



# HIV testing strategies, types of tests, and uptake by men who have sex with men and transgender women: a systematic review and meta-analysis #EPC335

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## Background

- HIV testing is the gateway to antiretroviral therapy for people living with HIV (PLWH);
- Men who have sex with men (MSM) and transgender women (TGW) still face several barriers to HIV testing.

## Goal

- We aimed to investigate the effectiveness of strategies and types of tests on HIV testing uptake among men who have sex with men (MSM) and transgender women (TGW), and in reaching the PLWH of this population. Additionally, we investigated barriers and facilitators to HIV testing.

## Methods

- A systematic review and meta-analysis were performed according to the PRISMA and registered in the PROSPERO, CRD42020192740 (Figure 1);
- The guiding question of the review was: "Which strategies for offering HIV testing are most effective to reach TGW and MSM living with HIV?"
- Articles published up to July 2020 were identified using PubMed, Bireme, Scopus, Web of Science, Science Direct, SciELO, LILACS electronic databases, and the grey literature (i.e., Google Scholar, Dissertation and Thesis Catalog of the Brazilian Coordination for the Improvement of Higher Education Personnel, and Proquest);
- Observational, intervention, and mixed studies that implemented HIV testing strategies for MSM and TGW were included;
- Medical Subject Headings (MeSH) and the Health Sciences Descriptors (DeCS) and were combined with Boolean operator AND, whereas their synonyms were combined with Boolean operator OR (i.e., HIV testing, HIV, AIDS, MSM, and TGW and transsexual people);
- The outcome variables were HIV testing uptake, the prevalence of HIV infection, and detection of new HIV diagnoses;
- We also used a random-effects meta-analysis to pool estimates with respective 95% confidence intervals (95%CI), and Cochran's Q test and I<sup>2</sup> to evaluate heterogeneity.
- Data were extracted from published articles and assessed the risk of bias.

Figure 2 - HIV testing strategies in the studies reviewed.

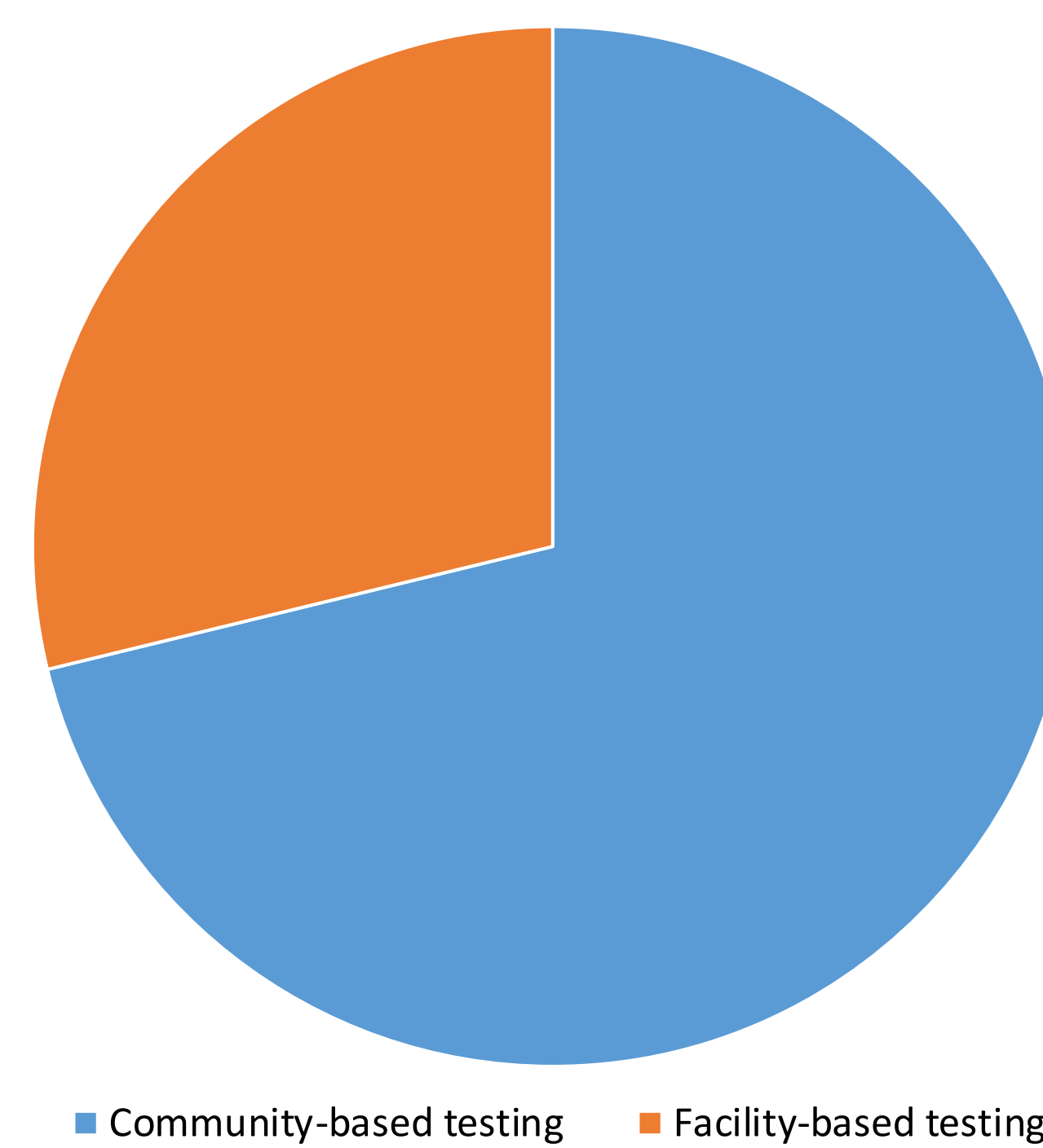


Figure 3 - Type of HIV test used in the studies reviewed.

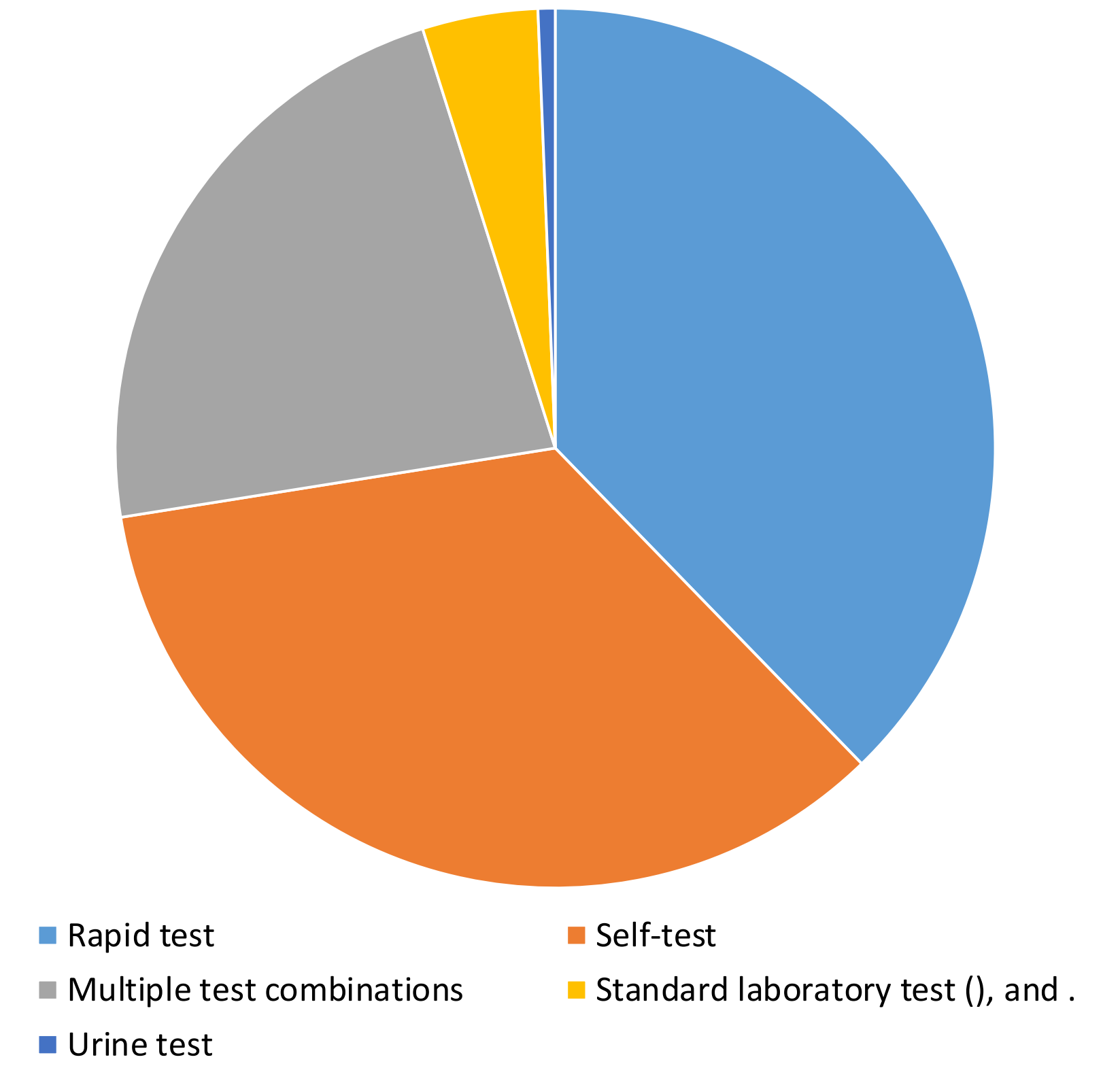


Table 1. Global meta-analysis of HIV testing uptake, HIV prevalence, and new HIV infection rate by testing strategy among MSM and TGW.

Test strategy	MSM					TGW						
	n tested	HIV testing uptake (95% CI)	n HIV	HIV prevalence (95% CI)	n new HIV diagnosis	New HIV infection rate (95% CI)	n tested	HIV testing uptake (95% CI)	n HIV	HIV prevalence (95% CI)	n new HIV diagnosis	New HIV infection rate (95% CI)
Community-based testing	45,529	78.1% (77.8-78.5)	5,344	6.8% (6.6-7.0)	1,783	4.0% (3.8-4.1)	407	78.1% (74.3-81.6)	467	8.6% (7.9-9.4)	181	6.4% (5.5-7.3)
Facility-based testing	21,092	96.4% (96.2-96.7)	3,529	7.7% (7.5-8.0)	2,771	6.9% (6.7-7.2)	260	100.0% (98.6-100.0)	53	20.4% (15.7-25.8)	53	20.4% (15.7-25.8)
Pooled estimate		90.7% (70.7-97.5)		7.2% (6.6-7.9)		5.2% (3.6-7.7)		99.3% (12.8-100.0)		13.1% (7.1-23.2)		11.5% (4.9-24.5)
Q	4790.65		39.57		364.37		101.78		32.27		49.23	
p	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
I <sup>2</sup>	100.0%		97.5%		99.7%		0%		97.4%		98.3%	

Table 2. Global meta-analysis of HIV testing uptake, HIV prevalence, and new HIV infection rate by HIV test type in MSM and TGW.

Test	MSM					TGW						
	n tested	HIV testing uptake (95% CI)	n HIV	HIV prevalence (95% CI)	n new HIV diagnosis	New HIV infection rate (95% CI)	n tested	HIV testing uptake (95% CI)	n HIV	HIV prevalence (95% CI)	n new HIV diagnosis	New HIV infection rate (95% CI)
Multiple strategies	5840	80.9% (79.9-81.8)	2183	7.0% (6.7-7.3)	1690	6.6% (6.3-6.9)	260	100.0% (98.6-100.0)	120	14.7% (12.3-17.3)	120	14.7% (12.3-17.3)
Rapid test	38704	92.2% (91.9-92.4)	4465	7.6% (7.4-7.8)	2264	5.0% (4.8-5.2)	-	-	388	8.6% (7.8-9.5)	102	5.3% (4.4-6.4)
Self-test	25027	66.4% (65.9-66.9)	1361	4.8% (4.5-5.0)	382	3.5% (3.1-3.8)	407	78.1% (74.3-81.6)	12	3.3% (1.7-5.6)	12	3.3% (1.7-5.6)
Standard laboratory test	500	100.0% (99.3-100.0)	725	14.3% (13.3-15.3)	83	6.4% (5.2-7.9)	-	-	-	-	-	-
Urine test	-	-	145	7.6% (6.4-8.9)	135	7.1% (6.0-8.3)	-	-	-	-	-	-
Pooled estimate		95.3% (54.4-99.7)		7.8% (5.7-10.6)		5.5% (4.4-6.9)		99.3% (12.8-100.0)		7.8% (3.9-15.1)		6.6% (3.1-13.3)
Q	8823.55		594.43		182.52		101.78		47.07		74.21	
p	<0.0001		<0.0001		<0.0001		<0.0001		<0.0001		<0.0001	
I <sup>2</sup>	100.0%		99.4%		98.0%		0.0%		95.4%		97.3%	

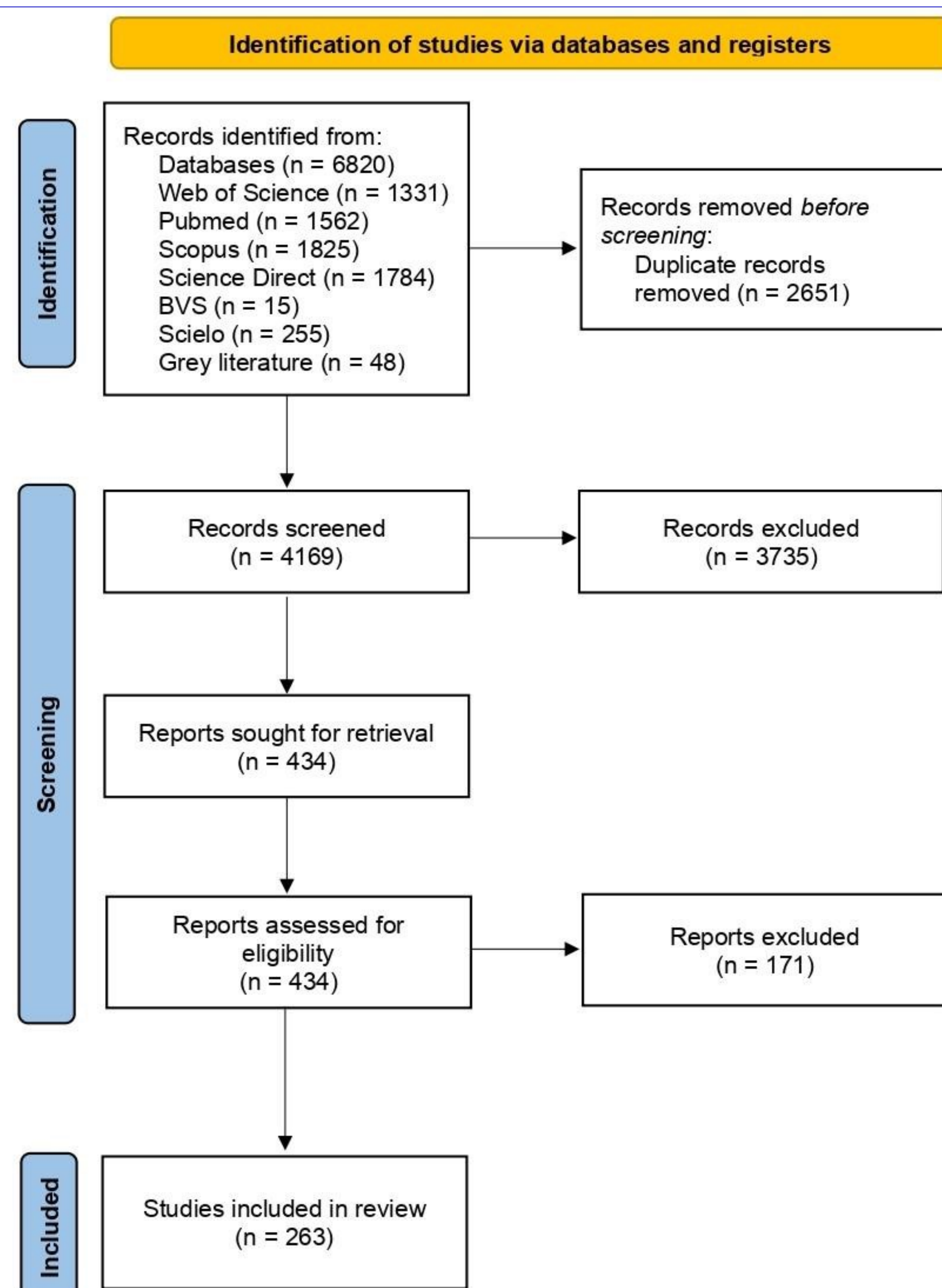


Figure 1 - Study selection flowchart

## Results

- A total of 6,820 references were selected, and 263 included in the review (n= 67,288 participants);
- Most studies included in this research were from high-income countries;
- Regarding the testing strategies, 71.2% of the studies used community- and 28.8% facility-based testing (Figure 2);
- The following tests were used: rapid test (24.0%), self-test (22.1%), multiple test combinations (14.4%), standard laboratory test (2.7%), and urine test (0.4%) (Figure 3);
- Figure 4 shows the temporal trend of publications using different type of tests; and Figure 5 shows the risk of bias across the studies.
- A higher uptake occurred in the facility-based testing strategy. The prevalence of HIV infection and the detection of new HIV diagnoses are shown in Table 1 by study groups;
- Standard laboratory test had the highest uptake for MSM and multiple test combinations for TGW (Table 2);
- Standard laboratory test showed the highest HIV infection prevalence among MSM and multiple test combinations among TGW (Table 2);
- Urine test detected the highest rate of new HIV diagnosis detection for MSM and multiple test combinations for TGW;
- Psychosocial and structural factors, such as stigma, and fear of positive test results, were the main barriers to HIV testing.

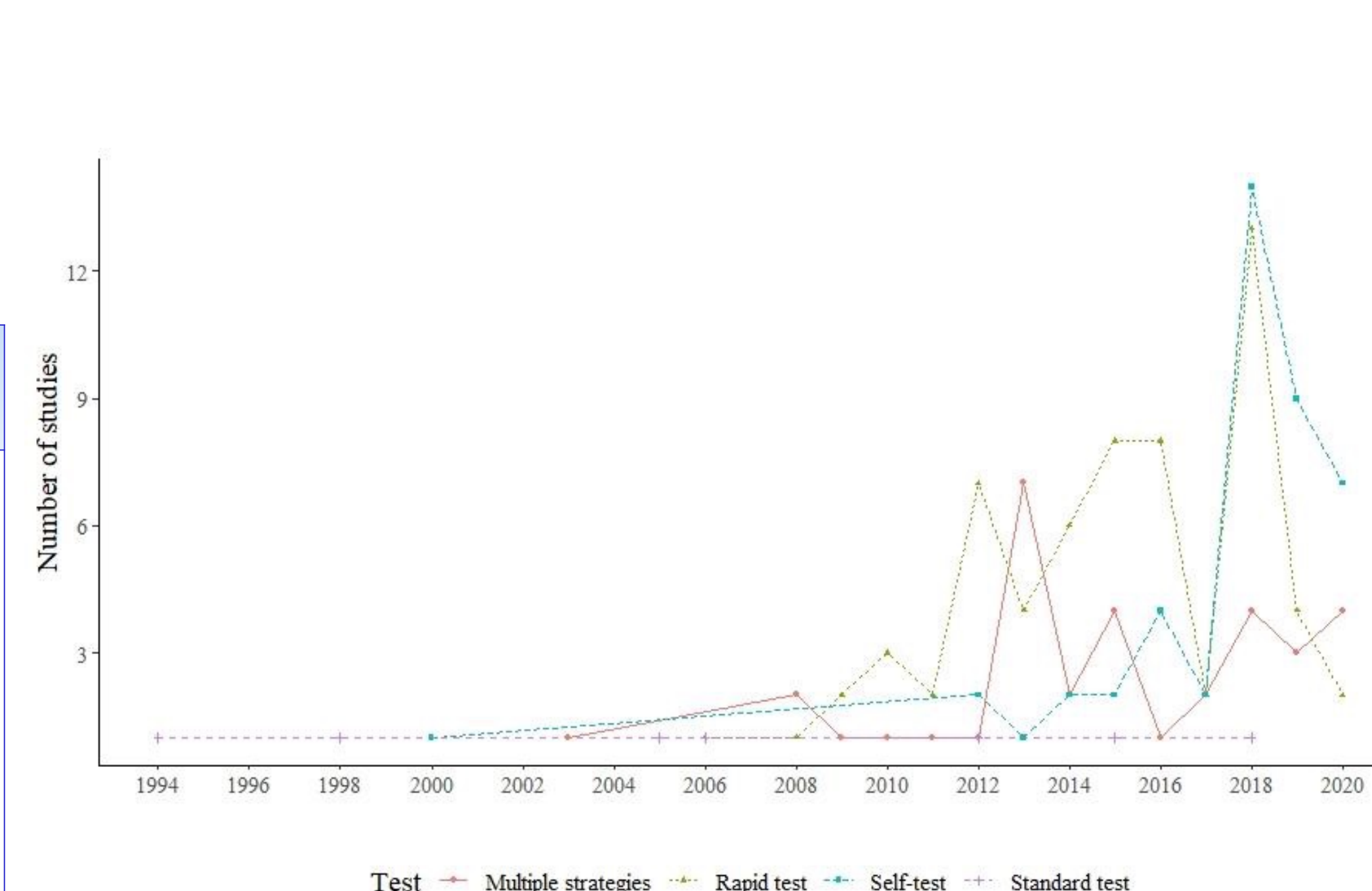


Figure 4 - Number of studies by type of HIV testing (1994-2020).

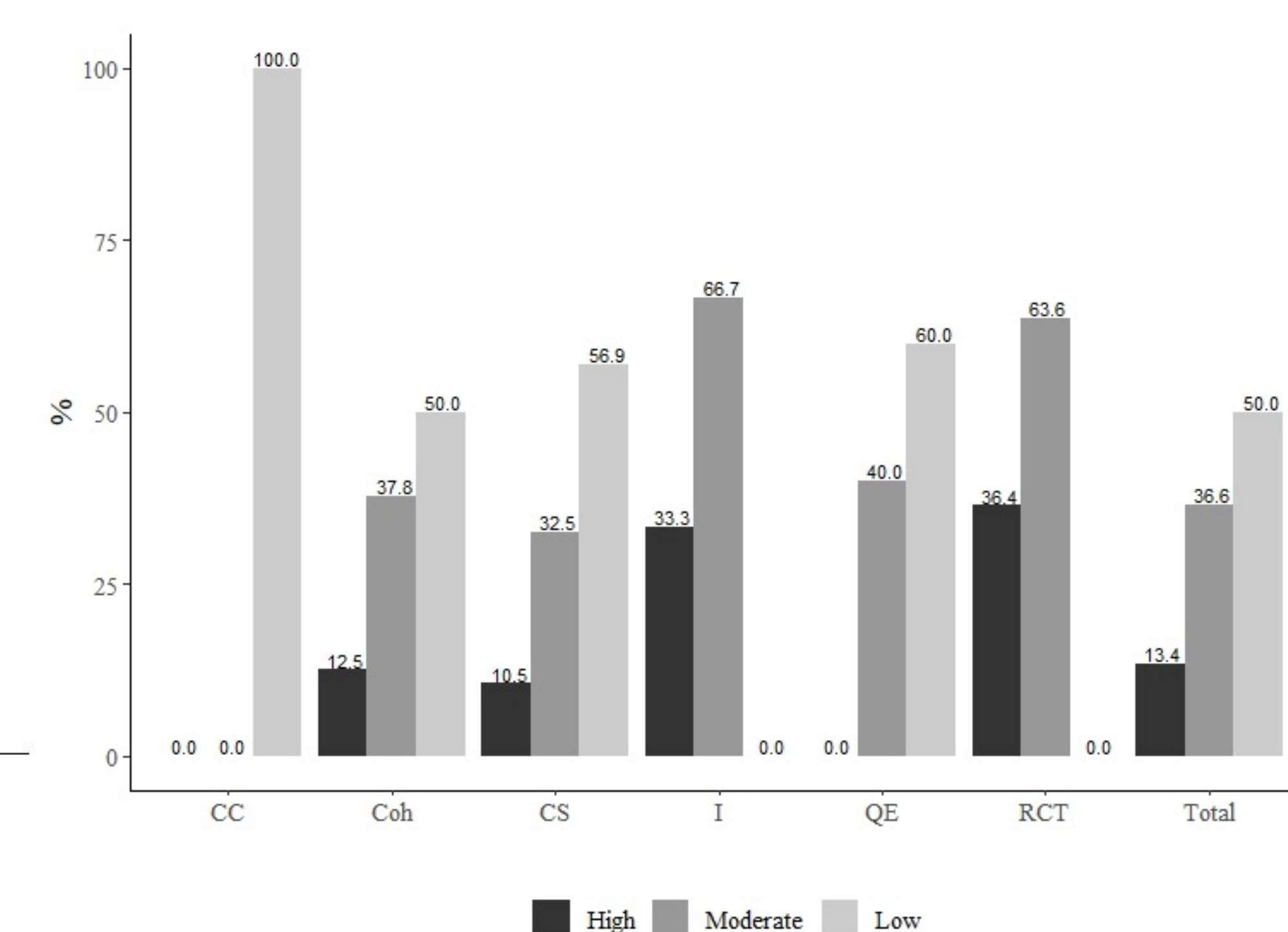


Figure 5 - Risk of bias according to study design (CC: case-control; Coh: cohort; CS: cross-sectional; I: intervention study; QE: quasi-experimental; RCT: randomized clinical trial)

## Conclusions

- Facility-based testing was the strategy with the highest uptake and reached more PLWH;
- Standard laboratory tests had the highest uptake and HIV prevalence among MSM, although the urine test achieved the highest rate of new HIV infections;
- Multiple test combinations had the highest uptake and reached more PLWH among TGW;
- Multiple test combinations may represent an important strategy to reach key populations that are difficult to access, as they offer autonomy of choice.
- Our study shows that it is important to consider a diversity of testing strategies, considering barriers and regional aspects, with different types of testing to increase uptake and to achieve PLWH between MSM and TGW.

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