Wageningen University   **Department of Social Sciences**

MSc Thesis: Communication strategies chair group

UNDERSTANDING SUB SAHARAN IMMIGRANT'S INTENTION TO GET TESTED FOR HIV

MSc Communication and Public health

August 2011

Student: Damascene Habimana

Registration number: 791130296060

Course code: COM-80533

Supervisors:

Dr. Anne Marike Lokhorst

Dr. Annemien Haveman-Nies

WAGENINGEN UR

For quality of life

ACKNOWLEDGEMENTS

Table of contents

Abstract

While it is known that getting tested for HIV is beneficial, it is estimated that 40% people living with HIV/AIDS in the Netherlands are unaware of their infection status. Three categories of consequences for not getting tested have been identified: clinical, economic and public health ones. Among the high risk groups whose prevalence rate has been increasing are the sub-Saharan immigrants. In this study, I investigated their intention to get tested for HIV. I used the Theory of Planned Behavior (TPB) extended with four more constructs: risk perception, past behavior, stigma and environmental constraints. Results show that subjective norm is an important predictor of intention as well as attitude and past behavior suggesting the importance of community in regards of HIV/AIDS issues. The effect of attitude on intention was found to be mediated by subjective norm. This relation needs to be investigated further as well as the role of past behavior on attitude formation.

1. Introduction

The Human Immunodeficiency Virus (HIV) is a retrovirus that causes AIDS - a disease of the human immune system (Douek et al. 2009; Weiss 1993). The history of HIV and AIDS can be traced back between 1979 and 1981. Although first cases have been reported in 1981, studies have shown that HIV/AIDS may have started long ago before (Barnett and Whiteside 2003). The HIV/AIDS is now a pandemic with a total of 33.4 million [31.1 million–35.8 million] people living with HIV; 2.7 million [2.4 million–3.0 million] incident cases occurred in 2008 worldwide and with 2.0 million [1.7 million–2.4 million] deaths the same year (UNAIDS 2009a)

The main transmission modes are sexual transmission, mother to child transmission, infection trough blood or blood products and intravenous drug use. Primary prevention strategy is the most useful as no effective vaccine has not yet been developed and distributed, even though antiretroviral therapies have managed to change HIV infection from a death sentence to a chronic disease (Edgar et al. 2007). It has become increasingly clear that primary prevention must focus on behavior and behavior change as AIDS is first and foremost a consequence of behavior and it is not who people are, but what people do that determines whether or not they expose themselves or others to HIV (Fishbein et al. 2001). Therefore, it is necessary to understand why people behave the way they do and study behaviors that underlie further transmissions.

In the Netherlands, the total HIV infected population registered by the SHM (Monitoring 2010) consisted of 18,000 HIV-infected patients in June 2010. The majority of these patients were men who have sex with men (MSM) (57%), or they were men (14%) or women (18%) infected via heterosexual contact. 4% patients were injecting drug user whilst 1% were infected by contact with infected blood. For 6% patients, the mode of transmission was unknown. (Monitoring 2010).

1.1. Problem statement

In The Netherlands, HIV testing has long been discouraged and was only actively promoted after Highly Active Antiretroviral Therapy: combination of three or four drugs for the treatment of HIV (HAART) was introduced in 1996. It has been reported that the Netherlands have one of the lowest testing rates in the industrialized world. (Dukers et al. 2007). Although the scale of the Dutch HIV epidemic is minute (only 0.2% of the population is estimated to be infected), the low testing rates makes very difficult to quantify the prevalence of HIV in each group in the Netherlands (Monitoring 2010).

While it is recognized that getting tested for HIV is beneficial at several levels, it is estimated that 40% people living with HIV/AIDS in the Netherlands are unaware of their infection (UNGASS 2010). Among risk groups, 65% of MSM are estimated to have been diagnosed and 34% of infected sex workers and 50% of infected immigrants from sub-Saharan Africa.

HIV testing is very beneficial, especially when it is performed early. Failure to get tested early results in getting tested late which is often termed as late presentation. The consequences of this may be very dangerous and be classified in three categories. The first group of consequences are clinical ones. Patients who get tested late and subsequently start treatment late are in an advanced stage of immunosupression and are at high risk of clinical events and progression (Egger et al. 2002; Girardi et al. 2007). The greater clinical severity (on top of AIDS-defining condition and opportunistic infections) of HIV infection among late presenters is also illustrated by the significant short-term mortality in this group, which is much higher than that recorded among those with an earlier diagnosis (Castilla et al. 2002; Girardi et al. 2007; Hocking et al. 2000). For example, one study has shown that 32% short-term AIDS mortality is reduced by earlier diagnosis (Chadborn et al. 2005). Another study on deferred therapy found that deferred therapy is associated with an increase in risk of death of 69% to 94% depending on how the treatment was deferred (Adler et al. 2009). Late presentation may also result in antiretroviral drug resistance (Truong et al. 2006).

The second group of consequence is the economic one. Care needs and associated costs for people who present late are very high compared to those who present early. This has been supported by a number of studies which found out that mean annual costs for late presenters may be 2.2 times greater than those for early presenters (Krentz et al. 2004). Another study done in Canada has found that those diagnosed late account for a high proportion of resource use, particularly in the first few months after presentation. The mean annual cost for healthcare in the year after HIV diagnosis has been estimated to be Can$18 488 for late presenters compared with only Can$8455 for non-late presenters (an increase by a factor of approximately 2.2) (Girardi et al. 2007). After adjusting for patient characteristics, the estimated excess annual cost attributable to late diagnosis was calculated as Can$9723; this appears to be largely a result of hospital care costs, which are 15 times higher for those diagnosed late (Girardi et al. 2007).

Cost effectiveness of the therapy is also jeopardized. For example, the cost-effectiveness ratio for three-drug therapy (when started at a CD4 cell count of 200 cells/ml) is US$17 000 per quality-adjusted year of life gained and this increases to US$26 000 when therapy is started later (at a CD4 cell count of less than 50 cells/ml) (Girardi et al. 2007). Interestingly, in a cost-effectiveness analysis performed within the context of a resource-limited setting, the same association between late therapy initiation and a decreased cost-effectiveness was reported (Badri et al. 2006; Wood et al. 2004).

From a public health point of view, people unaware of their infection are more likely to transmit HIV than those who know their HIV status (Sobrino-Vegas et al. 2009). Actually, knowing own serostatus is associated with a change in risk behavior and it reduces transmission because of both the adoption of changes in risk behaviour (Adler et al. 2009; Dukers et al. 2007). A recent study indicated that HIV-infected persons who were unaware of their infection contributed disproportionately to ongoing HIV transmission. It also indicated that the rate of HIV transmission was 3.5 times higher from persons who were unaware of their infection than from those who were aware of it (Hamers and Phillips 2008). That's why some studies have suggested that the sources that drive the epidemic are undiagnosed cases, most likely unaware of having been infected recently and are involved in high-risk sexual behaviour (Gras 2009)

Because of the advantage of getting tested, it is necessary to understand testing patterns, drivers and barriers associated to getting tested especially among high risk groups. In the Netherlands, some studies have been carried out to try to understand testing behaviour. For example, few studies have been done to study testing behavior in MSM (Mikolajczak et al. 2006; Stolte et al. 2007). Others have been carried out in the general population (Dukers-Muijrers et al. 2009; Heijman et al. 2009). Results of these studies suggested that the main barriers to HIV testing are affective, namely fear of a positive test result, fear of the detrimental consequences of a positive test and not being ready to cope with a positive test. However, it is not yet known why testing rates of other high risk groups are low. This is the case of sub-Saharan immigrants.

Several studies performed in some European countries found that sub-Saharan immigrants are less likely to get tested for HIV AIDS (Bakhao et al. ; Barry et al. 2002; Burns et al. 2007; Deblonde et al. 2010; Dodds et al. 2004; Manirankunda et al. 2009) and that immigrants are the ones that are likely to be tested later than people born in the country (Adler et al. 2009; Coenen et al. 2008). However, it is not elucidated why they don't want to get tested; especially in the Dutch context where sub-Saharan immigrants are the second high risk group which have high undiagnosed HIV cases (UNGASS 2010) and a growing number of prevalence. Only 157 sub-Sahara Africans were living with HIV/AIDS in 2000 (Adanse-Pipim et al. 2000) while recent estimations show that on the whole population of HIV positive people in the Netherlands, almost half of women with HIV in the Netherlands now originate from Sub-Saharan Africa and approximately one-third of men originate from Sub-Saharan Africa (Gras 2009). If their prevalent cases are increasing, this suggests that there are also many undiagnosed cases that are to contribute to ongoing transmission.

Therefore, it is necessary to know the drivers of testing behaviour of sub-Saharan immigrants, factors associated to their willingness to get tested as well as barriers that do hinder them to getting tested.

1.2. Research question

The main research question of this study is: what are the factors associated with HIV testing behavior of sub-Sahara African immigrants living in the Netherlands? The research sub questions are:

- Does their attitudes toward HIV testing influence their intention to get tested?
- How big is the role of social norms in influencing their intention to get tested?
- What are the barriers that do not allow them to get tested?
- Does past behavior predict future intention to get tested?
- Does stigma predict future intention to get tested?

1.3. Research objectives

The main objective of this research is to get to know the drivers of HIV testing behaviour of sub-Saharan immigrants living in the Netherlands. The specific objectives are:

- To find out if Sub-Saharan African immigrants attitude toward getting tested for HIV influences their intention to get tested;
- To quantify the role of social norms in influencing their intention to get tested;
- To find out barriers to their HIV testing;
- To find out if past behavior predicts future intention to get tested;
- To find out if stigma predicts future intention to get tested.

2. Theoretical framework

2.1. Behavior theories

Several theories have been used to describe and predict future behavior. These theories are termed as behavior theories. When it comes to AIDS related behavior, the Health Belief Model (HBM), the Theory of Planned of Planned behavior (TPB) and the Social Cognitive Theory (SCT) are very influential in a public health, clinical and social psychological approach respectively (Baum et al. 2001).

The HBM states that there are two main factors that would influence a person to adopt a protective behavior: the belief in a personal health threat and the belief in the effectiveness of a health behaviour. On the first hand, the belief in a personal health threat is determined by two elements: firstly by the perceived susceptibility to a disease and this can be understood as the subjective risk of acquiring an illness if no countermeasures are taken (Koelen and Ban 2004) and secondly by the perceived severity of a disease which can be expressed as physical (death, pain, disability, etc.) or social consequences (economic problems for example). On the other hand, the belief in the effectiveness of a health behaviour depends on two elements: the perceived benefits which are the individual's assessment of the positive consequences of adopting the behavior and the individual's assessment of the influence that facilitates or discourages adoption of the promoted behavior and this is referred to as the perceived barriers (idem).

The TPB states that intention is the only element that determine the performance (or non-performance) of the behavior. Intention is determined by three elements: attitude toward the behavior, perceived social pressure to perform the behavior and the perceived behavioral control. From the perspective of the SCT, in order to perform a given behavior, individual must believe in their capacity to perform the behavior and must also have incentives (personal, social, etc.) to perform it.

However, the Theory of Self-Regulation and Self-Control and the Theory of Subjective Culture and Interpersonal Relations cannot be ignored neither when it comes to the clinical domain and social psychology domain respectively. The Theory of Self-Regulation

and Self-Control describes how self-Regulatory processes (self-observation, self-evaluation and self-reinforcement) lead to satisfaction with behavioral performance and continuation of the behavior or to dissatisfaction and either self-corrective action or termination of the behavior (Baum et al. 2001). This theory identifies intention, self-efficacy, outcome expectancies, skills and affective states as important determinants of behavior (idem). According to the Theory of Subjective Culture and Interpersonal Relations, behavior performance is determined by three man elements: intention (determined by perceived consequences of performing the behaviour, social influences and emotions), habits and facilitating factors (Triandis 1977).

In an effort to capitalize on strength of these theories, the developers of these five main theories have agreed upon eight main points that are most important in explaining behavior. These factors are: intention, environmental constraints, skills, attitude, social pressure, personal standards, emotional reactions and capabilities to perform the behavior under certain circumstances (Baum et al. 2001). To take advantage of this, I chose to use one of these theories that can be extended to take into account the eight items above mentioned and the TPB possess such characteristics.

2.2. The Theory of Planned Behavior

The TPB has been used to predict behavioral intentions and ultimately account for a notable amount of variance in the performance of a multitude of behaviors (Kahlor 2007) and especially health behaviors (Godin and Kok 1996). It has also met with some degree of success in predicting a variety of behaviors and reviews of its use have proven its efficacy (Conner and Armitage 1998). For instance, reviews and researches have proved that several other constructs may be added (Conner and Armitage 1998) and even its authors have pointed to its openness to include other element (Ajzen 1991). That's why I chose to use the TPB and will extend it using some of the constructs mentioned in the eight item list and even from other models.

The TPB can be considered as an expectancy value theory. Its prerequisites are that people are aware of the negative consequences of their behavior (Bartholomew et al. 2011). The TPB was developed from the Theory of Reasoned Action (TRA). Initially, the

TRA was made of three construct (intention, attitude and subjective norm). The extension of the TRA gave birth to the TPB. It is made of the four elements and (intention, attitude, subjective norm and perceived behavioral control).

The starting element of the TPB is intention. This is the best predictor of behaviour. It can be either positive (the person wants to perform the behaviour) or negative (the person does not want to perform the behaviour) (Ajzen 1991). Intention is determined by three constructs: attitude, subjective norms and perceived behavioral control (Bartholomew et al. 2011). According to the TPB, attitude is the first element that determines intention. One of the most influential book on attitudes defines attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly and Chaiken 1993). It is like an internal state of a person that can be regarded as a bias that predisposes the individual toward evaluative responses that are positive or negative (idem). Thus, attitudes are positive or negative views of person, thing, place or event – often referred to as attitude object. According to the TPB, attitudes are determined by beliefs about the consequences of performing the behaviour, and of the evaluations of those consequences. These are perceived outcomes and they regarded as one of the key variables underlying behavioral performance (Tracey 2001). In our case, beliefs about getting tested could be that it will inform me about my health… and with each belief is connected with a positive (good) or negative (bad) evaluation. Other characteristics of attitudes are that:

- Attitudes are learned: people are born without attitudes and they are acquired over the course of socialization in childhood and adolescence (Perloff 2008)
- Attitudes influence thought and action: they allow to categorize people, places, and events quickly and to figure out what's going on (idem).

Subjective norm is the second element that determines intention. It reflects the social influence and is a perception of the social pressures to perform or not to perform the behaviour. It is a function of beliefs that specific, important individuals or groups (social referents) approve or disapprove of the focal person performing the behavior and how important that opinion is to the person (Bartholomew et al. 2011).

Perceived behavioral control is the third element that determines intention according to the TPB. It refers to the way people think they can carry out a given task successfully. It is about how the person perceives the behaviour to be easy or difficult to be performed. This element may be understood as consisting of three elements: perceived control, perceived confidence and perceived difficulty. (Kraft et al. 2005).

2.3. Additional constructs

To increase the prediction power of the TPB, I added some more constructs. The constructs I added are in relation to the behavior under investigation.

The first element I added is the construct of risk perception. Preventive behaviour is the result of the wish to reduce one's risks. This is assumed by several prevailing models of health behaviors like the Health belief model that makes perceived risk its cornerstone. Perception of risk is considered to be the first stage towards behavioral change from risk-taking to safer behavior. This is especially true for diseases whose infection has been considered to be a death sentence. Although the concept of risk perception is not included in the TPB, it is however assumed. Attitudes are for example assumed to be based on the summed products of the likelihood of positive and negative consequences of behavioral alternative and the evaluation of these consequences and attitudes will be most favorable towards alternatives with relatively high number of positive outcomes and a relative low number of negative outcomes (van der Pligt 1996).

Studies that have included the risk perception element in the TPB have considered the risk perception as a distal predictor of intentions through its effects on attitudes and beliefs (Schmiege et al. 2009). Indirect, as well as direct relationships from perceived risk to intentions through attitudes have been well supported by the literature (Bryan et al. 1997; Jackson and Aiken 2000). In the context of HIV testing behavior, studies done have highlighted risk perception as one of the element associated with getting tested (Erwin et al. 2002; Fenton et al. 2002; Girardi et al. 2007; Mills et al. 2011). This has to do probably with the fact that HIV has long been considered as a death sentence (Edgar et al. 2007). Therefore, I added this construct in the model and expect that it will have an indirect effect on intention through attitude.

The second element I added is the construct of Past behavior. According to the TPB, human behaviour is performed after reasoning. However, behaviour can also be associated with past behavior. Past behavior has received strongest evidence to predict future behavior in studies that have included it to the TPB (Smith et al. 2008) and past behavior significantly improved the prediction of future behavior over and above the effects of intentions and perceptions of behavioral control (Ouellette and Wood 1998). Researchers have argued that it is important to consider the role of past behavior when the behavior in question is performed repeatedly (Smith et al. 2008). Therefore, I think that it is necessary to include this element in our model as past behavior (having been tested before) may be associated with future behaviour (getting tested again). For example, a person who has already been tested may not have the same barriers than a person who never got tested. Logically, past behavior should lead to enhanced perceptions of control and on this basis, one might predict that past behavior should be most strongly correlated with perceived behavioral control (Conner and Armitage 1998). However, evidence from studies has shown that past behavior is strongly associated with intention (Ouellette and Wood 1998).

The third element I added is the construct of environmental constraints. Performing a behavior is not always an easy going process. A number of external elements might act as facilitators to the performance of the behaviour and other elements may be barriers. These barriers may be financial costs, social costs, institutional barriers… environmental constraints are therefore those external elements that may impact the intention to perform the behaviour. In the context of getting tested for HIV, I investigated possible barriers that people might meet. The barriers that I found are: knowing where to get tested, not having enough resources, not speaking the Dutch language and not legally residing in the Netherlands (Burns et al. 2007; Deblonde et al. 2010; Fakoya et al. 2008; Manirankunda et al. 2009).

The fourth element I added to the TPB is the construct of stigma. the dominant definition describes stigma as a "discrediting attribute" and stigmatized individuals as those who possess an "undesirable difference," and ignores aspects that describe stigma as something that is socially constructed (Goffman 1986). HIV stigma is very important that

the late Jonathan Mann, then director of the WHO Global Program on AIDS, identified three phases of the HIV/AIDS epidemic: the epidemic of HIV, the epidemic of AIDS, and the epidemic of stigma, discrimination, and denial and noted that the third phase is "as central to the global AIDS challenge as the disease itself" (Mann 1988).

AIDS stigma is a major barrier to HIV/AIDS prevention and treatment and it has impact on several levels. On a societal level, AIDS stigma undermines public support for social programs to assist people with HIV/AIDS (Kalichman et al. 2005) and on an individual level, AIDS stigma creates a barrier to HIV prevention, HIV testing, and accessing HIV treatment and care (Bond et al., 2002; Burris, 1999; Chesney and Smith, 1999; Parker and Aggleton, 2003). The importance of stigma as far as HIV/AIDS is concerned makes it an element that cannot be ignored. I included it in my initial model and expect it to influence directly intention.
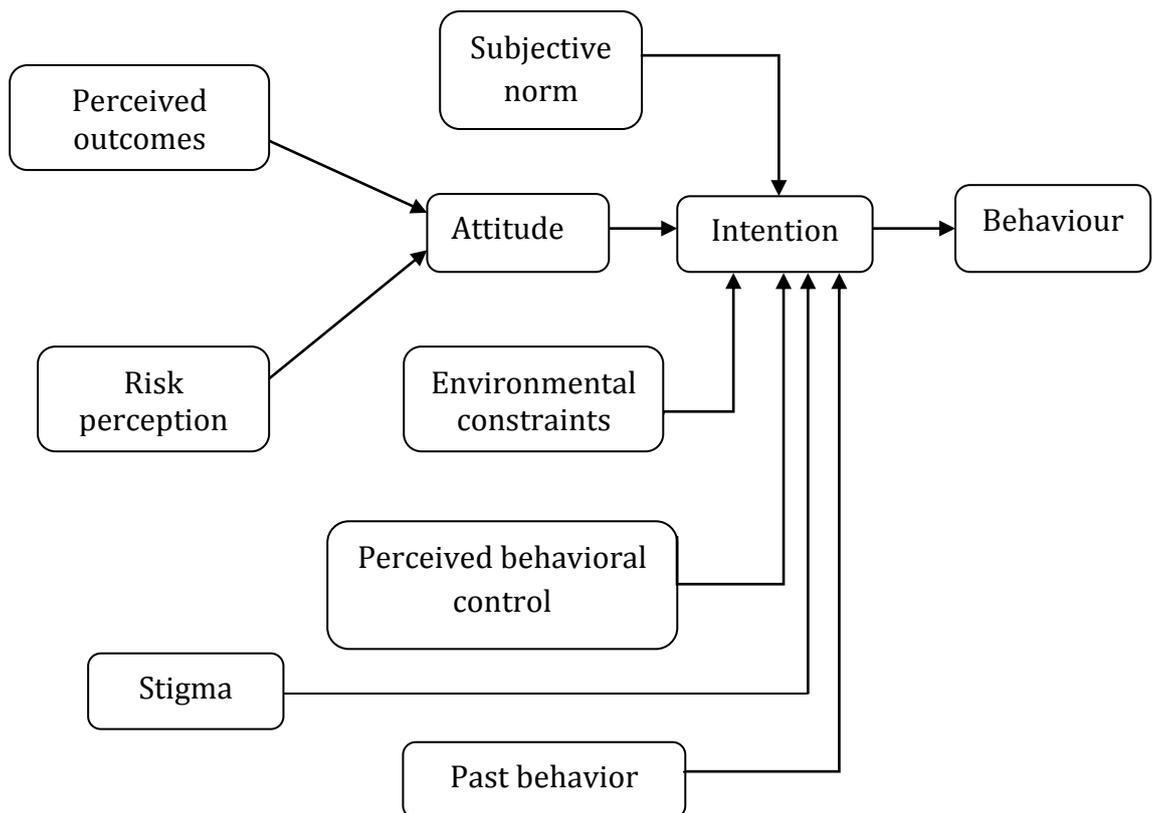
Figure 1: Our model

2.4. Hypotheses

From the discussion above, the following hypothesis guided my study:

1. First hypothesis: attitude toward getting tested for HIV will be positively related to intention for getting tested for HIV.

2. Second hypothesis: HIV risk perception and perceived outcomes for getting tested for HIV will be positively related to attitude toward getting tested for HIV

3. Third hypothesis: HIV testing related subjective norms will relate positively to intention for getting tested for HIV.

4. Forth hypothesis: HIV testing related environmental constraints will relate negatively to intention for getting tested for HIV.

5. Fifth hypothesis: getting tested perceived control will be positively related to intention for getting tested for HIV

6. Sixth hypothesis: people who got tested for HIV in the past will have a strong intention to getting tested again

7. Seventh hypothesis: HIV related stigma will have be negatively related to intention for getting tested for HIV.

3. Methods

3.1. Target group

The study population of my study is sub-Saharan Africans, men and women, living in the Netherlands, especially those aged between 18 and 65 years as this group is the most vulnerable to HIV/AIDS (Luuk Gras 2010). Many sub-Saharan immigrants live in big cities like Rotterdam and Amsterdam. Therefore, my target group is made of those immigrants living in Amsterdam as 46% of Amsterdam population are immigrants (Tillie 2004). Since I cannot do a research on this whole target group, I targeted a convenient sample of 100 respondents but due to time constraints, I could get 64 respondents only.

To find the respondents, I used mainly existing networks. Initially, I used the AFAPAC Foundation (African Foundation for AIDS Prevention AND Counseling)[1]. This organization is a non-governmental and a non-profit community based foundation and places particular emphasis on the promotion of preventive activities related to HIV/AIDS and other sexually-transmitted diseases. The foundation organizes meetings fortnightly and this was an opportunity for me to meet people and eventually they would fill in the questionnaire. The main target group of this foundation is immigrants from Ghana.

I also used another network of the NEDAS foundation[2]. This is a multicultural organization for development and welfare of East African immigrants (Ugandans, Rwandans, Tanzanians, Burundians and Kenyans). Its scope includes supporting the integration process of new immigrants, support in the improvement of family life of East African immigrants, with emphasis on general family health, and sanitation. Other small networks of community organizations were also used through mainly the heads of these communities. Another strategy that I used to get respondents was to go to some meeting points were Africans use to go regularly. Hence I went to one African barber shop and one African gift shop and there I would wait for some people to show up. After four weeks of data gathering, 64 respondents had filled the questionnaire.

---

[1] http://www.afapac.nl/
[2] http://www.nedas.nl/

3.2. The questionnaire

I developed a questionnaire based on the model described in chapter 2 (Figure 1). The questionnaire included items of the constructs of the model and all questionnaire items had a 5-point rating scale (a copy of the questionnaire can be found in the appendix). To measure all the items, I used scales which had been previously used in other studies. At the end of data collection, I started with checking if the scales I used are reliable. To check this, I ran the reliability analysis to get the Cronbach Alpha (α) for each scale and chose the option "scale if item is deleted" so that I could see which item could eventually be deleted to increase the reliability of the scale. Intention was measured using three items: I plan to get tested for HIV next year (strongly disagree/strongly agree), I plan to get tested for HIV every year (strongly disagree/strongly agree) and In the future, I will try to get tested for HIV every year (strongly disagree / strongly agree) (Fishbein et al. 2001; Kahlor 2007). The reliability analysis with these items and I got a sufficient level of reliability (α = .70).

HIV testing related subjective norms was measured using 3 items: most people who are important to me expect me to get tested for HIV next year (strongly disagree/strongly agree), most people who are important to me approve my getting tested for HIV next year (strongly disagree/strongly agree) and I feel under social pressure of getting tested for HIV every year (strongly disagree / strongly agree) (Ajzen 2003; Francis et al. 2004). I ran the reliability analysis for these items and I got a moderate level of reliability (α = .68). The analysis revealed that the deletion of the item 'I feel under social pressure of getting tested for HIV every year' would yield a sufficient level of reliability (α = 78). Hence I deleted it.

Attitude was measured using three items: my getting tested for HIV next year would be (bad/good), my getting tested for HIV next year would be (harmful/beneficial) and my getting tested for HIV next year would be (worthless/valuable) (Ajzen 2003; Kahlor 2007). The reliability analysis for these items and this scale proved not to be reliable (α = .46). However, the analysis revealed that the deletion of the item 'my getting tested for HIV next year would be bad/good' would produce a moderate level of reliability (α = .63). Hence, this item was deleted.

Environmental constraints items were developed from a body of literature reporting barriers that immigrants might come across in getting tested for AIDS. (Burns et al. 2007; Deblonde et al. 2010; Fakoya et al. 2008; Manirankunda et al. 2009). The items I used in the questionnaire are therefore: when you think about getting tested for HIV, do you ever think of the following as a barrier: - not knowing where to get tested, not having enough resources, not speaking the Dutch language and not legally residing in the Netherlands (Never/Always). I performed the reliability analysis for these items and this analysis yielded a very reliable coefficient (α = .83).

Perceived outcomes was measured using two items: my getting tested for HIV will make me know if I am HIV positive/negative (strongly disagree / strongly agree) and knowing that I am HIV positive/negative is (bad / good) (Ajzen 2001). I performed the reliability analysis for this items but the alpha coefficient was very low (α = 21). Therefore, I dropped this scale in the next steps of data analysis.

Risk perception was measured using three items: how serious would it be for you if you get HIV in the next year (not serious at all/very serious), how likely do you think that you will contract HIV in the next year (very unlikely/very likely) and how likely an infected person will die of AIDS (Very unlikely/very likely). (Brewer et al. 2007; De Zwart et al. 2009; Hingson et al. 1990). I performed the reliability analysis for these items. The analysis yielded a very low Cronbach alpha coefficient (α = .24). Therefore, this scale was dropped.

Perceived behavioral control was measured with one item: I am confident that I can get tested for HIV next month (strongly disagree/strongly agree). Stigma was measured using 9 items, each with five scale from strongly disagree to strongly agree: People who have AIDS are dirty, People who have AIDS are cursed, People who have AIDS should be ashamed, It is safe for people who have AIDS to work with children, People with AIDS must expect some restrictions on their freedom, A person with AIDS must have done something wrong and deserves to be punished, People who have HIV should be isolated, I do not want to be friends with someone who has AIDS and People who have AIDS should not be allowed to work (Kalichman et al. 2005). I performed a reliability analysis for these

items and I got a moderate level of reliability (α = .67). However, this analysis also revealed that the deletion of the item 'It is safe for people who have AIDS to work with Children' would improve significantly the alpha coefficient (α = .74). Hence, this item was dropped in further analysis. Past behavior was measured using one item: how often did you get tested for HIV in the last five years (with a rating from 1 to 5).

Apart from the constructs of the model, the questionnaire included also the following demographic questions: age, gender, education level, country of origin, time the respondent has been residing in the Netherlands, religiosity and health perception.

3.3. Characteristics of the study population

The first section of the questionnaire was about demographics of the study population. These characteristics are summed up in Table 1 below. As can be read from Table 1, 46 respondents were male (72% of the respondents) and 18 female (28%). The age of the respondents ranged from 21 to 64 years and the mean age was 41 (SD = 9.9). 20 respondents went to high school (31.3%), 9 have a bachelor level (14%), 26 have a higher level (40.6%) and 6 have another kind of education (9.4%). Half of the respondents (50%) are from Ghana, 14% are from Uganda, 7.8% are from Benin, 6.3% are from Nigeria and other countries share the remaining percentage (Ethiopia, Kenya, Rwanda, South Africa, Togo, Sierra Leone, Swaziland and Zimbabwe). All the respondents have already spent several years in the Netherlands. In average, respondents have been residing in the Netherlands for 13 years and 5 months - the minimum being 1 year and the maximum being 35 years. (SD = 12 years and 3 months). 48 respondents said they are HIV negative (75%), 1 is HIV positive (1.6%) and 12 did not know their status (18.8%).

Table 1: characteristics of the study population

		N	Frequency	Percent	Minimum	Maximum	Mean	Std. Deviation
1. Gender	- Male	64	46	71.9			1.28	.45
	- Female		18	28.1				
2. Age (in years)		64			21.00	62.00	41.03	9.91
3. Education level	- High school	61	20	31.3				
	- Bachelor		9	14.1				
	- Higher		26	40.6				
	- Other		6	9.4				
4. Time residing in the Netherlands (in months)		64					156.80	98.90
5. Religiosity		61					4.33	.96
6. Serostatus	Yes	61	1	1.6				
	Don't know		12	18.8				
	No		48	75				
7. Country of Origin	- Benin	64	5	7.8				
	- Ghana		32	50				
	- Nigeria		4	6.3				
	- Uganda		9	14.1				
	- Other[3]		14	21.8				

[3] Congo, Ethiopia, Kenya, Rwanda, Sieraa Leone, South Africa, Swaziland, Togo and Zimbabwe

4. Results

4.1. Descriptives and correlations

The main dependent variable is intention to get tested for HIV and the independent variables are: attitude, subjective norms, perceived behavioral control, past behavior, religiosity, stigma, environmental constraints, health perception and a number of demographics. In the second hypothesis, attitude a dependent variable while risk perception and perceived outcomes are independent variables.

The first step I performed in the data analysis was the bivariate correlations of all the variables that I measured. Table 2 displays means and correlations among the elements of the model. As can be read in that Table, the significant correlations are between gender and stigma (r= .265, p<.05), age and time residing in the Netherlands (r= .504, p<.01), PBC and age (r=-.357, p<.01), PBC and religiosity (r= .256, p<.05), PBC and intention (r= .38, p<.01), PBC and subjective norm (r= .255, p<.05), Gender and attitude (r= .295, p<.05), Past behavior and intention (r= .521, p<.01), Past behavior and subjective norm (r= .427, p<.01), Past behavior and attitude (r= .275, p<.05), Health perception and attitude (r= .334, p<.05), Religiosity and environmental constraints (r= .272, p<.05), Intention and subjective norm (r= .677, p<.05), Intention and attitude (r= .534, p<.05) and Subjective norm and attitude (r= .529, p<.05).

For the main constructs I am interested in, these correlations show that intention is strongly correlated with the TPB constructs and with past behavior. This means that people who scored high on scales of PBC, attitude and subjective norms; scored also high on the scale of intention. People who got tested at least once in the past also scored high on the scale of intention. Subjective norm is also correlated with several constructs I am interested in. Thus, people who scored high on subjective norms scale also scored high on attitude and PBC scales and for people who got tested at least once in the past. Women, those who got tested at least once in the past and those with a more positive perception of their health scored high on attitude scale. PBC was negatively correlated with age and this means that PBC was lower for older people. People who scored high on the scale of environmental constraints score high as well on the scale of religiosity.

For the second order constructs (demographics), there are also correlations. Thus, older people scored high on the scale of time spent in the Netherlands; people who have been living in the Netherlands for a longer period scored also high on the scale of religiosity. Women scored also high on the scale of stigma.

The demographics I used are correlated with some of the constructs I am interested in. These demographics could therefore be confounders in the causal analysis. As can be read in Table 2, the possible confounders that emerged are gender (associated with stigma and attitude), age (associated with PBC), religiosity (associated with environmental constraints) and health perception (associated with attitude).

Table 2: Correlation matrix for socio-demographic variables and behavioral determinants

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	1.28	.45	1													
2. Age	41.03	9.91	-.076	1												
3. Education level	2.29	1.04	.035	-.064	1											
4. Time reside	156.80	98.90	.064	.504*	-.079	1										
5. Health perception	4.11	.76	.000	.114	.055	.112	1									
6. Religiosity	4.33	.96	.170	-.014	-.083	.256*	.113	1								
7. Serostatus			-.088	-.116	-.124	.140	.066	.135	1							
8. PBC	2.93	1.40	.219	-.357*	.032	-.122	.084	.093	.145	1						
9. Past behavior	3.03	1.40	.138	.145	.063	.055	.178	.184	-.091	.162	1					
10. Environmental constraints	2.44	1.34	.056	-.061	-.030	.110	.129	.272*	-.046	-.081	.050	1				
11. Stigma	1.62	.56	.265*	-.022	.078	-.097	-.027	.109	-.105	.128	-.066	.132	1			
12. Subjective norm	2.79	1.12	.060	.075	.028	.057	.062	.083	-.125	.255*	.427*	.248	.068	1		
13. Attitude	3.95	.93	.295*	-.024	.077	.131	.334*	.217	-.028	.159	.275*	-.011	.071	.529*	1	
14. Intention	3.30	.94	.221	.150	.127	.069	.213	.063	-.071	.380*	.521*	.002	.115	.677*	.534*	1

*$p<.05$

4.2. Regression analysis

As from the hypotheses, the dependent variable of my study is intention to get tested for HIV and the independent variables are: attitude, subjective norms, past behavior, religiosity, stigma and environmental constraints. The dependent variable for the second hypothesis is attitude and independent variables are risk perception and perceived outcomes. In the first step of the regression analysis, I ran the linear regression analysis. The first block was made of the constructs that were significantly related to the intention as revealed by the correlation analysis (Table 2). These constructs are actually the construct of the TPB, attitude, subjective norm, perceived behavioral control and past behavior. The second block was made of other variables included in our model which previous studies have shown to predict intention to get tested. These variables are stigma (Stutterheim et al. 2008) and environmental constraints (Fakoya et al. 2008; Manirankunda et al. 2009).

The results of the first block of the regression analysis showed that Subjective norm (β=.39, p<.05) and past behavior (β= .26, p<.05) are good predictors of intention. Attitude and PBC was not found to be good predictors of intention. The proportion of variance explained by this model was 54.1%. The results of the second block of the regression analysis revealed that subjective norms (β= .42, p<.05) and past behavior (β= .27, p<.05) remained significant predictors of intention to get tested for HIV. These new predictors did not predict intention. The prediction power of the model remained the same. Therefore, adding these predictors is not significant.

The fact that the correlation analysis showed that attitude and intention are correlated and the regression analysis showed that attitude is not a good predictor of the intention to getting tested for HIV made me think of the existence of the mediation effects especially as attitude is often the most good predictor in several studies using the TPB (Armitage and Conner 2001). The mediation was suspected with subjective norms and past behavior as they are both strongly correlated with attitude and yet are good predictors in our model. Baron proposed several steps to check mediation and I used the same principles (Baron and Kenny 1986). First, I checked the mediation effect of past behavior. I ran the regression analysis with attitude as a predictor and past behavior as the dependent

variable and I found that attitude is a good predictor of past behavior (β=.275, p<.05). In the second step, I run the regression analysis with past behavior as a predictor of intention and found out that it is a good predictor (β=.521, p<.05). In the third step I ran the regression analysis with both attitude and past behavior as predictors of intention. Controlled for past behavior, attitude was still a good predictor of intention (β=.429, p<.05). The Sobel test was not significant (Z=1.88, p>.05). This means that it is not proven that past behavior is a mediator of the relation between attitude and intention.

I therefore, I checked if subjective norm is a mediator of the relation between attitude and subjective norm. The first step showed that attitude predicts subjective norm (β=.529, p<.05). The second step showed that subjective norm predicts intention (β=.677, p<.05). The third step showed that attitude is a good predictor of intention (β=.249, p<.05) when controlled for subjective norm. The sobel test was significant (Z= 3.35, p<.05). This means that subjective norm mediates the relation between attitude and intention.

Table 3: regression analyses

Steps		R2	Adjusted R2	Standardized β (step 1)	Standardized β (step 2)
Step 1	– PBC			.16	.13
	– Attitude	.576	.541	.21	.20
	– Subjective norm			.39*	.42*
	– Past behavior			.26*	.27*
Step 2	– Environmental constraint				-.11
	– Stigma	.593	.540		.10

*p<.05

4.3. Summary of the results

The first glance at the analysis of the data I collected revealed that there are several relations between different constructs of our model and intention. The correlation analysis revealed that intention is correlated with all the constructs of the TPB (attitude, subjective norm and perceived behavior control) and with past behavior. The regression analysis revealed that some constructs of the model are significant predictors of intention to getting tested for HIV. From the results of data analysis, I checked if my hypotheses was supported or rejected.

The first hypothesis predicted that attitude toward getting tested for HIV would be positively related to intention to getting tested for HIV. The regression analysis showed that attitude is not a good predictor of intention to getting tested for HIV and the mediation analysis showed that attitude effect on intention is through subjective norm. Thus, the first hypothesis was partially supported.

The second hypothesis stated that HIV risk perception and perceived outcomes to getting tested for HIV would be positively related to attitude toward getting tested for HIV. The reliability analysis revealed that the scales I used to measure risk perception and perceived outcomes were not reliable enough. Therefore, I could not perform neither the correlation nor regression analysis to confirm or reject the second hypothesis.

The third hypothesis predicted that HIV testing related subjective norms would relate positively with intention to getting tested for HIV. The regression analysis revealed that subjective norms is a strong predictor of intention ($\beta=42$, $p<.05$). Therefore, this hypothesis was supported.

The forth hypothesis of this study predicted negative relation between HIV testing related environmental constraints and intention to getting tested for HIV. This hypothesis was not supported since the regression analysis showed that environmental constraints are not a good predictor of intention.

The fifth hypothesis of this study predicted that perceived behavior control would be positively related to intention to getting tested for HIV. This hypothesis was not supported by the regression analysis ($\beta=.13$, $p>.05$).

The sixth hypothesis predicted that people who got tested for HIV in the past would have a strong intention to getting tested again. The regression analysis also revealed that past behavior was a significant predictor of intention to get tested ($\beta=.27$, $p<.05$). Therefore, the sixth hypothesis was supported.

The seventh hypothesis predicted that HIV related stigma will be negatively related to intention to getting tested for HIV. This hypothesis was not supported since the regression analysis showed that stigma is not a good predictor of intention to getting tested for HIV. Below is a Figure of our final model after the analysis.
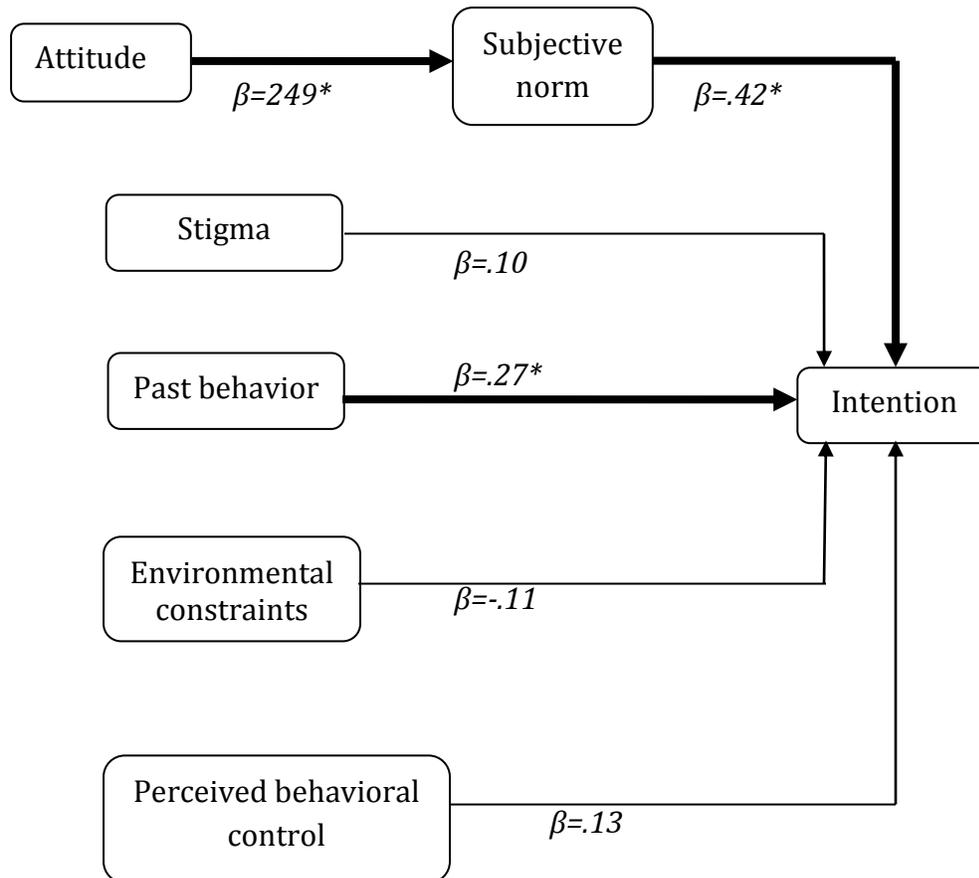
Figure 3: final model

Note: significant predictors are connected with bold arrows

* p<.05

Thus, past behavior and subjective norm are good predictors of intention and attitude effect on intention is mediated by subjective norms.

5. Discussion of the results

The results of this study show that the constructs of the TPB are good predictors of intention to get tested for HIV except for PBC. One of the most finding of this study is that the construct of subjective norm emerged as the most important among others. This is in sharp contrast with the results of other studies that used the TPB to study different behaviors. A meta-analysis review found that the construct of subjective norm is generally found to be a weak predictor of intention (Armitage and Conner 2001). Several authors have also argued that it is the weakest component of the TPB and the weakest to predict intentions (Sheppard et al. 1988), and several authors have even deliberately removed subjective norms from analysis (Armitage and Conner 2001). If the subjective norms emerged as a very important construct of the model, this has probably to do with our target group and the behavior at stake.

One possible explanation for this can be the importance of community life. In Such situation, the individual is defined by reference to the environing community and the person can be summed up in this statement: "*I am because we are, and since we are, therefore I am*." (Mbiti 1969). The sense of community makes that every person feels responsible of the survival of the community and anything that would threaten the community is addressed seriously by each member of the community. When the reality of the communal world takes precedence over the reality of individual life, anything that the person do is always referred to what is acceptable and what is not acceptable. Thus the importance of referents. I could also notice this during the data collection. Most respondents belong to already existing networks that they call 'community' and the meetings I participated in are called community meetings. These communities are organized with a board of leaders who organizes regular meetings to discuss a number of topics. Personally I participated in two meetings in which HIV/AIDS related issues where discussed. These communities feature the same social organization in their home countries. This suggests that immigrants keep the same community organization like those they have in their own home countries despite the fact that they have been living in the Netherlands for a long time (13 years on average).

Since subjective norm emerged as an important predictor of intention, this may also be related to the behavior under investigation. I would say that this is a sign that HIV/AIDS has become an important health issue that has moved from being an individual concern to being a community concern. This is

a very important point that should be taken into account to address HIV. This finding is in perfect accord with several studies in different African contexts which showed that social norms are strong predictors of different HIV related intentions such as condom use (Benefo 2010; Bosompra 2001; Meekers and Klein 2002).

Attitude also emerged as an important predictor of intention through subjective norms. The initial model of the TPB proposed that attitude is a personal element. Our findings suggest that the role of attitude is mediated by subjective norm. While this may be a proof of the primacy of subjective norms, it is very controversial to see that attitude effect on intention is mediated by subjective norm. The initial model of the TPB clearly shows that both constructs are very distinct. However, there is a discussion going on about the distinctiveness of both. For example, some authors argue that the attitudinal and normative components are not conceptually distinct, and that it is not possible to distinguish between personal and social influences on an individual's behavioral intention (O'keefe 2002; Park 2000). Problems of multicollinearity have also been raised between measures of attitudinal and normative components of the TRA which is actually the predecessor of the TPB and with which they share attitude and subjective norm constructs (Miniard and Cohen 1981).

In response to these criticisms with regard to the high correlation between attitudes and subjective norms, the founders of the TPB contend that attitudes and subjective norms are highly predictive of intentions and they correlated more strongly with the criterion than with each other (Fishbein and Ajzen 1981). Park proposes a methodological solution to this discussion (Park 2000). In Park's study, attitudes toward a behavior are divided into social and personal attitudes and it turned out that social attitudes correlate very high with subjective norms while personal attitudes are very distinct from subjective norm. Splitting the measurement of attitude into personal and social attitude sound to be a very good idea to understand the relation between attitude and subjective norm. Unfortunately I was not aware of this discussion at the time I started this study. However, this is an interesting issue that can be addressed in next studies addressing HIV testing behavior.

In this study I did not investigate the process of attitude formation. This process can be investigated further to know what other processes may trigger the formation of positive attitude toward getting tested for HIV. One interesting hypothesis that could be tested in attitude formation would be the role of past behavior.

Past behavior emerged also as a significant predictor. The proponents to the adding of the construct of past behavior on the TPB argued that it is important to consider the role of past behavior when the behavior in question is performed repeatedly (Smith et al. 2008). Although getting tested is not a daily behavior, it can however be understood as a behavior that needs to be performed repeatedly (may be every 6 months or after every risk behavior). The results of this study also supported this and this suggests that efforts on making HIV testing a habit that would be repeated regularly would be beneficial.

Several authors describe stigma as an obstacle to prevention (UNAIDS 2009b) and some do contend that it consists of negative attitudes towards those infected or suspected of being infected with HIV and those affected by AIDS (idem). It is an element that cannot be ignored when studying HIV related issues. Several studies have found a clear link between stigma and HIV testing behavior in different circumstances (Ogden and Nyblade 2005) and this relates either to not coming forward for testing, or to returning for their test results. Ogden stated that this maybe related in part to the way services are designed as many people may avoid going to clinics known as HIV testing sites for fear of being seen there by others and thus suspected as having HIV or if the that test results will not be kept confidential (Ogden and Nyblade 2005). Therefore, stigma is contextual and differs from place to place according to several elements. This study did not take into account this but this is an interesting issue that can be investigated. It is necessary to mention that this study focused only on the relation between intention and stigma. However stigma is associated with other HIV related issues and it would be interesting to delineate these relationships.

In the TPB, PBC is held to influence intention and behavior as well and its inclusion provides information about the potential constraints on action as perceived by the actor (Armitage and Conner 2001); and this means that the increase of the feeling of control over the performance of behavior should be associated with the decrease in possible barriers to the performance of the behavior. The correlation analysis supported this; unfortunately, the p-values were not significant.

To investigate the presence of eventual environmental constraints to getting tested, I used four possible barriers namely: knowing where to get tested for HIV, not having enough resources, not speaking the Dutch language and not legally residing in the Netherlands. The results of this study

show that the target group do not experience any environmental constraints. This may be related to the fact that most of the respondents are already part of the community networks that even address HIV/AIDS related issues. However, a closer look to the items of the scale of the environmental constraints reveals that all items I used are personal barriers which relate to the individual. However, there are other barriers relating to the institutional level that can be defined as structural and contextual factors surrounding HIV testing (Deblonde et al. 2010). The personal barriers are the most straightforward as far as HIV testing is concerned but the institutional ones are very also important and should not be ignored. It is therefore useful to delineate these different kind of barriers in studies so that it should be clear which kind of barriers people may face.

This study is subject to a number of limitations. The first limitation relate to the TPB I used. To understand and predict behavior, the TPB uses intention to predict behavior. Intention is like instructions that people give to themselves to behave in certain ways (Triandis 1979). However, intention-behavior relationship has been subject to reviews as the relation between both is not automatic. This means that a person may have a very strong intention to perform a given behavior but finally fail to implement his/her behavioral intention. A meta-analysis of meta-analyses of the TPB showed that behavioral intention explain 28% of the variance in future behavior which is not negligible (Sheeran 2002). This difference can be easily understood as the difference between the espoused theory of action (these are theories represent what someone says they would do in a certain situation) and the theory in use (which represent what they actually do) (Argyris and Schon 1974). Thus, having a strong intention does not mean automatically performing the behavior.

The second limitation is about the sample size. To calculate the sample size, I mainly aimed a convenient sample using the rule of thumb which suggests that a researcher has at least 10-15 participants per variable (Field 2009). With 9 variables, I initially aimed 90-135 respondents. However, due to time constraints I could get only 64 respondents. The sample I used suffers also from a number of issues. First, I did not choose respondents randomly. Second, some of the respondents refused to fill in the questionnaire for an unknown reason which may have to do with one of the elements that I am interested in. By the same token, one can question the reliability of answers respondents filled in and I am not sure if the answers provided were true or biased. The third issue is about the respondents themselves. The respondents are from very different backgrounds and this makes the sample very heterogeneous.

The third limitation is about the questionnaire. In ideal conditions, the questionnaire is pretested and corrected before real data collection. In my case, I did not pretest the questionnaire due to time constraints. In this study, I identified possible confounders in the preliminary analysis of the data. However, I did not adjust for them in the analysis due to time constraints. Also the sample size was not big enough to be able to make a stratified analysis.

This study has raised a number of issues that would be investigated further. The first one concerns the importance of the sense of community among immigrants. This study could only highlight the fact that subjective norm is an important element of the model. However, it could be interesting to explore why this construct is important among sub-Saharan immigrants. It would also be interesting to explore attitude toward testing by splitting the measurement of attitude into personal and social attitude. It should also be the same for

The main objective of this research was to get to know the drivers of HIV testing behavior of sub-Saharan immigrants living in the Netherlands. The results showed that intention to get tested is determined by social pressure, having ever been tested and attitude toward getting tested. Understanding the role of these factors is very useful in addressing HIV related issues in immigrants' communities. First, the results showed that social pressures are very important. Thus, any effort aiming at increasing the number of people who get tested can capitalize on this finding by emphasizing the efforts on the community level, for example by creating supportive communities. Also, the role of past behavior has been highlighted. As past behavior is also a good predictor, this suggests that efforts on getting people tested should focus on people who never got tested. This calls for further studies to find out which special groups are less tested.

Conclusion

This study analyzed the intention to get tested for HIV among sub-Saharan immigrants. I used the TPB enriched with few more construct: stigma, past behavior, environmental constraints and risk perception. The results show that attitude, past behavior and subjective norm are good predictors and other constructs are not. Subjective norm emerged as an important predictor and this is a clear indication of the importance of the sense of community. Attitude effect on intention was found to be mediated by subjective norm. Further studies are needed to investigate this relationship between attitude and subjective norm and to clarify the role of past behavior on attitude formation.

6. References

1. Adanse-Pipim, KA, Kyei, MB, and Boahene, K (2000), 'HIV/AIDS prevention and care initiative for Africans living in the Netherlands', 13.
2. Adler, A., Mounier-Jack, S., and Coker, RJ (2009), 'Late diagnosis of HIV in Europe: definitional and public health challenges', *AIDS care,* 21 (3), 284-93.
3. Ajzen (1991), 'The theory of planned behavior', *Organizational behavior and human decision processes,* 50 (2), 179-211.
4. --- (2001), 'Constructing a theory of planned behavior questionnaire', *Retrieved from* http://www-unix*. oit. umass. edu/ajzen/tpb. html.*
5. --- (2003), 'Constructing a TPB questionnaire: Conceptual and methodological considerations', *Retrieved April,* 14, 2003.
6. Argyris, C. and Schon, D.A. (1974), *Theory in practice: Increasing professional effectiveness* (Jossey-Bass).
7. Armitage, C.J. and Conner, M. (2001), 'Efficacy of the Theory of Planned Behaviour: A meta analytic review', *British Journal of Social Psychology,* 40 (4), 471-99.
8. Badri, M., et al. (2006), 'When to initiate highly active antiretroviral therapy in sub-Saharan Africa? A South African cost-effectiveness study', *Antiviral therapy,* 11 (1), 63.
9. Bakhao, N., et al. 'Factors associated with presentation to care with advanced HIV disease in Brussels and Northern France: 1997-2007', *BMC Infectious Diseases,* 11.
10. Barnett, T. and Whiteside, A. (2003), *AIDS in the twenty-first century: disease and globalization* (Palgrave Macmillan).
11. Baron, R.M. and Kenny, D.A. (1986), 'The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations', *Journal of personality and social psychology,* 51 (6), 1173.
12. Barry, SM, et al. (2002), 'The changing demographics of new HIV diagnoses at a London centre from 1994 to 2000', *HIV medicine,* 3 (2), 129-34.
13. Bartholomew, et al. (2011), *Planning health promotion programs: An intervention mapping approach* (Jossey-Bass).
14. Baum, A.E., Revenson, T.A., and Singer, J.E. (2001), *Handbook of health psychology* (Lawrence Erlbaum Associates Publishers).
15. Benefo, K.D. (2010), 'Determinants of Condom Use in Zambia: A Multilevel Analysis', *Studies in Family Planning,* 41 (1), 19-30.
16. Bosompra, K. (2001), 'Determinants of condom use intentions of university students in Ghana: an application of the theory of reasoned action', *Social Science & Medicine,* 52 (7), 1057-69.
17. Brewer, N.T., et al. (2007), 'Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination', *HEALTH PSYCHOLOGY-HILLSDALE THEN WASHINGTON DC-,* 26 (2), 136.
18. Bryan, A.D., Aiken, L.S., and West, S.G. (1997), 'Young women's condom use: The influence of acceptance of sexuality, control over the sexual encounter, and perceived susceptibility to common STDs', *Health Psychology,* 16 (5), 468.
19. Burns, et al. (2007), 'Why the (y) wait? Key informant understandings of factors contributing to late presentation and poor utilization of HIV health and social care services by African migrants in Britain', *AIDS care,* 19 (1), 102-08.
20. Castilla, J., et al. (2002), 'Late diagnosis of HIV infection in the era of highly active antiretroviral therapy: consequences for AIDS incidence', *Aids,* 16 (14), 1945.
21. Chadborn, T.R., et al. (2005), 'No time to wait: how many HIV-infected homosexual men are diagnosed late and consequently die?(England and Wales, 1993-2002)', *Aids,* 19 (5), 513.
22. Coenen, T., et al. (2008), 'Optimal HIV testing and earlier care: the way forward in Europe', *HIV medicine,* 9, 1-5.
23. Conner, M and Armitage, CJ (1998), 'Extending the theory of planned behavior: A review and avenues for further research', *Journal of applied social psychology,* 28 (15), 1429-64.

24. De Zwart, O., et al. (2009), 'Perceived threat, risk perception, and efficacy beliefs related to SARS and other (emerging) infectious diseases: Results of an international survey', *International journal of behavioral medicine,* 16 (1), 30-40.
25. Deblonde, J., et al. (2010), 'Barriers to HIV testing in Europe: a systematic review', *The European Journal of Public Health,* 20 (4), 422.
26. Dodds, J.P., et al. (2004), 'Increasing risk behaviour and high levels of undiagnosed HIV infection in a community sample of homosexual men', *Sexually transmitted infections,* 80 (3), 236.
27. Douek, D.C., Roederer, M., and Koup, R.A. (2009), 'Emerging concepts in the immunopathogenesis of AIDS', *Annual review of medicine,* 60, 471.
28. Dukers-Muijrers, N., et al. (2009), 'Effectiveness of an opting-out strategy for HIV testing: evaluation of 4 years of standard HIV testing in a STI clinic', *Sexually transmitted infections,* 85 (3), 226.
29. Dukers, N.H.T.M., et al. (2007), 'HIV incidence and HIV testing behavior in men who have sex with men: using three incidence sources, The Netherlands, 1984-2005', *Aids,* 21 (4), 491.
30. Eagly, AH and Chaiken, S (1993), *The psychology of attitudes* (Harcourt Brace Jovanovich College Publishers).
31. Edgar, T, Noar, SM, and Freimuth, VS (2007), *Communication Perspectives on HIV/AIDS for the 21st Century* (Lawrence Erlbaum).
32. Egger, M., et al. (2002), 'Prognosis of HIV-1-infected patients starting highly active antiretroviral therapy: a collaborative analysis of prospective studies*', *The Lancet,* 360 (9327), 119-29.
33. Erwin, J., et al. (2002), 'Pathways to HIV testing and care by black African and white patients in London', *Sexually transmitted infections,* 78 (1), 37.
34. Fakoya, I, et al. (2008), 'Barriers to HIV testing for migrant black Africans in Western Europe', *HIV medicine,* 9, 23-25.
35. Fenton, KA, et al. (2002), 'HIV testing and high risk sexual behaviour among London's migrant African communities: a participatory research study', *Sexually transmitted infections,* 78 (4), 241.
36. Field, A.P. (2009), *Discovering statistics using SPSS:(and sex and drugs and rock'n'roll)* (SAGE publications Ltd).
37. Fishbein and Ajzen, I. (1981), 'On construct validity: A critique of Miniard and Cohen's paper', *Journal of Experimental Social Psychology,* 17 (3), 340-50.
38. Fishbein, et al. (2001), 'Factors influencing behavior and behavior change', *Handbook of health psychology*, 3–17.
39. Francis, J.J., et al. (2004), 'Constructing questionnaires based on the theory of planned behaviour', *A manual for health services researchers.*
40. Girardi, E., Sabin, C.A., and Monforte, A.A. (2007), 'Late diagnosis of HIV infection: epidemiological features, consequences and strategies to encourage earlier testing', *JAIDS Journal of Acquired Immune Deficiency Syndromes,* 46, S3.
41. Godin, G. and Kok, G. (1996), 'The theory of planned behavior: A review of its applications to health-related behaviors', *American journal of health promotion*.
42. Goffman, E (1986), *Stigma: Notes on the management of spoiled identity* (Touchstone).
43. Gras (2009), 'Monitoring of human immunodeficiency virus (HIV) infection in the Netherlands'.
44. Hamers, FF and Phillips, AN (2008), 'Diagnosed and undiagnosed HIV infected populations in Europe', *HIV medicine,* 9, 6-12.
45. Heijman, RLJ, et al. (2009), 'Opting out increases HIV testing in a large sexually transmitted infections outpatient clinic', *Sexually transmitted infections,* 85 (4), 249.
46. Hingson, R.W., et al. (1990), 'Beliefs about AIDS, use of alcohol and drugs, and unprotected sex among Massachusetts adolescents', *American Journal of Public Health,* 80 (3), 295.
47. Hocking, J.S., et al. (2000), 'Late presentation of HIV infection associated with prolonged survival following AIDS diagnosis--characteristics of individuals', *International journal of STD & AIDS,* 11 (8), 503.
48. Jackson, K.M. and Aiken, L.S. (2000), 'A Psychosocial Model of Sun Protection and Sunbathing in Young Women: The Impact of Health Beliefs, Attitudes, Norms, and Self-Efficacy for Sun Protection* 1', *Health Psychology,* 19 (5), 469-78.
49. Kahlor, LA (2007), 'An augmented risk information seeking model: The case of global warming', *Media Psychology,* 10 (3), 414-35.

50. Kalichman, S.C., et al. (2005), 'Development of a brief scale to measure AIDS-related stigma in South Africa', *AIDS and Behavior,* 9 (2), 135-43.
51. Koelen and Ban, van den (2004), *Health education and health promotion* (Wageningen: Wageningen Academic Publishers).
52. Kraft, P., et al. (2005), 'Perceived difficulty in the theory of planned behaviour: Perceived behavioural control or affective attitude?', *British Journal of Social Psychology,* 44 (3), 479-96.
53. Krentz, HB, Auld, MC, and Gill, MJ (2004), 'The high cost of medical care for patients who present late (CD4< 200 cells/ L) with HIV infection', *HIV medicine,* 5 (2), 93-98.
54. Luuk Gras, Arl van Sighem, Colette Smit, Sima Zaheri, Maria Prins, Frank de Wolf (2010), 'Monitoring of Human Immunodeficiency Virus (HIV) Infection in the Netherlands', *Stichting HIV Monitoring (SHM).*
55. Manirankunda, L, et al. (2009), 'It's Better Not To Know": Perceived Barriers to HIV Voluntary Counseling and Testing among Sub-Saharan African Migrants in Belgium', *AIDS Education & Prevention,* 21 (6), 582-93.
56. Mann, J.M. (1988), 'Statement at an informal briefing on AIDS to the 42nd session of the United Nations General Assembly', *Journal of the Royal Statistical Society. Series A (Statistics in Society),* 151 (1), 131-36.
57. Mbiti, J.S. (1969), *African religions & philosophy* (Heinemann London).
58. Meekers, D. and Klein, M. (2002), 'Determinants of condom use among young people in urban Cameroon', *Studies in Family Planning,* 33 (4), 335-46.
59. Mikolajczak, J., Hospers, H.J., and Kok, G. (2006), 'Reasons for not taking an HIV-test among untested men who have sex with men: an Internet study', *AIDS and Behavior,* 10 (4), 431-35.
60. Mills, C.W., et al. (2011), 'Barriers to HIV Testing Among HIV/AIDS Concurrently Diagnosed Persons in New York City', *Sexually Transmitted Diseases,* 38 (12), 1.
61. Miniard, P.W. and Cohen, J.B. (1981), 'An examination of the Fishbein-Ajzen behavioral-intentions model's concepts and measures* 1', *Journal of Experimental Social Psychology,* 17 (3), 309-39.
62. Monitoring, Stichting HIV (2010), 'Monitoring of Human Immunodefificiency Virus (HIV) Infection in the Netherlands'.
63. O'keefe, D.J. (2002), *Persuasion: theory & research* (2: Sage Publications, Inc).
64. Ogden, J. and Nyblade, L. (2005), 'Common at its core: HIV-related stigma across contexts'.
65. Ouellette, J.A. and Wood, W. (1998), 'Habit and intention in everyday life: The multiple processes by which past behavior predicts future behavior', *Psychological Bulletin,* 124 (1), 54.
66. Park, H.S. (2000), 'Relationships among attitudes and subjective norms: Testing the theory of reasoned action across cultures', *Communication Studies,* 51 (2), 162-75.
67. Perloff, R. M. (2008), *The dynamics of persuasion : communication and attitudes in the 21st century* (LEA's communication series;9; New York, NY [etc.]: Erlbaum).
68. Schmiege, S.J., Bryan, A., and Klein, W.M.P. (2009), 'Distinctions between worry and perceived risk in the context of the theory of planned behavior', *Journal of applied social psychology,* 39 (1), 95-119.
69. Sheeran, P. (2002), 'Intention—behavior relations: A conceptual and empirical review', *European review of social psychology,* 12 (1), 1-36.
70. Sheppard, B.H., Hartwick, J., and Warshaw, P.R. (1988), 'The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research', *The Journal of Consumer Research,* 15 (3), 325-43.
71. Smith, J.R., et al. (2008), 'The attitude–behavior relationship in consumer conduct: The role of norms, past behavior, and self-identity', *The Journal of social psychology,* 148 (3), 311-34.
72. Sobrino-Vegas, P., et al. (2009), 'Delayed diagnosis of HIV infection in a multicenter cohort: prevalence, risk factors, response to HAART and impact on mortality', *Current HIV Research,* 7 (2), 224-30.
73. Stolte, I.G., et al. (2007), 'Low HIV-testing rates among younger high-risk homosexual men in Amsterdam', *Sexually transmitted infections,* 83 (5), 387.
74. Stutterheim, S.E., Bos, A.E.R., and Schaalma, H.P. (2008), 'HIV-related stigma in the Netherlands', *Maastricht: AIDSFonds & Maastricht University.*
75. Tillie, J. (2004), 'Social capital of organisations and their members: explaining the political integration of immigrants in Amsterdam', *Journal of ethnic and migration studies,* 30 (3), 529-41.
76. Tracey, B.A.W.R. (2001), 'Handbook of Health Psychology'.
77. Triandis, H.C. (1977), *Interpersonal behavior* (Brooks/Cole Pub. Co.).

78. Triandis, H.C. (1979), 'Values, attitudes, and interpersonal behavior', (University of Nebraska Press).
79. Truong, H.H.M., et al. (2006), 'Routine surveillance for the detection of acute and recent HIV infections and transmission of antiretroviral resistance', *Aids,* 20 (17), 2193.
80. UNAIDS (2009a), 'Epidemic Update, 2009', *Joint United Nations Programme on HIV/AIDS (UNAIDS) Geneva, Switzerland*, 1–50.
81. --- (2009b), 'Global report: UNAIDS report on the global AIDS epidemic'.
82. UNGASS (2010), 'UNGASS country Progress Report'.
83. van der Pligt, J. (1996), 'Risk perception and self-protective behavior', *European Psychologist,* 1 (1), 34-43.
84. Weiss, R.A. (1993), 'How does HIV cause AIDS?', *Science,* 260 (5112), 1273.
85. Wood, R., et al. (2004), 'When to start highly active antiretroviral therapy in sub-Saharan Africa?', (15), abstract no. TuPeB4515.

Appendix

Appendix 1: questionnaire

Dear Sir/Madam,

I would like to ask you to fill out this questionnaire. I have about 38 questions for you that pertain to getting tested for HIV. Filling out the questionnaire will take about 10 minutes. There are no right or wrong answers, just fill in what comes to mind. All the questions are anonymous. Most questions have a scale on which you can express your answer. For example you can say something about a statement like 'I like cats' with a table that says strongly disagree, disagree, don't disagree/don't agree, agree, strongly agree and you have to check the box that resembles most closely your answer.

I would like to thank you for your cooperation. This research is part of my Master program at Wageningen University.

1. Gender: Male _____ Female _____

2. Age: _____

3. Education level: High school _____ Bachelor _____ Higher _____ Other _____

4. Country of origin: _____

5. Country of birth of both parents: Father: _____

   Mother: _____

6. How long have you been living in the Netherlands: _____ years _____ months

	Not serious at all	Not serious	somewhat serious	a little serious	Very serious
7. How serious would it be for you if you get HIV in the next year					

	Very unlikely	Not likely	somewhat likely	a little likely	Very likely
8. How likely do you think that you will contract HIV in the next year?					
9. How likely is it that an HIV infected person will die of AIDS?					

10. When you think about getting tested for HIV, indicate the extent to which the following come to your mind:					
	Never	Almost never	Sometimes	Almost always	Always
• I do not know where to get tested for HIV					
• I don't have enough resources for that					
• I don't speak Dutch					
• I am not legally residing in the Netherlands					

	Strongly disagree	Disagree	Don't disagree/don't agree	Agree	Strongly agree
11. I plan to get tested for HIV next year					
12. People who have HIV are cursed.					
13. Most people who are important to me expect me to get tested for HIV next year					
14. A person with HIV must have done something wrong and deserves to be punished.					
15. I am confident that I can get tested for HIV next month					
16. I feel under social pressure of getting tested for HIV next year					
17. My getting tested for HIV will make me know if I am HIV positive/negative					
18. I do not want to be friends with someone who has HIV.					
19. Getting tested for HIV is entirely up to me					
20. People who have HIV are dirty.					
21. Most people who are important to me approve my getting tested for HIV next year					

22. It is safe for people who have HIV to work with children.					
23. I plan to get tested for HIV every year					
24. People with HIV must expect some restrictions on their freedom.					
25. People who have HIV should be isolated.					
26. People who have HIV should not be allowed to work?					
27. In the future, I will try to get tested for HIV every year					
28. The decision to get tested for HIV is beyond my control					
29. People who have HIV should be ashamed.					

	Very bad	Bad	Neither good nor bad	Good	Very good
30. My getting tested for HIV next year would be					
31. Knowing that I am HIV positive/negative is					
32. In general, how would you rate your health?					

	Very Difficult	Difficult	Neither difficult nor easy	Easy	Very easy
33. To get tested for HIV is					

	Very Worthless	worthless	Undecided	valuable	Very Valuable
34. My getting tested for HIV next year would be					

	Not religious at all	Not religious	undecided	A little religious	Very religious
35. To what extent do you consider yourself to be a religious person?					

	Very Harmful	A little harmful	Not harmful/not beneficial	A little beneficial	Beneficial
36. My getting tested for HIV next year would be					

37. How often did you get tested for HIV in the last five years

_____1/_____2/_____3/_____4/_____5

38. Are you HIV positive?

Yes _____ No _____ I don't know _____

Thank you for your cooperation. If you have any questions or comments, or if you would like to receive a copy of the results of this study, please feel free to contact me on damascene.habimana@wur.nl