HIV Risk Behaviors

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The risk of getting HIV varies widely depending on the type of exposure or behavior (such as sharing needles or having sex without a condom). Some exposures to HIV carry a much higher risk of transmission than other exposures. For some exposures, while transmission is biologically possible, the risk is so low that it is not possible to put a precise number on it. But risks do add up over time. Even relatively small risks can add up over time and lead to a high lifetime risk of getting HIV. In other words, there may be a relatively small chance of acquiring HIV when engaging in a risk behavior with an infected partner only once; but, if repeated many times, the overall likelihood of becoming infected after repeated exposures is actually much higher.

The table below lists the risk of transmission per 10,000 exposures for various types of exposures.

Estimated Per-Act Probability of Acquiring HIV from an Infected Source, by Exposure Act*

Type of Exposure	Risk per 10,000 Exposures
Parenteral	
Blood Transfusion	9,250
Needle-Sharing During Injection Drug Use	63
Percutaneous (Needle-Stick)	23
Sexual	
Receptive Anal Intercourse	138
Insertive Anal Intercourse	11
Receptive Penile-Vaginal Intercourse	8
Insertive Penile-Vaginal Intercourse	4
Receptive Oral Intercourse	Low
Insertive Oral Intercourse	Low
Other^	
Biting	Negligible
Spitting	Negligible
Throwing Body Fluids (Including Semen or Saliva)	Negligible
Sharing Sex Toys	Negligible

* Factors that may increase the risk of HIV transmission include sexually transmitted diseases, acute and late-stage HIV infection, and high viral load. Factors that may decrease the risk include condom use, male circumcision, antiretroviral treatment, and pre-exposure prophylaxis. None of these factors are accounted for in the estimates presented in the table.

^ HIV transmission through these exposure routes is technically possible but unlikely and not well documented.

Source:

- Patel P, Borkowf CB, Brooks JT. Et al. Estimating per-act HIV transmission risk: a systematic review. AIDS. 2014. doi: 10.1097/QAD.0000000000000298.
- Pretty LA, Anderson GS, Sweet DJ. Human bites and the risk of human immunodeficiency virus transmission. Am J Forensic Med Pathol 1999;20(3):232-239.

Principles for Selecting Estimates

Given different states of the science for the different prevention strategies reviewed, with a range of study designs (e.g., RCT, observational) and measurement methods used (e.g., self-report, blood levels of drug) in the literature, decision rules were made to be applied across strategies in an effort to select effectiveness estimates that were most closely aligned with each other and that most accurately represented effectiveness if the prevention strategy was actually used. More detailed principles are listed below, and the rationale for each specific estimate that was chosen is provided within the tables.

The choice of estimate was prioritized based on the following criteria:

- Only evidence based on peer-reviewed published reports was considered. Unpublished data, including conference abstracts, were not considered to be reliable because results may change as more data become available and data are re-analyzed or methods adjusted based on peer-review feedback. Additionally, the amount of information available for unpublished studies does not allow us to adequately assess methods and quality of data and analysis.
- Only evidence regarding HIV transmission (e.g., HIV outcomes) was considered. Data for non-HIV outcomes (e.g., pregnancy prevention, STD prevention) were considered not to be good proxies for HIV transmission because modeling or other methods that require complex assumptions would be required to equate proxies with HIV transmission rates and introduce additional uncertainty.
- For the consensus estimates, a hierarchy was established for prioritizing the type of estimate to select.
- The greatest priority was given to estimates based on "verified use" of the strategy or interventions that were based on the most objective measure available for determining "verified use" (not selecting highest or optimal use but instead selecting based on any evidence of actual use).
- If an objective measure for "verified use" was not available, then we chose the best subjective measure available (e.g., self-report) and prioritized the highest level of use reported based on subjective measure (e.g., consistent use or always using) recognizing that self-report may overestimate actual use.
- If no analysis based on actual or level of use was available, then the mITT/ITT comparison of "assigned" versus "not assigned" was selected.
- An estimate from a published meta-analysis was used if available and relevant for the strategy/risk factor in question; otherwise the most appropriate estimate from an RCT or observational study was used.

Acronyms			
ART	Anti-Retroviral Therapy	**MSM**	Men Who Have Sex with Men
BTS	Bangkok Tenofovir Study	**OLE**	Open-Label Extension
DOT	Directly Observed Therapy	**PrEP**	Pre-Exposure Prophylaxis
TDF/FTC	Drug combination of Tenofovir Disoproxil Fumarate and Emtricitabine	**PBMC**	Peripheral Blood Mononuclear Cells
FTC	Emtricitabine	**PWID**	Persons Who Inject Drugs
HPTN	HIV Prevention Trials Network	**RCT**	Randomized Controlled Trial
FTC-TP	Emtricitabine Triphosphate (active intracellular metabolite of FTC)	**STD**	Sexually Transmitted Disease
iPREX	Derived from the Spanish "Iniciativa Profilaxis Pre-Exposicion" meaning "PrEP initiative"	**TDF**	Tenofovir Disoproxil Fumarate
ITT	Intention To Treat	**TFV**	Tenofovir
mITT	Modified Intention-to-Treat	**TFV-DP**	Tenofovir Diphosphate (active intracellular metabolite of TFV)