

Summary Statement Title:

Abstinence-plus HIV prevention programs in high-income countries: Evidence and implications for public health

Quality Assessment Rating: 9 (Strong)

Review on which this summary statement is based:

Underhill K, Operario D, Montgomery P. (2007). **Systematic review of abstinence-plus HIV prevention programs in high-income countries.** *PLoS Medicine*, 4(9), 1471-1485.

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This is a summary statement written to condense the work of the authors of this systematic review, referenced above. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Review content summary

This systematic review investigated the effectiveness of abstinence-plus interventions for human immunodeficiency virus (HIV) prevention among youth participants in high-income countries (as defined by the World Bank) using randomized and quasi-randomized controlled trials. Abstinence-plus interventions promote sexual abstinence as the best means of preventing HIV, but also encourage condom use and other safer-sex practices. The review assessed 39 trials that included approximately 37,724 North American youth, though trials typically featured US ethnic minority adolescents from low-income urban areas. Programs were based in a range of settings including schools and community facilities and all outcomes were self-reported. Quantitative synthesis was not possible because of heterogeneity. Biological outcomes (e.g. STI's, pregnancy rates) are presented along with common behavioural outcomes. Of 39 trials, 20 found a protective program effect on at least one sexual behaviour, including abstinence, condom use, and unprotected sex. No trial found adverse program effects on any behavioural outcome. Most studies reported a significant positive effect on HIV/AIDS knowledge. The review authors note that only one trial directly compared an abstinence-plus against an abstinence-only or a safer-sex intervention; as such more comparisons of this type may be necessary.

Comments on this review's methodology

This is a methodologically strong review. Using clear inclusion criteria, the review authors searched 30 electronic databases without linguistic or geographical restrictions to February 2007. They contacted experts, and hand-searched conference abstracts. Two reviewers independently assessed the studies for methodological quality. Disagreements were resolved either by discussion or referral to the third reviewer. Criteria used to assess methodological quality included attrition, cost, acceptability, and implementation. Quantitative synthesis was not possible due to significant variation in results between studies, therefore results are discussed narratively. Review authors suggest that future studies should account for dropouts in their data analyses, describe randomization techniques and clearly outline program implementation.

Why this issue is of interest to public health

As of 2005, it was estimated that approximately 21,000 people had died with an HIV/AIDS infection in Canada.¹ By the end of 2005, the Public Health Agency of Canada (PHAC) estimated there were approximately 58,000 people in Canada living with HIV (including those living with AIDS) – a 16% increase from the 2002 estimate of 50,000 – and that approximately 27%, or 15,800 of these individuals, were unaware of their HIV infection.² This is of concern to public health practitioners, as no pharmaceutical prophylaxis or a cure are currently available. In 2005, the Government of Canada launched the Federal Initiative to Address HIV/AIDS in Canada, while PHAC took the lead for the overall coordination of the federal initiative, including the Canadian HIV Vaccine Initiative.³ From a financial perspective, Canadian estimates of lifetime care and treatment costs per person with HIV made in 1998 totaled about \$160,000. Moreover, the indirect costs associated with lost productivity and premature death may be as high as \$600,000 per person.³ Every HIV infection prevented avoids approximately \$750,000 in direct and indirect costs.³ In tackling HIV infection, public health practitioners must also address the social determinants of health that put certain populations at greater risk of HIV acquisition. Given that an estimated 2.5 million people became newly infected with HIV worldwide in 2007, this global epidemic requires attention and implementation of effective prevention strategies.

Evidence and implications

Evidence points identified in the table below are not presented in order of the strength of the evidence.

| What's the evidence? | Implications for practice and policy: |
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| <p>1. Abstinence-plus programs to <u>prevent sexually transmitted infection (STI)</u> (3 studies)</p> <p>1.1. Self-reported STI diagnosis by a doctor or nurse. Two studies assessed whether participants in abstinence-plus programs (compared to participants receiving knowledge-only programs) were likely to report fewer STI diagnoses by a doctor or nurse. Both studies found an increase in reported STI diagnoses among participants.</p> <p>1.1.1. In two studies that reported results between 0 to less than 6 months, abstinence-plus programs were no more effective at reducing STI diagnoses than knowledge only interventions (OR 1.15, 95% CI 0.07-18.68) and 1.38 (OR 1.38, 95% CI 0.44-4.38).</p> <p>1.1.2. Similarly at 6-11 months follow up, those in the abstinence-plus intervention were no less likely to receive an STI diagnosis than those receiving the knowledge only intervention (OR 0.15, 95% CI 0.01-2.98).</p> <p>1.2. And at over 12 months follow up, those receiving the abstinence-plus intervention were no less likely to receive an STI diagnosis compared to those receiving the knowledge only intervention (OR 0.80, 95% CI 0.21-3.00).</p> <p>1.3. Self-reported receipt of STI treatment. One study assessed whether participants in abstinence-plus programs (compared to participants receiving knowledge-only programs) were less likely to report receiving treatment for STIs. The study found that participants in abstinence-plus programs were just as likely to receive treatment for STIs as participants in knowledge-only programs.</p> <p>1.3.1. At up to 6 months those receiving the abstinence-plus intervention were no less likely to report receiving treatment for an STI compared to those receiving the knowledge only intervention (OR 0.11, 95% CI 0.01-1.09).</p> <p>1.4. The results of the three studies indicate a trend toward <u>increased likelihood</u> of (self reported) STIs diagnosed by a doctor or nurse, and toward increased risk of receiving treatment for STIs among participants in abstinence-plus programs compared to participants in knowledge-only programs.</p> | <p>1. Abstinence-plus programs (APP'S) to prevent sexually transmitted infection.</p> <p>1.1. Abstinence-plus programs should not be prioritized over knowledge only programs to prevent sexually transmitted infection among youth.</p> <p>1.2. Abstinence-plus programs should not be used to prevent STIs among youth in high income countries.</p> |
| <p>2. Abstinence-plus programs to <u>prevent pregnancy</u>. (6 studies)</p> <p>2.1. Abstinence-plus programs compared to knowledge-only programs. (5 studies).</p> <p>2.1.1. 4 of the 5 studies found that abstinence-plus programs did not reduce risk among youth participants of having or causing a pregnancy compared to knowledge-only programs.</p> <p>2.1.2. The one study reporting a significant positive effect found that girls receiving the abstinence-plus program were half as likely to report a pregnancy compared to those receiving the knowledge-only program (OR 0.52, 95% CI 0.34-0.81). The true effect ranged from 66% to 19% less likely to become pregnant. However a significant effect was not observed for boys in the same study (OR 0.89, 95%v CI 0.48-1.66).</p> <p>2.2. Non-enhanced abstinence programs compared to knowledge-only programs (1 study). The study found that those exposed to non-enhanced abstinence programs (e.g. program without homework or without newsletters) were half as likely to report or cause a pregnancy compared to those</p> | <p>2. Abstinence-plus programs (APP'S) to prevent pregnancy</p> <p>2.1. Abstinence-plus programs should not be prioritized over knowledge-only or non-enhanced programs to prevent having or causing a pregnancy among youth. Limited evidence suggests that abstinence-plus programs may be effective in preventing pregnancy among girls, and that school curricula-based programs may prevent having or causing a pregnancy among youth.</p> <p>2.2. While non-enhanced programs compared to knowledge-only programs for youth may prevent having or causing a pregnancy, more research is needed before this strategy can be recommended.</p> <p>2.1. While student curricula involving community service may prevent having or causing a pregnancy among youth more</p> |

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| <p>receiving the knowledge-only program. (OR 0.53, 95% CI 0.31-0.90). The true effect ranged from 69% to 10% less likely to report or cause a pregnancy.</p> <p>2.3. School based curriculum programs including community service (1 study). The study found that students who participated in community service had a trend toward fewer pregnancies than students without service although the results were not statistically significant.</p> | <p>research is needed before this strategy can be recommended.</p> |
| <p>3. Abstinence-plus programs to <u>reduce sexual risk behaviour</u> (39 studies).</p> <p>3.1. Abstinence-plus programs to reduce <u>incidence of unprotected vaginal sex</u> (3 studies). Two studies found that participants in abstinence-plus programs had significantly lower incidence of unprotected vaginal sex compared to participants who attended a program equal in format and duration that was not an abstinence-plus focused intervention; one study found no effect.</p> <p>3.1.1. The two studies found incidence of unprotected vaginal sex had decreased at 12 months follow up</p> <p>3.1.1.1. One study of sexually experienced participants found a significant reduction in lifetime incidence of unprotected vaginal sex</p> <p>3.1.1.2. The other study found reduced incidence of unprotected sex within the previous 3 months only among participants who were sexually experienced at baseline</p> <p>3.1.2. One study found that abstinence-plus programs had no effect on incidence of unprotected vaginal sex</p> <p>3.2. Abstinence-plus programs to reduce <u>frequency of unprotected vaginal sex</u> (12 studies).</p> <p>3.2.1. In six studies, abstinence-plus programs significantly reduced the frequency of unprotected sex among participants compared to participants who attended a program equal in format and duration that was not an abstinence-plus focused intervention, information about HIV, usual care or a non-enhanced program.</p> <p>3.2.1.1. One of the studies found reduced frequency of unprotected vaginal sex only among participants who reported sexual experience at baseline</p> <p>3.2.2. Six studies found no effect on frequency of unprotected vaginal sex among participants in abstinence-plus programs</p> <p>3.3. Abstinence-plus programs to reduce <u>frequency of unprotected anal or oral sex</u> (2 studies).</p> <p>3.3.1. A study in a juvenile reformatory found no program effect 7 months after baseline compared to participants who attended a program equal in format and duration that was not an abstinence-plus focused intervention</p> <p>3.3.2. A study in a community based organization found significantly reduced frequency of both unprotected anal and oral sex among participants over a 14 month follow up compared to a non-enhanced program</p> <p>3.4. Abstinence-plus programs to reduce <u>incidence of any (protected or unprotected) vaginal sex</u> (21 studies).</p> <p>3.4.1. Five studies found that abstinence-plus programs resulted in significantly reduced incidence of any vaginal sex among participants compared to no treatment, participants who attended a program equal in format and duration that was not an abstinence-plus focused intervention, usual care (among males only), or non-enhanced program</p> <p>3.4.2. Sixteen studies found no significant effect of abstinence-plus programs to reduce incidence of any vaginal sex</p> <p>3.5. Abstinence-plus programs to reduce <u>frequency of recent vaginal sex</u> (13 studies).</p> <p>3.5.1. Five studies found that abstinence-plus programs</p> | <p>3. Abstinence-plus programs (APP'S) to reduce sexual risk behaviour</p> <p>3.1. Abstinence-plus programs do not generally reduce sexual risk behaviour among youth in high income countries when compared to programs equal in format and duration that are not abstinence-plus programs, non-enhanced programs, HIV information, or usual care. Though some individual studies found that abstinence-plus programs reduced some risk behaviours (e.g., condom use), there were either too few studies assessing a particular risk behaviour to draw a compelling conclusion, or there were as many studies that reached the opposite result. In sum, the data are mixed at this time, and there is insufficient evidence to recommend abstinence-plus programs over alternative programs to reduce the sexual risk behaviours listed here.</p> |

resulted in significantly reduced frequency of recent vaginal sex among participants compared to participants who attended a program equal in format and duration that was not an abstinence-plus focused intervention, information about HIV, or usual care.

3.5.1.1. One of the studies found reduced frequency of recent vaginal sex only among participants who reported sexual experience at baseline

3.5.2. Eight studies found no effect of abstinence-plus programs to reduce frequency of recent vaginal sex

3.6. **Abstinence-plus programs to reduce incidence and frequency of anal sex (3 studies).**

3.6.1. Two studies found significantly reduced incidence of anal sex in the past 3 months compared to controls

3.6.1.1. One study found reduced incidence at 6 months follow-up

3.6.1.2. The other study found significantly reduced frequency at 6 months follow-up

3.6.2. One study found no reduction in anal sex at 24 months follow-up

3.7. **Abstinence-plus programs to reduce frequency of oral sex (1 study)**

3.7.1. While the study found a trend toward a small reduction in the frequency of oral sex among participants in abstinence-plus programs at 7 months follow-up, the results were not statistically significant

3.8. **Abstinence-plus programs to reduce incidence of any recent oral, anal or vaginal sex (4 studies).**

3.8.1. Two studies found significantly reduced incidence of recent oral, anal, or vaginal sex among participants in abstinence-plus programs compared to usual care at 5 months follow-up and to a non-enhanced program at 14 months follow-up respectively

3.8.2. Two studies found no reduction in any recent oral, anal or vaginal sex among program participants compared to usual care

3.9. **Abstinence-plus programs to reduce incidence of casual sex (2 studies).** The studies did not find that abstinence-plus program participation reduced incidence of casual sex.

3.9.1. One study found a small reduction in incidence of casual sex at 3.5 months follow-up with a skills training program component compared to an information-focused program, but the results were not statistically significant

3.9.2. One study found no reduction in frequency of casual sex at 7 months follow-up compared to a program equal in format and duration that was not an abstinence-plus focused intervention

3.10. **Abstinence-plus programs to reduce number of sexual partners (13 studies)**

3.10.1. Four studies found a significant reduction in the number of sexual partners among participants in abstinence-plus programs compared to a program equal in format and duration that was not an abstinence-plus focused intervention (2 studies), usual care (1 study), or a non-enhanced program (1 study)

3.10.2. Nine studies found no reduction in number of sexual partners among participants in abstinence-plus programs

3.11. **Abstinence-plus programs to reduce number of sexual partners with whom participants had unprotected sex (2 studies).**

3.11.1. One school-based program found a significant reduction in the number of sexual partners with whom participants reported unprotected sex at 19 months and 31 months follow-up compared to participants who received information about HIV only

3.11.2. Another school-based program found no reduction in the

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| <p>number of sexual partners with whom participants reported unprotected sex compared to usual care</p> <p>3.12. Abstinence-plus programs measuring <u>condom use</u> (26 studies)</p> <p>3.12.1. Fourteen studies found a significant increase in condom use at any follow-up point compared to no treatment, a program equal in format and duration that was not an abstinence-plus focused intervention, information about HIV, usual care or a non-enhanced program.</p> <p>3.12.2. Twelve studies found no effect on condom use</p> <p>3.13. Abstinence-plus programs and the <u>absolute number of times participants used condoms</u> (1 study)</p> <p>3.13.1. The study found no difference in condom use among participants who attended abstinence-plus, abstinence-only, or safer-sex programs compared to a no-treatment control group</p> <p>3.14. Abstinence-plus programs and <u>sexual initiation</u> (19 studies). Four studies found that participants in abstinence-plus programs had later sexual initiation compared to usual care or a non-enhanced program,</p> <p>3.14.1. 15 studies found no delay in sexual initiation among participants in abstinence-plus programs.</p> | |
| <p>4. Abstinence-plus programs and HIV/ AIDS knowledge (24 studies).</p> <p>4.1. Twenty studies found that abstinence-plus program participants reported significantly greater HIV /AIDS knowledge compared to non-enhanced programs or a program equal in format and duration that was not an abstinence-plus focused intervention</p> <p>4.1.1. In one study participants in a program without peer counselling demonstrated greater knowledge than participants in the enhanced program at 3 months follow up</p> <p>4.2. Four studies comparing abstinence plus program on a non-enhanced program found no increase in HIV/SIDS knowledge or attention control (pre-existing HIV education)</p> | <p>4. Abstinence-plus programs and HIV/ AIDS knowledge</p> <p>4.1. There is evidence to support implementing abstinence-plus programs to increase HIV/AIDS knowledge among youth in high income countries</p> |
| <p>5. Cost benefit or cost-effectiveness information</p> <p>5.1. No cost related information was included in the review.</p> | <p>5. Cost benefit or cost-effectiveness information</p> <p>5.1. Future research should include cost effectiveness of interventions.</p> |
| <p>General Implications</p> <ul style="list-style-type: none"> • Abstinence-plus programs do not prevent STIs among youth in high income countries. • Abstinence plus programs may have a small effect among girls to prevent pregnancy in high income countries. • Abstinence-plus programs do not reduce sexual risk behaviours among youth in high income countries. • Abstinence-plus programs may increase HIV/AIDS knowledge among youth in high income countries. | |
| <p>Legend: CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk **please see the health-evidence.ca glossary of terms (found under 'How to Use This Site') for definitions</p> | |

References used to outline issue

1. Health Canada. (n.d.). *Diseases & conditions, HIV/AIDS*. Retrieved from <http://www.hc-sc.gc.ca/hc-ps/dc-ma/aids-sida-eng.php>
2. Public Health Agency of Canada. (n.d.). *Infectious diseases, HIV/AIDS*. Retrieved from <http://www.phac-aspc.gc.ca/aids-sida/index-eng.php>
3. Canadian Public Health Association. (2005). *Leading together: Canada takes action on HIV/AIDS*. Retrieved from <http://www.leadingtogether.ca/>

Other quality reviews on this topic

- Elwy AR, Hart GJ, Hawkes S, Petticrew M. (2002). Effectiveness of interventions to prevent sexually transmitted infections and human immunodeficiency virus in heterosexual men: A systematic review. *Archives of Internal Medicine*, 162(16), 1818-1830.
- Horn AK, Rama SM, Griffin T, DeLuca JB, Mullins MM, Aral SO, et al (2007). The efficacy of behavioral interventions in reducing HIV risk sex behaviors and incident sexually transmitted disease in black and Hispanic sexually transmitted disease clinic patients in the United States: A meta-analytic review. *Sexually Transmitted Diseases*, 34(6), 319-332.

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- Yamada J, DiCenso A, Feldman L, Cormillott P, Wade K, Wignall R, et al. (1999). A systematic review of the effectiveness of primary prevention programs to prevent sexually transmitted diseases in adolescents. Hamilton, Ontario: Effective Public Health Practice Project.

Related links

- Association of Medical Microbiology and Infectious Disease Canada <http://www.ammi.ca/index.php>
- Canadian Aids Society. (2004). *Youth and HIV/AIDS*. Available from <http://www.cdnaids.ca/web/backgrnd.nsf/pages/cas-gen-0008>
- Canada Communicable Disease Report <http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/>
- Canadian Guidelines for Sexual Health Education http://www.phac-aspc.gc.ca/publicat/cgshe-ldnemss/cgshe_toc-eng.php
- Federal Initiative to Address HIV/AIDS in Canada <http://www.phac-aspc.gc.ca/aids-sida/fi-if/index-eng.php>
- Joint United Nations Programme on HIV/AIDS <http://www.unaids.org/en/>
- Public Health Agency of Canada: HIV/AIDS, Useful Links <http://www.phac-aspc.gc.ca/aids-sida/links-eng.php#3>
- The Sex Information and Education Council of Canada http://www.sieccan.org/pdf/sexual_health_qs.pdf

Suggested Citation

Greco, L., McRae, L., Dobbins, M. (2010). Abstinence-plus HIV prevention programs in high-income countries: Evidence and implications for public health. Hamilton, ON: McMaster University. Retrieved January 1, 2010, from *health-evidence.ca*: http://www.health-evidence.ca/documents/17228/Underhill_2007_Summary_Statement_-_English.pdf

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