

Vaccine Hesitancy: An Overview

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There is a considerable global effort underway to develop a COVID-19 vaccine, but the success of a vaccine depends on people availing of it. Evidence suggests that distrust in vaccines is on the rise globally and opinion polls have found that a large portion of the Irish population do not intend to get the first EU approved COVID-19 vaccine. This L&RS Note provides an overview of the topic of vaccine hesitancy and vaccine resistance from a public health perspective. It reviews the available research on reasons for vaccine hesitancy, interventions to address vaccine hesitancy, and briefly discusses some policy responses to vaccine hesitancy from Europe and Ireland.

Key points

- Vaccine hesitancy refers to the delay in acceptance or refusal of vaccines despite the availability of vaccination services.
- Leading global health organisations assert that vaccine hesitancy is increasing globally.
- Survey findings suggests that a sizeable portion of the population in Ireland, as elsewhere, do not intend to get the first EU approved COVID-19 vaccine. Research suggests that this may dampen the effectiveness of a potential COVID-19 vaccine.
- While many interventions to promote vaccines assume that increasing knowledge on vaccines will increase acceptance, evidence shows that vaccine resistance is a far more complex interplay of individual, societal and vaccine specific factors. These are reviewed in Section 2 of this Note.
- Research highlights the value of consultation and targeted, culturally sensitive approaches in addressing vaccine hesitancy. Evidence-based strategies addressing vaccine hesitancy are reviewed in Section 3 of this Note.
- Several European nations have introduced mandatory vaccines, but Ireland is not one of them. The evidence on mandatory vaccines is somewhat mixed, and the issue contentious.



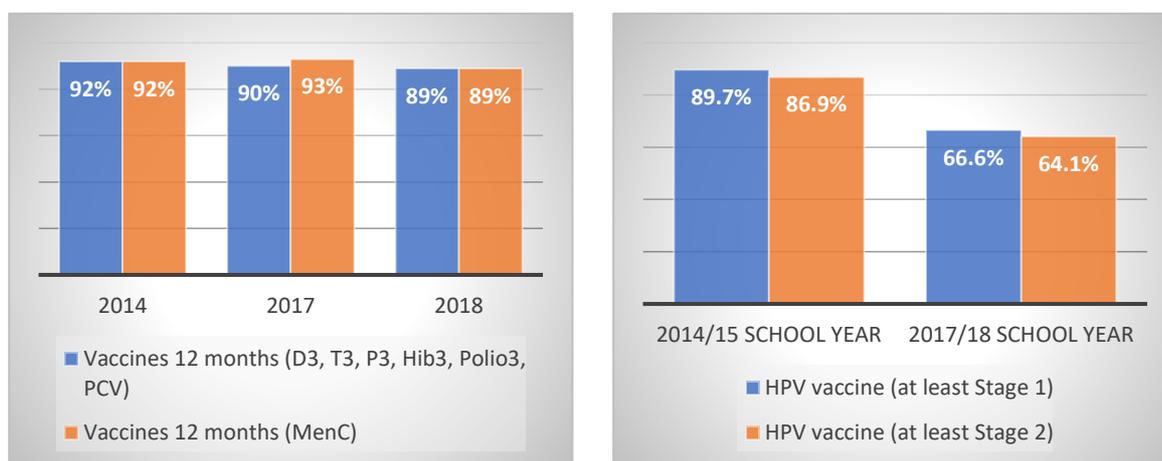
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Introduction

Evidence suggests that trust in vaccines has decreased and vaccine hesitancy has increased across many developed nations over the last decade¹. Vaccine hesitancy is defined as the delay in acceptance or refusal of vaccines despite availability of vaccination services. It recognises a continuum between full vaccine acceptance and complete vaccine refusal; vaccine hesitant individuals may accept all vaccines but remain concerned about them, they may refuse or delay some vaccines but agree to other vaccines, or they may refuse all vaccines². In 2019 the World Health Organisation (WHO) declared vaccine hesitancy one of the ten biggest threats to global health for the year, following the re-emergence of measles in countries where it had been previously eradicated due to insufficient vaccine coverage rates³. For Ireland, uptake of most vaccines has declined to some extent since around 2014/15⁴, with uptake of some vaccines (e.g. the HPV vaccine) declining very significantly (See Figure 1 for examples).

Figure 1: Uptake of primary childhood vaccines (at 12 months; left) and the HPV vaccine (right)



Source: HPSC⁵

The issue of vaccine hesitancy takes on particular importance in the context of the COVID-19 pandemic, as the development of a vaccine has been endorsed as a critical component in bringing the virus under control. However, opinion poll findings suggest that a sizeable portion of the population do not intend to use a COVID-19 vaccine, even if one becomes available. For instance, an RTÉ commissioned national poll (published October 1, 2020) which included the views of 1,345 people aged 12 and over found that almost a third of those polled (32%) would not take the first publicly available EU approved Covid-19 vaccine⁶. A previous opinion poll carried out by Amárach Research for Virgin Media Ireland⁷ (published 4 August, 2020) found that 67% of those polled would be happy to receive a vaccine for COVID-19. These findings mirror findings from other nations such as France, Italy and the United States where opinion polls have indicated that between 25-50% of the population would refuse a COVID-19 vaccine if one became available⁸.

An RTÉ national opinion poll found that 56% are 'likely' to take the first EU approved COVID-19 vaccine and 32% are 'unlikely' to do so

This has implications for all of society, as some experts have warned that the proportion of populations intending to take the COVID-19 vaccine may be too small to effectively stop the spread of the disease⁹. In essence, the capacity of a vaccine to end the COVID-19 pandemic depends on both the effectiveness of the vaccine and the number of people taking it. Most vaccines are not 100% effective. For example, the flu vaccine is typically between 40-60%

Research suggests that the less effective a potential COVID-19 vaccine is, the more of the population that would need to be vaccinated to end the pandemic

effective¹⁰, the MMR (measles, mumps, and rubella) vaccine is typically 93-97% effective depending on whether one or two doses are administered¹¹. The less effective a potential COVID-19 vaccine is, the more of the population that needs to be vaccinated to end the pandemic. One simulation study for the United States (US)¹² found that if everyone in the US (100% of the population) took a COVID-19 vaccine, the vaccine would

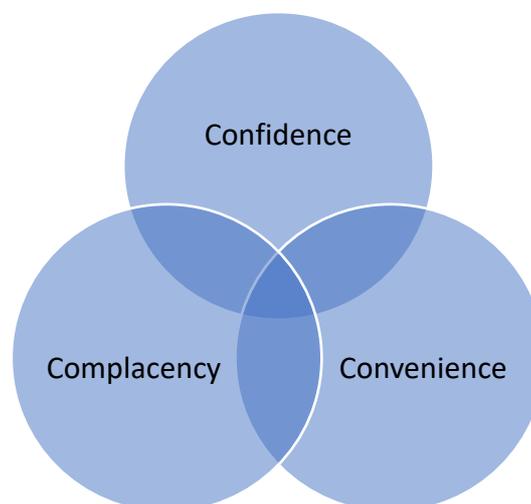
need to be 60% effective to end the pandemic. By contrast, if 60% of the population took a vaccine, the vaccine would need to be 80% effective to end the pandemic. That is not to say that a vaccine would not still be useful; rather that large outbreaks of the virus would continue, and social distancing and other measures would likely need to remain in place¹³.

Reasons for vaccine hesitancy

The reasons for vaccine hesitancy are complex and vary by time, place, culture and between vaccines¹⁴, with some vaccines more readily accepted than others. Understanding the complex nature of vaccine hesitancy is important because although most interventions to promote vaccines are based on the assumption that increasing knowledge on vaccines will increase acceptance, the evidence-base shows that vaccine resistance is actually a far more complex interplay of emotional, cultural, social, spiritual and/or political factors¹⁵.

Two popular models which account for vaccine hesitancy are summarised below. The first is the “3cs” model (Figure 2) which highlights factors such as confidence, complacency and convenience as central to decision-making on vaccines, albeit to different extents.

Figure 2: 3cs model of vaccine hesitancy



Confidence: Confidence refers to trust in (1) the effectiveness and safety of vaccines; (2) the system that delivers them, including trust in health services and professionals; and (3) the motivations of policymakers and health authorities who decide on vaccines.

Complacency: Complacency usually occurs where factors support a view that the risks of vaccine-preventable diseases are low, and vaccination is therefore not considered a necessary preventive action. These factors include low worry about the virus/disease, low perceived risk of the disease, decreased susceptibility to getting the disease and/or a view that the disease is not severe.

Convenience: Convenience means that barriers such as lack of easy access to vaccination providers, ability to understand (language and health literacy), financial cost associated with vaccine (including unwillingness to pay for vaccines) and travel time to obtain vaccines became reasons to decline vaccination.

In terms of the level of impact of the 3cs, a 2017 review study on the barriers to influenza vaccine¹⁷ found that a lack of confidence and complacency were the two most frequently reported reasons for vaccine hesitancy, with convenience only playing a minor role when attitudes were not otherwise strongly in favour or against vaccines. A European Centre for Disease Prevention and Control (ECDC) collaborative review study found that a lack of confidence in the form of vaccine-safety related concerns was the main determinant of vaccine hesitancy in Europe¹⁸. This concern should not be dismissed, as negative side-effects have been associated with approved vaccines in recent years. One well-known example of this was the increased risk of narcolepsy following vaccination with Pandemrix, a 2009 H1N1 influenza (Swine flu) vaccine used in several European countries¹⁹. The issue of lack of confidence as a barrier to vaccine uptake may be more pronounced in the case of COVID-19, as it is likely that any potential COVID-19 vaccine will be fast-tracked, albeit with appropriate trials.

An ECDC study found vaccine-safety related concerns to be the main determinant of vaccine hesitancy in Europe

A second popular model for vaccine hesitancy is the *Matrix of determinants of vaccine hesitancy*, developed by the *WHO Strategic Advisory Group of Experts on Immunisation (WHO SAGE) Working group on Vaccine Hesitancy*²⁰. The Matrix includes a range of contextual, individual/group and vaccine-specific factors which research has identified as potential influencers of vaccine hesitancy. It is summarised in Table 1 below.

Contextual influences include, among others, the influence of pro or anti-vaccination lobbies, geographic barriers to accessing vaccines and whether and how politics/policies support vaccines (for instance through legal mandates).

Individual and group influences include, among others, the impact of an individual's knowledge about vaccines, their experience with and trust in health providers and the experiences their family members, friends and community members have had with vaccines.

Vaccine/Vaccination specific issues include (among others) include the risks and benefits of a vaccine according to the scientific evidence, how a vaccine is administered (e.g. oral versus injection) and how strong a recommendation is given by a health professional.

Table 1: Matrix of determinants of vaccine hesitancy

<p>Contextual influences: Including historic, socio-cultural, environmental, health system/institutional, economic or political factors</p>	<ul style="list-style-type: none"> • Communication and media environment (e.g. pro or anti-vaccination sentiment) • Influential leaders, immunisation programme gatekeepers and anti-or pro-vaccination lobbies • Historical influences (e.g. past happenings which undermine public trust) • Religion/culture/gender/socio-economic (e.g. cultures which do not want women being vaccinated) • Politics/policies (e.g. vaccine mandates) • Geographic barriers (e.g. to accessing vaccines) • Perception of the pharmaceutical industry (e.g. industry distrusted)
<p>Individual and Group Influences: Including influences arising from personal perception of the vaccine or influences of the social/peer environment</p>	<ul style="list-style-type: none"> • Personal, family and/or community members' experience with vaccination, including pain associated with administration of vaccine • Beliefs, attitudes about health and prevention • Knowledge/awareness • Health system and providers (trust and personal experience) • Risk/Benefit (perceived or actual) • Immunisation as a social norm vs. not needed/harmful
<p>Vaccine/Vaccination specific issues: Including issues which are directly related to the characteristics of the vaccine or the vaccination process</p>	<ul style="list-style-type: none"> • Risk/Benefit (epidemiological and scientific evidence) • Introduction of a new vaccine or new formulation or a new recommendation for an existing vaccine • Mode of administration (e.g. oral vs. injection) • Design of vaccination programme/Mode of delivery (e.g. routine programme or mass vaccination campaign) • Reliability and/or source of supply of vaccine and/or vaccination equipment • Vaccination schedule • Costs • The strength of the recommendation and/or knowledge (e.g. health professionals as role models, advocates)

Source: WHO²¹

A final point worth mentioning here is that while other sociodemographic individual level factors (e.g. socio-economic status, ethnicity and education) have been identified as influential on vaccine hesitancy/acceptance (and are frequently referenced in the literature), the influence of these factors varies – in some cases they are barriers to vaccination but in other cases they promote vaccination. On this basis, several systematic review studies conclude that individual level factors such as these cannot be considered as reasons for or against vaccine hesitancy in isolation of contextual factors²².

Addressing vaccine hesitancy

A systematic review of the literature shows that few strategies have been explicitly designed to address vaccine hesitancy and even fewer of these strategies have been evaluated for impact²³. Among those strategies which have been evaluated, the wide variation between settings, target populations and the observed impact of measures has made it difficult to draw conclusions. However, while providing that caveat, two major research review studies published in 2015²⁴ and carried out in consultation with the WHO SAGE Working Group on Vaccine Hesitancy concluded that interventions to address vaccine hesitancy are most likely to be successful if they are:

- **Multicomponent:** Targeting multiple reasons for vaccine hesitancy simultaneously
- **Based on empirical data and situational assessment:** In other words, contextual factors like the most susceptible populations and main barriers to vaccination in a population are understood
- **Developed using a planning framework:** For instance, the [WHO Tailoring Immunization Programme](#) (TIP)²⁵ which uses a series of tools to identify barriers to and enablers of vaccination in vulnerable populations and recommends evidence-based responses based on these
- **Targeted:** Adapted to a specific target group and culturally sensitive. Worth noting here is that some studies²⁶ have found that communication messages which aim to address vaccine hesitancy but are not tailored can function to *reinforce* vaccine hesitancy
- **Use dialogue-based approaches**

More specifically, these studies found reasonable evidence to support the interventions set out in Table 2 below.

Table 2: Interventions to address vaccine hesitancy with reasonable evidence of success

Intervention	Description	Examples
Social mobilisation	Engaging and motivating a wide range of partners and stakeholders (e.g. members of the community, religious leaders) to work together to raise awareness of and encourage vaccination through dialogue	Evidence based small-group discussion (Pakistan), Teams (including Healthcare workers) distributed to vaccine hesitant households (India)
Social and mass media	Using social media and/or mass media campaigns to raise awareness of health services and promote vaccination. It is important that these are tailored	Text4health text message immunization reminder-recalls (Australia), Healthy.me a web-based personally controlled health management system (Australia)
Communications training for health-care workers (HCWs)	For instance, on how to address vaccine hesitant individuals. A study conducted by Gust ²⁷ and colleagues in the United States found that information or reassurance from a	Electronic medical record linked clinical decision support – tool provides educational content to HCWs (USA), CD-ROM-based tutorial for HCWs (USA)

	health-care provider was the main factor in changing the decision of parents who had planned to delay or refuse a vaccine for their child	
Employing reminder and follow-up	Such as telephone call and letter reminders to a target population about vaccination	Electronic medical record linked clinical decision support – Vaccine providers alerted when patient eligible for vaccine; patients contacted by phone to remind they are due a vaccine visit (USA)
Mandating vaccines	Vaccination requirements or mandates, for instance for school admittance, have been found to be effective at increasing vaccine uptake in high-income countries ²⁸ . However, it is worth noting that these strategies do not adequately address the underlying causes of vaccine hesitancy ²⁹ and can raise concerns about civil liberties ³⁰ that may heighten mistrust in the vaccine programme. Moreover, there are high-income countries where such policies are not in place, such as Canada, yet uptake rates are comparable	France and Italy (the evidence presented here is early emerging evidence)

Source: Various, see End Notes

The ECDC has also developed a catalogue of interventions to address vaccine hesitancy based on a systematic review of the literature³¹ (see Text box Page 7). Like the above studies, the ECDC study found that few interventions to address vaccine hesitancy have been adequately evaluated, and that evidence on some interventions was mixed (e.g. some studies recorded a change as a result of an intervention while others did not). At a broad level, the ECDC study highlights the importance of understanding the reasons (through consultation) for why different populations/target groups are vaccine hesitant and tailoring the design, format and content of interventions to address those reasons.

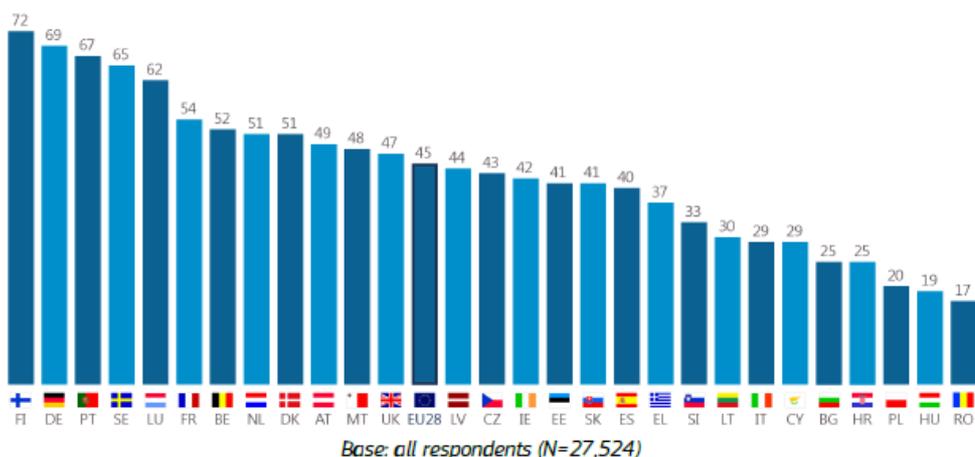
Some key findings from the ECDC study are as follows:

- That tailored messages, adapted to individual concerns (established through a short survey) increased intentions to vaccinate. However, untailored messages had a negative effect and worsened intentions to vaccinate
- A combination of tailored educational information and a consultation with a healthcare worker who was a specialist in the area had been found to increase vaccine uptake
- Combining discourse-based interventions (such as training health-care workers (HCWs) on how to communicate with vaccine hesitant individuals) with reminder-recall (e.g. letter reminders) tools was effective
- Graphical education information had a positive impact
- Using corrective information (e.g. MMR vaccine does not cause autism) to respond to specific concerns corrected misperceptions but did not increase intentions to vaccinate, and could even reduce intention in some cases
- Emotional, dramatic messages did not have any effect on misperceptions or on intentions to vaccinate

Policy in Europe and Ireland

Figure 3 below shows the proportion of respondents in a 2019 European Commission Eurobarometer survey³² who said that they had been vaccinated in the past five years. As can be seen, the proportion of respondents from Ireland was 42%, which is below the EU-28 average of 45%. Finland recorded the highest proportion of respondents (77%) saying that they had been vaccinated in the past five years.

Figure 3: Have you yourself or someone in your family had any vaccinations in the last five years? (%- YES, YOURSELF)



Source: European Commission

Research shows that vaccine policy, decision processes and outcomes vary widely across Europe³³. Several European countries have introduced legislation which makes vaccines mandatory in some capacity, for instance by imposing a penalty for failure to vaccinate, or by making vaccination a pre-condition of school attendance. Recent examples include Italy and France which made certain paediatric vaccinations mandatory in 2017 and 2018 respectively, and Germany which introduced mandatory healthcare professional consultations on vaccines (pre-school or kindergarten) in 2015³⁴. Other countries, including Ireland, have not made any vaccinations mandatory, meaning that parents are entitled to withhold consent and forego vaccination, although the former Minister for Health did seek legal consultation on the possibility of schemes for mandatory vaccination³⁵. A 2010 review study³⁶ of 27 EU countries (plus Iceland and Norway) found that 15 had no mandatory vaccines, although some countries have since introduced them. While there is some evidence to suggest that making vaccines mandatory increased vaccination rates in France³⁷ and Italy³⁸, as mentioned previously mandating vaccines does not address the underlying causes for vaccine hesitancy and some of the countries with the highest vaccine rates do not mandate vaccines.

Some evidence suggests an increase in vaccination rates following the introduction of mandatory vaccines, but one counterargument is that mandatory vaccines do not address the causes of vaccine hesitancy

A review study of 16 European countries (not including Ireland) found that most have National Immunisation Technical Advisory Groups (NITAGs)³⁹. For Ireland, the Vaccine Alliance⁴⁰ (launched in September 2019), aims to boost the uptake of childhood vaccines and reduce vaccine hesitancy. The Vaccine Alliance includes healthcare professionals, policy makers, patient advocates, students, and representatives from groups most affected by vaccine hesitancy. Ireland has no specific strategy to address vaccine hesitancy.

Eurobarometer data⁴¹ findings suggest that the media is not used to convey information on vaccines to the public in Ireland to the same extent as elsewhere in Europe. Only 36% of respondents from Ireland said that they had seen/heard/read information on vaccination on television in the past six months (compared to 51% for the EU average), while 45% said they had not seen/heard/read any information on vaccines in the media in the last six months (compared to 34% for the EU average).

Finally, in terms of data collection, the Irish Health Protection Surveillance Centre (HPSC) keeps data and published reports on the uptake of vaccines provided through the childhood vaccination programme and booster programme to children and adolescents in Ireland⁴². The data is broken down by age group, vaccination type and region. No data is collected or published on vaccine refusal rates in Ireland. There have also been no substantial studies on what aspects negatively affect attitudes towards vaccination in Ireland, although there are plans in place for a research study by the HSE's National Immunisation Office (NIO) to assess the levels of vaccine acceptance in Ireland⁴³.

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