Seroprevalence of SARS-CoV-2 antibodies among children in the Greater Toronto Area

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TARGet Kids!

UNIVERSITY OF TORONTO
DALLA LANA SCHOOL OF PUBLIC HEALTH

COVID-19 IMMUNITY TASK FORCE

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Conflict of Interest Declaration

- I have no conflicts of interest to disclose.

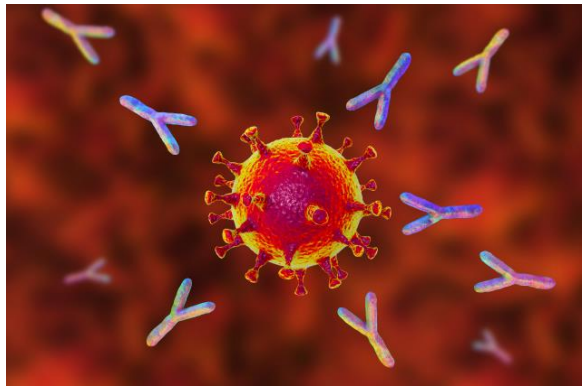
COVID-19 in the GTA

- The Greater Toronto Area (GTA) is a Covid-19 hotspot in Canada
- 1,070,635 children live in the GTA[1]
- Children are an important source of community transmission
- 123,873 confirmed cases of COVID-19 among children <12 years in the Ontario[2]
  - 2000 children with COVID-19 have required hospitalization[2]

1. Government of Canada SC. Census Profile, 2016 Census - Toronto [Census metropolitan area], Ontario and Ontario [Province]. Published February 8, 2017. Accessed February 27, 2023. https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMACA&Code1=535&Geo2=PR&Code2=35&Data=Count&SearchText=Caledon%20East&SearchType=Begins&SearchPR=01&B1=All
2. Ontario COVID-19 Data Tool. Public Health Ontario. Accessed February 27, 2023. https://www.publichealthontario.ca/en/data-and-analysis/infectious-disease/covid-19-data-surveillance/covid-19-data-tool

Objectives

- Describe the seroprevalence of infection-acquired antibodies among children recruited from TARGet Kids! in the Greater Toronto Area from January 2021 to November 2022
- Describe the seroprevalence of vaccination-acquired antibodies
- Examine heterogeneity by:
    - Age
    - Household income
    - Maternal education
    - Maternal ethnicity
    - Household density



TARGet Kids!

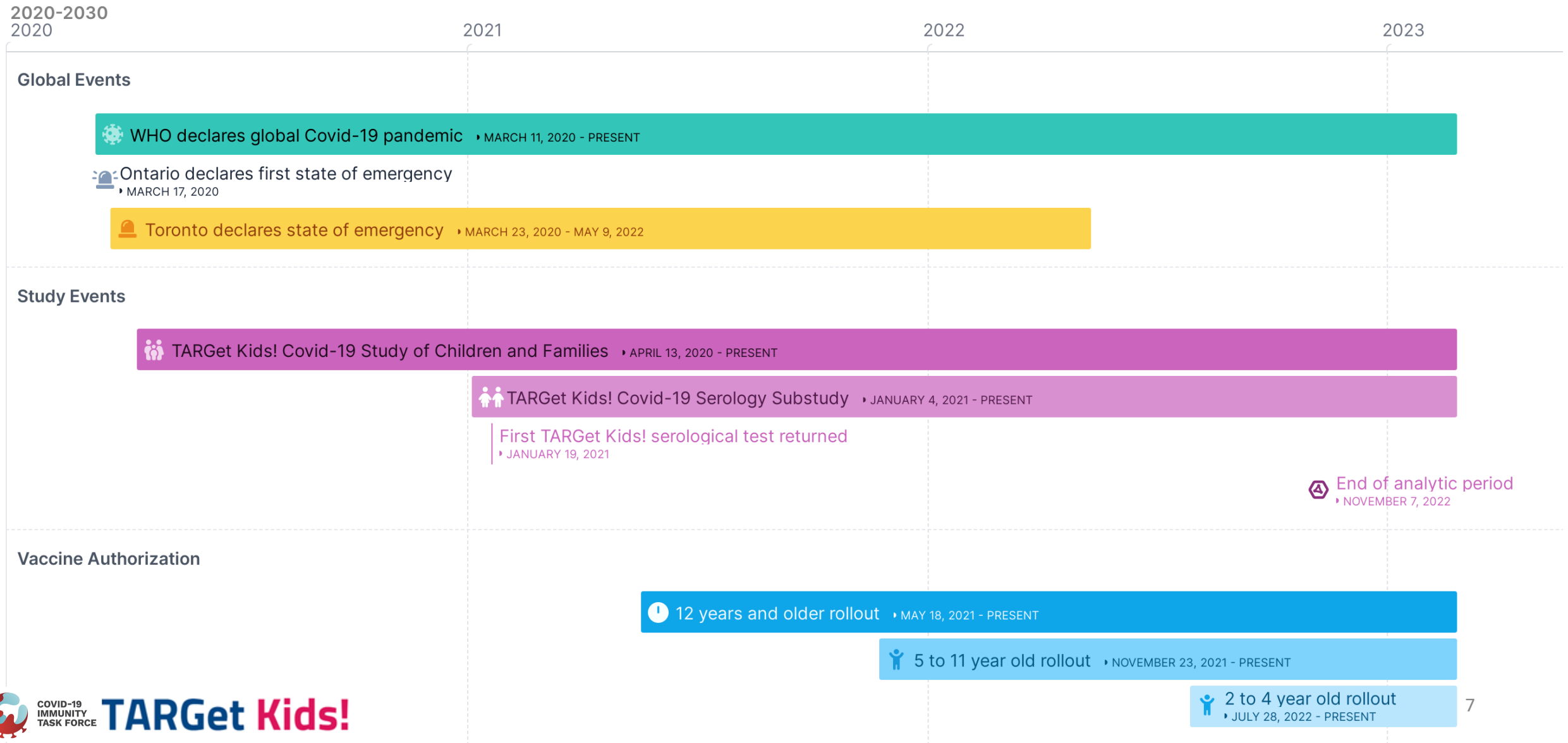
- The largest primary care research network in Canada
- Ongoing longitudinal data collection at well-child visits
- Over 12,500 children and their parents enrolled since 2008
- 14 large practices across GTA, Montreal and Kingston

Visit us at www.targetkids.ca

Methods

- **April 13, 2020: TARGet Kids! Covid-19 Study of Children and Families**
  - Comprehensive questionnaires on sociodemographics, school and childcare attendance, adherence to public health measures
  - Inclusion: Healthy children from birth to 10 years
- **January 4, 2021**: **Seroprevalence Substudy**
  - Primary outcome of interest: SARS-CoV-2 infection acquired antibodies
  - Secondary outcome of interest: Vaccination-acquired antibodies
    - Dried blood spot tests—3 antigen ELISA assay
- Descriptive statistics

Timeline

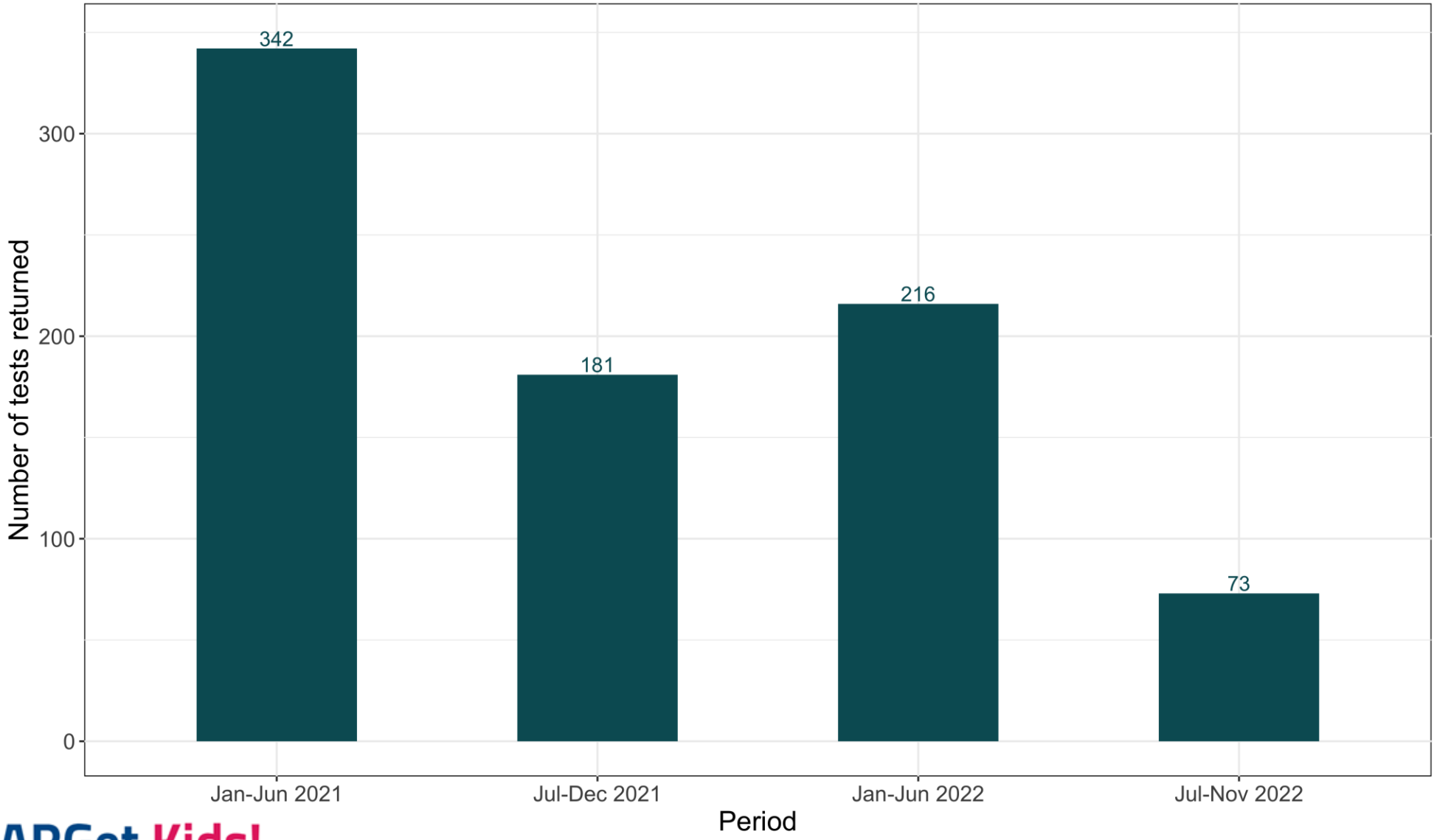

2020-2030
2020
2021
2022
2023
Global Events
WHO declares global Covid-19 pandemic
MARCH 11, 2020 - PRESENT
Ontario declares first state of emergency
MARCH 17, 2020
Toronto declares state of emergency
MARCH 23, 2020 - MAY 9, 2022
Study Events
TARGet Kids! Covid-19 Study of Children and Families
APRIL 13, 2020 - PRESENT
TARGet Kids! Covid-19 Serology Substudy
JANUARY 4, 2021 - PRESENT
First TARGet Kids! serological test returned
JANUARY 19, 2021
End of analytic period
NOVEMBER 7, 2022
Vaccine Authorization
12 years and older rollout
MAY 18, 2021 - PRESENT
5 to 11 year old rollout
NOVEMBER 23, 2021 - PRESENT
2 to 4 year old rollout
JULY 28, 2022 - PRESENT

Results

Sample characteristics (N=475)

	Overall
n	475
Age in years (mean (SD))	6.39 (3.17)
Number of people in household (mean (SD))	4.01 (0.88)
Child female sex, n (%)	227 (47.8)
Parent essential worker, n (%)	20 (4.2)
Mother's highest level of education, n (%)	
High school or less	10 (2.4)
Apprenticeship/CEGEP/College	47 (11.3)
University	358 (86.3)
Household income, n (%)	
0 to $49,999	16 (3.9)
$50,000 to $99,999	64 (15.6)
$100,000 to $149,999	192 (46.8)
$150,000+	138 (33.7)
Childcare attendance, n (%)	137 (71.7)
Mother European Ethnicity, n (%)	251 (67.1)
Father European Ethnicity, n (%)	269 (71.9)
House type dwelling, n (%)	327 (84.3)
Parent vaccination status at initial test, n (%)	287 (65.4)

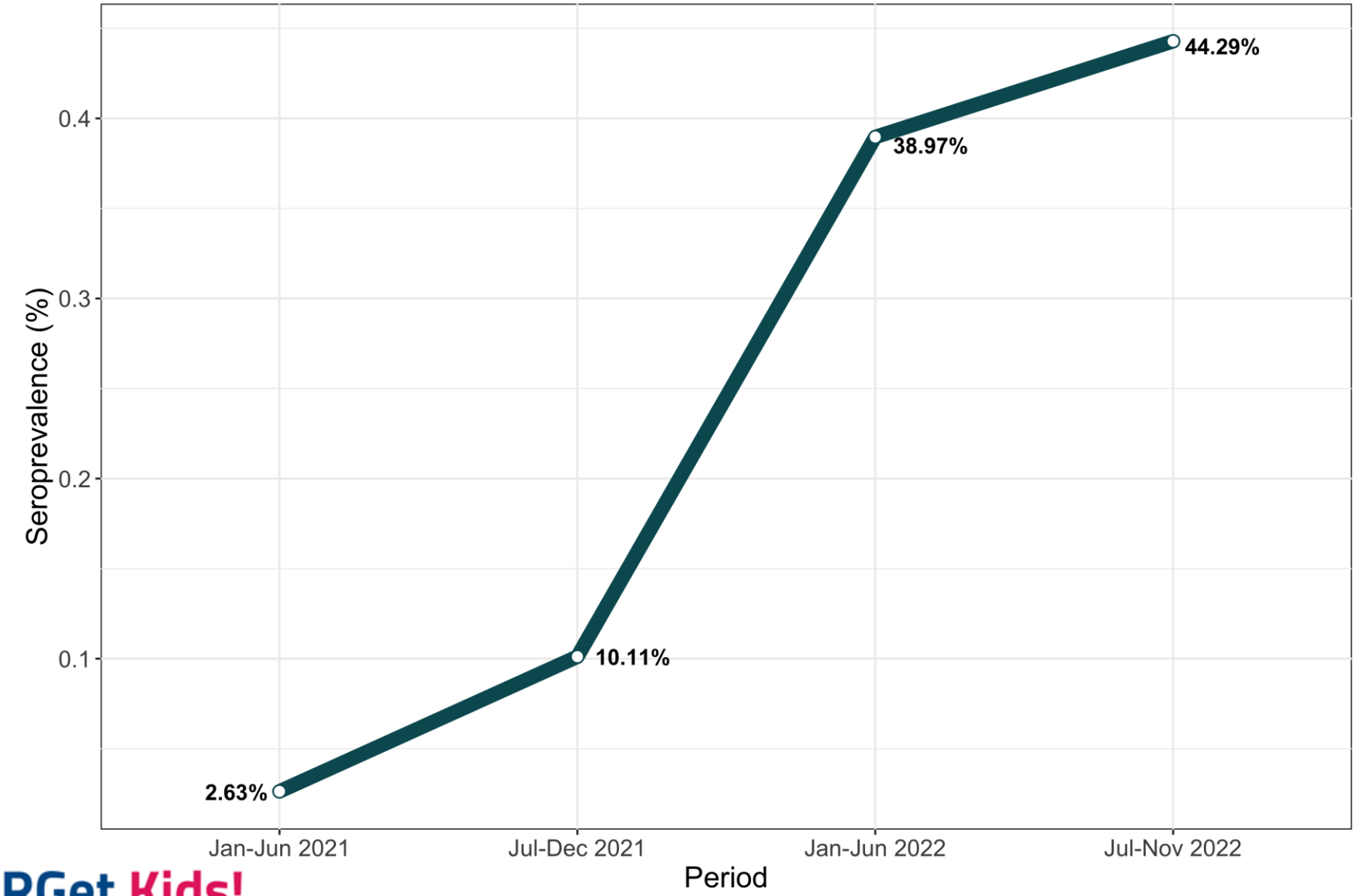
Number of participants returning tests per bi-annual period (N=475)



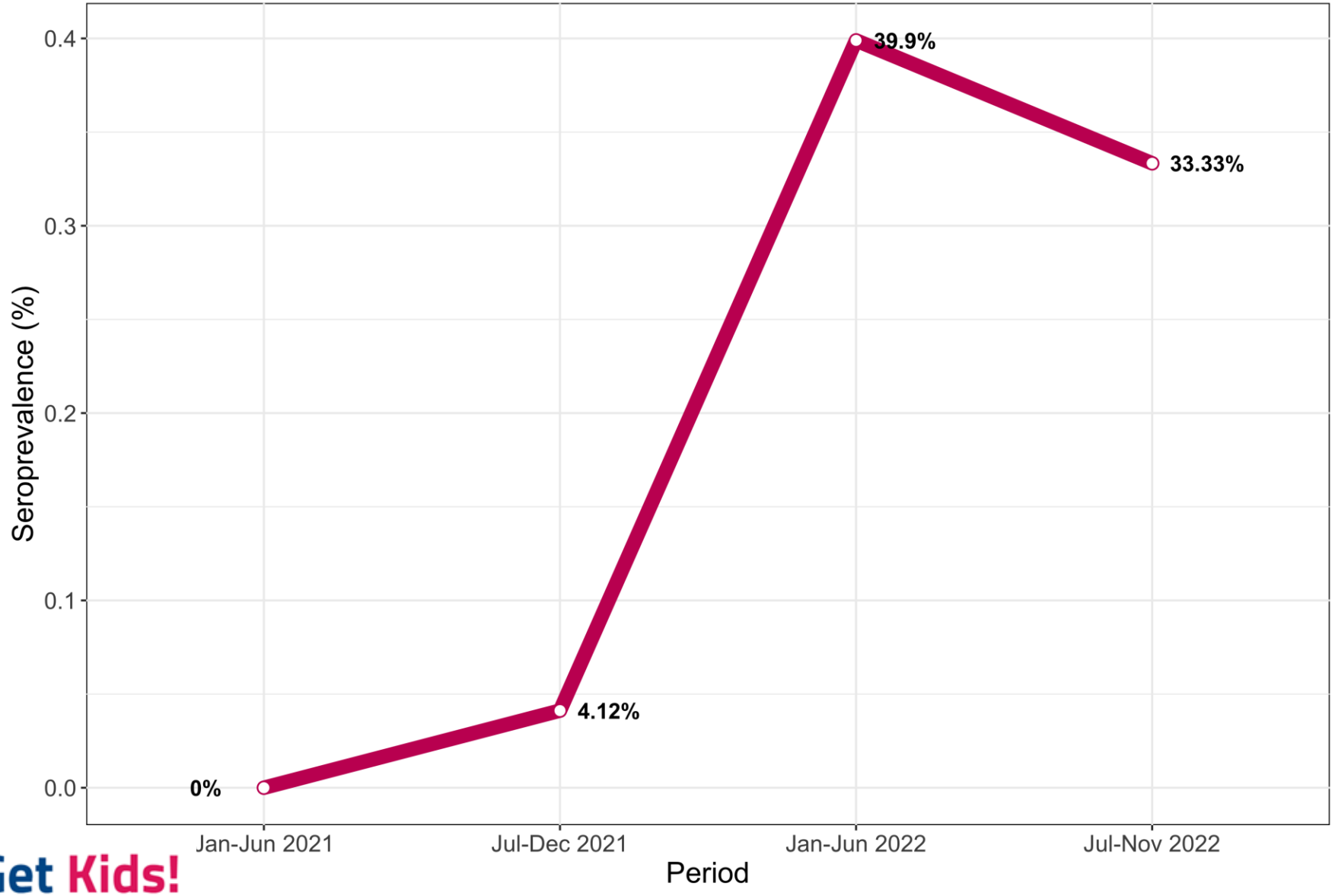
Sample characteristics by bi-annual period

	Jan-Jun 2021	Jul-Dec 2021	Jan-Jun 2022	Jul -Nov 2022
n	342	181	216	73
Age in years (mean (SD))	6.35 (3.04)	6.88 (3.14)	7.19 (3.44)	6.95 (3.39)
Number of people in household (mean (SD))	3.95 (0.89)	4.12 (0.96)	4.16 (0.98)	4.07 (1.11)
Child female sex, n (%)	168 (49.1)	86 (47.5)	111 (51.4)	35 (47.9)
Parent essential worker, n (%)	13 (3.8)	13 (7.2)	7 (3.2)	2 (2.7)
Mother's highest level of education, n (%)				
High school or less	6 (1.9)	4 (2.5)	0 (0.0)	0 (0.0)
Apprenticeship/CEGEP/College	37 (11.8)	21 (13.0)	34 (18.4)	11 (17.7)
University	270 (86.3)	137 (84.6)	151 (81.6)	51 (82.3)
Household income, n (%)				
0 to $49,999	9 (2.9)	8 (4.9)	9 (4.9)	3 (4.8)
$50,000 to $99,999	51 (16.5)	26 (16.0)	36 (19.5)	13 (21.0)
$100,000 to $149,999	152 (49.2)	75 (46.3)	77 (41.6)	22 (35.5)
$150,000+	97 (31.4)	53 (32.7)	63 (34.1)	24 (38.7)
Childcare attendance, n (%)	109 (73.6)	48 (64.0)	61 (66.3)	20 (66.7)
Mother European Ethnicity, n (%)	198 (68.0)	95 (65.5)	109 (64.5)	35 (63.6)
Father European Ethnicity, n (%)	207 (71.4)	103 (71.5)	120 (72.7)	38 (70.4)
House type dwelling, n (%)	246 (83.4)	138 (90.8)	147 (83.5)	56 (90.3)
Parent vaccination status, n (%)	177 (56.9)	148 (84.6)	192 (90.1)	56 (78.9)

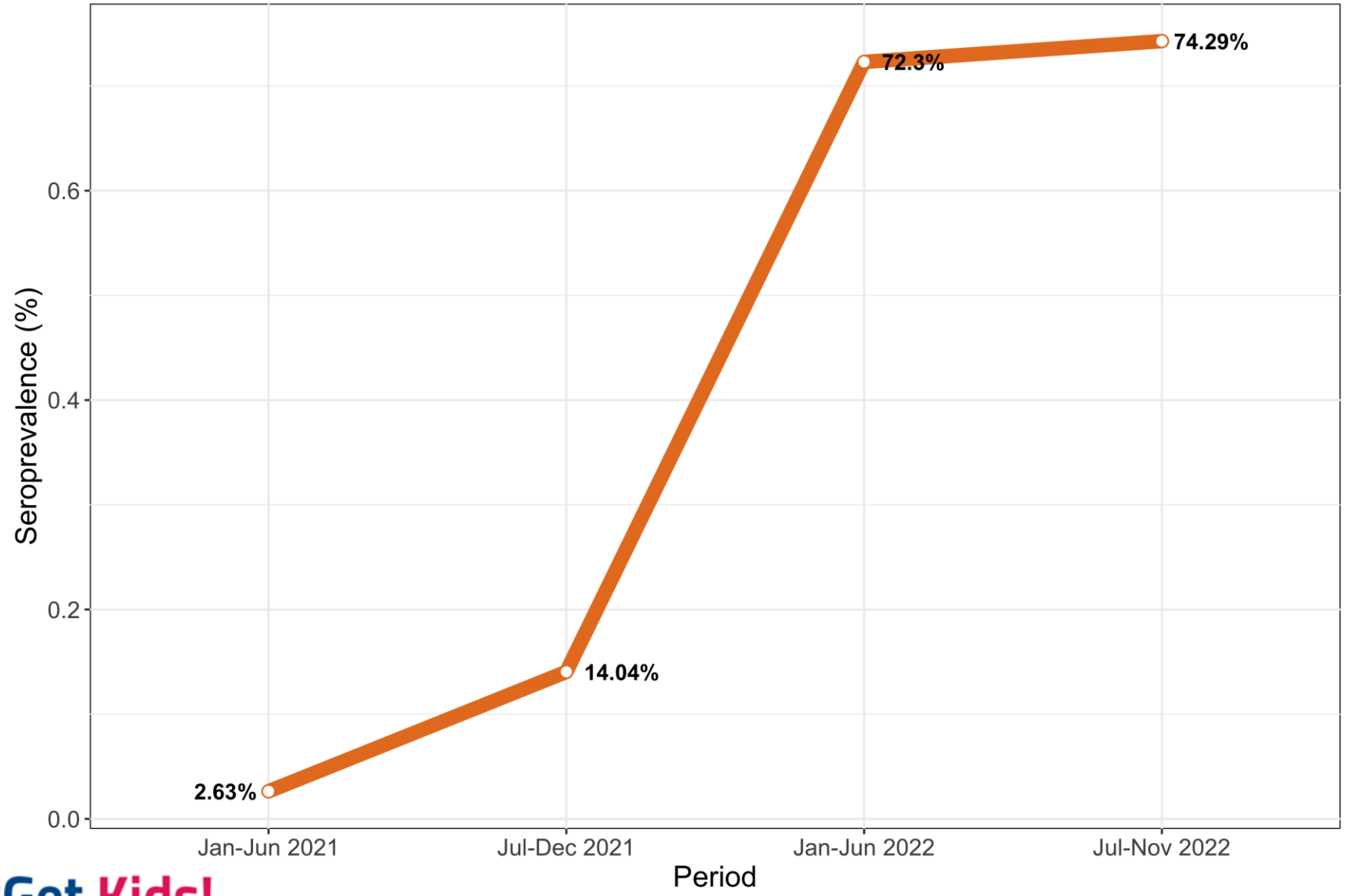
Seroprevalence of infection-acquired antibodies



Seroprevalence of vaccine-acquired antibodies

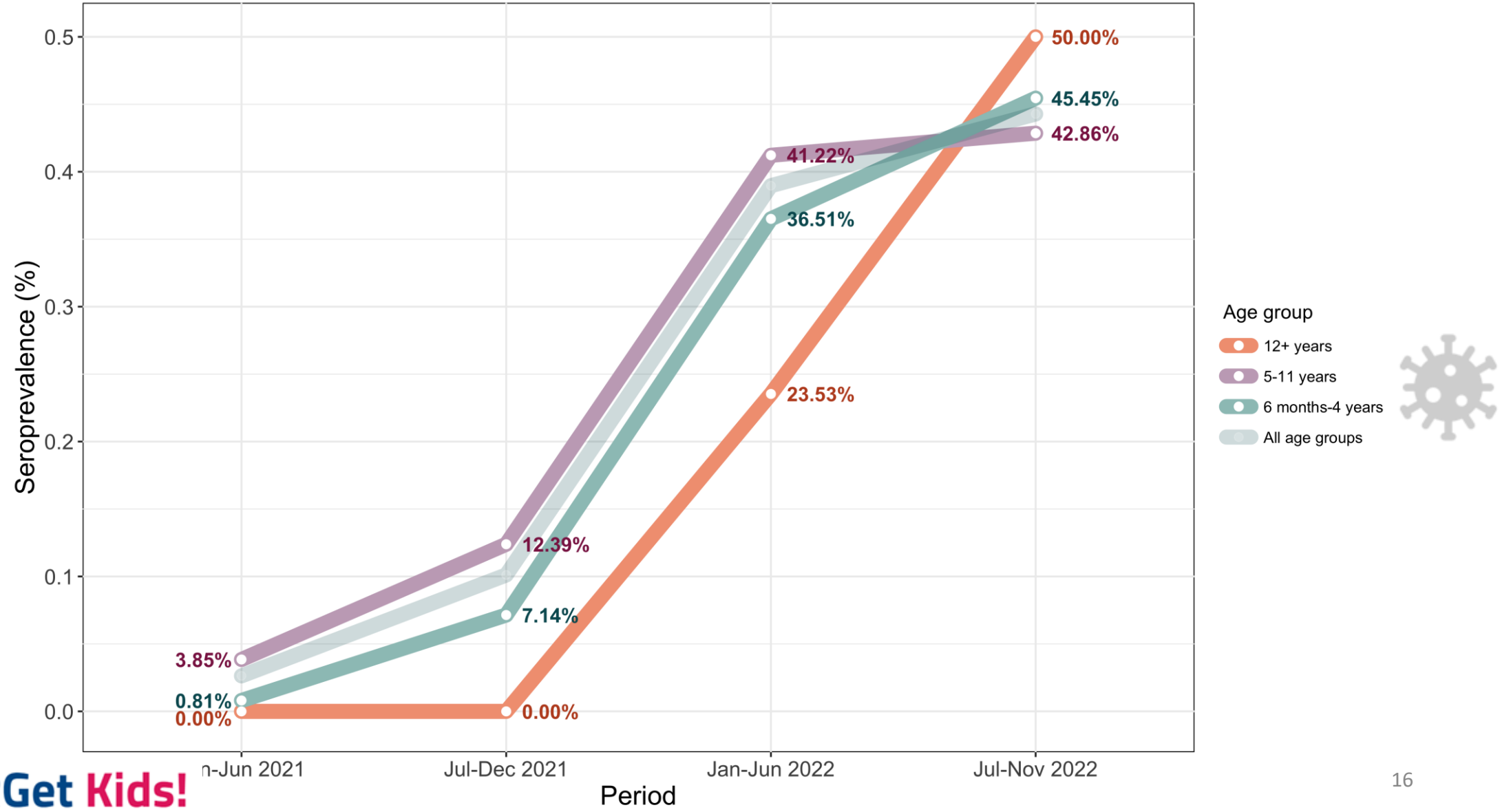


Overall seroprevalence, either infection or vaccine-acquired antibodies

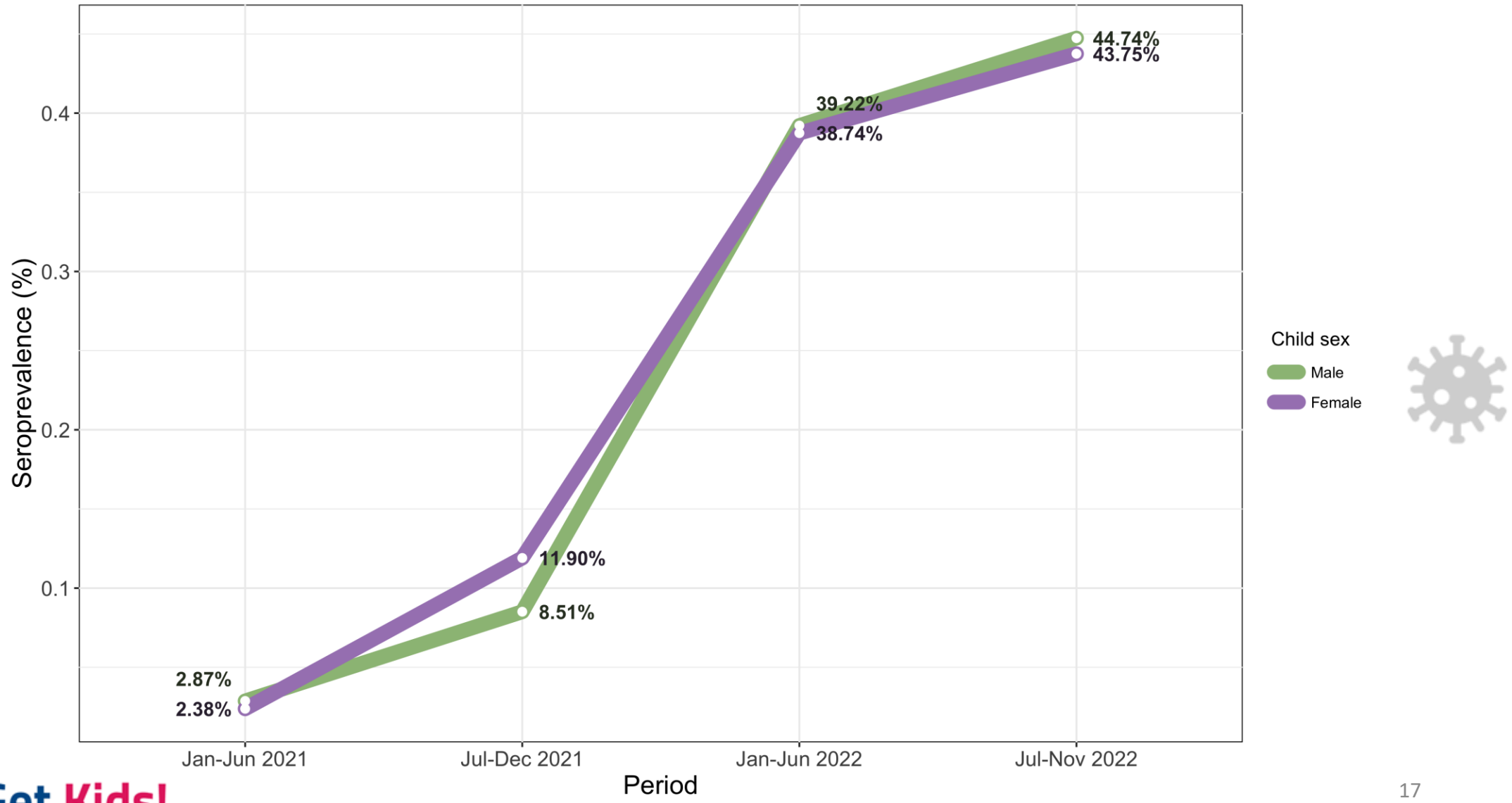


Seroprevalence of infection-acquired antibodies by sociodemographic characteristics

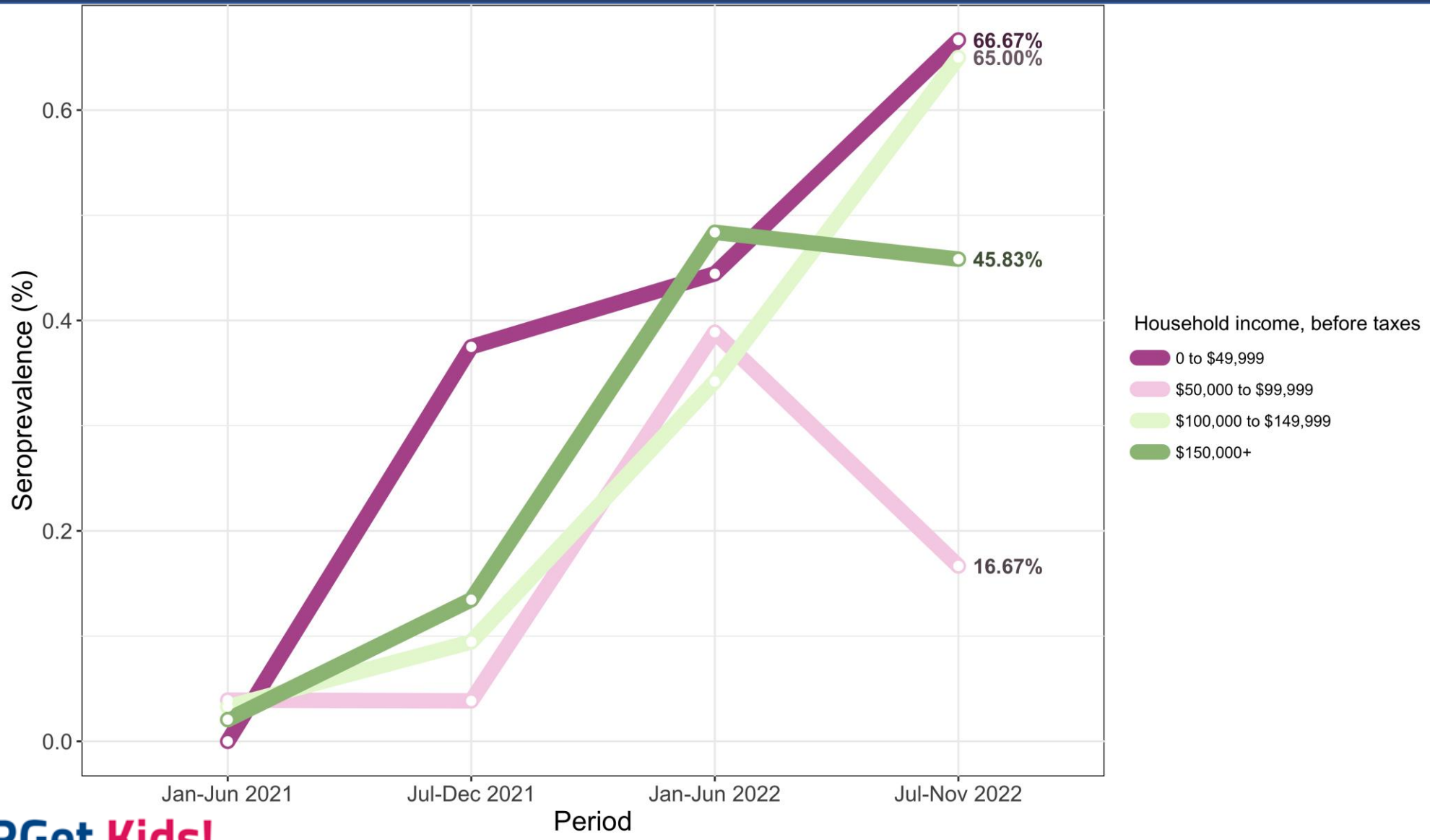
Seroprevalence of infection-acquired antibodies by age



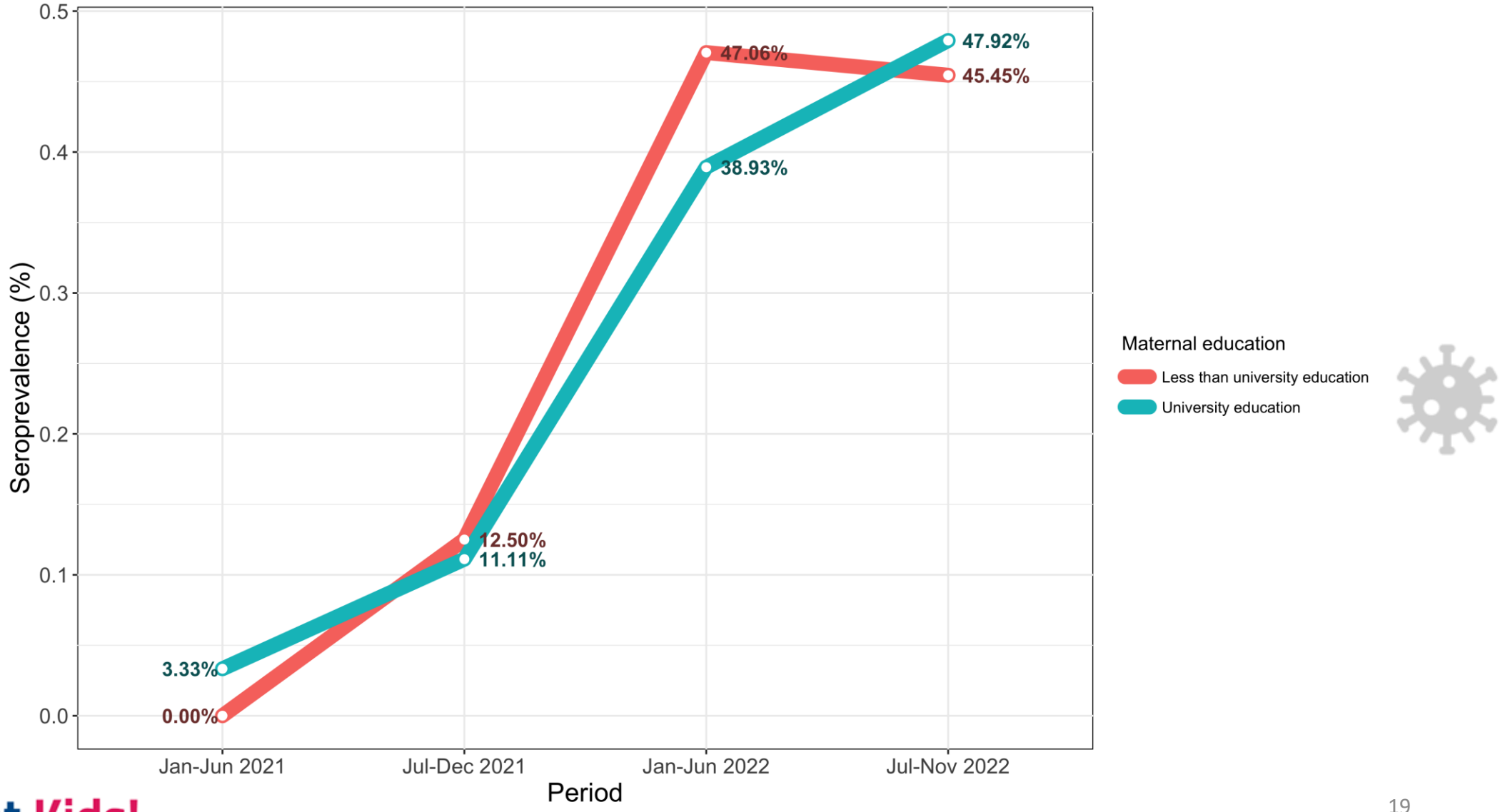
Seroprevalence of infection-acquired antibodies by sex



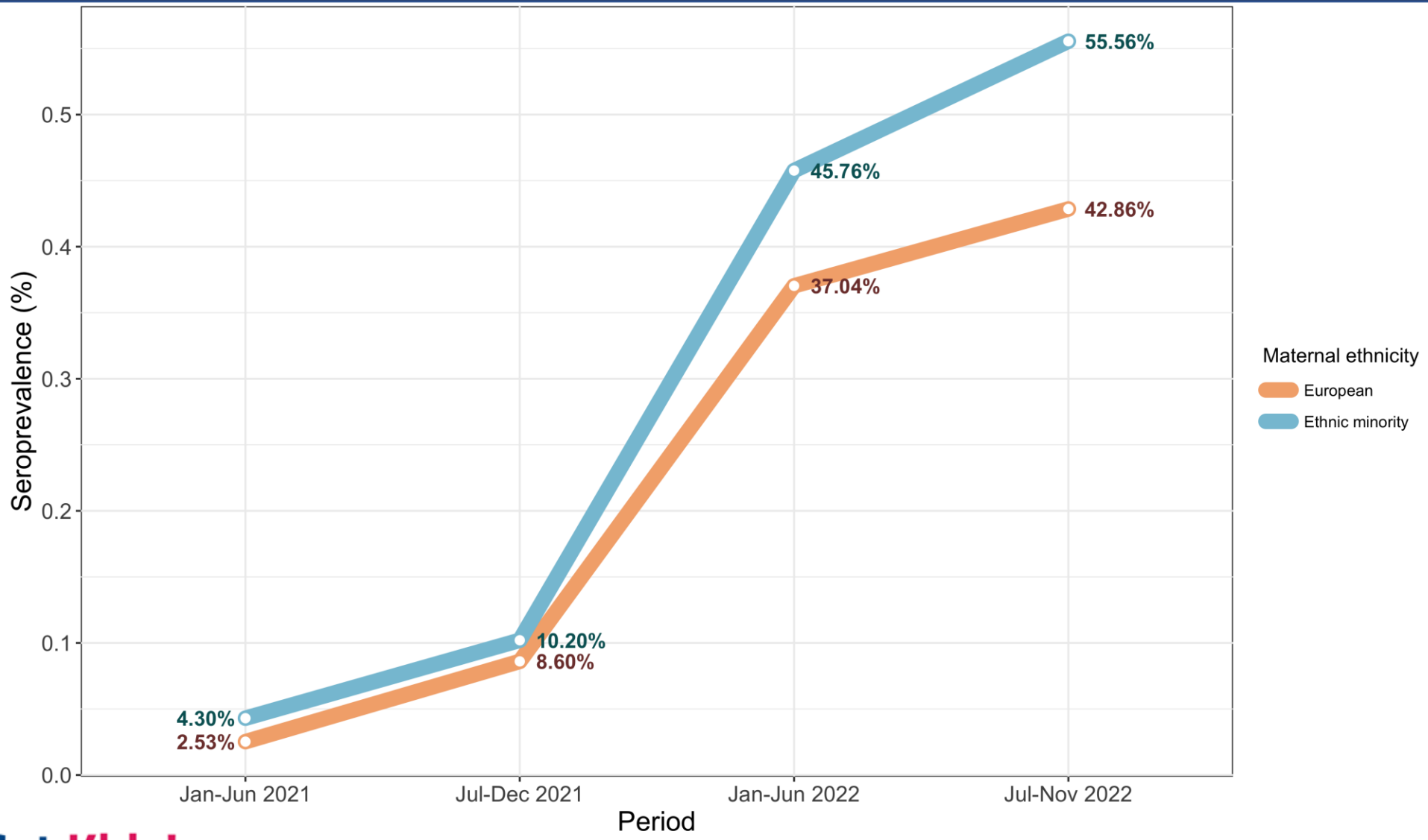
Seroprevalence of infection-acquired antibodies by income



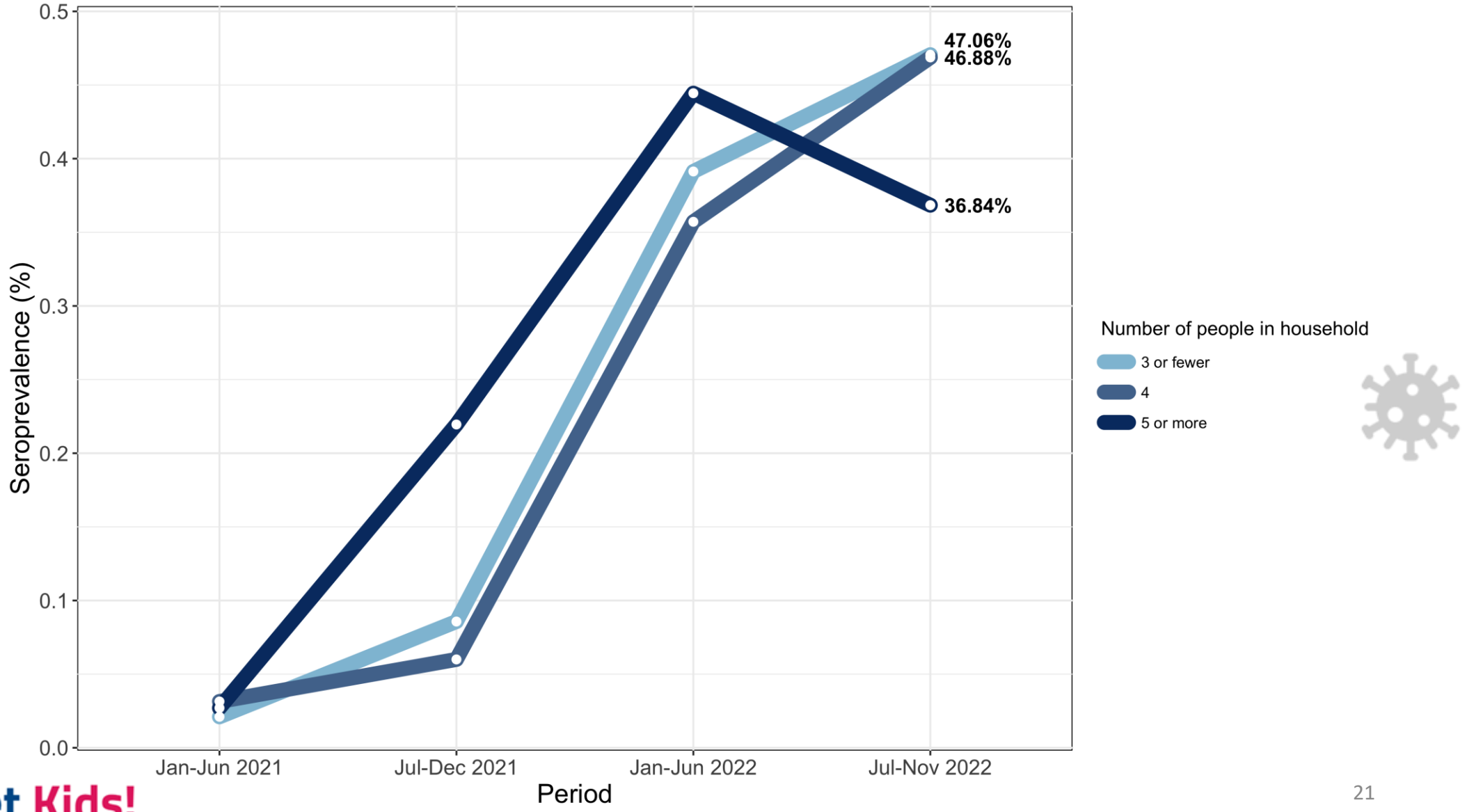
Seroprevalence of infection-acquired antibodies by maternal education



Seroprevalence of infection-acquired antibodies by maternal ethnicity

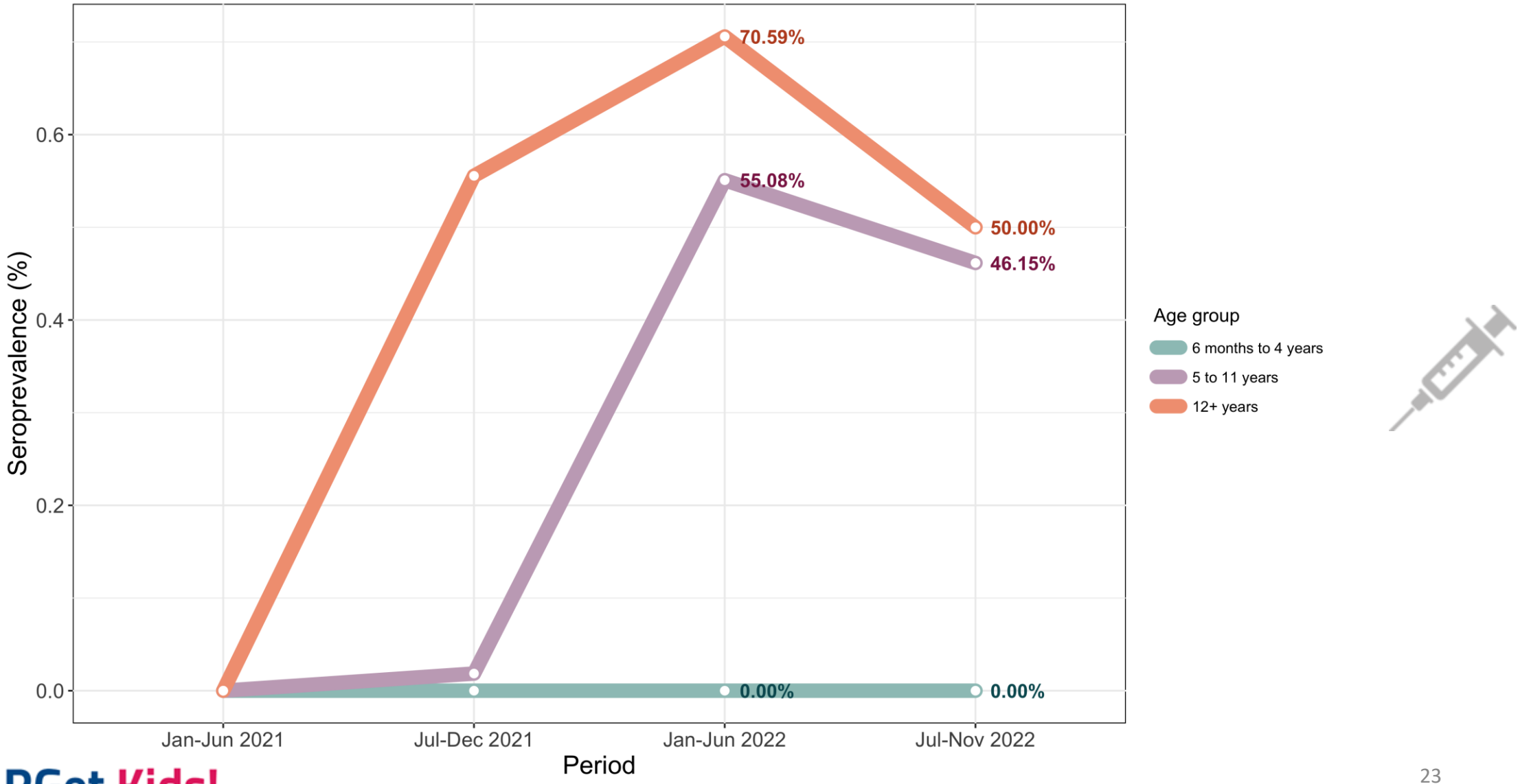


Seroprevalence of infection-acquired antibodies by household density

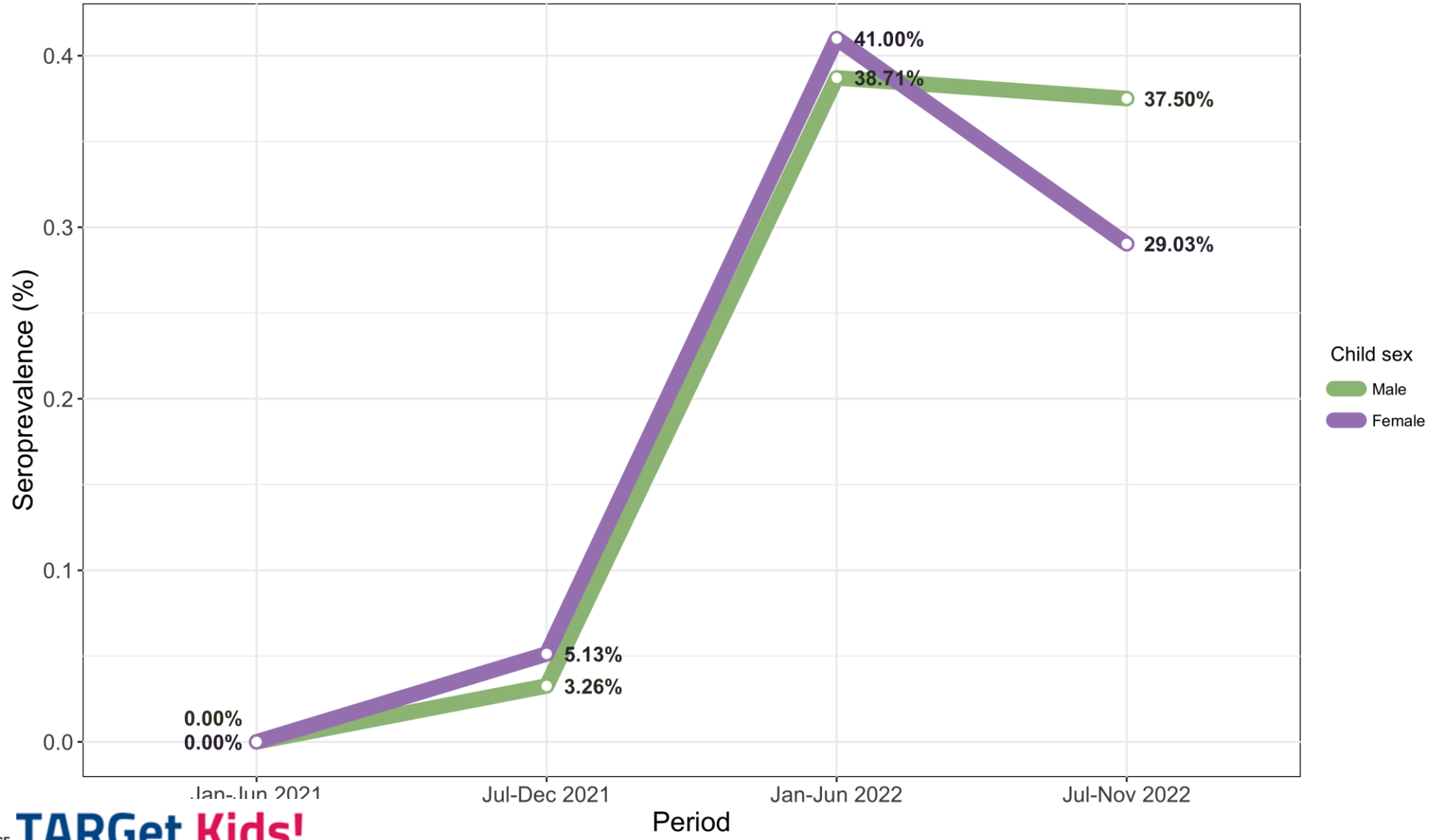


Seroprevalence of vaccine-acquired antibodies by sociodemographic characteristics

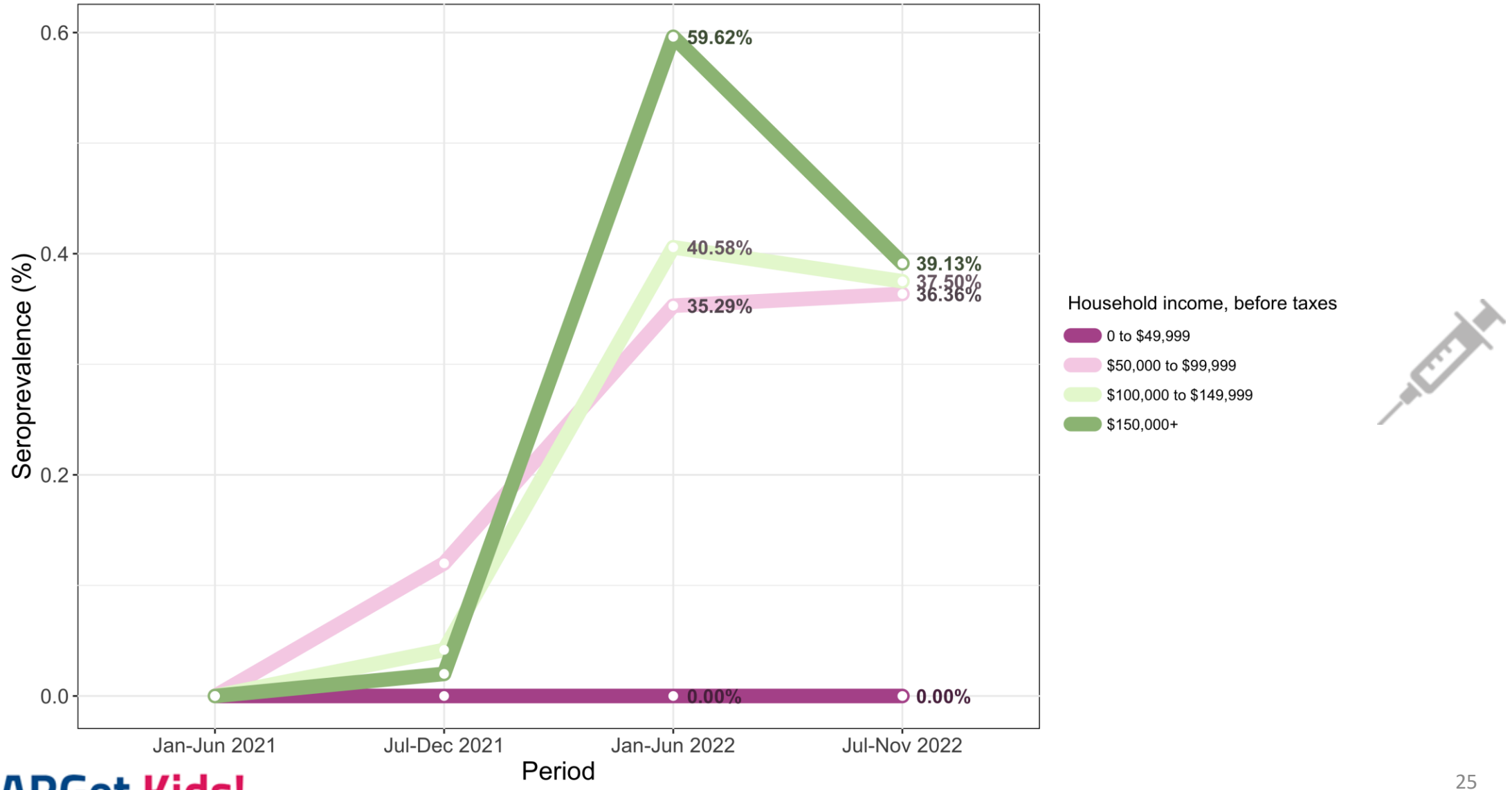
Seroprevalence of vaccine-acquired antibodies by age



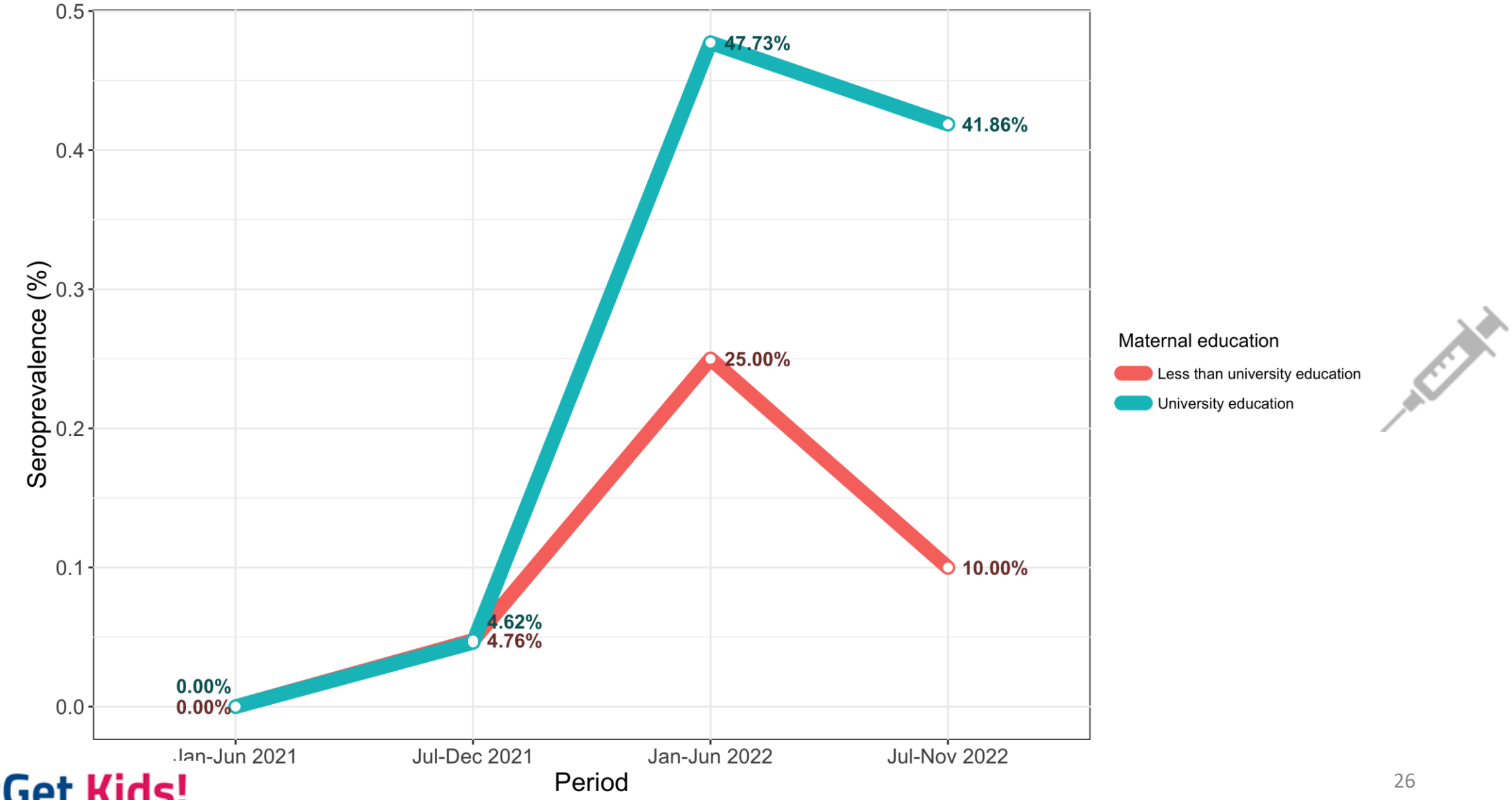
Seroprevalence of vaccine-acquired antibodies by sex



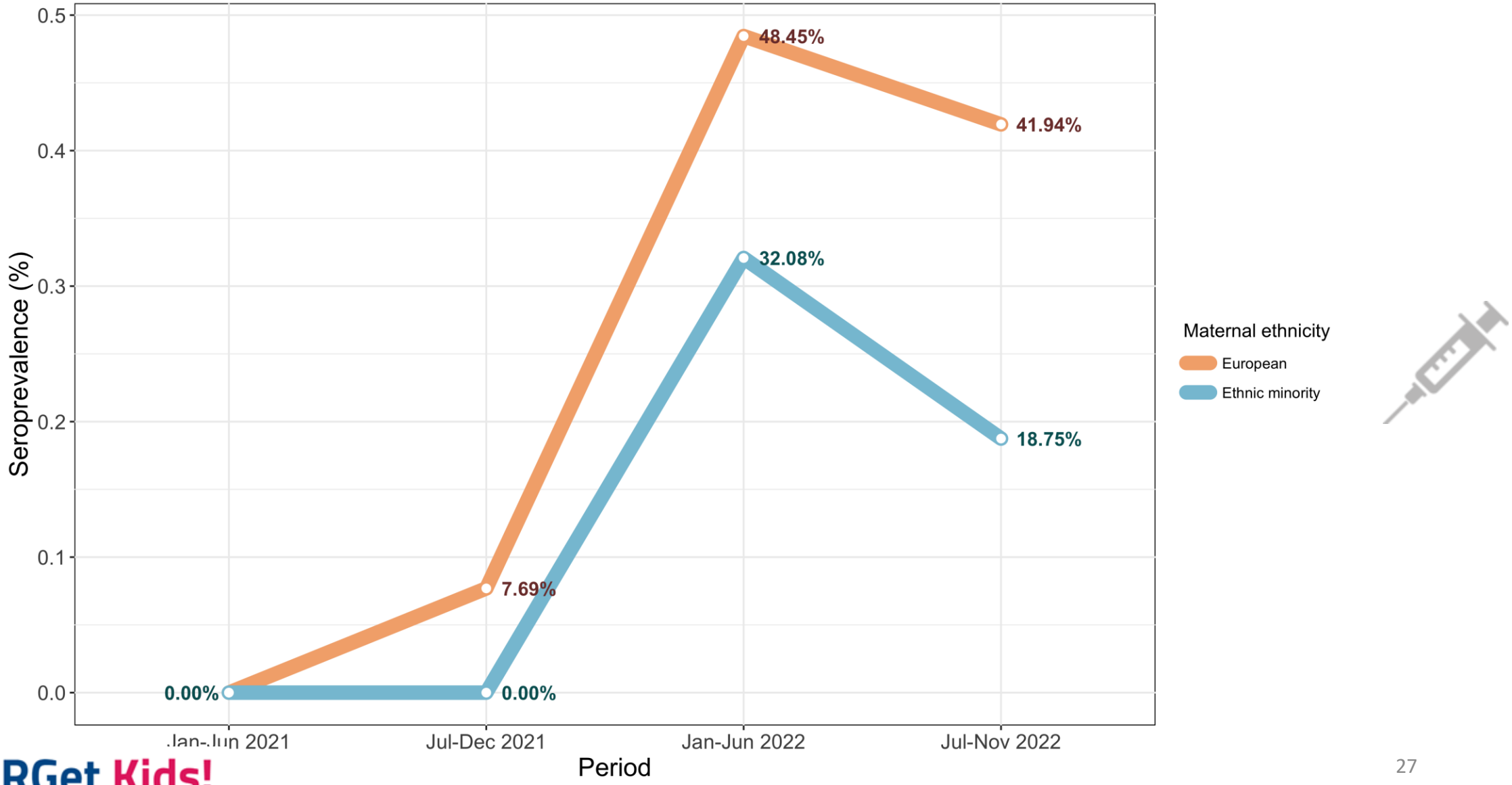
Seroprevalence of vaccine-acquired antibodies by income



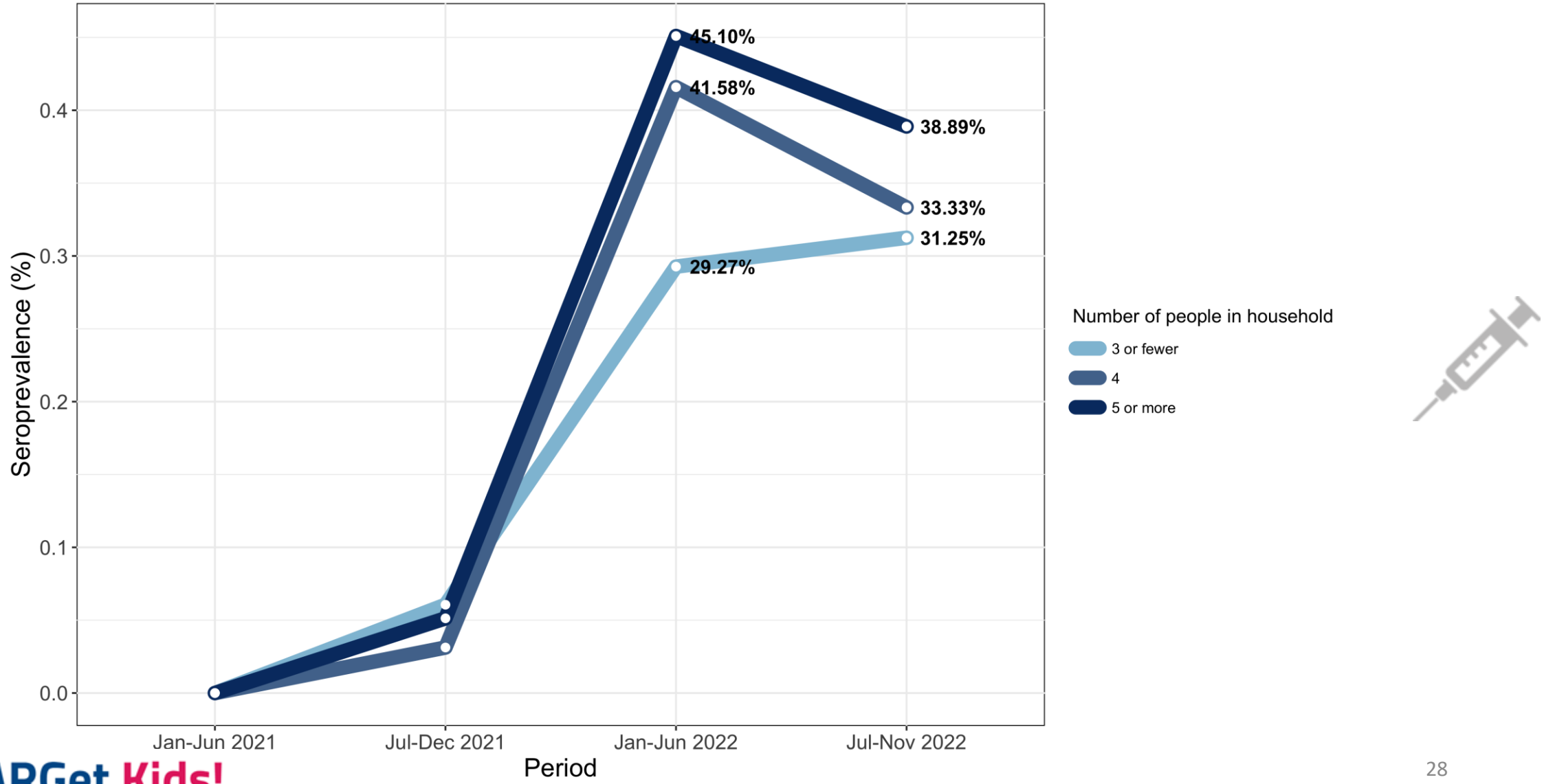
Seroprevalence of vaccine-acquired antibodies by maternal education



Seroprevalence of vaccine-acquired antibodies by maternal ethnicity



Seroprevalence of vaccine-acquired antibodies by household density



Key Findings

TARGet Kids! infection-acquired seroprevalence was **44%** from Jul-Nov 2022

- Lower seroprevalence than Toronto adult blood donors (62.02% in Sept 2022)[1]
- Lower seroprevalence than children in Montreal (58.1% from May-Sep 2022)[2]

TARGet Kids! overall seroprevalence was **74%** from Jul-Nov 2022

1. *COVID-19 Seroprevalence Report, December 2, 2022.* Canadian Blood Services; 2022. Accessed February 27, 2023. https://www.covid19immunitytaskforce.ca/wp-content/uploads/2022/12/covid-19-full-report-october-2022-december-2-2022.pdf
2. Results. Encore Study. Accessed February 27, 2023. https://www.encorestudy.ca/results

Key Findings

In the TARGet Kids! sample,

- No gradient in seroprevalence of infection-acquired antibodies for sociodemographic groups: age, income, maternal education, household density
  - Some differences observed for European versus racial minority
- Discernible gradients by sociodemographic characteristics observed for vaccine-acquired antibodies
  - Differences by age, income, education, ethnicity, household density

Discussion

Points for interpretation

- TARGet Kids! participants are a healthy subset of the pediatric population in the GTA
- Loss to follow-up may have introduced selection bias
- Crude values presented

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Questions

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