



A Brief Rebuttal to a Critique by the World Health Organization

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In September 2018, at a side event of the United Nations Human Rights Council in Geneva, Switzerland, a research analyst from *The Institute for Research and Evaluation* presented findings from their forthcoming report titled, “Re-examining the Evidence for School-based Comprehensive Sex Education: A Global Research Review.”¹ In addition to U.S. studies, the Institute (IRE) had analyzed the international (non-U.S.) studies cited by UNESCO² as evidence for its claims that comprehensive sexuality education (or CSE) is effective at reducing teenage sexual risk behavior, and the IRE findings contradicted these claims. Out of the 43 non-U.S. studies of school-based CSE in the UNESCO evidence base, IRE found only 3 that showed evidence of program effectiveness. The IRE definition of effectiveness was grounded in the scientific field of prevention research.³ It was, that an effective CSE program should have a significant positive impact on at least one key risk indicator (sexual abstinence, condom use, pregnancy, or STIs) for the targeted youth population (not just a subgroup), that the effect should last at least 12 months after the program’s end (i.e., from one school year to the next), and that the program should not have caused negative effects. The IRE reviewers found little evidence of CSE success in non-U.S. schools by this definition, and also found that 9 studies showed negative, harmful CSE effects—increases in teen sexual risk behavior, pregnancy, or STIs. Similar poor results were found in the U.S. studies. The researchers concluded that when a credible scientific lens is used to evaluate school-based CSE, rather than the lenient standards employed in many favorable CSE reviews, there is little evidence of effectiveness and appears to be more evidence of harm than real benefit.

Immediately following the presentation of these findings in Geneva, an official from the World Health Organization (WHO) announced to the IRE presenter, “We disagree with your findings and will be actively working to refute them.” In other words, without objectively examining the studies upon which the IRE findings were based, the WHO official decided, *a priori*, that the findings were false and should be rejected. Approximately five years later, the WHO has issued a critique of IRE’s international (non-U.S.) CSE findings, authored by personnel at WHO’s *Department of Sexual and Reproductive Health and Research* (VanTreeck, et al., 2023).⁴ The critique was published in a journal that is the publication arm of an advocacy organization (*Sexual and Reproductive Health Matters*) which describes itself as a “community of researchers, activists and other experts” working “to shift ideology and power-driven politics... towards human rights and social justice ... [with] explicit attention to sexual and reproductive justice.” (See: <https://www.srhm.org/about-us/>) This lacks even the appearance of being an objective scientific publication.

The WHO critique declares the IRE report to be unscientific and full of errors, and labels it with biased terms like “misinformation research” and “a CSE opposition campaign.” IRE has examined this WHO critique, and has found, to the contrary, that *it* is full of errors and misinformation. A detailed rebuttal of this critique is being prepared for publication. Here are three key points:

1. The WHO critique misrepresents the purpose and methods of the IRE review.

- a. A main purpose of the IRE review was to analyze a database previously identified by three authoritative scientific agencies in order to evaluate the evidence *they* claimed showed CSE effectiveness, rather than to conduct an original systematic review of the CSE research literature. IRE’s purpose was stated in its report as “[an] examination of the best available sex education outcome research, *as identified by three reputed scientific agencies*... This allowed us to examine what other experts have independently identified as some of the best evidence for school-based CSE effectiveness.”¹ (The UNESCO² evidence base was the source for IRE’s analysis of non-U.S. studies. For the U.S. analysis, studies cited by the CDC and the HHS Teen Pregnancy Prevention Evidence

Review were examined.¹) Notwithstanding this explanation, the WHO reviewers assumed the IRE review *was* a systematic literature review and criticized it for not following those research methods.

- b. Because the WHO reviewers mistook the purpose and methods of the IRE review, they criticized IRE for not specifying its criteria for selecting the individual studies it included. However, as explained above, *IRE did not select the individual studies for its review*. The IRE review was an analysis of a previously identified evidence base, a set of studies that had already been vetted by authoritative agencies as evidence for CSE effectiveness, which IRE “re-examined.” These agencies and their documentation were specified in the IRE report. A study’s inclusion in the UNESCO database (i.e., a study of school-based CSE) *was the criterion* for its inclusion in IRE’s international database. Thus, this WHO criticism is not applicable.
- c. The WHO reviewers seemed not to perceive that the UNESCO database reviewed by IRE was based primarily on UNESCO’s 2018 version of its *International Technical Guidance on Sexuality Education*.² Both the 2009 and 2018 editions were listed in IRE’s Endnote 29,¹ yet the WHO critique only references UNESCO’s 2009 publication in its citations (see “Citation 2”).⁴ Their questioning of the IRE list of included studies and their stated difficulty identifying the study sources appears to be because they were looking solely at the 2009 publication, an important oversight by the WHO reviewers. In fact, IRE relied on the 2018 reference list because it was the most recent.⁵ The 43 included studies are from this reference list and include the individual studies in the systematic reviews cited in this list. (Many of the 2009 sources were also on the 2018 list. However, it should be noted that if all of the older studies of non-U.S. school-based CSE from the 2009 reference list were included, it would not increase the number of studies showing evidence of effectiveness.) This misunderstanding on the part of the WHO reviewers could have been easily rectified if they had contacted the IRE analysts for clarification. The reason they gave for not doing so was: “Given the polarised environment of CSE research, we did not reach out to the authors for additional information on their search strategy.”⁴ It is unfortunate that such a bias on the part of the WHO reviewers prevented them from obtaining important clarification about the IRE data source.
- d. The WHO reviewers criticized IRE for not screening the included studies for scientific quality (i.e., rejecting those of lower quality) or assessing risk of study bias. Here again, the WHO critique misrepresents the IRE study, and in addition, employs a double standard. IRE did not conduct an assessment of study quality because, as noted in its report, IRE accepted whatever quality screening UNESCO employed in *its* criteria for included studies, in order to review all of the evidence presented by UNESCO. However, as did the WHO reviewers, the IRE report acknowledged the low quality of some studies included by UNESCO. For example, as stated by the WHO critique, “several of the studies had serious flaws [and] some low-quality studies had smaller sample sizes or were purely descriptive without employing robust statistical tests.”⁴ If this shows anything, *it is the lack of good quality research evidence upon which UNESCO’s positive claims about CSE are based*.

The WHO reviewers gave high praise to the recent Goldfarb and Lieberman review of CSE research (2021),⁶ asserting that its “validity and rigour” as a study has been “verified.” Unfortunately, this study conducted no screening whatsoever for the scientific quality of the 80 included sources and there was no assessment of “risk of study bias.” The authors actually acknowledged the “substantial number of studies with less rigorous designs, smaller samples, and/or more qualitatively based [i.e., subjective or non-experimental] approaches” (p.4) found in their evidence base. In fact, their citations include many sources that could not even be called studies, such as subjective write-ups by teachers about classroom discussions held with 15 to 20 students, a workshop in which testimonials were shared, and a subjective response to a musical performance. It should be asked whether this documented inclusion of inferior studies/evidence by both UNESCO and Goldfarb and Lieberman causes the WHO reviewers to question UNESCO’s positive assertions about CSE or the validity of

Goldfarb and Lieberman’s claims about CSE’s wide-ranging benefits. Or will the WHO endorse the low standards typically employed by such favorable CSE reviews while holding the IRE review to a set of rigorous criteria?

- e. The WHO reviewers criticized IRE for including studies in its review (included because they were in the UNESCO database) that did not measure a 12-month post-program effect—one of the IRE criteria for effectiveness—and thus, of unfairly labeling these programs as ineffective. In fact, IRE did not ever describe these programs as *ineffective*, but only as *lacking evidence of effectiveness*—a crucial distinction. Indeed, one of the purposes of the IRE review was to report on the substantial number of studies included by UNESCO that did *not* measure long-term effects and therefore could not provide evidence of program effectiveness, as UNESCO claimed that they did.
- f. The WHO reviewers criticized IRE for unfairly including these short-term studies in the denominator of its calculation of a CSE failure rate, which it expressly did not do, as stated in its report (this IRE methodology is stated on p. 167, under U.S. Findings¹).

These major misrepresentations of the purpose and methods of the IRE review undermine the validity of the WHO critique. In large part, it criticized the IRE review based on its own faulty premises.

2. The WHO critique has many factual errors.

The WHO reviewers claimed that IRE’s reporting of the results of the 43 studies contained errors regarding 74% of the studies. If accurate, this would seriously undermine the validity of the IRE findings. But it is not accurate. The WHO critique claimed to find 66 instances⁷ of “discrepancies” or errors among the 430 data points reported in the IRE data table as findings from the 43 reviewed studies. If these were all true discrepancies, the 66 out of 430 data points would be an error rate of 15% (not 74%). However, IRE analysts have examined each of these purported discrepancies, comparing them against the text and data tables published in each of the 43 cited studies and the 430 entries in the IRE data table. They found that the claims of the WHO could be verified in only 9 of the 66 instances, while 11 of the cases were debatable disagreements on the interpretation of research findings, not errors on the part of IRE. None of the 9 verified discrepancies were consequential—they did not change the overall results or conclusions of the IRE analysis. (Most were entries of “not measured” rather than “non-significant,” or vice versa.) The remaining 46 purported discrepancies were actually identified mistakenly as such by the WHO reviewers, based on their mistaken interpretation of study data or of the IRE data table. A number of these mistakes were such as would not be expected from someone in a research position at the WHO.

For example, the WHO reviewers:

- Mislabeled a significant increase found by one study in the number of teens who became sexually active—which was a negative program outcome, and was labeled so by the study in question—as a positive program outcome and therefore “evidence of program potential.”⁸
- Failed to acknowledge statistical analyses in several studies which found that program effects were actually subgroup effects, consistent with how IRE reported them (see details in Endnotes).⁹
- Mistook a data table reporting pre-test numbers for the study sample at follow-up as a report of program effects measured at the follow-up survey.¹⁰
- In a misinterpretation of the IRE data table, repeatedly claimed that single program outcomes on the IRE data table were labeled as both positive and negative results, which was not ever done. Positive and negative outcomes were all labeled separately and clearly in different columns of the data table.
- Committed a number of other technical errors that will be detailed in the full IRE rebuttal.
- Counted the two times that a study author’s name was slightly misspelled on the IRE data table (in other words, a “typo”) as an error in the study findings reported by IRE.

- Based their review on an earlier version of the IRE report; several of the supposed errors they noted were not contained in the final published journal article (in *Issues in Law and Medicine*, 2019).¹

In summary, the WHO critique claims there were 66 discrepancies out of 430 IRE data points. However, only 9 of these could be confirmed, resulting in an error rate of 2% (9 out of 430). This is less than the 5% error rate that would be expected to occur by chance. On the other hand, for the WHO analysis, 46 out of the 66 discrepancies in its data table were found to be erroneous, which is an error rate of 70%.

3. The WHO re-analysis of international CSE data actually reports findings similar to the original IRE findings.

Using the scientifically derived definition of program effectiveness employed by IRE, the WHO analysis of study findings still reported just 6 out of 43¹¹ international studies showing evidence of effectiveness for school-based CSE, only 3 more than IRE reported. (The WHO critique did not identify the specific studies these were, so we can only assume them to be the 6 studies listed in their Table B1 as showing “a positive effect,”¹² which is a completely different set of studies than the 3 identified by IRE.¹³) They also reported that 7 studies showed evidence of harmful impact, only two less than IRE reported. Correcting for the inarguable error by WHO reviewers in which they correctly reported a negative effect from a study but then mislabeled it as a positive result (Merakou, 2006),⁸ their own count of studies showing negative impact is 8, which compares to the 9 reported by IRE. Similar to the IRE results, these WHO findings show little evidence of CSE effectiveness and an inverse ratio of program effectiveness to harm.

Although the WHO critique only claims that 6 of the international school-based CSE programs have shown effectiveness, the IRE analysts disagree with that designation for those 6 programs. In each case, the designation of effectiveness is based on a misinterpretation by the WHO reviewers of the respective study’s findings. For example, in one case, they called a subgroup effect an overall effect,¹⁴ in another they gave credit for a 12-month post-program effect where none was indicated,¹⁵ and in another case, counted a program as effective that had produced multiple negative effects on program recipients.¹⁶

In addition, the WHO reviewers did not make clear that for all 6 of the CSE programs they claimed show effectiveness, the evidence did not come from independent studies. In each case, the evaluation study was conducted by either the program’s developer or by a researcher at the institution that developed or implemented the program. In other words, *the evaluation studies were not by independent evaluators.*

It should be mentioned that the WHO critique praised several other systematic reviews of CSE research as strong evidence for CSE effectiveness.⁴ Upon close examination, however, several of these reviews are found to be outdated,¹⁷ two are of poor scientific quality,^{6,18} and others suffer from the dual problem of using inadequate criteria for effectiveness (e.g., the finding of only short-term effects or subgroups effects) and/or of under-reporting negative program effects.¹⁹

On the other hand, the lack of evidence for school-based CSE identified in the original 2019 IRE review is confirmed by multiple recent rigorous systematic reviews of CSE research. A landmark meta-analysis of sex education effectiveness sponsored by the U.S. Centers for Disease Control and Prevention (2012), found that school-based CSE programs did not significantly increase teen condom use or reduce teen pregnancy or STIs.²⁰ A more recent meta-analysis of 19 U.S. school-based CSE programs (2018) found “no consistent evidence” that school-based CSE programs significantly increased teen condom use or abstinence or reduced teen pregnancy.²¹ A 2019 meta-analysis of 44 programs on the U.S. Teen Pregnancy Prevention approved list found no evidence that school-based CSE increased teen abstinence or condom use or reduced teen pregnancy or STIs.²² And a recent research review claiming to show evidence of wide-ranging CSE benefits (Goldfarb & Lieberman, 2021)⁶, did not hold up under an objective analysis which revealed that very few of

its cited sources were studies of CSE programs, and that most of those did not meet basic scientific standards for study quality.²³ Most recently, the U.S. Department of Health and Human Services 2023 update of the Teen Pregnancy Prevention Evidence Review could not identify any new studies of school-based CSE programs that showed sustained effects for the target population on any protective outcomes.²⁴

Summary

The WHO critique of IRE's report on international CSE programs is full of errors and misinformation, of which the above three points are emblematic. It is also tainted by the appearance of bias on the part of its authors and publisher and the lack of independent research studies supporting its conclusions. The IRE analysis of the WHO critique, which included a meticulous re-analysis of the IRE data table and the 43 cited studies, found a far higher rate of error in the WHO critique's reporting of data (70%) than could be confirmed in IRE's reporting of data (2%). And none of the 9 IRE discrepancies that were verifiable had any effect on IRE's original findings. Ironically, the WHO analysis, despite its inaccuracies, reports findings similar to those of IRE: that in an international database identified and screened by UNESCO there were very few school-based CSE programs that showed evidence of effectiveness but a substantial number (close to one in 5) that had negative effects. Thus, the WHO critique was confirmatory; it underscores the shaky foundation upon which school-based CSE stands—the lack of evidence of real program effectiveness and the unacceptable number of negative effects—even when calculated by those with a favorable bias towards CSE.

IRE stands by its original finding that when a credible scientific lens was used to evaluate international school-based CSE studies in the database identified by UNESCO as evidence for CSE success, only 3 out of 43 studies showed evidence of real effectiveness while 9 studies showed evidence of harmful CSE impact. IRE concludes that there appears to be too little evidence of benefit and too much evidence of harm by school-based CSE programs in international settings. And the same can be said of CSE in U.S. schools.¹

A more detailed IRE rebuttal is forthcoming that answers the remaining criticisms of the WHO review and provides full documentation of the findings reported above.

Endnotes and Citations

1. Ericksen, I.H. and Weed, S.E. (2019). "Re-Examining the Evidence for School-based Comprehensive Sex Education: A Global Research Review." *Issues in Law and Medicine*, 34(2):161-182.
2. United Nations Educational, Scientific and Cultural Organization. (UNESCO). *International Technical Guidance on Sexuality Education: An Evidence-Informed Approach*, Revised Edition, 2018. http://www.unaids.org/sites/default/files/media_asset/ITGSE_en.pdf; UNESCO. *International Technical Guidance on Sexuality Education*, Volume 1; 2009.
3. These standards or criteria for effectiveness are grounded in the work of the scientific field of prevention research. The criteria are: 1) the use of a reliable study designed to test cause and effect: an experimental or quasi-experimental design study with adequate sample size and reliable measures; 2) program results that show evidence of effectiveness: significant ($p < .05$) sustained protective effects (for school-based programs, effects lasting 12 months post-program), for the intended or target population of program recipients (not just a subgroup or subsample), on an important protective outcome (indicating a reduction in sexual risk behavior), without other negative program effects occurring on important outcomes. See the work of: Flay BR, Biglan A, Boruch RF, Castro FG, Gottfredson D. (2005). Standards of Evidence: Criteria for Efficacy, Effectiveness and Dissemination. *Prev Sci*, 6(3):151–175; Gottfredson DC, Cook TD, Gardner FEM, Gorman-Smith D, Howe GW, Sandler IN, Zafft KM. (2015). Standards of Evidence for Efficacy, Effectiveness, and Scale-up Research in Prevention Science: Next Generation. *Prev Sci*, 16(7):893-926. doi: 10.1007/s11121-015-0555-x; Blueprints for Healthy Youth Development: Blueprints Standards. Available at: <https://www.blueprintsprograms.org/blueprints-standards/>
4. VanTreeck K, Elnakib S, & Chandra-Mouli V. (2023) A reanalysis of the Institute for Research and Evaluation report that challenges non-US, school-based comprehensive sexuality education evidence base. *Sexual and Reproductive Health Matters*, 31:1, 2237791, DOI: 10.1080/26410397.2023.2237791
5. United Nations Educational, Scientific and Cultural Organization. (2018). *International Technical Guidance on Sexuality Education: An Evidence-Informed Approach*, Revised Edition. See p. 129, Appendix V. Studies referenced as part of the evidence review 2016. It states on this page that "Those [citations] marked with * were included in the analysis of systematic reviews and high-quality valuations." IRE included the studies marked with * and, where that study was a systematic review, also included the individual studies cited in that review, since they formed the basis for the systematic review's findings.
6. Goldfarb E and Lieberman L. (2021). Three Decades of Research: The Case for Comprehensive Sex Education. *J Adolesc Health*, 68(1):13-27. doi: 10.1016/j.jadohealth.2020.07.036
7. In Table B1, the WHO critique lists 59 entries of claiming discrepancies in the IRE data table (Table 7 in Endnote entry 1, above). Some of these entries note multiple discrepancies, giving a total of 66 itemized discrepancies or datapoints in the WHO critique.
8. Merakou K, Kourea-Kremastinou J. (2006). Peer education in HIV prevention: an evaluation in schools. *European Journal of Public Health*, Vol. 16, No. 2, 128–132. (On p.131 the study states, "more students from the intervention group initiated sex." The significant effect 5

- cited by the WHO from Table 4 is a negative impact on teens, not a positive one. The number of virgin students decreased more in the intervention group than the control group. WHO's claim of IRE error on this outcome is itself a very basic error in interpreting the study results.)
9. James S, Reddy P, Ruiter R, McCauley A, van den Borne B. (2006). The impact of an HIV and AIDS life skills program on secondary school students in Kwazulu-Natal, South Africa. *AIDS Education and Prevention*, 18(4), 281–294 (The "full implementation" group was a subgroup, since it was a product of "exploratory analyses" (p.287) that divided the sample into those who received "full" or "partial" implementation of the program. We took the "intent to treat" approach and considered these as subgroups, as the study also appeared to do, since they reported no overall behavioral effects for *the full sample* at any time); Mathews C, Aarø LE, Grimsrud A, Flisher AJ, et al. (2012—listed as 2010 in IRE report). Effects of the SATZ teacher-led school HIV prevention programmes on adolescent sexual behaviour: cluster randomised controlled trials in three sub-Saharan African sites. *International Health*, (4) 111– 122, Site 3 (When males and females were analyzed separately (p.117, Supplementary Tables 3 & 4), the effect was found only for males and not females. Thus, it became clear that it was a subgroup effect); Okonofua FE, Coplan P, Collins S, Oronsaye F, et al. (2003). Impact of an intervention to improve treatment-seeking behavior and prevent sexually transmitted diseases among Nigerian youths. *Int J Infect Dis*; 7: 61-73 (The outcome of interest is the relative change in the intervention group compared to the control group. This is given on p.66, where it states: "this statistically significant effect of the intervention was due to the reported increase among females (OR=1.80, 95%=1.11-2.92) rather than among males (OR=1.13, 95% CI=0.84-1.51) when comparing the intervention to control groups." Thus, it was a subgroup effect, occurring for females only); Stanton BF, Li X, Kahihuata J, Fitzgerald A, et al. (1998). Increased protected sex and abstinence among Namibian youth following a HIV risk-reduction intervention: a randomized, longitudinal study. *AIDS* 1998, 12:2473–2480 (On p.2475, the study states: "This effect appears to have been contributed primarily by changes among the females (e.g. there was no statistically significant effect on abstinence among males who were virgins at baseline)." Thus, it was a subgroup effect—occurring for females but not males.)
 10. Walker D, Gutierrez JP, Torres P, Bertozzi SM. (2006). HIV prevention in Mexican schools: prospective randomized evaluation of intervention, *BMJ*, doi:10.1136/bmj.38796.457407.80
 11. While the WHO critique states that it could not locate one of the 43 studies in the IRE database, it reported findings on this same study, which makes its database 43 studies as well.
 12. Dente, M, Fabiani, M, Okwey, R, Conestà, N, et al. (2005). Impact of Voluntary Counselling and Testing and Health Education on HIV Prevention among Secondary School Students in Northern Uganda. *VCT AND HEALTH EDUCATION FOR HIV PREVENTION*; 3 (1) 1 – 11; Jemmott, J, Jemmott, L, O'Leary, A, Ngwane, Z, et al. (2015). HIV/STI Risk-Reduction- Intervention Efficacy with South African Adolescents Over 54 Months. *Health Psychology*: 34(6): 610–621; Jewkes R, Nduna M, Levin J, Jama N, et al. (2008). Impact of Stepping Stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomised controlled trial. *BMJ*; 337:a506 doi:10.1136/bmj.a506; Mathews C, Aarø LE, Grimsrud A, Flisher AJ, et al. (2012—listed as 2010 in IRE report). Effects of the SATZ teacher-led school HIV prevention programmes on adolescent sexual behaviour: cluster randomised controlled trials in three sub-Saharan African sites. *International Health*, (4) 111– 122, Site 3; Stanton BF, Li X, Kahihuata J, Fitzgerald A, et al. (1998). Increased protected sex and abstinence among Namibian youth following a HIV risk-reduction intervention: a randomized, longitudinal study. *AIDS* 1998, 12:2473–2480; Visser M. (2007). HIV/AIDS prevention through peer education and support in secondary schools in South Africa, *SAHARA-J: Journal of Social Aspects of HIV/AIDS*,4:3, 678-694, DOI: 10.1080/17290376.2007.9724891
 13. Okonofua FE, Coplan P, Collins S, Oronsaye F, et al. (2003). Impact of an intervention to improve treatment-seeking behavior and prevent sexually transmitted diseases among Nigerian youths. *Int J Infect Dis*; 7: 61-73; Shuey DA, Babishangire BB, Omiat S, and Bagarukayo H. (1999). Increased sexual abstinence among in-school adolescents as a result of school health education in Soroti district, Uganda. *HEALTH EDUCATION RESEARCH*, 14 (3), 411–419; Stephenson J, Strange V, Allen E, Copas A, Johnson A, et al. (2008). The long-term effects of a peer-led sex education programme (RIPPLE): A cluster randomised trial in schools in England. *PLoS Med*, 5(11): e224. doi:10.1371/journal.
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 15. Dente, M, Fabiani, M, Okwey, R, Conestà, N, et al. (2005). Impact of Voluntary Counselling and Testing and Health Education on HIV Prevention among Secondary School Students in Northern Uganda. *VCT AND HEALTH EDUCATION FOR HIV PREVENTION*; 3 (1) 1 – 11 (The outcome measures were taken at the End of the Program--there was no evidence of a long-term (12-month) post-program effect.)
 16. Visser, 2007 Visser M. (2007). HIV/AIDS prevention through peer education and support in secondary schools in South Africa, *SAHARA-J: Journal of Social Aspects of HIV/AIDS*,4:3, 678-694, DOI: 10.1080/17290376.2007.9724891
 17. Grunseit A, Kippax S, et al., (1997). Sexuality Education and Young People's Sexual Behavior: A Review of Studies. *Journal of Adolescent Research*, Volume 12, Issue 4. <https://doi.org/10.1177/0743554897124002>; Kirby DB, Laris BA, Rollieri LA.(2007). Sex and HIV education programs: their impact on sexual behaviors of young people throughout the world. *J Adolesc Health Off Publ Soc Adolesc Med*, 40(3):206–217. doi:10.1016/j.jadohealth.2006.11.143; Underhill K, Operario D, Montgomery P. (2007). Systematic review of abstinence-plus HIV prevention programs in high income countries. *PLoS Med*, 4(9):e275. doi:10.1371/journal.pmed.0040275
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 21. Marseille E, et al. (2018) Effectiveness of school-based teen pregnancy prevention programs in the USA: a systematic review and meta-analysis, *Prevention Science*, 19(4):468–489.
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 24. Forrester e, Manzer J, Chesnut K, Knab J, et al. (2023). Updated Findings from the HHS Teen Pregnancy Prevention Evidence Review: October 2016-May 2022. U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation, April 2023. <https://tpp.evidencereview.youth.gov/>