nchiv22

15th Netherlands Conference on HIV Pathogenesis,
Epidemiology, Prevention & Treatment
22 November 2022, Amsterdam (hybrid conference)

Abstracts

Organisation

The 15th Netherlands Conference on HIV Pathogenesis, Epidemiology, Prevention and Treatment (NCHIV) is organised by:

HIV Monitoring

Rijksinstituut voor Volksgezondheid en Milieu
Ministerie van Volksgezondheid, Welzijn en Sport

nvhb

aidsfonds

aighd | AMSTERDAM INSTITUTE FOR GLOBAL HEALTH & DEVELOPMENT

Acknowledgements

This conference is made possible through contributions from:

Platinum sponsors

ViiV Healthcare BV

Gilead Sciences Netherlands BV

Gold sponsor

MSD Netherlands

Silver sponsor

Janssen-Cilag BV

Sponsors have had no input into the development of the NCHIV programme.

MEDtalks®

KIT Royal Tropical Institute

We would like to thank all presenters, abstract submitters and chairs for sharing and discussing their research results.

Correspondence to:
organisation@nchiv.org

Production: Sacha Boucherie, Ewita Djoechro, Yunka de Waart
Art Direction and DTP: GRAFICARE, Amsterdam

TABLE OF CONTENTS

ORAL PRESENTATIONS

POSTER PRESENTATIONS

01

IMMUNOGENICITY OF AN ADDITIONAL MRNA-1273 SARS-COV-2 VACCINATION IN PEOPLE LIVING WITH HIV WITH HYPORESPONSE AFTER PRIMARY VACCINATION

Marlou Jongkees[1], Daryl Geers[1], Kathryn Hensley[1], Wesley Huisman[2], Corine Geurts van Kessel[1], Susanne Bogers[1], Lennert Gommers[1], Grigorius Papageorgiou[1], Simon Jochems[2], Jan den Hollander[3], Emile Schippers[4], Heidi Ammerlaan[5], Wouter Bierman[6], Marc van der Valk[7], Marvin Berrevoets[8], Robert Soetekouw[9], Nienke Langebeek[10], Anke Bruns[11], Eliane Leyten[12], Kim Sigaloff[7], Marit van Vonderen[13], Corine Delsing[14], Judith Branger[15], Peter Katsikis[1], Yvonne Mueller[1], Rory de Vries[1], Bart Rijnders[1], Kees Brinkman[16], Casper Rokx[1], Anna Roukens[2]

[1] *Erasmus UMC, Rotterdam, the Netherlands*
[2] *Leiden UMC, Leiden, the Netherlands*
[3] *Maasstad Hospital, Rotterdam, the Netherlands*
[4] *Haga Teaching Hospital, The Hague, the Netherlands*
[5] *Catharina Hospital, Eindhoven, the Netherlands*
[6] *UMC Groningen, Groningen, the Netherlands*
[7] *Amsterdam UMC, Amsterdam, the Netherlands*
[8] *Elisabeth-Tweesteden Hospital, Tilburg, the Netherlands*
[9] *Spaarne Gasthuis, Haarlem, the Netherlands*
[10] *Rijnstate Hospital, Arnhem, the Netherlands*
[11] *UMC Utrecht, Utrecht, the Netherlands*
[12] *Haaglanden Medical Centre, The Hague, the Netherlands*
[13] *MC Leeuwarden, Leeuwarden, the Netherlands*
[14] *Medisch Spectrum Twente, Enschede, the Netherlands*
[15] *Flevo Hospital, Almere, the Netherlands*
[16] *OLVG Hospital, Amsterdam, the Netherlands*

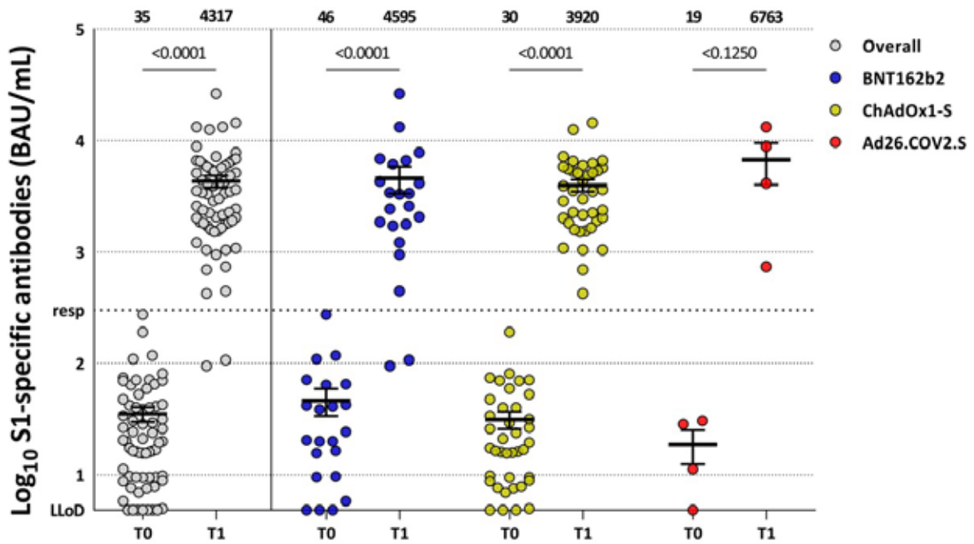
Background
The COVIH study is a nationwide prospective SARS-CoV-2 vaccination study in people living with HIV (PLWH). Of the 1154 PLWH enrolled, 14% showed a reduced or absent antibody response after the primary vaccination regimen. We evaluated whether an additional vaccination boosts immune responses in these hyporesponders.

Methods
Consenting hyporesponders received an additional 100 µg mRNA-1273 vaccination. Hyporesponse was defined as ≤300 spike(S)-specific binding antibody units [BAU]/mL. The primary endpoint was the increase in S1-specific antibodies 28 days after the additional vaccination. Secondary endpoints were the correlation between patient characteristics and antibody response, levels of neutralizing antibodies, S-specific T-cell and B-cell responses, and reactogenicity.

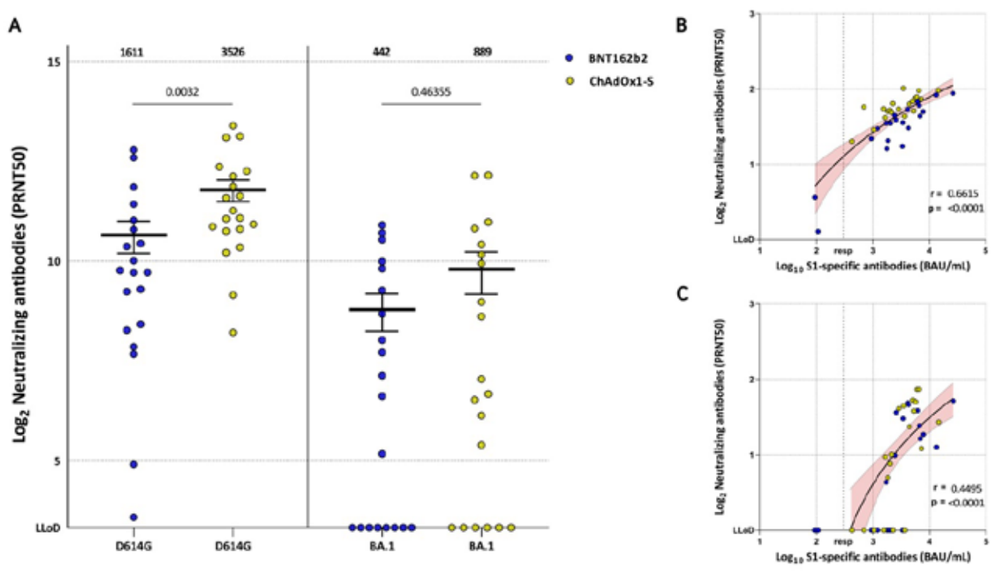
Results
Of the 75 PLWH enrolled, five were excluded as their antibody level had increased to >300 BAU/mL at baseline, two for a SARS-CoV-2 infection before the primary endpoint evaluation and two were lost to follow-up. Forty of the 66 participants had received ChAdOx1-S as primary vaccination, 22 BNT162b2, and four Ad26.COV2.S. The median age was 63 years [IQR:60-66], 86% were male, pre-vaccination and nadir CD4+ T-cell counts were 650/µL [IQR:423-941] and 230/µL [IQR:145-345] and 96% had HIV-RNA <50 copies/mL. The mean antibody level before the additional vaccination was 35 BAU/mL (SEM 5.4) and 45/66 (68%) were antibody negative. After the additional mRNA-1273 vaccination, all of the 45 antibody negative participants seroconverted and antibodies were >300 BAU/mL in 64/66 (97%) with a mean increase of 4282 BAU/mL (95%CI:3241-5323). No patient characteristics correlated with the magnitude of the antibody response, nor did the primary vaccination regimen. After additional vaccination, neutralizing antibodies against the ancestral SARS-CoV-2 were present in all subgroup participants (40/40) and against the Omicron (BA.1) variant in 65% of participants (26/40). The additional vaccination significantly increased the proportion of PLWH with ancestral S-specific T-cells (p=0.037) and ancestral S-specific B-cells (p=0.016), but not the proportion of PLWH with Omicron-specific CD4+ T-cells (p=0.95).

Conclusion
An additional mRNA-1273 vaccination induced a robust serological response in 97% of the PLWH with a hyporesponse after a primary vaccination regimen. This response was observed regardless of the primary vaccination regimen or patient characteristics.

01 (Figure 1)



01 (Figure 2)



02

HIV-INFECTED PEOPLE IN WEST-KENYA AT HIGHER RISK OF SARS-COV-2 INFECTION, SYMPTOMATIC COVID-19, AND COVID-19-RELATED HOSPITALIZATIONS: IMPLICATIONS FOR COVID-19 VACCINE PRIORITIZATION IN PEOPLE LIVING WITH HIV IN KENYA

Sam Sam[1], **Patricia Gómez-Pérez[2]**, Emmanuel Milimo[3], Cem Koyuncu[2], Michael Audi[3], Naomi Onyuka[3], Corrie Mevis Omollo[3], Gregory Ganda[4], Tobias Rinke de Wit[2], Khama Rogo[5]

[1] *University of Nairobi's School of Mathematics, Nairobi, Kenya*
[2] *PharmAccess Foundation, Amsterdam, the Netherlands*
[3] *PharmAccess Foundation, Kisumu, Kenya*
[4] *Kisumu County Department of Health and Sanitation, Kisumu, Kenya*
[5] *African Institute for Health Transformation, Kisumu, Kenya*

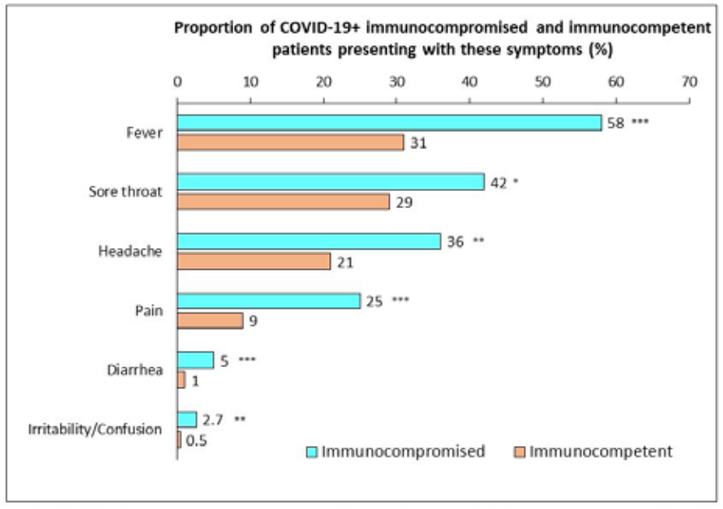
Background
Africa carries the highest burden of HIV globally, hosting 25.7 million out of 37.9 million people living with HIV (PLHIV) worldwide. Studies outside Africa have shown that PLHIV are not at higher risk of acquiring SARS-CoV-2 infections, while other studies including African data have shown that PLHIV are at increased risk of severe COVID-19 and COVID-19-related mortality, possibly associated to lower antiretroviral therapy coverage, inadequate viral load suppression, uncontrolled co-morbidities, and socio-economic factors leading to higher exposure to SARS-CoV-2. Hence, there is no consensus in Africa about the risk of PLHIV to SARS-CoV-2 infection, severe COVID-19, and mortality, nor specific health policies advised.

Methods
We analysed COVID-19 health services data from 111 healthcare facilities digitally connected and covering 14 Counties in the Lake Region Economic Bloc (LREB, West-Kenya) from 26 April 2021-4 September 2022. 62,073 patients with known COVID-19 status (PCR or/and rapid-test results) were included in the analysis. Two sample-test of proportions were performed to compare the percentage of HIV+ patients in the COVID-19+/- groups, the proportion of SARS-CoV-2-fully vaccinated or partially vaccinated versus non-vaccinated patients in the hospitalized/non-hospitalized groups, and the frequency of symptoms among COVID-19+ patients with and without HIV. Relative risk analyses were performed to assess the risk to being diagnosed SARS-CoV-2 infection depending on HIV status, and of hospitalization depending on vaccine status among COVID+ HIV+ patients.

Results
The proportion of HIV+ patients among COVID-19+ individuals was significantly higher than among the COVID-19- (0.81% versus 0.26%; *P < 0.001*). Also, the risk of being diagnosed with COVID-19 was 2.4 higher in HIV+ patients compared with HIV- patients (*P < 0.001*). Among patients diagnosed with COVID-19, HIV+ patients had 2-5 times more frequent COVID-19 symptoms, like fever, sore throat, headache, pain, diarrhea, and irritability/confusion than COVID-19+ HIV- patients **(Figure 1)**. COVID-19+ HIV+ patients are 2.3 times more likely to be hospitalized compared to COVID-19+ HIV- individuals (relative risk analysis; *P = 0.01*). Fully vaccinated HIV+ patients with COVID-19 are 89% less likely to be hospitalized compared to unvaccinated COVID-19+ HIV+ patients (relative risk analysis; *P = 0.01*) **(Figure 2)**.

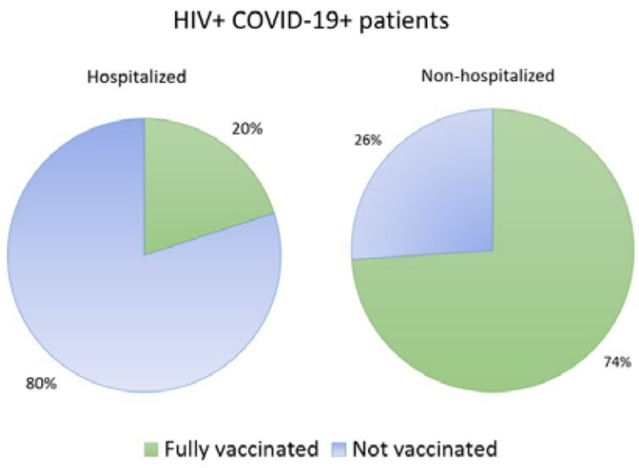
Conclusion
HIV+ patients attending healthcare centers within the LREB network are at larger risk for SARS-CoV-2 infection, COVID-19-related symptoms, and hospitalization. There is a protective effect of full COVID-19 vaccination for HIV+ patients by significantly reduced hospitalization. COVID-19 vaccination in LREB should be included into the standard package of treatment and care of HIV patients.

O2 (Figure 1) Certain COVID-19 symptoms are presented more frequently in immunocompromised (HIV) patients.



Level of significance of two sample test of proportions: ***, P<0.001; **, P<0.01; *, P=0.01.
Certain COVID-19 symptoms are presented more frequently in HIV+ patients

O2 (Figure 2) Fully vaccinated HIV+ individuals are better protected from hospitalization. Vaccinated HIV+ patients are better protected from hospitalization



03

HIV-1 3'-POLYPURINE TRACT MUTATIONS CONFER DOLUTEGRAVIR RESISTANCE BY SWITCHING TO AN INTEGRATION-INDEPENDENT REPLICATION MECHANISM VIA 1-LTR CIRCLES

José Dekker, Bep Klaver, Ben Berkhout, Atze Das

Amsterdam UMC, Amsterdam, the Netherlands

The integrase inhibitor dolutegravir (DTG) is a potent inhibitor of HIV replication and is currently recommended in drug regimens for people living with HIV. Whereas HIV normally escapes from antiviral drugs by acquisition of specific mutations in the gene that encodes the targeted enzyme, recent in vitro studies indicate that mutations in the HIV 3'-polypurine tract (3'PPT) motif, an RNA element that has a crucial role in the viral reverse transcription process, allow HIV replication in the presence of DTG.

Using an in vivo SELEX approach, we discovered that different mutations in the 3'PPT can confer DTG-resistance, suggesting that inactivation of this critical reverse transcription element causes resistance. Analysis of the viral DNA products formed upon infection by these 3'PPT mutants revealed that they replicate without integration into the host cell genome, concomitant with an increased production of 1-LTR circles. Additionally, we demonstrate that replication of 3'PPT mutated virus variants is activated by the HTLV-1 Tax protein, a factor that reverses epigenetic silencing of episomal HIV DNA.

Together, our data indicate that the 3'PPT-mutated viruses escape from DTG by switching to a unique integration-independent replication mechanism. Whether this exotic escape route can also contribute to viral escape in HIV-infected persons remains to be determined, but our results indicate that screening for 3'PPT mutations in patients that fail on DTG therapy is important.

04

THE BAF COMPLEX INHIBITOR PYRIMETHAMINE REVERSES HIV-1 LATENCY IN PEOPLE WITH HIV-1 ON ANTIRETROVIRAL THERAPY

Henrieke Prins[1], Raquel Crespo Galvan[2], Cynthia Lungu[3], Tokameh Mahmoudi[2], Casper Rokx[1], Shringar Rao[4], Letao Li[5], Ronald Overmars[3], Greg Papageorgiou[6], Yvonne Mueller[7], Tonmoy Hossein[4], Tsung Wai Kan[4], Bart Rijnders[1], Hannelore Bax[1], Eric van Gorp[3], Jan Nouwen[1], Dorine de Vries-Sluijs[1], Karin Schurink[1], Mariana de Mendonca Melo[1], Els van Nood[1], Angela Colbers[8], David Burger[8], Robert-Jan Palstra[4], Jeroen van Kampen[3], David van de Vijver[3], Tibeau Mesplede, Peter Katsikis[7], Rob Gruters[3], Birgit Koch[5], Annelies Verbon[1]

[1] *Erasmus MC, Department of Internal Medicine, Rotterdam, the Netherlands*
[2] *Erasmus MC, Department of Biochemistry, Rotterdam, the Netherlands*
[3] *Erasmus MC, Department of Viroscience, Rotterdam, the Netherlands*
[4] *Erasmus MC, Department of Biochemistry, Rotterdam, the Netherlands*
[5] *Erasmus MC, Department of Pharmacy, Rotterdam, the Netherlands*
[6] *Erasmus MC, Department of Biostatistics, Rotterdam, the Netherlands*
[7] *Erasmus MC, Department of Immunology, Rotterdam, the Netherlands*
[8] *Radboudumc, Department of Pharmacy, Nijmegen, the Netherlands*

Background
A major barrier towards HIV-1 cure is the presence of a replication-competent latent reservoir that, upon treatment cessation, can spark viral rebound leading to disease progression. Pharmacological reactivation of the latent HIV-1 reservoir with Latency reversing agents (LRAs) is a first step toward triggering reservoir decay. Inhibitors of the BAF-complex, a key repressor of HIV-1 transcription were identified to act as LRAs, and enhanced the effect of other LRAs such as histone deacetylase inhibitors ex-vivo. We repurposed the licensed drug pyrimethamine as a BAF-inhibitor to investigate its in vivo impact on the HIV-1 reservoir of people living with HIV-1 (PLWH).

Methods
Twenty eight PLWH on suppressive antiviral therapy were randomized in a 1:1:1:1 ratio to receive pyrimethamine; high dose valproic acid; both valproic acid and pyrimethamine; or no intervention for 14 days. The primary endpoint was change in HIV-1 reactivation measured as cell associated (CA)HIV-1 RNA at treatment initiation and at the end of treatment.

Results
We observed a rapid, modest and significant increase in CAHIV-1 RNA in CD4+T-cells in response to pyrimethamine exposure, which persisted throughout the 14 day treatment, concomitant with induction of BAF target genes as biomarkers of pyrimethamine activity as well as detected plasma pyrimethamine levels. Valproic acid treatment alone did not lead to increase in CAHIV-1 RNA, nor did valproic acid augment the latency reversal effect of pyrimethamine. Despite demonstrated latency reversal, pyrimethamine treatment did not result in a reduction in the size of the inducible reservoir as determined by a tat/rev limiting dilution assay. Serious adverse events were not observed, although physician-directed treatment adjustments occurred, particularly when combining valproic acid with pyrimethamine.

Conclusion
These data underline the need for pharmacovigilance in combinatorial clinical strategies and demonstrate that the BAF inhibitor pyrimethamine reverses HIV-1 latency in vivo in PLWH, substantiating its potential in advancement in clinical HIV-1 cure studies to target the proviral reservoir.
Clinicaltrials.gov: NCT03525730

05

EVALUATING THE IMPLEMENTATION OF HOME-BASED SEXUAL HEALTH CARE AMONG MEN WHO HAVE SEX WITH MEN USING THE RE-AIM FRAMEWORK

Hanneke Goense[1], Ymke Evers[1], Christian Hoebe[1], Jonas Manait[2], Nicole Dukers-Muijrers[1]

[1] *Maastricht University/South Limburg Public Health Service, Maastricht, the Netherlands*
[2] *Maastricht University, Maastricht, the Netherlands*

Background
Testing and subsequent treatment concerns an important strategy to improve clinical outcomes and reduce STI/HIV transmission in high-risk groups, such as men who have sex with men (MSM). Home-based sexual health care could reduce perceived barriers for testing and therefore, has the potential to reach MSM who do not (regularly) test for STI/HIV. Our ongoing study aims to systematically assess the implementation process of home-based sexual health care.

Methods
Our Dutch Centre of Sexual health care has recently implemented home-based sexual health care, including self-sampling STI/HIV tests for HIV-negative MSM, who do not use *HIV pre-exposure prophylaxis* (PrEP). Following the RE-AIM framework, we assessed (R) proportion reached population, (E) impact of the implementation, (A) adoption by health care providers, (I) degree of fidelity, and (M) possibility to institutionalise the intervention. This mixed-methods study design presents preliminary results from sexual history questionnaires and STI test results of the first 158 participants and, in-depth interviews with 10 health care providers.

Results
By September 2022, 266 applicants received a self-sampling test. Return rate of the self-sampling STI/HIV test was 64.9% (172/266). Participants who received their self-sampling test results had a median age of 30, the majority (96.2%) had a western background and were highly educated (62%). Of participants, 42.2% were reached through online communication (e.g., health care websites, social media, dating websites), 10.1% through peers. Whereas 31.3% indicated testing at least every six months, four out of ten participants reported never having tested for HIV before (39.2%). Nearly half of the participants (44.3%) would be open to online sexual health counselling, subjects preferably discussed would be PrEP use (52.9%) and, ways of STI/HIV testing (41.4%). The intervention was implemented with high fidelity, as most aspects of were implemented with minor revisions. Needs assessments among health care providers revealed acceptability for adoption and implementation of home-based sexual health care in addition to clinic-based care, mainly due to expected extended reach of MSM. Mentioned barriers to maintaining the implementation were technological infrastructures.

Conclusion
Our study shows that home-based sexual health care has reached MSM who never have tested for HIV before. Home-based care might be an inclusive offer to increase STI/HIV testing. Health care providers assess home-based sexual health care as acceptable for implementation in existing care structures, thereby further lifting infrastructural hurdles. Furthermore, home-based sexual health care may be promising for high-risk groups such as male sex workers and people who use PrEP.

06

HIV TEAMS AS A TOOL TO IMPROVE HIV INDICATOR CONDITION-GUIDED TESTING: THE NECESSITY OF BEING AWARE

Carlijn Jordans[1], Jaap Hanssen[2], Anna Roukens[2], Jeroen van Kampen[1], Femke Mollema[3], Jet Gisolf[4], Rachida El Moussaoui[5], Gonneke Hermanides[6], Bart Rijnders[1], Annelies Verbon[7], Casper Rokx[1]

[1] *Erasmus MC, Rotterdam, the Netherlands*
[2] *LUMC, Leiden, the Netherlands*
[3] *MC Haaglanden, Den Haag, the Netherlands*
[4] *Rijnstate ziekenhuis, Arnhem, the Netherlands*
[5] *Maasstad ziekenhuis, Rotterdam, the Netherlands*
[6] *Rode Kruis ziekenhuis, Beverwijk, the Netherlands*
[7] *UMC Utrecht, Utrecht, the Netherlands*

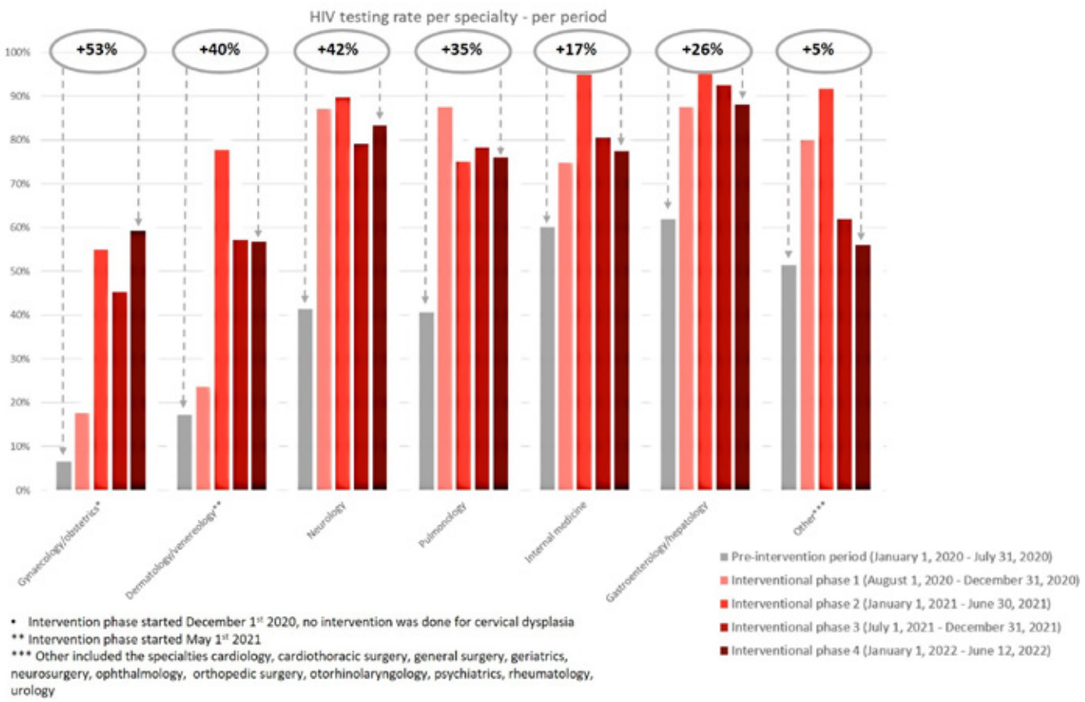
Background
The majority of patients newly diagnosed with HIV in the Netherlands are late presenters and had multiple prior missed opportunities to test for HIV. To stop the HIV epidemic, adequate identification of people unaware of their HIV diagnosis is necessary. A proven key strategy, recommended by (inter)national guidelines, is indicator condition-guided testing. The aim of this study is to evaluate the impact of HIV teams on HIV indicator condition-guided testing in hospitals.

Methods
A single center prospective implementation project was conducted at Erasmus University Medical Center Rotterdam. A two-step approach was used to identify possible HIV indicator conditions by automatic ICD-10 screening, followed by cross-comparing with standardized health insurance (DBC) codes. Data were collected on all patients ≥ 18 years who entered care between January 1st 2020 and June 12th 2022. Flagged indicator conditions were systematically reviewed by the HIV team. Multi-angle intervention started at August 1st 2020 and included proactive testing recommendations from the HIV team for physicians treating patients with HIV indicator conditions. We evaluated HIV indicator condition prevalence and the impact of HIV teams on HIV testing rate overall, per interventional phase and per specialty.

Results
During the study period, a total of 218,211 diagnoses were newly registered. Of these, 18,743 (8.6%) were flagged as possible HIV indicator conditions. After manually reviewing, 2,026 HIV indicator conditions were identified. The overall HIV testing rate was 61.4% (1,244/2,026). In the pre-intervention period, the HIV testing rate was 43%, while after implementing HIV teams, the HIV testing rate was 52.1%, 80.7%, 68.7% and 70.4% for interventional phase 1, 2, 3 and 4, respectively. The overall HIV positivity rate was 0.7% (9/1,244) (pre-implementation 0.4% and post-implementation 0.8%). Looking further at HIV test rates per specialty an increase in HIV testing rate was seen in all specialties with a peak in the first or second interventional phase **(figure 1)**.

Conclusion
Implementing HIV teams increased the HIV testing rates with continued clinical benefit after an initial peak. Our data confirms a gap between indicator condition identification and HIV testing, even after proactive HIV testing advice. Future studies should focus on improving this gap and evaluate the barriers to test for HIV after HIV testing advice is given.

06 (Figure 1) HIV testing rate per specialty - per period



- Intervention phase started December 1st 2020, no intervention was done for cervical dysplasia
** Intervention phase started May 1st 2021
*** Other included the specialties cardiology, cardiothoracic surgery, general surgery, geriatrics, neurosurgery, ophthalmology, orthopedic surgery, otorhinolaryngology, psychiatrics, rheumatology, urology

ORAL PRESENTATIONS

07

CRISPR-CAS ATTACK ON THE HIV-1 PROVIRUS CAN CAUSE UNINTENDED DELETION OF SURROUNDING CELLULAR DNA

Ye Liu, Caroline Binda, Atze Das, Ben Berkhout

Amsterdam UMC, Laboratory of Experimental Virology, UvA, Amsterdam, the Netherlands

Background
Current antiretroviral drugs inhibit active virus replication but do not address the HIV reservoir, meaning that HIV-infected individuals need lifelong therapy. Therefore, novel therapeutic strategies are required to achieve permanent inactivation of this viral reservoir. One option is targeting of the integrated HIV DNA with CRISPR-Cas gene-editing systems. We recently demonstrated that extinction of all infectious HIV provirus in infected T-cell cultures can indeed be achieved by continuous intracellular expression of HIV-targeting CRISPR-Cas systems or by repeated treatment of the cells with the CRISPR-Cas reagents. HIV-inactivation was mostly due to Cas-introduced small insertions/deletions (indels) at the HIV target sites, but also through excision and inversion of the viral DNA fragment between two target sites. We here investigated whether larger deletions involving chromosomal sequences do also occur when the proviral HIV DNA is edited.

Methods
Latently infected Jurkat cells that contain a single proviral DNA copy (Env-Nef-inactivated HIV-1 variant) were stably transduced with lentiviral vectors expressing Cas9 and gRNAs targeting HIV DNA. Latently infected SupT1 cells that contain an integrated doxycycline-inducible HIV-1 variant were transfected 3 times with HIV-targeting Cas9/gRNA or Cas12a/crRNA ribonucleoprotein complexes to ensure maximal editing. The occurrence of unintended large deletions at the targeted sites in the HIV DNA was analysed by a PCR-based sequencing strategy.

Results
We here demonstrate that both continuous and transient CRISPR-Cas attack on integrated HIV DNA not only results in small indels, but also in large deletions that frequently include surrounding cellular DNA sequences. The observed large deletions included the original HIV target, indicating that they are triggered by the on-target DNA cleavage activity.

Conclusion
CRISPR-Cas treatment of HIV-infected cell cultures does not only result in the intended mutational inactivation of the proviral DNA, but can also cause unintended large deletions that may involve cellular DNA sequences surrounding the proviral DNA. As the loss of chromosomal sequences may cause oncogenic transformation, this phenomenon should be studied in detail in the initial patients undergoing a CRISPR-Cas cure treatment.

08

DETECTION OF INTACT HIV PROVIRAL DNA IN THE CNS OF A VIRALLY SUPPRESSED HIV-INFECTED INDIVIDUAL

Marieke Nühn[1], Stephanie Gumbs[1], Pauline Schipper[1], Ninée Buchholtz[1], Gijsje Snijders[2], Frederieke Gigase[2], Annemarie Wensing[1], Lot de Witte[2], Monique Nijhuis[1]

[1] *UMC Utrecht, Utrecht, the Netherlands*
[2] *Icahn School of Medicine at Mount Sinai, New York, United States*

Background
There is compelling evidence that the central nervous system (CNS) can function as a viral reservoir for HIV. HIV DNA has been detected in multiple CNS cells of virally suppressed individuals, of which the microglia are the major cellular reservoir. The question remains, however, whether the DNA detected is intact and capable of producing a replication-competent virus that could fuel rebound viremia.

Methods
Single cell suspension was obtained from fresh human brain tissue of three different brain regions (frontal lobe, occipital lobe and the subventricular zone) of a virally suppressed individual on long-term antiretroviral therapy (ART). Isolation of microglial cells was performed based on expression of CD11b. The presence of intact and defective proviral HIV DNA was quantified by using the intact proviral DNA assay (IPDA) on the CD11b-positive and CD11b-negative cells. Full-length envelope reporter viruses were generated from HIV variants in the CD11b-positive fraction of the frontal lobe and phenotypically characterized in CD4$^+$ T cells.

Results
An estimated 13% of the total detectable proviral DNA in the brain was intact, and was more prevalent in the microglia-enriched (0.52%) than the microglia-depleted fraction (0.19%) **(figure)**. Intact proviral DNA was primarily found in the occipital lobe, whereas defective proviral DNA was more prevalent in the frontal lobe, both in microglia-enriched and microglia-depleted fractions **(figure)**. Phenotypic characterization of the frontal lobe-derived viruses revealed efficient viral entry and replication in CD4$^+$ T cells for all viral clones via the CCR5 HIV co-receptor.

Conclusion
This study supports the presence of intact HIV proviral DNA in microglia in different brain regions, but also within non-myeloid cells which may represent astrocytes or CNS resident CD4$^+$ T cells. Moreover, we provide evidence that the viral envelope region of the viral sequences obtained from the microglia are replication competent and require CCR5 for viral entry. Altogether, this points towards the presence of replication competent virus in the CNS which may fuel viral rebound upon ART interruption. This makes the CNS reservoir an essential component for the success of cure interventions.

O8 (Figure) The intact and defective proviral DNA copies per brain region within the total, microglia-enriched and microglia-depleted fractions per million cells.

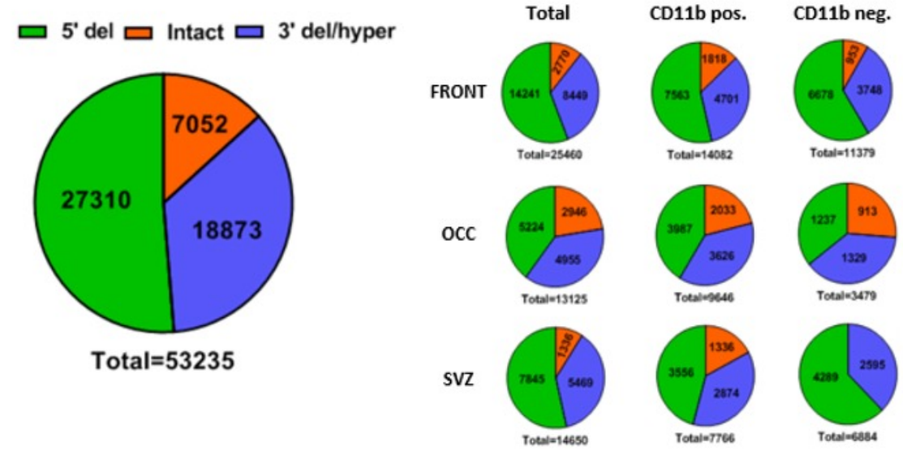


Figure: IPDA on CNS cells. Left pie chart depicts the sum of all intact and defective proviral DNA copies detected. Right pie chart depicts the number of proviral DNA copies detected per brain region within the total (total), microglia-enriched (CD11b pos.) and microglia-depleted (CD11b neg.) cellular fractions per million cells. Values within the pie charts represent the number of intact and defective proviral DNA copies detected per million cells per fraction in each brain region. The total number of proviral DNA copies detected per million cells is written below each chart. FRONT = frontal lobe, OCC = occipital lobe, SVZ = subventricular zone

09

TRANSMISSION OF (DRUG RESISTANT) HIV BETWEEN THE DUTCH CARIBBEAN ISLANDS AND THE NETHERLANDS

Marije Hofstra[1], Bert Rodenburg[2], Ashley Duits[3], Jaclyn de Kort[2], Athalia Alberto[3], Saskia Autar[4], Karina Kelly[2], Monique Nijhuis[1], Marlous Rodriguez[1], Esther Rooijakkers[3], Andert Rosingh[4], Audri Statie[4], Jeroen van Kampen[5], Ard van Sighem[6], Sufi Wadhwani[2], Annemarie Wensing[1], Tulio De Oliveira[7], Eduan Wilkinson[7], Diederik van de Wetering[3]

[1] *UMC Utrecht, Utrecht, the Netherlands*
[2] *Oduber Hospitaal, Oranjestad, Aruba*
[3] *Curaçao Medical Center, Willemstad, Curaçao*
[4] *Fundashon Mariadal Kralendijk Bonaire, Sint Eustatius and Saba*
[5] *Erasmus MC, Rotterdam, the Netherlands*
[6] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[7] *Stellenbosch University, Centre for Epidemic Response and Innovation, Stellenbosch, South Africa*

Background
Following our previously reported high prevalence of pre-treatment NNRTI resistance in Aruba in 2010-2015, we conducted up-to-date surveillance of drug resistance in the Dutch Caribbean islands. This is the first analysis of transmission dynamics between the different islands and the Netherlands.

Methods
Clinical data and all available protease/RT/integrase sequences (sampled mid-1999 to mid-2022) of all individuals with HIV-1 registered in care in Aruba, Bonaire and Curaçao were obtained. Pre-treatment sequences were interpreted using WHO criteria to determine pre-treatment drug resistance. We performed phylogenetic analyses of all prot/RT sequences (n=900), and included reference sequences from distinct geographical regions in the Netherlands (n=961) and publicly available global sequences (n=738).

Results
Resistance testing is increasingly performed before therapy (Table 1). Sequences of integrase were available since 2018 (Aruba n=45, Bonaire n=4, Curaçao n=99). Pre-treatment resistance to NRTIs and PIs is low on all islands and not observed for INSTIs (Table 2). Pre-treatment NNRTI resistance is low in Bonaire and Curaçao, but remains high in Aruba (26%; Table 1).

At least 1 prot/RT sequence (pre- or post-treatment) was available for 315/471 (67%) individuals in Aruba, 19/80 (24%) in Bonaire, and 566/1249 (45%) in Curaçao. Preliminary phylogenetic analysis showed expansion of the previously detected K103N cluster in Aruba from 37 individuals in 2015 to 84 in 2022. K103N was detected in 64/84 sequences, including 59 pre-treatment K103N sequences from Aruba and 3 K103N sequences from Curaçao (2 pre- and 1 post-treatment). The cluster also includes 6 reference sequences from the Netherlands and 1 from Venezuela. 30/84 individuals were not born in Aruba, mainly in Colombia (n=12), Venezuela (n=5), Netherlands (n=5) and Curaçao (n=2). The majority (n=71) report MSM contact, but the cluster also includes one female. Individuals were diagnosed between 2004 and October 2021. One individual was diagnosed in 2020 after presenting with symptoms highly suggestive of acute infection, indicating ongoing transmission within this network.

In addition, several other large transmission networks were detected, which confirm transmission links between the different islands, surrounding countries as well as the Netherlands.

Conclusion
The continued high prevalence of pre-treatment NNRTI resistance in Aruba is explained by persistent circulation of a K103N-strain within a large transmission network. Preliminary analysis suggests transmission networks extending between different Dutch Caribbean islands, the Netherlands and surrounding countries such as Venezuela. This could reflect migration patterns, but in-depth phylogenetic and network analyses are ongoing to better understand the impact of these findings.

O9 (Table 1) Number of new HIV-1 diagnoses and pre-treatment drug resistance testing for Aruba, Bonaire, curaçao and detection of K103N in Aruba.

	Aruba			Bonaire		Curaçao	
Year	Number of diagnoses	Number of pre-ART sequences (% of diagnoses)	Detection of K103N pre-ART (% of sequences)	Number of diagnoses	Number of pre-ART sequences	Number of diagnoses	Number of pre-ART sequences (% of diagnoses)
2021	25	20 (80)	2 (10)	4	2	29	26 (90)
2020	24	18 (75)	3 (17)	3	2	29	26 (90)
2019	28	26 (93)	4 (15)	3	2	25	23 (92)
2018	39	27 (69)	3 (11)	6	2	49	37 (76)
2017	41	38 (93)	14 (37)	1	1	44	26 (59)
2016	36	30 (83)	10 (33)	9	1	50	18 (36)
2015	35	31 (89)	14 (45)	10	0	51	5 (10)
2014	27	24 (89)	8 (33)	4	0	44	3 (7)
2013	13	10 (77)	3 (30)	6	0	73	3 (4)
2012	20	17 (85)	6 (35)	0	0	56	3 (5)
2011	15	11 (73)	1 (9)	3	0	55	1 (2)
2010	17	9 (53)	2 (22)	2	0	44	9 (20)
Subtotal	**325**	**264 (81)**	**70 (27)**	**51**	**10 (20)**	**549**	**180 (33)**
<2010	99	12 (12)	1 (2)	29	1	676	92 (14)
Totaal	**424**	**276 (65)**	**71 (26)**	**80**	**11 (14)**	**1225**	**272 (22)**

09 (Table 2) Prevalence of pre-treatment drug resistance by drug class.

	Aruba	Bonaire	Curaçao
NRTI			
D67N/G	1	0	2
T69D	1	0	0
L74I	1	0	0
V75M	0	0	1
M184I/V	4	0	1
L210W	1	0	1
T215Y	1	0	0
T215revertants	3	0	5
K219E/Q/R	1	1	3
Total	**11 (4.0%)**	**1**	**11 (4.0%)**
NNRTI			
L100I	1	0	0
K101E	0	0	1
K103N	71	0	6
Y181C	1	1	1
G190A	1	0	3
P225H	2	0	0
Total	**71 (25.7%)**	**1**	**8 (2.9%)**
PI			
D30N	0	0	2
M46I/L	3	0	0
F53L	1	0	0
V82A	0	0	1
I85V	0	0	1
N88D	0	0	2
L90M	2	0	2
Total	**6 (2.2%)**	**0**	**7 (2.6%)**
INSTI			
Total	**0**	**0**	**0**

ORAL PRESENTATIONS

O10

REVERSIBILITY OF TAF- AND/OR INSTI-ASSOCIATED WEIGHT GAIN

Myrthe Verburgh[1], Ferdinand Wit[2], Anders Boyd[2], Peter Reiss[1], Marc van der Valk[2]

[1] *Amsterdam UMC, location University of Amsterdam, Infectious Diseases, Amsterdam, the Netherlands*
[2] *HIV Monitoring Foundation, Amsterdam, the Netherlands*

Background
We and others have previously reported that excessive weight gain (WG) is common in virally suppressed people with HIV (PWH) after switching to TAF and/or INSTI. Data on reversibility of TAF and/or INSTI-associated WG are currently limited to case reports.

Methods
From the Dutch ATHENA Cohort, we selected all PWH with ≥7% WG within 24 months after first switch to TAF and/or INSTI whilst being virally suppressed. PWH with comorbidities/co-medication known to be associated with WG were excluded. We subsequently selected those who discontinued only TAF, only INSTI or both TAF+INSTI, with ≥1 weight measurement ≥3 months after discontinuation. Weight changes during the 24 months prior to and following discontinuation were modelled using mixed-effects linear regression, adjusted for age, last available weight prior to discontinuation, sex and region of origin. We compared changes in weight of these individuals to those of PWH with ≥7% WG who continued TAF and/or INSTI (those initiating or discontinuing TAF or INSTI were not included), with ≥1 weight measurement ≥3 months after first recording of ≥7% WG.

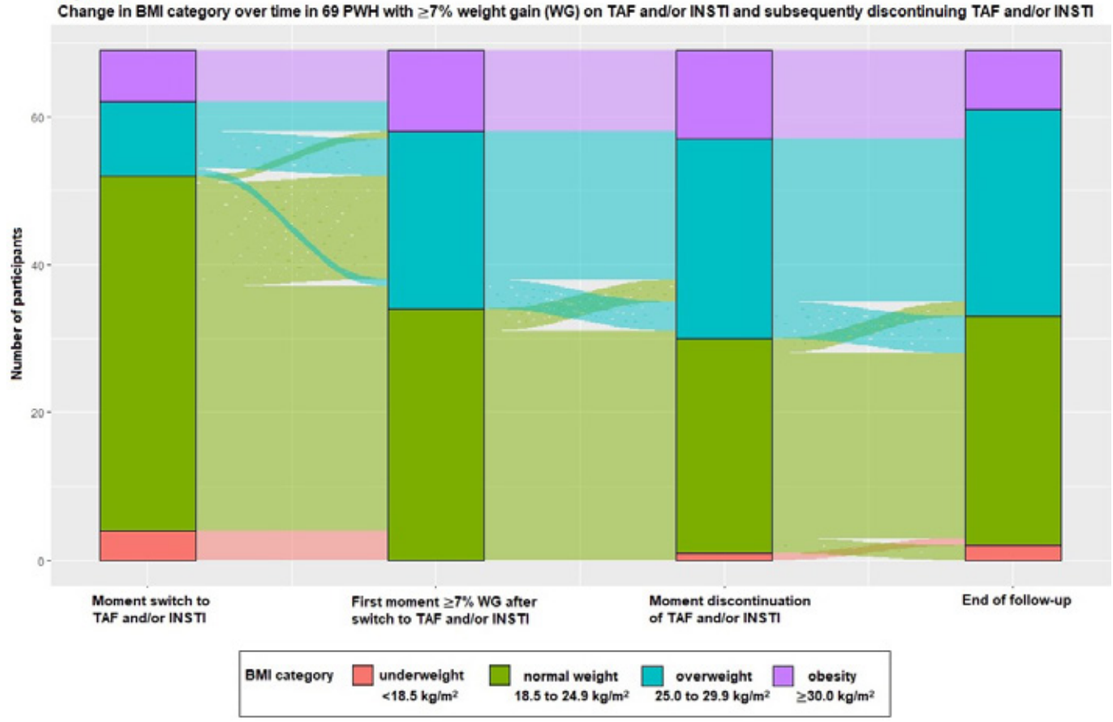
Results
In total, WG ≥7% was observed in 23.1% of the 6,245 PWH switching to TAF and/or INSTI, of whom 165 subsequently discontinued TAF and/or INSTI. Sufficient follow-up (median 24 months (IQR 18-54)) was available for 69/165 **(Table 1)**. Adjusted mean modelled weight change on TAF and/or INSTI in the 24 months prior to discontinuation was +3.20kg [95%CI, 1.02-5.40] in PWH who subsequently discontinued only TAF (n=21); +5.98kg [3.34-8.37] in those who discontinued only INSTI (n=37) and +5.84 [2.06-9.30] in those who discontinued TAF+INSTI (n=11). In the 24 months after discontinuation, adjusted mean modelled weight change in those three groups was -1.48kg [-4.24 to +1.27]; -2.73kg [-6.22 to +0.66] and -7.95kg [-15.57 to -0.33], respectively. Reductions in proportions overweight/obesity were observed in all three groups, but these were markedly less pronounced than the BMI category shifts having occurred whilst on TAF and/or INSTI **(Figure 1)**. In the 800 PWH who continued TAF and/or INSTI (245 only TAF; 347 only INSTI; 208 TAF+INSTI), the adjusted mean modelled weight change in the 24 months after first recording of ≥7% WG was -0.77kg [-1.32 to -0.21].

Conclusion
TAF and/or INSTI-associated WG of ≥7% appears to be partly reversible after discontinuing TAF and/or INSTI, with relatively modest improvement in BMI category. In contrast, in those continuing TAF and/or INSTI after first having ≥7% WG recorded, weight remained relatively unchanged.

Table 1. Characteristics of 69 PWH with ≥7% WG before starting and after stopping either TAF, INSTI or both; versus 800 PWH with ≥7% WG continuing TAF and/or INSTI

	Stopping only TAF N = 21	Stopping only INSTI N = 37	Stopping both TAF+INSTI N = 11	Continuing TAF and/or INSTI N = 800
Male gender	15 (71.4%)	30 (81.1%)	10 (90.9%)	636 (79.5%)
Regimen prior to stop TAF/INSTI				**Current regimen**
- Only TAF	20 (95.2%)	-	-	245 (30.6%)
- Only RAL	-	11 (29.7%)	-	48 (6.0%)
- Only EVG	-	2 (5.4%)	-	21 (2.6%)
- Only DTG	-	19 (51.4%)	-	278 (34.8%)
- TAF+EVG	0 (0.0%)	2 (5.4%)	6 (5.5%)	153 (19.1%)
- TAF+DTG	1 (4.8%)	3 (8.1%)	0 (0.0%)	16 (2.0%)
- TAF+BIC	0 (0.0%)	0 (0.0%)	5 (45.5%)	39 (4.9%)
BMI at start TAF/INSTI				
- <18.5 kg/m²	0 (0.0%)	3 (8.1%)	1 (9.1%)	35 (4.5%)
- 18.5 to 24.9 kg/m²	16 (76.2%)	25 (67.6%)	7 (63.6%)	462 (59.0%)
- 25.0 to 29.9 kg/m²	3 (14.3%)	5 (13.5%)	2 (18.2%)	218 (27.8%)
- ≥30.0 kg/m²	2 (9.5%)	4 (10.8%)	1 (9.1%)	68 (8.7%)
BMI at stop TAF/INSTI				*Not applicable*
- <18.5 kg/m²	0 (0.0%)	1 (2.7%)	0 (0.0%)	
- 18.5 to 24.9 kg/m²	9 (42.9%)	17 (46.0%)	3 (27.3%)	
- 25.0 to 29.9 kg/m²	9 (42.9%)	12 (32.4%)	6 (54.6%)	
- ≥30.0 kg/m²	3 (14.3%)	7 (18.9%)	2 (18.2%)	
BMI at end of follow-up				
- <18.5 kg/m²	0 (0.0%)	2 (5.4%)	0 (0.0%)	14 (1.8%)
- 18.5 to 24.9 kg/m²	9 (42.9%)	18 (48.7%)	4 (36.4%)	309 (38.6%)
- 25.0 to 29.9 kg/m²	10 (47.6%)	13 (35.1%)	5 (45.4%)	302 (37.8%)
- ≥30.0 kg/m²	2 (9.5%)	4 (10.8%)	2 (18.2%)	175 (21.9%)
Follow-up after stop TAF/INSTI, months, median (IQR)	12 (6 – 18)	24 (12 – 24)	12 (6 – 18)	*Not applicable*
Follow-up after first recording of ≥7% WG, months, median (IQR)	*Not applicable*	*Not applicable*	*Not applicable*	24 (18 – 24)

Figure 1.
Change in BMI category over time in 69 PWH with ≥7% weight gain (WG) on TAF and/or INSTI and subsequently discontinuing TAF and/or INSTI



O11

DEVELOPMENT OF A SEXUAL HEALTH-COUNSELLING PROGRAM FOR HIV CARE PROVIDERS DURING ROUTINE CONSULTATIONS; AN INTERVENTION MAPPING APPROACH

Suzanne de Munnik[1], John de Wit[2], Heidi Ammerlaan[1], Gerjo Kok[3], Sigrid Vervoort[4], Chantal den Daas[5]

[1] *Catharina Ziekenhuis, Eindhoven, the Netherlands*
[2] *Utrecht university, Utrecht, the Netherlands*
[3] *Maastricht university, Maastricht, the Netherlands*
[4] *Julius Center for Health sciences and Primary Care, Utrecht, the Netherlands*
[5] *University of Aberdeen, Aberdeen, United Kingdom*

Background
HIV-care providers experience difficulties discussing sexual health with their patients. However, providers do realise that sexuality should be addressed, because without discussing sexual health, problems may go unnoticed, advice cannot be given, no treatment plan established, and psychosocial implications cannot be addressed. HIV-care providers experience barriers preventing them from discussing sexual health. We developed a theory and evidence-based intervention, guided by the Intervention Mapping approach, to improve sexual health counselling and promote discussing sexuality by HIV care-providers.

Methods
We applied the six steps of Intervention Mapping (IM): an initial needs assessment to thoroughly understand the problem (step 1); formulation of the program objectives (step 2); selection of theory-based methods (step 3); program development (step 4); developing an implementation plan (step 5); and developing an evaluation plan focused on an assessment of behavioural determinants and sexual health counselling behaviour before and after the training through four consecutive online surveys (step 6).

Results
Step 1 consisted of focus groups and online surveys among HIV-care providers. Findings confirmed the need for an intervention targeting HIV care providers. In step 2 we formulated detailed program objectives. In step 3 we identified behavioural determinants, specifically attitude, knowledge, self-efficacy, and communication skills. These determinants guided the development of a two–day sexual health training programme, including interactive skills building with professional actors (Step 4). The two-one day training was attended by 37 day-one and 19 day-two HIV-care providers (Step 5). Descriptive analysis of data collected in step 6 showed that after the training, participants were more likely to initiate discussion on sexual health during routine HIV consultation, also when a third party is present (important barrier) and made us of bridging topic as learned. Also, they perceived their skills and self-efficacy had increased.

Conclusion
The training program enabled HIV-care providers to initiate sexual health during routine consultations. The IM approach facilitated to work through a structured, iterative, bottom-up, participatory process to develop the training to promote sexual health counseling in a real-life setting and to use evidence and theory. To promote sexual health counselling by HIV care providers it is important that they express confidence in their ability to discuss sexuality. Suggestions for the planning of support interventions highlights the importance of training with real-life case studies with professional actors experienced in the sexual healthcare sector.

O12

ASSESSING THE HIV CARE CONTINUUM AMONG TRANSGENDER WOMEN BETWEEN 2010 AND 2020 IN THE NETHERLANDS: DOES HIV CARE ENGAGEMENT DIFFER FROM THAT OF MEN WHO HAVE SEX WITH MEN?

Vita Jongen[1], Ceranza Daans[1], Ard van Sighem[2], Maarten Schim van der Loeff[1], Kris Hage[1], Camiel Welling[1], Alex von Vaupel-Klein[1], Martin den Heijer[3], Edgar Peters[3], Marc van der Valk[2], Peter Reiss[2], Maria Prins[1], **Elske Hoornenborg**[1]

[1] *Public Health Service Amsterdam, Amsterdam, the Netherlands*
[2] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[3] *Amsterdam UMC, Amsterdam, the Netherlands*

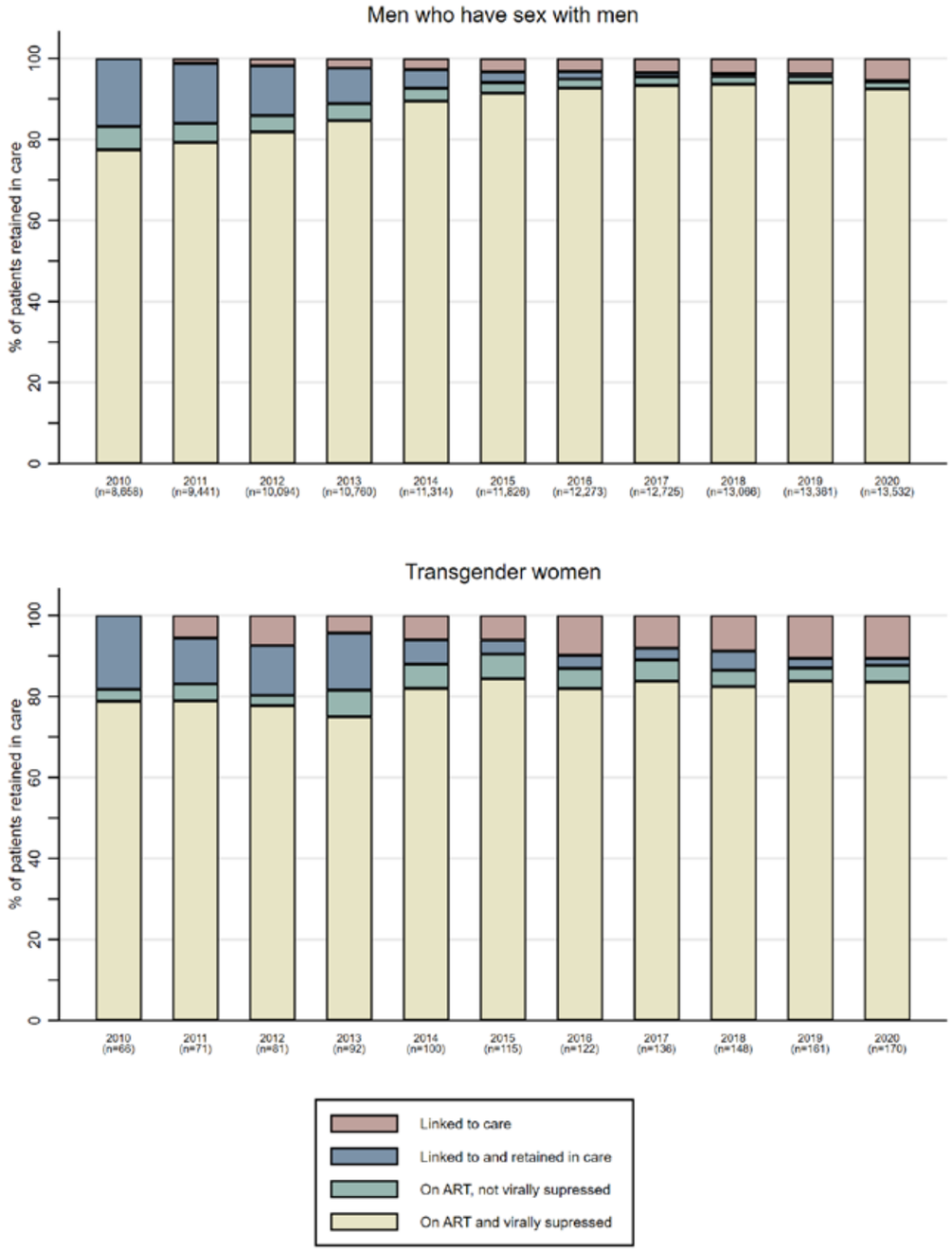
Introduction
Transgender women are at increased risk for acquiring HIV and earlier studies observed low retention in HIV care, as well as lower rates of antiretroviral therapy (ART) uptake, adherence and viral suppression. We compared HIV care retention between transgender women and men who have sex with men (MSM) in the Netherlands. Additionally, we compared the proportion of new HIV diagnoses those in care per year and proportion of late presenters.

Methods
Using data from the ATHENA cohort and a repeated cross-sectional design, we assessed the different stages of the HIV care continuum (linkage to care, retention in care, ART use, and viral suppression) among transgender women and MSM between 2010 and 2020. We described new HIV diagnoses among all individuals living with HIV within a calendar year. The proportion of individuals with a late diagnosis was calculated by dividing the number of late presenters (defined as a CD4 count of <350 cells/µl or an AIDS-defining event) by the number of newly diagnosed individuals in a given year.

Results
Between January 2010 and December 2020, 15,371 individuals attended at least one clinic visit; 188 (1%) transgender women and 15,183 (99%) MSM. Over time, the majority of transgender women and MSM were retained in care, received ART and were virally suppressed (Figure), albeit with greater gaps for transgender women than MSM. Of 170 transgender women and 13,532 MSM linked to care in 2020, fewer transgender women than MSM were retained in care (89% vs 95%, p=0.004), used ART (88% vs. 94%, p<0.001) and were virally suppressed (84% vs. 92%, p<0.001). The proportion of transgender women newly diagnosed with HIV ranged from 6% (4/67) in 2010 to 6% (9/156) in 2020; for MSM, this varied from 8% (699/8,756) in 2010 to 2% (215/12,892) in 2020. The proportion of transgender women who were late presenters varied between 25% and 75% over time, while for MSM it varied between 37% and 46%.

Conclusion
Over a 10 year time period, the vast majority of transgender women and MSM diagnosed with HIV in the Netherlands were linked to and retained in care, received ART and were virally suppressed. the HIV care continuum for transgender women continues to lag behind across its stages and late presentation remains more common. Identifying barriers to HIV care and designing targeted interventions, jointly with the transgender community, will be crucial to improve HIV care retention and outcomes.

012 (Figure 1) Linkage to and retention in care, cART use and viral suppression among transgender women and men who have sex with men between 2010 and 2020, the Netherlands.



ORAL PRESENTATIONS

013

ELIMINATION OF THE HIV-1 VIRAL RESERVOIR USING DDX3 INHIBITORS

Jade Jansen, Stefanie Kroeze, Shirley Man, Carla Ribeiro, Neeltje Kootstra, Teunis Geijtenbeek

Amsterdam UMC, Amsterdam, the Netherlands

Background
Persistence of the HIV-1 reservoir in effectively treated people living with HIV remains the biggest obstacle to a cure. A potential cure strategy involves reactivation of latent HIV-1 and subsequent clearance of infected cells. Several latency reversal agents (LRAs) have been identified, but clearance of the reactivated HIV-1 reservoir is still hampered. HIV-1 utilizes the host factor DDX3 for viral mRNA nuclear export and translation. Inhibition of DDX3 results in nuclear accumulation of viral mRNA, thereby triggering apoptotic processes only in the reactivated reservoir. Here, we investigated the functional impact of DDX3 as a molecular target for promoting selective cell death of the reactivated cellular reservoir. To this end, small molecule DDX3 inhibitor (DDX3i) in combination with known LRA was used to evaluate elimination of the HIV viral reservoir.

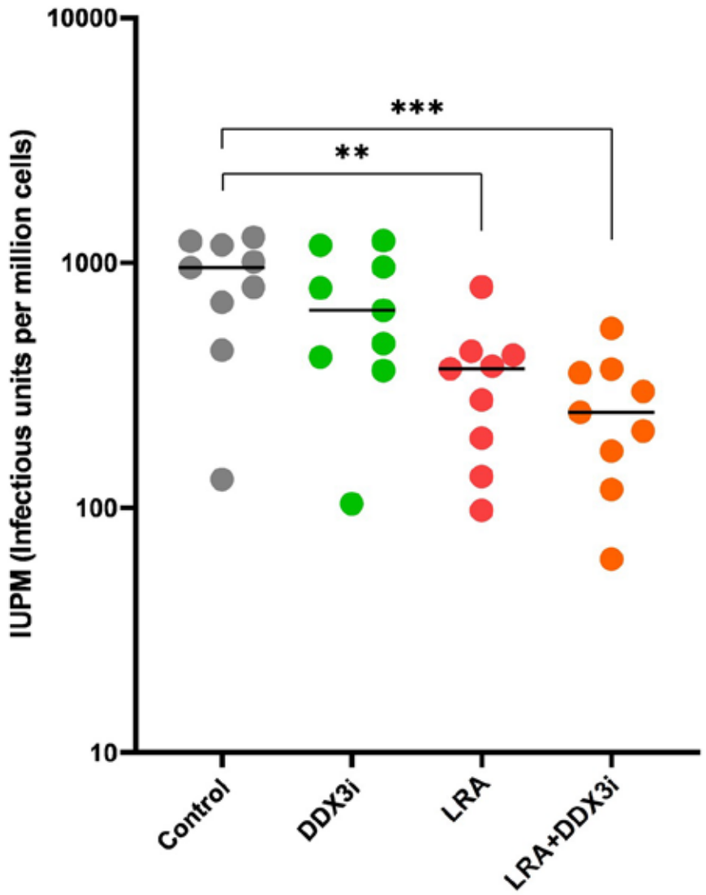
Methods
SupT1 cell line and human primary cells were infected with a reporter virus that allows distinction between active or latently infected cells. , and subsequently incubated with DDX3i, LRA or DDX3i-LRA combination. The size of the viral reservoir in peripheral blood mononuclear cells (PBMC) from people living with HIV on antiretroviral therapy was measured by a TZM-BL cells based assay, upon reservoir reactivation by phytohemagglutinin. The effect of DDX3i, LRA or DDX3i-LRA combination on viral latency and the size of the viral reservoir was determined.

Results
In SupT1, DDX3i alone did not affect the proportion of latently infected cells but reduced the number of actively infected cells, which suggests that DDX3i does not reactivate HIV-1 reservoirs, but rather induces apoptosis of actively HIV-1 infected cells. The DDX3i-LRA combination reduced the proportion of latently as well as actively infected cells by 3- and 2-fold, respectively. Moreover, in human primary cells, the DDX3i-LRA combination resulted in a decrease of both latently and actively infected cells (13% and 17%, respectively) compared to untreated cells (18% latent and 48% active infection).

When PBMC obtained from people living with HIV on antiretroviral therapy were treated with the DDX3i and LRA for 48 hours, a 2.2-fold reduction of the reservoir upon treatment with an LRA (p=0.0015) and a 3-fold reduction upon DDX3i-LRA treatment (p=0.0006) was observed (Figure 1).

Conclusion
Our findings underscores the potential of a novel combination therapeutic strategy involving inhibition of host factor DDX3 to selectively induce cell death of reactivated latently infected HIV-1 cells *in vitro* as well as reduce HIV-1 viral reservoir *ex vivo*.

O13 (Figure 1) Reduction of the viral reservoir in PBMC from people living with HIV upon ex-vivo treatment using DDX3i-LRA combination.



ORAL PRESENTATIONS

O14

PROGRESS TOWARDS WHO HCV ELIMINATION INCIDENCE TARGETS AMONG PEOPLE WITH HIV: FINDINGS FROM THE INTERNATIONAL COLLABORATION ON HEPATITIS C ELIMINATION IN HIV COHORTS

Daniela van Santen[1], Rachel Sacks-Davis[2], Anders Boyd[3], Jim Young[4], Ashleigh Stewart[2], Joseph Doyle[2], Marc van der Valk[3], Colette Smit[3], Andri Rauch[5], Catrina Mugglin[5], Inmaculada Jarrin[6], Juan Berenguer[7], Jeffrey Lazarus[8], Karine Lacombe[9], Dominique Salmon[10], Linda Wittkop[11], Marina Klein[4], Gail Matthews[12], Tim Spelman[2], Maria Prins[13], Mark Stoové[2], Margaret Hellard[2]

[1] *Burnet Institute and GGD Amsterdam, Amsterdam, the Netherlands*
[2] *Burnet Institute, Melbourne, Australia*
[3] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[4] *McGill University, Montreal, Canada*
[5] *University of Bern, Bern, Switzerland*
[6] *Instituto de Salud Carlos III, Madrid, Spain*
[7] *Hospital General Universitario Gregorio Marañón, Madrid, Spain*
[8] *Barcelona Institute for Global Health, Barcelona, Spain*
[9] *Sorbonne Université, Paris, France*
[10] *Université Paris Descartes, Paris, France*
[11] *University of Bordeaux, Bordeaux, France*
[12] *The Kirby Institute, Sydney, Australia*
[13] *GGD Amsterdam, Amsterdam, the Netherlands*

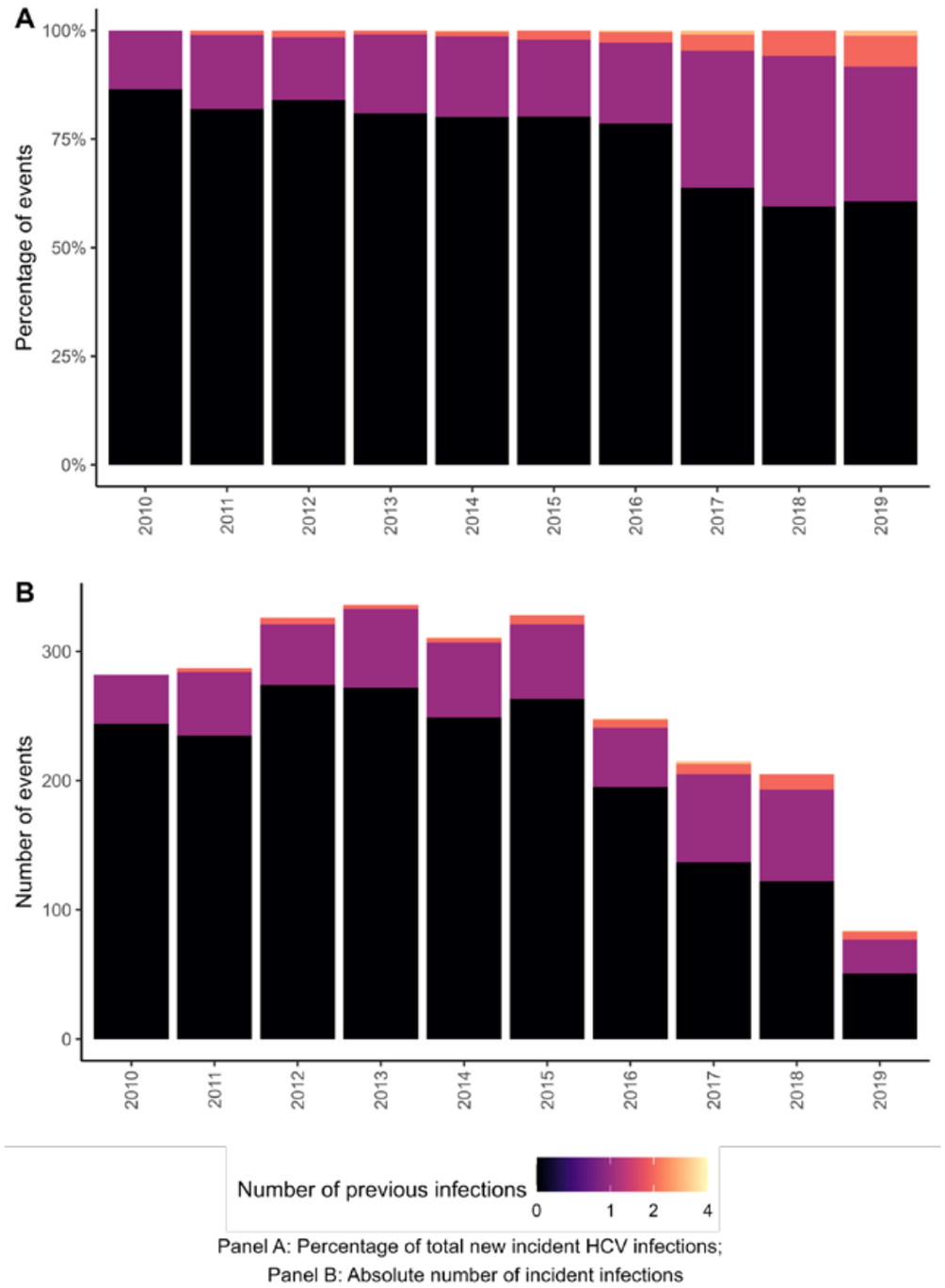
Background
The World Health Organization (WHO) set targets to eliminate hepatitis C virus (HCV), including reducing HCV incidence by 30% in 2020 and 80% in 2030, compared to 2015. As HCV infection is more common among people with HIV (PHIV) than HIV-negative individuals, we aimed to assess trends in primary (first) infection and reinfection incidence among PHIV, and the relative contribution of primary and reinfection infections to the total number of new infections over time.

Methods
We used pooled data from six cohorts from the International Collaboration on Hepatitis C Elimination in HIV Cohorts (InCHEHC), including data from Australia, France, the Netherlands, Switzerland and Spain (2010-2019). For primary incidence, follow-up started from the first negative HCV-antibody test date until the last negative antibody test or estimated infection date. For reinfection, follow-up started from the first negative HCV RNA test indicating treatment or spontaneous clearance until the last negative HCV RNA test or estimated reinfection date. Poisson regression was used to calculate annual rates. To assess the relative contribution of infection type, we divided the sum of all incident infections per infection type, including multiple reinfections, by the sum of all incident infections by year.

Findings
Overall, 45,942 participants at risk of primary infection were followed over 248,189 person-years (PY), with an overall primary incidence of 0.82 per 100 PY (95%CI=0.78, 0.86) between 2010-2019. For reinfection, 8,222 participants were followed for 23,612 PY, with an overall first reinfection incidence of 3.8 per 100 PY (95%CI=3.5, 4.1). Both primary and reinfection incidence decreased over time. When comparing 2015 to 2019: primary incidence decreased by 49%, from 0.81 per 100 PY (95%CI=0.76, 0.86) to 0.41 per 100 PY (95%CI=0.35, 0.47), and reinfection incidence decreased by 27%, from 4.3 per 100 PY (95%CI=3.8, 4.9) to 3.1 per 100 PY (95%CI=2.5,3.8), respectively. Most incident HCV infections could be attributed to primary infection. The proportion of incident HCV infections due to reinfection increased, from 18% in 2010 to 45% in 2019 (Figure 1).

Conclusion
InCHEHC countries are on track to meet the WHO's incidence reduction target among PHIV, likely due to the availability and high uptake of DAAs. Whilst incidence has declined, reinfection incidence has declined at a slower rate than primary incidence and its relative contribution to the current epidemic has grown since DAAs were introduced. This highlights the importance of continued monitoring in people at risk of reinfection in our efforts to eliminate HCV.

014 (Figure 1)



Panel A: Percentage of total new incident HCV infections;
Panel B: Absolute number of incident infections

POSTER PRESENTATIONS

P1

DOLUTEGRAVIR/LAMIVUDINE IS CLINICALLY NON-INFERIOR TO DOLUTEGRAVIR BASED TRIPLE DRUG ANTIRETROVIRAL THERAPY: 1 YEAR RESULTS OF THE DUALING PROSPECTIVE MATCHED REAL-WORLD COHORT STUDY

Marta Vasylyev[1], Ferdinand Wit[2], Robin Soetekouw[3], Steven van Lelyveld[3], G.J. Kootstra[4], C. Delsing[4], Heidi Ammerlaan[5], M.E.E. van Kasteren[6], A.E. Brouwer[6], Eliane Leyten[7], M.A.A. Claassen[8], R.J. Hassing[8], Jan den Hollander[9], M. van den Berge[10], Marc van der Valk[2], Bart Rijnders[1], Casper Rokx[1].

[1] *Erasmus MC, Rotterdam, the Netherlands*
[2] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[3] *Spaarne Gasthuis, Haarlem, the Netherlands*
[4] *Medisch Spectrum Twente, Enschede, the Netherlands*
[5] *Catharina Ziekenhuis, Eindhoven, the Netherlands*
[6] *Elisabeth Tweesteden Ziekenhuis, Tilburg, the Netherlands*
[7] *Haaglanden Medisch Centrum, Den Haag, the Netherlands*
[8] *Rijnstate Ziekenhuis, Arnhem, the Netherlands*
[9] *Maasstadziekenhuis, Rotterdam, the Netherlands*
[10] *Admiraal de Ruyter Ziekenhuis, Eindhoven, the Netherlands*

Background
Dolutegravir/lamivudine (DTG/3TC) is recommended for treatment-naïve and -experienced people with HIV (PWH). Real-world clinical efficacy of this dual regimen compared to well-matched controls continuing triple drug DTG-based regimens is unavailable.

Materials and Methods
DUALING is a prospective cohort study embedded within the Dutch ATHENA cohort to compare treatment outcomes of switching from DTG-based triple antiretroviral therapy (ART) to DTG/3TC in well-suppressed PWH without prior virological failure (cases) with matched controls continuing DTG-based triple ART. We matched the first 390 consecutive cases 1:2 to 780 controls by age, sex, HIV acquisition category, absent prior virological failure, pre-ART CD4+T-cells and viral load. Follow-up for controls started at the visit date closest to the matched case DTG/3TC start. We report 1-year outcomes in the 'on treatment' population with treatment failure defined as (1) 2 consecutive viral loads >50cps/mL, or (2) 1 viral load >50cps/mL directly followed by ART switch, death or lost-to-follow-up. Individuals switching ART or becoming lost-to-follow-up with viral loads <50cps/mL were censored.

Results
The 1170 participants were median 48.1 years (37.9-56.8), 88.2% males, 94.1% acquired HIV sexually, median pre-ART CD4+T-cell count 315 (190-480) and viral load 70,900cps/mL (23,000-210,000). Ten (2.6%) cases and 18 (2.3%) controls became lost-to-follow-up with viral load <50cps/mL. Eighteen (4.6%) cases and 138 (17.7%) controls switched ART with viral loads <50cps/mL. Of the remaining 362 cases and 624 controls, 5 (1.4%) and 6 (1.0%) experienced treatment failure (p=0.54). One case and 2 controls had treatment failure because they switched ART with 1 viral load between 50-200cps/mL. Four cases and 4 controls had treatment failure because of 2 consecutive viral loads >50cps/mL. Of these 8, 2 controls had peak viremia >200cps/mL (440 and 1120cps/mL). Two in each group re-suppressed to <50cps/mL without ART switch, and two in each group continued having low-level viremia without ART switch. The treatment failure risk difference for cases compared to controls was +0.42% (95%CI -1.01-+1.85%).

Conclusion
Switching to DTG/3TC in well-suppressed PWH was highly efficacious and non-inferior after 1 year compared to matched controls on DTG-based triple ART in a real-world setting.

P2

ONE YEAR OF FOLLOW-UP AFTER SWITCHING TO DORAVIRINE IN TREATMENT EXPERIENCED HIV-PATIENTS

Vincent Lanting, Piter Oosterhof, Daoud Ait Moha, Roos van Heerde, Marie Jose Kleene, Janneke Stalenhoef, Marieke de Regt, Saskia Vrouenraets, Guido van den Berk, Kees Brinkman

OLVG, Amsterdam, the Netherlands

Background
Doravirine is a non-nucleoside reversed transcriptase inhibitor with demonstrated effect as third agent in treatment naive and experienced people living with HIV (PLWH). Real-world data studies are still scarcely available.

Aim
To evaluate efficacy and tolerability of doravirine based regimens one year after cART-switch in treatment-experienced and virologically suppressed PLWH.

Methods
A retrospective analysis was done of all treatment-experienced, virologically suppressed PLWH in a Dutch HIV-treatment center (OLVG Amsterdam) for whom doravirine was prescribed between September 2019 and June 2021 with a follow-up of^{3} 1 year. In the OLVG care path, reasons for switching cART are documented prospectively. All PLWH who stopped doravirine within one year were identified and the reasons to stop were collected. Medication prices in the Netherlands were used for estimation of medication costs. Descriptive statistics using IBM SPSS were performed.

Results
A total of 687 PLWH (92% men) were included: 97.7% switched to doravirine/tenofovir/lamivudine (DOR/TDF/3TC) and 2.3% to other doravirine based regimens. After one-year 593/687 (86.3%) PLWH continued therapy. In the group of 94/687 (13.7%) PLWH that stopped therapy, the main reason was patient-reported adverse events in 70/687 (10.2%); most frequent reasons were insomnia or psychological (4.9%) and gastrointestinal (2.9%) (see table). Medical reasons to stop were 'increased ALT levels' in 6/687 (0.9%), 'elevated creatinine levels' in 3/687 (0.4%), 'as precaution' after diagnosis of osteoporosis in 2/687 (0.3%) and 'virological failure' in 4/687 cases (0.6%). One person demonstrated a V106A resistance-mutation to doravirine at failure, which in retrospect was already present in the medical history. No resistance could be demonstrated in the other 3 PLWH. Finally, 9/687 (1.3%) patients had another reason to stop. Within the PLWH that continued treatment, medication costs decreased from €4,553,716 to €3,470,974 (23.8% reduction) during one year of follow-up. Body mass index (BMI) was available in 58/593 of PLWH at switch and after one year. No significant change was observed (BMI 26.05 vs. 25.84, p=0,34).

Conclusion
The large majority of patients successfully continued a doravirine based regimen after one year of follow-up, demonstrating its effective, well tolerated and cost-saving role in maintenance therapy.

P2 (Figure 1)

Patients with one-year of follow-up	n=687	percentage
Continued	**593**	**86.3%**
Stopped	**94**	**13.7%**
Reason to stop		
Virologic failure	**4**	**0.6%**
Resistance - V106A	1	0.1%
Incompliance	1	0.1%
Unknown	2	0.3%
Medical reason	**11**	**1.6%**
Patient-reported adverse event*	**70**	**10.2%**
Insomnia	17	2.5%
Psychological symptoms	17	2.5%
Gastro-intestinal	20	2.9%
Musculoskeletal	11	1.6%
Possible allergic skin reactions	8	1.2%
Other skin reactions	6	0.9%
Other	**8**	**1.2%**

Table: Percentage of patients that stopped therapy after one year and the reason to stop as percentage of the total 687 patients.
* First row demonstrates the total number of patients followed by the categories of adverse events. Some patients had more than one adverse event as reason to stop.

P3

PREVALENCE OF TRADITIONAL CARDIOVASCULAR RISK FACTORS AND GUIDELINE ADHERENCE IN PREVENTION OF CARDIOVASCULAR DISEASE IN PEOPLE LIVING WITH HIV IN THE NETHERLANDS

Marc Blaauw[1], Louise van Eekeren[1], Wilhelm Vos[1], Albert Groenendijk[1], Marvin Berrevoets[2], Gert Weijers[1], Niels Riksen[1], Jan van Lunzen[3], Andre van der Ven[1], Joost Rutten[1]

[1] *Radboudumc, Nijmegen, the Netherlands*
[2] *Elisabeth-TweeSteden Hospital, Tilburg, the Netherlands*
[3] *ViiV Healthcare, Brentford, United Kingdom*

Background
People living with HIV (PLHIV) are at higher risk of cardiovascular disease (CVD) and therefore, optimal management of hypertension, dyslipidemia and diabetes mellitus is essential. Subclinical CVD is an important predictor for cardiovascular events and can be assessed by intima media thickness (IMT) of the carotid artery and presence of carotid plaque. The present study aimed to analyze in a large cohort of PLHIV in the Netherlands 1. The clinical and HIV-specific factors that are associated with subclinical CVD, 2. Adherence to guidelines for statin prescription to prevent CVD.

Methods
In 1795 PLHIV using suppressive ART, participating in the 2000HIV study (clinical trials NCT03994835), IMT was measured in both carotid arteries using 2D ultrasound with a L14-5WE transducer and we assessed the presence of carotid plaques. We obtained patient characteristics and medical history from all participants and the Framingham 10-year risk score and the SCORE2/SCORE2-OP for CVD risk evaluation were calculated in those without a history of CVD. We performed multivariate regression analysis, including HIV specific parameters such as CD4 nadir and duration of HIV infection, to investigate the association of various clinical factors with log transformed IMT, and presence of plaques.

Results
In our cohort, 818 individuals (44.5%) had a carotid plaque. Median IMT was 0.66 mm [IQR 0.57 – 0.76]. Age, black ethnicity, body mass index (BMI), diabetes type 2 and smoking (pack years) were all positively associated with log transformed IMT. HDL cholesterol was found to be negatively associated with log transformed IMT in our multivariate regression analysis. Age, systolic blood pressure and prior myocardial infarction were all positively associated with the presence of carotid plaque. Of note, none of the currently investigated HIV specific clinical factors were associated with log transformed IMT or carotid plaques. Lipid lowering treatment was prescribed to 25.4% of all patients with a LDL cholesterol level > 2.6 mmol/l and a Framingham risk > 10% and LDL-cholesterol (LDL-c) > 2.6 mmol/L and to 32.3% of patients with a LDL cholesterol > 2.6 mmol/l and a SCORE2 > 5% (Table 1).

Conclusion
Our data shows that in PLHIV, the conventional classical cardiovascular risk factors, and not HIV-related factors are associated with subclinical CVD. Furthermore, less than one-third of patients with a high risk of cardiovascular disease and an increased LDL-cholesterol level received lipid-lowering treatment. Based on the results of this cohort, improvement of guideline adherence is recommended in Dutch HIV outpatient clinics.

P3 (Table 1) Status use based on guideline adherence

	Statin use	No statin use	Percentage guideline adherence	Plaque presence	Statin use + plaque	Percentage plaques	Percentage statin use with plaque
Previous CVD	142	38	78.9%	129	103	71.7%	79.8%
Previous CVD + DM2	18	2		16	15	80%	93.8%
DM2 without previous CVD	35	35	50%	36	18	51.4%	50%
DM2 and LDL-C > 2.6 mmol/L without previous CVD	35	23	60.3%	20	7	34.5%	35%
Framingham score							
Risk < 10%	27	589		178	6	28.9%	3.4%
Risk > 10% and LDL-C > 2.6mmol/L	195	573	25.4%	364	71	47.4%	19.5%
SCORE2 risk							
Risk < 5%	77	676		282	32	37.5%	11.3%
Risk > 5% and LDL-C > 2.6 mmol/L	153	320	32.3%	250	58	52.9%	23.2%
Risk > 5% and LDL-C > 3 mmol/L	153	266	36.5%	189	31	45.1%	16.4%

Abbreviations: CVD, cardiovascular disease; DM2, diabetes mellitus type 2; LDL-c, low density lipoprotein cholesterol; SCORE2, Systematic Coronary Risk Evaluation 2
EACS guideline: start statin in people with previous CVD, in people with DM2 or Framingham risk score > 10% and LDL-c > 2.6
Dutch cardiovascular risk management guideline: start statin in people with previous CVD, DM2 and SCORE2 risk > 5% and LDL-c > 2.6

P4

FIRST PHARMACOKINETIC DATA OF DOLUTEGRAVIR IN COMBINATION WITH A TAF CONTAINING BACKBONE IN CHILDREN LIVING WITH HIV

Lisanne Bevers

Radboudumc, Nijmegen, the Netherlands

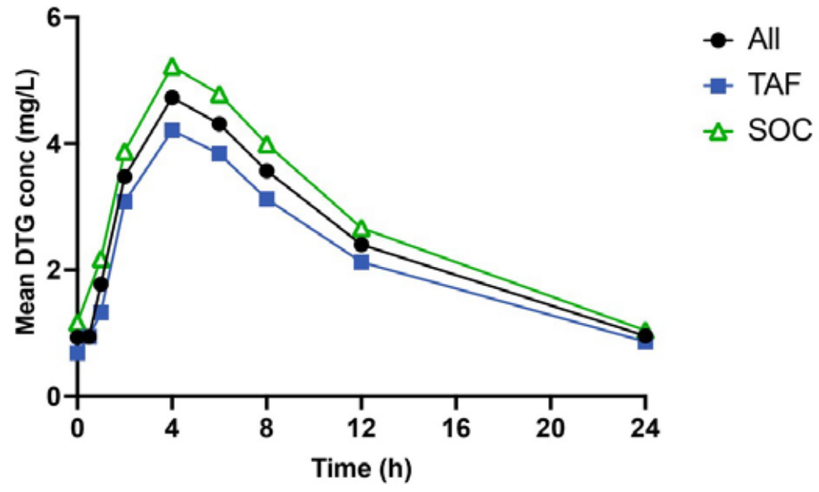
Background
A backbone of two Nucleoside Reverse Transcriptase Inhibitors (NRTIs) combined with a integrase inhibitor (INSTI) is currently one of the preferred treatment regimens for children living with HIV. Tenofovir alafenamide fumarate (TAF) is one of the recommended NRTI backbone drugs in children. Dolutegravir (DTG) is the preferred INSTI drug, because of its high potency and high barrier to resistance. As a result, a combination of DTG and TAF will be widely used. However, pharmacokinetic data on the exposure of DTG in combination with TAF in children is currently lacking. Therefore, we undertook a nested PK substudy in the CHAPAS4 randomized controlled trial (#ISRCTN22964075) evaluating DTG exposure with or without TAF.

Methods
In CHAPAS4 919 African children aged 3-15 years failing first-line ART were randomized to TAF versus standard of care (SOC: abacavir or zidovudine) and to DTG or ritonavir-boosted protease inhibitors in a factorial design, being followed for 96 weeks. Children on DTG weighing 14-19.9kg took 25mg as dispersible tablets (DT) and children >20kg took 50mg film-coated tablets (FT) with food, regardless of the backbone. For this PK substudy DTG concentrations were measured using a validated LC-MS/MS method (samples were taken at t = (0.5), 1, 2, 4, 6, 8, 12, 24 h post intake of DTG). The target Ctrough was defined as 0.32 mg/L. Statistical comparisons were made using independent T-tests on the log transformed data.

Results
41 children aged 3-15 years taking DTG were included in this PK substudy. 20 children receiving DTG with TAF had an AUC0-24h GM(CV%) of 48.5 (42) h.mg/L and a Ctrough GM(CV%) of 0.67 (78) mg/L. 21 children receiving DTG with SOC (i.e. without TAF) had an AUC0-24h GM(CV%) of 63.24 (33) h.mg/L and a Ctrough GM(CV%) 0.91 (51) mg/L. The AUC ratio TAF/SOC was 0.77 (95% Confidence Interval (CI) 0.61-0.96) and a similar trend was seen in the individual weight bands. The Ctrough target for DTG was achieved in all but two subjects.

Conclusion
This study shows that the exposure of DTG in combination with TAF seems to be slightly lower than with SOC, but generally does not lead to subtherapeutic levels. The clinical relevance of this has not yet been determined and needs further investigation.

P4 (Figure 1) Plasma concentration curve of DTG (TAF vs SOC)



P5

THE VISION OF PEOPLE LIVING WITH HIV ON CURRENT AND FUTURE HIV CARE IN THE NETHERLANDS

Marjolein Poen[1], Marieke Bierhoff[1], Fred Verdult[2], Erwin van Ditmarsch[2]

[1] *Gilead Sciences, Amsterdam, the Netherlands*
[2] *Volle Maan Communicatiebureau, Amsterdam, the Netherlands*

Background
There is a growing support for patient-involvement and shared decision making in Dutch HIV care. However, large-scale uptake of shared decision making is challenging, and recent implementation projects have shown the difficulty of getting a fair representation of the patients' voice.1 The COVID19 pandemic accelerated changes in HIV care. This study aimed to obtain insights in how people living with HIV (PLWH) from diverse backgrounds experience their care and their vision on HIV care post-COVID19.

Methods
This independent study consisted of a qualitative and quantitative phase. In the qualitative phase two group interviews with seven PLWH each and 10 individual interviews were conducted. In the quantitative phase approximately 100 respondents participated in an online questionnaire addressing the topics highlighted during the qualitative phase, 45 people (mostly with a non-western background) have completed the questionnaire with the help of Spiritualiteit hiv AIDS (ShivA) and Stichting MARA.

Results
Participants included a variety of people ranging in age from 18-79 years-old, in year of diagnosis from prior to 1995 until 2021, 52% were women, 50% identified as heterosexual, and 50% had a non-Dutch background. The survey response rate was high, with over 92 responders per question. Overall, the participants scored the quality of their HIV care high, and 98% (91/93) and 85% (78/92) indicated that the consultation with their HIV-doctor and HIV-nurse was important to them, respectively. Compared to standard of care (alternating doctor and nurse visit, twice a year), 31% indicated a preference on seeing both at every hospital visit and 39% would prefer a different frequency of visits. Most participants (>85%) prefer in-person consultations, but shorter updates are preferred via (video)call (>55%), although 72% indicated it's complicated not to know an exact time. Preferred topics for consultation included blood test results, physical and mental health, and long-term health. Over 60% of participants indicated long term health should be discussed more regularly. Stigma remains an issue with occasional shame reported by 52% while 17 and 31% do not want to discuss this with their nurse or doctor respectively.

Conclusion
This study aimed to capture the visions of PLWH of diverse backgrounds on HIV care. In general, the quality of care was perceived very satisfactory. On the improvement side, participants indicated a variety of preferences regarding their ideal care and preferred more focus on their long-term health. This highlights the need for a personalized approach that fits both patient and healthcareproviders.

P6

A COST-SAVING ANTIRETROVIRAL TREATMENT ALGORITHM FOR EFFECTIVE HIV CARE IN THE NETHERLANDS

Piter Oosterhof[1], M. van Luin[2], Karin Grintjes[3], Narda van der Meche[1], Olivier Richel[3], Janneke Stalenhoef[1], Reinout van Crevel[3], Kees Brinkman[1], David Burger[3]

[1] *OLVG, Amsterdam, the Netherlands*
[2] *UMC Utrecht, Utrecht, the Netherlands*
[3] *Radboudumc, Nijmegen, the Netherlands*

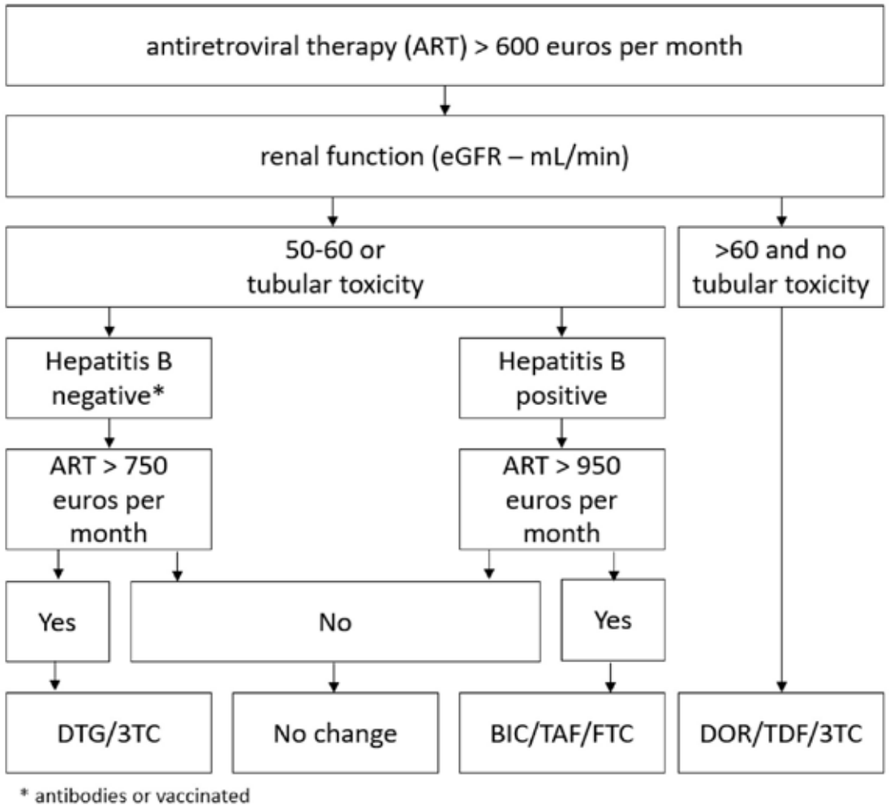
Background
Nowadays a wide range of antiretroviral therapy (ART) with a favorable side effect profile is available, with a very variable price. Due to these great differences, there is a high potential to reduce ART costs. It is estimated that more than 70% of the costs spent on HIV care in the Netherlands go to antiretroviral therapy. In the Netherlands, this amounts to more than 200 million euros per year. We have created an antiretroviral treatment algorithm to reduce ART costs within two large hospitals in the Netherlands. With this algorithm, we proactively switch virologically suppressed patients to a more cost effective HIV treatment.

Methods
This was a prospective study of our antiretroviral treatment algorithm in two Dutch HIV treatment centers. A pharmacist screened ART regimes during one year. Patients were suitable to switch if the current ART exceeded 600 euros per month. In addition, we took into account renal function and/or tubular toxicity, hepatitis B status and history of resistance (figure 1). If appropriate, an advice with a proposal to switch was noted in the patient file. If the difference between the old and new ART was less than 100 euros per month, no advice was noted. Our objective was to investigate acceptance of the proposal and the effect of the proactive switch on total costs of ARVs.

Results
In total, we screened 1570 patients, 983 within OLVG in Amsterdam and 587 in the RadboudUMC in Nijmegen. Patients were predominantly male (89.6%), the median (IQR) age was 55 (47-62) years, and the median (IQR) years on current ART was 4 (3-6) years. According to the algorithm, a total of 821 patients (OLVG; 481 [49.0%], RadboudUMC; 340 [57.9%]) were eligible for a proactive switch. Seven hundred forty-nine patients (47.6%) were unsuitable because they: already received cost-effective therapy (=36.1%), resistance (=19.8%), or recently switched therapy (17.4%). Six hundred eighty-two patients (OLVG; 383 [79.6%], RadboudUMC; 299 [87, 9%]) accepted the proposal to switch. The vast majority switched to an STR consisting of doravirine/tenofovir disoproxil fumarate/lamivudine (OLVG 87%; RadboudUMC 73%). The proposed switch in the 682 patients has resulted in a total cost saving of 1,162,976 euros (-15.6%) per year.

Conclusion
In conclusion, our antiretroviral treatment algorithm shows high acceptance and a substantial cost saving. It has the potential to offer significant cost savings to Dutch healthcare payers as a switching strategy for virologically suppressed patients.

P6 (Figure 1) antiretroviral treatment algorithm



POSTER PRESENTATIONS

P7

HIV, KNOWLEDGE & ATTITUDE; A CROSS-SECTIONAL DESCRIPTIVE QUANTITATIVE STUDY ON THE ATTITUDE AND KNOWLEDGE OF NURSING STAFF WITHIN A GENERAL HOSPITAL IN THE CARE OF PERSONS WITH HIV.

Linda Scheiberlich

Medisch Spectrum Twente Enschede Netherlands

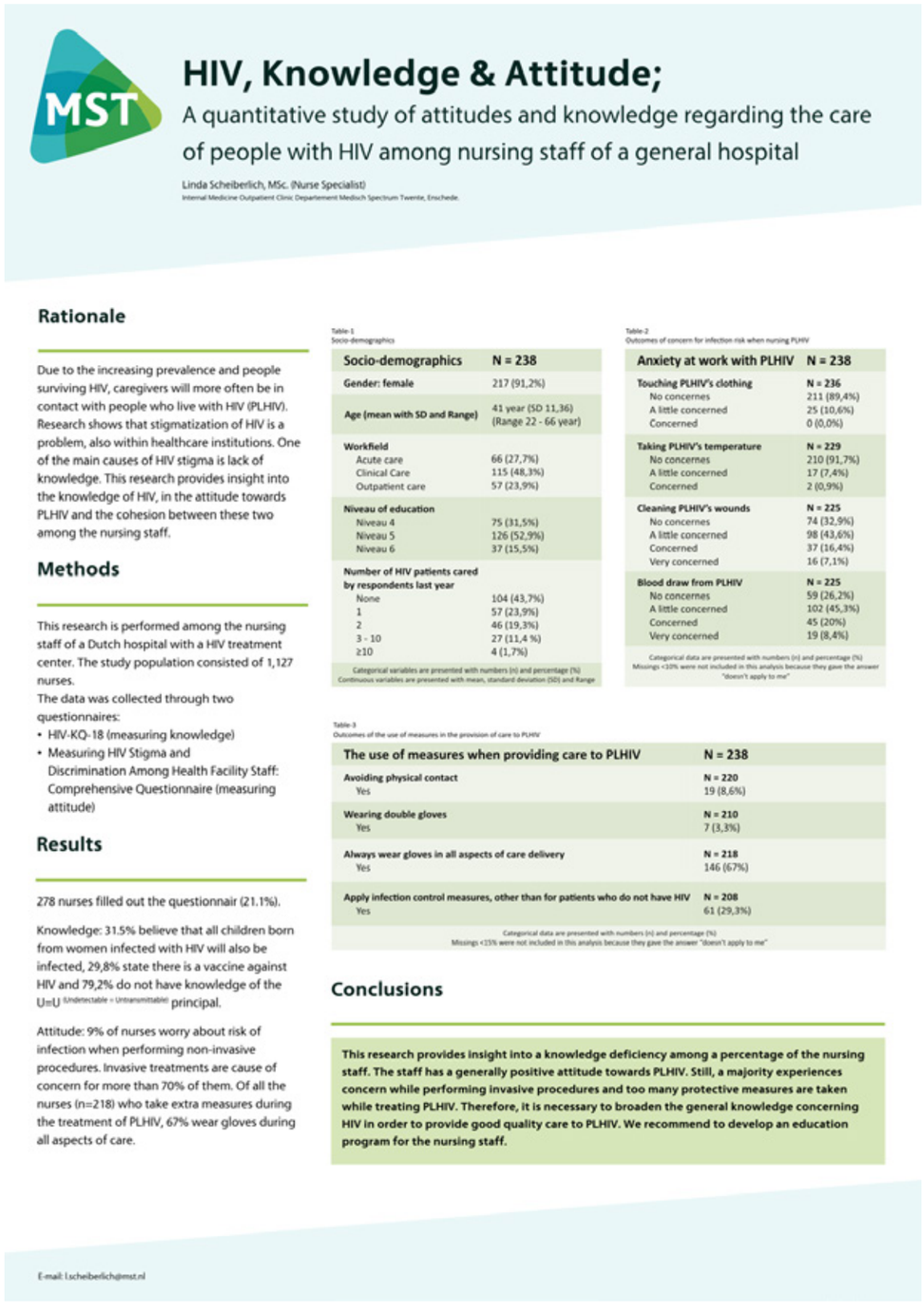
Background
Due to the increasing prevalence and survival of HIV, caregivers will more often be in contact with people who live with HIV (PLHIV). Research shows that stigmatization is a problem, also within healthcare institutions. One of the main causes of HIV stigma is lack of knowledge. This research provides insight into the knowledge of HIV and in the attitude towards PLHIV.

Methods
This quantitative research is performed among the nursing staff of a Dutch hospital. The study population consisted 1,127 nurses. The data was collected through two questionnaires, the “HIV-KQ-18” and the “Measuring HIV Stigma and Discrimination Among Health Facility Staff: Comprehensive Questionnaire”.

Results
The response was 21,1% (n=278). The results of the HIV-KQ-18 were processed on item level; 31,5% believes that HIV transmission always takes place during pregnancy, 29,8% states there is a vaccine against HIV and 79,2% do not have knowledge of the N=N principal. The Cronbach’s Alpha for the attitude questionnaire is 0,74 and had an average sum score of 2,7 (SD 1,9; range 0,0 – 7,0). 9 % of the non-invasive treatments consists of procedures during which nurses worry about the risk of infection. Invasive treatments are cause for concern for over 70%. Of all the participants (n=218) who take extra measures during the treatment of PLHIV, 67% wear gloves during all aspects of care.

Conclusion
This research provides insight into a knowledge deficiency among a percentage of the nursing staff. The staff have mainly a positive attitude towards PLHIV. Still, a majority experiences concern while performing invasive procedures and necessary protective measures are not taken while treating PLHIV. Therefore, it is necessary to broaden the general knowledge concerning HIV in order to provide good quality care to PLHIV. The recommendation is to create an education program.

P7 (Figure 1)



MST

HIV, Knowledge & Attitude;

A quantitative study of attitudes and knowledge regarding the care of people with HIV among nursing staff of a general hospital

Linda Scheiberlich, MSc. (Nurse Specialist)
Internal Medicine Outpatient Clinic Departement Medisch Spectrum Twente, Enschede.

Rationale

Due to the increasing prevalence and people surviving HIV, caregivers will more often be in contact with people who live with HIV (PLHIV). Research shows that stigmatization of HIV is a problem, also within healthcare institutions. One of the main causes of HIV stigma is lack of knowledge. This research provides insight into the knowledge of HIV, in the attitude towards PLHIV and the cohesion between these two among the nursing staff.

Methods

This research is performed among the nursing staff of a Dutch hospital with a HIV treatment center. The study population consisted of 1,127 nurses.
The data was collected through two questionnaires:

- HIV-KQ-18 (measuring knowledge)
- Measuring HIV Stigma and Discrimination Among Health Facility Staff: Comprehensive Questionnaire (measuring attitude)

Results

278 nurses filled out the questionnair (21.1%).

Knowledge: 31.5% believe that all children born from women infected with HIV will also be infected, 29,8% state there is a vaccine against HIV and 79,2% do not have knowledge of the U=U (Undetectable = Untransmittable) principal.

Attitude: 9% of nurses worry about risk of infection when performing non-invasive procedures. Invasive treatments are cause of concern for more than 70% of them. Of all the nurses (n=218) who take extra measures during the treatment of PLHIV, 67% wear gloves during all aspects of care.

Table-1
Socio-demographics

Socio-demographics	N = 238
Gender: female	217 (91,2%)
Age (mean with SD and Range)	41 year (SD 11,36) (Range 22 - 66 year)
Workfield	
Acute care	66 (27,7%)
Clinical Care	115 (48,3%)
Outpatient care	57 (23,9%)
Niveau of education	
Niveau 4	75 (31,5%)
Niveau 5	126 (52,9%)
Niveau 6	37 (15,5%)
Number of HIV patients cared by respondents last year	
None	104 (43,7%)
1	57 (23,9%)
2	46 (19,3%)
3 - 10	27 (11,4 %)
≥10	4 (1,7%)

Categorical variables are presented with numbers (n) and percentage (%)
Continuous variables are presented with mean, standard deviation (SD) and Range

Table-2
Outcomes of concern for infection risk when nursing PLHIV

Anxiety at work with PLHIV	N = 238
Touching PLHIV's clothing	N = 236
No concernes	211 (89,4%)
A little concerned	25 (10,6%)
Concerned	0 (0,0%)
Taking PLHIV's temperature	N = 229
No concernes	210 (91,7%)
A little concerned	17 (7,4%)
Concerned	2 (0,9%)
Cleaning PLHIV's wounds	N = 225
No concernes	74 (32,9%)
A little concerned	98 (43,6%)
Concerned	37 (16,4%)
Very concerned	16 (7,1%)
Blood draw from PLHIV	N = 225
No concernes	59 (26,2%)
A little concerned	102 (45,3%)
Concerned	45 (20%)
Very concerned	19 (8,4%)

Categorical data are presented with numbers (n) and percentage (%)
Missings <10% were not included in this analysis because they gave the answer "doesn't apply to me"

Table-3
Outcomes of the use of measures in the provision of care to PLHIV

The use of measures when providing care to PLHIV	N = 238
Avoiding physical contact	N = 220
Yes	19 (8,6%)
Wearing double gloves	N = 210
Yes	7 (3,3%)
Always wear gloves in all aspects of care delivery	N = 218
Yes	146 (67%)
Apply infection control measures, other than for patients who do not have HIV	N = 208
Yes	61 (29,3%)

Categorical data are presented with numbers (n) and percentage (%)
Missings <15% were not included in this analysis because they gave the answer "doesn't apply to me"

Conclusions

This research provides insight into a knowledge deficiency among a percentage of the nursing staff. The staff has a generally positive attitude towards PLHIV. Still, a majority experiences concern while performing invasive procedures and too many protective measures are taken while treating PLHIV. Therefore, it is necessary to broaden the general knowledge concerning HIV in order to provide good quality care to PLHIV. We recommend to develop an education program for the nursing staff.

E-mail: l.scheiberlich@mst.nl

POSTER PRESENTATIONS

P8

DIGITAL EMERGENCY HEALTHCARE CONSULTATION BEHAVIOR OF UKRAINIANS LIVING WITH HIV IN EUROPE.

Carlijn Jordans, Marta Vasylyev, Casper Rokx

Erasmus MC, Rotterdam, the Netherlands

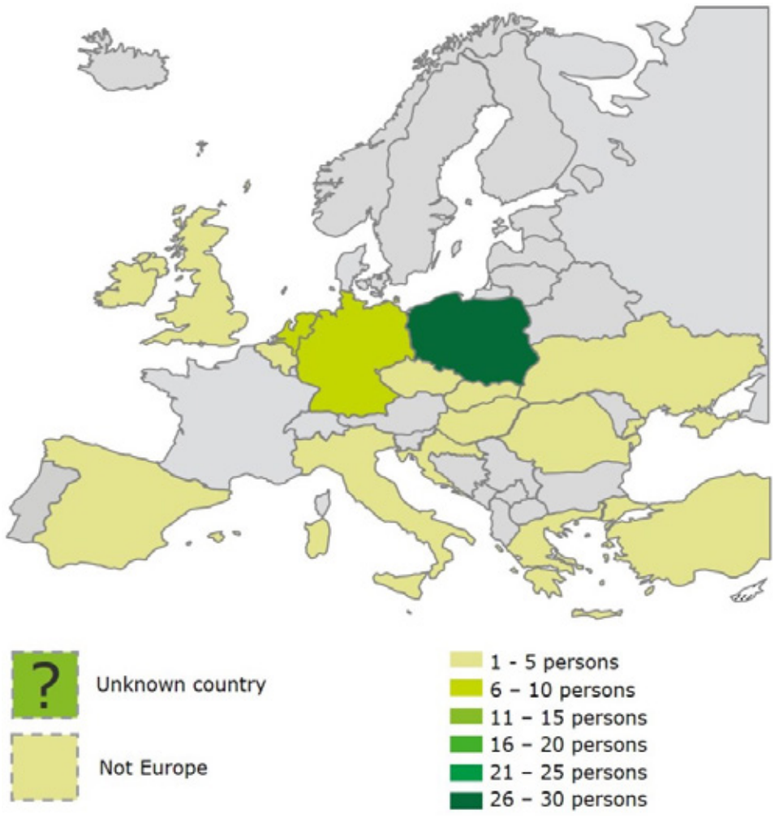
Background
Ukraine is one of the European countries that is hardest-hit by HIV. To stop the HIV epidemic, widespread and well-accessible care for people living with HIV (PLWHIV) is necessary. The Russian invasion in February 2022 abruptly interrupted HIV care services. As part of emergency HIV care strategies, several professional HIV networks within Europe started remote digital counselling platforms for Ukrainian PLWHIV who were forced to leave their country. An overview of digital healthcare consultation can help to adapt these platforms to the needs of PLWHIV.

Materials and Methods
February 28 2022, we launched the #awarehivUkraine project to raise awareness and support for Ukrainian PLWHIV. The project and website (www.awarehiv.com/ukraine) were widely distributed across European professional HIV networks and HIV advocacy groups. By filling in a digital form, people could contact HIV physicians directly for help. Demographical data and healthcare information provided were anonymously analyzed. Main endpoints were: evolution of digital healthcare consultation, including the number of people seeking contact, country where they needed help, and the needs asked for.

Results
Since its start until September 12, the website has been visited 1,216 times. The website was mostly found by social media (21%) and search engines (15%). We were contacted 80 times (range 1-9/week, peak mid/end June) with questions for a total of 89 PLWHIV. Only 3 individuals could not be answered due to incorrect or missing contact details. Most were women (56/89), 26 were men and 7 did not disclose their sex. All but 4 contact topics were on antiretroviral therapy related questions(76/80).
Half (43) sought contact from Eastern Europe, most from Poland (29/89). Germany hosted most people who sought contact from Western Europe (10/89) (Figure 1). Over time, a decrease was seen in the number of people contacting from Eastern Europe along with an increase from Western Europe (Table 1).

Conclusion
As a consequence of the war in Ukraine, HIV management related digital healthcare consultation comes from across Europa and is mostly on antiretroviral therapy. This type of healthcare seems feasible within professional HIV networks and can be a useful support for PLWHIV and HIV care providers wanting to provide emergency HIV care.

P8 (Figure 1) Countries where Ukrainian people living with HIV seek care



P8 (Table 1) Number of people seeking contact and the country where they needed help over time. Started on February 28, 2022 (week 1).

	Number of people seeking contact	Eastern European country, n (%)	Western European country, n (%)	Other country, n (%)	Unknown country, n (%)
Week 1-5	21	13 (62)	6 (29)	-	2 (9)
Week 6-10	44	23 (52)	14 (32)	-	7 (16)
Week 11-15	18	6 (33)	6 (33)	3 (17)	3 (17)
Week 16-19	6	1 (17)	4 (67)	-	1 (17)

P9

IMPACT OF PAST PNEUMOCYSTIS JIROVECII PNEUMONIA ON DIFFUSION CAPACITY IN PEOPLE LIVING WITH HIV: A DROP IN THE OCEAN

Patrick Oomen, Inez Bronsveld, Andy Hoepelman, Berend van Welzen, Tatania Mudrikova

UMC Utrecht, Utrecht, the Netherlands

Background
Pneumocystis jirovecii pneumonia (PJP) is one of the most common opportunistic infections in people living with HIV (PLWH) with advanced immunodeficiency and is characterized by hypoxemia due to diffusion capacity impairment. It is unknown whether pulmonary function abnormalities resolve after treatment of PJP, which is important given the high background prevalence of diffusion impairment in PLWH, likely due to an increased prevalence of smoking and HIV-infection itself. Considering that PJP could further harm the diffusion capacity, we evaluated the impact of past PJP on long-term diffusion capacity in PLWH with previous advanced immunodeficiency.

Methods
We performed a prospective, single-center, cross-sectional study and included adult PLWH with a nadir CD4+ <200, divided into those with and without a history of PJP >1 year ago. Participants completed one pulmonary function test consisting of pre-bronchodilation spirometry, body plethysmography and single-breath carbon monoxide transfer factor (TLCO) measurement. Both groups were matched by age, sex, smoking status and time since HIV to limit confounding. TLCO, diffusion impairment (defined as a TLCO Z-score <-1.64), forced expiratory volume in one second/ forced vital capacity (FEV1/FVC) and total lung capacity (TLC) Z-scores were assessed. Multivariable regression analyses were conducted with Z-scores and odds of diffusion impairment as outcomes.

Results
A total of 102 participants were included between 2016 and 2022, 51 of whom had past PJP with median ten years since PJP. The median age of the study population was 54.00 years (interquartile range 47.75 – 58.00) and 13 (12.75%) were female. Compared to those without PJP, PLWH with PJP had lower median nadir CD4+ counts (28.00 vs. 78.00, p<0.001) (Table 1). Mean TLCO Z-score did not differ between groups (-0.98 (1.11) vs. -0.92 (1.04), p=0.790) nor did the diffusion impairment rate (14/51 (27.45%) vs. 12/51 (23.53%), p=0.650). Past PJP was not independently associated with TLCO Z-score (β 0.14; 95% confidence interval (CI) -0.30 – 0.57) nor diffusion impairment (odds ratio 1.00; 95% CI 0.36 – 2.75), whereas current (vs. never) smoking was associated with lower TLCO Z-scores and more diffusion impairment (Table 2). Current smoking was also associated with lower FEV1/FVC and higher TLC Z-scores, with no association found for past PJP.

Conclusion
Past PJP was not found associated with persistent diffusion impairment in PLWH with a history of advanced immunodeficiency. Our findings suggest that PJP-related pulmonary damage recovers in the long-term or is negligible in the presence of persistent pulmonary impairment from smoking or HIV-infection.

P9 (Table 1) Characteristics of PLWH according to PJP status at time of PFT

	PJP		Non-PJP		
Demographics	n = 51	(IQR) / (%)	n = 51	(IQR) / (%)	*p-value*
Age (years)	54.00	50.00 - 58.00	53.00	46.00 - 59.00	0.453
Sex at birth (male)	44	86.27	45	88.24	0.767
Clinical characteristics					
Time since HIV (years)	10.00	6.00 – 17.00	11.00	7.00 – 17.00	0.245
Time since PJP (years)	10.00	5.00 – 16.00	-	-	-
Time since start antiretroviral therapy (years)	10.00	6.00 – 16.00	10.00	7.00 – 16.00	0.341
Smoking					0.834
- Current	27	52.94	24	47.06	
- Former	13	25.49	15	29.41	
- Never	11	21.57	12	23.53	
Mode of transmission					0.207
- MSM	25	49.02	31	60.78	
- Heterosexual	8	15.69	10	19.61	
- Other / unknown	18	35.29	10	19.61	
History of pneumothorax [a]	5	9.80	-	-	
Admission to ICU during PJP [a]	9	17.64	-	-	
Adjunctive steroids during PJP [a]	33	64.71	-	-	
Biochemical characteristics					
Nadir CD4⁺ count (cells/mm³)	28.00	10.00 – 50.00	78.00	41.00 – 152.00	**<0.001**
CD4⁺ at PFT [a]	478.00	372.75 – 559.75	537.00	392.50 – 691.75	0.120
VL <400 at PFT (cop/mL)*	51	100	51	100	-

All categorical data are expressed as frequency (percentage) and all continuous data are expressed as median (interquartile range).

a. Missing data: CD4⁺ at PFT (1 non-PJP (1.96%) / 1 PJP (1.96%)), History of pneumothorax (3 PJP 5.88%), Admission to ICU during PJP (3 PJP 5.88%), Adjunctive steroids during PJP (2 PJP 3.92%)
* Detectable viral loads at the time of PFT were observed for three PLWH with PJP (VLs of 319, 83, 75 cop/mL) and one PLWH without PJP (VL of 179 cop/mL).

Abbreviations: ICU, intensive care unit; IQR, interquartile range; MSM, men who have sex with men; PFT, pulmonary function test; PJP, *Pneumocystis Jirovecii* Pneumonia; PLWH, people living with HIV; VL, viral load.

P9 (Table 2) Multivariate logistic and linear regression analysis for TLCO Z-scores and diffusion impairment (defined as TLCO Z-score <-1.64).

	TLCO Z-score			Diffusion impairment		
	β	95% CI	*p-value*	OR	95% CI	*p-value*
Past PJP (*vs* no past PJP)	0.14	-0.30 – 0.57	0.545	1.00	0.36 – 2.75	0.997
Age at PFT (per year increase)	-0.02	-0.04 – 0.01	0.164	1.00	0.95 – 1.06	0.971
Male sex (*vs* female sex)	0.21	-0.40 – 0.81	0.504	0.46	0.13 – 1.65	0.235
Time since HIV (per year increase)	0.01	-0.02 – 0.04	0.454	1.02	0.95 – 1.09	0.648
Smoking						
- Never	1		-	1		-
- Former	-0.14	-0.63 – 0.36	0.597	1.68	0.51 – 5.74	0.396
- Current	-1.10	-1.61 – -0.59	**<0.001**	6.02	1.94 – 18.72	**0.002**
Nadir $CD4^+$ count (per 5 cell/mm3 increase)	0.02	0.00 – 0.04	0.061	0.97	0.93 – 1.02	0.195

Abbreviations: CI, confidence interval; OR, odds ratio; PFT, pulmonary function test; PJP, *Pneumocystis Jirovecii* Pneumonia; TLCO, transfer factor for carbon monoxide.

P10

IMPACT OF HIV POST-TREATMENT CONTROL AND ELIMINATION ON THE HIV EPIDEMIC AMONG MEN WHO HAVE SEX WITH MEN IN THE NETHERLANDS

Franco Romero Gonzalez[1], Kim Romijnders[1], Maartje Dijkstra[2], Ard van Sighem[3], Godelieve de Bree[4], Peter Reiss[4], Maarten Schim van der Loeff[2], Mirjam Kretzschmar[1], **Ganna Rozhnova[1]**

[1] *Julius Center for Health Sciences and Primary Care, UMC Utrecht, Utrecht, the Netherlands*
[2] *Amsterdam UMC, University of Amsterdam, Department of Internal Medicine, Amsterdam, the Netherlands*
[3] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[4] *Amsterdam UMC, UvA, Center for Tropical Medicine and Travel, Amsterdam, the Netherlands*

Background
When an HIV cure becomes available, it may have consequences for HIV transmission at the population level. A more plausible cure scenario is post-treatment control (PTC), whereby HIV remains suppressed after stopping antiretroviral treatment (ART). This study assessed the potential impact of PTC on the HIV epidemic among men who have sex with men (MSM) in the Netherlands.

Methods
We developed a model of HIV transmission in a population stratified by sexual risk behavior and with access to ART, pre-exposure prophylaxis (PrEP) and PTC. PTC is targeted to individuals on ART who remain virally suppressed without ART but who may experience viral rebound, become infectious and start ART again if PTC fails. We examined how HIV prevalence (excluding individuals on PTC) was affected by PTC uptake and the average time to PTC failure. The model was calibrated to behavioral and HIV surveillance data for MSM in the Netherlands.

Results
An uptake of 15% of a perfect PTC that never fails can decrease HIV prevalence from 6.9% currently to 2.5% within 5 years after PTC introduction. In case of an imperfect PTC, HIV prevalence will decrease if PTC uptake is similar to the current ART uptake and the average time to failure is more than 10 years. Likewise, HIV prevalence will decrease regardless of the average time to failure if ART uptake after failure and getting infected while on PrEP are similar. For the average time to failure of 3 years and a PTC uptake of 99%, HIV prevalence will increase if ART uptake after failure is the same as the current ART uptake.

Conclusion
Strict monitoring is needed to prevent an increase in HIV prevalence among MSM after the introduction of PTC. Without monitoring, HIV prevalence will decrease only if the average time to failure exceeds a decade.

P11

FC-ENGINEERING OF ANTI-HIV-1 ANTIBODIES AND NANOBODIES TO IMPROVE FC MEDIATED EFFECTOR FUNCTIONS

Angela Schriek[1], Steven de Taeye[1], Marit van Gils[1], Neeltje Kootstra[2]

[1] *Department of Medical Microbiology, Amsterdam UMC, Amsterdam, the Netherlands*
[2] *Department of Experimental Immunology, Amsterdam UMC, Amsterdam, the Netherlands*

Background
Broadly neutralizing antibodies (bNAbs) targeting the HIV-1 envelope glycoprotein (Env) have shown potential for the implementation in current HIV-1 therapies and cure strategies. In addition to the neutralizing capacity, BNabs can mediate Fc effector functions such as complement dependent cytotoxicity (CDC), antibody dependent cellular cytotoxicity (ADCC) and antibody dependent cellular phagocytosis (ADCP) to facilitate clearance of HIV-1 infected cells. Research has shown that the Fc effector functions of bNabs contribute substantially to their capacity to block viral entry, suppress viremia and confer therapeutic activity. Antibodies may be further modulated through Fc engineering to make them more suitable for therapeutic application. These strategies focus on increasing the affinity for FcγRs and C1q to enhance Fc effector functions. Common Fc engineering strategies include: introducing amino acid substitutions, altering the antibody subclass or modulating the N297 glycan.

Methods
We produced eight different variants of the N6, PGT121, PGDM1400, A32, J3 and 1F10 anti-HIV-1 antibodies and nanobody-IgG1 constructs. These antibodies target various epitopes of the HIV-1 Env: the CD4 binding site, trimer apex, V3 loop, V3 base plus surrounding glycans and the C1–C2 regions of gp120. This panel will allow us to study how different engineering strategies affect Fc effector functions in antibodies with different specificities. Our engineering strategies mainly focus on enhancing the binding to FcγRIIA, FcγRIIIA and C1q. This is achieved by producing the antibodies afucosylated, as an IgG3 or by introducing several amino acid substitutions. In addition, by elongating the hinge of the antibodies we hope to improve ADCP.

Results
The antibody and nanobody-IgG1 constructs were successfully produced in HEK293F cells and purified after which molecular weight and the composition of the constructs was confirmed using SDS-polyacrylamide gel electrophoresis. The majority of Fc engineered antibodies were produced with acceptable yields and followed expected migration patterns on gel. In addition, we confirmed that the engineered antibodies retained their ability to bind HIV-1 Env. Next, we will study in depth how the engineering strategies affected our antibodies. This will be done by looking at FcγR/C1q binding, neutralization potency and Fc effector function assays.

Conclusion
This study will show whether the engineering strategies result in epitope specific effects and if the strategies will mediate the same effect in nanobody-IgG1s constructs as they do in conventional antibodies. If our engineering antibodies demonstrate enhanced Fc effector functions, they may prove to be valuable towards HIV-1 curing strategies.

P12

DISTINCT DETECTION OF INTACT AND DEFECTIVE PROVIRAL DNA FOR HIV SUBTYPE B AND C

Ninée Buchholtz, Marieke Nühn, Dorien de Jong, Annemarie Wensing, Jori Symons, Monique Nijhuis

UMC Utrecht, Utrecht, the Netherlands

Background
The major barrier for HIV cure is persistence of replication-competent provirus despite suppression of viral replication by antiretroviral therapy (ART). In search for a global cure, it is of great importance to not only study HIV subtype B (Europe and the U.S.) but also subtype C (most dominant variant worldwide). Moreover, it is important to accurately quantify the intact and defective HIV-reservoir to monitor the impact of cure interventions on these reservoirs. The Intact Proviral DNA assay (IPDA) provides the unique possibility to distinctly quantify intact and defective viral DNA, but this assay has never been optimized for quantification of subtype C reservoirs.

Methods
Primer and probe sequences were strategically positioned at conserved regions and generated for both subtype B and C according to the the Los Alamos National Laboratory database (https://www.hiv.lanl.gov). Subsequently, G-blocks for both subtypes were generated to test the efficacy of both subtype sets. Reconstruction experiments were performed with dilution series of G-blocks alone or in combination with human PBMCs to determine the limit of blank (LoB) and limit of detection (LoD). At last, different annealing temperatures have been tested to address the impact of sequence variability within the target regions.

Results
Developed pan-subtype B and C primers and probes showed comparable efficacy to detect both subtype B and C sequences. The LoB of intact proviral DNA copies was 0, the LoD for intact proviral DNA copies was 6 (>95% certainty). Quantification of 2-5 copies could be performed with a certainty of 83%-97%. Comparable LoB and LoD were observed for the detection of 5'-defective and 3'-defective proviral DNA. Mixture experiments with intact and defective proviral DNA demonstrated correct quantification of 5% intact proviral DNA in the background of defective proviral DNA with a total input ranging from 10-200 copies. Lowering the annealing temperature from 60°C to 55°C resulted in a minor increase of the LoB, but prevented exclusion of samples because of polymorphisms.

Conclusion
We have developed a robust pan-subtype B-C IPDA which enables the detection of intact and defective proviral DNA with >95% certainty when at least 7 copies of detective/intact proviral DNA are present (LoB+LoD). As the number of intact proviral DNA copies decreases after start of treatment, it is important to note that 2-5 copies can still be quantified with a >80% certainty. This makes the pan-subtype B-C IPDA an ideal candidate to monitor the impact of cure-interventions in (large-scale) clinical studies.

P13

ABORTIVE HIV-1 RNA TRANSCRIPTS ARE DETECTED IN SERUM OF PEOPLE LIVING WITH HIV DURING LONG-TERM EFFECTIVE ANTIRETROVIRAL THERAPY

Stefanie Kroeze, Shirley Man, Jade Jansen, Carla Ribeiro, Teunis Geijtenbeek, Neeltje Kootstra

Amsterdam UMC, Amsterdam, the Netherlands

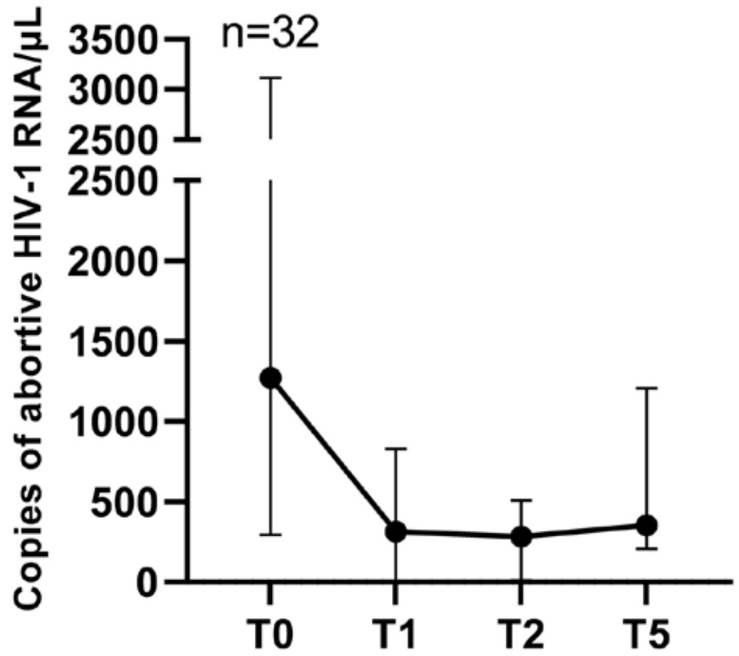
Background
The HIV-reservoir remains a major obstacle in HIV-cure research. An easy way to routinely monitor the HIV-reservoir is a challenge in current HIV-cure research, because most established assays rely on cell-based measurements, which requires intricate handling and labour intensive procedures. The identification of suitable targets and markers of the HIV-reservoir are therefore a main topic of HIV-cure research. The transactivation-response element (TAR) RNA has been proposed as potential biomarker of the latent HIV-reservoir. TAR-RNA is a short abortive HIV-1 RNA transcript and is expressed in latently infected cells and can be detected in serum. However, the dynamics of abortive HIV-1 RNA expression during long term therapy remains largely unknown. Here, we established a qPCR assay to monitor abortive HIV-1 RNA transcripts in serum of HIV-1 infected individuals and investigated the dynamics before and during effective antiretroviral therapy (ART).

Methods
Serum samples from thirty-two participants enrolled in the Amsterdam Cohort Studies who had been living with HIV for at least 2 years prior to starting ART, and had an undetectable viral load after 1 year of ART, were selected. A qPCR was developed to measure abortive HIV-1 RNA pre-ART (T0), and 1, 2, and 5 years on-ART. Repeated measures ANOVA with post-hoc pairwise comparison was used to investigate the time-course effect. Univariable linear regression analysis was used to investigate associations of abortive HIV-1 RNA and pre-ART variables: CD4+ T-cell count, CD8+ T-cell count, CD4/CD8 ratio and viral load.

Results
We observed an overall decline in abortive HIV-1 RNA from pre-ART up to 5 years on ART (p-value=0.004)(figure 1). Notably, a steep decline in abortive RNA copy number from pre-ART (Median: 3.10, IQR: 2.56-3.49 log10 copies/µL) to year 1 (median: 2.50, IQR 0.69-2.90 p-value: 0.017) and year 2 (2.45, 1.25-2.65, p-value: 0.017). At 5 years on-ART, the copy number was no longer significantly different from the pre-ART level (2.55, 2.34-3.07, p-value: 0.519). The regression analysis showed that pre-ART CD8+ T-cell count was associated with year 2 abortive HIV-1 RNA log10 copy number (coefficient: 0.0013, standard error: 0.0005, p-value: 0.015). None of the other pre-ART variables were associated with abortive HIV-1 RNA at any of the time-points.

Conclusion
Here we show that abortive HIV-1 RNA is detected in serum during long term therapy and represents a potential biomarker for monitoring latent viral reservoir. Future studies will determine whether serum-derived abortive HIV-1 RNA levels are associated with cellular viral reservoir measurements.

P13 (Figure 1) Long-term abortive HIV-1 RNA in serum. Figure shows the median-IQR abortive HIV-1 RNA copy number detected in serum



P14

TRANSCRIPTOMIC PROFILING OF TRANSCRIPTIONALLY LATENT AND ACTIVE HIV-INFECTED CD4 T+ CELLS ISOLATED WITH A NOVEL FLOW-FISH DETECTION METHOD

Shirley Man, Stefanie Kroeze, Jade Jansen, Carla Ribeiro, Teunis Geijtenbeek, Neeltje Kootstra

Amsterdam UMC, Amsterdam, the Netherlands

Background
Improved reservoir detection and characterization are crucial for HIV monitoring and evaluation of the efficacy of cure strategies. We identified and isolated transcriptionally latent and active viral reservoir cells from HIV-infected individuals with a novel flow cytometry-fluorescent in situ hybridization (flow-FISH) approach. Subsequently, transcriptomic analyses on the distinct cell subsets was performed to gain more insight into the molecular characteristics of the viral reservoir.

Methods
Using previously designed probes, flow-FISH was performed on twenty-six PBMCs from HIV-1 infected individuals with an untreated chronic infection. Next, the developed flow-FISH detection method was used to sort three distinct cell populations, namely transcriptionally latent HIV-infected, transcriptionally active HIV-infected, and uninfected CD4+ T cells derived from PBMCs of people living with HIV-1. The isolated cell fractions were subjected to 3' RNA sequencing, followed by gene expression analysis.

Results
Our probe combination detected and distinguished transcriptionally latent and active HIV-infected CD4+ T cells within PBMCs of infected individuals. Paired differential gene expression analysis of the transcriptomic data revealed distinct up- and downregulated genes when comparing the three isolated populations. Notably, overlapping genes for the transcriptionally latent and active HIV-infected cells were found to be more associated with transfer RNA/ribosomal RNA processing and mitochondrial metabolism, whereas genes specific for the transcriptionally latent HIV-infected cells were found to be linked to epigenetic regulation, RNA stability, and HIV elongation arrest.

Conclusion
To conclude, our novel flow-FISH approach is able to detect and differentiate between cells with transcriptionally latent or active HIV in PBMCs from infected individuals without the need for ex vivo stimulation. Furthermore, our data revealed transcriptomic signatures associated with the viral reservoir. Our flow-FISH method in combination with gene expression profiling will be useful in finding potential biomarkers of the viral reservoir and improved monitoring of HIV in infected individuals.

P15

CO-STIMULATION OF TLR-8 AND RIG-I-LIKE RECEPTORS TO ELIMINATE RE-ACTIVATED HIV-1 RESERVOIRS BY ENHANCING ANTIVIRAL IMMUNE RESPONSES.

Killian Vlaming[1], Neeltje Kootstra[1], Monique Nijhuis[2], Godelieve de Bree[1], Teunis Geijtenbeek[1]

[1] *Amsterdam UMC, Amsterdam, the Netherlands*
[2] *UMC Utrecht, Utrecht, the Netherlands*

Background
HIV-1 cure requires elimination of HIV-1 reservoirs consisting of latent infected immune cells. Toll-like receptor (TLR) agonists have been investigated due to their potential dual effects as latency reverting agents (LRAs) and immune modulatory compounds. In particular strong antiviral immunity would be required to eliminate HIV-1 reactivated cells. Notably, we have recently shown that crosstalk between TLRs and RIG-I-Like Receptors (RLRs) enhances antiviral immunity. We investigated therefore whether co-stimulation of TLR-7/8 agonists with RLR agonists enhances antiviral immunity.

Methods
Here, we have investigated the crosstalk between responses induced by different TLR and RLR agonists including those under clinical investigations. Peripheral blood mononuclear cells (PBMCs) and monocyte-derived dendritic cells (DCs) were incubated with TLR and RLR-agonists for 24 hours and innate and adaptive immune responses were determined (cytokines, type. I IFN responses, co-stimulatory molecule expression).

Results
TLR-7 and TLR-8 agonists induced both in DCs and PBMCs different cytokines including IL-6. TLR-8 agonists were more potent in activating DCs. However, in most cases little IL-12 was induced by the TLR-7 and TLR-8 agonists alone. Strikingly, co-stimulation with TLR-8 agonists and RLR agonist polyI:C induced significantly higher levels of IL-12p70 by both DCs and PBMCs. Moreover, crosstalk between TLR-8 and RLR agonists induced a strong type I IFN response as different IFN-stimulated genes were upregulated by the combination but not the agonists alone.

Conclusion
Our data strongly suggest that TLR crosstalk with RLRs leads to strong antiviral immunity as shown by induction of IL-12 and type I IFN responses in contrast to TLRs alone. We are currently investigated the effect of crosstalk on re-activation of latent infected cells. Thus, co-stimulation of TLRs and RLRs might be a powerful strategy to induce reactivation of latent reservoir as well as antiviral immunity that eliminates the reactivated cells.

P16

ANTIBODY MEDIATED KILLING OF HIV-1 INFECTED CELLS WITH GLYCOENGINEERED BROADLY NEUTRALIZING ANTIBODIES

Steven de Taeye[1], Angela Schriek[1], Jeffrey Umotoy[1], Marloes Grobben[1], David Falck[2], Rogier Sanders[1], Marit van Gils[1]

[1] *Amsterdam UMC, Amsterdam, the Netherlands*
[2] *Leiden University Medical Center, Leiden, the Netherlands*

Background
Despite the success of anti-retroviral therapy in suppressing HIV-1, alternative approaches are required to achieve ART-free remission or complete eradication of HIV-1 in people living with HIV-1 (PLWH). One such strategy, the shock and kill, aims to reactivate the latently HIV-1 infected cells followed by clearance of these reactivated cells through immune effector cells such as CD8+ T cells and Natural killer (NK) cells. Broadly neutralizing antibodies (bNAbs) targeting the HIV-1 envelope glycoprotein (Env) are interesting candidates to complement the development of an efficient kill strategy as they were found to delay viral rebound in ART treatment interruption (ATI) studies. To further enhance their killing capacity through NK-cells, we produced glycoengineered (afucosylated) bNAbs that have an enhanced affinity for Fc gamma receptor IIIa (FcγRIIIa) on NK-cells.

Methods
Monoclonal anti-HIV-1 bNAbs (N6, 2G12, PGDM1400, PGT121 and PGT151) were produced as conventional and as afucosylated antibodies and characterized for the degree of fucosylation (mass-spectrometry), HIV-1 Env binding (ELISA), NK-cell activation (CD107 expression, FACS) and killing of HIV-1 infected cells. NK-cells were isolated from PBMCs from healthy donors (HD) and PLWH using CD56+ microbeads and served as effector cells in NK-cell activation and killing assays. Reactivated ACH-2 cells or HIV-1 infected CEM.CCR5. Nkr cells served as target cells and antibody dependent cellular cytotoxicity (ADCC) was quantified by the loss of infected (p24+) cells after co-incubation with NK-cells and antibodies.

Results
Using mass-spectrometry, we confirmed that the fucosylation degree of the afucosylated antibodies was markedly reduced (0-20%) compared to the conventional bNAbs (>95%). Afucosylated antibodies displayed enhanced FcγRIIIa binding, NK-cell degranulation and NK-cell activation compared to conventional bNAbs. Furthermore, ADCC of reactivated latent cells was observed with three afucosylated anti-HIV-1 antibodies (N6, 2G12, PGT151). When NK-cells from PLWH were used, the activation and degranulation response to afucosylated antibodies was less prominent, which is partially explained by the low frequency of CD16 on the NK-cells from PLWH. Surprisingly, expression of exhaustion markers TIGIT and PD-1 was higher on NK-cells from HD compared to PLWH, suggesting that other mechanisms are responsible for the hampered NK-cell activation in PLWH.

Conclusion
Here, we demonstrate that afucosylated anti-HIV-1 bNAbs enhance NK-cell activation and degranulation, culminating in ADCC mediated killing of HIV-1 infected cells in vitro. A better understanding of the exhaustion profile of NK-cells from PLWH will be necessary to address the potential of afucosylated antibodies for HIV-1 therapy.

P17

AN HIV-1 VACCINATION REGIMEN PRIMES NEUTRALIZING CD4BS RESPONSES IN MULTIPLE ANIMAL MODELS AND IN A HUMAN CLINICAL TRIAL

Tom Caniels

Amsterdam UMC, Amsterdam, the Netherlands

Eliciting a potent and broad neutralizing antibody (bNAb) response is a major goal for HIV-1 vaccine design. Particularly, the VRC01-class of bNAbs that target the conserved CD4 binding site (CD4bs) on the envelope trimer (Env) present an attractive target because of their distinct genetic signature. However, VRC01-class germline precursors represent only a fraction of the naive B cell repertoire and thus engaging these bNAb precursors likely requires an immunogen that can specifically target and activate this population. Here, we present a trimer-based germline targeting immunogen BG505 germline trimer 1.1 (GT1.1), a structure-based improvement of GT1 that shows increased range for VRC01-class gl precursors. A single immunization with GT1.1 expands antigen- and CD4bs-specific B cells in a gl-VRC01 knock-in mouse model and selects for VRC01-class somatic hypermutation. Monoclonal antibodies (MAbs) isolated from these mice show CD4bs-specific binding to N276D trimers as well as GT1.1 with the N276 glycan, indicating B cells are selecting for mutations necessary to accommodate glycans around the CD4bs. In non-human primates (NHPs), two priming immunizations followed by two immunizations with fully glycosylated BG505 revealed GT1.1 primes a CD4bs-specific response in >60% of immunized non-human primates (NHPs) as measured with electron-microscopy polyclonal epitope mapping (EMPEM), which is reflected in their ability to neutralize a VRC01-class signature panel of pseudoviruses. MAbs from immunized NHPs neutralize GT1.1 and BG505 N276D at high potencies and occasionally neutralize native, circulating HIV-1 strain BG505 at IC50s < 1 µg/mL. Crystallization studies reveal selected CD4bs MAbs target conserved residues in the CD4bs, similar to VRC01-class bNAbs. Thus, we validate GT1.1 as a priming immunogen that selects for VRC01-class mutational patterns as well as CD4bs-dependent binding and VRC01-class signature neutralization in mice and non-human primates. GT1.1 is currently in a phase I clinical trial to evaluate its immunogenicity.

P18

A LONGITUDINALLY ENHANCED CD8+ T CELL RESPONSE ACCOUNTS FOR 22 YEARS POST-TREATMENT CONTROL IN AN HLA-B*44 POSITIVE PATIENT TEMPORARILY TREATED DURING HIV INFECTION

Pien van Paassen[1], Lisa van Pul[1], Karlijn van der Straten[1], Marloes Grobben[1], Ad van Nuenen[1], Karel van Dort[1], Brigitte Boeser-Nunnink[1], Suzanne Jurriaans[1], Monique Nijhuis[2], Jori Symons[2], Ninee Buchholtz[2], Marit van Gils[1], Jan Prins[1], Godelieve de Bree[1], Neeltje Kootstra[1]

[1] *Amsterdam UMC, Amsterdam, the Netherlands*
[2] *UMC Utrecht, Utrecht, the Netherlands*

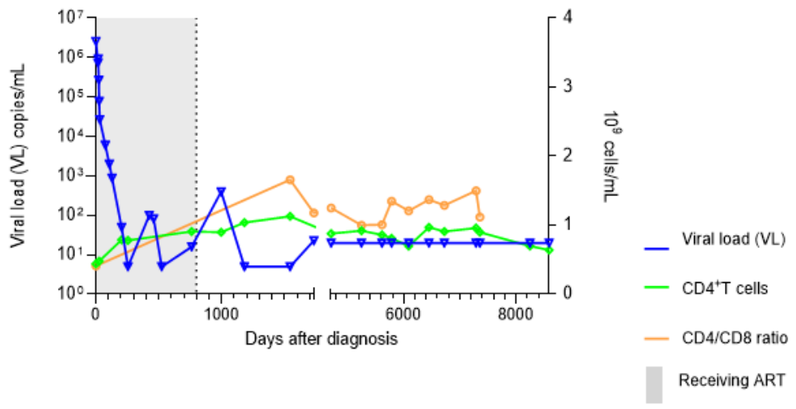
Background
In the search for cure strategies, comprehension of viro-immunological characteristics of the rare patients that control HIV after temporary treatment is pivotal. Several theories for post-treatment control have been proposed but the exact mechanism remains unclear. Here, we present a longitudinally high HIV specific T-cell response in a patient who controlled viral replication for 22 years post-treatment.

Methods
Viral reservoir assessments were performed by HIV pol qPCR, Intact Proviral DNA Assay (IPDA) and quantitative viral outgrowth assay (qVOA). Viral replication was determined in peripheral blood mononuclear cells (PBMC) from healthy donors and the patient. IgG binding levels against HIV envelope subdomains and serum neutralization breadth and potency were determined. HIV-specific T-cell responses upon HIV peptide pool stimulation were performed by flowcytometry.

Results
The person described in this study was diagnosed with acute HIV infection in 1998. Five weeks after the start of complaints he initiated combined antiretroviral therapy (cART), which, apart from a few viral blips, successfully suppressed his plasma HIV-RNA below 40 copies/mL for over 20 years (Figure). After 26 months he interrupted cART at his own request. The patient was HLA-A*02, A*68 and B*44:02 (homozygous). Replicating HIV was isolated 1 month after diagnosis (48 IU/ 106 CD4 T-cells), but not at later time points. However, proviral DNA (1500 x106 copies/mL) as well as intact provirus (37/ 106 PBMC) could be detected in PBMC 18 years after treatment. Replication capacity of the patients' viral variant was not impaired and efficient replication was observed in PBMC from healthy donors and the patient. Our patient exhibited stable serum IgG binding responses against HIV specific envelope spike proteins. Immunologic assays demonstrated that a very strong antiviral CD8+ T-cell proliferation targeting gag (30,2%), but not nef, pol and env with a high precursor frequency (3,96%) was present after infection.

Conclusion
This patient did not carry protective HLA-alleles and had a high viral load at diagnosis. This person was infected with a replication-competent virus, that could be isolated shortly after diagnosis, but not at later timepoints. A highly potent HIV-gag specific CD8+ T-cell response was developed within the first months after infection. Upon treatment interruption, this remained present until 24 years after diagnosis. In this patient, low level viral replication drives a functional immune response. Our data indicate that a potent CD8 T-cell response is an essential component of long term virological control and should be a target of cure interventions.

P18 (Figure 1) Viral load, CD4 T cell counts and CD4/CD8 during 24 years of follow-up



P19

A GENETIC VARIATION IN FUCOSYLTRANSFERASE 8 ACCELERATES HIV-1 DISEASE PROGRESSION INDICATING A ROLE FOR N-GLYCAN FUCOSYLATION

Lisa van Pul, Karel van Dort, Irma Maurer, Brigitte Boeser-Nunnink, Neeltje Kootstra

Amsterdam UMC, Amsterdam, the Netherlands

Background
Fucosyltransferase 8 (FUT8) is an enzyme that is uniquely responsible for a process known as N-glycan core fucosylation and is involved in post-translational modification of glycoproteins. Changes in core fucosylation by FUT8 has been shown to affect the immune response: Fucosylation of immunoglobulin G (IgG) alters the antibody binding to Fc receptors; Alterations in T-cell receptor (TCR) fucosylation influences TCR conformation, TCR signaling, T-cell development and function; low level of core fucosylation diminishes PD-1 expression and thereby improves T-cell responses. We hypothesize that genetic variations in FUT8 may affect fucosylation and thus the immune response. Here we investigate the effect of single nucleotide polymorphisms (SNPs) in FUT8 on the outcome of HIV-1 infection and disease course.

Methods
SNPs in FUT8 were analysed in HIV-1 infected participants of the Amsterdam Cohort Studies (ACS) on HIV-1 and AIDS. Cox regression and survival analysis was performed to determine the effect of the SNPs on the outcome of untreated infection. Using flow cytometry, the effect of a SNP in FUT8 on T-cell surface marker expression was determined 1 year before HIV-1 infection and 1 and 5 years after seroconversion (SC). T-cell function was analysed by proliferation assay using CellTrace Violet staining and measuring ZAP70 phosphorylation of donor PBMC with or without the SNP.

Results
Genome wide association study (GWA) in the ACS identified 92 SNPs in the FUT8 gene region. FUT8 SNPs that were previously identified to affect IgG fucosylation, had no effect on disease progression. However, the presence of the minor allele of SNP rs4131564 in FUT8 was associated with an accelerated disease progression (AIDS-defining events including CD4 counts <200 cells/ul) independent of the CCR5Δ32 genotype and HLA-B*57 as determined by Cox regression. T-cell phenotyping showed no significant differences in T-cell activation (HLA-DR/CD38) and exhaustion (PD-1) compared to individuals homozygous for the major allele. T-cell proliferation and ZAP70 phosphorylation upon TCR activation was not affected by the SNP in FUT8.

Conclusion
We observed that a naturally occurring genetic variation in the FUT8 gene was associated with accelerated HIV-1 disease progression. The SNP was not associated with differences in IgG fucosylation, T-cell activation, PD-1 expression, TCR signaling and T-cell proliferation. However, these assays were unable to detect minor or combined effects of the SNP on the immune response. Our data show that glycoprotein fucosylation plays a role in HIV-1 infection by a yet unknown mechanism.

P20

THE EXPECTED IMPACT OF AN HIV CURE ON THE QUALITY OF LIFE, STIGMA AND SEXUAL SATISFACTION OF PEOPLE LIVING WITH HIV AND KEY POPULATIONS VULNERABLE TO HIV IN THE NETHERLANDS

Kim Romijnders[1], Maartje Basten[1], Franco Romero Gonzalez[1], Amy Matser[2], Myrthe Verburgh[3], Maartje Dijkstra[4], Mirjam Kretzschmar[1], Pythia Nieuwkerk[5], Maarten Schim van der Loeff[4], Ganne Rozhnova[1], Peter Reiss[4]

[1] *Julius Center for Health Sciences and Primary Care, UMC Utrecht, Utrecht, the Netherlands*
[2] *Department of Infectious Diseases, Public Health Service of Amsterdam, Amsterdam, the Netherlands*
[3] *Department of Infectious Diseases, Amsterdam UMC, UvA, Amsterdam, the Netherlands*
[4] *Amsterdam UMC, UvA, Department of Internal Medicine, Amsterdam, the Netherlands*
[5] *Department of Medical Psychology, Amsterdam UMC, Amsterdam, the Netherlands*

Background
When an HIV cure becomes available, it will have consequences for people living with HIV (PLHIV) and key populations who do not have but are vulnerable for HIV. We explored the expected impact of an HIV cure on quality of life (QoL), stigma, and sexual satisfaction of PLHIV and key populations in the Netherlands.

Methods
A cross-sectional survey among PLHIV and key populations (e.g., men who have sex with men (MSM) without HIV) was conducted in the Netherlands. Participants were recruited from the Amsterdam Cohort Studies, the AGEhIV Cohort Study, the outpatient clinic of the University Medical Centre Utrecht, the Dutch HIV Association, GGDs, and Grindr. The questionnaire included two hypothetical cure scenarios: (1) post-treatment control (PTC) in which HIV is suppressed without the need for ongoing antiretroviral treatment (ART) and (2) HIV elimination from the body. Participants were asked to complete questions about QoL (EQ-5D), stigma (the Berger and Rudger stigma scale), and sexual satisfaction (short new sexual satisfaction scale (NSSS-S) for their current situation and both scenarios; and finally, their preferences between PTC and HIV elimination. We compared current QoL, stigma, and sexual satisfaction with expected QoL, stigma, and sexual satisfaction after PTC and elimination scenarios using paired sample t-tests.

Results
In total, 723 participants completed questions about the current situation and PTC, and 648 participants competed questions about the current situation and both scenarios. (Table 1). Of the 648 participants who completed all three sets of questions, 78% of PLHIV and 88% of key populations preferred elimination of HIV over PTC. The expected change in QoL, stigma and sexual satisfaction between the current situation and PTC or elimination scenarios are shown for PLHIV and key populations in Figure 1. PLHIV expected significantly improved QoL and sexual satisfaction, and expected less stigma compared to the current situation for both PTC and elimination scenarios. Key populations expected improved QoL after elimination but not after PTC, and improved sexual satisfaction and less stigma after both PTC and elimination scenarios.

Conclusion
Both PLHIV and key populations expect a favourable impact of PTC and HIV elimination on QoL, stigma, and sexual satisfaction. In further analyses we will investigate predictors of expected change, such as time since diagnosis, age, and gender.
Our results could help researchers anticipate the needs and impact that possible cure scenarios for HIV may have on affected populations.

P20 (Table 1) Participant characteristics

	PLHIV (n=227)	Key populations (n=496)
Age (n (%))		
18- 24	1 (1%)	44 (9%)
25 – 34	29 (13%)	117 (24%)
35 – 44	42 (19%)	122 (25%)
45 – 54	72 (32%)	128 (26%)
55 – 64	60 (27%)	59 (12%)
65 – 74	20 (9%)	22 (4%)
>=75	0	3 (1%)
Gender (n (%))		
Male	202 (90%)	481 (92%)
Female	18 (8%)	3 (1%)
Trans man	0	2 (<1%)
Trans woman	1 (<1%)	3 (1%)
other	3 (1%)	6 (2%)
Education [A] (n (%))		
Low	31 (14%)	12 (2%)
Middle	54 (24%)	84 (17%)
High	207 (55%)	450 (91%)
Country of birth (n (%))		
Netherlands	195 (86%)	411 (83%)
Western	17 (8%)	48 (10%)
Non-Western	12 (5%)	21 (4%)
High prevalence of HIV[B]*	2 (1%)	13 (3%)
Unknown	1 (<1%)	3 (<1%)
Years since HIV diagnosis		
Mean (min, max)	13 [1,39]	n.a.
Marital status (n (%))		
Single	115 (51%)	327 (66%)
Legal partnership with a man	41 (18%)	65 (13%)
Legal partnership with a woman	2 (1%)	3 (1%)
Married	49 (22%)	56 (11%)
Divorced	11 (5%)	12 (2%)
Widowed	1 (1%)	5 (1%)
Sexual orientation (n (%))		
Gay	183 (82%)	401 (81%)
Lesbian	1 (1%)	(0%)
Bisexual	13 (6%)	84 (17%)
Straight	25 (11%)	4 (1%)
Other	1 (1%)	3 (1%)

[A] The International Standard Classification of Education was used to categorize education.
[B] UNAIDS reported the countries of high prevalence and incidence in 2021. The top 10 were coded as high prevalence regardless of their region: Brazil, India, Indonesia, Kenya, Nigeria, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

P20 (Figure 1)

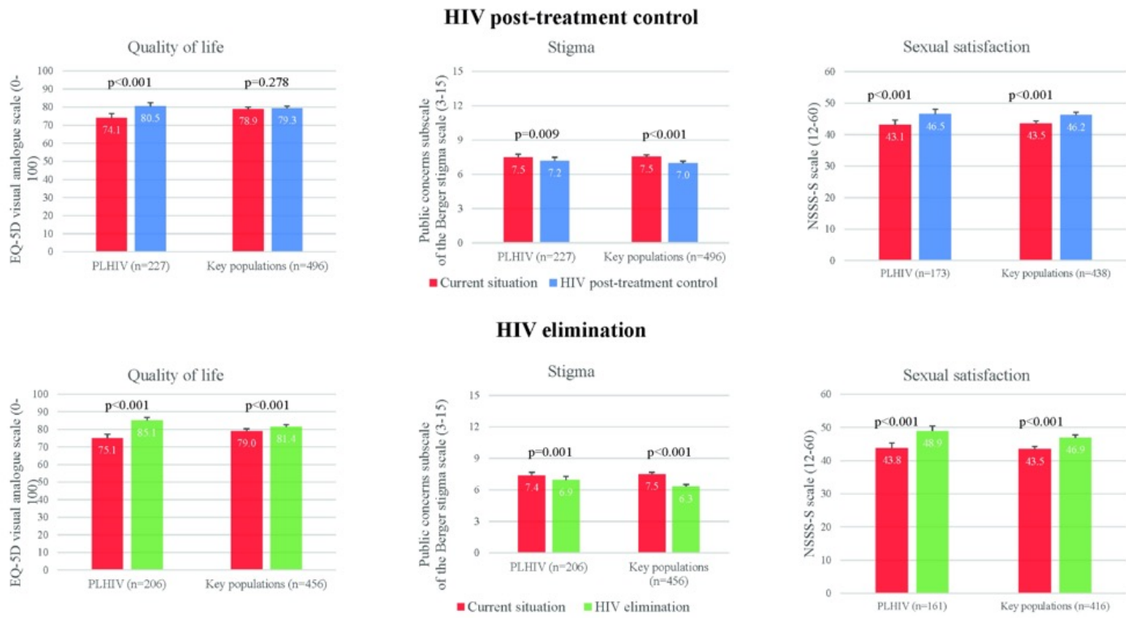


Figure 1 The scores reported in QoL, stigma, and sexual satisfaction after either post-treatment control or elimination of HIV compared to the current situation among PLHIV and key populations. The mean scores are displayed in the bars and numbers inside the bars. p-values display a significant expected change within a group. The error bars represent the confidence intervals.

P21

LOWER PERCEIVED CONCERN FOR PREP USERS, HIGHER PERCEIVED RISK FOR MSM WITH HIV: PERCEIVED CONCERN AND RISK OF GETTING INFECTED WITH MONKEYPOX AMONG MSM LIVING IN THE NETHERLANDS, JULY 2022

Haoyi Wang, Kennedy D'Abreu de Paulo, Thomas Gültzow, Hanne Zimmermann, Kai Jonas

Maastricht University, Maastricht, the Netherlands

Background
The current monkeypox epidemic is most prevalent among men-who-have-sex-with-men (MSM). PrEP users and MSM with HIV (MSMHIV) are considered to have the highest risk for monkeypox infection in the Netherlands and are being targeted for monkeypox vaccination. Next to the epidemiological evidence, perceived concern/risk are also important in decision-making about health behaviour uptake, e.g., vaccination uptake. It is thus relevant to examine which subpopulations among MSM consider themselves most at risk and most concerned about monkeypox. This study aimed to investigate this to complement and to help determine if the current measures to curb the epidemic are successfully targeted or not in the Netherlands.

Methods
We conducted an online survey among 394 Dutch MSM. We first calculated the prevalence and standardised prevalence ratio (SPR) of high perceived concern/risk of monkeypox by the PrEP-use and HIV status. We then conducted two multivariable logistic regression analyses to investigate the perceived concern/risk of monkeypox and their potential socio-demographic/behavioural/health/psycho-social determinants.

Results
Among the included MSM, 52% showed high perceived concern and 30% showed high perceived risk of monkeypox. PrEP users (SPR=0.83) showed a significantly lower chance of perceived concern; and MSMHIV (SPR=2.09) were found to have a significantly higher chance of perceiving high risk of monkeypox, more results for other MSM sub-populations see Table 1. In the multivariable logistic analyses, non-PrEP users (aOR=2.55) were more likely to perceive high concern, while MSM who were retired (aOR=0.23) and who had chemsex recently (aOR=0.63) were less likely to perceive high concern. MSMHIV (aOR=4.29) and MSM who had an unknown/ undisclosed HIV status (aOR=6.07), who had attended private sex parties (aOR=2.10), and who knew people who have/had monkeypox (aOR=2.10) were more likely to perceive a high risk of monkeypox. We found that a higher perceived risk (aOR=2.97) and a higher concern (aOR=3.13) of monkeypox were correlated with each other.

Conclusion
In sum, only one-third of Dutch MSM considered themselves at a high risk of monkeypox infection, and only half of them showed a high concern. We identified a potential discrepancy between the "actual risk" and the perceived risk and concern of monkeypox among MSM in this early stage of the monkeypox epidemic in the Netherlands, especially among PrEP users and MSMHIV. More refined public health communication strategies may be needed to improve the understanding and knowledge of the "actual risk" of monkeypox infections among these MSM sub-populations to encourage and facilitate an improved health behaviour uptake.

P21 (Table 1) Prevalance and standardised prevalence ratio of perceived concern and risk of monkeypox among MSM in the Netherlands, July 022

Sub-population	Perceived concern of monkeypox (High/very high vs. rest of scale) *					Perceived risk of monkeypox (High/very high vs. rest of scale) *				
	n	Prevalence (%)	95%CI	SPR	95%CI	n	Prevalence (%)	95%CI	SPR	95%CI
Total sample (N=394)	205	52.03	47.10;56.92	NA	NA	120	30.46	26.12;35.17	NA	NA
PrEP users (N=241)	113	46.89	40.69;53.19	0.83	0.68;0.99	74	30.71	25.22;36.79	1.09	0.86;1.36
Non-PrEP users (N=122)	72	59.02	50.14;67.34	1.05	0.82;1.30	28	22.95	16.38;21.16	0.82	0.54;1.15
HIV positive (N=22)	15	68.18	47.31;83.63	1.31	0.73;2.05	14	63.64	42.95;80.27	2.09	1.14;3.32
HIV negative (N=363)	185	50.96	45.84;56.07	0.98	0.84;1.13	102	28.10	23.72;32.93	0.92	0.75;1.11
HIV status unknown/ undisclosed (N=9)	5	55.56	26.67;81.12	1.06	0.34;2.21	4	44.44	18.88;73.33	1.45	0.38;3.23

Note: CI: confidence interval; NA: not applicable; PrEP: pre-exposure prophylaxis; SPR: standardised prevalence ratio. * 1 – 5 Likert scale, with 1 = extremely unlikely and 5 = extremely likely)

P22

MONKEYPOX VACCINATION WILLINGNESS, DETERMINANTS, AND COMMUNICATION NEEDS IN GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN, IN THE CONTEXT OF LIMITED VACCINE AVAILABILITY IN THE NETHERLANDS (DUTCH MPX-SURVEY)

Nicole Dukers-Muijrers[1], Ymke Evers[2], Veja Widdershoven[2], Udi Davidovich[3], Philip Adam[4], Eline Op de Coul[5], Paul Zantkuijl[6], Amy Matser[3], Maria Prins[3], Henry De Vries[3], Casper den Heijer[2], Christian Hoebe[2], AnneMarie Niekamp[2], Francine Schneider[7], Juliana Reyes-Uruena[8], Roberto Croci[8], Angelo D'Ambrosio[8], Marc van der Valk[9], Dirk Posthouwer[10], Robin Ackens[10], Henriette ter Waarbeek[2], Teymur Noori[8], Elske Hoornenborg[3]

[1] *Health promotion, Maastricht University & South Limburg Public Health Service, the Netherlands*
[2] *South Limburg Public Health Service Heerlen, Heerlen, the Netherlands*
[3] *Public Health Service Amsterdam, Amsterdam, the Netherlands*
[4] *Institute for Prevention and Social Research Utrecht, Utrecht, the Netherlands*
[5] *RIVM, Bilthoven, the Netherlands*
[6] *STI AIDS Netherlands, Amsterdam, the Netherlands*
[7] *Dept. Health Promotion, Maastricht University, Maastricht, the Netherlands*
[8] *European Centre for Disease Prevention and Control (ECDC), Stockholm, Sweden*
[9] *SHM and Amsterdam UMC, Infectious Diseases, Amsterdam, the Netherlands*
[10] *Hiv treatment clinic, MUMC+, Maastricht, the Netherlands*

Introduction
In the global monkeypox (MPX) outbreak primary preventive vaccination for MPX (PPV) is offered to people at higher risk. To increase effectiveness of public health strategies to increase PPV-uptake, strategies can be targeted to subgroups with lower intention and communication can be tailored to underlying beliefs. Current study in gay, bisexual and other men who have sex with men (GBMSM), and transgender persons (TGP) reports preferences, and willingness to accept PPV and its determinants. Findings inform the MPX-public health response.

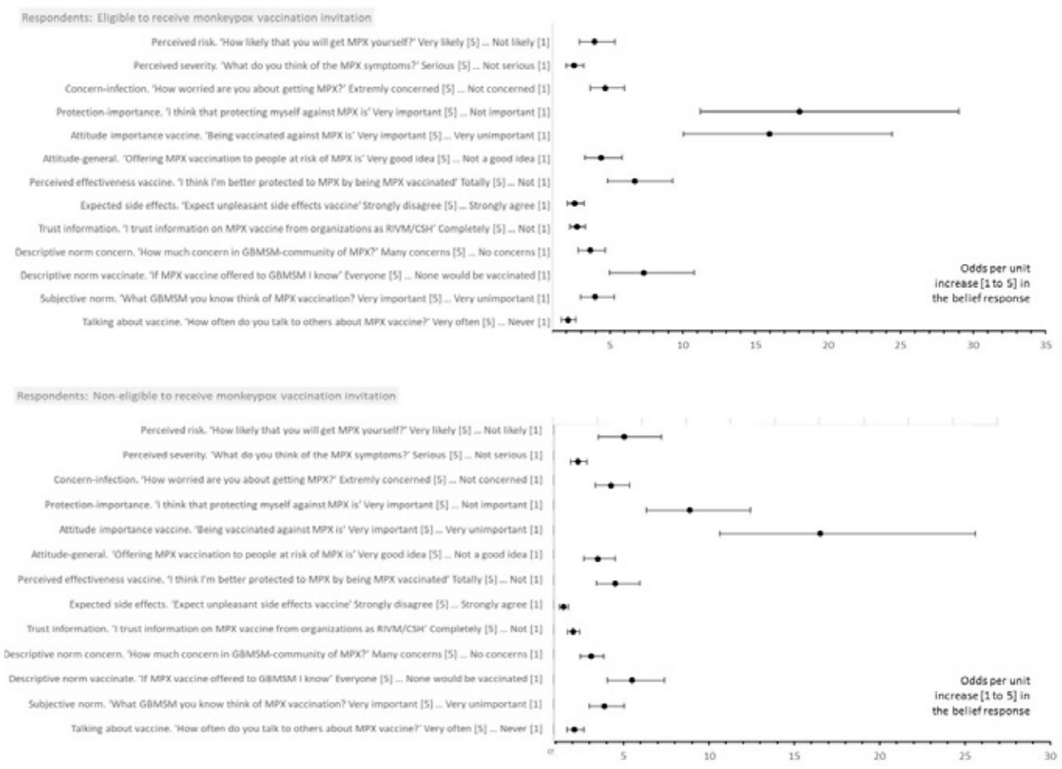
Methods
Online survey in convenience sample of GBMSM/TGP at early start of PPV-program (20/07-05/09/2022, Netherlands). Respondents were grouped as PPV-eligible (based on Dutch LCI criteria) when they (i) use(d) HIV-PrEP, (ii) living with HIV, (iii) visited Center for Sexual Health (CSH) and reported STI or >3 male sexpartners. We evaluated determinants for being (un)willing to accept PPV by multivariable multinominal and logistic regression analyses, calculating adjusted ORs/95%CI. Determinants included sociodemographic, social environment, medical and behavioral factors, that may inform the targeting of strategies to subgroups. Other determinants were beliefs that (reputably) can be changed and may inform tailoring of communication. An open question asked peoples' preferences, analyzed by inductive coding.

Results
Of respondents, 81.5% (n=1512/1856) were willing to accept PPV; 85.2% (799/938) in PPV-eligible respondents and 77.7% (713/918) in non-eligible. Independent associated determinants for being unwilling to accept PPV: urbanization (rural: aOR:2.2;1.2-3.7; low-urban: aOR:2.4;1.4-3.9; versus high-urban), not knowing monkeypox-vaccinated persons (aOR:2.4;1.6-3.4), and lack of connection to gay/queer-community (aOR:2.0;1.5-2.7). aOR shown for entire study-population and similar for eligible/non-eligible respondents; crude proportions in Fig.1.
Beliefs independently associated with willing to accept PPV: higher perception of risk/MPX-severity, motivation to protect oneself against MPX, positive attitude towards PPV, positive outcome expectations post PPV, positive perceived social norms regarding PPV importance and PPV-behavior of their social network; aOR in Fig.2.
Respondents recommended to communicate stigma-free, factual on MPX risks and PPV-benefits, more frequent and uniform, and clear on prioritization/operational PPV-issues.

Conclusion
Willingness to accept MPX PPV seems high in line with other EU countries; and can be further increased by strengthening public health efforts in less urbanized areas, reaching-out to those who lack connection to GBMSM/TGP community, and by tailoring communication messages to underlying beliefs, such as personal risks, benefits of vaccinating and social norms. The community should be involved to lift further barriers to MPX PPV, while public health ensures equity in access to the broad (PPV and alternatives) MPX preventive offer.

P22 (Figure 1)

P22 (Figure 1)



P23

COMPARING BELIEFS DRIVING STIGMA ACROSS COMMONLY STIGMATIZED INFECTIONS AMONG MSM: THE CASE OF MONKEYPOX, HIV, SYPHILIS, CHLAMYDIA, AND GONORRHOEA

Hanne Zimmermann, **Thomas Gültzow**, Tamika Marcos, Haoyi Wang, Kennedy D'Abreu de Paulo, Kai Jonas, Sarah Stutterheim

Maastricht University, Maastricht, the Netherlands

Background
In the Netherlands, the ongoing monkeypox epidemic is most prevalent among men who have sex with men (MSM). Because of this, as with the human immunodeficiency virus (HIV) epidemic and other infections commonly associated with MSM, MSM with monkeypox are likely to experience stigmatization. Currently, the scientific literature on monkeypox focuses mainly on epidemiology and clinical outcomes; beliefs that drive stigma have yet to be explored. In this study, we set out to explore beliefs that drive stigma, i.e., perceived severity and perceived responsibility, in relation to monkeypox, and compared them across stigmatized infections (i.e., HIV, syphilis, gonorrhoea, and chlamydia).

Methods
In July, 2022, we conducted an online survey with 394 MSM in the Netherlands. We measured perceived severity of monkeypox infection in terms of social consequences (scale 1 [least] – 5 [most]), and perceived responsibility for monkeypox infection, from a personal standpoint and as perceived to be present in society (extent to which participants or society, respectively, blame individuals who contract monkeypox, scale 1–5). Descriptive data informed how stigma-related beliefs pertain to monkeypox. Subsequently, we performed repeated measures ANOVA to examine how monkeypox stigma compares to other stigmatized infections.

Results
Mean perceived severity was 3.79 (SD=0.99), perceived responsibility from a personal standpoint was 2.12 (SD=1.10), and perceived responsibility in society was 3.32 (SD=1.11). Endorsement of stigma-related beliefs differed across stigmatized conditions for all beliefs: perceived severity, $F(4,1965)=212.16$, $p<0.001$), perceived responsibility from a personal standpoint, $F(4,1965)=4.77$, $p=0.001$), and perceived responsibility in society, $F(4,1965)=3.41$, $p=0.009$). Compared to other stigmatized conditions, monkeypox was considered less severe than HIV, but more severe than syphilis, gonorrhoea, and chlamydia. Furthermore, from an individual standpoint, perceived responsibility for monkeypox was lower than perceived responsibility for chlamydia and for HIV. In terms of societal perceptions, perceived responsibility for monkeypox was lower than for HIV. All other comparisons were nonsignificant.

Conclusion
The MSM in our study considered monkeypox to be relatively severe and held people with monkeypox responsible for their infection, but to a lesser extent than perceived responsibility they considered to be attributed in broader society. Compared to other stigmatized infections, monkeypox was thought to be more severe than most other infections, with the exception of HIV. This demonstrates that monkeypox stigma is at play in MSM communities and beyond in the Netherlands. Continuous monitoring and campaigns addressing stigma are warranted as stigma is known to negatively influence health outcomes.

P24

COVARIATES OF MONKEYPOX INFECTION AND RECENT MONKEYPOX VACCINATION AMONG MSM IN THE NETHERLANDS: ASSESSING AND COMPARING THE ASSOCIATION WITH USING HIV-PREP, LIVING WITH HIV, RECENT STI DIAGNOSIS, AND SEXUAL ACTIVITIES

Philippe Adam[1], Eline Op de Coul[2], Paul Zantkuijl[3], Hanna Bos[3], Cor Blom[3], Margreet te Wierik[2], John de Wit[4]

[1] *Institute for Prevention and Social Research, Utrecht, the Netherlands*
[2] *National Institute for Public Health and the Environment, Bilthoven, the Netherlands*
[3] *Soa Aids Nederland, Amsterdam, the Netherlands*
[4] *Utrecht University, Department of Interdisciplinary Social Science, Utrecht, the Netherlands*

Background
MSM who use hiv-PrEP or who live with HIV have greater odds of acquiring STIs and Monkeypox infection, and are consequently targeted since the end of July 2022 to receive Monkeypox vaccination. A population-based survey can help assess and compare factors associated with contracting Monkeypox and having recently received vaccination, and identify any disparities. We conducted a study among MSM in the Netherlands to assess whether the proxy criteria used as vaccination indication matched the risk factors for contracting Monkeypox.

Methods
A cross-sectional quantitative survey was conducted online between July 29 and August 30, 2022, corresponding to the first month of a stepwise rolled-out Monkeypox vaccination campaign. MSM were recruited via advertisements on social media and gay dating apps. 2,460 MSM reported on their sexual activity and whether they had a Monkeypox diagnosis or a recent Monkeypox vaccination. We calculated the proportions of MSM who contracted Monkeypox and had recently vaccinated, and used logistic regression to identify associated factors, including using hiv-PrEP, living with HIV, recent STI diagnosis, number of sex partners, group sex, chemsex, and sex in gay saunas or sex clubs.

Results
Of the 2,460 respondents, 73 (3.0%) had Monkeypox, and 485 (19.7%) had already vaccinated in this early phase of the vaccination program. Univariate associations were found with most covariates (Table). In multivariable analyses, common independent covariates of contracting Monkeypox and recent vaccination were using hiv-PrEP, living with HIV, and reporting 20 or more partners per year. While STI diagnosis in the past year was independently associated with vaccination, it was not an independent covariate of Monkeypox infection. Conversely, sex in gay saunas or sex clubs in the past two months was independently associated with Monkeypox infection, but not vaccination.

Conclusion
The number of Monkeypox cases has decreased in September 2022 in the Netherlands, but the local dynamics of the Monkeypox epidemic remains uncertain, also as Monkeypox could also be reintroduced from outside. The present findings can help fine-tune indication criteria for future vaccination eligibility. While proxies used for vaccination indication overall match risk factors for Monkeypox infection, important independent covariates of Monkeypox infection – higher number of sex partners and visiting commercial sex venues – could be added to the existing indication criteria for vaccination. Decreasing the odds of future Monkeypox outbreaks may require that MSM visiting gay saunas or sex clubs, including those not using hiv-PrEP and not living with HIV, obtain Monkeypox vaccination.

P24 (Table 1)

Table: Covariates of Monkeypox infection and recent Monkeypox vaccination among MSM in the Netherlands (N=2,460)

	Monkeypox infection				Recent Monkeypox vaccination			
	Univ. analyses		Multiv. analyses		Univ. analyses		Multiv. analyses	
	OR	P-value	aOR	P-value	OR	P-value	aOR	P-value
Current PrEP use	5.08	.000	3.49	.000	9.81	.000	9.43	.000
Living with HIV	1.46	.259	2.35	.054	.82	.000	1.92	.000
STI diagnosis[1]	3.58	.000	1.27	.380	4.10	.000	2.81	.000
Twenty or more partners[1]	7.45	.000	3.16	.000	2.96	.000	1.35	.028
Group sex[2]	5.43	.000	1.13	.729	3.41	.000	1.23	.280
Chemsex[2]	4.62	.000	1.48	.244	2.81	.000	1.01	.958
Sex in gay saunas and sex clubs[2]	6.78	.000	2.05	.014	2.89	.000	.89	.487

Note: [1] in the past 12 months, [2] in the past two months

P25

BEHAVIOURAL RISK BEFORE, DURING AND AFTER HEPATITIS C TREATMENT AMONG MEN WHO HAVE SEX WITH MEN WITH HIV BEFORE AND IN THE DIRECT-ACTING ANTIVIRAL ERA

Kris Hage[1], Anders Boyd[1], Daniëla van Santen[1], Kees Brinkman[2], Joop Arends[3], Fanny Lauw[4], Bart Rijnders[5], Arne van Eeden[6], Marc van der Valk[7], Astrid Newsum[1], Amy Matser[1], Janke Schinkel[8], Maria Prins[1]

[1] *Public Health Service of Amsterdam, Amsterdam, the Netherlands*
[2] *OLVG, Amsterdam, the Netherlands*
[3] *UMC Utrecht, Utrecht, the Netherlands*
[4] *MC Jan van Goyen, Amsterdam, the Netherlands*
[5] *Erasmus MC, Rotterdam, the Netherlands*
[6] *DC Klinieken Lairesse, Amsterdam, the Netherlands*
[7] *Stichting hiv monitoring, Amsterdam, the Netherlands*
[8] *Amsterdam UMC, Amsterdam, the Netherlands*

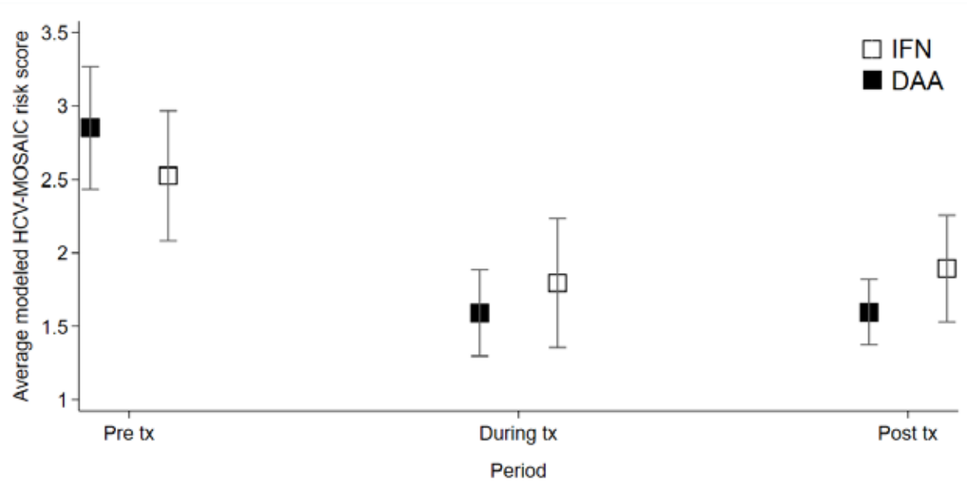
Background
With the introduction of direct-acting antivirals (DAAs), most individuals with hepatitis C virus (HCV) can be cured with well-tolerated regimens. Given more simplified treatments with higher cure rates compared to interferon (IFN)-based therapy, men who have sex with men (MSM) may be less prone to behavioural changes following HCV treatment.

Methods
Data from the Dutch observational MOSAIC study between 2009 and 2017 were used. We included MSM with HIV aged ≥18 years who received any HCV treatment. We evaluated risk behaviour through a validated HCV risk score (HCV-MOSAIC score=0-7) and individual risk behaviours included in this score (i.e., condomless receptive anal intercourse, sharing sex toys, sharing straws, unprotected fisting, injecting drug use (IDU) and ulcerative STI). Levels of risk behaviour before, during and after HCV treatment were stratified by treatment type and modeled using linear/logistic regression with Generalized Estimating Equations. Changes in behaviour post treatment were investigated in a separate model, while comparing treatment regimens.

Results
Of 143 study participants, 131 MSM were included with 157 infections. Median total follow-up was 29 months (IQR=10-54). Median age at baseline was 45 years (IQR=40-50); 78.6% were born in the Netherlands. For MSM treated with IFN-based treatment, the average risk score decreased from 2.9 (95%CI=2.4-3.3) pre-treatment to 1.6 (95%CI=1.3-1.9) during treatment and remained stable afterwards (1.6, 95%CI=1.4-1.8). For MSM treated with DAAs, the average risk score decreased from 2.5 (95%CI=2.1-2.9) pre-treatment to 1.8 (95%CI=1.3-2.2) during treatment and 1.9 (95%CI=1.5-2.2) post-treatment (Figure 1). There was no evidence of overall differences in risk scores between treatment regimen across timepoints (p>0.05). For individual risk behaviours, the proportion of IDU differed significantly between treatment regimen across timepoints (p=0.03). There were no changes in risk scores or proportion of individuals engaging in individual risk behaviour post treatment for either treated regimen (p>0.05).

Conclusion
In MSM with HIV-HCV, we found no difference in behavioural patterns, either from the HCV-MOSAIC score or for most individual behaviours, between IFN and DAA regimens. Nevertheless, a large proportion of individuals treated with DAAs are at risk of HCV reinfection (i.e., score ≥2.0) post-treatment, underscoring the need for ongoing HCV testing and behavioural interventions.

P25 (Figure 1) Average modeled HCV risk score pre-, during and post-treatment among MSM treated with IFN and DAAs



P26

IMPROVING THE HIV TESTING CASCADE: IMPLEMENTING HIV TEAMS TO SUPPORT HIV INDICATOR CONDITION-GUIDED TESTING IN GENERAL PRACTICE IN THE NETHERLANDS

Carlijn Jordans[1], Daniella van Otterdijk[1], Lotte Rokx-Niemantsverdriet[2], Jelle Struik[2], Eva van der Waal[3], Paul van der Voorn[3], Nienke Bakker[4], Casper Rokx[1]

[1] *Erasmus MC, Rotterdam, the Netherlands*
[2] *Gezondheidscentrum Mathenesserlaan, Rotterdam, the Netherlands*
[3] *Huisartsenpraktijk Händellaan, Delft, the Netherlands*
[4] *Huisartsen maatschap Rozenburcht, Capelle aan den IJssel, the Netherlands*

Background
In the Netherlands, many patients newly diagnosed with HIV in general practices are late presenters with multiple missed testing opportunities prior to their HIV diagnosis. HIV indicator condition (IC)-guided testing facilitates a timelier diagnosis of HIV. This pilot study aimed to evaluate the prevalence, diagnostic gaps and opportunities of HIV IC-guided testing at general practitioners (GPs) in a region with a relatively high rate of undiagnosed HIV infections in the Netherlands.

Materials and Methods
In an ongoing prospective observational study in 14 general practices on 3 locations in the Rotterdam region, we setup an HIV team consisting of HIV physicians and GP ambassadors from each location to evaluate HIV testing adequacy of 14 preselected common HIV ICs in general practices. In addition, GPs were informed at pilot start on the relevance of HIV IC-guided testing and received free point-of-care HIV tests in their general practices. The main endpoint was the HIV testing rate adequacy of identified HIV ICs. Patient and GP experiences with the implemented strategy were assessed by questionnaires.

Results
A total of 377 HIV ICs, including 238 sexually transmitted infections (STIs), were identified on 54,248 screened GP appointments over a 1 year period (prevalence: 0.7%, 95% CI 0.63%-0.77%). xzThe overall HIV testing rate of HIV ICs was 25.7%. Major deficiencies in HIV testing adequacy were observed in all 14 HIV ICs, with STIs having a 30.2% ($p<0.001$) testing rate and unexplained weight loss having the highest testing rate (55.6%)(Table 1). Most common given reasons not to test for HIV were; patient was unreachable (n=7) and no-show on follow-up appointment (n=4). Questionnaires performed amongst participating GPs and in a subset of patients who received point-of-care HIV testing showed, however, near universal positive attitudes towards HIV testing with GPs unanimously perceiving benefits for patient care and the implementation of a more proactive HIV testing strategy.

Conclusion
This pilot indicates that a significant gap exist between the positive attitudes of GPs and patients on HIV testing and the actual HIV IC-guided testing adequacy. More pro-active interventions will likely improve HIV testing rates with GPs in this low HIV prevalence setting.

P26 (Table 1) HIV indicator conditions testing rates, grouped by sexually transmitted infections and non-sexually transmitted infections

		Reported n, (%)	Test offered[2] n, (%)	Test performed[2] n, (%)	p-value[3]
Total		377 (100)	118 (31.3)	97 (25.7)	<0.000
Sexually transmitted infections		238 (63.1)	91 (38.2)	72 (30.2)	<0.001
Non-sexually transmitted infections (all other HIV[1] indicator conditions)		139 (36.9)	27 (19.4)	25 (18.0)	<0.001
	Cervical dysplasia	4 (1.1)	0 (0.0)	0 (0.0)	
	Community-acquired pneumonia	25 (6.6)	0 (0.0)	0 (0.0)	
	Herpes zoster	47 (12.5)	4 (8.5)	3 (6.4)	
	Mononucleosis-like illness	2 (0.5)	1 (50.0)	1 (50.0)	
	Seborrheic dermatitis/exanthema	9 (2.4)	4 (44.4)	3 (33.3)	
	Severe or atypical psoriasis	4 (1.1)	1 (25.0)	1 (25.0)	
	Unexplained chronic diarrhea	3 (0.8)	0 (0.0)	0 (0.0)	
	Unexplained fever	0 (0.0)	0 (0.0)	0 (0.0)	
	Unexplained leukocytopenia	4 (1.1)	1 (25.0)	1 (25.0)	
	Unexplained lymphadenopathy	8 (2.1)	3 (37.5)	3 (37.5)	
	Unexplained oral candidiasis	13 (3.4)	3 (23.1)	3 (23.1)	
	Unexplained thrombocytopenia	2 (0.5)	0 (0.0)	0 (0.0)	
	Unexplained weight loss	18 (4.8)	10 (55.6)	10 (55.6)	

[1]HIV: Human Immunodeficiency Virus.
[2]Percentages calculated based on reported total of HIV indicator conditions.
[3]Calculation based on comparison between observed HIV test rate and the assumed baseline HIV test uptake of 50% (z-test)

P27

CHARACTERIZING SUBGROUPS OF SEXUAL BEHAVIORS AMONG MEN WHO HAVE SEX WITH MEN ELIGIBLE FOR, BUT NOT USING, PREP IN THE NETHERLANDS

Feline De la Court[1], Daphne van Wees[2], Birgit van Benthem[2], Elske Hoornenborg[1], Maria Prins[1], Anders Boyd[1]

[1] *GGD Amsterdam, Amsterdam, the Netherlands*
[2] *RIVM, Bilthoven, the Netherlands*

Background
In the Netherlands, demand for pre-exposure prophylaxis (PrEP) has surpassed provision capacity within the national PrEP pilot (NPP), creating a need to prioritize individuals already eligible for PrEP. This study identified subgroups of sexual behaviors associated with increased STI/HIV risk among eligible non-PrEP users during the NPP.

Methods
We used data from sexual health centers (SHCs) in the Netherlands, including all visits of eligible but non-PrEP using men who have sex with men (MSM), men who have sex with men and women (MSMW) and transgender persons between July 2019 (start of NPP) and June 2021. Using latent class analysis (LCA), we identified classes of sexual behaviors (number of partners, chemsex, group sex and sex work) and explored whether these classes were associated with numbers of STI diagnosis and sociodemographics.

Results
Across 45,582 visits (n=14,588), the best fitting LCA model contained three classes. These classes were distinguished by seldomly reported sexual behaviors (class 1; 53.5%, n=24,383), the highest proportions of ≥6 partners and group sex (class 2; 29.8%, n=13,596), and the highest proportions of chemsex and sex work (class 3; 16.7%, n=7,603). Visits classified in classes 2 and 3 (vs. class 1) were significantly more often observed in individuals who were diagnosed with an STI, older (≥36 vs. ≤35 years), MSMW (vs. MSM), and visiting an urban (vs. non-urban) SHC; while these visits were significantly less often observed in individuals from an STI/HIV endemic area (i.e., non-Western). The percentage of visits at which an STI was diagnosed was 17.07% (n=4,163) in class 1, 19.53% (n=2,655) in class 2 and 25.25% (n=1,920) in class 3.

Conclusion
Among PrEP eligible individuals, the highest risk of STI was in those engaging in specific subgroups of sexual activity characterized by frequently reporting multiple partners, group sex and chemsex. PrEP uptake should be encouraged in these individuals.

P28

SEXUAL BEHAVIOR AND STI INCIDENCE DURING THE FIRST FOUR YEARS OF PREP USE AMONG MSM

Mark van den Elshout, **Eline Wijstma**, Vita Jongen, Liza Coyer, Anders Boyd, Udi Davidovich, Henry de Vries, Maria Prins, Maarten Schim van der Loeff, Elske Hoornenborg

Department of Infectious Diseases, Public Health Service Amsterdam, Amsterdam, the Netherlands

Background
A prospective demonstration project in Amsterdam (AMPrEP) provided pre-exposure prophylaxis (PrEP) to people vulnerable to HIV in 2015-2020. Data on long-term trends in sexual behavior and incidence of STIs during PrEP use are needed to inform future PrEP programs. Therefore, we assessed sexual behavior and incidence rates of STIs among MSM and transgender women on PrEP over four years.

Methods
AMPrEP participants chose between oral PrEP daily (dPrEP) or event-driven (edPrEP) at baseline and could switch regimens at each 3-monthly study visit. They were tested for STIs at those visits and if necessary in between. Follow-up began at PrEP initiation and continued until 48 months of follow-up or was censored at March 15, 2020 (start COVID-19), whichever occurred first. We assessed changes over time in incidence rates(IR) of chlamydia, gonorrhea, and infectious syphilis using Poisson regression. We estimated the IR of Hepatitis C (HCV) diagnoses per consecutive year. We described the number of HIV diagnoses, and sexual behavior (i.e. number of sex partners, condomless anal sex acts with casual partners [CAS]).

Results
A total of 367 (365 MSM) started PrEP and contributed 1249 person-years of observation. IRs of any STI was 87[95%CI 82-93]/100PY. There was no change in the IR of any STI and infectious syphilis over time on PrEP. We observed a slight decrease in incident chlamydia and gonorrhea in daily PrEP users (Table). Two incident HIV cases were diagnosed in the first year of follow-up. IRs for HCV were 1.5[0.6-3.6], 2.5[1.3-5.0], 0.7[0.2-2.7], and 0.4[0.1-2.8]/100PY, per consecutive year on PrEP.
Median number of sex partners per 3-month period decreased from 16[IQR 8-34] and 12[6-25] (dPrEP and edPrEP, respectively) at baseline, 15[7-30] and 8[3-16] at 24 months, and 12[6-26] and 5[2-12] at 48 months. Median number of CAS acts with casual partners were respectively 7[3-15] and 4[1-9] at baseline, 14[5-25] and 4[1-12] at 24 months, and 12[4-25] and 4[1-9] at 48 months.

Conclusion
Over the first 4 years of PrEP use overall STI incidence was high and stable. Chlamydia and gonorrhea incidence declined slightly in daily users. Numbers of sex partners seemed to decrease in both dPrEP and edPrEP users. Number of CAS acts with casual partners appeared to increase first, and then stabilized. Notably, this did not result in increased incidence of STIs. Regular testing and treatment of STIs remain a priority among PrEP users. Biomedical prevention of STIs can be examined in this context.

P28 (Table 1) Incidence rate ratios for bacterial STIs per year increase in time on PrEP, stratified by regimen, during the first four years of PrEP use. Aug

	Total		Daily PrEP		Event-driven PrEP	
	No. of positive tests	aIRR[a] [95%CI]	No. of positive tests	aIRR[a] [95%CI]	No. of positive tests	aIRR[a] [95%CI]
Any STI[b]	1090	0.98 [0.93-1.04]	887	0.98 [0.92-1.04]	203	1.02 [0.89-1.16]
Any chlamydia	525	0.92 [0.85-1.00]	430	0.92 [0.84-1.01]	95	0.96 [0.79-1.16]
Any gonorrhea	614	0.93 [0.86-1.00]	504	0.91 [0.84-1.00]	110	1.02 [0.85-1.21]
Infectious syphilis	141	0.99 [0.85-1.16]	108	1.08 [0.91-1.29]	33	0.76 [0.55-1.06]

[a]Adjusted for age category and individual testing frequency;
[b]Including chlamydia, gonorrhea, and infectious syphilis.

P29

INTENTION TO USE LONG-ACTING HIV PREP AMONG KEY POPULATIONS, THE NETHERLANDS, 2022

Jeffrey Koole, Maarten Schim van der Loeff, Udi Davidovich, Amy Matser, Kenneth Yap, Maria Prins, Elske Hoornenborg, Vita Jongen

Public Health Service Amsterdam, Amsterdam, the Netherlands

Background
HIV pre-exposure prophylaxis (PrEP) prevents HIV acquisition. Since oral PrEP is highly dependent on adherence and not all PrEP-eligible individuals are willing or able to adhere to (semi-)daily oral PrEP regimens, long-acting PrEP (LA-PrEP) could offer an alternative. In this study we assessed the intention to use LA-PrEP among men who have sex with men (MSM), and transgender and gender diverse persons (TGDP).

Methods
Between May and August 2022, HIV-negative MSM and TGDP, recruited through Grindr (gay dating application), social media, TransKliniek and the Centre of Sexual Health Amsterdam, completed an online questionnaire on LA-PrEP. A short description of three LA-PrEP options (oral once monthly, intramuscular once bimonthly and subdermal annually) was provided. We measured intention to use, and expected adherence, effectiveness and side-effects for these LA-PrEP options using a 7-point Likert scale. We used univariable and multivariable logistic regression to identify factors associated with a high intention (defined as ≥5.5) to use LA-PrEP.

Results
Of the 702 participants, 676 (96.3%) were MSM and 26 (3.7%) TGDP. Median age was 36 years (interquartile range [IQR] 30-45) and 573 (81.6%) reported PrEP use in the preceding 6 months. 350 (49.9%) participants reported group sex in the preceding 6 months, 308 (43.9%) sexualized drug use and median number of sex partners was 10 (IQR 5-20). Of all participants, 248 (35.3%) had previously heard of LA-PrEP, and 572 (81.5%) reported having a high intention to use oral LA-PrEP, 327 (46.5%) to use intramuscular and 262 (37.3%) to use subdermal LA-PrEP if these options would be available. In multivariable analyses, having a high intention to use oral, intramuscular or subdermal LA-PrEP was associated with younger age, being employed, recent short-acting oral PrEP use, being PrEP eligible according to the Dutch PrEP guidelines, reporting sexualized injecting drug use, high expected adherence and effectiveness, and few expected side-effects of LA-PrEP (Table 1).

Conclusion
Among MSM and TGDP, awareness of LA-PrEP was limited, but intention to use was high, especially for oral LA-PrEP. When LA-PrEP options become available in the Netherlands, informing MSM and TGDP about all PrEP modalities including LA-PrEP is important to ensure they can make an informed HIV prevention choice.

P29 (Table 1)

Table 1. Factors associated with high intention to use oral, intramuscular and subdermal long-acting HIV pre-exposure prophylaxis (PrEP) for men who have sex with men (n=676) and transgender and gender diverse persons (n=26), the Netherlands, 2022. Results from multivariable logistic regression.

	Long-acting HIV PrEP modality					
	Oral		Intramuscular		Subdermal	
Variable	**aOR (95% CI)**	***p***	**aOR (95% CI)**	***p***	**aOR (95% CI)**	***p***
Age group						
16-34 years (ref)			1	0.0014		
35-44 years			0.78 (0.54-1.13)			
≥45 years			0.48 (0.32-0.72)			
Currently employed, yes	1.69 (1.01-2.83)	0.046				
Recent PrEP use, yes[1]	2.46 (1.55-3.89)	<0.001	1.70 (1.11-2.62)	0.015		
PrEP eligible, yes[2]			1.66 (1.15-2.38)	0.006	1.62 (1.12-2.34)	0.010
Injecting drug use, yes[1]					2.70 (1.05-6.93)	0.039
Expected adherence[3], score	1.29 (1.17-1.43)	<0.001	1.14 (1.02-1.28)	0.024	1.22 (1.07-1.38)	0.002
Expected effectiveness[3], score			1.11 (1.00-1.24)	0.046	1.17 (1.05-1.31)	0.005
Expected side-effects[3], score	0.89 (0.80-1.00)	0.041	0.86 (0.78-0.93)	<0.001	0.86 (0.78-0.94)	0.001

aOR: adjusted odds ratio, CI: confidence interval.

1. In preceding 6 months.

2. HIV pre-exposure prophylaxis (PrEP) eligibility criteria following Dutch National PrEP guidelines include: men who have sex with men (MSM) or transgender persons (TGP) having sex with other men or TGP, and one of the following in the preceding 6 months: (a) condomless anal sex with a partner with unknown HIV-status, (b) condomless anal sex with an individual living with HIV with an unknown or detectable viral load, (c) rectal bacterial sexually transmitted infection or syphilis, (d) post-exposure prophylaxis use. Also eligible are individuals at substantial risk of HIV acquisition, e.g. those who have sex with MSM or TGP or with people from a region with a high HIV prevalence.

3. Expected adherence, effectivity and side-effects of long-acting PrEP (LA-PrEP) compared to short-acting oral PrEP were measured using a 7-point Likert scale. The ORs may be interpreted as follows: for each point increase on the 7-point Likert scale of expected adherence to oral LA-PrEP, the odds for having a high intention to use this LA-PrEP options increases 1.29 fold.

P30

SHIFTING SOURCES OF HIV INFECTIONS AMONG AMSTERDAM RESIDENTS: FURTHER FINDINGS FROM THE ROADMAP STUDY, 2010-2021

Alexandra Blenkinsop[1], Mélodie Monod[2], Ard van Sighem[3], Nikos Pantazis[4], Daniela Bezemer[3], Eline Op de Coul[5], Thijs van de Laar[6], Christophe Fraser[7], Maria Prins[8], Peter Reiss[9], Godelieve de Bree[9], Oliver Ratmann[2]

[1] AIGHD/Imperial College London, London, United Kingdom
[2] Imperial College London, London, United Kingdom
[3] Stichting hiv monitoring, Amsterdam, the Netherlands
[4] University of Athens, Athens, Greece
[5] National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands
[6] Sanquin Research, Amsterdam, the Netherlands
[7] University of Oxford, Oxford, United Kingdom
[8] Amsterdam UMC, Amsterdam, the Netherlands
[9] Amsterdam UMC/AIGHD, Amsterdam, the Netherlands

Background
Recent phylogenetic evidence suggests that over half of newly-acquired HIV infections in Amsterdam had a source who resided within the city, and of these, 8 of 10 were in MSM. Here, we characterise the sources of these within-city infections in MSM between 2010-2021.

Methods
We leveraged viral sequence data from individuals registered into ATHENA with an Amsterdam postal code, in the context of international background sequences, to reconstruct phylogenetic trees. We identified phylogenetic transmission chains circulating in Amsterdam with more than one individual. To estimate sources of within-city infections, we developed a Bayesian mixture model that exploits both observed genetic distances and estimated time between infection and sampling times between pairs in the same chain. This approach can account for larger genetic distances when time elapsed is long, critical for accurate inferences with frequent late diagnoses. Estimation of infection time, and time from infection to sampling, was based on biomarker, demographic and clinical data, derived from ATHENA.

Results
In the likely transmission chains we find 348 [285-418] pairs of MSM who had a transmission pair probability of >50% when considering genetic distance, time elapsed, last negative test of the source and infection times of the recipient consistent with transmission, and viral load data indicating the source was not virally suppressed on infection date of the recipient.

308 recipients had an infection date in 2010-2015, and 113 had an infection date in 2016-2021.

We find that for MSM from all world regions, who live in and likely acquired their infection in Amsterdam in 2010-2021, the predominant source were Dutch-born MSM (57% [55-58%], Figure 1A). Only Amsterdam MSM from the Caribbean and South America showed considerable within-group transmission dynamics, with an estimated 34% [30-38%] of within-city infections originating from the same group.

With the sample sizes available, we can consider the sources of infections in Amsterdam MSM in more detail by time period for Dutch-born and foreign-born MSM. In 2010-2015, an estimated 61% [59-64%] of infections in Dutch-born MSM originated from Dutch-born MSM, and 56% [53-59%] of infections in foreign-born MSM also originated from Dutch-born MSM.

In 2016-2021, relatively more infections in Amsterdam MSM originated from foreign-born MSM, suggesting a shift in sources over time (Figure 1B).

Conclusion
HIV phylogenetic data suggests in Amsterdam, MSM transmission has historically been sustained by Dutch-born MSM, while in 2016-2021, foreign-born MSM living in Amsterdam have overtaken as the primary source of new within-city infections.

P30 (Table 1)

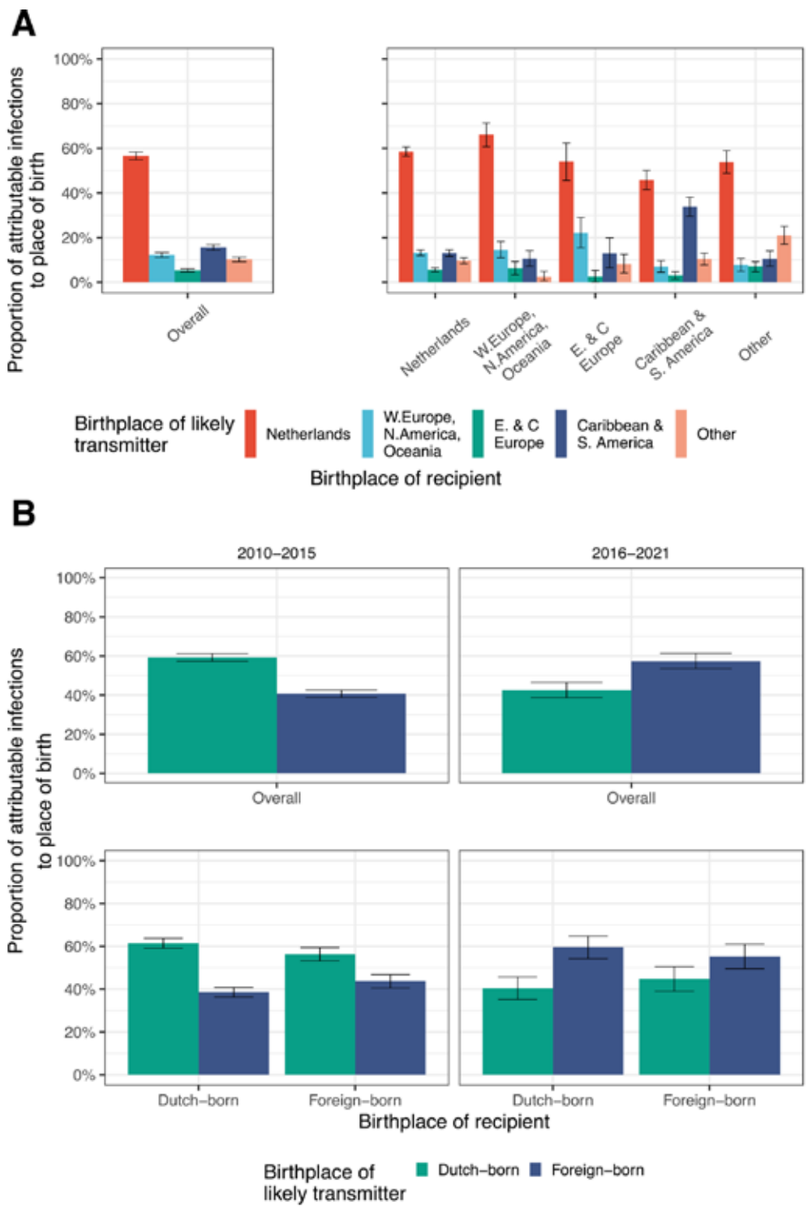


Figure 1: *A) Estimated proportion of infections acquired in 2010-2021 attributable to MSM risk groups by place of birth in Amsterdam, overall and stratified by birthplace of recipient in each likely source-recipient transmission pair. B) Estimated proportion of infections acquired in 2010-2015 and 2016-2021 attributable to Dutch-born and foreign-born MSM in Amsterdam, overall and stratified by birthplace of recipient in each likely source-recipient transmission pair.*

POSTER PRESENTATIONS

P31

MAPPING HEMATOLOGISTS' HIV TESTING BEHAVIOR AMONG LYMPHOMA PATIENTS IN AMSTERDAM, THE NETHERLANDS – A MIXED-METHODS STUDY

Saskia Bogers[1], Hanne Zimmermann[2], Amie Ndong[1], Udi Davidovich[3], Marie José Kersten[4], Peter Reiss[1], Maarten Schim van der Loeff[3], **Suzanne Geerlings[1]**

[1] Department of Internal Medicine, Amsterdam UMC, location UvA, Amsterdam, the Netherlands
[2] Department of Work and Social Psychology, Maastricht University, Maastricht, the Netherlands
[3] Department of Infectious Diseases, Public Health Service of Amsterdam, Amsterdam, the Netherlands
[4] Department of Hematology, Amsterdam UMC, location UvA, Amsterdam, the Netherlands

Background
Routine HIV testing among patients with malignant lymphoma (PWML) is recommended in international guidelines, but its implementation in the Dutch hematology setting varies by lymphoma type and hospital. We evaluated HIV testing among PWML, and mapped factors influencing hematologists' testing behavior.

Materials
We conducted a mixed-methods study assessing HIV testing among PWML, factors influencing HIV testing and opportunities for improvement in five hospitals in the region of Amsterdam, the Netherlands. The proportion of PWML tested for HIV within 3 months before or after lymphoma diagnosis and percentage positive were assessed using electronic health records (EHR) of PWML from January 2015 through June 2020. Questionnaires on intention to test, testing behavior and psychosocial determinants for HIV testing were conducted among hematologists. Through twelve semi-structured interviews among hematologists and authors of hematology guidelines, we further explored influencing factors and opportunities for improvement.

Findings
Overall, 1,612 PWML were included for analysis, including 976 patients newly diagnosed and 636 patients who were referred or with progressive/relapsed lymphoma. Seventy percent (678/976) of patients newly diagnosed and 54% (343/636) of patients with known lymphoma were tested for HIV (Table 1). Of 1,306 patients who received treatment for their lymphoma, 928 (71%) were tested for HIV. However, 242/1,306 (19%) of patients who received treatment had no evidence of ever being tested for HIV in their EHR. The remaining 136/1,306 (10%) were tested more than 3 months before or after lymphoma diagnosis. Among patients without any evidence of HIV testing, 139/242 (57%) had a new lymphoma diagnosis requiring immediate treatment. Overall, 7/1,021 (0.7%) PWML tested HIV positive, exceeding the 0.1% cost-effectiveness threshold. Questionnaires were completed by 40/77 invited hematologists, and 85% reported intention to test PWML for HIV (Figure 1). In the interviews, hematologists reported varying HIV testing strategies, including testing all PWML or only when lymphoma treatment is required. Recommendations for improved HIV testing included guideline adaptations, providing electronic reminders and monitoring and increasing awareness.

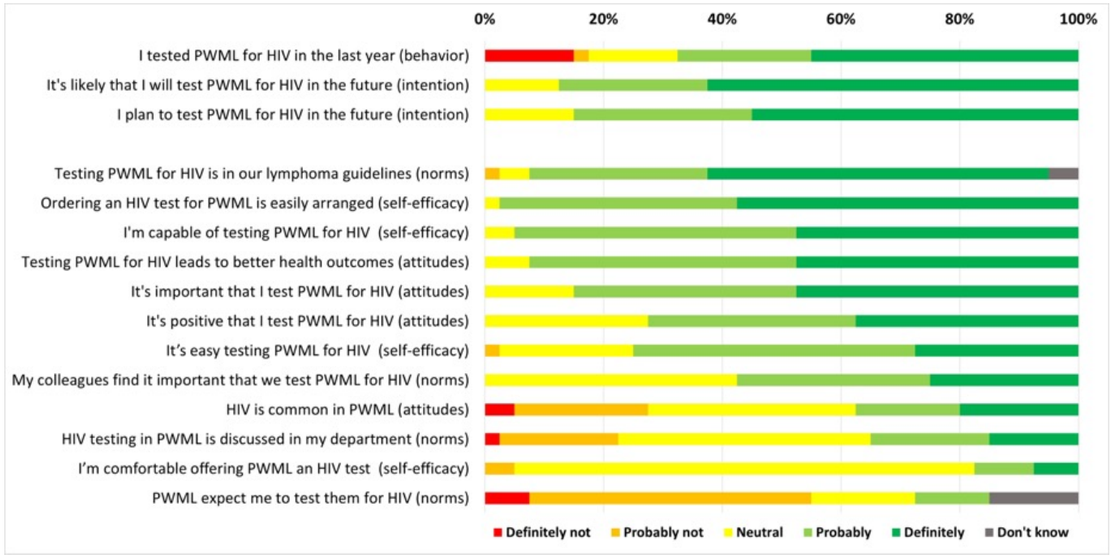
Conclusion
Missed opportunities for HIV testing among PWML occurred and HIV test strategies varied among hematologists. Efforts to improve HIV testing among PWML should include a combination of approaches for optimal effect.

P31 (Table 1) Questionnaire responses on HIV testing among PWML by hematologists from 5 hospitals in the region of Amsterdam, 2020

	Overall (column %) (n= 1,612)	Tested for HIV (row %) (n=1,021)	Not tested for HIV (row %) (n=591)	*p* value
Sex				<0.001
Female	687 (42.6%)	398 (57.9%)	289 (42.1%)	
Male	925 (57.4%)	623 (67.4%)	302 (32.7%)	
Age at lymphoma diagnosis (y)	61 (49-71)	59 (47-69)	64 (53-74)	<0.001
Socio-economic status*				0.870
Low	494 (31.0%)	317 (64.2%)	177 (35.8%)	
Intermediate	392 (24.6%)	250 (63.8%)	142 (36.2%)	
High	706 (44.4%)	443 (62.8%)	263 (37.3%)	
Hospital of inclusion				<0.001
University hospital 1	473 (29.3%)	297 (62.8%)	176 (37.2%)	
University hospital 2	471 (29.2%)	293 (62.2%)	178 (37.8%)	
Teaching hospital 1	352 (21.8%)	259 (73.6%)	93 (26.4%)	
Teaching hospital 2	203 (12.6%)	99 (48.8%)	104 (51.2%)	
Non-teaching hospital 1	113 (7.0%)	73 (64.6%)	40 (35.4%)	
Lymphoma diagnosis				<0.001
Newly diagnosed at study site	976 (60.6%)	678 (69.5%)	298 (30.5%)	<0.001
Requiring immediate treatment	832 (85.3%)	614 (73.8%)	218 (26.2%)	
Requiring treatment later	44 (4.5%)	24 (54.6%)	20 (45.5%)	
Not requiring treatment	100 (10.3%)	40 (40.0%)	60 (60.0%)	
Known lymphoma diagnosis at presentation	636 (39.5%)	343 (53.9%)	293 (46.1%)	<0.001
Progressive, requiring treatment	26 (4.1%)	8 (30.8%)	18 (69.2%)	
Relapsed lymphoma	171 (26.9%)	82 (48.0%)	89 (52.1%)	
Second opinion	117 (18.4%)	20 (17.1%)	97 (82.9%)	
Transfer from another hospital	322 (50.6%)	233 (72.4%)	89 (27.6%)	

*Data are depicted as n (%) or median (IQR). *Twenty patients had a missing socio-economic status.*

P31 (Table 1) Characteristics of PWML in five hospitals in the region of Amsterdam, overall and by HIV testing ≤3 months before/after lymphoma diagnosis, 2015-2020



P32

DO CROSS-BORDER DIFFERENCES IN HIV-TESTING DETERMINE THE FIRST PILLAR OF THE CARE CONTINUUM? DATA FROM A EUREGIONAL SETTING BRIDGING BELGIUM, GERMANY, AND THE NETHERLANDS

Hanne Zimmermann, Sarah Stutterheim, Kai Jonas

Maastricht University, Maastricht, the Netherlands

Background
The Netherlands is on track to reach the 95-95-95 goals by 2025. In regions like Limburg where countries are in very close proximity, HIV-risk is not only determined by within-country but also between-country factors. These considerations were the rationale for our “EuRegio project”, in which we take a regionally-tailored approach to reducing HIV-risk in the EuRegion Meuse-Rhine (EMR; consisting of Belgian, German, and Dutch regions). To set priorities, we explored between-country differences in HIV-indicators in the EMR using two different data-driven approaches.

Method
First, we used aggregated 2020 surveillance data from the German Robert Koch Institute, Belgian Sciensano, and the Dutch HIV Monitoring Foundation to report on the EMR-specific 95-95-95 goals. Second, we used the cross-sectional EMIS-2017 survey (including only MSM) to report on determinants of HIV-testing in the EMR. For the latter, we employed multilevel multinomial regression modelling to identify sociodemographic factors associated with recent (<1 year), non-recent (≥1 year) or never-testing for HIV, while adding a random effect to explore differences between EMR-countries.

Results
Using the EMR-specific surveillance data, we found that the estimated number of individuals with HIV is 23,216 with an estimated 2,982 remaining undiagnosed (13%). In terms of the 95-95-95 goals, countries differed most on the first pillar: 92-94-97 in the Dutch EMR-region, 87-98-96 in the German region and 91-92-94 in the Belgian region. Similarly, in EMIS-2017, half of MSM (n=1,335/2,669) were recently tested for HIV, 26% were not-recently tested (n=693), and 24% (n=641) were never-tested; with 8% of HIV-testing variance explained by between-country differences (7.6% for non-recent; 8.3% for never-testing). Non-recent testing and never-testing were both significantly but inversely associated with age (positively with non-recent; negatively with never-testing) and relationship status (non-recent more likely in a steady relationship; never-testing less likely in a complicated relationship). Both outcomes were more prevalent among less “out” MSM, those with less sexual risk behaviour, and those financially struggling. Never-testing, but not non-recent testing, was additionally more likely in less-urban regions, and among transgender individuals.

Discussion
Results from two data sources show between-country differences in HIV-indicators leading to differences in HIV-risk. Determinants of HIV-testing suggest that some key populations (e.g. transgender individuals) and a lack of resources (e.g. living outside larger cities and financially struggling) significantly determine differences in HIV-testing. Targeted approaches that address regional and socio-demographic differences are needed, especially to tackle HIV-testing barriers and reach individuals undiagnosed who may be unaware of cross-border differences.

POSTER PRESENTATIONS

P33

HIV TESTING AND LINKAGE TO CARE IN SUB-SAHARAN AFRICAN MIGRANTS IN THE NETHERLANDS

Oladipupo Shobowale, Kai Jonas, Sarah Stutterheim

Maastricht University, Maastricht, the Netherlands

Background
Sub-Saharan African migrants (SSAM) remain the most-at-risk migrant population for HIV in the Netherlands and are disproportionately affected by HIV, with late diagnoses and delayed presentation for HIV care remaining a challenge. However, research on barriers to HIV-testing and linkage to care among SSAM in the Netherlands, and in Europe, remains limited. Using the socioecological framework, we set out to identify and investigate important changeable factors influencing HIV-testing and linkage to care in people from sub-Saharan Africa living in the Netherlands.

Method
In this qualitative study, we conducted 40 semi-structured interviews with a broad range of (at time, intersecting) SSAM subpopulations (heterosexual men, heterosexual women, men-who-have-sex-with-men (MSM), undocumented individuals, and PLHIV) and key informants. Interviews were transcribed and thematic analyses was conducted.

Results
We identified several barriers and facilitators at multiple socioecological levels. Both HIV-testing and linkage to care barriers were largely driven by HIV-related stigma and fear of HIV-stigma which spanned individual, interpersonal, and community levels. HIV-stigma also contributed to self-categorization as being at low HIV risk, fear of a positive result, deportation concerns (among undocumented individuals), fear of social exclusion, concerns about stigma attached to test-seeking, and cultural interpretations of HIV and HIV-testing. These also intersected with the stigma of HIV as a “black” and “African” disease leading to distrust in healthcare providers. Organizational and community barriers included insufficient HIV-testing promotion strategies resulting in lack of awareness about testing possibilities, high threshold services, distrust in healthcare institutions, and gatekeeper pushback due to perceived inconsistent community engagement. Organizational facilitators of testing included HIV education and awareness campaigns, SSAM representation in service provision, and “safe spaces” for outreach testing. Community level facilitators were positive stories and positive role models, and community mobilization. Barriers to linkage to care were present on the individual (faith healing, low awareness about right to free HIV care), interpersonal (lack of SSAM-based peer support systems) and organizational level (lack of specialized psychosocial support, complex linkage processes). Facilitators to linkage to care were adequate counseling, rapid linkage, and visibility of SSAM advocacy/support groups.

Conclusion
Overall, the findings suggest the need for multilevel interventions to enhance testing and linkage to care. It is critical that theory and evidence-based community-owned interventions that reduce stigma and increase awareness on HIV and HIV-testing opportunities are developed and implemented.

nchiv22