

randomized trials (CONSORT 2010⁴), observational studies (STROBE), and qualitative research (SRQR⁵). In recent years, guideline extensions have been developed to emphasize important aspects of interventions (TIDieR⁶). A checklist and explanatory document typically describe the guideline's components and characteristics. Guidelines assist authors in thoroughly documenting their studies in peer-reviewed literature, thus improving other researcher's ability to replicate studies and interpret findings.

Several reporting guidelines apply to the adolescent pregnancy prevention replication studies, three of which, and two extensions, being geared toward rigorous evaluation studies and interventions. These guidelines include (1) CONSORT (Consolidated Standards of Reporting Trials), which was revised in 2010 to offer guidance about reporting parallel group randomized trials⁴; (1a) an extension

to CONSORT for social and psychological interventions (SPI), which is specifically relevant to public health; (1b) TIDieR (Template for Intervention Description and Replication) an extension to CONSORT used for reporting interventions⁶; (2) TREND (Transparent Reporting of Evaluations with Nonrandomized Designs), which is used for reporting non-randomized designs⁷; and (3) STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) which is used for reporting on observational studies in epidemiology.

REPLICATION AHEAD

Initiatives supporting adolescent pregnancy prevention are moving the field forward in productive ways. However, an emphasis on replication that embraces the various types and purposes of replication research

will benefit both the science and practice of adolescent pregnancy prevention, as well as strengthen our ability to apply social and behavioral sciences to public health problems.

Embracing replication research is not without challenges. The development of the knowledge and intervention base for adolescent pregnancy prevention will require considerable resources, collective effort, and a systematic approach to replication that addresses the multiple goals and strategies for building the evidence. *AJPH*

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REFERENCES

1. Valentine JC, Biglan A, Boruch RF, et al. Replication in prevention

science. *Prev Sci.* 2011;12(2):103–117.

2. Gottfredson DC, Cook TD, Gardner FE, et al. Standards of evidence for efficacy, effectiveness, and scale-up research in prevention science: next generation. *Prev Sci.* 2015;16(7):893–926.

3. Simera I, Moher D, Hirst A, Hoey J, Schulz KF, Altman D. Transparent and accurate reporting increases reliability, utility, and impact of your research: reporting guidelines and the EQUATOR network. *BMC Med.* 2010;8(1):24.

4. Schulz KF, Altman DG, Moher D. CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMJ.* 2010;340:c332.

5. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med.* 2014;89(9):1245–1251.

6. Hoffmann TC, Glasziou PP, Boutron I, et al. Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ.* 2014;348:g1687.

7. Vlahov D. Transparent reporting of evaluations with nonrandomized designs (TREND). *J Urban Health.* 2004;81(2):163–164.

The Promise of Technology to Advance Rigorous Evaluation of Adolescent Pregnancy Prevention Programs in American Indian and Alaska Native Tribal Communities

Despite high levels of adolescent childbearing and sexual risk taking among American Indian and Alaska Native (AI/AN) youths,¹ to date, no adolescent pregnancy prevention programs adapted or developed for AI/AN youths have been identified by federal review systems as effective. The lack of evidence-based interventions (EBIs) for this

population may arise from the challenges of implementing rigorous evaluation designs within tribal communities. Advances in technology hold promise to offset these challenges by providing engaging and culturally appropriate adolescent pregnancy prevention programs with high fidelity, while also easing some of the burdens associated with conducting

rigorous research in low-resourced settings.

Challenges to conducting rigorous research with tribes are numerous. Vast geographic distances between small diverse tribes and poorly maintained roads connecting communities within tribes impede timely recruitment and consistency in program participation. Varying tribal review and approval processes and timelines can pose delays.² Pervasive community poverty is often coupled with financially fragile community

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partner organizations; this fragility may result in temporary closures, youth attrition, personnel turnover, or compromised intervention fidelity. Furthermore, fiscal regulations may not easily accommodate the fluid field conditions extant on remote tribal sites.³

Evaluating program effectiveness where youths live, however, is critical to establishing relevance, feasibility, and sustainability. This call for in situ evaluation of promising, culturally appropriate adolescent pregnancy prevention interventions is not just academic. Building evidence for adolescent pregnancy prevention programming with tribal communities is necessary to improve services for AI/AN youths. Moreover, program or service provision grants—the lifeblood of many AI/AN organizations—frequently favor implementation of EBIs; however, EBIs have often been evaluated in settings and with populations that are quite distinct from tribal communities. While the OAH Teen Pregnancy Prevention (TPP) Tier 2 funding award—supporting the project from which we draw examples here—included time and resources for adaptation, such conditions are rare in grants. Absent committed resources to support local adaptation, tribal organizations struggle to achieve the fidelity, reach, and effectiveness witnessed in the original evaluation, and all too often experience weak outcomes and poor program sustainability.

TECHNOLOGY AND RESEARCH WITH TRIBES

Technology in intervention research can take many forms, including social media

recruitment, online intervention delivery, video-sharing Web sites, and mobile health applications. Successful technology-based components require prior and ongoing community engagement during development and implementation. Through strong partnerships, technology may assist in recruitment, retention, fidelity, and ultimately, sustainability.

Recruitment through the Internet or social media, either independently or in concert with community partners, may greatly expand the number of participants. Inviting AI/AN parents through social media advertisements to consider their children's participation in research potentially extends targeted reach and provides opportunity to review the materials at their convenience. In AI/AN communities, such convenience is a key advantage because many parents face time or transportation obstacles to travel to recruitment sites. For older adolescents not requiring parental consent, social media recruitment may be particularly effective, catering to adolescents' communication preferences. Finally, technology-based recruitment methods provide multiple platforms (e-mail, discussion boards, text) for participants to ask salient and sensitive questions about the research, thereby enhancing the informed consent process.

In-person instruction certainly offers great benefits to intervention delivery, particularly for sensitive topics. However, online interventions can provide developmentally and culturally tailored skills-building content to populations who otherwise may not have access to such material. Furthermore, a single intervention can be programmed so that tribal-specific content is tailored to particular communities (e.g., Northern Plains or

Southwest teachings) or to specific types of individuals within those communities (e.g., girls or boys). Such responsiveness to cultural sensitivities will also likely increase tribes' willingness to participate in research, though they may require time to observe the potential benefits. For example, in our recently completed work, tribal communities were highly receptive to an online intervention, but requested an additional in-person component, which we created with their input. At the end of the project, tribes suggested a family oriented online version of the program would be well received in their communities. Indeed, online interventions could target parents, guardians, or others involved in conversations regarding sex and childbearing, providing prompts for culturally age-appropriate conversations. Such an approach will likely resonate with family centric ideals of many tribal cultures.

Online intervention delivery also ensures that youths receive high fidelity, engaging content at asynchronous times. In addition, for class-based administration, youths who do not attend programs or schools regularly can make up the lessons at a later time without loss of quality. For example, in our hybrid online and in-person intervention, youths engaged with an average of six out of seven online intervention sessions and only 3.5 out of seven live-group sessions. Delivery of online content, of course, was not without challenges, including browser incompatibility, limited bandwidth, and power outages. Resources from the TPP Tier 2 grant, however, allowed us to provide support to address these challenges. In summary, within the context of large distances and limited household or community infrastructure to provide

transportation, such flexibility in high-fidelity implementation may assist greatly in engagement and retention of participants—particularly for adolescents.

THE TECHNOLOGY DIVIDE—WHERE IS IT NOW?

Technology in adolescent pregnancy prevention research is not new. However, with few exceptions,^{4,5} technology-based adolescent pregnancy prevention research in tribal communities has not kept pace with adolescent pregnancy prevention research among other populations. The “technology divide” that disadvantages some people because of economic constraints or lack of infrastructure still affects AI/AN communities, which may hamper technology-involved research. Slow uptake may also be the result of community leadership preference for in-person interventions or researchers' concerns around cultural incompatibility. However, our experience with tribal communities indicates openness to technology, especially for youths. This openness reflects recent statistics on technology use: compared with other racial groups, AI/ANs were the least likely to indicate a lack of interest or a need to go online at home, and the most likely to report having a home computer. Though infrastructure shortcomings and cost remain concrete barriers—especially with respect to broadband Internet service—AI/ANs have the highest rate of mobile broadband use among minority groups.⁶ This may be particularly true for AI/AN youths. In the Pacific Northwest, for example, AI/AN youths aged 13 to 21 years reported levels of technology use

similar to those in the general population, with 75% using the Internet and 78% using a cell phone at least daily or weekly.⁷ And, as with the rest of the country, AI/AN Internet use will only expand. Anecdotally from our work, many tribal members attest to the pervasiveness of social media for connecting people and families within and across tribes, particularly among tribal youths.

TECHNOLOGY IS NOT A PANACEA

Technology, of course, does not solve every challenge commensurate with conducting rigorous adolescent pregnancy prevention research within tribal communities. Aside from issues of hardware, connectivity, data plans, and the fast pace of industry change, technology cannot

replace community engagement and meaningful participation in the research process, or the trust and rapport such partnership builds. Technology cannot replace the value of cultural connectedness among family, kin, and community that makes AI/AN tribal communities unique, vital, and resilient. However, when used judiciously and in the context of strong research partnerships, technology can complement the community and cultural life of AI/AN adolescents, provide adolescent pregnancy prevention information and skills-building they may otherwise not receive, and facilitate youth and family participation in rigorous evaluation research to generate evidence for interventions relevant to their communities. *AJPH*

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Exploring Alternative Outcome Measures to Improve Pregnancy Prevention Programming in Younger Adolescents

Adolescent pregnancy prevention efforts have shifted over time to include middle school youths as a way to educate young people before they become sexually active. Unfortunately, the field draws on the same individual-level sexual behavior outcomes that are used for high school populations, such as sexual initiation or recent vaginal intercourse without condoms or birth control, to evaluate adolescent pregnancy prevention programs in younger adolescents, and this often results in prevalence rates that are

too low to adequately assess a program's effectiveness.

LITTLE ROOM FOR IMPROVEMENT

From a statistical viewpoint, inadequate power to detect the effects is not the primary issue, because the variance of a binomial distribution is minimized at the lower end of the distribution. Rather, the problem is one of having very little room for improvement: Consider an outcome such as unprotected vaginal sex in the past three

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REFERENCES

- de Ravello L, Everett Jones S, Tulloch S, Taylor M, Doshi S. Substance use and sexual risk behaviors among American Indian and Alaska Native high school students. *J Sch Health*. 2014;84(1):25–32.
- Jernigan VB, Jacob T, The Tribal Community Research Team, Styne D. The adaptation and implementation of a community-based participatory research curriculum to build tribal research capacity. *Am J Public Health*. 2015;105(suppl 3):S424–S432.

3. Kaufman CE, Black K, Keane EM, et al. Planning for a group-randomized trial with American Indian youth. *J Adolesc Health*. 2014;54(suppl 3):S59–S63.

4. Markham CM, Rushing SC, Jessen C, et al. Factors associated with early sexual experience among American Indian and Alaska Native youth. *J Adolesc Health*. 2015;57(3):334–341.

5. Kaufman CE, Litchfield A, Schupman E, Mitchell CM. Circle of Life HIV/AIDS-prevention intervention for American Indian and Alaska Native Youth. *Am Indian Alsk Native Ment Health Res*. 2012;19(1):140–153.

6. National Telecommunication and Information Administration. Exploring the digital nation: embracing the mobile Internet. 2014. Available at: https://www.ntia.doc.gov/files/ntia/publications/exploring_the_digital_nation_embracing_the_mobile_internet_10162014.pdf. Accessed February 3, 2016.

7. Rushing SC, Stephens D. Use of media technologies by Native American teens and young adults in the Pacific Northwest: exploring their utility for designing culturally appropriate technology-based health interventions. *J Prim Prev*. 2011;32(3–4):135–145.

a reduction to zero percent is unrealistic) in the intervention arm, which corresponds to a small Cohen's *d* effect size of 0.20. Consequently, the size of the intervention's potential effect is constrained to be small, solely because of the low prevalence outcomes, given the age of the sample. Perhaps more importantly, these sexual behavior outcomes may be less salient to younger adolescents' current experiences, thus missing opportunities to shape programs and evaluate their effectiveness using factors and behaviors that are more relevant to the adolescents' current stage of sexual development.

months. If the prevalence rate in the control arm is four percent by the time students complete middle school, as it was in the Office of Adolescent Health-funded replication study of *It's Your Game* in South Carolina,¹ the biggest impact the program can hope to achieve is a reduction to one percent (assuming

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1. Kirsten J. Black, Bradley Morse, Nicole Tuitt, CeCe Big Crow, Carly Shangreau, Carol E. Kaufman. 2018. Beyond Content: Cultural Perspectives on Using the Internet to Deliver a Sexual Health Intervention to American Indian Youth. *The Journal of Primary Prevention* **39**:1, 59-70. [[Crossref](#)]
2. Amy Feldman Farb, Amy L. Margolis. 2016. The Teen Pregnancy Prevention Program (2010-2015): Synthesis of Impact Findings. *American Journal of Public Health* **106**:S1, S9-S15. [[Citation](#)] [[Full Text](#)] [[PDF](#)] [[PDF Plus](#)] [[Supplemental Material](#)]
3. Christine M Markham, Stephanie Craig Rushing, Cornelia Jessen, Gwenda Gorman, Jennifer Torres, William E Lambert, Alexander V Prokhorov, Leslie Miller, Kelly Allums-Featherston, Robert C Addy, Melissa F Peskin, Ross Shegog. 2016. Internet-Based Delivery of Evidence-Based Health Promotion Programs Among American Indian and Alaska Native Youth: A Case Study. *JMIR Research Protocols* **5**:4, e225. [[Crossref](#)]