Proactive HIV testing strategies in primary care
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SUMMARY

PROACTIVE HIV TESTING STRATEGIES IN PRIMARY CARE

Chapter 1 provides an introduction to this thesis and presents an overview of the epidemiology, clinical background and proactive HIV testing strategies in the Netherlands. By the end of 2014, 12% to 34% of HIV-infected individuals (depending on the method used), were estimated to be unaware of their infection. Unfortunately, a high percentage of newly diagnosed HIV-infected patients still present late for care (44%). The World Health Organization (WHO) recommends starting treatment as early as possible in all cases where HIV has been diagnosed, regardless of clinical stage or CD4+ T-cell count. Recent studies have shown that immediate therapy after diagnosis, regardless of CD4+ T-cell count, improves the health prospects of the person being treated. Also, early initiation of therapy greatly reduces the risk of transmission of HIV to sexual partners. These findings further support the need for early detection.

In Chapter 2 we report on information collected from general practitioners (GPs) concerning sexually transmitted infection (STI) consultations, in particular with regard to HIV testing pre- or post-consultation. We used a primary care database (NIVEL) that includes 42-45 practices and 59 GPs, and covers about 0.8% of the total Dutch population, representative for age, gender, geographical distribution and population density. Since 2008, GPs have been requested to complete a report form in each case of an STI-related consultation. As part of our study, a questionnaire was used to request additional information from GPs on STI consultations which did not lead to an HIV test. An HIV test was reported for 40% of the STI consultations concerning risk groups, while in 26% of the consultations in which an HIV test was not performed, an HIV test had been performed in a previous, or was performed in a follow-up, consultation or at an STI clinic. In 23% of the HIV-related consultations, the GP initiated discussion on testing for HIV. Multiple reasons for not testing were reported (for example, the patient had not been at risk, or the patient wavered or refused testing). The choice between ‘rigid’ testing according to the guidelines, and personal, individual patient care rightfully remains at the discretion of GP and patient.

This chapter also investigated the contribution of GPs to the diagnosis of HIV infections in the Netherlands by using the ATHENA national observational HIV cohort, which monitors all individuals who have registered with the 31 HIV treatment centres. Our study showed that GPs diagnose about one-third of all new cases of HIV. Compared to STI clinics, the individuals diagnosed with HIV in general practice were more likely to be older, female, heterosexual men or Sub-Saharan African.

In Chapter 3 we report on a survey conducted among newly diagnosed HIV patients attending the HIV outpatient clinics of two hospitals in Amsterdam. Using questionnaires
we collected information on: 1. the number of consultations and HIV testing in healthcare settings prior to HIV diagnosis; 2. the proportion of HIV-infected patients with an indicator condition (IC) prior to diagnosis; and 3. patient and GP awareness of sexual orientation and ethnicity. GPs were approached for additional information by phone. In the five years prior to HIV diagnosis, 82.9% of the 111 patients had one or more consultations with their GP, but only 34.8% had one or more HIV tests performed during this period. GPs diagnosed 48.3% of all ICs and 39.5% of this group were offered an HIV test at that time. GPs mentioned that of their patients who were men who have sex with men (MSM) they were aware of their sexual orientation in 59.6% of cases, but sexual orientation was documented in the Electronic Medical Record in only 34.0% of the cases. In addition, GPs were aware of the origin of more than half of their patients from HIV endemic countries. Documentation of sexual orientation and ethnicity, and IC-guided testing by GPs could be the starting point for more proactive provider-initiated HIV testing.

**Chapters 4 and 5** report on two studies aimed at investigating the incidence of predefined HIV indicator conditions (ICs) reported in primary care medical records prior to HIV diagnosis. In both studies we performed a cross-sectional search using a matched case-control design to identify which predefined ICs registered by Dutch GPs prior to the time of diagnosis were most associated with an HIV-positive status. In the study reported in Chapter 4, we used a primary care database (HAG net) that collects medical records from six general practices located in the southeast of Amsterdam. A total of 26 predefined ICs were selected from the European Centre for Disease Prevention and Control (ECDC) list of ICs with an associated undiagnosed HIV prevalence of > 0.1%. The selection included all conditions that Dutch GPs can diagnose themselves. Specific ICs were changed into operational definitions for manual searching in the open text fields of the medical records. We found that up to five years prior to HIV diagnosis, in 58.8% of HIV cases, one or more preselected HIV IC had been reported in the patient’s medical record, compared to 7.4% for the controls. In Chapter 4 we also report that patients who developed HIV had, in many cases, visited their GP at least once per year prior to diagnosis, suggesting opportunities to implement proactive HIV testing strategies.

In Chapter 5 we report on data extracted from another primary care database (IPCI) that incorporates data from a considerable proportion (about 10%) of the total Dutch population, making it representative of the general population. We found that in two-thirds (60.8%) of cases, the medical file reported at least one preselected IC in the period up to five years prior to the index date, compared to 18.7% in controls. We also found that 32.1% (95% CI: 17.9 to 50.7) of individuals diagnosed with syphilis had no HIV testing reported in their medical records in the same or follow-up consultation(s); for gonorrhoea this was 44.7% (95% CI: 30.1 to 60.3). ICs are frequently observed in the period prior to HIV diagnosis and may contribute to early detection.

In **Chapter 6** we identify areas in the Netherlands with a high HIV prevalence for purposes of monitoring and prevention. With the use of data from the ATHENA national observational
HIV cohort, Geographic Information System (GIS) techniques were used to map HIV prevalence at the municipality level (the Netherlands) and at the level of city neighbourhoods (in the three largest cities in the Netherlands). The geographical maps showed that ten municipalities in the Netherlands have an HIV prevalence rate of 2 or more per 1,000 inhabitants aged 15-59 years, including Amsterdam (8.1) and its peripheral municipalities, Rotterdam (3.4) and The Hague (2.7). There are significant differences between various neighbourhoods in the three cities. In particular, in Amsterdam, HIV is highly concentrated in two districts: Amsterdam-Centre (9-28) and Amsterdam-Southeast (5-20). In Rotterdam and The Hague, HIV prevalence is lower and there are smaller differences between neighbourhoods. Geographical analyses reveal differences in HIV prevalence rates between Dutch municipalities and neighbourhoods in large cities. This data can be used in devising new interventions to detect HIV in a more targeted manner.

In Chapter 7 we report on a qualitative study performed among GPs to investigate the barriers to and potential facilitators of testing regardless of proactive HIV testing strategies (IC-guided testing and the routine offer of HIV testing in primary care in higher HIV prevalence areas). We combined semi-structured in-depth interviews with focus group sessions. Nine GPs – key informants on STI/HIV prevention and control – were selected for the interviews. Additionally, we organized focus groups with a broad sample of GPs. Various barriers were found that related to the content of these new testing strategies (for example, doubts about testing the right group, too many negative results, competing priorities), their organizational implementation (for example, lack of time; lack of clarity concerning when to repeat the HIV test; a long list of ICs) and the patient population (for example, creating fear among patients; stigmatizing patients, and concerns regarding financial costs). Many GPs stated that performing a sexual risk assessment of patients is important before applying either strategy. Also, they recommended implementing the targeted IC-guided testing strategy only in high prevalence areas and combining HIV tests with other laboratory blood tests. GPs tend to cling to old patterns of risk-based testing. The guiding principle behind both proactive provider-initiated strategies is that avoiding a risk assessment bypasses some of the barriers GPs encounter and thus could help to accelerate HIV testing. It is important to promote awareness of HIV testing and educate GPs about the benefits of these additional proactive provider-initiated HIV testing strategies.

In Chapter 8 we report on an investigation of the effectiveness of a blended educational programme which incorporated evidence-based guidelines and multiple teaching strategies for trainers of GPs to stimulate proactive HIV testing. GP trainers at the Academic Medical Center in Amsterdam were invited to participate in a training programme incorporating evidence-based practice guidelines and multiple teaching strategies, such as interactive lectures, discussion groups, e-learning and quality improvement targets. The GP trainers completed questionnaires before and after the programme to evaluate its effect. We also used six-monthly cumulative laboratory data from 2010 to 2015 to compare changes in HIV-
testing requests by GP trainers involved in the programme to the general trend in requests by non-participating GPs.

Ninety GP trainers participated in the programme. Their median score on achieving their quality improvement targets was high during the programme. Also, the quality of the programme was highly appreciated. Between 2010 and 2013, the mean annual number of laboratory-documented HIV tests decreased by 9.1% in the 624 control GPs, and by 13.0% in the 11 intervention GPs for whom we could collect data on this variable. After the programme in 2014, the annual decreases were 2.3% and 1.8% in the control and intervention groups, respectively. Before the programme, GPs in the intervention group requested 50% more laboratory-documented HIV tests than GPs in the control group. After the programme, the former requested twice as many laboratory-documented HIV tests than the latter. The blended educational programme appeared to have stabilized – at a higher request level – the initially stronger downward trend in the 11 GP trainers undergoing the intervention, indicating that perhaps the programme may have had an impact on GP HIV testing.

In Chapter 9 we report on our investigation into whether a routine offer of HIV testing in emergency departments would be a useful and cost-effective way of identifying undiagnosed HIV-infected patients. In a cross-sectional, multicentre study, eligible adult patients who had a blood test performed (regardless of the indication) were given the choice to also be tested for HIV. In addition, at one hospital, unused stored blood samples (drawn for diagnostic purposes) from patients from whom no informed consent could be obtained were batch-tested anonymously (the samples were not retraceable to patients). A subset of patients were asked about risk factors for HIV infection. A total of 7,577 patients were eligible during the study period and 3,223 patients were tested, resulting in an inclusion rate of 43%. Of the 7,577 patients visiting the emergency department, the prevalence of HIV infection was at least 0.5%, but only two patients were diagnosed with HIV (0.03%). Both patients were at risk of HIV infection, and targeted or diagnostic HIV testing could have been performed at an earlier stage. We did not find any additional HIV infections in the group of patients that were anonymously tested. On the basis of the investigation, we concluded that non-targeted HIV testing at the emergency department was not cost-effective.

In Chapter 10 we evaluate an HIV testing week (HTW), which was organized in Amsterdam in 2015. The HIV testing week was promoted through a multimedia campaign among the people of Amsterdam in general, but also focused in particular on MSM and migrants from HIV endemic countries. The central message of the campaign was: If you are HIV positive, you can live a long and healthy life with good treatment, but you need to know your HIV status. HIV testing was offered free of charge and anonymously in several clinical and nonclinical healthcare settings. A total of 1,231 participants were tested. With three new HIV infections, the detection rate was 0.3% (95% CI 0.26-0.37) and more than half of the participants belonged to one of the groups targeted by the HTW. For 32.7% of the participants, it was the first time that they had been tested, while a further 35.1% had been tested more than one
year prior to the testing week. Healthcare workers were positive about the HIV testing week. Future research needs to investigate whether the HIV testing week is a cost-effective way to identify those who are infected with HIV but are unaware of their diagnosis.

In Chapter 11 we discuss the findings of this thesis in conjunction with relevant international literature in order to reflect on proactive provider-initiated HIV testing strategies in primary care. GPs are key players in a proactive HIV testing policy. We found that HIV-infected patients frequently visit their GP and a large group of these individuals present with ICs in the period prior to HIV diagnosis. To operationalize provider-initiated IC-guided testing, we need to take into account the barriers to and potential facilitators of GP-initiated testing in relation to this strategy. We also recommend that IC-guided testing should be better integrated into future guidelines for GPs. 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.