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Vaccine decision-making of highly-skilled migrant parents in Twente.

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Abstract

Background: Vaccination is a preventive tool which helps in controlling and eliminating infectious diseases. It is a cost-effective health intervention which is estimated to avert 2 to 3 million deaths each year. There has been steady increase in the migrating population in the Netherlands. Besides from the asylum seeking, immigrants, there is a shortage for skilled labor which attracts highly skilled migrants to the Netherlands. Though there have been studies on individual decision-making and on decision-making of the asylum seekers there has been no such study for highly-skilled migrants.

Objective: The main objective of this thesis is to determine the factors that have an effect or influence the decision of highly-skilled migrants to whether vaccinate or not to vaccinate their children. These factors are determined by two processes, initially with a literature review which is then followed by interviewing a sample highly skilled migrant parents from the Twente region of the Netherlands.

Method: An explorative study was carried out which consisted of a literature review and a qualitative analysis. In the literature review, different determinants/factors were investigated that had an effect or influences the decision of highly-skilled migrant parents for vaccination of their children. These factors were determined with the combination of the factors from the literature and from the basic theoretical framework. The three C's model of confidence, complacency and convenience was used to determine the factors. In the qualitative analysis, semi-structured interviews with highly-skilled migrant parents (N=10) were conducted to explore the barrier they come to face during decision process of vaccination of their children.

Result: According to the literature, there are various determinants/ factors that affects the decision of migrant parents. These factors are categorized in the three C's model of confidence, complacency and convenience. Convenience created the practical barriers for the highly-skilled migrant parents. It was described by the participants as language barrier, accessibility to reschedule the appointment for the vaccinations and availability of more vaccines other than the 12 basic vaccines provided in the NIP schedule. Information provided or received by the participants should be satisfactory and in a language that is understandable to them. Confidence as described by the participants is trust in the authority or the system that delivers the vaccines. Complacency in terms of composition of the vaccine or the social norm was not considered to a barrier for the vaccination of the children of the highly-skilled migrant parents.

Conclusion: There are factors/determinants that affects the individual decision of highly-skilled migrant parents to whether vaccinate or not to vaccinate their children. The participants in this study were found to be aware about vaccination of children. According to the three C's model confidence and complacency were not considered to a major barrier for the decision. Convenience was considered to be a barrier according to this thesis. Convenience as described by the participants are not receiving information from the vaccination provider satisfactorily or in a language that is understandable to the participants, difficulty in accessibility in rescheduling the appointment time for the vaccination, not enough information provided for the availability of vaccines that are available to the highly-skilled migrant parents for their children other than the basic 12 vaccination from the NIP schedule, the consultation time is too short to be satisfied with the information provided to the highly-skilled migrants. Though the recall system in the Netherlands is effective but due to the information being in Dutch, it is not understandable to many of the participants.

According to the parents the intervention should be more of a tailored program for them, like receiving mail in a language that is understandable to them rather than in Dutch, increase in the consultation time during or before the vaccination of the children to provide with the information required to make a decision.

List of Abbreviations

BCG – Bacillus Calmette-Guerin
CWC – Child Welfare Centre
EU – European Union
EMN – European Migrant Network
GP – General Physician
HSM – Highly-skilled Migrant
NIP – National Immunization Programme
OECD – Organization for Economic Co-operation and Development
RIVM National Institute of Public Health and Environmental
VPD – Vaccine Preventable Diseases
VCP – Vaccine Care Provider
WHO – World Health Organization

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Chapter 1: Introduction

Infectious diseases are one of the major contributors for the cause of illness and death in the world (CDC, 2011). The efforts to prevent and control such diseases are continuously confronted with the microbe's evolution and their adaptation (CDC, 2011).

To prevent from a particular disease, vaccines provide the host with the acquired immunity. Vaccination is the process of administering vaccine, which is the most effective method of preventing infectious diseases (CDC, 2011). Vaccination also provides herd immunity, especially to those who are under vaccinated or not vaccinated. It has led to reduction in the morbidity and mortality of children, caused by vaccine preventable diseases (Prymula, 2017). It is estimated that vaccination prevents up to 2 - 3 million deaths each year worldwide (WHO, 2018).

In the Netherlands, to protect the children against infectious disease there is an extensive program called the National Immunization Program (NIP) (Chapter 2) (RIVM Committed to health and sustainability, 2016). NIP provides vaccination against twelve difficult to treat and potentially fatal infectious diseases. It is a voluntary program which offers vaccination to children free of charge. Local Child Welfare Centers (CWC) in the Netherlands, offer free health check-ups and also provides the vaccinations as per the schedule of NIP (Harmsen I. B., 2015). Even though the program is not compulsory, more than 95% parents from the total population of the Netherlands have their child vaccinated (RIVM Committed to health and sustainability, 2016).

Though more than 95% of parents vaccinate their children, there are still groups of sub-population with lower vaccination rates. Outbreaks of the diseases have been attributed to under vaccination of such sub-populations (Prymula, 2017). These sub-population and the factors affecting the decision for the vaccination of their children have been studied (van Lier A. v., 2013) (Harmsen I. B., 2015) (Dube E. G., 2014) (MacDonald, 2015). According to these researchers there are factors that affects the vaccination uptake in these sub-populations. These factors are religion, perceived behavior (risk and benefits), attitude, knowledge or awareness, social norms.

One such sub-population is the migrating population in the Netherlands. In the last decade, there has been a steady increase in the migrating population in the Netherlands.

According to Eurostat, in the Netherlands in 2010, 1.8 million (11.1%) people of the total population were foreign born residents (Vasileva, 2011). 8.5% of this population were born outside the European Union (EU) and 2.6% were born in another EU member state, primarily Belgium, United Kingdom, Germany and Poland (Vasileva, 2011).

A migrant is a person who lives outside their native country in order to find work or better living conditions (oxford dictionary). A migrant can be categorized 5 different categories: students, asylum seekers, undocumented people, displace people and skilled migrants (Mladovsky, 2007). Skill shortage in the labor market of Europe has attributed to an increase in the number of immigrants, specifically highly-skilled migrants with different expertise (Mahroum, 2001). Skill shortage in Europe was initially perceived as a temporary problem, but as the population as a whole is stabilized the age of the population continues to grow. Workers aged 55-64 years accounts for the major share of working age (Mahroum, 2001). This has created major difficulties for the industry to fill in the vacant jobs, thus the Organization for Economic Co-operation and Development (OECD) countries have placed new incentives to increase their gain in the international global market (Mahroum, 2001). Thus, this has led to an increase in the migration of highly-skilled people.

The migration population can comprise a notable portion of the host country. The risk of vaccine preventable diseases in this migrant population is mild to moderate but not irrelevant (Prymula, 2017). Migration also affects the health of the recipient countries population (Spallek, 2010). Along with the factors such as religion, attitude, knowledge or awareness a migrant's decisions for vaccinations can be affected by additional factors such as language, accessibility, under registration and transition (Mollema L., 2012) (Harmsen I. B., 2015).

The immigrants and the asylum seekers are the people who migrates to another country with the intention of permanent settlement, the highly-skilled migrants are those who migrate to different countries for better opportunity in jobs. The highly-skilled migrants visit their native country or different countries either regularly or for the purpose of their job/education due to which their preferences and decision for vaccination of their children might vary.

Highly-skilled migrant parents can be categorized into two broad categories: parents with children born in the Netherlands and those with children born outside of the Netherlands. This thesis focuses on the highly-skilled migrant parents' decision to whether to vaccinate or not to vaccinate their children. To the best of our knowledge, there is no study on this particular

group of migrants. It is important to study such groups because they travel to countries where certain vaccine preventable diseases are prevalent which is either under control or eliminated in the Netherlands. The children of the migrant parents when travel to the country of parental origin have high exposure to infectious diseases like hepatitis that are under control in the Netherlands. After their visit, outbreaks are seen in the Netherlands especially among children who travelled followed by the children of the same ethnic origin and then to the other children (Sonder, 2006). The migrants (children and adults) in their origin country might not be vaccinated or may be under vaccinated and are vulnerable to vaccine preventable diseases which is circulating in the country to which they travel or visits.

This thesis focuses on highly-skilled migrants (HSM) in the Twente region of the Netherlands. The region Twente is considered by the researcher as it provided with easy accessibility to recruit participants for the interviews. The goal of this thesis is to determine the factors that influence/affect the decision making for vaccinations uptake in highly skilled migrants.

1.1: Societal Relevance:

As child morbidity and mortality caused by vaccine preventable diseases is reduced due to vaccination (Pavlopoulou, 2013). Migration has been discussed as a cause of infectious diseases, especially in countries with immigrants from places with high prevalence of infectious disease (Wormann, 2011). “Healthy migrant” effect is an assumption that specifically healthy and active individuals are the one who migrates, however, this sometime does not apply to the vaccine preventable diseases (Razum, 2006) (Edward, 2016). There is a raised concern for the extent of vaccination among the migrants, especially if they belong to countries with suboptimal or countries without a national vaccination program (Edward, 2016). In addition, there are unprotected individuals who either travel to the countries where there is high prevalence of infectious diseases. There might also be a risk of acquiring infection from unprotected family members visiting the country (Foster, 2017).

This thesis can help to understand the factors that influences the decision of highly-skilled migrant parents for vaccinating their children. The vaccination decision such parents is relevant because they commute between countries and their children are more susceptible to being infected with the vaccine preventable diseases (VPD) (Sonder, 2006). These vaccine

preventable diseases are those which have either reached a level in which herd immunity is possible to the society or if infected the primary treatment is available. Thus, the children of highly-skilled migrant parents might become contagious with this disease and may be the cause of the infection. Herd immunity is beneficial for the general population especially for those who are not vaccinated. Therefore, a high rate of vaccination is of benefit not just to individuals but also to the society in general.

1.2 Scientific Relevance:

According to World Health Organization (WHO), vaccination has helped the residents of 53-member states of the European region. However, there is a clear threat of resurgence of vaccine preventable diseases like endemic measles were reported in 32member states in 2014, despite a high vaccination coverage (Prymula, 2017).

In the Netherlands, vaccination coverage is high, but for newborns, most vaccination has declined by 0.5% approximately for the third consecutive year (RIVM, 2017). However, there are clusters of under vaccinated groups resulting in recent outbreaks of vaccine preventable diseases like measles (Dube E. G., 2014) (Woudenberg, 2017). Vaccine-hesitant individuals are those who refuses, delay or partially accepts vaccines.

Migrants are considered to be more vulnerable to vaccine preventable diseases as they are normally from areas with low or no vaccination coverage (Pavlopoulou, 2013). Upon arrival migrants tend to be healthier (Healthy Migrant effect) than the locals but they face number of difficulties in accessing health care which can be extended to vaccination. Culture, language and lack of previous records on vaccination are barriers due to which there is delay in vaccination (Prymula, 2017) (Suurmond, 2011).

Vaccination is an individual decision and vaccination decision making is well studied for asylum seekers and refugees. Research is needed to know more about the highly-skilled migrant parent's decision on vaccination. literature research and interviews with the highly-skilled migrant parents might be able to provide with an insight on their behavior and hindrances they face for vaccination.

1.3 Research Question:

The research question being: *“Which factors affects the highly-skilled migrant parents’ decision to whether vaccinate or not to vaccinate their children?”*

Sub-Questions:

1. What are the factors that affects the decision of highly-skilled migrant parent to vaccinate or not to vaccinate, according to the literature?
2. According to highly-skilled migrant parents, what factors affect their decision to whether vaccinate or not to vaccinate their children?

1.4 Thesis Outline:

In chapter 2 there is a brief description about the highly skilled migrants and their categories according to the Netherlands policy for highly-skilled migrants. Along with the highly-skilled migrants there is a brief description about the National Immunization Program of the Netherlands and the registration tool of the Netherlands called Praeventis. In chapter 3, a mini literature review is conducted to determine a theoretical framework and the factors that affect vaccination decision-making among immigrants, asylum seekers and people with ethnic backgrounds are discussed. This is followed by the theoretical factors according to the literature. This chapter also answers the first sub-question of this thesis. In chapter 4, research method, research setting, sample, data collection method, data analysis and ethical approval have been discussed. In chapter 5, the result to the sub-question 2, *i.e.* the factors affecting the highly-skilled migrant parents’ decision is presented. In chapter 6, the conclusion of the thesis along with the discussion is carried out. This chapter also presents the strengths and limitations of this thesis and recommendations for future research.

Chapter 2: Highly-Skilled Migrants and Vaccination Program in the Netherlands

In this chapter, first there is a short discussion about who are the highly-skilled migrants. Then there is a brief description about the vaccination program followed in the Netherlands. National Immunization Program (NIP) is the vaccination program which provides vaccination against 12 infectious diseases (RIVM Committed to health and sustainability, 2016). Following the vaccination program there is a description about Praeventis, which is a register system in which the data of a child is stored irrespective of whether he/she receives vaccination.

2.1 Highly-skilled migrant (HSM):

The European Migrant Network (EMN) defines the highly skilled migrant as “anyone with a higher vocational or higher academic qualification and all others who play a catalyzing role in innovation process” (EMN, 2007). European countries have implemented policies to attract skilled migrants such as academics, medical personnel, engineers and more generally high-income earners (Cerna, 2016). The Dutch government’s ambition to be the front-runner in the European Union (EU) to make it a knowledge economy led to a possible solution of kennismigrant (knowledge migration) (EMN, 2007). Before the implementation of knowledge migrant scheme, if a highly skilled migrants wanted an entry or residence he/she had to deal with a variety of Ministries and agencies (EMN, 2007). To resolve this issue, single office was established with single procedure and single document for the highly skilled migrants. Single criteria were opted for the definition of highly skilled migrants and that is the salary criteria. Every calendar year this salary gets revised for the highly skilled migrants (Figure 1).

The Dutch government has opted for the salary criteria to define the highly skilled migrants whereas ISCO classified the highly skilled migrant into first three groups of ISCO 88 Classification leaving the level of income aside (EMN, 2007). The third country highly-skilled worker is defined as a non-EU/EEA whose proficiency lies within the three classifications as mentioned below:

- Major Group I: Legislators, Senior Officials and Managers;
- Major Group II: Professionals;
- Major Group III: Technicians and Associate Professionals (European Migration Network, 2007).

The Netherlands introduces in October 2004 a knowledge migrant scheme (Kennismigrantenregeling) targeted at highly-skilled migrants (Wiesbrock, 2010). It is the salary criterion which defines the standard of the skilled migrants (EMN, 2007). In the Netherlands, highly-skilled migrants including person from the EU are provided with tax discounts (Mahroum, 2001). Highly skilled migrants are even included in the 30% ruling in Tax and Customs Administration (EMN, 2007). The salary criterion is revised every calendar year for the highly-skilled migrants, which is in effect from January 1 (EMN, 2007) (KPMG Internatinal Member, 2017). As published by the statistics Netherlands, they use a percentage-based changes on most recent index figure for CAO (Collective Labor Agreement) (EMN, 2007). There is an exception to the salary criterion for the scientific researchers and doctors who complete their studies in the Netherlands to become a specialist (Article 1d, 1b and 1c) (Wiesbrock, 2010) (Act, 1995).

Apart from the salary criterion, and the general documents¹, no other specific criterion is enforced on the skilled migrants for example – no requirements in relation to knowledge or mastery of the Dutch language (EMN, 2007). This scheme does not have any type of advance selection procedure that would give priority to specific professional sectors. In the Netherlands, if the income criterion is met the skilled migrant is granted with the residence permit for the duration of employment contract, maximum of five year, after which the residence permit can be renewed (European Migration Network, 2007).

In this thesis, no distinction is made in the age criterion of above 30 years or under 30 years old. Though there are two broad classification skilled migrants i.e. ISCO 88 and the Netherlands salary criterion, in this thesis neither of the classifications were used rather the education level of the highly-skilled migrants were used to interview them. Knowledge migrants are those who are offered a position by an employer and are to receive a minimum income as curtained by the Minister of Social Affairs and Employment on an annual basis (Wiesbrock, 2010).

¹ Such as valid border crossing documents and no criminal past.









2.2 National Immunization Program (NIP):

National Immunization Programme was started in 1957, to offer children born from 1945 onwards with DTP (Diphtheria, tetanus, pertussis) and polio vaccination (RIVM, 2017). The main objective of the NIP is to provide protection to the people against infectious diseases through vaccination (RIVM, 2013). The participation in this program is not compulsory.

NIP has a vaccination schedule for the immunization of children at different stages of their life. It provides vaccine to children against 12 infectious diseases. To provide maximum protection against the diseases the vaccination schedule is divided into 4 phases i.e. Phase 1 (6 weeks – 14 months), Phases 2 (4 years), Phase 3 (9 years) and Phase 4 (12 years) (RIVM Committed to health and sustainability, 2016). Children start receiving vaccines when they are 6-week-old (RIVM, 2016). In Figure 1. the schedule of the vaccination along with the diseases it protects from is shown (RIVM Committed to health and sustainability, 2016). In addition to these vaccines people aged more than 60 years and people at high risk of morbidity and mortality due to influenza virus infection receive vaccine from the NIP through the National Influenza Prevention Program (NPG) (RIVM, 2013).

Two weeks after a child is born, parents are visited by a nurse from the child welfare center in the Netherlands (Harmsen, 2015). The parents are then provided with the information about the NIP. When the child is 4-6 weeks old the parents also receive an information brochure through mail (Harmsen, 2014). This brochure provides information about vaccination program, schedule, diseases, vaccines, side-effects of vaccines and also a reference to the website of the Public Health Institute (PHI) (Harmsen, 2014) (RIVM, 2013). It is the National Institute of Public Health and the Environment (RIVM/PHI) who manages the NIP's implementation and provides information about the program (RIVM, 2013). The vaccination program is also monitored by the RIVM.

Vaccination schedule National Immunisation Programme

Phase 1	Injection 1	Injection 2	Phase 2	Injection 1	Injection 2
 6-9 weeks	DTaP-IPV Hib HBV	PCV	 4 years	DTaP-IPV	
 3 months	DTaP-IPV Hib HBV				
 4 months	DTaP-IPV Hib HBV	PCV			
 11 months	DTaP-IPV Hib HBV	PCV			
 14 months	MMR	MenC			
Phase 3	Injection 1	Injection 2	Phase 4	Injection 1	Injection 2
 9 years	DT-IPV	MMR	 12 years	HPV*	HPV* (6 months later)

Meaning of the abbreviations

D Diphtheria
aP Pertussis (whooping cough)
T Tetanus
IPV Poliomyelitis
Hib Haemophilus influenzae type b

HBV Hepatitis B
PCV Pneumococcal disease
M Mumps
M Measles
R Rubella

MenC Meningococcal C disease
HPV Human papillomavirus
* Only for girls



Figure 1: Vaccination Schedule National Immunization Program (RIVM, 2016)

2.3 Praeventis:

Praeventis is a tool implemented in the Netherlands to monitor and evaluate the vaccination coverage (van Lier, 2012). It is an electronic national immunization register which was implemented in 2005. This register is managed by the department Regional Coordination of Programs/Purchases, Storage and Distribution (RCP/IOD). It not only registers vaccination data of children but also generates the letters and reminders for the vaccination (van Lier, 2012). This database is used to monitor the vaccination process, control the stocks of the vaccines, also provides information for paying fees to the organizations involved in the vaccination programs (Harmsen, 2014). In this register all children under the age of 19 years and eligible for vaccine are registered (van Lier, 2012). These files of the children are stored for 15 more years (until the age of 34 years) (van Lier, 2012). For every new born or immigrated child a NIP record with its number is automatically created in the Praeventis (van Lier, 2012). It includes records of children irrespective of their vaccination status. Its other functions include maternal screening for hepatitis B, syphilis, HIV as well as neonatal screening for congenital diseases (van Lier, 2012).

The invitation letters to the parents for vaccination of their children is generated through Praeventis and is sent by RCP/IOD (van Lier, 2012). It is sent at the age of four month, four years and nine years, for girls around 12 years. This invitation also includes a personalized vaccination card (Figure 2.) that is required to be brought by parents during vaccination procedure. This card records the administered vaccination along with the reasons or principle for objection to vaccination (van Lier, 2012).

Newborns 3rd day of life	Infants 1 year	Toddlers 2 years	Preschool children 5 years	School children 10 years	Adolescent girls 14 years
	DTaP-IPV-3	DTaP-IPV-4	DTaP-IPV-5	DT-IPV-6	
	Hib-3	Hib-4			
	PCV-3	PCV-4			
		MMR-1		MMR-2	
		MenC			
					HPV-3
HepB-o ^a		HepB-3/4			

■ primary immunisation
 ■ basic immunity
 ■ revaccinated
 ■ fully immunised

DTaP: diphtheria-tetanus-acellular pertussis vaccine; HepB: hepatitis B vaccine; Hib: *Haemophilus influenzae* type b vaccine; HPV: human papillomavirus vaccine; IPV: inactivated polio vaccine; MenC: meningococcal C-conjugate vaccine; MMR: measles-mumps-rubella vaccine; PCV: pneumococcal conjugate vaccine.

^a Only for children whose mother tested positive for hepatitis B surface antigen (HBsAg).

Figure 2: Individual age at which vaccination coverage is determined per (combination) vaccine, the Netherlands, 2011 (van Lier, 2012)

2.4 Conclusion:

Highly-skilled migrants can be classified either according to ISCO 88 or according to the Dutch classification. For the purpose of this thesis the educational qualification of the highly-skilled migrant parents was used for the purposes of the interviews. Further, in this chapter the National Immunization Program of the Netherlands is described in brief also with it Praeventis which is a tool used to monitor and evaluate the vaccination program in the Netherlands has been discussed.

Chapter 3: Theory & Literature Review

Chapter 2 provided insights on the highly-skilled migrants and the vaccination program in the Netherlands. In this chapter, answer to research sub-question 1 (chapter 1): “*What are the factors that affects the decision of highly-skilled migrant parent to vaccinate or not to vaccinate, according to the literature?*” is provided. Firstly, a mini literature review is conducted and discussed along with the theoretical framework. The determinants/factors are derived from the studies included in the literature review and theoretical framework. The purpose of this literature review is to form a basis for the interview question for this thesis.

3.1 Literature Review:

For literature review, several databases were searched for the relevant articles. The database searched for the articles were Scopus, Medline (PubMed), Web of Science and Google Scholar. For the search to be continued in the database certain keywords were used. These keywords were also used in combination to provide a better search result.

Keywords: immunization, vaccination, immigrants, refugees, asylum seekers, migrants, ethnic backgrounds.

Combination of keywords: “immunization, immigrants/ refugees/ migrants/ ethnic backgrounds/ asylum seekers”, “vaccination, immigrants/ refugees/ migrants/ ethnic backgrounds/ asylum seekers”.

The articles were further selected on the basis of the inclusion and exclusion criteria as mentioned below. With limited number of article in the category the search was expanded to look for models with factors or determinants affecting the vaccination decision.

3.1.1 Inclusion criteria:

In the inclusion criteria, the articles to be considered needs to provide evidence for the theories according to which questions can be answered. The studies were included only if they covered the following inclusion criteria.

1)The publication of the articles should not be older than the year 2000. 2) In the initial screening of the titles and abstracts, studies with English abstract were included irrespective of the full text being in any other language. The purpose to do so was to find all the relevant articles and to further check if they were available in English. If the articles were found not to be in English language, then they were excluded from the further screening. 3) The study population comprises of immigrants, migrants, asylum seekers and people with different ethnic background. 4) The country for the study selection was not limited to the Netherlands.

3.1.2 Exclusion criteria:

In the exclusion criteria, the articles not fulfilling the inclusion criteria were excluded along with specific conditions.

1)The studies that were excluded were published before the year 2000. 2) The articles not found to be in English language were excluded. 3) The study population excluded the natives or the people who had the origin of the same country as the research was being conducted. 4) Though relevant abstract was initially included, lack of access to full article the abstract was excluded from the search strategy.

3.1.3 Search Strategy:

The main objective of the search strategy is to identify all the published articles related to the vaccination of children of migrant parents. The migrant parents may either be the immigrants, asylum seekers and are of different ethnic backgrounds.

These search terms were used in the databases to find the studies to be included in the review. A total of 640 articles were looked for initial screening of the titles. 430 articles from the Web of Science, 90 articles from Scopus, 70 articles from the Medline (PubMed) and 50 articles were screened from Google Scholar. These were screened based on abstracts and titles. After the initial screening of the titles 250 duplicate articles were removed. 390 abstracts were reviewed of which 90 abstracts from Scopus were excluded as the full texts were not available for them. After the application of inclusion and exclusion criteria 260 articles were removed. Full text was reviewed for the remaining 40 articles. A further 10 articles were added from searching the reference list of the remaining 40 articles, giving a total of 50 articles to be

reviewed for full text. A total of 15 articles were finally used in the thesis and the rest of the articles were removed due to irrelevancy or were reports or editorial paper. The search strategy is represented in Figure 3.

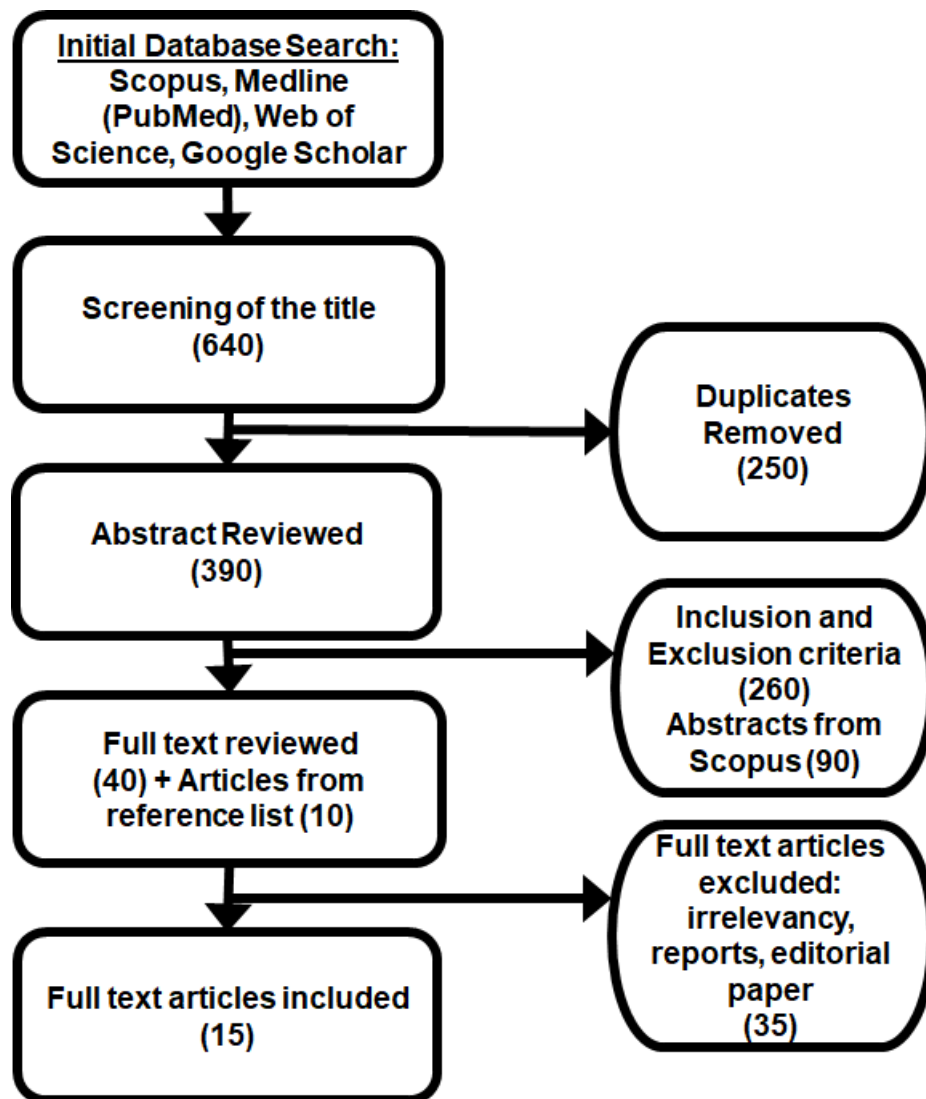


Figure 3: Search Strategy

The 15 articles that were included in the literature review are mentioned in Appendix I in detail. The articles mentioned in the literature review helped in the presentation of theoretical framework as described in the following section, which further helped in the formulation of interview questions.

3.2 Theoretical Framework:

In this section, vaccine hesitancy and potential causes of vaccine hesitancy is discussed. Following this section, the potential barriers that might affect the highly-skilled migrant parents' decision are discussed.

Vaccine Hesitancy:

Vaccine hesitancy is defined as a delayed acceptance or refusal of vaccination irrespective of the vaccinations provided (MacDonald, 2015). It is a behavior which results from the decision-making process and there are factors that influence the individual's decision to accept some, all or nothing in the recommended vaccination schedule.

The decision to vaccinate can be potentially influenced by a number of factors. First proposed model for vaccine hesitancy was from WHO EURO Vaccine Communications Working Group in 2011, which comprises of the 3Cs model (MacDonald, 2015). In this 3 Cs model there is first Confidence which depends on the safety and efficacy of vaccines, reliability and competence of the health services and health care providers and motivation of the policy-makers. Second is the complacency which exists when the risk of vaccine preventable diseases is considered to be low and vaccination is not seen as important. Third is the convenience which is the factor associated with physical availability, affordability, geographical accessibility (MacDonald, 2015). Along with the model a determinant matrix was also developed or identified for the discussion of factors that influences the vaccine hesitancy.

Theoretical framework is based on the systematic review of the literature conducted in the previous section. The literature review conducted was on the vaccination decision of immigrants, asylum seekers, but due to limited number of articles the search also included 2 articles on general decision making of the parents for vaccinations of their children. Thus, the model presented is the "3 Cs" model which was first proposed in 2011 to the WHO EURO Vaccine Communications Working Group (MacDonald, 2015). This model highlights the three broad categories: Complacency, Convenience and Confidence (Figure 4) (MacDonald, 2015).

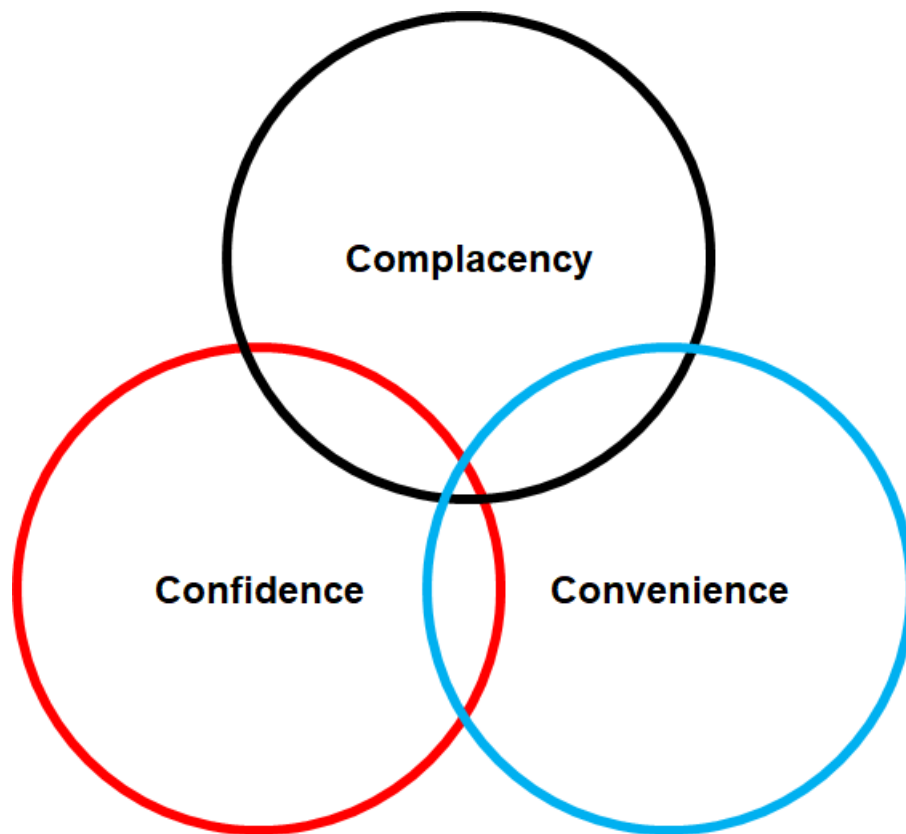


Figure 4: Three C's Model of Vaccine Hesitancy (MacDonald, 2015)

According to the 3 Cs model, confidence can be described as trust. The trust may be in safety and effectiveness of the vaccine or in the health professionals providing them. The second category complacency is described for perceived risk for vaccine preventable diseases, vaccines deemed as unnecessary, other life/health responsibilities were more important at a particular time. The third category convenience describes the accessibility, language, affordability, willingness-to-pay (MacDonald, 2015).

The factors in this model are the general determinants for vaccine hesitancy and these factors are well established. The factors of the 3 Cs model are compared with the factors presented in the articles from the literature review. This is done so that the factors affecting the highly-skilled migrants can be further described. The factors that are common in both the model and the literature review are presented in Table 1.

<u>3 C's</u>	<u>Factors</u>
Confidence	Religion
Complacency	Composition
Convenience	Language, Accessibility

Table 1: Theoretical Framework

3.3 Theoretical Determinants/factors:

This section describes the factors that affects the decision of the parents and tries to relate them to the highly-skilled migrant parent's decision. After the comparison of the determinants/factors from the literature with the theoretical framework, only those factors are described from the model which were also present in the articles from the literature review. The factors described are according to the three C's model in presented in Figure 5.

3.3.1. Religion as a potential barrier (Confidence)

Religion plays a role in the decision making of parent for the uptake of vaccine. It affects the perception of vaccination and as to whether the vaccination is permitted or not in the religion. For example, in Islam, it is believed that religion wants them to take care of their children and would decide to take vaccine whereas Orthodox protestants have objection to vaccination based on religious beliefs (van Lier, 2013) (Foster, 2017) (Harmsen, 2015).

Religious beliefs are generally considered to be linked with the core beliefs of the parents (McKee, 2016). These beliefs become very difficult to discourage. The choice of not vaccinating a child on basis of religion is not because of ignorance but is an intentional decision (McKee, 2016). Religion might act as a potential barrier for the highly-skilled migrant parents depending upon their religious beliefs.

Religious beliefs may also be due to composition of the vaccine such as use of animal derived gelatins for the production of vaccine (Foster, 2017). As in Islam, certain animal

products are absolutely forbidden while other forms are allowed depending on the way they are obtained (Wombwell, 2015). Similarly, people following Hindu faith may object to vaccines containing bovine components or use of fetal cells. In Christianity, objection arises due to vaccines containing aborted human fetus tissue (Wombwell, 2015).

Religion provides a positive influence on the decision of people following Islam. As in Islam vaccination of children is considered to be beneficial whereas in orthodox protestant religion of the Netherlands is highly related to vaccine refusal (Harmsen, 2015).

3.3.2. Composition of the vaccine (Complacency)

The basic ingredient of vaccine is immunogens, which are live/killed viruses, purified viral proteins, inactivated bacterial toxins or polysaccharides (Offit, 2003). In addition to these, vaccine also contain preservatives, adjuvants, additives and sometime may contain residual quantities of substances used during the process of manufacturing a vaccine (Offit, 2003).

Preservatives (e.g. thimerosal) are used to prevent bacterial and fungal contamination, especially in multidose vials (Offit, 2003). Thimerosal is a mercury containing preservative and the toxicity of mercury is well-known. This ingredient of vaccine is under intense scrutiny from the media. Attention by media has caused some parents to rethink their decision for vaccine as it may harm their child (Offit, 2003). Thimerosal contains around 49.6% mercury, which leads to the withdrawal of thimerosal from vaccine that were intended for children below the age of 6 months (Offit, 2003) (Dorea, 2017). Even with the efforts to eliminate or reduce the mercury content in the vaccines there are specific exemption of thimerosal, such as used as preservative in certain vaccines. This give rise to discrimination by providing thimerosal containing vaccine to low/middle income countries, whereas high income countries are provided with no-thimerosal or reduced-thimerosal content vaccines (Sykes, 2014).

Aluminum and calcium salts are presently used as adjuvants in vaccine (Offit, 2003). More widely used adjuvant is aluminum as calcium has limited use. Initially it was found to enhance the immune response after vaccination (Baylor, 2002). Subsequently it was found that it helps in enhancing the antigen uptake by antigen presenting cells, activate-antigen presenting cells (Baylor, 2002). Recently, there has been focus on the use of organic compounds as adjuvants in the vaccine. There are few organic compounds which have a similar function to that of the aluminum salts (Offit, 2003).

Additives main function in a vaccine is to stabilize the vaccine from detrimental condition like freezing or drying (Offit, 2003). It also prevents the vaccine from sticking to the surface of the vials. Stabilizers generally used in vaccine are sugars, amino acids and proteins (Offit, 2003). There are three main concern with the use of additives in the vaccine, they are 1) even though a rare occurrence but there is a chance of immediate-type hypersensitivity reaction to vaccines containing gelatin, 2) presence of infectious agents in human serum albumin 3) concern with the use of bovine derived materials in the vaccine (Offit, 2003) (Foster, 2017).

There are sometime presences of manufacturing residuals in the vaccine (Offit, 2003). These residuals are inactivating agents (e.g. formaldehyde), antibiotics, cellular residuals (e.g. egg and yeast proteins) (Offit, 2003). The residual agents maybe of concerns as they arise the issue of safety for example allergic reactions to egg protein in the vaccine (Offit, 2003).

3.3.3. Language as a potential barrier (Convenience)

The Netherlands has a high vaccination coverage rate. In the Netherlands the official language is the Dutch/Nederland's. Willingness to vaccinate is considered to be high among the migrant parents, but there is less potential for completing the NIP fully and in time when compared with the parents born in the Netherlands (van Lier, 2013). Language barrier is a concern among parents as they did not speak Nederland's and are apprehensive that their children might not receive the correct vaccinations or might get vaccinated twice (Foster, 2017).

The parents are provided with an invitation letter for vaccination along with which they are also provided with a brochure or educational material (Harmsen, 2015). These provided materials are in Dutch language (Harmsen, 2015). There is a substantial group of immigrants who do not understand the language and thus it creates an obstacle for the parents to receive full information regarding vaccination (Harmsen, 2015). Language might present itself as a factor as the highly-skilled migrant parents migrates to Netherlands and are not the native to the land.

3.3.4. Accessibility (Convenience)

Another factor that possibly influences the decision of highly-skilled migrant parents is the degree to which the vaccine provider is accessible or reachable to the parents. For vaccination of children in the Netherlands the parents need to visit the child welfare centers (CWC) (Harmsen, 2015). Child welfare centers is the place where the child receives both the health check-ups and the vaccination (Harmsen, 2015). The distance to the child welfare centers might be a potential barrier for vaccination of children (Harmsen, 2015). The distance the parents are willing to travel to receive vaccinations for their children influences the decision of the parents.

Transportation is not the only barrier in accessibility to the child welfare center. It may also be the duration of the consultation time that a parent has while visiting the center (Harmsen, 2015). Dissatisfaction of parents towards the procedure or the service provider may also affect the decision making (Harmsen, 2015).

3.4 Conclusion:

The literature study, showed the articles for the potential barriers for the vaccination decision. A conceptual framework further helped in focusing on the factors/determinants. The factors were then described in detail: the factors were language, religion, accessibility and content of the vaccines. This provided the basic concept to formulate the interview questions. The research design and data collection are explained in the next chapter.

Chapter 4: Research Method

In this chapter, the method that was used in this research is described. The study design, study population/sample, data collection, ethical approval and data analysis are discussed.

4.1 Research Design:

Interview: To answer the following sub-question, qualitative research is conducted. Sub-question 2: *“According to highly-skilled migrant parents, what factors affect their decision to whether vaccinate or not to vaccinate their children?”*

A qualitative research method provides the interviewer with a deeper insight and better understanding to the participants perception by asking the participant their decisions and experiences (Austin, 2014). The research collected the qualitative data which helped in better understanding of the decision-making process of parents works and factors that plays an important role in influencing the decision of the parents. The qualitative research is done in a cross-sectional study also known as cross-sectional analysis, it involves observation of a number of participants at a particular moment (Babbie, 2013). Interviews with highly-skilled migrant parents were conducted to get an insight on their decisions and factors affecting those decision.

4.2 Ethical Consideration:

4.2.1 Ethical Approval:

The permission for carrying out this research was approved by the ethical committee of the Faculty of Behavioral, Management and Social Sciences of the University of Twente under application number 18447.

4.2.2 Informed Consent:

The respondents were informed about the research through email. They were informed about the interview being a voluntary and they could stop the interview at any point of time. Participants consent were taken with regards to recording the conversation or the writing of interview. Consent on giving the interviewee voluntarily about their view on vaccination. They were informed that the recordings were to be deleted after the transcription of the data were completed.

Informed consent was signed by the researcher and the participant before the interview. The informed consent form is added to the Appendix II. In the informed consent form, it stated that the interview was recorded for the transcribing purpose and the data collected will be used anonymously. It also describes that there is an option to quit the interview at any point.

4.3 Data Collection Method:

Interview:

The data collected is carried out in a semi-structure in-depth interview. Semi-structured interview is relevant as they provide a way of collecting a context rich information in an organized manner. This semi-structured interview provides the interviewer with space to ask for possible additional questions besides the prepared questions. The additional questions can help further clarify or provide a deeper explanation for a particular situation. The interview conducted is an in-depth interview with individuals (Austin, 2014). In this the interview is face-to-face between the interviewer and interviewee. Qualitative research method is a personal intimate encounter which is direct with the use of verbal questions for the interviewee (DiCicco-Bloom, 2006). The interview method of collecting data reduces the chance of misunderstanding a question and the intent of the question can be better clarified by the interviewer.

The interviews were conducted from May 24th 2018 until June 8th 2018. In this period 10 parents were interviewed. The study aimed to the diversity of the respondent group as much as possible. The participants for the interview belonged to a diverse group of nationality such as 2 participants were from Indonesia, 2 from India, 1 from Germany, 1 from Iran, 1 from Nepal, 1 from Colombia, 1 from the United States of America and 1 from Philippines. For the participation of the respondent's snowball sampling technique was employed. In this the existing respondents helped in recruiting the future respondents from among their acquaintances (Explorable, 2009). The interview conducted were in English, as the parents were not a native from the Netherlands.

The interviews were conducted according to the interview scheme which is in Appendix III. The interview consisted of three main parts with different question in every section. In the first section the interview started with the general information about the children. In the next section the parents were asked about their preferences or opinion about the factors that affects

their decision for vaccination of their children. In this the parents were provided with the show-card of the vaccination timetable according to the NIP. This was to help them provide with the most appropriate answer in regards to the vaccination of their children. In the last section, the question was asked to parents with children not born in the Netherlands, or even if born in the Netherlands but frequently commute between countries as this question was more specific to compare the vaccinations of the two country and know about the preference that affect the decision of their vaccination. The interview ended with space to provide for other suggestion and ideas.

These interviews were conducted in place according to the preference of the respondents. All respondents in this research was informed in advance about the interview. The interview took half an hour to one hour depending upon the respondent's answer to the questions. The participants recruited for the interviews were through the snowball sampling method. This is a technique in which one individual name the other individuals having the desired characteristics. One respondent recruits the other respondents who in turn recruits other respondents until the desired number of respondents are reached (Sadler, 2010). The reason for applying this technique for this thesis is that the highly-skilled migrant group is a hard-to-reach group, especially with children belonging in the age criteria of vaccination.

The initial 3 respondents were known (friends and acquaintance) to the researcher, who then helped in recruiting the other respondents. Of the 3 respondents, 2 respondents helped in recruiting the other 2 respondents, while the third respondent did not know anyone who has the characteristics for being included in this research. From the 2 recruited respondents, 1 respondent helped in recruiting another respondent, while the other respondent was not able to help in recruiting the respondent. 3 respondents were recruited from known people (such as the supervisor and husband of the researcher) to the researcher. Of the three recruits one of the respondents cannot be categorized according to the characteristics but helped in recruiting 2 respondents who belonged to the category required for this research.

The advantage of using this technique is that it maintains the diversity in the group of respondents recruited for the interview (Sadler, 2010). Another advantage of snowball sampling is cultural competence and the inherent trust among the participants which increases the researcher's probability of identifying the respondents willing to talk (Sadler, 2010).

The disadvantage of this technique is that the sample recruited for this thesis is not a random sample. Also, there is a risk of disclosure of personal information to the others, or the reluctance of the respondent to contact other individuals (Sadler, 2010).

4.4 Research Sample:

The research is to be executed among the highly-skilled migrant parents. These semi-structured interviews were accessible to both male and female respondents, with at least one child below the age of 10 years. This respondent group was selected due to the fact that the children aged 10 years or less receives the vaccination along with its booster doses with the exception of HPV vaccination as according to the Netherlands it is given at the age of 12 years and is only for girls.

For the interviews to be conducted for collecting the data there are certain inclusion and exclusion criteria's. these criteria's need to be fulfilled prior to the interviews to be conducted. The participants to be included in the research fulfills the provided criteria's. These criteria are mentioned in Table 2. The characteristics of the participants are mentioned in Appendix IV.

<u>Inclusion Criteria</u>	<u>Exclusion Criteria</u>
Highly-skilled migrant parents (at least University Diploma)	Immigrant parents, Asylum seekers, 1st and 2nd generation immigrants, natives of the Netherlands.
Children's age should be less than 10 years	Children above 10 years of age
	Highly-skilled migrant parents having no children

Table 2: Inclusion & Exclusion Criteria

4.5 Data-Analysis Method:

The first interview that was conducted, it performed as a pilot to check whether the questions were understandable and clear to the participants and to see if some changes were deemed necessary. The interviews of the parents were transcribed in Microsoft Word from the audio. It was important to make a detailed interview transcript for the answers of the participants for the semi-structured interviews, or else important information could be missed and to provide a

direct citation of the quotes of the participants. The software program Atlas.ti 8 was used for the analysis to make the process of analyzing more systematic, organized and accessible.

Interview with the parents/participants:

After the transcription, the file was uploaded in the Atlas.ti 8. First the process of open coding was used to create codes. After this the codes were grouped relatively to the four main codes, namely: background information, such as the parent in the interview is the mother or father of the children, how many children do they have, birth country of children, age of the children and the vaccination status of the children. The second code was given to the determinants affecting the vaccination decision. The third code was for the parents with children born both in the Netherlands and outside of the Netherlands. The final code was for the content of the vaccine. Along with the main code, and the related codes created interview answers were verified next to it (Appendix V).

4.6 Conclusion:

This chapter aimed to provide the method used in the thesis. This research was a qualitative research and the data was collected through semi-structured interviews from a sample size of 10 participants who were highly-skilled migrant parents. In further sections data analysis was described, in which Atlas.ti8 was used for a structured and organized analysis of the data. This research was approved by the Ethics Committee of University of Twente.

Chapter 5: Result

In this chapter, the result of the interviews with the parents are presented. In section 5.1 the characteristics of the participant are discussed. In section 5.2 the result to answer the sub-question 2 is presented and in section 5.3 a brief conclusion of the result is described.

To answer the research sub-question 1 “*What are the factors that affects the decision of highly-skilled migrant parent to vaccinate or not to vaccinate, according to the literature?*” is answered in chapter 3 section 3.3. As that chapter deals in the literature review and the factors according the literatures are discussed in detail.

5.1 Characteristics:

The sample size of the survey was 10 participants. The participant in the sample were diverse. They belonged to different countries and their children were either born in different country or in the Netherlands. Information about the children above the age of 10 were excluded from the interview. Table 2 represents the characteristics of the participation.

Of the 10 participants in the thesis 8 participants were female and 2 participants were male. Among the 10 participants, 4 participants had their children in the Netherlands, 3 participants had their children out of the Netherlands (The United States of America, Indonesia and Spain), whereas 3 participants had at least one child born in the Netherlands (Finland, Sweden, Indonesia). On Average the vaccination status of the children is up to date except in one case where the vaccination was delayed and another in which pre-vaccination was done.

<u>Sl. No.</u>	<u>Parent</u>	<u>No. of children</u>	<u>Age of the children</u>	<u>Birth country of children</u>	<u>Vaccination Status</u>
1.	Mother.	2	Child 1: 4 Child 2: 1	Child 1: Finland Child 2: Enschede, the Netherlands	Child 1: Delayed Men C vaccination Child 2: Up to date
2.	Mother	2	Child 1: 11 Child 2: 6	Child 1: the Netherlands Child 2: Sweden	Child 2: 1st and 2nd in Sweden and rest in the Netherlands
3.	Mother	1	4 years	United States of America	Up to date
4.	Mother	2	Child 1: 4 Child 2: 1 yr. 3 months	Child 1: the Netherlands Child 2: the Netherlands	Child 1: Up to date Child 2: Up to date
5.	Father	3	Child 1: 12 Child 2: 7 Child 3: 8 months	Child 2: Indonesia Child 3: the Netherlands	Child 2: Up to date Child 3: Up to date
6.	Mother	2	Child 1: 8 Child 2: 4	Child 1: Indonesia Child 2: Indonesia	Child 1: Up to date Child 2: Up to date
7.	Father	1	2 yr. 2 month	Spain	Pre-vaccination for Men C vaccine
8.	Mother	1	2 yr. 6 month	The Netherlands	Yes, “manage to do the vaccination from here and then tried to maintain the vaccination from Colombia”
9.	Mother	1	10 months	The Netherlands	Up to date
10.	Mother	1	2 yr. 6 months	The Netherlands	Up to date

Table 3: Characteristics of the children and the parents

5.2 Sub-question 2:

In this section the result of the research sub-question 2 “*According to highly-skilled migrant parents, what factors affect their decision to whether vaccinate or not to vaccinate their children?*”

To answer this sub-question the highly-skilled migrant parents were interviewed. After the interviews were completed, the factors from the theoretical framework as discussed in chapter 3 (Table 1) were combined with the factors described by the highly-skilled migrant parents. These factors were then integrated in the three C’s model (Table 4).

<u>3 C’s</u>	<u>Factors</u>
Confidence	Religion, Trust, Side-effects
Complacency	Composition, Social Norm
Convenience	Language, Accessibility, Availability, Receiving Information & Preferred Country of Vaccination

Table 4: Theoretical Framework (Framework after the interview with the highly-skilled migrant parents’)

According to the three C’s model, confidence is defined as religion, trust in the system or the authority that delivers the vaccine and also the side-effects associated with the vaccines. Complacency is described as the perceived risk of vaccine-preventable disease is low and vaccination is not seen as necessary, the composition of the vaccine and the social norm also influences the decision of the highly-skilled migrant parents. Convenience of vaccination is described as ability to understand (Language), accessibility, the information received, the country preference for vaccination and availability of the vaccines.

Confidence:

As described above confidence is categorized into 3 categories first is the religion, followed by trust in the system or the authority and third being the side-effects.

1) Religion:

During the interview procedure there were no specific question related to religion. Though there were open question as to what might influence their decision. This gave the participants an open space to discuss about religion if it affects their decision. Of the 10 participants, only 1 participant barely talked about religion. His context for religion was in relation to the composition of the vaccines and not the religion as barrier in a whole Table 3.

Factor	Facilitator	Barrier
Religion		Participant 5 (499-501 & 497-498) <i>“the government promote and persuade in Indonesia that the vaccination is halal, sometime we thinking here that really that is halal or not. We don’t know here exactly so we do not take risk.” “we think if the ingredient is halal if not halal not to take it. But here actually that is our consideration but we cannot to receive recommendation from the GGD.”</i>

Table 5: Religion as a factor for vaccine decision.

2) Trust:

Trust as described under confidence is discussed by 4 participants. This is shown in Table 6. In this the four participant who mentioned about trust, they implied the trust on the government or the authority that are providing the vaccines

Factor	Facilitator	Barrier
Trust	<p>Participant 2 (196-197) <i>“its here they use the international standard so I guess we trust on them but I don’t think it will affect my decision”</i></p> <p>Participant 4 (432-433) <i>“To be honest I trust them definitely If I know that something in the vaccination would damage something in my children life I wouldn’t do”</i></p> <p>Participant 7 (635-637) <i>“I think I mean I not expert in this, I mean the authority which advises in this have probably done a lot of research and also its preventive, it’s a cumulative knowledge that has led to this vaccination and I believe in that.”</i></p> <p>Participant 9 (805-807) <i>“I appreciate the Netherlands vaccination program because the doctors here are very careful in terms of mistake, they want to more examine.”</i></p>	

Table 6: Trust in the authority delivering the vaccines

In this, the highly-skilled migrant when asked about the composition of the vaccine, they answered that they trust the authority or the government providing the vaccine, and they would be informed from them itself if there were any problem with the vaccine. According to them the organization/government/authority providing the vaccine would not promote something which might endanger a child’s life.

3) Side-effects:

Side-effects is another factor that affects the decision for vaccination. In this only 2 participants mentioned of their child having a high fever as a side effect of vaccination. The participants mentioned that they did not receive information on the fever and were worried when the temperature rise Table 7.

Factor	Facilitator	Barrier
Side-effects		<p>Participant 3 (267-271) <i>“The first time he got a vaccination here did had a reaction so it was just a fever and we were very worried as he was young we were first parents this was our only child and he had a severe fever of 104 and it was Sunday night there were no hospitals nothing open we were new to the country, we didn’t speak the language so we were very frightened by it”</i></p> <p>Participant 7 (615-617) <i>“complications you don’t go back to people who give vaccination you go to GP because that’s the first point where you need to contact and can you cannot reach the vaccine providers basically, this impossible”.</i></p>

Table 7: Side-effects

Complacency:

It is also categorized into 2 factors. They are composition of the vaccines and the social norm.

1) Composition:

Composition of the vaccine provided in the Netherlands is categorized in the complacency. In this after asking the participants about the composition of vaccine influencing their decision the answers are presented in the Table 8. In total of 10 participants, except one participant, the rest either did not find composition as a barrier or they did not have any problem as they did not know much about.

Factor	Facilitator	Barrier
Composition	<p>Participant 8 (729-732) <i>“To be honest I don’t want to be deeply involved in the topic in terms of scientifically manner. If I go too deeply I might change my thinking about vaccinations because I’ll see what is their side of the situations so I prefer just to do normal parent without scientific knowledge”.</i></p> <p>Participant 3 (377-380) <i>“I personally do not understand chemistry so I am not just gonna belief any claims. Unless some one gets me it in a way that is clear, things that I read are too contradictory to be something important. I am not convinced by anything that I read is that its important.”</i></p>	<p>Participant 5 (499-501 & 497-498) <i>“the government promote and persuade in Indonesia that the vaccination is halal, sometime we thinking here that really that is halal or not. We don’t know here exactly so we do not take risk.”</i> <i>“we think if the ingredient is halal if not halal not to take it. But here actually that is our consideration but we cannot to receive recommendation from the GGD.”</i></p>

Table 8: Composition of the vaccines in the Netherlands as a factor

According to highly-skilled migrant parents, composition does not present a barrier that might influence or affect their decision of whether to vaccinate or not to vaccinate their children. With an exception of one participant, who due to religious beliefs considered the composition as a barrier but it did not influence his decision as they wanted to have their children vaccinated.

2) Social norm:

Social norm is also a factor that has been discussed by only one participant during the interview protocol. According to the participant – Participant 3 (252-260) *“I just feel like it’s a social decision and if the Netherlands decides to do it this way I will agree to the ways the Netherlands does it because that’s like it has to be a social decision because it’s a social outcome like everybody has to do it otherwise it doesn’t work and what’s the point of a vaccine so if everybody else is doing it you also have to do it because that what vaccine is for. It doesn’t make sense to be the one person who doesn’t have a vaccine unless you had some illness that makes it harder for you to vaccinate. Point of the vaccine is to have immunity from the disease, so it just seems like a group decision to all have minor version of the diseases instead of everybody going through the major version”.*

Convenience:

Convenience is categorized into 5 categories. They are language, accessibility, availability, preferred country, and receiving information.

1) Language:

Language is broadly referred to communication with the vaccine care provider. In this after asking the parents about the factors which affect their decision the answers of the participants were categorized into two sub categories as barrier and facilitators. This is shown in the Table 9. In a total sample of 10 participants, for 5 participants was a barrier in communication, 1 participant did not remark language as a barrier as she always preferred talking in English and was responded to in English, whereas the 3 participants did not mention language as the potential barrier for vaccination. 1 participant did mention about the miscommunication with the vaccine provider *“one year ago here, they put new vaccination on the schedule then we went again to the doctor and she didn’t remember if she put the vaccination or not. We are sure we finished the schedule but from the person from the doctor ‘s centre she was not sure wanted to put again the vaccination.”*

According to the results of language as a factor, for some parents the language was a barrier in understanding the information provided to them either through interaction with the vaccine provider/ GP’s or the brochure/ written information provided to them. The mails delivered to the participants were in Dutch which were not understand for the participants.

Factor	Facilitator	Barrier
Language	Participant 2 (147-148) <i>“I never had the problem with the language”</i>	Participant 3 (299) <i>“The language definitely was more problematic”</i> Participant 6 (538-539) <i>“I had little bit barrier with the language”</i> Participant 5 (479-481) <i>“my wife already try to learn Dutch so little bit she understands ya maybe there is a little barrier but not too big problem”</i> Participant 1 (40-41) <i>“I can read Dutch but would have easier to have straight away in English”</i> Participant 4 (401-402) <i>“what’s the meaning of the vaccination in Netherlands and translate it to my language”</i>

Table 9: Language (ability to understand) as a factor influencing the vaccination decision

2) Accessibility:

The second category in the confidence is the accessibility to the vaccination. In this accessibility refers to the appointment or rescheduling the vaccination. This factor accessibility (Schedule/timing) is sub categorized into two as whether the appointment was a barrier or a facilitator for rescheduling. This is shown in Table 10. 3 participants found rescheduling the appointment as a barrier in which 1 participant even mentioned that the vaccination was delayed – Participant 1 (55-57) *“The vaccination was delayed by two months or something because it took that long to get a new appointment.”*. 3 participants did not find rescheduling of the appointments as a barrier. 1 participant mention he did not know as his wife handled the vaccination of their children. 3 participants did not mention accessibility as an issue.

Factor	Facilitator	Barrier
Accessibility – Schedule/time	Participant 6 (540-541) <i>“my husband come to the GGD and explain our situation and the GGD reschedule it.”</i>	Participant 1 (43-44) <i>“With regards to appointment time that’s really actually pretty difficult because they have very rarely appointments before 9 after 4 actually”</i>
	Participant 7 (603-604) <i>“the appointments were planned quite in advance so we didn’t really have any issues”</i>	Participant 2 (136-138) <i>“one of the factor that really affects vaccination is hours. The scheduling that is if you are working of course either you have to take the day off to vaccinate your kid but they don’t have hours during the weekend.”</i>
	Participant 9 (774-775) <i>“I reschedule the vaccination 1 week late because she had fever”</i>	Participant 4 (411-414) <i>“It is time consuming then I need to write an email or make a contact with another person and then explain all the story for example I was this morning I was there and I told the nurse and I need to re-explain everything to ask them to just to change an appointment or do something or to solve a problem.”</i>

Table 10: Accessibility in terms of scheduling of appointment as a factor

According to the literature, accessibility refers to the distance a migrant parent travel for the vaccination of their children or primary access to healthcare/vaccination. As the vaccination of children are given in the consultancy bureau, the distance to travel for vaccination was not a barrier. According to the highly-skilled migrants’ accessibility in terms of scheduling or rescheduling of the appointment for vaccination of their children was a barrier. The rescheduling was a barrier as the parents either had to take a day off from their job or negotiate for a time which would less hamper their other schedule. They preferred timing such as early morning or late in the afternoon.

3) Receiving information:

The third category is the communication or receiving enough information for the decision on vaccination. This factor is categorized into two sub categories namely, barrier and facilitation. This is shown in Table 11. In this, 3 participants were fully satisfied with the information they received or the communication they had. 4 participants mentioned that they did not receive enough information through communication and they rather search for it themselves. 1 participant did not think about it and just did what was told or given in the booklet *“we got few cards for vaccination by post and those are with the dates at what time which vaccination needs to be give and so we just followed the time table”* whereas another participant received information through online search or reading articles and through the booklet provided.

Factor	Facilitator	Barrier
Information, Communication	Participant 2 (154-158) <i>“in the Netherlands during the procedure, before they start a procedure they tell you everything, they tell you this is how I am going to do it, where the injection is going to be and after the injection the kid will have this long problem and if the problem is like this you have to do this and so I think they provide a quite a detail information here”</i>	Participant 1 (63-65) <i>“there is no interaction about anything that I could do beyond the program and I would even pay for it, but nobody discussed it with me”</i>
	Participant 3 (324-326) <i>“I basically just went to the appointment and followed the advice that they gave me which was this is this vaccination you are schedule for and this is the age that we give them here”</i>	Participant 4 (416-417) <i>“not enough information just they said that the baby can have fever after the vaccination”</i>
	Participant 6 (542-543) <i>“Yes, from the doctor in Indonesia and in here from the GGD officer like nurse. After they explain face-to face then they saw us with the book and explain that.”</i>	Participant 7 (607, 615-617) <i>“We stick to the standards we didn’t really question that. complications you don’t go back to people who give vaccination you go to GP because that’s the first point where you need to contact and can you cannot reach the vaccine providers basically, this impossible”</i>
		Participant 8 (702) <i>“No, it like in the centre its time to have the vaccination but no information”</i>

Table 11: Receiving information as a factor:

According to highly-skilled migrant parents, receiving information was a barrier to some parents while some parents did what they were told to do. There were 4 participants who felt that they did not receive enough information before or during the vaccination procedure. One participant instead of depending on the vaccine provider for the information tried search for the information through the internet, while the other participants felt that they received the information that was required before or during the vaccination.

4) Availability:

The fourth category is the availability of the vaccines. This does not imply that the vaccines are not available but the participants preference to have more vaccine than just the 12 vaccines in the schedule. The factor is subcategorized into two namely, required and not required. This is shown in Table 12. In these 3 participants feels they need more vaccination than just the 12 vaccines in the schedule whereas 2 participants required BCG vaccination as they travelled to their native country. 2 participants feel there is no need for extra vaccination in which one participant says Participant 4 (397-398) *“we checked about my country and they said that ok there is no specific vaccination you need. So, then I understood that the system is more or less the same”*, whereas another participant feels Participant 7 (633-634) *“we don’t want to give any more vaccination then the required standard.”*

According to highly-skilled migrant parents, there is a need in the increase in the number of vaccines in the Netherlands schedule. Though the receive the basic 12 vaccinations and specific vaccination like BCG if they are travelling to countries where tuberculosis is still dominant. The highly-skilled migrant parents desired to have vaccinations like for influenza, Rota virus or chicken pox. There are parents who travel between countries with different schedule and different vaccines in the schedule, among them is also participant 8 who tried combining the schedule of the Netherlands and that of Colombia to get the vaccination of her child.

Factor	Facilitator	Barrier
Availability	Participant 4 (397-399) <i>“we checked about my country and they said that ok there is no specific vaccination you need. So, then I understood that the system is more or less the same”</i> Participant 7 (582-583) <i>“try to do at least do the mandatory ones and sometime not extras as it also has lot of side effects”</i>	Participant 1 (25-26,31) <i>“I think the Dutch program could really be a broader and include few more things Availability is really important.”</i> Participant 2 (143) <i>“I just find there are less vaccines here”</i> Participant 3 (213-214) <i>“I was little concerned about when we got here was whether he had a shot for chicken pox in America which wasn’t gonna get boosted here”</i> Participant 9 (749-750, 756) <i>“TB vaccination it is specially for Asian kids. I think TB is optional”</i> Participant 10 (816-817) <i>“they said the vaccination for TB is required”</i>

Table 12: Availability of more vaccines as a factor

5) Preferred Country:

This is a factor specifically for highly-skilled migrant with at least one child born in the Netherlands. They were chosen as they would be better able to compare and decide where to vaccinate or prefer the vaccination. In the sample group there were 3 participants who were in this category (Table 13).

In this participant 1 preferred to have the vaccination of her children in Finland when compare to the Netherlands. According to her Participant 1 (82-83,87-89) *“I felt better informed and better cared in Finland, its okay here but it was better over there.”*, *“definitely in Finland I got a flu shot and here I didn’t. would like have more information on what’s possible”*.

The participant 2 preferred vaccinating her children in the Netherlands when compared to Sweden. According to her Participant 2 (168-170, 171-173,180-184) *“its different country different language and people in Sweden are we were in Stockholm and in the hospital, there were lot of people who are not good with English”*, *“here you have lot of centres for vaccination so consultancy bureau is the main place and every part of the city has one consultancy bureau for that district how do you say for that area. But in Sweden it is only the hospitals.”*, *“In fact in the Netherlands the whole system when we moved somebody visited us at home and look at the kids personally and then also*

looked at the vaccination what we had so it was the 1st appointment which in principle we should go to a consultancy bureau and they should do it but some body actually came to our home to do this”.

The participant 5 preferred vaccinating his children in the Netherlands when compared to Indonesia. According to him Participant 5 (486, 487-491,491-494) *“To be honest I prefer to get the vaccination here”, “in my country there is a vaccination program from the government but not all of vaccination is given to the children the reason is the population in Indonesia not all of them not protect by insurance. But here health insurance is one kind of mandatory and if we join the basic structure all of the vaccination is covered.”, “In Indonesia the vaccination program by the government is free for endemic disease, but for non-endemic disease they pay and the fee is quite expensive. Sometime the reason is sometime hard to go to the vaccination. But here the vaccination covered by insurance.”.*

Factor		Facilitator	Barrier
Preferred Country	Finland		Participant 1 (70-71) <i>“I liked it in Finland more because they offered more and I had really great nurse in Finland.”</i>
	Netherlands	Participant 2 (168-170) <i>“I think the Netherlands reason being its different country different language and people in Sweden are we were in Stockholm and in the hospital, there were lot of people who are not good with English”</i>	
	Netherlands	Participant 5 (486) <i>“To be honest I prefer to get the vaccination here”</i>	

Table 13: Preferred country of Vaccination.

5.3 Conclusion:

In this chapter, answer to the sub-question 2 is provided. The highly-skilled migrant parents were interviewed and the results were presented according the theoretical model. There were other factors according to the parents which was a barrier to them during the decision-making process. With the exception of religion, as it is not mentioned by any participants except one in relation to composition other factors from the theoretical model did somehow were barrier for the highly-skilled migrant parents.

Chapter 6: Discussion and Conclusion

In the discussion, the main research question “*Which factors affects the highly-skilled migrant parents’ decision to whether vaccinate or not to vaccinate their children?*” is answered. Other than that, the strength and limitations of this thesis is discussed. This is followed by a recommendation to both the highly-skilled migrant parents and the GGD. Finally, a short conclusion is presented.

6.1 Discussion

The research question: “*Which factors affects the highly-skilled migrant parents’ decision to whether vaccinate or not to vaccinate their children?*” can be answered with the result of the sub-questions, the literature review and the interviews with the participants.

The main goal of this thesis was to gain insight into the different factors influencing the vaccination decision of highly-skilled migrant parents. There is a study focusing on the vaccination decision of the immigrants and problem they face during the vaccination of their children (Harmsen, 2015). However, they do not specifically mention that the participants included were highly-skilled or not. There are also studies in which the general factors that affect the vaccination decision of the parents are described (MacDonald, 2015) (van Lier, 2013). Literature review helped in forming a theoretical framework for the highly-skilled migrant parents. Initially, the conceptual model of vaccine hesitancy was applied for the framework, but as it provides the factors affecting the individual decision-making for vaccination it was not included (Dube, 2013). The three C’s model was then used for the theoretical framework as it included multiple factors which might have an influence on the highly-skilled migrant parents.

The generalized result of this thesis indicates that the parents in the sample population were supportive towards vaccination, though some of them did face difficulty during the vaccination of their children. Irrespective of the problems faced by the parents they were supportive and self-evident towards vaccination of their children.

Important outcome:

Convenience plays a major role in influencing the decision of the highly-skilled migrant parents. The highly-skilled migrant parents face certain barriers that could be co-related to

convenience from the three C's model. The factors affecting according to the convenience (3 C's model) are described below.

The first factor which was problematic for the participants as well as mentioned in the literature is the language. For some parent's language was a barrier, as either they were not properly able to communicate what they desired or understand the information received from the vaccine care providers (Moller, 2016) (Harmsen, 2015). Both in the literature and the interview the participants mention about receiving an invitation letter to schedule time and date for vaccination. The problem associated with the letter is that it is in Dutch which becomes a hindrance for participants as they put it aside for more urgent works that need their attention. It is also possible that they do not understand the urgency of the vaccination because of the communication being in a different language. As mentioned by one of the participants, there was miscommunication with the vaccine provider regarding the updated status of the vaccination of her child. In this the participant was confident that her child had received the vaccination but due to miscommunication it was not updated in the system and the vaccine provider wanted to revaccinate the child.

According to the literature the problem with accessibility was associated with distance/geographical barrier to the vaccination center or visitation to the center which acted as a potential barrier (Moller, 2016) (Chu, 2004). But according to the interview conducted the participant did not had problem with the visitation to the center rather they had issues with the scheduling process. In this, the participant indicated that as they are working parents they require flexibility with the timing, which according to them is at the same time as their working hours. Few participants even find negotiating a time with vaccine care provider was too difficult. The rescheduling of the vaccination has even caused in the delay of vaccination of one of the participant's child.

More than 50% of the participants in this study evaluated the amount of received information as insufficient. It is not mentioned in the theoretical factors affecting the vaccination decision of highly-skilled migrant parent because it was thought that most of the information might be already with the participants either through internet or study materials they might read. But according to this thesis some parents instead of depending on the vaccine providers to give a complete information and clear concerns they rather have it searched thoroughly by themselves. There are participants who even believed that the information

provided to them was not sufficient and would have preferred a longer consultation time for the same.

This study also showed that availability of the vaccines was also an issue with the participants. Though the vaccinations are provided as routine from the government, there are participants according to whom there should be more vaccines available for certain viruses such as influenza virus and Rota virus. Highly-skilled migrant parents also need to get their children vaccinated for vaccines such as BCG before travelling as it is not in the NIP schedule.

The country of birth of the child did not affect the highly-skilled migrant parents' decision as they optimally managed the vaccination procedure by either being provided with the vaccine details along with the brand names and doses. The only reason their preference might be changed is that the number of vaccine available is too few in the Netherlands.

Relevant outcome:

Confidence in the model is described as trust in the government and the authority. According to the participants they trust the government or the authority providing them the vaccinations. Even there was a participant who trusted the system that delivers the vaccination and which also includes the safety and competence of the health professionals. Another factor is side-effects, though it is a barrier for the participants it turned out to be a minor factor.

Complacency in the model is described as the composition of the vaccines in the Netherlands. The composition of the vaccine was thought to be a determinant that affected the decision of the highly-skilled migrant parents, but based on the results from the study, composition was not an important factor. Most participants were not bothered by the composition as they trusted the government or the authority that was providing the vaccination. For them, if a vaccination would have problems then the authorities will stop the use of that particular vaccine. There were also participants who knew about the problems associated with the composition of the vaccines but were not bothered with it. There was only one participant who had issues with the composition of the vaccine with regard to halal animal product. His concern was whether the vaccines provided has halal ingredients. This did generate as a barrier for the beliefs of an individual but was not influential enough to change the decision for vaccination for their children. Another factor in complacency is social norm, this was described by only one participant. Though it is not a potential barrier but it was the behavior of the participant towards vaccination.

6.2 Strength and Limitations:

To the best knowledge of the researcher, this is the first study investigating the highly-skilled migrant parents' decision regarding vaccinating their children in the Netherlands. This research could be helpful in creating awareness among the vaccine centers as to the problems faced by the highly-skilled migrant parents.

There are some limitations to this thesis which should be considered in a future work for a better interpretation of the result. First is, the interviews were conducted with a limited number of participants. The highly-skilled migrant is a specific sub-population, the criteria for the participants and the accessibility to the participants made it difficult to recruit a greater number of participants. A note for future research is that to have a greater number of participants and proper accessibility to these participants.

Second limitation of this thesis is that the participants recruited for the interview were through snowball method. This method might cause selection bias, as the initial few participants were acquaintance of the researcher. To overcome the selection bias, an approach to the participants could be made through the organization (like Expat Centers) who deals with the highly-skilled migrants.

Finally, the participant in the thesis had completely vaccinated their children according to NIP, future research could be done with participants whose children are not vaccinated. This might provide an insight on factors influencing the highly-skilled migrant parents whose children are not vaccinated.

6.3 Recommendation:

It is shown from this study that the highly-skilled migrant parents have a positive attitude towards the vaccination decision of their children. They perceive practical barriers such as language, need for more information, options to more vaccines. By overcoming the barriers faced by the highly-skilled migrant parents may result in better vaccination rate and prevent infectious diseases to both the children of the highly-skilled migrant parents and the children of the parents from the Netherlands (host country).

The vaccination program in the Netherlands is effective. The only way to further reduce the infection is definitive vaccination strategies for the highly-skilled migrant population to protect both the children and the adults from the infectious diseases. These strategies should be

planned in a way as to ensure continuity of childhood vaccination schedule (Semenza, 2016). The findings suggest that there needs to be a tailored program for the vaccination of the children. The strategy should include both the culture and health simultaneously to overcome the barriers. The most effective way to increase the vaccination coverage is introduction of more vaccines in the schedule for the children of highly-skilled migrant parents. Children born to parents that are not native to the Netherlands should be provided with vaccines for the infectious diseases that are endemic in the country to which the highly-skilled migrants belong.

Highly-skilled migrant parents prefer to receive more information in a language, preferably English, which is understandable to them. The need for longer consultation time during or before the vaccination procedure and explaining how the procedure works, further instructions that need to be given. The recall system in the Netherlands for the vaccination of children is good but for highly-skilled migrant parents it sometime creates problem as the communication is in Dutch which is not understandable for all the parents. The communication could be provided in English which is understood by the highly-skilled migrant parents. The highly-skilled migrant parents having children in the Netherlands receive a thorough consultation regarding vaccination after the birth of their children. This consultation could be provided to the parents migrating with their children, with a provision for additional vaccination (if required by parents), increased consultation time to better understand the procedure and vaccinations provided and in English language in which the parents are able to understand.

6.4 Conclusion:

A final conclusion on the result of this study explains that the highly-skilled migrant parents are self-evident and supportive of vaccination of their children, though they face practical barrier during vaccination such as convenience. Convenience as described by the parents through the interviews are language or ability to understand the information that they are receiving from the vaccination provider. Accessibility to reschedule the appointment for the vaccination also creates a barrier for the highly-skilled migrants. Availability of more vaccines other than the 12 vaccines in the Netherlands schedule or the lack of communication either from the vaccine providers or from the GP's create difficulty for these parents to get the vaccination and that too on time.

Despite the positive support of the highly-skilled migrant parents, a tailored intervention meaning a process in which they receive information or communicate even for a greater number of vaccines in the schedule from the GGD is required. The details from the GGD needs to be detailed and the consultation duration to be increased so as all the queries are answered.

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Appendix

Appendix I: Literature Review

Author	Journal	Title	Population	Factors
1. Sanne Pagh Moller (Moller, 2016)	European Journal of Pediatrics	Difference in uptake of immunizations and health examinations among refugee children compared to Danish-born children: a cohort study	Refugee children and Danish-born children	Language, education, nature of migration, accessibility
2. Alice s Forster (Foster, 2017)	Journal of epidemiology and Community Health	Ethnicity-specific factors influencing childhood immunization decision among Black and Asia Minority Ethnic groups in the UK: a systematic review of qualitative research	(literature review)	Religion, language, migration status
3. Christina P Muller (Muller, 2009)	Vaccine, Volume 27, Issue 19	Vaccination coverage against measles in German-born and foreign-born children and identification of unvaccinated subgroups in Germany	Foreign-born and German-born children	Belief, anthropical
4. MF van der Wal (van der Wal, 2005)	Archives of Disease in Childhood	Vaccination rates in a multicultural population	Under-registration, unable to produce relevant paperwork	Children aged between 5 and 12 years
5. Chephra McKee (McKee, 2016)	The Journal of Pediatric Pharmacology and Therapeutics	Exploring the Reasons Behind Parental Refusal of Vaccines	(literature review)	Religion, Belief, Safety concerns
6. Paul A. Offit (Offit, 2003)	American Academy of Pediatrics Volume 112/Issue 6	Addressing Parents' Concerns: Do Vaccines Contain Harmful Preservatives, Adjuvants, Additives, or Residuals	-	Composition
7. Norman W. Baylor (Baylor, 2002)	Vaccine, Volume 20, Supplement 3	Aluminum salts in vaccines – US perspective	-	Composition
8. Jose G. Dorea (Dorea, 2017)	Environmental Research, Volume 152	Low-dose Thimerosal in pediatric vaccines: Adverse effects in perspective	-	Composition
9. Victoria H Buelow (Buelow, 2008)	Journal of Immigrants and Minority Health	Timely Immunization Series Completion among Children of Immigrants	Immigrants and parental nativity	Accessibility, education
10. Susan Y Chu (Chu, 2004)	American journal of Public Health	Racial/Ethnic Disparities in Preschool Immunizations: United States, 1996-2001	Non-Hispanic, White, non-Hispanic Black, Asian preschool children	Accessibility, Trust

11. Lindsay Wilson (Wilson, 2018)	Vaccine, Volume 36, Issue 8	Barriers to immunization among newcomers: A systematic review	(Literature review)	Social norm, accessibility, Education
12. Irene A. Harmsen (Harmsen I. B., 2015)	BMC Public Health	Vaccination decision-making of immigrant parents in the Netherlands; a focus group study	Moroccan, Turkish, and other ethnic backgrounds with at least one child aged 0-4	Language, accessibility
13. E Dube (Dube E. G., 2014)	Vaccine, Volume 32, Issue 49	Mapping vaccine hesitancy – Country-specific characteristics of a global phenomenon	-	Religion, Communication, Knowledge, Beliefs, attitudes, Cost, Risk/Benefit, Mode of administration
14. Alice van Lier (van Lier A. v., 2013)	European Journal of Public Health	Vaccine uptake determinants in the Netherlands	Children born in 2005 Language, education, nature of migration, accessibility	Language, religion, socio-economic status
15. Noni E. MacDonald (MacDonald, 2015)	Vaccine, Volume 33, Issue 34	Vaccine Hesitancy: Definition, scope and determinants	-	Mode of administration, Competence of the health professionals, Complacency, Affordability, Accessibility

Appendix II: Informed Consent Form

Informed consent form

Title research: Why vaccination program fails

Responsible researcher:

To be completed by the participant

I declare in a manner obvious to me, to be informed about the nature, method, target of the investigation. I know the data and results of the study will only be published anonymously and confidentially to third parties. My questions have been answered satisfactorily. (If applicable) I understand that audio content therefor will be used only for analysis or presentation.

I voluntarily agree to take part in this study. While I reserve the right to terminate my participation in this study without giving a reason at any time.

Name of the participant:

Date: Signature of the participant:

To be completed by the researcher

I have given a verbal explanation of the study. I will answer remaining questions about the investigation into power. The participant will not suffer any adverse consequences in case of early termination of participation in this study.

Name of the researcher:

Date: Signature of the researcher:

Vaccine Decision-making of Highly Skilled Migrant Parents in Twente

Researcher Bina Agarwal, Master student Health Science (2018) interview.

Dear Parents,

Thank you for participating in my research. The goal of my research is to investigate the factors that influences the vaccination decision-making among highly-skilled migrant parents in Twente region in the Netherlands.

The interview consists of three different parts which have open questions about different subjects in relation to vaccination.

UNIVERSITEIT TWENTE.

Preface:

1. To be filled:

- A Day:
- B Month:
- C Year:
- D Time:
- E Minutes:

To begin with present the research for the survey.

My name is Bina Agarwal, a Master student of Health Science at the University of Twente. I would like to ask you questions in relation to vaccination of your children in the Netherlands.

The questions asked need your explicit personal opinion about vaccination and not what you see or hear in and around your surroundings.

The information provided by you is treated confidential and will not be shared with any other parties. Transcripts or recordings of the interview will be stored without reference to any personal data.

The interview should last for 45 minutes approximately. The questions are separated into three parts.

- In the first part, we start with the general information about your children (Age, Sex, Birth place, etc.)
- In the second part of the questionnaire, we discuss in general about the vaccinations. In this we talk about the factors affecting the vaccinations decision-making, vaccination program in the Netherlands.
- In the third part, we discuss your experience regarding vaccinations of your children and the preferred country for vaccinations.

During this interview, I would record our conversation for future data analysis. Do you approve the recording of our conversation? A permission form needs to be signed.

- Do you have any questions at this point?

A large, empty rectangular box with a thin black border, intended for the respondent to provide answers or notes.

Part 1: General question

1. To be noted: The parent during the interview is a

Father ☐

Mother ☐

Both ☐

2. How many children do you have?

3. What are the ages of your children?

Child 1 –

Child 2 –

Child 3 –

Child 4 -

4. In which country were your children born?

Child 1 –

Child 2 –

Child 3 –

Child 4 -

5. Are the vaccinations of your children up to date?

Child 1 Yes/No






Child 2 Yes/No


Child 3 Yes/No

Child 4 Yes/No


Note: Before the next question is asked, I would like to provide you information about the vaccinations and its schedule of the Netherlands.

Vaccination schedule National Immunisation Programme

Phase 1	Injection 1	Injection 2
 6-9 weeks	DTaP-IPV Hib HBV	PCV
 3 months	DTaP-IPV Hib HBV	
 4 months	DTaP-IPV Hib HBV	PCV
 11 months	DTaP-IPV Hib HBV	PCV
 14 months	MMR	MenC

Phase 2	Injection 1	Injection 2
 4 years	DTaP-IPV	

Phase 3	Injection 1	Injection 2
 9 years	DT-IPV	MMR

Phase 4	Injection 1	Injection 2
 12 years	HPV*	HPV* (6 months later)

Meaning of the abbreviations

D Diphtheria
aP Pertussis (whooping cough)
T Tetanus
IPV Poliomyelitis
Hib Haemophilus influenzae type b

HBV Hepatitis B
PCV Pneumococcal disease
M Mumps
M Measles
R Rubella

MenC Meningococcal C disease
HPV Human papillomavirus

* Only for girls



6. If no, which child and what are the vaccinations he/she is missing?

Child 1	Child 2	Child 3	Child 4

7. (If a child is missing some vaccinations) **What is the reason for missing/not vaccinating your children?**

Child 1	Child 2	Child 3	Child 4

Part 2: General questions

1. **What is your opinion about vaccinations of children?**

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2. **What are the reasons that affects your decision to either vaccinate your child or not to vaccinate?**

--

- 3. Did you receive enough information to enable you for decision about whether or not to vaccinate your child(ren)? If not, could you explain the reasons for it.**

Part 3: Additional questions to parents with at least one child not born in the Netherlands.

- 1. What is your preferred country for the vaccinations of your child(ren): home country or the Netherlands?**

- 2. What were the difference in the vaccinations in the Netherlands when compared with the vaccinations provided by your home country?**

- 3. How do the composition of the vaccine in the Netherlands affects your decision about whether or not to vaccinate your children?**

- 4. (Space for questions)**

Appendix IV: General Characteristics

<u>Sl. No.</u>	<u>Parent</u>	<u>No. of Children</u>	<u>Age of the Children</u>	<u>Birth Country of Children</u>	<u>Vaccination Status</u>
<u>1.</u>	Mother	2	Child 1: 4 years Child 2: 1 year	Child 1: Finland Child 2: The Netherlands	Child 1: Delayed MenC vaccination Child 2: Up to date
<u>2.</u>	Mother	2	Child 1: 11 years Child 2: 6 years	Child 1: The Netherlands Child 2: Sweden	Child 2: 1st and 2nd in Sweden and rest in the Netherlands
<u>3.</u>	Mother	1	Child 1: 4 years	Child 1: The United States of America	Yes
<u>4.</u>	Mother	2	Child 1: 4 years Child 2: 1 year 3 months	Child 1: The Netherlands Child 2: The Netherlands	Child 1: yes Child 2: yes
<u>5.</u>	Father	3	Child 1: 12 years Child 2: 7 years Child 3: 8 months	Child 1: Indonesia Child 2: Indonesia Child 3: The Netherlands	Child 2: yes Child 3: yes
<u>6.</u>	Mother	2	Child 1: 8 years Child 2: 4 years	Child 1: Indonesia Child 2: Indonesia	Child 1: yes Child 2: yes
<u>7.</u>	Father	1	Child 1: 2 years 2 months	Child 1: Spain	Pre-vaccination for Men C vaccine
<u>8.</u>	Mother	1	Child 1: 2 years 6 months	Child 1: The Netherlands	Yes, “manage to do the vaccination from here and then tried to maintain the vaccination from Colombia”
<u>9.</u>	Mother	1	Child1: 10 months	Child 1: The Netherlands	yes
<u>10.</u>	Mother	1	Child 1: 2 years 6 months	Child 1: The Netherlands	yes

Appendix V: Code Framework

Determinants	Code	Remarks	
Language	Language	Facilitator	Barrier
		<i>"I never had the problem with the language"</i>	<i>"The language definitely was more problematic"</i> <i>"I had little bit barrier with the language"</i> <i>"my wife already try to learn Dutch so little bit she understands ya maybe there is a little barrier but not too big problem"</i> <i>"I can read Dutch but would have easier to have straight away in English"</i> <i>"what's the meaning of the vaccination in Netherlands and translate it to my language"</i>
Determinant	Code	Barrier	Facilitator
Accessibility	Accessibility	<i>"With regards to appointment time that's really actually pretty difficult because they have very rarely appointments before 9 after 4 actually"</i> <i>"one of the factor that really affects vaccination is hours. The scheduling that is if you are working of course either you have to take the day off to vaccinate your kid but they</i>	<i>"my husband come to the GGD and explain our situation and the GGD reschedule it."</i> <i>"the appointments were planned quite in advance so we didn't really have any issues"</i> <i>"I reschedule the vaccination 1 week late because she had fever"</i>

Accessibility	Accessibility	<p><i>don't have hours during the weekend."</i></p> <p><i>"It is time consuming then I need to write an email or make a contact with another person and then explain all the story for example I was this morning I was there and I told the nurse and I need to re-explain everything to ask them to just to change an appointment or do something or to solve a problem."</i></p>	
Determinant	Code	Facilitator	Barrier
Information receiving	Information Receiving	<p><i>"in the Netherlands during the procedure, before they start a procedure they tell you everything, they tell you this is how I am going to do it, where the injection is going to be and after the injection the kid will have this long problem and if the problem is like this you have to do this and so I think they provide a quite a detail information here"</i></p> <p><i>"I think here the explain it quite well, so I knew how the whole procedure is going to work out and how the kid is going to feel and if the kid is going to feel differently how I am going to do things and so</i></p>	<p><i>"I wish there would have been a conversation about other possibilities for example I didn't know if it was possible to have extra vaccination for example I would like influenza vaccination for the children when they are in the day care, so there is no interaction about anything that I could do beyond the program and I would even pay for it, but nobody discussed it with me. If it's even possible, I don't even know if I can get an extra vaccination."</i></p> <p><i>"not enough information just they said that the baby can have fever after the vaccination"</i></p>

Information Receiving	Information Receiving	<p><i>everything was really nicely explained.”</i></p> <p><i>“I basically just went to the appointment and followed the advice that they gave me which was this is this vaccination you are schedule for and this is the age that we give them here”</i></p> <p><i>“Yes, from the doctor in Indonesia and in here from the GGD officer like nurse. After they explain face-to face then they saw us with the book and explain that.”</i></p>	<p><i>“We stick to the standards we didn’t really question that. complications you don’t go back to people who give vaccination you go to GP because that’s the first point where you need to contact and can you cannot reach the vaccine providers basically, this impossible”</i></p> <p><i>“No, it like in the centre its time to have the vaccination but no information”</i></p>
Determinants	Code	Remarks	

Side-effects	Side-effects	<p>"he did had a reaction so it was just a fever and we were very worried as he was young we were first parents this was our only child and he had a severe fever of 104 and it was Sunday night there were no hospitals nothing open we were new to the country, we didn't speak the language so we were very frightened by it. It was actually very frightening for us at that time but it was just a fever and it did go down and it wasn't that big the deal."</p> <p>"1st 2 days were not so high and I think that was the natural reaction against vaccination but then there was one day break when she was fine and then everything started. So, we didn't know if that has anything to do with the vaccination, maybe it is so we don't know if something else come in contact when she was sick. Such complications you don't go back to people who give vaccination you go to GP because that's the first point where you need to contact and can you cannot reach the vaccine providers basically, this impossible"</p>
Determinant	Code	Remarks
Social norm	Social norm	<p><i>"I just feel like it's a social decision and if the Netherlands decides to do it this way I will agree to the ways the Netherlands does it because that's like it has to be a social decision because it's a social outcome like everybody has to do it otherwise it doesn't work and what's the point of a vaccine so if everybody else is doing it you also have to do it because that what vaccine is for. It doesn't make sense to be the one person who doesn't have a vaccine unless you had some illness that makes it harder for you to vaccine. Point of the vaccine is to have immunity from the disease, so it just seems like a group decision to all have minor version of the diseases instead of everybody going through the major version than I guess there</i></p>

		<p>would be some people more harmed by it than I was as a child like with chicken-pox there would be some people who are more severely affected and I didn't know that as a child because I was one of the lucky ones with nothing to worry over and perhaps that ends up some kind of harsh world vision making us a weaker group or something that is sort of way of looking at things. If we could save everybody, it seems like a nicer way to do things so why don't we all just work toward a nicer world and it seems very sensible"</p>	
Determinants	Code	Barrier	Facilitator
Availability	Availability	<p>"I think the Dutch program could really be a broader and include few more things Availability is really important."</p> <p>"I just find there are less vaccines here"</p> <p>"I was little concerned about when we got here was whether he had a shot for chicken pox in America which wasn't gonna get boosted here"</p> <p>"TB vaccination it is specially for Asian kids. I think TB is optional"</p> <p>"they said the vaccination for TB is required"</p>	<p>"we checked about my country and they said that ok there is no specific vaccination you need. So, then I understood that the system is more or less the same"</p> <p>"try to do at least do the mandatory ones and sometime not extras as it also has lot of side effects"</p>
Determinants	Code	Remarks	

Trust	Trust	<p><i>“its here they use the international standard so I guess we trust on them but I don’t think it will affect my decision”</i></p> <p><i>“To be honest I trust them definitely If I know that something in the vaccination would damage something in my children life I wouldn’t do”</i></p> <p><i>“I think I mean I not expert in this, I mean the authority which advises in this have probably done a lot of research and also its preventive, it’s a cumulative knowledge that has led to this vaccination and I believe in that.”</i></p> <p><i>“I appreciate the Netherlands vaccination program because the doctors here are very careful in terms of mistake, they want to more examine.”</i></p>
Composition	Composition	<p><i>“In my case sorry no. I have read about vaccinations too, I know about the lead controversy but I think there is not much lead in vaccines anymore. my mom had issues saying that back then the vaccines were not that good and but I have read that they are much better and just a lower dose of viruses.”</i></p> <p><i>“To be honest it does not really affect because the 1st thing how much the difference in the composition is and 2nd thing mainly it is important that they get a proper vaccine.”</i></p> <p><i>“I don’t know about that really, I mean I know that it’s a thing but I don’t know enough about chemistry to know if people are making sense or having those issues like I hear so many different stories that whether, I personally do not understand chemistry so I am not just gonna belief any claims. I am not convinced by anything that I read is that its important.”</i></p> <p><i>“in Indonesia there are program from government we follow but we have to pay, we think of the ingredient is halal, we think if the ingredient is halal if not halal not to take it. But here actually that is our consideration but we cannot to receive recommendation from the GGD.From</i></p>

Composition	Composition	<p><i>the government promote and persuade in Indonesia that the vaccination is halal blah blah, sometime we thinking here that really that is halal or not. We don't know here exactly so we do not take risk."</i></p> <p><i>"No, that is we are not the Netherlands population we are newcomer here so we had to follow what this government says, because we don't want to make a problem if GGD suggest your children shod vaccinate, and if we didn't take the suggestion maybe next time GGD will not good citizen something like that. We follow the Netherlands procedure."</i></p> <p><i>"Not really, I think I mean I not expert in this"</i></p> <p><i>"To be honest I don't want to be deeply involved in the topic in terms of scientific manner. If I go too deeply I might change my thinking about vaccinations because I ll see what is the their side of the situations so I prefer just to do normal parent without scientific knowledge, I already have the scientific knowledge in my mind because I have to take the risk but both ways are risk so we don't know exactly if we should which is worse."</i></p> <p><i>"I have to know more about the ingredients, I want to but they did not give anything but for me I am connected with health products and I want to know and study about how they control the disease and everything"</i></p> <p><i>"No, we didn't really think so much about the ingredients"</i></p>
Preferred Country		Reason
1. Finland		<p><i>"I liked it in Finland more because they offered more and I had really great nurse in Finland."</i></p> <p><i>"I think I felt better informed and better cared in Finland, its okay here but it was better over there."</i></p>

	<p>"Finland provide more vaccinations then then the Netherlands and also what I like in Finland there is the same nurse so I had really developed a relationship with the health care provider and here at the GGD you never know who you get"</p>
2. The Netherlands	<p><i>"I think the Netherlands reason being its different country different language and people in Sweden are we were in Stockholm and in the hospital, there were lot of people who are not good with English"</i></p> <p>"here you have lot of centres for vaccination so consultancy bureau is the main place and every part of the city has one consultancy bureau for that district how do you say for that area. But in Sweden it is only the hospitals. So, you cannot just go anywhere close to your home and have vaccination so you have to really go in a big hospital and there they do the vaccination. So, it was difficult to go there as all were very big and then you have to wait a lot for the vaccination and language was different and all the communication was fine."</p>
3. The Netherlands	<p><i>"To be honest I prefer to get the vaccination here"</i></p> <p>"in my country there is a vaccination program from the government but not all of vaccination is given to the children the reason is the population in Indonesia not all of them not protect by insurance. But here health insurance is one kind of mandatory and if we join the basic structure all of the vaccination is covered."</p> <p>"In Indonesia the vaccination program by the government is free for endemic disease, but for non-endemic disease they pay and the fee is quite expensive. Sometime the reason is sometime hard to go to the vaccination. But here the vaccination covered by insurance."</p>