FIRST COVID-19 SEROSTUDY RESULTS

Author

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SYNOPSIS

The results of the first week's investigation into a heavily COVID-19 affected population in Germany have been released:

Immunity: Approximately 14% of the tested population were immune (antiSARS-CoV2 IgG positive)

PCR positive: Approximately 2% of the tested population had a PCR +ve for SARS-CoV-2

Case fatality rate: Approximately 0.37%.

Overall mortality: Based on the total population in Gangelt the overall mortality is currently 0.06%.

THE COVID-19 CASE-CLUSTER-STUDY

On 9 April, the Minister President of North Rhine-Westphalia, Armin Laschet, launched the "COVID-19 Cluster Study" to investigate the epidemiology of COVID-19 in the Gangelt Community, Heinsberg District of North Rhine-Westphalia state.

This area became an epi-centre of COVID-19 in Germany following a carnival which brought visitors from Germany and many other countries.

It was decided that this population was ideal to study to learn more of the epidemiology and immunity of SAR-CoV-2.

The objectives of the "Covid-19 Case-Cluster-Study" study include determining the "undisclosed amount" of SARS-CoV-2-infected people currently and those who have already had the infection, in order to create a complete survey of the burden of SARS-CoV-2 on the Heinsberg district.

The research project started on Monday, March 30, 2020 and is scheduled to run for four weeks.

The research team includes Prof. Dr. Hendrik Streeck, Prof. Dr. Martin Exner, Prof. Dr. Matthias Schmid, and Leibniz Prize winner Prof. Dr. Gunther Hartmann, and 80 medical student assistants, other doctors and scientists.

The first results (in German) were handed to Prime Minister Laschet on 9 April.

GERMAN COVID-19 STATISTICS

Table from [Robert Koch Institute](#) (updated 9 April)

Table 1: Number and cumulative incidence (per 100,000 population) of notified laboratory-confirmed COVID-19 cases and deaths per federal state, Germany (09/04/2020, 12:00 AM)

Federal State	Total Number of cases	Number of new cases	Cases/100,000 pop.	Number of deaths
Baden-Wuerttemberg	21,603	923	195	519
Bavaria	28,827	1,263	220	635
Berlin	4,202	174	112	37
Brandenburg	1,578	106	63	30
Bremen	445	21	65	11
Hamburg	3,320	155	180	44
Hesse	5,242	277	84	100
Mecklenburg-Western Pomerania	572	17	36	11
Lower Saxony	6,804	419	85	141
North Rhine-Westphalia	21,961	1,032	122	384
Rhineland-Palatinate	4,336	188	106	50
Saarland	1,693	56	171	23
Saxony	3,261	117	80	52
Saxony-Anhalt	1,075	55	49	16
Schleswig-Holstein	1,932	105	67	34
Thuringia	1,351	66	63	20
Total	**108,202**	**4,974**	**130**	**2,107**

Heinsberg data: 1,281 confirmed infections, 34 deaths.

[Openstreetmap](#) of Heinsberg – showing Galgelt

METHODS (machine translated from German)

Goal: The goal of the study is to determine the level of ongoing SARS-CoV2 infections (percentage of all infected) taking place in the community. In addition, the status of the current SARS-CoV2 immunity can be determined.

Procedure: A form letter was sent to approximately 600 households. Eventually approximately 1,000 residents from approximately 400 households took part in the study. Questionnaires were collected, throat swabs taken and blood was tested for the presence of antibodies (IgG, IgA). The preliminary results come from the evaluation of approximately 500 people.

PRELIMINARY RESULT (machine translated from German)

1. An existing immunity of approximately 14% (antiSARS-CoV2 IgG positive (specificity of the method > 99%) was determined.

2. About 2% of the individuals had a current SARS-CoV-2 determined using the PCR method.

3. Those who had been infected (current infection or immune) was a total of approximately 15%.

4. The lethality (case fatality rate) based on the total number of Infected in the community of Gangel, based on the preliminary data from this study, is about 0.37%. (Currently German CFR from Johns-Hopkins University data is calculated at 1.98% and is 5 times higher.)

5. The Mortality based on the total population in Gangelt is currently 0.06%.

PRELIMINARY CONCLUSION (machine translated from German)

The mortality rate from Johns-Hopkins University, which is several times higher than in this study in Gangelt, is explained by the different reference size of the infected. This study is getting all infected people in the sample, including those with asymptomatic and mild gradients.

In Gangelt, the proportion of the population that is already immune to SARS-CoV-2 is approximately 15%. This means that15% of the population in Gangelt can no longer be infected with SARS-CoV-2, and the process is the process of developing herd immunity is underway. This 15% of the population reduces the speed (net number of reproductions R in epidemiological models) of further spread of SARS-CoV-2 accordingly.

By adhering to stringent hygiene measures, it can be expected that the virus concentration during an infection event of a person can be reduced so far may result in less severe illness simultaneous training of immunity. These favorable conditions assume there is no exceptional outbreak event (superspreading event, e.g. carnival session, apres ski bar). With hygiene measures, favorable effects with regard to all-cause mortality can also be expected.

RECOMENDATIONS (machine translated from German)

We therefore strongly recommend the proposed four-phase strategy:

Phase 1: Continuing social quarantine (lockdown) with the aim of containment and slowing the pandemic and avoiding overloading the critical supply structures, in particular the Health Care System

Phase 2: Beginning withdrawal of quarantine (lockdown) with simultaneous ensuring hygienic framework conditions and behavior.

Phase 3: Removal of the quarantine while maintaining the hygienic framework

Phase 4: State of public life as before the COVID-19 pandemic (Status quo ante).

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