

Preliminary result and conclusions of the COVID-19 case cluster study (Gangelt Municipality)

Dr. Hendrik Streeck (Institut für Virologie)

Dr. Gunther Hartmann (Institut für Klinische Chemie und Klinische Pharmakologie, spokesman for cluster of excellence ImmunoSensation²)

Dr. Martin Exner (Institut für Hygiene und öffentliche Gesundheit)

Dr. Matthias Schmid (Institut für Medizinische Biometrie, Informatik und Epidemiologie)

University Hospital Bonn,

Bonn, 9 April 2020

Background: The municipality of Gangelt is one of the areas most affected by COVID-19 in Germany. It is assumed that the infectious outbreak can be attributed to a Karneval meeting on 15 February 2020, as multiple people tested positive for SARSCoV2 following this gathering. The Karneval meeting and outbreak following the meeting are currently being investigated more closely. A representative sample of the municipality of Gangelt (12,529 inhabitants) was taken in the district of Heinsberg. The World Health Organization (WHO) recommends a protocol in which 100 to 300 households are randomly inspected, depending on the expected prevalence. The representative nature of this sample was coordinated with Prof. Manfred Güllner (Forsa).

Objective: The objective of the study is to determine the status of past and ongoing SARS-CoV2 infections (percentage of all infected individuals) in the municipality of Gangelt. Furthermore, the state of current SARS-CoV2 immunity should be thereby ascertained.

Approach: A form letter was sent to approx. 600 households. A total of around 1000 inhabitants from approx. 400 households took part in the study. Questionnaires were answered, throat swabs were taken and blood was tested for the presence of antibodies (IgG, IgA). The interim results and conclusions from approx. 500 individuals are included in this initial evaluation.

Preliminary result: A current immunity of approx. 14% (anti SARS-CoV2 IgG positive, specificity of the method >.99%) was determined. Around 2% of individuals exhibited a current SARS-CoV2 infection identified via PCR method. The infection rate (current or past infection) was approx. 15%. The lethality (*case fatality rate*) based on the total number of infected individuals in the municipality of Gangelt is, with the preliminary data from this study, approx. 0.37%. The current lethality in Germany calculated by Johns Hopkins University is 1.98%, and is thus five times higher. The mortality based on the total population in Gangelt currently amounts to 0.06%.

Preliminary conclusion: The 5-times greater lethality compared to this study identified by Johns Hopkins University stems from the different reference sample size of infected individuals. In Gangelt this study records all infected individuals in the sample, including those with asymptomatic and mild cases. In Gangelt the segment of the population that has thus already formed an immunity to SARS-CoV2 is around 15%. This means that 15% of the population in Gangelt can no longer be infected with SARS-CoV2, and the process for achieving herd immunity has already commenced. This 15% segment of the population reduces the speed (net reproduction figure R in epidemiological studies) of further spread of SARS-CoV2 accordingly.

By adhering to strict hygiene measures it is to be expected that the virus concentration of an infected individual can be reduced to the point that the illness manifests more mildly, with simultaneous development of an immunity. These favourable conditions are not present in a superspreading event (e.g. *Karneval meeting, apres-ski bar in Ischgl, Austria*). Hygienic measures are expected to have positive effects on overall mortality.

We thus explicitly recommend implementing the four-phase strategy developed by the Deutsche Gesellschaft für Krankenhausthygiene (DGKH), which puts forth the following model:

Phase 1: Social quarantining with the goal of inhibiting and slowing the pandemic and preventing overload of critical supply structures, in particular the healthcare system

Phase 2: Initial loosening of quarantine with simultaneous assurance of hygienic conditions and behaviours

Phase 3: Lifting the quarantine with adherence to hygienic conditions

Phase 4: Public life returns to as it was before the COVID-19 pandemic (status quo ante)

(The statement from the DGKH can be found here:

https://www.krankenhausthygiene.de/ccUpload/upload/files/2020_03_31_DGKH_Einladung_Lageeinschaetzung.pdf

Note: These results are preliminary. The final results of the study will be published and presented to the public once they are available.