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## BACKGROUND AND RATIONALE

- Deficiencies in PrEP uptake exist among eligible individuals.
- In the Netherlands, it is unknown how many PrEP eligible individuals are not using PrEP, what characterizes them and whether these individuals are at increased risk of STI diagnosis.
- Identifying and characterizing eligible non-PrEP users with high PrEP need is crucial for effective HIV prevention.

## RESEARCH AIMS

- Identify subgroups of sexual behavior among men who have sex with men (MSM), men who have sex with men and women (MSMW) and transgender persons (TGP) who were eligible for, but did not use, PrEP between July 2019 and June 2021.
- Explore whether these subgroups were associated with STI diagnosis and sociodemographic variables.

## 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 the NPP) and June 2021.
- We used latent class analysis (LCA) at the visit level to:
  - Identify classes of sexual behaviors (number of partners, chemsex, group sex and sex work).
  - Explore whether these classes were associated with STI diagnosis and sociodemographic characteristics (age, sexual orientation, region of SHC visit, being from an STI/HIV endemic area and education level)
- Sensitivity analyses included applying the LCA model to various COVID-19 periods and to each year separately.

## RESULTS

### Study population

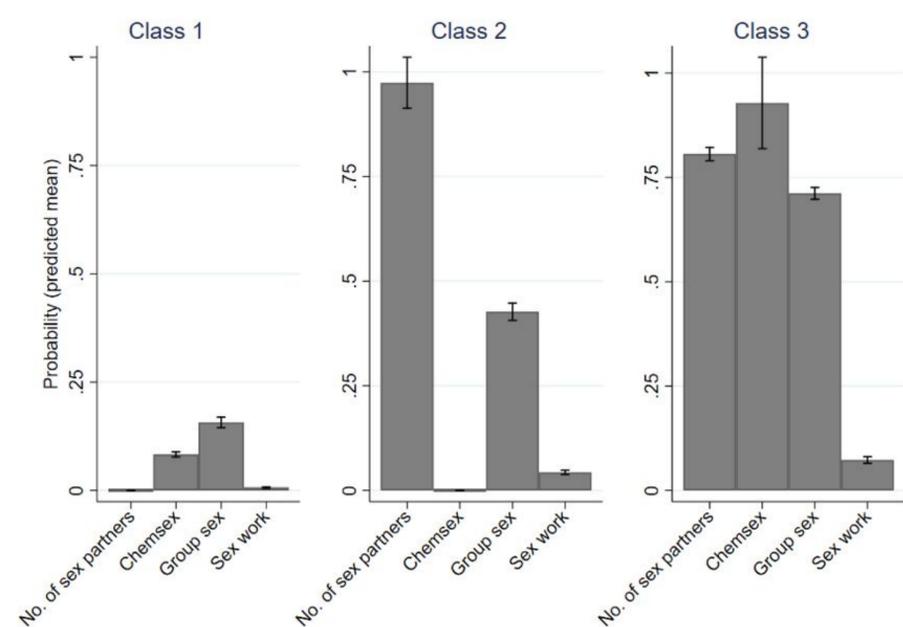
- 14,588 individuals were included in analyses, contributing 45,582 visits (median visits per individual=2; IQR=1-4). See Table 1 for characteristics.

**Table 1:** study population characteristics at first visit between July 2019 and June 2021

	Total (n=28,739)
Age, ≤35 years	59.2% (n=17,007)
MSM	82.3% (n=23,637)
Urban region (i.e., Randstad)	65.7% (n=18,892)
From STI/HIV endemic area	78.9% (n=22,669)
High education level	59.01% (n=16,960)
Male	98.5% (n=28,310)

Any STI includes anal chlamydia, anal gonorrhoea, hepatitis C virus, hepatitis B virus, and syphilis diagnosed at the visit. Originating from an STI/HIV endemic area is defined as being born in and having either one or both parents born in Surinam, Turkey, Netherlands Antilles, Morocco, North Africa, Sub-Saharan Africa, Eastern Europe, Central and South America, or Asia. Region is defined as urban, referring to all "Randstad" provinces, or non-urban, referring to all other provinces.

**Figure 1:** Sexual behavior associated with increased STI risk across three latent classes



Bars represent the mean proportion of visits reporting each sexual behavior for class 1, 2 and 3. Bands at the top of each bar represent 95% confidence intervals, which were calculated using the delta method. All sexual behaviors refer to the six months prior to the visit. Number (=No.) of sexual partners refers to those with ≥6 sexual partners in the six months prior to the visit.

## CONCLUSIONS

- This study has identified classes of sexual behavior in individuals eligible, but not using, PrEP.
- The highest risk of STI, and thereby HIV, was in those engaging in specific subgroups of sexual behavior characterized by frequently reporting multiple partners, group sex, sex work and chemsex. PrEP uptake should be encouraged and prioritized for these individuals.

### Classes of sexual behavior

- LCA revealed three classes of visits at which individuals were eligible for but did not use PrEP between July 2019 and June 2021 (Figure 1).
- The proportion of visits assigned to class 1, 2 and 3, based on the highest class membership probability, were 53.5% (n=24,383), 29.8% (n=13,596) and 16.7% (n=7,603), respectively.

### STI diagnosis and sociodemographic variables associated with sexual behavior classes

- An STI was diagnosed at 19.2% (n=8,738) of all included visits. Per class, 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.
- Table 2 shows all associations between class membership and covariates.

**Table 2:** Association between class membership and various factors (LCA model with covariates)

	Class 2 vs. class 1			Class 3 vs. class 1			Class 3 vs. Class 2		
	aOR	95% CI	p	aOR	95% CI	p	aOR	95% CI	p
Any STI	1.3	1.1-1.5	<0.001	1.8	1.6-2.0	<0.001	1.3	1.2-1.5	<0.001
Age, ≥36 years	1.3	1.2-1.5	<0.001	2.4	2.2-2.6	<0.001	1.8	1.6-2.0	<0.001
MSM	2.2	1.8-2.6	<0.001	1.4	1.2-1.8	<0.001	0.4	0.4-0.5	<0.001
Urban region	1.9	1.7-2.2	<0.001	1.9	1.7-2.2	<0.001	0.7	0.6-0.8	<0.001
From STI/HIV endemic area	0.7	0.7-0.8	<0.001	0.8	0.7-0.9	<0.001	1.3	1.1-1.5	0.002
High education level	1.2	1.1-1.3	0.002	1.0	0.9-1.1	0.730	0.9	0.8-1.1	0.379

Explanation of data: OR = odds ratio; aOR= adjusted odds ratio; 95% CI = 95% confidence interval; p = p-value (significance defined at p-value <0.05). Any STI includes anal chlamydia, anal gonorrhoea, hepatitis C virus, hepatitis B virus, and syphilis diagnosed at the visit. Originating from an STI/HIV endemic area is defined as being born in and having either one or both parents born in Surinam, Turkey, Netherlands Antilles, Morocco, North Africa, Sub-Saharan Africa, Eastern Europe, Central and South America, or Asia. Region is defined as urban, referring to all "Randstad" provinces, or non-urban, referring to all other provinces.

### Sensitivity analyses for COVID-19 and year

- During COVID-19 restrictions, the composition of latent classes remained comparable but had overall lower proportions of visits where ≥6 partners and group sex were reported.
- Class membership sizes remained stable in 2019 and 2020, but in 2021, the number of visits were notably higher in class 1 and lower in class 2 than in the primary analysis.