



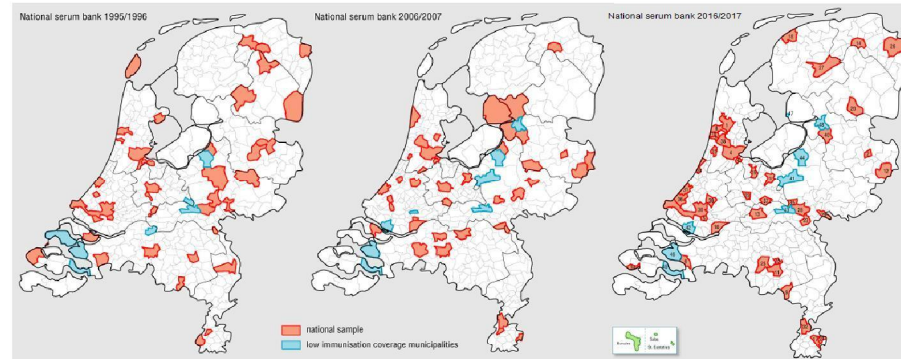
## PIENTER CORONA

update and preliminary results

08-09-2020



### Serosurveillance in NL: PIENTER studies





## Design PIENTER-3 and PICO

- **PIENTER-3 (pre-pandemic samples)<sup>1</sup>:**
  - 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



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

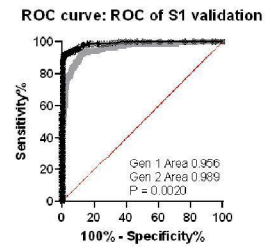
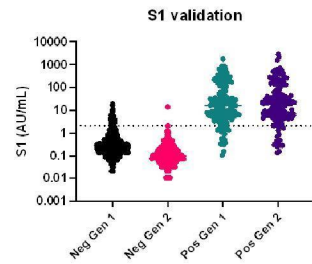


## PICO1 – April, 2020

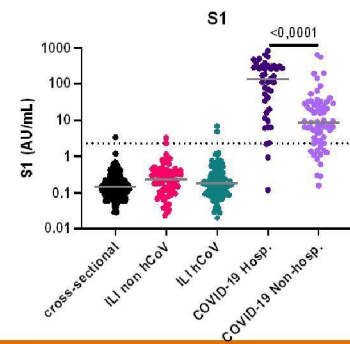
- **Over 3200** participants from 2-90 years of age donated a blood sample and most of them completed the questionnaire
  - 82% from national sample (NS)
  - 18% from low vaccination coverage municipalities (LVC)
- Blood sampling: 31 March – 11 May, 2020
  - > **median date: 3 April**
  - > 80% of samples 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



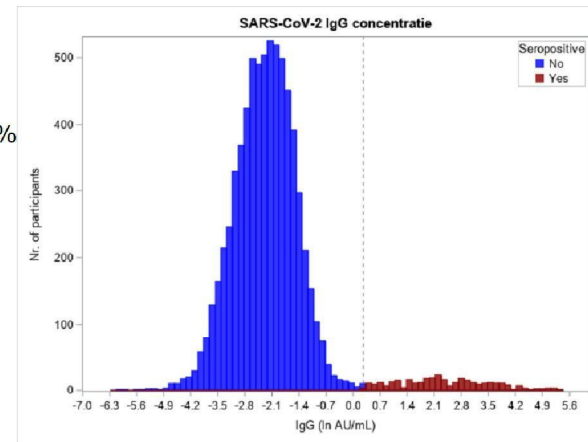
## Corona Multiplexed Immuno Assay



- Luminex platform
- Simultaneous detection multiple antigens

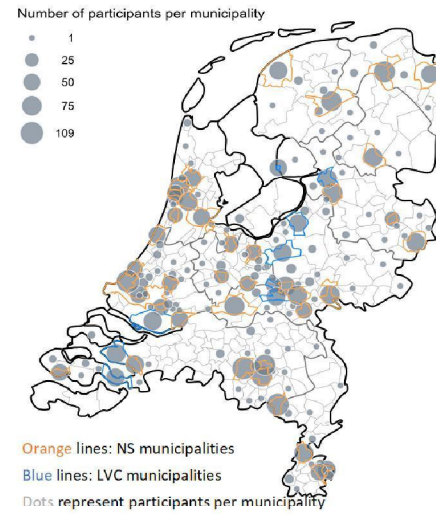
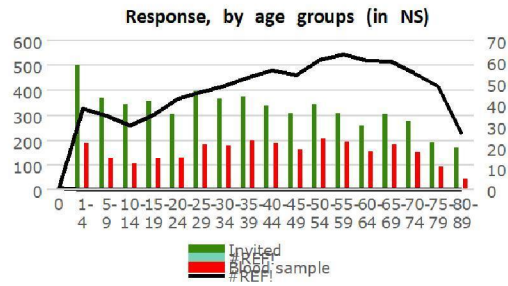


specificity=99.7% and sensitivity=89.0%





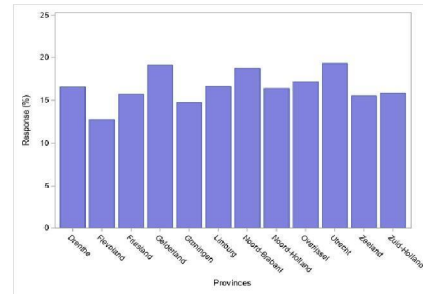
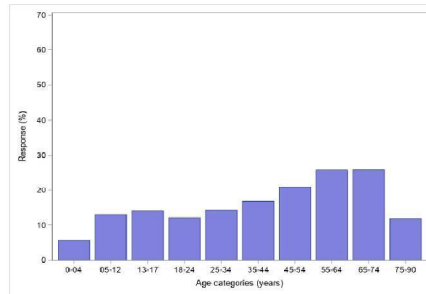
## PICO1 – April, 2020



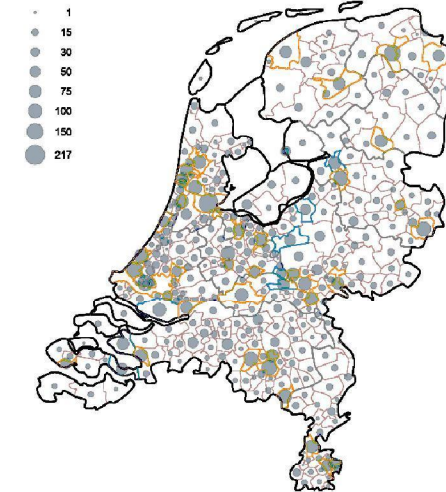


## PICO2 – June, 2020

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



Number of participants per municipality, PICO2

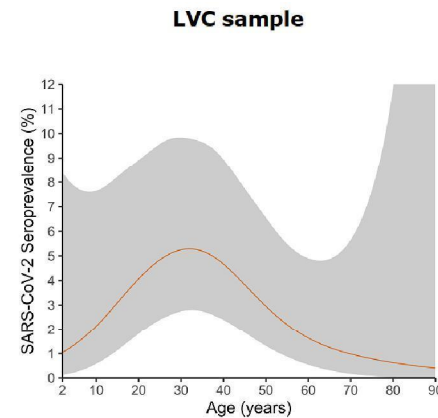
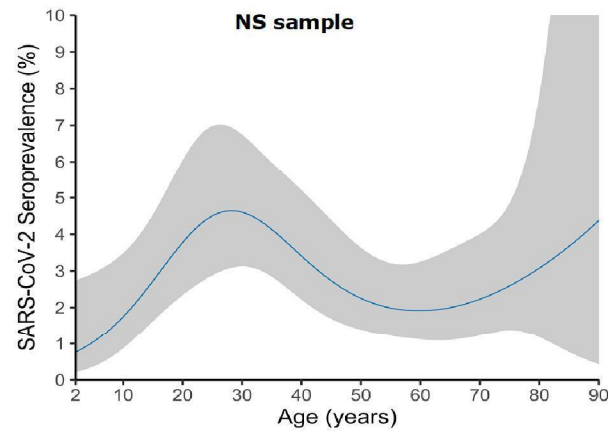






## PICO1 - Main findings

- 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)





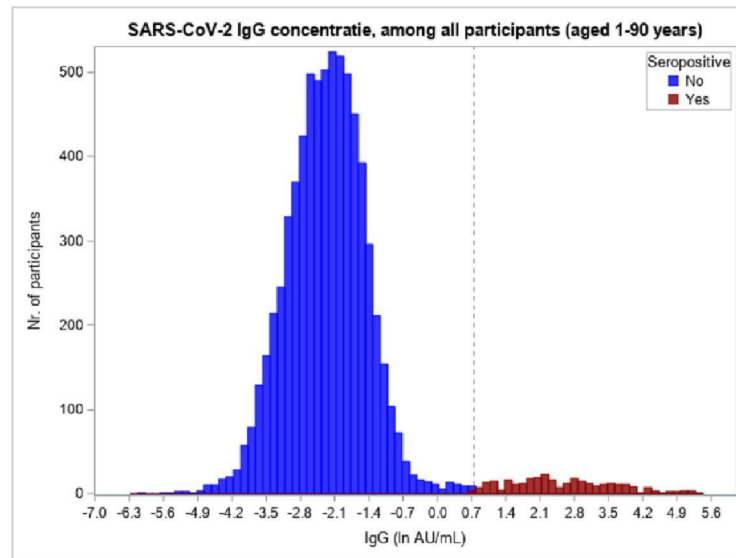
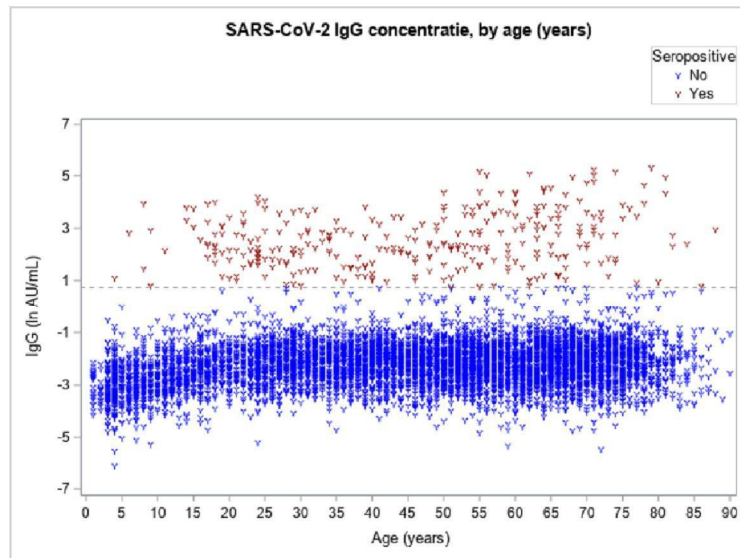


## PICO1 – Main findings

- 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.



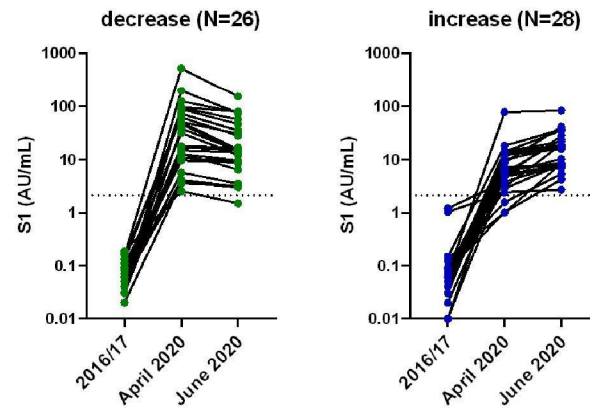
## SARS-CoV-2 IgG concentration ( $S_1$ , ln AU/mL), PICO2





## Pieter-Corona antibody kinetics

- T1 (pre) 2016/2017
- T2 1<sup>st</sup> week of April 2020 (n=3207)
- T3 1<sup>st</sup> 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





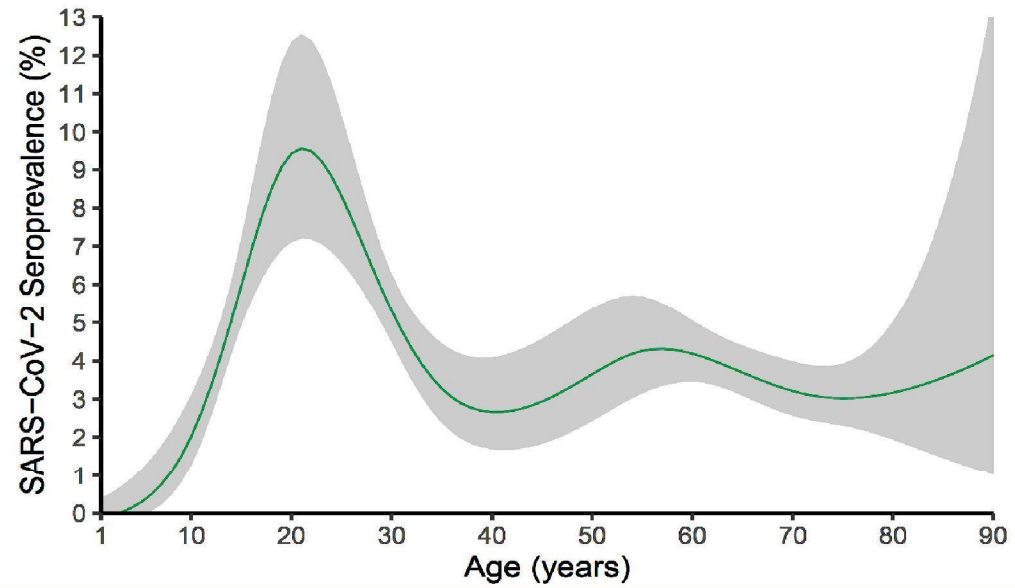
## Seroprevalence – NL, June 2020

-> 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]

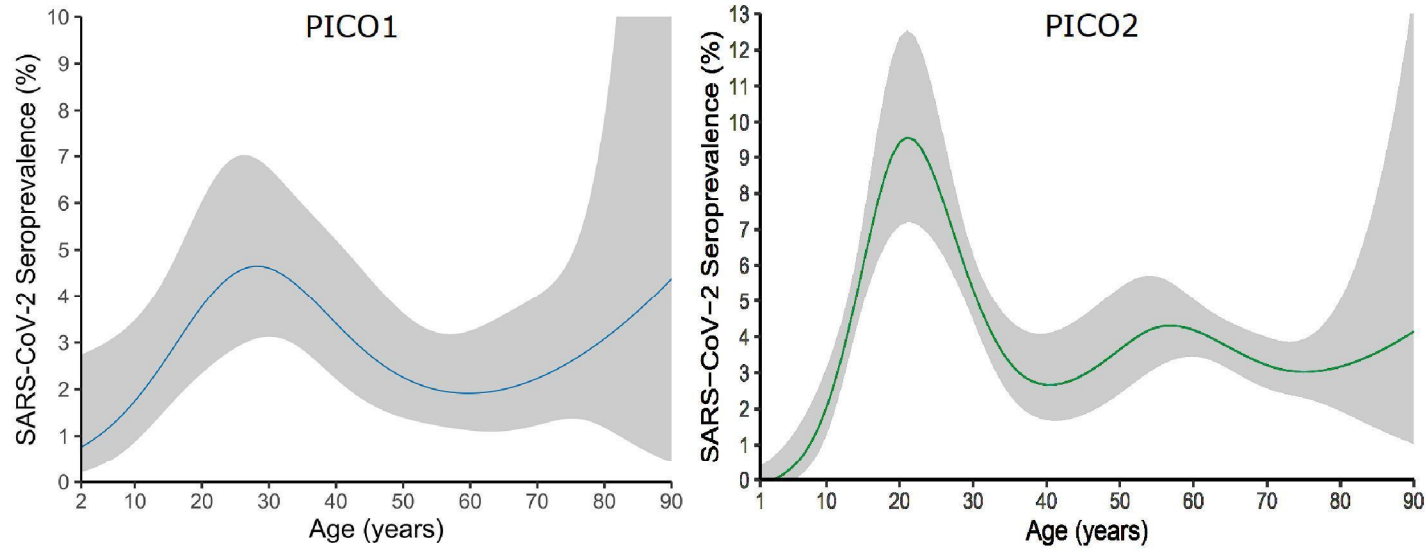


## Seroprevalence – NL, by age



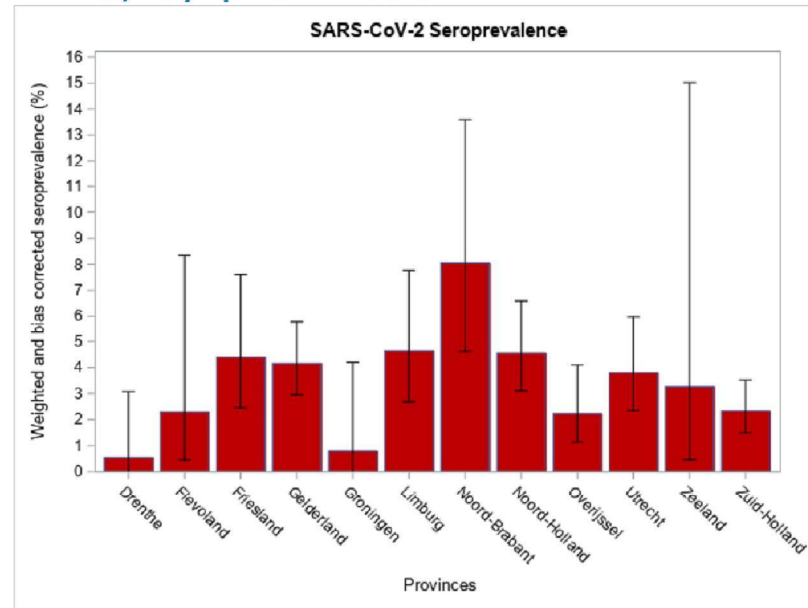


### April versus June 2020





## Seroprevalence – NL, by provinces





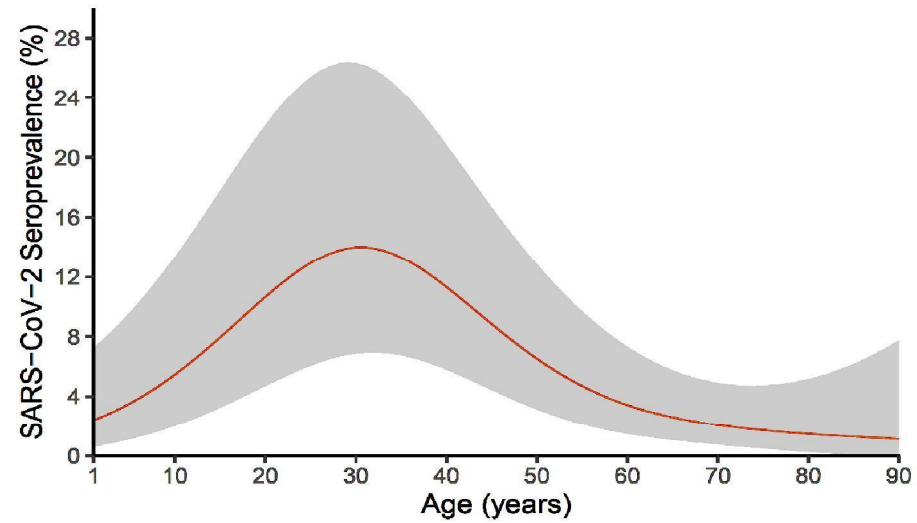


## Seroprevalence – LVC

**Overall:** 6.6% [2.6-13.3]

By **sex:**

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

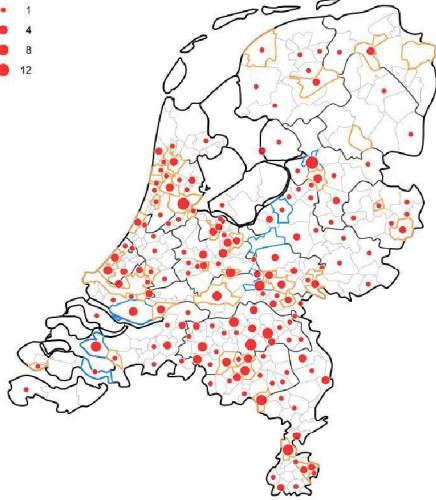




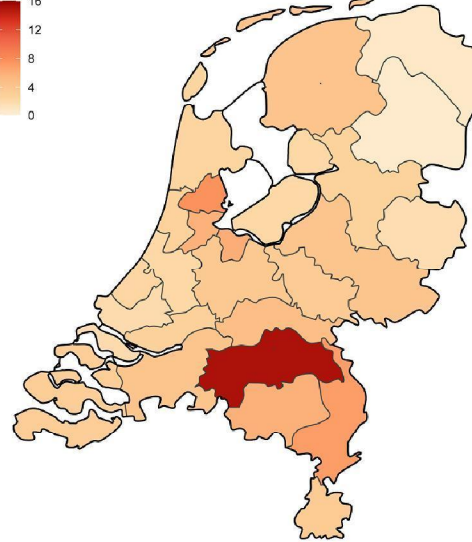
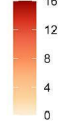
## Seroprevalence – NL, by geo spread

Number of SARS-CoV-2 seropositive participants per municipality

- 1
- 4
- 8
- 12



SARS-CoV-2 seroprevalence (%), PICO2





## Next to do, ongoing

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