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

Knowledge brief

SocioVax literature review: interventions that could promote 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 in the National Immunisation Programme is voluntary. Registered vaccination figures show that vaccination uptake is not evenly 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 actions, strategies and measures can promote participation in the National Immunisation Programme. This could include interventions for the purpose of:

- giving people accurate information about vaccinations;
- supporting people in making choices about vaccinations;
- maximising ease of access to vaccinations.

By conducting a literature review, we have mapped out current international knowledge about such interventions, for the general population as well as for people who have a lower socio-economic position or a migration background. This knowledge can be used to identify points of departure for policy, practice 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 literature review conducted in 2024. In 2025, it was supplemented by literature review specifically focused on target groups in which vaccination coverage is lower than average. This includes 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:

Effective interventions for promoting vaccination uptake often focus on communication and knowledge development, and/or on increasing ease of access to vaccinations. Although this study does not include quantitative analysis, it is worth noting that the reported effects of the interventions are generally modest. Key findings about the various types of interventions:

Communication and knowledge development:

- Information channels: It is important to disseminate information through channels that are appropriate to the target audience. Due consideration should also be given to involving key people, such as a religious leader, GP or individuals with first-hand experience.
- Communication strategies:
  - It is important to consider differences in what information is needed. Some people want concise summaries, while others prefer to dig deeper.
  - Different communication strategies can increase willingness to vaccinate or vaccination uptake. Strategies could include recommendations, storytelling and presumptive communication. An example of a presumptive communication strategy is that the care provider phrases the recommendation to be vaccinated in the form of an announcement.
  - Among people who are functionally illiterate and groups from different cultural backgrounds, using information resources that are tailored to the linguistic and cultural needs of a specific target audience can be an effective way to increase willingness to vaccinate or vaccination uptake.
- Knowledge development: Educational interventions that rely on a familiar and trusted messenger, providing targeted information about disease risks and/or also targeting the parents, can increase willingness to vaccinate or vaccination uptake.
- Refresher training for healthcare professionals: Refresher training for healthcare professionals can have a positive impact on vaccination coverage. Youth healthcare professionals in The Netherlands can attend training sessions to learn techniques for conducting conversations about vaccination with parents.

Ease of access:

- Alternative locations: The option to administer vaccinations at a location where the target group already goes can lower the threshold for getting vaccinated. This can increase willingness to vaccinate or vaccination uptake.
- Reminders: Vaccination reminders can increase willingness to vaccinate or vaccination uptake. This applies to various target groups and different forms of reminders, such as SMS, e-mail and letter. A reminder sent to the care provider that a patient will soon reach the next step in the vaccination schedule can also lead to higher willingness to vaccinate or vaccination uptake.
- Catch-up options: Offering catch-up options (an extra time when vaccination is possible) can be effective in raising vaccination uptake. This is often seen in combination with a different intervention.
- Standing orders: The literature suggests that authorising care providers to administer vaccinations ('Standing orders') may be effective in increasing willingness to vaccinate or vaccination uptake.

Combined interventions:

In combined interventions, multiple intervention strategies are deployed at the same time. These approaches generally seem to work better than interventions based on a single strategy. In evaluations, however, it is difficult to determine whether all the different elements of the intervention were necessary.

Implications

- Interventions that have proven effective can be deployed at local and national levels. Combined interventions are preferred in that context.
- The effectiveness of interventions may vary depending on the target group, local context, and type of vaccination. Publishing evaluations of interventions that are deployed in actual practice (even when they are not effective) contributes to the development of knowledge about what does and does not work, where, and for whom.
- It is important to investigate whether there are (in specific groups) determinants of vaccination uptake that are currently not fully addressed by interventions. Examples might include confidence in vaccinations, or social norms. For an overview of determinants, see the 'knowledge brief: literature review on determinants of vaccination uptake'.
- There are a number of interventions that have proven effective for a general population, but it is unknown whether they are also effective for specific target groups. Further research could be conducted on that topic.

Explanation of the results

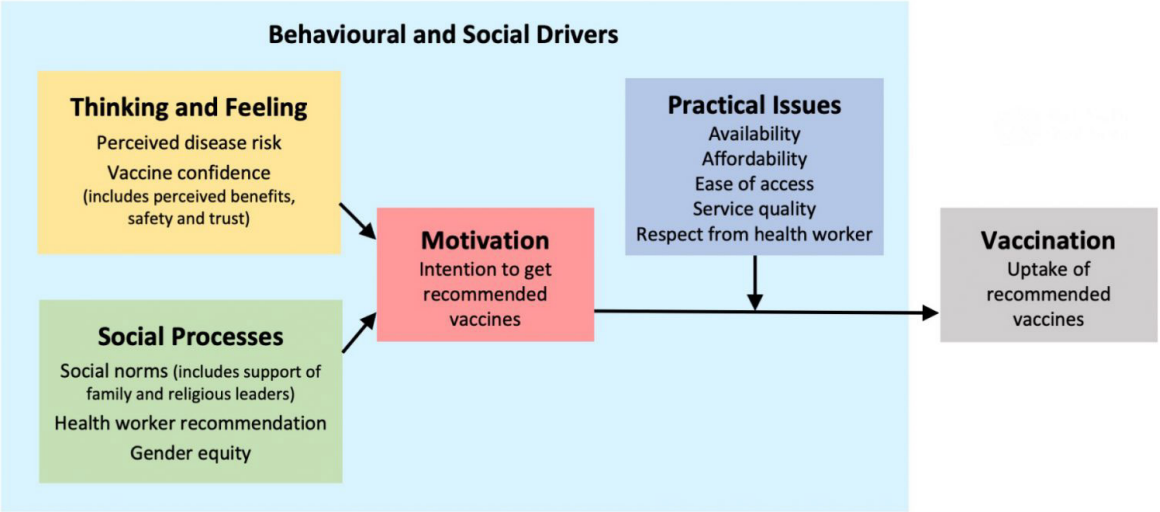
Theoretical background

Willingness to vaccinate and vaccination uptake are influenced by various factors. The following model by the World Health Organization (WHO BeSD working group, 2022[1]) identifies four categories of factors (Figure 1). Motivation to get a vaccination is influenced by what people Think and Feel, and by Social Processes. Whether the Motivation is then converted into behaviour – actually getting the vaccination – depends on Practical Issues. More background on the various types of factors (or 'determinants') is provided in the RIVM knowledge brief SocioVax literature review: determinants of vaccination uptake in children (KN-2025-0105.

Effective interventions to promote vaccination uptake focus on one or more of these determinants. For example, an intervention aimed at convincing people that vaccinating is useful focuses on what people think and feel about vaccinations. If the perceived usefulness of a vaccination was in fact a key factor related to getting that vaccination, and the intervention successfully increased the perceived usefulness, it could lead to a higher vaccination uptake. Conversely, if people were already convinced that it was useful, but uptake was determined more strongly by social norms in local communities ('social processes'), this intervention would not be effective. In other words, alignment between determinants and intervention strategies is essential. Which determinants are important may vary depending on the vaccinations, target groups and contexts.

It is possible to differentiate generally between interventions aiming to increase motivation (willingness or intention to vaccinate), and interventions aimed at resolving practical issues for people who are already willing, making it as easy as possible for them to actually get the vaccination.

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



Method

Four sources were used for this knowledge brief:

a) A research report on measures to increase vaccination coverage in the Netherlands, written by researchers from the Netherlands Institute for Health Services Research (Nivel) and the Amsterdam University Medical Center, commissioned by the Ministry of Health, Welfare and Sport (VWS). The report was based on literature review and consultations with national and international experts and stakeholders about measures that could be effective in increasing vaccination coverage[2]. In the main text, we refer to this as '2019 Foresight Study'.
b) Literature review to identify new insights. To that end, we searched for review articles published between 2019 and January 2024 in three different scientific databases (PubMed, PsycINFO, Embase).
c) Supplementary literature review specifically focusing on interventions that promote vaccination uptake among children in communities with a low socio-economic position and/or a migration background. To that end, we searched for reviews published between 2014 and January 2025 in two different scientific databases (PsycINFO, Embase).
d) Discussions with professionals working at the Youth Healthcare Services in The Netherlands (JGZ), conducted in February and March 2023.[1]

There may be overlap in the individual studies that were the basis for the 2019 Foresight Study, and the studies included in the review articles in the literature review conducted later (sources b and c). This is due to the fact that the reviews included individual studies from before and after 2019. 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

[1] The findings from sources a, b and d were previously reported on the website of the National Institute for Public Health and the Environment (RIVM). In this knowledge brief, the results have been compiled and enriched with the insights specifically for groups with lower-than-average vaccination coverage (source c).

literature review is not exhaustive (see also the 2022 intervention overview provided by the WHO). In addition, international literature cannot always be transliterated directly into the Dutch context. It could offer inspiration, however.

In this overview, willingness to vaccinate or vaccination uptake are referred to in the broadest sense, not only including willingness to vaccinate (a person intends or is willing to vaccinate) and vaccination uptake (whether a person has actually been vaccinated), but also vaccination hesitancy (experiencing doubt when making a vaccination decision). Reviews 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 vaccination in the context of the National Immunisation Programme.

In total, the literature review (parts b and c) is based on 17 reviews. Three of those were about the specific target groups as defined. A majority of the reviews were focused on HPV or a combination of multiple vaccines. Study populations generally involved parents, while some studies focused on children, young people, or pregnant people.

Results

1. Interventions aimed at increasing motivation: Communication and knowledge development

Appropriate information channels and key individuals
The 2019 Foresight Study emphasises that it is important to reach target groups through appropriate information channels. Experts and stakeholders indicate that communication needs to include a focus on diversity among target groups. This means that it would be best to reach different target groups through different channels, such as specific newspapers, TV broadcasters and social media platforms. In addition, experts and stakeholders note that it is important for reliable information to be easy for the general public to find. For that reason, reliable information should be ranked high in the online search results. Information about the National Immunisation Programme could be placed on sites that are consulted by many people in the Netherlands, such as Thuisarts.nl. Experts and stakeholders also suggest disseminating information about the National Immunisation Programme at relevant locations, such as childcare centres and schools, in order to reach parents or adolescents. They also state that it is important to deploy key individuals to reach different target groups.

The literature shows that information provided face to face by care providers or (trained) volunteers works better than information on paper or online for certain target groups, such as people who are functionally illiterate and people who have a limited understanding of vaccinations. The supplementary literature review also confirms that deploying key individuals can help to increase willingness to vaccinate or vaccination uptake. Examples of these key individuals include: socially engaged people from specific groups in society, such as religious leaders; people with first-hand experience, such as

parents who were also hesitant about vaccination; and independent experts, such as midwifes or school nurses[3].

Experiences from Youth Healthcare Services (JGZ)
Youth healthcare professionals note that it is important to be visible to the target group. This means that information is present and highlighted at relevant locations or through relevant channels. For example, JGZ showcases the National Immunisation Programme through schools, municipalities and GP practices. A substantial percentage of the JGZ organisations are also active on social media. For example, they post updates that focus on upcoming vaccination rounds and ask parents and young people who are hesitant or have questions to contact their local JGZ organisation.

Finally, various JGZ organisations set up public information meetings on the topic of vaccinating that focus on specific neighbourhoods or target groups, for example through schools, welfare organisations, and religious gatherings. This sometimes happens in collaboration with key individuals, such as a religious leader or community worker. In practice, while the public information meetings are well received by participating parents, attendance is often limited.

Appropriate information resources
Appropriate information resources are essential to support making 'a well-informed choice' – the guiding principle of Dutch vaccination policy. In the 2019 Foresight Study, experts and stakeholders advised that communication should consider the varying skills that people have. Some of the population in the Netherlands have difficulty understanding written health information, and the majority is incapable of accurately interpreting tables and statistical comparisons. For that reason, experts and stakeholders suggest offering scientific facts at B1 language level. They also advise offering information resources in comprehensible language with lots of pictograms or through public information videos.

The literature does not yet present conclusive findings on the best way to adapt information resources. Information resources are often part of a broader intervention (see also 'Knowledge development'). The literature review found that educational interventions that had been culturally or linguistically tailored to the audience were effective in increasing willingness to get the HPV vaccine among minority populations in the USA[4]. However, educational interventions – including adapted versions with simplified language usage – focused on the combined vaccine against diphtheria, tetanus and pertussis during pregnancy were not effective[5].

Experiences from Youth Healthcare Services (JGZ)
It is important to align with the information needs of various groups of parents. To that end, some JGZ organisations develop their own information resources, such as leaflets, booklets or public information videos. In addition, professionals in the Netherlands often go out and visit target groups to support the vaccination decision. During those visits, they offer information that the target group understands. The use of appropriate information resources is in line with this. Using information resources that are tailored to the linguistic and cultural needs of a specific target audience can help to increase willingness to vaccinate or vaccination uptake among groups from different cultural backgrounds and people who are functionally illiterate. Professionals also consider that parents may have varying information needs. Some parents prefer concise information, while others would rather have in-depth details.

Communication formats

1. Strong recommendation/presumptive communication

A strong recommendation is the use of a powerful tone in favour of vaccinating. This is characterised by the use of phrases such as 'strongly recommend' and speaking in the first person ('I recommend...' rather than 'it is recommended...'), supported by clear reasons. Multiple reviews of strategies to promote HPV vaccination uptake suggest that a strong recommendation exudes self-confidence, thus alleviating concerns about vaccine safety. This was then linked to a higher willingness to vaccinate or vaccination uptake[6,7]. This strategy is more effective than engaging in discussions with parents about vaccination, or stating that parents should first and foremost make their own choice (without support). Professionals do note in the 2019 Foresight Study that a recommendation and a good discussion are not mutually exclusive.

A presumptive communication style refers to conveying the invitation to vaccinate as an announcement that does not require a response ('We have a vaccine ready for you'). Combining the vaccine with other recommended vaccines is also considered a presumptive strategy, appealing to the assumption that there is no specific hesitation about that vaccine. Evidence supporting this strategy's effectiveness, similar to the evidence supporting the use of strong recommendations, is derived from multiple reviews about the HPV vaccination[6,8].

Experiences from Youth Healthcare Services (JGZ)

In interviews with the Youth Healthcare Services (JGZ), the use of strong recommendations or presumptive communications is not explicitly mentioned as a strategy currently being used in actual practice. However, it is possible that such strategies are being used.

2. Addressing concerns about vaccination

Some communication strategies focus on explicitly addressing the concerns that people have about vaccinations. In the literature, this often involves face-to-face discussions. 'Motivational Interviewing' could be used in this context: a conversational tactic focused on jointly identifying and addressing concerns. The evidence supporting the effectiveness of communication strategies that explicitly address concerns about vaccination is not conclusive.

A review on interventions to promote acceptance of the influenza vaccine and pertussis vaccine during pregnancy shows that face-to-face talks that address concerns, debunk myths and emphasise the benefits of vaccination can increase willingness to vaccinate or vaccination uptake[9]. A review[6] looking at strategies to increase willingness to vaccinate or vaccination uptake for the HPV vaccine (among people aged 9 to 26 years and/or their parents), however, did not show any conclusive evidence supporting the 'Motivational Interviewing' communication strategy. In the context of the HPV vaccination, no conclusive evidence was found to support the effectiveness of 'In-depth Discussion' – in which the discussion lasts longer or is more complex, for example due to the use of more technical terminology.

Experiences from Youth Healthcare Services (JGZ)

Interviews with the Youth Healthcare Services (JGZ) revealed that a number of professionals in the Netherlands apply the conversational styles of 'Shared Decision Making' (a joint decision-making process) or 'Motivational Interviewing' (jointly identifying and discussing parents' concerns).

3. Balanced information
Balanced information about vaccinations is complete and transparent, covering the benefits and drawbacks of vaccinating. Experts and stakeholders advised that balanced communication must be ensured in public communication efforts. In their view, side effects currently receive a disproportionately high percentage of attention and the positive effects should be emphasised more strongly. A study in the 2019 Foresight Study suggests that offering balanced information about the human papillomavirus and HPV vaccination would not lead to higher vaccination coverage, but could lead to increased knowledge about the vaccine among parents.

A review of which communication strategies would be best for doctors to use in order to increase HPV willingness to vaccinate or vaccination uptake (among people aged 9 to 26 years and/or their parents) showed that there is no conclusive evidence for the effectiveness of emphasising the benefit that HPV vaccination prevents cancer or sexually transmitted infections [6]. The researchers emphasise that it could lead to increased willingness to vaccinate or vaccination uptake when combined with a strong recommendation and presumptive communication style (see above).

4. Storytelling
'Storytelling' refers to the use of personal stories about the importance of vaccination. An example of 'Storytelling' is a (short) story about a mother talking about her child who had measles, illustrating the importance of vaccination. The 2019 Foresight Study revealed that 'Storytelling' can have a positive influence on how parents (including those who are hesitant) view vaccination, compared to communication focusing on data and statistics.

The literature review includes a review of interventions to increase HPV vaccination among minority populations in the USA (aged 9 to 26 years), in which one study used 'Storytelling'. This pilot study among Khmer-American mothers and daughters (aged 14 to 17 years) showed that a culturally adapted educational 'Storytelling' video led to an increase in willingness to vaccinate against HPV within one month, but did not lead to a higher vaccination uptake [10]. Further evaluations of the effectiveness of this strategy were not identified in the literature review.

Experiences from Youth Healthcare Services (JGZ)
Various professionals view 'Storytelling' (a personal story) as an appealing and more dynamic way of communicating about the importance of vaccination. One of the professionals stated that stories told by people who witnessed infectious diseases first-hand do emphasise the severity of the infectious disease and can offer a way to boost awareness among parents (and prospective parents). We are not aware of the extent to which 'Storytelling' is used in communications by JGZ organisations.

Digital interventions
Digital interventions are interventions that use digital resources, such as digital text messages, digital gamification or a digital appointment management system. In the 2019 Foresight Study, experts and stakeholders noted the use of digital interventions, such as QR codes on information resources (leaflets, letters or posters) that make it easier to find accurate and reliable information, possibly translated into multiple languages. There was still a lack of solid research on whether digital interventions were effective in increasing vaccination uptake.

Indications were found in the literature review that offering health information on a mobile phone can increase vaccination coverage[11,12]. A review of strategies focusing on promoting HPV vaccination indicates, for example, that 'mHealth interventions' (health interventions via a mobile phone) can increase willingness to vaccinate among parents [12]. Effective elements include using standard text messages (reminders, educational messages or messages adapted to the target group) and interactive voice messages. Combining multiple methods can also be effective, such as text messages as well as phone calls, and health education sessions combined with reminders by text message/phone. Another review looked at whether access to a personal electronic patient portal had an impact on willingness to vaccinate or vaccination uptake in various target groups. The results are not conclusive. A patient portal with various integrated functions, such as educational posts or digital articles about health, also has no clearly proven effect on willingness to vaccinate or vaccination uptake[13].

A review about vaccination in multiple target groups (including children, students and the general population) shows that digital gamification can be effective in increasing willingness to vaccinate or vaccination uptake[14]. Digital gamification refers to using game principles and techniques to positively incentivise preferred behaviour. Successful elements mentioned in the review include using a character or roleplay, earning or losing tokens, and increasing levels of difficulty. These elements should preferably be used based on existing behavioural theories. Using a character or roleplay enables participants to more accurately assess the perceived risk of a disease, for example by virtually experiencing the impact of decisions on whether or not to vaccinate. It is preferable to use characters that people can identify with. In addition, interaction with other (virtual) characters in the game can address how vaccination affects group immunity.

Experiences from Youth Healthcare Services (JGZ)
In practice, professionals already use digital interventions on a regular basis. Examples QR codes on information resources, the digital appointment management system, and digital resources that promote ease of access to information (translation or read-aloud functions on JGZ website).

Knowledge development
Educational interventions aim to increase knowledge about the vaccine and/or the disease that the vaccine protects against. Various forms of knowledge development can increase willingness to vaccinate or vaccination uptake. There are often relevant preconditions that determine effectiveness, however. Experts and stakeholders noted in the 2019 Foresight Study that the types of information conveyed in various ways to various target groups can make a significant difference (see the sections on appropriate information resources and appropriate information channels). The 2019 Foresight Study also mentioned research showing that educational interventions do increase knowledge about vaccinations, but noted that this is not converted into higher vaccination uptake.

In the literature review, we see that educational interventions proved effective in some studies, and not in others. A review of strategies for healthcare professionals to increase willingness to vaccinate or vaccination uptake for the HPV vaccination among children and adolescents aged 9 to 17 years reveals that providing a leaflet with information about HPV can be effective. The leaflets had a focus on positive long-term effects, and were followed by an explicit recommendation to get the vaccine[8]. Another review found that educational interventions focusing on the HPV vaccine were more

effective when they also targeted parents, compared to when they only targeted young adults[4]. However, various educational interventions focused on the pertussis vaccine during pregnancy were not effective[5].

Experiences from Youth Healthcare Services (JGZ)
In actual practice in the Netherlands, professionals mainly focus on providing information during a doctor's appointment or vaccination appointment. In addition, multiple JGZ organisations also offer public information meetings or webinars for specific neighbourhoods and target groups.

Refresher training for healthcare professionals
There are indications that refresher training for healthcare professionals can have a positive effect on vaccination coverage, although this has not been evaluated often. In the 2019 Foresight Study, experts indicated that it is important for healthcare professionals to be able to handle questions and needs from various groups of parents. Conversational training and knowledge development can help with that. Knowledge development helps care providers to give accurate information, so people can consider it carefully in the vaccination decision. A study referenced in the 2019 Foresight Study shows that doctors who received an online training to develop knowledge about HPV epidemiology and communicate with parents and adolescents (aged 11 to 13 years) achieved higher vaccination coverage. The supplementary literature review found no reviews about the effectiveness of conversational training for healthcare professionals. Evidence was found for the effectiveness of knowledge development in professionals: two reviews about intervention strategies for vaccinations during pregnancy found that educating care providers, for example by showcasing the guidelines or giving information about the safety and effectiveness of the vaccines, can increase willingness to vaccinate or vaccination uptake[5,9].

Experiences from Youth Healthcare Services (JGZ)
Our interviews showed that healthcare professionals in the Netherlands also learn various communication techniques. During conversational training sessions, they discuss the best way to contact parents to discuss vaccination. They also learn how to guide parents in making a vaccination choice. Healthcare professionals consider it important to have accurate substantive knowledge about vaccination, so they can give people accurate information and address their questions and concerns.

Research in specific target groups
Research on communication-driven interventions shows that various interventions are effective in promoting willingness to vaccinate or vaccination uptake among people who have a lower socio-economic position or a migration background.

Clear and simple communication, cultural context and healthcare professionals
The use of clear, comprehensible language in communicating with parents contributes to higher willingness to vaccinate or vaccination uptake[15,16]. Information should be culturally sensitive and be offered in the native language of the target group. Deployment of bilingual healthcare professionals is important here[16]. It is also important for healthcare professionals to actively recommend vaccinations to eliminate hesitation about the risks and to emphasise the benefits of vaccination. Interactive discussions, encouragement and recommendations from healthcare professionals can reduce barriers and increase willingness to vaccinate or vaccination uptake[16].

Community-driven interventions
Research shows that a community-driven approach is crucial for interventions targeting minorities in society. In this context, it is essential to actively involve community members in developing an intervention[15-17]. It is important that information about vaccinations is shared through sources that are seen as reliable within the community, for example by religious leaders[16].

Multiple exposures to information
Research among these target groups has shown that using written, visual and interactive forms of information lead to more knowledge about vaccinations[16,17]. Repeated exposure to information through different channels has proven more effective than one-time exposure from a single source. In this context, it is important for the information to include the benefits and drawbacks of vaccinations, as well as address the reasons why some parents refuse to vaccinate, in order to resolve misunderstandings[16].

Social media and digital interventions
Some social media interventions show very promising results, but primarily among adolescents. One review concludes that there is no evidence supporting the effectiveness of digital interventions, such as online education about the importance of vaccinating, in promoting vaccination uptake in the target group[17].

2. Interventions focused on facilitating vaccination uptake
Alternative locations
The location where people can get a vaccination may affect willingness to vaccinate or vaccination uptake. Locations nearby, which people visit often, can lower the threshold for vaccinating. This also includes references to 'alternative locations', to emphasise that this does not involve the usual locations for the Youth Healthcare Services (JGZ). Examples include schools, pharmacies, GP practices or home visits.

In general, the literature shows that the option to get a vaccination at an alternative location increases willingness to vaccinate or vaccination uptake. Two reviews show that offering vaccinations at a location where the target group is already present results in higher willingness to vaccinate or vaccination uptake[5,8]. Such locations include midwife and obstetrician clinics for pregnant people and babies, shopping centres, or (for HPV) other locations that are easy for young people to access.

Experiences from Youth Healthcare Services (JGZ)
In actual practice, there are JGZ organisations that offer home vaccination as an alternative for children aged 0 to 4 years who would otherwise get the vaccine at the well-baby clinic. In contrast, for children and adolescents (aged 4 to 18 years) who would otherwise get the vaccine in a group setting, the well-baby clinic is offered as an alternative location. At a group vaccination location, children who have a fear of needles could be vaccinated in a separate space that offers a calmer setting.

Longer opening hours
The 2019 Foresight Study shows that field parties advise expanding opening hours for vaccination locations, for example in the evening and/or weekends. In our review, we have not found any literature insights regarding a possible relationship between longer opening hours and willingness to vaccinate or vaccination uptake.

Experiences from Youth Healthcare Services (JGZ)
Expanding opening hours for the age category of 4 to 18 years is an intervention that is regularly mentioned during the interviews. Over one-quarter of the JGZ organisations we interviewed have already introduced longer opening hours for group vaccinations, or are trying it out (as a pilot project).

Vaccination reminders
According to the literature, reminding people of a vaccination (vaccination reminder) can be effective in increasing willingness to vaccinate or vaccination uptake[7,10,18,19]. This has been shown for various target groups and different forms of reminders, sent by e.g. SMS, e-mail or letter. A reminder sent to an attending care provider (e.g. a midwife) that a patient will soon reach the next step in the vaccination schedule can also result in higher willingness to vaccinate or vaccination uptake[5,9].

Experiences from Youth Healthcare Services (JGZ)
Interviews with Youth Healthcare Services (JGZ) show that professionals in the Netherlands do use vaccination reminders in actual practice. Some JGZ organisations send parents of children (aged 0–4 years) a reminder by text message before the appointment, and/or parents receive a follow-up phone call if they have missed an appointment. Reminders by phone call or SMS are used less often for the target group aged 4–18 years.

Catch-up options
In terms of catch-up options, extra vaccination times are offered with the aim of increasing vaccination coverage. They are often part of other interventions. The 2019 Foresight Study found that catch-up options can increase vaccination coverage. We did not find any additional evidence to support this in the supplementary literature review.

Experiences from Youth Healthcare Services (JGZ)
In practice, examples of catch-up times are mentioned, such as the option to vaccinate during walk-in clinic hours.

Standing orders
The literature suggests that authorising care providers to administer vaccinations ('Standing orders') may be effective in increasing willingness to vaccinate or vaccination uptake. This makes it easier to have a vaccination during a routine visit. This has been shown for willingness to vaccinate or vaccination uptake during pregnancy, for example when the midwife was authorised to administer vaccines.

Research in specific target groups
Research shows that various interventions are effective in improving ease of access to vaccinations among people who have a lower socio-economic position and/or a migration background.

Reminders
Research shows that reminders before vaccination appointments are an effective intervention to increase willingness to vaccinate or vaccination uptake in these target groups[15-17]. Reminders can be offered in various ways, such as through computer-generated phone reminders, letters, cards or phone calls[15-17]. SMS reminders show varying results, but seems particularly well suited for use with adolescents[17]. In

addition, personalised reminders are generally more effective than standard messages[16].

Locations in community
Improved ease of access to information as well as vaccination locations has proven effective in increasing willingness to vaccinate and vaccination uptake. Using familiar locations in the community, such as community centres and churches, is an effective way to reach people within these target groups and inform them about vaccinations[16].

Alternative vaccination locations
Access to vaccinations can be improved by offering alternative vaccination locations, such as mobile clinics, walk-in clinic hours and home visits. These interventions lower thresholds by shortening travel times, aligning more smoothly with parents' schedules, and increasing the ability access vaccinations[15,17]. Home visits can also be cost-effective, especially when they are part of a combined intervention approach[17].

Flexible opening hours
Flexible opening hours for vaccination facilities contribute to higher willingness to vaccinate and vaccination uptake in the target groups[15,17].

3. Combined interventions
Combined interventions are interventions that combine multiple intervention strategies. An effective combined intervention approach consists of multiple elements, for example improving ease of access, sending reminders, offering education, focusing on community-driven mobilisation, and providing communication adapted to the language and health skills of the target group[15,17]. Two reviews show that interventions that use multiple strategies in combination usually work better than interventions using a single strategy[7,18]. This may be because the choice of whether or not to vaccinate can be a complex decision, in which multiple social, cognitive and contextual factors play a role. Combined interventions can target several different factors at the same time[15].

Experiences from Youth Healthcare Services (JGZ)
In actual practice, simultaneous deployment of multiple interventions is already happening. The chosen combinations depend on the local needs. One example of a combination is translating information resources, organising public information meetings in the local neighbourhood, and offering alternative vaccination locations.

Research in specific target groups
Research shows that combined interventions are the most effective option for increasing willingness to vaccinate and/or vaccination uptake, also among people with a lower socio-economic position and people with a migration background.

Community-driven combined interventions
Research shows that combined interventions that are specifically adapted to the local community are the most effective approach to increasing willingness to vaccinate or vaccination uptake[15-17]. The locally designed interventions are aligned with the specific context and target group and are particularly effective in urban, ethnically diverse and socio-economically disadvantaged communities[17]. Because these interventions have been adapted to the specific context and target group, they may be less applicable under different circumstances.

Increasing in intensity
Interventions that gradually increase in intensity have proven exceptionally effective for people who repeatedly do not respond to vaccination invitations. This intervention approach could start, for example, by sending a reminder, followed by a phone call and eventually a home visit. This combined intervention approach has proven cost-effective and ensures a more efficient approach to increase willingness to vaccinate and/or vaccination uptake in the target group[17].

Literature

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