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BRIEF REPORT

Triggers of change in sexual behavior among people with HIV: The Swiss U=U statement and Covid-19 compared

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We assessed changes in sexual behaviour among people with HIV (PWH) over 20 years. Condom use with stable partners steadily declined from over 90% to 29% since the Swiss U=U statement with similar trajectories between men who have sex with men (MSM) and heterosexuals. Occasional partnership remained higher among MSM compared to heterosexuals even during COVID-19 social distancing.

Key Words: HIV, SEXUAL BEHAVIOR, MSM, HETEROSEXUAL, SWISS STATEMENT

INTRODUCTION

Sexual behaviour differs across persons and adapts to changing factors intrinsic and external to the individual. Such changes have taken place among people with HIV (PWH) over the last decades [1]. In the Swiss HIV Cohort Study (SHCS), the rates of self-reported condomless sex increased between 2008 and 2013. These increases were associated with the HIV-status of the partner and antiretroviral therapy (ART) use [2]. Endorsement of the undetectable = untransmissible (U=U) concept had an impact on sexual behaviour among PWH [3]. In Switzerland, the Swiss Federal Commission for HIV/AIDS issued a statement (*Swiss-Statement*) in 2008 that HIV is not transmitted sexually in PWH taking ART, with suppressed HIV-RNA for at least six months and in the absence of other sexually transmitted diseases (STDs) [4]. Since then, studies have contributed evidence that culminated in the validation and worldwide establishment of the U=U concept which further expanded its implications for sexual behaviour among PWH [5].

Another circumstance likely to impact sexual behaviour originated at the beginning of the COVID-19 pandemic in Switzerland, when the federal government introduced in March 2020 stringent measures including social-distancing to limit the risk of COVID-19 transmission [6].

This study investigates the impact of two external factors (termed “triggers” herein) which might influence sexual behaviour: i) The Swiss U=U Statement (“trigger of relief”), and the COVID-19 social distancing (“trigger of restriction”). For this purpose, we investigated over 20-years of long-term trajectories in condom use and occasional partnership among PWH in the SHCS.

METHODS

The SHCS (www.shcs.ch) is an ongoing, nationally representative cohort study of PWH. Clinical, behavioural and laboratory data is collected at study registration and bi-annually thereafter [7]. All centres local ethical committees approved the cohort study and all patients provided written informed consent.

We included SHCS participants who self-identified their likely route of HIV infection as either men who have sex with men (MSM) or heterosexual (HET). The analyses included data on

consistent condom use and occasional partnership between the years 2000 and 2022. For analysis on condom use trajectories, we included persons registered before the year 2008. For the analysis on occasional partnership trajectories, we included persons registered before the year 2020. Patient representatives were involved in the interpretation and presentation of the study results.

At study registration and at each follow-up visit, persons were asked the following questions i) did you have a stable-partner in last 6 months? If yes, ii) did you have sex with your stable-partner? If yes, iii) did you use condoms with your stable-partner? iv) what is the HIV status of your stable-partner, v) did you have occasional-partner in last 6 months? , vi) did you use condoms with your occasional-partner?

We analyzed trajectories of three variables: i) consistent condom use with HIV-negative stable-partner, ii) consistent condom use with HIV-positive stable-partner, iii) occasional partnership and iv) consistent condom use with occasional-partner. We calculated trajectories using behavioral matrices [8] for each person at study registration and bi-annually thereafter. We estimated the rate of change of the trajectories one year following the triggers between MSM and HET (one year after trigger of relief: 2008-2009; one year after trigger of restriction: 2020-2021).

Syphilis screening has been routinely performed in the SHCS since 2005. We calculated syphilis incidence over the study period and defined a syphilis episode as a newly positive treponema pallidum hemagglutinin or particle agglutination test or a venereal disease research laboratory (VDRL) titer of more than 1:8 and more than four-fold VDRL increase from last VDRL titer.

RESULTS

Trajectories of condom use were assessed among 2,212 MSM and 2,417 HET. Trajectories of occasional partnership were assessed among 5,617 MSM and 6,356 HET. Supplementary table 1 for patient characteristics.

Before the Swiss-Statement, consistent condom use with HIV-negative stable-partner was mean: 95% (IQR: 94% - 96%) among MSM and 89% (IQR: 88% - 91%) among HET (Figure A1). Following the Swiss-Statement in 2008, condom use steadily declined from 94% to 30% in MSM and from 88% to 28% in HET. Consistent condom use with HIV-positive stable-partner decreased from 49% to 10% in MSM and 45% to 10% in HET following the Swiss-Statement (Figure B1). Consistent condom use with occasional-partner was frequent from 2000 to 2007, mean: 86% (IQR: 85% - 87%) in MSM and 83% (IQR: 82% - 85%) in HET and declined to 33% (IQR:28%-37%) and 53% (IQR: 40%-66%) in 2021 (Supp Fig S1).

Between 2000 and 2019, the frequency of occasional partnership remained relatively stable before the COVID-19 restrictions and was higher in MSM compared to HET (mean: 43% [IQR: 41% - 45%] vs 9% [IQR: 8% - 11]) respectively (Figure C1). Following the implementation of

the COVID-19 social distancing measures, occasional partnership declined from 45% and 8% in 2020 to 37% and 6% in 2021 in MSM and HET respectively (Figure C1). The trajectories in condom use did not change after the beginning of the COVID-19 pandemic (Figure A1).

We observed differences in the rate of change between MSM and HET upon the triggers. One year after the Swiss-Statement, HET had a more rapid change in the frequency of consistent condom use with HIV-negative stable-partner than MSM (-10% and -4%, respectively, Figure A2). Conversely, the frequency of occasional partnership following COVID-19 declined more rapidly among MSM than HET (-8% compared to -2%, Figure C2).

Syphilis incidence among PWH in the SHCS increased from 14.8 in 2006 to 36.8 in 2017 per 1000 person years, with decreasing trends thereafter (Supplementary Figure 2).

DISCUSSION

Since the publication of the Swiss-Statement in 2008, consistent condom use with HIV-negative stable-partner declined from over 90% to around 30% in 2021. Consistent condom use with HIV-positive-stable partner declined from over 50% to around 10%. The long-term trajectories in condom use were remarkably similar between MSM and HET. Consistent condom use with occasional-partners declined following the Swiss-Statement with a more pronounced decrease among MSM. Occasional partnership frequencies were consistently higher among MSM than HET with stable levels until the COVID-19 pandemic. Shortly after the onset of the COVID-19 pandemic, there was a marked decline in the frequency of occasional partnership among MSM.

In this study, we focussed on two major external triggers which impact sexual behaviour. The rate of change in the first year following the trigger differed between MSM and HET. The decline in condom use was faster in HET following the Swiss-Statement while the decline in occasional partnership was faster for MSM following COVID-19. The Swiss-Statement included a strong recommendation of an informed decision with regard to condom use between serodiscordant couples in stable relationships [4]. The Swiss-Statement included a particular recommendation for heterosexual couples wishing to conceive. In clinical routine, the latter situation was frequently discussed between caregivers and patients shortly after the release of the Swiss-Statement. With the improvement of quality of life and social integration among PWH, the Swiss-Statement provided an opportunity for serodiscordant couples to conceive a child naturally without the fear of HIV transmission to their partner [4]. In this context, it is not surprising that the initial decrease in condom use following the release of the Swiss-Statement was more pronounced among HET compared to MSM. While the decrease in consistent condom use after the Swiss-Statement in the SHCS has been documented in previous studies until 2013 [2,9], we demonstrate here a continuous decrease thereafter. The increasing evidence for the U=U concept including the two large landmark studies PARTNER and HPTN-052 have further contributed to the decrease in condom use in serodiscordant partnerships [3,5]. Furthermore, the

recent increase in treatment and viral suppression rates (by the end of 2019, 96% of SHCS participants are virologically suppressed [7]), and the increase in the use of pre-exposure prophylaxis (PrEP) coupled with altruistic adherence to ART likely have contributed to this trend [10].

With regard to occasional partnership, the change in behavior among MSM is in line with previous studies showing a decline in occasional-partner associated with the fear of severe COVID-19 and an increase in online sex practices [11]. Although the large majority of health facilities providing PrEP remained open during the COVID-19 pandemic in Switzerland, PrEP-interruptions or fewer opportunities for STD testing during the COVID-19 lockdown might have contributed to a decrease in sex with occasional-partner [12].

Unlike condom use among MSM and HET, which decreased steadily over the study period, syphilis incidence stabilized in 2014 and decreased in COVID-19 times when frequency of occasional partners also decreased. While claiming causation in this case is out of the scope of this manuscript, this observation is consistent with previous studies that underscored occasional sexual partnership regardless of condom use a key risk factor for syphilis transmission [13,14].

Our study is among the largest investigations on long-term trajectories in sexual behavior among PWH. We assessed the impact of major factors influencing sexual behavior in a large representative cohort study over 20 years in both MSM and HET. Some limitations should be noted. First, the sexual behavior data used in this analysis is solely based on self-reports to caregivers, hence social-desirability biases are likely. Secondly, due to the recency of the pandemic, long-term trajectories following the COVID-19 restrictions cannot yet be analyzed. Finally, we cannot claim causality of the Swiss-Statement and the decrease in condomless sex as other factors including the increase in treatment rates and availability of PrEP likely influenced sexual behavior.

CONCLUSION

Condom use with stable-partner has steadily declined in the SHCS since the endorsement of the Swiss-Statement. Overall, the decline in consistent condom use has been remarkably similar between MSM and HET without a noticeable impact of the COVID-19 pandemic. The proportion of PWH with occasional-partner has remained stable over 20 years until the COVID-19 social distancing measures were introduced in 2020. Thereafter, the frequency of occasional partnership declined in both MSM and HET but remained considerably higher in MSM. Behaviour changes one year following the Swiss-Statement and the COVID-19 social distancing measures differed between MSM and HET. Overall, external triggers of relief and restriction had a marked impact on sexual behaviour among PWH.

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FIGURE LEGENDS

Figure 1. Trajectories and Rate of Change in Consistent Condom Use and Occasional Partnership Stratified By Sexual Orientation. **Panel A1)** Consistent condom use with HIV negative stable partners in MSM and HET: Registration year < 2008. **Panel A2)** Rate of change in consistent condom use with HIV negative stable partner following the trigger. **Panel B1)** Consistent condom use with HIV positive stable partners in MSM and HET: Registration year < 2008. **Panel B2)** Rate of change in consistent condom use with HIV positive stable partner following the trigger. **Panel C1)** Occasional partners in MSM and HET: Registration year <2020. **Panel C2)** Percent change in occasional sex partners following the trigger**.** Shaded region: 95% Confidence Intervals.