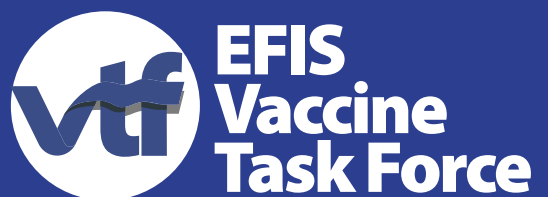


EFIS Vaccine Task Force report: Lessons learned from European COVID-19 vaccination rollout programmes



European Federation of
Immunological Societies



EFIS statement

The European Federation of Immunological Societies (EFIS) is a non-profit umbrella organisation that represents 35 European immunology Societies, as well as associations from Eurasia and the Middle East. Every active member of any EFIS-affiliated Society is automatically considered a 'member' of EFIS and can as such benefit from EFIS programmes. EFIS thus acts as an organisation uniting nearly 14,000 individual researchers and clinicians working in the fields of immunology and allergology.

The main goals of EFIS are to support immunological research and education, as well as to strengthen scientific interaction among its members.

As this has been a rapid review, it is a summary of the research at time of writing; it is not an exhaustive literature review. It is the considered input of the Vaccine Task Force and does not necessarily represent the position of EFIS, its members or the individual members of the EFIS Vaccine Task Force.

All web references were accessed in July 2022.

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Notes from EFIS President and Chair of the EFIS Vaccine Task Force



Note from Professor Andreas Radbruch, Former President of EFIS

“With the COVID-19 pandemic we have seen the world’s single largest vaccination drive reach billions of people across the globe at an unprecedented pace. As immunologists, collaborating to communicate our understanding of immunity through vaccines, how they work, and how our immune system interacts with different COVID-19 variants will be key to the public policy decisions which will set our future course in the near and longer terms. It is crucial that we learn from the COVID-19 pandemic response and apply this knowledge and experience to ensure that international populations are informed and have faith in vaccination programmes for this disease and future outbreaks. This report from the EFIS Vaccine Task Force aims to share some of the learnings we have taken in Europe from the COVID-19 pandemic in order that we can be more prepared to help save the lives of millions of people in future.”



Note from Dr Doug Brown, Chair of the EFIS Vaccine Task Force

“Chairing the EFIS Vaccine Task Force has been a fantastic opportunity to exchange knowledge and experience with immunologists from across Europe. Participating in discussions about the challenges and long-term impact of the COVID-19 pandemic and sharing recommendations about how best to communicate immunological research allows us to better respond to this and other diseases. I and the contributors to this report hope that by sharing our reflections on how our countries rolled out our vaccine programmes so quickly – along with some of the challenges of these rollouts – we can encourage future collaboration and contribute to the preparedness of countries for future pandemics.”

Executive summary

The COVID-19 pandemic led to an unprecedented, collaborative research effort to drive forward our understanding of the disease. Labs around the world strove to develop an effective vaccine against a disease that had halted the world in its tracks, claiming more and more lives as time went on. This was achieved at an extraordinary and admirable pace, with the first approved COVID-19 vaccines being deployed in December 2020.

This also marked the beginning of what would be one of the largest peacetime logistical operations in history, as countries across Europe and the world began to mobilise their vaccine deployment programmes. This is a road that we are still travelling down, and it is not one that has been without its challenges. During the vaccine rollout worldwide, there have been many hurdles to overcome such as building reliable supply chains, ensuring equitable access to vaccines, building vaccine confidence, and combatting misinformation.

Over a year on from the first use of COVID-19 vaccines, we have come a long way. National economies are recovering, civil liberties are being restored, and hospitalisations and deaths from COVID-19 are dramatically down compared with the same timepoints in 2020 and 2021. There is still a long way to go, however. The successful deployment of first generation COVID-19 vaccines in Europe does not herald the end of the pandemic.

The optimum deployment of the next generations of COVID-19 vaccines will rely on us learning the lessons of the past 18 months, and that is the purpose of this policy paper. We are already seeing how vaccine developers are seeking to overcome supply chain issues, and in the same way we must draw on the successful experiences we have at overcoming vaccine hesitancy and increasing vaccine confidence to make sure that as many of our populations are vaccinated as possible. In this report, we, therefore, examine case studies of successful interventions in a variety of EFIS member nations that might be applied both in other European countries and also further afield. Lastly, the original mission of the EFIS Vaccine Taskforce was to improve uptake of vaccinations across Europe. It is our hope therefore, that the effective strategies identified for increasing COVID-19 vaccine uptake might also be applied to routine immunisations too, so that a legacy of positive action comes from this pandemic.



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Recommendations from the EFIS Vaccine Task Force

1 Immunologists should collaborate across national borders to respond to health crises.

Sharing information internationally is crucial in the effective response to international pandemics, and international collaboration can be facilitated by groups and fora with membership from multiple countries – such as the EFIS Vaccine Task Force. Sharing success stories and challenges from one country can help to assuage issues in other countries. We must work together to learn from experience and identify commonalities in the way the public engages with the importance of vaccinations.

2 We must work together to proactively respond to vaccine hesitancy across Europe.

The proportion of people who are hesitant to take a vaccine depends on the demographics of a particular country. Different factors correlate to varying levels of vaccine uptake and differ between countries. It is important to understand and address nation-specific concerns about vaccines that are prominent in public discussion and may lead to hesitancy to vaccination. It is fundamental that these concerns are shared between countries, so that others may learn from the challenges of engaging with the public to get vaccinated and save lives.

3 Immunology needs to be at the heart of national and international health policy.

Many of the members of the EFIS Vaccine Task Force are working immunologists who have been involved in the national response to the COVID-19 pandemic in their home countries. Where immunologists have directly informed policy and – crucially – had the trust and respect of the public, vaccine uptake has been higher and fewer people have been hospitalised or died with COVID-19. Immunologists need to share their research in clear, open and accessible ways to allow the public to engage and understand the importance of science-based policy and activity. Clearly articulated position statements, such as the EFIS Vaccine Task Force statement on immunity at the end of this report, will help to provide clear, immunology-based information of this type.

4 Engaging the public through co-creation of resources is key to increasing confidence in vaccines.

To respond positively to a reluctance to get vaccinated among European populations, it is important to include members of the public in the planning and dissemination of informative resources. Clearly defining what is meant by ‘immunity’ in relation to COVID-19 is an important first step in framing discussions about the success of vaccine rollouts across Europe.

The importance of European collaboration

Collaboration is key, and science should not be conducted in silos. So much more can be achieved through the active exchange of ideas, through collaboration and through working together to share best practice than can be accomplished alone. EFIS was founded on the principles of breaking down the barriers and borders that hinder scientific collaboration and this is the ethos which the organisation continues to work to today. In the spirit of this, the EFIS Vaccine Task Force has collated case studies from a number of our national immunological Societies which encapsulate what strategies and approaches have yielded success in their respective countries for tackling the COVID-19 pandemic. The case studies span a range of topics, from scientists working with government during a time of crisis, to how best to increase vaccine uptake among populations with lowest confidence in vaccines. It is our hope that these case studies will highlight exemplars that will be relevant to other countries in finding solutions to difficult issues that exist in continuing to battle COVID-19, as well as in improving their own pandemic preparedness measures going forward.

In our first case study, Professor Aurelija Žvirblienė of the Lithuanian Society for Immunology details the importance of a strong relationship between immunologists and the policymakers who are making decisions regarding COVID-19 that are being adopted in Lithuania. Professor Žvirblienė also highlights the need for flexible decision making that is moulded by events in real time. This case study emphasises the importance of building close links between immunologists and those in policy making. Maintaining a good working relationship with those at the levers of power in periods of relative calm will mean that immunologists are among the ‘go to’ experts when a more turbulent period is encountered. The pandemic has reinforced the value of immunology and both those in the immunological community and those in government and legislatures across Europe should work to maintain the relationships that have been built over the last two years, to ensure that policymaking is stronger and more robust in the future.



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Case study one: the Lithuanian response to COVID-19

By Prof. Aurelija Žvirblienė

Along with other specialists, members of the Lithuanian Society for Immunology participate in national expert groups providing advice to policymakers (including the Presidency and government departments such as the Ministry of Health) on the management of the COVID-19 pandemic. Recommendations of immunologists are considered by politicians when taking decisions related to vaccination. The examples of such decisions include:

- Enforcing a vaccination delay up to 7 months for those who have recovered from COVID-19
- Only one vaccine dose for those who have recovered from COVID-19
- The possibility of confirming recovery from COVID-19 not only by previous PCR test but also by serologic test
- Heterologous vaccination with mRNA-based vaccines after adenovirus-based vaccines
- The possibility of receiving a booster dose after three months

These recommendations were based on real-world data provided by the analysts of the Lithuanian Department of Statistics who demonstrated a decreasing vaccine effectiveness within 3–4 months against infection and hospitalisations. In general, these measures were timely and had a positive impact for stabilising the COVID-19 situation in the country.

Besides expert activities, Lithuanian immunologists actively communicate with mass media, giving interviews and comments about vaccination, presenting public lectures to different audiences. The demand for professional information on COVID-19 vaccines is very high in society. In Lithuania, four COVID-19 vaccines are available (Comirnaty, Spikevax, Vaxzevria, Janssen) with the possibility of choosing any vaccine. The vaccination process is coordinated by the Ministry of Health, under explicit guidance from immunologists.

At the beginning of the vaccination campaign, about 60% of Lithuanian adults were ready to take COVID-19 vaccines. Vaccine hesitancy correlated with lower income and education levels. The unprecedented vaccine rollout speed and possible side effects were the most common reasons for not getting vaccinated. Introduction of the national COVID-19 certificate ('opportunity passport'), allowing access to many services and activities, had a positive impact on vaccination rate among adults, reaching 80% by the end of 2021. Almost half of them received a booster dose. However, vaccination coverage of adults aged 65+ remained insufficient (80% fully vaccinated, 65% boosted), as the benefits of the 'opportunity passport' were less prominent for this age group. To improve vaccine uptake, the government offered a payment of 100 Euros to seniors aged 75+ who were newly vaccinated or boosted. Additional measures included vaccination





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without prior registration in pharmacies, supermarkets, churches, bringing vaccination into homes of older people. Although these efforts had some effect, the expected high vaccination rate of the older population was not achieved. As noticed by the experts, possible reasons for refusing vaccines were the lack of convincing and attractive communication strategy in the country, and a wide spread of disinformation in social networks.

The attempts of the government to introduce mandatory vaccination for healthcare workers were not approved by the parliament. Some experts also did not support this decision due to its potential negative impact on vaccine acceptance.

In general, COVID-19 vaccine coverage in Lithuania is one of the highest among Eastern European countries. This allowed us to keep social venues open and avoid major restrictions during the fourth wave of the pandemic. Although the spread of SARS-CoV-2 Delta variant caused an increase in the number of infection cases and hospitalisations, the healthcare system remained functioning. The Omicron variant became dominant in February 2022 causing a significant rise in infection cases, also among vaccinees. Therefore, the 'opportunity passport' was cancelled, as suggested by the experts.

The main lessons learned during the COVID-19 pandemic are a close collaboration of policymakers and specialists in solving problems related to the pandemic, and the importance of flexible political decisions in a rapidly changing situation.

Data and European comparisons

Throughout the COVID-19 pandemic, comparative data from across Europe has been shared widely by scientists, governments and journalists. Data on hospitalisations, mortalities and strategy has been used to assess the most effective response to the pandemic – from assessing the merits of vaccination to establishing which vaccines have the best success rate and how many doses are required for maximum immunity against COVID-19. When used correctly, these comparisons can serve the international community by demonstrating best practice and allowing countries to learn from each other in developing their own vaccination strategy.

There are, of course, difficulties in collecting and comparing national governments' data about the rollout of COVID-19 vaccines. Up-to-date, daily figures on the spread of the disease are difficult to compare across countries, and variations in the capacity and capability to gather and share these figures results in significant discrepancies. However, where these figures are available, comparing and contrasting countries' responses to the pandemic, and particularly vaccine uptake, is a valuable way of sharing best practice and learning from each other. In our next case study, Professor Anne Spurkland of the Scandinavian Society for Immunology summarises the data about vaccine coverage provided by five European national governments: Norway, Sweden, Finland, Iceland and Denmark, in their response to COVID-19.



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Case study two: Nordic responses to COVID-19

By Prof. Anne Spurkland

The Nordic countries are characterised by populaces that are imbued with a greater sense of trust in government and by extension public health authorities. The response to COVID-19 in these countries shows that even in a part of the world with higher-than-average levels of vaccine confidence, there is still work to be done in ensuring that this sentiment is not taken for granted and that those working in public health live up to the expectations of the people they serve.

The COVID-19 vaccine rollouts in the Nordic countries have all followed a similar path. Norway collaborated with Sweden for the purchase of vaccines together with the EU. In Sweden and Norway, the Public Health Agencies were commissioned by their respective governments to create a vaccination priority plan.

In both Norway and Sweden, those with the highest need for protection against COVID-19 were prioritised for vaccination. The elderly and the most vulnerable living in care facilities were offered the vaccine first, along with healthcare workers working with risk groups, in December 2020 and January 2021. The regional authorities (Sweden and Denmark) or municipal authorities (Norway and Finland) were responsible for the COVID-19 vaccination. Individuals were invited to book a time for vaccination on dedicated websites and were allocated a time slot at vaccination centres that had been established in each community for deployment. Healthcare workers employed by the communities were involved in the distribution of COVID-19 vaccines in Norway, along with support from voluntary workers from Non-Governmental Organisations (NGOs) and from the military.

All the Nordic countries now have booster programmes, with more than 50% of the adult population currently having received a booster dose. Iceland is the country with the highest rate of booster vaccination, with a booster vaccine offered to people over 16 years old after four months of vaccination.

The Nordic countries have followed a similar strategy for vaccine rollout, with the respective national public health authorities in charge of organising the vaccine deployment programme.

Early on in the vaccine rollout, in March 2021, Denmark halted the distribution of the adenovirus-based Vaxzevria vaccine after reports of serious side effects in the form of thrombotic thrombocytopenic disease in newly vaccinated people. Norway followed suit straight after. After distributing 135,000 doses of the Vaxzevria vaccine in Norway, six patients were diagnosed with vaccine-induced immune thrombotic thrombocytopenic syndrome (VITT) of whom four died. The Vaxzevria vaccine was thereafter taken out of the Norwegian and Danish vaccination programmes.

Lessons learned

Across the five Nordic countries of Iceland, Denmark, Norway, Sweden and Finland, people, generally, have high trust in the government and in scientific advice when compared with other European countries. The governments' decisions to remove the Vaxzevria vaccine from the national COVID-19 programmes in Norway and Denmark, showed the population that important side effects of the new vaccines were taken seriously, which helped to maintain the trust that already existed.



Table 1: COVID-19 vaccination status in the Nordic countries, 13 April 2022

People >18 years			
Country	1 dose	2 doses	3 doses
Sweden*	87.1%	84.9%	63.6%
Denmark ^a	82.2%	80.8%	61.6%
Finland [§]	81.5%	78.0%	52.4%
Norway	80.4%	74.8%	54.2%
Iceland [#]	84.5%	79.0%	68.4%

* people aged >12 years for 1st and 2nd doses; <https://www.folkhalsomyndigheten.se/folkhalsorapportering-statistik/statistikdatabaser-och-visualisering/vaccinationsstatistik/statistik-for-vaccination-mot-covid-19>

^a <https://www.sst.dk/da/Udgivelser/2020/Meddelelse-om-prioritering-af-maalgrupper-og-vaccinefordeling-i-vaccinationsindsatsen-mod-COVID-19>

[§] <https://ourworldindata.org/covid-vaccinations?country=FIN>

[#] people >5 years for 1st and 2nd doses, as of 31.3.2022; <https://www.covid.is/statistical-information-on-vaccination>



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The challenges of vaccine hesitancy in European populations

With the emergence of COVID-19, the crucial role that vaccines play in protecting our health has come into sharp focus. During this pandemic, the development of successful and safe vaccines provided hope, and immunologists around the world worked to develop vaccines that would protect us against infection by this virus. While reluctance to heed the recommendations and advice of scientists is often frustrating to researchers, it is important to understand and address vaccine concerns that are prominent in public discussion and may lead to hesitancy to vaccination.

According to a recent survey conducted by IPSOS on willingness to receive a COVID-19 vaccination, the most common reasons not to get vaccinated cited by respondents are that:

- they fear side effects
- they question its effectiveness
- they do not consider themselves at risk for contracting severe COVID-19 disease

Our next case study explores the issue of vaccine hesitancy, its impact, and some of the possible reasons behind choosing not to get vaccinated.



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Case study three: the Croatian response to COVID-19

By Prof. Felix Wensveen

The COVID-19 vaccination effort in Croatia has been marked by a clear dichotomy in society. Due to a very strong anti-vaccination movement, our vaccination rate has not risen over 55%, and has resulted in a clear polarisation. Either people are greatly in favour of vaccination and adopt the first, second and third vaccine doses very rapidly, or people are greatly opposed and do not want to get vaccinated under any circumstances.

Various reasons underlie this hesitancy, mostly associated with a low confidence in our official bodies, including experts in the field. This was not helped by the limited and sometimes chaotic provision of information by our central government, including the official boards responsible for advising the state on its COVID-19 policies. People who are uncertain are pulled into either the pro- or anti-vax camp. General nationwide strategies have therefore been of very limited success, nor have been communicated by experts in the media.



Strategies that do seem to convince people are on a much smaller scale: meetings and seminars by experts to a relatively small number of people, with the opportunity to ask questions. As such, the Croatian population is more prone to believe experts upon a personal contact, rather than in general information distribution, which makes the process very labour-intensive, limited in scope and dependent on the quality of the speakers.



Engaging the public and building trust in vaccines

Immunologists know that vaccination is the safest and most effective strategy for protecting the public against the spread of SARS-CoV-2. This confidence is grounded not in the reputation of a particular vaccine, but on the scientific method that is required by these developers to demonstrate that a vaccine both works and is safe. Nevertheless, it is understandable that people have questions about vaccination, particularly for a new disease about which little is known. When distributing a vaccine, it is therefore important to discuss all elements of vaccines in an open and transparent way. By being open and honest it should become clear that any side effects are outweighed enormously by the benefits of vaccination. In addition, when talking about a 'new' vaccine, it should be communicated that many aspects of such vaccines are not new individually but are in fact based on established and well-known platforms and technologies. As such, only a small component of a new vaccine is usually new, which should give further confidence about its safety after trials have been carried out.

When communicating what a vaccine does, it should first be clear what it intends to do. The underlying molecular mechanisms are quite complex, but the basic principles are not. The purpose of a vaccine is to train the immune system in a safe way to recognise a harmless form of a bacteria or virus (a 'pathogen'), so that when that pathogen is encountered, the immune system can easily identify and destroy it before it makes the person sick. In order to do that, a vaccine uses part of the pathogen to activate the immune system without causing an infection but producing a specific immune response to fight off the pathogen. Various techniques are available, but in all of them, usually only a small piece of the pathogen is used. Some of the latest COVID-19 vaccines make use of new technologies, such as mRNA or adenovirus-based platforms.

In our next case study, Dr Doug Brown of the British Society for Immunology discusses how information campaigns were used to address awareness and importance of vaccines among the public in the UK.



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Case study four: the British response to COVID-19

By Dr Doug Brown

The UK response to the COVID-19 pandemic was swift and largely effective, although, as with other countries, there were challenges to ensuring a cohesive and effective uptake of the new vaccines. The UK was the first country in the world to authorise and deploy the Pfizer and AstraZeneca COVID-19 vaccines and was the first major European nation to vaccinate 50% of its population with at least one dose. Despite these successes, the UK was faced with some challenges to the necessary large-scale vaccination rollout that have already been highlighted in this report: in particular, building confidence about the safety of vaccines and increasing public awareness of the importance and efficacy of vaccination against highly infectious diseases. It became vital that the public were able to trust and understand the message that vaccination was the safest and most effective way to protect themselves against COVID-19. Luckily, immunologists were able to build on existing campaigns to reinforce the message that vaccination was the safest way to ensure immunity to COVID-19 and protect lives and livelihoods.

The Celebrate Vaccines campaign was launched at the beginning of the pandemic in 2020 and was run by the British Society for Immunology. It aimed to champion the critical role of vaccination and vaccine research in advancing global health. The expert voice of the immunology community is a vital part of the main objective of Celebrate Vaccines: to strengthen public understanding of vaccination and to help everyone make informed decisions about vaccines and immune health. Although the work to design the campaign predated the COVID-19 pandemic, the main aims of Celebrate Vaccines were pertinent to the vaccine rollout in response to COVID-19. These aims were:

- To strengthen the understanding of vaccine immunology among a wide audience, helping the public to make informed health decisions.
- To showcase the benefits of vaccine research in advancing global public health.
- To provide an opportunity for immunologists to share their passion for immunology research successes and celebrate vaccine research.
- To target diverse audiences across the UK.



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For the COVID-19 pandemic, immunologists were able to capitalise on the experience of this type of collaboration and engagement, and were central to the public messaging about the need for vaccination against the virus. The British Society for Immunology led the way in supporting immunologists to have accessible discussions with local communities where researchers responded openly and in plain language to commonly asked questions about the vaccine, including ‘what ingredients are in the vaccine?’, ‘what sort of protection does COVID-19 vaccination give me?’, and ‘how long will the vaccine protect me from getting ill with COVID-19?’. Immunologists also collaborated on resources that were made available to healthcare professionals, researchers, and members of the public with clear guidance on how to talk to people who had questions about the COVID-19 vaccine rollout – including about the risks and benefits of vaccinating pregnant women and how the vaccines were able to be developed so quickly.

Through the British Society for Immunology, UK immunologists worked closely with politicians, policymakers and journalists to ensure these messages were clear and accessible to everyone through public webinars, engagement on social media, blogs, media interviews, YouTube videos and through the creation of resources to aid engagement. The impact of these interactions between researchers and external audiences was significant, including increasing public knowledge of COVID-19 vaccines, ensuring policymakers had access to the latest evidence-based COVID-19 vaccine research, and increasing confidence in having effective conversations around COVID-19 among researchers and healthcare workers.

Many UK-based researchers have reported a number of advantages to their work and have personally enjoyed working with colleagues on such a significant problem, reporting that they wish to continue doing so in future. The legacy of the work to engage the public with the importance of vaccination will be increased collaboration and immunologists at the centre of policy and public engagement in future health crises.



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Defining immunity

By sharing examples of the response to the COVID-19 pandemic from across Europe, this report has aimed to encapsulate some of the collaborative discussions that the EFIS Vaccine Task Force has held over the last two years. The EFIS Vaccine Task Force is committed to sustained information sharing of this type and has committed to publish position statements that will be of use to researchers, policymakers, journalists and the public looking for evidence-based definitions and summaries of subjects pertinent to immunology in an international context. Below is the position statement that the EFIS Vaccine Task Force has worked to develop that defines immunity and its relevance to the COVID-19 pandemic.

What is meant by 'immunity'?

Immunity is protection against infectious disease. The immune system has many ways to fight off an infection and specialised immune cells are specific to each pathogen. If your immune system wins the fight against the harmful pathogen, these specific immune cells remain in the body after the infection as memory cells and if the same pathogen is encountered again, your immune system has an immunological memory of the pathogen and is ready to quickly prevent you from getting sick. This is immunity. However, sometimes the immune system doesn't win this initial battle and you can become very ill with serious complications. Vaccines safely train your immune system and provide a level of protection, or immunity, against infectious diseases.

In scientific terms, at an individual level immunity is the competence of your immune system to fight off a virus (or other pathogen) challenge after it has been educated by an initial challenge – either from the virus itself or from a part of the virus in the vaccine. We can have varying levels of immunity depending how effective our immune systems are. If the level is high enough and in the right place in the body, it will stop an infection completely. Even if it can't completely stop an infection, it is very often high enough to stop severe disease.

Immunity after infection with SARS-CoV-2 is very variable, whereas immunity after COVID-19 vaccination is more predictable. Nevertheless, infection does provide a level of immunity and data suggests that it is on par with the immunity conferred by COVID-19 vaccines when the Delta variant is the predominant strain, but not when the Alpha variant dominated. It is unclear however whether this is because of the different variant, waning immunity, or because many unvaccinated people are younger. Infection-acquired immunity from another variant is largely evaded by the Omicron variant.

Immunity after infection with SARS-CoV-2 may be broader (targeting the whole virus not just the spike protein) and therefore may cope better with variants. Infection as well as vaccination does provide more predictable long-term immunity, and will maintain immunological memory.



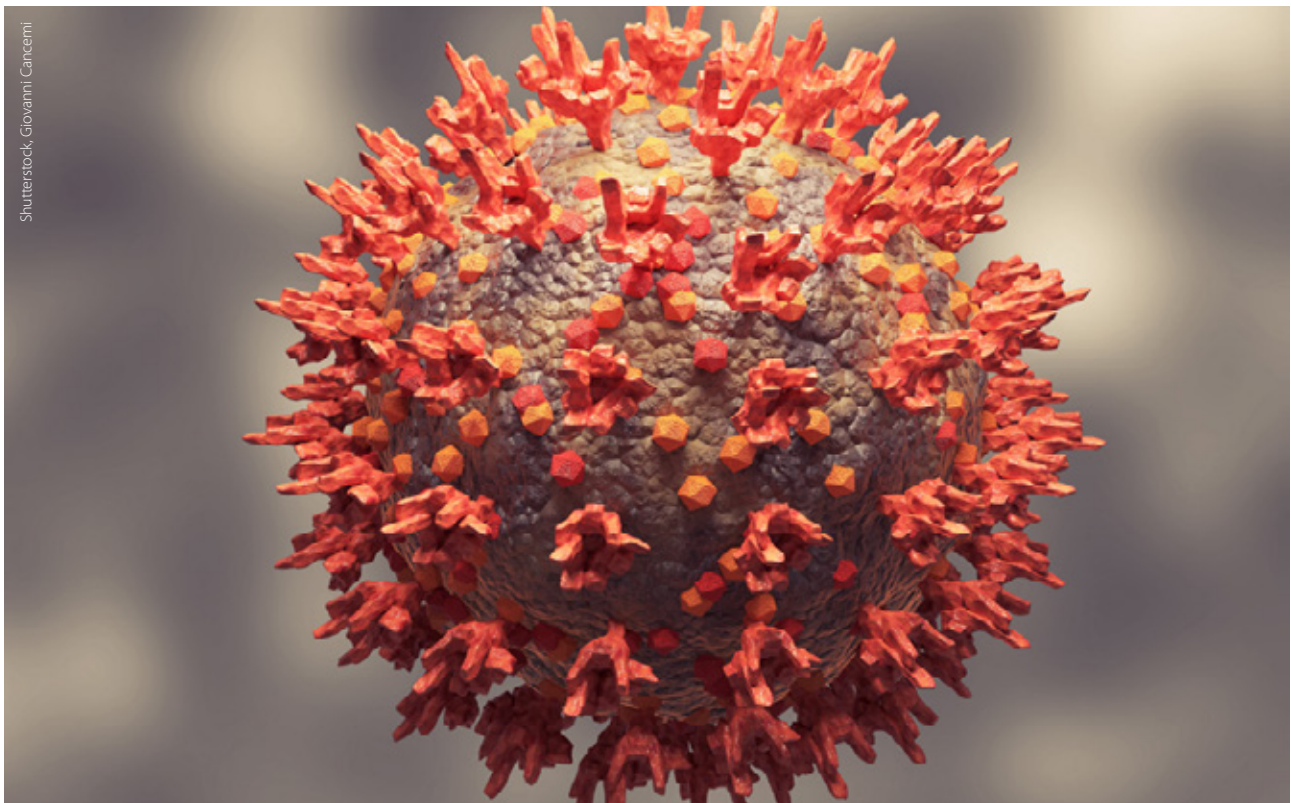
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Importantly, the evidence shows that vaccination is very safe and effective in people who have previously been infected. Even if you've had COVID-19, vaccination will safely boost whatever immunity you have from previous infection.

How long does immunity last and what are the correlates of protection?

Levels of immunity are expected to wane during the course of the immune reaction (for up to 6 months after the initial immune challenge), but then will level out at about 10% to 20% of the early maximum. But it is important to note that while the immune reaction eliminates the antigen, it selects for antibodies which can bind to the antigen much better, so that in the end, the quality of the antibodies produced is 10 to 100 times better than in the beginning. This therefore also provides broad immunity to yet unseen variants of the virus, although probably not to all of them. Antibody-secreting plasma cells expressing such antibodies recruited to immunological memory, are maintained in the bone marrow, and are a correlate of long-term antibody protection (humoral memory). It is important to note that these antibodies, neutralising or otherwise, protect the body systemically via the blood from severe disease. To protect from infection by airborne viruses, we need antibodies on the surface of our respiratory tract, also called secretory antibodies, which seem to wane much faster than the systemic antibodies.

It should be noted however, that just measuring antibodies alone is not an accurate measure of our immunity status. Memory B cells and memory T cells are also maintained by immunological memory, which can react very quickly to a new antigen challenge, which breaks through the protection provided by antibodies. In a secondary immune reaction, new plasma cells producing more antibodies are generated. In addition, T cells and NK cells recognise and eliminate infected cells, thus limiting spread of the virus. T cells have been found to be responsive to infection by the Omicron variant. However, increasing the numbers of memory plasma cells and memory B and T cells by repeated challenges, infection or vaccination, obviously has its limitations. Repeated vaccinations saturate immunological memory; with COVID-19 vaccines, this seems to be the case after three vaccinations, with further boosters being less effective.



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Conclusions

By sharing the recommendations of the EFIS Vaccine Task Force alongside case studies of the strategies and activities from European Immunology Societies, this report aims to demonstrate the importance of international collaboration to share research, insight and best practice. Engaging the public at all stages is crucial in building trust in vaccines and, as a consequence, ensuring the maximum uptake possible from the public.

The case studies have shown the importance of building public trust in immunologists and ensuring that science is at the centre of policy. The impact of the COVID-19 pandemic has been intense, with devastating consequences on individuals and nations that are likely to have long-term effects. We need to learn from each other from this pandemic and apply these learnings to future global health emergencies.

The EFIS Vaccine Task Force will continue to work collaboratively to share knowledge and experience among immunologists and beyond. We are committed to serve as a forum for immunologists to ensure that their research benefits global populations and positively impact health.

To find out more about the EFIS Vaccine Task Force, please visit: www.efis.org/efis-task-forces/efis-vaccine-task-force
Or email us at: b.wilcock@immunology.org



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About EFIS



The European Federation of Immunological Societies (EFIS) is a non-profit umbrella organisation that represents 35 European Immunology Societies, including, as well, associations from Eurasia and the Middle East. Every active member of any EFIS-affiliated Society is automatically considered a 'member' of EFIS and can as such benefit from EFIS programmes. EFIS thus acts as an organisation uniting nearly 14,000 individual researchers and clinicians working in the fields of immunology and allergology.

The main goals of EFIS are to support immunological research and education, as well as to strengthen scientific interaction among its members. Together with its partner official journals, the *European Journal of Immunology* and *Immunology Letters*, EFIS focuses especially on supporting young scientists, for example, through fellowships or travel grants. For more info, browse the pages dedicated to EFIS-EJI Meeting Support, EFIS-IL Short-term Fellowships, Travel Grants and Awards.

About the EFIS Vaccine Task Force



The EFIS Vaccine Task Force was originally established in 2020 following the World Health Organization's report that 'vaccine hesitancy' was one of the top 10 threats to global health. EFIS noted that the impact of this hesitancy on European and world health was significant and created the new Task Force to focus efforts on this issue.

The Task Force's primary aim is to pool resources and expertise across European immunology to play a key role in encouraging the uptake of vaccination, including childhood vaccination programmes, by providing a strong, engaging, evidence-based and collective voice. Although the EFIS Vaccine Task Force was established to tackle general vaccine uptake across Europe, due to the pandemic we pivoted the focus to increasing public confidence in COVID-19 vaccines across Europe.

The EFIS Vaccine Task Force's membership is as follows:

Dr Doug Brown (Chair), British Society for Immunology

Prof. Dr Ursula Wiedermann (Vice-Chair), Austrian Society for Allergology and Immunology/Österreichische Gesellschaft für Allergologie und Immunologie

Dr Carmen Álvarez Domínguez Spanish Society for Immunology/Sociedad Española de Inmunología

Prof. Christian Bogdan German Society for Immunology/Deutsche Gesellschaft für Immunologie e.V.

Prof. Dr İhsan Gürsel Turkish Society of Immunology/Türk İmmünoloji Derneği

Dr Srđa Janković Immunological Society of Serbia/Društvo Imunologa Srbije

Prof. Claude LeClerc French Society for Immunology/Société Française d'Immunologie

Prof. Massimo Locati Italian Society for Immunology, Clinical Immunology and Allergology/Società Italiana Immunologia, Immunologia Clinica e Allergologia

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