The differences in sexual behaviour between MSM who grew up in urban and rural areas in the Netherlands

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Abstract

Background. Men who are having sex with men (MSM) are at higher risk for transmission and infection of sexually transmitted infections (STIs) compared to heterosexuals. Particular for MSM, Dutch regional public health services provide freely accessible and government funded information about sexual health and screening for STIs. Despite the facilities for sexual health, the number of STIs remains high among MSM, which may indicate that sexual risk behaviour is ongoing. Looking at previous studies, much is known about sexual behaviour of MSM, however, most of this information has been collected in very urbanised areas. As a result, limited information is available about sexual behaviour of rural MSM in the Netherlands. The aim of this study was to gain insight into the potential differences in sexual behaviour between MSM who grew up in urban and rural areas in the Netherlands. **Methods.** An online anonymous questionnaire was spread by LGBT organisations through the placement of targeted online advertisements. This questionnaire was partly based on the concepts of Theory of Planned Behaviour (TPB) to measure sexual behaviour and its determinants. In total, the data of 90 respondents was analysed. Descriptive statistics, correlations and multiple statistical tests (e.g. chi-square test and independent t-test) were used to determine the differences between MSM who grew up in urban and rural areas. Furthermore, regression analyses have been performed to examine the relationships between determinants, intention and sexual behaviour. **Results.** Condom use, vaccination behaviour, use of pre-exposure profylaxis (PrEP), test behaviour and intentions did not differ between MSM raised in urban or rural areas. Only a few MSM consistently used a condom for both oral and anal sex, 60 percent have been vaccinated against Hepatitis B virus, 19 percent uses PrEP and 46 percent of MSM at risk for STIs tested themselves in the last six months as recommended. Looking at the determinants of condom use and testing behaviour, it appears that rural MSM experience more STI-related stigma than urban MSM. Furthermore, this study shows that intentions are difficult to explain from TPB. Attitude, age and living area were related to intention to use condoms. Perceived behavioural control and stigma were related to previous testing behaviour. **Conclusion.** This study showed that there are no differences in intentions and sexual behaviours between MSM who grew up in urban or rural areas. Nevertheless, risk behaviour, such as inconsistent condom use, is still ongoing. Further research with sufficient sample sizes for both urban and rural living MSM is recommended to gain more insight in the relationship of stigma with multiple sexual behaviours and what role the living area of MSM plays in these sexual behaviours, in particular condom use.

Samenvatting

Achtergrond. Mannen die seks hebben met mannen (MSM) hebben in vergelijking tot heteroseksuelen, meer kans op een overdracht en een infectie van een seksueel overdraagbare infecties (SOA). De Nederlandse GGD'en bieden, in het bijzonder voor MSM, vrij toegankelijke en door de overheid gefinancierde informatie over seksuele gezondheid en het de mogelijkheid tot screenen op soa's. Ondanks de faciliteiten blijft het aantal soa's bij MSM hoog, wat kan duiden op seksueel risicogedrag. Kijkend naar voorgaande onderzoeken is er veel bekend over seksueel gedrag van MSM, echter is deze informatie voornamelijk verzameld in zeer verstedelijkte gebieden. Hierdoor is er beperkte informatie beschikbaar over seksueel gedrag van MSM woonachtig op het platteland in Nederland. Het doel van dit onderzoek was om inzicht te krijgen in de mogelijke verschillen in seksueel gedrag tussen MSM die zijn opgegroeid in stedelijk en plattelandsgebieden in Nederland. **Methode.** Een online anonieme vragenlijst werd verspreid door LHBT-organisaties door middel van het plaatsen van gerichte online advertenties. Deze vragenlijst was deels gebaseerd op de concepten van de Theorie van Gepland Gedrag om de determinanten van seksueel gedrag te kunnen meten. In totaal zijn de gegevens van 90 respondenten geanalyseerd. Bijschrijvende statistieken, correlaties en meerdere statistische toetsen (chi-kwadraattoets en onafhankelijke t-toets) werden gebruikt om de verschillen te bepalen tussen MSM die opgroeiden in stedelijke en plattelandsgebieden. Verder zijn regressieanalyses uitgevoerd om de relaties tussen determinanten, intentie en seksueel gedrag te onderzoeken. **Resultaten.** Condoomgebruik, vaccinatiegedrag, het gebruik van pre-expositie profylaxe (PrEP), testgedrag en gedragsintenties verschilden niet tussen MSM opgegroeid in stedelijk en plattelandsgebieden. De resultaten tonen aan dat maar weinig MSM consequent een condoom gebruiken bij zowel orale als anale seks. Zestig procent is ingeënt tegen het Hepatitis B virus, 19 procent gebruik maakt van PrEP en 46 procent van de MSM die risico lopen op soa's zichzelf, zoals aanbevolen, in de afgelopen zes maanden heeft getest. Kijkend naar de determinanten van condoomgebruik en testgedrag, blijkt dat MSM die opgegroeid zijn op het platteland meer soa-gerelateerd stigma ervaren in vergelijking met MSM in stedelijk gebied. Verder laat dit onderzoek zien dat intenties moeilijk te verklaren zijn vanuit de Theorie van Gepland Gedrag. Attitude, leeftijd en woonomgeving zijn gerelateerd aan de intentie om condooms te gebruiken. Waargenomen gedragscontrole en stigma zijn beide gerelateerd aan voormalig testgedrag. **Conclusie.** Deze studie laat zien dat er geen verschillen zijn in intenties en seksueel gedrag tussen MSM die zijn opgegroeid in stedelijk en plattelandsgebied. Toch is risicogedrag, zoals inconsistent condoomgebruik, nog steeds aan de gang. Verder onderzoek

met voldoende steekproefomvang voor zowel stedelijk als landelijk wonende MSM wordt aanbevolen, om meer inzicht te krijgen in de relatie van stigma met meerdere seksuele gedragingen en welke rol het leefgebied van MSM speelt bij dit seksueel gedrag, in het bijzonder condoomgebruik.

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Introduction

Men who are having sex with men (MSM), that are both homosexual and bisexual men, are at higher risk for transmission and infection of sexually transmitted infections (STIs) including human immunodeficiency virus (HIV) compared to heterosexuals. The majority of HIV infections in high income countries occur through sexual contact and are mostly among MSM (UNAIDS, 2019). An explanation is that they engage more frequently in anal intercourse which increases the risk for transmission due to the susceptibility of the intestinal mucosa (WHO, 2011). Despite that the number of HIV diagnoses in the Netherlands has decreased over the years due to an increase in the HIV testing uptake, 90 percent of the 249 new diagnoses were among MSM (RIVM1, 2018; Slurink et al., 2019). Besides the transmission of HIV, syphilis and gonorrhoea is highest among MSM (Slurink et al., 2019; van der Snoek, de Wit, Mulder & van der Meijden, 2005). More specifically, for syphilis, 96 percent of the 1224 cases that were diagnosed were among MSM. Additionally, gonorrhoea has been diagnosed in 7362 people of which 76 percent were among MSM (Slurink et al., 2019).

Dutch regional public health services (RPHSs) provide information about sexual health and screening for STIs (including HIV). This care is freely accessible and government funded for MSM. Next to the RPHSs, general practitioners (GP) provide primary care for STIs (Kampman et al., 2018). Despite the sexual health facilities, the amount of STIs among MSM remains high which may indicate that sexual risk behaviour is ongoing (Slurink, van Benthem, van Rooijen, Achterbergh & van Aar, 2020).

Today, much is known about the (risky) sexual behaviours of MSM, however the majority of international and national research is focused on very urbanised areas such as Amsterdam and Rotterdam (Basten et al., 2018; Xiridou, Wallinga, Dukers-Muijers & Coutinho, 2009; Giano et al., 2019). For example, a Dutch large scaled study shows that 69 percent of the respondents were living in urban areas (number of addresses per square km > 2500) and 18 percent in (semi) rural areas (number of addresses per square km < 1000). As a result, limited information is available about sexual behaviour of rural MSM in the Netherlands.

Sexual behaviour

Sexual behaviour can be divided into protective sexual behaviour and testing behaviour that can be classified as a secondary preventive behaviour. When the chance for getting a STI is increased, for example by sex without a condom, this can be seen as sexual risk behaviour.

Condom use

Consistent use of condoms is the most substantial protection that prevents both transmission and infection of STIs. Nevertheless, condoms are used inconsistently, making especially unprotected anal intercourse an important risk behaviour (Hess, Crepaz, Rose, Purcell & Paz-Bailey, 2017). In 2018, 59 percent of MSM reported both insertive and receptive anal intercourse of which 21 percent reported consistent condom use (RIVM2, 2019). These findings were comparable with Slurink et al. (2019) who indicated that 25 percent of MSM reported consistent anal condom use. Consistent condom use during oral sex, on the other hand, is very low by only one percent (Slurink et al., 2019; RIVM2, 2019). In general, MSM have a favourable intention towards the use of condoms (Franssens, Hospers & Kok, 2009). MSM with low intentions reported that the use of condoms creates distrust in their sexual partner and described condoms as an irritating disturbance. On the other hand, MSM with a higher intention described condom use as hygienic and that it creates a feeling of being safe (Franssens et al, 2009). Looking at the degree of urbanisation, an American study stated that condom use in the last year or with their most recent sex partner did not differ between MSM living in rural and urban areas (McKenney et al., 2018). This is in contrast to another study, where rural MSM used condoms less often (Kakietek, Sullivan, Heffelfinger, 2011). Notable is that this study concerned only MSM that met their partner online.

Next to condoms, MSM use other, mainly less effective strategies to manage their sexual risk and protect themselves and their partners from HIV transmission (Suominen, Heikkinen, Pakarinen, Sepponen & Kylmä, 2017). One of these sexual risk management approaches is serosorting. Approximately two third of HIV-negative and untested men have unprotected intercourse with HIV-negative men to reduce the risk of acquiring or transmitting HIV. However, the HIV status of the partner is often unknown due to a lack of explicit communication about the status or a lack of awareness of recent HIV infections. Another sexual risk management approach is strategic positioning whereby a different sexual position or practice is chosen dependent on the HIV status of their sexual partner. According to a systematic review of the World Health Organization (2011), serosorting among MSM was associated with an increase in HIV transmission of 79 percent and an increase in STI transmission of 61 percent compared to consistent protective anal intercourse. Nevertheless, compared to unprotected anal intercourse, serosorting was associated with a reduction in HIV transmission of 53 percent and a reduction in STI transmission of 14 percent (WHO, 2011).

Vaccinating behaviour

Another beneficial method for MSM to protect themselves against one STI in particular, is to vaccinate against Hepatitis B virus (HBV). This STI causes mainly cirrhosis and insufficiency of the liver, but also other health problems (Vet, de Wit & Das, 2010). Despite the fact that the incidence of HBV in the Netherlands is low, most cases are among MSM (Hahné, Veldhuijzen, Smits, Nagelkerke & van der Laar, 2008). Vaccination against HBV is offered without costs for risk groups including MSM (Vet et al., 2010). Despite the free offered vaccination, the HBV vaccination rate among MSM in the Netherlands is 59 percent. Additionally, 15 percent is incompletely vaccinated against HBV (den Daas et al., 2018). The intention of MSM to obtain a HBV vaccination is moderately positive. MSM with high intentions to obtain a vaccination, perceived vaccinating as an effective strategy to reduce their future risk of HBV infection. This influences the behaviour to obtain the vaccine positively compared to MSM who had less confident beliefs regarding the efficacy of vaccination (Das, de Wit, Vet & Frijns, 2008; Vet et al., 2010). However, de Wit, Vet, Schutten & Steenbergen (2005) found no association between intention and vaccinating. Apart from the higher incidence of HBV among Dutch MSM living in urban areas (van Houdt et al., 2009), to knowledge there is no data about the potential differences between vaccinating behaviour and intention based on urbanisation.

Using PrEP

Lastly, the use of pre-exposure profylaxis (PrEP) is an upcoming preventive behaviour among MSM. Pre-exposure profylaxis is a medicine that consists of HIV inhibitors that prevent the virus from entering the immune system. Pre-exposure profylaxis can be administered continuously or at times before and after sexual activities (Bil et al., 2015). In 2013, approximately 15 percent of Dutch HIV-negative MSM were familiar with PrEP, almost a half find administering PrEP beneficial and one in five would consider using it (Rutgers, 2015). However, according to van Dijk et al. (2020), 90 percent of MSM were familiar with PrEP and approximately 7 percent uses PrEP. This increase in awareness can be due to the dropping price of PrEP at RPHSs since mid-2019. Nevertheless, intention to administer PrEP is low (van Dijk et al., 2020; Hulstein et al., 2020). This can be reasoned by the fact that men do not want to administer medication on a daily basis, have concerns regarding the potential adverse effects of PrEP, do not want to change their strategy to protect themselves and perceive risk for HIV acquisition as low (van Dijk et al., 2020; Dubov, Gablo, Altice & Fraenkel, 2018). To date, limited research has been done considering PrEP as it is a relatively

new preventive measure. Furthermore, collected data was derived from urban populations. According to an American study, this may be because there are insufficient care institutions in rural areas that prescribe PrEP, which limits the accessibility to PrEP (Sarno, Bettin, Jozsa & Newcomb, 2020). In addition, primary care providers (e.g. GP) in rural areas indicate that they have insufficient knowledge and are therefore reluctant to prescribe this (Owens et al., 2020). Nevertheless, this finding cannot be generalised fully to the Netherlands due to the fact that rural areas in the United States are more distant from urban areas compared to the Netherlands.

Testing behaviour

Next to protective sexual behaviour, MSM can test themselves for STIs as a secondary prevention. The percentages for STI testing vary. The percentage of MSM that tests twice a year as advised for MSM is relatively low (Visser, Heijne, Hogewoning & van Aar, 2017; Vriend et al., 2015). The testing uptake for STIs in Dutch outpatient clinics was 19 percent (Visser et al., 2017). However, according to a study in the eastern part of the Netherlands, 41 percent got tested every six months. Though a limitation is that their testing behaviour may differ compared to other parts of the Netherlands due to the semi-rural environment (Kampman et al., 2018). With regard to the degree of urbanisation in which one is living, there is relatively little difference in testing behaviour. According to a Dutch study from den Daas et al. (2018), 55 percent of MSM living in very urbanised areas get themselves tested for HIV, this percentage is slightly lower for MSM living in rural areas. According to data derived from a study conducted in the United States, rural MSM were less likely to get tested for STIs (McKenney et al., 2018).

The importance of protective sexual behaviour

When MSM engage in protective sexual behaviours, STIs are prevented or detected earlier. This has positive outcomes for both public and individual health. With early detection of HIV, treatment can be started as quickly as possible causing that the life expectancy of HIV positive population in the Netherlands remains the same compared to HIV negative population (RIVM1, 2018). In addition, the chance of transmission is reduced by approximately 97 percent through early detection of HIV. On the other hand, there is still a population that is unknown of their infection with HIV causing that the HIV epidemic stays maintained (Joore et al., 2017). Therefore, it is, in addition to the possible differences in sexual behaviour of urban and rural MSM, important to better understand the determinants for

intention and behaviour. In particular for condom use and testing behaviour as these make the greatest contribution to sexual health.

Theory of Planned Behaviour

Theory of Planned Behaviour is a useful model for predicting and understanding determinants of intention and behaviour (see figure 1 for a schematic representation) (Ajzen, 1991). This psychological theory states that behaviour is best predicted by behavioural intentions that are formed based on attitudes, subjective norms and perceived behaviour control.

Attitudes towards behaviour result from beliefs a person has about the consequences of particular behaviour and that can either be favourable or unfavourable. *Subjective norm* refers to the perception of approval or disapproval from significant others regarding to particular behaviour. This perception is based on an individual's motivation to meet the expectations others have on a particular behaviour. *Perceived behavioural control* refers to the individual's perception of his/her ability to perform a behaviour and is a mixture of Bandura's self-efficacy and controllability. Self-efficacy is referred to the level of perceived difficulty to perform the behaviour, or one's belief in their own ability to succeed in performing the behaviour. On the other hand, controllability refers to external factors, one's belief that they personally have control over the performance of the behaviour or that it is controlled externally. This means that perceived behavioural control can also influence behaviour directly. Generally, the intention to perform behaviour will be stronger with a more favourable attitude and subjective norm towards behaviour in combination with greater perceived behavioural control (Ajzen, 1991).

Next to the determinants that predict intention, Theory of Planned Behaviour also assumes that other more distant variables, such as demographics, knowledge, acceptation and stigmatisation may influence intention and behaviour through these three determinants (Ajzen, 1991).

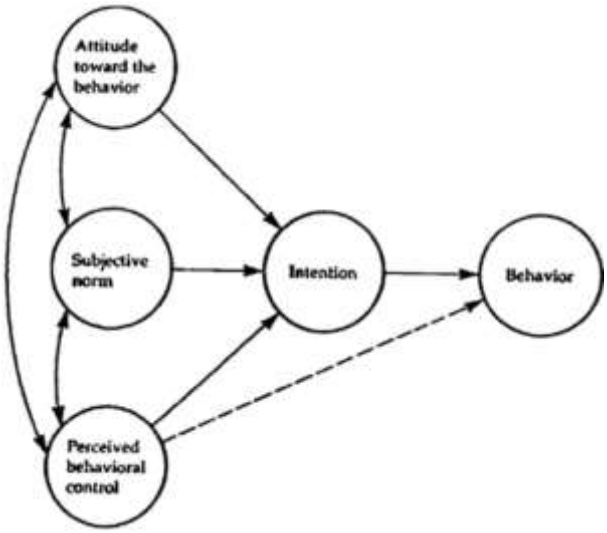

Figure 1. Schematic representation of the Theory of Planned Behaviour (Ajzen, 1991)

Determinants of condom use

Theory of Planned Behaviour was applied in multiple studies concerning condom use and is the most useful model as framework for a study that predicts or increases the understanding of condom use (Andrew et al., 2016; Espada, Morales, Guillén-Riquelme, Ballaster, Orgilés, 2015; Montanaro & Bryan, 2014; Chambers et al., 2018; Teng & Mak, 2011). Attitude and perceived behavioural control were predictors for intention to use condoms (Franssens et al., 2009). A systematic review concluded that Theory of Planned Behaviour explained 24 percent of the variance in intention to use condoms and 12 percent of the variance in behaviour (Andrew et al., 2016). Another study that is focused on condom use of students in South Africa indicate that attitude correlates strongest with and predicts condom use. Attitude and subjective norms predicted condom use via intention and perceived behavioural control predicted condom use directly (Protogerou, Flisher, Wild, Aarø, 2013).

Despite the fact that someone can have a preferable intention toward the use of condoms, behaviour (the actual use of condoms) can be directly influenced by alcohol and drugs use before or during sex. This is because both substances affect the decision-making process whereby an individual may not successfully perform protective sexual behaviours such as using condoms. Furthermore, MSM may engage in sexual risk behaviours as having sex with multiple partners or group sex (Weatherburn, Hickson, Reid, Torress-Rueda & Bourne, 2017; Heiligberg et al., 2012; Giorgetti et al., 2017). Chemsex (using harddrugs during sex) among MSM has increased over the years with a reported prevalence of approximately 18 to 29 percent in the Netherlands. Under the influence of drugs, men are able to prolong their sexual activity which enlarges the possibility of transmission STIs due to an

increased risk of tearing a condom and damaging rectal tissue (Baas, Bakker & Knoops, n.d.). According to the Theory of Planned Behaviour, this phenomenon is a discrepancy or 'intention-behaviour gap' between intention and behaviour. In other words, this gap can be explained by the fact that intention leads to behaviour only if the person can decide at will to perform the particular behaviour (Ajzen, 1991).

Determinants of testing behaviour

Compared to condom use, the model that can be best applied for explaining testing behaviour is varying given by multiple studies. According to Adam et al. (2014), testing behaviour was associated with attitude and subjective norm. Perceived behavioural control, on the other hand, was associated with HIV testing in particular. This study suggests that there is an association, however this study did not investigate if these determinants are predictive for testing behaviour. Concerning perceived behavioural control, multiple studies involving problems in accessibility of healthcare are focused on the United States and indicate that the accessibility to medical professionals in rural areas is less compared to urban areas (Giano et al., 2019; Schafer et al., 2017). In the Netherlands, perceived difficulties in accessibility of sexual healthcare is reported by older MSM as a barrier to test seeking behaviour (SOA AIDS Nederland, 2019). Furthermore, the RPHSs in the Netherlands are located in urban areas which may lead to problems in accessibility for MSM living in rural areas. This hypothesis is based on data that has been collected in practice among MSM and has not been scientifically studied.

Next to the concepts of Theory of Planned Behaviour, other determinants may predict testing behaviour. According to multiple studies, stigma towards STIs is an important barrier for testing, meaning that a higher amount of stigmatisation towards STIs minimized the likelihood to test (Cunningham, Kerrigan, Jennings & Ellen, 2009; Fortenberry et al., 2002). Cunningham et al. (2009) defined stigma as: "An interpersonal process in which a person is set apart from others and linked to a negative evaluation due to their real or imagined possession of a particular trait.". Stigma can be divided into perceived stigma and self-stigma or shame. Perceived stigma refers to what individuals think of what other people would think of themselves and can be defined as the individual belief about the attitude of others. Self-stigma on the other hand, refers to individuals' negative attitudes about themselves as a result of internalising stigmatising ideas held by society (Cunningham et al., 2009). Looking at the degree of urbanisation in which men are living, McKenney et al. (2018) and Preston, D'augelli, Kassab & Starks (2007) indicate that communities in rural areas in the United

States are less tolerant towards gay and bisexual persons. This study indicated that MSM living in rural areas perceived more stigma compared to urban MSM. Shame towards STIs, on the other hand, was not associated with testing behaviour (Cunningham et al., 2009). Nevertheless, another study stated that shame may be an important factor in condom use (Sales et al., 2007). This indicates that stigmatisation may be an important barrier for multiple sexual behaviours.

Current study

Summed up, the cited studies provide theoretical insights in protective sexual behaviours, risk factors related to condom use and testing behaviour of MSM. As pointed out previously, these findings are mainly based on very urbanised areas, which causes a lack in literature regarding sexual behaviour of MSM living in rural areas.

The current study will be the first study that aimed to get insight into the potential differences in sexual behaviour between MSM who grew up[1] in urban or rural areas in the Netherlands. Theory of Planned Behaviour was applied to gain more insight into the social-cognitive determinants of using condoms and getting tested on STIs. Thus, this broad explanatory study has the following research questions:

1) To what extent is there a difference in protective sexual behaviour between MSM who grew up in urban and rural areas.

2) To what extent is there a difference in testing behaviour between MSM who grew up in urban and rural areas.

3) To what extent is there a difference in social cognitive determinants of using condoms and getting tested on sexually transmitted infections between MSM who grew up in urban and rural areas.

4) Which determinants are related to (intention to) use condoms and to get tested for sexually transmitted infections, and to the actual use of condoms and actual test behaviour.

[1] The focus of this study has changed during the collection of data. A detailed explanation is given in the method and discussion section.

Method

Participants and procedure

The target population, that are MSM, may be difficult to reach due to the perceived stigma (Wright, 2005). Additionally, sexuality is a sensitive topic to talk about. For these reasons and to guarantee the privacy of the respondents, an anonymous online questionnaire was used for this study. Moreover, this method preserves the autonomy of the respondents (Toepoel, 2016). The study has received ethical approval from the Ethics Committee of the University of Twente. After this approval, MSM living in the Netherlands with a minimum age of 16 years old were approached for participation in this study. This means that eligible participants were self-selected men, who are sexually attracted to men and with a minimum age of 16 years old. Another inclusion criterion was that the participants had to understand the Dutch language because the questionnaire was presented in Dutch.

Initially, the recruitment would go through placing targeted online advertisements by regional LGBT organisations in the Netherlands, LGBT meeting places and dating applications special for MSM (e.g. Grindr and PlanetRomeo). Partly due to COVID-19, not all channels could be used as predicted in advance (e.g. closed meeting places for MSM due to the Dutch measures). In addition, it was not possible to advertise on Grindr for an unknown time. As a result, other channels had to be used to draw attention to this research. Furthermore, the focus of this research was adjusted during the collection of data for the reason that the group of respondents living in rural areas was very small. In addition, the difficulties in recruiting respondents for this study has been decisive in changing the focus of this research. Beforehand, the focus was on the potential differences in sexual behaviour between urban and rural living MSM. In order to stay close to the original aim of this study, it was decided to compare the sexual behaviour of men who grew up in urban or rural areas, as these groups were equally divided.

The final recruitment went through the placement of targeted online advertisements by regional LGBT organisations in the Netherlands. Furthermore, the research was brought to attention by RPHS located in the Dutch region Twente through their website and flyers. In addition, participants were recruited through Facebook and LinkedIn. A link was embedded into the advertisements which forwarded participants to the online survey tool Qualtrics XM. Before starting the questionnaire and therefore participating in this study, the participants had to agree with an active online informed consent. The data was collected between April and June 2020.

A total of 132 participants completed the questionnaire of which 19 were excluded following the inclusion criteria. Furthermore, 23 participants were excluded for further analysis because they only completed the first questions of the questionnaire. The final sample consisted of 90 participants. An overview of the characteristics of the participants is displayed in the results (see Table 2).

Questionnaire

The online questionnaire consisted of a wide range of sexuality related themes. Various existing questionnaires from previous research have been used and complemented by questions based on literature to form the final questionnaire. The questionnaire was translated from English to Dutch and personalised for every individual participant by using follow-up questions based on their response. The questionnaire can be found in Appendix A.

Demographics and sexuality. The first part of the questionnaire consisted of the participants' demographics which included the participants' four numbers of the postcode, age, gender and educational level. In addition, the participants were asked if they were born in the Netherlands and whether they have lived primarily in an urban area or a rural area until the age of 20 years. Added to the first part of the questionnaire, the participants' sexual preferences were asked to exclude non-eligible participants. These questions were partly retrieved from the survey of Soa Aids (den Daas et al., 2018).

Knowledge. In the second part of the questionnaire, the participants' knowledge about STIs and HBV in particular, was examined by 12 items (e.g. "Hepatitis B can be transmitted during unprotected sex"). Response options were agree, disagree and I do not know. During the analyses of these data, the percentage of respondents who answered the question correctly was examined for each question (see Table 14 for the items). The majority of the questions about knowledge were retrieved from Kampman, Hautvast, Koedijk, Bijen & Hoebe (2020). Questions about vaccinating were based on literature (de Wit et al., 2005). The source of information about sexual themes was measured using 6 items where participants had to fill in from who they received their information. The response options were friends, parents, Internet, RPHSs, GP, school and others. Multiple response options were possible.

Protective sexual behaviour: condom use. In the third part of the questionnaire, behaviour was determined by asking the participants whether they used condoms for both oral and anal sex dependent on their type of relationship (steady relationship, casual partners or both steady and casual partners). This was measured on two identical scales with 4 items (response options: 1=never, 2=not always, 3=always, 4=not applicable). These items were

retrieved from a survey of RPHS Twente that is not published yet (Kampman, 2020). Behaviour was coded as preventive when a condom was used at all times, and as risky when at least one episode of unprotected oral or anal sex was reported. The option 'not applicable' was added for the participants who may not involve in one of these sexual practices. Behavioural intention was measured on a 5-point Likert scale, ranging from 1 (totally disagree) to 5 (totally agree) which was partly derived from Boer & Mashamba (2006) and Franssens et al. (2009).

The social cognitive determinants of condom use were measured with a 5-point Likert scale 1 (totally disagree) to 5 (totally agree). The question number, number of items, range and alpha of the constructs for condom use are given in Table 1. Attitudinal beliefs towards condom use were measured using 6 items, of which 5 were derived from Franssens et al. (2009) (alpha=.72) and item 3 was derived from Boer & Mashamba (2006) (alpha=.90). An example question is "Using condoms will reduce my sexual pleasure.". Three negatively formulated items were re-coded so that a higher score indicates a more positive attitude towards using condoms. Subjective norms towards condom use were measured by 5 items (Boer & Mashamba, 2006, alpha=.71). An example question is: "I think that my sexpartner thinks that I should use condoms.". Items 3, 4 and 5 were phrased negatively and were re-coded. Perceived behavioural control was measured by 6 items (Boer & Mashamba, 2006, alpha=.64) which were all phrased positively (e.g. "I am able to talk about condom use with my sexpartner".).

Risk factors: substance use. The fourth part of the questionnaire examined the drug and alcohol use of MSM by filling in if they ever used drugs or alcohol before or during sex followed up by four statements about sex under the influence of drugs or alcohol (response options: agree or disagree). The items were scored separately. An example statement is "I am more likely to have sex without a condom when using drugs.". These questions were retrieved from the same survey from RPHS Twente that has not been published yet (Kampman, 2020).

Testing behaviour. In the fifth part of the questionnaire, the participants were asked what they do to minimize the risk of getting a STI. Furthermore, their intention to test for STIs was measured on a 5-point Likert scale, ranging from 1 (totally disagree) to 5 (totally agree), which was derived from Kampman et al. (2020). Thereafter, the participants were asked when they were last tested. The follow-up questions depended on the participants response, with a total of three questions (e.g. "What was the most important reason for your last STI test?"). These questions were also retrieved from Kampman et al. (2020).

The social cognitive determinants of testing were measured with a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree) and derived from literature instead of previous scales (den Daas et al., 2018; Mirandola et al., 2017; Deblonde et al., 2010). The question number, number of items, range and alpha of the constructs for testing behaviour are given in Table 1. Attitudinal beliefs towards testing were measured using four items. An example question is "Testing on STIs can prevent the transmission of STIs.". Item 3 and 4 were deleted to increase Cronbach's alpha from .19 to .65. Subjective norm was measured by two items (e.g. "I think that my sexpartner thinks that I should get tested for STIs."). Perceived behavioural control was measured by four items (e.g. "I am confident enough to make an appointment for a STI test.").

Lastly, STI related stigmatisation and shame were measured by 10 items (e.g. When you have an STI, people would be uncomfortable around you."). These items were derived from Cunningham et al. (2009). Both stigma and shame were rated on a 4-point scale 1 (strongly disagree) 4 (strongly agree) with 6 items to measure stigma (alpha=.92) and 4 items to measure shame (alpha=.89).

Protective sexual behaviour: vaccinating. Three literature-based questions were examined regarding HBV vaccination (den Daas et al., 2018; De Wit et al., 2005). First, the behaviour of vaccinating against HBV was measured, using the question "Are you vaccinated against Hepatitis B?". Based on the response given by the participant (response options: not vaccinated or I do not know), they had to response if they intend to vaccinate against Hepatitis B in the next 6 months and the reason why they have not vaccinated before. When answering 'yes', the participant skipped to the next part in the questionnaire.

Protective sexual behaviour: PrEP. Finally, six questions were asked regarding PrEP. These questions were based on literature (Slurink, van Benthem, van Rooijen, Achterbergh & van Aar, 2020; Hess, 2017). First, the participants were asked whether they are familiar with PrEP. Based on the response given by the participant (response option: not familiar), the participant skipped to the end of the questionnaire. When answering 'familiar with PrEP', the participant had to indicate if they are using PrEP at the moment. If the participant is using PrEP at the moment, they were asked how they received it. Furthermore, they were asked to give their opinion (response options: agree or disagree) about the following statement: "I am more likely to have unprotected anal sex when using PrEP.". If the participant was not using PrEP, they were asked why they are not using it and if they intend to use it in the next 6 months.

Table 1
Scales and their reliabilities

Scale	Question number	Items	Range	α
Condom use				
Intention	12	1	1-5	
Attitude	13	6	1-5	.71
Subjective norm	14	5	1-5	.74
Perceived behavioural control	15	6	1-5	.63
Testing behaviour				
Intention	23	1	1-5	
Attitude [a]	28	2	1-5	.65
Subjective norm	29	2	1-5	.86
Perceived behavioural control	30	4	1-5	.92
Stigma	31	6	1-4	.84
Shame	32	4	1-4	.90

Note. [a] this number is referred to the questionnaire, [b] two items are deleted.

Data analysis

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software version 24. Before analysing, the data was inspected for missing values. Two respondents did not completely fill in the questionnaire, they completed up to STI testing. However due to the limited number of respondents, these data were included in analyses.

First of all, a new variable was created in which the postcodes were classified according to the degree of urbanity. By means of address density, the living area was divided into urban (number of addresses per square km > 1000) and rural areas (number of addresses per square km < 1000) (CBS, 2020).

The descriptive analyses for the demographics were conducted using means, standard deviations and frequencies. Before other descriptive analyses were conducted, negatively phrased items had to be recoded.

To test the differences between MSM that grew up in urban or rural areas, chi-square tests or independent samples t-tests were applied. For the reason that not all assumptions were met for an independent sample t-test, bootstrapping was used in some cases.

Spearman's Rho and Point-Biserial correlation analyses were applied to gain insight into the relationship between variables of both condom use and testing behaviour.

Furthermore, both hierarchical regression and hierarchical logistic regression analyses were performed to analyse the multivariate relations of the determinants with condom use and testing behaviour.

Results

Sample characteristics

Table 2

Demographics of the respondents according to the degree of urbanisation in which they grew up

	Total (*n*=90)		Urban (*n*=43)		Rural (*n*=47)		
Characteristics	*n*	%	*n*	%	*n*	%	p [d]
Age							.31
16-25	13	14.4	8	18.6	5	10.6	
26-35	28	31.1	9	20.9	19	40.4	
36-45	17	18.9	8	18.6	9	19.1	
46-65	29	32.2	16	37.2	13	27.7	
> 65	3	3.3	2	4.7	1	2.1	
Educational level							.46
Pre-secondary education [a]	11	12.2	7	16.3	4	8.5	
Secondary education [b]	26	28.9	13	30.2	17	27.2	
Higher education [c]	53	58.9	23	53.5	30	63.8	
Living area based on urbanity							.00***
Urban area	74	82.2	42	97.4	32	68.1	
Rural area	16	17.8	1	2.3	15	31.9	
Gender sexpartners							.69
Males	76	84.4	37	86.0	39	83.0	
Both males and females	14	15.6	6	14.0	8	17.0	
Relationship status							.43
Steady	24	26.7	13	30.2	11	23.4	
Casual	42	46.7	17	39.5	25	53.2	
Both steady and casual	24	26.7	13	14.4	11	12.2	

Note. [a] Dutch educational system: VMBO, MAVO, HAVO, VWO, Gymnasium, [b] Dutch educational system: MBO, [c] Dutch educational system: HBO, WO and post academic, [d] chi-square test for differences between MSM who grew up in urban and rural areas, p***<.001 (2-tailed).

Table 2 presents the demographic characteristics of the sample, divided for MSM who grew up in urban and rural areas in the Netherlands. Currently, 82 percent of the respondents are living in urban areas, whereas 18 percent are living in rural areas. There is a significant difference (p<.001) based on the degree of urbanisation in which one grew up. Almost all respondents who grew up in urban areas still live in urban areas (97%), while many respondents who grew up in rural areas currently live in urban areas (68%). Most respondents are aged between 26-35 and 46-65 years old. It is noteworthy that 4 percent of rural MSM are aged between 26-35 years old in contrast to 21 percent of urban MSM. Nevertheless, this difference is not significant. Concerning the educational status, about a half of the respondents completed higher education (comprises HBO, WO and post academic). Additionally, 29 percent of the respondents completed secondary education. Another crucial characteristic to note is the type of sexual relationship, considering it can determine the intention to perform certain behaviour. Besides, MSM with casual partners are more at risk for complications in

their sexual health. In total, 27 percent of the respondents are in a steady relationship, which is equal to respondents who are in a sexual relationship with both a steady and casual partner(s). Almost half (47%) of the respondents have sex with casual partner(s). Respondents who grew up in a rural area indicated more often that they have a casual sexual relationship in contrast to respondents who grew up in urban areas. However, there are no significant differences in the type of relationship based on the degree of urbanisation in which MSM grew up. The minority of the respondents have sex with both males and females (16%) in contrast to the majority of the respondents who are only having sex with other men (84%).

Sexual behaviour

Condom use

An overview of the descriptive statistics of condom use per type of sexual relationship can be found in Table 3. Considering the risk group, MSM who have sex with casual partners or with both casual partner(s) and a steady partner, about half reported using a condom while having anal intercourse. Only a few reported the use of condoms during oral sex. Based on the results, there are hardly any differences in condom use between insertive and receptive anal intercourse, idem for oral sex. Regarding the use of condoms during anal intercourse, there is clearly a difference between MSM with a steady partner and MSM at risk for STIs. Fifty percent of MSM at risk reported that they will use a condom during anal intercourse. On the other hand, MSM with a steady partner generally do not use a condom during anal intercourse. Looking at the degree of urbanisation in which men grew up, intention to use condoms and the actual use did not significantly differ for the at-risk group.

In Table 3, the frequencies, mean scores, and standard deviations for intention and condom use of the at-risk group are presented. Mean intention to use condoms is slightly negative. However, the standard deviations are quite large which indicates that the respondents' intentions to use a condom vary.

Table 3

Frequencies of condom use during oral or anal sex, per type of relationship status

	Total						Urban						Rural						
	Steady			Risk group [a]			Steady			Risk group [a]			Steady			Risk group [a]			
Variables *n*(rural,urban)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	p
Oral condom use																			.91 [b]
Receiving oral (41,46)																			
With condom	0	0		3	4.8		0	0		2	7.1		0	0		1	2.9		
Without condom	24	100		60	95.2		13	100		26	92.9		11	100		34	97.1		
Giving oral (42,46)																			
With condom	1	4.2		2	3.1		0	0		1	3.4		1	9.1		1	2.9		
Without condom	23	95.8		62	96.9		13	100		28	96.6		10	90.9		34	97.1		
Anal condom use																			.77 [b]
Receptive anal (39,39)																			
With condom	4	20		28	48.3		4	33.3		13	48.1		0	0		15	48.4		
Without condom	16	80		30	51.7		8	66.7		14	51.9		8	100		16	51.6		
Insertive anal (37,44)																			
With condom	4	17.4		29	50		4	33.3		12	48		0	0		17	51.5		
Without condom	19	82.6		29	50		8	66.7		13	52		11	100		16	48.5		
Intention to use condoms [d]			2.29 (1.33)			2.58 (1.15)			2.46 (1.27)			2.37 (1.10)			2.09 (1.45)			2.75 (1.18)	.18 [c]
(totally) disagree				37	56.1					20	66.7					17	47.2		
neutral				13	19.7					4	13.3					9	25.0		
(totally) agree				16	24.2					6	20.0					10	27.8		

Note. [a] risk group consisting of both steady partner and casual partners and casual partners, [b] chi-square test within the risk group (n=66) for differences in condom use between MSM who grew up in urban and rural areas, [c] bootstrapped independent t-test within the risk group (n=66) for differences in intention to use condoms between MSM who grew up in urban and rural areas, [d] scale ranged from 1 (totally disagree) to 5 (totally agree).

Risk factors related to condom use

Table 4 presents the frequencies of MSM who ever engaged in risky behaviours. Approximately 51 percent reported that they ever used drugs before or during sex. The amount of MSM that ever used alcohol before or during sex is slightly higher by 73 percent. Other risk factors that may influence condom use are serosorting and strategic positioning. According to the results, only a few participate in this behaviour to protect themselves for a HIV infection. In total, 17 percent of MSM uses serosorting to reduce the chance of an infection. The number of MSM choosing another sex position or practice depending on the HIV status of their sex partner is even lower by only 2 percent. Nevertheless, these data do not reflect whether this behaviour is in combination with the use of condoms. Based on whether MSM grew up in an urban or rural area, no significant differences were found in all risky behaviours.

Table 4

Frequencies of MSM who participate in risky behaviours based on the degree of urbanisation in which they grew up

	Total		Urban		Rural		
Variables *n*(urban,rural)	*n*	%	*n*	%	*n*	%	p [a]
Risk factors							
Drugs use (43,47)	46	51.1	22	51.2	24	51.1	.99
Alcohol use (43,47)	66	73.3	30	69.8	36	76.6	.46
Serosorting (42,45)	15	17.2	8	19.0	7	15.6	
Strategic positioning (42,45)	2	2.3	1	2.4	1	2.2	

Note. [a] chi-square tests for differences between MSM who grew up in urban and rural areas.

Vaccinating behaviour

An overview of the descriptive statistics for vaccinating against HBV can be found in Table 5. Sixty percent of MSM is protected against HBV, indicating that they have had three vaccinations. Eighteen respondents did not get a vaccination. These respondents were asked whether they want to be vaccinated within six months. Of these, 47 percent point out that they do not want to be vaccinated. Vaccinating behaviour did not differ between MSM who grew up in urban and rural areas. The percentage of fully protected MSM was almost equal with 57 percent of urban MSM and 63 percent of rural MSM.

Using PrEP

An overview of the descriptive statistics for PrEP can be found in Table 5. Almost all respondents indicated that they are familiar with PrEP. Nevertheless, only 19 percent uses

PrEP of which 15 percent among urban MSM and 22 percent among rural MSM. Sixty one percent of the respondents indicate a low intention to use this in the future. The cited reasons for not using PrEP and other descriptive statistics can be found in Appendix B. Both intention and the use of PrEP did not differ between MSM who grew up in urban and rural areas.

Table 5
Descriptive statistics of protective sexual behaviour according to the degree of urbanisation in which MSM grew up

	Total			Urban			Rural			
Variables *n*(urban,rural)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	p
Vaccinated (42,46)										.57 [b]
Protected	53	60.2		24	57.1		29	63.0		
Incompletely vaccinated [a]	17	19.3		9	21.4		8	17.4		
Not vaccinated	12	13.6		6	14.3		6	13.0		
Unknown	6	6.8		3	7.1		3	6.5		
Intention to vaccinate (8,9)										
(totally) disagree	8	47.1		4	50.0		4	44.4		
neutral	6	35.3		4	50.0		2	22.2		
(totally) agree	3	17.6		0	0.0		3	33.3		
Using PrEP (41,45)	16	18.6		6	14.6		10	22.2		.37 [b]
Intention to use PrEP			1.55			1.68			1.43	.18 [c]
(34,35)			(.76)			(.84)			(.66)	
(totally) disagree	42	60.9		19	55.9		23	65.7		
neutral	16	23.2		7	20.6		9	25.7		
(totally) agree	11	15.9		8	23.5		3	8.6		

Note. [a] 1-2 vaccinations, [b] chi-square test for differences between men who grew up in urban and rural areas, [c] bootstrapped independent t-test for differences between men who grew up in urban and rural areas.

Testing behaviour

An overview of the descriptive statistics for STI testing can be found in Table 6. Considering MSM at risk, 85 percent indicated to have tested themselves on STIs, of which 46 percent tested themselves in the past six months. These percentages were equal for MSM with a steady partner. The intention to get tested for STIs among MSM at risk is positive. Despite this rather positive intention, the participants' intentions to get tested for STIs vary based on the high standard deviations. Compared to MSM at risk, MSM with a steady partner are less likely to get tested within 6 months due to the rather negative intention.

No significant differences have been observed in both intention to and testing for STIs between urban and rural MSM.

Table 6

Descriptive statistics for testing for sexually transmitted infections according to the degree of urbanisation in which MSM grew up and type of relationship status

	Total						Urban						Rural						
	Steady (*n* = 23)			Risk group [a] (*n* = 65)			Steady (*n* = 12)			Risk group [a] (*n* = 30)			Steady (*n* = 11)			Risk group [a] (*n* = 35)			
	n	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	*n*	%	M (SD)	p
Variables																			
Testing																			.79 [b]
< 6 months	7	30.4		30	46.2		2	16.7		15	49.9		5	45.5		15	42.8		
> 6 months	12	43.5		25	38.4		8	66.7		10	33.4		4	36.4		15	42.8		
Never	4	17.4		10	15.4		2	16.7		5	16.7		2	18.2		5	14.4		
Intention to test [d]			2.61 (1.41)			3.92 (1.25)			2.83 (1.53)			3.77 (1.22)			2.36 (1.29)			4.06 (1.28)	.36 [c]
(totally) disagree	13	56.5		12	18.5		6	50.0		6	20.0		7	63.6		6	17.1		
neutral	3	13.0		5	7.7		1	8.3		2	6.7		2	18.2		3	8.6		
(totally) agree	7	30.4		48	73.8		5	41.7		22	73.3		2	18.2		26	74.3		

Note. [a] risk group consisting of both steady partner and casual partners and casual partners, [b] chi-square test for differences between men who grew up in urban and rural areas, [c] bootstrapped independent t-test for differences between men who grew up in urban and rural areas, [d] scale ranged from 1 (totally disagree) to 5 (totally agree).

Determinants of condom use and testing behaviour

Mean scores and standard deviations of determinants for both condom use and testing behaviour can be found in Table 7. Additionally, significant differences according to the degree of urbanisation in which MSM grew up are displayed. The results are based on the group at risk.

Determinants of condom use

Attitude towards condom use of MSM who grew up in urban areas did not significantly differ from MSM who grew up in rural areas. The mean attitude of urban men indicates a slightly positive attitude towards using condoms which is comparable to the attitude of rural men. Likewise, the difference in perception of approval and disapproval from others towards condom use between men who grew up in urban or in rural areas is non-significant. Both urban and rural MSM feel some pressure or expectations from others to use condoms. Also, there is no significant difference in perceived behavioural control between MSM who grew up in urban or rural areas.

Determinants of testing behaviour

Attitude towards STI testing of MSM who grew up in urban areas is not significantly different from MSM who grew up in rural areas. The mean attitude of urban men is comparable with rural men and indicates a preferable attitude towards testing for STIs. Also, the difference in subjective norm between MSM who grew up in urban and in rural areas is non-significant. Both urban and rural men indicate that they feel some pressure from others to get tested for a STI. Correspondingly to the other two determinants, there is no significant difference in perceived behavioural control between MSM who grew up in urban and rural areas. The level of perceived behavioural control to perform the behaviour for both urban and rural men is relatively high.

Other, more distant variables, stigmatisation and shame may influence intention and behaviour through the previous three determinants. The perceived stigmatisation by MSM who grew up in urban areas ($M=3.07$, $SD=0.57$) is significantly different from MSM who grew up in rural areas ($M=2.79$, $SD=0.45$, $p< 0.05$). This signifies that MSM raised in urban areas experience more stigmatisation compared to rural MSM. Furthermore, shame did not significantly differ which indicates that both urban and rural MSM are little to a bit ashamed of having a STI.

Table 7

Differences in condom use and test behaviour of MSM in the risk group according to the degree of urbanisation in which they grew up

	Total (n = 65)		Urban (n = 30)		Rural (n = 35)		
Variables	Mean	(SD)	Mean	(SD)	Mean	(SD)	p [a]
Condom use							
Attitude	3.40	(.60)	3.45	(.53)	3.38	(.67)	.63
Subjective norm	3.77	(.65)	3.75	(.61)	3.81	(.61)	.72
Perceived behavioural control	4.03	(.49)	4.03	(.47)	4.05	(.49)	.84
Testing sexually transmitted infections							
Attitude	4.22	(.73)	4.10	(.89)	4.33	(.56)	.21
Subjective norm	3.28	(.91)	3.15	(.91)	3.40	(.91)	.27
Perceived behavioural control	4.15	(.83)	4.07	(.92)	4.21	(.75)	.48
Stigma	2.11	(.52)	1.96	(.58)	2.24	(.43)	.03*
Shame	2.99	(.83)	2.81	(.88)	3.14	(.77)	.11

Note. All scales ranged from 1 (totally disagree) to 5 (totally agree) except stigma and shame who range from 1 (totally disagree) to 4 (totally agree), [a] bootstrapped independent t-test, * p<.05 (2-tailed).

Correlation analysis

The correlations between both condom use and testing behaviour, the constructs of the Theory of Planned Behaviour, other determinants and demographics are conducted separately.

To see what variables were related to each other, a correlation matrix of anal condom use is given in Table 8. Of the determinants, only attitude correlated significantly moderately positive with condom use (r=.45, p< .01) and low with intention to use condoms (r=.27, p< .05). Intention to use condoms correlated moderately positive to the actual behaviour. Furthermore, none of the demographics was significantly correlated with intention to use a condom or the actual behaviour. The same applies to the degree of urbanism where MSM grew up, this did not significantly correlate with intention to use condoms and the determinants.

Table 8

Spearman's rho correlation between anal condom use, determinants, and demographics (n=66)

	Variables	1 [a]	2	3	4	5
1	Condom use [a]	-				
2	Intention	.34**	-			
3	Attitude	.45**	.27*	-		
4	Subjective norm	.19	.12	.45**	-	
5	Perceived behavioural control	.21	.07	.09	.27*	-
	Age	.07	-.05	-.26*	-.35**	.03
	Educational level	.08	.15	.27*	.05	.09
	Living area [a]	.19	.18	-.15	-.13	-.18
	Urbanism [a b]	.04	.17	-.07	.03	-.01

Note. [a] point-biserial correlation, [b] the degree of urbanism in which someone grew up, *p<.05, **p<.01 (2-tailed).

To see what variables were related to each other, a correlation matrix of STI testing is given in Table 9. Testing for STIs correlated moderately positive with perceived behavioural control (r=.36, p<.01) and negatively low with stigma (r=-.26, p<.05). Given this correlation, MSM would be likely to get tested when they feel more capable of doing so. Idem for stigma, assuming that experiencing higher levels of stigmatisation has a negative relation with testing behaviour. None of the demographic variables correlated significantly with testing for STIs. Intention to get tested correlated moderately positive with testing behaviour. Furthermore, intention to test for STIs correlated both moderately positive with perceived behavioural control (r=.37, p<.01) and subjective norm (r=.34, p<.01). None of the demographics were significantly correlated with intention to test. The degree of urbanism where one grew up is correlated positively low with stigmatisation (r=.27, p<.05). Other determinants, intention to test and testing behaviour did not significantly correlate with the degree of urbanism.

Table 9
Spearman's rho correlation between test behaviour, determinants, and demographics (n=65)

	Variables	1 [a]	2	3	4	5	6	7
1	Test behaviour [a]	-						
2	Intention	.42**	-					
3	Attitude	.13	.07	-				
4	Subjective norm	.06	.34**	.16	-			
5	Perceived behavioural control	.36**	.37**	.30*	.25*	-		
6	Stigma	-.26*	-.15	-.02	-.06	-.14	-	
7	Shame	-.24	-.08	.16	.07	-.29*	.56**	-
	Age	.24	-.10	.06	.11	.15	-.10	-.38**
	Educational level	.18	.15	-.01	.22	.05	-.24	-.17
	Living area	-.24	-.16	.13	-.22	-.08	.12	.13
	Urbanism [a b]	.03	.12	.16	.14	.09	.27*	.20

Note. [a] point-biserial correlation, [b] the degree of urbanism in which someone grew up *p<.05, **p<.01 (2-tailed).

The determinants mutually correlate positively with each other, illustrating that for instance, a more preferable attitude toward testing has a positive cohesion with subjective norms and perceived behaviour control. Idem for subjective norms and perceived behavioural control. Concerning the correlation, it is noticeable that shame and stigma correlate positively with each other (r=.55, p<.01). This suggests that a higher experienced STI related stigmatisation provoke higher levels of STI related shame.

Regression analysis

Two hierarchical regression analyses were performed to measure the extent to which the determinants of condom use and testing behaviour were predictive of the intention to perform

particular behaviour. Furthermore, two hierarchical logistic regression analyses were performed to measure the extent to which determinants of anal condom use and testing behaviour were predictive.

Predicting intention

The results of the regression analysis on intention to use condoms are given in Table 10. The first model, including the control variables age and living area, did not significantly predict intention to use condoms. The second model, in which attitude was added, could predict 16 percent of the variance in intention to test. However, this prediction is not significant. Attitude, on the other hand, was a significant predictor in model two. By adding the degree of urbanism where one grew up as dichotomy variable in the last model, the explained variance remained the same. In addition, urbanity was not a significant predictor for intention which means that the degree of urbanism where one grew up did not predict intention to use condoms. Furthermore, attitude did not remain a predictor in model 3.

Table 10
Hierarchical regression analysis predicting intention to use condoms during anal intercourse

Model		b	SE	β	95% CI
1	Age (ref: > 45)				
	16-25	-0.33	0.47	-0.10	[-1.20, 0.64]
	26-35	0.44	0.34	0.18	[-0.19, 1.11]
	36-45	0.04	0.43	0.01	[-0.79, 0.90]
	Living area (ref: rural)	-0.42	0.41	-0.15	[-1.22, 0.39]
	F (df)	1.39 (4,61)			
	R^2	.083			
2	Age (ref: > 45)				
	16-25	-0.62	0.46	-0.19	[-1.44, 0.35]
	26-35	0.29	0.35	0.12	[-0.39, 0.99]
	36-45	0.02	0.41	0.01	[-0.78, 0.85]
	Living area (ref: rural)	-0.55	0.42	-0.19	[-1.40, 0.28]
	Attitude	0.55	0.28	0.29	[0.01, 1.11]
	F (df)	2.20 (5,60)			
	R^2	.155			
3	Age (ref: > 45)				
	16-25	-0.60	0.46	-0.18	[-1.45, 0.32]
	26-35	0.26	0.37	0.11	[-0.48, 0.99]
	36-45	-0.00	0.41	0.00	[-0.82, 0.81]
	Living area (ref: rural)	-0.48	0.43	-0.17	[-1.36, 0.34]
	Attitude	0.55	0.29	0.29	[-0.02, 1.12]
	Urbanism (ref: rural) [a]	-0.16	0.29	-0.07	[-0.74, 0.42]
	F (df)	1.86 (6,59)			
	R^2	.159			

Note. Bootstrapped sample was 2000 (n=66), [a] the degree of urbanism in which one grew up.

The results of the regression analysis on intention to get tested are given in Table 11. The first model, including the control variables age and living area, did not significantly predict intention to test for STIs. The second model, which includes subjective norm and perceived behavioural control, perceived behaviour control was a significant predictor. Besides, age category 16 to 25 years old is a positive predictor which implies that MSM who are aged between 16 and 25 years have a stronger intention to get tested for STIs compared to MSM >45 years of age. By adding the degree of urbanism where one grew up as dichotomy variable in the last model, the explained variance was 18 percent. However, as with the other models, this prediction is not significant. Only the age category remained a significant predictor in model 3.

Table 11
Hierarchical regression analysis predicting intention to get tested

Model		b	SE	β	95% CI
1	Age (ref: > 45)				
	16-25	0.43	0.36	0.12	[-0.30, 1.13]
	26-35	0.35	0.41	0.13	[-0.47, 1.15]
	36-45	0.69	0.40	0.21	[-0.11, 1.47]
	Living area (ref: rural)	0.61	0.42	0.20	[-0.19, 1.46]
	F (df)	1.06 (4,60)			
	R^2	.066			
2	Age (ref: > 45)				
	16-25	0.78*	0.35	0.22	[0.12, 1.47]
	26-35	0.32	0.40	0.12	[-0.48, 1.08]
	36-45	0.72	0.38	0.22	[-0.04, 1.46]
	Living area (ref: rural)	0.39	0.39	0.12	[-0.38, 1.16]
	Subjective norm	0.26	0.21	0.19	[-0.15, 0.68]
	Perceived behavioural control	0.36	0.21	0.24	[0.02, 0.82]
	F (df)	1.98 (6,58)			
	R^2	.170			
3	Age (ref: > 45)				
	16-25	0.79*	0.36	0.22	[0.09, 1.49]
	26-35	0.25	0.40	0.09	[-0.53, 1.02]
	36-45	0.68	0.39	0.20	[-0.12, 1.40]
	Living area (ref: rural)	0.55	0.43	0.17	[-0.25, 1.48]
	Subjective norm	0.22	0.23	0.16	[-0.22, 0.68]
	Perceived behavioural control	0.35	0.22	0.23	[-0.06, 0.82]
	Urbanism (ref: rural) [a]	-0.33	0.36	-0.13	[-1.07, 0.34]
	F (df)	1.84 (7,57)			
	R^2	.184			

Note. Bootstrapped sample was 2000 (n=65). [a] the degree of urbanism in which one grew up, *p<.05 (2-tailed).

Predicting behaviour

The results of the regression analysis on condom use are given in Table 12. The first model, including the control variables age and living area, predicted 18 percent of the variance in condom use. Living area was a significant predictor, where MSM living in urban areas were less likely to use a condom compared to MSM living in rural areas. Besides, age category 26 to 35 years old was a significant predictor, where MSM were less likely to use condoms compared to MSM >45 years old. Adding attitude in the second model led to an increased explained variance of 33 percent. Attitude is a significant predictor that enlarges the likelihood to use condoms. By adding urbanism in model 3, the model did not significantly change, and the model fit remained unchanged (model chi-square=32.81, R^2=.535). All mentioned predictors remained predictors in the models.

Table 12
Hierarchical logistic regression analysis predicting anal condom use (n=64)

Model		b	SE	Odds ratio
1	Age (ref: > 45)			
	16-25	0.41	0.84	1.51
	36-35	-1.35*	0.69	0.26
	36-45	-1.18	0.82	0.31
	Living area (ref: rural)	-1.55*	0.75	0.21
	Model chi-square (df)	9.06 (4)		
	Step chi-square (df)	9.06 (4)		
	Nagelkerke R^2	.176		
2	Age (ref: > 45)			
	16-25	-0.88	1.15	0.42
	26-35	-3.01**	1.02	0.05
	36-45	-1.98	1.03	0.14
	Living area (ref: rural)	-3.18**	1.09	0.04
	Attitude	3.21***	0.90	24.67
	Model chi-square (df)	32.56 (5) ***		
	Step chi-square (df)	23.50 (1) ***		
	Nagelkerke R^2	.532		
3	Age (ref: > 45)			
	16-25	-0.78	1.18	0.46
	26-35	-3.16**	1.09	0.04
	36-45	-2.04*	1.04	0.13
	Living area (ref: rural)	-3.02**	1.13	0.05
	Attitude	3.26***	0.92	25.91
	Urbanism (ref: rural)	-0.42	0.83	0.66
	Model chi-square (df)	32.81(6) ***		
	Step chi-square (df)	0.25 (1)		
	Nagelkerke R^2	.535		

Note. Dichotomous variable is 0=no condom and 1=condom, [a] the degree of urbanism in which someone grew up, *p<.05, **p<.01, ***p<.001 (2-tailed).

The results of the regression analysis on testing behaviour are given in Table 13. The first model, including the demographics, did not significantly predict testing behaviour. The explained variance increased significantly when perceived behavioural control and stigma were added in the second model and predicted 39 percent of the variance in testing behaviour. Perceived behavioural control was a significant predictor that indicated that higher perceived behavioural control enlarges the likelihood of having been tested. Next to perceived behavioural control, stigma became a significant predictor by adding the degree of urbanism in model 3, showing that higher perceived STI-related stigma was related to less testing behaviour.

Table 13
Hierarchical logistic regression analysis predicting testing behaviour

Model		b	SE	Odds ratio
1	Age (ref: > 45)			
	16-25	-1.88	1.06	0.15
	36-35	-0.85	0.96	0.43
	36-45	0.18	1.33	1.20
	Living area (ref: rural)	1.55	0.82	4.69
	Model chi-square (df)	.15 (4)		
	Step chi-square (df)	7.15 (4)		
	Nagelkerke R^2	.181		
2	Age (ref: > 45)			
	16-25	-0.69	1.21	0.50
	26-35	-0.47	1.08	0.63
	36-45	0.51	1.39	1.67
	Living area (ref: rural)	1.35	0.93	3.86
	Perceived behavioural control	1.33*	0.57	3.77
	Stigma	-1.82	0.99	0.16
	Model chi-square (df)	16.60 (6)*		
	Step chi-square (df)	9.44 (2)**		
	Nagelkerke R^2	.391		
3	Age (ref: > 45)			
	16-25	-0.46	1.27	0.63
	26-35	-0.83	1.17	0.44
	36-45	0.47	1.49	1.60
	Living area (ref: rural)	2.79	1.47	16.25
	Perceived behavioural control	1.40*	0.59	4.05
	Stigma	-2.27*	1.04	0.10
	Urbanism (ref: rural)	-2.28	1.46	0.10
	Model chi-square (df)	19.80 (7)**		
	Step chi-square (df)	3.21 (1)		
	Nagelkerke R^2	.456		

Note. Dichotomous variable is 0=no test and 1=test, [a] the degree of urbanism in which someone grew up, *p<.05, **p<.01 (2-tailed).

Knowledge

Table 14 displays the percentage of correct answers of knowledge about STIs and vaccinating against Hepatitis B. The knowledge about (vaccinating against) Hepatitis B is clearly lower in comparison to STIs. For example, 54 percent of MSM indicated the right response for the statement "HBV can always be cured". The results also show that MSM were familiar with the institutions that are committed to their sexual health, independently whether one grew up in an urban or rural area. However, only 52 percent were aware that vaccinations against Hepatitis B can be retrieved at the GP as well. Approximately 36 percent wrongly thinks that STIs can be cured naturally and that 46 percent wrongly thinks that HBV can always be cured. These percentages are relatively high.

Table 14

Percentage (%) of correct answers to statements about sexually transmitted infections and hepatitis b virus vaccinating knowledge

		Total (*n*=90)	Urban (*n*=43)	Rural (*n*=47)
1 [b]	You notice that you have an STI [c] because you always get complains	81.1	79.1	83.0
2 [b]	Some STIs can be cured naturally	64.4	60.5	68.1
3 [a]	HBV [d] can be transmitted during unprotected sex	91.1	88.4	93.6
4 [b]	HBV can always be cured	54.4	55.8	53.2
5 [a]	Vaccinating against HBV prevents infection	70.0	69.8	70.2
6 [a]	STIs can be tested at the GP [e]	80.0	79.1	80.9
7 [a]	STIs can be tested at RPHSs [f]	98.9	100	97.9
8 [a]	An HBV vaccination can be obtained at the GP	52.2	55.8	48.9
9 [a]	An HBV vaccination can be obtained at RPHSs	90.0	90.7	89.4

Note. [a] correct statement, [b] incorrect statement, [c] sexually transmitted infection, [d] Hepatitis B virus, [e] general practitioner, [f] regional public health services.

Information about sexual health is mainly acquired from RPHSs or via Internet (Table 15). Depending on the subject, these percentages fluctuate between both sources. In addition, some information will also be obtained from friends. It is striking that MSM who grew up in urban areas tend to obtain information from GPs more often compared to rural MSM. For example, 42 percent of MSM indicate that obtain their information about PrEP from the GP, this is 50 percent of MSM who grew up in urban areas and 34 percent of MSM who grew up in rural areas.

Table 15

Percentage (%) of total, urban and rural men, and their source of information

	Total (*n*=90)	Urban (*n*=43)	Rural (*n*=47)
STI [a]			
Internet	86.7	88.4	85.1
RPHS [b]	78.9	79.1	78.8
GP [c]	46.7	58.1	36.2
Vaccinating HBV [d]			
Internet	67.8	72.1	63.8
RPHS	81.1	86.0	76.6
GP	45.6	25.6	20.0
Safe sex			
Friends	34.4	39.5	29.8
Internet	77.8	81.4	74.5
RPHS	62.2	60.5	63.8
GP	26.7	39.5	14.9
HIV/AIDS [e]			
Internet	82.2	81.4	83
RPHS	74.4	74.4	74.5
GP	48.9	60.5	38.3
PrEP [f]			
Internet	62.9	66.7	59.6
RPHS	75.3	78.6	72.3
GP	41.6	50.0	34.0
Alcohol and drugs			
Friends	35.6	37.2	34.0
Internet	70.0	72.1	68.1
RPHS	45.6	51.2	40.4

Note. Only sources that are in total at least for 25% used are included in this table, [a] sexually transmitted infection, [b] regional public health services, [c] general practitioner, [d] Hepatitis B virus, [e] human immunodeficiency virus/acquired immune deficiency syndrome, [f] pre-exposure prophylaxis *n*(rural,urban) is *n*(42,47).

Discussion

The aim of this explanatory study was to get insight into the potential differences in sexual risk behaviour (e.g. substance use before or during sex), protective and preventive behaviour (e.g. condom use, vaccinating, administering PrEP and STI testing) between men who are having sex with men, raised in urban or rural areas in the Netherlands. Many outcomes of the current study concern MSM at risk for potential negative consequences of unprotected sex, i.e. men with casual partners (that can also be in combination with a steady partner). However, substance use, vaccinating and administering PrEP was measured among all respondents. Firstly, the results show that there are no significant differences in sexual behaviour and behavioural intentions between MSM who are raised in urban or rural areas. In general, MSM perform risky behaviour, like inconsistent condom use. Secondly, social cognitive determinants of condom use and testing behaviour did not significantly differ based on the degree of urbanisation in which MSM grew up, except for perceived stigmatisation towards STIs. Rural MSM perceive more STI related stigmatisation compared to urban MSM. Thirdly, attitude, living area and age between 26 and 45 were significantly related to anal condom use. This means that MSM at risk with a positive attitude towards condom use are more likely to use condoms during anal intercourse. Additionally, MSM who are living in urban areas are less likely to use condoms during anal intercourse. Last, perceived behavioural control and stigma were significantly related to previous testing behaviour. This means that MSM who are at risk with higher levels of self-efficacy and controllability were more likely to have been tested for STIs. In addition, MSM who perceive high levels of STI related stigmatisation were less likely to have been tested for STIs. The interpretations of essential findings will be discussed in more detail in the following paragraphs.

Sexual behaviour

Condom use

As stated earlier, condom use did not differ based on the degree of urbanisation in which MSM grew up. This finding is in line with an American study that indicated that sex without a condom in the last year or with their most recent sex partner did not differ between rural and urban living MSM (McKenney et al., 2018). Despite that this finding is based on living area instead of where MSM grew up, the results of the current study showed that living area is related to anal condom use. This would mean that urban living MSM were less likely to use a condom compared to men living in rural areas. However, these interpretations must be taken

carefully in consideration as this finding is based on a very small group of men living in rural areas.

In total, three percent of MSM at risk for the potential negative consequences of unprotected sex, uses condoms consistently during both oral and anal sex. Only three percent reported consistent condom use during oral sex, which is in line with previous findings (Slurink et al., 2019; RIVM2, 2019). For anal condom use, however, about half of MSM at risk reported consistent condom use compared to 20 percent of men with a steady relationship. This difference can be explained by the fact that MSM with a steady relationship are less at risk for a STI since they have sex with one steady partner. The percentages of condom use are pretty similar to those of Slurink et al. (2019) who found 25 percent of consistent condom use during anal sex among MSM without considering the type of relationship. In addition to the relatively low use of condoms, in general, MSM hold a neutral intention towards the use of condoms. This outcome is in contrast with the study of Franssens et al. (2009) who stated that men with a casual relationship have a high favourable intention towards the use of condoms.

Vaccinating behaviour

Vaccination behaviour did not differ between MSM who grew up in urban or rural areas. Given the higher incidence of HBV among Dutch MSM living in urban areas (van Houdt et al., 2009), we might have expected that urban men were less likely to vaccinate compared to rural men. Even though van Houdt et al. (2009) did not give reasons for the higher incidence among urban MSM, it might be that HBV is more reported among urban MSM due to the higher experienced anonymity in urban areas. Consistent with findings from previous research (den Daas et al., 2018), 60 percent of MSM is protected against HBV. Unfortunately, in the current study, little can be said about the intention to vaccinate due to the limited number of respondents. However, according to previous research, MSM have a moderately positive intention towards vaccinating (Das et al., 2008; Vet et al., 2010). As stated in previous research, the moderate vaccination uptake can be reasoned by an individual's low perception of their susceptibility and the severity of HBV infection (van Houdt et al., 2009). In addition, results of the current study suggest that there may be insufficient knowledge about HBV and where to get vaccinated. This could negatively influence the intention to get vaccinated.

Using PrEP

The use of PrEP did not differ between MSM that grew up in urban or rural areas. Suggested by previous research, access to PrEP in rural areas is limited due to both the health professionals in rural areas who indicate that they have insufficient knowledge about PrEP, as the few health institutions in rural areas that prescribe PrEP (Sarno et al., 2020; Owens et al., 2020). This could also be the case in the Netherlands, when looking at where MSM live instead of where they grew up. The current study showed that most MSM obtain information about PrEP from RPHSs. Additionally, MSM who grew up in an urban area indicate more often that they obtain information from GP in comparison to rural MSM. Besides, some respondents explained that they did not use PrEP because it was not provided by their GP. However, it is unclear whether this was argued by rural or urban respondents. As expected and corresponding with previous research, the percentage of both intention and administering PrEP is low (van Dijk et al., 2020; Hulstein et al., 2020). A possible explanation can be that PrEP is a relatively new preventive measure as protection against HIV infection. Therefore, it can be that MSM have insufficient knowledge, causing both a low intention to and actual intake of PrEP. This reasoning is further reinforced by the argumentation of respondents and by previous studies (van Dijk et al., 2020; Hoornenborg, 2020). Besides, the percentage of MSM that use PrEP can be lower as a result that not all MSM in the current study were eligible for PrEP given the guidelines they must have met, given the fact that this was not measured during the current study. Perhaps that other factors may influence the intention to use PrEP, such as age, educational level and type of relationship. Respondents with a steady partner indicated that they did not use PrEP because of their relationship status. The extent to which these factors are related to the use of PrEP has not been examined further in this study.

Testing behaviour

Corresponding with previous research (Visser et al., 2017; Vriend et al., 2015), test behaviour did not differ between MSM who grew up in urban or rural areas. We expected that MSM who grew up in rural areas experience more difficulties in the accessibility of sexual healthcare facilities, which would decrease testing behaviour of men from rural areas. These findings will be explained in more detail later in the discussion. Results of the current study showed that, in total, 46 percent of MSM who are at risk for STIs got themselves tested in the last six months as advised (Kampman et al., 2018; Visser et al., 2017). Though, a quarter of men at risk reported that they have never tested themselves. The intention of MSM at risk for a STI is rather positive for both urban and rural MSM. The intention of men with a steady

partner, on the other hand, is rather negative. This can be reasoned by the fact that men with a steady partner have a reduced chance of getting a STI during unprotected sex. Despite the rather positive intention to test, a relatively small percentage of MSM at risk for a STI get themselves tested when we consider the percentage that consistently uses a condom during sex with a casual partner.

Determinants of sexual behaviour

Determinants of condom use

The social cognitive determinants of condom use did not differ between MSM who grew up in urban or rural areas. We cannot compare this finding with previous research because to our knowledge, no previous research has examined this.

In general, MSM hold a rather neutral attitude towards the use of condoms during anal intercourse. Subjective norms are slightly more positive meaning that men's perceptions of whether other people think that they should use a condom or not, were encouraging. Furthermore, men's perceived behavioural control regarding condom use was generally high. These findings largely correspond to the findings of Franssens et al. (2009), except for attitude which was indicated as preferable in their study. All three determinants seem, according to the Theory of Planned Behaviour, beneficial regarding the intention to use condoms. However, the intention to use condoms is rather neutral, so we could assume that other determinants play a more important role in relation to the intention to use condoms.

When looking at the determinants that were related to intention and condom use, attitude was the only social cognitive determinant that was significantly related to both intention and condom use. Living area and age, on the other hand, were only significantly related to condom use. In the current study, both of the relationships with attitude were very weak. This could mean that attitude is not as important to determine the use of condoms as expected, which contradicts to what previous studies suggested (Andrew et al., 2016; Franssens et al., 2009; Protogerou et al., 2013; Bennett & Bozionelos, 2000). Additionally, in this study, intention appears difficult to explain from the Theory of Planned Behaviour which is also inconsistent with what previous studies imply (Andrew et al., 2016). According to Andrew et al. (2016), variance in intention with the three main variables of Theory of Planned Behaviour, is explained by 24 percent. However, the explained variance in the current study is only 16 percent. Besides, intention is not explained by the three main variables of the Theory of Planned Behaviour, as no significant relationship has been found for both subjective norms and perceived behavioural control with the intention to use condoms. As mentioned before,

this may also indicate that other factors can be related to condom use. Another explanation would be that the constructs have not been accurately measured considering that other studies have found relationships between the Theory of Planned Behaviour and condom use. Nevertheless, Andrew et al. (2016) indicated that a large amount of variance in behaviour remains unexplained. Besides, the Theory of Planned Behaviour explains protected sexual behaviours to a lesser extent compared to other health promoting behaviours (e.g. diet behaviours) (Andrew et al., 2016). However, when we look at the extent to which other behavioural models predict and explain intention to and the use of condoms, literature still suggests that the Theory of Planned Behaviour explains best (Espada, et al., 2015; Montanaro & Bryan, 2014; Chambers et al., 2018). The Health Action Process Approach (HAPA), on the other hand, is also helpful for understanding and predicting intention and behaviour. However, only a few studies had used HAPA as framework for understanding condom use. According to Teng & Mak (2011), variance in intention with the determinants of HAPA (action self-efficacy and the perceive benefits of condom use) is explained by 18 percent. The explained variance of condom use is 11.6 percent. Both percentages are slightly lower compared to those of the Theory of Planned Behaviour as intention and perceived behavioural control explained 12.4 percent of the variance in condom use (Andrew et al., 2016). Nevertheless, it may be interesting to use HAPA as a framework in future research as it states that in addition to intention, behaviour is determined by self-regulating processes, perceived self-efficacy and planning which ensures that the intention-behaviour gap will be reduced (Andrew et al., 2016).

As expected from previous research, the use of substances could have an effect on the low consistent use of condoms among MSM which can be explained by the intention-behaviour gap (Ajzen, 1991). For instance, the use of substances (e.g. alcohol and drugs) could have an effect on the decision-making process, making it harder to perform intended behaviour. According to findings of Koblin et al. (2003), high rates of unprotected anal intercourse were associated with alcohol and drugs use in the United States. Additionally, chemsex is associated with higher rates of unprotected anal intercourse (Maxwell, Shahmanesh & Gafos, 2019). The results of the current study show that 51 percent of men ever used drugs and 73 percent ever used alcohol before or during sex. The percentage of men who ever used these substances was not related to the degree of urbanisation in which they grew up. These findings are in line with the findings of another Dutch study (Evers, van Liere, Hoebe & Muijrers, 2019). However, as stated before, the intention to use condoms is rather neutral indicating that other determinants may influence behavioural intention.

Determinants of testing behaviour

The social cognitive determinants of the Theory of Planned Behaviour did not differ between MSM who grew up in urban or rural areas. This is contrary to what we expected in advance. As hypothesised, we expected differences in perceived behavioural control based on the degree of urbanisation in which MSM grew up. Several studies indicated that MSM living in rural areas may experience problems in the accessibility of sexual healthcare (especially RPHSs) due to the fact that facilities are located in urban areas (Giano et al., 2019; Schrafer et al., 2017; SOA AIDS Nederland, 2019). Nevertheless, the results showed that MSM in general report a high perceived behavioural control in relation to test behaviour, in particular controllability. However, this finding is based on the degree of urbanisation in which men grew up instead of where they live. In the current study, 68 percent of respondents that grew up in rural areas moved to an urban area. For that reason, we might expect that these men now perceive less obstacles in the accessibility of sexual healthcare facilities. However, the respondents that are currently living in rural areas, also grew up there. Nevertheless, with these findings we cannot conclude that MSM who have grown up or live in rural areas have more difficulties in accessing sexual healthcare facilities. Therefore, it would be of value to conduct a follow-up research, especially considering the relationship that was found in the current study between perceived behavioural control with both intention to get tested and actual test behaviour.

In general, MSM hold a positive attitude towards STI testing. Subjective norms, which refer to the perception of approval or disapproval from significant others regarding testing behaviour, were found to be neutral. Furthermore, both urban and rural MSM would generally not feel ashamed when having a STI. The amount of perceived STI related stigmatisation, on the other hand, is higher among MSM who grew up in rural areas compared to urban MSM. This means that rural raised MSM indicate higher levels of personal fears about negative societal reactions towards a STI. This is in line with previous research in which MSM living in rural areas indicate that their communities are less tolerant towards gay and bisexual persons (McKenney et al., 2018; Preston et al., 2004).

When looking at the determinants that were related to intention and testing behaviour, stigma was significantly related to testing behaviour and age was significantly related to intention. This suggests that MSM aged between 16 and 25 years old have a higher intention to get themselves tested for a STI compared to other age groups. An explanation for this may be that they have recently become sexually active. Besides, the likelihood of having a steady relationship is lower compared to older men. Nevertheless, age does not emerge to be related

to previous testing behaviour. An explanation for this could be that someone of 16 years old has not yet experienced any previous test behaviour. Stigma is related to previous testing behaviour indicating that higher amount of stigmatisation towards STIs minimized the likelihood to have been tested. This result is consistent with previous research (Cunningham et al., 2009; Fortenberry et al., 2002). Therefore, the findings of the current study are important as the perceived STI-related stigma was high, especially among MSM who grew up in rural areas. However, these interpretations must be taken carefully in consideration as the findings in the regression analyses are just significant. Besides, previous research showed that it is unclear which model best explains testing behaviour. Adam et al. (2014) suggested that testing behaviour is associated with attitude, subjective norms and perceived behavioural control. Stigma and shame, on the other hand, were not associated with testing behaviour meaning that the findings of the current study are not fully in line with their study.

Limitations and strengths

Multiple insights have been found in this research, however limitations should be noted. The greatest limitation is that the focus of this research was changed during the data collection. Beforehand, the focus was on the potential differences concerning the urbanisation in which MSM are living instead of in which MSM grew up. During the research, the focus has changed for the reason that the group of MSM living in rural areas was very small. Secondly, the sample size of this study is relatively small despite the fact that the data was collected within three months. This small sample size could be explained by the fact that not all channels (e.g. Grindr, LGBT organisations) that were planned to be used for recruitment of participants could be used in this period. This is because the data collection took place during the occurrence of COVID-19. As a result, meeting places of MSM were closed causing that these places were not able to contribute to the distribution of the questionnaire. Furthermore, during the data collection it was not possible to use Grindr for advertisements. According to previous studies conducted by RPHS Twente, Grindr was predicted to be the best channel to recruit participants. The third limitation was that the sample consists of many respondents from the same area in the Netherlands. This means that the degree to which the results are representative for Dutch MSM is limited due to reduced external validity and therefore less generalizable. However, the data can be representative for MSM in the eastern part of the Netherlands. An additional limitation is that this study is based on self-reported data. Both response bias and social desirability bias should be kept in mind when drawing conclusions despite that the questionnaire was thoughtfully framed to prevent response bias.

Despite these limitations, some strengths of this study deserve mentioning. To our knowledge, this is the first study to highlight the differences and similarities in determinants of condom use and testing behaviour between MSM raised in urban or rural areas in the Netherlands. There are a few Dutch studies that focused on determinants of anal condom use among MSM (Franssens, Hospers & Kok, 2009). In addition, a large-scale study has been carried out that gives insights in the sexual behaviour of Dutch MSM (den Daas et al., 2018). Differences in some sexual behaviour per urbanisation were indicated in these studies, but determinants were not discussed.

Another strength is that most of the questions of the current study are based on questionnaires from previous studies which increases the reliability and validity. However, questionnaires had to be translated to Dutch which means that this version may have limited validity, as we did not have the opportunity to investigate the cross-cultural validity. Nevertheless, the scales have high alphas which indicate a good internal consistency between items.

Recommendations for further research

Future research is recommended according to the results of this explanatory research as this study shows that STI related stigma differs from where one grew up and is related to test behaviour. Although no correlations had been found between STI related stigma and living area, it would still be interesting to conduct a follow-up research with a sufficient number of respondents to examine the relationship of stigmatisation with multiple sexual behaviours and to what extent there is a difference between MSM living in urban or rural areas in the Netherlands. In order to obtain more targeted information, it would be recommended to distinct stigma into public and self-stigma due to the fact that public stigma leads to the development of self-stigma (Vogel, Bitman, Hammer & Wade, 2013).

Another recommendation is to investigate condom use between MSM living in rural or urban areas as the current study shows that living area is related to anal condom use. Due to the small number of respondents living in a rural area in this survey, this result may be based on coincidence. In addition, it is important that not only determinants, but also the possible intention-behaviour gap has to be taken into account because this may indirectly influence condom use. Because of the fact that the Theory of Planned Behaviour does not reduce this gap, it could be considered to use HAPA as a framework for future research. Finally, with regard to the measurement of intentions, condom use and testing behaviour of MSM when using Theory of Planned Behaviour as framework, it is advisable to do more research into

good scales for the measurement of attitudes, subjective norms and perceived behavioural control. This because the scales used during this research were translated without further validation which could be one of the reasons that behavioural intentions were difficult to measure in this study.

Conclusion

By means of an online questionnaire, it can be concluded that this explanatory study does show similarities in both behavioural intentions and sexual behaviour (e.g. protective sexual behaviour, risk factors and testing behaviour) between MSM raised in urban or rural areas in the Netherlands. In general, MSM perform sexual risky behaviours such as inconsistent condom use and a relatively low testing uptake.

The social cognitive determinants, including the concepts of Theory of Planned Behaviour, of condom use and testing behaviour were similar between MSM that grew up in urban and rural areas. Except for the perceived stigmatisation towards STIs. The results indicate that MSM generally perceived STI related stigma as high and that men who grew up in rural areas perceive more stigma compared to urban men.

With regard to which determinants were related to both behavioural intentions, condom use and testing behaviour, attitude was related to condom use. In general, MSM hold a rather neutral attitude towards the use of condoms during sex. Besides, living area and age between 26 and 45 years old are related to anal condom use. This means that MSM who are living in urban areas as well as MSM aged between 26 and 45 years old are less likely to use condoms during anal intercourse. For testing behaviour, both STI related stigma and perceived behavioural control were related to testing behaviour. This means that higher levels of perceived stigmatisation minimize the likelihood to test which is a critical finding as MSM perceive high levels of STI related stigma. Perceived behavioural control on the other hand, was reported as high, indicating a high perception of their ability to get themselves tested. Furthermore, perceived behavioural control and age between 16 and 25 years old are related to intention to test. This means that MSM with high perception of their ability to get themselves tested as well as MSM aged between 16 and 25 years old have a higher intention to get themselves tested.

Further research with sufficient sample sizes for both urban and rural living MSM is recommended to gain more insight in the relationship of stigma with multiple sexual behaviours and what role the living area of MSM plays in these sexual behaviours, in particular condom use.

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Appendices

Appendix A. Questionnaire (in Dutch)

INFORMED CONSENT

- Ik heb de informatie hierboven gelezen en begrepen. Ik doe mee met het onderzoek.
- Nee, ik doe niet mee aan het onderzoek.

Indien 'nee, ik doe niet mee aan het onderzoek.' wordt de participant geëxcludeerd uit het onderzoek.

ALGEMENE VRAGEN

De vragenlijst start met een aantal algemene vragen over jouw persoonlijke situatie.

1. Wat zijn de vier cijfers van je postcode? (hiermee kunnen we alleen zien of je in een stad of in een dorp woont)

____

2. Wat is je leeftijd?

- Jonger dan 16 jaar
- 16-25 jaar
- 26-35 jaar
- 36-45 jaar
- 46-65 jaar
- Ouder dan 65 jaar

Als de leeftijd beneden de 16 jaar is wordt de participant geëxcludeerd uit het onderzoek.

3. Ik ben…

- Man
- Vrouw
- Anders, namelijk: ___ (vul in)

Als 'vrouw' ingevuld wordt, wordt de participant geëxcludeerd uit het onderzoek.

4. Van welk geslacht zijn je sekspartners?

- Alleen mannen
- Alleen vrouwen
- Zowel mannen als vrouwen
- Ik heb nooit seks gehad

Als 'alleen vrouwen' en 'ik heb nooit seks gehad' ingevuld wordt, wordt de participant geëxcludeerd uit het onderzoek.

5. Wat is de hoogste opleiding die je hebt afgemaakt?

- Geen
- Basisonderwijs

- o Middelbaar algemeen onderwijs (MAVO/MULO)
- o Voorbereidend middelbaar beroepsonderwijs (VMBO)
- o Hoger algemeen onderwijs (HAVO/VWO/Gymnasium)
- o Middelbaar beroepsonderwijs (MBO)
- o Hoger onderwijs (HBO/WO, postacademisch)
- o Anders namelijk, _____

6. Waar heb je tot je 20e levensjaar voornamelijk gewoond?

- o Stad in Nederland
- o Dorp in Nederland
- o Buiten Nederland

KENNIS

Nu volgen er een aantal uitspraken die jouw kennis testen over soa's en vaccineren. Daarna volgen er een aantal vragen over waar jij je kennis vandaan haalt.

7. De volgende uitspraken gaan over soa's en vaccineren.
Geef per uitspraak aan of jij het hiermee eens of oneens bent.

	eens	oneens	weet ik niet
1. Je merkt dat je een soa (chlamydia, gonorroe, syfilis, hiv, hepatitis b, genitiale herpes, genitiale wratten) hebt doordat je altijd klachten krijgt	o	o	o
2. Sommige soa's gaan vanzelf over	o	o	o
3. De meeste soa's zijn eenvoudig te genezen	o	o	o
4. Hepatitis B kan worden overgedragen tijdens onveilige seks	o	o	o
5. Hepatitis B is altijd te genezen	o	o	o
6. Vaccineren tegen Hepatitis B voorkomt een besmetting	o	o	o
7. Bij een soa test moet je altijd bloed prikken	o	o	o
8. Bij een soa test moet er altijd een wattenstaafje in de urinebuis gebracht worden	o	o	o
9. Testen op soa's kan bij de huisarts	o	o	o
10. Testen op soa's kan bij de GGD	o	o	o
11. Vaccineren tegen Hepatitis B kan bij de huisarts	o	o	o
12. Vaccineren tegen Hepatitis B kan bij de GGD	o	o	o

8. Bij wie/waar zoek of zou jij informatie zoeken over:

Meerdere antwoorden zijn mogelijk.

	vrienden	ouders	Internet	GGD	huisarts	school	anders
1. Soa's	○	○	○	○	○	○	○
2. Vaccineren Hepatitis B	○	○	○	○	○	○	○
3. Veilige seks	○	○	○	○	○	○	○
4. Hiv/aids	○	○	○	○	○	○	○
5. PrEP (hiv-remmers om het risico op het krijgen van hiv te verkleinen)	○	○	○	○	○	○	○
6. Gebruik van alcohol/drugs bij seks	○	○	○	○	○	○	○

CONDOOMGEBRUIK

De aankomende vragen gaan over het gebruik van condooms. Daarnaast wordt er gevraagd naar jouw mening over het gebruik van condooms. Deze vragen zijn gericht op jouw (seks)relatie.

9. Welk relatietype beschrijft je situatie het beste?

- ○ Een vaste relatie
- ○ Een vaste relatie en losse partners
- ○ Losse partners

Wanneer uitkomst 'vaste relatie' dan vraag 10.

Wanneer uitkomst 'losse partners' dan vraag 11.

Wanneer uitkomst 'vaste relatie en losse partners' dan zowel vraag 10 als 11.

10. Gebruik je bij je vaste partner een condoom als je:

	nooit	soms	altijd	niet van toepassing
1. Pijpt	1	2	3	4
2. Gepijpt wordt	1	2	3	4
3. Anale seks ontvangt (bottom)	1	2	3	4
4. Anale seks geeft (top)	1	2	3	4

11. Gebruik je bij losse partners een condoom als je:

	nooit	soms	altijd	niet van toepassing

1. Pijpt	1	2	3	4
2. Gepijpt wordt	1	2	3	4
3. Anale seks ontvangt (bottom)	1	2	3	4
4. Anale seks geeft (top)	1	2	3	4

12. In hoeverre ben jij het eens of oneens met de volgende uitspraak?

In de toekomst zal ik geen seks hebben als het niet mogelijk is om een condoom te gebruiken.

- Helemaal oneens
- Oneens
- Neutraal
- Eens
- Helemaal eens

13. Hieronder staan een aantal uitspraken over het gebruik van condooms

In hoeverre ben jij het eens of oneens met deze uitspraken over condoomgebruik?

Condoomgebruik...	helemaal oneens	oneens	neutraal	eens	helemaal eens
1. Condoomgebruik maakt seks minder intiem	1	2	3	4	5
2. Condoomgebruik is een vervelende onderbreking van de seks	1	2	3	4	5
3. Condoomgebruik vermindert seksueel genot	1	2	3	4	5
4. Condoomgebruik is hygiënisch	1	2	3	4	5
5. Condoomgebruik geeft een veilig gevoel	1	2	3	4	5
6. Condoomgebruik is een goede manier om je te beschermen tegen soa’s	1	2	3	4	5

14. Hieronder staan een aantal uitspraken over **de mening van anderen** over jouw condoomgebruik. Geef aan in hoeverre je het eens of oneens bent met deze uitspraken.

Ik denk dat…	helemaal oneens	oneens	neutraal	eens	helemaal eens
1… mijn sekspartner vindt dat ik een condoom moet gebruiken	1	2	3	4	5
2… de belangrijkste mensen in mijn omgeving vinden dat ik een condoom moet gebruiken	1	2	3	4	5
3… condoomgebruik mijn sekspartner het idee geeft dat ik drager ben van het hiv-virus	1	2	3	4	5
4… condoomgebruik mijn sekspartner het idee geeft dat ik met iedereen seks heb	1	2	3	4	5
5… mijn sekspartner boos wordt als ik voorstel een condoom te gebruiken	1	2	3	4	5

15. Hieronder staan een aantal uitspraken over wat het moeilijk of makkelijk maakt om een condoom te gebruiken tijdens de seks. Geef aan in hoeverre je het eens of oneens bent met deze uitspraken.

	helemaal oneens	oneens	neutraal	eens	helemaal eens
1. Ik kan met mijn sekspartner praten over condoomgebruik	1	2	3	4	5
2. Ik weet hoe ik condooms moet gebruiken	1	2	3	4	5
3. Ik weet waar ik condooms kan kopen	1	2	3	4	5
4. Ik durf condooms te kopen	1	2	3	4	5
5. Ik kan mijn sekspartner naar zijn seksverleden vragen	1	2	3	4	5
6. Ik heb altijd condooms bij me voor het geval dat ik ze nodig heb	1	2	3	4	5

DRUGSGEBRUIK EN/OF ALCOHOLGEBRUIK

16. Heb je ooit drugs gebruikt voor of tijdens de seks?

- Ja
- Nee

Wanneer uitkomst 'ja' dan vraag 17-18

Geef aan wat je van de onderstaande uitspraak vindt.

17. Als ik drugs gebruik, heb ik eerder seks zonder condoom.

- Eens
- Oneens

Geef aan wat je van de onderstaande uitspraak vindt.

18. Als ik drugs gebruik, doe ik eerder seksuele dingen die ik anders niet had gedaan.

- Eens
- Oneens

19. Heb je ooit alcohol gebruikt voor of tijdens de seks?

- Ja
- Nee

Wanneer uitkomst 'ja' dan vraag 20-21

Geef aan wat je van de onderstaande stelling vindt.

20. Als ik alcohol gebruik, heb ik eerder seks zonder condoom.

- Eens
- Oneens

Geef aan wat je van de onderstaande stelling vindt.

21. Als ik alcohol gebruik, doe ik eerder seksuele dingen die ik anders niet had gedaan.

- Eens
- Oneens

SOA EN TESTGEDRAG

De aankomende vragen gaan over soa's en het testen op soa's. Daarnaast wordt er ook gevraagd naar jouw mening over het testen op soa's.

22. Wat doe jij om de risico's op een soa te verkleinen?

Meerdere antwoorden zijn mogelijk.

- Ik gebruik een condoom tijdens de seks
- Ik maak gebruik van PrEP
- Ik kies een sekspartner met dezelfde hiv-status, om een hiv-infectie te voorkomen (serosorting)

- Ik verander tijdens de seks mijn sekspositie/standje om een hiv-infectie of transmissie te voorkomen (strategisch positioneren)
- Ik laat mij minstens elke 6 maanden testen op een soa
- Anders

23. In hoeverre ben jij het eens of oneens met de volgende uitspraak?
Ik ben van plan om binnen nu en 6 maanden een soa-test te doen.

- Helemaal oneens
- Oneens
- Neutraal
- Eens
- Helemaal eens

24. Wanneer ben je voor het laatst op een soa getest?
Als je het antwoord niet precies weet, maak dan een schatting.

- 0-3 maanden geleden
- 4-6 maanden geleden
- 6-12 maanden geleden
- Meer dan 12 maanden geleden
- Ik heb nooit een soa test gedaan

Wanneer uitkomst 'nee' dan vraag 27

25. Wat was voor jou de belangrijkste reden voor je meest recente soa-test?

- Ik had onveilige seks
- Ik laat me regelmatig testen
- Ik had klachten
- Ik was gewaarschuwd voor een soa door een sekspartner
- Mijn sekspartner vond dat ik mij moest laten testen op een soa
- Belangrijke mens(en) in mijn omgeving vond(en) dat ik mij moest laten testen op een soa
- Anders, ____

26. Waar heb je de laatste keer een soa-test gedaan?

- Bij de huisarts
- Bij de GGD
- In het ziekenhuis
- Ik heb een thuistest gedaan
- Anders

27. Wat is voor jou de belangrijkste reden dat je nog nooit getest bent op een soa?

- Ik heb geen klachten (gehad) die wijzen op een soa

- Ik heb geen (onveilige) seks gehad
- Ik weet niet waar ik mij kan laten testen
- Het is er (nog) niet van gekomen
- Ik ben bang voor de uitslag
- Ik ben bang een bekende tegen te komen
- Ik vind een soa test te duur
- Ik heb geen vervoer om naar een testlocatie te komen
- Anders, namelijk ___

28. Hieronder staan een aantal uitspraken over soa's.
In hoeverre ben jij het eens of oneens met deze uitspraken?

Het testen op een soa…	helemaal oneens	oneens	neutraal	eens	helemaal eens
1… kan het verspreiden van een soa infectie voorkomen	1	2	3	4	5
2… geeft inzicht in mijn seksuele gezondheid	1	2	3	4	5
3… wordt te veel met homoseksualiteit geassocieerd.	1	2	3	4	5
4… is vervelend/onaangenaam.	1	2	3	4	5

29. Hieronder staan een aantal uitspraken over **de mening van anderen** over jouw soa testgedrag. Geef aan in hoeverre je het eens of oneens bent met deze uitspraken.

Ik denk dat…	helemaal oneens	oneens	neutraal	eens	helemaal eens
1… mijn sekspartner vindt dat ik mij moet laten testen op soa's	1	2	3	4	5
2… de belangrijkste mensen in mijn omgeving vinden dat ik mij moet laten testen op soa's	1	2	3	4	5

30. Hieronder staan een aantal uitspraken over wat het moeilijk of makkelijk maakt om een soa-test te doen. Geef aan in hoeverre je het eens of oneens bent met deze uitspraken.

	helemaal oneens	oneens	neutraal	eens	helemaal eens
1. Ik weet waar ik mij kan laten testen op een soa	1	2	3	4	5
2. Ik weet hoe ik een afspraak kan maken om mij te laten testen	1	2	3	4	5
3. Ik kan testlocaties goed bereiken (o.a. openbaar vervoer, auto, fiets)	1	2	3	4	5
4. Ik durf een afspraak te maken om mij te laten testen	1	2	3	4	5

31. Hieronder staan een aantal uitspraken over soa's. Geef aan in hoeverre je het eens of oneens bent met deze uitspraken.

Wanneer je een soa hebt…	Helemaal oneens	Oneens	Eens	Helemaal eens
1… denken mensen dat je vies bent	1	2	3	4
2… willen mensen geen vrienden met je zijn	1	2	3	4
3… walgen mensen van je	1	2	3	4
4… voelen mensen zich ongemakkelijk bij jou	1	2	3	4
5.Wanneer je een soa hebt denken mensen dat je immoreel* bent	1	2	3	4
6… denken mensen dat je niet goed voor jezelf zorgt	1	2	3	4

*dat je iets doet wat niet fatsoenlijk is volgens de algemene norm.

32. Hieronder staan een aantal uitspraken over het hebben van een soa. Geef aan in hoeverre jij het hiermee eens of oneens bent.

Als ik een soa zou hebben…	Helemaal oneens	Oneens	Eens	Helemaal eens
1… dan zou ik me schamen	1	2	3	4
2… dan zou ik me schuldig voelen	1	2	3	4

3… dan zou ik me angstig voelen	1	2	3	4
4… dan zou ik teleurgesteld zijn in mijzelf	1	2	3	4

VACCINEREN

De volgende vragen gaan over het vaccineren tegen Hepatitis B.

33. Ben je gevaccineerd tegen Hepatitis B?

- Nee
- Ja, ik heb drie prikken gehad
- Ja, ik heb één of twee prikken gehad
- Weet ik niet

Wanneer uitkomst 'weet ik niet' dan naar vraag 36..

Wanneer uitkomst 'nee' dan vraag 35.

34. In hoeverre ben jij het eens of oneens met de volgende uitspraak?

Ik ben van plan om binnen nu en 6 maanden mij te laten vaccineren tegen Hepatitis B.

- Helemaal oneens
- Oneens
- Neutraal
- Eens
- Helemaal eens

35. Wat is de reden dat je je niet hebt laten vaccineren tegen Hepatitis B?

Meerdere antwoorden zijn mogelijk.

- Ik weet niet wat het is
- Ik zie het belang hier niet van in
- Ik loop geen risico op Hepatitis B
- Ik weet niet waar ik mij kan laten vaccineren
- Het kost te veel geld om mij te laten vaccineren
- Ik vind dat een vaccinatie je niet beschermd tegen Hepatitis B
- Het lukt me niet om op een locatie te komen waar ze vaccineren
- Ik wil niet dat iemand weet dat ik seks heb met mannen
- Anders, namelijk ____

PrEP

De laatste vragen gaan over PrEP (hiv-remmers om het risico op het krijgen van hiv te verkleinen)

36. Heb je wel eens gehoord van PrEP

- Ja
- Nee

Wanneer uitkomst 'ja' dan vraag 37.
Wanneer uitkomst 'nee' dan einde questionnaire.

37. Gebruik je op dit moment PrEP?

- Ja
- Nee

Wanneer uitkomst 'ja' dan vraag 38, 39.
Wanneer uitkomst 'nee' dan vraag 40, 41.

38. Hoe kwam je aan PrEP?

- Huisarts
- GGD
- Online
- Via een bekende
- Anders

39. Geef aan wat je van de volgende uitspraak vindt.
Door het gebruik van PrEP heb ik sneller onbeschermd anale seks.

- Eens
- Oneens

40. Waarom maak je geen gebruik van PrEP?

- Ik loop geen risico op hiv
- Ik wil geen bijwerkingen van PrEP
- Ik schaam me om het te gebruiken
- Ik vind het gebruiken van PrEP te duur
- Anders, namelijk __

41. In hoeverre ben jij het eens of oneens met de volgende uitspraak?
Ik ben van plan om binnen nu en 6 maanden PrEP te gaan gebruiken.

- Helemaal oneens
- Oneens
- Neutraal
- Eens
- Helemaal eens

Appendix B. Additional information about PrEP

In total, 27 MSM indicated other reasons for not using PrEP, than the one mentioned in Table 16. The most cited reasons were insufficient knowledge or consideration about using PrEP. Furthermore, some men indicated that they contacted RPHS but were not eligible to use PrEP. In addition, a steady relationship was mentioned, and that some GP does not want to prescribe PrEP.

Table 16

Descriptive statistics for PrEP according to the degree of urbanisation in which men grew up

	Total		Urban		Rural	
Variables *n*(urban,rural)	*n*	%	*n*	%	*n*	%
Familiar with PrEP [a] (42,46)	86	97.7	41	97.6	45	97.8
Provider of PrEP (6,10)						
GP [b]	4	25.0	1	16.7	3	30.0
RPHSs [c]	10	62.5	4	66.7	6	60.0
Other	2	12.5	1	16.7	1	10.0
Reason of not using PrEP (34.34)						
Not at risk for HIV [d]	19	27.9	9	26.8	10	29.4
Side effects	6	8.8	2	5.9	4	11.8
Ashamed to use	4	5.9	2	5.9	2	5.9
High costs (too expensive)	12	17.6	5	14.7	7	20.6
Other	27	39.7	16	47.1	11	32.4

Note. [a] pre-exposure prophylaxis, [b] general practitioner, [c] regional public health services, [d] human immunodeficiency virus.