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An tÚdarás Um Fhaisnéis
agus Cáilíocht Sláinte

Advice to the National Public Health Emergency Team (NPHET)

The factors influencing, and measures to improve, vaccination uptake

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About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent statutory authority established to promote safety and quality in the provision of health and social care services for the benefit of the health and welfare of the public.

HIQA's mandate to date extends across a wide range of public, private and voluntary sector services. Reporting to the Minister for Health and engaging with the Minister for Children and Youth Affairs, HIQA has responsibility for the following:

- **Setting standards for health and social care services** — Developing person-centred standards and guidance, based on evidence and international best practice, for health and social care services in Ireland.
- **Regulating social care services** — The Chief Inspector within HIQA is responsible for registering and inspecting residential services for older people and people with a disability, and children's special care units.
- **Regulating health services** — Regulating medical exposure to ionising radiation.
- **Monitoring services** — Monitoring the safety and quality of health services and children's social services, and investigating as necessary serious concerns about the health and welfare of people who use these services.
- **Health technology assessment** — Evaluating the clinical and cost-effectiveness of health programmes, policies, medicines, medical equipment, diagnostic and surgical techniques, health promotion and protection activities, and providing advice to enable the best use of resources and the best outcomes for people who use our health service.
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- **National Care Experience Programme** — Carrying out national service-user experience surveys across a range of health services, in conjunction with the Department of Health and the Health Service Executive.

Foreword

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly infectious virus which has caused tens of millions of cases of COVID-19 since its emergence in 2019, with a considerable level of associated mortality. In the context of the ongoing COVID-19 pandemic, SARS-CoV-2 constitutes a significant public health concern due to its high basic reproduction rate, the absence of immunity in the human population, and the current lack of an effective vaccine or treatment approaches.

The National Public Health Emergency Team (NPHE) oversees and provides national direction, guidance, support and expert advice on the development and implementation of strategies to contain COVID-19 in Ireland. Since March 2020, HIQA's COVID-19 Evidence Synthesis Team has provided research evidence to support the work of NPHE and associated groups and inform the development of national public health guidance. The COVID-19 Evidence Synthesis Team which is drawn from the Health Technology Assessment Directorate in HIQA, conducts evidence synthesis incorporating the scientific literature, international public health recommendations, and existing data sources as appropriate.

From September 2020, as part of the move towards a sustainable response to the public health emergency, HIQA provides evidence based advice in response to requests from NPHE. The advice provided to NPHE is informed by research evidence developed by HIQA's COVID-19 Evidence Synthesis Team and with expert input from HIQA's COVID-19 Expert Advisory Group. Topics for consideration are outlined and prioritised by NPHE. This process helps to ensure rapid access to the best available evidence relevant to the SARS-CoV-2 outbreak to inform decision-making at each stage of the pandemic.

The purpose of this report is to outline the advice provided to NPHE by HIQA regarding the factors, both demographic and psychological, that are predictors of intention and uptake of vaccination, and the evidence for interventions and communication strategies to effectively tackle barriers to, and increase informed uptake of, vaccination.

HIQA would like to thank its COVID-19 Evidence Synthesis Team, the members of the COVID-19 EAG and all who contributed to the preparation of this report.

A handwritten signature in black ink, appearing to read 'M. G.', is located at the bottom left of the page.

Dr Máirín Ryan

Deputy CEO & Director of Health Technology Assessment

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Particular thanks are due to the Expert Advisory Group (EAG) and the individuals within the organisations listed below who provided advice and information.

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The advice is developed by the HIQA Evidence Synthesis Team with support from the Expert Advisory Group (EAG). Not all members of the EAG and Evidence Synthesis Team are involved in the response to each research question. The findings set out in the advice represent the interpretation by HIQA of the available evidence and do not necessarily reflect the opinion of all members of the EAG.

Conflicts of Interest

None declared.

Advice to the National Public Health Emergency Team

The purpose of this evidence synthesis is to provide advice to the National Public Health Emergency Team (NPHET) on the following policy areas:

- 1: The factors, both demographic and psychological, that are predictors of intention and uptake of vaccination.
- 2: Evidence for interventions and communication strategies to effectively tackle barriers to, and increase informed uptake of, vaccination.

As of 9 December 2020, no vaccine for the prevention of COVID-19 has been authorised by the European Medicines Agency (EMA). Evidence for factors influencing vaccine uptake and measures to improve uptake must therefore be drawn from national and international experience with other vaccines. Given the very limited time to complete this evidence review and based on an initial scoping of the literature, evidence in relation to influenza (including seasonal and pandemic influenza) vaccination uptake was selected as a surrogate for COVID-19 vaccination due to similarities in the target populations (older adults, healthcare workers and individuals with underlying conditions) that may be prioritised for vaccination.

The response to the policy question is informed by an evidence synthesis considering two elements:

1. Evidence of the factors influencing, and measures to improve, influenza vaccination uptake, identified from the following document categories:
 - a. A database search to identify systematic reviews of qualitative, quantitative or mixed-methods evidence.
 - b. A search of select international public health agencies.
2. Input from the COVID-19 Expert Advisory Group

The key points of this evidence synthesis, which informed HIQA's advice, are as follows:

Evidence underpinning the factors influencing, and measures to improve, vaccination uptake

- Due to the abundance of studies and existing reviews in the scientific literature, two 'overviews of reviews' were undertaken: an overview of qualitative syntheses and mixed methods reviews investigated factors affecting influenza vaccination uptake and an overview of systematic reviews that examined the effectiveness of interventions to improve influenza vaccination uptake internationally.

- Data from nine of the qualitative and mixed methods reviews on the barriers and facilitators to an individual’s uptake of vaccination against influenza were synthesised.
- The evidence relating to barriers and facilitators to vaccination uptake can be summarised into ten themes common to both seasonal and pandemic influenza vaccinations. The themes are: ‘perceived risks and or benefits of vaccines’; ‘access and or contextual factors’; ‘psychological and or internal factors’; ‘perceived risks and or susceptibility to flu’; ‘perceived responsibility’; ‘social influences’; ‘past behaviours and or experiences’; ‘knowledge’; ‘socio-demographic factors’ and ‘health and health behaviours’. The barriers and facilitators within each theme are listed in Table 1.
- Overall, these themes were consistent across the different populations groups, that is, those at high risk of severe disease, healthcare workers and pregnant women. There were some differences in themes identified in the studies of these different groups:
 - In those considered to be at high risk of severe disease, ‘perceived responsibility’ was not identified as a barrier nor a facilitator.
 - In pregnant women, ‘perceived responsibility’, ‘knowledge’ and ‘health and health behaviours’ were not identified as barriers to vaccination uptake. Pregnant women were more likely to report protection of their baby, knowledge about flu, vaccination policy and past experiences as reasons for vaccination uptake.
 - In healthcare workers, ‘health and health behaviours’ were not cited as a barrier to vaccination uptake, and ‘psychological and or internal factors’ as facilitators were not identified as a theme.
- Of the nine included qualitative reviews six were deemed to be of moderate to high quality and three of low quality. However, inherent biases with qualitative literature remain and the transferability of their findings to the current Irish situation needs to be interpreted with caution.

Table 1 Overview of the barriers and facilitators to vaccine uptake, categorised by theme

Themes	Barriers	Facilitators
Perceived risks and or benefits of vaccine	<ul style="list-style-type: none"> ▪ Doubts about vaccine effectiveness. ▪ Being opposed to vaccination in general. ▪ Concerns or uncertainties about side effects. 	<ul style="list-style-type: none"> ▪ Higher perceived benefits of vaccine (both clinical and societal). ▪ Beliefs in vaccine safety and effectiveness.

Access and or contextual factors	<ul style="list-style-type: none"> ▪ Access, time, availability, cost and logistics of getting vaccinated. ▪ Living alone. 	<ul style="list-style-type: none"> ▪ Lower perceived costs of vaccination.
Psychological and or internal factors	<ul style="list-style-type: none"> ▪ Lack of motivation/procrastination. ▪ Mistrust towards government and pharmaceutical companies. ▪ Forgetfulness. ▪ Lack of perceived behavioural control. ▪ Fear/distrust of being vaccinated. ▪ Perception of rumours/myths related to vaccination. ▪ Perceived poor health. 	<ul style="list-style-type: none"> ▪ Actively planning when and where to receive the vaccine. ▪ Belief in one's ability to arrange a time and transportation. ▪ Psychological flexibility. ▪ Fear/regret over not getting vaccinated. ▪ Perceived poor health.
Perceived risks and or susceptibility to influenza	<ul style="list-style-type: none"> ▪ Not caring about influenza. ▪ Believing that influenza is a mild disease. ▪ Low risk perception. 	<ul style="list-style-type: none"> ▪ Perceived severity of influenza. ▪ Beliefs about being at heightened risk of influenza if unvaccinated. ▪ Believing that influenza is highly contagious.
Perceived responsibility	<ul style="list-style-type: none"> ▪ Denial of the social benefit of influenza vaccination. ▪ Lack of professional or ethical obligation to get vaccinated. 	<ul style="list-style-type: none"> ▪ Desire to protect oneself and others. ▪ Being willing to prevent influenza transmission. ▪ Believing that influenza prevention is important.
Social influences	<ul style="list-style-type: none"> ▪ Low social pressure (either real or perceived). ▪ Negative influence of family/friends/media. 	<ul style="list-style-type: none"> ▪ Receiving recommendation from respected healthcare workers. ▪ Having a family that is usually vaccinated. ▪ Positive influence of family/friends/media and their encouragement to have vaccination.
Past behaviours and or experiences	<ul style="list-style-type: none"> ▪ Not having had influenza in the previous years. ▪ Participants' previous experiences with vaccinations. 	<ul style="list-style-type: none"> ▪ Previously had influenza. ▪ Past influenza vaccinations.
Knowledge	<ul style="list-style-type: none"> ▪ Lack of adequate influenza-specific knowledge. 	<ul style="list-style-type: none"> ▪ Knowledge that the vaccine is required each year. ▪ Knowing that the vaccine is effective. ▪ Knowledge of influenza in pregnancy. ▪ Knowledge of availability of vaccines.
Socio-demographic factors	<ul style="list-style-type: none"> ▪ Being a nurse. ▪ Being older.* ▪ Not having had a medical check-up in the past year. ▪ Not having health insurance. ▪ Single. ▪ Lower social class. ▪ Not having higher education. ▪ Having a lower household income. ▪ Not having a family doctor. 	<ul style="list-style-type: none"> ▪ Being a medical doctor. ▪ Being older.* ▪ Having had a medical check-up in the past year. ▪ Having health insurance. ▪ Married. ▪ Higher social class. ▪ Having higher education. ▪ Having a higher household income. ▪ Having a family doctor.
Health and or health behaviours	<ul style="list-style-type: none"> ▪ Not having a chronic disease. ▪ Being a smoker. 	<ul style="list-style-type: none"> ▪ Having a chronic disease. ▪ A non-smoker.

*This was identified as both a barrier and a facilitator by different reviews.

- Twenty-one systematic reviews were identified relating to interventions aimed at increasing influenza vaccine uptake. Of these, seven reviews were considered to be of high methodological quality and the narrative synthesis was based on these

high quality reviews. Evidence was retrieved for all populations of interest (older adults [aged ≥ 60 years], adults and children with underlying conditions, pregnant women, healthcare workers and general adult/adolescent/child populations). Significant overlap in terms of included primary studies was noted between some systematic reviews. The number of primary studies included in systematic reviews ranged from two to 61, published between 1986 and 2018.

- A wide range of heterogeneous interventions were assessed that varied significantly in terms of intensity and resources required for delivery. Studies included both individual-level (e.g. patient letters and phone calls) and system-level (e.g. provider prompts) interventions. None related to mass media campaigns.
- Analysis of systematic reviews of high methodological quality found:
 - moderate- to high certainty evidence that low- (e.g. postcards), medium- (e.g. personalised phone calls), and high-intensity (e.g. home visits or facilitators in practices) interventions are effective in increasing community demand for, and uptake of, vaccination among older adults. Physician incentives (payments) were also successful.
 - low- to very low certainty evidence that some interventions, including multicomponent interventions, are effective in increasing uptake among adults and children with underlying conditions and pregnant women. Call and recall methods using more personalised approaches (such as letters, postcards or personal telephone calls) appear to be more effective than simple reminders.
 - low- to very low certainty evidence that a range of interventions, including multicomponent interventions that combine education, incentives, declination policies (such as written refusal statements along with reasons why), reminders and access are effective in increasing uptake among healthcare workers. Mandatory vaccination is the most effective single intervention (RR 1.71; 95% CI 1.70 to 1.72; six before and after studies, N=105,538 participants). However, there are concerns regarding individuals' autonomy when introducing mandatory vaccination. The evidence is less consistent regarding incentives, 'opt-out' and declination policies as single interventions. In general, concerns exist regarding the acceptability of mandatory vaccination, 'opt-out' and declination policies to healthcare workers, and that these policies may negatively affect staff morale.

- moderate certainty evidence that implementing patient reminder and recall systems probably improve vaccine uptake in adult and child populations. Some evidence was also found that educational interventions aimed at parents and provider prompts increased uptake in children.
- This review has a number of limitations. Most reviewed studies focussed on the seasonal influenza vaccine and not the pandemic influenza vaccine. While influenza vaccination uptake was chosen as a surrogate for COVID-19 due to similarities between the target populations, it is not known how applicable studies on interventions to improve influenza vaccination uptake are to COVID-19. Societal experiences following months of public health measures aimed to contain the COVID-19 pandemic will also likely impact on vaccination uptake preferences and behaviours. Additionally, no review specifically included older individuals in long-term care facilities, a target group of importance for COVID-19 vaccination.
- In conclusion, a number of barriers and facilitators were identified that can negatively or positively affect an individual's uptake of vaccinations, respectively. Interventions (including multicomponent interventions) that can successfully increase the uptake of influenza vaccination across a range of eligible groups, by overcoming the barriers or promoting the facilitators, were identified. These interventions vary greatly in terms of intensity. Consideration must be given to the resource requirements and the acceptability of the intervention to the target population.

COVID-19 Expert Advisory Group

- A meeting of the COVID-19 Expert Advisory Group (EAG) was convened for clinical and technical interpretation of the evidence provided.
- It was noted that COVID-19 and influenza are very different diseases and the applicability of evidence from influenza vaccines is likely to be limited. The huge amount of attention to COVID-19 in society in general will be an important influencing factor. For example, compared with other vaccines, the motivations to obtain the vaccine will likely differ substantially between demographic groups; uptake in younger people may be driven by social responsibility rather than perceived risk of the disease for themselves.
- The EAG noted the opportunity to build upon previous successful vaccination campaigns, where there may be practical learnings from relevant contexts that could be applied. It was noted that there is precedence for the introduction of novel vaccines in response to significant health risks associated with certain diseases, for example, polio, meningitis and Haemophilus influenzae type b (Hib)

vaccines as part of the childhood vaccination programme, and pertussis vaccine in pregnancy. The latter was noted to have a high uptake rate which was achieved due to clear and consistent information relating to the risk and benefit provided to women by a combination of obstetricians, staff in antenatal clinics and GPs. It was noted that the most relevant evidence will be that relating directly to COVID-19 vaccination, and that it will be important for reliable evidence in relation to effectiveness and safety obtained through ongoing surveillance to be made available in an open and accountable manner.

- Concern was expressed in relation to misconceptions about how novel mRNA vaccines work. It was identified that there is a need for access to reliable information in relation to the COVID-19 vaccines in development, their mechanism of action, the trial efficacy and safety data, and the effectiveness data from population-based vaccination programmes as they become available. In this regard, it was noted that data submitted to the FDA is openly available (for example, this [link](#) to one of the COVID-19 vaccines).
- Concern was also expressed regarding misconceptions about the rigour of the authorisation process for the COVID-19 vaccines. It was identified that the International Coalition of Medicines Regulatory Authorities (ICMRA) has a [statement](#) which aims to provide healthcare professionals with important messages regarding vaccines and vaccination. The statement reiterates the robust scientific evaluation that vaccines undergo to determine their safety and effectiveness and that regulators continue to monitor vaccines after their approval.
- It was noted that the majority of individuals do not have an inherent bias for or against a vaccine, but need to be assured and informed in terms of the evidence for potential benefit or harm relevant to them or their family. There was agreement among EAG members that any policy aiming to maximise uptake of the COVID-19 vaccine needs to focus on trust, communication and knowledge. There is a need for communication to reassure the public of the process of vaccination approval by the European Medicines Agency (EMA). While timelines have been shortened, processes have been carried out in parallel rather than sequentially and are robust. All vaccines, including the new COVID-19 vaccines, undergo the same rigorous evaluation process by regulatory authorities.
- Healthcare workers are an important at-risk population group. They are also a recognised and trusted source of information and influence, with surveys such as the Amárach survey identifying GPs in particular as trusted source of information for the public. This indicates the need to ensure appropriate dissemination of comprehensive information regarding the new vaccine technologies to healthcare

workers. Clear information regarding how the vaccine works, the licensing process including post-licensing surveillance, safety and effectiveness, and current gaps in evidence were felt to be important in dealing with concerns.

- It was recognised that uptake will be influenced by a wide range of influencers, depending on demographics. The role of community leaders, such as religious leaders and other influencers, was believed to be important in conveying the message.
- Equity issues were also discussed in terms of access, cost and availability of the vaccine. These issues were believed to be important and require careful consideration to ensure equitable access to those who require it. Equity of access must also take consideration of requirements for transport to vaccination centres if access cannot be provided locally and to address other such barriers that might limit access.
- Uptake of influenza vaccination was noted to be very high in people aged over 65 years residing in long term care facilities (LTCFs) in Ireland. However while processes are in place to facilitate vaccination in these settings, the important distinction between an established vaccine such as the seasonal influenza vaccine and a vaccine against COVID-19 was acknowledged. It was noted that vaccination of this population will only occur based on informed consent. This requirement for informed consent will also apply to residents of other long-term residential facilities and other vulnerable individuals.
- The mandating of vaccines in different settings was discussed. It was noted that there is precedence in the context of, for example, certain travel vaccines (a requirement for evidence of yellow fever vaccination in order to be permitted entrance to some countries) and for evidence of childhood immunisation for school entry in some countries. While recognising the evidence that such policies are extremely effective in increasing uptake, it was noted that there may be significant ethical and organisational issues surrounding any mandatory vaccination policy for a workforce in the context of COVID-19.
- The issue of convenience was also raised. It was noted that individuals may opt to avail of vaccination for non-health reasons, for example to facilitate travel or as an alternative to serial testing in an occupational setting.
- There is a need for ongoing collating of evidence relating to COVID-19 vaccination uptake once the vaccine is made available. This could include research on societal-level interventions to increase uptake.

- It was noted that the successes Ireland has already achieved in relation to COVID-19, has been largely based upon consensus rather than penalties and enforcement. Therefore, there is a need to build on these successes while informing COVID-19 vaccination policy.

Advice

Arising from the findings above, HIQA's advice to NPHE is as follows:

- A COVID-19 vaccine, when used in combination with public health measures such as physical distancing, face masks, respiratory etiquette and hand hygiene has the potential to reduce the burden of illness.
- With a number of COVID-19 vaccines currently under consideration by the European Medicines Agency (EMA), it is important to understand the factors that influence and the measures that improve vaccine uptake.
- A rapid evidence review to identify factors influencing vaccine uptake found:
 - a number of overarching themes namely: perceived risks and benefits, knowledge, social influences and patient-specific factors (for example sociodemographic factors). These were found to act as either barriers or facilitators depending on the context.
 - perceived benefit from vaccination and recommendations from healthcare professionals were consistently found to be important facilitators for vaccination uptake.
 - interventions (including multicomponent interventions) can successfully increase vaccine uptake across a range of eligible groups. Studies included both individual-level and system-level interventions. These interventions vary greatly in terms of intensity. None related to mass media campaigns.
 - consideration must be given to the resource requirements and the acceptability of interventions to the target population.
- Given the novelty of COVID-19 and the societal experiences following months of public health measures aimed to contain the pandemic, evidence from other vaccines (for example, seasonal influenza, routine childhood vaccines) is likely to have limited applicability to COVID-19 vaccination uptake, preferences and behaviours.
- A vaccination campaign should build on what Ireland has already achieved in relation to COVID-19, which has largely been based upon knowledge and consensus rather than penalties and enforcement. Trust, communication and knowledge are core to informed decision making.

- Healthcare workers are an important at-risk population group as well as a recognised and trusted source of information and influence. In advance of any vaccination programme commencing, healthcare workers should be provided with the necessary information to support them to make informed decisions for themselves and to act as a trusted source of information for others.
- Given the importance of social influence on an individual's behaviour, key opinion leaders in the community including GPs, community pharmacists, public health nurses, religious and sports leaders should be provided with evidence-based information and tools to build community engagement.
- As with other successful vaccination strategies in Ireland, potential barriers to equitable access should be minimised. For example, taking account of the location and settings where the vaccine is provided.
- Communication campaigns should focus on providing information on the following aspects specific to COVID-19 vaccines, the:
 - vaccine technology and how it may differ from other vaccines (for example, mRNA vaccines)
 - currently available evidence regarding safety and efficacy of the vaccines
 - rigour of the process used by the EMA to scientifically evaluate the safety and effectiveness of the vaccines to make a decision whether to approve them for use, and requirements for the post-marketing continuous evaluation of benefit and risk.
- Evidence in relation to the effectiveness and safety of COVID-19 vaccines obtained through ongoing surveillance should be made available in a proactive, open and accountable manner to maintain public trust.

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