



The rise and fall of the COVID-19 epidemic in early 2020

The COVID-19 pandemic peaked in Iceland around 22 March 2020, after rising rapidly since it was spotted in late February. The number of people diagnosed was stable for the next two weeks, but after 5 April, the number of daily infections suddenly decreased. The measures taken against the pandemic were, on the one hand, individually based hygiene and, on the other hand, public measures aimed at preventing people from gathering, at border control, increasing distance between individuals, taking viral tests for

infection, contact tracing, isolating the infected, and quarantining those exposed to an infected person.

Figure 1 shows a curve of the number of people infected each day, calculated as the moving average of the last five days in order to reduce daily fluctuations. The objective of these measures against the epidemic was to reduce the reproduction number (R). Until 21 March, the figure was >1, which means that every infected person infected on average more than one and the epidemic was growing. During the period in which the epidemic

was stable (22 March–5 April), each infected person may be assumed to have infected one other person on average ($R \sim 1$). After 5 April, the number of infected persons decreased day by day ($R < 1$) and the epidemic declined.

Public measures against the COVID-19 epidemic

Figure 1: Number of COVID-19 cases in Iceland and action timeline

1. 26 February 2020. Iceland defines high-risk areas, i.e. Northern Italy and Tirol, ahead of other states, and takes tough action. Everyone who comes to the country from these areas is subjected to 14 days of quarantine.
2. 6 March 2020. Visiting ban imposed on nursing homes and Landspítali National Hospital.
3. 13 March 2020. Public gatherings are limited to 100 people. Colleges and universities are closed, and the operation of day-care centres and primary schools limited to a certain number of students. The first untraceable infections are identified. deCode Genetics, an Icelandic biopharmaceutical company, initiates general screening for COVID-19.
4. 19 March 2020. All countries defined as high-risk areas. All Icelandic citizens and people residing in Iceland who come to

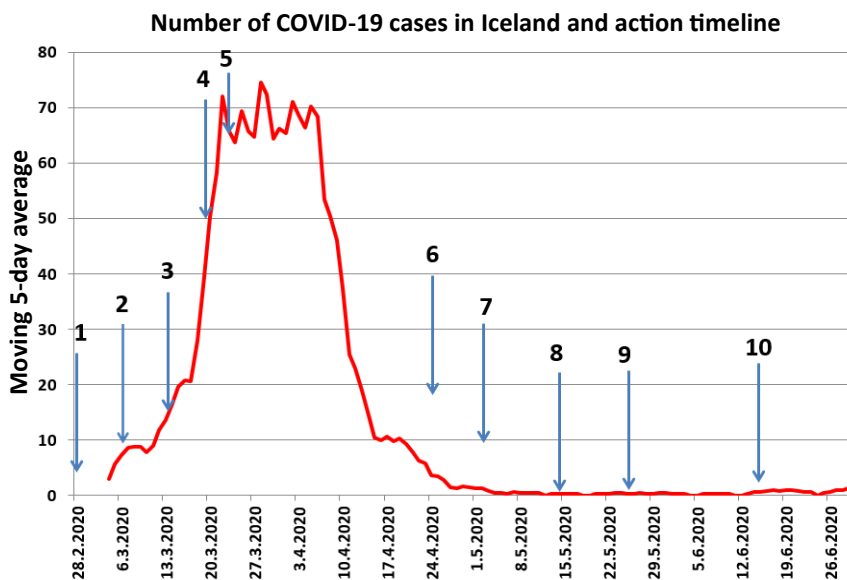


Fig. 1

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 Marianna Thordardóttir

Editor

Haraldur Briem, Special Advisor

Directorate of Health

Chief Epidemiologist for Iceland

Katrinartun 2
 105 Reykjavík
 Tel: +354 5101900
 Fax: +354 5101920
 E-mail: mottaka@landlaeknir.is
 www.landlaeknir.is

- Iceland after their stay abroad are subjected to 14 days of quarantine. Foreigners who are neither EEA nor EFTA nationals will be prohibited from entering the country unless they can demonstrate that their travel is due to urgent matters.
5. 22 March 2020. The Minister of Health announces further restrictions on public gatherings in accordance with the advice of the Chief Epidemiologist. The limit set to 20 people. Entry into force on midnight between 23 and 24 March.
 6. 24 April 2020. Quarantine rules changed. Everyone coming to the country (including foreign tourists) is required to quarantine for 14 days from arrival. At the same time, temporary border control of the internal borders is introduced. The rules apply until 15 May 2020.
 7. 4 May 2020. Relaxation of restrictions on public gatherings and schooling. The number restrictions extended from 20 to 50 people. Day-care centres and primary schools, sport, and youth work without restrictions. Secondary schools and universities can open, and various business activities are reopened. Sensitive groups encouraged to continue taking special caution.
 8. 15 May 2020. New rules on quarantine take effect. Those who come to Iceland are still obliged to quarantine for 14 days and authorisation to apply occupational quarantine is extended. At this point, all countries, except Greenland and the Faroe Islands, are deemed high-risk areas. This means that no travel restrictions apply in Iceland against those who come to Iceland from the Faroe Islands or Greenland. Border rules to be re-evaluated before 15 June.
 9. 25 May 2020. Restrictions on gatherings and schooling relaxed. Number restrictions extended from 50 to 200 people. Fitness centres allowed to reopen with the permitted maximum number of visitors never exceeding half the maximum permitted number according to their operating licence. All restaurants, including pubs and entertainment venues, as well as gaming arcades, may be open until 11 p.m. As far as

possible, maintaining a 2-metre social distance is recommended. The implementation of the 2-metre rule is altered to some degree, the aim being to protect primarily those who are vulnerable by creating the conditions they prefer to maintain the 2-metre social distance.

10. 15 June 2020. Passengers arriving in Iceland from 15 June 2020 onwards are given the opportunity to undergo testing for COVID-19 rather than being quarantined for 14 days. Children born in 2005 and later do not have to undergo testing or quarantine. Testing is offered at Keflavik Airport and, for arriving passengers, at other international airports and harbours. Passengers are also required to fill in a pre-registration form prior to arrival, to follow public health measures, and are encouraged to download the app *Rakning C-19*. At the same time, further relaxation of the ban on public gatherings took effect. Number restrictions at gatherings extended from 200 to 500 and restrictions on the number visiting swimming pools and health centres are cancelled.

What determinants influenced the decline of the COVID-19 epidemic?

The spread of the virus SARS-CoV-2 causing COVID-19 has been a matter of debate. Screening conducted by deCODE Genetics of the prevalence of antibodies against the virus on behalf of the Chief Epidemiologist during the period from 3 April to 20 June 2020, mostly after the peak of the epidemic was over, included 33,220 individuals. Most of the samples (80%), were taken 5 May to 6 June after the peak of the epidemic was over. People seeking medical attention for reasons other than COVID-19 were invited to donate blood for antibody testing. Those who had already been diagnosed with the disease were not included. Of those participating in the

screening, 13,953 were men (43%) and 19,057 were women (57%). There was little difference in the prevalence of antibodies by age group, with the mean being 1.3%, highest in the age groups 20–39 years and lowest in those older than 70 years, see Table 1.

From this, it can be concluded that the prevalence of antibodies in the community has not been crucial to curbing and reducing the epidemic and that most of the population is still susceptible to the disease. Recent studies suggest that cellular resistance to the disease can be present without antibodies in the blood. It should therefore be borne in mind that part of the population may have been infected with SARS-CoV-2, or even related coronary viruses, and have acquired cellular immunity without antibody formation in the blood.

Which mitigation measures were most

Table 1

Age group	Number	With anti-bodies	% positive
0-9 years	357	5	1,4
10-19 years	1122	21	1,9
20-29 years	3135	62	2,0
30-39 years	4239	86	2,0
40-49 years	4900	80	1,6
50-59 years	5895	72	1,2
60-69 years	6581	68	1,0
70 years or older	6991	33	0,5
Total	33220	427	1,3

important in stopping the spread of the COVID-19 epidemic in Iceland? It is difficult to assess when the measures are multifaceted. However, the quarantine can be assumed to have achieved great results, since about 60% of those diagnosed had been in quarantine. It is appropriate to draw attention to several important issues related to the prevention measures:

- Day-care centres and primary schools were not closed although access was limited.
- No curfew was imposed.
- People were not encouraged to use face masks in public.
- The country was never formally closed.
- Transmission of infections from foreign tourists to people living in Iceland could not be detected, even though tourists were not quarantined at the beginning of the epidemic. There was one exception when COVID-19 infections were detected in three foreigners who were arrested for

burglary and had not followed any quarantine instructions when arriving in the country shortly before 15 June. Three Icelandic police officers were infected in connection with their arrest.

Last May, the first steps were taken, in a cautious manner, to alleviate a variety of restrictions, such as concerning schooling, sports, and public gatherings. On 15 June, all passengers arriving from the EU/EEA and EFTA regions were invited to undergo a viral test or 14 days quarantine.

The situation in mid-2020

At the end of June 2020, a total of 1,847 people had been diagnosed with COVID-19 in Iceland and 434 were in quarantine. A total of 22,507 individuals had been in quarantine from the onset of the disease. Following the release of restrictions for

travel to Iceland from 15 June, 15,179 tourists were screened for the virus (SARS-CoV-2) and antibodies against it until the end of June. Six foreign travellers had active infection (0.03%) while 23 were detected with antibodies against the virus and were not considered infectious (0.13%). Two Icelandic travellers (one coming from the United States and the other from Albania) were identified with the virus in a second test they chose to undergo a few days after their return, even though the first one, taken upon arrival, had been negative. In the meantime, one of them had managed to infect number of a people through a multifaceted network in sports and social gatherings. This is an indication that Icelanders and others residing in this country may pose a risk of distributing COVID-19 after returning from high-risk areas. This risk seems much less when foreign tourists are involved.

Sexually transmitted diseases

Syphilis and gonorrhoea continue to be of particular concern. In the first six months of the year, 43 people with syphilis were identified, which is a significant increase compared to the previous year. As in previous years, the majority was male, or 91%. Almost half of those identified (9%) are Icelandic citizens. Gonorrhoea is also growing.

During the first six months of the year, 68 people had been diagnosed with the disease, which is more than in previous years at the same time. As is the case with syphilis, the majority of those diagnosed is men, or 69%, and mostly Icelandic citizens, or 81%. The driving force in the spread of syphilis and gonorrhoea are men.

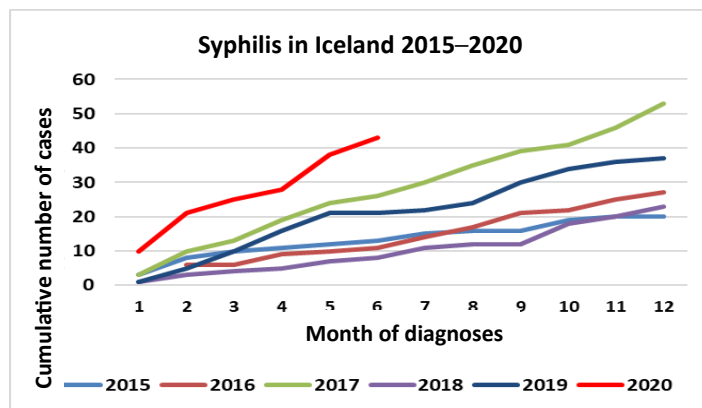


Fig. 2

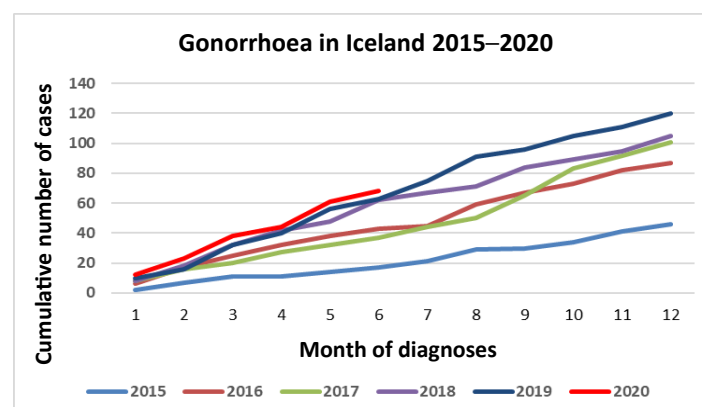


Fig. 3