



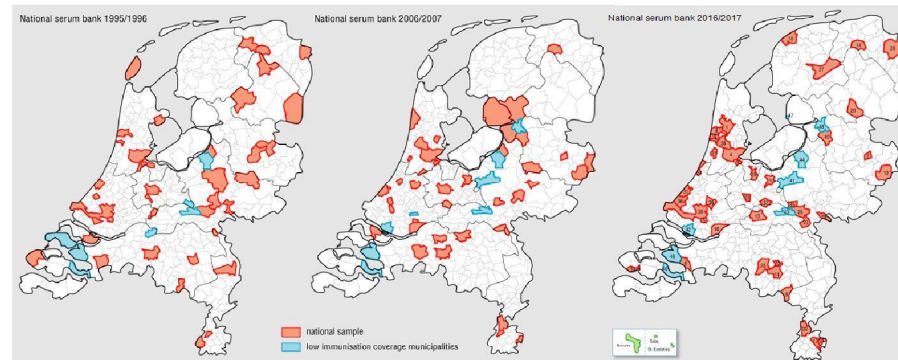
PIENTER CORONA

update and preliminary results

08-09-2020



Serosurveillance in NL: PIENTER studies





Design PIENTER-3 and PICO

- **PIENTER-3 (pre-pandemic samples)¹:**
 - Nationwide sample of the Dutch population (2016/2017) to look into protection against vaccine-preventable diseases
 - Two-stage cluster design: six regions, comprising 49 randomly assigned municipalities (including low-vaccination coverage)
 - Biobank of 7,600 participants
 - N=6,102 participants (80%) gave consent to be approached in the future
- **PIENTER-Corona (PICO):** Prospective serosurveillance study of SARS-CoV-2 in the general population of the Netherlands
 - **Design:** self-collected fingerstick blood sample (microtainer) and an online questionnaire on risk factors and contacts
 - repeated during 1,5 year, approx. 6 collections



¹ Vos RA & Verberk JDM, et al. *BMC Inf Dis* (2019)

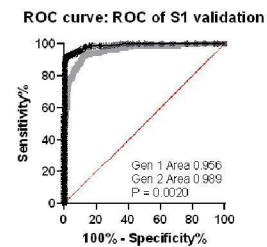
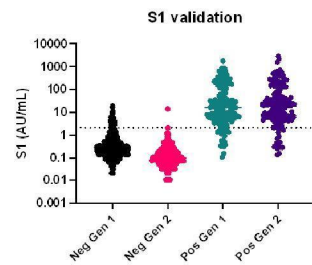


PICO1 – April, 2020

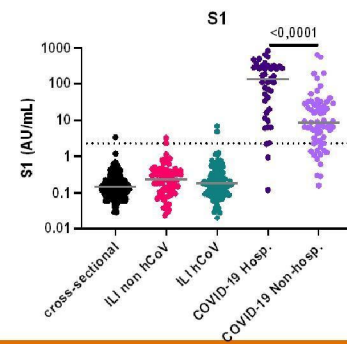
- **Over 3200** participants from 2-90 years of age donated a blood sample and most of them completed the questionnaire
 - 82% from national sample (NS)
 - 18% from low vaccination coverage municipalities (LVC)
- Blood sampling: 31 March – 11 May, 2020
 - > **median date: 3 April**
 - > 80% of samples on 9 April, 2020
- All samples were tested for the presence of SARS-CoV-2 IgG antibodies targeted at the **spike S1-antigen**
 - Also N and RBD. IgA, IgM. Results pending
- Seroprevalence was estimated controlling for the survey design, individual pre-pandemic cross-reactivity (using the paired PIENTER-3 samples), and test performance. Logistic regression was used to identify risk factors for seropositivity



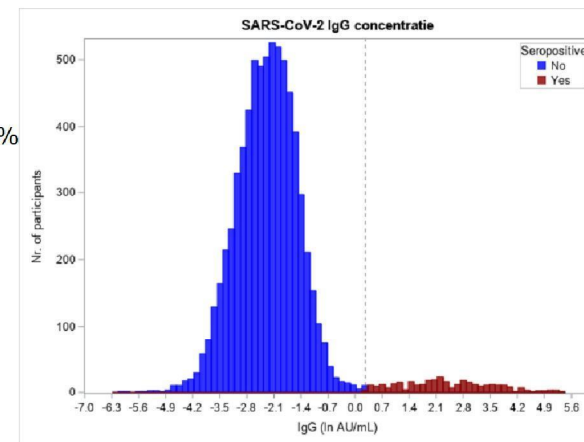
Corona Multiplexed Immuno Assay



- Luminex platform
- Simultaneous detection multiple antigens

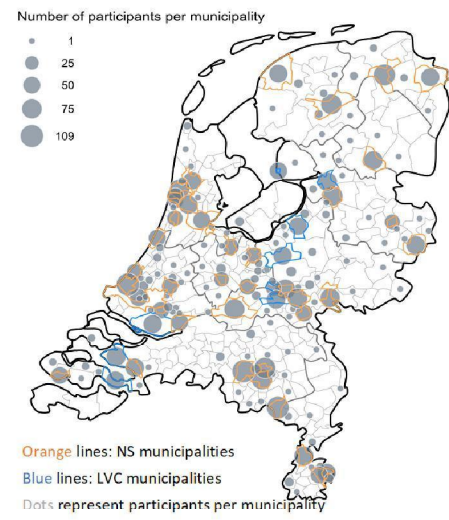
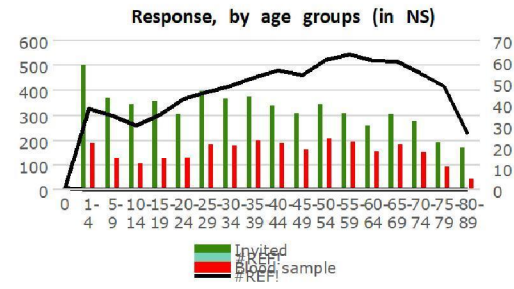


specificity=99.7% and sensitivity=89.0%





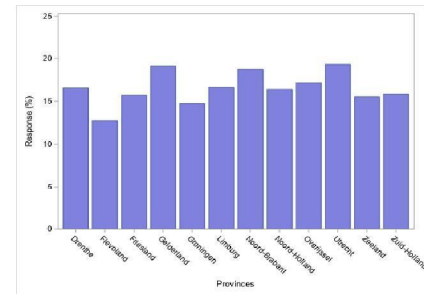
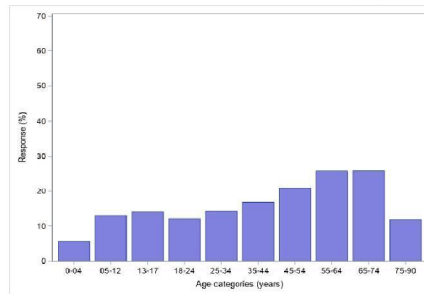
PICO1 – April, 2020



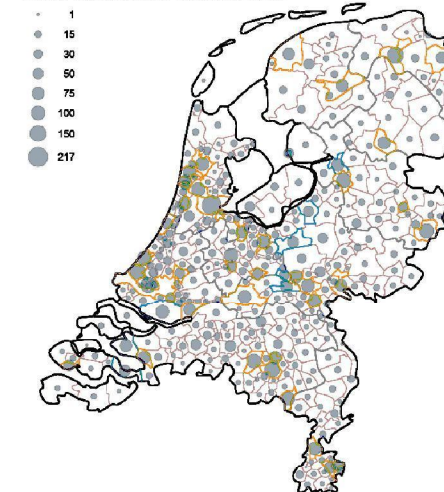


PICO2 – June, 2020

- **Longitudinal measures:**
 - PICO2-NS sample: $n \geq 2,300$
 - PICO2-LVC sample: approx. 500
- An additional sample to enhance the geographical spread (sampling across the NL and all ages)
PICO2-PLUS: extra $n \geq 4,600$



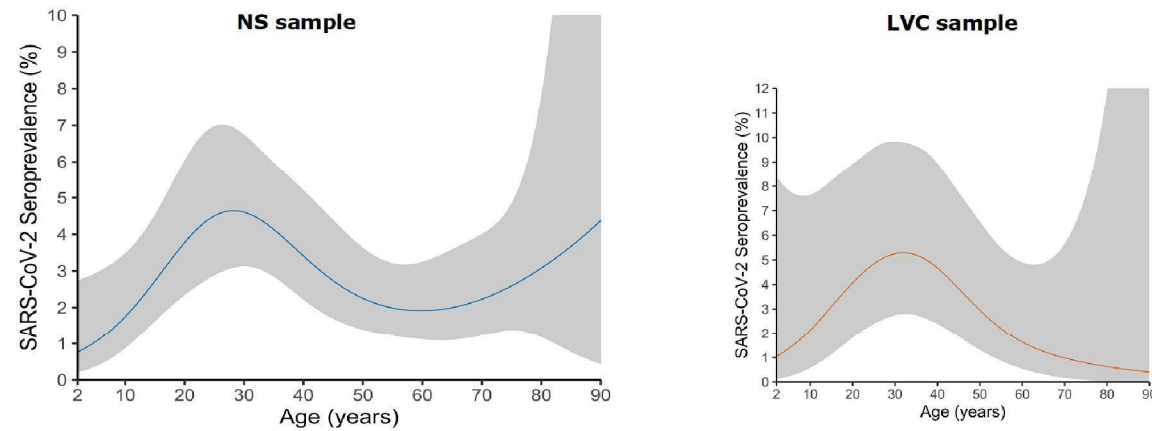
Number of participants per municipality, PICO2





PICO1 - Main findings

- Overall seroprevalence in NS: **2.8% (2.0-3.7)** -> i.e., half a million inhabitants
 - > no differences between sexes or ethnic background
 - > regionally ranging between 1.3-4.0% (in line with hospitalizations)



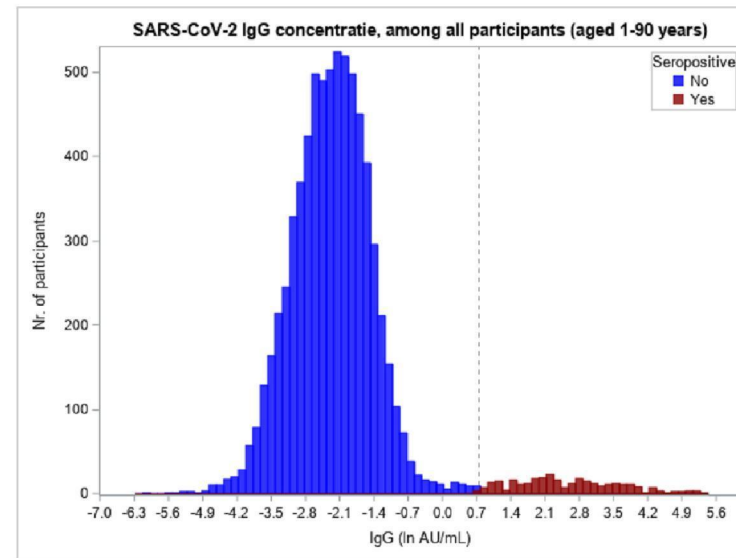
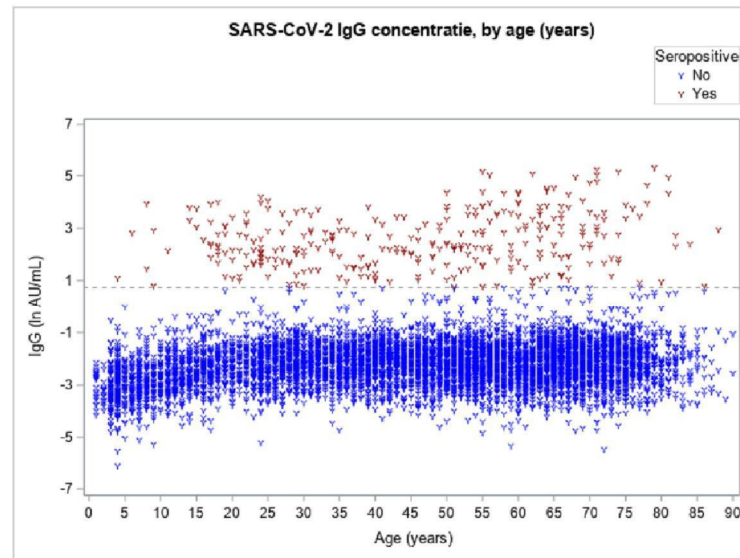


PICO1 – Main findings

- Antibody concentrations in seropositive persons were significantly higher in those with **fever or dyspnea** in contrast to those without ($p=0.01$ and $p=0.04$, respectively).
- **Anosmia/ageusia** was the most discriminative symptom between seropositive (53%) and seronegative persons (4%, $p<0.0001$).
- Persons taking **immunosuppressants**, persons who self-reported to have been in **contact with a COVID-19 case**, and people from the **Orthodox-Reformed Protestant community** had both over four times higher odds of being seropositive compared to others.



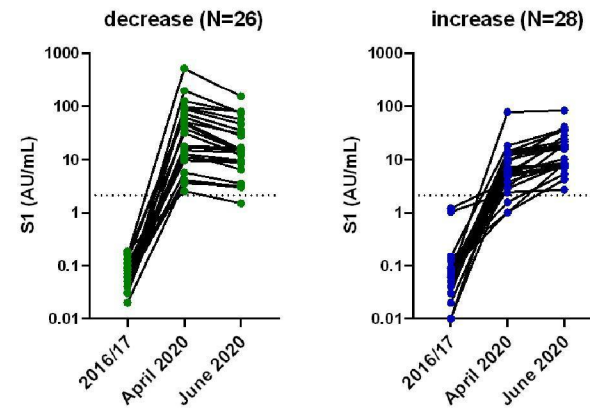
SARS-CoV-2 IgG concentration (S_1 , ln AU/mL), PICO2





Pieter-Corona antibody kinetics

- T1 (pre) 2016/2017
- T2 1st week of April 2020 (n=3207)
- T3 1st week of June 2020 (n=7278)
- Seroconversion (concentrations) 14-17 day delay
- Decreasing and increasing concentrations
 - Visualizes time of sampling relative to onset of disease symptoms





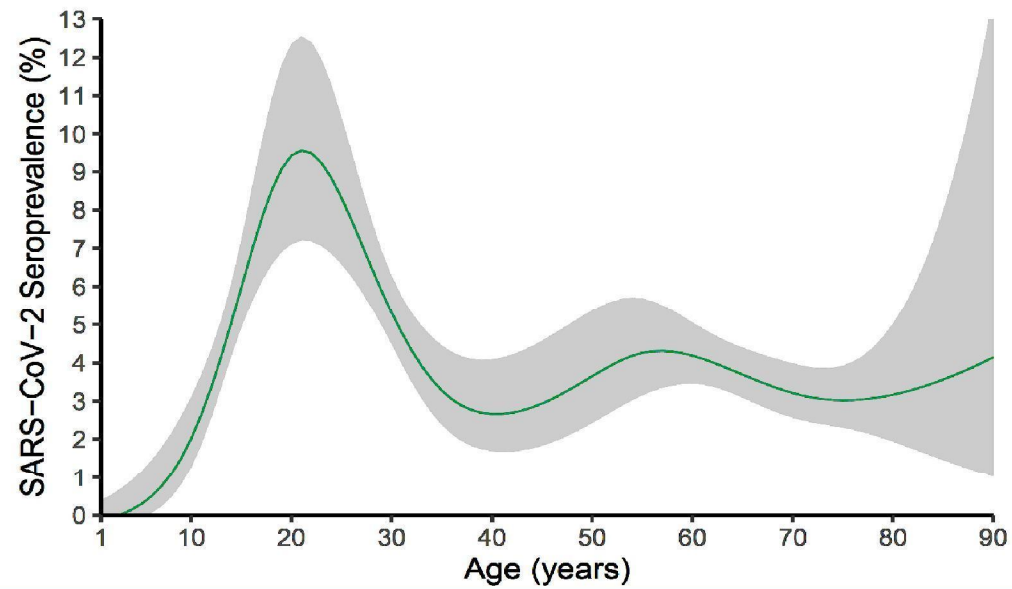
Seroprevalence – NL, June 2020

- > *Note: all data were corrected for the survey design (NS & PLUS samples were pooled), weighted, as well as corrected for test specifics (specificity=99.7% and sensitivity=89.0%)*

- **Overall:** **4.1% [3.4-4.9]**
- By **sex**:
 - Men: 4.4% [3.5-5.3]
 - Women: 3.8% [3.1-4.6]
- By **ethnicity**:
 - Dutch: 4.3% [3.5-5.4]
 - Non-Dutch Western: 2.4% [1.2-4.3]
 - Non-Western: 4.0% [2.1-7.1]

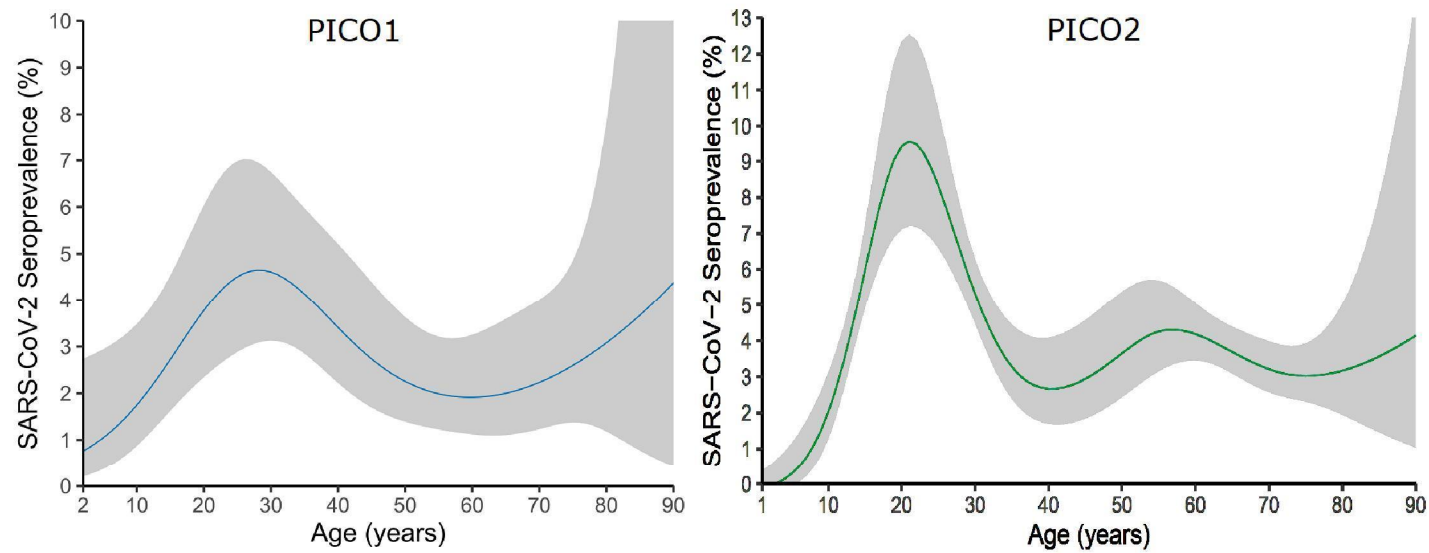


Seroprevalence – NL, by age



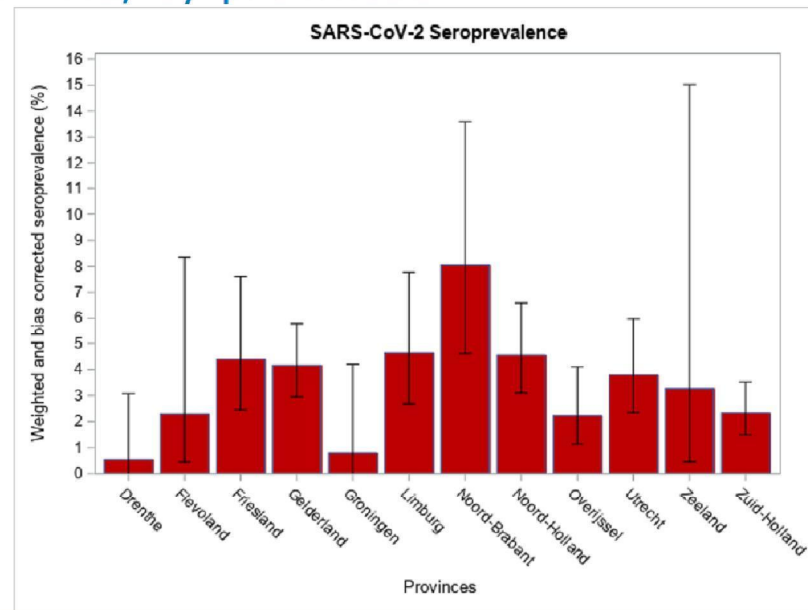


April versus June 2020





Seroprevalence – NL, by provinces



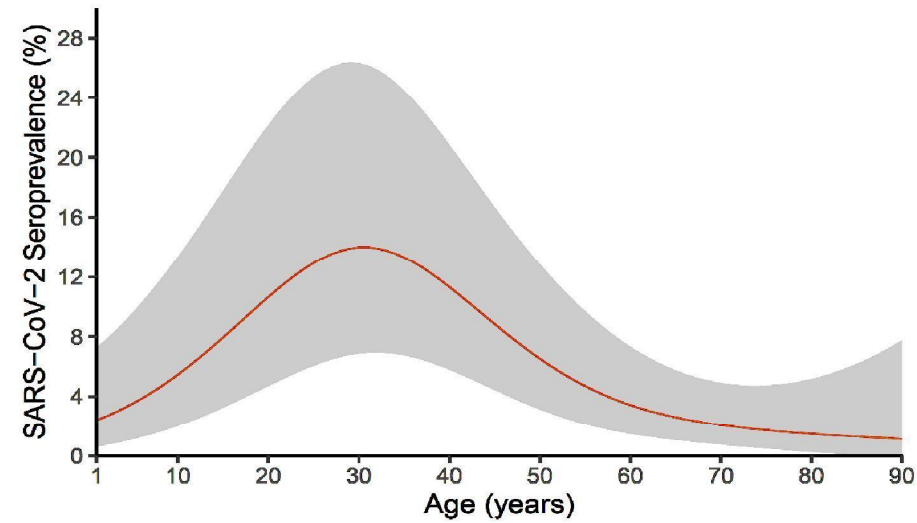


Seroprevalence – LVC

Overall: 6.6% [2.6-13.3]

By **sex:**

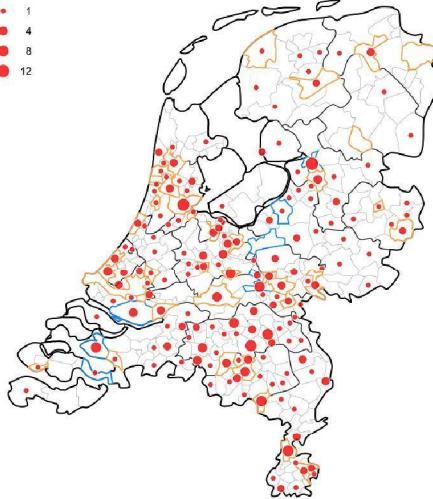
- Men: 8.6% [2.7-19.1]
- Women: 4.7% [1.9-9.2]



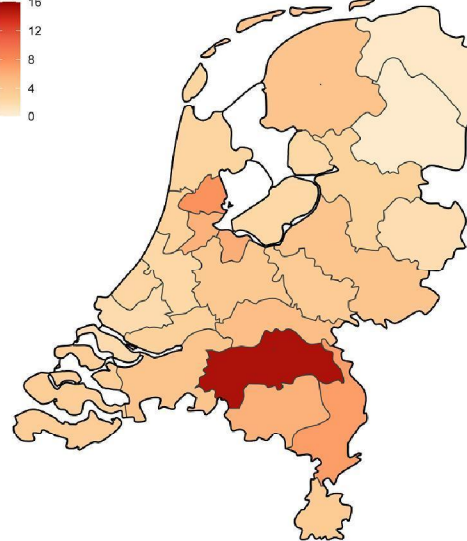
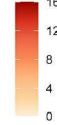


Seroprevalence – NL, by geo spread

Number of SARS-CoV-2 seropositive participants per municipality



SARS-CoV-2 seroprevalence (%), PICO2





Next to do, ongoing

- Kinetics antibodies
 - IgM and IgA analyses
 - Symptoms over time
 - Antibodies and immunity to reinfection
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- PICO 3, on 21-25 September, 7800 packages sent to participants by mail