

Disease Eradication as a Springboard for Broader Public Health Communication

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Abstract

In the initial stages of a public health campaign, the mass media is usually very effective in communicating with the majority of the public. Thereafter, focused and intensive engagement is required to reach the underserved, politically, and economically marginalized sectors of society: people who have little social capital, who avoid risks that could destroy the fragile security systems they possess, or those who simply do not have access to the information and services provided to the rest of society. Here is where the final battles against disease are fought. Local initiatives—those which identify the most marginalized segments of society and encourage ownership and participation through intensive interpersonal communication and modifications in service delivery—are necessary to ensure the success of large-scale public health efforts. For all major public health initiatives, the underserved or late adopters are the hardest to reach, yet because an eradication effort must achieve nearly 100% coverage, they hold the key to success or failure. Identifying these groups and understanding the segmentation required even within these minority groups represent critical elements in program design. Strategies and results from the Global Polio Eradication Initiative in India and Nigeria are discussed and applied to the design of future public health and disease eradication initiatives.

Introduction

Health communication has evolved greatly over the past fifty years. Better linkages between social and communication theory, research, and practice have yielded strong evidence for what works best in the field. When communication began to emerge as an area of study, it was guided by claims from the realms of psychology and the social sciences that the mass media could exact

immediate and powerful effects. This basic tenet of mass effect informed early health communication efforts and still persists today in many health communication programs. Along with the supposition that mass media could have a dramatic influence on public behavior, the medical establishment widely believed that people, as rational actors, would naturally embrace a behavior that would help them or their loved ones achieve a longer, healthier life.

These assumptions proved wrong. Simple yet obviously beneficial actions (e.g., wearing a safety belt when driving or putting out the cigarette forever) have yet to be universally adopted despite the near universal understanding that such actions are good things to do. Public health officials and communication professionals came to understand that health promotion is very difficult when it involves a lot of people doing something different from what they and their community usually do. Gradually, it was recognized that social identity, cultural norms, and political dynamics all play important roles in whether a person adopts a required behavior, and it is through these social and personal channels that behaviors can be best promoted.

Fortunately for disease control and eradication, most health interventions do not require drastic behavior changes. Social behaviors around health are usually positive, with the majority of the public demanding better and more impactful preventative and curative services. However, people do not always make healthy choices even if they are well aware of the risk and dangers of continuing behavior or not changing their ways. Thus the role of health communication is to interact with communities by providing information and assisting in service delivery so that people can be persuaded to participate in specific health actions.

In the process of adoption, the most difficult phases are the introduction of an innovation, when only risk takers or people with special interests pick up the behavior, and the final stages, when late adopters persistently remain difficult to reach. Late adopters—those who adhere to old practices, take an oppositional perspective to new ways, or are simply out of reach of the health system—pose one of the most significant threats to an eradication initiative, which by definition needs to reach everyone. Whether the public health objective is to get the public to hold out their arm for a single vaccination prick, use a mosquito bed net, or accept multiple doses of oral polio vaccine (OPV) for their children beyond the prescribed immunization schedule, late adopters hold the key to the ultimate success or failure of any eradication effort.

In the initial stages of a public health campaign, mass media is usually very effective at reaching the majority of the public who are the first to adopt an innovation, according to the theory of diffusion of innovations (Rogers 2003). However, the public health world has learned that once you have painted over the public health canvas with the large brush of mass media, there are small pockets that resist or miss out on these broad strokes. These are usually underserved, political and economically marginalized people who have little social capital and avoid risks that could destroy the fragile security systems

they already have, or those who simply do not have access to the information and services provided to the rest of society. It is in these pockets that the final battles against the disease are fought. At this phase, when success seems so close and as groups grow to recognize that eradication is high on the state agenda, the nature of the eradication effort itself empowers these groups by giving them leverage to negotiate issues more salient to their needs (Taylor 2009). Local initiatives that encourage ownership and participation, and which complement mass media efforts with intensive interpersonal communication and environmental modifications in service delivery have proven most successful in countering this type of resistance.

A quick look at the public health communication literature tells us that:

- Having a health communication theory in place at the start of the campaign to guide research, implementation, and evaluation increases the chances for success.
- Formative research is essential to understand public sentiment, including both challenges and opportunities, around the health service or behavior.
- Messages have more recall and impact when they are simple, personal, vivid, and repeated messages from multiple sources.
- Audiences are active participants in the communication process; thus health communication efforts need to monitor constantly how messages are interpreted, knowledge and sentiment created, and information shared to keep the campaign on course.

The key lessons to be applied to future eradication efforts, however, are that the pockets of late adopters need to be anticipated in the beginning of the campaign and that from the start, large-scale efforts need to be supplemented by nurturing the trust and involvement of local leaders and communities, in their own language and in a context that empowers them not to comply with a central government or even a local physician or leader, but to own and promote the health service themselves. As the health promotion efforts progress, these potential pockets of late adopters need to be continuously reassessed and efforts modified to ensure that they are fully participating in the health services.

Throughout the history of disease eradication, examples can be drawn from several communication campaigns to exemplify this point. The successful efforts to eradicate smallpox are championed, primarily because they were successful rather than because they were well thought through or particularly persuasive: much of the smallpox effort was closer to coercion, particularly in the later stages. Coercion differs from persuasion in that persuasion leaves the final choice up to the individual or community in question. The failed attempt to eradicate malaria is often overlooked because it was ultimately unsuccessful; however there are good lessons to be learned from that period. Polio eradication stands out among eradication campaigns because it is a contemporary, high-profile, and well-documented effort that offers the public health

community a window into the internal dynamics of the communication elements behind successes and failures.

The Polio Experience

When the World Health Assembly passed the resolution to eradicate polio in 1988, it seemed a fairly feasible task. OPV was safe and easy enough to administer so that just about anyone could do it, provided that there was a functioning cold chain and access to children. Countries and regions became increasingly polio free, and it looked like the initiative was on track for the 2000 deadline. As this deadline passed, the wild poliovirus was present in only a handful of countries. Another year or so and transmission would easily be stopped, or so it seemed (Figure 18.1).

As 2002 came, several countries faced great difficulty in reaching the necessary levels of population immunity. Polio continued to paralyze children in high-rise communities in Cairo, hard to reach areas of Afghanistan and Pakistan, and perhaps most strikingly in Nigeria, where high-profile resistance to immunization in northern states was increasingly implicated in continued transmission. In India, despite high levels of immunity in the majority of children across the country, the virus continued to circulate in the northern states of Uttar Pradesh and Bihar, where populations were enduringly resistant to immunization efforts. Important operational challenges existed, but the social element was increasingly attributed to the failure to deliver OPV to vulnerable children.

The initial reaction was to assume that ignorance or false beliefs constituted the heart of resistance, which contradicted much of the contemporary development rhetoric. Research and cogent observation made it increasingly clear that power relations based on social, cultural, economic, and political realities

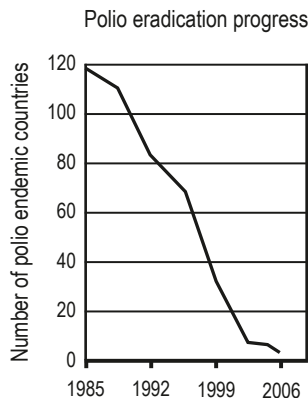


Figure 18.1 Progress in polio eradication (adapted from a presentation by Bruce R. Aylward to the GPEI evaluation team in June 2009).

inspired opposition to the mass immunization efforts. Polio eradication planners began to respond to this reality in India in 2004, with the introduction of the “underserved strategy,” which aimed to develop and nurture strategic partnerships and community ownership in areas resistant to polio campaigns. Local ownership lessened the resistance, which was ultimately not to the vaccine, but to the source from which it came—the central government—and the methods of delivery. These lessons continue to be applied to additional underserved groups in India, as the epidemiology of the polio virus has required the program to review continually its assessment of the underserved.

Although education and persuasion are, and will continue to be, important elements of any health campaign, the very local, sociopolitical sphere is often the level at which complex power relations and formations of social identity occur, requiring the most attention. This was accomplished in India and Nigeria. Drawing on these examples, let us examine how the polio eradication initiative has engaged late adopters at various levels of society.

Nigeria

Utilizing Traditional and Religious Leaders to Mobilize Resistant Communities for Polio Vaccination

Collaboration and partnership with traditional and religious leaders in Africa has long been an important strategy to successfully deliver health interventions to local populations. In Ghana and South Africa, local leaders have been instrumental in delivering messages about the dangers of HIV/AIDS since the early 1990s. In 1996, African leaders, both political and traditional, launched an enormous effort to improve the health of children across the continent and united to eradicate polio forever from the continent. Together the (then) Organization of African Unity pledged its determination to make Africa polio free.

In 2000, WHO, UNICEF and USAID jointly commissioned a study in Nigeria to examine priority communication channels for polio and routine immunization services. The study highlighted the importance of working with community leaders in rural and semirural areas of the country and confirmed the emerging practice of engaging traditional leaders to mobilize specific communities for the national immunization program (WHO, UNICEF and USAID 2000). Nonetheless, it took a national emergency and the near derailment of the global polio eradication initiative to reinforce the importance of working with traditional and religious leaders in Nigeria.

The Crisis

In 2003–2004, polio vaccination boycotts in Nigeria threatened global efforts to eradicate the disease. The ban by some northern states was brought about

through unsubstantiated rumors that the vaccine was unsafe, could cause sterility, or spread HIV. Political motives were behind the circulation of these rumors, as some local leaders used the potential threat to the polio eradication program—a high-profile government initiative—as leverage to petition the central government for other demands. Once the rumors took hold, however, they became firmly entrenched in the community psyche and were implicated in wide-scale vaccine avoidance and subsequent boycott of polio campaigns in northern Nigeria. Entire villages of defiant communities were created; these groups were not laggards, they were hardcore resisters.

With public confidence shattered, the Nigerian government quickly mobilized traditional leaders to resolve the boycott and restore community support for the polio vaccine. After conflicting studies and reports were published on the safety of the polio vaccine, it was left to the Sultan of Sokoto, Alhaji Muhammadu Maccido, the spiritual head and spokesperson for the majority of Nigeria's Muslim population, to announce in early 2004 that the "oral polio vaccine is safe" (Renne 2006).

Rebuilding Trust

In September 2004, following the resumption of polio activities across the country, the Nigerian Federal Ministry of Health, with support from UNICEF and partners, organized a cross-border meeting of religious and traditional leaders in Kano. More than 150 sheiks, imams, mallams, and traditional leaders from Cameroon, Chad, Niger, Togo, Benin, and Burkina Faso joined together to share experiences and develop strategies in support of polio immunization. This served as an important first step in formalizing the roles and responsibilities of traditional leaders in the program. Traditional leader support was cemented in August 2005, when the Nigerian Forum of Religious and Traditional Leaders and the Media on Immunization and Child Survival was officially inaugurated by President Obasanjo (WHO 2011).

Polio eradication partners continued to work with traditional leaders through various initiatives, but the effort lacked national momentum and seemed consistently short of making a real impact. In February 2009, Bill Gates, on behalf of the Bill & Melinda Gates Foundation, which actively supports polio eradication efforts, visited Nigeria for the first time. During his visit he met national and state representatives as well as His Eminence, Sa'adu Abubakar, Sultan of Sokoto, to encourage his increasing involvement in the program. The Sultan obliged and soon addressed northern traditional leaders with a direct request for their heightened support for polio eradication. These leaders responded by inaugurating the Northern Traditional and Religious Leaders Forum for Primary Healthcare and Polio Eradication. This forum comprises emirs from twenty northern states, including the Federal Capital Territory, and has three primary objectives:

1. to improve immunization coverage and ensure interruption of wild poliovirus in Nigeria,
2. to support the strengthening of routine immunization in northern Nigeria, and
3. to contribute to the development of an effective primary health care system in northern Nigeria.

Although a number of technical and operational strategies as well as stronger political ownership of the polio program by the Nigerian government at all levels have undoubtedly contributed to the significant reduction of Nigerian polio cases in 2010, the systematic engagement of Nigeria's revered traditional leadership stands out as a pivotal contribution. It was instrumental in mobilizing excluded populations who were critical for achieving universal immunization coverage. Utilizing national and local leaders to reiterate consistent messages on OPV safety helped reinstate public trust in immunization services, particularly in the North, while engendering local ownership and commitment to the polio program.

In March 2010, the 19th Expert Review Committee (the national technical advisory body responsible for oversight of polio eradication efforts in Nigeria) specifically recognized the contributions traditional and religious leaders had made to the country's sudden progress toward eradication, noting that the "dramatic reduction of transmission of polioviruses" was achieved primarily through improved coverage, which in turn was made possible through "the deepening engagement of political and traditional leaders in polio eradication in Nigeria." The 19th Expert Review Committee further expressed its belief that "polio can be eradicated from Nigeria in 2010, if the commitment of political, government, and traditional leaders is sustained and strengthened..." (Tomori et al. 2010).

In practice, traditional leaders in northern Nigeria have been engaged in every Immunization Plus Day (IPD, or polio campaign) since October 2009. Revered as royal fathers, several emirs have made strict public declarations that polio eradication is a public health priority for all Nigerians (Figure 18.2).

District, village, and ward heads, who are representatives of the emirs, can now be seen walking the dusty streets of northern Nigeria, working to ensure polio teams reach every house in their community while also helping families to understand, trust, and accept the vaccine by facilitating community dialogs and public meetings. In the evenings, many traditional leaders attend the debriefing meetings at local health facilities, an activity they may have openly resisted just a few years ago.

The Impact

This community engagement approach—coupled with improved operational strategies to ensure that the vaccine is delivered to outlier communities—has

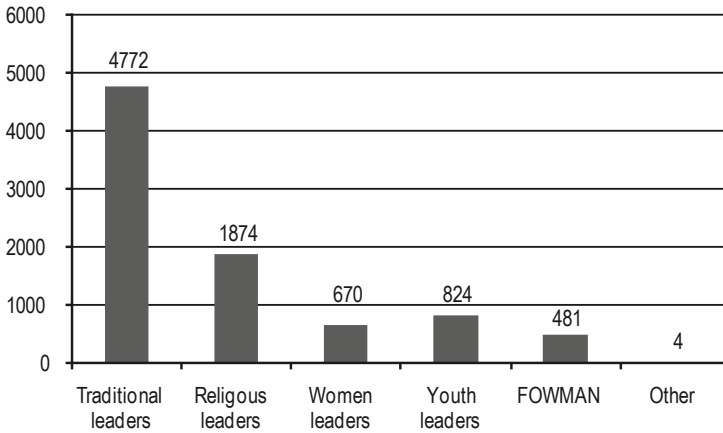


Figure 18.2 Traditional leaders in Nigeria now facilitate more than 60% of all community dialogs in northern Nigeria. Evidence from campaign monitoring indicates that more children are immunized in areas where traditional leaders lead efforts, such as dialogs (data from WHO campaign monitoring of IPDs, April 2010).

yielded considerable results in Nigeria. Since the committee's inauguration in August 2009, noncompliant households monitored throughout campaigns have fallen rapidly and, as a result, the levels of under-immunized children are dropping, particularly in northern states of Kano, Katsina, and Sokoto where the traditional system is strongest. As of November 2010, Nigeria has only eleven confirmed cases of wild poliovirus (six WPV1 and five WPV3) compared with 383 cases during the same period in 2009.

India

Engaging Migrant and Mobile Communities for Polio Vaccination in India

In 2002 and 2003, when the polio eradication program began to stumble in India, global partners needed a response. Polio cases in Muslim children were much higher than in the general population, and children in Muslim communities in northern India were not receiving OPV at the same rate as Hindu children. The resistance to immunization was volatile, and vaccinators, who were primarily Hindu, were not entirely accepted in Muslim communities.

Qualitative research in resistant areas revealed that resistance to immunization in primarily Muslim communities was not based on religious beliefs, as previously believed. Instead, it emerged from the sense of social identity, which was oppositional to the central government. Lack of trust in the government was borne out of years of marginalization and neglect, and thus was a logical response to the immunization services. In 2004, local influencers and

religious leaders were brought into the program to convince resistant groups of underserved Muslim population that OPV was not a government strategy aimed at sterilizing their children and limiting population growth. Their help was crucial in bringing down resistance to OPV to record low levels in the program. However, this progress also revealed another group of underserved: migrants and mobile communities (WHO 2007b).

According to the 2001 census, the two polio endemic states of Uttar Pradesh and Bihar have the highest rates of out-migration in India. Approximately 5.13 million people move out of Uttar Pradesh annually, followed by Bihar which has 3.45 million people who travel largely in search of employment or better social opportunities. Between 2007 and 2009, 47% of the polio cases that occurred outside of the endemic states of Uttar Pradesh and Bihar were found to be multiple importations of wild poliovirus from either Central Bihar or Western Uttar Pradesh, according to Indian Ministry of Health monitoring data. The 17 polio type 1 cases reported in 2010 have almost all been detected in areas where the virus no longer circulates, and detailed epidemiological investigation undertaken by WHO's National Polio Surveillance Program has found 95% of these cases to be associated with mobile, migrant, or underserved populations.

Due to inadequate knowledge, insufficient demand, and disparate access to health services, migrant populations in Uttar Pradesh have been found to be almost twice as likely to have not been immunized with OPV as other population groups in the same area, according to monitoring data (Figure 18.3). A UNICEF-supported social survey undertaken in the highest-risk communities of Uttar Pradesh and Bihar found that only 51% of migrants and mobile communities in Uttar Pradesh knew where the polio vaccination booth was in their community, compared to the general population, where 95% knew where the booth was located during immunization campaigns (UNICEF 2010). With barriers to access and low demand, the probability that these mobile groups will receive every required dose of OPV rests almost entirely on whether or not they are identified, located, and engaged by mobile vaccination teams.

Based on their likelihood to miss doses of OPV and their role in maintaining and spreading polio transmission throughout India, mobile and migrant populations were added to the classification of "underserved" population groups in 2009.¹ With the trend of polio cases among Muslim populations reversed for the first time in 2008, and the epidemiology of the virus highlighting the vulnerability of mobile and migrant children, mobile and migrant groups were now characterized as the population most at risk for polio. Strategies to reach these groups with communication approaches and OPV vaccination now

¹ The term underserved was coined in 2004 to describe efforts to improve immunization coverage in the primarily Muslim minority population group of northern India—the first group identified as disproportionately vulnerable to the polio virus.

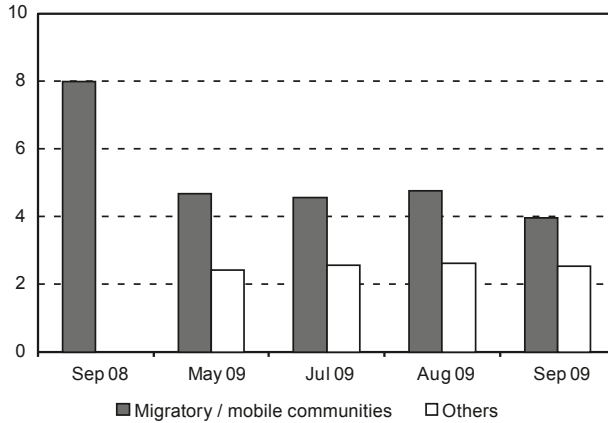


Figure 18.3 Migratory and mobile communities are almost twice as likely not to be immunized as the rest of the population, according to data presented by the National Polio Surveillance Project at the 21st India Expert Advisory Group for Polio Eradication meeting in November 2009.

comprise the “expanded underserved strategy,” which has been embraced by the Indian Ministry of Health as the next strategic phase for polio eradication.

Avoiding Disparities in Migrants’ Access to Health Services

Migrants in India have no entitlements to livelihood support systems or formal welfare schemes. Often they are not paid full wages because contractors deduct portions of their earnings as charge for securing employment. Migrants have limited bargaining power and greatly diminished social capital since they reside outside their familial or traditional social structures. With the additional burden posed by a lack of access to basic facilities, the results are borne mainly by women and children who suffer disproportionately in terms of disease burden and mortality. The vulnerability of nomadic groups is on par to that of migrants and is compounded further by their lack of legal residential status in many instances, their wariness of government-supported services, and the mutual reticence that health service providers and vaccinators feel about providing outreach services to these often clandestine groups.

It is therefore not surprising that migrants and nomadic groups are often left out of formal health services and lack the benefits offered through engagement with other social facilities such as education, clean water, and basic sanitation. In the Indian polio program, these populations represent the remaining groups yet to adopt healthy behaviors in general and OPV vaccination in particular. They comprise the weakest link that now challenges polio eradication in India.

To reach these groups with OPV vaccination, the polio eradication program first had to identify migrant groups, locate them, and employ an approach that reached every single child, as opposed to every single household. Subsequently,

the program needed to develop appropriate ways to engage and involve these isolated groups in the eradication effort to ensure their full participation and ownership, similar to the way Muslim communities were engaged in the early days of the program.

Removing Impediments to Migrants' Access to Preventive and Curative Services

Utilizing experience from the underserved strategy to reach minority Muslims, the program immediately recognized that these groups had to be reached through trusted leaders and influencers from their own communities. In 2009, UNICEF's Social Mobilization Network (SMNet) identified and enlisted over 1300 nomadic informers in the seven highest risk districts of Uttar Pradesh. These mobilizers were chosen because they have social capital in these communities and can thus positively influence group behavior. Landlords, business owners, shopkeepers, and community leaders who are both well informed on population movements in and out of their district and influential and reliable in disseminating information were given preference in selection, and were sensitized regularly to the importance of reaching these groups with OPV vaccination. Each week they are contacted by a local SMNet worker to provide updates on incoming and outgoing population movements within their catchment area. Block mobilizers follow up on the leads, list all children under five years old, and turn the household list over to local officials and vaccination teams. As of September 2010, over 30,000 mobilizers in migrant communities had been identified in approximately 37,645 communities in Uttar Pradesh.

Once settlements are identified, a separate visit is undertaken to initiate discussion and disseminate messages on the importance of OPV and routine vaccination. Entrance into the community is facilitated by a trusted informant who has influence over the group. For most of these communities, literacy and knowledge is low, but OPV is largely accepted since it is the only public health service offered to them: "We take OPV because it is free of cost and Government is giving it to us at our doorstep"—nomadic mother in Western Uttar Pradesh (UNICEF 2010). Further evidence of this is found in a UNICEF 2009 communication review report on migrants and mobile communities in Badaun and Ghaziabad:

Although uptake of polio immunization is fairly high among the target groups, there are key gaps in knowledge pertaining to immunization, polio itself, and other factors related to the disease. Indeed, when residents were asked about why they need to take repeated doses, many stated that this was the desire of the CMCs [community mobilization coordinators]; few were able to provide reasons for taking the OPV (Badaun).

Making inroads in this area is facilitated by the fact that the communities, having traditionally been so excluded, welcome almost any service with openness given

the fact that they have been isolated from most basic services and amenities for so long (Ghaziabad).

The identification of these communities was undertaken initially by SMNet and vaccination teams, and access was facilitated by mobile vaccination teams, which provided a critical entry point not only for increasing OPV vaccination rates among these vulnerable groups, but also for the provision of wider health services to help reduce vulnerability to poliovirus infection and other diseases. Because vaccinators and social mobilization staff are essentially the only functionaries who have reached out to these communities, migrants and nomadic groups have begun to turn to these polio workers to fulfill their demands for a wider range of other basic needs, including the provision of clean water, sanitation, and education.

Expanded messages on key healthy behaviors that could potentially inhibit poliovirus transmission are being introduced in these communities. Not only do these additional interventions help to reduce polio risk factors (e.g., poor hygiene, sanitation, and nutritional status), they can also empower these groups to take control of the health of their children and their families. The extra services provided will additionally build goodwill, trust, and an enabling environment for OPV vaccination.

Minimizing the Negative Impact of the Migration Process on Health Outcomes

Population movement intensifies migrants' vulnerability to a wide range of health risks, including polio, as migrants are more likely to miss out on OPV doses than any other population group in India. The need to minimize the negative impact of the migration process on health outcomes, coupled with the communication imperative to minimize the distance between the communication message and the provision of a service, has led to the adaptation of OPV delivery system to reach Indian migrants as they travel.

For example, if you travel by train in Uttar Pradesh, Bihar, or Delhi during a polio round, it would be difficult to miss the yellow polio banners draped along stairwells, hung over platforms, and strung between arrival and departure announcement screens. Vaccinators clad in yellow vests work in each major entry point, searching for passing children under five years old to vaccinate. This transit strategy has been in effect for over five years, with continuously evolving innovations designed to reach and vaccinate the maximum number of migrants in transit.

Communication channels have recently been expanded to maximize outreach to these groups while they travel, not only at train and bus stations, but also through posters and hoardings at rest stops on major highways, through visible booths placed along mela routes for traveling pilgrims to be vaccinated as they make their religious treks, as well as on the border between Nepal

and India as migrants travel through the porous borders searching for work. Messaging has been more specifically targeted to migrants, highlighting the importance of getting vaccinated especially while traveling. Messages are disseminated on trains themselves, together with vaccination teams who travel on the most critical routes between Uttar Pradesh, Bihar, Delhi, and Maharashtra.

According to May 2010 monitoring data, 2,321,991 people in Uttar Pradesh and 1,898,494 in Bihar were vaccinated at train stations, melas, and bazaars.

Impact

It is premature to demonstrate the impact of the expanded underserved strategy; the intensified focus on these groups began less than one year ago and these groups continue to play a large role in persisting transmission in India. There is, however, evidence that the same strategy contributed to the significant reduction of cases among underserved Muslims since 2004, when the approach was first initiated (Figure 18.4). The Government of India and its partners are confident that the main principles of the underserved strategy—identifying and segmenting underserved groups, mobilizing credible local influencers to facilitate access and deliver messages, and utilizing communication messages and materials that are contextually relevant to segmented groups—are transferable to additional underserved communities. The Indian experience further demonstrates the need for communication programs that dynamically respond to continuous epidemiological assessments in an effort to identify underserved populations. Only then can universal coverage of all population groups be ensured at every stage of the program.

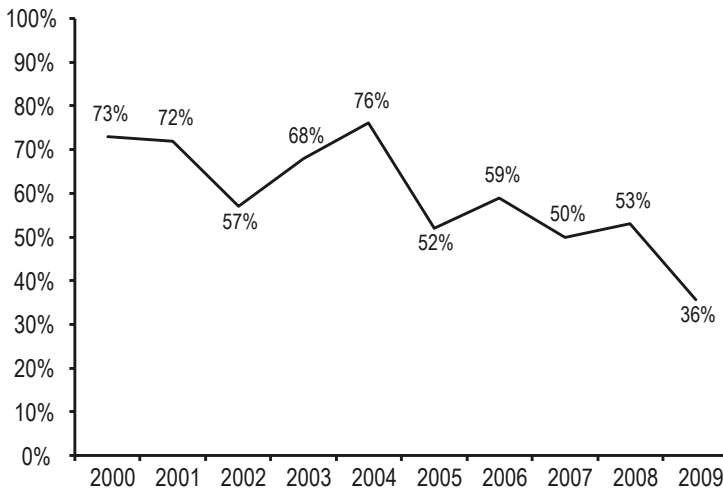


Figure 18.4 P1 cases among minority Muslims in Uttar Pradesh declined from 76% in 2004 to an all-time low of 35.7% in 2009.

Conclusion

Past eradication campaigns offer lessons to help us avoid repeating mistakes in future efforts. If applied, these lessons will also help the global public health community achieve better, timelier results for initiatives that aim to improve the general health and welfare of the world's growing population. Standard communication approaches have important contributions to make in support of any public health goal, but the nature of an eradication effort demands consideration and planning beyond the typical public health campaign. Our purpose in this chapter was to highlight areas where additional efforts and foresight are necessary, particularly in identifying and reaching out to marginalized groups in the early stages of the public health initiative.

Eradication efforts require both global advocacy and local communication that operate with a clear set of intended outcomes. Global efforts usually receive inspiration through a mandate from established bodies, such as the World Health Assembly, along with the coordinated efforts of a large donor and political community. The combined efforts of these bodies and institutions are critical for mobilizing the political and financial will necessary to persuade national governments to adopt public health interventions aimed at the eradication of a disease. A global communication strategy which inspires local campaigns to employ evidence-based, state-of-the-art approaches to health communication for behavior change is likely to succeed in moving a majority of the audience toward the end behavior, and thus closer to the eradication goal. It is important to recognize the important contribution that each of these elements can make toward the goal of eradication, as well as to identify the need to supplement large-scale approaches with local and more nuanced strategies.

In social and communication theory, it is accepted that people act on incentives and that the incentive for early and late majority adopters will be their health as well as the welfare of their loved ones. It is logical to assume that this powerful incentive is enough to move all people to adopt an end behavior. However, as we have illustrated here, the single incentive of personal welfare can be subverted by other incentives when some populations take oppositional positions to the public health good or fail to benefit from services offered. Thus, in addition to extending services into areas where people have traditionally been excluded, communication and incentives need to be highly localized and contextually adapted to motivate late adopters.

Fortunately, the polio eradication program and other public health activities offer successful examples of localized incentives. These include, but are not limited, to the following:

- Identify those populations likely to be left out of mass public health interventions during the beginning stages of the eradication effort; health and other social metrics are available and can be utilized to highlight where the eradication effort will likely confront challenges. It is not a

coincidence that Kano, Nigeria, or Uttar Pradesh, India, were both two of the last vestiges of smallpox and are now the final frontier for polio eradication.

- Continue to revisit the assessment of underserved and marginalized groups as political, socioeconomic, and epidemiological dynamics change over time, so as to ensure that the communication strategy can quickly respond to updated assessments.
- Identify local leaders from each segmented group in society, ideally at an early stage in the public health campaign, to promote ownership and engage communities up front; this would dissuade movements that would prompt opposition from a central authority.
- Establish processes that will help the program constantly reassess influencers who are most relevant and effective to the local context.
- Identify and address local identity issues by providing services that are synchronized with local social, cultural, and political realities, even if this means empowering leaders and groups outside of the mainstream political sphere.
- Embed the singular public health service, such as provision of OPV, into a larger health and social welfare framework—one that meets the perceived needs of local communities. (This was generally successful in Nigeria when the Immunization Plus Day strategy was launched in 2006; it bundled polio vaccine with other popular public health interventions and treatments such as paracetamol, soap, deworming tablets.)
- Maintain constant vigilance of mass and local community sentiment early to detect deviations in community sentiment or public behaviors that could threaten the public health outcomes, and have a dynamic system in place to provide immediate responses.

Engaging traditional and religious leaders in Nigeria demonstrated the importance of targeted messaging as well as utilizing the appropriate messengers. To engage and mobilize every group required for universal coverage in Nigeria, the messengers were perhaps just as critical as the message itself. This lesson, learned also in India several years ago, should be applicable to any public health program as a model of community engagement and partnership. It demonstrates how critical it is for underserved populations to take ownership of their own health, and to be able to translate national priorities to the needs of their own communities.

Ultimately society is a very dynamic formation, and public health efforts through social communication must nurture the relationship between the medical intervention and local realities in which they are delivered. This requires communication to start with the child most at risk and build upward to ensure that all involved—from the immediate caregiver to the health worker to the policy maker—have the understanding, access, and will to make this relationship work. The assumption that people act in concert to achieve a global good

will most likely end in disappointment, even if there are early sweeping successes. The vital lesson available to us from the polio experience is that we need to anticipate the final stage or last few steps and to plan as much as possible at the outset of a program. Acting on this lesson will most certainly be the key to future successful eradication efforts.