

Supplementary File 10 – Forest plots of all pooled studies by type of comparison and pre-specified outcomes

[behavioural review outcomes only, as insufficient studies available for biological outcomes and adverse events]

Content:

A Forest plots (as pre-specified in protocol)

- Comparison 1.1 – SMS intervention vs. inactive control (not containing active SMS)
- Comparison 1.2 – SMS intervention vs. standard of care containing active SMS component
- Comparison 1.3 – SMS intervention blended with face-to-face contact vs inactive control
- Comparison 2 – Facebook intervention vs inactive control
- Comparison 3 – Smartphone App intervention vs inactive control

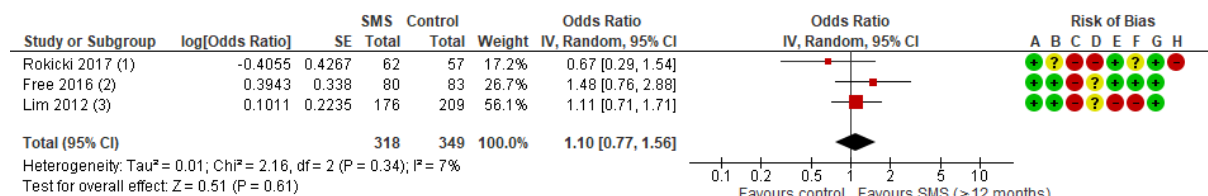
B Additional forest plots (subgroup analyses)

- Comparison 1.1 – SMS intervention vs. inactive control (not containing active SMS)

Forest plots (as pre-specified in protocol):

Comparison 1.1– SMS intervention vs. inactive control (not containing active SMS)

1.1.1 | Condom use (self-reported at ≥ 12 months)



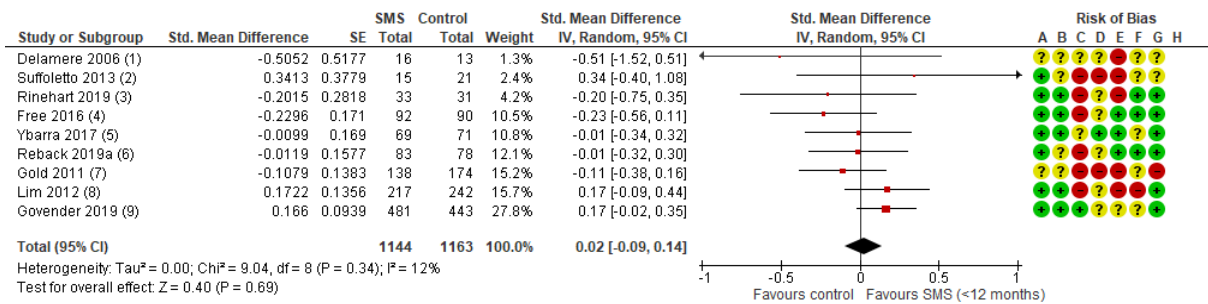
Footnotes

- (1) Unidir. SMS arm - Sex. int. w/o condom past year (inverse), 15 m (cluster RCT, OR, ICC 0.05)
- (2) Condom use at last sex, 12 m.
- (3) Not always used condom with risky partners (inverse), 12 m (f/m combined)

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.2 | Condom use (self-reported at < 12 months)



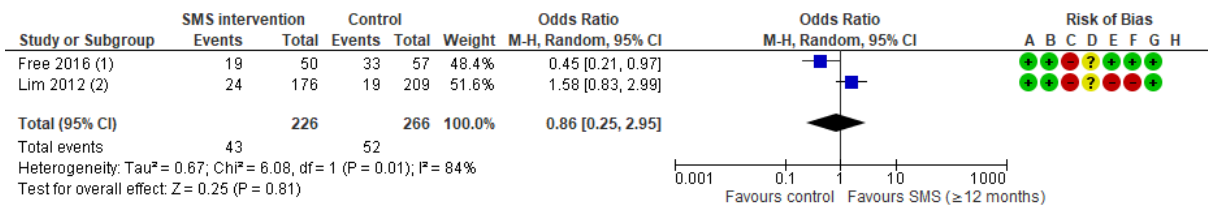
Footnotes

- (1) Unprotected sexual intercourse (inverse), 3 m
- (2) Condom use last vaginal sex, 3 m
- (3) Unprotected sex, 6 m (inverse)
- (4) Condom use at last sex, 1 m
- (5) Condomless sex acts (inverse), 4m1w; Mean, subgroup: sexually experienced, Placebo-control
- (6) TXT arm, Episodes of CAI w. non-main partners (obtained from trialist) past month (inverse), Mean, 6 m
- (7) Consistent condom use, 6 m; placebo-control
- (8) Not always used condom w. casual/new/multiple partners (inverse), 6 m (f/m combined)
- (9) No condom use at last sex, 6 m, (inverse), OR adjusted for baseline differences

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.3 | STI/HIV testing (objectively confirmed or self-reported at ≥ 12 months)



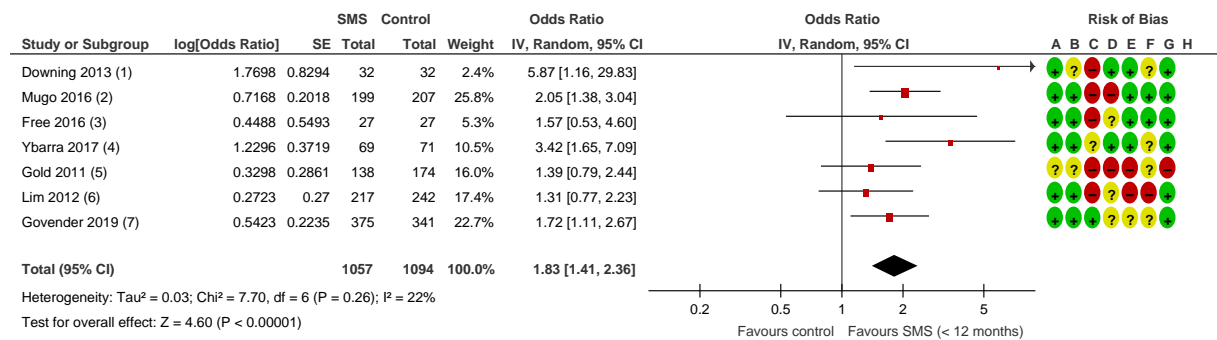
Footnotes

- (1) STI test prior to first sex with new partner, 12 m (subjective)
- (2) STI test in past 6 months, 12 m (subjective, f/m combined)

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

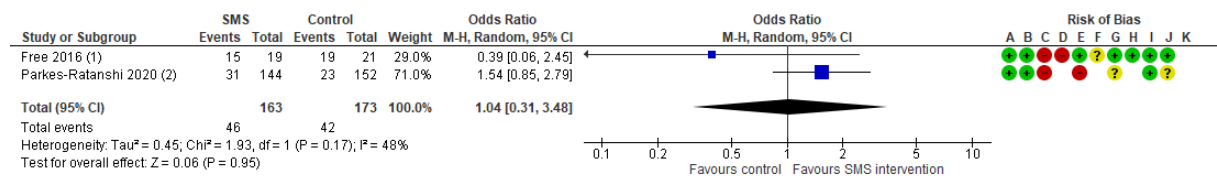
1.1.4 | STI/HIV testing (objectively confirmed or self-reported at < 12 months)



Footnotes

- (1) Chlamydia trachomatis re-testing, 3-4 m (objectively confirmed)
- (2) HIV re-testing, 2 w (objectively confirmed)
- (3) STI testing prior to first sex with someone new, 1 m (self-reported)
- (4) HIV testing (sexually experienced), 4m1w (self-reported, AOR accounting for baseline diff., placebo control)
- (5) STI testing, 6 m (self-reported, placebo control)
- (6) STI test in past 6 months, 6 m (self-reported, f/m combined)
- (7) HIV testing, 6 m (self-reported, AOR accounting for baseline diff.)

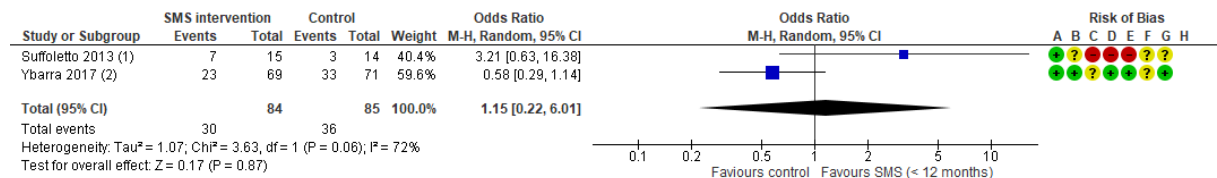
1.1.5 | Partner notification



Footnotes

- (1) Told last partner they had sex with to take treatment, 1 m (subjective, subgroup: participants with STI at baseline)
- (2) Partner attendance for Syphilis testing/treatment at next ANC visit (objective), about 3 w (20 day median)

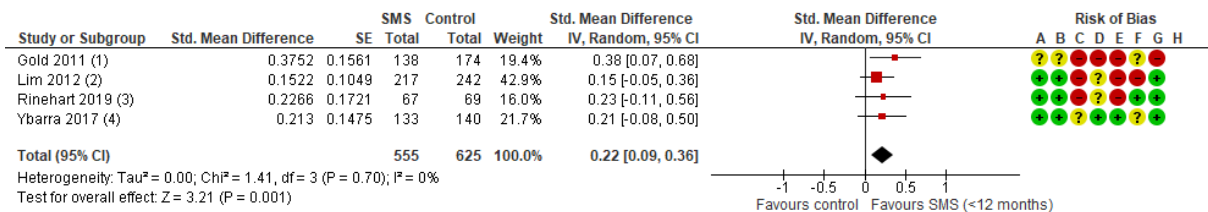
1.1.6 | Other behavioural outcomes – abstinence (< 12 months)



Footnotes

- (1) No sex in past 28 days, 3 m
- (2) Abstinence in past 90 days, 4m1w (in sexually experienced subgroup, placebo control)

1.1.7 | Cognitive outcomes - STI/HIV knowledge



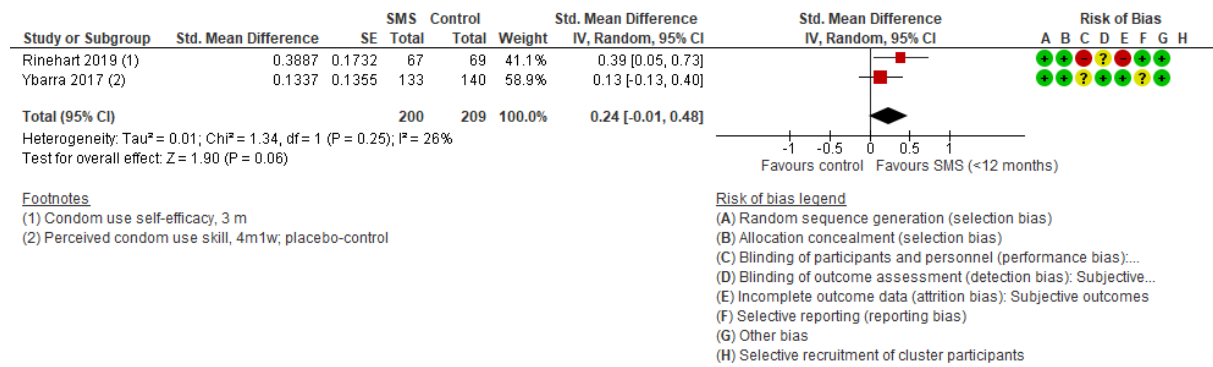
Footnotes

- (1) Sexual health knowledge (all 3 questions correct), 5-6 m; placebo-control
- (2) STI knowledge (>5 of 8 questions correct), 6 m, female/male combined
- (3) STI knowledge, 6 m
- (4) HIV knowledge (>75% of 13 questions correct), 4m1w; placebo-control

Risk of bias legend

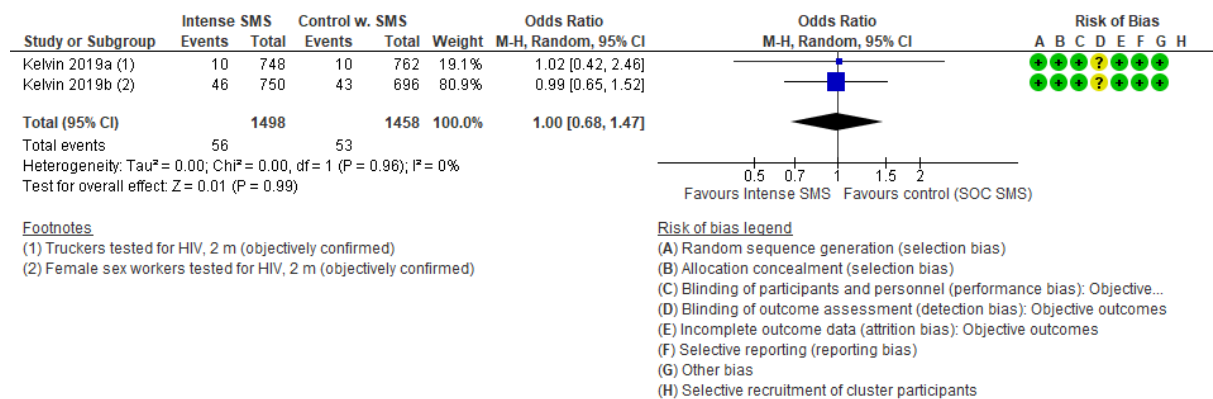
- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.8 | Cognitive outcomes – Condom use self-efficacy/skill



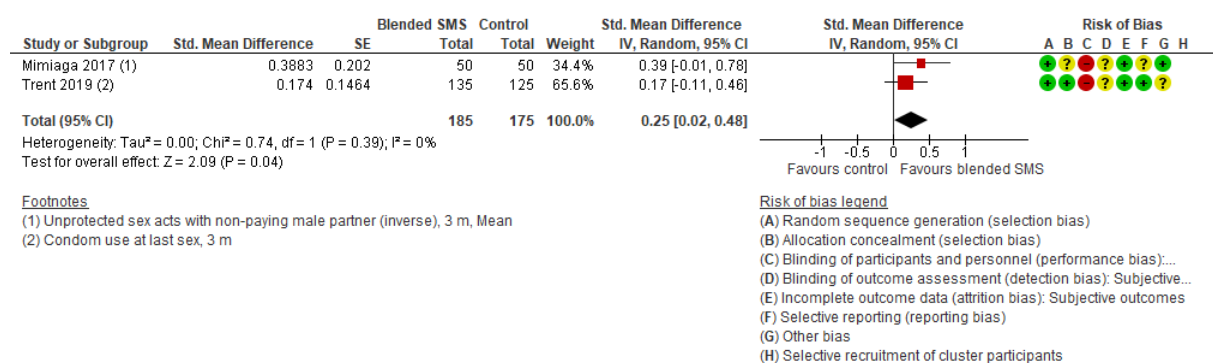
Comparison 1.2 – SMS intervention vs. SOC control containing active SMS component

1.2.1 | STI/HIV testing (objectively confirmed or self-reported at < 12 months)



Comparison 1.3 – SMS intervention with face-to-face vs inactive control

1.3.1 | Condom use (self-reported at < 12 months)

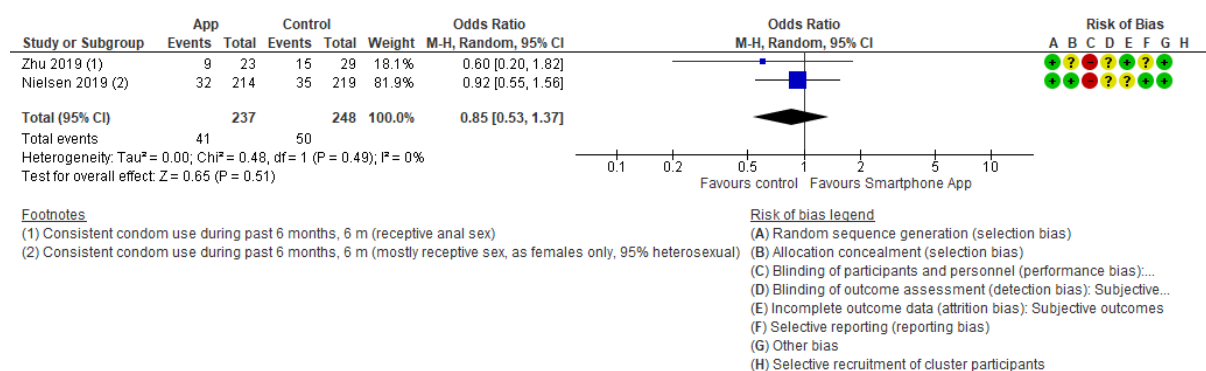


Comparison 2 – Facebook intervention vs inactive control

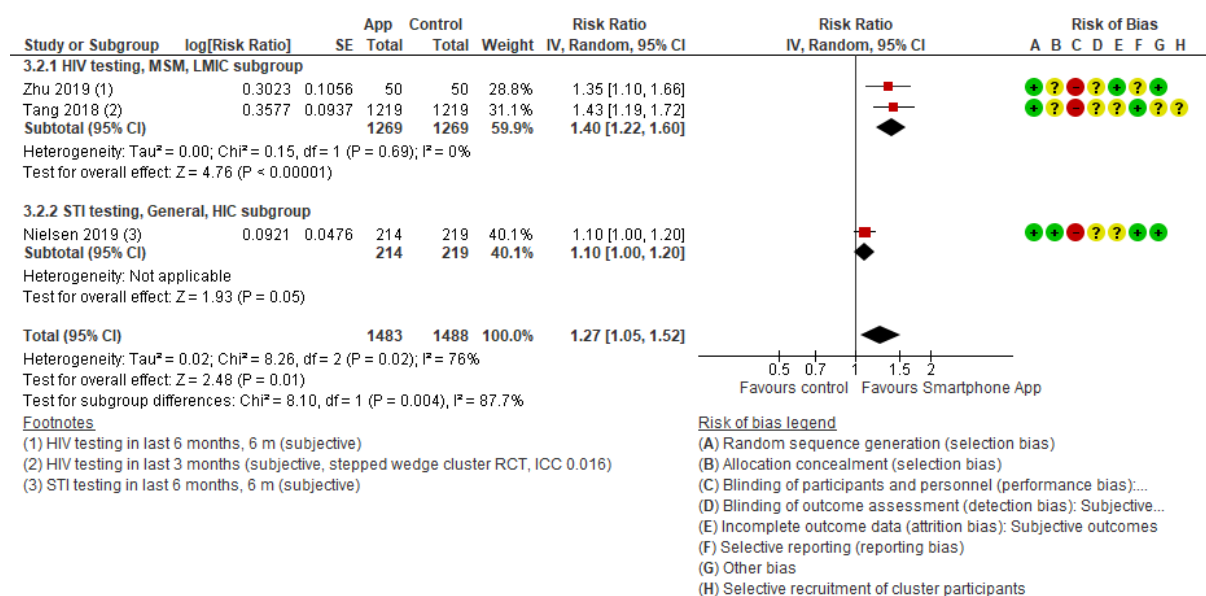
No pooling possible due to insufficient studies

Comparison 3 – Smartphone App intervention vs inactive control

3.1 | Condom use (self-reported at < 12 months)



3.2 | STI/HIV testing (objectively confirmed or self-reported at < 12 months)



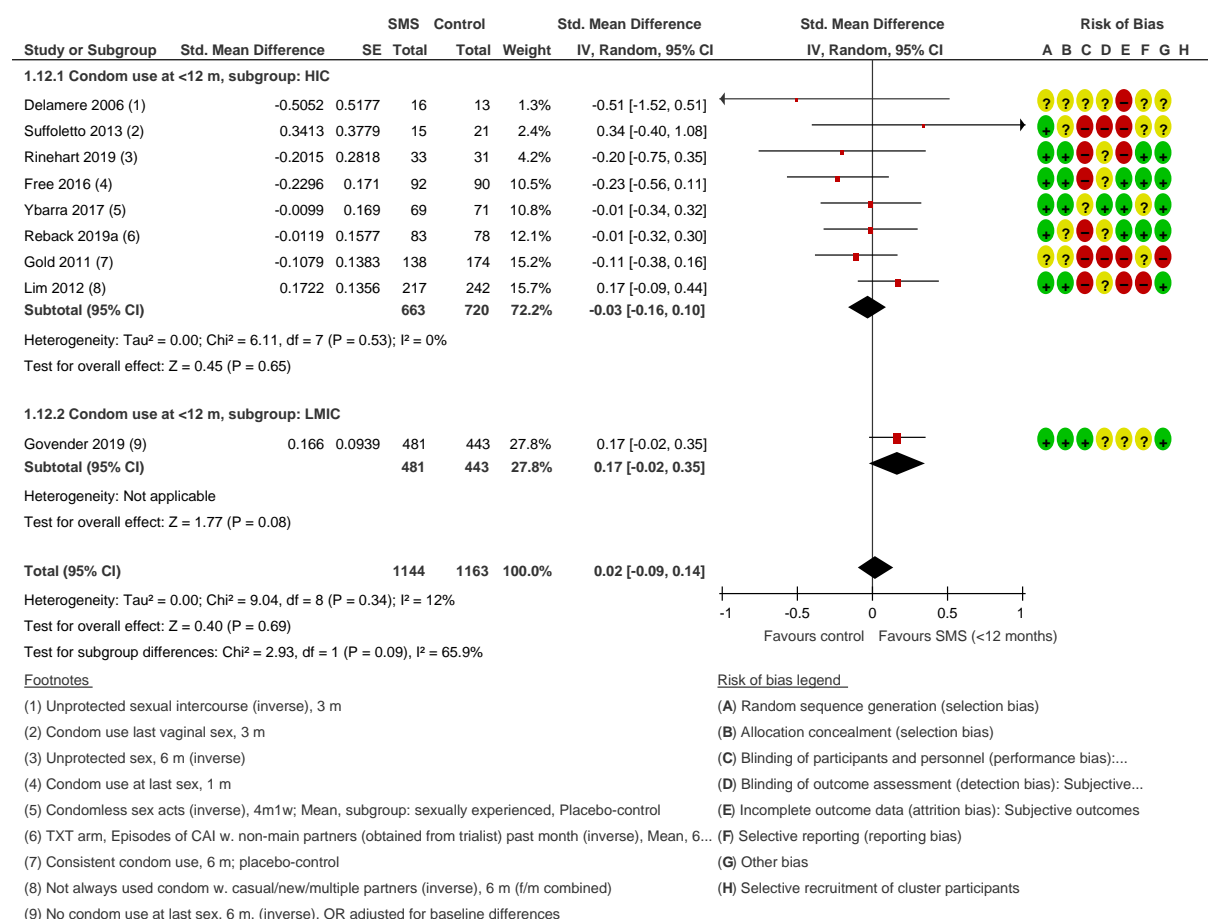
Additional Forest plots (subgroup analyses)

Statistical heterogeneity of all meta-analyses above was low ($I^2 < 50\%$, $p > 0.05$), apart from 1.1.3 and 3.2. Nevertheless, we have computed further sub-group analyses where at least four trials were included (i.e. for Comparison 1.1, Outcome 1.1.2, 1.1.4 and 1.1.7 only) to better visualize results of trials in different settings, among different populations and of different quality.

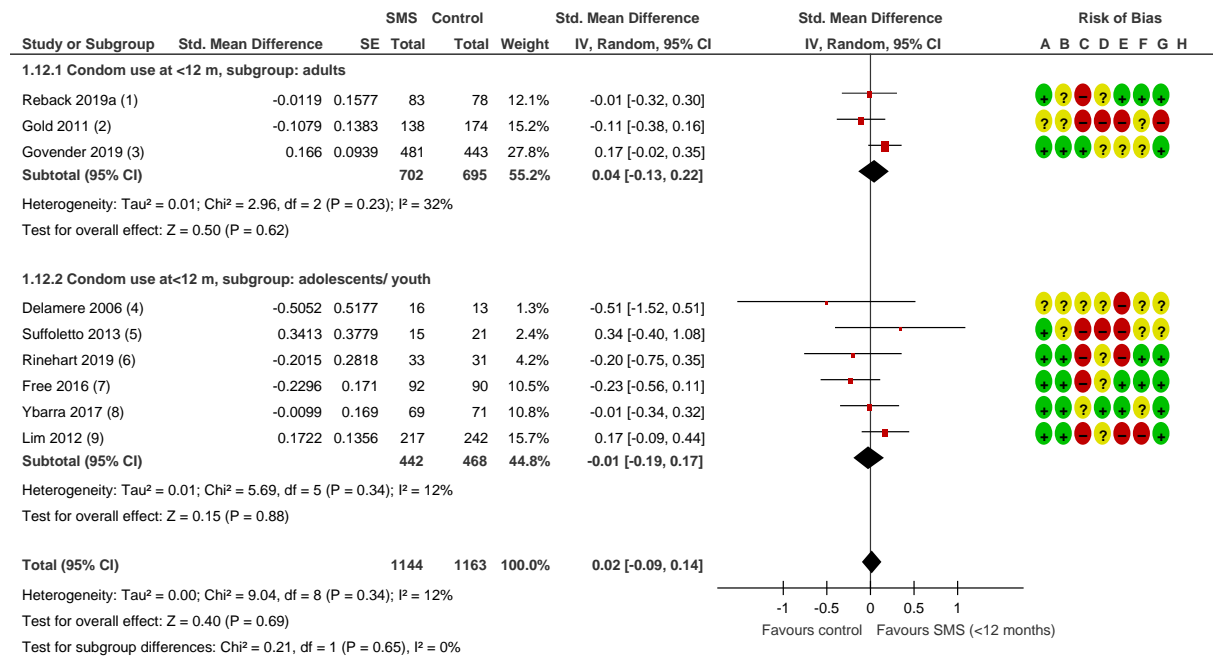
Comparison 1.1– SMS intervention vs. inactive control (not containing active SMS)

1.1.2. subgroups | Condom use (self-reported at < 12 months)

1.1.2. a) Subgroup analyses by income region (HIC versus LMIC)



1.1.2. b) Subgroup analyses by age group (adolescents/youth versus adults)[#]



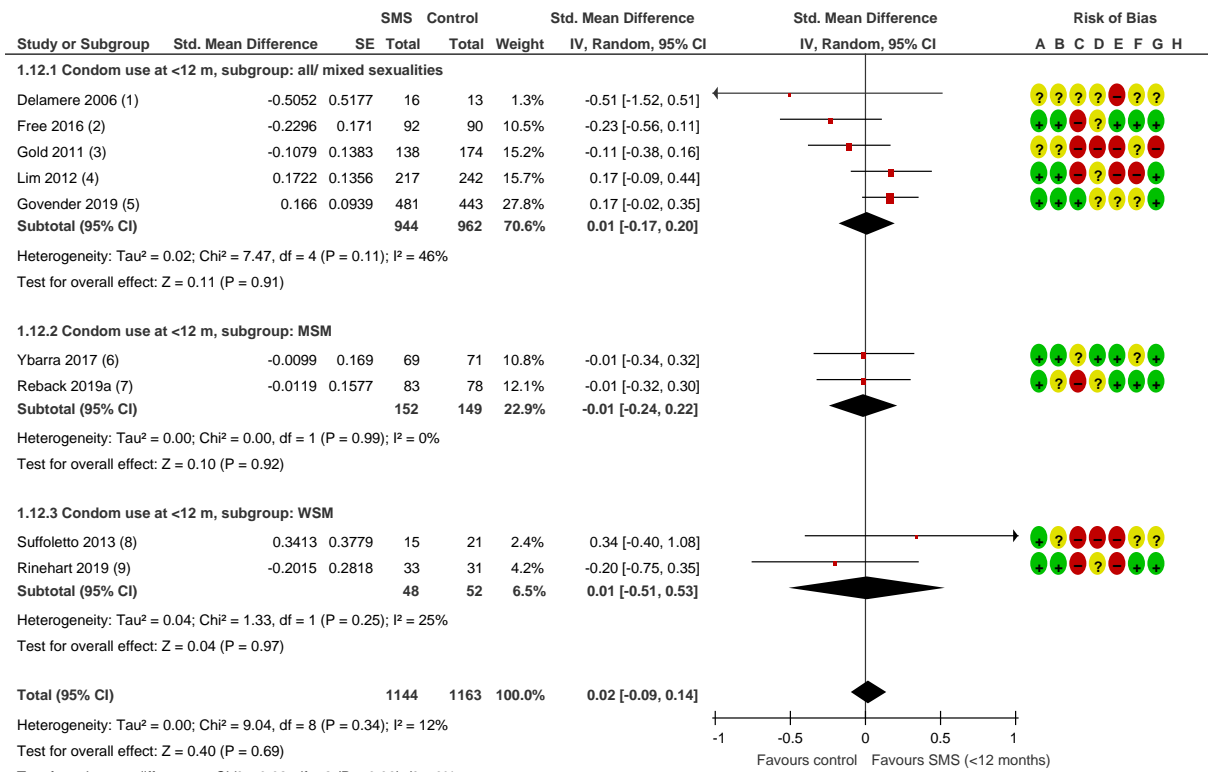
Footnotes

- (1) TXT arm, Episodes of CAI w. non-main partners (obtained from trialist) past month (inverse), Mean, 6...
- (2) Consistent condom use, 6 m; placebo-control
- (3) No condom use at last sex, 6 m, (inverse), OR adjusted for baseline differences
- (4) Unprotected sexual intercourse (inverse), 3 m
- (5) Condom use last vaginal sex, 3 m
- (6) Unprotected sex, 6 m (inverse)
- (7) Condom use at last sex, 1 m
- (8) No. of condomless sex acts (inverse), 4m1w; Mean, subgroup: sexually experienced, Placebo-control
- (9) Not always used condom w. casual/new/multiple partners (inverse), 6 m (f/m combined)

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.2 c) Subgroup analyses by sexuality (MSM versus WSM versus all sexualities) *



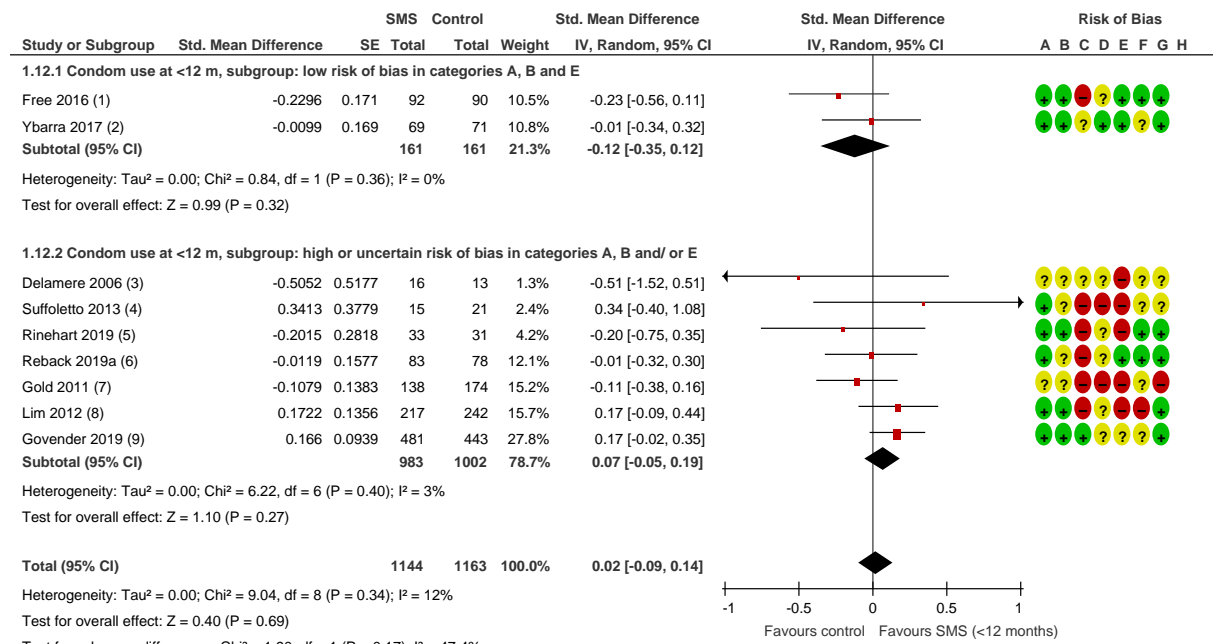
Footnotes

- (1) Unprotected sexual intercourse (inverse), 3 m
- (2) Condom use at last sex, 1 m
- (3) Consistent condom use, 6 m; placebo-control
- (4) Not always used condom w. casual/new/multiple partners (inverse), 6 m (f/m combined)
- (5) No condom use at last sex, 6 m, (inverse), OR adjusted for baseline differences
- (6) Condomless sex acts (inverse), 4m1w; Mean, subgroup: sexually experienced, Placebo-control
- (7) TXT arm, Episodes of CAI w. non-main partners (obtained from trialist) past month (inverse), Mean, 6...
- (8) Condom use last vaginal sex, 3 m
- (9) Unprotected sex, 6 m (inverse)

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.2 d) Subgroup analyses by risk of bias level (low versus high/uncertain risk of bias rating in category A, B and E)



Footnotes

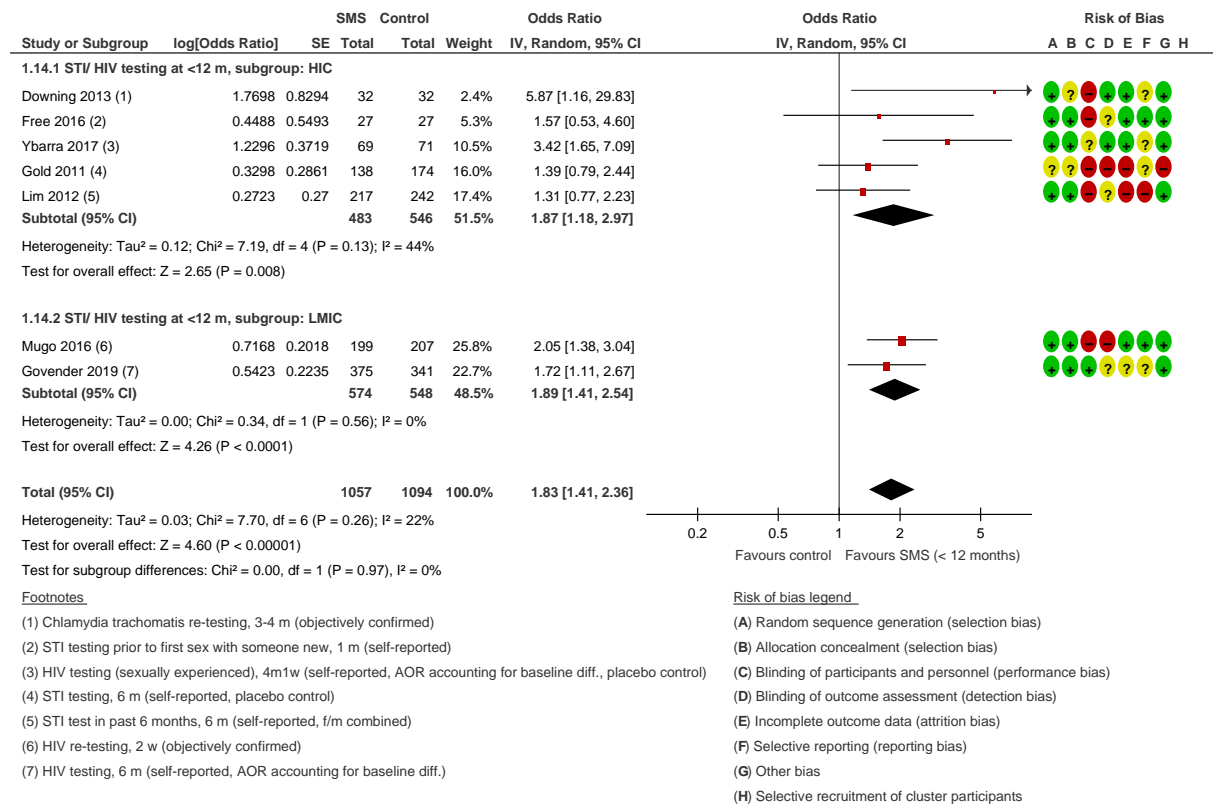
- (1) Condom use at last sex, 1 m
- (2) Condomless sex acts (inverse), 4m1w; Mean, subgroup: sexually experienced, Placebo-control
- (3) Unprotected sexual intercourse (inverse), 3 m
- (4) Condom use last vaginal sex, 3 m
- (5) Unprotected sex, 6 m (inverse)
- (6) TXT arm, Episodes of CAI w. non-main partners (obtained from trialist) past month (inverse), Mean, 6...
- (7) Consistent condom use, 6 m; placebo-control
- (8) Not always used condom w. casual/new/multiple partners (inverse), 6 m (f/m combined)
- (9) No condom use at last sex, 6 m, (inverse), OR adjusted for baseline differences

Risk of bias legend

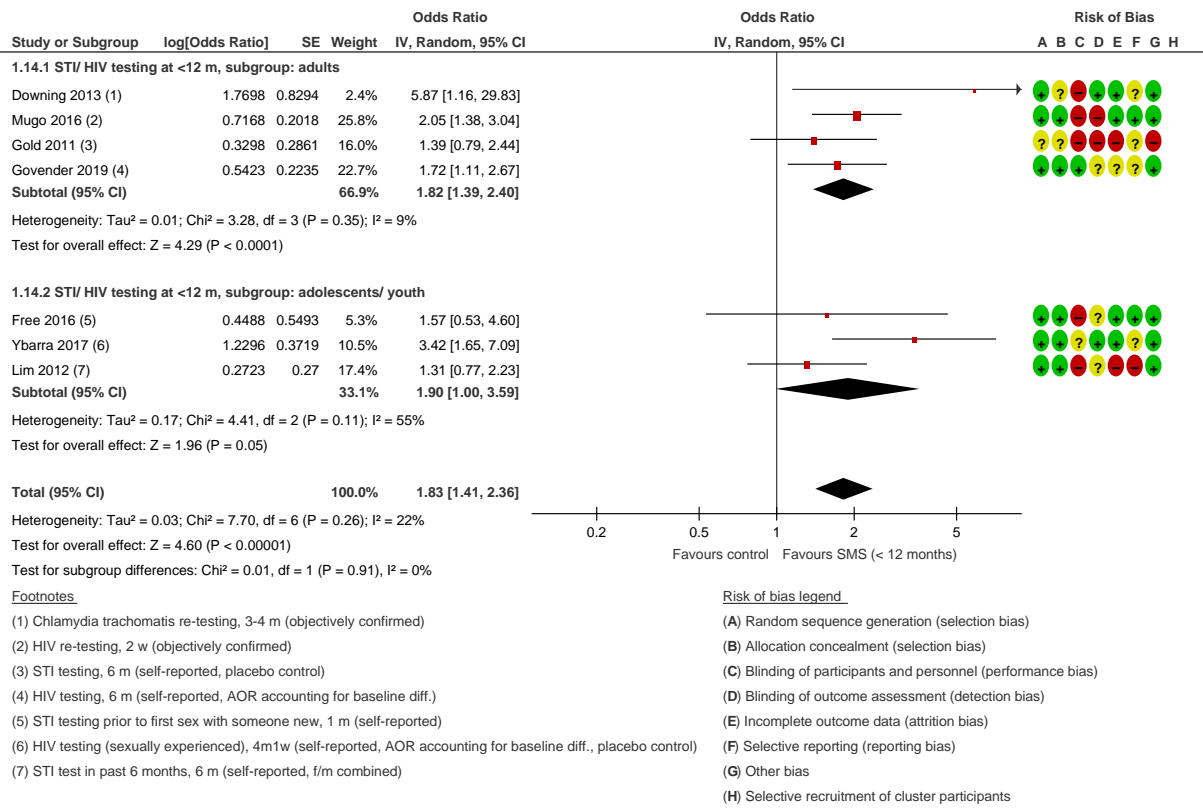
- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.4 subgroups | STI/HIV testing (objectively confirmed or self-reported at < 12 months)

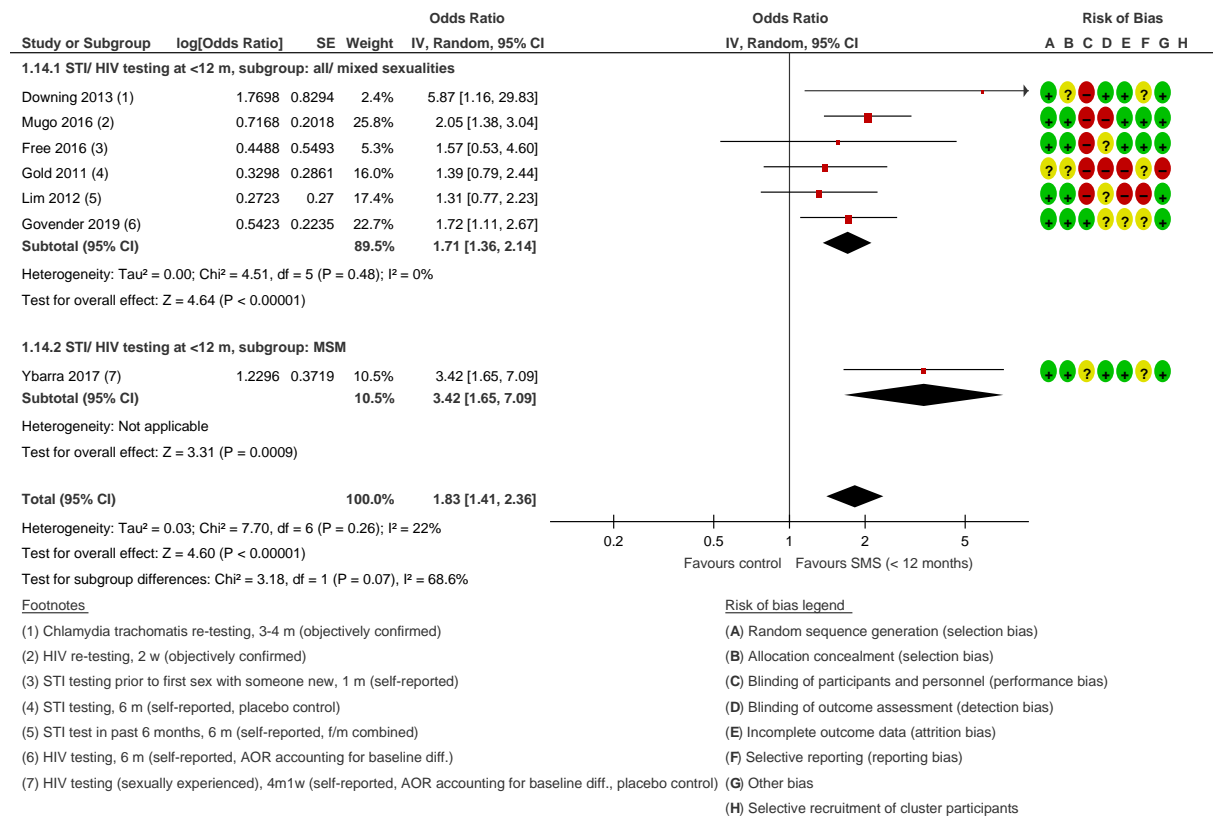
1.1.4 a) Subgroup analyses by income region (HIC versus LMIC)



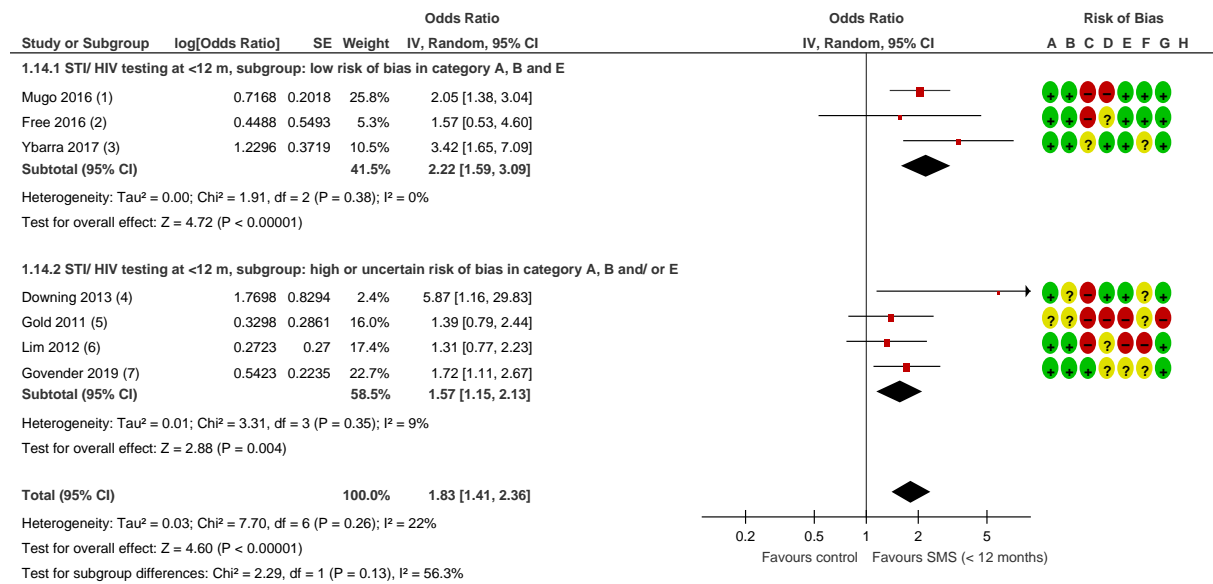
1.1.4 b) Subgroup analyses by age group (adolescents/youth versus adults)[#]



1.1.4 c) Subgroup analyses by sexual orientation (MSM versus all sexualities) *



1.1.4 d) Subgroup analyses by risk of bias level (low versus high/uncertain risk of bias rating in category A, B and E)



Footnotes

- (1) HIV re-testing, 2 w (objectively confirmed)
- (2) STI testing prior to first sex with someone new, 1 m (self-reported)
- (3) HIV testing (sexually experienced), 4m1w (self-reported, AOR accounting for baseline diff., placebo control)
- (4) Chlamydia trachomatis re-testing, 3-4 m (objectively confirmed)
- (5) STI testing, 6 m (self-reported, placebo control)
- (6) STI test in past 6 months, 6 m (self-reported, f/m combined)
- (7) HIV testing, 6 m (self-reported, AOR accounting for baseline diff.)

Risk of bias legend

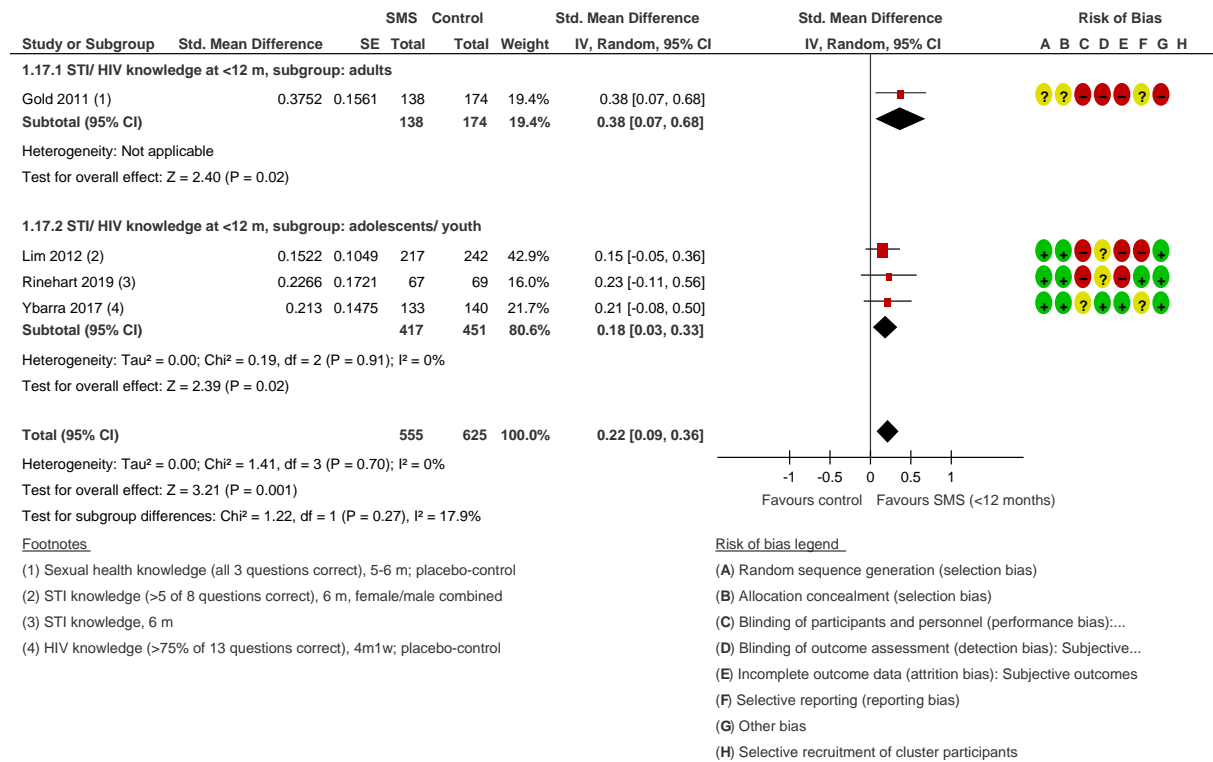
- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias)
- (D) Blinding of outcome assessment (detection bias)
- (E) Incomplete outcome data (attrition bias)
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.7. subgroups | Cognitive outcomes - STI/HIV knowledge

1.1.7 a) Subgroup analyses by income region (HIC versus LMIC)

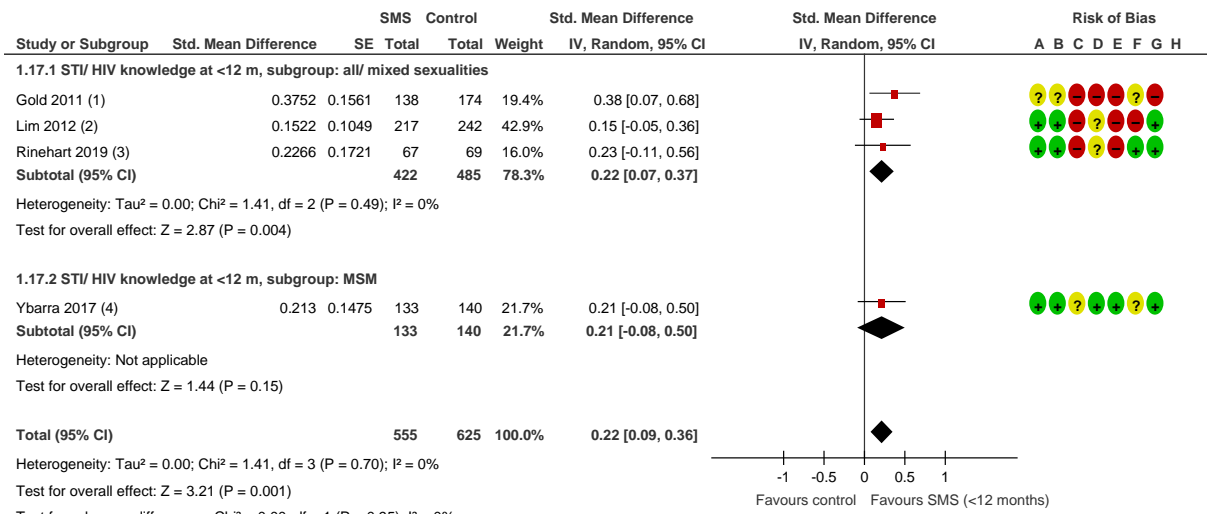
Not applicable (all included studies were conducted in high-income countries)

1.1.7 b) Subgroup analyses by age group (adolescents/youth versus adults)#



Note: Gold 2011 includes participants aged 16-29 years (Intervention arm: 4.4% 16-19 years, 42.4% 20-24 years, 53.2% 25-29 years; Control arm: 7% 16-19 years, 35% 20-24 years, 58% 25-29 years) [For Rinehart 2019, Ybarra 2017 and Lim 2012 see footnote # below]

1.1.7 c) Subgroup analyses by sexual orientation (MSM versus WSM versus all sexualities)*



Footnotes

- (1) Sexual health knowledge (all 3 questions correct), 5-6 m; placebo-control
- (2) STI knowledge (>5 of 8 questions correct), 6 m, female/male combined
- (3) STI knowledge, 6 m
- (4) HIV knowledge (>75% of 13 questions correct), 4m1w; placebo-control

Risk of bias legend

- (A) Random sequence generation (selection bias)
- (B) Allocation concealment (selection bias)
- (C) Blinding of participants and personnel (performance bias):...
- (D) Blinding of outcome assessment (detection bias): Subjective...
- (E) Incomplete outcome data (attrition bias): Subjective outcomes
- (F) Selective reporting (reporting bias)
- (G) Other bias
- (H) Selective recruitment of cluster participants

1.1.7 d) Subgroup analyses by risk of bias level (low risk rating in category A, B and E versus high/uncertain risk in these categories)

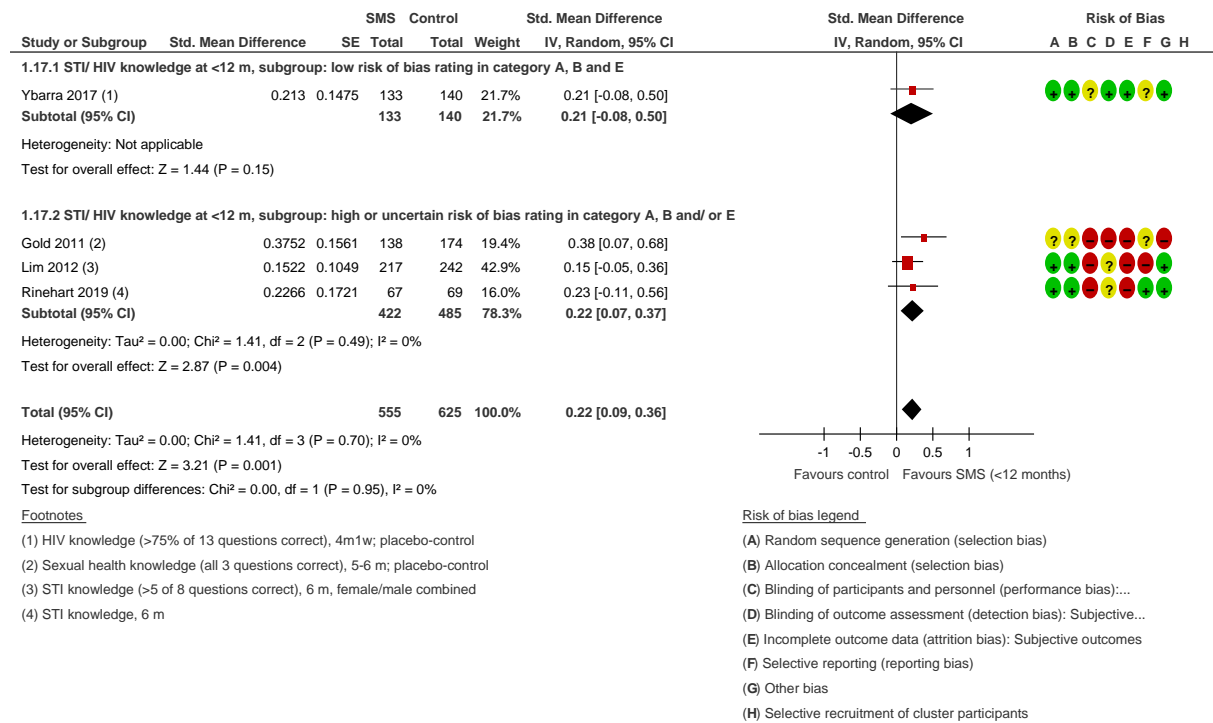


Figure legend/ Acronyms

Risk of bias rating:  = low risk,  = high risk;  = uncertain risk of bias

ANC, antenatal care; ICC, intra-cluster correlation coefficient; CI, confidence interval; AOR, adjusted odds ratio; HIC, high-income country; LMIC, low-and middle-income countries; MSM, men having sex with men; RCT, randomized controlled trial; SE, standard error; SMD, standardised mean difference; SMS, short message service (mobile phone text messaging); SOC, Standard of care; STI, sexually transmitted infection; TXT, text messaging; WSW, women having sex with women; WSWM, women having sex with women and men; WSW, women having sex with women; f/m comb., female/male combined; m, month(s); w, week(s); w/o, without

We consider the trial to report on adolescents/youth if at least 70% of randomized persons (for whom results are reported separately) fall within the age range of 10-24 years (WHO definition of adolescents: 10-19 years; UN definition of youth: 15-24 years)

* We consider the trial to report on WSM if at least 70% of randomized persons (for whom results are reported separately) are women having sex with men ($\leq 30\%$ may include WSWM or WSW); the same, applies to the MSM category (at least 70% being MSM)

Note: Studies within forest plots sorted by objectively confirmed vs. self-reported outcome (where applicable) and by study weight

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