National Institute for Public Health and the Environment
Ministry of Health, Welfare and Sport

Knowledge brief

SocioVax literature review: Determinants of vaccination uptake in children

RIVM

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Synopsis

Background and aim:

The Dutch National Immunisation Programme consists of a series of vaccinations that protect children against serious diseases. The programme is very effective: many of the diseases for which the vaccinations offer protection are now rare in the Netherlands. Participation is voluntary. Registered vaccination figures show that participation in the National Immunisation Programme is unevenly distributed in various groups of Dutch society. In the Netherlands, vaccination uptake is lower than average among people who have a lower socio-economic position and people with a migration background. In the SocioVax programme (part of the 'Verder met Vaccineren' programme), RIVM is investigating which socio-psychological factors are associated with participation in the National Immunisation Programme. By conducting a literature review, we have mapped out current international knowledge about factors related to vaccination uptake in the context of the National Immunisation Programme, in the general population as well as among people who have a lower socio-economic position or a migration background. This knowledge offers insights for policy and communication in order to support people in the Netherlands in making an informed decision about vaccinations in the National Immunisation Programme and to reduce uneven distribution of vaccination uptake.

Approach:

This knowledge brief is based on a literature review conducted in 2024. In 2025, it was supplemented by a literature review specifically focused on target groups in which vaccination coverage is lower than average. These target groups are people who have a low socio-economic position and people with a migration background.

The key terms used here are 'willingness to vaccinate' and 'vaccination uptake'. In the context of the National Immunisation Programme, it is about the intention and willingness of parents to have their child vaccinated (willingness to vaccinate) and whether parents have actually had their child vaccinated (vaccination uptake). Some studies also looked at willingness to vaccinate or vaccination uptake among pregnant people, or among young people who have a say or can decide for themselves about their vaccinations.

Key results:

What people think and feel

- More positive thoughts or feelings about vaccination are correlated to higher willingness to vaccinate and/or vaccination uptake. Conversely, more negative thoughts or feelings about vaccination are correlated to lower willingness to vaccinate and/or vaccination uptake.
- Topics that people consider in making this choice include vaccine safety, benefits and effectiveness, disease risks, and confidence in the healthcare system and medical experts.

Social processes

- What people see as socially acceptable affects their willingness to vaccinate and/or vaccination uptake.
- People who see vaccinating as a social responsibility, get information from official sources, and were advised to vaccinate by a care provider, are more inclined to have their child vaccinated.
- Certain cultural norms and beliefs, language and religion, and the use of information from non-official sources are correlated to lower willingness to vaccinate and/or vaccination uptake.

Practical issues

- Perceived obstacles, such as costs or less reachable locations, are correlated to lower willingness to vaccinate and/or vaccination uptake.
- Positive experiences with the service provided and free vaccinations are correlated to higher willingness to vaccinate and/or vaccination uptake.

What people do

- Previous behaviour may play a role. Willingness to vaccinate and/or vaccination uptake is higher when people have been vaccinated before, and exhibit other proactive health behaviour (such as a recent visit to a care provider).

Specific target groups

- For groups with a lower socio-economic position (SEP) or a migration background, extensive research has been done about what people think and the role of ease of access to vaccinations. These factors are no different than those described above. Less is known about the possible role played by emotions, and about social processes that could specifically play a role for these target groups. One example is possible fears that people feel regarding vaccinations. Another is the influence of cultural norms from the country of origin.

Implications

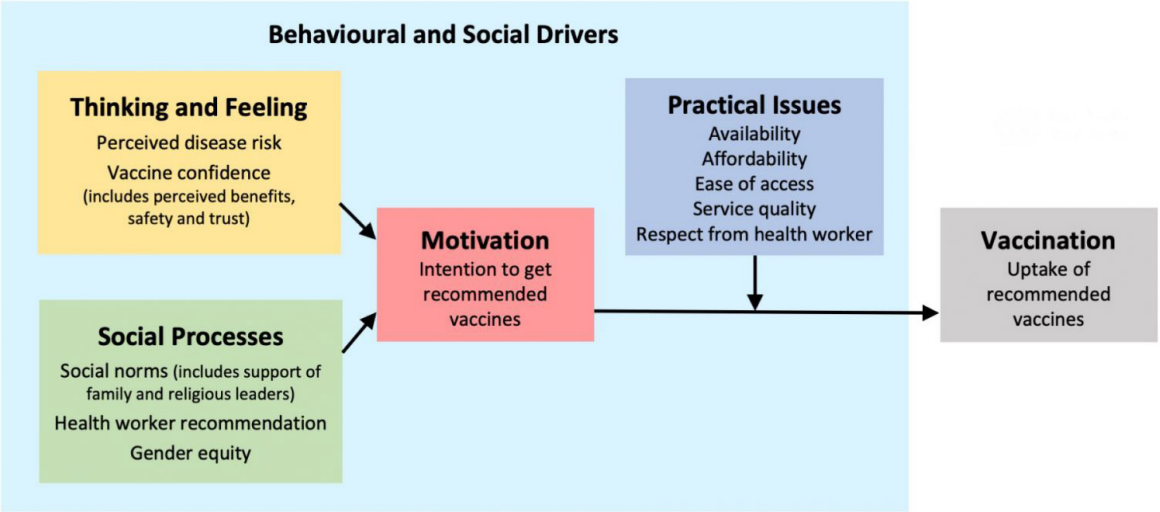
- Willingness to vaccinate is influenced by what people think and feel, social processes, and the perceived ease of access to vaccinations. Supporting an informed choice therefore requires effort in all these factors (each and every one, not choosing one of the available alternatives).
- It is important to invest in research on the role of emotions and social processes in target groups where vaccination coverage lags behind. There may be potential opportunities for interventions there that are currently underemphasised.

Explanation of the results

Theoretical background

Our research makes use of the model on 'Behavioural and social drivers' provided by the World Health Organization (WHO, 2022; Figure 1)[1]. The model shows that various types of factors affect vaccination uptake: (1) 'thinking and feeling', thoughts and emotions that people have about vaccinations, such as the belief that vaccinating protects against disease, or concerns about safety; (2) 'social processes', influences from family and friends, other key individuals such as care providers or religious leaders, and traditional or social media. These influences can encourage or discourage people from getting a vaccination. These factors – 'thinking and feeling' and 'social processes' – jointly influence a third: (3) motivation, i.e. willingness to vaccinate. Finally, whether people who would be willing to get a vaccination then actually go and get the vaccination, depends on (4) 'practical issues': costs or practical barriers, such as locations that are difficult to reach, or are open at inconvenient times.

Figure 1. Model: 'Behavioural and social drivers that influence vaccination uptake' (WHO, 2022).



In the literature review, we identify the specific factors in these categories for which robust evidence has been found to support the correlation with willingness to vaccinate or vaccination uptake. The *strength* of the correlation between specific factors and vaccination uptake cannot be determined with this literature review.

Method

The literature review focused solely on reviews and/or meta-analyses, because they combine multiple sources. This reveals patterns and consistency in the findings, which reinforces the reliability of the results. As a result, it also makes it less likely that the findings will change as a result of new insights.

Three different scientific databases were used (Pubmed, PsycINFO, Embase). The literature was reviewed up to and including January 2024. In January 2025, a supplementary search was done in two databases (Embase and PsychINFO) to explore reviews that specifically looked at willingness to vaccinate or vaccination uptake among people in a low socio-economic position and people with a migration background. We only searched for studies from 2014 or later.

Reviews and meta-analyses were included on the condition that:

- the authors had conducted a quality check of the individual studies;
- a systematic search was conducted in multiple databases according to a clearly described method;
- the population and outcome scales were described clearly;
- the studies were conducted in a context that was (to some extent) comparable to the Netherlands (i.e. European countries, the United States of America, Canada, Australia and New Zealand);
- they were written in Dutch or English;
- they investigated vaccinations that are part of the Dutch National Immunisation Programme.

There may be some overlap in individual studies that were included in the reviews. Our literature review relied exclusively on reviews, since they combine multiple sources. This reveals patterns and consistency in the findings, which reinforces the reliability of the results. However, it also makes it less likely that the findings will change as a result of new insights. The disadvantage of this approach is that it may overlook more recent

individual studies. Accordingly, the literature review is not exhaustive. In this knowledge brief, we describe determinants that were reported as a main finding in at least two reviews. Further explanation can be based on a single review.

In total, the literature review is based on 43 reviews, with a scope of between 4 and 115 individual studies per review. A total of 13 reviews were about the specific target groups as defined. Study populations generally involved parents, while some studies focused on children, young people, or pregnant people. A majority of the reviews were focused on HPV or a combination of multiple vaccines (including MMR, pertussis, meningococcal disease, and hepatitis B).

Results

1. What people think and feel

Key findings
Many reviews find a link between what people think about vaccinations and their willingness to vaccinate or vaccination uptake. What people think about vaccinations is investigated in various ways, e.g. by measuring general attitudes, or looking at specific beliefs and feelings. In general we see that more positive attitudes, beliefs or feelings towards vaccination are correlated to higher willingness to vaccinate or vaccination uptake. And that more negative attitudes, beliefs or feelings about vaccination are correlated to lower willingness to vaccinate or vaccination uptake. One key factor is whether people have confidence in the healthcare system and in medical experts. In addition, we often found that the beliefs that people hold about the safety of vaccinations, the benefits and effectiveness of vaccinations, and the risks of the disease that the vaccine protects against are correlated to willingness to vaccinate or vaccination uptake

Knowledge
Knowledge about a disease or vaccine and/or awareness of its existence are often related to willingness to vaccinate or vaccination uptake, according to the literature. Insufficient knowledge or awareness of the disease[2-9] or the vaccine [2,3,6,10-13] is associated with lower willingness to vaccinate or vaccination uptake. Conversely, having more knowledge or awareness of the disease[4,5,13-17] or the vaccine[4,5,16-19] is associated with higher willingness to vaccinate or vaccination uptake.

Risk perception of the disease
Multiple studies show a link between risk perception of the disease that a vaccine protects against and willingness to vaccinate or vaccination uptake. People who view the disease as more serious[2,13,20] or believe it is more likely that they will contract the disease[2,8,13,14,17] show a higher willingness to vaccinate or vaccination uptake. Viewing the disease as less serious[7,8,20,21] or believing it is less likely that they will contract the disease[7-9,13,17,20-22] is related to lower willingness to vaccinate or vaccination uptake.

Some people think that the risk of damage from the vaccine is higher than the risk of the disease itself, and therefore show a lower willingness to vaccinate or vaccination uptake[20]. Others feel a lack of urgency, since they do not perceive many risks from the disease[20]. They do not take action and will not get vaccinated until there is an outbreak.

Perceived safety of vaccine
Many studies show that people who are concerned about the safety of vaccines exhibit lower willingness to vaccinate or vaccination uptake[2,4,6-9,12,13,17,18,21].

The same applies to concerns about side effects[7-9,13,16,17,20,23-25]. Conversely, people who have confidence in the safety of vaccines are more likely to show higher willingness to vaccinate or vaccination uptake.[5,16,20]. Specific concerns that are mentioned include e.g. the perception that a child is too young to be vaccinated[21,24]. For example, because the child's immune system is still developing, parents may belief that vaccination could overload the immune system[21].

These concerns are often mentioned in the context of offering a combination vaccine or administering several vaccines at the same time. These parents sometimes perceive separate vaccinations as safer[21]. People may also be concerned because they think that certain substances in vaccines are harmful. A specific concern that mainly seems to be present in relation to the MMR vaccine is the concern that this vaccine could cause autism[20-22]. A publication released in 1998 that was later withdrawn due to serious professional misconduct during the study claimed that there was a link between autism and an MMR vaccine. No link between vaccination and autism has been found since then in other studies, but the concerns caused by that publication continue to worry some parents. Other determinants that play a role include the fear that side effects from vaccinations could be more serious than the disease that they protect against, and other perceptions based on misinformation, misunderstandings or rumours[20-22].

Perceived benefits and vaccine effectiveness
People who perceive vaccines as more effective[6,13,20] and see more benefits to vaccination[2,5,7-9,13] show higher willingness to vaccinate or vaccination uptake. Conversely, concerns or doubts about the effectiveness[2,4,7,8,18,20,21] or benefits of vaccines[22] seem to be closely correlated to lower willingness to vaccinate or vaccination uptake. People who are convinced that giving separate vaccinations has benefits compared to a combination vaccine show a lower willingness to vaccinate or vaccination uptake.

Attitudes and other beliefs
People with more positive attitudes towards vaccination show higher willingness to vaccinate or vaccination uptake[2,5,7,16]. Conversely, people with more negative attitudes towards vaccination show lower willingness to vaccinate or vaccination uptake[26]. Religious beliefs also play a role in willingness to vaccinate or vaccination uptake. The willingness to vaccinate or vaccination uptake is higher[20,27] or lower[5,27] depending on how people interpret the customs and writings of their religion.

The literature also describes a number of other beliefs that play a role in willingness to vaccinate or vaccination uptake. For example, willingness to vaccinate or vaccination uptake is lower among people who prefer natural immunity rather than vaccination[21,24]. This also holds true for people who are convinced that it is better not to vaccinate when a child has a mild illness[25].

Emotions
Some people are influenced by emotions that are not about the medical effects of vaccination, but the consequences of accepting the vaccine. We often found that fear of injections was associated with lower willingness to vaccinate or vaccination uptake[9,20,25]. Fear of deportation can also play a role among refugees, immigrants and asylum-seekers in deciding whether to use the healthcare system, including vaccination services[3]. In the context of the HPV vaccine, parents who fear that HPV vaccination will lead to sexual promiscuity show lower willingness to vaccinate or vaccination uptake[17,18].

Confidence
Confidence in health professionals, experts and/or the healthcare system plays a key role in vaccination. The literature often shows that people who do not have confidence in health professionals, experts[5,10,20,21] and/or the healthcare system[3,5,10-12,17,22-24] also have lower willingness to vaccinate or vaccination uptake.

Related factors that are associated with lower willingness to vaccinate or vaccination uptake include lack of confidence in the government[14,21,22], lack of confidence in vaccination research[21], lower confidence in information about vaccines and in the stakeholders involved[28], lack of confidence in the people who advocate using vaccines (including believing in conspiracy theories)[25], lack of confidence in Western medicine[17], and greater confidence in alternative medicine or natural remedies[20]. Some parents, especially in anthroposophical communities, were convinced that contracting measles is a necessary part of natural child development and preferred natural development of the immune system or prioritised natural measures to prevent measles[20].

Research among specific target groups
Research among people with a migration background and/or a low socio-economic position shows that low risk perception[11,27,29-31], misconceptions and taboos[30,32,33], and negative attitudes about vaccination[3,29] pose obstacles to willingness to vaccinate or vaccination uptake. Negative attitudes are often based on cultural and religious norms, practices or ideas[3,30,33-37]. Specifically for HPV, two reviews showed that sex-related misconceptions and taboos, such as the concept that giving this vaccination could encourage sexual activity (with multiple partners) are negatively associated with willingness to vaccinate or vaccination uptake[32,37]. Fear of (known or unknown) side effects also leads to lower willingness to vaccinate or vaccination uptake[27,29,30,32].

In addition, research shows that lack of confidence in the healthcare system, health professionals and science[37] correlates to lower willingness to vaccinate or vaccination uptake in this target group[3,30,32,33,35,36]. Moreover, low confidence in the effectiveness[3,29,30,36] or safety of vaccines leads to lower willingness to vaccinate or vaccination uptake[3,29,30]. Positive attitudes[29] and confidence, on the other hand, promote willingness to vaccinate or vaccination uptake in this target group[11,37].

Various reviews found that a lack of knowledge about vaccinations correlates to lower willingness to vaccinate or vaccination uptake in this target group, while more knowledge has a positive contribution[35].

Finally, the findings indicated that low health literacy correlates to lower willingness to vaccinate or vaccination uptake[32]. Health literacy refers to whether people can easily find, understand and apply information that is relevant to their health. One review also found that poor reading comprehension, writing skills and digital fluency correlated to lower willingness to vaccinate or vaccination uptake[38].

2. Social processes

Key findings
Many reviews found a correlation between social processes and willingness to vaccinate or vaccination uptake. Social processes include social norms, parenting, sources of information and recommendations from care providers. Whether these processes are associated with a higher or lower willingness to vaccinate or vaccination uptake depends on how the social norm is perceived.

Higher willingness to vaccinate or vaccination uptake correlates to: seeing vaccination as a social responsibility, obtaining information from health care providers (as opposed to informal sources), and a health care provider's recommendation to vaccinate. Lower willingness to vaccinate or vaccination uptake correlates to: cultural bias and barriers, insufficient knowledge, misinformation, information obtained from more informal sources, and not receiving the recommendation from a health care provider.

Social norm
Social norms are codified or unwritten rules that determine what is viewed as acceptable or expected behaviour within a certain group of people. Depending on the social norm, it may be negatively [2,9,14,28,39] or positively[2,14,28] correlated to willingness to vaccinate or vaccination uptake. This also applies to the opinions or judgments about vaccinating that are expected from others, such as family, parents or age peers[7,20,24,28].
Whether others support or recommend the decisions is also correlated to willingness to vaccinate or vaccination uptake. People who perceive support for or recommendations of vaccinating from their social circles (family, parents or age peers) show higher willingness to vaccinate or vaccination uptake[9,13,17,19]. People who show lower willingness to vaccinate or vaccination uptake are more likely to have no perceived support for a decision to vaccinate[21].

Besides immediate social circles, a broader sense of social responsibility also plays a role in vaccination. Higher willingness to vaccinate or vaccination uptake was found in people who perceive vaccinating as a social responsibility to protect the health of the community and your child[6,20,28]. People who do not feel this sense of responsibility were found to have lower willingness to vaccinate or vaccination uptake[21].

Parenting
Parenting plays a role in vaccination behaviour. Cultural or religious norms and convictions about vaccinations are passed on by parents and caregivers and can pose an obstacle to vaccinating[3,11,14,17]. One review found that parents in a religious community did not feel that there was any risk of HPV infection for their daughters, because they believed that their parenting had defined the moral behaviour of their daughters, such that their daughters would not have premarital sex[14]. Speaking a different language at home than is generally spoken in public is also correlated to lower willingness to vaccinate or vaccination uptake[3,11,17].

Conversely, being raised by parents who model preventive health behaviour, for example by getting regular preventive screenings or having the seasonal flu jab, is correlated to higher willingness to vaccinate or vaccination uptake in their children[19,40].

Sources of information
The source of information plays a role in vaccination. In general, people with a high willingness to vaccinate or vaccination uptake are more likely to obtain their information from healthcare providers[16,17,20,40]. People with a lower willingness to vaccinate or

vaccination uptake, in contrast, are more likely to get their information from more informal sources, such as social media and laypersons[20-22].

Misinformation, or erroneous information, also plays a role here. Misleading information, convictions and perceptions about the disease or the vaccine are related to lower willingness to vaccinate or vaccination uptake[7,20,21]. Espousing conspiracy theories also correlates to lower willingness to vaccinate or vaccination uptake[14].

Sometimes people are dissatisfied with communications. For example, they might feel that the information they receive is insufficient, poorly timed, exhibit perceived language barriers (too much medical terminology, or lack of information in their own native language), or ineffectively communicated. A review on willingness to vaccinate or vaccination uptake for maternal vaccinations showed, for example, that women did not perceive vaccination as very important, because the information was provided in a rushed manner and in a limited time frame[23]. The literature shows that these communication problems correlate to lower willingness to vaccinate or vaccination uptake[21,23].

Recommendation from care provider
The link between willingness to vaccinate or vaccination uptake and a recommendation from a healthcare provider is frequently reported. The recommendation from a healthcare provider to vaccinate correlates to higher willingness to vaccinate or vaccination uptake[2,4,5,8,9,14,17- 19,23,39]. People who do not receive a recommendation from a healthcare provider[2,7,9,39], or who feel that a care provider is advising against the vaccination[13], are more likely to have lower willingness to vaccinate or vaccination uptake.

Research among specific target groups
Research among people with a low socio-economic position and people with a migration background shows that social norms affect willingness to vaccinate or vaccination uptake in these groups[29,33,34]. Multiple studies specifically mention negative influence from social norms[29,34]. For example, views expressed by other mothers opposing HPV vaccination are associated with vaccination refusal in individuals[29]. Perceived discrimination among people with a migration background is also mentioned as a factor that can reduce willingness to vaccinate[30,34].

Cultural or religious norms and factors also play a key role in willingness to vaccinate or vaccination uptake among people with a migration background[3,11,29,33,34,36,37]. One example is cultural or religious norms surrounding sexuality. As referenced previously in this document, the conviction that HPV vaccination encourages sexual activity (premarital sex or with multiple partners), which does not fit within specific cultural or religious norms, correlates to lower willingness to vaccinate or vaccination uptake[37]. Another review shows that not openly speaking about sexuality (cultural silence) correlates to lower willingness to vaccinate or vaccination uptake[37]. Two other reviews show that acculturation and bridging cultural differences – such as the extent to which parents with a migration background have acquired language skills, and can effectively apply their skills, knowledge and experience from their country of origin within a new culture – can contribute to higher willingness to vaccinate and vaccination uptake for the HPV vaccination[37].

Cultural sensitivity is considered important in healthcare. Contacting people with an awareness of and respect for their cultural norms and values, and avoiding stigmatisation, contributes to willingness to vaccinate and vaccination uptake among people with a migration background[11,33,34,37]. According to one review, community

information (providing information and education about vaccinations to groups of people adapted to a specific community) has a positive influence on willingness to vaccinate or vaccination uptake[11]. Finally, recommendations from care providers play a key role: among people who received a recommendation to vaccinate, willingness to vaccinate or vaccination uptake is higher on average than among people who did not receive a recommendation[11,29,36,37].

3. Practical issues

Key findings
Many reviews found a correlation between practical barriers and willingness to vaccinate or vaccination uptake. Practical barriers can influence ease of access to vaccinations, for example if people do not have time or cannot easily reach the vaccination location. Affordability, accessibility and quality of communication, ease of access to vaccination services, and service quality can result in practical barriers. In general, fewer barriers, more accessible communication and ease of access to services are correlated to higher willingness to vaccinate and vaccination uptake.

Ease of access
Various types of barriers related to ease of access to vaccinations can play a role in willingness to vaccinate or vaccination uptake. Some barriers are personal in nature, such as not having much time[28] or having to arrange transport[3,9]. Others are more closely related to the vaccination system and how it is organised, such as how easy it is to reach a vaccination location[3,41]. Offering vaccinations at school through a school vaccination programme, for example, correlates to a higher willingness to vaccinate or vaccination uptake, compared to offering vaccinations at the doctor's office[16,42,43]. It means that children do not have to go anywhere special to be vaccinated. Sending reminders also increases the likelihood of vaccination uptake[10,28].

Affordability
International literature shows that higher costs of a vaccine[2,4,7-10,13,18,20,34,39] and not having health insurance[2,7,8,16,43,44] correlate to lower willingness to vaccinate or vaccination uptake. In the Netherlands, the vaccinations in the National Immunisation Programme are free. Such determinants are therefore likely to play a less significant role here for these vaccinations.

Accessibility of communication and service quality
The perceived accessibility of communication about vaccinations – e.g. appropriate language usage or different languages – correlates to willingness to vaccinate or vaccination uptake[3,20,27,41]. The perceived quality of vaccination services by care providers also plays a role. This is mainly shown by satisfaction about the interaction with the care provider(s)[21]. Perceived room to talk to the care provider correlates to higher willingness to vaccinate or vaccination uptake[17]. Conversely, lower satisfaction about overall and vaccination-related communication with the care provider correlates to lower willingness to vaccinate or vaccination uptake[25,34].

Research among specific target groups
For some people with a low socio-economic position and/or migration background, language barriers pose an obstacle to accessing vaccinations. A lack of available information in the native language and insufficient fluency in the local language of the country pose obstacles to understanding vaccination information and services[3,11,27,30,34,35,38]. This makes it difficult for parents to decide to have their child vaccinated. For example, they may be afraid that the wrong vaccine will be administered,

or that a vaccine will accidentally be given twice[27]. Accessible information and communication tailored to the audience can promote willingness to vaccinate or vaccination uptake[35]. Information resources about the National Immunisation Programme are available in multiple languages in the Netherlands, for example on the website of the National Immunisation Programme.

Issues that obstruct ease of access to vaccination services also play a role in willingness to vaccinate or vaccination uptake in this target group[11]. Limited ease of access to care providers correlates to lower willingness to vaccinate or vaccination uptake[3,31,34,35,38]. Perceived practical barriers include long travel times, limited availability in time, and significant geographical distance to the vaccination location. One review also found that financial costs pose an obstacle to accessing vaccinations in this target group[34], while free vaccinations could contribute to higher willingness to vaccinate or vaccination uptake[31]. In the Netherlands, vaccinations in the context of the National Immunisation Programme are free.

Obstacles perceived by care providers also play a role, such as insufficient knowledge and training about vaccinations, the lack of clear guidelines, and the lack of dedicated time or personnel[35].

4. What people do

A number of reviews found a correlation between previous behaviour and willingness to vaccinate or vaccination uptake. This includes whether a person has been vaccinated before, as well as proactive behaviour, such as a recent visit to a care provider. In general, we see that previous vaccinations[13,16,21,40] and proactive behaviours[16] are correlated to higher willingness to vaccinate or vaccination uptake.

We did not find any supplementary insights on this topic for the specific target groups.

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