

## Editorial Note on Post-Exposure Prophylaxis

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Evidence on the long-term risk of HIV infection in individuals taking HIV post-exposure prophylaxis remains limited. During this retrospective data linkage study, we evaluate the occurrence of HIV infection in 975 individuals who sought post-exposure prophylaxis during a tertiary hospital between 2007 and 2013. Using privacy preserving probabilistic linkage, we link these 975 records with two observational databases providing data on HIV events (Zurich Primary HIV Infection study and therefore the Swiss HIV Cohort Study). This permits us to spot 22 HIV infections and to get long-term follow-up data, which reveal a median of 4.1 years between consultation for post-exposure prophylaxis and HIV diagnosis. Albeit men who roll in the hay with men constitute only 35.8% of these seeking post-exposure prophylaxis, all 22 events occur during this subgroup. These findings should strongly encourage early consideration of pre-exposure prophylaxis in men who roll in the hay with men after a primary episode of post-exposure prophylaxis.

Post-exposure prophylaxis (PEP) may be a widely accepted measure to stop HIV transmission<sup>1</sup>, and has been an integral part of Switzerland's prevention program since 1997. Although indication criteria for non-occupational PEP and drug regimens may slightly differ across healthcare institutions, PEP is usually prescribed to individuals within 48–72 h after unprotected anal or vaginal sexual exposure, with a HIV-positive partner not on suppressive antiretroviral therapy, or with a partner of unknown HIV-status belonging to groups at considerable risk of HIV transmission (i.e., men who roll in the hay with men (MSM), sex workers, people using intravenous drugs, and individuals from a neighborhood with high HIV prevalence (defined as >10%))<sup>3</sup>. In individuals receiving PEP, 3-compound antiretroviral therapy is run for 4 weeks, and follow-up should include testing for HIV at 3 months to exclude late seroconversions<sup>2</sup>.

One possible approach to mitigate loss to follow-up bias resides within the linkage of various health-related databases. Linkage could also be performed between different datasets employing a common unique identifier (e.g., linkage of electronic records between two departments within one institution), or using probabilistic record linkage whenever unique identifiers aren't available (e.g., linkage of records from two independent cohort studies). Probabilistic linkage commonly uses variables considered as personal identifying information, like names or

date of birth. In recent years, linkage of private identifying variables became increasingly challenging thanks to privacy protection laws, thereby resulting in the event of latest methodological approaches<sup>15</sup>. Among others, the Privacy Preserving Probabilistic Record Linkage (P3RL) has been found to be a reliable method to preserve confidentiality: after one-way encoding by the responsible datacenters, a third, independent party is involved to perform probabilistic data linkage

The primary aim of this retrospective data linkage study was to estimate the long-term risk of HIV infection in PEP seekers. More specifically, we assessed the occurrence of HIV diagnoses until October 2019 in individuals who sought PEP at a tertiary referral hospital in Switzerland (University Hospital of Zurich—USZ) between 2007 and 2013. To realize this, we used a privacy preserving data linkage method between 3 different databases. As previous evidence suggests that sexual risk taking occurs in phases lasting 12 to 24 months<sup>16</sup>, we hypothesized that HIV infections would be clustered shortly after the time of PEP consultation. We were also curious about characterizing subgroups at higher risk of HIV infection, i.e., to assess their clinical presentation and to explore which factors were related to long-term risk of HIV diagnosis. Additional analyses aimed toward assessing whether the choice to prescribe PEP at the time of PEP consultation was appropriate.

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