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Redefining Immunization: Not Just a Shot in the Arm

NANCY ANDERSON¹, NANA WILSON², TAMICA MOON³, NATALIA KANEM⁴, AMAD DIOP⁵, and ERICK GBODOSSOU⁶

¹*Division of Evening and Weekend Studies, The Evergreen State College, Seattle, Washington, USA*

²*Department of Microbiology, Biochemistry and Immunology, Morehouse School of Medicine, Atlanta, Georgia, USA*

³*Department of Community Health and Preventive Medicine, Morehouse School of Medicine, Atlanta, Georgia, USA*

⁴*The Lloyd Best Institute of the West Indies, Tunapuna, Trinidad and Tobago*

⁵*Malango Traditional Healers Association, Fatick, Senegal*

⁶*PROMETRA International, Dakar, Senegal*

The persistence and periodic resurgence of vaccine-preventable diseases have raised questions about the determinants of poor immunization coverage. In Sub-Saharan Africa, traditional health practitioners (THPs) play a major role in providing health care and health education, particularly in rural areas where Western health care is unavailable. The project, Immunization Advocacy: Saving Lives of Africa's Children, funded by the Bill and Melinda Gates Foundation, was carried out in three countries, Benin, Nigeria, and Senegal, with THPs and other community-based leaders to gain insight into their basic knowledge, attitudes, and perceptions about immunization. In this article, the authors present the results from the Senegal study. In Senegal, 696 THPs involved in community culture, rites, education, and health were surveyed. THPs and community leaders were centrally involved in defining the term *immunization* during survey development, and their definition was integrated into the survey questionnaire. Results of the study in Senegal show that although knowledge about vaccination is high among THPs, their perceptions of vaccines may hinder the acceptance of vaccines in their communities. THPs define immunization as a comprehensive program of health promotion and provision that includes attention to traditional beliefs and behaviors, overall access to health care and, potentially, vaccination. Effective educational programs that involve THPs in vaccine campaigns from inception, that address their perceptions and integrate their cultural belief systems into vaccine advocacy programs in a culture-centered manner, and that recognize and respect the importance of comprehensive primary health care will be necessary to improve essential vaccine coverage in this population.

The effect of childhood vaccines on child mortality rates is undeniable. The implementation of childhood vaccines in the United States and other industrialized countries led to a rapid and large decrease in morbidity and mortality from common childhood diseases over the course of the second half of the 20th century (Keegan & Bilous, 2004). With respect to the developing world, in 1974, the World Health Organization (WHO) established its Expanded Program on Immunization (EPI) to increase childhood immunization coverage, so that developing countries could experience the same beneficial changes in mortality as in the industrialized world. The EPI has brought nine major diseases under varying degrees of control and achieved remarkable success as a universal technology promoted through globalized approaches. An estimated 12 million children were saved as a result of the broad vaccination campaign against

preventable childhood diseases undertaken in the 1980s (UNICEF, 2015). Studies of particularly at-risk populations in Sub-Saharan Africa indicate that up to 70% of under-five child deaths are avoided when children are fully immunized. Achievement of the United Nations' Millennium Development Goals for child survival highlight improved rates of immunization, along with other selective interventions (Habimana, Mwinga, Sagoe-Moses, & Ketsela, 2010). The introduction of new vaccines, to decrease the toll of pneumonia, has also been advanced as a child survival tactic (Schwarz et al., 2008).

However, rates of immunization vary among the populations that need it most. Research to explore reasons for low immunization uptake in some African countries has focused on a combination of cultural, social, economic, educational, and logistical factors (Helman & Yogeswaran, 2004). Low uptake has been associated with low-income status, large families, low educational level of mothers, social isolation, migrant status, and certain cultural beliefs (Heggenhougen & Clements, 1990). Other studies identified organizational or vaccine supply problems at immunization clinics as reasons for low uptake (Nichter, 1995; van Turenout, Vandelanotte, van den Akker, & Depoorter, 2003). Motivating mothers and other caretakers, educational programs, community participation,

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Address correspondence to Nana Wilson, Department of Microbiology, Biochemistry and Immunology, Morehouse School of Medicine, 720 Westview Drive SW, Atlanta, GA 30310, USA. E-mail: nanaotoo@gmail.com

and improving vaccine supply are the major strategies that have been recommended for increasing immunization coverage within communities (Heggenhougen & Clements, 1990). Examples of community resistance to immunization, as has happened during tetanus toxoid campaigns in Cameroon and Uganda and oral polio vaccine campaigns in Nigeria, have reignited concern over “anti-vaccination rumors” (Leach & Fairhead, 2008, p. 418). Overall, these explanations of underimmunization have focused on ignorance, misinformation, and a need to educate populations on its importance, but trusted sources of local knowledge and leadership may also affect community levels of trust, distrust, comfort or anxiety related to Western-based immunization practices (Leach & Fairhead, 2008). If immunization programs are not carried out in a manner consistent with cultural mores, traditions, and constraints, they become an easy target for religious, cultural, and reproductive health-related fears and this may result in lower coverage rates than expected.

In addition, the relatively narrow focus on vaccines, in the absence of the other social, political, and economic changes that are major influences on health status, can also be an obstacle to vaccine coverage, as well as a stark reminder that adequate vaccination coverage does not eliminate all the risks to the health of women and children. Approximately 4.4 million children born alive die before age 5 in Sub-Saharan Africa. This constitutes almost half of the global total of under-five deaths (Habimana et al., 2010). Pneumonia, malaria, diarrhea, and malnutrition remain responsible for most of the under-five child deaths (Kinney et al., 2010). In addition, broad disparities with respect to primary and specialty health care access starkly delineate the differences between attempts at universal promotion of immunizations, including potential economic incentives, and the limited availability of other kinds of biomedical health care, often beyond the economic reach of most households in Sub-Saharan Africa.

Traditional health practitioners (THPs), including traditional healers and traditional birth attendants, are ubiquitous throughout Africa where they represent the first line of care for 60–90% of the population (WHO, 2002). Although their training is not homogenous and the profession is rarely regulated, THPs outnumber biomedical health practitioners by a hundred-fold or more and are regularly consulted by a wide range of clients for numerous health conditions for which modern treatments are rarely accessible (Hoff, 1997; Homsy, King, Balaba, & Kabatesi, 2004; King & Homsy, 1997). THPs have broad and sustained community reach, remaining engaged with their clients, providing the potential for continuity that is frequently not possible with conventional community health workers (Homsy et al., 2004). Their ancestral community roots and intimate, direct experience of poverty, inequity, and disease have earned them a wide and respectful audience as well as an in-depth knowledge of the culture (Homsy et al., 2004).

Several health programs have equipped THPs with the knowledge, skills, and support to efficiently integrate biomedical information into their practice. For example, the organization Traditional and Modern Health Practitioners Together against AIDS has involved thousands of African THPs in AIDS and sexually transmitted disease prevention and care. These THPs have performed as well as, if not better than, community health workers in educating communities, promoting counseling, and in treating and referring the sick for care (Colvin, Gumede, Grimwade, Maher, & Wilkinson, 2003; Gloyd et al., 2001; Hoff, 1997; Homsy et al., 1999; King & Homsy, 1997; Wilkinson, Gcabashe, & Lurie, 1999). Similarly, traditional birth attendants have proven essential to the successful implementation of safe motherhood programs, including those focused on the prevention of mother-to-child transmission of HIV (bij de Vaate, Coleman, Manneh, & Walraven, 2002; Imogie, Agwubike, & Aluko, 2002; Maimbolwa, Yamba, Diwan, & Ransjo-Arvidson, 2003).

Strategies that involve highly motivated THPs in promotion and advocacy for immunization initiatives could increase immunization coverage and acceptance in Africa. Previous work has recognized THPs as potential partners for polio disease surveillance and potential key informants in immunization initiatives (Coates, Fitzgerald, & Newberry, 2012). However, THPs’ knowledge and perception of vaccination and its relations to health and illness, while considered in some previous research (Ghinai, Willott, Dadari, & Larson, 2013; Jegede & Owumi, 2013), must be assessed more broadly in Sub-Saharan Africa before successfully carrying out such initiatives.

In this context, the project Immunization Advocacy: Saving Lives of Africa’s Children, funded by the Bill and Melinda Gates Foundation, which focused on leveraging the voices of traditional healers and indigenous religious leaders to inform government and donor-supported immunization programs the role traditional medicine and religious leaders play in utilization of immunization program, was initiated in three countries: Benin, Nigeria, and Senegal. As part of the project, a study was carried out to learn about THPs and other community-based leaders’ knowledge, attitudes, and perceptions of immunizations, the associated infrastructures, and their overall perceptions of preventive health measures, particularly beliefs and practices that may affect infant wellbeing. This research paper focuses on the individual-based study that was carried out in Senegal.

Method

Study Area and Population

Senegal has a population of 14,086,103 inhabitants, with a density of 66.58 inhabitants/km². The population is ethnically diverse and includes the Wolof (43.3%), Hall pulaar (23.8%), Seereer (14.7%), Joola (3.7%), Malenke (3.0%), Soninke (2.1%), and the Manjak (2%) as major ethnic groups. Islam,

followed by Christianity, separately and in combination with indigenous beliefs, are the major religions. The country is divided into 14 regions. The health system is organized around the country's administrative structure. It has a national level, an intermediate level composed of 14 medical regions, and a peripheral level composed of 74 health districts covering more than 1,000 health care delivery points.

Three of these medical regions (Dakar, Diourbel, and Fatick) were chosen for survey in this study to provide settings that included urban neighborhoods (Dakar), a center of Islamic Religion (Diourbel), and Fatick, where endogenous culture and religion are very important. The study was conducted in partnership with the Association of Islamic Charities and the Malango Association of Traditional Healers, an organization recognized by the Senegal government.

The national infant mortality and under-five mortality rates are 45 and 55 per 1000 live births (Gavi, the Vaccine Alliance, 2014). The literacy rate is low (39.3%), particularly among young women, who are most commonly mothers of vaccine-age children. The country has free and obligatory vaccination for every child, infectious and parasitic diseases are dominant causes of disease and death, and vaccine coverage has been estimated at 80% for measles, 85% for polio, and 89% for DPT3 in 2013 (Gavi, 2014; WHO, 2015a). However, in the previous year (2012), the estimated coverage was 84% for measles, 89% for polio, and 92% for DPT3 (Gavi, 2014; WHO, 2015a) indicating a slight decreased in coverage in 2013. In addition, the coverage for rotavirus vaccine was 6% in 2013 (Gavi, 2014; WHO, 2015a). In 2014, the country recorded 32 cases of measles, no polio, and 101 cases of rubella (WHO, 2015b). All 76 districts in the country have microplans that include activities to raise immunization coverage (WHO, 2015a); however, 16% of the districts achieved less than 50% DPT3 coverage in 2014 (Gavi, 2014).

Questionnaire Development

This study took place between November 2009 and November 2011. The National Advisory Committees in the three participating countries coordinated the research procedures and were responsible for project implementation and identification of appropriate people to conduct subject interviews.

Focus groups, which included traditional healers and community leaders, were held using semi-structured interviews to provide insight on questionnaire development. An important element of these discussions, and essential to the questionnaire, was the understanding of immunization. In contrast with the (Western) biomedical definition of *immunization*, the traditional healers and community leaders' definition included all of the practices that support wellness and prevent illness through the support of the human ability to stay healthy and avoid disease. The focus groups defined *immunization* to be "any endogenous and/or

exogenous process which makes it possible to develop and to consolidate the immune system of the individual." In a nonexhaustive way, the participants evoked practices such as balanced diet, prevention of malnutrition, a variety of traditional beliefs, and practices during pregnancy, vertical (nonsupine) childbirth delivery, and overall respect for cultural, religious, and spiritual practices.

This definition of immunization was integrated into the questionnaires and interviews, and it allowed the study to explore ways in which traditional health-promoting practices are congruent with biomedical belief systems and ways that they differ. The following results and discussion focus on findings related to this endogenous definition, from the individual-based surveys. The term *traditional healer* used in this article refers to either herbalists, spiritualists, or traditional priests. The great majority of the traditional healers are often involved in more than one practice. In addition, some of the traditional healer also practice as traditional birth attendants. In this context, the term *traditional health practitioner* or *THP* used in this article includes traditional healers and traditional birth attendants.

Sampling

In partnership with Association of Islamic Charities and the Malango Association of Traditional Healers, we identified key informants who identified other appropriate THPs for participation in the study. A total of 696 THPs who are involved in traditional community culture, rites, education, and health in the districts of Dakar, Diourbel, and Fatick of Senegal were recruited for participation in the study.

The final interviewer-administered structured questionnaire was written in French, and carried out by local interviewers and at least one of the principal investigators in the native language of the respondents.

Funding and Ethical Considerations

The study was funded by the Bill and Melinda Gates Foundation (grant # OPP 5119) and the grantee is Promotion of Traditional Medicine (PROMETRA) International. PROMETRA International maintains an International Scientific and Legal Advisory Committee that serves as its internal institutional review board committee. The study was approved by the institutional review board committee. In addition, a project advisory board made up of representatives from Senegal Ministry of Health reviewed the scientific protocols for quality, cultural competency, and ethical standards.

Informed consent was obtained in two stages. Community-based leaders provided initial informed consent for the study to take place in their communities. Researchers also obtained individual signed consent from the study population with translation as appropriate to the participants' preferred language.

Statistical Analysis

Data entry, management, and analysis were conducted using SPSS/PASW 18.0 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics were used to describe univariate and bivariate analyses. Binary logistic regression modelling was used to determine the odds ratios for multivariate analysis after controlling for potential confounders, with 95% confidence interval. A *p* value of < .05 was considered significant for all analysis.

Results

Demographic Characteristics of the Participants

A total of 696 completed questionnaires were obtained from the THP. Table 1 details the demographic distribution of participants. THP ages ranged from 20 to 99 years, with

Table 1. Demographic Characteristics of Traditional Health Practitioners in Senegal (*N* = 696)

Variable	<i>n</i>	%
Age (years)		
<i>M</i> ± <i>SD</i>	59.8 ± 12.2	
<40	44	6.3
40–60	334	48.0
>60	314	45.1
Gender		
Female	241	34.6
Male	455	65.4
Education		
French/English school		
No formal education	574	82.5
Primary	86	12.4
Secondary	31	4.5
Koranic school	430	61.8
Religion		
Muslim	204	29.3
Animist	7	1.0
Christian and Animist	13	1.9
Muslim and Animist	472	67.8
Ethnic group		
Wolof	367	52.7
Pulaar	44	6.3
Serere	249	35.8
Other	36	5.2
Marital status		
Single	106	15.2
Married	590	84.8
Occupation		
Traditional health practitioner (primary occupation)	468	67.2
Traditional health practitioner + other*	228	32.8

*Traditional health practitioner + other refers to those whose secondary occupation is traditional health practitioner.

mean age of 59.8 ± 12.2 years (Table 1). The majority of the participants were males (65%). Eighty-two percent of the participants had no formal French or English education, but 62% had attended Koranic School. Muslim (29%) and Muslim/Animist (68%) were the dominant religions among the THPs. Of the THPs, 85% were married and 67% practiced traditional medicine as their primary livelihood.

Knowledge and Perceptions on Vaccination/Immunization and Other Health Conditions in Infancy

As regards to knowledge about vaccination, 99% of those who were surveyed stated that they were familiar with vaccination, 2.3% reported vaccinating their children or grandchildren, and about 90% of THPs acknowledged that vaccination provides protection against diseases (Table 2). Among the participants, 72% thought that infant vaccination during the first six months is acceptable. However, only 27% of THPs acknowledged participating in vaccination campaigns.

Concerns About Vaccination

Respondents recognized a number of obstacles to the successful adoption of vaccination as a form of immunization.

Table 2. Knowledge and Perceptions About Vaccination Among Traditional Health Practitioners in Senegal (*N* = 696)

Variable	<i>n</i>	%
Vaccination knowledge	688	98.9
Children/grandchildren vaccinated	16	2.3
Participation in vaccination campaign	187	26.9
Preferred vaccination methods		
Oral	564	81.0
Injection	233	33.5
Nasal	115	16.5
Vaccination period (0–6 months)		
Good time	500	71.8
Too early	196	28.2
Opinion on vaccination		
Protection	624	89.7
Long practice habits	31	4.5
Restore the value of vaccination	39	5.6
Disadvantages of vaccination		
Fever	481	69.1
Abscess	101	14.5
Swelling	50	7.2
Functional impairment	114	16.4
Barriers to vaccination		
Taboos	209	30.0
Rumors	536	77.0
Beliefs	404	58.0
Cultural factors	384	55.2
Economic factors/lack of resources	630	90.5
Unsanitary personnel	357	51.3
Untrained personnel	123	17.7
Misinformed personnel	213	30.6

These concerns can be divided into the four broad categories of practical/material and logistical constraints, concerns about potential adverse health effects, cultural considerations, and perceptions that the biomedical health care providers lack competency and have not considered the importance of community-based leaders in vaccine campaigns. About 81% of the participants preferred oral vaccination to injection (Table 2). Seventy percent of the THPs recognized that fever was a disadvantage of vaccination, while a minority of THPs also described the potential for abscess, swelling, and overall functional impairment. In addition, THPs recognized that their perceptions of vaccine use were influenced by cultural taboo (beliefs about unwise or forbidden behavior), rumors (perceptions circulating in the community about the effects of vaccination on fertility and diseases), and their underlying culture and belief systems. Economic factors, such as lack of resources and transportation to vaccine sites, were an overwhelmingly important concern about vaccination, with 90% of THPs acknowledging lack of resources as a concern. Doubts about the competency of health personnel that carry out vaccination campaigns, particularly with respect to hygiene, were a broad concern as well.

The Promotion of Advocacy for Vaccination

The study participants had clear ideas about ways to improve THP support for vaccinations. The THPs indicated that they want to be involved in the immunization advocacy or support processes (see Table 3). In addition, they emphasized that their perceptions on immunization and vaccination such as taboos, endogenous knowledge, beliefs, and economic and cultural factors should be considered when making decisions on vaccination that affect their communities. THPs suggested that there is the need for increased accessibility of vaccination points in communities. Results emphasizing the importance of THP involvement in vaccine-related interventions are confirmed in Table 4, where binary logistic regression, controlling for potential confounders such as age and gender, demonstrates that THPs who are full-time healers are most likely to believe that biomedical immunization is ineffective (OR = 3.78, 95% CI [1.62, 8.84]), and the perception of THP noninvolvement in vaccine planning and interventions was associated with the perception that vaccines are ineffective (OR = 10.57, 95% CI [2.94, 37.95]). This association was also statistically significant, unlike any associations

Table 3. Factors to Consider for Improving Immunization Coverage (N = 696)

Variable	n	%
Involvement of traditional health practitioners	678	97.4
Consider culture, beliefs, and taboos	626	89.9
Accessibility of vaccination point	615	88.4

Table 4. Logistic Regression Analyses of Factors Associated With Perception of Ineffective Vaccines Among Traditional Health Practitioners in Dakar, Senegal

Variable	Odds ratio	95% CI	p
Traditional health practitioner (primary occupation)	3.78	1.62, 8.84	.002
Female	0.48	0.24, 0.94	.036
Age	0.99	0.97, 1.03	ns
Taboos			
Traditional methods	1.28	0.61, 2.70	ns
Source of disease	0.05	0.01, 0.34	.003
Sterility	0.15	0.07, 0.32	<.0001
Rumors			
Sterility	0.31	0.13, 0.73	.008
Beliefs			
Noninvolvement of leaders	10.57	2.94, 37.95	<.0001

Note. The odds ratio and 95% confidence intervals were obtained with logistic regression in multivariate analyses adjusted for age and gender. Statistical significance was set at $p < .05$. Model I was used for the logistic regression analysis. In the logistic regression model age was treated as covariate while other variables were treated as categorical variables.

related to rumors of fertility reduction or cultural taboos (see Table 4).

Immunization Outside of the Vaccination Model

The aforementioned results are consistent with a high general fund of knowledge with respect to vaccine availability and appropriate use, as well as a recognition of potential barriers. Most THPs also indicated awareness of other kinds of knowledge, attitudes, perceptions, and practices that have immunizing effects—in other words, that reinforce the immune or health-protecting status of children—in addition to vaccines. Thus, the definition of *immunization* among the THPs encompassed many other health beliefs and practices besides vaccination. In particular, THPs indicated that adherence to traditional practices associated with childbirth, particularly vertical (nonsupine) labor and delivery, are overwhelmingly associated with subsequent health of children (Table 5). Their responses underline a belief that the inability to observe traditional practices associated with childbirth is a broad barrier to giving birth in a modern (health system-supported) site of care, even though 85% of the THPs surveyed preferred this category of birth site to other alternatives. THPs also overwhelmingly recognized a lack of financial resources as a barrier to birth in a modern delivery site.

Malnutrition: A Non-Vaccine-Preventable Disease That THPs Perceive as a Far-Reaching Threat to Maternal-Child Health

The THPs sampled were clearly aware of vaccine-preventable as well as other diseases as major threats to child health.

Table 5. Immunization Outside of Vaccines: Threats and Promotors of Child Health (*N* = 696)

Variable	<i>n</i>	%
Causes of illness and death for young children		
Malnutrition	353	50.7
Malaria	281	40.4
HIV/AIDS	35	5.0
Tuberculosis	36	5.2
Reasons for malnutrition		
Unbalanced diet	551	79.2
Not enough food	574	82.5
Poverty	602	86.5
Social conflict	398	57.2
Disaster	465	66.8
Consequences of malnutrition: Increase in morbidity and mortality for . . .		
Pregnant women	598	85.9
Nursing mothers	550	79.0
Infants	529	76.0
Precipitates spontaneous abortion	555	79.7
Specific conditions caused by malnutrition		
Kwashiorkor	88	12.6
Goiter	75	10.8
Bleeding gums	143	20.5
Rickets	201	28.9
Process of childbirth—Site and process of delivery—Impact on child health		
Preferred site: Modern	590	84.8
Preferred site: Traditional	75	10.8
Preferred site: Home	133	19.1
Protective effect of traditional (upright) versus modern (supine) delivery on child health	661	95.0
Barriers to optimal delivery in a modern delivery site		
Inability to observe traditional practices	416	59.8
Lack of resources/poverty	657	94.4

While THPs described a number of threats, including a variety of infectious diseases such as malaria, tuberculosis, and HIV, malnutrition was recognized most commonly by the THPs as a serious threat to maternal-child health and well-being (Table 5). Study participants were broadly cognizant of the consequences for pregnant women, nursing mothers, and infants, and understood the major biological and social determinants of malnutrition, including insufficient food, poverty, social conflict, and disaster. Sizable minorities also recognized some of the health conditions that result from overall caloric deficit as well as specific micronutrient deficiency.

Discussion

Many of the results presented in this study are consistent with other similar studies in that poverty, access, perceived

quality, potential side effects, and characteristics of health worker behavior are directly related to perceptions related to vaccine use (Schwarz et al., 2009; Tadessa, Deribew, & Woldie, 2009). Parental fears with respect to mild adverse effects can be alleviated through adequate and respectful education. Insufficient communication resulting from health-care workers not explaining the purpose of vaccinations to mothers may deter them from vaccinating their children (Black, 1985; Ekunwe, Taylor, Macauley, & Ayodele, 1994). Unacceptable risk as a result of errors in the immunization system from poor-quality vaccines, improper storage, and healthcare worker incompetence must be eliminated (Callreus, 2010). Trust plays an important role in the public's compliance with public health interventions such as childhood immunizations (Silverman, 2009). Where public trust is eroded, rumors can spread and lead to rejection of an intervention. This suggests that before a routine national immunization program is introduced in the country, careful consideration should be taken on how best to facilitate trust between the communities and the healthcare system in a sustainable way that does not overburden already stretched resources and personnel (Zipursky, Wiysonge, & Hussey, 2010).

In addition to these findings, the study results have some unique implications for national health ministries and other organizations hoping to increase vaccination rates. First, these results suggest that THPs can act as advocates for vaccination programs. Despite the particular concerns that primary THPs have with vaccine effectiveness, the relatively low overall immunization coverage in Senegal (World Health Organization, 2015a), and extremely low percentage of THPs who immunize their children or grandchildren, most THPs surveyed know about vaccination, believe that it has protective effects, and are comfortable with infant vaccination that starts at less than six months of age. For THPs to serve in this role, however, they expect to be involved in planning for vaccination programs and expect that their cultures and belief systems will be respected. Primary THPs, who spend most of their time as healers, are most likely to be skeptical about vaccine efficacy and should be a specific target and source for this kind of two-way education process between ministries of health, other health organizations, and communities.

Perhaps the most important study implications stem from the definition of immunization that THPs developed in creating the survey instrument. Their definition of immunization encompassed many other health promoting beliefs and practices besides vaccination. The THPs surveyed believe that these other kinds of knowledge, attitudes, perceptions, and practices are as important for the prevention of childhood disease as vaccines. This comprehensive definition of disease prevention includes nutritional support and traditional practices for pregnant women and infants. Some of these beliefs, such as the importance of a varied diet, are consistent with Western perceptions of healthy

behaviors. Parts of the belief system, including a variety of fears with respect to vaccination, are not consistent with biomedicine. A third set of beliefs (e.g., those related to optimal childbirth practices) are increasingly recognized in developed countries as healthy approaches to the birthing process. A final set of beliefs, such as adherence to taboos and other cultural practices, are not a part of Western biomedicine but are not in direct competition with biomedical beliefs and may easily coexist with them.

Overall, the comprehensive nature of the endogenous definition of immunization described in this study, whether congruent with Western biomedicine or not, is consistent with the holistic conception of health originally formalized by the WHO in 1946, when the organization defined *health* as “a state of complete physical, mental and social well-being” (WHO, 2005) dependent on a variety of factors that can either promote or obstruct the attainment of health. In comparison, the current biomedical definition of *immunization* refers to one method of preventing a certain number of contagious diseases. Current available vaccines undoubtedly have cut child death rates. Successful vaccine programs may also decrease the relation between poverty and child death and may serve as the linkage to more comprehensive services (Bawah et al., 2010; Olusanya, 2009). However, vaccines do not and cannot guarantee the health of women or children who are economically, socially, and culturally marginalized within the world economy.

The THPs understand the multiple factors responsible for poor child health in their communities, and they recognize the overwhelming importance of malnutrition and poverty as health risk factors for women and children. Their perceptions are completely congruent with public health evidence. Globally, it is estimated that undernutrition (prenatal, neonatal, and infant) accounts for 21% of under-five deaths. Half of these occur in Sub-Saharan Africa (Black et al., 2008). No vaccine or associated program can substitute for peace, political stability, equity or the food security that will ensure adequate child nutrition (Zuberi & Thomas, 2012). The obvious difference between vaccines, a partial solution to disproportionate infant death rates, and the actual comprehensive interventions needed to improve child survival will serve to increase the potential for suspicion when communities notice that timely vaccine completion does not guarantee health or even survival to a child that is malnourished, to a family with inadequate access to basic goods and resources, or to those traumatized by war. In addition, even where primary care is offered and vaccines are free, in many desperately poor countries other essential components of primary care cost money and may be unattainable, so that the primary health system falls short of what is necessary to promote and facilitate health and wellbeing. Use of personal incentives in exchange for child vaccination may also have unfortu-

nate consequences, encouraging multiple and inappropriate vaccinations (PROMETRA, 2012) as well as serving to remind parents that other equally essential services are disproportionately costly.

Limitations of the Study

This study has a number of limitations. While the study aimed to get geographic representation of Senegal, the study used convenience sampling of THP population that were identified by key informants. This may have subjected the study to selection bias. No clear sample size was determined before the study and the expectation was to include as many THPs as possible. It is possible that the study oversampled THPs with specific perceptions of immunization and vaccination. In addition, the questionnaires required multiple translations into local languages, and although native speakers carried out the survey and efforts were made for uniform translation, it is possible that the questions were not completely understood, or were misinterpreted. Also, it is possible that the Senegalese THPs' all-inclusive definition of *immunization*, as distinguished from *vaccination*, may be unique to that country, although mothers studied in Southwestern Nigeria (Jegade et al., 2013) similarly recognized vaccination as one of many ways to protect (or immunize) their infants.

Conclusion and Implications

Despite the study limitations, and although a comparative analysis must be carried out in the other study sites, these results do have policy implications. First, the quality and availability of vaccine programs can and must be improved in order to receive the support of the communities who are targeted. A number of current efforts target vaccine supply and quality, health worker training, and disposal safety (Arevshatian, et al., 2007; Habimana et al., 2010; Program for Appropriate Technology in Health, 2004; Wiysonge, Uthman, Ndumbe, & Hussey, 2012). These measures are certainly necessary, but they are not sufficient. Initiatives that recognize the importance of culture and focus on community engagement, generally described as bottom-up efforts (Arevshatian, et al., 2007; Wiysonge et al., 2012), are also essential. Medical anthropologists have stressed the importance of understanding local perceptions and ensuring that immunization programs make sense to communities in terms of their level of knowledge and their indigenous belief systems and practices (Heggenhougen & Clements, 1990; Nichter, 1995), and health communications scholars have recognized the importance of culture in developing effective health communication (Kreuter & McClure, 2004). However, sensitivity to cultural differences will continue to leave vaccine initiatives at risk of failure if health

education and communication components are unidirectional, aimed out from the biomedical healthcare system to the community. Rather, the results of this study call for a culture-centered, culturally embedded approach to health communication, as described by Dutta (2007) and Airhihenbuwa and colleagues (2014), one that recognizes the central importance of endogenous culture, that values the definition of health and prevention encompassed within the THP definition of immunization, and that uses this definition as the working description of what immunization programs should provide. THPs, who deliver the majority of front line primary care in many parts of Sub-Saharan Africa, must be directly involved in defining the conceptual framework of health, and in developing preventive health policy priorities that include but are not limited to vaccines. Governmental health institutions must accept them as primary sources of health education and as experts in communication substance and strategy. Any other approach leaves essential vaccination programs more vulnerable to misinformation and sabotage by rumor, as has already occurred in Nigeria (Ghinai et al., 2013). Last, policymakers must realize that people understand the difference between the comprehensive support needed to improve maternal-infant health in Africa and the limited tools that are currently offered. THPs' knowledge, attitudes, and perceptions in the context of this study confirm that healers can and must play a leadership role bridging the gap between the lofty goals of health for all and the existing health conditions that still limit the health and wellbeing of Africa.

References

- Antai, D. (2009). Inequitable childhood immunization uptake in Nigeria: A multilevel analysis of individual and contextual determinants. *BMC Infectious Diseases*, 9, 181–190. doi: 10.1186/1471-2334-9-181
- Arevshatian, L., Clements, C., Lwanga, S., Misore, A., Ndimbe, P., Seward, J., & Taylor, P. (2007). An evaluation of infant immunization in Africa: is a transformation in progress? *Bulletin of the World Health Organization*, 85, 449–457. doi: 10.2471/BLT.06.031526
- Airhihenbuwa, C. O., Makoni, S., Iwelunmor, J., & Munodawafa, D. (2014). Sociocultural infrastructure: Communicating identity and health in Africa. *Journal of Health Communication: International Perspectives*, 19, 1–5. doi: 10.1080/10810730.2013.868767
- Bawah, A., Phillips, J., Adjuik, M., Vaughan-Smith, M., Macleod, B., & Binka, F. (2010). The impact of immunization on the association between poverty and child survival: Evidence from Kassena-Nankana district of northern Ghana. *Scandinavian Journal of Public Health*, 38, 95–103. doi: 10.1177/1403494809352532
- bij de Vaate, A., Coleman, R., Manneh, H., & Walraven, G. (2002). Knowledge, attitudes and practices of trained traditional birth attendants in the Gambia in the prevention, recognition and management of postpartum haemorrhage. *Midwifery*, 18, 3–11. doi: <http://dx.doi.org/10.1054/midw.2001.0289>
- Black, R. E. (1985). Communication for improved health services. *Development Community Report*, 51, 1–2.
- Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., de Onis, M., Ezzati, M., Mathers, C., & Rivera, J. (2008). Maternal and child undernutrition: Global and regional exposures and health consequences. *The Lancet*, 371, 243–260. doi: 10.1016/S0140-6736(07)61690-0
- Black, R. E., Cousens, S., Johnson, H. L., Lawn, J. E., Rudan, I., Bassani, D. G., Jha, P., ... Child Health Epidemiology Reference Group of WHO and UNICEF. (2010). Global, regional, and national causes of child mortality in 2008: A systematic analysis. *The Lancet*, 375, 1969–1987. doi: 10.1016/S0140-6736(10)60549-1
- Callreus, T. (2010). Perceptions of vaccine safety in a global context. *Acta Paediatrica*, 99, 166–171. doi: 10.1111/j.1651-2227.2009.01583.x
- Coates, E. A., Fitzgerald, S., & Newberry, D. for CORE Group Polio Project (CGPP). (2012). *CORE group polio project final evaluation*. Retrieved from http://www.coregroup.org/storage/Polio_Initiative/CGPP_Reports/CGPP_Evaluation_Final.5-30-13.pdf
- Colvin, M., Gumede, L., Grimwade, K., Maher, D., & Wilkinson, D. (2003). Contribution of traditional healers to a rural tuberculosis control programme in Hlabisa, South Africa. *International Journal of Tuberculosis and Lung Disease*, 7(9 Suppl. 1), S86–S91.
- Cruikshank, S., & Grills, S. (2012, August). Immunization strategies: Eradicating meningitis in Sub-Saharan Africa. *CIGI Junior Fellows Policy Brief*, 1, 1–9.
- Dutta, M. J. (2007). Communicating about culture and health: Theorizing culture-centered and cultural sensitivity approaches. *Communication Theory*, 17, 304–328. doi:10.1111/j.1468-2885.2007.00297.x
- Ekunwe, E. O., Taylor, P., Macauley, R., & Ayodele, O. (1994). How disease prevention fails without good communication. *World Health Forum*, 15, 340–344.
- Gavi, the Vaccine Alliance. (2014). *Senegal Country Hub*. Retrieved from <http://www.gavi.org/country/senegal/>
- Ghinai, I., Willott, C., Dadari, I., & Larson, H. J. (2013). Listening to the rumors: What the northern Nigeria polio vaccine boycott can tell us ten years on. *Global Public Health*, 8, 1138–1150. doi: 10.1080/17441692.2013.859720
- Gloyd, S., Floriano, F., Seunda, M., Chadreque, M. A., Nyangezi, J. M., & Platas, A. (2001). Impact of traditional birth attendant training in Mozambique: A controlled study. *Journal of Midwifery and Women's Health*, 46, 210–216.
- Habimana, P., Mwinga, K., Sagoe-Moses, C., & Ketsela, T. (2010). Progress in implementing child survival strategy in the African region. *The African Health Monitor*, 11, 18–23. Retrieved from <http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.0040073>
- Heggenhougen, H. K., & Clements, C. I. (1990). An anthropological perspective on the acceptability of immunization services. *Scandinavian Journal of Infectious Diseases*, 79(Suppl.), S2–S31.
- Helman, C. G., & Yogeswaran, P. (2004). Perceptions of childhood immunisations in rural Transkei: A qualitative study. *South African Medical Journal*, 94, 835–838.
- Hoff, W. (1997). Traditional health practitioners as primary health care workers. *Tropical Doctor*, 27(Suppl. 1), 52–55.
- Homsy, J., Katabira, E., Kabatesi, D., Mubiru, F., Kwamya, L., Tusaba, C., ... King, R. (1999). Evaluating herbal medicine for the management of Herpes zoster in human immunodeficiency virus-infected patients in Kampala, Uganda. *Journal of Alternative and Complementary Medicine*, 5, 553–565. doi: 10.1089/acm.1999.5.553
- Homsy, J., King, R., Balaba, D., & Kabatesi, D. (2004). Traditional health practitioners are key to scaling up comprehensive care for HIV/AIDS in Sub-Saharan Africa. *AIDS*, 18, 1723–1725.
- Imogie, A. O., Agwubike, E. O., & Aluko, K. (2002). Assessing the role of traditional birth attendants (TBAs) in health care delivery in Edo State, Nigeria. *African Journal of Reproductive Health*, 6, 94–100.
- Jegede, A. S. (2007). What led to the Nigerian boycott of the Polio Vaccination Campaign? *PLoS Medicine*, 4, 417–422. doi: 10.1371/journal.pmed.0040073
- Jegede, A. S., & Owumi, B. E. (2013). Factors influencing infant immunization uptake in the Yoruba community of Southwestern Nigeria. *Journal of Community Medicine and Health Education*, 3, 215–220. doi: 10.4172/2161-0711.1000215

- Keegan, R., & Bilous, J. (2004). Current issues in global immunizations. *Seminars in Pediatric Infectious Diseases, 15*, 130–136.
- King, R., & Homsy, J. (1997). Involving traditional healers in AIDS education and counselling in Sub-Saharan Africa: A review. *AIDS, 11*(Suppl. A), S217–S225.
- Kinney, M., Kerber, K., Black, R., Cohen, B., Nkrumah, F., Coovadia, H., Nampala, P., & Lawn, J. (2010). Science in Action Saving the lives of Africa's mothers, newborns, and children working group. Sub-Saharan Africa's mothers, newborns, and children: Where and why do they die? *PLOS Medicine, 7*(6), e1000294. doi: 10.1371/journal.pmed.1000294
- Kreuter, M. W., & McClure, S. M. (2004). The role of culture in health communication. *Annual Review of Public Health, 25*, 439–455. doi: 10.1146/annurev.publhealth.25.101802.123000
- Leach, M., & Fairhead, J. (2008). Understandings of immunization: Some west African perspectives. *Bulletin of the World Health Organization, 86*(6), 418–419. doi: 10.2471/BLT.08.054726
- Maimbolwa, M. C., Yamba, B., Diwan, V., & Ransjo-Arvidson, A. B. (2003). Cultural childbirth practices and beliefs in Zambia. *Journal of Advanced Nursing, 43*, 263–274.
- Nichter, M. (1995). Vaccinations in the Third World: A consideration of community demand. *Social Science and Medicine, 41*, 617–632.
- Olusanya, B. (2009). Optimising the use of routine immunisation clinics for early childhood development in Sub-Saharan Africa. *Vaccine, 27*, 3719–3723. doi:10.1016/j.vaccine.2009.04.017
- Program for Appropriate Technology in Health. (2004). *Changing the face of immunization in West Africa*. Retrieved from http://www.path.org/vaccineresources/files/CVP_Senegal.pdf
- Promotion of Traditional Medicine (PROMETRA) International, Dakar, Senegal. (2012). Immunization advocacy: Saving lives of Africa's children. Unpublished socio-anthropological survey data.
- Schwarz, N. G., Gysels, M., Pell, C., Gabor, J., Schlie, M., Issifou, S., . . . Cherian, T. (2008). Vaccines to prevent pneumonia and improve child survival. *Bulletin of the World Health Organization, 86*, 365–372. doi: 10.2471/BLT.07.044503
- Schwarz, N. G., Gysels, M., Pell, C., Gabor, J., Shlie, M., Issifou, S., . . . Pool, R. (2009). Reasons for non-adherence to vaccination at mother and child care clinics (MCCs) in Lambaréné, Gabon. *Vaccine, 27*, 5371–5375. doi: 10.1016/j.vaccine.2009.06.100
- Silverman, R. D. (2009). Litigation, regulation, and education: Protecting the public's health through childhood immunization. *New England Journal of Medicine, 360*, 2500–2501.
- Tadesse, H., Deribew, A., & Woldie, M. (2009). Predictors of defaulting from completion of child immunization in south Ethiopia, May 2008: A case control study. *BMC Public Health, 9*, 150–155. doi: 10.1186/1471-2458-9-150
- Taylor, S. (2009). Political epidemiology: Strengthening socio-political analysis for mass immunisation: Lessons from the smallpox and polio programmes. *Global Public Health, 4*, 546–560.
- UNICEF. (2015). *Archives. Thematic overview 1980–1989 child survival and development*. Retrieved from <http://www.cf-hst.net/unicef-temp/cf-hst%20redesign/milestones%20overview%2080-89.htm>
- van Turennot, C., Vandelanotte, J., van den Akker, M., & Depoorter, A. M. (2003). A mass campaign too often? Results of a vaccination coverage survey in the Dikgale-Soekmekaar district. *South African Medical Journal, 93*, 65–68.
- Wilkinson, D., Gcabashe, L., & Lurie, M. (1999). Traditional healers as tuberculosis treatment supervisors: Precedent and potential. *International Journal of Tuberculosis and Lung Disease, 3*, 838–842.
- Wiysonge, C. S., Uthman, O. A., Ndumbe, P. M., & Hussey, G. D. (2012). Individual and contextual factors associated with low childhood immunisation coverage in Sub-Saharan Africa: A multilevel analysis *PLoS ONE, 7*(5), e37905. doi: 10.1371/journal.pone.0037905
- World Health Organization (WHO). (2002). *Traditional medicine—Growing needs and potential. WHO Policy Perspectives on Medicines*. Geneva, Switzerland: Author. Retrieved from http://whqlibdoc.who.int/hq/2002/WHO_EDM_2002.4.pdf
- World Health Organization (WHO). (2015a). *Vaccine preventable diseases: Monitoring system. 2015 global summary*. Geneva, Switzerland: Author. Retrieved from http://apps.who.int/immunization_monitoring/globalsummary/coverages?c=SEN
- World Health Organization (WHO). (2015b). *Disease surveillance and burden*. Geneva, Switzerland: Author. Retrieved from [http://apps.who.int/immunization_monitoring/globalsummary/countries?country-criteria\[country\]=SEN](http://apps.who.int/immunization_monitoring/globalsummary/countries?country-criteria[country]=SEN)
- World Health Organization Commission on the Social Determinants of Health. (2005). *Action on the social determinants of health: Learning from previous experiences*. Retrieved from http://www.who.int/social_determinants/resources/action_sd.pdf
- Zipursky, S., Wiysonge, C. S., & Hussey, G. (2010). Knowledge and attitudes towards vaccines and immunization among adolescents in South Africa. *Human Vaccines, 6*, 455–461.
- Zuberi, T., & Thomas, K. (2012). *Demographic projections, the environment and food security in Sub-Saharan Africa* (UNDP Working Paper 2012-001). Retrieved from <http://web.undp.org/africa/knowledge/WP-2012-001-zuberi-thomas-demography-environment.pdf>