| **Study, Year** | **Study design** | **Target population** | **Population characteristics** | **Sample size** | **Acquired HIV**  **infection** | **Screening instrument items** |
| --- | --- | --- | --- | --- | --- | --- |
| Beymer, 2017129 | Retrospective cohort  MSM who were negative at baseline and had at least one subsequent test; no formal testing protocol | MSM | Derivation cohort: Los Angeles LGBT center (2009 to 2014) cohort  Age <25 years: 26%  Ages 25 to 29 years: 26%  Ages 30 to 39 years: 28%  Age ≥40 years: 21%  White: 48%  Hispanic: 32%  Black: 7.8% | Derivation cohort: 9,481 | Derivation cohort: 3.9% (370/9,481) | 1) Race/ethnicity  2) History of any STI  3) Condom use during receptive anal sex, last partner  4) Race/ethnicity, last partner  5) Age difference, last partner  6) Number sex partners, last 3 months  7) Intimate partner violence  8) Ecstasy use, prior 12 months  9) Methamphetamine use, prior 12 months  10) Nitrates use, prior 12 months  Scoring of items unclear, total |
| Hoenigl, 2015130  SDET score | Retrospective cross-sectional  MSM who underwent HIV testing and classified as EAH or no EAH | MSM | San Diego "Early Test" (2008 to 2014) cohort  Age (median, years): 30 in acute and early HIV infection, 33 in those who remained uninfected  White: 67%  Asian: 8%  Black: 6%  Hispanic ethnicity: 27%  Cohort randomly split in 2:1 ratio into derivation and validation cohorts | Derivation cohort: 5,568  Validation cohort: 2,758 | Entire cohort:  2.4% (200/8,326) for acute and early HIV infection | 1) ≥10 male partners (0 or 2)  2) Condomless receptive anal intercourse and ≥5 male partners (0 or 3)  3) Condomless receptive anal intercourse with HIV-infected partner (0 or 3)  4) Bacterial STI (0 or 2) |
| Jones, 2017135 A: ARCH-MSM B: Menza C: SDET | Cohort  Non-Hispanic, black and white MSM who were HIV-negative at baseline and had HIV testing every 6 months or until HIV-infected for 24 months | MSM | Involve[men]t study cohort Age (mean, years): 27 White: 54% Black: 46% | 562 | 5.7% (32/562); 6 were determined to be acutely infected at baseline (included in analysis) | A: ARCH-MSM: See Smith 2012 (drug use questions modified from last 6 to last 12 months) B: SDET: See Hoenigl 2015 C: Menza: See Menza 2009 (drug use question modified from last 6 to last 12 months) |
| Lancki, 2018134 A: ARCH-MSM B: CDC criteria C: Gilead indications | Cohort  Self-identiified as African American or black, ages 16 to 29 years, oral or anal intercourse with a man within the past 24 months, located on South Side of Chicago, HIV-uninfected, testing at baseline and at 9-month intervals over 18 months | MSM | uConnect study cohort Age (mean, years): NR White: 0% Black: 100% | 300 | 11% (33/300) | A: ARCH-MSM: See Smith 2012 (drug use questions modified from last 6 to last 12 months) B: CDC criteria: Any male sex partner in past 6 months, not in a monogramous partnership with a recently tested, HIV-uninfected man and one of the following: a) Any anal sex without condoms (receptive or insertive) b) Any STI diagnosed or reported in past 6 months c) In an ongoing sexual partnership with an HIV-positive male partner C: Gilead indications: a) Inconsistent or no condom use b) Diagnosis of STI c) Exchange of sex for commodities d) Use of illicit drugs or alcohol dependence (excluding marijuana) e) Incarceration f) Partners of unknown HIV-1 status with any of the factors listed above |
| Menza, 2009131 | Retrospective cohort  In derivation cohort, MSM were HIV-negative at baseline and had at least one subsequent HIV test; no formal testing protocol  In validation cohort, MSM were HIV-negative at baseline and underwent retesting every 6 months | MSM | Derivation cohort: Public Health-Seattle and King County STI Clinic (2001 to 2008) repeat testers cohort  Age <40 years: 80%  Age ≥40 years: 20%  White, Asian, or Pacific Islander: 77%  Other race: 23%  Gonorrhea on STI testing: 12% Chalmydia on STI testing: 8.8%  Methamphetamine use in past 6 months: 6.7%  Inhaled nitrites in past 6 months: 8.9%  Crack/cocaine in past 6 months: 2.8%  Validation cohort: Project EXPLORE (1999 to 2001) RCT, control arm (behavioral intervention trial)  Age <40 years: 76%  Age ≥40 years: 24%  White, Asian, or Pacific Islander: 75%  Other race: 25%  Gonorrhea on STI testing: 3.0% Chlamydia on STI testing: 4.2% Methampetamine in past 6 months: 11%  Inhaled nitrites in past 6 months: 28%  Crack/cocaine use in past 6 months: 2.3% | Derivation cohort: 1,903  Validation cohort: 2,081 | Derivation cohort: 5.3% (101/1,903)  Validation cohort: 6.9% (144/2,081) | 1) Gonorrhea, chlamydia, or syphilis, or a history of these infections (0 or 4 points)  2) Used methamphetamine or inhaled nitrites in the past 6 months (0 or 11 points)  3) Unprotected anal intercourse with an HIV-infected partner or unknown HIV status in the past year (0 or 1 point)  4) 10 or more male sexual partners in the prior year (0 or 3 points) |
| Smith, 2012132  HIRI-MSM  (now ARCH-MSM) | Retrospective cohort  In derivation and validation cohorts, MSM were HIV-negative at baseline and underwent retesting every 6 months | MSM | Derivation cohort: VAXGEN 004 (1998 to 1999) RCT (HIV vaccine trial)  Ages 18 to 28 years: 19%  Ages 29 to 49 years: 48%  Ages 41 to 48 years: 22%  Age ≥49 years: 11%  Non-Hispanic white: 86%  Amphetamine use: 8.2%  Popper use: 27%  Validation cohort: Project EXPLORE (1999 to 2001) RCT (behavioral intervention trial)  Age ≤25 years: 18%  Ages 26 to 30 years: 22%  Ages 31 to 35 years: 22%  Age ≥36 years: 39%  Non-Hispanic white: 75%  Amphetamine use: 12%  Popper use: 33% | Derivation cohort: 4,386  Validation cohort: 3,368 | Derivation cohort: 7.2% (318/4,386)  Validation cohort: 4.3% (144/3,368) | 1) Age (0 to 8 points)  2) Total number of male partners, prior 6 months (0 to 7 points)  3) Total number of infected male partners, prior 6 months (0 to 8 points)  4) Times had unprotected receptive anal intercourse with any HIV status partner, prior 6 months (0 or 10 points)  5) Used amphetamines, prior 6 months (0 or 5 points)  6) Used poppers, prior 6 months (0 or 3 points) |
| Smith, 2015133 ARCH-IDUs | Retrospective cohort  Patients who reported drug use in the last 11 years and HIV-uninfected, underwent testing every 6 months | PWID | Derivation cohort: ALIVE (1988 to 2008) cohort  Age <30 years: 17%  Ages 30 to <40 years: 46%  Ages 40 to <50 years: 27%  Age ≥50 years: 7.9%  Injected heroin: 75%  Injected cocaine: 74%  Methadone maintenance: 11%  MSM: 1.8% | Derivation cohort: 1,904 | Derivation cohort 11% (205/1,904) | 1) Age (0 to 38 points)  2) In the last 6 months, in methadone maintenance program (0 or 31 points)  Next 5 items receive 0 or 1 points on injection subscore:  3) In the last 6 months, inject heroin 1 or more times  4) In the last 6 months, inject cocaine 1 or more times  5) In the last 6 months, share cooker 1 or more times  6) In the last 6 months, share needle 1 or more times  7) In the last 6 months, visit shooting gallery 1 or more times  Add 5 injection subscores, 0=score 0, 1=score 7, 2=score 21, 3=score 24, 4=score 24, 5=score 31 |

**Abbreviations:** ARCH-IDUs=Assessing the Risk of Contracting HIV in Injection Drug Users; ARCH-MSM=Assessing the Risk of Contracting HIV in Men Who Have Sex With Men; CDC=Centers for Disease Control and Prevention; EAH=early or acute HIV infection; EXPLORE=A Randomized Clinical Trial of the Efficacy of a Behavioral Intervention to Prevent Acquisition of HIV Among Men Who Have Sex With Men; HIRI-MSM=HIV Incidence Risk Index for Men Who Have Sex With Men; LGBT=lesbian, gay, bisexual, and transgender; MSM=men who have sex with men; NR=not reported; PWID=persons who inject drugs; RCT=randomized, controlled trial; SDET=San Diego Early Test; STI=sexually transmitted infection.