Prevention Science (2020) 21 (Suppl 1):S65–S73
https://doi.org/10.1007/s11121-018-0916-3

Multilevel and Community-Level Interventions with Native Americans: Challenges and Opportunities

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Published online: 2 June 2018

Abstract
Multilevel and community-level interventions that target the social determinants of health and ultimately health disparities are seldom conducted in Native American communities. To contextualize the importance of multilevel and community-level interventions, major contributors to and causes of health disparities in Native communities are highlighted. Among the many documented socioeconomic factors influencing health are poverty, low educational attainment, and lack of insurance. Well-recognized health disparities include obesity, diabetes, and hypertension. Selected challenges of implementing community-level and multilevel interventions in Native communities are summarized such as the shortage of high-quality population health data and validated measurement tools. To address the lack of multilevel and community-level interventions, the National Institutes of Health created the Intervention Research to Improve Native American Health (IRINAH) program which solicits proposals that develop, adapt, and test strategies to address these challenges and create interventions appropriate for Native populations. A discussion of the strategies that four of the IRINAH grantees are implementing underscores the importance of community-based participatory policy work, the development of new partnerships, and reconnection with cultural traditions. Based on the work of the nearly 20 IRINAH grantees, ameliorating the complex social determinants of health disparities among Native people will require (1) support for community-level and multilevel interventions that examine contemporary and historical factors that shape current conditions; (2) sustainability plans; (3) forefronting the most challenging issues; (4) financial resources and time to collaborate with tribal leaders; and (5) a solid evidence base.

Keywords Multilevel, community-level interventions · Indigenous · Native American · Health disparities · Community-based participatory research

Community-based interventions aim to work in partnership with communities to address priorities (Trickett 2009). Often these interventions are guided by a socioecological framework to understand and address various levels of influence, such as individual, community, or policy levels, to promote health (McLeroy et al. 1988). For example, an intervention focused solely on an individual-level might be a health education workshop to promote disease management among diabetic patients. A community-level intervention might implement menu labels and reduced pricing to encourage healthy eating. Smoking bans are an especially successful example of policy-level interventions, leading to significant reductions in cigarette use.

Multilevel interventions are defined as interventions that use multiple approaches to intervene on multiple levels of the socioecological framework, typically at least two or more levels, simultaneously (Charns et al. 2012). These types of interventions employ multiple approaches to address the various levels of influence contributing to a problem, ideally creating environments conducive to sustaining individual behavior change. Thus, multilevel interventions are thought to hold the greatest promise of improving health (Trickett 2009).

Both community-level and multilevel interventions are relatively rare in Native American communities, despite

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significant and pervasive health disparities affecting Native populations. The life expectancy for Natives is 4 years lower than that of the overall US population; mortality rates among Natives are nearly 50% greater than mortality rates for whites and, while rates appear to be declining among whites, they are increasing among Natives (Espey et al. 2014).

Nevertheless, most interventions implemented within Native communities have been focused largely on the individual level of the socioecological model, with few developed and implemented at community or policy levels, and fewer still that would be considered multilevel. Reasons for this vary but include challenges in recruitment and retention, a lack of linguistically and culturally appropriate intervention approaches, and gaps in knowledge with regard to appropriate intervention dose, reach, and fidelity at multiple implementation levels (U.S. Department of Health and Human Services, National Institutes of Health 2015).

Recent research has attempted to address the challenges of developing multilevel interventions by arguing for more "context-sensitive" perspectives in complex interventions (Trickett et al. 2011). Trickett et al. (2011) argue that too much emphasis has been placed on treating the knowledge of the host community as secondary to the development of the intervention, with a narrow focus on evaluating individual health metrics to determine an intervention's success. Trickett and colleagues suggest a new scientific paradigm that conceptualizes interventions as system events—complex interactions between the socioecological levels—used to develop and build upon local capacity. Such an approach underscores the structural and policy factors affecting community life and is, therefore, more likely to lead to sustainable, community-level impact.

The partners of Intervention Research to Improve Native American Health (IRINAH) are developing, adapting, and testing strategies to address these challenges and create "context-sensitive" interventions with Native populations. The IRINAH studies vary greatly in terms of their partnering communities, scope, and breadth. However, all of the studies are driven by the understanding that the health disparities plaguing Natives are deeply rooted in the social determinants of health, and only by developing context-specific interventions designed for implementation within each unique community can the causes and ultimate consequences of these disparities be eliminated.

The purpose of this paper is threefold. First, the etiology of health disparities in Native communities with a focus on the intersection of factors in the socioecological framework is summarized. Secondly, challenges of implementing community-level and multilevel interventions in Native communities are identified, and the strategies that partners of IRINAH are employing to address these challenges are discussed. Lastly, conclusions and recommendations are presented to inform future research and practice. Notably, while not all of the IRINAH interventions presented are directed at multiple levels, the intervention settings and levels described serve to address key gaps in knowledge regarding intervention science with Native populations.

Etiology of Health Disparities Among Native Americans: an Intersection of Factors in the Socioecological Framework

The risk factors that contribute to Native health disparities are rooted in the social determinants of health. These factors are more widespread among Native people and in some cases more severe, than those experienced by other groups. According to the most recent data, 28.3% of Natives live in poverty, nearly twice the national rate of 15.5%, and the highest of any racial or ethnic group; the median Native household income is $37,227, compared to $53,657 for the nation as a whole; 23.1% of Natives lack health insurance coverage, compared to the national average of 11.7%; and the percentage of Natives who drop out of school is 11%, compared to 5% of non-Hispanic Whites (U.S. Census Bureau 2015).

The historical experiences of Native Americans—epidemic disease, removal and restriction to reservations, and forced assimilation and urbanization—have shaped the contemporary health disparities of these populations (Indian Affairs Laws and Treaties 1953). As an example, the removal and restriction of Natives to reservations resulted in their reliance on the Food Distribution Program on Indian Reservations instituted by the U.S. Department of Agriculture (U.S. Department of Agriculture 2012). This monthly program provides canned and packaged surplus foods, most of which are high in sugar and fat. It has been associated with the significant prevalence of obesity, diabetes, and hypertension among Natives (Dillinger et al. 1999). Although this program has seen modest improvements in recent years, generations of Natives have consumed these foods, and still do, as a primary food source, lacking the money to purchase healthier options or the access to stores that sell healthy foods. The health consequences are obvious, severe, and well documented (Blue Bird Jernigan et al. 2017a).

Moreover, the full extent to which the legacy of institutionalized racism has damaged, and continues to damage, the physical and mental health of Native communities has only recently started to be fully examined (Blue Bird Jernigan et al. 2015; Brockie et al. 2013). Meanwhile, the systematic underfunding of the Indian Health Service, as well as the cultural disconnection between the US healthcare delivery system and indigenous norms and values, undermine the potential success and sustainability of community-based interventions (Warne and Frizzell 2014).

Challenges to Implementing Community-Level and Multilevel Interventions in Native Communities

One fundamental challenge to the development of community-level and multilevel interventions with Native populations is the lack of high-quality Native population health data. Because Native populations are small, they are rarely represented in national epidemiological surveys. This omission hinders both intervention science and the ability of Native community leaders to inform evidence-based health policy.

Intervention science with Native communities has also been limited by the absence of validated measures. Indeed, community-level measures that utilize appropriate Indigenous theories to guide measurement development and consider the unique cultural and socioecological contexts of tribal settings are so lacking that they are virtually nonexistent. As an example, little is known about the role of social and environmental influences on obesity among Native people. Theoretical models of food systems and food environments have not been applied in the context of sovereign tribal nations. As a result, both the meaning and extent of the consumption of traditional foods, as well as the influence of tribal policies and programs on food access and quality, remain poorly understood (Jernigan et al. 2010).

Another major gap in knowledge is an understanding of tribal policies and policy-making processes necessary for the development of multilevel policy interventions. Databases that track health-related legislation, such as NetScan's Health Policy Tracking Service, track federal and state policies but do not track the policies of the more than 550 sovereign Native Nations. Much of the evidence base for multilevel policy interventions derives from studies implemented by state and local governments; few or none of these studies have been modified, implemented, and evaluated in sovereign Nation settings. Researchers and health planners are simply unfamiliar with tribal policies, do not know where to start in developing multilevel, policy-focused interventions with Native partners, and often do not have access to government or economic leadership within sovereign Nations to address the multiple influences of health. These factors have stalled multilevel intervention science in Native communities and further exacerbated disparities. For example, as statewide policies such as smoking bans take effect and improve population health in non-tribal settings, Native health disparities will worsen unless similar progress is made in Native Nations (Woolf and Braveman 2011).

Finally, it is important to note that evaluating interventions using rigorous randomized control trial methods in Native communities may not always be feasible or the best approach due to the often high levels of need for healthcare and other services within these communities. Further, centuries of racism under the guise of "medical research" have resulted in mistrust of any kind of research in many Native communities (Davis and Keemer 2002). It is, therefore, crucial to build time into projects to work closely with the community so that the intervention is culturally centered, a community priority, and perceived by community members to hold real value and promise for improving Native health.

Innovative Strategies Employed by IRINAH Partners

IRINAH is addressing the challenges of implementing community-level and multilevel interventions in Native communities in two primary ways: through collaboration as a network and research studies conducted by individual network members. As a network, investigators and community partners engage in telephone and in-person meetings to share data collection tools and best practices. Also, IRINAH studies collectively administer a standard set of measures previously unexamined among Natives, including assessments of wealth, housing, and other key social determinants. These collaborative efforts are generating validated measures and population health data that are urgently needed. Individually, IRINAH studies employ innovative methods to develop culturally centered and contextually appropriate interventions. Selected studies are summarized in the following paragraphs. In keeping with recent guidelines suggested by the National Institutes of Health, for each case example presented, a description is provided of its taxonomy regarding the levels affected (e.g., individuals, organizations, community, policy) and populations addressed.

The MICUNAY Intervention Study

Motivational Interviewing and Culture for Urban Native American Youth (MICUNAY) is a randomized controlled trial of a community-level intervention. MICUNAY works with Native youth in underserved and understudied urban communities in northern, central, and southern California to prevent alcohol and drug use. Participating youth are primarily the children and grandchildren of Natives who were moved to urban areas under federal relocation and termination policies in order to be assimilated into mainstream society (Indian Affairs Laws and Treaties 1953). These youth experience high rates of substance and alcohol use and have cited the lack of traditional and culturally centered treatments as a barrier to seeking care (Brown et al. 2016; Rutman et al. 2008).

Co-led by an Alaska Native researcher and guided by a community participatory orientation, MICUNAY responds to the requests of urban Native youth for opportunities to learn about traditional healing practices (Dickerson et al. 2016). The goal of the study is to improve overall physical, social,

emotional, and functional well-being among urban Native youth. The study does this by integrating traditional practices, which foster spiritual, cultural, and community connection, with motivational interviewing, a Western, clinical approach that facilitates and engages intrinsic motivation within the youth to change behavior (Brown et al. 2016). Many urban Native youth might not fully identify with their Native heritage because they are of mixed ethnicity (Brown et al. 2016). Therefore, MICUNAY was designed with the help of elders, providers, youth, and parents in these communities to create a non-judgmental environment for youth to learn about culture and traditional practices.

Over the first year of the project, the investigators worked closely with two Native urban communities to obtain a better understanding of the needs of these communities and the best ways to address those needs. Several focus groups were conducted with providers, parents, and adolescents to discuss issues of identity, challenges in living in an urban environment, and risk behaviors, such as alcohol and drug use (Dickerson et al. 2016). The project also worked with an Elder and adolescent advisory board in each community to help with the development of the intervention protocol and recruitment materials and hire highly regarded community members. A Native artist developed the project logo and vetted all logo ideas with the communities. The extensive collaboration with these communities led to the successful recruitment of adolescents to participate in the program and high retention rates.

Intervening at a community level, MICUNAY offers a monthly community wellness gathering for all participating youth at each study site, with a focus on traditional culture and living a healthy life. Half of the youth are randomized to attend three group workshops that address cultural practices, including beading, prayer, and Native cooking. Also, there is an interactive discussion utilizing motivational interviewing focused on how to make healthy choices around alcohol and drug use. The workshops are tailored to the level of each participant's experience and cultural background so that all will feel welcome. A total of 185 adolescents were recruited and randomized to the intervention or control condition. Intervention participants receive the community wellness gathering plus the three workshops; control participants receive only the community wellness gathering. After control participants complete a 6-month follow-up survey, they are also offered the opportunity to participate in the three workshops. Study outcomes will identify ways in which integrating evidence-based practices with traditional healing can help to eliminate disparities in Native peoples.

The THRIVE Study

Another IRINAH study addresses the lack of validated measures, as well as limited knowledge regarding tribal policies and the policymaking processes, by intervening at the levels of environment and policy to increase access to healthy foods, including fresh vegetables and fruits, in rural tribal Nations. The Tribal Health and Resilience in Vulnerable Environments (THRIVE) study is a randomized control trial implementing "healthy makeovers" in eight tribally owned and operated convenience stores (four control and four intervention stores) across the Chickasaw and Choctaw Nations of Oklahoma (Blue Bird Jernigan et al. 2017b; Jernigan et al. 2016).

Led by a Choctaw citizen who is a community participatory researcher, the study partnership formed in 2010 with the goal to improve tribal food environments through policy. The initial year focused on partnership development and the forging of relationships between academic and tribal health planners, as well as commerce leaders from both tribes who, before this study, had not worked with tribal health planners let alone university health researchers.

Using a Health Impact Assessment planning framework (Lock 2000), and guided by a participatory research orientation, the partnership looked for areas of mutual interest and overlapping agendas across the commerce, health, and tribal government sectors within both Nations. Through this process, partners discovered, for instance, that while commerce leadership was not specifically tasked with improving health, they were interested in offering a new variety of fresh foods that might boost sales and expand upon their "quick and go" options. They were also interested in potential marketing and pricing data collected as part of the study. Similarly, tribal government leaders were not as concerned as health leaders anticipated about loss in revenue during the course of this study and, instead, appreciated the opportunity the study afforded to send the message to tribal citizens that leadership cared for their health. Tribal government leaders were also interested in determining if revenue would be lost should healthier foods not sell and, further, if that revenue might be offset by savings in tribal healthcare.

After extensive community input and with guidance from the commerce and tribal government leadership, the THRIVE study adapted and implemented the following healthy retail strategies: (1) increased availability and convenience of healthy foods, (2) reduced pricing for healthy foods, and (3) the promotion and marketing of these foods within the tribal stores. Both Chickasaw and Choctaw Nations agreed to make physical changes to the store layouts, adding large open-air coolers, increasing shelf space devoted to healthy choices, and installing promotional signage throughout the intervention stores. Both tribal Nations also agreed to increase the availability and variety of healthy foods, including fresh vegetables and fruits, and to offer these foods at competitive prices.

The intervention and its trial, now underway, will be implemented for 9 months in one of the Nations and 12 months in the other Nation. Primary outcomes include changes in fruit

and vegetable availability (store level) and purchasing and consumption (individual level) among a cohort of 1620 Natives residing within the control and intervention communities before and after the interventions. Tribal commerce leaders are providing weekly sales data on all products in participating stores so that the researchers can assess potential increases or reductions in the sale of healthy foods and less healthy options. Once the interventions are completed, the study efficacy and costs will be incorporated into policy recommendations for tribal leadership review, providing tribal leadership with scientific data to inform the scale-up of the interventions should they wish to implement them as tribal policy.

The THRIVE study has already provided the first data on the association between food insecurity and chronic disease in rural tribal Nations (Blue Bird Jernigan et al. 2017b). In addition, the study has developed or adapted several measures to assess tribal food environments, which were previously nonexistent, including an adapted Nutrition Environment Measures Survey to assess the impact of changes to the food environment in these rural tribal settings (Wetherill et al. 2016) as well as a scale to assess food choice considerations among Natives within these communities (Wetherill et al. 2018).

Though the study's effect on the primary outcomes of vegetable and fruit purchasing and intake is still unknown, both Nations agree that study processes and findings will inform them in integrating more solid health impact data as a foundation for evidence-based policy formulation and the design and implementation of policy and environmental interventions to address obesity among tribal citizens. Indeed, one initial and unanticipated policy change that has already occurred has been the expansion of healthy choices available by the supply companies that provide the foods for all of the stores and businesses of both Nations. Wishing to avoid the loss of a significant contract with these large tribal Nations, the suppliers responded to the requests of both Nations to expand their offerings in the stores to meet the nutritional needs set forth by the study. This resulted in expanded choices across all divisions in both Nations whenever food is ordered for any tribal needs. Further, the full engagement of tribal commerce and government leaders to participate in and ultimately guide a health intervention study is broadly considered by both Nations a significant change to the organizational policies and practices that were in place prior to the study.

TCU-BeWell

The Tribal Colleges and Universities Behavior Wellness Study ("TCU-BeWell") offers a culturally and contextually specific alcohol intervention for Native students attending seven of the 37 Tribal Colleges and Universities (TCUs), which are located on or near Native reservations across the USA. Adhering to a community-based participatory research orientation, TCU-BeWell aims to improve academic achievement through reducing alcohol use disorders for a nationally representative sample of 1200 Native students by adapting the highly successful Brief Alcohol Screening and Intervention for College Students (BASICS) for use in TCUs (Dimeff 1999). The study also tests a college-level intervention for policy and systems change that entails instituting a harm reduction policy in place of a zero-tolerance alcohol policy as well as integrating behavioral health resources for the benefit of high-risk TCU students.

Although the BASICS program has proven efficacious for preventing college drinking in more than 30 randomized controlled trials (Cronce and Larimer 2011), it still required extensive cultural tailoring for use in TCUs. Through partnership meetings at individual colleges as well as national American Indian Higher Education Consortium events, the collaborative research team conducted key informant meetings and focus groups with Presidents, counseling staff, faculty, and students. This intensive engagement process led to several core aspects of the intervention being modified to achieve culture-centeredness, which represents community voice, local knowledge and meaning, socio-cultural history, and cultural renewal and grounding. The revised BASICS was a representation of tribal values about alcohol consumption, a direct reflection of tribal-specific social norms and adverse consequences of drinking, and included tribal history, meanings, and culture. The research collaboration identified new theories of etiology regarding mental distress and health inequities, including land dispossession that impacts family systems, exercise, and access to traditional foods.

This study's primary hypothesis is that a culturally contextualized adaptation of BASICS will surpass a waitlist control condition in reducing hazardous or harmful drinking and alcohol-related negative consequences and improve academic outcomes, with a significantly greater effect in TCU with the policy intervention. In moving from a zero-tolerance alcohol policy to a harm-reduction policy, the TCU-BeWell intervention is working to integrate local Indian Health Service, Tribal Health Services, and Urban Indian Health Clinics—community-level healthcare systems—to ensure adequate treatment and support is available and coordinated with the TCUs. Additionally, the intervention is collecting capacity, acceptability, and feasibility data about integrating treatment and support services into the colleges for improved referral and treatment for high-risk TCU students. These aspects will test whether an environmental approach will positively impact the intervention and its outcomes. This innovative mixed methods study will have important public health impact as it standardizes and tests BASICS for high-risk Native TCU students, helps isolate and target individual and policy level variables involved in the initiation and reduction of hazardous drinking

and substance abuse, and refines and tests the methods of CBPR in TCU settings.

The FRESH Study

Another IRINAH study, the Food Resource Equity and Sustainability for Health (FRESH) study, currently in its second year, is addressing the gap in multilevel, multicomponent interventions, as well as the application of Indigenous theories, to reduce obesity and hypertension in the Osage Nation. The study is guided by the principles of Indigenous Food Sovereignty which includes the right of Indigenous peoples and Nations to define their own agricultural, labor, fishing, food, and land policies which are ecologically, socially, economically, and culturally appropriate to their unique circumstances. This also includes the right to safe, nutritious, and culturally appropriate foods as well as food-producing resources that allow Indigenous peoples, communities, and Nations to sustain themselves and their societies (Food First 2002).

The Osage Nation community health planners and university partners, guided by this Indigenous Food Sovereignty orientation, developed and are currently implementing a comprehensive food system intervention, targeting both producer and consumer subsystems, to intervene at multiple levels within the Osage Nation. This study will assess the impact of a tribally initiated community farm and gardening intervention on vegetable and fruit intake, food insecurity, obesity, and blood pressure among 250 Osage families (total $n = 500$ individuals).

In this study, the unit of randomization is the Osage Nation Head Start Program. Osage adults with children aged 3–5 that attend one of the Osage Nation Head Start Centers were contacted and invited to enroll in the study. A total of 10 Osage Nation Head Start Centers were matched by size and sociodemographic characteristics and five were randomized to receive the intervention in the spring of 2018 with the remaining five to serve as the wait-list control, receiving the intervention in the fall of 2018.

The Head Start portion of the intervention includes a 15-week cooking, gardening, and nutrition curriculum implemented 1 hour per week with Native children in the classrooms. Additionally, gardens have been planted in each of the 10 centers, and a master gardener will work each week with the intervention sites to conduct weekly gardening activities. At the end of each week, the children are provided with take-home recipes and ingredients for intervention families to prepare a family meal.

The intervention also includes a 15-week Internet-based intervention for parents, as well as four in-person "Traditional and Local Food Nights" (one per month for the semester) at the schools. The 15-week Internet-based parent curriculum includes an action-oriented food sovereignty curriculum, providing education about the Osage Nation food system, the relationship of the food system to health, and empowerment activities to facilitate and support parent involvement in their local food systems to cultivate citizen demand for healthier food. The curriculum also focuses on creating healthy household food environments, providing parents with training in nutrition, and parenting-related topics associated with nutrition, such as role modeling healthy eating, preparing healthy foods, and reducing sugar-sweetened beverages in the home. The monthly "Traditional and Local Foods Night" allows parents to taste test traditional Osage foods and well as watch a cooking demonstration of these foods. They will also be served a healthful meal that includes traditional foods as well as sample foods from the gardens. They will be able to see some of the works the children have been doing in the classrooms that relate to gardening, nutrition, and healthy eating.

At organizational and policy levels, the Osage Nation Head Starts have adopted a menu change policy whereby produce from the Head Start gardens, as well as the Osage Nation's newly developed Bird Creek Farm, will be incorporated into the Head Start menus as part of this farm-to-school intervention. The Osage Nation will source the intervention Head Start menus with local vegetables and fruits grown by the children, when available, and, for year-round produce, Osage Bird Creek Farm's hydroponic growing and hoop houses will supply the produce. These menu changes will not only support Osage Nation Head Start Programs to meet the new 2017–2018 USDA Child and Adult Care Food Program (CACFP) standards but to implement CACFP Best Practice standards (USDA Food and Nutrition Service 2017).

The overall study design intervening at multiple levels supports the Osage Nation's vision of aligning tribal agricultural policies with Osage Nation health goals, intervening at the level of the food system to address production, access, preferences, and intake of healthy foods (Blue Bird Jernigan et al. 2011; Gittelsohn and Rowan 2011; McKinnon et al. 2009). Because the intervention was developed as part of a larger initiative of the Osage Nation to address food security and food sovereignty, it is likely to be sustainable if it proves effective.

Other IRINAH Studies

Other collaborative efforts funded by IRINAH include a Residential Wood Smoke Intervention study, implemented within the household and community levels across two Native reservations, with the goal to create wood yards (community-level intervention) and promote best-burn practices (household-level intervention). Another IRINAH group

worked to develop training materials for the Be Under Your Own Influence (BUYOI) campaign to reduce substance use among Native youth across urban and rural settings. The study involved numerous focus groups with youth from diverse backgrounds, who used role models from local high schools in developing posters and slogans for participating communities. The resulting messages highlighted the importance of Native traditions and cultures: "We are History Makers and Ground Breakers," Learning from Those Who Paved the Way," "Honoring Our Ancestors." Finally, the *Qungasvik* project addresses suicide risk and alcohol use among Yup'ik youth in Alaska. By feedback from community leadership, intervention development began with an emphasis on protective factors at the individual, community, and family levels, rather than the individual level alone. Every module in the resulting intervention takes local Yup'ik processes and practices as its starting point (Rasmus et al. 2014).

Conclusions and Recommendations

All IRINAH partners are guided by a tribal and community participatory research orientation. All focus on incorporating rigorous study designs with culturally appropriate measures to achieve the shared goal of reducing or eliminating Native health disparities. Although most of the IRINAH studies are still underway, the process of developing and implementing them has already yielded important recommendations for future research and practice.

First, it is essential to continue developing multilevel intervention studies that address the complex social determinants of health disparities among Natives. These studies must examine both contemporary and historical factors that shape current conditions, and they must explore how these factors interact to make Native communities vulnerable to negative health outcomes. For example, the MICUNAY study was designed for implementation with Native youth living in urban settings, many of whom are relatives of Natives who were moved to urban areas under federal relocation and termination policies in order to be assimilated into mainstream society. This historical context, coupled with contemporary issues of poverty, isolation, and a disruption in the connection that some of the youth may have with their own cultural identity, was identified and incorporated into the final intervention strategies to create a culturally centered and context-specific intervention. Similarly, the THRIVE and FRESH studies, which intervene upon tribal food environments to promote healthy eating, incorporated measures assessing social, historical, and contextual factors related to dietary intake and food choice considerations, including connection to cultural and traditional foods and the impact of the historical relocation to reservations and subsequent dependence upon commodity foods as a driver shaping food tastes and preferences. Final study designs incorporated these social, contextual, and historical factors into the intervention strategies.

Second, multilevel interventions need to be sustainable. The sustainability of an intervention is enhanced by cultural relevance and community support, which in turn make it easier to disseminate. For example, MICUNAY was originally developed to provide six 1-h workshops, but community feedback indicated that transportation would be an issue, so the program was redesigned to provide three 2-h workshops (Dickerson et al. 2016). This modification increased participation and retention of youth while facilitating dissemination. To date, the MICUNAY workshops have been successfully disseminated in 10 different urban communities across California. Incorporating input from each community before implementation ensured that the resulting workshops were a good fit for each community and were implemented in a sustainable way. Similarly, the THRIVE study worked collaboratively with tribal leaders to understand the best ways to improve local food environments while supporting and augmenting existing individual-level programs implemented across both tribal Nations. The result was an intervention based in convenience stores that was met with widespread community support. When communities feel that they are truly heard, and researchers work with communities to develop the necessary infrastructure, the likelihood of sustaining a successful intervention after grant funding ends is substantially elevated.

Third, researchers and funding agencies must recognize that substantial financial resources and time are needed to collaborate with tribal leaders and representatives of other sectors of tribal nations, including commerce, during the development and implementation of multilevel interventions. Since all IRINAH studies are guided by the principles of community-based participatory research, all work intensively with their study communities to identify local issues and understand how to best address them. This collaborative process has fostered many productive relationships but is also incredibly time intensive and often involves the same community and academic partners, most of whom have other duties related to their appointments as faculty members or tribal health planners. In future work, therefore, it is important to ensure that enough time is taken to understand the highly specific contexts of each population or community and that timelines from the funding agencies be flexible to allow this work to happen.

Fourth, multilevel interventions must implement evidenced-based practices. For Native communities, however, no practice is truly evidenced-based unless it has been designed or adapted for application in these culturally specific settings. Indeed, the adaptation and development of measures that are appropriate for assessing multiple levels in Native communities have just begun—yet such measures are essential to the success of multilevel interventions. For example, in the THRIVE study,

recommendations for healthy food environment changes based on the Institute of Medicine and Centers for Disease Control and Prevention were used as a guide to developing the healthy retail interventions; however, these strategies merely served as a starting place for adaption and localization in these tribally owned and operated stores located within the context of these unique cultural, geographic, and politically diverse sovereign Nations' settings.

Finally, researchers and research partnerships must recognize and promote strength-based approaches for implementation in Native communities (Costa et al. 1999; Duran et al. 2005). For example, interventions that promote stable and supportive parental relationships, prosocial adult role models and peer groups, self-efficacy in social relations, bonding with school and conventional society, and cultural and spiritual involvement have all been associated with abstinence from substance use (Costa et al. 1999; Duran et al. 2005). Interventions that recognize and promote these strength-based approaches and community assets, particularly those that are culturally centered and grounded in Indigenous theories and ways of knowing, as exemplified in MICUNAY, TCU-BeWell, and the FRESH study, hold the greatest promise for effecting positive change within Native communities.

Despite centuries of adversity and discrimination, Native populations are extremely resilient. Research partnerships that honor and strengthen this resilience by building capacity, actively engaging diverse voices, working to promote true collaboration, and shoring up community resources and infrastructure will improve the chances that future interventions are successful. IRINAH partners are at the forefront of such efforts as they build on programs already underway (Blue Bird Jernigan et al. 2015). Their work underscores the value of fostering engagement among researchers, community members, tribal leaders, and policymakers in the shared goal of promoting true health and wellness among Native peoples.

Funding This Supplemental Issue of *Prevention Science* was supported through funds from the National Cancer Institute (NCI). The research projects in which the issue is based include 26 awards through PAR-11-346 and PAR-14-260, funded through the National Cancer Institute (NCI), National Heart, Lung, and Blood Institute (NHLBI), National Institute on Alcohol Abuse and Alcoholism (NIAAA), National Institute of Dental and Craniofacial Research (NIDCR), National Institute on Drug Abuse (NIDA), National Institute of Environmental Health Sciences (NIEHS), National Institute of Mental Health (NIMH), National Institute of Nursing Research (NINR), Office of Behavioral and Social Sciences Research (OBSSR), and National Institute on Minority Health and Health Disparities (NIMHD). Support for this paper included grants from NHLBI (R01HL117729, Jernigan, PI); NIMHD (R01MD011266, Jernigan, PI); and NIAAA (R01AA022066, D'Amico, PI; R01 AA022068, Duran, PI).

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The studies referenced in this article did not include animals.

Informed Consent Informed consent was obtained from all individual participants included in these studies.

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