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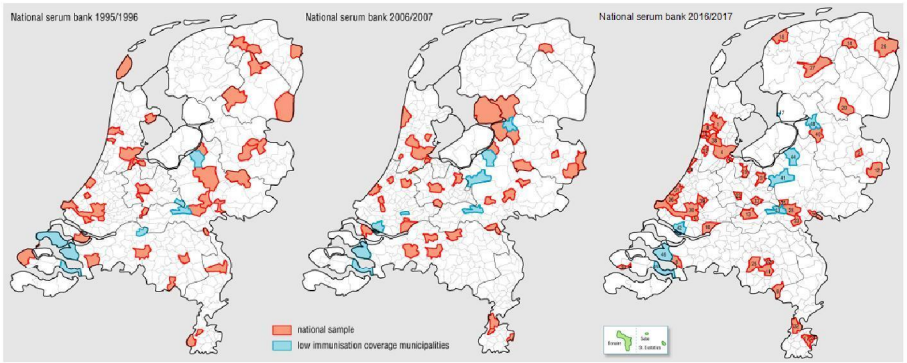
PIENTER CORONA

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 approach 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 filled out an online questionnaire on risk factors and contacts
    - repeated during 1,5 year, approx. 6 collections

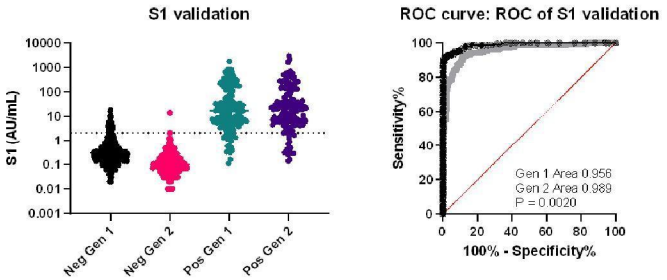
[1] Vos RA & Verberk JDM, et al. *BMC Inf Dis* (2019)

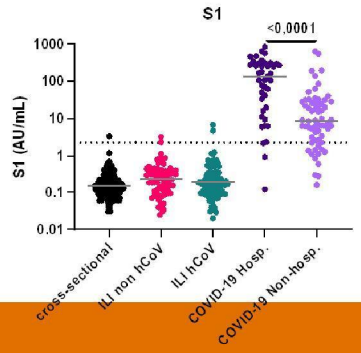
PICO1 – April, 2020

- **3207** (53%) participants from 2-90 years of age donated a blood sample, of which 3152 completed the questionnaire
  - 2637 (82.4%) from national sample (NS)
  - 570 (17.6%) 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

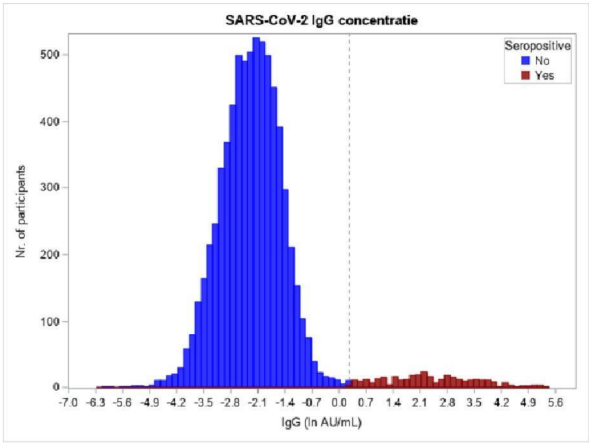
Vos RA, et al. (under review)

Corona Mutiplexed Immuno Assay

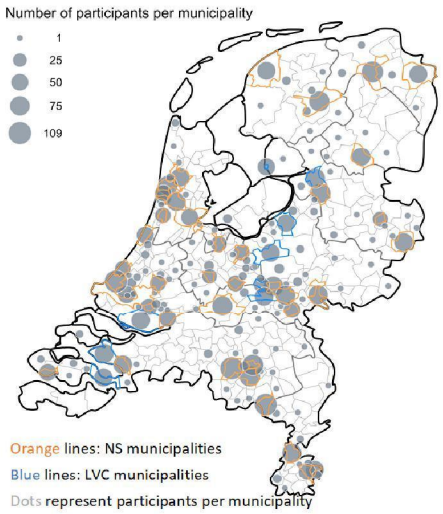


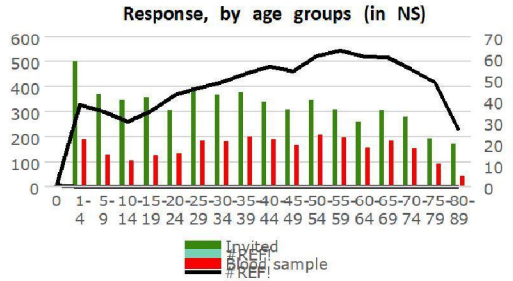


- Luminex platform
- Simultaneous detection multiple antigens



PICO1 – April, 2020

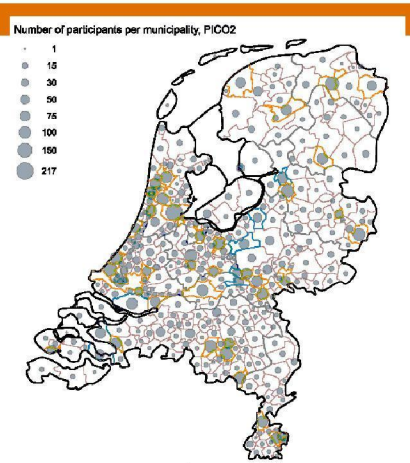


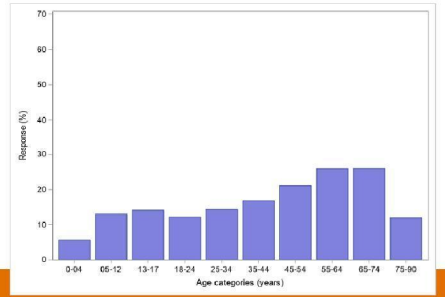


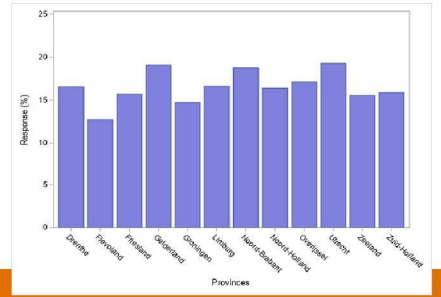
PICO2 – June, 2020

- **Longitudinal measures:**
  - PICO2-NS sample: n=2,323 (87% of PICO1-NS)
  - PICO2-LVC sample: n=500 (87% of PICO1-LVC)

- Besides the NS and LVC sample an additional sample was included in PICO2 to enhance the geographical spread (sampling across the NL and all ages)
  PICO2-PLUS: n=4,614 (17.1% of 27,053 invited)



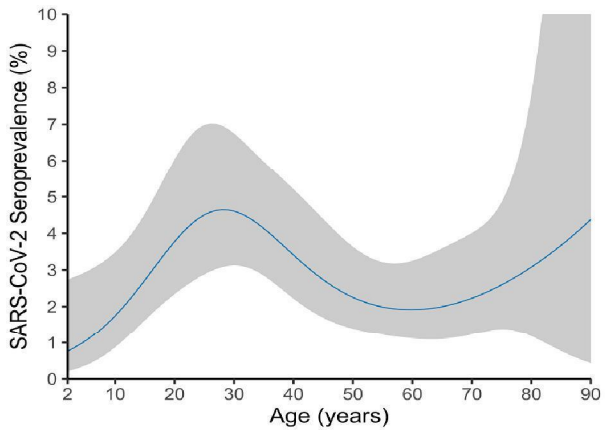




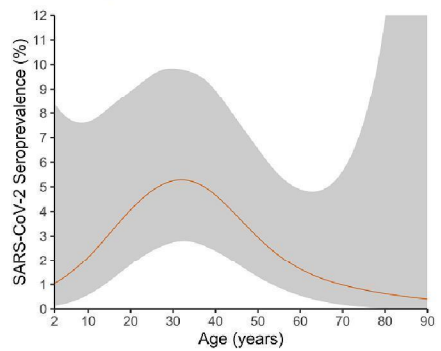
PICO1 - Main findings

- 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)

NS sample



LVC sample

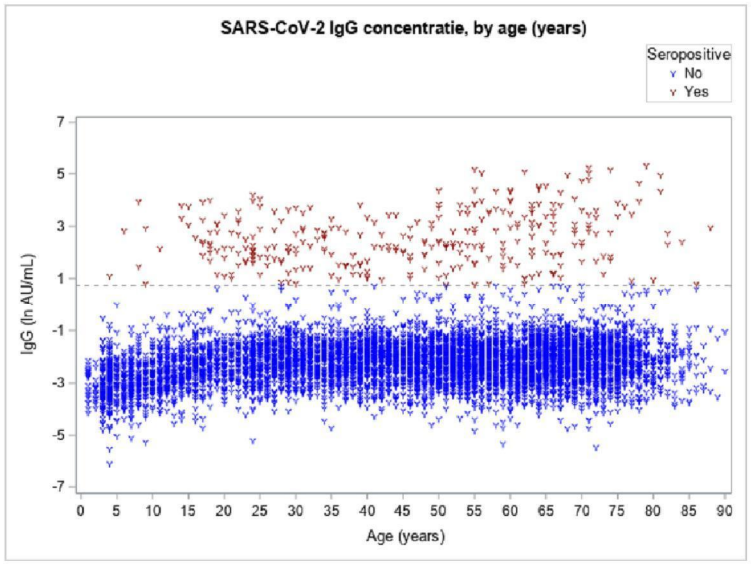


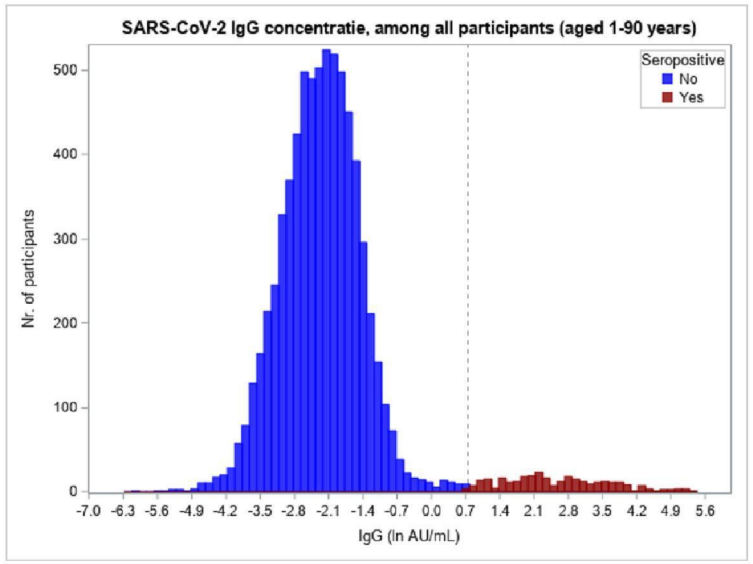
Vos RA, et al. (under review)

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 (S1, ln AU/mL), PICO2



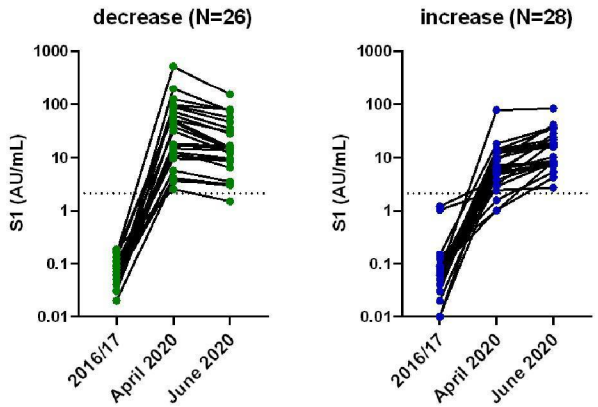


Pienter-Corona antibody kinetics

- T1 (pre) 2016/2017
- T2 1st week of April 2020 (n=3207)
- T3 2st 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

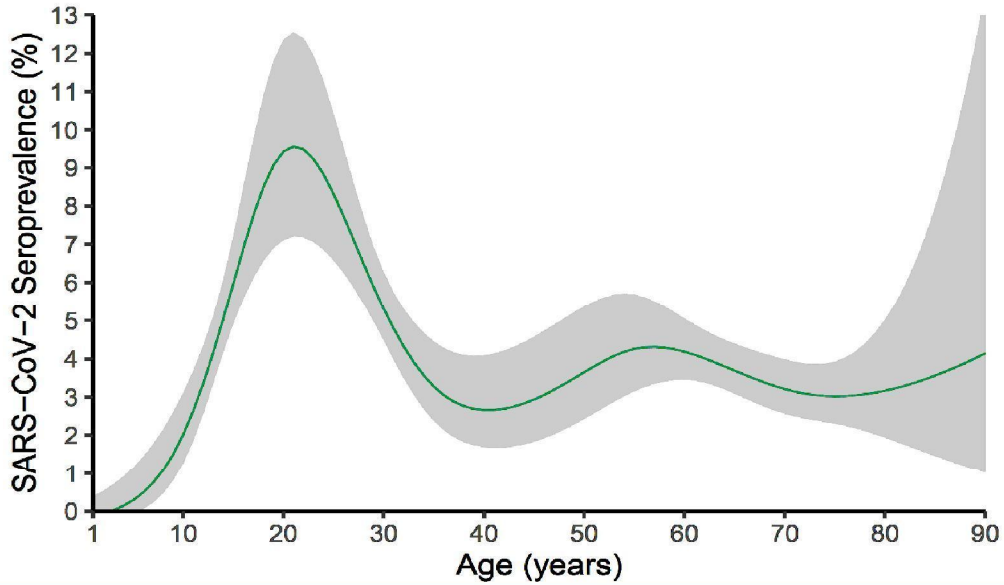


Seroprevalence – NL, June 2020

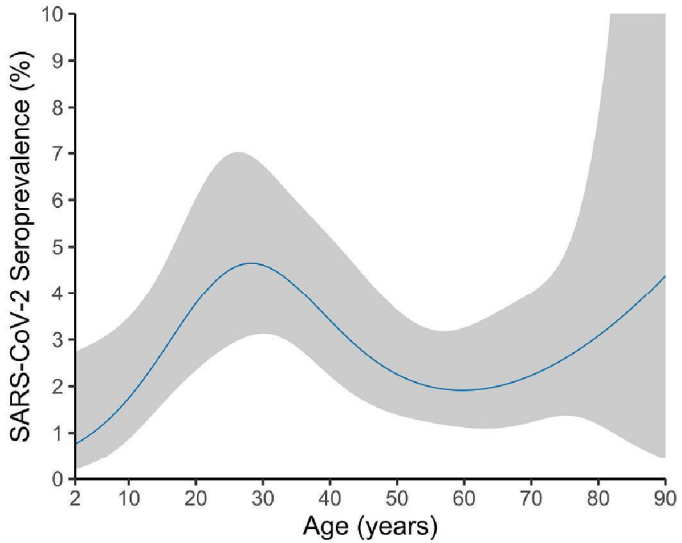
-> *Note: all data were corrected for the survey design (NS & PLUS samples were pooled), weighted, as well as corrected for test specifics (specificity=99.7% and sensitivity=89.0%)*

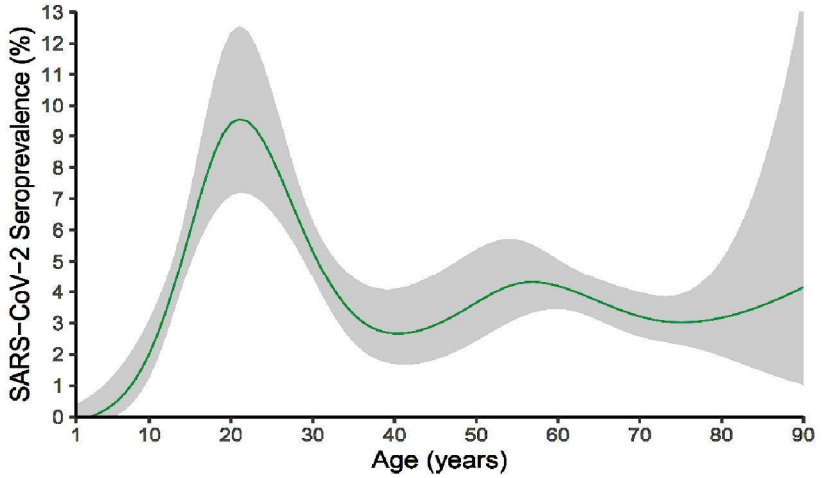
- **Overall:** **4.1% [3.4-4.9]**
- By **sex**:
  - Men: 4.4% [3.5-5.3]
  - Women: 3.8% [3.1-4.6]
- By **ethnicity**:
  - Dutch: 4.3% [3.5-5.4]
  - Non-Dutch Western: 2.4% [1.2-4.3]
  - Non-Western: 4.0% [2.1-7.1]

Seroprevalence – NL, by age

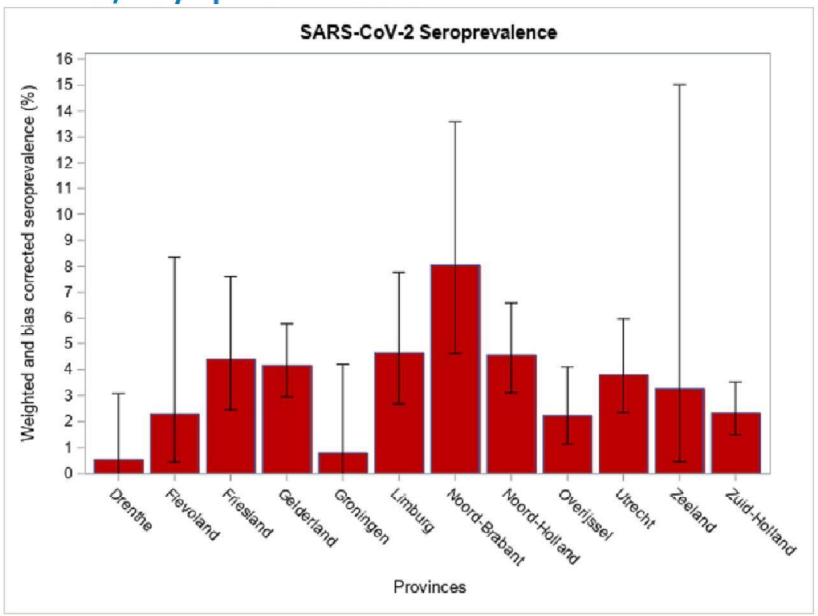


April to June 2020





Seroprevalence – NL, by provinces

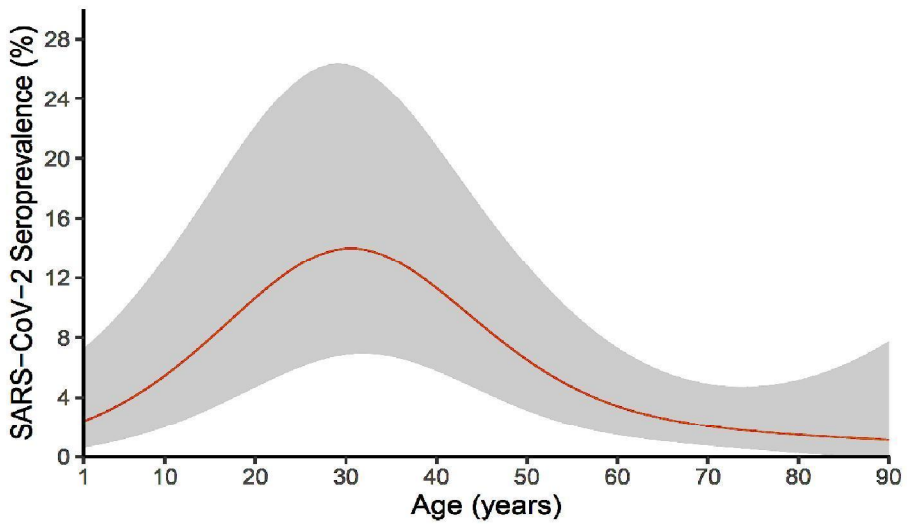


Seroprevalence – LVC

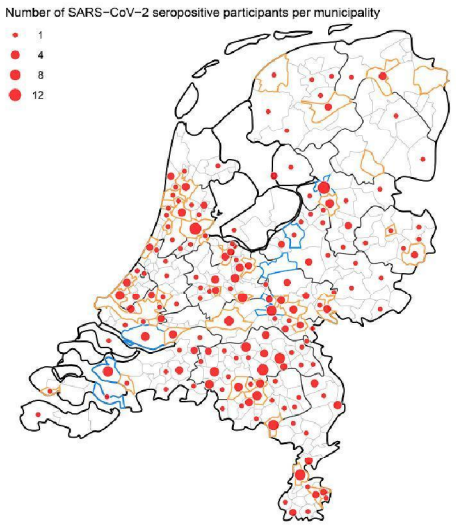
Overall: **6.6% [2.6-13.3]**

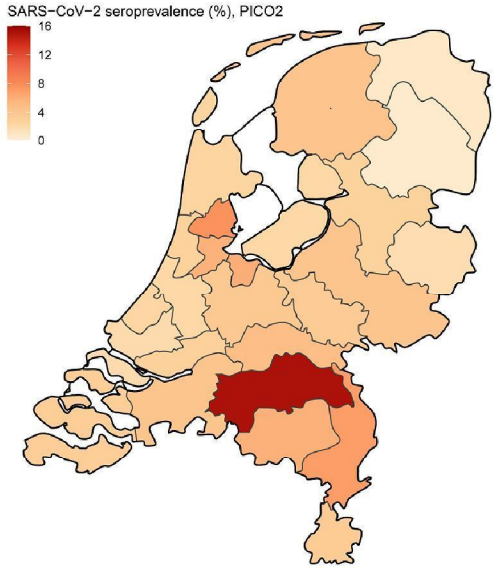
By **sex:**

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



Seroprevalence – NL, by geo spread





Next to do, ongoing

- Kinetics antibodies
- IgM and IgA analysis
- Symptoms over time

- PICO 3, 21-25 September, 7800 packages sent by mail