |
| 60+ | 85 (60) | 69.86 | 57.75, 81.97 | 170 (118) | 70.93 | 62.82, 79.05 | 138 (89) | 66.98 | 57.61, 76.36 | 157 (105) | 66.38 | 57.54, 75.23 |
| Total | 169 (131) | 83.91 | 79.50, 88.32 | 307 (229) | 78.09 | 73.10, 83.08 | 330 (257) | 81.28 | 76.94, 85.62 | 538 (417) | 80.53 | 77.45, 83.62 |
| **Ontario** | | | | | | | | | | | | |
| 17-24 | 183 (164) | 89.44 | 85.88, 93.00 | 337 (302) | 89.77 | 87.25, 92.29 | 210 (183) | 87.92 | 84.52, 91.32 | 385 (336) | 86.33 | 83.75, 88.91 |
| 25-39 | 579 (473) | 83.07 | 79.85, 86.30 | 1,144 (957) | 84.97 | 82.86, 87.08 | 801 (662) | 82.93 | 80.31, 85.55 | 1,065 (914) | 87.58 | 85.60, 89.55 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40-59 | 1,099 (850) | 79.26 | 76.67, 81.84 | 1,558 (1,235) | 79.32 | 77.27, 81.38 | 1,209 (966) | 79.93 | 77.62, 82.24 | 1,630 (1,297) | 80.19 | 78.26, 82.12 |
| 60+ | 886 (590) | 65.58 | 62.28, 68.87 | 1,183 (762) | 65.34 | 62.55, 68.14 | 937 (660) | 72.01 | 69.08, 74.94 | 1,390 (922) | 64.89 | 62.43, 67.35 |
| Total | 2,747 (2,077) | 76.96 | 75.33, 78.60 | 4,222 (3,256) | 78.57 | 77.34, 79.80 | 3,157 (2,471) | 79.35 | 77.95, 80.76 | 4,470 (3,469) | 78.18 | 77.02, 79.35 |
| **Atlantic Canada** | | | | | | | | | | | | |
| 17-24 | 28 (25) | 90.95 | 81.58, 100.00 | 67 (63) | 93.10 | 88.87, 97.33 | 21 (16) | 76.17 | 63.53, 88.82 | 18 (18) | 96.43 | 90.79, 100.00 |
| 25-39 | 64 (50) | 77.34 | 70.31, 84.38 | 68 (58) | 86.98 | 81.22, 92.73 | 38 (33) | 90.30 | 83.22, 97.39 | 55 (46) | 81.59 | 75.31, 87.88 |
| 40-59 | 77 (61) | 74.54 | 68.25, 80.83 | 165 (132) | 77.89 | 71.92, 83.86 | 161 (132) | 82.61 | 77.19, 88.02 | 346 (262) | 76.00 | 72.12, 79.88 |
| 60+ | 66 (42) | 63.28 | 52.95, 73.62 | 293 (201) | 70.32 | 65.04, 75.60 | 158 (116) | 73.54 | 66.32, 80.76 | 367 (242) | 65.78 | 61.02, 70.54 |
| Total | 235 (178) | 74.67 | 70.61, 78.73 | 593 (454) | 79.55 | 76.66, 82.44 | 378 (297) | 80.26 | 76.56, 83.96 | 786 (568) | 74.05 | 71.38, 76.72 |
| **Total** | 5,970 (4,554) | 77.96 | 76.88, 79.03 | 8,108 (6,221) | 78.41 | 77.49, 79.32 | 6,670 (5,201) | 79.41 | 78.42, 80.40 | 10,045 (7,819) | 78.71 | 77.92, 79.50 |