



UvA-DARE (Digital Academic Repository)

Proactive HIV testing strategies in primary care

Joore, I.K.C.W.

Publication date

2017

Document Version

Other version

License

Other

[Link to publication](#)

Citation for published version (APA):

Joore, I. K. C. W. (2017). *Proactive HIV testing strategies in primary care*.

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

CHAPTER 11

General discussion

In this chapter, I will discuss the findings of this thesis, as well as the international literature, in order to reflect on proactive provider-initiated HIV testing strategies in primary care. The results of these studies may contribute to improving proactive HIV testing programmes and may help to reduce the number of undiagnosed cases and late HIV diagnosis.

PROACTIVE HIV TESTING AMONG RISK GROUPS

A Dutch study has shown that 64% of patients from risk groups are not tested during STI-related consultations, as proposed by the Dutch STI guidelines for general practitioners (GPs). However, contextual information from this study was lacking.^{1,2} For the study reported on in **Chapter 2**, we therefore collected additional information from the same network of GPs. In 26% of the STI consultations in which no test was requested involving people in risk groups, an HIV test had been performed in a previous or follow-up consultation or at an STI clinic. This observational study showed the importance of obtaining more information on previous or follow-up consultations and reasons for testing for HIV or not. GP testing behaviour may be different in areas with a higher HIV prevalence. In addition, in our study, patients from risk groups may have been tested at an STI clinic without informing the GP. The interpretation of these self-reported results requires some caution as information from questionnaires may not always be a reflection of actual HIV testing behaviour of GPs and may be biased by socially desirable answers or recall bias.

As described in **Chapter 2**, being a man who have sex with men (MSM) or an individual from an HIV endemic country does not automatically lead a GP to suggest that an HIV test be done. The choice between 'rigid' testing according to the guidelines, and personal, individual patient care rightfully remains at the discretion of GP and patient. Nevertheless, we strongly advise that the issue of HIV testing in these risk groups be addressed.

In **Chapter 2** we also reported that a low percentage of HIV tests were initiated by the GP (23%). While similar rates of provider-initiated testing have been observed in other countries,³⁻⁶ they are accompanied by a high level of patient acceptance of this strategy, as was reported in several studies.³⁻⁶ People may appreciate provider-initiated testing as a way of avoiding the embarrassment of asking themselves.⁷ Nevertheless, proactive provider-initiated testing among risk groups may not be that easy to operationalize in daily practice.^{3,6,8} There are also personal factors that hinder GPs from discussing an HIV test and which contribute to low levels of provider-initiated testing.^{4,9,10} GPs may find it difficult to ask detailed questions about risky sexual behaviour and ethnicity.^{7,8,11,12} Moreover, adopting a proactive strategy of offering an HIV test to people in risk groups takes time and can interfere with a GP's daily practice.¹³ It should also be taken into account that not every GP is aware of the sexual orientation or ethnic background of their patients and the latter's partners, which makes operationalization of provider-initiated testing among risk groups challenging.

In **Chapter 3** we saw that GPs reported that they were aware of the sexual orientation of more than half of their patients who were MSM; however, sexual orientation was documented in patient medical records in only one-third of the cases. The standard information recorded in patients' medical files in Dutch primary care does not include details of sexual identity and ethnicity.¹⁴ Formal registration of sexual orientation and ethnicity in medical files is a sensitive and complex issue.^{11, 12, 15} Moreover, we cannot expect that every GP remembers their patients' sexual orientation or ethnicity. Where this information might be recorded in medical files remains a point of discussion. We recommend that there should be opportunities to document this crucial information in medical records.

HIV INDICATOR CONDITION-GUIDED TESTING

In recent year, more attention has been focused on offering an HIV test to patients with HIV indicator conditions (IC).¹⁶ The European Centre for Disease Prevention and Control (ECDC) list of ICs is based on studies from the United States and Europe which have suggested that HIV testing is cost-effective when the undiagnosed HIV prevalence for that condition is above 0.1%.¹⁶⁻¹⁸ IC-guided testing has limitations with respect to implementation, as many disorders are non-specific and not all of them are equally predictive for HIV.¹⁶ Notably, the ECDC recommends that the IC list should be continuously revised and updated and certain age restrictions may be imposed.¹⁶ European studies have concluded that HIV testing rates in relation to well-established preselected ICs are low in different healthcare settings in Europe.^{3, 17, 18} However, a British study showed that 94% of patients stated that they would undergo an HIV test if an IC was diagnosed.⁶ In **Chapter 4** and **Chapter 5** we showed that two-thirds of newly diagnosed HIV patients had at least one preselected IC reported in their medical records in the period up to five years prior to the index date, compared to a much lower percentage in the matched controls. Recently, a Spanish study showed that offering HIV testing to people diagnosed with a preselected IC in primary care is cost-effective, since the prevalence of HIV in these patients was higher than 0.1% for most of the suggested ICs.¹⁹ While ICs were frequently diagnosed by the GP, an HIV test was not often done (18.6%).¹⁹ IC-guided testing could be the starting point for more proactive provider-initiated HIV testing in primary care and could aid GPs in identifying people at increased risk of undiagnosed HIV.

One way to assist GPs to remember ICs is by using electronic clinical reminder systems. The use of clinical reminders in primary care remains challenging: healthcare providers find them inconvenient and do not use them or reject them and believe that they interfere with their practice.²⁰⁻²³ We planned to perform a study that integrated IC-guided testing with clinical reminders but faced severe reluctance from Dutch GPs, and were therefore not successful in executing this proposed pilot study.

Dutch GPs generally follow national rather than European STI guidelines for decision-making and obtaining knowledge.^{2,16} Many GPs may not be up to date with the ECDC list of ICs. IC-guided testing was briefly mentioned in the Dutch STI guidelines for GPs at the end of 2013.² Many of the ICs from the ECDC list are not often seen in primary care; however, all ICs listed in the ECDC guideline are relevant for HIV testing in primary care.¹⁶ Nevertheless, the current Dutch STI guidelines for GPs mention only a few ICs, including STIs which have been recommended for years.² In **Chapter 5** we showed that an HIV test is not always offered when an STI is diagnosed. A Spanish study reported that 61% of patients with an STI had not received an HIV test.²⁴ Chlamydia is highly prevalent among Dutch patients who belong to groups that are presumed to have a low risk of HIV,²⁵ however, there is still debate about the need to test for HIV in primary care if chlamydia is found in a person not classified as being in a high-risk group. To date, the majority of the ICs mentioned in the European list are not sufficiently implemented in STI guidelines or in other, non-STI guidelines for GPs. A more specific list of relevant ICs for primary care is needed. We recommend that provider-initiated IC-guided testing should be better integrated into future guidelines for GPs. In addition, it is recommended that IC-guided testing be implemented in other healthcare settings.^{17,18,26} For example, the recommendation that all tuberculosis (TB) patients in the Netherlands be tested for HIV has not been implemented, and approximately 40% of TB patients do not have a registered HIV status.^{16,27} The extent to which Dutch medical specialists have integrated IC-guided testing in daily practice is unknown.²⁸ Therefore, we advocate that key players take the opportunity to work together in 'medical specialists' committees to develop guidelines and promote IC-guided testing in other healthcare settings.

MAPPING THE HIV EPIDEMIC AND THE ROUTINE OFFER OF HIV TESTING

Since HIV prevalence can vary by municipality or neighbourhood, partly due to socioeconomic and cultural factors, a targeted local approach can help to detect HIV in a timely manner.^{29,30} This approach has been published by the National Institute of Health and Care Excellence (NICE) in England.³¹⁻³³ These guidelines recommend that an HIV test be routinely offered to patients aged 15-59 years in areas with an HIV prevalence above 0.2%. This proactive strategy is also mentioned in the supplementary file of the national STI guidelines for GPs.³⁴ Pinpointing high-prevalence areas using distribution maps is a first step towards the implementation of this proactive HIV testing strategy. Therefore, as reported in **Chapter 6**, we identified the areas in the Netherlands with a high HIV prevalence for purposes of monitoring and prevention. Our study did not take into account the background characteristics of HIV-infected patients, such as age, gender, sexual orientation and ethnicity, and as a result it is not possible to identify sub-groups contributing to a higher prevalence in

that neighbourhood. Additional research, in which the sociodemographic characteristics of residents are included in GIS analyses, may help us to develop more targeted interventions at the neighbourhood level.

The British guidelines recommend operationalizing the routine offer of HIV testing by proactively offering HIV tests to new patients registering at a primary care practice or to patients who are giving blood samples.³¹⁻³³ The implementation of this strategy remains challenging, partly due to certain obstacles among GPs, such as a lack of time, fear of harming the relationship of trust with patients and financial barriers, as described in **Chapter 7**. Several European studies have shown that most people found a routine offer of an HIV test acceptable.^{6, 7, 35} One way to operationalize this strategy in primary care is, for example, to offer an HIV test during an annual check-up to patients with hypertension. Another option is combining the HIV test with other blood tests. European studies have shown that the combination of several blood tests to detect multiple infections (HIV, Hepatitis B or C) was feasible and acceptable in primary care.^{23, 36} A French study investigated the impact of the routine offer of HIV testing as recommended by French guidelines.^{37, 38} This study showed that the strategy had a positive impact on levels of GP HIV testing.³⁷ More research is needed to determine whether the routine offer of an HIV test in high prevalence areas would be feasible and cost-effective in Dutch primary care.

OPINIONS OF NEW PROACTIVE PROVIDER-INITIATED HIV TESTING STRATEGIES

In **Chapter 7** we reported on a qualitative study in which GPs were of the opinion that a high proportion of HIV tests would be negative even if new proactive provider-initiated HIV testing strategies (IC-guided testing and the routine offer of HIV testing in higher HIV prevalence areas) are cost-effective.^{16, 31, 32} However, in this regard, it is important to realize that the number needed to test is high but an HIV test does not harm the patient. On the contrary, testing also provides an opportunity for HIV prevention with those who test negative. Moreover, screening for other rare conditions has been implemented in the Netherlands for years. For example, antenatal STI/HIV screening in pregnant women, and the neonatal heel prick or Guthrie test, which is a screening test done on new-borns to detect rare illnesses.^{39, 40} These conditions are rare but can be treated if detected at an early stage. In line with such practices, the early detection and treatment of HIV infection provides clear benefits for the health of the individual and that of the public at large.⁴¹⁻⁴⁴ It remains a matter of debate whether general health checks and screening programmes should be a part of GP practice, which is primarily aimed at individual patient care. However, recent initiatives recommend focusing more on preventive strategies in primary care in neighbourhoods.⁴⁵

In **Chapter 7** we reported that GPs also thought that there was a lack of time to implement these new proactive HIV testing strategies. However, the context of pre-test information and how the HIV test is offered may help GPs save time in the consultation.⁴⁶ Global and European guidelines recommend that a minimum standard of pre-test information should be provided before the test.^{47, 48} There are differences between guidelines regarding the content and type of pre-test information that is required.^{47, 48} We recommend that GPs should be taught to perform a quick and short pre-test information gathering procedure. For example, operationalizing the IC-guided strategy the GP can more easily say to patient ('with this disease/infection an HIV test is recommended'). On the organizational level, to save time, GPs should consider delegating rapid HIV testing to practice nurses or even lay providers in their practice.^{36, 49}

Financial costs were also mentioned by GPs as barriers to the implementation of new proactive HIV testing strategies. However, the costs of STI tests and medication from the GP are covered by mandatory health insurance, with the patient only having to cover their insurance excess.⁵⁰ The dilemma of accepting or refusing the HIV test based on financial motives should thus be discussed at the insurance and policy levels as this impacts on individual and public health.

It is important to take into account barriers to and facilitators of GPs adopting new proactive HIV testing strategies, as this will assist the implementation process. We noted that GPs are not always aware of the strengths of this strategy and tend to cling to old patterns of risk-based testing. These new proactive HIV testing strategies are, for example, helpful in reducing complex conversations about sexual behaviour and ethnicity.^{9, 51-53} Therefore, these strategies can help to normalize the use of HIV tests and to increase the uptake of HIV testing.^{51, 52, 54}

BLENDED EDUCATIONAL PROGRAMME TO PROMOTE PROACTIVE HIV TESTING

As described in **Chapter 8**, we developed a blended educational programme and investigated the effectiveness of this programme for trainers of GPs in stimulating proactive HIV testing. Educational strategies are often the first step in an implementation process. However, changing GPs' behaviour such that they follow new recommendations and evidence-based guidelines is a complex task.⁵⁵⁻⁵⁷

Our study showed that a blended educational programme had a limited effect on GP trainers' own laboratory-documented HIV testing. The programme appeared to have led to the stabilization, at a higher request level, of the initially stronger downward trend in the 11 GP trainers who were involved in the intervention, indicating that the programme may have had an impact on GP HIV testing levels. Nevertheless, reporting an increase or decrease in GP

laboratory-documented HIV testing levels before and after the programme could not offer any insight into whether GPs followed the new recommendations of the programme. In this regard, we would like to know which patients were tested and why. More research is needed to collect this additional information and to validate the actual impact of an educational programme on GP HIV testing behaviour.

While the educational programme did have an impact on testing behaviour, the overall downward trend in HIV testing by GP trainers was surprising. Even before the guideline was established in 2013, recommending proactive HIV testing, there had been greater interest shown in the professional media for more proactive HIV testing.^{41,42} There are several reasons that might explain this counterintuitive downward trend in GP practices.

Firstly, people from risk groups could have changed their healthcare-seeking behaviour and have decided to be tested for HIV at an STI clinic rather than at the GP. Secondly, another explanation is that due to the compulsory excess payments for primary care, heterosexual people have become more reluctant to have an HIV test than before.^{50, 58} Thirdly, we also hypothesize that GPs may have found a better way to determine those who should or should not be tested. More research is warranted to find out the real reasons for this downward HIV testing trend.

One limitation of the study is that we could not collect the figures on laboratory-documented HIV testing for the majority of the GPs in both the intervention and control groups. Thus, the results should be interpreted with caution, as our findings may not be representative of all participants. In addition, the wide confidence intervals indicate the limited precision of some of our estimates. We vigorously attempted to retrieve this laboratory information, but even after multiple reminders by phone and email not all laboratories agreed or responded to requests to participate in our study. This is a serious drawback faced when implementing a study design in daily reality. *Know your epidemic, know your response*, is an often referred to principle of prevention and control for infectious diseases.⁵⁹ We highly recommend gaining more insight into national and regional laboratory-documented HIV testing trends over time. These trends will help us to identify interventions that are most likely to have the largest impact.

THE ROUTINE OFFER OF HIV TESTING IN EMERGENCY DEPARTMENTS

In **Chapter 9** we reported on a prospective multicentre study in three Dutch emergency departments in which we found a very low number of new HIV infections compared to other countries. This may be due to a lower overall HIV prevalence in the Netherlands.⁶⁰⁻⁶⁴ In addition, the implementation of proactive HIV testing strategies in other healthcare settings could have had an effect on this low percentage; for example, the opt-out of HIV screening

among pregnant women and the routine offer of HIV screening in STI outpatient clinics.^{25, 40} The routine offer of HIV testing in the emergency department was found to not be cost-effective. Therefore, we advise against implementing the routine offer of HIV testing in Dutch emergency departments. As we described in **Chapter 9**, the HIV-infected patients diagnosed as a result of the study both had risk factors for HIV. Targeted HIV testing may offer an alternative approach in this setting. Therefore, we recommend that more effort, including the use of educational strategies, needs to be devoted to creating awareness among emergency department medical specialists about proactive provider-initiated HIV testing strategies in this setting.

THE HIV TESTING WEEK IN AMSTERDAM

To curb the HIV epidemic, a comprehensive public health approach with the most effective interventions needs to be implemented and tailored to the epidemiological, geographical and social context.⁶⁵ Partly due to the high concentration of HIV cases in large cities globally, this has led to new initiatives worldwide, such as the UNAIDS 'Fast-Track Cities Initiative', a worldwide cooperation between cities that are making an extra effort to curb the HIV epidemic.²⁹

Amsterdam has emerged as one of the leaders among the cities that are currently part of this initiative. In order to support the ambition of eliminating HIV, the 'HIV Transmission Elimination AMsterdam' programme (H-TEAM, www.hteam.nl) was set up in 2014.^{29, 66} The H-team has been developing and implementing a combination of interventions to prevent the spread of the virus and to extend HIV testing and its direct linkage to care. For example, an educational training programme for GPs was developed that provides feedback on test performance in order to stimulate proactive HIV testing.⁶⁷ In addition, part of the H-TEAM's programme is to investigate the use of antiviral therapy for HIV prevention in HIV-negative cases, known as pre-exposure prophylaxis (PrEP).^{68, 69} A recent study showed that PrEP for HIV prevention among MSM in the Netherlands is cost-effective.⁷⁰ To date, it is unclear if Dutch GPs are willing to prescribe PrEP and if this setting is suitable for implementing this HIV prevention strategy.

Another initiative of the H-TEAM was the evaluation of the HIV testing week (HTW) in Amsterdam in 2015, described in **Chapter 10**. We found a detection rate of 0.3%, while a British study reported that the routine offer of an HIV test during a national HTW had a detection rate of 0.12%.⁷¹ In addition, a study from the United States showed that a national HTW had a detection rate of 0.7%.⁷² A recent analysis by the Centre for Disease Control and Prevention (CDC) revealed a significant increase in HIV testing and new HIV diagnoses in connection with the national HIV testing day in the United States.⁷³ However, measuring the success of the HTW by comparing detection rates between countries is difficult as the HTW

study design and adult background prevalence of HIV is different between countries. The HTW in Amsterdam was successful in reaching populations at risk of HIV. A more systematic evaluation of the cost-effectiveness of the future editions of the HTW is warranted.

The HTW in Amsterdam incorporated community-based testing and free-of-charge rapid HIV self-tests.^{74, 75} Community-based testing allows providers to strategically reach people most at risk of HIV who may not visit healthcare settings. In the UK, 24,000 certified self-tests were sold in the period between April 2015 and December 2015.^{76, 77} The concerns related to these point-of-care tests are whether people will be effectively linked with medical care after a positive test result, and also that false negative HIV test results can occur.⁷⁵⁻⁷⁷ A previous Dutch study has shown that the free offer of self-tests succeeded in reaching almost 40% of first-time and infrequent testers.⁷⁸ To date, these tests are not well implemented in the Netherlands.⁷⁹ These new HIV testing strategies have the potential to extend HIV testing beyond clinical healthcare settings and may help to reach people who are traditionally less likely to be tested.

CONCLUSIONS AND FURTHER DIRECTIONS

GPs are key players in a proactive HIV testing policy. We found that HIV-infected patients frequently visit their GP, and a large number of these individuals present with ICs in the period prior to HIV diagnosis. To operationalize IC-guided testing, we need to address the barriers to and facilitators of GP-initiated HIV testing. We also recommend that IC-guided testing should be better integrated into future GP guidelines. More research is needed to determine whether the routine offer of an HIV test in high prevalence areas would be feasible and cost-effective in Dutch primary care.

REFERENCES

1. Trienekens SC, van den Broek IV, Donker GA, et al. Consultations for sexually transmitted infections in the general practice in the Netherlands: an opportunity to improve STI/HIV testing. *BMJ Open*. 2013;3(12):e003687.
2. Van Bergen J, Dekker J, Boeke A, et al. NHG standaard: Het soa-consult. *Huisarts Wet* 2013; 56(9):450-463. Available at <https://www.nhg.org/standaarden/volledig/nhg-standaard-het-soa-consult> (accessed October 2016) [In Dutch]
3. Elmahdi R, Gerver SM, Gomez Guillen G, et al. Low levels of HIV test coverage in clinical settings in the U.K.: a systematic review of adherence to 2008 guidelines. *Sex Transm Infect*. 2014;90(2): 119-24.
4. Deblonde J, De Koker P, Hamers FF, et al. Barriers to HIV testing in Europe: a systematic review. *Eur J Public Health*. 2010;20(4):422-32.
5. Burke RC, Sepkowitz KA, Bernstein KT, et al. Why don't physicians test for HIV? A review of the US literature. *AIDS*. 2007;21(12):1617-24.
6. Drayton R, Keane F, Prentice E. Patients' attitudes towards increasing the offer of HIV testing in primary and secondary care. *Int J STD AIDS*. 2010;21(8):563-6.
7. Navaza B, Abarca B, Bisoffi F, et al. Provider-Initiated HIV Testing for Migrants in Spain: A Qualitative Study with Health Care Workers and Foreign-Born Sexual Minorities. *PLoS One*. 2016;11(2): e0150223.
8. Manirankunda L, Loos J, Debackaere P, et al. "It is not easy": challenges for provider-initiated HIV testing and counseling in Flanders, Belgium. *AIDS Educ Prev*. 2012;24(5):456-68.
9. De Cock KM, Johnson AM. From exceptionalism to normalisation: a reappraisal of attitudes and practice around HIV testing. *BMJ*. 1998;316(7127):290-3.
10. Moyer E, Hardon A. A disease unlike any other? Why HIV remains exceptional in the age of treatment. *Med Anthropol*. 2014;33(4):263-9.
11. Vos J, Pype P, Deblonde J, et al. Collecting and registering sexual health information in the context of HIV risk in the electronic medical record of general practitioners: a qualitative exploration of the preference of general practitioners in urban communities in Flanders (Belgium). *Prim Health Care Res Dev*. 2015:1-18.
12. Callander D, Bourne C, Pell C, et al. Recording the sexual orientation of male patients attending general practice. *Fam Pract*. 2015;32(1):35-40.
13. Donker G, Dorsman S, Spreeuwenberg P, et al. Twenty-two years of HIV-related consultations in Dutch general practice: a dynamic cohort study. *BMJ Open*. 2013;3(4).
14. Cardol M, van Dijk L, de Jong JD, et al. Tweede nationale studie naar ziekten en verrichtingen in de huisartspraktijk. *Huisartsenzorg: wat doet de poortwachter?* NIVEL/RIVM; Utrecht/Bilthoven, 2004. Available at http://www.nivel.nl/sites/default/files/bestanden/ns2_rapport2.pdf (accessed October 2016) [In Dutch]
15. Seksuele oriëntatie van mannen vermelden in het dossier van de huisarts? Peter Leusink. *Ned Tijdschr Geneesk*. 2015;159:A8969.
16. HIV Indicator Conditions: Guidance for implementing HIV testing in Adults in Health Care Settings. HIV in Europe; Copenhagen, 2012. Available at <http://hiveurope.eu/Portals/0/Guidance.pdf.pdf> (accessed October 2016)
17. Sullivan AK, Raben D, Reekie J, et al. Feasibility and effectiveness of indicator condition-guided testing for HIV: results from HIDES I (HIV indicator diseases across Europe study). *PLoS One*. 2013; 8(1):e52845.

18. Raben D, Mocroft A, Rayment M, et al. Auditing HIV Testing Rates across Europe: Results from the HIDES 2 Study. *PLoS One*. 2015;10(11):e0140845.
19. Agusti C, Montoliu A, Mascort J, et al. Missed opportunities for HIV testing of patients diagnosed with an indicator condition in primary care in Catalonia, Spain. *Sex Transm Infect*. 2016;92(5):387-92.
20. Bokhour BG, Saifu H, Goetz MB, et al. The role of evidence and context for implementing a multimodal intervention to increase HIV testing. *Implement Sci*. 2015;10(1):22.
21. Saleem JJ, Patterson ES, Militello L, et al. Exploring barriers and facilitators to the use of computerized clinical reminders. *J Am Med Inform Assoc*. 2005;12(4):438-47.
22. Matui P, Wyatt JC, Pinnock H, et al. Computer decision support systems for asthma: a systematic review. *NPJ Prim Care Respir Med*. 2014;24:14005.
23. Hargreaves S, Seedat F, Car J, et al. Screening for latent TB, HIV, and hepatitis B/C in new migrants in a high prevalence area of London, UK: a cross-sectional study. *BMC Infect Dis*. 2014;14:657.
24. Fernandez-Balbuena S, Hoyos J, Rosales-Statkus ME, et al. Low HIV testing uptake following diagnosis of a sexually transmitted infection in Spain: implications for the implementation of efficient strategies to reduce the undiagnosed HIV epidemic. *AIDS Care*. 2016;28(6):677-83.
25. van den Broek IVF, van Aar F, van Oeffelen AAM, et al. Sexually transmitted infections in the Netherlands in 2015. National Institute for Public Health and the Environment (RIVM); Bilthoven, 2016. Available at http://rivm.nl/Documenten_en_publicaties/Wetenschappelijk/Rapporten/2016/juni/Sexually_transmitted_infections_in_the_Netherlands_in_2015 (accessed October 2016)
26. Sogaard OS, Lohse N, Ostergaard L, et al. Morbidity and risk of subsequent diagnosis of HIV: a population based case control study identifying indicator diseases for HIV infection. *PLoS One*. 2012;7(3):e32538.
27. De Vries G, Riesmeijer R. Nationaal Plan Tuberculosebestrijding 2016-2020. Op weg naar eliminatie. RIVM Rapport; Bilthoven, 2016. Available at http://www.rivm.nl/Documenten_en_publicaties/Wetenschappelijk/Rapporten/2016/maart/Nationaal_Plan_Tuberculosebestrijding_2016_2020_Op_weg_naar_eliminatie (accessed October 2016)
28. Lord E, Stockdale AJ, Malek R, et al. Evaluation of HIV testing recommendations in specialty guidelines for the management of HIV indicator conditions. *HIV Med*. 2016.
29. Focus on location and population: on the Fast-Track to end AIDS by 2030. UNAIDS; 2015. Available at http://www.unaids.org/sites/default/files/media_asset/WAD2015_report_en_part01.pdf (accessed October 2016)
30. Schers H, Molleman G, Nieuwboer M, et al. Wijkgerichte aanpak in de eerste lijn werkt. *Med Contact*. 2014;26:1323-25.
31. Increasing the uptake of HIV testing to reduce undiagnosed infection and prevent transmission among black African communities living in England. Public Health Guidance, 33. National Institute for Health and Care Excellence (NICE); 2011. Available at <https://www.nice.org.uk/guidance/ph33> (accessed October 2016)
32. Increasing the uptake of HIV testing to reduce undiagnosed infection and prevent transmission among men who have sex with men. Public Health Guidance, 34. National Institute for Health and Care Excellence (NICE); 2011. Available at <https://www.nice.org.uk/guidance/ph34> (accessed October 2016)
33. Palfreeman A, Fisher M, Ong E, et al. UK national guidelines for HIV testing 2008, Report, London, British HIV Association (BHIVA); 2008. Available at <http://www.bhiva.org/documents/guidelines/testing/glineshivtest08.pdf> (accessed October 2016)

34. Heijnen A, Hermanussen R. Hiv: verdieping naast de NHG-Standaard 'Het Soa Consult'. Utrecht: NHG; 2013. Available at <http://www.sekshag.nl> (accessed October 2016)
35. Glew S, Pollard A, Hughes L, et al. Public attitudes towards opt-out testing for HIV in primary care: a qualitative study. *Br J Gen Pract.* 2014;64(619):e60-6.
36. O'Kelly M, Byrne D, Naughten E, et al. Opt-out testing for blood-borne viruses in primary care: a multicentre, prospective study. *Br J Gen Pract.* 2016;66(647):e392-6.
37. Sicsic J, Saint-Lary O, Rouveix E, et al. Impact of a primary care national policy on HIV screening in France: a longitudinal analysis between 2006 and 2013. *Br J Gen Pract.* 2016.
38. High Health Authority Screening for HIV infection in France - strategies and screening device. Available at http://www.has-sante.fr/portail/upload/docs/application/pdf/2009-10/synthese_depistage_vih_volet_2_vfv_2009-10-21_16-48-3_460.pdf (accessed October 2016) [In French]
39. Screening tests for newborn babies: Heel prick test, Hearing test. RIVM Available at http://www.rivm.nl/Documenten_en_publicaties/Algemeen_Actueel/Brochures/Preventie_Zorg_Ziekte/Hielprik/Screeningen_bij_pasgeborenen_incl_vertalingen (accessed October 2016)
40. Op de Coul EL, Hahne S, van Weert YW, et al. Antenatal screening for HIV, hepatitis B and syphilis in the Netherlands is effective. *BMC Infect Dis.* 2011;11:185.
41. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *N Engl J Med.* 2011;365(6):493-505.
42. Cohen MS, Chen YQ, McCauley M, et al. Antiretroviral Therapy for the Prevention of HIV-1 Transmission. *N Engl J Med.* 2016;375(9):830-9.
43. Lundgren JD, Babiker AG, Gordin F, et al. Initiation of Antiretroviral Therapy in Early Asymptomatic HIV Infection. *N Engl J Med.* 2015;373(9):795-807.
44. Danel C, Moh R, Gabillard D, et al. A Trial of Early Antiretrovirals and Isoniazid Preventive Therapy in Africa. *N Engl J Med.* 2015;373(9):808-22.
45. Toekomstvisie huisartsenzorg: Modernisering naar menselijke maat: Huisartsenzorg 2022. Landelijke Huisartsen Vereniging, Nederlands Huisartsen Genootschap; Utrecht, 2013. Available at http://www.tkv2022.nl/wp-content/uploads/2012/11/LHV001-37-Toekomstvisie-Totaal-Binnenwerk_021112_WWW.pdf (accessed October 2016) [In Dutch]
46. Montoy JC, Dow WH, Kaplan BC. Patient choice in opt-in, active choice, and opt-out HIV screening: randomized clinical trial. *BMJ.* 2016;532:h6895.
47. Bell SA, Delpech V, Casabona J, et al. Delivery of HIV test results, post-test discussion and referral in health care settings: a review of guidance for European countries. *HIV Med.* 2015;16(10):620-7.
48. Bell SA, Delpech V, Raben D, et al. HIV pre-test information, discussion or counselling? A review of guidance relevant to the WHO European Region. *Int J STD AIDS.* 2016;27(2):97-104.
49. HIV testing: WHO recommends HIV testing by lay providers. WHO; 2015. Available at <http://www.who.int/hiv/pub/toolkits/policy-hiv-testing-by-lay-provider/en/> (accessed October 2016)
50. Rijksoverheid. Zorgverzekering. Available at <https://www.rijksoverheid.nl/onderwerpen/zorgverzekering> (accessed August 2016) [In Dutch]
51. Kall MM, Smith RD, Delpech VC. Late HIV diagnosis in Europe: a call for increased testing and awareness among general practitioners. *Eur J Gen Pract.* 2012;18(3):181-6.
52. van Bergen JE. Normalizing HIV testing in primary care. Commentary on: Late HIV diagnoses in Europe: a call for increased testing and awareness among general practitioners. *Eur J Gen Pract.* 2012;18(3):133-5.
53. Wise J. Guidelines call for HIV testing to be "normalised". *BMJ.* 2008;337:a1796.
54. Roura M, Wringe A, Busza J, et al. "Just like fever": a qualitative study on the impact of antiretro-

- viral provision on the normalisation of HIV in rural Tanzania and its implications for prevention. *BMC Int Health Hum Rights*. 2009;9:22.
55. Grol R, Braspenning J, Dijkstra R, et al. Implementatie van NHG-Standaarden: succes of probleem? *Huisarts Wet* 2010;53(1):42-6.
 56. Grol R, Grimshaw J. From best evidence to best practice: effective implementation of change in patients' care. *Lancet*. 2003;362(9391):1225-30.
 57. Grol R, Wensing M. Implementatie, effectieve verandering in de patiëntenzorg. 3e druk. Elsevier Gezondheidszorg, Maarsen.2006.
 58. Bergen JE. Financiële drempel schadelijk voor volksgezondheid. Stop dure soa-tests. *Medisch Contact*, 2013. Available at file:///H:/Downloads/31_32_JanvanBergen_soa-tests%20(1).pdf (accessed October 2016)
 59. Wilson D, Halperin DT. "Know your epidemic, know your response": a useful approach, if we get it right. *Lancet*. 2008;372(9637):423-6.
 60. Van Sighem AI, Gras LA, Smit C, et al. Monitoring Report 2015: Human Immunodeficiency Virus (HIV) Infection in the Netherlands. Amsterdam, Stichting HIV Monitoring; 2015. Available at <http://www.hiv-monitoring.nl/nederlands/onderzoek/monitoring-reports/> (accessed October 2016)
 61. Bath R, Ahmad K, Orkin C. Routine HIV testing within the emergency department of a major trauma centre: a pilot study. *HIV Med*. 2015;16(5):326-8.
 62. Geren KI, Lovecchio F, Knight J, et al. Identification of acute HIV infection using fourth-generation testing in an opt-out emergency department screening program. *Ann Emerg Med*. 2014;64(5):537-46.
 63. Phillips D, Barbour A, Stevenson J, et al. Implementation of a routine HIV testing policy in an acute medical setting in a UK general hospital: a cross-sectional study. *Sex Transm Infect*. 2014;90(3):185-7.
 64. Hsieh YH, Kelen GD, Beck KJ, et al. Evaluation of hidden HIV infections in an urban ED with a rapid HIV screening program. *Am J Emerg Med*. 2016;34(2):180-4.
 65. Jones A, Cremin I, Abdullah F, et al. Transformation of HIV from pandemic to low-endemic levels: a public health approach to combination prevention. *Lancet*. 2014;384(9939):272-9.
 66. Hiv Transmissie Eliminatie Amsterdam. Amsterdam, H-TEAM; 2014. Available at <http://hteam.nl/> (accessed October 2016) [In Dutch]
 67. Verstappen WH, van der Weijden T, Sijbrandij J, et al. Effect of a practice-based strategy on test ordering performance of primary care physicians: a randomized trial. *JAMA*. 2003;289(18):2407-12.
 68. Molina JM, Capitant C, Spire B, et al. On-Demand Preexposure Prophylaxis in Men at High Risk for HIV-1 Infection. *N Engl J Med*. 2015;373(23):2237-46.
 69. McCormack S, Dunn DT, Desai M, et al. Pre-exposure prophylaxis to prevent the acquisition of HIV-1 infection (PROUD): effectiveness results from the pilot phase of a pragmatic open-label randomised trial. *Lancet*. 2015.
 70. Nichols BE, Boucher CA, van der Valk M, et al. Cost-effectiveness analysis of pre-exposure prophylaxis for HIV-1 prevention in the Netherlands: a mathematical modelling study. *Lancet Infect Dis*. 2016.
 71. Bath R, O'Connell R, Lascar M, et al. TestMeEast: a campaign to increase HIV testing in hospitals and to reduce late diagnosis. *AIDS Care*. 2016;28(5):608-11.
 72. Van Handel M, Mulatu MS. Effectiveness of the U.S. national HIV testing day campaigns in

- promoting HIV testing: evidence from CDC-funded HIV testing sites, 2010. *Public Health Rep.* 2014;129(5):446-54.
73. Lecher SL, Hollis N, Lehmann C, et al. Evaluation of the Impact of National HIV Testing Day - United States, 2011-2014. *MMWR Morb Mortal Wkly Rep.* 2016;65(24):613-8.
 74. Implementing HIV Testing in Nonclinical Settings: A Guide for HIV Testing Providers. Centers for Disease Control and Prevention; 2016. Available at http://www.cdc.gov/hiv/pdf/testing/cdc_hiv_implementing_hiv_testing_in_nonclinical_settings.pdf (accessed October 2016)
 75. Consolidated guidelines on HIV prevention, treatment and care for key populations. WHO; Genève, 2016. Available at <http://www.who.int/hiv/pub/guidelines/keypopulations-2016/en/> (accessed October 2016)
 76. Brady M et al. Self-testing for HIV: initial experience of the UK's first kit. Abstract. 22nd Annual Conference of the British HIV Association. Manchester, 2016.
 77. Rodger A and Brady M. DIY Testing. 22nd Annual Conference of the British HIV Association, Manchester, April 2016.
 78. Zuure F, van der Helm J, van Bergen JEAM, et al. Home testing for HIV succeeds in reaching first-time and infrequent testers in the Netherlands: results of the HIVTest@Home trial. Abstract 21st international AIDS conference Durban, South Africa, July 18-22, 2016. WEPEC210. Page 379. Available at http://www.aids2016.org/Portals/0/File/AIDS2016_Abstracts_LOW.pdf?ver=2016-08-10-154247-087 (Accessed October 2016)
 79. Soa-testen, zelf doen of laten (doen)? Soa Aids Nederland; Amsterdam, 2013. Available at <https://www.soaids.nl/sites/default/files/documenten/Professionals/Rapport%20zelftesten%20Soa%20Aids%20Ned%20DEF.pdf> (accessed October 2016)