

EQUaIS: modelling for an effective and EQUitable response to pandemics

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Introduction

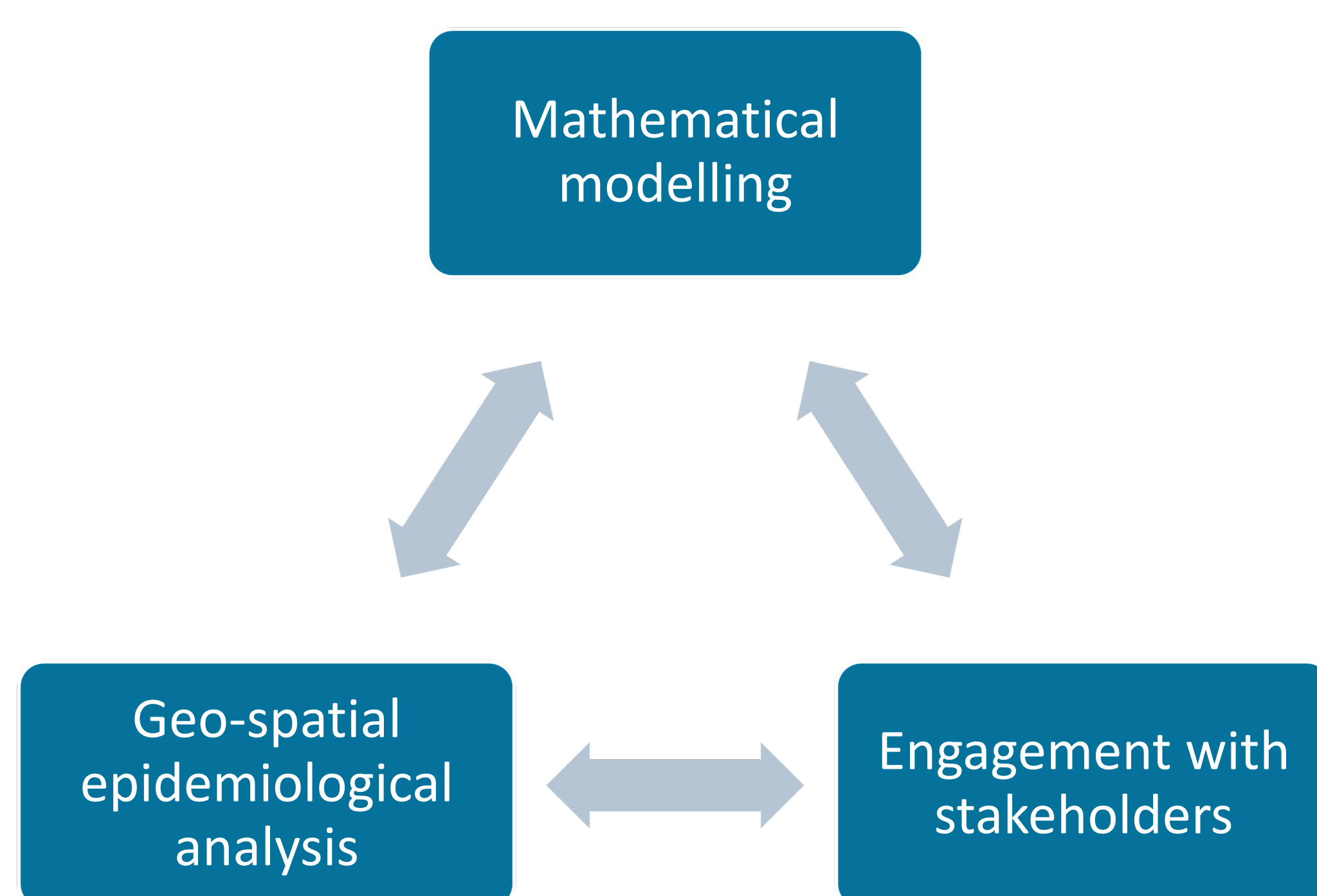
The COVID-19 pandemic has highlighted long-standing **inequalities** that resulted in already-vulnerable groups bearing a disproportionate burden of the disease.

- Numerous possible explanations, ranging from **health factors, health seeking behavior and barriers to accessing COVID-19 information, vaccine uptake, differences in contact behavior**, all likely to differ by **socio-economic status (SES)**.
- Non-pharmaceutical interventions (NPIs) may have exacerbated inequalities, for instance because of differences in the ability to comply for work reasons.

Objectives

- To estimate the time-varying associations between COVID-19 infections/hospitalizations and areal level SES and proportion of migrants, in 2020 and 2021 in the Netherlands
- Develop a mathematical framework to design effective and equitable measures

Methods



Data:

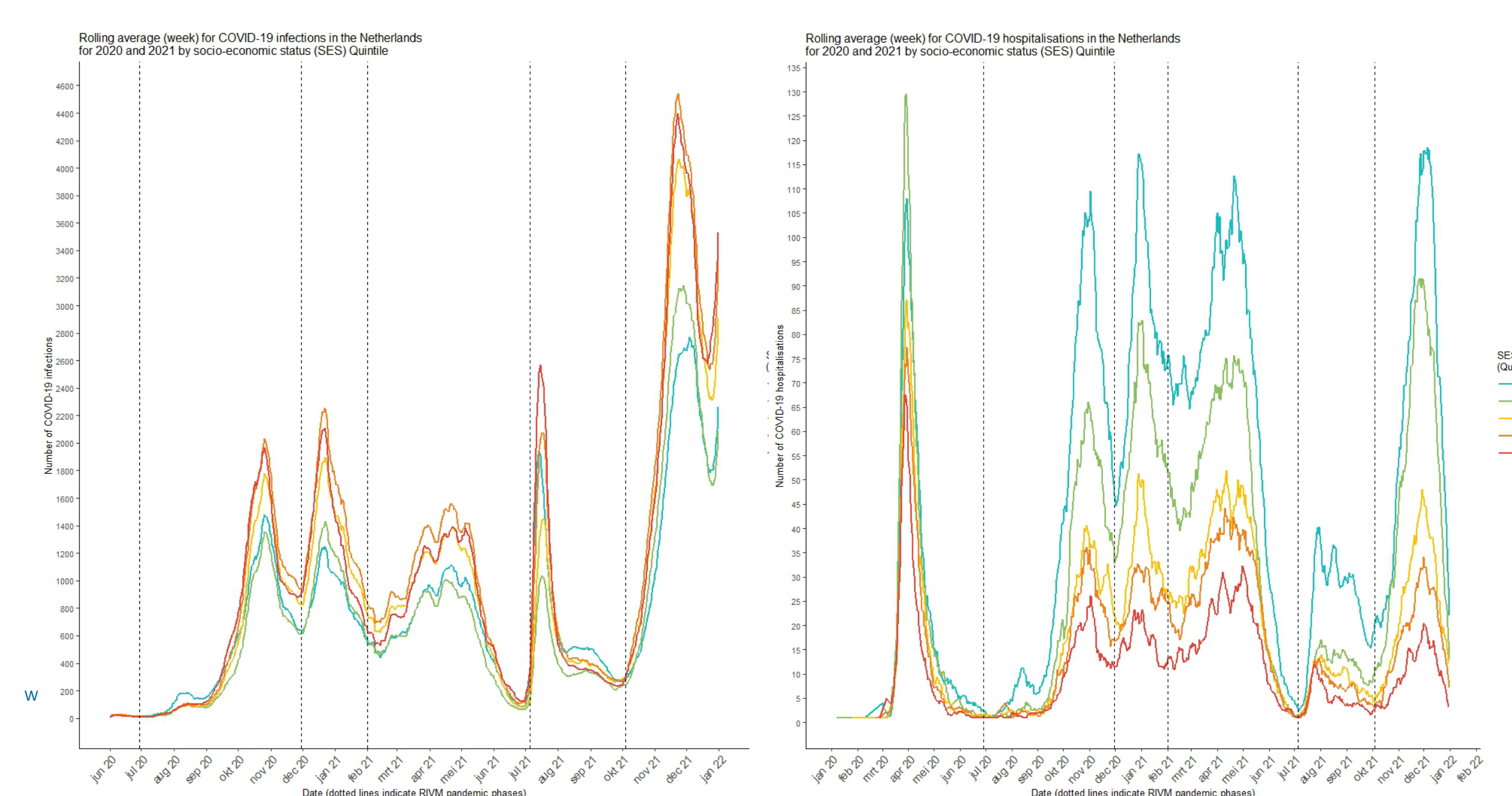
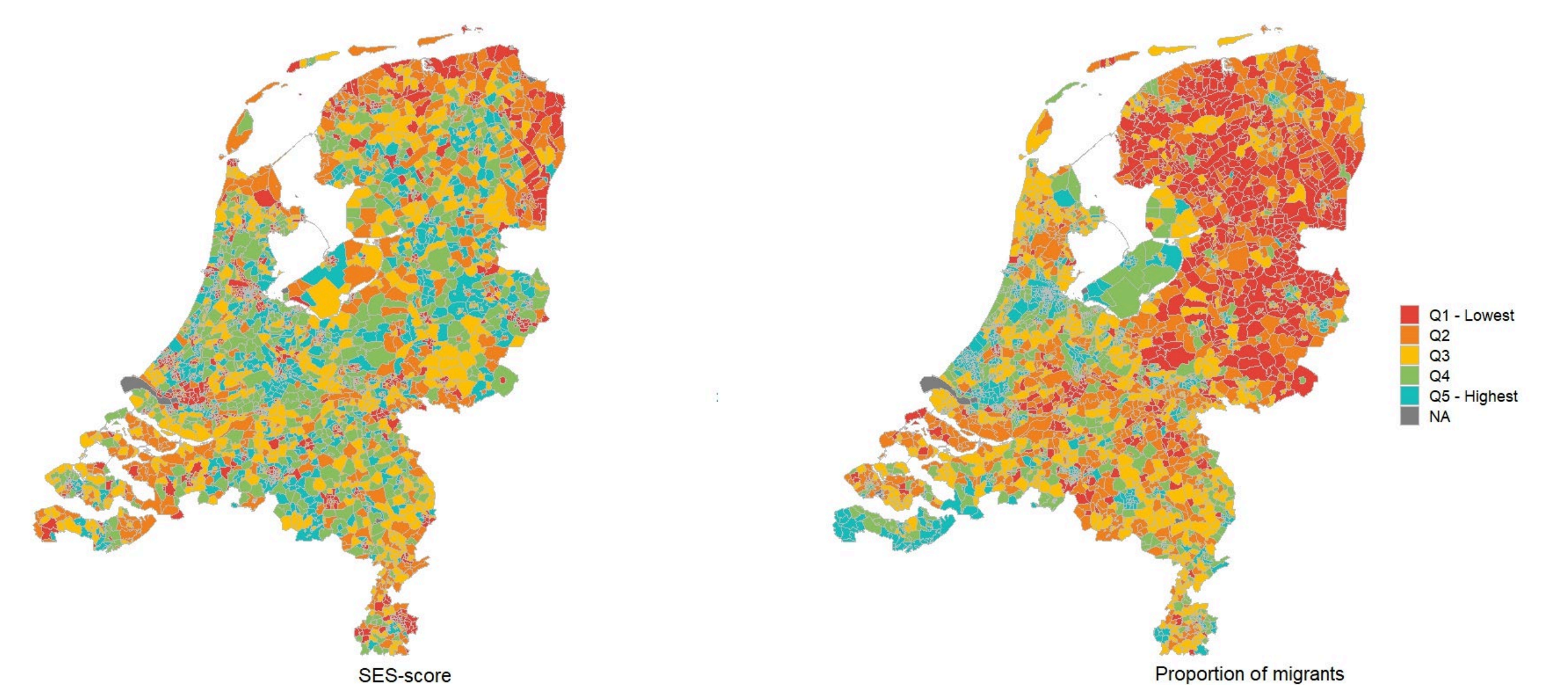
Pieter Corona (PiCO) contact and serological surveys, population data (CBS), positive tests (CBS) and hospitalizations (DHD).

Engagement with stakeholders: meetings with experts to receive input/feedback on main drivers for inequalities, definition of scenarios to model

Geo-spatial epidemiological analysis: Bayesian hierarchical model for district level inequalities over the different phases of the COVID-19 pandemic

Mathematical modelling: general approach to account for specific risk groups (unequal contact patterns, unequal susceptibility to severe infections)

Results



- Tool to identify vulnerable areas in the country.
- Framework to simulate the impact of different intervention packages on different risk groups.

Lessons learned

Our work highlights the need to integrate socioeconomic determinants into epidemic modelling of infectious diseases.

To do so, routine collection or simplified linkage of SES and migration background data in infectious disease surveillance is recommended.

Specific measures that aim to reduce prevalence of risk factors/co-morbidities in vulnerable groups in “peace” times are likely to have the largest impact for pandemic preparedness.