**MASTER THESIS**

# The intention of Dutch teenagers': getting vaccinated or not?

*A study about how conceptual influences, individual and/or social group influences and vaccination specific issues influences the intention to get vaccinated*

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## Preface

In front of you lies the thesis entitled*: 'The intention of Dutch teenagers': getting vaccinated or not?'*

This thesis is the final product of the Master Health Sciences and has been performed in cooperation with GGD Twente and the University of Twente. I enjoyed developing my skills as a future health scientist in the practical setting of the GGD.

First of all, I would like to thank my supervisors of the University of Twente, Ariana Need and Magda Boere-Boonekamp, for their great assistance and support during the period I worked on my thesis. Their feedback and guidance supported me in order to achieve this final result.

Second, thanks to my supervisor Cherelle van Stenus from the GGD. She made it possible for me to experience the practical field of the health scientist, gave me support and feedback. I found it very interesting to be part of a company like the GGD, and I thank her for the possibility she gave me with composing my master thesis there. I would also like to thank all my colleagues from the GGD, who supported me during this period. I hope the results of this study will yield a good start for the GGD to shape the extra call-up for not (completely) vaccinated teenagers.

Without the effort of the participating schools and teenagers, this thesis could not have been completed. A special thanks is going out to Jan and Ben.

Finally, I want to thank my family and friends for supporting me to do what I like and letting me relax and laugh in the weekends or evenings, so I had enough fresh energy to work on my thesis the rest of the time.

I hope you enjoy reading my thesis!

Lisanne Schulenburg, July 2019

## Abstract

### Introduction

The decreasing vaccination coverage is related to a lower acceptance or refusal of vaccines despite the availability of vaccine services, also called vaccine hesitancy. The determinants that influence the behavioural decision to accept, delay or reject some or all vaccinations can be described under contextual influences, individual/social group influences, and vaccination specific issues. To stop the vaccination coverage from decreasing and to develop targeted strategies, there is knowledge needed about reasons for vaccine hesitancy. There is currently no knowledge available about reasons for vaccine hesitancy among teenagers and why they are intended to vaccinate or not. Additionally, a policy measure is developed, namely the extra vaccination call-up for 16- and 17-year aged teenagers who are not (completely) vaccinated, but the elaboration of the policy measure is not there yet. With investigating which determinants are influencing whether teenagers are intended to vaccinate or not, targeted recommendations to shape the policy measure can be made. The research question in this study is: *"Which contextual influences, individual and/or social group influences and vaccination specific issues influence the intention of teenagers aged 14-19 to get all the offered vaccinations of the Dutch National Immunization Programme (NIP)?"*

### Methods

First, a systematic literature review was composed to identify the determinants with the largest effect on vaccine hesitancy. Additionally, an online questionnaire with two open questions was conducted. The questionnaire gathered background characteristics and questions around contextual influences, individual/social group influences and vaccination specific issues. The study was conducted at two high schools in the Netherlands, where 618 teenagers aged 14-19, were asked to fill in the questionnaire. SPSS was used in order to analyse the outcomes of the questionnaires by correlations, comparing means and the ANOVA. The correlations were used to measure the dependent variable 'intention to get all the offered vaccinations' (interval) with the main independent variables: contextual influences, individual/social group influences, and vaccination specific issues (interval). For the dependent variable and the background characteristics (categoric), the means and ANOVA were calculated.

### Results

The response rate was 39.3% (243/618). The results of the conceptual influences show a significant relation between the determinants 'religion/culture/gender and socioeconomic group' and 'geographic barriers' and the intention to get all the offered vaccinations. Of the individual/social group influences, the determinants 'knowledge awareness', 'personal experience and health system and providers- trust' and 'beliefs, attitudes, and motivation about health and prevention'' show a significant relation with the intention to get all the offered vaccinations. The vaccination specific issues determinants influencing the intention to get all the offered vaccinations are: 'design of vaccination program/mode of delivery' and 'risk/benefit (scientific evidence)'.

### Conclusion

Shaping the new policy measurement with strategies that influence the intention of teenagers to get all the offered vaccinations can make the policy measurement successful, encourage future vaccine acceptance by teenagers and minimise the potential for the development of hesitancy. The main point where strategies should be developed on is information and the provision of information to increase the knowledge of teenagers about the safety of vaccinations, of which vaccinations the NIP consists, why vaccinations are important for someone's health, what happens with the health of people when they do not vaccinate based on religious or cultural reasons, the risk for teenagers to get a vaccine-related disease, how well a vaccination protects against getting the disease and about the risk of side effects from vaccination. Teenagers can be informed by letter/leaflet, parents/guardians, school-based programs, or the internet. Additionally, teenagers must be satisfied with the distance to the place where they can get vaccinated, and there must be trust in the advice a doctor/nurse gives teenagers.

## Samenvatting

### Introductie

De dalende vaccinatiegraad is gerelateerd aan een lagere acceptatie of weigering van vaccinaties, ondanks de beschikbaarheid van vaccinaties, ook wel ‘vaccinatie twijfel’ genoemd. De determinanten die van invloed zijn op de gedragsmatige beslissing om sommige of alle vaccinaties te accepteren, voorlopig of helemaal te weigeren, kunnen worden beschreven onder contextuele invloeden, individuele/sociale groep invloeden en specifieke vaccinatie invloeden. Om te voorkomen dat de vaccinatiegraad afneemt en om gerichte maatregelen en/of strategieën te kunnen ontwikkelen, is er kennis nodig over redenen die zorgen voor vaccinatie twijfel. Er is momenteel geen kennis beschikbaar over de redenen voor vaccinatie twijfel bij tieners en waarom ze de intentie zouden hebben zich wel of niet te laten vaccineren. Daarnaast is een beleidsmaatregel ontwikkeld, namelijk het oproepen van tieners (16-17 jaar) die niet (volledig) zijn gevaccineerd om vaccinatie(s) alsnog kosteloos in te halen, maar de uitwerking van de beleidsmaatregel is er nog niet. Door te onderzoeken welke determinanten invloed hebben op de intentie van tieners om zich wel of niet te laten vaccineren, kunnen gerichte aanbevelingen worden gedaan om de beleidsmaatregel vorm te geven. De onderzoeksvraag in dit onderzoek luidt: "Welke contextuele invloeden, individuele en/of sociale groep invloeden en vaccinatie specifieke invloeden, beïnvloeden de intentie van tieners van 14-19 jaar om alle aangeboden vaccinaties van het Rijksvaccinatieprogramma (RVP) te krijgen?"

### Methode

Om de determinanten die het grootste effect hebben op vaccinatie twijfel te identificeren, werd een systematisch literatuuronderzoek uitgevoerd. Daarnaast is een online vragenlijst met aanvullend twee open vragen uitgezet. De vragenlijst verzamelde achtergrondkenmerken en vragen rondom contextuele invloeden, individuele/sociale groep invloeden en specifieke vaccinatie invloeden. De vragenlijst werd uitgezet op twee middelbare scholen in Nederland. Op deze scholen werden 618 tieners van 14-19 jaar gevraagd om de vragenlijst in te vullen. SPSS werd gebruikt om de uitkomsten van de vragenlijsten te analyseren door middel van correlaties, het vergelijken van gemiddelden en de ANOVA. De correlaties werden gebruikt om de relatie tussen de afhankelijke variabele ‘intentie om alle aangeboden vaccinaties te halen’ (interval) en de onafhankelijke variabelen: contextuele invloeden, individuele/sociale groepsinvloeden en specifieke vaccinatievaccinaties (interval) te onderzoeken. Voor de afhankelijke variabele en de achtergrondkenmerken werden de gemiddelden vergeleken en de ANOVA berekend.

### Resultaten

Het respons percentage was 39,3% (243/618). De resultaten van de conceptuele invloeden laten een significante relatie zien tussen de determinanten 'religie/cultuur/geslacht en sociaaleconomische invloeden' en 'geografische barrières' en de intentie om alle aangeboden vaccinaties te halen. Van de invloeden van de individuele/sociale groep, tonen de determinanten 'kennis/bewustzijn', ‘persoonlijke ervaring en vertrouwen in het gezondheidssysteem/leveranciers’ en 'overtuigingen, houdingen en motivatie over gezondheid en preventie' een significante relatie met de intentie om alle aangeboden vaccinaties te halen. De vaccinatie specifieke determinanten die van invloed zijn op de intentie om alle aangeboden vaccinaties te halen zijn: 'ontwerp van vaccinatieprogramma/wijze van levering' en 'risico/voordeel (wetenschappelijk bewijs)'.

### Conclusie

Het vormgeven van de nieuwe beleidsmaatregel op basis van strategieën die van invloed zijn op de intentie van tieners om alle aangeboden vaccinaties te halen, kan de maatregel succesvol maken, toekomstige acceptatie van vaccinatie aanmoedigen en het ontstaan van vaccinatie twijfel minimaliseren. Het belangrijkste punt waarop strategieën moeten worden ontwikkeld is informatievoorziening. Tieners kunnen worden geïnformeerd per brief/folder, ouders/verzorgers, schoolprogramma’s of internet. Informatie die tieners ontvangen moet gaan over: de veiligheid van

vaccinaties, welke vaccinaties het RVP bevat, waarom vaccinaties belangrijk zijn voor iemands gezondheid, wat er gebeurt met de gezondheid van mensen als ze niet vaccineren vanwege religieuze of culturele redenen, het risico voor tieners om een vaccinatie gerelateerde ziekte te krijgen, hoe goed een vaccinatie beschermt tegen het krijgen van de ziekte en informatie over het risico op bijwerkingen. Bovendien moeten tieners tevreden zijn met de afstand tot de plaats waar ze kunnen worden gevaccineerd en moet er vertrouwen zijn in het advies dat een arts/verpleegkundige aan tieners geeft.

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## Concepts and definitions

| Concept | Definition |
|---|---|
| Vaccine | “A biological preparation that improves immunity to a particular disease” (WHO, N.D.-a, p.1). |
| Vaccination | “The administration of antigenic material (a vaccine) to stimulate an individual's immune system to develop adaptive immunity to a pathogen” (Allied academies, N.D.). |
| Global vaccination coverage | “Global vaccination coverage is the size of children in the world who receive recommended vaccines” (WHO, 2018-d). |
| Vaccination coverage | “Vaccination coverage can be defined as the number of persons among a certain population (i.e. one birth cohort, a group targeted by vaccination campaigns, etc.) who are vaccinated against a specific disease, divided by the total number of individuals belonging to the same population” (Lopalco & Santisteve, 2014). |
| Infectious diseases | “Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another” (WHO, N.D.-e). |
| Strategies | “Strategy is described as a plan, or something equivalent, to guide or course an action into the future, a path to go from one place to another” (Mintzberg, 2000). |
| Vaccine hesitancy | “Vaccine hesitancy refers to delay in acceptance or refusal of vaccines despite availability of vaccine services. Vaccine hesitancy is complex and context specific, varying across geographies and vaccine types. It is influenced by factors such as complacency, convenience and confidence (3 “Cs” model)” (MacDonald, 2015, p3). |
| Teenager | “A person aged between 13 and 19 years” (Oxford English Dictionary, N.D.). |

## 1. Introduction

This study is about a policy measure targeting the decreasing vaccination coverage: an invitation for teenagers aged 16/17 who are not (completely) vaccinated to get the vaccination(s) they miss. The study aims to find which conceptual influences, individual and/or social group influences and vaccination specific issues influences the intention of teenagers aged 14-19 to get all the offered vaccinations, so strategies, to make the extra vaccination call-up policy measure for teenagers aged 16 and 17 successful, can be developed. The introduction starts with information about infectious diseases and vaccines. Additionally, the Dutch National Immunization Program is discussed. It is followed by the risks of vaccinations and the risks of no vaccination. Furthermore, the regulation around vaccination is explained, vaccine hesitancy is described and the vaccination coverage is presented. Finally, the knowledge gap, aim of the study and the research question are described.

### 1.1. Infectious diseases and vaccines

According to the WHO, infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another (WHO, N.D.-e). Infectious diseases can be hazardous because they can make individuals ill and can spread easily. To prevent this from happening, the national government started in 1957 with the current so-called National Immunization Program (NIP) (RIVM, 2018-m). The NIP protects children for infectious diseases by administering a vaccine. In this study, the definition of the World Health Organization (WHO) for a vaccine is adopted and a vaccine is defined as "a biological preparation that stimulates immunity to a particular disease" (WHO, N.D.-a, p.1). A vaccine consists of a pharmaceutical agent that simulates a disease-causing microorganism. The pharmaceutical agent is based on impaired or killed forms of the microbe, toxins of the microbe or proteins located on the surface. The pharmaceutical agent provokes the immune system of the body to identify the agent as strange, destroy it, and remember it, so the immune system remains able to provoke and destroy all microorganisms for which the vaccine is intended that follow (WHO, N.D.-a). Vaccination is the administration of a vaccine. Thus, the aim of administering the vaccine is to make an individual immune or resistant to an infectious disease. This process can be described as immunization.

### 1.2. The Dutch National Immunization Programme

The NIP protects children for infectious diseases by stimulating immunization. The National Institute for Public Health and the Environment ("Rijksinstituut voor Volksgezondheid en Milieu, RIVM") (2018-a) is responsible for the NIP. The NIP contains vaccinations for twelve possible deadly infectious diseases: Diphtheria (D), Pertussis (whooping cough) (aP), Tetanus (T), Polio (IPV), Haemophilus influenzae type b disease (Hib), Pneumococcal disease (PCV), Hepatitis B (HBV), Mumps (M), Measles (M), Rubella (German measles) (R), Meningococcal disease (MenACWY) and cervical cancer caused by the Human Papillomavirus (HPV) (Rijksoverheid, N.D). Appendix 1 shows a table with the information about the diseases that the vaccinations prevent and in what way the infections are transmitted. Appendix 2 shows the Dutch and English abbreviations of the vaccinations.

All the vaccinations for the aforementioned infectious diseases decrease the risk of infection of the vaccination preventable disease, or they decrease the severity of it. Up to four to six weeks, after a woman has given birth, the parents will get a call-up for the child to take part in the NIP. Additionally, they will get a brochure, a vaccination certificate, and a set of vaccination cards. For every vaccination, the parents will receive independent call-ups. Even when parents deny their child to be vaccinated, they will still get call-ups for the next vaccinations in case they changed their mind or medical reasons for denying the vaccination are no longer playing a part (Rijksoverheid, N.D.; RIVM, 2018-k). The vaccination schedule includes a total of 12 vaccinations for boys and 14 for girls (RIVM, 2018-a). Parents are expected to take their call-up card with them when having their child vaccinated. Vaccinations are mostly given by healthcare workers (physicians and nurses) in well-baby and toddler clinics, municipal health services (GGD'en) or Youth and Family Centres. Furthermore, they can be given in 'azielzoekcentra (AZC)'. In 2017, around 760.000 children between the age of 0 to 18 got

2.140.000 vaccinations within the NIP. There are no costs for parents connected to the vaccination program and participation is voluntary (RIVM, 2018-a, WHO, N.D.-b).

Figure 1. Which vaccines will my child receive? Adapted from RIVM. (2018). Copyright (2019) by RIVM.

Figure 1 shows at which age children receive a specific vaccination. See Appendix 2 for the Dutch and English abbreviations of the vaccinations. The first vaccinations (DTaP-IPV-Hib-HBV- and PCV-vaccines) are usually given when the baby is six to nine weeks old. Then, when the baby is three months old, he or she is offered a repeat of the DTaP-IPV-Hib-HBV vaccinations. The third vaccination for DTaP-IPV-Hib-HBV is offered when the baby is four months, together with the second PCV vaccine. When the baby is eleven months, he or she can get a revaccination for DTaP-IPV-Hib-HBV- and PCV. After these vaccinations, the child is for now sufficiently enough protected for the diseases the child is vaccinated against. When the child is fourteen months, the vaccinations MMR and MenACWY are offered. When a child is four years, he or she can receive the fifth DTaP and IPV vaccination. A nine-year-old child can get two repeated vaccinations: DT-IPV and MMR. Girls aged thirteen can receive a vaccination against the HPV (Rijksoverheid, N.D; RIVM, 2018-k).

Most vaccinations contain series with more than one vaccination. Basic immunity is achieved after administering of completed series of vaccinations and offers long-term protection. Sometimes the protection is very long-term to life-long, sometimes there are regular revaccinations necessary to maintain and achieve the desired level of protection. How many vaccinations are needed to achieve basic immunity varies per vaccine, as well age plays a role in this (RIVM, 2018-k). See table 1, the basic immunity for DTaP + IPV (After four vaccinations) and MMR (after one vaccination) is reached when a child is vaccinated with the up to then offered vaccinations at the age of two. At the same age, the vaccinations for Hib (four vaccinations), Hep B (four vaccinations), PCV (three vaccinations) and Men ACWY (one vaccination) are completed and full immunity for these diseases is reached. The full immunity for DTaP and MMR occurs after the revaccination and is received at the age of ten. The full immunity for HPV is reached after two vaccination at the age of fourteen. Girls who are getting vaccinated for HPV after the age of fifteen get three vaccinations in order to achieve full immunity (RIVM, 2018-b).

Table 1. The age when children reach basic and full immunity for NIP vaccinations

| Vaccination | Age | Basic immunity | Full immunity |
|---|---|---|---|
| DTaP + IPV | 2 | After 4 vaccinations | |
| MMR | 2 | After 1 vaccination | |
| Hib | 2 | | After 4 vaccinations |
| Hep B | 2 | | After 4 vaccinations |
| PCV | 2 | | After 3 vaccinations |
| Men ACWY | 2 | | After 1 vaccination |
| Ap | 4 | | After revaccination (5) |
| DT + IPV | 10 | | After revaccination (5) |
| MMR | 10 | | After revaccination (5) |
| HPV | 14 | | After 2 vaccinations* |

* Girls who are getting vaccinated for HPV after the age of 15 get three vaccines for full immunity (RIVM, 2018-b).

Vaccination programmes are considered as the main contributor to the decline of infectious diseases over the 20th century. In the first 13 years of mass vaccinations in the Netherlands, case notifications declined rapidly with 82.4% of notified cases of diphtheria averted, 92.9% cases of poliomyelitis, and 79.1% cases of mumps. Vaccination of eleven-year-old girls against rubella averted 49.9% of cases, while universal vaccination averted 68.1% of cases. These findings show that vaccination programmes have contributed substantially to the reduction of infectious diseases in the Netherlands (van Wijhe, Tulen, Korthals Altes, McDonald, de Melker, Postma & Wallinga, 2018). Vaccination is proven to be a cost-effective investment because it can save millions of lives, protect countless children from illness and disability and can eliminate life-threatening infectious diseases (UNICEF, N.D; WHO, N.D.-c). The WHO estimates that, worldwide, due to immunization, two to three million deaths per year are averted (WHO, N.D.-c). Additionally, the late 19th and early 20th century saw a big decrease in childhood mortality and a fast increase in life expectancy. Among children born in the Netherlands between 1953 and 1992, according to Van Wijhe, 6.000 to 12.000 deaths are prevented (van Wijhe, 2018).

## 1.3. Risks of vaccinations and risks of no vaccination

Vaccinations are intended to prevent infectious diseases and the spread of diseases. Every preventive measure has advantages as well as disadvantages. These (dis)advantages can influence the decision to get vaccinated or not.

Nowadays, diseases related to vaccinations occur less frequently and people often do not see the risks and consequences of the diseases anymore. Therefore, risks of vaccinations are more visible to people (RIVM, 2018-c). Some childhood diseases do not look dangerous. However, they can have serious consequences; for example, poliomyelitis can cause paralysis. Other consequences can be especially dangerous for adults who have not been vaccinated in their childhood. For example, measles: with increasing age, there are increasing risks of complications (Rijksoverheid, N.D; RIVM, 2019-g). There are nowadays still children who get a handicap or die due to vaccination preventable diseases. Mostly, these children are not or not completely vaccinated (RIVM, 2018-c). An individual with an infectious disease can spread this to others who are also not or not yet immune due to non-vaccination. In this way, outbreaks of infectious disease can occur when fewer people are vaccinated (Centres for Disease Control and Prevention, 2018). Furthermore, no vaccination gives the risk of getting the vaccination preventable disease. Moreover, the risk of getting harmed by the vaccination preventable disease increase. The consequences of diseases can be found in Appendix 1: an explanation of vaccinations.

The disadvantages and risks of vaccination are the side effects that can occur due to physical response on the vaccinations. Because the desired effect of vaccination is protection against infectious diseases, all other effects are considered as side effects. In 2017, 'Lareb' reported in total 5,423 side effects due to vaccination in the Netherlands. Side effects are varying per vaccination. A painful arm, a red spot, light fever, or swelling where the vaccine is injected are examples of side effects from vaccination. Young children sometimes behave adherent and cry longer after vaccinations. Five frequently reported possible side effects after vaccinations, and their notifications can be found in Appendix 3. The most side effects are not dangerous and disappear in a few days. Serious side effects are very rare (RIVM, 2018-c). Besides the aforementioned side effects, 'bijwerkingen centrum lareb' mentions some side effects that can occur due to the sensitivity of the vaccinated individual: febrile seizures, discoloured arms or legs, collapse reactions, breath holding spells, skin abnormalities and reactions in the reduced immune system. While vaccinations can have side effects, there is no signal that indicates that NIP vaccinations are unsafe (RIVM, 2018-a). The WHO also mentions that vaccinations are safe (WHO, 2018).

The RIVM states that the risks of vaccinations do not outweigh the risks that a child incurs by not being vaccinated (RIVM, 2018-c). Additionally, the WHO states there is a higher possibility to be injured by a vaccination preventable disease than by a vaccination (WHO, 2018-a).

## 1.4. Regulation around vaccination

As mentioned before, the risks of getting vaccinated are not as high as the risk of not being vaccinated and vaccinations are considered safe. The WHO and the Dutch government both state that there are, to secure the safety of vaccines, serious safety requirements before vaccines are approved. They have to go to rigorously tests with multiple phases of trials. The efficacy and possible side effects are examined. After entering the market, vaccines are still monitored for side effects (WHO, 2018-a; RIVM, 2018-c).

The WHO established the Strategic Advisory Group of Experts (SAGE) to provide guidance on global policy recommendations and strategies for all vaccination preventable diseases and vaccination programmes, including the NIP (WHO, 2018-b).

Worldwide, there are important differences in regulations for vaccination. In the Netherlands, vaccination is voluntary. This is in contrast to some other countries, for example, Italy, where vaccination for polio, diphtheria, tetanus, hepatitis B, measles, mumps, rubella, meningitis B, whooping cough and varicella is mandatory. The consequence is a fine of €500 to € €7500 for refusing parents (RIVM, N.D.-a).

Article 24 of the Dutch law states that every child has a right to the greatest possible degree of health and the right to health care (Kinderrechten, N.D.). This stated, children have the right to be vaccinated. According to the Act on the Medical Treatment Agreement ('de wet op de geneeskundige behandelingsovereenkomst, WGBO'), for children up to the age twelve, permission from the parents or guardians is required before any medical treatment can be performed. The children have a right to information but are not allowed to decide for themselves. For teenagers aged between twelve and sixteen, the permission of the parents or guardians and the permission of the children themselves are necessary. In two cases, only the permission of the child is enough: (1) when no treatment has harmful consequences (e.g., sexually transmitted disease) and, (2) when the treatment is a well-considered decision (e.g. abortion). In these cases, no permission of the parents or guardians is required. Teenagers older than 16 can decide independently of their parents or guardians (KNMG, 2019).

## 1.5. Vaccination coverage

Global vaccination coverage is the percentage of children in the world who receive recommended vaccinations. The coverage remains at 85%, with no significant changes during the past few years (WHO, 2018-d). The Global Vaccine Action Plan is a framework approved by the World Health Assembly in May 2012 to achieve the Decade of Vaccines vision by delivering universal access to immunization.

The Global Vaccine Action Plan describes that the vaccination coverage is lower in lower- and middle-income countries (due to access) compared to high-income countries (WHO, N.D.-d).

Since 2014, the Dutch vaccination coverage for most vaccinations has fallen by around 2% to 3% in total. The decline is much higher for HPV vaccinations, which decreased by 15% since 2016. In table 2, an overview of the decreasing vaccination coverage from 2006-2018 for new-borns, toddlers, and schoolchildren can be found. The vaccination coverage is determined at the following ages: 1, 2, 5, 10, and 14. Age 1 for DTaP + IPV, Hib and PCV. Age 2 for DTaP + IPV, Hib, Hep B, PCV, MMR, Men C, and the completed vaccinated measurement (percentage of children aged 2 who received all the vaccines). Age 5 contains a measurement of the revaccination of DTaP + IPV. At the age of 10, the vaccination coverage of DT-IPV and MMR are measured again. Lastly, at the age of 14, the HPV coverage is measured. The most recent coverage rates are determined in March 2018 (RIVM, 2018-l).

Table 2. Vaccination coverage (%) per vaccine for age cohorts of new-borns, toddlers, schoolchildren and adolescent girls in 2006–2018 (RIVM, 2018-l)

| Report year | Newborns* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | cohort | DTaP -IPV | Hib | HBVa | PCV ** | MMR | MenC | full *** |
| 2006 | 2003 | 94.3 | 95.4 | 15.2 | - | 95.4 | 94.8 | |
| 2007 | 2004 | 94.0 | 95.0 | 17.1 | - | 95.9 | 95.6 | |
| 2008 | 2005 | 94.5 | 95.1 | 17.9 | - | 96.0 | 95.9 | |
| 2009 | 2006 | 95.2 | 95.9 | 18.6 | 94.4 | 96.2 | 96.0 | |
| 2010 | 2007 | 95.0 | 95.6 | 19.3 | 94.4 | 96.2 | 96.1 | |
| 2011 | 2008 | 95.4 | 96.0 | 19.4 | 94.8 | 95.9 | 95.9 | |
| 2012 | 2009 | 95.4 | 96.0 | 19.5 | 94.8 | 95.9 | 95.9 | |
| 2013 | 2010 | 95.5 | 96.1 | 19.7 | 95.1 | 96.1 | 96.0 | |
| 2014 | 2011 | 95.4 | 95.9 | 51.4 | 95.0 | 96.0 | 95.8 | |
| 2015 | 2012 | 94.8 | 95.4 | 94.5 | 94.4 | 95.5 | 95.3 | |
| 2016 | 2013 | 94.2 | 94.9 | 93.8 | 93.8 | 94.8 | 94.6 | |
| 2017 | 2014 | 93.5 | 94.2 | 93.1 | 93.6 | 93.8 | 93.5 | 91.2 |
| **2018** | **2015** | **92.6** | **93.4** | **92.2** | **92.8** | **92.9** | **92.6** | **90.2** |

| Report year | Toddlers* | | | | Schoolchildren* | | | Adolescent girls* | |
|---|---|---|---|---|---|---|---|---|---|
| | cohort | DTaP -IPV[b] | DTaP -IPV[c] | DTaP -IPV[d] | cohort | DT -IPV | MMR **** | cohort | HPV |
| 2006 | 2000 | 92.5 | 1.4 | 93.9 | 1995 | 93.0 | 92.9 | | |
| 2007 | 2001 | 92.1 | 1.6 | 93.7 | 1996 | 92.5 | 92.5 | | |
| 2008 | 2002 | 91.5 | 1.6 | 93.1 | 1997 | 92.6 | 92.5 | | |
| 2009 | 2003 | 91.9 | 2.0 | 93.9 | 1998 | 93.5 | 93.0 | | |
| 2010 | 2004 | 91.7 | 2.6 | 94.3 | 1999 | 93.4 | 93.1 | | |
| 2011 | 2005 | 92.0 | 2.6 | 94.7 | 2000 | 92.2 | 92.1 | | |
| 2012 | 2006 | 92.3 | 2.1 | 94.4 | 2001 | 93.0 | 92.6 | 1997 | 56.0 |
| 2013 | 2007 | 92.3 | 2.4 | 94.7 | 2002 | 93.1 | 92.9 | 1998 | 58.1 |
| 2014 | 2008 | 92.0 | 2.4 | 94.4 | 2003 | 92.7 | 92.4 | 1999 | 58.9 |
| 2015 | 2009 | 91.9 | 2.2 | 94.1 | 2004 | 92.7 | 92.7 | 2000 | 61.0 |
| 2016 | 2010 | 91.5 | 2.1 | 93.7 | 2005 | 92.0 | 92.0 | 2001 | 61.0 |
| 2017 | 2011 | 91.1 | 2.1 | 93.2 | 2006 | 90.8 | 90.9 | 2002 | 53.4 |
| **2018** | **2012** | **90.4** | **2.3** | **92.7** | **2007** | **90.0** | **90.1** | **2003** | **45.5** |

* Vaccination coverage is assessed at the ages of two years (new-borns, five years (toddles), 10 years (schoolchildren) and 14 years (adolescent girls).
** Only for new-borns born on or after 1 April 2006.
*** Key figure full participation new-borns: received all NIP vaccinations at two years of age
**** Two MMR vaccinations (in the past at least one MMR vaccination was reported)
a. Percentage of the total cohort. In 2011 universal hepatitis B vaccinations was introduced; only risk groups were vaccinated previously
b. Revaccinated toddles
c. Toddlers that reached basic immunity at age 2-5 years and were therefore not eligible for revaccination at toddlers age
d. Sufficiently protected toddlers (sum of b and c)

Adapted from RIVM. (2018-l).

It is crucial to keep monitoring developments in vaccination coverages closely. High vaccination coverage is necessary to reduce the prevalence of the disease and accomplish group protection. Vulnerable people and people who are not (yet) vaccinated benefit from this group protection as they have also a lower chance of getting the disease. To keep this effect stable, and to decrease the possibility of future breakouts of diseases, it is important that as many people as possible are vaccinated (RIVM, 2018-b). According to the WHO, with an example a measles-free country, the risk of an epidemic increases if the coverage is below 95% across age groups, geographical regions and population subgroups (European Centre for Disease Prevention and Control, N.D.).

## 1.6. Vaccine hesitancy

Decreasing vaccination coverage is influenced by the acceptance of vaccines. The continuum character of vaccine acceptance is now recognized by the introduction of the term "vaccine hesitancy" that has been defined by the aforementioned Strategic Advisory Group of Experts working group of the WHO as: “a delay in acceptance or refusal of vaccines despite availability of vaccine services. Vaccine

hesitancy is complex and context specific, varying across geographies and vaccine types. It is influenced by the factors complacency, convenience and confidence (3 “Cs” model)” (MacDonald, 2015, p3). This stated, vaccine hesitancy is an important factor for the decreasing vaccination coverage in high-income countries and thus in the Netherlands. People who are vaccine hesitant are a heterogeneous group who, as shown in figure 2, (1) refuse all vaccines but are unsure, (2) refuse some, delay and accept some, or (3) accept all but are unsure (MacDonald 2015).

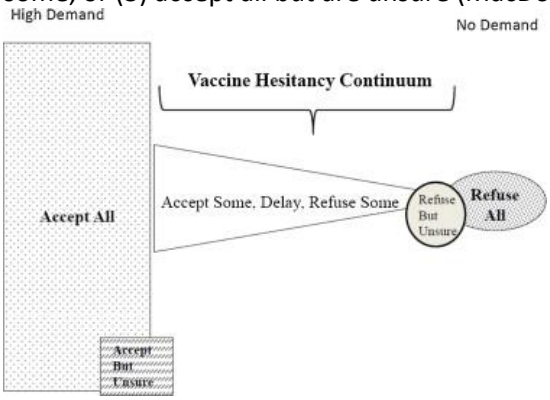


Figure 2. The continuum of vaccine hesitancy between full acceptance and outright refusal of all vaccines. Adapted from ScienceDirect, by N.E., MacDonald. (2015). Copyright 2019 by ScienceDirect.

To achieve high individual and community vaccine demand, context, community and vaccination specific strategies beyond those aimed at addressing vaccine hesitancy need to be developed (MacDonald, 2015). The Strategic Advisory Group of Experts workgroup of the WHO developed the 3Cs model that describes the factors complacency, convenience and confidence which influence vaccine hesitancy. The model is extended to the 5 Cs model with calculation and collective responsibility as additional factors. The Strategic Advisory Group of Experts working group also mentioned the Vaccine Hesitancy Determinants Matrix. The matrix shows the determinants that influence the behavioural decision to accept, delay or reject some or all vaccinations under the following categories: contextual, individual/social group, and vaccine/vaccination-specific influences. Contextual influence arises due to historical, sociocultural, institutional, economic or political factors. Individual/social group influences arise from personal perception or influences of the social environment. Vaccination specific influences are directly related to the vaccine or vaccination. The matrix is used in several studies and provides evidence that vaccine hesitancy is an individual behaviour that results from many variables and determinants such as religion, fear or side effects, geographic obstructions, media influence and the way of vaccine deliveries (Thomson et al, 2015). The matrix is seen as potentially useful in selecting vaccine hesitancy indicators and survey questions and will therefore be used in this study (WHO,2014). In part 2.2.1. the model and matrix will be further discussed.

## 1.7. Knowledge gap

The European Parliament was, in 2018, asked for measures to stop the decreasing vaccination coverage by vaccine hesitancy in Europe. To develop targeted measures and/or strategies, there is knowledge needed about reasons for vaccine hesitancy. The vaccine hesitancy determinants matrix displays the factors influencing the behavioural decision to accept, delay or reject some or all vaccines. A recent European review showed that the main reason for public concern (which is vaccine-, country- and population-specific) is the safety of vaccinations, followed by the perception of a small chance of getting NIP diseases and the low severity of NIP diseases, the conviction that vaccines do not work, and a general lack of information. The articles in the review commonly studied healthcare workers, parents, adults, and individuals at high risk of vaccination preventable disease (RIVM, 2018-b; Karafillakis & Larson, 2017). The review included Dutch articles as well. There is a lot of research done among parents and healthcare workers and their perspective to vaccination, but there is a knowledge gap about the perspective of children/teenagers in the Netherlands.

The global vaccine action plan states that there will never come a point at which immunization is no longer required and to ensure vaccine continuity, development of new strategies needs to begin. Effective national immunization systems require ongoing nurturing, political commitment and public support (WHO, 2018-c). The WHO also mentioned that immunization programmes need to be designed so that individuals and communities understand the value of vaccines and demand immunization (WHO, 2018-c).

Currently, the Dutch Secretary of State (VWS) wants to limit the decreasing vaccination coverage and change it into an increasing rate, to better protect the Netherlands against the outbreak of serious infectious diseases. At the end of 2018, he announced a vaccination alliance in which all involved parties (parents, doctors, nurses, experts, etc.) bundle their forces to make the importance of vaccinations clearer and more visible in a variety of ways. Inaccurate information about vaccinations will, for example on social media, be actively refuted. Parents are actively approached if they do not want to participate in the NIP. Up till eighteen, children and teenagers are entitled to free vaccinations from the NIP. After reaching the age of eighteen, individuals need to pay for vaccinations. Currently, teenagers who didn't receive a certain vaccination do not get an extra invitation to get vaccinations they miss (RIVM, 2018-d). The Dutch Secretary of State announced in a letter to the chairman of the House of Representatives the extra call-up for teenagers aged sixteen and seventeen who are not (completely) vaccinated (Rijksoverheid, 2018). Up till sixteen, parents play an important role in child vaccination. As aforementioned, individuals of sixteen years and older can decide for themselves whether they want to be vaccinated or not and they can thus reconsider their parents' decision (Rijksoverheid, 2018). According to the manager of the NIP (personal communication, February 5, 2019), there is no plan for the performance of the extra call-up yet.

Thus, to develop targeted measures and/or strategies to stop the vaccination coverage from decreasing, there is knowledge needed about reasons for vaccine hesitancy. There is currently not known which determinants influence the intention of teenagers to vaccinate or not. Additionally, a policy measure is developed; extra vaccination call-up for 16- and 17-year aged teenagers who are not (completely) vaccinated, but the elaboration of the policy measure is not there yet. Filling this knowledge gap is of practical and scientific relevance because, with this study, a contribution to scientific knowledge will be made.

## 1.8. Aim and research question

The aim of the study is to find which conceptual influences, individual and/or social group influences and vaccination specific issues influences the intention of teenagers aged 14-19 to get all the offered vaccinations so strategies, to make the extra vaccination call-up policy measure for teenagers aged 16 and 17 successful, can be developed. With these strategies, it is possible to increase the intention to vaccinate.

GGD Twente is interested in the perspectives of teenagers towards getting vaccinated or refusing vaccinations. To achieve the aim of this study, it will be consistent with the aforementioned vaccine hesitancy determinants matrix and the various determinants of this matrix. The matrix will be used because it can explain vaccine hesitancy and the factors of the matrix can help to get insight into the determinants that influence the intention of teenagers to get vaccinated. The research question that arises from the aim is: *"Which contextual influences, individual/social group influences and vaccination specific issues, influence the intention of teenagers aged 14-19 to get all the offered vaccinations of the Dutch National Immunization Programme (NIP)?"* The research question leads to the following sub-questions:

1. Which determinants have the largest effect on vaccine hesitancy according to the literature?
2. What are the contextual influences, that arise due to historical, sociocultural, institutional, economic or political factors, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?

3. What are the individual/social group influences, that arise from personal perception or influences of the social environment, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?
4. What are the vaccination specific issues, which are directly related to the vaccine or vaccination, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?

## 2. Theoretical Framework

The definitions of often used words in this study are described in the table that is shown after the content (P7). As there are many theories and models about vaccine hesitancy and reasons to vaccinate or not, the purpose of this chapter is to show that the vaccine hesitancy determinants matrix is the best model to use by comparing it with other possible models. This chapter starts with the 3 Cs model, which is mentioned in the description of the often-used concept 'vaccine hesitancy'. After that, the 5 Cs model (the expansion from the 3Cs model), and the vaccine hesitancy determinants matrix will be explained. Lastly, the conclusion will show the outcome of the comparison of the matrix with other models.

### 2.1. Frameworks about vaccination influences

#### 2.1.1. The "3 Cs" model

The word vaccine hesitancy, used in this study, states in the definition that it is influenced by the factor's complacency, convenience and confidence. The Strategic Advisory Group of Experts (SAGE) of the WHO let these factors come together in the 3 Cs model that can be found in figure 3 (Macdonald, 2015). The factors have determinants to which they are positively or negatively related. A positive relation means the determinant stimulates the experience of the concerning factor. A negative relation is a barrier to experiencing the considering factor.

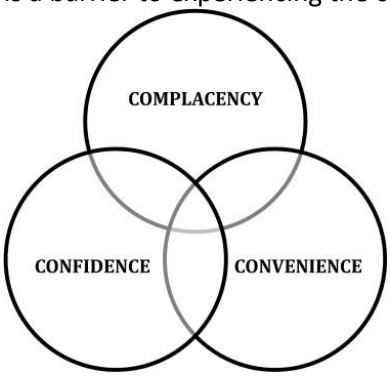


Figure 3. "Three Cs" model of vaccine hesitancy. Adapted from ScienceDirect, by N.E., MacDonald. (2015). Copyright (2019) by ScienceDirect.

The model describes confidence as trust in (1) the effectiveness and safety of vaccinations, (2) the delivering of vaccinations and thus the reliability and competence of the health care workers and (3) the desires of policymakers who make decisions on the needed vaccinations. Individuals who have a lack of confidence will have a negative attitude towards vaccinations. Misinformation, belief in conspiracies, beliefs of harms of medicines and conspiracy mentality and increased perceptions of vaccine-related risks contribute to the negative attitude. Confidence has a positive relation with correct knowledge about vaccination, trust in the health care system and beliefs about benefits of vaccinations (Macdonald, 2015; Betsch, Schmid, Heinemeier, Korn, Holtmann & Böhm, 2018).

Complacency performs when the perceived risks of the vaccination preventable diseases are low and therefore vaccination is not considered as a necessary preventive action. Individuals do not feel threatened by the vaccination preventable disease. Individuals weigh the risks of the vaccinations against the risks of the preventable disease. Due to vaccination, vaccination preventable disease is no longer common. As there is low involvement, knowledge, awareness and the level of active information searching is also low. Another point that influences the complacency with regard to vaccine hesitancy is self-efficacy, as individuals can choose for themselves whether they want to be vaccinated or not. Furthermore, complacency has a negative relation with perceived risks of diseases and consideration of future consequences. As consequences in the future are not relevant, individuals high in complacency have generally spoken a high-risk attitude, indicating risk-seeking behaviour (Macdonald, 2015; Betsch et al, 2018).

Lastly, convenience is about being able to proceed with vaccination without difficulty. It is influenced by a lot of factors such as physical availability, affordability and willingness to pay, geographical accessibility and ability to understand. These factors can influence vaccination uptake. Organizational factors like the time and place of the vaccinations can be convenient and comfortable or not and thus create vaccine hesitancy. Structural and psychological barriers (poor access, lack of self-control) are important factors that can obstruct the implementation of vaccination intention into behaviour (Macdonald, 2015; Betsch et al, 2018).

### 2.1.2. The 5 "Cs" model

The 3 Cs model is extended to the 5 Cs model with 2 extra factors. Besides confidence, complacency and convenience, the model also describes calculation and collective responsibility. Calculation and collective responsibility are added because they make it able to understand the psychological underpinnings of the vaccination coverage (Betsch et al, 2018).

Calculation refers to individuals' involvement in extensive information searching. Individuals high in calculation are assumed to evaluate the risk of infections and vaccinations to derive a good decision. Individuals search for different information resources, with different results. Therefore, a high calculation can lead to non-vaccination as there are a lot of anti-vaccination sources e.g. on the internet. Generally speaking, there is expected that the more information individuals look for, the more vaccine-critical sources they will discover which is also supported by the false-balance effects in the media (more anti-vaccination sources). So, there is a positive relation with perceived vaccination risks. Individuals high in calculation are risk-averse. They often have a more deliberative cognitive style of decision making and less irrational thinking (Betsch et al, 2018).

Collective responsibility refers to the willingness to protect others by someone's own vaccination by means of group immunity. The other side is the willingness to free-ride when enough others are vaccinated. Individuals with high collective responsibility are ready to vaccinate on behave of another. Therefore, there is a negative relation to individualism. Low collective responsibility can mean an individual is not known with the concept of group immunity, does not care or does not want to act on behave of others. So, collective responsibility has a positive relation with collectivism, communal orientation and empathy (Betsch et al, 2018).

The 5C model makes it able to monitor psychological antecedents of vaccination and facilitates diagnosis, intervention design and evaluation. The model is suitable for field settings and regular global monitoring of relevant antecedents of vaccination (Betsch et al, 2018).

### 2.1.3 The Vaccine Hesitancy Determinants Matrix

The Strategic Advisory Group of Experts of the WHO also mentioned the Vaccine Hesitancy Determinants Matrix. The matrix shows the determinants that influence the behavioural decision to accept, delay or reject some or all vaccinations under the following categories: contextual, individual and group, and vaccine/vaccination-specific influences. The term 'determinants of vaccine hesitancy' includes concepts related to barriers and enablers for uptake, reasons for vaccine refusal, beliefs and attitudes towards vaccination and system design mediated factors. As aforementioned, contextual influences can be described as influences that arise due to historical, sociocultural, institutional, economic or political factors. Individual and group influences as personal perceptions of, or beliefs about, vaccines and influences from the social environment. Vaccination specific influences are influences directly related to the vaccine or vaccination. The determinants can be found in figure 4 and are established through research studies, the experience of the creators in the field, and information of experts.

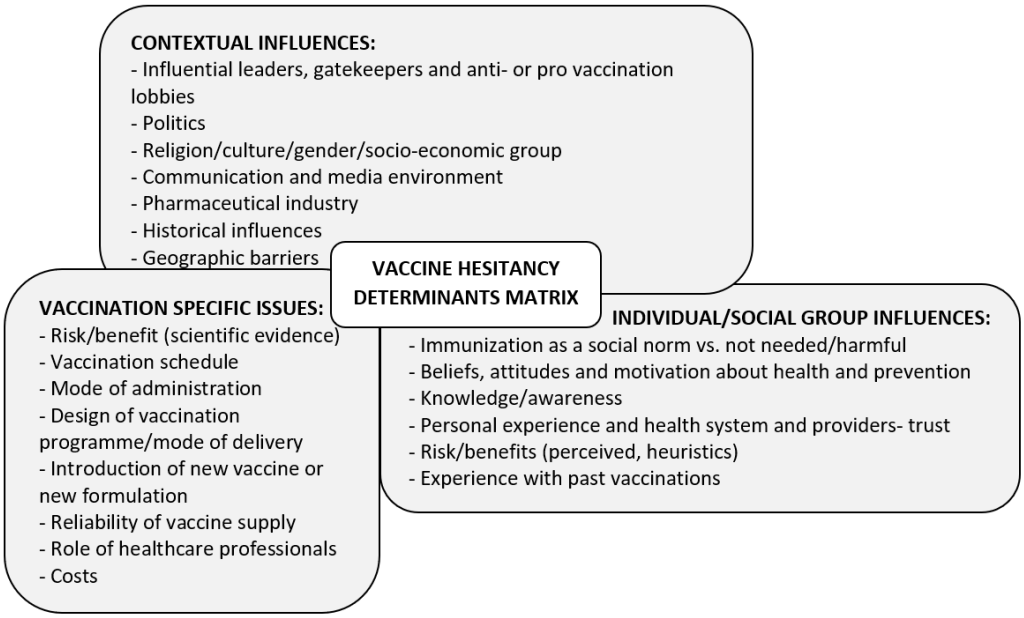

Figure 4. Vaccine Hesitancy Determinants matrix

The matrix is seen as potentially useful in selecting vaccine hesitancy indicators and survey questions (WHO,2014). The matrix is used in studies and provided evidence that vaccine hesitancy is an individual behaviour that results from many variables and determinants such as religion, fear of side effects, geographic obstructions, media influence and the way of vaccine deliveries. A further explanation of the different determinants can be found in table 3 (Thomson et al, 2015).

Table 3. Determinants of vaccine hesitancy (Thomson et al, 2015).

| **Determinants contextual influences** | **Explanation** |
|---|---|
| Communication and media environment | Media and social media can cause a negative or positive vaccination attitude and can provide a platform for lobbies and key opinion leaders to influence others; social media allows users to freely voice opinions and experiences and it can facilitate the organization of social networks for or against vaccinations. |
| Influential leaders, gatekeepers and anti- or pro vaccination lobbies | Community leaders and influencers, such as a leader in religion, can have big influence on vaccine acceptance or hesitancy. |
| Historical influences | Historical influences, such as negative experience with vaccination, can weaken public trust and influence vaccine acceptance, especially when combined with pressures of influential leaders and media. A community's experience isn't necessarily limited to vaccination but may affect it. |
| Religion/culture/gender and socio-economic group | Leaders of religion can prohibit vaccination. There are also cultures that do not allow children to be vaccinated. |
| Politics/policies | Policies can make vaccination mandatory as action against a decreasing vaccination coverage. |

| | |
|---|---|
| Geographic barriers | Hesitation can occur when the health centre to get vaccinated is too far away or access is difficult. |
| Pharmaceutical industry | Individuals can see industries as profit seeking companies which are not motivated or interest in public health. This can lead to distrust in the government. |
| **Determinants individual/social group influences** | **Explanation** |
| Experience with past vaccination | Past negative or positive experience with a particular vaccination can influence hesitancy or willingness to vaccinate. Knowledge of someone who suffered from a vaccination preventable disease due to non-vaccination may enhance vaccine acceptance. Personal experience or knowledge of someone who experienced side effects following immunization can also influence hesitancy. |
| Beliefs, attitudes and motivation about health and prevention | Beliefs that vaccination preventable diseases are needed to build immunity (and that vaccines destroy important natural immunity) or beliefs that other behaviours (breastfeeding, traditional/alternative medicine or naturopathy) are as or more important than vaccination to maintain health and prevent diseases influence the intention to vaccinate negatively. Beliefs about the benefits of vaccination influence the intention to vaccinate positively. |
| Knowledge/awareness | Decisions to vaccinate or not are affected by whether an individual or group has accurate knowledge, a lack of awareness caused by no information, or misperceptions due to misinformation. |
| Personal experience and health system and providers-trust | Trust or distrust in government or authorities can influence trust in vaccines and vaccination programmes delivered or mandated by the government. Past experiences that influence hesitancy can contain system procedures that were too long or complex, or personal interactions were difficult. |
| Risk/benefit (perceived, heuristic) | Perceptions of risk or perceptions of lack of risk may influence vaccine acceptance. Complacency occurs where the perception of disease risk is low and the need for vaccination is low. |
| Immunization as a social norm vs. not needed/harmful | Vaccine acceptance or hesitancy is influenced by peer group and social norms. |
| **Determinants vaccination specific issues** | **Explanation** |
| Risk/benefit (scientific evidence) | Scientific evidence of risk/benefit and history of safety issues can cause hesitancy, even when safety problems are clarified and/or addressed. Milder, local side effects can also provoke hesitancy. |

| | |
|---|---|
| Introduction of a new vaccine or new formulation | Hesitancy to accept a new vaccine can occur when individuals feel it has not been used/tested long enough or feel that the new vaccine is not needed or do not see the direct impact of the vaccine (e.g. HPV vaccine preventing cervical cancer). Individuals may be more willing to accept a new vaccine if the working of vaccinations is visible. |
| Mode of administration | Oral or nasal administration is more convenient and may be accepted by individuals who are afraid of injections or who do not have confidence in the health workers skills or devices used. |
| Design of vaccination programme/mode of delivery | Individuals may not have confidence in home vaccination or a campaign approach driven by the government. The Design of vaccination is also influenced by the distance to the health centre or the hours in which individuals can get their vaccination. |
| Reliability of vaccine supply | Hesitancy may occur when individuals do not have confidence in the system's ability to provide vaccine(s) or in the source of the supply (e.g. if produced in a country/culture the individual is suspicious of) ; health workers may also be hesitant to administer a vaccine (especially a new one) if they do not have confidence that the supply will continue as it affects their clients trust in them. Caregivers may not have confidence that a needed vaccine and or health staff will be at the health facility if they go there. |
| Vaccination schedule | Individuals can be reluctant to comply with the recommended schedule (e.g. multiple vaccines or age of vaccination). |
| Costs | Some individuals do not have the financial resources to be vaccinated or cannot afford the costs needed to get themselves to the immunization point. |
| Role of healthcare professionals | If health care professionals are hesitating (e.g. due to lack of confidence in a vaccine's safety or need), this can affect the willingness of clients to be vaccinated. |

### 2.2. Conclusion usability of models

There is a growing number of frameworks to measure vaccine hesitancy. There are several concepts that, based on literature, provide more insight into determinants or factors related to the acceptance of vaccination. Models as the Vaccine Confidence Scale VCS (Gilkey, Magnus, Reiter, McRee, Dempsey, & Brewer, 2014) and the parents' attitudes about childhood vaccines survey (PACV) (Opel, Taylor, Zhou, Catz, Myaing, & Mangione-Smith, 2013) are found not suitable because they are focused on the parent's perspective. Furthermore, the 5A model, a method for evidence-based analysis of the coverage gap and the development of a strategic plan that targets the key determinants of poor coverage, is considered. It is focused on access, affordability, awareness, acceptance and activation.

The 5A model has considerable overlap with the 5Cs model (Betsch et al, 2018; Thomson et al, 2015). Other considered models, as the conceptual model for determining Use, Under-Use and Non-Use of vaccination services also fit in the 5Cs model (WHO, 2014).

The determinants of the vaccine hesitancy determinants matrix match with the factors in the 5 Cs model. In the 5 Cs model, there is a positive relation between confidence and attitude, knowledge, beliefs about medicine (benefits) and trust in health care systems (provider, payer, institution). Beliefs about the harms of medicines influence confidence negatively. The determinants around confidence are more or less the same as the determinants of the individual/social group influences of the matrix. They are both influenced by personal perception or influences of the social environment. A risk attitude, perceived personal health status, perceived threat due to infectious diseases, perceived risk of disease, normative beliefs and considering future consequences and invulnerability influence complacency. The factors of complacency fit in the individual/social group influences and vaccination specific issues of the matrix. Convenience has a relation with perceived behavioural control, self-efficacy, empowerment, self-control, perceived access to health care and time pressure. The determinants of convenience fit partly in the determinants of the contextual influences of the matrix as the perceived access to health care and time pressure fit in the geographical barriers. These determinants also fit partly in individual/social group influences of the matrix where self-efficacy, empowerment, self-control and perceived behaviour are coming back. Calculation has a relation with the perceived risk of vaccination, preference for deliberation, perceived risk of disease and superstitious beliefs. The determinants of calculation are in accordance with the individual/social group influences of the matrix as individuals high in calculation should be rather risk-averse (risk/benefit; perceived, heuristic determinant), which should also be associated with a more deliberative cognitive style of decision making and less irrational thinking. Collective responsibility has a relation with communal orientation, collectivism, empathy and individualism. Collective responsibility determinants match the immunization as a social norm vs. not needed/harmful determinant of the individual/social group influences of the matrix.

In chapter 1, there is already described that the vaccine hesitancy determinants matrix will be used. After a rigorous evaluation of other models, the model still seems suitable to use as it offers an extensive framework with determinants. It is easier to use in comparison with the 5Cs model because the matrix has clear determinants which belong to one of the three factors. The matrix will be used to guide the data gathering.

## 3. Mini review

The vaccine hesitancy determinants matrix was used to guide the literature review. The matrix contains a lot of determinants. This chapter gives an overview of the available knowledge about the determinants that have the largest effect on vaccine hesitancy by using a mini-review as developed by Griffiths (2002). In such a way, the determinants with the largest effect, according to the literature, can be investigated and determinants with no or a small effect can be excluded.

### 3.1. Determinants with the largest effect on vaccine hesitancy

The available knowledge on hesitancy and reason for not vaccinating with the NIP vaccinations was investigated using a systematic mini-review as developed by Griffiths (2002). A mini-review is a quick and simple way for finding the available knowledge on a specific subject. Searches were done in Scopus, Web of Science, PubMed, Cochrane, and Google Scholar. To make the volume of material manageable, search results were limited to the last five years if there were too many results. The mini-review is done in order to answer the first sub-question: "Which determinants have the largest effect on vaccine hesitancy according to the literature?"

Search terms consisted of words and synonyms for "hesitancy", "reasons", "vaccination" and "no vaccination". Detailed information on search words used is presented in Appendix 4. The titles and abstracts of retrieved records were screened based on the inclusion and exclusion criteria in table 4. The inclusion and exclusion criteria were based on the PICOTS categories. PICOTS stand for: Population, Intervention, Comparators, Outcomes, Timing, and Setting (Van der Zee-van den Berg, Boere-Boonekamp, IJzerman, Haasnoot-Smallegange, & Reijneveld, 2017).

Table 4. Inclusion and exclusion criteria mini review

| **Study characteristics** | **Inclusion criteria** | **Exclusion criteria** |
|---|---|---|
| Population | Children and teenagers<br>Parents<br>Professionals/health care workers dealing with vaccination | Adults who are not parent |
| Intervention | Vaccination | |
| Comparators | No vaccination | |
| Outcomes | The reported outcome provides information about vaccine hesitancy or reasons for no vaccination | Reported outcomes provide no information about vaccine hesitancy or reasons for no vaccination |
| Timing | Published in or after 2014 | Published before 2014 |
| Setting | A study conducted in a high-income economic country as defined by the World Bank | Study conducted in a country other than the high-income economic countries as defined by the World Bank<br>- Clinical setting |
| Study design | Observational study with comparator (prospective or retrospective)<br>Case series<br>Randomized controlled trial<br>Systematic reviews | |
| Report criteria | Article in English or Dutch | Article in a language other than English or Dutch<br>Abstract or full-text not found<br>Duplicates |

Besides checking articles on the inclusion and exclusion criteria, they were screened in three phases. In the first phase, the titles of the results were scanned. In the second phase, the abstracts were screened and read. In the third and last phase, full articles were screened. In total, four articles were included. The flow chart can be found in figure 5. The quality of the included articles is assessed with the checklists from Greenhalgh and Donald (2000), see Appendix 5. These checklists are focused on the qualitative approach, sampling strategy, potential bias, methods, data analysis, results, validation and transferability.

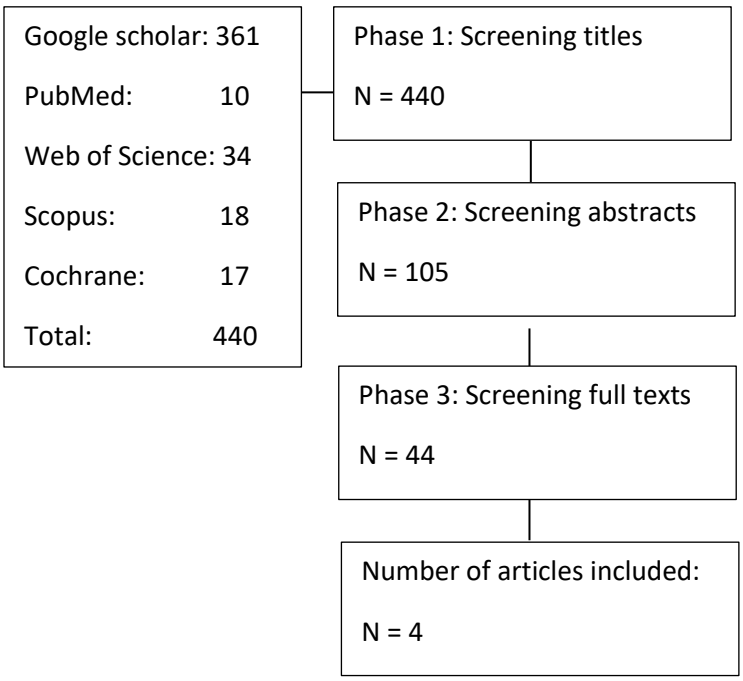


Figure 5. Flow chart mini review

Of each included article in this mini-review, the study design, aim of the study, and hesitancy or reasons for no vaccination are outlined in table 5.

Table 5. Study design, study aim and results of included articles in the mini-review concerning hesitancy of vaccination or reasons for no vaccination.

| Title | Study design | Aim | Results |
|---|---|---|---|
| Mapping vaccine hesitancy—Country-specific characteristics of a global phenomenon (Dubé, Gagnona, Nickels, Jeram & Schuster, 2014). | Qualitative (semi-structured Interviews with 13 immunization managers) | Understanding the variety of vaccine hesitancy existing in different settings | The findings show that vaccine hesitancy was not restricted to any specific region or continent but exists worldwide. Identified determinants with regard to vaccine hesitancy: concerns regarding vaccine safety, sometimes due to scientifically proven side effects after vaccination or else triggered by rumours, misconceptions or negative stories spread in the media, religious beliefs and the influence of religious leaders, the influence of communication and media environment, lack of knowledge or education of the population, and the mode of vaccine delivery (i.e. |

| | | | |
|---|---|---|---|
| | | | geographic barriers, mass vaccination campaigns). |
| Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015–2017 (Lane, MacDonald, Marti & Dumolard, 2018). | Cohort study | Determine the reported rate of vaccine hesitancy across the globe, the cited reasons for hesitancy, if these varied by country income level and/or by WHO region and whether these reasons were based upon an assessment. | The Joint Reporting Form (JRF) questionnaire of 2014, 2015 and 2016 was conducted under 194 WHO member states, including the Netherlands. The JRF questionnaire includes estimates of national immunization coverage, reported cases of vaccine-preventable diseases, immunization schedules, and indicators of immunization system performances. This study confirms that hesitancy is present in the majority of countries globally with less than 10% reporting no hesitancy. The most frequently cited reasons for vaccine hesitancy are varied by country income level and by region. Globally they are related to (1) the risk benefit of vaccines, (2) knowledge and awareness issues, (3) religious, cultural, gender or socio-economic factors. In high-income countries: (1) risk/benefit (scientific evidence, (2) beliefs, attitudes and motivation about health and prevention and (3) risk/benefit (perceived, heuristic). In Europe: (1) risk/benefit (scientific evidence), (2) knowledge/awareness and (3) communication and media environment. Only just over 1/3 of countries reported that their reasons were assessment based, this were mainly high-income and European countries. |
| Underlying factors impacting vaccine hesitancy in high-income countries: a review of qualitative studies (Dubé, Gagnon, MacDonald, Bocquier, Peretti-Watel, & Verger, 2018). | Systematic review | Insights into the determinants of parental decision-making about vaccination | What a parent thinks and does about vaccination is very specific to a particular vaccine and will vary according to socio-cultural context, social circumstances and personal experience. Trust in health care providers and mainstream medicine, the influence of social networks and social norms, knowledge, and sources of (and trust in) information about vaccines and risk perceptions regarding vaccines<br>and vaccine-preventable diseases influence parental vaccination decisions. |

| | | | |
|---|---|---|---|
| The benefit of the doubt or doubts over benefits? A systematic literature review of perceived risks of vaccines in European populations (Karafillakis & Larson, 2017) | Systematic review | Examine studies on vaccine and vaccination risk perceptions and concerns across European populations | The most important concern across all European countries was vaccine safety, followed by perceptions of small possibilities of getting vaccine-preventable diseases (VPDs), perceived low severity of VPDs, beliefs that vaccines do not work, and in general lack of information. Concerns were found to be vaccine-, country- and population-specific. Additionally, this study confirmed that individuals have many safety concerns about vaccination and generally believe there are more risks than benefits for vaccinating. |

To be able to determine which determinants have the largest effect on vaccine hesitancy the determinants of the vaccine hesitancy determinants matrix are judged on their occurrence by the criteria in table 6.

Table 6. Criteria for effect determining

| **Article** | **Big effect** | **Small effect** | **No effect** |
|---|---|---|---|
| Mapping vaccine hesitancy—Country-specific characteristics of a global phenomenon (Dubé, et al, 2014). | When a determinant was mentioned by at least six immunization managers, it was considered as having a big effect. | When a determinant was mentioned by less than six immunization managers, it was considered as having a small effect. | Not mentioned at all. |
| Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015–2017 (Lane et al, 2018). | When a determinant was mentioned in the top three reasons for vaccine hesitancy in the European region in 2016 and high-income countries in 2016, it was considered as having a big effect. | When a determinant was mentioned but not in the top three reasons for vaccine hesitancy in the European region in 2016 and high-income countries in 2016 it was considered as having a small effect. | Not mentioned at all. |
| Underlying factors impacting vaccine hesitancy in high-income countries: a review of qualitative studies (Dubé et al, 2018). | Determinants reported as main finding were seen as having a big effect on vaccine hesitancy. | Determinants that were mentioned, but not as main finding, were considered as having a small effect. | Not mentioned at all. |
| The benefit of the doubt or doubts over benefits? A systematic literature review of perceived risks of vaccines in European populations (Karafillakis et al, 2017). | The most common concerns in Europe and the Netherlands are considered as determinants with a big effect. | Determinants mentioned but not mentioned as most concern in Europe or the Netherlands are considered as having a small effect. | Not mentioned at all. |

Three of the four included studies, see table 5, used the concept of vaccine hesitancy as used in this study (Dubé, Gagnona, Nickels, Jeram & Schuster, 2014; Lane, MacDonald, Marti & Dumolard, 2018; Dubé, Gagnon, MacDonald, Bocquier, Peretti-Watel, & Verger, 2018; Karafillakis & Larson, 2017). As aforementioned, this concept of vaccine hesitancy refers to a delay in acceptance or refusal of vaccines despite the availability of vaccine services. Vaccine hesitancy is complex and context specific, varying across geographies and vaccine types. It is influenced by factors such as complacency, convenience and confidence (3 "Cs" model) (MacDonald, 2015, p3).

Looking at table 7, it can be seen that all studies mentioned that the determinant religion/culture/gender and socioeconomic status had an association with vaccine hesitancy (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). Religious beliefs were usually linked to the refusal of all vaccines. Vaccine hesitancy was seen mainly among illegal settlers or immigrants without an official status (Dubé et al, 2014). Besides, it was globally the third most mentioned reason for vaccine hesitancy according to the study of Lane et al, (2018) e.g. due to certain religious sects or traditional cultural beliefs. There is also vaccine hesitancy due to socio-economic group influences (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). Examples are social judgment and social norms. Higher education may be associated with both lower and higher levels of vaccine acceptance (Dubé et al, 2014).

The determinant communication and media environment was mentioned in all studies as having an association with vaccine hesitancy by rumours, misconceptions, negative information and internet stories that are carried out in the mass media (television and internet) (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017).

Lack of knowledge or misinformation can be caused by not being properly informed. Individuals felt that they had insufficient knowledge to make an informed decision. The knowledge and awareness determinant was mentioned in all studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017).

The risk/benefits (scientific evidence) determinant was mentioned in all studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). It was the most mentioned reason in Europe and in high-income countries (including the Netherlands) for vaccine hesitancy. The risk/benefit determinant contained among others vaccine safety concerns and fear of side effects (Lane et al, 2018). Risk perceptions include concerns about the safety of vaccination, lack of perceived benefits of vaccination and lack of understanding the burden of vaccination preventable diseases. Vaccine hesitancy was associated with adverse events after immunization (Dubé et al, 2014).

Mode of delivery was mentioned in three of the four studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018). The design of the vaccination programme could be seen as a contributory factor to vaccine hesitancy (Dubé et al, 2014). The views on vaccination program were identified as having an influence on deciding to vaccinate or not. Not all public health interventions are properly designed as individuals would want (Dubé et al, 2018).

The determinant about the role of the healthcare professional was mentioned in all studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). Lack of knowledge about vaccination among health professionals was linked to vaccine hesitancy. Furthermore, it was emphasized that health professionals may themselves be vaccine-hesitant which can influence the vaccination uptake. However, these reasons are only mentioned a few times as this is often not the case (Dubé et al, 2014).

Additionally, Dubé et al, (2018) found that there was trust/mistrust in healthcare professionals and institutions. This trust/mistrust was mentioned in all studies and can be subdivided to the determinant personal experience with and trust in the health system and provider. People reported mistrust in authorities, doctors and governments (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017).

The determinant risk/benefit (perceived, heuristic) was mentioned as a reason for vaccine hesitancy in all studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). Vaccine hesitancy was associated with a lack of perceived benefit of vaccination due to the low

prevalence of vaccination preventable disease in the country (Dubé et al, 2014). Vaccine hesitancy also occurs due to perceived non-severity of traditional childhood diseases (Karafillakis et al, 2017).

Anticipated regret, feeling of responsibility and attitudes towards immunity and vaccines refers back to beliefs, attitudes and motivation about health and prevention (Dubé et al, 2018). This determinant was mentioned in all studies as a reason for vaccine hesitancy. The attitude towards vaccination was seen as important determinant in getting vaccinated (Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017).

Influential leaders were associated with leading anti-vaccination groups or religious groups (Dubé et al, 2014). The influence of influential leaders as the reason for vaccine hesitancy was described in two of four articles but was not mentioned in the other two studies (Dubé et al, 2014; Lane et al, 2018; Karafillakis et al, 2017).

Additionally, immunization as a social norm or as needed/harmful was mentioned in three of four included studies and refers back to the influence of the peer group (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017). It was however only mentioned by a small group of people and the effect on vaccine hesitancy was small.

About geographical barriers; it was mentioned that it was easier to mobilize the vaccination team than the population Dubé et al, 2014). There were barriers found in accessing vaccination services (Dubé et al, 2018). Geographical barriers were mentioned by three out of four studies (Dubé et al, 2014; Lane et al, 2018; Dubé et al, 2018).

Reliability was mentioned in two studies (Dubé et al, 2014; Dubé et al, 2018; Karafillakis et al, 2017). Reliability of vaccine supply was mentioned as a reason for vaccine hesitancy were individuals do not trust the vaccination supply and think vaccines are out of stock or vaccination cannot be completed (Dubé et al, 2014).

The introduction of new vaccines was perceived as contributing to vaccine hesitancy in three of the four studies (Dubé et al, 2014; Lane et al, 2018; Karafillakis et al, 2017). Introduction of new and costly vaccines was seen as triggering vaccine hesitancy (Dubé et al, 2014). Concerns about new vaccines were linked to uncertainties and individuals often think there is insufficient evidence or testing of the vaccine (Karafillakis et al, 2017).

Dubé et al, (2018) described that direct/indirect experience with vaccination preventable diseases was related to vaccine hesitancy. Previous negative experience with vaccination was related to vaccine hesitancy. This connects with the determinant experience in the past that was mentioned in three of four studies (Dubé et al, 2018; Lane et al, 2018; Karafillakis et al, 2017).

There were small issues with timely vaccination and with following the schedule in two of the four studies which were related to the determinant 'vaccination schedule'. Some individuals were not comfortable with schedules, they think it's not okay to give many vaccinations in a short time (Lane et al, 2018; Dubé et al, 2018; Karafillakis et al, 2017).

Politics is in no included study mentioned as a reason for vaccine hesitancy. A determinant that was only mentioned in one study was the mode of administration (Karafillakis et al, 2017). Additionally, historical influences were only mentioned in Lane et al, (2018) and had a small impact in that study. Furthermore, the determinant costs was only mentioned in two of the four studies but was not relevant in the Netherlands as the costs of vaccinations are covered by the government (Dubé et al, 2014; Lane et al, 2018). The pharmaceutical influence was mentioned in two studies. They reported that mistrust was common in especially pharmaceutical companies and the government (Lane et al, 2018; Karafillakis et al, 2017).

Results of the study of Lane et al, (2018) show that reasons for vaccine hesitancy were varying by country income level, by WHO region and over time and within a country. For high-income countries (the Netherlands among others), risk benefit (scientific evidence) stayed the most mentioned reason (lane et al, 2018). The most common concerns about risks and benefits of vaccination in the Netherlands were vaccine safety, low risk of contracting vaccination preventable diseases, low severity of vaccination preventable diseases, low effectiveness and vaccinations do not qualify (karafillakis et al, 2017).

Table 7. Effects of the determinants of the vaccine hesitancy determinants matrix in the included articles

| **Determinants contextual influences** | Effect in Dubé, et al (2014)? | Effect in Lane et al, (2018)? | Effect in Dubé, et al (2018)? | Effect in Karafillakis et al, (2017)? |
|---|---|---|---|---|
| *Communication and media environment* | Small | Big | Big | Big |
| Influential leaders, gatekeepers and anti- or pro vaccination lobbies | Big | Big | Non | Non |
| Historical influences | Non | Small | Non | Non |
| *Religion/culture/gender and socio-economic* | Big | Big | Small | Big |
| Politics/policies | Non | Non | Non | Non |
| *Geographic barriers* | Big | Small | Big | Non |
| Pharmaceutical industry | No | Small | No | small |
| **Determinants individual and group influences** | | | | |
| Experience with past vaccination | Non | Small | Big | small |
| *Beliefs, attitudes and motivation about health and prevention* | Small | Big | Big | Big |
| *Knowledge/awareness* | Small | Big | Big | Big |
| *Personal experience and health system and providers-trust* | Small | Small | Big | Big |
| *Risk/benefit (perceived, heuristic)* | Big | Big | Big | Big |
| Immunization as a social norm vs. not needed/harmful | Non | No effect in 2014, small effect 2015 and 2016 | Big | small |
| **Determinants vaccination specific issues** | | | | |
| *Risk/ Benefit (scientific evidence)* | Small | Big | Big | Big |
| Introduction of a new vaccine or new formulation | Small | Small | Non | Big |
| Mode of administration | Non | Small in 2014, non in 2015 and 2016 | Non | small |
| *Design of vaccination program/mode of delivery* | Small | Big | Big | Non |
| Reliability and/or source of vaccine supply | Small | Small | Non | Non |
| Vaccination schedule | Non | Small | Small | Non |
| Costs | Small | Small | Non | Non |
| Role of healthcare professionals | Small | Big | Small | Small |

## 3.2. Conclusion mini review

In two of the four included studies, the vaccine hesitancy determinants matrix was used (Dubé et al, 2014; Lane et al, 2018; Kumar et al, 2016). In the other studies, the results still fit into one of the determinants of the matrix, even when it was not used, and no additional determinants were found (Dubé et al, 2018; Karafillakis et al, 2017). Altogether, it can be stated that except for politics, all of the determinants in the vaccine hesitancy matrix are found as a reason for vaccine hesitancy, see table 7.

To be able to answer the first sub-question: '*Which determinants have the largest effect on vaccine hesitancy according to the literature?*' the determinants were judged by looking at the effect of the determinant on vaccine hesitancy (see table 6). Some had a big effect, other a small or were not mentioned at all. A determinant that had in all studies effect on vaccine hesitancy and in at least two studies a big effect, was considered an important determinant influencing vaccine hesitancy. A determinant that was mentioned in three studies as a reason for vaccine hesitancy, from which at least two studies describe that the determinant had a big effect, was also considered as an important determinant influencing vaccine hesitancy. With these two criteria in mind, it can be concluded that the determinants which have the largest effect on vaccine hesitancy are the italic determinants from table 7, they can be found in table 8.

Table 8. The nine determinants with the largest effect on vaccine hesitancy

| **Contextual influences** | **Individual/social group influences** | **Vaccination specific issues** |
|---|---|---|
| Communication and media environment | Beliefs, attitudes and motivation about health and prevention | Risk/benefit (scientific evidence) |
| Religion/culture/gender, socio-economic group | Knowledge/awareness | Design of vaccination program/mode of delivery |
| Geographic barriers | Personal experience and health system and providers-trust | |
| | Risk/benefit (perceived, heuristic) | |

## 3.3. Hypotheses

The findings from the mini-review lead to the determinants that have the largest effect on vaccine hesitancy, see table 8. The determinants with the largest effect on vaccine hesitancy lead to the hypotheses in table 9.

Table 9. Hypotheses

| **Hypotheses** |
|---|
| 1. Communication and media environment |
| -1A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they obtain information from doctors and nurses as compared to teenagers aged 14-19 who obtain information from internet pages, social media, friends, parents, classmates or teenagers who are not looking for any information at all.<br>- 1B. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they want to be informed through a folder/letter, while in class, through an information meeting in or out school, a digital decision aid, an app, government campaign, consult with a doctors or nurse, through their parents/guardians or when they do not want information because they have already decided they are getting vaccinated, as compared to teenagers aged 14-19 who want to be informed through a website or social media. |
| 2. Religion/culture/gender and socio-economic group |

- 2A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they do not belong to a religion as compared to teenagers aged 14-19 who belong to a religion.
- 2B. Teenagers aged 14-19 are more likely to get all the offered vaccinations when their parents do not belong to a religion as compared to teenagers aged 14-19 whose parents belong to a religion.
- 2C. Teenagers aged 14-19 are more likely to get all the offered vaccinations when their migration background is Dutch as compared to teenagers with a non-Dutch migration background.
- 2D. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they follow high education (HAVO/VWO) as compared to teenagers aged 14-19 who are following middle (VMBO-T) or low education (practical education, VMBO-B, VMBO-K).
- 2E. Teenagers aged 14-19 are more likely to get all the offered vaccinations when their parents are highly educated (HBO, University) as compared to teenagers aged 14-19 whose parents are middle (HAVO, VWO, MBO) or low (basic education, VMBO) educated.
- 2F. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think that not vaccinating for religious or cultural reasons does endanger the health of children as compared to teenagers aged 14-19 who think not vaccinating for religious or cultural reasons does not endanger the health of children.

3. Geographic barriers

- 3A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they want to invest more time than 15 minutes to get a vaccine compared to teenagers aged 14-19 who do not want to invest more time than 15 minutes to get a vaccine.
- 3B. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they are satisfied with the distance to the place where they can get vaccinated compared to teenagers who are not satisfied with the distance to the place where they can get vaccinated.

4. Beliefs, attitudes and motivation about health and prevention

-4A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think vaccinations are important for their health as compared to teenagers aged 14-19 who think vaccinations are not important for their health.

5. Knowledge/awareness

- 5A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they know which vaccinations the national vaccination program consists of compared to teenagers aged 14-19 who do not know which vaccinations the national vaccination program consists of.
- 5B. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think they have sufficient knowledge to make a choice as to whether or not they want to be vaccinated compared to teenagers aged 14-19 who do not think they have sufficient knowledge to make a choice as to whether or not they want to be vaccinated.

6. Personal experience and health system and providers- trust

- 6A. Teenagers aged 14-19 are more likely to get all the offered when they trust the vaccination advice from their nurse or doctor compared to teenagers aged 14-19 who do not trust the vaccination advice from their nurse or doctor.

7. Risk/benefit perceived, heuristic

- 7A. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they do not have any concerns about vaccination compared to teenagers aged 14-19 who have concerns about vaccination.

8. Risk/benefit scientific evidence

- 8A. Teenagers aged 14-19 are more likely to get all the offered when they think vaccinations are safe compared to teenagers aged 14-19 who do not think vaccinations are safe.
- 8B. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think they get enough information about vaccinations and their safety compared to teenagers aged 14-19 who think they do not get enough information about vaccinations and their safety.

# 4. Data and methods

In this chapter is described how the second, third and fourth sub-question will be answered by analysing the results of the questionnaire. This chapter will outline the method used and starts with the study design and study population. The questionnaire is described in the data collection, together with the procedure. Additionally, the ethical approval is presented. Lastly, the data analysis will be discussed.

## 4.1. Study design

Within this study, a quantitative approach was used. This study has a cross-sectional design, as data were collected at only one point in time. A questionnaire is a good manner to gather information in a cross-sectional study (Mann, 2003). The structured questionnaire provides quantitative information with regard to the intention to get all the offered vaccinations of teenagers aged 14-19.

## 4.2. Study population

### 4.2.1. Sample size

Two high-schools participated in this study. At one school, classes with education levels VMBO-T, HAVO and VWO participated. At the other school, two HAVO classes participated. Pupils aged 14-19 were included. The policy measure is for teenagers with the age of sixteen and seventeen. The reason for including teenagers aged 14-19 was because teenagers who are slightly younger will also reach the age where the policy measure can affect them and teenagers who are slightly older might have relevant information. Another inclusion criterion was an education level from 'practical education' to 'VWO-gymnasium'. Furthermore, teenagers had to master the Dutch language. Besides, parents of teenagers younger than sixteen and teenagers themselves must have given their consent for voluntary participating in this investigation. Exclusion criteria were teenagers older or younger than 14-19 year, another education level than 'practical education' to 'VWO-gymnasium', not mastering the Dutch language, parents who obligated to participating and teenagers who themselves were not willing to participate. No teenagers dropped out due to not speaking the Dutch language, obligation from their parents, their education level or age. The consent of teenagers and parents will be further described in part 4.2.2.

### 4.2.2. Recruitment

The two participating high-schools were located in cities in the middle and the east of the Netherlands. The school located in the middle of the Netherlands had a student population of 2.300-2.400 students in 2018 and the school teach the following education levels: 'VMBO-B', 'VMBO-K', 'VMBO-T', 'HAVO', 'VWO-Athenium', and 'VWO-Gymnasium'. The school located in the east of the Netherlands had a student population of 1.000-1.100 students in 2018, the educational levels that are teached: 'VMBO-T', 'HAVO', 'VWO-Athenium', and 'VWO-Gymnasium'. The schools were on forehand contacted for participating by e-mail and provided with the objective and relevance of this study. The parents of the children received an information letter about the involvement of their child(-ren) in the study and that they could object against participating of their child(-ren). This is called an opt-out option (Van den Broucke, 2006). Only parents of children under the age of 16 could object because teenagers older than 16 may by law decide for themselves whether they want to participate or not. The Dutch letter to the parents can be found in Appendix 8. If there were objections from parents, the child was excluded and did not receive a link for participating. However, as aforementioned, no parents objected against participating. Participation was voluntary, children who participated gave permission by clicking on 'next' to go further to the first question in the questionnaire (Appendix 6). There were 618 teenagers asked to fill in the online questionnaire. Of the invited teenagers, 301 participants started the questionnaire; thus, the response rate was 48.7% (301/618) in total. Of the participants that started the questionnaire, 243 participants completed the questionnaire; thus the response rate for completed questionnaires was 39.3% (243/618).

## 4.3. Data collection

In order to collect data, a structured questionnaire with 25 questions (Appendix 6) was composed. The questionnaire is based on the vaccine hesitancy determinants matrix (see figure 4 and table 3). The INTENTION TO GET ALL THE OFFERED VACCINATIONS was the dependent variable. The intention to get all the offered vaccinations was measured by a question in the questionnaire. Teenagers that did not receive all the offered NIP vaccinations or did not know whether they had received all the offered vaccinations got the question whether the teenagers has the intention to receive them when they get the missed vaccination(s) offered again, on a five-point Likert scale (no, probably not, in doubt, probably yes, and yes). The determinants of the contextual influences, individual/social group influences and vaccination specific issues with the largest effect (see table 8) were used to guide the structure of the questionnaire. The CONCEPTUAL INFLUENCES, INDIVIDUAL AND/OR SOCIAL GROUP INFLUENCES and VACCINATION SPECIFIC ISSUES were the main independent variables. Conceptual influences contained the following independent variables: communication and media environment, religion/culture/gender and socio-economic and geographic barriers. Individual and/or social group influences contained the independent variables: beliefs, attitudes and motivation about health and prevention, knowledge/awareness, personal experience and health system and providers- trust and risk/benefit (perceived, heuristic). The vaccination specific issues independent variables were risk/ benefit (scientific evidence) and design of vaccination program/mode of delivery. Additionally, most of the gathered background characteristics were also independent variables. The independent background characteristics were: gender, education level teenager and parents, religion teenager and parents and the migration background of the teenager and the parents. The students were also asked to which school they went and what their age was, these background characteristics were used as control variables. The independent variables were measured with the questions in the questionnaire. See Appendix 6, the independent variables can be found in brackets behind the questions.

The first part of the questionnaire was based on a survey about the vaccine hesitancy determinants matrix (WHO, 2014; Larson, Jarrett, Schulz, Chaudhuri, Zhou, Dube, & Wilson, 2015) and a survey from the National Institute for Public Health and the Environment of the opinion of young people about the vaccination of meningococci and the organization thereof (personal communication, March 13, 2019). This first part consisted of sixteen questions, see Appendix 6. The questions were either multiple choice questions, open questions or questions about statements based on a five-point Likert-scale (0-4): 'totally disagree', 'partly disagree', 'neither agree nor disagree', 'partly agree', and 'totally agree'.

In Appendix 7, the operationalization of the questions can be found. The determinant 'communication and media environment' was determined by asking with multiple choice questions (teenagers could choose multiple answers) where teenagers looked for information, how they would like to be informed and which information they would like to receive. The determinant 'religion/culture/ gender and socioeconomic group' was investigated by asking with a Likert scale question whether teenagers think that people who do not have their child vaccinated because of religious or cultural reasons are risking the health of their child. The determinant 'geographic barriers' were determined with asking (Likert scale) teenagers whether the place where teenagers can be vaccinated is conveniently located and how much time they want to spend on getting a vaccination. The determinant 'beliefs, attitudes and motivation about health and prevention' was investigated wit asking the teenagers, based on the Likert scale, whether they think vaccinations are important for their health. The 'knowledge/awareness' determinant was investigated by asking whether teenagers think they know of which vaccinations the NIP consist and whether teenagers feel have enough knowledge to make a choice whether or not they want to be vaccinated, both asked with the Likert scale. The determinant 'risk/benefit (scientific evidence) was determined by asking, with the Likert scale, whether teenagers believe vaccinations are safe and whether they think they receive sufficient information about vaccinations and their safety. The determinant 'risk/benefit perceived heuristic' was determined by asking whether teenagers have concerns about vaccinations (Likert scale), and if yes, what these concerns are (open question). The determinant 'personal experience and health system

and providers- trust' was determined by asking whether teenagers have confidence in the vaccination advice that their caregiver give them. Last, the determinant 'design of vaccination program/mode of delivery' was investigated by asking teenagers, with an open question, which things could be done to make it easier for them to get all the offered vaccinations.

The second part of the questionnaire were nine questions about background characteristics. The operationalisation can be found in Appendix 7. Teenagers got the question to which school they went (school 1 = 1; school 2 =2), their age (13 = 0; 14 = 1; 15 = 2; 16 = 3; 17 = 4; 18+ = 5) , their gender (man = 0; woman = 1), the highest education level of the household (low = 0 [basic education, VMBO]; middle =1 [HAVO, VWO, MBO]; high = 2 [HBO, University]; do not know =3), the education level of the teenager self (VMBO-T = 0, HAVO =1, VWO=2), the religion of their parents and themselves (no religion: 0; re-reformed: 1; Islam:2 other religion (roman catholic, protestant and other): 3), and the migration background of teenagers themselves and their parents (Dutch = 1; first or second generation immigrant =2) (CBS, 2016). These questions were partly based on questions from 'Centraal Bureau voor de Statistiek' and partly drawn up by the researcher herself.

The questionnaires were gathered and completed from April 15 to April 26, 2019. In part one, participants could not go to the next question without answering, but with the answer option 'I do not want to answer', they were not forced to respond. For open questions and statements in part one and all questions in part two, participants were able to go to the next question without answering. Participants got, however, a notification when answers were missing so they could then choose to adjust or proceed.

In a pilot, six teenagers were asked to fill in the questionnaire to verify the duration of the questionnaire (+/- 10 minutes) and to test whether the questions were understandable. They all understood the questions and completed the questionnaire in around 10 minutes, as estimated in advance.

The online survey tool Qualtrics was used for the distribution of the questionnaire. The researcher distributed the link to teachers of participating schools. Next, participants received from their teacher an invitation by email to participate while in class. Teenagers could fill in the questionnaire via laptop or phone.

## 4.4. Ethical approval

Because the study involved humans in a direct way, the study design had to be approved by the ethical committee (University of Twente, N.D.). Approval for proceeding this investigation has been granted by the ethical committee of the Faculty of Behavioural, Management and Social Sciences of the University of Twente under file number 190240.

## 4.5. Data analysis

### 4.5.1. Data management

Table 10 contains the data management plan (University of Twente, N.D.-a).

Table 10. Data management plan

| Subject | Elaboration |
|---|---|
| Data type | Questionnaire. |
| Data storage | The gained data is stored at the laptop of the researcher. The laptop is secured with a password.<br>There is a backup on the google drive account of the researcher. |
| Data security | The gained data is secured and confidential because only the researcher has access to the laptop (through a password) and the account on google drive.<br>Only the researcher and her primary, secondary and extern supervisor have access to the data. The supervisors had access to the raw data via the central and secured BMS server.<br>The data had a small likelihood of being traceable back to specific persons because no names are mentioned and the name of the schools were recoded. |
| Data archiving | After finishing the study, the anonymous data was archived for a minimum period of 10 years at the University of Twente.<br>First supervisor prof. Dr. A. Need is responsible for the data archiving. |

### 4.5.2. Analysing the data

The data accomplished through the questionnaires was downloaded from Qualtrics and uploaded in IBM SPSS Statistics where it was analysed. In Appendix 9, the syntax can be found. Missing values were not taken into further analysis and could be found by checking if the data got a 1 (finished) or 0 (not finished) in the column 'finished'. Questions that participants didn't want to answer or that participants answered with 'I do not know' were excluded from analysis for that specific question. As aforementioned, 243 participants completed the questionnaire. As there were only two participating schools, the participant (1) who said to study at another school than these two was excluded and thus 242 participants remained, see figure 6.

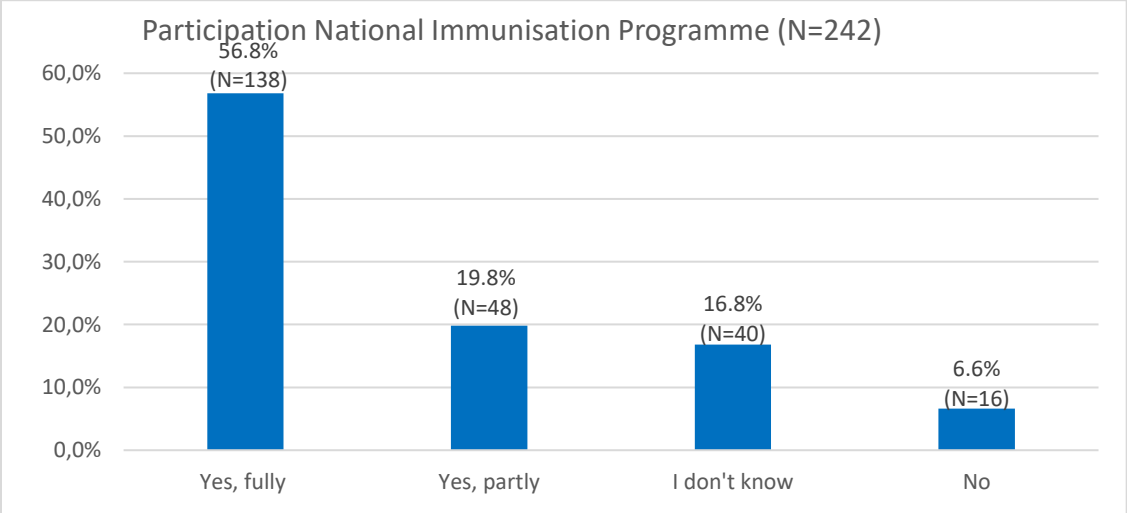


Figure 6. Participation National Immunisation Programme

As this study is about a policy measure for teenagers who are not or not (completely) vaccinated, participants who are completely vaccinated (N=138) were not further investigated and excluded from the analysis. Teenagers who did not know whether they were completely vaccinated or not (40) were taken into account because this can also contain not completely vaccinated teenagers, and this group can, therefore, generate relevant information. In total, 104 of the 242 (43.2%) filled in questionnaires were found eligible for the analysis. All variables were discrete, either nominal, ordinal or binair.

First, questions about the background characteristics were used for the univariate analysis to create an overview of the characteristics of the study population. The characteristics overview was created by using descriptive statistics. According to the central limit theorem, all values were normally distributed (Field, 2013).

Second, the bivariate analyses for the dependent variable 'intention to get all the offered vaccinations' was executed. The dependent variable 'intention to get all the offered vaccination' was ordinal but could also be seen as an interval variable. The statement questions about 'whether teenagers think vaccinations are important for their health', 'whether teenagers think that people who do not have their child vaccinated because of religious or cultural reasons are risking the health of their child', 'whether teenagers think they know of which vaccinations the NIP consist', 'whether teenagers have confidence in the vaccination advice that their caregiver give them', 'whether teenagers have concerns about vaccinations', 'whether teenagers believe vaccinations are safe', 'whether teenagers feel that they receive sufficient information about vaccinations and their safety', 'whether the place where teenagers can be vaccinated is conveniently located' and 'whether teenagers feel they have enough knowledge to make a choice whether or not they want to be vaccinated' were asked based on a 0 to 4 scale (Likert) and could be seen as interval. The relations between the intention to get all the offered vaccination and the statement questions were measured by the Spearman correlation. To use the Spearman correlation, the N had to be at least 30 and the data met this condition (Universiteit Utrecht, N.D). A p-value higher than 0.05 means that there is no statistical significance (Twisk, 2016).

The means and One-Way Analysis of Variance (ANOVA) were used to measure if the intention of teenagers to get all the offered vaccinations was associated with the school, gender, age, education, religion and migration background of the teenagers. If there was a statistically significant difference found based on the ANOVA, the means were compared to look at the difference. The means and ANOVA were also used to measure whether there was a significant difference in the characteristics of parents (education, religion) and whether a teenager is intended to get all the offered vaccinations.

Teenagers who had concerns were asked about what their concerns were. Their answers were measured by summarizing the answers briefly and vigorously in 1 or 2 keywords or a very short sentence and categorize them. The same goes for questions that also contained the option 'otherwise, namely…' and the open question about what things can be done to make it easier for teenagers to get vaccinations.

Because the N was too small, a multivariate analysis was not performed.

## 5. Results

The aim of this chapter is answering the second, third and fourth sub-questions. The chapter will start with the participants' characteristics and teenager's information source, the way they want to be informed and what information they want. The results of the bivariate analyses are used to answer the sub-questions and they are described based on the nine determinants with the largest effect on vaccine hesitancy of the vaccine hesitancy determinants matrix. The results show means, Spearman correlations and p-values. The means are based on an intention scale of 0 (no intention to get all the offered vaccinations), 1 (probably not going to get all the offered vaccinations) 2 (in doubt) 3 (probably going to get all the offered vaccinations) and 4 (yes, going to get all the offered vaccinations).

### 5.1. Participants characteristics

The intention to get all the offered vaccinations is the dependent variable in this study. There are 104 teenagers included in this analysis. As could be seen in figure 6 of chapter 4, 16 of the 104 included teenagers are not vaccinated, 48 are not completely vaccinated and 40 do not know whether they are completely vaccinated or not. Figure 7 shows the intention of these not (completely) vaccinated teenagers. As can be seen, 8.7% have no intention to get all the offered vaccination, 8.7% is probably not going to get all the offered vaccinations, 26.0% is in doubt, 26.9% is probably going to get all the offered vaccinations and 29.8% is determined to get all the offered vaccinations.

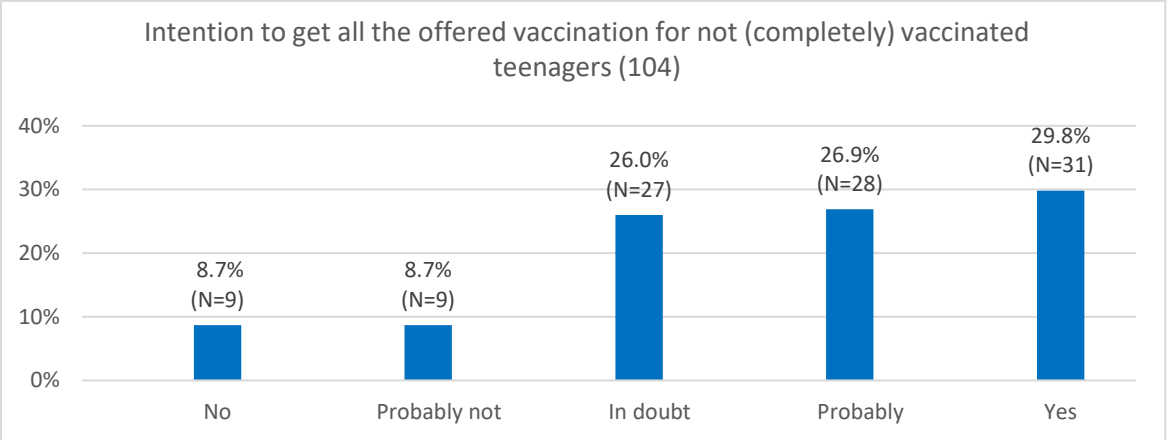


Figure 7. Intention of the not (completely) vaccinated teenagers aged 14-19 to get all the offered vaccinations.

Table 11 displays the background characteristics of the participants. There are no participants completely vaccinated, as these participants are excluded from further analysis. Of all participants, 46.2% is partly vaccinated, 38.4% do not know whether they are vaccinated or not, and 15.4% is not vaccinated. The mean age of the participants is 15.7, or while 16. The majority of the participants is a woman. Most teenagers follow the education level HAVO and a small part follow the education level VMBO-T or VWO. The highest education level of the household is mostly high, followed by inter-medium and a small part of the household have low as the highest education level. The majority of the teenagers do not belong to a religion, a quarter is re-reformed and the percentage that belongs to the Islam or belongs to another religion (other, reformed or roman catholic) is the same. The majority of the fathers and mothers of teenagers do not belong to a religion. After no religion, most parents belong to re-reformed, followed by Islam and other religion. The majority of teenagers is Dutch and the remaining percentage is first- or second-generation Immigrant.

Table 11. Background characteristics

| **Background characteristics** | **N** | **%** |
|---|---|---|
| Total | 104 | 100 |
| *Participation NIP* | | |
| Yes, completely | 0 | 0 |
| Yes, partly | 48 | 46.2 |
| No | 16 | 15.3 |
| Do not know | 40 | 38.5 |
| *Age* | | |
| 14 | 12 | 11.5 |
| 15 | 38 | 36.5 |
| 16 | 34 | 32.7 |
| 17 | 12 | 11.5 |
| 18+ | 8 | 7.8 |
| *Gender* | | |
| Man | 33 | 31.7 |
| Woman | 71 | 68.3 |
| *Education teenagers* | | |
| VMBO-T | 11 | 10.6 |
| HAVO | 78 | 75.0 |
| VWO | 15 | 14.4 |
| *Highest education level of the household* | | |
| Low | 15 | 14.4 |
| Inter-medium | 28 | 26.9 |
| High | 46 | 44.3 |
| Other | 15 | 14.4 |
| *Religion teenager* | | |
| No | 38 | 36.5 |
| Re-reformed | 26 | 25.1 |
| Islam | 20 | 19.2 |
| Other religion (other, reformed, roman catholic) | 20 | 19.2 |
| *Religion father* | | |
| No | 41 | 39.5 |
| Re-reformed | 25 | 24.0 |
| Islam | 20 | 19.2 |
| Other religion (other, reformed, roman catholic) | 15 | 14.4 |
| Unknown | 3 | 2.9 |
| *Religion mother* | | |
| No | 33 | 31.7 |
| Re-reformed | 25 | 24.0 |
| Islam | 20 | 19.2 |
| Other religion (other, reformed, roman catholic) | 22 | 21.2 |
| Unknown | 4 | 3.9 |
| *Migration background teenager* | | |
| Dutch | 66 | 63.5 |
| First or second-generation Immigrant | 37 | 35.6 |
| Unknown | 1 | 0.9 |

## 5.2. Information source, information provision and what information teenagers want

Table 12 presents where teenagers are looking for information, the way they would like to be informed, and what information they would like to receive. Participants could give more than one answer; thus, the reported percentage is the share that has picked that option.

Table 12. Information source, the way teenagers want to be informed and what information teenagers want

| Question | N | % |
|---|---|---|
| Total: | 104 | 100 |
| **Where do you look for information?** | | |
| Internet pages | 70 | 67.3 |
| Parents/guardians | 65 | 62.5 |
| Doctor/nurse | 26 | 25.0 |
| Friends | 25 | 24.0 |
| I do not look for information | 23 | 22.1 |
| Classmates/teacher | 8 | 7.7 |
| Social media | 6 | 2.5 |
| I do not want to answer this question | 1 | 0.5 |
| Other | 0 | 0 |
| **How would you like to be informed about vaccinations?** | | |
| Folder/letter | 60 | 57.7 |
| Parents/guardians | 40 | 38.5 |
| Website | 31 | 29.8 |
| Talk with doctor/nurse | 31 | 29.8 |
| During class | 25 | 24.0 |
| Information-session at school | 12 | 11.5 |
| Digital choice-aid | 9 | 8.7 |
| Not, I know that I want to be vaccinated | 9 | 8.7 |
| App | 8 | 7.7 |
| Information-session outside school | 8 | 7.7 |
| Social media | 8 | 7.7 |
| Not, I know that I do not want to be vaccinated | 5 | 4.8 |
| Government campaign | 4 | 3.8 |
| I do not want to answer this question | 2 | 0.8 |
| Other | 1 | 0.4 |
| **What information would you like to receive about vaccines?** | | |
| Risk on the Vaccination preventable disease (VPD) | 73 | 70.2 |
| Effectiveness of vaccine in preventing VPD | 62 | 59.6 |
| Risk on side-effects from the vaccination | 55 | 52.9 |
| Symptoms of VPD | 44 | 42.3 |
| Experience of other teenagers with the vaccination | 39 | 37.5 |
| Composition of the vaccination | 35 | 33.7 |
| Number of patients, hospital admissions and mortality | 34 | 32.7 |
| Available studies about the vaccination | 29 | 27.9 |
| Experience in other countries with the vaccination | 26 | 10.7 |
| I would not like to receive information about vaccination | 5 | 4.8 |
| I do not want to answer this question | 6 | 1.5 |
| Other | 2 | 0.5 |

When teenagers aged 14-19 want to know something about vaccination, they can search on different sources. The majority (67.3%) search for information on the internet or asks their parents or guardians for information (62.5%). Other sources are a doctor or nurse, friends, classmates and/or their teacher and social media. Some teenagers are not searching for information about vaccination.

The teenagers got also a question of how they want to be informed about vaccination to be able to make a choice whether to vaccinate or not. Most teenagers, with 57.7%, would like to be informed by folder or letter. The second most favourite way teenagers want to be informed is, with 38.5%, by their parents or guardians. An equal percentage would like to be informed by a doctor/nurse or via a website. Other ways of informing are during class, via an information-session at school, via digital decision aid, an information-session outside school, social media, by an app or by a government campaign. Some teenagers do not need information because they already know that they are (not) getting vaccinated. A small part of the participants answered with 'other' but mentioned that he or she did not know how they want to be informed.

Teenagers could also make a choice in what information they want to receive about diseases and/or vaccinations against these diseases. Most teenagers, with 70.2%, would like to receive information about the risk for teenagers to get a VPD. Also, a lot of the teenagers with 59.6%, would like to receive information about the effectiveness of the vaccination in preventing the VPD, or otherwise said; how well a vaccination protects against getting the disease. 52.9% would like to receive information about the risk of side effects from vaccination. Almost half of the teenagers would like information about VPD symptoms. Around a third would like to know the experience of other teenagers, the composition of the vaccination and the number of patients, hospital admissions and mortality from the disease. Other wanted information is about available studies that have been done about diseases and experience in other countries. A small part does not want any information. The answers given by the answer category 'other' are: "side effects so that I know this is due to the vaccination" and "for how long the vaccination will protect me."

## 5.3. Contextual influences

The second sub-question is: *"What are the contextual influences, that arise due to historical, sociocultural, institutional, economic or political factors, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?"* In order to answer the second sub-question, the bivariate analyses are performed. With the bivariate analyses, hypotheses are tested and it is investigated which contextual influences have a significant relation with the intention to get all the offered vaccinations of teenagers aged 14-19.

### 5.3.1. Communication and media environment

In order to test the hypotheses belonging to the determinant 'communication and media environment' of the contextual influences, bivariate analyses are performed, and the results can be found in table 13.

Hypothesis 1A states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they obtain information from doctors and nurses as compared to teenagers aged 14-19 who obtain information from internet pages, social media, friends, parents, classmates or teenagers who are not looking for any information at all.* See table 13; the results show that there is no statistical difference between the information sources internet, social media, parents/guardians, friends, classmates/teacher, doctor/nurse and the intention of teenagers to get all the offered vaccinations. Additionally, there is no significant relation between not looking for any information and the intention to get all the offered vaccinations. Therefore, this hypothesis is rejected.

Hypothesis 1B states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they want to be informed through a folder/letter, while in class, through an information meeting in or out school, a digital decision aid, an app, government campaign, consult with a doctors or nurse, through their parents/guardians or when they do not want information because they have already decided they are getting vaccinated as compared to teenagers aged 14-19 who do not' want to be informed because they already know they are not getting vaccinated, want to be informed through a website or social media.* There is no statistical difference found in the intention to get all the offered vaccinations and teenagers who want to be informed by a folder/letter, website, social media, while in class, information meeting at school, information meeting outside school, digital decision aid, app,

government campaign, through a consult with a doctor or nurse, through parents/guardians or when they do not need information because they already know they are getting vaccinated, see table 13. There is, however, a significant relation found between the intention to get all the offered vaccinations of teenagers who say 'I do not need information because I already know that I am not getting vaccinated' and 'I do need information because I already know that I am not getting vaccinated' (P=0.00), see table 13. The mean score on the intention scale (0-4) to get all the offered vaccinations of teenagers who do not want information because they already decided they do not want to be vaccinated is 1.00. The mean score on the intention scale (0-4) to get all the offered vaccinations of teenagers who do not say that they do not need any information is 2.54. It can be stated that the intention to get all the offered vaccinations of people who do not need any information because they already know they are not going to get all the offered vaccinations is much lower than the intention of people who want information but already knowing that they are not getting vaccinated. However, none of the other information sources has a significant difference with the intention to get all the offered vaccinations and not wanting information because teenagers already decided they do not want to be vaccinated cannot be compared with the other information sources, thus the hypothesis is rejected.

Table 13. Mean score on the intention to get all the offered vaccinations (scale 0-4) and p-values of the determinant communication and media

| **Question** | **Answer** | **Mean (N=104)*** | **P-value (N=104)** |
|---|---|---|---|
| Where do you search for information if you want to know something about vaccination? | Internet | 2.61 | 0.92 |
| | No internet | 2.58 | |
| | Social media | 2.00 | 0.49 |
| | No social media | 2.61 | |
| | My parents/guardians | 2.60 | 0.95 |
| | Not my parents/guardians | 2.62 | |
| | My friends | 2.36 | 0.26 |
| | Not my friends | 2.68 | |
| | Classmates and/or teacher | 3.13 | 0.22 |
| | Not my classmates and/or teacher | 2.56 | |
| | A doctor or nurse | 2.92 | 0.13 |
| | Not a doctor or nurse | 2.50 | |
| | | | 0.72 |
| | I'm not looking for any information | 2.63 | |
| | I'm looking for any information | 2.52 | |
| How do you want to be informed to make a choice whether or not you want to be vaccinated? | Folder/letter | 2.55 | 0.60 |
| | No folder/letter | 2.68 | |
| | Website | 2.32 | 0.13 |
| | No website | 2.72 | |

| | | |
|---|---|---|
| Social media | 2.13 | 0.26 |
| No social media | 2.65 | |
| While in class | 2.60 | 0.98 |
| Not while in class | 2.61 | |
| Information meeting at school | 2.17 | 0.19 |
| No information meeting at school | 2.66 | |
| Information meeting outside school | 2.88 | 0.56 |
| No information meeting outside school | 2.58 | |
| Digital decision aid | 2.78 | 0.67 |
| No digital decision aid | 2.59 | |
| | | 0.53 |
| App | 2.86 | |
| No app | 2.58 | |
| Government campaign | 3.25 | 0.29 |
| No government campaign | 2.58 | |
| Through a consult with a doctor or nurse | 2.84 | 0.21 |
| Not through a consult with a doctor or nurse | 2.51 | |
| Through my parents / guardians | 2.60 | 0.97 |
| Not through my parents / guardians | 2.61 | |
| I do not need information because I already know that I am getting vaccinated | 3.33 | 0.07 |
| I do need information because I already | 2.54 | |

| | | | |
|---|---|---|---|
| | know that I am getting vaccinated | | |
| | I do not need information because I already know that I am not getting vaccinated | 1.00 | 0.00** |
| | I do need information because I already know that I am not getting vaccinated | 2.67 | |

* The means are based on an intention scale of 0 (no intention to get all the offered vaccinations), 1 (probably not going to get all the offered vaccinations) 2 (in doubt) 3 (probably going to get all the offered vaccinations) and 4 (yes, going to get all the offered vaccinations).
** Statistically significant

### 5.3.2. Religion/culture/gender and socio-economic group

In order to test the hypotheses belonging to the determinant 'religion/culture/gender and socio-economic group' of the contextual influences, bivariate analyses are performed. The results can be found in table 14.

Hypothesis 2A states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they do not belong to religion as compared to teenagers aged 14-19 who belong to a religion.* A statistical significance between the intention of teenagers to get all the offered vaccinations and belonging to a religion or not is found, and this hypothesis is accepted (P=0.01), see table 14. It can be stated that teenagers who do not belong to religion have the highest mean score on the intention to get all the offered vaccinations scale (0-4), with 3.13. After not belonging to a religion, teenagers who belong to the religion re-reformed have the highest mean score on the intention to get all the offered vaccinations scale (0-4), with 2.46. Followed by teenagers who belong to another religion (roman catholic, protestant and other), they have a mean score on the intention scale of 2.30. Teenagers who belong to the Islam have the lowest mean score on the intention to get all the offered vaccinations scale, with 2.10.

Hypothesis 2B states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when their parents do not belong to a religion as compared to teenagers aged 14-19 whose parents belong to a religion.* There is a significant difference found between the religion of the father of the teenager(P=0.01) and the intention of the teenager to get all the offered vaccinations, see table 14. The mean score on the intention to get all the offered vaccinations scale (0-4) of teenagers with a father who doesn't belong to a religion is 2.97, from teenagers with a father who belong to the Islam 1.90, teenagers with a father belonging to re-reformed have a mean intention score of 2.52 and teenagers whose father belongs to another religion (roman catholic, protestant and other) have a mean intention score of 2.73. Besides a statistical difference between the intention and the religion of the father, there is also a statistical difference between the intention of teenagers to get all the offered vaccinations and the religion of the mother (P=0.02), see table 14. Teenagers whose mothers do not belong to a religion have a mean score of 3.12 on the intention to get all the offered vaccinations scale (0-4) and the teenagers whose mother belong to the Islam have a mean score of 2.10 on the intention scale. The mean score on the intention to get all the offered vaccinations scale of teenagers whose mother is re-reformed is 2.44 and the mean intention score of teenagers whose mother belong to another religion (roman catholic, protestant and other) is 2.45. For both, the mother and father can be stated that when they do not belong to a religion, the teenager has a higher intention to get all the offered vaccinations than when the parents belong to a religion. Thus, the hypothesis is accepted. The intention of the teenagers whose parents who belong to another religion (roman catholic, protestant

or other) is the highest after no religion, followed by re-reformed. The intention of teenagers to get all the offered vaccinations is the lowest when their parents belong to the Islam.

Hypothesis 2C states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when their migration background is Dutch as compared to teenagers with a non-Dutch migration background.* The results show that there is no relation between the migration background of the teenager and the intention to get all the offered vaccinations, see table 14. This hypothesis is rejected.

Hypothesis 2D states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they follow high education (HAVO/VWO) as compared to teenagers aged 14-19 who are following middle (VMBO-T) or low education (practical education, VMBO-B, VMBO-K).*
It can be shown that there is no significant difference between the education levels, VMBO-T and HAVO or VWO of the teenagers and their intention to get all the offered vaccinations, see table 14. Therefore, this part of the hypothesis will be rejected. There were no participants with a low education level, so no pronunciation can be made about this part of the hypothesis.

Hypothesis 2E states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when their parents are high educated (VWO, HBO, University) as compared to teenagers aged 14-19 whose parents are middle (HAVO, MBO) or low (basic education, VMBO) educated.*
There is no significant difference between the highest education level of the household and the intention of teenagers to get all the offered vaccinations and this hypothesis is rejected.

Hypothesis 2F states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think that not vaccinating for religious or cultural reasons does endanger the health of children as compared to teenagers aged 14-19 who think not vaccinating for religious or cultural reasons does not endanger the health of children.* The results show that there is a significant small positive correlation between the teenagers who think that not vaccinating for religious or cultural reasons does endanger the health of children and the intention to get all the offered vaccinations (P=0.01, R=0.26), see table 14. This means that the more the teenagers agree to not vaccinating for religious or cultural reasons does endanger the health of children, the higher their intention to get all the offered vaccinations.

Table 14. Mean score on the intention to get all the offered vaccinations (scale 0-4) or correlations and p-values of the determinant religion/culture/gender and socio-economic group

| Variable(s) and category | N | Mean (0-4)* | Correlation | P-value |
|---|---|---|---|---|
| Religion teenager | 104 | | | 0.01** |
| - No religion | | 3.13 | | |
| - Re-reformed | | 2.46 | | |
| - Islam | | 2.10 | | |
| - Other religion (roman catholic, other, protestant) | | 2.30 | | |
| - Overall | | 2.61 | | |
| Religion father | 101 | | | 0.01** |
| - No religion | | 2.97 | | |
| - Re-reformed | | 2.52 | | |
| - Islam | | 1.90 | | |
| - Other religion (roman catholic, other, protestant) | | 2.73 | | |
| - Overall | | 2.61 | | |
| Religion mother | 100 | | | 0.02** |
| - No religion | | 3.12 | | |
| - Re-reformed | | 2.44 | | |
| - Islam | | 2.10 | | |
| | | 2.45 | | |

| | | | | |
|---|---|---|---|---|
| - Other religion (roman catholic, other, protestant) | | 2.60 | | |
| - Overall | | | | |
| Migration background teenager | 103 | | | 0.30 |
| - Dutch | | 2.69 | | |
| - First or second-**generation** Immigrant | | 2.43 | | |
| - Overall | | 2.60 | | |
| Education level teenager | 104 | | | 0.85 |
| - VMBO-T | | 2.45 | | |
| - HAVO | | 2.60 | | |
| - VWO | | 2.73 | | |
| - Overall | | 2.61 | | |
| Highest education level household | 89 | | | 0.57 |
| - Low | | 2.26 | | |
| - Inter-medium | | 2.42 | | |
| - High | | 2.63 | | |
| - Overall | | 2.51 | | |
| "I believe that people who do not (completely) vaccinate their child for religious or cultural reasons endanger their child's health" *and* "Intention to get all the offered vaccinations" | 103 | | 0.26 | 0.01** |

* The means are based on an intention scale of 0 (no intention to get all the offered vaccinations), 1 (probably not going to get all the offered vaccinations) 2 (in doubt) 3 (probably going to get all the offered vaccinations) and 4 (yes, going to get all the offered vaccinations).
** Statistically significant

### 5.3.3. Geographic barriers

To test the hypotheses belonging to the determinant 'geographic barriers' of the contextual influences, bivariate analyses are performed. See table 15 for the results.

*Hypothesis 3A states: Teenagers aged 14-19 are more likely to get all the offered vaccinations when they want to invest more time than 15 minutes to get a vaccination compared to teenagers aged 14-19 who do not want to invest more time than 15 minutes to get a vaccination.* See table 15, there is no significant relation found and this hypothesis is rejected.

*Hypothesis 3B states. Teenagers aged 14-19 are more likely to get all the offered vaccinations when they are satisfied with the distance to the place where they can get vaccinated compared to teenagers who are not satisfied with the distance to the place where they can get vaccinated.*
A significant, small positive relation is found and this hypothesis is accepted (P=0.03, R=0.22). It can be stated that the more satisfied teenagers are with the distance to the place where they can get vaccinated, the higher their intention to get all the offered vaccinations.

Table 15. Correlations and p-values of the determinant geographic barriers

| Variable | N | Correlation with "intention to get all the offered vaccinations" | p-value |
|---|---|---|---|
| "How much time do you want to spend on getting a vaccination?" | 104 | -.03 | 0.74 |
| "I am satisfied with the distance to the place where I can be vaccinated." | 102 | 0.22 | 0.03* |

* Statistically significant

### 5.3.4. Conclusion contextual influences

The aforementioned results show that the determinants 'religion/culture/gender and socioeconomic group' and 'geographic barriers' are the conceptual influences that are related to the intention of teenagers to get all the offered NIP vaccinations.

## 5.4. Individual/social group influences

The third sub-question is: *"What are the individual/social group influences, that arise from personal perception or influences of the social environment, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?"* In order to answer the third sub-question, bivariate analyses are performed. With the bivariate analyses is investigated which individual/social group influences have a significant relation with the intention to get all the offered vaccinations of teenagers aged 14-19 and which hypotheses can be rejected or accepted.

### 5.4.1. Beliefs, attitudes and motivation about health and prevention

In order to test the hypothesis belonging to the determinant 'beliefs, attitudes and motivation about health and prevention' of the individual/social group influences, bivariate analyses are performed. See table 16 for the results.

*Hypothesis 4A states: Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think vaccinations are important for their health as compared to teenagers aged 14-19 who think vaccinations are not important for their health.* The results shown in table 16 confirm hypothesis 4A, there is a positive medium statistically significant difference (P=0.00, R=0.44). It can be stated that the more teenagers agree to think vaccination is important for their health, the higher is their intention to get all the offered vaccinations.

Table 16. Correlation and p-value of the determinant beliefs, attitudes and motivation about health and prevention

| Variable | N | Correlation with "intention to get all the offered vaccinations" | p-value |
|---|---|---|---|
| "I think vaccination is important for my health." | 103 | 0.44 | 0.00* |

* Statistically significant

### 5.4.2. Knowledge/awareness

In order to test the hypotheses belonging to the determinant 'knowledge/awareness' of the individual/social group influences, bivariate analyses are performed. See table 17 for the results.

Hypothesis 5A states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they know which vaccinations the national vaccination program consists of compared to teenagers aged 14-19 who do not know which vaccinations the national vaccination program consists of.* There is a small positive correlation and statistically significant difference found (P=0.04, R=0.20),

see table 17. It can be stated that the stronger teenagers agree to know which vaccinations the national vaccination program consist of, the higher is their intention to get all the offered vaccinations.

Hypothesis 5B states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think they have sufficient knowledge to make a choice as to whether or not they want to be vaccinated compared to teenagers aged 14-19 who do not think they have sufficient knowledge to make a choice as to whether or not they want to be vaccinated.* There is also a positive medium correlation and significant difference between having enough knowledge to make a choice as to whether or not teenagers want to be vaccinated and their intention to get all the offered vaccinations (P=0.00, R=0.34), see table 17. Based on the results it can be stated that the stronger teenagers agree that they have enough knowledge to make a choice as to whether or not they want to be vaccinated, the higher their intention to get all the offered vaccinations.

Table 17. Correlations and p-values of the determinant knowledge/awareness

| **Variable** | **N** | **Correlation with "intention to get all the offered vaccinations"** | **p-value** |
|---|---|---|---|
| "I know which vaccinations the RVP consists of." | 104 | 0.20 | 0.04* |
| "I have enough knowledge to make a choice as to whether or not I want to be vaccinated." | 102 | 0.34 | 0.00* |

* Statistically significant

### 5.4.3. Personal experience and health system and providers- trust

In order to test the hypothesis belonging to the determinant 'personal experience and health system and providers- trust' of the individual/social group influences, bivariate analyses are performed. See table 18 for the results.

Hypothesis 6A states: *Teenagers aged 14-19 are more likely to get all the offered when they trust the vaccination advice from their nurse or doctor compared to teenagers aged 14-19 who do not trust the vaccination advice from their nurse or doctor*. As can be seen in table 18, there is a positive medium correlation and statistical difference found in the intention to get all the offered vaccinations and the trust in the advice about vaccinations that the doctor or nurse gives (P=0.00, R=0.36). Thus, the more trust in the advice about vaccinations that the doctor or nurse give, the higher the intention of teenagers to get all the offered vaccinations.

Table 18. Correlation and p-value of the determinant personal experience and health system and providers- trust

| **Variable** | **N** | **Correlation with "intention to get all the offered vaccinations."** | **p-value** |
|---|---|---|---|
| "I trust the advice about vaccinations that the doctor or nurse gives me." | 103 | 0.37 | 0.00* |

* Statistically significant

### 5.4.4. Risk/benefit perceived, heuristic

In order to test the hypothesis belonging to the determinant 'risk/benefit perceived, heuristic' of the individual/social group influences, bivariate analyses are performed. See table 19 for the results.

Hypothesis 7A states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they do not have any concerns about vaccination compared to teenagers aged 14-19 who have concerns about vaccination.* See table 19, there is no statistically significant difference between having concerns about vaccinations and the intention of teenagers to get all the offered vaccinations (P=0.27), and this hypothesis can be rejected. Some teenagers do have concerns about vaccinations. They were asked what their concerns are, and most concerns are about side effects. But as said, this does not influence their intention to get all the offered vaccinations.

*"I consciously chose (together with my parents) not to take the cervical cancer vaccination. You can get cervical cancer if you have a lot of unsafe sex at a young age. That is not the case with me, so for that reason, it would not be necessary. Also, there were serious side effects; for example, a girl with flu symptoms died after three days. That is why I think that some vaccinations are unnecessary and at the same time have dangerous and even fatal side effects."*

As the quotation of respondent 22 show, this teenager is not right informed, which causes her to think that vaccination is unnecessary. In addition, she is worried about the side effects which provokes she thinks that vaccinations are dangerous.

Table 19. Correlation and p-value of the determinant risk/benefit perceived, heuristic

| Variable | N | Correlation with "intention to get all the offered vaccinations." | p-value |
|---|---|---|---|
| "I have concerns about vaccinations." | 104 | -.11 | 0.27 |

### 5.4.4. Conclusion individual/social group influences

The results show that the determinants 'beliefs, attitudes and motivation about health and prevention', 'knowledge awareness' and 'personal experience and health system and providers- trust' are the individual/social group influences that have a relation with the intention of teenagers aged 14-19 to get all the offered NIP vaccinations.

## 5.5. Vaccination specific issues

The fourth sub-question is: *"What are the vaccination specific issues which are directly related to the vaccine or vaccination, that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations?"* This sub-question is answered by investigating, with the bivariate analyses, which vaccination specific issues have a significant relation with the intention to get all the offered vaccinations and which hypotheses can be rejected or accepted.

### 5.5.1. Risk/benefit scientific evidence

In order to test the hypotheses belonging to the determinant 'risk/benefit scientific evidence' of the vaccination specific issues, bivariate analyses are performed. The results can be found in table 20.

Hypothesis 8A states: *Teenagers aged 14-19 are more likely to get all the offered when they think vaccinations are safe compared to teenagers aged 14-19 who do not think vaccinations are safe.* There is a statistical difference and positive medium correlation (P=0.00, R=0.37), see table 20.
Based on the results it can be stated that the saver teenagers think the vaccinations are, the higher their intention to get all the offered vaccinations.

Hypothesis 8B states: *Teenagers aged 14-19 are more likely to get all the offered vaccinations when they think they get enough information about vaccinations and their safety compared to teenagers aged 14-19 who think they do not get enough information about vaccinations and their safety.* The relation between the intention to get all the offered vaccinations and whether teenagers think they get enough information about the safety of vaccinations is not significant and this hypothesis is rejected, see table 20.

Table 20. Correlations and p-values of the determinant risk/benefit scientific evidence

| Variable | N | Correlation with "intention to get all the offered vaccinations" | p-value |
|---|---|---|---|
| "I believe vaccinations are safe." | 103 | 0.46 | 0.00* |
| "I think I get enough information about the safety of vaccinations." | 102 | 0.09 | 0.37 |

* Statistically significant

### 5.5.2. Design of vaccination program/mode of delivery

Teenagers got an open question about what there could be done to make it easier for them to get vaccinations. Their Dutch answers and coding can be found in Appendix 10. Teenagers mention that information improvements can be made; this can be seen in the quotes from respondent 43 and 44 below.

*"Provide more information about vaccinations, the side effects and all information. So, give all the pros and cons via an email, information letter or something similar."*

*"Some more explanation about the vaccinations itself, the diseases they prevent, what it exactly does to someone, and what possible side effects there are."*

Besides improvements around giving information, teenagers also mention the way to provide this information. For example, not reading a letter or wanting information by mail, through an app or at school. The place to get a vaccination is also often mentioned, see the quotes of respondent 30 and 104 below.

*"Get the vaccination in a place that is easily accessible for everyone, and that is close to where that person lives."*

*"For example, if vaccination takes place at school. I have to go to school anyway, so it doesn't affect my time."*

The quotations about the place to get vaccinations to show that teenagers want to be vaccinated as nearby as possible and it should be easily accessible. Teenagers mention there should be more places to vaccinate.

Where getting information and the place to get a vaccination are the most important factors mentioned to improve, teenagers also mention the mode of administration, the point of time when they can get vaccinations, waiting times and the attitude and/or working method of professionals.

### 5.5.3. Conclusion vaccination specific issues

The results show that the determinant 'risk/benefit (scientific evidence)' influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations. As the open question of the determinant 'design of vaccination program/mode of delivery' gives relevant information, this determinant is also seen as having an influence on the intention to get all the offered vaccinations.

## 6. Discussion

The discussion will start by answering the research question. Following, a discussion about the study results. Additionally, practical implications are given. Furthermore, the limitations and strengths of this study will be described. Lastly, recommendations for future research are mentioned.

### 6.1. Answer research question

The research question determined in this study was: *"Which contextual influences, individual/social group influences and vaccination specific issues influence the intention of teenagers aged 14-19 to get all the offered vaccinations of the Dutch National Immunization Programme (NIP)?"* The vaccine hesitancy determinants matrix is used for the theoretical framework and data gathering as it included multiple determinants which might influence the intention of teenagers to get all the offered vaccinations. Based on the results it can be concluded that the determinants, '*religion/culture/gender and socioeconomic group*' and '*geographic barriers*' of the conceptual influences, the determinants '*knowledge/awareness*', '*personal experience and health system and providers- trust'* and '*beliefs, attitudes and motivation about health and prevention*' of the individual/social group influences and the determinants '*design of vaccination program/mode of delivery*' and '*risk/benefit (scientific evidence)*'of the vaccination specific issues influences the intention of teenagers aged 14-19 to get all the offered vaccinations.

### 6.2. Discussion study results

Vaccine hesitancy is, as aforementioned, related to a lower acceptance or refusal of vaccines despite the availability of vaccine services. The determinants that influence the behavioural decision to accept, delay or reject some or all vaccinations can be described under contextual influences, individual and group influences, and vaccination specific issues. These categories come together in the vaccine hesitancy determinants matrix. This matrix was suitable to use because it leads to determinants that have a significant relation with the intention to get all the offered vaccinations. This study was conducted to fill the knowledge gap around the determinants that influence the intention of teenagers aged 14-19 to get all the offered NIP vaccinations. The results of this study give a good first understanding and also offer directions to shape the new policy measurement.

Our results on which determinants influence the intention of teenagers to get all the offered vaccinations are, except for two determinants, in accordance with an earlier described study of Lane et al, (2018) that investigated cited reasons for vaccine hesitancy around the globe. The study of Lane shows that vaccine hesitancy is in high-income countries related to: (1) risk/benefit (scientific evidence), (2) beliefs, attitudes and motivation about health and prevention and (3) risk/benefit (perceived, heuristic). In Europe: (1) risk/benefit (scientific evidence), (2) knowledge/awareness and (3) communication and media environment (Lane et al, 2018). Comparing these results with the results of our study show that in both studies the determinant 'risk/benefit (scientific evidence)', 'beliefs, attitudes and motivation about health and prevention', 'risk/benefit (perceived, heuristic)', and 'knowledge/awareness' are important influences on vaccine hesitancy. In the study of Lane, they had all a big effect; in this study the effects were small or medium. A possible explanation is the small N of this study (N=104). According to Lane et al (2018), 'risk/benefit (perceived/heuristic)' is a determinant influencing vaccine hesitancy. However, in this study, no significant relation is found between this determinant and the intention of a teenager to get all the offered vaccinations. This determinant is about perceptions of risk or perceptions of lack of risk that may influence vaccine acceptance. As the study of Lane et al, (2018) did not include teenagers, the study population can explain why this determinant seems to be influential in the study of Lane et al and not in this study. It is possible that teenagers have other risk perceptions than adults. Additionally, Lane et al (2018) also mentioned that the determinant 'communication and media environment' had a big influence on vaccine hesitancy. In this study is no relation found between the intention of teenagers to get all the offered vaccinations and this determinant. As above stated, an explanation can be the study population. Teenagers are

more known with communication and media sources than adults and therefore the influence can be different.

Our study investigated the relation between the education level of teenagers and parents and the intention of teenagers to get all the offered vaccinations. The results show that there is no relation. In the aforementioned study of Dubé et al (2014), he describes that higher education may be associated with both lower and higher levels of vaccine acceptance. The study describes the word 'may' which shows they are not absolutely sure there is an association between the education level and vaccine acceptance. Our study, therefore, provides new results that show that there is no relation between the intention of teenagers to get all the offered vaccinations and a higher education level of themselves or their parents.

The 13 immunization managers from different countries that are interviewed in the study of Dubé et al, (2014) show as identified determinants with regard to vaccine hesitancy: concerns about vaccine safety, religion, the influence of communication and media environment, lack of knowledge or education of the population, and the mode of vaccine delivery (i.e. geographic barriers, mass vaccination campaigns) (Dubé et al, 2014). These results are in accordance with the results of our study, except for the part about education and communication and media environment which are explained above.

Comparing the results of our study with the results of Dubé et al (2018), who investigated parental vaccination decisions, show that most aspects that influence parental vaccination decision also influence teenager's intention. These aspects are trust in health care providers and mainstream medicine, the influence of social networks and social norms, knowledge, and sources of (and trust in) information about vaccines and risk perceptions regarding vaccines and vaccine-preventable diseases. Just as in the study of Lane et al, (2018), the same determinants are coming back as having a relation with parental decision making but not with the intention of teenagers. Parents are influenced by social networks and social norms, no significant relation between this and the intention of teenagers to get all the offered vaccinations is found. Also, risk/benefit perceptions are mentioned in Dubé et al (2018), but this determinant has no significant relation with the intention of teenagers to get all the offered vaccinations. The explanations are aforementioned; the study population and other knowledge about communication and media. According to the literature study in part three, the determinants had in the study of Dubé et al (2018) a big effect. In this study the effect is small or medium, but as aforementioned, this can be due to the small research population (N=104).

Our study showed that teenagers who do not belong to a religion or whose parents do not belong to a religion have the highest intention to get all the offered vaccinations. Teenagers who belong to the Islam or whose parents belong to the Islam have the lowest intention to get all the offered vaccinations. Looking at the literature, the outbreak of several vaccination preventable diseases is largely limited to an orthodox Protestant minority group. They accept or refuse vaccinations based on their religion. However, the vaccination coverage among Dutch orthodox Protestants is increasing over time (Spaan, Ruijs, Hautvast & Tostmann, 2017). This can explain why they do not have the lowest intention to get all the offered vaccinations anymore. There is no research found about a negative or positive relation between teenagers belonging to the Islam and their intention to vaccinate.

## 6.2. Practical implications

Based on the found results, strategies to use in practice are developed. Shaping the new policy measurement with strategies that influence the intention of teenagers to get all the offered vaccinations can make the policy measurement successful, encourage future vaccine acceptance by teenagers and minimise the potential for the development of vaccine hesitancy.

The results show that the stronger teenagers agree that to having enough knowledge to make a choice as to whether or not they want to be vaccinated, the higher their intention to get all the offered vaccinations. The most mentioned improvement to make it easier for teenager to get vaccinations is, according to the teenagers' self, related to information. The main point where strategies should be

developed on is the information teenager receive and provision of information to increase the knowledge of teenagers (individual/social group influences: knowledge/awareness). Looking at the results it is essential that the information teenagers receive is at least information about the following subjects:

- The safety of vaccinations because the more teenagers agree to believe that vaccinations are safe the higher is their intention to get all the offered vaccinations (vaccination specific issues: risk/benefit (scientific evidence)).
- Of which vaccinations the NIP consists because the more teenagers agree to know which vaccinations the NIP exist of, the higher is their intention to get all the offered vaccinations (individual/social group influences: knowledge/awareness).
- Why vaccinations are important for someone's health because the more teenagers agree to think vaccination is important for their health, the higher is their intention to get all the offered vaccinations (individual/social group influences: beliefs, attitudes and motivation about health and prevention).
- What happens with the health of people when they do not vaccinate based on religious or cultural reasons (contextual influences: religion/culture/ gender and socioeconomic group). This recommendation is based on the finding that the more teenagers agree that not vaccinating for religious or cultural reasons does endanger the health of children, the higher is their intention to get all the offered vaccinations. Another way to form this result into action is by using the evidence-based strategy that increases vaccine acceptance by engaging community leaders, religious or other influential leaders to promote vaccination in the community (MacDonald et al, 2018).
- The three most mentioned subjects' teenagers want information about are the risk for teenagers to get a vaccination related disease, how well a vaccination protects against getting the disease and about the risk of side effects from vaccination. Providing teenagers with this information is consistent with their information needs but it cannot be concluded that these subjects will influence the intention of teenagers to get all the offered vaccinations.

The way teenagers mainly want to be informed is by letter/leaflet or by their parents/guardians, it can however not be concluded that these ways of informing teenagers lead to a higher intention to get all the offered vaccinations. Wanting to inform teenagers via their parents or guardians is possible by providing parents with the information teenagers want so that they can spread the information to the teenagers. Information can be provided by, for example, offering a meeting via school, individual talks between a professional and parent(s) or a meeting with the parent(s) and teenager all in once. In the literature can be found that, while not as yet widely tested for shaping vaccinations beliefs, school-based programs are a proven effective way to spread information (MacDonald, Butler, & Dubé, 2018). Additionally, the internet and parents are by far the main sources of information for teenagers but a specific information source does not lead to a higher intention to get all the offered vaccinations.

Furthermore, it is helpful to keep in mind that the more satisfied teenagers are with this distance to the place where they can get vaccinated, the higher their intention to get all the offered vaccinations (vaccination specific issues: design of vaccination program/mode of delivery). Also, the higher the trust in the doctor's or nurse's advice about vaccinations, the higher the intention of teenagers to get all the offered vaccinations (individual/social group influences: personal experience and health system and providers- trust). Communication tool-based training for healthcare workers might help as this has a proven positive impact on the uptake of tuberculosis, poliomyelitis, diphtheria, tetanus, pertussis and measles (Jarrett, Wilson, O'Leary, Eckersberger, & Larson, 2015). Communication should be proactive and not reactive, have a focus on listening not unidirectional provision of information, be tailored to fit the needs of the teenagers and the problem being addressed and use techniques that appeal to the teenagers including new media and stories, not just facts (MacDonald et al, 2018).

## 6.3. Strengths and limitations

The results should be considered in light of some strengths and limitations.

### 6.3.1. Limitations

The first limitation of this study contains the sample size; the N is not very high (N=104). The researcher has tried to get as many participating high schools and participants as possible but without any result. Because of the N of this study, the results have to be interpreted with caution. The included group only contained teenagers with the education levels VMBO-T, HAVO and VWO. Because not all education levels participated, the hypothesis about the relation between the education level and the intention to get all the offered vaccinations could partly not be tested (teenagers aged 14-19 are more likely to get all the offered vaccinations when they follow high education (HAVO/VWO) as compared to teenagers aged 14-19 who are following middle low education (practical education, VMBO-B, VMBO-K)). This means there is not a complete view of the relation between the education level of teenagers and their intention to get vaccinated. In the literature is nothing found about the relation of teenagers with a lower education level than VMBO-T and their intention to vaccinate. The small sample size caused the researcher was limited in the performance of statistical tests. No multivariate analyses could be performed, and the results are based on bivariate analyses, which means that the association between the dependent and independent variables is not taking other independent variables into account. Besides, the participating schools were located in the middle and east of the Netherlands. Some parts of the Netherlands have an association with more objections against vaccinations, but these parts were not included in this study, for example, the bible-belt (Lisowski, Yuvan & Bier, 2019). The small sample sizes, the fact that no teenagers with a lower education level than VMBO-T participated and no schools located elsewhere than the middle or east of the Nederlands undermine the external validity of the study as it is not generalizable to all the Dutch teenagers aged 14-19.

The quality of the data can be seen as a limitation. In this study is assumed that the answers that participants have given are honest. However, this is not known for sure. Therefore, the results have to be interpreted with caution. To improve the data quality, the researcher has instructed the parents in the information letter to provide the teenagers with the information whether they are (completely) vaccinated or not in order to stimulate a correct answer. Additionally, in the introduction of the questionnaire for the teenagers is recommended to read the questions and information carefully to be able to answer the questions as well as possible.

### 6.3.2. Strengths

The theoretical framework of this study, the vaccine hesitancy determinants matrix, made that the study is broad and comprehensive and the outcomes are useful to understand which determinants influence the intention to get all the offered vaccinations of not (completely) vaccinated teenagers aged 14-19. There is content validity because the questionnaire measures all relevant aspects of the vaccine hesitancy determinants matrix.

Additionally, the design of the study is a strength. Seen the limited time, a cross-sectional study design was suitable to gather information and to be able to find the determinants influencing the intention to get all the offered vaccinations.

## 6.4. Recommendations for future research

After the implementation of the practical implications, one should perform a rigorous evaluation of their impact on vaccine hesitancy/acceptance and the intention to vaccinate.

I recommend replicating the study with a bigger representative N for three reasons. First of all, there were no participants with another education level than VMBO-T, HAVO and VWO. With a bigger N, more education levels can be included and the relation between the intention to get all the offered vaccinations and the education level of teenagers and/or parents can be investigated. Second, in this study, the N was too small to perform multivariate analyses, replicating this study with a bigger N will make it possible to perform multivariate analyses. Third, a lot of relations had a ‘small’ or ‘medium’ effect, with a possible reason a lower N. Replication the study with a bigger N gives the opportunity to look at correlation of bigger samples.

There is no literature found about the relation between belonging to the religion Islam and the intention of teenagers and/or parents to get all the offered vaccinations. In this study is found that teenagers who belong to the Islam and teenagers whose parents belong to the Islam have the lowest intention to get all the offered vaccinations. Therefore, a more comprehensive study about the relation of the Islam and vaccinations should be done so interventions to react to their possible barriers can be developed.

The more trust in the advice about vaccinations that the doctor or nurse give, the higher the intention of teenagers to get all the offered vaccinations. To realize that teenagers actual trust the advice of doctors and nurses, there should be research to investigate how this can be created in practice.

This research investigated the influence of determinants on all NIP vaccinations. To be able to create more vaccination specific strategies, one should do research about the determinants that specifically influence a particular vaccination.

## 7. Conclusion

Considering vaccine hesitancy and the decision whether to accept, delay or reject some or all vaccinations, the determinants that influence the intention to get all the offered vaccinations are investigated.

In conclusion, the determinants '*religion/culture/gender and socioeconomic group*' and '*geographic barriers*' of the conceptual influences, the determinants '*beliefs, attitudes and motivation about health and prevention*', '*knowledge/awareness*' and '*personal experience and health system and providers- trust'* of the individual/social group influences and the determinants '*risk/benefit (scientific evidence)*' and '*design of vaccination program/mode of delivery*' of the vaccination specific issues influences the intention of teenagers aged 14-19 to get all the offered vaccinations.

Teenagers are more likely to get all the offered vaccinations when they, and their parents, do not belong to a religion as compared to teenagers aged 14-19 who themselves and their parents belong to a religion (religion/culture/gender and socioeconomic group). Also, the more the teenagers agree to not vaccinating for religious or cultural reasons does endanger the health of children, the higher their intention to get all the offered vaccinations (religion/culture/gender and socioeconomic group). Vaccine hesitation can occur when the health centre to get vaccinated is too far away or access is difficult. The more teenagers are satisfied with this distance to the place where they can get vaccinated, the higher their intention to get all the offered vaccinations (geographic barriers). Furthermore, beliefs about harms or benefits of vaccinations can negatively or positively influence the intention to get vaccinated. The more teenagers agree that vaccinations are important for their health, the higher is their intention to get vaccinated (beliefs, attitudes and motivation about health and prevention). Additionally, the decision to get all the offered vaccinations is affected by whether the teenager has accurate knowledge, a lack of awareness caused by no information, or misperceptions due to misinformation. The stronger teenagers agree to know which vaccinations the national vaccination program consist of; the higher is their intention to get all the offered vaccinations. Also, the stronger teenagers agree that they have enough knowledge to make a choice as to whether or not they want to be vaccinated, the higher their intention to get all the offered vaccinations (knowledge/awareness). Furthermore, teenagers are influenced by trust or mistrust in healthcare providers (personal experience and health system and providers- trust) and the more trust in a nurse or doctor, the higher the intention of teenagers to get all the offered vaccinations. Moreover, safety issues can cause vaccine hesitancy (risk/benefit (scientific evidence)), the saver teenagers think vaccinations are, the higher is their intention to get all the offered vaccinations. Lastly, the decision to get all the offered vaccinations of teenagers is influenced by the design of vaccination program/mode of delivery. Teenagers mentioned 'getting information/information provision' as the most important improvement in the design of the NIP.

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## Appendix 1. Explanation of vaccinations

Table 1. Explanation of vaccinations

| Vaccine | Related disease, symptoms and consequences | Way of infection |
|---|---|---|
| Diphtheria (D) | Diphtheria is mainly caused by the bacterium Corynebacterium diphtheriae. The bacterium produces a toxin which damages tissues, in for example the skin or the lungs. The location of the infection determines which disease symptoms the patient has (RIVM, 2018-f). | Humans can infect each other through the air (sneezing, coughing) or through direct contact with an infected person (kissing, touching infected wound) (RIVM, 2018-f). |
| Pertussis/whooping cough (aP) | Whooping cough is a respiratory infection caused by the bacterium Bordetella pertussis. The bacterium makes a toxin, which causes coughing and sometimes vomiting. Whooping cough can also lead to pneumonia. Infected babies may develop oxygen deficiency or a stroke, which both cause brain damage (RIVM, 2019-c). | Infections occurs through the air or direct contact (RIVM, 2019-c). |
| Tetanus(T) | Tetanus is caused by the bacterium Clostridium tetani. The tetanus bacterium enters the body through a wound. The bacterium produces toxins that can cause severe muscle cramps (RIVM, 2018-i). | There is no transmission possible (RIVM, 2018-i). |
| Poliomyelitis (IPV) | The infection is caused by the poliovirus. There are mostly only symptoms of the flu. Occasionally, the virus causes an infection of the spinal cord and sometimes the brainstem. This can cause paralysis and / or brain (fleece) inflammation (RIVM, 2018-j). | People can infect each other through the air or direct contact (RIVM, 2018-j). |
| Hamophilys influenzae type b (Hib) | Haemophilus influenzae type b disease is caused by the bacterium Haemophilus influenzae type b (Hib). If the bacterium enters the bloodstream or the nervous system, it can cause serious illnesses such as blood poisoning or meningitis. Other consequences are swelling of the throat valve what can cause suffocation (epiglottitis), pneumonia and joint inflammation (septic arthritis) (RIVM, 2018-g). | Infections occurs through the air or direct contact (RIVM, 2018-g). |
| Hepatitis B (HBV) | Hepatitis B is an inflammation of the liver caused by infection with the hepatitis B virus. Symptoms are fatigue, poor appetite, muscle and joint pains, fever (flu), icterus (discoloration of skin, stools and urine) and sometimes itching (RIVM, 2019-b). | The infection is transmitted from mother to child at birth (when the mother is infected), through sexual contact or contact with blood of infected people (RIVM, 2019-b). |
| Pneumococcal disease (PCV) | Pneumococcal is caused by the bacteria pneumococci. The infection can cause | Transmitting occurs through the air or through direct contact (RIVM, 2018-h). |

| | | |
|---|---|---|
| | respiratory infections such as ear infection and pneumonia. The bacterium can also cause serious invasive infections such as blood poisoning and meningitis (RIVM, 2018-h). | |
| Mumps (M) | Mumps is due to an infection by the mumps virus. The infectious disease is characterized by inflammation of the salivary gland (cheek and/or ear). Other complications are permanent deaf or testicular inflammation (RIVM, 2019-a). | People can infect each other through the air or direct contact (RIVM, 2019-a). |
| Measles (M) | Measles is caused by a type of virus called a paramyxovirus. Measles starts with fever, cough, rhinitis and eye inflammation. About two to four days later, red spots appear. The measles virus can also cause middle ear inflammation and diarrhoea, and in severe cases pneumonia, convulsions or brain inflammation (RIVM, 2019-d). | Measles is transmitted through the air or direct contact (RIVM, 2019-d). |
| Rubella (R) | Rubella is caused by the rubella virus. It often starts with some general symptoms such as mild fever followed by a red skin rash. The rash is mainly behind the ears, in the face and in the neck. Sometimes rubella can lead to a shortage of platelets, brain inflammation or joint inflammation (RIVM, 2019-f). | Transmitting occurs through the air or direct contact (RIVM, 2019-f). |
| Meningococcal ACWY disease (MenACWY) | Meningococcal disease is a very serious infectious disease caused by a bacterium, the meningococcus. The infection causes serious illnesses such as meningitis or blood poisoning, which can quickly develop into a shock that many people die of. There are different types of meningococci and therefore a vaccine that protects multiple types (RIVM, 2019-e). | Transmitting is possible through the air or direct contact (RIVM, 2019-e). |
| Human papillomavirus (HPV) | Infection with HPV can cause cervical cancer. There are more than 100 different kinds of the HPV virus of which twelve can cause cancer. HPV 16 and HPV 18 are the cause of 70% of the cervical cancer cases and the vaccine is effective for these two variances (RIVM, 2018-e). | People can transmit the virus by having unsafe sex with someone who is infected (RIVM, 2017). |

## Appendix 2. Abbreviations vaccinations

Table 2. Vaccination abbreviations in Dutch and English

| Vaccination in Dutch | Vaccination in English |
|---|---|
| DKTP | DTaP + IPV |
| DTP | DT-IPV |
| Hib | Hib |
| Hep B | HBV |
| Pneu | PCV |
| BMR | MMR |
| Men C | Men C |
| HPV | HPV |

**Abbreviation vaccinations in English**

| |
|---|
| D = Diphtheria |
| aP = Pertussis (whooping cough) |
| T = Tetanus |
| IPV = Polio |
| Hib = Haemophilus influenzae type b |
| PCV = Pneumococcal disease |
| HBV = Hepatitis B |
| M = Mumps |
| M = Measles |
| R = Rubella (German measles) |
| MenACWY = Meningococcal disease |
| HPV = Human papillomavirus |

**Abbreviation vaccinations in Dutch**

| |
|---|
| D=difterie |
| K=kinkhoest, |
| T=tetanus |
| P=poliomyelitis, |
| Hib=Haemohilus influenzae type b ziekte |
| Hep B=hepatitis B |
| Pneu=pneumokokkenziekte, |
| B=bof |
| M=mazelen |
| R=rodehond |
| Men C=meningokokken C-ziekte |
| HPV=humaan papillomavirus infectie |

## Appendix 3. Five frequently reported possible side effects after NIP vaccinations and their notifications

| Gemelde bijwerking | Aantal keer gemeld in 2016 | Aantal keer gemeld in 2017 |
|---|---|---|
| Koorts | 543 | 608 |
| Ontstekingsreactie op de plaats van injectie | 474 | 476 |
| Huilen | 351 | 234 |
| Hoofdpijn | 170 | 77 |
| Extensive limb swelling (ELS) | 161 | 75 |

Vijf veel gemelde mogelijke bijwerkingen na RVP vaccinaties in 2016 en 2017. Bron: Lareb 2017

Figure 1. Five frequently reported possible side effects after NIP vaccination in 2016 and 2017. Adapted from RIVM by RIVM. (2018). Copyright (2019) by RIVM.

## Appendix 4. Search words mini review

| Database | Search term | Number of records | Action | result |
|---|---|---|---|---|
| Google Scholar | "child vaccination" OR "children vaccination" OR vaccination OR vaccine AND “vaccination hesitancy” OR “vaccine hesitancy” OR “vaccination doubts” OR “vaccine doubts” OR “reasons no vaccination” AND "Dutch” OR “the Netherlands” OR high-income" OR "developed country" | 467 | Too many results, only articles since 2014 | 361 |
| Cochrane | "child vaccination" OR "children vaccination" OR vaccination OR vaccine AND “vaccination hesitancy” OR “vaccine hesitancy” OR “vaccination doubts” OR “vaccine doubts” OR “reasons no vaccination” AND “high-income" OR "developed country" | 17 | | |
| PubMed | (vaccine[Title/Abstract] OR vaccination[Title/Abstract]) AND "vaccination hesitancy"[Title/Abstract] OR "vaccine hesitancy"[Title/Abstract] OR (("vaccines"[MeSH Terms] OR "vaccines"[All Fields] OR "vaccine"[All Fields]) AND doubts[All Fields] AND Title/Abstract[All Fields]) AND (reasons[All Fields] AND ("vaccination"[MeSH Terms] OR "vaccination"[All Fields])) AND "OR "[All Fields] AND ("vaccination refusal"[MeSH Terms] OR ("vaccination"[All Fields] AND "refusal"[All Fields]) OR "vaccination refusal"[All Fields]) | 10 | | |
| Scopus | "child vaccination" OR "children vaccination" OR vaccination OR vaccine AND “vaccination hesitancy” OR “vaccine hesitancy” OR “vaccination | 18 | | |

| | | |
|---|---|---|
| | doubts” OR “vaccine doubts” OR “reasons no vaccination” AND "high-income" OR "developed country" | |
| Web of science | ((TS =( vaccination AND "vaccination hesitancy" OR "reasons no vaccination" AND "high-income" OR "developed country" AND "child view" OR "parental view" ))) AND LANGUAGE: (English OR Dutch) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Timespan=Last 5 years | 34 |

## Appendix 5. Quality assessment of mini review articles

The quality of the included articles is assessed with the checklists from Greenhalgh and Donald (2000).

**The article: Mapping vaccine hesitancy—Country-specific characteristics of a global phenomenon (Dubé, Gagnona, Nickels, Jeram & Schuster, 2014)**

| CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE ON QUALITATIVE RESEARCH<br>Note that the questions on the checklist are really looking for problems of bias, confounding, low power, and poor validity | |
|---|---|
| **A. Was a qualitative approach appropriate?** | Yes/No/Do not know |
| 1. Did the study ask how or why something was taking place (e.g. how people experience illness, health services or how or why patients and health professionals behave the way they do)? | Yes |
| 2. Was there a clearly formulated question (which may have been extended, refined or modified as the results accumulated)? | Yes |
| **B. Was the sampling strategy clearly defined and justified?** | |
| 3. Was the method of sampling (for both the subjects and the setting) adequately described? | Yes |
| 4. Did the investigators study a representative range of individuals and settings relevant to their question? | Yes |
| 5. Were the characteristics of the subjects defined? | Do not know |
| **C. Has the researcher critically examined their own role, potential bias and influence?** | |
| 6. Has the researcher taken their background and perspective into account in the analysis?<br>● Is there a clear statement on the researcher's background and perspective and how this is likely to have influenced the results? | Yes |
| **D. What methods did the researcher use for collecting data?** | |
| 7. Have appropriate data sources been studied?<br>● Did the author conduct a literature search? | No |
| 8. Were the methods used reliable and independently verifiable?<br>● Audiotape, videotape, field notes?<br>● Were observations taken in a range of circumstances (e.g. at different times)?<br>● Was more than one method of data collection used (triangulation)? | <br>Yes<br>No<br><br>No |
| **E. What methods did the researcher use to analyse the data, and what quality control measures were implemented?** | |
| 9. Did the authors use systematic methods to reduce their<br>own biases influencing the results?<br>● Did more than one researcher independently perform the analysis? | <br><br>Yes |

| | |
|---|---|
| ● Were explicit methods used to resolve differences of interpretation?<br>● Were explicit methods used to address negative or discrepant results? | Yes<br><br>No |
| **F. What are the results?** | |
| 10. What are the main findings of the research?<br>● Are they coherent?<br>● Do they address the research question? | <br>Yes<br>Yes |
| 11. Are the results credible?<br>● Are they consistent with the data?<br>● Is it possible to determine the source of data presented (e.g. by numbering of extracts)?<br>● Is most or all of the information collected available for independent assessment? | <br>Yes<br>No<br><br>Unknown |
| 12. Have alternative explanations for the results been explored and discounted? | No |
| **G. Were conclusions valid?** | |
| 13. What were the authors' conclusions?<br>● Were they consistent with the data and results? | <br>Yes |
| **H. To what extent are the findings of the study transferable to other clinical settings?** | |
| 14. Were the subjects in the study similar in important respects to my own patients? | Yes |
| 15. Is the context similar to my own practice? | Yes |

**Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015–2017**

| CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE DESCRIBING A COHORT STUDY<br>Note that the questions on the checklist are really looking for problems of bias, confounding, low power, and poor validity | |
|---|---|
| **A. Are the results of the trial valid and do they contain minimum bias?** | Yes/No/Do not know |
| 1. Did the trial address a clearly focused question (PEO)?<br>● Population<br>● Exposure to risk factor(s) over specified time period<br>● Outcome(s) | <br>Yes<br>Yes<br><br>yes |
| 2. Was the cohort study prospective (stronger) as opposed to retrospective (weaker)? | Retrospective |
| 3. Were the two groups (control and exposed) similar in relevant factors at the start of the study (e.g. sex, age, social class, smoking)? | Yes |
| 4. Were all the participants who entered the study properly accounted for?<br>● Was follow-up > 80%? If not, is it likely to have affected the results?<br>● Were participants analysed in the groups to which they were initially allocated? | Yes<br><br><br><br>Yes |
| **B. What are the results?** | |

| | |
|---|---|
| 5. How large was the effect of the exposure?<br>● What outcomes were measured (measures of risk, e.g. odds ratios, relative risk, absolute risk, absolute risk reduction or increase)? | rate of vaccine hesitancy across the globe, the cited reasons for hesitancy, if these varied by country income level and/or by WHO region and whether these reasons were based upon an assessment. |
| 6. How precise was the estimate of the exposure effect?<br>● What are its confidence limits (or p-values)? | No |
| **C. How relevant are the results?** | |
| 7. Were the study participants sufficiently different from my population that this study doesn't help me at all? | No |

**The article: Underlying factors impacting vaccine hesitancy in high-income countries: a review of qualitative studies (Dubé, Gagnon, MacDonald, Bocquier, Peretti-Watel, & Verger, 2018).**

| CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE DESCRIBING A SYSTEMATIC REVIEW<br>Note that the questions on the checklist are really looking for problems of bias, confounding, low power, and poor validity | |
|---|---|
| **A. Was selection of studies valid?** | Yes/No/Do not know |
| 1. Did the trial address a clearly focused question<br>Clearly defined:<br>● Population<br>● Intervention<br>● Outcome(s) | <br><br><br>Yes<br>Yes<br>Yes |
| Were high-quality, relevant studies included?<br>● Robust study design (RCTs?)<br>● Sufficient sample size (power)?<br>● Addressing relevant question (population/intervention/ outcome)? | <br>No<br>Yes<br>Yes |
| 3. Is it unlikely that important, relevant studies were missed?<br>● Repeatable search strategy?<br>● Comprehensive search strategy, including relevant databases and other, unpublished sources for information (e.g. EMBASE, Cochrane Library controlled trials register, MEDLINE back to 1966, contacts from reference lists)? | <br><br>Yes<br>Yes |
| 4. Was the validity of the included studies assessed properly?<br>● Reproducible (explicit) assessment method?<br>● More than one independent assessor? | <br><br>Yes<br>Yes |
| 5. Were the results similar from study to study (i.e. were they comparable)? | Yes |
| **B. What are the results?** | |
| 6. What are the overall results of the review? | vaccine acceptance is not just an individual behaviour, but is part of a 'wider social world'. Experiences, emotions, routine ways of |

| | |
|---|---|
| | thinking, information sources, peers/family, risk perceptions, and trust, among other factors, inform people's attitudes and decision-making processes. To help build long-term trust in vaccination, people need benefit and risk information that is accessible, understandable, trustworthy, and empowering to enable informed health decisions. |
| 7. How precise were the results (e.g. measures of risk, confidence intervals, p-values)? | Qualitative studies included, they were measured accurately |
| 8. Can the results be applied to my patients? (Compare patient with review population, intervention, outcome) | Yes |
| **C. How relevant are the results to me?** | |
| 9. Were sufficient important outcomes (for me) considered? | Yes |

**Article: The benefit of the doubt or doubts over benefits? A systematic literature review of perceived risks of vaccines in European populations (Karafillakis & Larson, 2017)**

| CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE DESCRIBING A SYSTEMATIC REVIEW<br>Note that the questions on the checklist are really looking for problems of bias, confounding, low power, and poor validity | |
|---|---|
| **A. Was selection of studies valid?** | Yes/No/Do not know |
| 1. Did the trial address a clearly focused question<br>Clearly defined:<br>● Population<br>● Intervention<br>● Outcome(s) | <br><br><br>Yes<br>Yes<br>Yes |
| Were high-quality, relevant studies included?<br>● Robust study design (RCTs?)<br>● Sufficient sample size (power)?<br>● Addressing relevant question (population/intervention/ outcome)? | <br>No<br>Yes<br>Yes |
| 3. Is it unlikely that important, relevant studies were missed?<br>● Repeatable search strategy?<br>● Comprehensive search strategy, including relevant databases and other, unpublished sources for information (e.g. EMBASE, Cochrane Library controlled trials register, MEDLINE back to 1966, contacts from reference lists)? | <br><br>Yes<br>Yes |
| 4. Was the validity of the included studies assessed properly?<br>● Reproducible (explicit) assessment method?<br>● More than one independent assessor? | <br><br>Yes<br>No |
| 5. Were the results similar from study to study (i.e. were they comparable)? | Yes |
| **B. What are the results?** | |

| | |
|---|---|
| 6. What are the overall results of the review? | Across all articles, the most common beliefs related to balancing risks of vaccination to non-vaccination were about vaccine safety (n = 107/145 articles) and the perceived low risk of contracting (n = 51/145). Other important perceptions included beliefs that VPDs are not dangerous (n = 36/145), vaccines do not work(n = 32/145), vaccines are not needed (n = 24/145), adults or children were healthy enough not to need vaccination (n = 20/145),not enough evidence or adequate testing of vaccines (n = 21/145),no recommendation to take the vaccine (n = 20/145) or a lack of information about vaccines and/or VPDs (n = 31/145). |
| 7. How precise were the results (e.g. measures of risk, confidence intervals, p-values)? | Measured precisely |
| 8. Can the results be applied to my patients? (Compare patient with review population, intervention, outcome) | Yes |
| **C. How relevant are the results to me?** | |
| 9. Were sufficient important outcomes (for me) considered? | Yes |

## Appendix 6. Structured questionnaire

**Vragenlijst Vaccinatie**

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Start of Block: Informed Consent

**Introductie**

Welkom bij deze vragenlijst! Wij vragen jullie deze vragenlijst voor de Universiteit Twente en de GGD in te vullen. Het doel van deze vragenlijst is te onderzoeken waarom jongeren van jullie leeftijd (14 t/m 19 jaar oud) zich wel of niet laten vaccineren.

**Welke informatie wordt verzameld?**

Het volgende wordt tijdens het invullen van de vragenlijst aan je gevraagd:
- Vragen over de organisatie van het vaccinatieprogramma zoals communicatie en (social) media.
- Vragen over je houding tegenover vaccinatie.
- Vragen over zaken die met de vaccinatie zelf te maken hebben zoals veiligheid en zorgen.
- Achtergrondgegevens: school; leeftijd; opleidingsniveau, religie en afkomst van je ouders en jij; en of je alle aangeboden vaccinaties hebt gehad.

**Wat gebeurt er met jouw antwoorden?**

De vragenlijst wordt online en anoniem ingevuld. Je naam zal binnen dit onderzoek niet worden gevraagd. Ook zullen antwoorden niet te herleiden zijn naar jou.
Degenen die toegang hebben tot de ingevulde gegevens zijn de onderzoekers en de begeleiders van de onderzoekers. De gegevens zullen 10 jaar bewaard worden op een server van de Universiteit Twente.

**Handig om te weten**

Het is van belang dat je de vragen goed leest voordat je antwoord geeft op de vraag en het is van belang dat je de toelichting (uitleg) knopjes bekijkt zodat je de vragen zo goed mogelijk kunt beantwoorden.

We willen graag jouw mening horen. Er bestaan dus geen goede of foute antwoorden. Alle antwoorden verwerken we vertrouwelijk en delen we niet met anderen.

Het invullen van de vragenlijst duurt +/- 10 minuten.

**Toestemming tot vrijwillige deelname**

Door op “volgende” te klikken en daarmee te starten met de vragenlijst, geef je toestemming tot vrijwillige deelname.

End of Block: Informed Consent

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Start of Block: Deel I: Vaccinatie

Heb je meegedaan aan het Rijksvaccinatieprogramma?

*** Toelichting:** Ouders ontvangen 4-6 weken na de geboorte van hun kind een uitnodiging voor alle vaccinaties in de eerste 14 maanden. In het jaar dat kinderen 4 jaar wordt ontvangen ze een uitnodiging voor de DKTP vaccinatie. In het jaar dat kinderen 9 wordt ontvangen ze een uitnodiging voor de laatste DTP- en BMR vaccinatie. Meisjes ontvangen in het jaar dat zij 13 worden een uitnodiging voor de HPV vaccinatie.

- ○ Nee (0)
- ○ Ja, gedeeltelijk, want ik heb niet alle vaccinaties gekregen die ik voor mijn leeftijd zou moeten hebben (1)
- ○ Ja, volledig, want ik heb alle vaccinaties gekregen die ik voor mijn leeftijd zou moeten hebben (2)
- ○ Weet ik niet (3)

---

Geef antwoord op de volgende vraag:
Selecteer het bolletje wat overeenkomt met jouw antwoord op de vraag.

| | Nee (0) | Waarschijnlijk niet (1) | Twijfel (2) | Waarschijnlijk wel (3) | Ja (4) |
|---|---|---|---|---|---|
| Wanneer je een oproep krijgt om de vaccinaties die je niet hebt gehad gratis te halen, zou dit dan doen? | ○ | ○ | ○ | ○ | ○ |

---

Geef antwoord op de volgende vraag:
Selecteer het bolletje wat overeenkomt met jouw antwoord op de vraag.

| | Nee (0) | Waarschijnlijk niet (1) | Twijfel (2) | Waarschijnlijk wel (3) | Ja (4) |
|---|---|---|---|---|---|
| Stel je bent niet (volledig) gevaccineerd en krijgt een oproep om de vaccinatie(s) die je niet hebt gehad gratis te halen, zou je dit dan doen? (Q1.2b_Intentie_gevac) | ○ | ○ | ○ | ○ | ○ |

Waar zoek jij informatie als je iets wilt weten over vaccinatie? Meerdere antwoorden mogelijk.
(Contextual influences: Communication and media environment)

- ☐ Internet pagina's (1)
- ☐ Social media zoals Facebook, Twitter of Instagram (2)
- ☐ Mijn ouder(s)/verzorger(s) (3)
- ☐ Mijn vrienden (4)
- ☐ Klasgenoten en/of leraar (5)
- ☐ Een arts of verpleegkundige (6)
- ☐ Ik zoek geen informatie op over vaccineren (7)
- ☐ Ik wil deze vraag niet beantwoorden (8)
- ☐ Anders, namelijk: (9) _____

Hoe zou je geïnformeerd willen worden over vaccinaties om een keuze te kunnen maken of je wilt laten vaccineren? Meerdere antwoorden mogelijk. (Contextual influences: Communication and media environment)

- [ ] Folder/brief
- [ ] Website
- [ ] Social media zoals Facebook, Twitter of Instagram
- [ ] Tijdens een les
- [ ] Informatie bijeenkomst op school
- [ ] Informatie bijeenkomst buiten school
- [ ] Digitale keuzehulp (een online hulpmiddel dat je helpt een keuze te maken)
- [ ] App
- [ ] Overheidscampagne
- [ ] Via een gesprek met een arts of verpleegkundige
- [ ] Via mijn ouder(s)/verzorger(s)
- [ ] Ik heb geen behoefte aan informatie want ik weet al dat ik me laat vaccineren
- [ ] Ik heb geen behoefte aan informatie want ik weet al dat ik me niet laat vaccineren
- [ ] Anders, namelijk: _____
- [ ] Ik wil deze vraag niet beantwoorden (14)

Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte* en de vaccinatie daartegen zou je dan willen krijgen? (Meerdere antwoorden mogelijk) * **Toelichting** Difterie, Kinkhoest, Tetanus en Polio (DKTP/DTP), Bof, Mazelen en Rodehond (BMR), Hepatitis B, Pneumokokken, HIB-ziekten (Haemophilus Influenzae type B), Meningokokkenziekte (MenACWY) en Baarmoederhalskanker (HPV). (Individual/social group influences: knowledge awareness).

- ☐ Het risico voor jongeren om de ziekte op te lopen
- ☐ Aantal patiënten, ziekenhuisopnames en sterfte door deze ziekte bij jongeren
- ☐ Ziekteverschijnselen bij jongeren
- ☐ Wat er in een vaccinatie zit
- ☐ Hoe goed een vaccinatie beschermt tegen het oplopen van de ziekte bij jongeren
- ☐ Risico op bijwerkingen van de vaccinatie bij jongeren
- ☐ Ervaring van andere jongeren
- ☐ Ervaring in andere landen
- ☐ Beschikbare onderzoeken die gedaan zijn naar de ziekte
- ☐ Geen informatie
- ☐ Anders, namelijk: _____
- ☐ Ik wil deze vraag niet beantwoorden

---

Geef je mening over de volgende stellingen:
Selecteer het bolletje wat overeenkomt met jouw mening over de stelling.

| | Helemaal niet mee eens | Enigszins mee oneens | Niet eens en niet oneens | Enigszins mee eens | Helemaal mee eens |
|---|---|---|---|---|---|
| 1. Ik vind vaccineren belangrijk voor mijn gezondheid. (Individual/social group influences: beliefs, attitudes and motivation about health and prevention') | ○ | ○ | ○ | ○ | ○ |
| 2. Er zijn mensen die hun kind niet laten vaccineren vanwege geloof of culturele redenen. Ik vind dat mensen de gezondheid van hun kind in gevaar brengen als zij hun kind niet (volledig) laten vaccineren. (Contextual influences: religion/culture/ gender and socioeconomic group) | ○ | ○ | ○ | ○ | ○ |
| 3. Ik weet uit welke vaccinaties het Rijksvaccinatieprogramma bestaat. (individual/social group influences: knowledge awareness) | ○ | ○ | ○ | ○ | ○ |
| 4. Ik vertrouw het advies over vaccinaties dat een arts of verpleegkundige mij geeft. (Individual/social group influences: personal experience and health system and providers- trust) | ○ | ○ | ○ | ○ | ○ |
| 5. Ik ben van mening dat vaccinaties veilig zijn. (Vaccination specific issues: risk/benefit (scientific evidence)) | ○ | ○ | ○ | ○ | ○ |
| 6. Ik heb het gevoel dat ik voldoende informatie krijg over de veiligheid van vaccinaties. (Vaccination specific issues: risk/benefit (scientific evidence)) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| 7. Ik ben tevreden met de afstand tot de plek waar ik gevaccineerd kan worden. (Contextual influences: geographic barriers) | ○ | ○ | ○ | ○ | ○ |
| 8. Ik heb voldoende kennis om een keus te maken of ik mij wel/niet wil laten vaccineren. (Individual/group influences: knowledge awareness) | ○ | ○ | ○ | ○ | ○ |

Geef je mening over de volgende stelling:
Selecteer het bolletje wat overeenkomt met jouw mening over de stelling.
(Individual/social group influences: risk/benefit perceived, heuristic)

| | Helemaal niet mee eens | Enigzins mee oneens | Niet eens en niet oneens | Enigzins mee eens | Helemaal mee eens |
|---|---|---|---|---|---|
| 1. Ik heb zorgen over vaccinatie | ○ | ○ | ○ | ○ | ○ |

Je hebt bij de vorige vraag aangegeven zorgen te hebben over vaccinaties. Wat zijn je zorgen?
Bijvoorbeeld zorgen over veiligheid, toediening en/of werking.
(Individual/social group influences: risk/benefit perceived, heuristic)

_____

Hoeveel tijd wil je maximaal kwijt zijn aan het halen van een vaccinatie (inclusief reistijd)?
(Contextual influences: geographic barriers)

- ○ 0-15 minuten
- ○ 15-30 minuten
- ○ 30-45 minuten
- ○ 45-60 minuten
- ○ Meer dan 60 minuten
- ○ Maakt me niet uit
- ○ Ik wil deze vraag niet beantwoorden

---

Welke dingen kunnen worden gedaan om het je makkelijker te maken vaccinaties te krijgen? Bijvoorbeeld over plek, toedieningswijze en/of de informatie die je krijgt.
(Vaccination specific issues: design of vaccination program/mode of delivery)

_____

**End of Block: Deel I: vaccinatie**

---

**Start of Block: Deel II: Achtergrond gegevens**

Achtergrond gegevens
Op welke school zit je?

- ○ School 1
- ○ School 2

---

Wat is je leeftijd?

- ○ 13
- ○ 14
- ○ 15
- ○ 16
- ○ 17
- ○ 18
- ○ 19

---

Wat is je geslacht?
(Contextual influences: religion/culture/ gender and socioeconomic group)

- ○ Man
- ○ Vrouw

---

Welke opleiding volg je?
(Contextual influences: religion/culture/ gender and socioeconomic group)

- ○ Practical education
- ○ VMBO-B
- ○ VMBO-K
- ○ VMBO-T
- ○ HAVO
- ○ VWO-Atheneum
- ○ VWO-Gymnasium

---

Wat is de hoogste opleiding die je ouders hebben gevolgd?
(Contextual influences: religion/culture/ gender and socioeconomic group)

| | Opleidingsniveau | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Basisonderwijs | VMBO | HAVO | VWO | MBO | HBO | Universiteit | Anders | Weet ik niet |
| Vader | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Moeder | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

---

Welk geloof heb jijzelf?
(Contextual influences: religion/culture/ gender and socioeconomic group)

- ○ Geen
- ○ Rooms-katholiek
- ○ Gereformeerd
- ○ Protestant
- ○ Islam
- ○ Ander geloof

---

Welk geloof hebben je ouders?
(Contextual influences: religion/culture/ gender and socioeconomic group)

| | Geloof | | | | | | |
|---|---|---|---|---|---|---|---|
| | Geen | Rooms-katholiek | Gereformeerd | Protestant | Islam | Ander geloof | Weet ik niet |
| Vader | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Moeder | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

---

Waar ben je geboren?
* **Toelichting** Onder Oceanië valt een groot aantal eilanden in de Grote en Stille Oceaan waaronder Australië en Nieuw-Zeeland.
(Contextual influences: religion/culture/ gender and socioeconomic group)

- ○ Nederland
- ○ Westers land: Europa (geen Turkije of Nederland), Noord-Amerika, Oceanië*, Indonesië of Japan
- ○ Niet-Westers land

---

Waar zijn je ouders geboren?
* **Toelichting** Onder Oceanië valt een groot aantal eilanden in de Grote en Stille Oceaan waaronder Australië en Nieuw-Zeeland. Westers land: Europa (geen Turkije of Nederland), Noord-Amerika, Oceanië**, Indonesië of Japan.
(Contextual influences: religion/culture/ gender and socioeconomic group)

| | Afkomst | | |
|---|---|---|---|
| | Nederland | Westers land* | Niet-Westers land |
| Vader | ○ | ○ | ○ |
| Moeder | ○ | ○ | ○ |

Hartelijk dank voor het invullen van deze vragenlijst!

**End of Block: Deel II: Achtergrondgegevens**

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## Appendix 7. Data operationalization

| Code | Question (variable label) | Choice (value label) | Type data | Gepaard of ongepaard |
|---|---|---|---|---|
| Q1.1_Deelname_vac | Heb je meegedaan aan het Rijksvaccinatieprogramma? | Nee (0)<br>Ja, gedeeltelijk (niet alle prikken gekregen die ik voor mijn leeftijd zou moeten hebben) (1)<br>Ja, volledig (alle prikken gekregen die ik voor mijn leeftijd zou moeten hebben) (2)<br>Weet ik niet (3) | Nominaal | Ongepaard |
| Q1.2a_intentie_n_gevac | Wanneer je een oproep krijgt om de vaccinatie(s) die je niet hebt gehad gratis te halen, zou je dit dan doen? | Nee (= 0)<br>Waarschijnlijk niet (1)<br>Twijfel (2)<br>Waarschijnlijk wel (3)<br>Ja (4) | Ordinaal | Ongepaard |
| Q1.2b_Intentie_gevac | Stel je bent niet (volledig) gevaccineerd en krijgt een oproep om de vaccinatie(s) die je niet hebt gehad gratis te halen, zou je dit dan doen? | Nee (= 0)<br>Waarschijnlijk niet (1)<br>Twijfel (2)<br>Waarschijnlijk wel (3)<br>Ja (4) | Ordinaal | Ongepaard |
| Q1.3_Info_zoeken | Waar zoek jij informatie als je iets wilt weten of vaccineren? Meerdere antwoorden mogelijk | - Internetpagina's (nee = 0, ja =1)<br>- Social media zoals facebook, twitter of Instagram (nee = 0, ja =1)<br>- Mijn ouders (nee = 0, ja =1)<br>- Mijn vrienden (nee = 0, ja =1)<br>- Klasgenoten (nee = 0, ja =1)<br>- Een zorgverlener (nee = 0, ja =1)<br>- Ik zoek geen informatie op over vaccineren (nee = 0, ja =1)<br>- Ik wil deze vraag niet beantwoorden (nee = 0, ja =1)<br>- Anders, namelijk.. (nee = 0, ja =1) | Nominaal | Ongepaard |
| Q1.4_Info_bron | Hoe zou je graag geïnformeerd willen | - Folder/ brief (nee = 0, ja =1) | Nominaal | Ongepaard |

| | | | |
|---|---|---|---|
| | worden over ziektebeelden / vaccinaties om een keuze te kunnen maken of je je wilt laten vaccineren? (Meerdere antwoorden mogelijk) | - Website (nee = 0, ja =1)<br>- Sociale media (Facebook, Twitter) (nee = 0, ja =1)<br>- Tijdens een les (nee = 0, ja =1)<br>- Informatiebijeenkomst op school (nee = 0, ja =1)<br>- Informatiebijeenkomst buiten school (nee = 0, ja =1)<br>- Digitale keuzehulp (een online hulpmiddel die je helpt een keuze te maken) (nee = 0, ja =1)<br>- App (nee = 0, ja =1)<br>- Overheidscampagne (nee = 0, ja =1)<br>- via een consult met een arts of verpleegkundige (nee = 0, ja =1)<br>- via mijn ouders/verzorgers (nee = 0, ja =1)<br>- Ik heb geen behoefte aan informatie want ik weet al dat ik me laat vaccineren (nee = 0, ja =1)<br>- Ik heb geen behoefte aan informatie want ik weet al dat ik me niet laat vaccineren (nee = 0, ja =1)<br>- Ik wil deze vraag niet beantwoorden (nee = 0, ja =1)<br>- Anders, namelijk: (nee = 0, ja =1) | |
| Q1.5_Welke_info | Welke informatie over de ziektebeelden en de vaccinatie zou je willen krijgen? (Meerdere antwoorden mogelijk met een maximum van 3) | - Het risico voor jongeren om ziekten op te lopen (nee = 0, ja =1)<br>- Aantal patiënten, ziekenhuisopnames en sterfte door ziekten bij | Nominaal |

| | | | | |
|---|---|---|---|---|
| | | jongeren (nee = 0, ja =1)<br>- Ziekteverschijnselen bij jongeren (nee = 0, ja =1)<br>- Risico op bijwerkingen bij jongeren (nee = 0, ja =1)<br>- Hoe goed het vaccin beschermt tegen het oplopen van de ziekte bij jongeren (nee = 0, ja =1)<br>- Wat er in het vaccin zit (nee = 0, ja =1)<br>- Ervaring van andere jongeren (nee = 0, ja =1)<br>- Ervaring in andere landen (nee = 0, ja =1)<br>- Beschikbare onderzoeken die gedaan zijn naar ziektebeelden (nee = 0, ja =1)<br>- Geen informatie (nee = 0, ja =1)<br>- ik wil deze vraag niet beantwoorden (nee = 0, ja =1)<br>- Anders, namelijk: (nee = 0, ja =1) | | |
| Q1.6.1_mening_gezondheid | Ik vind vaccineren belangrijk voor mijn gezondheid | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.6.2_mening_religie | Er zijn mensen die hun kind niet laten vaccineren vanwege religieuze of culturele redenen. Ik vind dat mensen de gezondheid van hun kind in gevaar brengen als zij hun kind niet (volledig) laten vaccineren | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.6.4_mening_inhoudrvp | Ik weet uit welke vaccinaties het | Helemaal niet mee eens (0) | Ordinaal | Ongepaard |

| | | | | |
|---|---|---|---|---|
| | Rijksvaccinatieprogramma bestaat. | Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | | |
| Q1.6.4_mening_vertrouwen | Ik vertrouw het advies over vaccinatie dat een arts of verpleegkundige mij geeft | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.6.5_mening_veilig | Ik ben van mening dat vaccinaties veilig zijn | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.6.6_mening_info | Ik vind dat ik voldoende informatie krijg over de veiligheid van vaccinaties | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4 | Ordinaal | Ongepaard |
| Q1.6.7_mening_plek | Ik ben tevreden met de afstand tot de plek waar ik gevaccineerd kan worden | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.6.8_mening_kennis | Ik heb voldoende kennis om een keuze te maken of ik mij wel/niet wil laten vaccineren. | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.7A_Zorgen | Ik heb zorgen over vaccinatie | Helemaal niet mee eens (0)<br>Enigszins mee eens (1)<br>Niet eens en niet oneens (2)<br>Enigszins mee eens (3)<br>Helemaal mee eens (4) | Ordinaal | Ongepaard |
| Q1.7B_welke_zorgen | Je hebt bij de vorige vraag aangegeven zorgen te hebben over vaccinaties. Wat zijn je zorgen? | | Nominaal | Ongepaard |

| | | | | |
|---|---|---|---|---|
| Q1.8_Tijd | Hoeveel tijd wil je maximaal kwijt zijn aan het halen van een vaccinatie (inclusief reistijd)? | 0-15 minuten (0)<br>15-30 minuten (1)<br>30-45 minuten (2)<br>45-60 minuten (3)<br>Meer dan 60 minuten (4)<br>Maakt niet uit (5)<br>Ik wil deze vraag niet beantwoorden (6) | Nominaal | Ongepaard |
| Q1.9_Makkelijker_vac | Welke dingen kunnen worden gedaan om het je makkelijker te maken vaccinaties te krijgen? Bijvoorbeeld over plek, toedieningswijze en/of de informatie die je krijgt. | | Nominaal | Ongepaard |
| Q3.1_school | Op welke school zit je? | School 1 (0)<br>School 2 (1) | Nominaal | Ongepaard |
| Q3.2_leeftijd | Wat is je leeftijd? | A t/m g, 13 t/m 19 (13 = 0; 14 = 1; 15 = 2; 16 = 3; 17 = 4; 18+ = 5) | Ordinaal | Ongepaard |
| Q3.3_geslacht | Wat is je geslacht? | Man = 0; vrouw = 1 | Binair /nominaal | Ongepaard |
| Q3.4_opl_tiener | Welke opleiding volg je? | Practical education, VMBO-B, VMBO-K, VMBO-T, HAVO VWO-ATHENEUM, VWO-GYMNASIUM (VMBO-T = 0, HAVO = 1, VWO =2) | Ordinaal | Ongepaard |
| Q3.5_opl_ouders | Wat is de hoogste opleiding die je ouders hebben gevolgd? | Basisonderwijs, VMBO, HAVO, VWO, MBO (middelbaar beroepsonderwijs), HBO (hoger beroepsonderwijs), Universiteit, Weet ik niet (laag = 0 [ basic education, VMBO]; midden =1 [HAVO, VWO, MBO]; hoog = 2 [ HBO, University]; anders = 3, do not know =4) | Ordinaal | Ongepaard |
| Q3.6_geloof_tiener | Welke geloof heb jijzelf? | Geen (0)<br>Gereformeerd (1)<br>Islam (2)<br>Ander geloof (rooms katholiek, protestant en anders) (3) | Nominaal | Ongepaard |

| | | | | |
|---|---|---|---|---|
| Q3.7_geloof_ouders | Welk geloof hebben je ouders? | Geen (0)<br>Gereformeerd (1)<br>Islam (2)<br>Ander geloof (rooms katholiek, protestant en anders) (3)<br>Weet ik niet (4) | Nominaal | Ongepaard |
| Q3.8_afkomst_tiener | Waar ben je geboren? | Nederland (0)<br>Eerste of tweede generatie (1) | Nominaal | Ongepaard |

## Appendix 8. Information letter parents

Betreft: Onderzoek Rijksvaccinatieprogramma onder jongeren

Geachte Ouder(s)/Verzorger(s),

In het kader van mijn afstudeeronderzoek voor de master Gezondheidswetenschappen aan de Universiteit Twente doe ik een onderzoek naar de dalende vaccinatiegraad van het Rijksvaccinatieprogramma in Nederland. Ik richt mij hierbij op de leeftijdsgroep 14 tot 19 jaar en hun beweegredenen om zich wel/niet te laten vaccineren. Het doel van dit onderzoek is om inzicht te krijgen in de behoeftes van deze leeftijdsgroep omtrent vaccineren. Aangezien de onderzoeksgroep in de leeftijd valt waarin toestemming van de ouder(s)/verzorger(s) nodig is voor deelname vraag ik dit aan u middels deze e-mail.

Ik stuur u deze e-mail om u te informeren dat uw kind op een school zit waarbij tussen 15 en 26 april 2019 een vragenlijst van ongeveer 10 minuten zal worden afgenomen.

**Welke informatie wordt verzameld?**
De volgende informatie wordt in de vragenlijst aan uw kind gevraagd:
Demografische gegevens: school, leeftijd, opleidingsniveau van kind en ouder(s)/verzorger(s), religie van kind en ouder(s)/verzorger(s) en etnische achtergrond/afkomst van kind en ouder(s)/verzorger(s).
Vragen omtrent de organisatie van het rijksvaccinatieprogramma zoals communicatie en (sociaals-) media.
Vragen omtrent individue en sociale invloeden zoals de houding tegenover vaccinatie.
Vragen omtrent vaccinatie specifieke issues zoals de invoer van een nieuwe vaccinatie.

**Wat vragen we van u als ouder(s)/verzorger(s)?**
Voor het invullen van de vragenlijst is het handig dat uw kind weet of hij of zij alle aangeboden vaccinaties (vanuit het Rijksvaccinatieprogramma) heeft gehad, dit zal namelijk aan uw kind worden gevraagd. Ik zou het erg waarderen als u dit met uw kind bespreekt zodat hij/zij antwoord op deze vraag kan geven.

**Hoe ga ik om met de verzamelde gegevens?**
De vragenlijst wordt online en anoniem ingevuld. Hoe bewaren en gebruik ik de informatie die uw kind mij geeft?
De kinderen ontvangen voor deelname aan het onderzoek een link die hetzelfde is voor alle deelnemende kinderen. De naam van uw kind zal binnen dit onderzoek niet worden gevraagd. De antwoorden in de vragenlijst worden dus anoniem verwerkt, waardoor de vragenlijsten niet terug te herleiden zijn naar uw kind.
Degenen die toegang hebben tot de gegevens is de onderzoeker en diens begeleiders. De school van uw kind heeft geen toegang tot de ingevulde gegevens. De gegevens zullen tot 10 jaar bewaard worden op een server van de Universiteit Twente.

**Vrijwilligheid**
Deelname van uw kind aan dit onderzoek is vrijwillig. Uw kind wordt voor het invullen van de vragenlijst zelf om akkoord gevraagd voor vrijwillige deelname. Naast de ouderlijke toestemming voor minderjarige kinderen (jonger dan 16), worden deze kinderen zelf ook gewezen op vrijwillige deelname en om toestemming gevraagd.

**Contactinformatie en bezwaar indienen**

Deze brief heeft tot doel om uw toestemming te vragen voor deelname van uw kind (jonger dan 16) aan dit onderzoek. Indien u bezwaar heeft tegen deelname van uw kind (jonger dan 16) aan de vragenlijst dan kunt u dit kenbaar maken aan *'naam + mailadres contactpersoon school'*. Indien u bezwaar aantekent verwacht ik tevens van u dat u dit door zult geven aan uw kind. De docent zal dan in de klas geen link tot de vragenlijst verstrekken aan uw kind. Indien u geen bezwaar aantekent tot deelname zie ik dit als akkoord gaan met deelname. Indien uw kind ouder is dan 16 jaar dan mag uw kind wettelijk gezien zelf kiezen of uw kind de vragenlijst wil invullen. Uw kind (ouder dan 16) zal in de klas standaard de link tot de vragenlijst ontvangen en kan hierbij zelf de keus maken om wel/niet deel te nemen.

Mocht u vragen hebben naar aanleiding van dit onderzoek of deze brief, dan kunt u contact opnemen met *'naam + mailadres contactpersoon school'.* Dit onderzoeksproject is beoordeeld en goedgekeurd door de ethische commissie van de Faculteit van Behavioural, Management and Social Sciences van de Universiteit Twente. Bent u het ergens niet mee eens of heeft u zorgen over de onderzoeksprocedure? Dan kunt u mailen naar de ethische commissie van de Universiteit Twente via: ethicscommittee-bms@utwente.nl.

Met vriendelijke groet,
Lisanne Schulenburg

## Appendix 9. Syntax

```
* Encoding: UTF-8.
* Encoding: .
GET
 FILE='C:\Users\lisan\Dropbox\universiteit\Master health science\Thesis\Thesis\Vragenlijst '+
  'Vaccinatie - Officieel_May 15, 2019_01.10.sav'.
DATASET NAME DataSet2 WINDOW=FRONT.

* Stap 1: opschonen van de data.
* volledig ingevulde vragenlijsten (FINISED=1) worden meegenomen, niet volledig ingevulde
vragenlijsten (FINISHED = 0) worden niet meegenomen.
SELECT IF FINISHED=1.
EXECUTE.

* Na het excluderen van onvolledige ingevulde vragenlijsten bleken er nog wat vragenlijsten met
ontbrekende achtergrondgegevens te zijn.
* Dit zijn de vragenlijsten met de nummers 44, 96, 100, 184, 225 en 227. Deze worden ook
geëxcludeerd.
* De vragenlijst is op 2 scholen uitgevoerd. Participanten die aangaven op een andere school dan
deze 2 te zitten zijn geëxcludeerd.

FILTER OFF.
USE ALL.
SELECT IF
(Nmiss(Q3.1_school,Q3.2_leeftijd,Q3.3_geslacht,Q3.4_opl_tiener,Q3.5_opleiding_vader_1,Q3.5_opl
eiding_moeder_1,Q3.6_geloof_tiener,Q3.7_geloof_vader_1,Q3.7_geloof_moeder_1,Q3.8_afkomst_t
iener,Q3.9_afkomst_vader_1,Q3.9_afkomst_moeder_1) < 1).
EXECUTE.

SELECT IF (Q3.1_school=2 OR Q3.1_school=3).
EXECUTE.

* Opleidingsniveau ouders en kind hercoderen naar ‘vmbo-t’ ‘havo ‘vwo’ en 'laag, midden, hoog'.
RECODE Q3.4_opl_tiener (4=0)(5=1)(6=2)(7=2) INTO Q3.4_opl_tienercat.
VARIABLE LABELS Q3.4_opl_tienercat 'Q3.4_opl_tienercat'.
VALUE LABELS Q3.4_opl_tienercat 0 'VMBO-T' 1 'HAVO' 2 'VWO'.
EXECUTE.

RECODE Q3.5_opleiding_vader_1 (1=0)(2=0)(3=1)(4=1)(5=1)(6=2)(7=2)(8=8)(9=9) INTO
Q3.5_opleiding_vadercat.
VARIABLE LABELS Q3.5_opleiding_vadercat 'Q3.5_opl_vadercat'.
VALUE LABELS Q3.5_opleiding_vadercat 0 'Laag' 1 'Midden' 2 'Hoog' 8 'Anders' 9 'Weet ik niet'.
EXECUTE.

RECODE Q3.5_opleiding_moeder_1 (1=0)(2=0)(3=1)(4=1)(5=1)(6=2)(7=2)(8=8)(9=9) INTO
Q3.5_opleiding_moedercat.
VARIABLE LABELS Q3.5_opleiding_moedercat 'Q3.5_opl_moedercat'.
VALUE LABELS Q3.5_opleiding_moedercat 0 'Laag' 1 'Midden' 2 'Hoog' 8 'Anders' 9 'Weet ik niet'.
EXECUTE.
```

```
* Nieuwe variabelen aanmaken: alleen hoogst genoten opleiding meenemen zodat je minder
variabelen hebt.
IF (Q3.5_opleiding_vadercat=0 AND Q3.5_opleiding_moedercat=0) Q3.5_hoogste_opleiding_laag=0.
IF (Q3.5_opleiding_vadercat=1 AND Q3.5_opleiding_moedercat=0) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=2 AND Q3.5_opleiding_moedercat=0) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=0 AND Q3.5_opleiding_moedercat=1) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=0 AND Q3.5_opleiding_moedercat=2) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=1 AND Q3.5_opleiding_moedercat=1) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=2 AND Q3.5_opleiding_moedercat=2) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=2 AND Q3.5_opleiding_moedercat=1) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=1 AND Q3.5_opleiding_moedercat=2) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=8 AND Q3.5_opleiding_moedercat=0) Q3.5_hoogste_opleiding_laag=0.
IF (Q3.5_opleiding_vadercat=8 AND Q3.5_opleiding_moedercat=1) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=8 AND Q3.5_opleiding_moedercat=2) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=0 AND Q3.5_opleiding_moedercat=8) Q3.5_hoogste_opleiding_laag=0.
IF (Q3.5_opleiding_vadercat=1 AND Q3.5_opleiding_moedercat=8) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=2 AND Q3.5_opleiding_moedercat=8) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=9 AND Q3.5_opleiding_moedercat=0) Q3.5_hoogste_opleiding_laag=0.
IF (Q3.5_opleiding_vadercat=9 AND Q3.5_opleiding_moedercat=1) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=9 AND Q3.5_opleiding_moedercat=2) Q3.5_hoogste_opleiding_laag=2.
IF (Q3.5_opleiding_vadercat=0 AND Q3.5_opleiding_moedercat=9) Q3.5_hoogste_opleiding_laag=0.
IF (Q3.5_opleiding_vadercat=1 AND Q3.5_opleiding_moedercat=9) Q3.5_hoogste_opleiding_laag=1.
IF (Q3.5_opleiding_vadercat=2 AND Q3.5_opleiding_moedercat=9) Q3.5_hoogste_opleiding_laag=2.
ADD VALUE LABELS Q3.5_hoogste_opleiding_laag (0) Laag (1) Midden (2) Hoog.
EXECUTE.

* Verwijderen oude variabelen opleidingsniveau ouders en kind.
DELETE VARIABLES Q3.4_opl_tiener, Q3.5_opleiding_vader_1, Q3.5_opleiding_moeder_1.
EXECUTE.

* Verwijderen niet relevante vragen (vragen van tom).
DELETE VARIABLES StartDate, EndDate, Status, IPAddress, Progress, Duration__in_seconds_,
Finished, RecordedDate, ResponseId, RecipientLastName
RecipientFirstName, RecipientEmail, ExternalReference, LocationLatitude, LocationLongitude,
DistributionChannel, UserLanguage,
Q2.1A_uitnodiging, Q2.1B_gevaccineerd, Q2.1C_intentie, Q2.2_mening_vaccinaties,
Q2.2_mening_menacwy, Q2.3_ernstig,
Q2.4_vatbaarheid, Q2.4_effectiviteit, Q2.4_barrieres_bijwerking, Q2.4_barriers_pijn, Q2.5_ouders,
Q2.5_vrienden, Q2.5_klasgenoten, Q2.5_5.
EXECUTE.

* Value labels kort maken/hernoemen.
VARIABLE LABELS Q1.1_Deelname_vac 'Ben je volledig gevaccineerd?'.
VARIABLE LABELS Q1.2A_intentie_n_gevac 'Wanneer je een oproep krijgt om de vaccinaties die je
niet hebt gehad gratis te halen, zou je dit dan doen?'.
VARIABLE LABELS Q1.2b_Intentie_gevac 'Stel je bent niet volledig gevaccineerd en je krijgt een
oproep om de vaccinaties die je niet hebt gehad gratis te halen, zou je dit dan doen?'.
VARIABLE LABELS Q1.3_info_zoeken_1 'Waar zoek jij informatie als je iets wilt weten over
vaccinatie? Internet pagina's.
VARIABLE LABELS Q1.3_info_zoeken_2 'Waar zoek jij informatie als je iets wilt weten over
vaccinatie? Social Media'.
```

VARIABLE LABELS Q1.3_info_zoeken_3 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Mijn ouders/verzorgers'.
VARIABLE LABELS Q1.3_info_zoeken_4 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Vrienden'.
VARIABLE LABELS Q1.3_info_zoeken_5 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Klasgenoten/leraar'.
VARIABLE LABELS Q1.3_info_zoeken_6 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Arts of verpleegkundige'.
VARIABLE LABELS Q1.3_info_zoeken_7 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Ik zoek geen informatie op'.
VARIABLE LABELS Q1.3_info_zoeken_8 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Ik wil deze vraag niet beantwoorden'.
VARIABLE LABELS Q1.3_info_zoeken_9 'Waar zoek jij informatie als je iets wilt weten over vaccinatie? Anders, namelijk'.
VARIABLE LABELS Q1.4_info_bron_1 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Folder/brief'.
VARIABLE LABELS Q1.4_info_bron_2 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Website'.
VARIABLE LABELS Q1.4_info_bron_3 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Social media'.
VARIABLE LABELS Q1.4_info_bron_4 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Tijdens een les'.
VARIABLE LABELS Q1.4_info_bron_5 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Informatiebijeenkomst op school'.
VARIABLE LABELS Q1.4_info_bron_6 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Informatiebijeenkomst buiten school'.
VARIABLE LABELS Q1.4_info_bron_7 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je wilt laten vaccineren? Digitale keuzehulp'.
VARIABLE LABELS Q1.4_info_bron_8 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? App'.
VARIABLE LABELS Q1.4_info_bron_9 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Overheidscampagne'.
VARIABLE LABELS Q1.4_info_bron_10 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Via een gesprek met een arts of verpleegkundige'.
VARIABLE LABELS Q1.4_info_bron_11 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Ik heb geen behoefte aan informatie, ik laat me vaccineren'.
VARIABLE LABELS Q1.4_info_bron_12 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Ik heb geen behoefte aan informatie, ik laat me niet vaccineren'.
VARIABLE LABELS Q1.4_info_bron_13 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Anders, namelijk'.
VARIABLE LABELS Q1.4_info_bron_14 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Ik wil deze vraag niet beantwoorden'.
VARIABLE LABELS Q1.4_info_bron_15 'Hoe zou jij geïnformeerd willen worden over vaccinaties om een keuze te maken of je je wilt laten vaccineren? Mijn ouders/verzorgers'.
VARIABLE LABELS Q1.5_welke_info_1 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Risico op ziekte'.
VARIABLE LABELS Q1.5_welke_info_2 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Aantal patiënten, ziekenhuis opnames en sterfte'.

```
VARIABLE LABELS Q1.5_welke_info_3 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Ziekteverschijnselen'.
VARIABLE LABELS Q1.5_welke_info_4 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Inhoud vaccinatie'.
VARIABLE LABELS Q1.5_welke_info_5 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Bescherming vaccinatie'.
VARIABLE LABELS Q1.5_welke_info_6 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Risico op bijwerkingen'.
VARIABLE LABELS Q1.5_welke_info_7 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Ervaringen andere jongeren'.
VARIABLE LABELS Q1.5_welke_info_8 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Ervaringen andere landen'.
VARIABLE LABELS Q1.5_welke_info_9 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Beschikbare onderzoeken over vaccin(atie)'.
VARIABLE LABELS Q1.5_welke_info_10 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Geen informatie'.
VARIABLE LABELS Q1.5_welke_info_11 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Anders, namelijk'.
VARIABLE LABELS Q1.5_welke_info_12 'Als je een vaccinatie krijgt aangeboden, welke informatie over de ziekte en de vaccinatie daartegen zou je dan willen krijgen? Ik wil deze vraag niet beantwoorden'.
VARIABLE LABELS Q1.6_mening_gezondheid 'Stelling: Ik vind vaccineren belangrijk voor mijn gezondheid'.
VARIABLE LABELS Q1.6_mening_religie 'Stelling: Ik vind dat mensen die hun kind niet (volledig) laten vaccineren de gezondheid van hun kind in gevaar brengen.'.
VARIABLE LABELS Q1.6_mening_inhoud_rvp 'Stelling: Ik weet uit welke vaccinaties het RVP bestaat.'.
VARIABLE LABELS Q1.6_mening_vertrouwen 'Stelling: Ik vertrouw het advies over vaccinaties dat een arts of verpleegkundige mij geeft.'.
VARIABLE LABELS Q1.6_mening_veilig 'Stelling: Ik ben van mening dat vaccinaties veilig zijn.'.
VARIABLE LABELS Q1.6_mening_9 'Stelling: Ik vind dat ik voldoende informatie krijg over de veiligheid van vaccinaties.'.
VARIABLE LABELS Q1.6_mening_plek 'Stelling: Ik ben tevreden met de afstand tot de plek waar ik gevaccineerd kan worden.'.
VARIABLE LABELS Q1.6_mening_10 'Stelling: Ik heb voldoende kennis om een keuze te maken of ik mij wel/niet wil laten vaccineren'.
VARIABLE LABELS Q1.7A_zorgen_1 'Stelling: Ik heb zorgen over vaccinaties.'.
VARIABLE LABELS Q1.8_tijd 'Hoeveel tijd wil je maximaal kwijt zijn aan het halen van een vaccinatie?'.
EXECUTE.

* 0 invullen voor niet gegeven antwoorden / missing values van Q1.3, Q1.4, Q1.5.
RECODE Q1.3_info_zoeken_1 Q1.3_info_zoeken_2 Q1.3_info_zoeken_3 Q1.3_info_zoeken_4
  Q1.3_info_zoeken_5 Q1.3_info_zoeken_6 Q1.3_info_zoeken_7 Q1.3_info_zoeken_8
Q1.3_info_zoeken_9
  Q1.4_info_bron_1 Q1.4_info_bron_2 Q1.4_info_bron_3 Q1.4_info_bron_4 Q1.4_info_bron_5
  Q1.4_info_bron_6 Q1.4_info_bron_7 Q1.4_info_bron_8 Q1.4_info_bron_9 Q1.4_info_bron_10
  Q1.4_info_bron_15 Q1.4_info_bron_11 Q1.4_info_bron_12 Q1.4_info_bron_13 Q1.4_info_bron_14
  Q1.5_welke_info_1 Q1.5_welke_info_2 Q1.5_welke_info_3 Q1.5_welke_info_4 Q1.5_welke_info_5
  Q1.5_welke_info_6 Q1.5_welke_info_7 Q1.5_welke_info_8 Q1.5_welke_info_9
Q1.5_welke_info_10
  Q1.5_welke_info_11 Q1.5_welke_info_12 (SYSMIS=0) (1=1).
EXECUTE.
```

```
* Stap 2: bekijken afhankelijke variabele.
FREQUENCIES VARIABLES=Q1.1_Deelname_vac Q1.2a_intentie_n_gevac Q1.2b_Intentie_gevac
  /ORDER=ANALYSIS.
```

*Conclusie bekijken afhankelijke variabele: Er zijn 16 tieners (6.6%) niet gevaccineerd, 48 tieners(19.8%) gedeeltelijk gevaccineerd, 138 tieners (56.8%) volledig gevaccineerd en 40 tieners(16.9%) weten niet of ze volledig gevaccineerd zijn.
* In totaal zijn er van de 242 meegenomen reacties, 104 tieners niet gevaccineerd, niet volledig of weten niet of ze gevaccineerd zijn. Deze groep wordt meegenomen in de analyse.

```
* Uitsplitsen tabel Q1.2B: 'Volledig' en 'weet ik niet' om zo de verschillende antwoordgroepen te kunnen bekijken o.b.v. Q1.1.

SORT CASES BY Q1.1_Deelname_vac.
SPLIT FILE BY Q1.1_Deelname_vac.
FREQUENCIES  VARIABLES=Q1.2a_intentie_n_gevac.
SPLIT FILE OFF.

** Q1.2A samenvoegen met antwoord 'weet niet' op Q1.1 met Q1.2B. omdat 'weet ik niet' wel een relevante antwoordcategorie is om mee te nemen.
COMPUTE AFHLisanne = Q1.2a_intentie_n_gevac.
FREQUENCIES  AFHLisanne Q1.2a_intentie_n_gevac.
VALUE LABELS  AFHLisanne 0 'Nee' 1 'Waarschijnlijk niet' 2 'Twijfel' 3 'Waarschijnlijk wel' 4 'Ja'.
FREQUENCIES  AFHLisanne Q1.2a_intentie_n_gevac.
IF (Q1.1_Deelname_vac = 3) AND (Q1.2b_intentie_gevac = 0) AFHLisanne = 0.
IF (Q1.1_Deelname_vac = 3) AND (Q1.2b_intentie_gevac = 1) AFHLisanne = 1.
IF (Q1.1_Deelname_vac = 3) AND (Q1.2b_intentie_gevac = 2) AFHLisanne = 2.
IF (Q1.1_Deelname_vac = 3) AND (Q1.2b_intentie_gevac = 3) AFHLisanne = 3.
IF (Q1.1_Deelname_vac = 3) AND (Q1.2b_intentie_gevac = 4) AFHLisanne = 4.
FREQUENCIES  AFHLisanne Q1.2a_intentie_n_gevac.

* Stap 3: Alleen participanten die niet weten of ze volledig gevaccineerd zijn, die niet gevaccineerd zijn en die niet volledig (gedeeltelijk) gevaccineerd zijn worden meegenomen in verdere analsyse.
SELECT IF (AFHLisanne=0 OR AFHLisanne=1 OR AFHLisanne=2 OR AFHLisanne=3 OR AFHLisanne=4).
EXECUTE.
FREQUENCIES  AFHLisanne Q1.2a_intentie_n_gevac.

*stap 4. Hercoderen.
*hercoderen van geloof voor tiener, vader en moeder.
RECODE Q3.6_geloof_tiener (0=0)(1=3)(2=1)(3=3)(4=2)(5=3) INTO Q3.6_geloof_tiener_geen.
VARIABLE LABELS Q3.6_geloof_tiener_geen 'Q3.6_geloof_tiener_geen'.
VALUE LABELS Q3.6_geloof_tiener_geen 0 'Geen geloof' 1 'Gereformeerd' 2 'Islam' 3 'Ander Geloof / RK / Protestant'.
EXECUTE.

* Geloof van vader.
RECODE Q3.7_geloof_vader_1 (0=0)(1=3)(2=1)(3=3)(4=2)(5=3) INTO Q3.7_geloof_vader_geen.
VARIABLE LABELS Q3.7_geloof_vader_geen 'Q3.7_geloof_vader_geen'.
VALUE LABELS Q3.7_geloof_vader_geen 0 'Geen geloof' 1 'Gereformeerd' 2 'Islam' 3 'Ander Geloof / RK / Protestant'.
EXECUTE.
```

```
* Geloof van moeder.
RECODE Q3.7_geloof_moeder_1 (0=0)(1=3)(2=1)(3=3)(4=2)(5=3) INTO Q3.7_geloof_moeder_geen.
VARIABLE LABELS Q3.7_geloof_moeder_geen 'Q3.7_geloof_moeder_geen'.
VALUE LABELS Q3.7_geloof_moeder_geen 0 'Geen geloof' 1 'Gereformeerd' 2 'Islam' 3 'Ander Geloof
/ RK / Protestant'.
EXECUTE.

*Migratieachtergrond ouders en kind naar Nederlands, eerste generatie en tweede generatie.
IF (Q3.9_afkomst_vader_1=1 AND Q3.9_afkomst_moeder_1=1) Q3.9_afkomst_ouders=0.
IF (Q3.9_afkomst_vader_1=2 AND Q3.9_afkomst_moeder_1=1) Q3.9_afkomst_ouders=1.
IF (Q3.9_afkomst_vader_1=3 AND Q3.9_afkomst_moeder_1=1) Q3.9_afkomst_ouders=1.
IF (Q3.9_afkomst_vader_1=1 AND Q3.9_afkomst_moeder_1=2) Q3.9_afkomst_ouders=1.
IF (Q3.9_afkomst_vader_1=1 AND Q3.9_afkomst_moeder_1=3) Q3.9_afkomst_ouders=1.
IF (Q3.9_afkomst_vader_1=2 AND Q3.9_afkomst_moeder_1=2) Q3.9_afkomst_ouders=1.
IF (Q3.9_afkomst_vader_1=3 AND Q3.9_afkomst_moeder_1=3) Q3.9_afkomst_ouders=1.
ADD VALUE LABELS Q3.9_afkomst_ouders (0) NL (1) Niet-NL.
EXECUTE.

IF (Q3.8_afkomst_tiener=1 AND Q3.9_afkomst_ouders=0) Q3.9_afkomst_tiener_NL=0.
IF (Q3.8_afkomst_tiener=2) Q3.9_afkomst_tiener_NL=1.
IF (Q3.8_afkomst_tiener=3 ) Q3.9_afkomst_tiener_NL=1.
IF (Q3.8_afkomst_tiener=1 AND Q3.9_afkomst_ouders=1) Q3.9_afkomst_tiener_NL=1.
ADD VALUE LABELS Q3.9_afkomst_tiener_NL (0) NL (1) Eerste generatie en tweede generatie.
EXECUTE.

* Hercoderen voor het aanmaken van de constante van vragen die nog geen constante hebben.
* Hercoderen geslacht.
RECODE Q3.3_geslacht (1=0) (2=1).
VALUE LABELS Q3.3_geslacht 0 'Man' 1 'Vrouw'.
EXECUTE.

*Hercoderen school.
RECODE Q3.1_school (2=0) (3=1).
VALUE LABELS Q3.1_school 0 'School Z' 1 'School A'.
EXECUTE.

*Hercoderen tijd.
RECODE Q1.8_tijd (1=0) (2=1) (4=2) (5=3) (7=4) (8=5).
VALUE LABELS Q1.8_tijd 0 '15 - 30 minuten' 1 '30 - 45 minuten' 2 '45 - 60 minuten' 3 'maakt me niet
uit' 4 '0-15 minuten' 5 'meer dan 60 minuten'.
MISSING VALUES Q1.8_tijd (6).
EXECUTE.

*Hercoderen leeftijd; 18 en 19 samennemen naar 18+.
RECODE Q3.2_leeftijd (1=0)(2=1)(3=2)(4=3)(5=4)(6=5)(7=5).
VALUE LABELS Q3.2_leeftijd 0 '13' 1 '14' 2 '15' 3 '16' 4 '17' 5 '18+'.
EXECUTE.

* Stap 5: label geven aan nieuw gemaakte variabelen.
VARIABLE LABELS Q3.4_opl_tienercat 'wat is je opleidingsniveau? vmbo-t is constante.'.
```

```
VARIABLE LABELS Q3.5_hoogste_opleiding_laag 'wat is de hoogste genoten opleiding van je ouders?
laag is constante'.
VARIABLE LABELS AFHLisanne 'intentie om te vaccineren bij een heroproep van niet (volledig)
gevaccineerden en tieners dit dit niet weten. nee is constante.'.
VARIABLE LABELS Q3.6_geloof_tiener_geen 'welk geloof heb je? geen is constante.'.
VARIABLE LABELS Q3.7_geloof_vader_geen 'Welk geloof heeft je vader? geen is constante.'.
VARIABLE LABELS Q3.7_geloof_moeder_geen 'Welk geloof heeft je moeder?geen is constante.'.
VARIABLE LABELS Q3.9_afkomst_tiener_NL 'Ben je NL, eerste generatie NL of tweede generatie NL?
NL is constante'.

*Stap 6: univeriate analyse: kijken naar descriptives.
*Tabel met de achtergrond kenmerken van deelnemers.
FREQUENCIES VARIABLES=Q1.1_Deelname_vac Q3.1_school Q3.2_leeftijd Q3.3_geslacht
Q3.7_geloof_vader_geen
Q3.7_geloof_moeder_geen Q3.6_geloof_tiener_geen Q3.9_afkomst_tiener_NL Q3.4_opl_tienercat
Q3.5_hoogste_opleiding_laag
 /ORDER=ANALYSIS.

DESCRIPTIVES VARIABLES=Q1.1_Deelname_vac Q3.1_school Q3.2_leeftijd Q3.3_geslacht
Q3.7_geloof_vader_geen
Q3.7_geloof_moeder_geen Q3.6_geloof_tiener_geen Q3.9_afkomst_tiener_NL Q3.4_opl_tienercat
Q3.5_hoogste_opleiding_laag.

*Kijken naar de frequencies van het aantal mensen dat aangeeft zich zorgen te maken.
FREQUENCIES variables = Q1.7A_zorgen_1.

*Analyseren multiple response vragen.
*Bekijken multiple choice vragen Q1.3, Q1.4 en Q1.5.

MULT RESPONSE GROUPS=$Q1.3_mr_info_zoeken (q1.3_info_zoeken_1 q1.3_info_zoeken_2
q1.3_info_zoeken_3
  q1.3_info_zoeken_4 q1.3_info_zoeken_5 q1.3_info_zoeken_6 q1.3_info_zoeken_7
q1.3_info_zoeken_8
  q1.3_info_zoeken_9 (1))
 /FREQUENCIES=$Q1.3_mr_info_zoeken.

MULT RESPONSE GROUPS=$Q1.4_mr_info_bron_1 (q1.4_info_bron_1 q1.4_info_bron_2
q1.4_info_bron_3
  q1.4_info_bron_4 q1.4_info_bron_5 q1.4_info_bron_6 q1.4_info_bron_7 q1.4_info_bron_8
  q1.4_info_bron_9 q1.4_info_bron_10 q1.4_info_bron_15 q1.4_info_bron_11 q1.4_info_bron_12
  q1.4_info_bron_13 q1.4_info_bron_14 (1))
 /FREQUENCIES=$Q1.4_mr_info_bron_1.

MULT RESPONSE GROUPS=$Q1.5_mr_welke_info (q1.5_welke_info_1 q1.5_welke_info_2
  q1.5_welke_info_3 q1.5_welke_info_4 q1.5_welke_info_5 q1.5_welke_info_6 q1.5_welke_info_7
  q1.5_welke_info_8 q1.5_welke_info_9 q1.5_welke_info_10 q1.5_welke_info_11
q1.5_welke_info_12 (1))
 /FREQUENCIES=$Q1.5_mr_welke_info.

* Stap 7: bivariate analyse: analyseren significante relaties.
*Kijken naar significante relaties tussen de intentie van tieners om zich te laten vaccineren en
achtergrondgegevens.
```

```
means VARIABLES AFHLisanne BY Q3.1_school Q3.2_leeftijd Q3.3_geslacht Q3.7_geloof_vader_geen
Q3.7_geloof_moeder_geen Q3.6_geloof_tiener_geen
Q3.9_afkomst_tiener_NL Q3.4_opl_tienercat Q3.5_hoogste_opleiding_laag / STATISTICS = ANOVA.

*Kijken naar significante relaties tussen de intentie van tieners om zich te laten vaccineren en de
likert-scale vragen.
NONPAR CORR
 /VARIABLES=AFHLisanne Q1.6_mening_gezondheid Q1.6_mening_religie Q1.6_mening_inhoud_rvp
  Q1.6_mening_vertrouwen Q1.6_mening_veilig Q1.6_mening_9 Q1.6_mening_plek
Q1.6_mening_10 Q1.7A_zorgen_1 Q1.8_tijd.
 /PRINT=SPEARMAN TWOTAIL NOSIG
 /MISSING=PAIRWISE.

*Kijken naar signifcante realties tussen de multiple choice vragen en de intentie om zich te laten
vaccineren.
means VARIABLES AFHLisanne BY Q1.3_info_zoeken_1 Q1.3_info_zoeken_2 Q1.3_info_zoeken_3
Q1.3_info_zoeken_4 Q1.3_info_zoeken_5
Q1.3_info_zoeken_6 Q1.3_info_zoeken_7 Q1.3_info_zoeken_8 Q1.3_info_zoeken_9 / STATISTICS =
ANOVA.

means VARIABLES AFHLisanne BY Q1.4_info_bron_1 Q1.4_info_bron_2 Q1.4_info_bron_3
Q1.4_info_bron_4 Q1.4_info_bron_5 Q1.4_info_bron_6 Q1.4_info_bron_7
Q1.4_info_bron_8 Q1.4_info_bron_9 Q1.4_info_bron_10 Q1.4_info_bron_15 Q1.4_info_bron_11
Q1.4_info_bron_12 Q1.4_info_bron_13 Q1.4_info_bron_14 / STATISTICS = ANOVA.

means VARIABLES AFHLisanne BY Q1.5_welke_info_1 Q1.5_welke_info_2 Q1.5_welke_info_3
Q1.5_welke_info_4 Q1.5_welke_info_5 Q1.5_welke_info_6 Q1.5_welke_info_7 Q1.5_welke_info_8
Q1.5_welke_info_9 Q1.5_welke_info_10
Q1.5_welke_info_11 Q1.5_welke_info_12 / STATISTICS = ANOVA.
```

## Appendix 10. Answers and coding of open questions

**Vraag: Je hebt bij de vorige vraag aangegeven zorgen te hebben over vaccinaties. Wat zijn je zorgen?**

| Antwoorden | Codering |
|---|---|
| Ik weet niet veel over vaccinaties. | Kennis |
| Er wordt heel weinig informatie over verteld en je wordt slecht toegelicht | Informatie |
| Het is niet per se dat ik me zorgen maak, maar ik denk soms wel: waarom is dat allemaal nodig? En wat gebeurt er als ik het niet doe? | Afvragen noodzakelijkheid |
| Ik heb bewust gekozen (samen met mijn ouders) om niet de vaccinatie voor baarmoederhalskanker te nemen. Baarmoederhalskanker kun je krijgen als je op jonge leeftijd veel onveilige seks hebt. Dat is bij mij niet het geval waardoor dat niet nodig zou zijn. Daarnaast was er ook sprake van heftige bijwerkingen; zo is er een meisjes met griepverschijnselen na 3 dagen overleden. Daarom vind ik dat sommige vaccinaties onnodig zijn en tegelijkertijd gevaarlijke en zelfs dodelijke bijwerkingen hebben. | Afvragen noodzakelijkheid<br>Bijwerkingen |
| Ik ben redelijk bang voor naalden dus daar maak ik me een beetje zorgen over. Ook weet ik niet zeker of de vaccinaties 100% werken en veilig zijn | Manier van toediening<br>Veiligheid |
| De bijwerkingen en de veiligheid | Bijwerkingen<br>Veiligheid |
| Bijwerkingen | Bijwerkingen |
| Bijwerkingen | Bijwerkingen |
| Heb een soort naalden angst dus is Sws al een probleem dus het toedienen is een probleem | Manier van toediening |
| Dat ik nog geen menigocokken vaccinatie heb gehad. | Zorgen over het niet hebben van de meningokokken vaccinatie |
| Veiligheid | Veiligheid |
| Mijn zorgen zijn of er geen erge bijwerkingen zijn, en of het wel helemaal goed is voor de gezondheid | Bijwerkingen<br>Afvragen werking |
| Zorgen over de veiligheid, omdat er verschillende meningen zijn over sommige vaccinaties (van huisartsen). | Veiligheid |
| Doordat er nu een discussie gaande is of het wel goed is om je te laten vaccineren vraag ik me nou of het echt wel goed is. Je krijgt wel van alles binnen wat misschien ook weer zo z'n gevolgen heeft. | Afvragen werking |
| Bijwerkingen | Bijwerkingen |
| Dat er iets mis kan gaan met de vaccinaties En schade kan vormen voor onze gezondheid. | Afvragen werking |
| Ik ben bang dat de mensen die die inenting moeten geven een fout maken | Geen vertrouwen in professionals |

| | |
|---|---|
| ik wil graag dat het op Ziggo voetbal staat of dat het op het jeugdjournaal of op Nickelodeon en Veronica komt. alvast bedankt! | Informatie |

**Vraag: Welke dingen kunnen worden gedaan om het je makkelijker te maken vaccinaties te krijgen?**

| Antwoorden | Codering |
|---|---|
| Dicht in de buurt | Plek |
| school | Plek |
| niks | Geen verbeteringen nodig |
| Geen hele lange wachtrij | Wachttijden |
| Meer plaatsen | Plek |
| Verdoving of pijnstillers en een niet te grote naald. | Manier van toediening |
| Meer plek om mensen te laten vaccineren | Plek |
| Meerdere dagen beschikbaar | Meer vaccinatie momenten |
| hoe het wordt aangebracht | Manier van toediening |
| een vaccinatie dicht bij je huis doen is makkelijk voor de meeste mensen | Plek |
| Dichtbij, flexibele tijden | Plek<br>Tijdstippen |
| Ik denk dat als je van tevoren voldoende informatie verleend aan de patiënt over wat er gaat gebeuren, of er eventuele risico's zijn en waarom je het wel of niet zou doen, dat je de keuze dan wel makkelijker kan maken | Informatie |
| De informatie | Informatie |
| Meer informatie over vaccinaties. | Informatie |
| Ik woon in X en als ik mij wil laten vaccineren moet ik helemaal naar de andere kant van X. Ik zou het makkelijker vinden als er meerdere plekken zijn waar je je kunt laten vaccineren. | Plek |
| Duidelijk zijn over de voor- en nadelen van de vaccinatie. (dus bijwerkingen) | Informatie |
| De informatie krijg je vaak per brief, maar ik persoonlijk kijk nooit in brieven daardoor heb ik onlangs ook een vaccinatie misgelopen. Ik zou dus aanraden om een mailtje of app te maken/sturen. | Informatie |
| Ik denk dat er vooral meer informatie moet worden gegeven over de vaccinaties. Wanneer en waarvoor precies, en wat dus de ziekte inhoud en de risico's die aan het vaccineren zitten. Ook moet er onderscheid gemaakt worden in belang van bepaalde vaccinaties, welke zijn bijna noodzakelijk en welke optioneel. | Informatie |
| Meer informatie over wanneer je een prik moet krijgen | Informatie |
| De mogelijkheid om dichter bij mijn woonplek gevaccineerd te worden | Plek |

| | |
|---|---|
| meer informatie die naar je toegestuurd word, zoals een brief waarin alles staat of een gesprek met een dokter | Informatie |
| als het bijv. op school gebeurd, ik moet toch wel naar school dus heeft het geen invloed op mijn tijd | Plek |
| Duidelijke onderzoek resultaten laten zien en vertellen hoe goed een vaccinatie beschermt tegen een ziekte | Informatie |
| Op meer verschillende plekken zo dicht mogelijk in de buurt | Plek |
| door meer informatie te krijgen en meer plekken beschikbaar te stellen voor het halen van de vactinatie | Informatie<br>Plek |
| De vaccinaties thuis krijgen | Plek |
| Als er nog wat meer informatie zou komen over wat de ziekte precies is waar je voor ingeënt wordt zou ik dat wel fijn vinden. | Informatie |
| Voldoende juiste informatie om een goede keus te maken. Verder een gesprek met mijn ouders en een niet al te verre plaats waar ik hem zou moeten halen. | Informatie<br>Gesprek met ouders<br>Plek |
| De tijden waarop het gedaan wordt zijn nog wel eens nadelig met school. Dus dat zou anders kunnen. Ook is het wachten vaak erg lang. | Tijdstippen<br>Wachttijden |
| meer informatie op duidelijke plekken. | Informatie |
| meer oproep en meer duidelijkheid over alle vaccinaties. | Meer oproepen<br>Informatie |
| Meer informatie over de inhoud van de ziekten die je tegengaat met een vaccinatie | Informatie |
| genoeg informatie, de plek moet niet te ver weg zijn | Informatie<br>Plek |
| Meer informatie erover geven en dan ook de bijwerkingen en alle informatie. Dus alle voor- en nadelen geven via een mail, of informatiebrief of iets dergelijks. | Informatie |
| Wat meer uitleg over de vaccinatie zelf en de ziekte en wat het nou precies met je doet en wat eventuele bijwerkingen kunnen zijn. | Informatie |
| Alle informatie makkelijk beschikbaar stellen | Informatie |
| misschien wat meer informatie over de vaccinaties dat je beter weet wat voor een prik het is en waarvoor | Informatie |
| meerdere mensen tegelijk, gerust stelling | Wachttijden<br>Houding/werkwijze professionals |
| Informatiebijeenkomst of uitleg op school vanuit verschillende perspectieven, om zelf een weloverwogen beslissing te kunne nemen. | Informatie |
| Er moeten vaker vaccinatie momenten zijn zodat de hoeveelheid mensen die daar naartoe gaan | Meer vaccinatie momenten<br>Geen massavaccinatie |

| | |
|---|---|
| zich uitspreiden over de verschillende momenten | |
| Extra informatie | Informatie |
| dat weet ik niet. Ik heb bijna geen vaccinaties gehad, dus dan zou ik denken dat er wat veranderd kan worden aan de informatie die je de mensen geeft. | Informatie |
| Veel uitleg, mensen die goed kunnen vaccineren, kennis hebben om je te helpen als je naaldenangst hebt | Informatie<br>Houding/werkwijze professionals<br>Manier van toediening |
| Informatie toesturen | Informatie |
| Geen spuitje, want spuitjes zijn eng | Manier van toediening |
| Dat het op meerdere plekken wordt gedaan, want als het niet op veel plekken is en het is ver van je dan moet je veel reizen. Daarnaast vind ik het belangrijk wat mij wordt toegediend en waarom. | Plek<br>Informatie |
| Folders en/of flyers bij in- en uitgang, zorgen dat de vaccinatie binnen 30 min te halen is. | Informatie<br>Wachttijden |
| Informatie | Informatie |
| Meer informatie | Informatie |
| Meer informatie verspreiden | Informatie |
| vooral de informatie is belangrijk | Informatie |
| bij huisarts | Plek |
| Ik heb er geen problemen mee hoe het nu is. | Geen verbeteringen nodig |
| ik heb bijna geen informatie gekregen over vaccinaties en dat zou voor mij helpen, door het op school er over te hebben of een brief te krijgen. | Informatie |
| Meer informatie over de vaccinatie | Informatie |
| Informatie krijgen via post. Dat de dag van te voren of week een herinnering wordt gestuurd | Informatie<br>Herinnering voor vaccinatie |
| De informatie, soms wordt er heel weinig informatie gegeven over de vaccinatie die wordt gegeven. | Informatie |
| zo dichtbij mogelijk | Plek |
| weet ik niet. Ik kan nu niks bedenken. Het gaat voor mijn gevoel nu allemaal wel prima. | Geen verbeteringen nodig |
| meer informatie die de standpunten van de mensen die tegen vaccinatie zijn afbreekt. | Informatie |
| De mensen worden niet allemaal rond dezelfde tijd verwacht. Hierdoor is het niet druk als je de vaccinatie krijgt en ben je er zo weer klaar mee. | Tijdstippen |
| Niet perse heel veel. Dan zou ik zeggen dat dan meer informatie wel fijn kan zijn. Zodat de keuze makkelijker kan worden. | Informatie |
| Informatie krijgen | Informatie |
| Goede informatie geven over wat de prik doet | Informatie |
| Ik weet niet | Ik weet geen verbetering |

| | |
|---|---|
| is maar een prikje | Geen verbeteringen nodig |
| ik moet goed weten wat voor vaccinaties ik krijg | Informatie |
| welke vaccinatie je krijgt | Informatie |
| Meer toelichting | Informatie |
| Weet niet | Ik weet geen verbetering |
| Plaats dichterbij | Plek |
| Niet iedereen te gelijk | Geen massavaccinatie |
| Niet te lang wachten | Wachttijden |
| de mensen die de vaccinatie geven dat zij wat rustgevender zijn tegen mensen die het spannend of eng vinden | Houding/werkwijze professionals |
| Niks maakt mij niet uit | Geen verbeteringen nodig |
| Het moet dichtbij je huis zijn | Plek |
| De plek | Plek |
| geen idee | Ik weet geen verbetering |
| Voldoende informatie | Informatie |
| Dichtbij, school, hoe snel het gaat | Plek<br>Wachttijden |
| Een plek die dichtbij huis is | Plek |
| informatie | Informatie |
| is al goed | Geen verbeteringen nodig |
| dat de vaccinatie mensen bij mij thuis komen in plaats van dat ik naar hun moet komen. | Plek |
| De vaccinatie krijgen op een plek die makkelijk bereikbaar is voor iedereen en in de buurt ligt van waar die persoon woont. En ook genoeg informatie krijgen over de vaccinatie. | Plek<br>Informatie |