behaviour of older adults regarding COVID-19 vaccination, and the impact of the COVID-pandemic on their perceptions on vaccination

Rijksinstituut voor Volksgezondheid
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*Ministerie van Volksgezondheid,
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Exploring the decision-making behaviour of older adults regarding COVID-19 vaccination, and the impact of the COVID-pandemic on their perceptions on vaccination.

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1. Background

On the 11th of March, 2020, COVID-19 was declared a pandemic by the WHO. Ten months later, in January 2021, there were almost 94 million confirmed cases of COVID-19 and more than 2 million deaths worldwide (World Health Organization, 2021). In the Netherlands, there were over 900.000 cases and almost 13.000 deaths (World Health Organization, 2021). Especially the elderly people are disproportionally affected by COVID-19. Since aging goes along with immunosenescence (the gradual deterioration of the immune system (Suchard, 2015)) and co-morbidities, elderly people are more susceptible to infectious diseases and experience more severe symptoms than younger adults. Through time, vaccination has proven to be a successful tool against infectious diseases by reducing hospitalisations, deaths, and chronic distress (Bonanni et al., 2018). Also for COVID-19, a vaccine is seen as the solution in combatting the virus. Therefore, several pharmaceutical companies around the world started with developing a vaccine. At the time this article has been written, three vaccines have been approved by the EMA for the European market and are being distributed among the different European countries. In the Netherlands, around 1.4 million vaccinations have been given by the beginning of March 2021 (Rijksoverheid, 2021).

For a vaccination program to work optimal, the acceptance of vaccines and therefore vaccination coverage is crucial. For influenza, this vaccination coverage in the Netherlands has been decreasing for several years; from around 70% in 2008, to 53% in 2019 (Heins, Hooiveld, & Korevaar, 2020). The most important reason for these people for not receiving the influenza vaccination is that they think the vaccine is not necessary or useful (Heins, Hooiveld, & Koorevaar, 2019). To address this challenge, the European VITAL project is launched (financed by the Innovative Medicine Initiative (IMI)), which aims to assess the burden of infectious diseases and mechanisms of immunosenescence, in order to provide evidence-based knowledge on vaccination strategies (VITAL, n.d.-a). One aim of this project is "to develop strategies to educate and train health care professionals and to promote awareness among stakeholders involved in elderly care management" (VITAL, n.d.-b). Following this aim, focus groups have been organized in order to explore, among other things, the perspectives of older adults towards and information needs regarding vaccination. These focus groups were performed before COVID-19 became a pandemic. In 2020, during the COVID-19 pandemic, we saw a much higher turnout for the influenza vaccination then the years before, indicated by the call to healthy people between the ages of 60 and 69, to postpone their vaccination because of a possible shortage. No research has been done yet on whether the COVID-19 pandemic may have had an influence on the willingness to get vaccinated for other infectious diseases, like influenza.

Also for COVID-19 the vaccination coverage will be crucial in order for the vaccination program to be effective. A research carried out in the Netherlands shows that the willingness to get vaccinated against COVID-19 increased over time, from 66% in November 2020, to 75% in January 2021 (Ipsos, 2021). This study listed several reasons for why the people do or do not want to receive a vaccine against COVID-19, but not much information is given why people come to certain positions. From research it is known that there are several factors that play a role in people's willingness to get vaccinated, like perceived susceptibility for the disease (Blank, Bonnelye, Ducastel, & Szucs, 2012; Determann et al., 2016; Determann et al., 2014; Eilers, Krabbe, & de Melker, 2014, 2015; Gaczkowska, Mertens, Reckendrees, Wortberg, & Pott, 2013; Pereira, Gilca, Waite, & Andrew, 2019; Williams et al., 2020), perceived severity of the disease (Determann et al., 2014; Eilers et al., 2014,

2015; Gaczkowska et al., 2013; MacDougall et al., 2015; Pereira et al., 2019; Williams et al., 2020), the perceived effectiveness of the vaccine (Blank et al., 2012; Determann et al., 2014; Eilers et al., 2014, 2015; Gaczkowska et al., 2013; MacDougall et al., 2015; Pereira et al., 2019), and many more. Yet, for COVID-19 specifically, little is known about the factors that play a role in the decision-making process for vaccinating against this virus.

Therefore, the aim of this study is to give a deeper understanding on the motives of people aged 50 years and older for whether or not to receive the COVID-19 vaccination and whether the COVID-pandemic has had an influence on the vaccine uptake for influenza. In addition, a comparison is made between COVID-19 and influenza in the factors that are important in the decision-making process regarding the vaccination for these two viruses.

2. Methods

This explorative study received approval from the Medical Research Ethics Committees United (MEC-U), reference number W20.274.

2.1 Recruitment and study population

For the recruitment of participants, six citizen panels from different cities within the Netherlands were contacted. Four of these panels were willing to cooperate. Two of them were located in the west, one in the east and one in the south of the Netherlands. Because all the participants from these panels lived in urban areas, the commercial agency CG Research was approached for the recruitment of participants for two more focus groups. A contract has been concluded with this agency in which it was agreed that they would recruit participants for two focus groups (in total 16 participants) who lived in rural areas. For one focus group, the additional requirement was set to recruit only people from the two northern provinces in order to improve the geographic distribution of the participants participating in the focus groups.
On behalf of the researchers, all members of the citizen panels aged 50 years and older, received the question whether they were interested in participating in the study. The people who indicated their interest, received an information letter by email, describing the background, aims, and the procedure of the study. If after reading this information letter, the people were still interested in participating, they had to sign in by replying on the email. Due to the high number of interested persons from the panels in the east and the south, for these people a draw had to take place. The people who were going to participate, received an informed consent and a short survey on their demographics, which had to be completed before the focus group took place.
The participants, of whom 20 were female and 30 male, were between 51 and 79 years of age. Twenty-eight of the participants had received the 2020 influenza vaccine and 12 received the pneumococcal vaccine (table 1). To ensure a geographical distribution among the participants, in total, eight focus groups were performed.

Table 1. The characteristics of the study population.

	Total (N= 51)	
	Range	**Mean**
Age (years)	51-79	63
Gender	**N (%)**	
Female	20 (39.2)	
Male	30 (59.8)	
Rather not say	1 (2.0)	
Level of education	**N (%)**	
Primary education	1 (2.0)	
Secondary education	8 (15.7)	
Secondary vocational education	8 (15.7)	
Higher professional education	16 (31.4)	
University	18 (35.3)	
Vaccination received:	**N (%)**	
Influenza 2020	28 (54.9)	
Pneumococcal disease	12 (23.5)	
Currently working (N)	26 (51%)	
Proportion living in city: living in village	37:14	

2.2 Focus groups

The first seven focus groups were performed between the 26th of November and the 10th of December and the last one in January 2021. The focus groups were done online, using the program GoToMeeting. On forehand the participants received the link to the meeting. All focus groups had the same moderator, accompanied by an assistant. The meetings lasted for around two hours, with a break of ten minutes in between. The sessions were guided using a semi-structured interview guide (see appendix 1). This interview guide was based on the Integrated Change model (De Vries, Mesters, Van de Steeg, & Honing, 2005) and outcomes of an additional literature search on important topics that play a role in people's decision-making behaviour regarding vaccination, like trust, perceived susceptibility, and perceived severity. Each meeting started with a short introduction round and a repeat of the aim of the study. Subsequently, questions were asked about the participant's thoughts on the disease and the vaccine against COVID-19, influenza and pneumococci. Thereafter, questions were asked about people's thoughts on vaccination in general and on important conditions that play a role in their process of decision-making regarding vaccination. The last topic entailed questions about the trust the participants had in the authorities which are involved in developing and carrying out policy concerning vaccination. All focus groups were recorded, both audio and video.

2.3 Analysis

The recordings were transcribed verbatim. Because the participants were unfamiliar with the pneumococcal bacteria and vaccine, this topic was excluded from the analyses. Thematic analysis was applied on the transcripts with the software program MAXQDA. The first round of open coding consisted of labelling pieces of the text with concepts derived from the text (inductively). First, two transcripts were coded this way by two researchers (ARP and RE), independently. The codes and labelling criteria were discussed and refined until consensus was reached. Because coding schemes were quite identical, consensus was easily reached. Thereafter, the other six transcripts were coded as well. In the second round of coding, axial coding was performed. Codes that were similar were merged and subthemes were categorized under main themes that covered the context of the subthemes. The third round of coding existed of selective coding. In this final round interdependencies between codes were investigated. This meant that the categorization of themes with their subthemes were changed at some points in order to get a more clear view on the most important themes that are related to the research questions.

3. Results

The general views on vaccination and the factors that influence the decision-making process on whether to receive vaccination for COVID-19 and influenza are described below. There are four main themes: general views, factors that influence the decision on whether to receive vaccination against COVID-19, factors that influence the decision on whether to get vaccinated against influenza, and conditions (Figure 1). With conditions is meant the prerequisites that are needed to make a decision to receive vaccination or not. The themes are divided in different factors and are illustrated by using quotes from the focus groups. First the theme of vaccination in general will be discussed. Subsequently, the factors will be discussed which are important in the decision-making process regarding the COVID-19 vaccination. Additionally, the main factors in the decision-making process regarding the influenza vaccination will be discussed. The three themes 'general views', 'COVID-19', and 'influenza' have overlap in the factors that will be discussed. However, these factors are specified for each theme specifically, because the participants perceived them differently for the different themes.

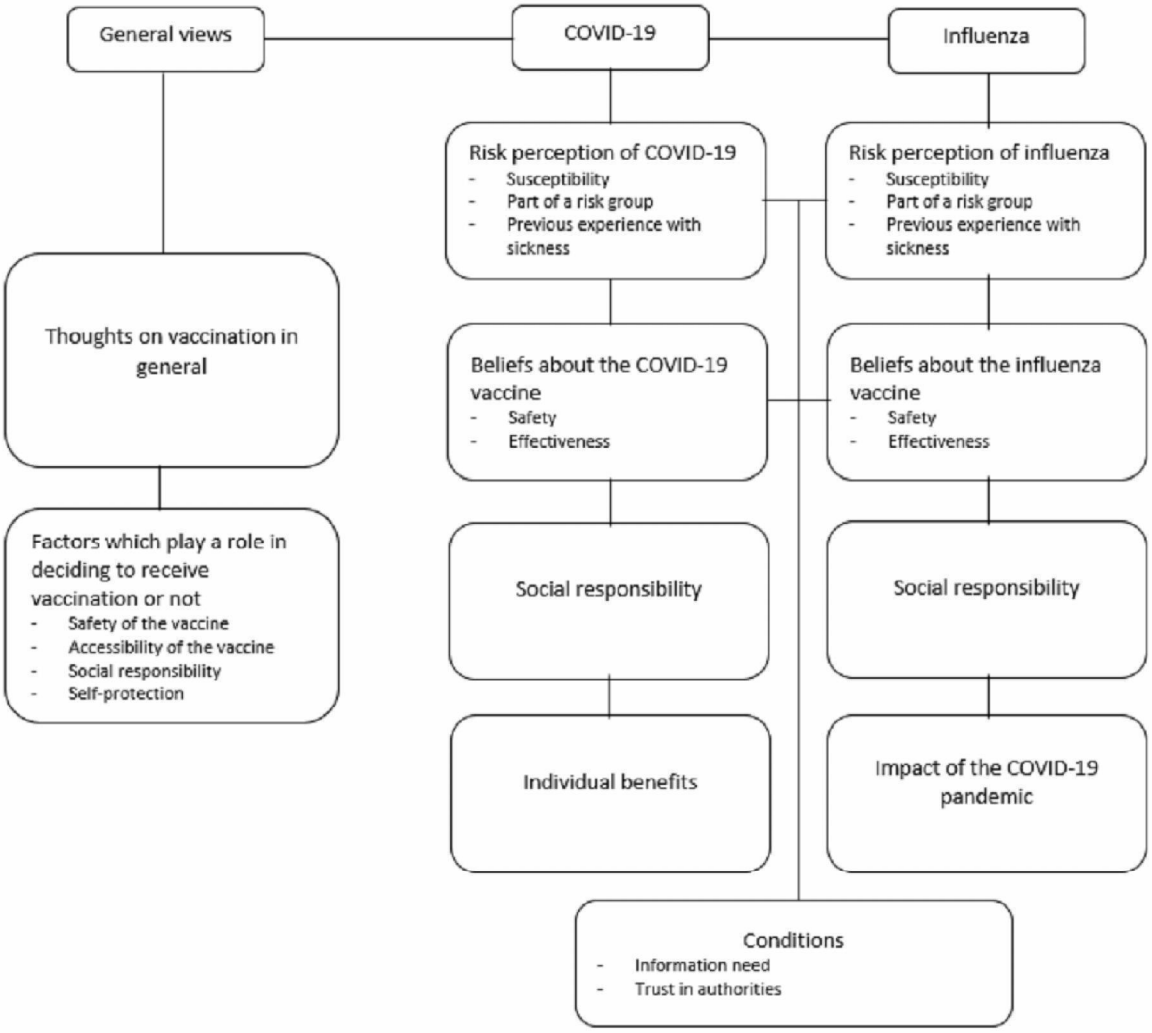

Figure 1. An overview of the themes and factors retrieved during the focus groups.

A. General views

A.1 Thoughts on vaccines in general

In general, the participants thought of vaccines in a positive way. They found vaccination to be an acquired good from the modern times and the prove of progress that is being made in science. Vaccines are said to offer protection and have prevented our society from a lot of misery. One participant phrased it as follows:

"I think vaccination is one of the most important achievements of our modern science. In any case, we have been able to ensure that many infectious diseases that threaten us, as a population of the world, are excluded or at least counteracted as much as possible. And yes, I think a lot of people owe their lives to this". (focus group 1, male, living in a city)

For several participants, vaccination was seen as self-evident and they associated the word 'vaccination' with the vaccines received during their childhood and with travel vaccinations. In general vaccines were seen as useful. However, some participants doubted the necessity of vaccination, because they think that the less body-foreign substances you inject, the better. Some also made clear that receiving a vaccine is not a decision you take from one moment to the next. It is something to be thought about and it should not become an end in itself.

A.2 General factors in decision-making process for vaccination
When making a decision on whether to receive a vaccine for an infectious disease, the participants mentioned multiple factors that are important for them in making their decision. In the next section the most important factors are discussed.

A.2.1 Safety vaccine One of the most important factors for the participants in making a choice to get a certain vaccine or not, is the safety of the vaccine. Short-term side-effects, like feeling sick for two days, were seen as acceptable, but the possibility of longer-term side-effects decreases the willingness to get vaccinated. One woman said the following: *"Possible side effects are always very important to me. And not a side effect that you feel sick for a day or two, but if there could really be a long-term side effect, the risk for that, then immediately the attractiveness of the vaccination is much less."* (focus group 2, male, living in a city)

A.2.2 Accessibility The participants mentioned some practical factors that play a role in their decision to receive a vaccine or not. These are for example the costs of a vaccine. Participants said that if they had to pay for a vaccine, they are less likely to get the vaccine. Besides costs, also the infrastructure plays a role. It was mentioned that long travel distances for getting a vaccine are unpractical, because not everyone owns a car

A.2.3 Social responsibility For some participants, protecting others was a very important reason for getting vaccinated. One person even said that vaccination is a responsibility you have to others. Another person called vaccination a 'common duty' and was disturbed by people who thought otherwise: "*I am really annoyed by the free-rider behaviour. That you don't think from the perspective of the group interest, but being so individualistic, that annoys me a lot*." (focus group 1, male, living in a city)

A.2.4 Self-protection There were also participants who never thought of vaccination in the light of ; protecting others'. Several people indicated that the reason for vaccinating is to protect themselves from certain infectious diseases. Some also say that by protecting themselves, they hope they will not endanger other persons as well, but is emphasized multiple times that vaccination is in the first place meant to protect themselves. One person said: *"I vaccinate for myself and everyone can benefit from my decision. But it's not like I'm vaccinating for someone else. How can I be good for someone else, if I am not good for myself? I really go for myself first and the rest can benefit."* (focus group 8, female, living in a city)

B. Factors that influence the decision on whether to get vaccinated against COVID-19
During the focus groups, several factors came up that were important for the participants to take into account when deciding on vaccination against COVID-19. The following section discusses these factors.

B.1 Risk perception of COVID-19
When determining the risk of COVID-19, the participants had different reasons for if they were at risk or not and whether it was a reason for them to receive a vaccine. The most important reasons are outlined in this section.

B.1.1 Susceptibility The first aspect that was discussed by many participants in determining the risk of COVID-19, was perceived susceptibility. This factor was mostly not directly mentioned as a reason for getting vaccinated, but was for many a topic of concern and ambiguity. Most of the people thought they were (very) susceptible for COVID-19. Many said that every person is susceptible for COVID-19. People felt susceptible because of different reasons. For example, taking care of

vulnerable people, working outside of the home, or children who go to school and may be exposed to the virus there and then take it back home. At the same time participants mentioned they felt invulnerable for COVID-19, because they had the feeling it will not happen to them, for example because they are living a healthy lifestyle or are being careful outside of the house. Most of the time these participants were fast with saying that it was probably not right to think this way, but still they thought COVID-19 would not hit them that hard. One participant described it the following way: *"I feel like I am invulnerable, but of course that is not the case at all. But I am fairly careful on the street and in the shops. I work from home as much as possible. But I also sometimes have the feeling that I am a little invulnerable. That it won't happen to me."* (focus group 4, male, living in a city)
A lot of participants mentioned the arbitrariness of COVID-19. Many thought that the disease is highly unpredictable and there is no clear risk group. Most of the participants did what they could to avoid being infected, but indicated that an infection could still happen. You cannot be blamed for a COVID-19 infection.

B.1.2 Part of a risk group There were several people in the focus groups who perceived the risk of COVID-19 very high, because they were part of one of the risk groups for COVID-19. These persons were for example suffering from asthma, hart disease, or a deteriorated immune system or were part of the risk group based on their age. Some people mentioned that they probably will not survive a COVID-19 infection and therefore wanted to get vaccinated very badly. One man put it as this: *"Well, I think if I get COVID, then I won't survive. I think it's that serious. And I also keep to all agreements that have been made and I do not leave my house. I am not going to see my grandchildren, so I am very anxious. And I also hope that the vaccination will come very soon, because I'm at the front of the line to get it."* (focus group 3, male, living in rural area)

B1.3 Previous disease experience Some participants of the focus groups had been infected with COVID-19. These people all wanted to get vaccinated against COVID-19. One lady phrased it as follows: *"Well, I've had it myself. At the very beginning from mid-March I had Corona for a few weeks. And I've been really, really sick and I still have shortness of breath and a few other minor complaints, but it will go away some time. But I'll go first, (...) when it's my turn after a while, I won't say no [to a COVID-vaccination]. I don't want to get that disease again. I thought it was really bad."* (focus group 7, female, living in rural area)
There were also participants who had persons in their surroundings who suffered from COVID-19. For some this was a reason for wanting the vaccine. Some people had friends or family who became very sick from the disease and had/have a long period of revalidation afterwards, some participants lost people in their surrounding because of COVID-19. Other participants had people in their surrounding who have had an infection, but only had mild symptoms. Because of these experiences they are doubting the severity of COVID-19.

B.2 Beliefs about the COVID-19 vaccine
The two most important factors for the participants concerning the COVID-19 vaccine are safety and effectiveness. These two factors will be discussed below

B.2.2 Safety One of the most discussed topics concerning the COVID-19 vaccine was the safety of it. Opinions on this matter differed. Multiple participants thought the COVID-vaccine is safe, because all the available money and people are put into developing these vaccines and they trust on the fact that all normal procedures have been followed. Additionally, participants believed in the safety of these vaccines, because there was already prior knowledge on corona-viruses, because of the SARS- and MERS-outbreaks. The vaccine is therefore not totally new: *"And the vaccine, well bring it on, because as I recently read or saw that, one of you also said that, of course it's not a vaccine which is coming out of the blue. They are all sequels to pre-existing vaccines. So I am confident that they will work."* (focus group 4, female, living in a city)

Participants also believed in the safety of the vaccines, because they said the vaccines will not be on the market when they are not safe to use, because this will have consequences for the pharmaceutical companies as well.
On the contrary, there were also participants who doubted the safety of the COVID-19 vaccines. Several participants indicated that they would like to wait with receiving the COVID-vaccine. The most frequently mentioned reasons for doubting the vaccine's safety were the possible long-term side-effects of the vaccine, not wanting to be a guinea pig for this vaccination campaign, and the fast development of the vaccines. Some participants even called it a rat-race between the pharmaceuticals on who was going to be the first with a vaccine on the market. According to the participants, this race would not benefit the safety of the vaccines. There were also doubts on the new technologies that have been used in developing the vaccines using RNA. Because it is a new technology, it is not sure what will happen on the longer term. Some preferred the more traditional technologies for vaccine making.
Some participants indicated that, although they perceived some risks in getting vaccinated, they still wanted to get the vaccine against COVID-19. The reason for this was that they perceived the consequences of a COVID-19 infection worse, than possibly experiencing side-effects from the vaccine. However, others were more hesitant because of the possible side-effects. One lady, who is part of the risk group because of suffering from asthma, wanted to get the vaccine against COVID-19, but so far does not dare to take it, because for her a lot is unclear about the safety of the vaccine. For her the possible side-effects outweigh the risk of getting infected with COVID-19. She said: *"I would really like to get vaccinated, but I just run into things that I find frightening in terms of consequences as an asthma patient. (...) I am afraid of the consequences [of the COVID-vaccination]. (...) Once I have the information I'm looking for, I'll be the first to queue. I definitely want to get vaccinated when I know what I'm doing and what I'm getting into."* (focus group 8, female, living in a city)

B.2.1 Effectiveness Most of the participants thought that COVID-19 will never be eradicated, even with a vaccine. However, many thought that the vaccine will help in getting COVID-19 under control and that it will be effective in reducing the severity of COVID-19 after infection. Many drew a parallel with the influenza-vaccination that also does not eradicate the influenza-virus, but makes the symptoms less worse. One person said the following: *"Actually, I kind of think, I kind of hope just like with the flu shot, that in many cases it occurs and that you may still sometimes become ill, but less so. I hope so, I don't know. That's my hope, but I don't expect it 100% to make sure you never get sick, never get COVID, I don't think so."* (focus group 2, male, living in a city)
An effectiveness of 90% for the COVID-19 vaccines was perceived as high by several participants. However, there were also doubts on the effectiveness of the vaccine. For example, participants mentioned the fact that a virus can mutate and then the vaccine might not work anymore. Besides that, participants stressed the fact that it is not known for how long after vaccination you are protected and if you are still contagious after getting vaccinated.
Multiple participants also emphasized the importance of a high vaccination coverage. They said that the vaccination program will only be successful when the vaccination coverage is high enough. Only with a high vaccination coverage the amount of COVID-19 infections will decrease and some freedoms can be regained. A man said the following about this: *"But overall, look I'm not an epidemiologist, but I do think that with any vaccination program, the success depends on vaccination coverage. And yes, then you have to reach a reasonable number to see a clear effect."* (focus group 1, male, living in a city)

B.3 Social responsibility
An important reason why the participants wanted to get vaccinated against COVID-19 was protecting others; family, friends, colleagues. Many people indicated that they fear the possibility of infecting others while not knowing it. Some people see it as a responsibility they have to others to get vaccinated against COVID-19. As one participant mentioned: *"And what strikes me with this*

disease is that enormous uncertainty; it can take fourteen days or ten days before it turns out that you have it and then you've already passed it on to others. That does give some sort of responsibility. Well, which leads to me, if you have the option to vaccinate on a large scale, I would." (focus group 2, male, living in a city)
One participant indicated that only since the COVID-19 pandemic her perspective towards vaccination changed. Before, she has never seen vaccination as a 'social act'. However, the COVID-19 pandemic made her aware of the fact that she can contribute to diminishing the transmission of the virus by getting vaccinated.

B.4 Individual benefits
Another important reason for people to get vaccinated against COVID-19 are individual benefits. The most frequently mentioned reasons are regaining some freedom, self-protection, and the restart of people's social life. Several participants have the belief that after vaccination they will regain some freedoms like travelling, going out for a dinner or visiting a museum. Additionally, the participants want to take the vaccine to protect themselves against COVID-19 and thereby also decreasing the chance of spreading the virus. For many participants also the contact with family and friends is a reason for them to get vaccinated. One man said: *"Since March, I cannot cuddle my grandchildren or whatever, so in that respect, I'm at a loss about that. So if a vaccination comes up, I'll be right there."* (focus group 8, male, living in a city)

C. Factors that influence the decision on whether to get vaccinated against influenza
During the focus groups, several factors came up that were important for the participants to take into account when deciding on vaccination against influenza. The following section discusses these factors.

C.1 Risk perception of influenza
For determining the risk of influenza, three factors came up; susceptibility, previous experience with sickness, and contagiousness. These three factors are discussed in the following section.

C.1.1 Susceptibility Not many people felt susceptible for influenza, mostly because they have (almost) never experienced the flu. Because of this, the participants perceive the vaccine as not useful. One person indicated he does feel susceptible and therefore accepts the influenza-vaccine each year. Several participants expressed that they felt less susceptible for influenza this year, because of the restrictions due to COVID-19. Many participants argued that these restrictions help in decreasing the burden of influenza as well: *"I am much less prone to the flu this year than other years, because I hardly meet any people. So there are actually no situations. I no longer travel with public transport. All those things make me think that I hope I won't get in touch with it this year."* (focus group 2, female, living in a city)

C.1.2 Part of a risk group
The most frequently mentioned reason for receiving the influenza vaccine is for self-protection. Especially for the participants who suffered from underlying conditions like asthma or a deteriorated immune system or participants who were part of the risk group based on their age, this was the main reason for them to receive the influenza vaccine.

C.1.3 Previous disease experience From the people who did experience an influenza infection, several perceived influenza as a severe disease. These experiences were also the reason for some people to get vaccinated against influenza: *"I have had a severe flu about four times in my life, and with severe, I really mean that I was so sick that at one point I only had tunnel vision and with a fever of 40/41 was almost blind during that infection. (...) So from the moment I was able to get that flu shot, I did it and never had it again. So I've become religious about that, haha. Give me that flu shot!"* (focus group 4, male, living in a city)

Other people indicated that they did not find influenza that severe, because they only experienced mild symptoms or only have it once in a couple of years. One person said that it is not worth to perform 'all kind of breakneck tricks' for the prevention of a disease that only occurs once in the 20 years.

C.2 Beliefs about the influenza vaccine

Also for the influenza-vaccine, the two most frequently discussed factors are safety and effectiveness. These two factors will be discussed below

C.2.1 Safety In contrast to the COVID-19 vaccine there are less doubts in the safety of the influenza-vaccine. Most of the participants described the influenza-vaccine as safe, because it is established in the vaccination program for years already and the participants do not experience many side-effects: *"I have had type 1 diabetes since I was 31. I've been given the flu vaccine for 20 years. So from personal experience, I never had any problems with it. So from personal experience I can only say that I think it is a very safe vaccine."* (focus group 1, male, living in a city)

Only a couple of participants indicated they fear possible side-effects from the vaccine, because of own experience or because their parents experienced side-effects. For these participants this is a reason not to accept the vaccine.

C.2.1 Effectiveness Most of the participants doubted the effectiveness of the influenza vaccine because of the gamble participants perceive in which influenza type will be dominant. A consequence of this is, that there is a chance you are not protected against the influenza type that is wandering around: *"I think it is generally known that the effectiveness of the flu vaccine is far from 100%. Especially because they simply do not know which flu is circulating at what time. So research is being done every year and there is a gamble on this and this and that will be it this year."* (focus group 8, male, living in a city)

Some people, however, emphasize that, although the vaccine might not work 100%, the vaccine is still effective in reducing the severity of the disease: *"It is known that it does not always prevent you from getting the flu. But usually when you have been vaccinated, it will be less bad, say, becomes less severe." (focus group 2, female, living in a city)*

In general, the influenza-vaccine is perceived as less effective than the COVID-19 vaccine.

C.3 Social responsibility

Another reason that was mentioned often for receiving the influenza vaccination, was to protect others. Just like for COVID-19, participants saw a high vaccination coverage as an important factor of the vaccination program. Besides that, participants indicated they took care of for example their parents and do not want to infect them: *"I have parents-in-law who are already in their late 90's, early 90's, they are also vulnerable, you don't want to infect them either."* (focus group 7, male, living in rural area)

C.4 Impact of COVID-19 pandemic on willingness to get vaccinated for influenza

During the focus groups the participants were asked whether the COVID-19 pandemic had any influence on their willingness to get vaccinated for other infectious diseases than COVID-19. Almost all participants related this question to the vaccination for influenza. Several people, who before (almost) never took the influenza-vaccine, now did receive the injection. The reason that was given most often, was that the people did not want to have COVID-19 and influenza at the same time, expecting that that would be a bad scenario: *"Until now, I always thought well, the flu, then I will get the flu. I never have the flu, what does that once in a few years matter? And now I thought well, I should not get the flu and then COVID, because then you could be a lot worse off."* (focus group 8, female, living in a city)

Other reasons for why the COVID-19 pandemic had influence on the people's willingness to get vaccinated for influenza were related to the previous reason, namely because people thought the

influenza-vaccination would increase their resistance and it might help in the defense against COVID-19. There were also people who followed the advice of their doctor to get the influenza-vaccine this year, so in case the person would get ill, the doctor could rule out more easier that it is influenza. Another reason for taking the influenza-vaccine this year was to not put more pressure on the care than already is. There was one person who mentioned that, although he received the influenza-vaccine this year (in contrast to previous years), he was not sure if he would get it again next year. This year he felt the urgency to take the influenza-vaccine to make him less susceptible 'for whatever', but in general he thinks that the less body-foreign substances you bring into your body, the better it is.
There were also people who, unlike previous years, wanted to get the influenza-vaccine, but eventually did not get it, because there was a shortage in vaccines and they were asked to postpone their vaccination.

Other people expressed that the COVID-19 pandemic did not have influence on their willingness to receive an influenza vaccination. This could be because they already received the influenza vaccination on a yearly basis, and this year was no different. Another reason for why the COVID-19 pandemic had no influence was that the participants did not think that is was necessary for them to get vaccinated against influenza. The COVID-19 pandemic did not change this belief: *"For those twice in the 56 years that I have had the flu, I do not think it is necessary to get vaccinated every year. I think that it is a waste of the work and the energy and money that it ultimately costs. So no, nothing will change."* (focus group 3, female, living in rural area)

D. Conditions
For whether to receive vaccination, people mentioned some conditions that were important in their decision-making process. Especially for the COVID-19 vaccination, there was a need for more information among the participants.

D.1 Information need
So far, the information provided about COVID-19 is, in general, perceived as not good by the participants from the focus groups. The information is perceived as insufficient and some other time as too much with too many people giving their opinion.

D.1.1 Content of the information The participants mentioned specific information they want to know about the COVID-19 vaccination while deciding about accepting the vaccination. The most important ones are the possible side-effects of the vaccine and which vaccine he or she will get and why. Additionally, there should be practical information provided on where to be for the vaccination, at what time, if there is waiting time, etc. Subsequently, people want to know how long the vaccine is effective, from which point onwards it is effective, and if there are differences in effectiveness per target group. Moreover, the participants want to know how it is possible the vaccine is being developed this fast.

D.1.2 Provider of the information For most of the participants, the general practitioner (GP) is the person from who they would like to receive the information on the COVID-vaccination. Additionally, also the RIVM and the government were mentioned often as parties from which the participants want to receive the information.

D.1.3 Channel Participants indicated they want to receive the information preferably by television. The second most frequently mentioned channel was social media. Additionally, while some participants argued that the use of different channels would be better *"I think that this information provision should not only be traditional, so via brochures, but also much more, yes, such as with those influencers, so just a broad spectrum."* (focus group 1, male, living in a city)

others were more in favor of using only one channel: *"I am actually in favor of unambiguous communication. That it comes from one [channel], just to get very little interference. And, that doesn't mean that you can't pick it up later and make it more popular, but I still think that the raw message, you know, this is in it and we are going to do that, that that just comes in through one channel."* (focus group 1, male, living in a city)

D.1.4 Format The most frequently mentioned need for the format of the information, is that the use of language should be understandable: *"But indeed, everyone should be able to understand. I mean, there are apparently, people sometimes joke that we have 17 million virologists in the Netherlands. This is of course not true. I mean, most people are not HBO or academically trained, so they have a lot more trouble understanding things. So yes, that really has to be in understandable language and with pictures, and I don't care what all."* (focus group 6, male, living in a city)
Additionally, the message should be short and clear, and it should be uniform across the different channels.

D.2 Trust in the authorities
During the focus groups the participants were asked whether or not they trusted the authorities which are involved in the development and implementation of the vaccination program regarding COVID-19. The four main authorities which were discussed, were the GP, the RIVM, the government, and the GGD (municipal health services).
Concerning the GP, there were no doubts among the participants in the amount of trust. All participants trusted their GP. Also the RIVM was in general perceived as trustworthy. However, some participants indicated that their amount of trust had decreased during the COVID-19 pandemic, because of mistakes that were made by the RIVM. About the government, the opinions were more divided. Several participants said the government gained their respect for handling this completely new situation: *"And I think it is very well done, yes, how they [the government] have tackled it and how they have given all the advice and arranged everything to the best of their ability."* (focus group 8, female, living in a city).
There were, however, also participants who had a decreased trust in the government because of the way they are approaching this pandemic. Some of these participants also mentioned the 'double agendas' and conflicting interests that play a role in the decisions that are made. Concerning the GGD, the participants had in general a decreased trust. This had to do with the problems the GGDs had in scaling up the test capacity and the contact tracing.
When the participants were asked whether their decreased trust in the RIVM, government, or GGD had any influence on their willingness to receive a COVID-19 vaccination, everyone said it had no influence. The participants perceived this a two separate things; a decreased trust in the authority did not mean a loss in trust in the vaccine.

4. Discussion

This research has identified themes that are important in the decision-making process of older adults on vaccination in general and for COVID-19 and influenza specific. For vaccination in general the main themes were the safety of the vaccine, accessibility, social responsibility, and self-protection. The overlapping themes identified for deciding on the COVID-19 vaccination and influenza vaccination are the risk perception of the disease, the beliefs about the vaccines, and social responsibility. For COVID-19, 'individual benefits' were a main theme as well, while for influenza the 'impact of the COVID-19 pandemic' was identified as one of the main themes.
Although most of the main themes for deciding on receiving vaccination for COVID-19 and influenza are the same, there were differences in which are the most important factors.

The first difference was that when asking about reasons for getting vaccinated against COVID-19, most often social responsibility came up, while for influenza it was mostly self-protection. Only after asking if social responsibility had a role in deciding on the influenza vaccine as well, they answered affirmative. A possible reason for this is the difference in perceived risk of the diseases. COVID-19 was in general perceived to be more severe and contagious. Participants talked about the fear of unknowingly infecting (vulnerable) others and the guilt they would feel if they would. Vaccination against COVID-19 could prevent this from happening. For influenza the fear for the disease and infecting others was perceived less and therefore the protection of others could be perceived as a less important reason for vaccination. The importance of the social aspect in receiving a vaccination against COVID-19 is also underlined in the study of Williams et al. (2020). In this research people above 65, or people aged between 18 and 65 with a chronic respiratory disease, were included and

had to complete a questionnaire on their perception of COVID-19 and their willingness to accept a COVID-19 vaccination. The study concluded that, among other things, achieving herd immunity and protecting the health of others are facilitating factors in accepting the COVID-19 vaccination. The COVID-19 vaccination was seen as a civic duty. Also other studies on vaccination in general showed that social responsibility is a reason for people to receive a vaccination (Determann et al., 2016; Eilers et al., 2015; MacDougall et al., 2015). Another reason for why the protection of others was mentioned often as a reason to receive the COVID-19 vaccination and less often for the influenza vaccination, could be the difference in the way the two vaccines are being announced. During press conferences from the prime minister and radio and TV commercials about the COVID-19 vaccination, it has been emphasized that vaccination is a social act with which you protect not only yourself, but especially the people around you. Since the participants from the focus groups made clear that they like to receive information about the vaccination via television, it could be that they have been influenced by these messages on TV. In the case of the influenza vaccine, these kind of messages are not spread that widely. Most of the participants who were vaccinated against influenza received an invitation for this vaccination based on their age or underlying illnesses and receive their vaccination from their GP. A consequence of this might be, that one of the first reasons that come to mind for getting the influenza vaccination is self-protection, based on their vulnerability.

Another difference that clearly stands out is the beliefs the participants had about the vaccines. While for COVID-19 the safety of the vaccine was questioned by several participants, for influenza this was not considered as a problem. Reasons for the doubts in safety of the COVID-19 vaccine were the fast development of the vaccine, possible long-term side-effects, and the new technologies that are being used for developing the vaccines. In other studies performed on the willingness to get vaccinated against COVID-19, these factors were main concerns as well (Fisher et al., 2020; Neumann-Böhme et al., 2020; Reiter, Pennell, & Katz, 2020; Wang et al., 2020; Williams et al., 2020). Following on these safety concerns, there was a need for information about the COVID-19 vaccine on side-effects, how it could be developed this fast, and how the vaccine works. Several other studies showed these concerns as well and advised that, to increase the willingness of people to get vaccinated against COVID-19, clear, honest and tailored information should be provided to the people (Fisher et al., 2020; Neumann-Böhme et al., 2020; Trogen, Oshinsky, & Caplan, 2020; Wang et al., 2020). Our study shows that in this regard, it should be emphasized that the GP should be the person to provide this information, because he or she is the most trusted authority in the field. Another interesting finding is the impact that the COVID-19 pandemic had on the increased willingness to get vaccinated against influenza. Reasons for this were: wanting to diminish the chance of suffering from COVID-19 and influenza at the same time, the belief that the influenza vaccine might boost their immune system against COVID-19 as well, doctor's advice, or wanting to prevent extra pressure on the healthcare services. It is the question whether this change will be structural. The Integrated Change model (De Vries et al., 2005), which explains motivational and behavioural change, shows that there are numerous factors involved in how people come to certain behaviour. Therefore, it goes beyond the scope of this study to make predictions on the uptake of the influenza vaccine next year.

Our data indicated a decreased trust of some participants in the authorities that are involved in developing and carrying out the vaccination strategy. The results showed, however, that this decreased trust had no influence on their willingness to get vaccinated against COVID-19. This is in contrast with other studies that state that trust has influence on people's willingness to get vaccinated (Determann et al., 2016; MacDougall et al., 2015). An explanation for this could be that these studies were not performed during an ongoing pandemic, while this study is. It could be that during the urgent situation of a pandemic, trust is seen as a less important factor in deciding on whether to receive a vaccine or not. Additionally, in the study of Determann et al. (2016), three countries were compared with each other (Sweden, Poland, and the Netherlands) on their opinion on and attitude towards future pandemics and vaccination. In Sweden and Poland trust played a role

in people's attitude towards vaccination. For the Netherlands these results were, however, not found. Another study performed in the Netherlands by Eilers et al. (2015) on motives of older adults to accept vaccination, showed as well that trust was not a key theme in people's decision-making process regarding vaccination. Participants of this study told that they believed that the government would not offer a vaccination if it would not do any good. The results of our study showed the same beliefs. It might therefore be concluded that in the Netherlands, trust in the authorities does not play a key role in people's willingness to receive a vaccination.

4.1 Strengths and limitations

A strength of this study is that this study was performed during the COVID-pandemic as vaccination programs were developed. Our focus group study therefore offers relevant information on this issue.

There are also a few limitations to this study. With recruiting the participants, emphasis was put on getting an as mixed group as possible, by taking into account the geographical distribution and including people from both urban and rural areas. By using citizen panels, we hoped to get a representative group of participants. However, from the demographic data collected upfront of the focus groups, it shows that highly educated people were overrepresented in the focus groups and that the proportion of participants living in an urban or rural area was not balanced.

Furthermore, we tried to perform all the focus groups in a short period of time, so participants had in potential the same background information. Around the time the focus groups were performed (November 26th – December 10th), information on COVID-19 and COVID-19 vaccination changed fast. Due to incurred delay, the last focus group was performed in January, after the first injections of the COVID-19 vaccine had been given in the Netherlands. From the analyses of this eighth focus groups, however, the same themes were identified compared to the other seven focus groups.

5. Conclusion

This study showed that for COVID-19 the most important themes that play a role in the decision-making process regarding whether or not to receive vaccination are the risk perception of COVID-19, the beliefs about the COVID-19 vaccine, social responsibility, and individual benefits. Some of these themes differed from the themes that were most important for receiving vaccination against influenza. In general, COVID-19 was perceived as a more severe and contagious disease than influenza. Additionally, for COVID-19, social responsibility was seen as the most important reason for receiving vaccination, while for influenza this was self-protection. Moreover, the vaccine against COVID-19 was believed to be effective, but there were doubts about its safety. For influenza it was the other way around; in general, there were no doubts about the safety of the vaccine, but the effectiveness was questioned.

For several participants the COVID-19 pandemic was a reason to receive vaccination against influenza. Reasons that were given were to avoid the risk of an infection of both COVID-19 and influenza at the same time or the belief the influenza vaccine might boost the immune system against COVID-19 as well. More quantitative research should be done on the scope of the influence of the COVID-19 pandemic on the uptake of the influenza vaccine and the question if the possible change will be structural or not.

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Appendix

Appendix 1

Semi-structured interview guide used during the focus groups.

Introductievragen (1 vraag kiezen)

- Wat is het eerste wat in jullie opkomt bij het woord 'vaccinatie'?
- Weet je wat vaccinaties zijn?
- Weet je hoe vaccinaties werken?
- Weet u nog wat het laatste vaccin is wat u heeft ontvangen? Kun je die benoemen?

Key questions

AWARENESS / MOTIVATION / INTENTION

De afgelopen maanden heeft COVID-19 een grote rol gespeelt in ons leven en is er vanaf het begin af aan ook gesproken over een mogelijk vaccin tegen COVID-19.

COVID-19

- Heb je gehoord over het COVID-19 vaccin wat in ontwikkeling is? Wat heb je er van gehoord?
- Voel je jezelf vatbaar voor COVID-19? Waarom wel / waarom niet?
- Vind je COVID-19 een ernstige ziekte?
- Als je besmet zou raken met COVID-19, hoe waarschijnlijk acht je de kans dat je het virus overdraagt op andere mensen zoals je familie en vrienden?
- Hoe denk je over de veiligheid van het mogelijke vaccin tegen COVID-19?
- Hoe denk je over de effectiviteit van het vaccin tegen COVID-19?
- Ben jij, of je naasten, besmet geweest met COVID-19, voor zover je weet? Heeft deze ervaring je ideeën veranderd ten aanzien van COVID-19 of het COVID-19 vaccin?
- Zou je overwegen om het COVID-19 vaccin te accepteren wanneer het beschikbaar komt?
    - Zo ja, om welke redenen? (bijv. om te voorkomen dat je anderen besmet?)
    - Zo nee, om welke redenen?
    - *Als men het niet weet:* wat heb je nodig om deze beslissing te maken?
- Zijn er bepaalde voorwaarden waaraan voldaan moet worden voordat je een vaccinatie accepteert?
- Het vaccin tegen COVID-19 zal waarschijnlijk in fases worden ingevoerd, omdat er nooit gelijk genoeg vaccins zijn voor iedereen. Als jij in de eerste groep zou zitten die het vaccin kunnen ontvangen, zou je je dan laten vaccineren?
  En als je zou moeten wachten om je te kunnen laten vaccineren, wat zou dit betekenen voor jouw bereidwilligheid om je te laten vaccineren tegen COVID-19?
- Denk je dat we met een eventueel COVID-19 vaccin het virus onder controle krijgen?
- Hoe makkelijk of moeilijk denk je dat het wordt om gevaccineerd te worden tegen COVID-19, zodra er een vaccin op de markt komt?
- Maakt het voor jou uit door wie je gevaccineerd wordt (je huisarts, de GGD, anders)?
- Heeft het beschikking hebben over medicijnen tegen COVID-19, invloed op uw bereidheid om een eventueel vaccin tegen COVID-19 te accepteren? (*Wanneer nodig uitleggen wat het verschil is tussen een medicijn en het vaccin.*)
- Voor het verstrekken van informatie over het nieuwe COVID-vaccin, van wie vinden jullie dat deze informatie moet komen? En op welke manier willen jullie deze informatie ontvangen? En wat moet er dan in staan?
- Denk je dat de aandacht die er nu is voor het COVID-19 vaccin je bereidheid heeft beïnvloed voor het vaccineren tegen andere infectieziektes waarvan al langer vaccins bestaan (zoals bijvoorbeeld voor de griepprik)?

Momenteel zijn het griepvaccin en het pneumokokkenvaccin onderdeel van het vaccinatieprogramma in Nederland.

Influenza:

- Heb je dit jaar een uitnodiging ontvangen voor de griepvaccinatie?
    - Zo ja, heb je je laten vaccineren? Waarom wel/ waarom niet? BESPREKEN MET DE HELE GROEP, NIET INDIVIDUEEL
      (*Mogelijk hebben mensen een bericht ontvangen van hun huisarts dat ze de griepprik niet moeten komen halen, vanwege een tekort aan het vaccin door hogere opkomst.*)

- Zo niet, heb je zelf contact opgenomen om alsnog een griepprik te ontvangen? Waarom wel/ waarom niet?

Als die nog gehaald moet worden:

- Heb je de intentie om de griepprik te gaan halen?
  - Waarom wel / Waarom niet?
  - *Wanneer iemand het nog niet weet*: wat heb je nodig om deze beslissing te maken?

- Heb je de griepprik al vaker ontvangen?
  - Zo niet, wat is de reden dat je hem nu wel hebt ontvangen? (heeft de COVID-19 pandemie invloed hierop gehad?)
- Hoe makkelijk of moeilijk is het voor jou om een griepvaccin te ontvangen?
- Voel je jezelf vatbaar voor het krijgen van de griep? Waarom wel / waarom niet? BESPREKEN MET HELE GROEP, NIET INDIVIDUEEL.
  - Heeft de uitbraak van COVID-19 invloed gehad op je gedachten omtrent je vatbaarheid voor een andere infectieziekte, zoals de griep?
- Vind je de griep een ernstige ziekte voor jou persoonlijk?
- Hoe waarschijnlijk acht je de kans dat wanneer je de griep hebt, je dit overdraagt op familie en/of vrienden?
- Hoe denk je over de veiligheid van het jaarlijkse griepvaccin?
- Denk je dat het griepvaccin effectief is in de bescherming tegen de griep?
- Zou je overwegen om het griepvaccin te accepteren om te voorkomen dat je de griep doorgeeft aan anderen?
- Ben je door de COVID-19 uitbraak anders gaan denken over de griep en/of het griepvaccin?

Sinds dit jaar is er voor het eerst een uitnodiging uitgegaan naar een groep volwassenen om de pneumokkokkenprik te komen halen (cohort met geboortedatum tussen 1-1-1941 en 31-12-1947).

Pneumokokken:

- Heb je al eens gehoord van het pneumokokkenvaccin (pneumokokken kunnen verschillende ziektes overdragen, zoals neus-bijholte-ontsteking, oorontsteking en longontsteking)?
- Heb je je dt jaar laten vaccineren? Waarom wel/ waarom niet? BESPREKEN MET DE GROEP, NIET INDIVIDUEEL.
  - Zo niet, heb je zelf contact opgenomen om alsnog een pneumokokkenvaccinatie te ontvangen?

Als die nog gehaald moet worden:

- Heb je de intentie om het pneumokokkenvaccin te gaan halen?
  - Waarom wel / Waarom niet?
  - *Wanneer iemand het nog niet weet*: wat heb je nodig om deze beslissing te maken?

- Heb je in het verleden al eerder een pneumokokkenvaccinatie ontvangen?
  - *Als nu wel ontvangen en in het verleden niet:* waarom heb je het nu wel ontvangen? (Vanwege uitnodiging of vanwege COVID-19 pandemie of... ?)
- Hoe makkelijk of moeilijk is het voor jou om een pneumokokkenvaccin te ontvangen?
- Voel je jezelf vatbaar voor pneumokokkenziekte? Waarom wel / waarom niet? BESPREKEN MET DE GROEP, NIET INDIVIDUEEL.
  - Heeft de uitbraak van COVID-19 invloed gehad op je gedachten omtrent je vatbaarheid voor een andere infectieziekte, zoals voor de pneumokokken bacterie?
- Vind je pneumokokkenziekte een ernstige ziekte voor jou persoonlijk?

- Hoe waarschijnlijk acht je de kans dat wanneer je de pneumokokkenbacterie hebt opgelopen, je deze overdraagt op familie en/of vrienden?
- Hoe denk je over de veiligheid van het pneumokokkenvaccin?
- Denk je dat het pneumokokkenvaccin effectief is in de bescherming tegen pneumokokkenziekte?
- Zou je overwegen om het pneumokokkenvaccin te accepteren om te voorkomen dat je een mogelijke besmetting met de bacterie doorgeeft aan anderen?

Ben je door de COVID-19 uitbraak anders gaan denken over pneumokokkenziekte en/of het vaccin daartegen?

MOTIVATION

- Hoe denk jij over vaccinaties?
    - Is het iets goeds of slechts?
    - Is het nuttig?
- Denk je dat de COVID-19 pandemie invloed heeft gehad op hoe je nu denkt over vaccineren in het algemeen? Ben je anders gaan denken over dit onderwerp, of niet?

PREDISPOSING

- Welke zaken spelen bij jou een rol om je wel of niet te laten vaccineren? (*Eerst de mensen laten antwoorden, niet gelijk onderstaande vervolgvragen stellen.*)
    - De ernst van de infectieziekte?
        - Wanneer is een ziekte ernstig genoeg om je te laten vaccineren?
    - Je vatbaarheid voor de infectieziekte?
        - Voel je je vatbaar voor het oplopen van een infectieziekte?
    - De effectiviteit van het vaccin?
        - Zou je een vaccin accepteren die niet 100% de garantie biedt dat je beschermd bent?
        - Vanaf welk percentage zou je het vaccin accepteren?
        - Verschilt dit nog per ziekte?
    - De eventuele bijwerkingen van het vaccin?
        - Zijn bijwerkingen acceptabel? In welke mate zijn ze acceptabel?
    - Andere factoren?
        - Angst voor naalden.
        - Eerdere ervaringen met infectieziektes (besmetting bij jezelf of familie/vrienden?)
- Heb je eerder een vaccinatie ontvangen? Wat zijn je ervaringen hiermee?
- Wat zijn voorwaarden voor jullie om een vaccinatie te accepteren?

TRUST

Bij het beleid rondom en het uitvoeren van vaccinaties zijn verschillende partijen betrokken. Bijvoorbeeld de overheid, je huisarts en het RIVM.

- In welke mate heb je vertrouwen in deze partijen wanneer het gaat om vaccinaties en is dit veranderd gedurende de COVID-19 pandemie?
    - Vertrouwen in de overheid?
    - Vertrouwen in je huisarts?
    - Vertrouwen in het RIVM?

- Heeft de mate van vertrouwen die je hebt in deze instanties invloed op je keuze om je wel of niet te laten vaccineren?
    - In het algemeen?
    - Tegen de griep?
    - Tegen pneumokokken?
    - Tegen COVID-19?

Wanneer er tijd genoeg is:

Herpes zoster

- Heb je al eens gehoord over de herpes zoster (ook wel gordelroos genoemd) vaccinatie?
- Heb je je al gevaccineerd tegen gordelroos? Waarom wel / waarom niet?
    - Zo niet: heb je de intentie om je binnenkort te laten vaccineren tegen gordelroos?
        - Waarom wel / waarom niet?
        - *Wanneer iemand het niet zeker weet*: wat heb je nodig om deze beslissing te maken?
- Voel je jezelf vatbaar voor gordelroos? Waarom wel / waarom niet?
    - Heeft de uitbraak van COVID-19 invloed gehad op je gedachten omtrent je vatbaarheid voor een andere infectieziekte, zoals voor gordelroos?
- Vind je gordelroos een ernstige ziekte?
- Hoe makkelijk of moeilijk is het voor jou om het gordelroos vaccin te ontvangen?
- Hoe waarschijnlijk acht je de kans dat wanneer jij gordelroos hebt opgelopen, je dit overdraagt op anderen?
- Hoe denk je over de veiligheid van het vaccin tegen gordelroos?
- Denk je dat het vaccin effectief is tegen gordelroos?
- Zou je overwegen om het vaccin tegen gordelroos te accepteren om te voorkomen dat je een mogelijke besmetting doorgeeft aan anderen?
- Ben je door de COVID-19 uitbraak anders gaan denken over gordelroos en/of het vaccin daartegen?

Afsluitende vragen:

- Om het allemaal samen te vatten, kun je in een paar zinnen aangeven óf, en in welke mate de COVID-19 uitbraak invloed heeft gehad op jouw bereidheid tot vaccineren.
- Zijn er nog bepaalde aspecten die we nu niet hebben besproken, maar die jullie toch graag zouden noemen?