



Supplement Figure 1: Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flow diagram[1] outlining the selection process for studies

Search terms (EMBASE)

1. Human immunodeficiency virus/ or Human immunodeficiency virus infection/ or Human immunodeficiency virus 1/ or Human immunodeficiency virus 2/
2. acquired immune deficiency syndrome/
3. (HIV or HIV-1 or HIV-2 or HIV1 or HIV2 or HIV infect* or human immunodeficiency virus or human immune deficiency virus or human immuno-deficiency virus or human immune-deficiency virus or (human immun* and deficiency virus)).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
4. (AIDS or acquired immunodeficiency syndrome or acquired immunodeficiency syndrome or acquired immuno-deficiency syndrome or acquired immune-deficiency syndrome or (acquired immun* and deficiency syndrome)).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
5. (risk\$3 adj1 behavio?r\$).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
6. condom\$1.mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
7. ((sex\$3 adj2 partner\$) or (number adj3 partner\$)).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
8. condom/ or "condom use"/ or sexual partners/
9. sexual behavior/ or unsafe sex/ or risk reduction/
10. serodiagnosis/ or HIV test/ or HIV serosorting/ or HIV seropositivity/
11. (test\$3 or diagnos\$2 or serosort\$3 or sero-sort\$3 or sero-assort\$3 or sero-assort\$3 or seroadapt\$5 or sero-adapt\$5 or seroconversion or positive* or seropositive).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
12. (Africa\$1 not (African American\$1 or African-American\$1)).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
13. (((Angola or Benin or Botswana or Burkina Faso or Burundi or Cameroon or Cameroun or Cape Verde or Cabo Verde or Central African Republic or Republique Centrafricaine or Chad or Tchad or Comoros or Comores or Congo or ivory coast or Eritrea or Ethiopia or Cote d'Ivoire or Gabon or Gabonaise or Gambia or Ghana or Guinea or Guinee or Guinea-Bissau or Guinee-Bissau or Namibia or Niger or Nigeria or Rwanda or Sao Tome) and Principe) or Senegal or Seychelles or Sierra Leone or Somalia or South Africa or Sudan or Kenya or Lesotho or Liberia or Madagascar or Malawi or Mali or Mauritan* or Mauritius or Mayotte or Mozambique or Swaziland or Tanzania or Togo or Togolaise or Uganda or Zambia or Zimbabwe).mp. [mp=title, abstract, subject headings, heading word, original title, keyword]
14. "Africa south of the Sahara"/ or Africa/ or Central Africa/ or South Africa/
15. 1 or 2 or 3 or 4
16. 5 or 6 or 7 or 8 or 9
17. 10 or 11
18. 12 or 13 or 14
19. 15 and 16 and 17 and 18
20. limit 19 to (english language and yr="2004 -Current")

Study exclusion criteria

Studies were excluded if they met any of the the following criteria:

1. Study design did not allow pre-post test comparison
2. Enrollment began before 1 January 2003
3. No quantitative data on behavioural outcomes was presented
4. No data from HIV- individuals was included
5. Data was not stratified by serostatus

For each reviewed study, the exclusion criteria were applied in the above order.

Assessing study bias

Below is a brief description of how judgements of risk of bias were made:

- **Sampling bias:** Studies which extensively employed convenience sampling, non-consecutive enrolment and clinic-based recruitment were regarded as at risk of sampling bias, while systematic random sampling strategies, including census based sampling, were not.
- **Social desirability bias:** Studies which used face-to-face interviews where responses were not anonymised were deemed at risk of social desirability bias.
- **Recall bias:** Studies where participants were asked to remember sexual behaviours over a month ago were at risk of recall bias, while they were not if the recall period was one month or less. This threshold was chosen because previous research has suggested that participants can recall behaviours relatively reliably during this time period[2, 3].
- **Attrition bias:** Studies in which the follow-up rate was less than 80% were deemed to be at risk of attrition bias (in line with Cochrane guidelines[4]), unless data was presented showing no differences between those who did and did not complete follow-up. Studies were assumed to not be at risk of attrition bias if the follow-up rate was greater than 80%, unless data suggested otherwise.

Types of outcome

Outcomes were divided into three domains, and measured over different time-frames (for example, last 1 month):

1. Condom use: measured as consistent condom use (defined as “always”, “consistent”, or 100% use or zero unprotected acts); no condom use; unprotected sex (fraction reporting risky sex based on various levels of

condom use, any level of condom use <100%, condom use at last sex); unprotected sex acts (fraction of sex acts unprotected by condom). In two studies data was converted, from proportion of individuals using a condom[5] and acts for which condoms were used[6], to proportion not using a condom and acts for which a condom was not used respectively, to allow synthesis with other results.

2. Number of sexual partners: measured as multiple partnerships (greater than 1 partner, concurrency, sex outside main partnership); monogamy or zero partners; and total, mean, or median number of partners.
3. Number of sex acts: measured as zero sex acts; had sex at least once; total, mean, or median number of sex acts.

Study	Condom outcome measure	Baseline value	Follow-up value and time
Gray 2007[7] circumcised	Not used in last year	39.5%	35.5% (6 m), 42.1% (12 m), 36.4% (24 m)
	Consistent use in last year	32.6%	35.3% (6 m), 34.2% (12 m), 29.6% (24 m)
Gray 2007[7] uncircumcised	Not used in last year	37.3%	40.3% (6 m), 40.6% (12 m), 36.1% (24 m)
	Consistent use in last year	33.7%	35.7% (6 m), 35.6% (12 m), 30.7% (24 m)
Wawer 2011[8] women with circumcised partners	Not used in last year	85.5%	81.1% (12 m), 84.5% (24 m)
	Consistent use in last year	0.3%	1.2% (12 m), 1.1% (24 m)
Wawer 2011[8] women with uncircumcised partners	Not used in last year	81.2%	80.4% (12 m), 78.5% (24 m)
	Consistent use in last year	0.8%	1.6% (12 m), 0.6% (24 m)
Djomand 2008[9] males	Unprotected sex in last 6 months	66.7%	53.6% (16m), 56.7% (12 m)
Djomand 2008[9] females	Unprotected sex in last 6 months	60.6%	43.5% (16m), 43.5% (12 m)
Bechange 2010[10]	% reporting risky sex in last 3 months	30.9%	9.1% (6 m), 15.9% (12 m), 14.3 (24 m)
Mugwanya 2013[11] and Baeten 2012 [12]	Proportion reporting sex without condom with HIV+ partner in last month	27.3%	13% (12 m), 9% (24 m)
Ritchie 2012[13]	Sexual behaviour score in last 3 months	0.0085	0.000 (3 m), 0.000 (6 m), 0.000 (9 m)
	Sexual behaviour score in last 3 months	0.024	0.012 (3 m), 0.012 (6 m), 0.018 (9 m)

Supplement Table 1: Summary of results over time for studies assessing condom use before and at multiple follow-up times after testing.

Study	Outcome measure	Baseline value	Follow-up value and time
Gray 2007[7] circumcised	No partners in last year	18.9%	20.6% (6 m), 19.4% (12 m), 13.4% (24 m)
	2+ partners in last year	34.5%	23.7% (6 m), 25.1% (12 m), 35.5% (24 m)
Gray 2007[7] uncircumcised	No partners in last year	19.6%	40.3% (6 m), 40.6% (12 m), 36.1% (24 m)
	2+ partners in last year	34.1%	35.7% (6 m), 35.6% (12 m), 30.7% (24 m)
Wawer 2011[8] women with circumcised partners	No partners in last year	0.0%	0.4% (12 m), 0.5% (24 m)
	2+ partners in last year	3.5%	4.1% (12 m), 3.5% (24 m)
Wawer 2011[8] women with uncircumcised partners	No partners in last year	0.3%	0.2% (12 m), 0.2% (24 m)
	2+ partners in last year	3.7%	4.7% (12 m), 4.6% (24 m)
Ndase 2012[14] males	Sex with HIV+ primary partner only	90.1%	85.0% (3 m), 80.1% (6 m), 75.6% (9 m), 72.6% (12 m), 69.2% (15 m), 69.1% (18 m), 64.6% (21 m), 66.3% (24 m)

	Sex with outside partner in last month	4.3%	7.2% (3 m), 9.0% (6 m), 11.3% (9 m), 12.8% (12 m), 15.6% (15 m), 16.6% (18 m), 18.1% (21 m), 19.1% (24 m)
	Concurrency in last month	4.1%	5.5% (3 m), 5.2% (6 m), 5.6% (9 m), 6.2% (12 m), 6.5% (15 m), 6.3% (18 m), 6.9% (21 m), 6.7% (24 m)
Ndase 2012[14] females	Sex with HIV+ primary partner only	91.6%	88.2% (3 m), 84.8% (6 m), 83.5% (9 m), 81.9% (12 m), 80.1% (15 m), 76.2% (18 m), 73.5% (21 m), 73.5% (24 m)
	Sex with outside partner in last month	0.5%	0.9% (3 m), 1.8% (6 m), 2.7% (9 m), 3.3% (12 m), 3.7% (15 m), 4.3% (18 m), 3.4% (21 m), 4.0% (24 m)
	Concurrency in last month	0.5%	0.7% (3 m), 0.8% (6 m), 0.7% (9 m), 0.4% (12 m), 0.3% (15 m), 0.6% (18 m), 0.6% (21 m), 0.5% (24 m)
Djomand 2008[9] males	4+ partners in last 6 months	21.9%	12.5% (6 m), 5.0% (12 m)
Djomand 2008[9] females	2+ partners in last 6 months	66.7%	21.7% (6m), 8.7% (12 m)

Supplement Table 2: Summary of results over time for studies assessing number of partners before and after testing

Study	Outcome measure	Baseline value	Follow-up value and time
Ndase 2012[14] males	No sex in last month	5.6%	7.8% (3 m), 10.7% (6 m), 13.2% (9 m), 14.6% (12 m), 15.3% (15 m), 14.4% (18 m), 17.5% (21 m), 14.7% (24 m)
Ndase 2012[14] females	No sex in last month	7.9%	10.9% (3 m), 13.4% (6 m), 13.8% (9 m), 15.0% (12 m), 16.2% (15 m), 19.7% (18 m), 23.1% (21 m), 22.5% (24 m)

Supplement Table 3: Summary of results over time for studies assessing frequency of sex acts before and after testing

Supplementary Material References

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