



VACCINATIONS IN THE THIRD WORLD: A CONSIDERATION OF COMMUNITY DEMAND

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Abstract—Impressive increases in immunization rates have been reported in several less developed countries (LDCs) as a result of intensive EPI programs. An issue arises as to whether existing rates of immunization coverage can be sustained/increased given projected cutbacks in funding. This issue calls into question the assumption that as immunizable disease rates fall, local populations will need less encouragement to secure immunization services. This article considers how immunizations are perceived by lay populations and how perceptions of utility and need effect demand which in turn effects the sustainability of EPI programs. Among issues addressed is the observation that when specific diseases are not linked to specific immunizations, misimpressions related to the number of immunizations needed for “good health” abound. Also considered are metamedical reasons immunizations (and immunization programs) are both resisted and demanded in particular political contexts.

Key words—immunization rates, community demands, health prevention, immunization programs

Those who plan and conduct public health programmes seldom give the same thoughtful consideration to the human relations aspects of their projects as they give to the physical, technical and organizational aspects . . . What is needed is for programme organizers and administrators to recognize that their undertakings operate in social and cultural as well as physical and biological environments [1].

Over the last decade remarkable success in vaccinating pregnant women and children has been reported by international health agencies such as UNICEF [2]. In 1991 it was estimated that vaccinations had saved the lives of some three million children, that the number of infants vaccinated had doubled in the past five years, and that 80% of global EPI* goals had been established [3]. Just as impressive have been reports that infants who are immunized maintain a better chance of survival in general, beyond protection from specific EPI diseases [4]. Such data have led to statements being made that: “In a world where so much seems to go wrong, the EPI program is one international initiative that is fulfilling its promise” [5].

What has largely been demonstrated is that given ‘political will,’ vaccination rates may be dramatically increased as a result of intensive campaigns which mobilize the community. I use the phrase ‘mobilize the community’ in the sense that leaders endorse vaccination programs, social marketing campaigns blitz the community with spot messages about the timings and availability of vaccinations, primary

health care workers engage in active community surveillance, and vaccination camps are held. While there is some talk about the cost effectiveness of vaccination programs and how vaccination rates may be further increased beyond existing plateaus in the mid 1990s, others have questioned the extent to which vaccination rates will be sustainable once expensive campaigns are phased down given economic constraints [6].

The philosophy behind intensive vaccination campaigns has been that once the public have been introduced to the benefits of medical technology and have experienced lower rates of illness and suffering as a result of vaccination programs, demand for such technology will follow. In this paper, I will question this assumption and consider community demand for “vaccinations in general” as well as demand for specific vaccinations [7]. I will draw a distinction between *active demand for* and *passive acceptance of* vaccinations. Active demand entails adherence to vaccination programs by an informed public which perceives the benefits of and need for specific vaccinations. Passive acceptance denotes compliance: passive acceptance of vaccinations by a public which yields to the recommendations and social pressure, if not prodding, of health workers and community leaders.

A consideration of community demand for vaccinations requires an examination of popular perceptions of vaccinations as well as local interpretations of vaccineable diseases and associated local illness categories. Toward this end, I will present data from South and Southeast Asia (India, Sri Lanka, Indonesia), the Pacific Basin (Philippines) and Africa. After a general discussion, I will draw special attention to

*EPI stands for the Expanded Programme on Immunizations. Initiated in 1974, it includes immunizations against diphtheria, pertussis, tetanus, tuberculosis, measles, and poliomyelitis and entails five vaccines (DPT, BCG, measles, polio and tetanus toxoid).

measles, an illness causing considerable mortality in less developed countries [8].

Before considering local response to vaccination programs, however, it is worth examining the sociopolitical context into which they are being introduced. Positive press which applauds governmental and international efforts to save the children would lead us to believe that vaccination programs are exceedingly popular and appreciated throughout the Third World. Does such an impression mask voices of dissent, if not a sense of ambivalence and mistrust within these countries? Is there uncritical acceptance of all vaccination programs since the smallpox success story?

VOICES OF DISSENT TO VACCINATION PROGRAMS

While vaccination programs are often introduced with a fair amount of fanfare, they are not always greeted with a great amount of trust by all members of the populace or scientific community [9]. Vaccination programs have in fact provided an opportunity for political commentary as well as the articulation of collective anxieties. For example, in India segments of the population have linked vaccination initiatives to coexisting national directives, most notably family planning. Conspiracy theories have emerged among both conservative Muslim and Hindu groups linking the two programs to hidden political agenda [10]. Hindus have been vocal in communicating their fear that Muslims are undermining national population policy by attempting to produce as many children as possible in an effort to gain votes [11]. Muslims fear that the Hindu majority may be covertly introducing family planning through the vaccination program. This fear is shared by Hindus who fear that because some sectors do not voluntarily adopt family planning methods, the government feels justified in controlling population growth through clandestine operations.

Rumors reflecting these fears were legion in the 1970s during India's 'emergency' exercise of state power in the name of population control. Mistrust has reemerged in the 1990s, a time of Hindu-Muslim unrest, vaccination program intensification, and press accounts and critiques of new anti-fertility vaccine trials in India [12]. In lieu of a growing fear that the vaccinations women and children are asked to receive may somehow be linked to sterilization, there is a questioning of why so many are needed. As a result of distrust, members of one community whom I interviewed in 1992 articulated their desire to receive vaccinations from private practitioners instead of government primary health center (PHC) staff [13].

This is not the only conspiracy theory involving vaccinations. One leader of a Hindu group located in a South Indian city (the site of considerable Christian missionary and medical activity) recently engaged me in a discussion about the "real purpose of vaccination programs." The man began by pointing out to me the

visual similarity between the Christian cross and a hypodermic set, noting that injections and vaccinations came from foreign Christian countries. Just as Christian missionaries had come to India to convert Hindus in the past and had won over the local population by offering aid in the form of hospitals and schools, so vaccinations were an extension of this scheme. After receiving the protection of vaccinations and foreign medicines, the population would no longer feel the need to adhere to traditional values. They would be "civilized" in a Western sense, at the expense of their moral and ethnic identity. He referred to "Brigade Road youth," youth that congregate along a fashionable street in the state capital, as epitomizing this trend. Like the children of Indians living abroad, such youth rejected their heritage in favor of "Christian values, tastes, and desires." Vaccinations, he said, made them feel immune from the wrath of the gods whom they had forsaken.

This political leader's litany against modern youth and the subversive activities of Christian (i.e. capitalist) purveyors of 'development' was launched within the context of a discussion of vaccination programs. The metamedical theme which underlay his discussion is worth further scrutiny. Vaccinations were associated with "civilizing the other" and interpreted in terms of a "process of domestication" analogous to missionary work—only in this case the body is saved at the expense of the soul. But saved for what? The gist of his view was that "the other" (i.e. Hindu) is rendered less dangerous by vaccinations in order to become a citizen-consumer in a "global community" driven by Christian (i.e. Western) tastes [14]. The term colonialism was not overtly referred to by the informant, but it was clear that he suspected a subtle process of hegemony taking place in which secular values were embodied through vaccinations and dependency on Western medicine. Medicines were not seen as neutral, but rather as a vehicle of ideology. Reciting a Sanskrit sacred verse (*sloka*), he told me that in India this strategy would not be effective. For each disease protected against by a vaccination or medicine, a new affliction would arise as a sign of the power of the gods if the sacred was neglected [15]. In defense of his position, he noted that the control of smallpox had brought new afflictions in this region, such as Japanese encephalitis, Kyasanur forest disease, and increasing rates of tuberculosis [16].

Discussion of vaccination programs has also served as a platform from which to address issues related to foreign policy and national identity. For example, in 1987 there was heated controversy in India's national press about an Indo-U.S. vaccine program. The United States was accused of using the Indian population as guinea pigs for vaccine experiments, despite the fact that the vaccines to be introduced had undergone tests in the U.S. and that the India's Department of Biotechnology had set up a strict ethical review process. Such charges are not uncommon in developing countries and need to be con-

sidered metamedically, that is in terms of what they have to say about issues related to the 'body politic' and 'social body' as distinct from the physical body [17, 18].

Calling attention to the penetration of Indian bodies with foreign vaccines indexes concern about national boundaries and a sense of moral geography. This is reflected in Indian charges that the epidemiology center the U.S. proposed to build as part of the joint vaccination venture would violate national security by collecting computerized data on the genetic makeup of the Indian population. Fear was expressed in several newspaper editorials that a national profile of immunity would be collected [19]. Biopolitical imagery was engaged wherein the immune system became a potential battlefield much in keeping with Haraway's description of cell wars in an era of star wars. The body, conceived of as a strategic system, ceases to be a "stable map of normalized functions and instead emerges as a highly mobile field of strategic differences" [20]. Embracing the semantics of defense and invasion, concern was expressed in the Indian press about the "strategic importance of immunocompetence", the need to protect against bioterrorism, and the threat of AIDS [21]. In one discussion I had with a prominent member of the press at this time, a direct link was made between computer viruses and AIDS. Both constituted man-made sources of communication terrorism in the form of a rapidly proliferating foreign code which needed to gain entry to a population's "operating system", in order to render it immobile. The immune system was the body's "operating system" [22].

Poignant charges have also been leveled against international health agencies and donor groups by members of the Indian academic community. Some local scholars have questioned the wisdom as well as the motivation of intensive vaccination campaigns given the health infrastructure of several of India's states. Debabar Banerji, an outspoken critic (and anthropologist) has blatantly accused an "unholy alliance of national and international power brokers" of technocentric colonialism [23]. Counter to the Ministry of Health's claims that India's national vaccination program has been a success, Banerji evaluates the program as a dismal failure in reaching less than one fifth of vaccinable children in one half of India's population. Harsher still is his charge that technocentric approaches to health have been attractive to the ruling classes of less developed countries because they "achieve visible and dramatic improvements in health which divert attention away from the lack of basic survival needs" [24].

Banerji has criticized international agencies for their obsession with herd immunity as well as for their exploitation of the plight of helpless young children [25]. Against figures of "lives saved by immunizations," he questions the allocation of resources to vaccination programs pointing to opportunity costs and the diversion of resources from other programs

such as India's national TB program. The balance of resources expended to keep children under five safe from vaccinable diseases is questioned, given the meagre resources expended to improve the quality of life for child survivors. Alluded to is the fact that mortality from diseases such as measles and TB were dramatically reduced in the West as a result of social and sanitary reform long before the advent of vaccines and chemotherapy.

Arguing that vaccination programs represent an example of selective primary health care failure, Banerji calls attention to the need for a community based approach to primary health care [26]. What needs to be clarified is that it is not vaccinations *per se* which are rejected by critics such as Banerji. The imposition of a vaccination campaign complete with targets, plans for community surveillance, and the possibility of coercion are questioned, as are campaigns rendering the community dependent and powerless to decide upon its own health care priorities. It is only when vaccinations are recognized as a perceived need and demanded by the "community" that they become community development resources in a "comprehensive primary health care" sense [27].

I highlight this point to distinguish between short- and long-term vaccination goals and the programs designed to meet them. Programs designed to achieve rapid vaccination coverage to meet time bound targets differ from programs designed to educate a community about vaccinations through appropriate conceptualization. For the most part, global vaccination initiatives have focused on the short-term goals with the assumption being that once communities were "covered," the demonstration effect of vaccinations would translate into widespread acceptance and popularity.

But has this been the case? I have been struck by the paucity of evaluations of sustained community interest following vaccination campaigns. The results of one such study are sobering. Visaria, Anandjiwala and Desai studied a Gujarati community in India which was the target of an intensive mass vaccination campaign conducted between 1987-88 [28]. For two years the campaign was evaluated as highly successful. As a result, it was decided to suspend active surveillance and vaccination camps. In lieu of a third year of intensive outreach efforts, primary health center and hospital staff were encouraged to ask parents to vaccinate their children. The hope was that after two years of intensive communication about vaccinations, parents would actively seek out services for their children.

The results of a follow up survey in 1989 were disturbing. Out of 150 eligible children in seven villages only 14 children (less than 10%) received the appropriate vaccinations. In two villages, cases of measles were reported after a two year interval. The researchers concluded in their report that: "The overall situation is quite puzzling. There seems to be

a fatalistic and almost unquestioning acceptance of childhood illness" [27].

It could be argued that attitudes toward vaccinations in a rural area of Gujarat reflect the poor educational levels of mothers. A study by Kutty in Kerala State, India, suggests other issues may be involved [29]. Kerala has been heralded as one of the world's "good health at low cost" success stories [30]. Kerala maintains India's highest level of literacy and lowest level of infant mortality [31]. Kutty's study revealed that regardless of educational status, mothers' attitudes toward vaccination remained surprisingly low in Kerala. Both mothers with less than 10 years of school and mothers with over 10 years of schooling maintained positive attitudes about vaccinations in only 31% and 39% of cases, respectively [32]. While vaccination rates in Kerala are reported to be high, data such as these suggest that demand within the community may wane at any time if not accompanied by a proactive vaccination program [33].

FACTORS INFLUENCING VACCINATION ACCEPTANCE

In the long run, the success of vaccination campaigns will be measured in terms of community demand for vaccination services. Three sets of factors influence vaccination acceptance and demand once the community has been made aware of this resource: supply and service factors, social factors, and cultural factors which influence how vaccinations are interpreted. I will briefly consider the first two sets of factors and focus on the third in keeping with the objective of this paper; a consideration of community demand.

Supply-service factors

When discussing lower than expected rates of vaccination acceptance, health planners typically call attention to either (a) the public's low awareness of the availability of vaccinations or, (b) operational problems entailed in keeping the health service infrastructure supplied with vaccines. These problems are compounded by structural and organizational barriers to health care utilization [34]. Health service researchers have repeatedly drawn attention to vaccination accessibility (location and the timing of clinics) as real life constraints facing people who may want to change their behavior [35]. On the basis of such research, some researchers have argued for community participation in deciding when and where vaccinations are to be made available.

Attention has also been called to missed opportunities on the part of health workers who have failed to vaccinate children when mildly ill or when vaccine wastage might result from opening multidose vials of vaccine for one child [36]. Underappreciated in this literature is the vulnerable position of health workers who are subject to community censorship. Their reasons for not wanting to take risks needs to be

appreciated more fully. Many work in a context where responsibility for death is avoided at all costs to the point that PHC doctors refer critical cases to distant hospitals to retain their reputations. Just as doctors do not follow 'rational' drug guidelines because they are subject to community demands (and profit motives), health workers can not be expected to vaccinate ill children if held accountable for their health by a community which deems vaccinating during illness a sign of disregard [37].

The ways in which the organizational culture of national health infrastructures influence health worker performance are also underappreciated. This includes factors affecting staff motivation, teamwork, and supervision, as well as patient follow-up [38, 39]. As I have noted in my earlier study of vaccination acceptance, faith in health staff is decreased by a target system where attention is focused entirely on the quantity and not the quality of service administered [10]. Staff pressured to meet EPI targets are perceived by many community members as willing to compromise their best interests. The vaccination of mildly ill children is taken as evidence of this. In this context, 'missed opportunities' on the part of some staff to immunize mildly ill children may constitute a deliberate attempt to secure community confidence over time.

Each of the factors noted above plays an important role in reducing vaccination coverage. Emphasis on health care delivery issues alone, however, eclipses an even more basic issue: does the 'public' want the growing range of vaccines being made available to them? This issue demands a consideration of who the public is, that is, a consideration of different segments of local populations.

Social factors

As Bonair, Rosenfield and Tengvald have aptly noted, the compliance perspective which has driven most health diffusion research fails to get at a broader understanding of how and when new innovations are adopted [34]. Understanding factors which facilitate community demand requires a shift in research focus from 'predictors of non-use of vaccinations' (non-compliance) to 'predictors of demand' (adherence) and 'self-regulation' which pay credence to the agency of community members. In keeping with a social marketing approach to studying consumer behavior, much research on predictors of vaccination acceptance have segmented the population. There has been a tendency to focus on the social characteristics of individuals which predispose them to accept (passively) or seek out (actively) vaccinations. Mothers are the most common unit of analysis (considered in terms of their education or work status), although more research has begun to focus on fathers and elders as decision makers. The birth order and gender of children as predictors of vaccination acceptance and timing (when received) have also been considered [40].

Such research has provided valuable insights into patterns of vaccination use. For example, studies in North India and Nepal have pointed out gender specific differences in vaccination which favor male children over females [41]. Studies in Indonesia have likewise pointed out significant differences between women who work inside and outside the home with respect to vaccination behavior and constraints [42].

One limitation of this type of research has been that it has focused more on discrete, measurable variables than on pathways and processes associated with vaccination acceptance. We do not know, for example, what it is about a mother's education which predisposes her to have her children vaccinated (e.g. the content of education, affiliation with modernity, social mobility) or contexts in which her education does and does not have leverage. Existing research focuses more barriers which make it difficult for some groups of mothers to use vaccination services, than it does on demand factors which lead other members of these groups to seek out services even in the face of time constraints [43].

Cultural perceptions of vaccinations and EPI related illnesses

Less appreciated than the impact of social factors on vaccination acceptance is the influence of cultural factors on vaccination demand [44]. Cultural factors include not only perceptions of vaccinations and EPI associated illnesses, but also perceptions of vulnerability and protection as well as the role which medicines play in producing and maintaining health. Consideration of the context (past experiences, contingencies) as well as cosmos into which vaccinations programs are introduced leads to a recognition of why these programs are often greeted with a fair amount of apathy and ambivalence.

Even where the availability of vaccination services are known and accessible, they are often underutilized [45]. Cultural factors need to be taken into consideration when considering demand for vaccinations in general, for a limited number of vaccinations, and for specific vaccinations. In a previous paper, drawing upon data collected from South India and Sri Lanka in the early 1980s, I argued that local populations had a poor understanding of what vaccinations do and what diseases they protect against [10]. This resulted in both misconceived perceptions and unrealistic expectations. I want to extend this argument by offering additional data reported in the literature and collected in Asia during 1991–92.

It has been widely reported that (a) mothers often have little idea or an exaggerated idea of what diseases are protected against by vaccinations and (b) mothers with knowledge of any illness(es) protected against tend to accept vaccinations more readily than those unable to specify such illnesses [10–53]. Three sets of issues prompted by these data may be explored.

First, it may asked what local populations perceive the purpose of vaccinations to be if they are not associated with EPI related diseases. During field work conducted over the past 20 years, I have consistently recorded two sets of impressions about the purpose of vaccinations. The first of these is that 'vaccinations are good for a child's health'. The second is that 'vaccinations prevent against serious illness.' These impressions are fostered by vague health education messages offered to mothers by primary health care workers and doctors. Typically these messages are offered as rapid explanations for why mothers should comply with health worker directives or as 'the only messages illiterate mothers can understand.'

Vague messages about vaccinations can have dire, unexpected consequences. Given the impression that vaccinations are good for health or protect against all serious diseases, some community members get the sense that all vaccinations are alike and enhance a child's health in some form of incremental fashion. In other words, in lieu of knowledge that specific vaccinations protect against particular illnesses and a belief in the specific etiology of illness, the number of vaccinations rather than the type of vaccinations may constitute demand criteria.

I have encountered this type of thinking in both India and Indonesia. Let me cite data from a recent survey I conducted in rural South India and then discuss data from Indonesia. In South Kanara District, Karnataka State, India, rural mothers ($n = 124$) with a child under the age of five were asked a series of open ended questions about their health care behavior, including their use of and impressions about vaccinations. Coded responses to the following two questions are relevant:

- Q1: What is the purpose of vaccinations (*dakku*)?
- | | |
|---|-----|
| Protect against specific illness | 50% |
| (named by informant) | |
| Protect against all big illnesses (<i>roga</i>) | 28% |
| No idea | 18% |
| Other | 4% |
- Q2: Do all vaccinations (*dakku*) protect against the same illnesses or do specific vaccinations protect against particular illnesses?
- | | |
|---|-----|
| Have no idea | 42% |
| Different illnesses are protected against | 40% |
| The same illnesses are protected against | 18% |

Based on responses to the two questions, it would appear that between 40–50% of mothers surveyed thought that vaccinations protect against specific illnesses. When we asked them to state which illnesses might be protected against, however, few—less than 25%—named a local illness which encompassed a vaccineable disease other than polio or TB. Of local illness terms reported, almost all were non-vaccineable diseases [54]. Not one informant mentioned a local illness term encompassing tetanus [55]. When probed, some women noted that pregnant women received an

injection for this illness, but infants need not if the delivery was not cesarian [56]. Moreover, I was told that this illness wasn't a problem any more in this place and therefore it was unnecessary to receive a vaccination for it. Government midwives' efforts to encourage pregnant women to get vaccinated were interpreted as netting them personal gain by meeting quotas.

We asked mothers if they would take their next born infant to a PHC for vaccinations if a health worker did not come to their house to encourage them or check records. Notably, 85% said that they would do so. A wide range of opinion was expressed, however, concerning how many vaccinations they thought it was necessary for the child to receive. It would be misleading to express these opinions quantitatively because the number of vaccinations deemed beneficial was often described in relation to a set of contingencies which depended upon the child's reaction to vaccinations and state of health. An indication of how motivated child caretakers might be to seek vaccinations is indicated by reports of how many vaccinations children aged 15–36 months had received. Of 84 children in this age range, 11% had received no vaccinations, 19% had received one to two vaccinations, 37% had received three vaccinations, 19% had received four, and only 19% had received five to six vaccinations. Most informants resided within five miles of a government PHC or *taluk* (county) hospital offering vaccination services.

One of the major findings of two separate studies of vaccinations in Indonesia was that mothers who do not fully vaccinate their children believe that they are healthy and therefore not in need of further vaccinations [42, 57]. Ms Kasniyah and I conducted a series of interviews in Central Java to explore factors underlying this perception. Mothers interviewed perceived vaccination as necessary for a child's good health. Their criteria of good health was 'no serious illness'. Once a child was perceived to be healthy and thus protected against a range of serious diseases by vaccinations having similar purposes, they were no longer thought to be in need of additional vaccinations. Maintaining a vaccination schedule was less important for these mothers after the first few vaccinations. It was the *quantity*, not the *qualities* of distinct vaccinations which mattered [58].

Three other ramifications of 'general' messages may be highlighted. The first involves expectations. General messages foster expectations that vaccinations protect against illnesses they are not designed to prevent. Such expectations may contribute to perceptions that vaccinations are not very effective. I have encountered this perception throughout South–Southeast Asia where vaccinations are associated with diarrhea and acute respiratory infection, malaria, guinea worm, goiter, filariasis, dengue, and more! In South Kanara, several informants perceived vaccinations to be similar and to protect against all

sudden and serious sickness. They were also reported to prevent skin rashes (*Tulu: Kajji*) from becoming serious, help babies gain weight and grow (*Tulu: mai bulepuna matta, dumbuda aroyga belavanige*), clean the blood so no disease will come, and clean the intestines of impurities obtained during the birthing process (*Tulu: karalu nangi popundu*).

A second ramification of general messages involves perceptions of vaccination compatibility. Given impressions that vaccinations are both "good for health" and "similar," there is a propensity for mothers to evaluate "them all" as incompatible if a child experiences a marked side effect (such as high fever) to any one vaccine. I have encountered this reasoning in both India and the Philippines. In the Philippines, the Tagalog concept of *hiyang* is applied to medicine compatibility in general as well as vaccinations [59]. I documented three separate instances of an infant's *hiyang* for vaccinations being questioned after they suffered fever and/or illness unrelated to vaccination. In each case, perceptions of compatibility led a mother to weigh the ascribed benefits of future vaccinations against the state of ill health experienced by her child.

A third ramification of general messages is that segments of a population may question why it is that only young children and women are receiving vaccinations. In 1990, in an urban Indian slum, I encountered adults who expressed a need for 'government injections' given a sense of perceived vulnerability associated with an outbreak of 'gastroenteritis' widely reported by the press. They saw vaccination programs directed at infants and women as privileging these segments of the population while male and older children were left to fend for themselves. During a group discussion of their perceptions of 'government injections,' the idea emerged that vaccinations prevented illness from becoming serious—in this case simple diarrhea from becoming gastroenteritis. Not distinguishing different types of vaccinations from one another, the group's perception was that the government could not afford to vaccinate everyone routinely. Young children were vaccinated because they were weakest and required smaller doses of medication. Cholera vaccinations were conflated with children's vaccinations, and the groups' perception was that vaccinations were only administered to the general public if political pressure was brought to bear on the government. Cholera vaccinations are in fact used in India as a political ploy to offset fears of epidemic diarrheal disease irrespective of the pathogen in question [10].

On the one hand, criticism that vaccination programs privilege particular segments of the population is a reflection of consumer demand. On the other, it points to tensions over entitlement which might escalate and disrupt vaccination programs in the future, particularly in contexts of epidemics. The issue of entitlement has been reported elsewhere. For example, in Burkina-Faso it has been reported that

men feel offended that women and children are the focus of vaccination programs which provide them with free white man's medicine [10]. Vaccinations are loosely associated with a wide range of illnesses and men question why they as the bearers of power and authority are not offered this efficacious agent. After all, it is they who 'move around more', so are more vulnerable.

Another issue which arises is whether local illness terms exist which correspond to EPI diseases. In an earlier article I pointed out that while direct correspondence between local illness categories and EPI diseases do not exist, significant overlap does exist in the cases of tetanus and pertussis, and to a lesser extent measles [60]. What this implies is that it is possible to communicate to local populations in India, Sri Lanka, the Philippines etc. that specific vaccinations protect children (and mothers) against illnesses associated with these diseases. A problem is posed, however, by the imperfect fit between local illnesses and EPI diseases. The fact that the local terms encompassing tetanus in Sri Lanka and the Philippines also encompass unpreventable illness associated with meningitis or pneumonia means that cases of apparent vaccination failure will exist. The same would be true in South India where a local term encompassing pertussis (*Kannada: nai kemmu*) may also be applied to acute respiratory illness marked by bouts of coughing of long duration. In the Philippines the English term 'measles' and the *Tagalog* terms *sikal* and *tigdas* encompass several different disease states sharing common symptoms [61].

Some health planners have drawn attention to such problems of translation as a rationale for communicating only simple, nonspecific messages to mothers which focus on the timings of vaccination and not their purpose. What needs to be evaluated is the impact of programs making appropriate use of local illness terms and concepts of efficacy on community demand. This would require careful monitoring of the perception of vaccination efficacy given that (a) cases of non-vaccinable illness associated with the local illness term will occur, and (b) cases of vaccinable disease will occur due to vaccine failure.

At issue is whether increased knowledge of illnesses protected against by vaccinations and more realistic expectations of vaccination efficacy will increase community demand. A case study may illustrate why I think it is important to investigate this issue further. During an ARI study on the island of Mindoro in the Philippines we found that of a sample of 80 literate mothers (ranging in educational status from basic literacy to college attendance) and eight teachers, not one knew that pertussis could be prevented by a vaccination [62]. Most could recognize the disease. When shown an illness video containing illustrations of various acute respiratory infections, they were able to identify this illness as *tuspirina* and in only a few cases was this term used to identify other forms of

ARI. In other words the sensitivity and specificity of term use appeared to be high.

At the time of the study, three cases of pertussis were present in the local hospital and vaccination posters referring to pertussis, not *tuspirina*, were posted in community (*barangay*) health stations and the local clinic. When asked if *tuspirina* was preventable mothers stated that when there was an outbreak of this illness, it was useful to take children to the beach to expose them to sea air. In a context where a majority of mothers are literate and interested in children's health issues, is information on the timings of clinics enough? Might vaccination demand have been boosted considerably by drawing attention to *tuspirina*, even if the term might occasionally be applied to an illness which was not pertussis [62]?

A final issue pertains to what vaccinations are perceived to do irrespective of whether they are associated with specific illnesses or illness in general. Let me present some initial observations followed by a case study of measles in South India. While those in public health speak of vaccinations as *preventing* illness, local populations in many less developed countries perceive vaccinations to *protect* against serious illness [63]. This distinction involves more than semantics. Protection is perceived as relative and not absolute, time bound, and contingent upon factors over which humans have some, but not total control. Protection of children and pregnant women from malevolent forces is commonplace and vaccination in the minds of many is as much associated with the protection afforded by talismans as medicines [64]. Indeed, it could be argued that talismans constitute technical fixes of an indigenous science which is based upon assumptions about the nature of the cosmos which differ from our own. Given this scenario, vaccinations require a leap of faith and constitute magic from the vantage point of a population unfamiliar with germ theory. As Hsu observed some time ago, while the common man in America accepts magic if disguised as science, those in other cultures may be more likely to accept science if presented in relation to existing cultural frameworks which have explanatory power [65].

Vaccinations are comprehended in terms of indigenous knowledge systems. Imperato and Traore drew attention to this tendency two decades ago in their study of the Bambara of Mali [66]. The Bambara perceived vaccinations to be like amulets which needed to be renewed periodically [67]. Imperato and Traore emphasized that the Bambara's acceptance of vaccinations had little to do with an altered perception of illness causality. It was rather related to an extension of existing ideas about protection applied to biotechnology [68].

Both magic and medicine figure into cultural models employed to interpret technical fixes [69]. How does one explain the significance of the raised skin of a TB skin test? Does an Indian doctor's explanation that this is like a divination procedure

constitute a contentious spread of superstition, or is it a viable first-step approach to health education? Those who argue against 'unscientific explanations' in favor of vague educational messages need to reconsider their position in relation to how vague 'health education' messages are interpreted and what expectations they set up. Is leading a mother to believe that BCG will prevent her child from experiencing TB or vaguely telling her BCG is good for health truthful? Is it more or less truthful than telling her that BCG protects her child from suffering a severe case of TB, just as an amulet protects against spirit attack for some time [70]?

This raises the issue of whether people who do not subscribe to the doctrine of specific causality believe that specific illnesses can be prevented by vaccinations. African researchers have noted that not all mothers who accept vaccinations have faith in their power to prevent illness [71, 72]. Their reason for accepting vaccinations is related to a perception that they can reduce the severity of illness. Given the results of studies carried out by researchers such as Aaby in West Africa, the observations of these mothers may be correct [73]. Aaby has reported that children immunized with measles vaccine (even if under nine months) suffer milder cases of measles if the illness occurs, inferring that partial immunity is possible. Aaby notes that recognition that milder forms of illness occurs has led mothers in Guinea Bissau to perceive 'vaccine failure' (illness occurrence) as a visible demonstration of the vaccines' utility [74]. These women did not maintain an 'either or' assumption that vaccines either prevent disease or don't work.

To the best of my knowledge, the notion that vaccines reduce the severity of measles has not been part of any vaccination campaign in Asia, yet I have encountered the notion in India, Indonesia, and the Philippines. Let me consider the potential significance of working with this notion in the context of a more detailed discussion of measles in South Kanara District, Karnataka State, India. The data presented were collected during the spring of 1992 during the health behavior survey referred to above.

Measles: case study

Kora is a Kannada term encompassing measles as well as other diffuse skin rashes accompanied by fever [75]. As in other parts of India, *kora* is (a) linked to female deities (as well as wild *bhuta* spirits such as *Guliga*), (b) thought to especially trouble those whose body is rendered vulnerable by heat, and (c) known to be contagious [76]. It is recognized that *kora* can lead to serious sickness among some children. An even larger fear, however, is that if *kora* is not allowed to run its course it can become especially severe. For this reason, *kora* is not treated with strong medicines until the rash has completely come out expelling internal heat and toxins [77]. Informants stated that if this was not allowed to happen, the illness might act

like a "half wounded tiger" and attack with greater force. Other informants stated that the illness might remain latent in the body only to return intermittently over one's life course [78].

Several mothers expressed the idea that it was better for a child to get *kora* when young and be done with it [79]. Some believed that if small *kora* (small spots) were experienced then serious rashes and large pox diseases would not trouble the person later [80]. In 1991 a few cases of adult onset *kora* were reported in the community [81]. The suffering of these adults was referred to by several informants when stating why it was good to have *kora* when young.

How did these ideas influence perceptions of measles vaccinations? As noted, few informants in our survey mentioned measles (or a local name encompassing it) when asked to name illnesses protected against by vaccinations. When they were directly asked if there was a vaccination which protected children against *kora*, 49% reported that they had heard of such an injection [82]. When asked if they wished their children to receive it, however, only 6% replied yes, while 78% replied no, and 16% were unsure.

Follow-up interviews revealed that two distinct perceptions of measles vaccinations existed, the first more common than the second [83]. The first perception was that the vaccination offered protection to children, but left them vulnerable to *kora* after the age of 12–15. Even among mothers who thought *kora* could be prevented, some ventured the opinion that vaccinations did not work for all children. Several reported cases of children experiencing *kora* although vaccinated. Their observations could be related to any one of five possibilities: the child was immunized too early (under nine months), the vaccine was ineffective, the *kora* experienced was not measles, the vaccination received was not for measles but a different disease, or the child did in fact have a mild case of measles.

The second perception was that the vaccination reduced the severity of *kora*, but did not prevent it [84]. One informant who maintained this view expressed the opinion that measles vaccinations were more important to receive currently as a result of mobility. In times past, she argued, people traveled little but nowadays transportation was readily available and women commonly traveled with their young children to visit relatives, attend religious functions, and visit the town. Her reasoning was appreciated by another community member who commented that: "The mosquitoes in one's place trouble you less than the mosquitoes of another place. You are accustomed to your mosquitoes. When mosquitoes of other places bite, your skin swells up more than if you are bitten by a local mosquito. Like that, the *kora* one experiences at home can be tolerated, but vaccinations are needed so one can tolerate the *kora* of some other place."

Without knowledge of germs and the immune

system, this informant had grasped a principle concordant with biomedical thinking. Through observation and analogical reasoning, she presented a case for vaccinating children deemed credible by her two neighbors who previously expressed ambivalence about vaccinations.

CONCLUSION

In practice, populations frequently do not know why they are being immunized, what antigens are incorporated and what benefits this confers to them. The rush to increase coverage rates reduces the time available for communicating with the people about the values of immunization [85].

The missing ingredient among health workers is the gift of sensitivity and the process of sensitization. A person sensitized on the subject of immunization will say: "I understand the need for them, I want my children to have them, and I will bring them for you to administer the injections." In this way the request comes from the people, cooperation is assured, everyone is satisfied, and coverage is complete [86].

That a population is illiterate does not empower the state to push a vaccination or vasectomy program without ensuring that all information is available to participants [87].

The focus of this paper has been vaccination demand. Paying credence to studies which link demand to supply, timing, accessibility and convenience, I have called attention to two other factors. These factors are (a) trust associated with lay perceptions of the agenda of those advocating and administering vaccinations and (b) local interpretations of what vaccinations do and don't do [88]. I have argued on the basis of data presented in this and a previous paper that misconceptions about vaccinations are not only common, but have serious consequences [10]. The assumption that mothers who are non-acceptors of vaccinations (or identified as 'vaccination drop-outs') have lower levels of concern about their children's health has been questioned. To the contrary, I have argued that it is often health concerns which lead child caretakers to selectively use or turn down vaccination services available to them [89].

General messages about the purpose of vaccinations are interpreted in terms of local conceptual frameworks, when thought about at all. It is my impression that in most contexts vaccinations are not thought about very much. Vaccinations are accepted passively as a result of interactions with health care providers and because compliance is demanded by those in positions of power. Demand is often low, even among populations having impressive immunization rates. These rates often tell us more about the effectiveness of time and resource intensive programs than about the popularity of vaccinations. Given current budgetary constraints, it is unlikely that such expenditures may be sustained—a reality which makes it all the more important to consider community demand. Moreover, it has been pointed out that resentment and fear flourishes in a context of scarce resources where (a) vaccination programs are privileged above other health programs and (b) compli-

ance is mandated by the state with little perception of need by the local population.

When vaccinations are thought about by child caretakers, it is just as often in relation to the risk of vaccinations doing harm as the potential of vaccinations being beneficial. Concerns related to a child's current state of health commonly underlay missed vaccination opportunities. Moreover, as we have seen failure to take advantage of some vaccination services may reflect underlying health concerns. In several cultures, for example, measles is perceived to be a developmental milestone or a necessary illness preventing the onset of more serious forms of illness later in life.

Vaccination demand, when it does occur, is either triggered by (a) a general perception that vaccinations are good for infants' growth and health, and/or (b) a marked sense of vulnerability to serious illness—illness which may or may not be protected against by the vaccination sought. In the first scenario mothers may want a few but not necessarily all vaccinations advised by primary health care workers. If a child is healthy after receiving a few vaccinations perceived as similar in content and intent, then this number of vaccinations may be considered sufficient. Some mothers may consciously engage in self regulation by deciding how many vaccinations their child should receive. In most cases, however, it is likely that conscious decisions are not made. It is the mother's motivation for securing 'additional vaccinations' which wanes once the perceived benefit from vaccinations is realized.

In the second scenario, the factor driving demand is perceived vulnerability to serious illness. This may either take the form of concern about specific illnesses or involve a sense of general vulnerability associated with social and environmental change. With respect to specific illness(es), an important point raised in this paper is that lay populations have little idea what illnesses vaccinations protect against. This situation fosters unrealistic and often misguided expectations which in the short-term may increase demand, but in the long run result in the perception that vaccinations are not all that effective. Vulnerability may also be associated with change which renders a population at increased risk to serious illness or the perception that this will be the case. Mobility, the changing composition of communities, and exposure to others associated with the unknown lead to an increased sense of vulnerability. In this regard, the view of the Indian informant who spoke of other mosquitoes harming one more than those to which one is accustomed, warrants further consideration. This informant's perception of increased risk at once indexes fear of the 'other' as well as recognition that vaccinations are adaptive and protective. In this case, the informant viewed measles vaccination as useful, not as a protection against an illness which was culturally marked, but as a protection against serious illness which did not originate from her place. Measles vaccination

better enabled her to live in a changing world marked by social transformation by insuring that the *kora* her children experienced would not be very serious.

This Indian woman's comments made me think of attitudes toward vaccinations I have encountered in my own place, Southern Arizona—a region of the U.S. with very low (50%) vaccination rates for children not yet registered for school/preschool. On more than one occasion I have encountered mothers who have not deemed it essential to fully immunize their child prior to enrolling the child in a program which mandated vaccination. After all, I was told on one occasion, "the child was at home and not really at much risk" [90].

In the U.S., school is perceived as a space where children get ill more often because they are exposed to the germs of other children—"others" who may come from far off places and "even from the other side of the border." Public health messages which draw attention to vaccinating children prior to preschool/school may unintentionally reinforce this perception. For example, one mother I spoke to drew an analogy between an adult getting vaccinations before travelling to a foreign country and a child getting shots before going to school. An additional factor which may foster the perception that illnesses from foreign places are more dangerous than the illnesses of one's own place, is the naming of various types of 'flu' with exotic names designating foreign origins [91]. Demand for vaccination against these illnesses is often higher than demand for 'school shots.'

In light of this discussion, it might prove insightful to reexamine data on differential vaccination rates among migrant populations. For example, Raharjo and Corner found that in Sumatra, Javanese transmigrants were more positively disposed to receiving vaccinations than members of the local population, although they were not sure what illnesses the vaccinations received protected against [57]. Could differential perceptions of risk associated with moving to a new place and health concerns associated with mobility contribute to differences in vaccination demand? Or are such differences explained by other factors such as an immigrant group's desire to fit in and not anger government officials? What impact does an influx of foreign immigrants or foreign trade (such as that envisioned by the North American Free Trade Agreement) have on regional vaccination demand? These questions invite research attentive to social transformation.

Hirschhorn, Dunn and Claquin have suggested that it might be better to consider vaccination schedules to be less driven by biology and existing technology, and more responsive to regional disease patterns [92]. This raises several questions. Would an approach to vaccination education and service provision which builds upon local perceptions of illness vulnerability foster greater demand for vaccinations than programs which rely on political leverage and

the prodding of health staff to secure compliance [93]? Could vaccination demand be increased by raising community awareness of the burden of infectious disease through educational programs which begin by calling attention to familiar illnesses which are already a source of concern? Would education about the signs and symptoms, duration and severity, and cure and prevention of locally recognized illnesses increase vaccination demand? What other issues involving the household production of health increase demand? For example, in contexts where mothers work outside the home, might information on the number of work days generally lost caring for an ill child having measles or pertussis motivate caretakers?

Planners of health programs who are concerned about issues of vaccination demand and sustainability might profit from paying as much attention to the epidemiology of representations as the epidemiology of diseases [94]. Like infectious disease agents, ideas about illness and biotechnology are also contagious and transmitted from person to person at rates influenced by environmental and other 'ecological' factors [95]. Researchers such as Raharjo and Corner have suggested that the goal of demand creation for preventive health services is better served by social marketing than health education [57]. The former focuses on the creation of positive attitudes toward health behaviors and products, the latter on better cognitive understanding of these behaviors and products and why they are necessary. Referencing Coca-Cola as a model of marketing success and placing emphasis on product (vaccination campaign) image, they go on to suggest that health education is an inefficient strategy for demand creation. It is time that we critically examine such advice and consider the long- as well as short-term goals of public health [96].

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2. UNICEF. *The State of the World's Children*. UNICEF, New York, 1990.
3. Estimates of EPI coverage vary by method of measurement used—presence of immunization card in the house, or total number of unit doses reported to be administered nationally divided by the population of eligible children. The poorest immunization rates are for measles and tetanus. Measles claims some one and a half million lives a year. It is estimated that only 30% of mothers are immunized against tetanus globally and some three quarters of a million children die from neonatal tetanus a year.
4. At issue here is the occurrence of replacement mortality, that is when death of high risk children from one set of diseases is averted by immunizations only to have the children die from other illnesses in what Lincoln Chen (1986) has referred to as a context of chronic ill health. This possibility suggested by Mosley (1985) and Kasongo Project data (1981) which generated considerable debate as well as a series of studies focusing on the utility of immunizations. For a discussion of this literature and data which demonstrate that measles immunizations have long-term utility during childhood see Aaby

- (1991); Garenne and Aaby (1990); and Holt *et al.* (1990). Aaby has been vocal in criticizing the replacement death position. He points out that few community studies examine the total impact of health interventions. His data suggest that both children who have experienced measles and live, and children who have received measles vaccine, have lower mortality rates over time than those exposed to neither. Exposure to the illness or the vaccine, he speculates, may stimulate the immune system in some way. See Chen L. Primary health care in developing countries: overcoming operational, technical and social barriers. *Lancet* **8518(2)**, 1260, 1986. Mosley W. H. Will primary health care reduce infant and child mortality? A critique of some current strategies, with special reference to Africa and Asia. In *Health Policy, Social Policy and Mortality Prospects* (Edited by Vallin J. and Lopez A. D.), pp. 103–137. Ordina, Liege, 1985. Kasongo Project team, Influence of measles vaccination on survival patterns of 7–35 month old children in Kasongo, Zaire. *Lancet* **1**, 764, 1981. Holt E. A., Boulos R., Halsey N. A., Boulos L. M. and Boulos C. Childhood survival in Haiti: protective effect of measles vaccination. *Pediatrics* **85**, 188, 1990. Garenne M. and Aaby P. Pattern of exposure and measles mortality in Senegal. *J. Infect. Dis.* **132**, 531, 1990. Aaby P. Determinants of measles mortality: host or transmission factors? *Medical Virology* **10**, 83, 1991.
5. Hayden G. F., Sato P. A., Wright P. F. and Henderson R. H. Progress in worldwide control and elimination of disease through immunization. *J. Pediatr.* **114**, 520, 1989.
 6. Promises of one dose time-release super shots (nasal sprays, pills, etc.) which protect against EPI diseases and more loom on the horizon of the foreseeable future. Considerable research will be needed, however, to discover how many antigens a baby's immune system can handle at one time, such that one immune response does not wipe out another. (See Gibbons A. Children's vaccine initiative stumbles. *Science* **265**, 1376, 1994.) Until the efficacy and long-term effect of such technology is evaluated in less developed countries and research costs are paid for making such technology affordable, inhabitants of less developed countries will continue to be exposed to an increasing number of vaccinations. On the financial blocks impeding the progress of vaccine research see Cohen J. Bumps on the vaccine road. *Science* **265**, 1371, 1994. See for example Anderson N., Paredes S., Legorreta J. and Ledogar R. J. Who pays for measles? The economic arguments for sustained immunization. *Health Policy Planning* **7**, 352, 1992.
 7. I use the term 'community' in this paper as a heuristic device and recognize a tendency within international health and development to reify community as an entity which exists in its own right (Schwartz, 1981). As distinct from static structures defined by the state, communities are a fluid collectivity mobilized and defined in relation to sets of activities which bring together people having shared stakes and interests. My use of the term community does not suggest consensus or homogeneity beyond shared habitus (Bourdieu, 1977). See Schwartz N. Anthropological views of community and community development. *Human Organiz.* **40**, 313, 1981. Bourdieu P. *Outline of a Theory of Practice*. Cambridge University Press, Cambridge, 1977.
 8. Measles deaths are commonly associated with pneumonia and diarrhea. The anorexia which occurs during and following measles is a notable cause of malnutrition.
 9. The extent to which community trust of vaccination programs has been lowered by press coverage of ineffective vaccines and inappropriate storage is not dealt with in this paper and constitutes an area for future research. In need of study is not only the extent to which mistrust leads people to suspect that 'normal' side effects are signs of bad medicine, but the extent to which mistrust leads people to seek out vaccinations from the private sector.
 10. Nichter M. Vaccinations in South Asia: false expectations and commanding metaphors. In *Anthropology and Primary Health Care* (Edited by Coreil J. and Mull D.). Westwood Press, Connecticut, 1990. On the spread of conspiracy stories as a new form of folklore worthy of serious attention see Campion-Vincent. The baby parts story: a new Latin American legend. *Western Folklore* **49**, 9, 1990.
 11. On Muslim culture as pronatalist in ideology and politics see Mahadevan K. (Ed.) *Fertility and Morality: Theory, Methodology and Empirical Issues*, Chap. 8. Sage, Beverly Hills, 1986.
 12. Fears that vaccinations might be related to family planning efforts emerged during ethnographic interviews, but did not surface as responses to survey questions about vaccination demand. Notably, this perception was articulated by men and not women and did not appear to be widespread. My impression is that the fear is presently latent, but capable of capturing the popular imagination given the right set of conditions. One can only wonder what impact an injectable contraceptive might have on the EPI program given the memory of 'emergency' family planning excesses in India during the 1970s and present ethnic and religious tensions. On this note, it is worth mentioning that Talwar and associates (Talwar and Raghupathy, 1989) have been experimenting with an injectable contraceptive in India. Although this research has been reported in the press, and protested by women's health activists (*AIDS Weekly*, 1992), it is not widely known about. Rumors that such a vaccine exists may impact on EPI irrespective of whether the contraceptive vaccine is ever introduced. Vaccinations have been associated with family planning in countries other than India. Bastien (1989), for example, reports that Ammara peasants in Bolivia who have little idea what illnesses vaccinations protect against, fear vaccinations will cause them to be sterile. In the Philippines, pro-life activist groups have won a court order to suspend anti-tetanus vaccinations because they contain a minute amount of a hormone capable of causing an abortion. Talwar G. and Raghupathy R. Anti-fertility vaccines. *Vaccine* **7**, 97, 1989. Bastien J. Cultural perception of neonatal tetanus and program implications, Bolivia. Applied Anthropology Meetings, Santa Fe, New Mexico, 1989. *AIDS Weekly*. Activists protest proposed AIDS and contraceptive vaccines, p. 8, 20 April 1992.
 13. Members of this peri-urban community rarely utilized primary health care services and depended on private practitioners for their health care needs. They viewed vaccination surveillance with suspicion. While the government, in principle, supplied vaccines free of charge to private practitioners, the supply was erratic, many private practitioners did not request vaccines routinely, and there was poor follow up on the part of practitioners with respect to reminding mothers about vaccination schedules. Practitioners complained that mothers frequented more than one doctor, making it difficult for them to know what vaccinations a child had received. On the growing importance of private practitioners as providers of immunizations in India, see Duggal R. and Amin S. *Cost of Health Care: A Household Survey in an Indian District*. Foundation for Research in Community Health, Bombay, India, 1989. They report that 42% of children surveyed in Jalgaon District, Maharashtra, received their immunizations exclusively from private practitioners.
 14. The 'other' would be included in a global 'community' defined in relation to mutual desires as well as perceptions of risk and protection. Similarities may be drawn between missionary activities directed at clothing the

- natives for their own good (and good health) and attempts to penetrate the surface and vaccinate. Germane to this assessment are the deliberations of Comaroff and Comaroff (1992, Chap. 10) on the relationship of domestication and colonialism in Africa. See Comaroff J. and Comaroff J. *Ethnography and the Historical Imagination*. Westview, Boulder, CO, 1992.
15. An example of how deities are perceived to show their power through new disease patterns after biomedicine has controlled diseases traditionally associated with their power is provided by Egnor (1984). Egnor considers the fate of the smallpox goddess, once smallpox was controlled in Tamil Nadu, India. On the open ended way in which deities show their power in India see Nuckolls (1992). Egnor M. The changed mother or what the smallpox goddess did when there was no more smallpox. *Contribut. Asian Stud.* 18, 24, 1984. Nuckolls C. Divergent ontologies of suffering in South Asia. *Ethnology* 31, 57, 1992.
 16. Kyasanur forest disease was linked to the wrath of local deities (*bhuta*) as the result of both forest clearance and the failure to perform yearly rituals to these patron spirits. A vaccine to combat this deadly disease was promised in the press, but was not forthcoming. Nichter M. Of ticks, kings, spirits and the promise of vaccines. In *Paths to Asian Medical Systems* (Edited by Leslie C. and Young A.), pp. 224-556. Univ. of California Press, Berkeley, Calif., 1992.
 17. Scheper-Hughes N. and Lock M. M. The mindful body: a prolegomenon to future work in medical anthropology. *Med. Anthropol.* 6, 1, 1987.
 18. Turner B. *Medical Power and Social Knowledge*. Sage, London, 1987 and *Regulating Bodies*. Routledge, London, 1992.
 19. Such data would in any case be accessible from hundreds of thousands of Indians living abroad.
 20. Haraway explores the emergence of the immune system as a semiotic system, "an elaborate icon for principal systems of symbolic and material difference in late capitalism, a map drawn to guide recognition and misrecognition of self and other in the dialectics of Western politics" (1991, p. 204). See Haraway D. J. *Simians, Cyborgs and Women: The Reinvention of Nature*. Routledge, 1991. I would add that in the Indian context this imagery draws meaning from Brahmanic ideology about encoded body substance and fluid self construction which has influenced several healing traditions and influenced codes of conduct having to do with ritual purity, group identity, and boundaries. On this issue see Marriott (1976), Marriott and Inden (1977), and Daniel (1984). Daniel E. V. *Fluid Signs*. University of California Press, Berkeley, 1984. Marriott M. Interpreting Indian society: a monistic alternative to Dumont's dualism. *J. Asian Stud.* 36(3), 189, 1976. Marriott M. and Inden R. Toward an ethnosociology of South Asian caste systems: In *The New Wind: Changing Identities in South Asia* (Edited by Kenneth David). Mouton, Hague, 1977.
 21. AIDS has also been linked to the "ill effects" of too many foreign influences penetrating India's borders as a form of national encroachment. See Jayaramon K. Storm in India. In *Blaming Others: Prejudice, Race, and Worldwide AIDS* (Edited by Sobotier R.). New Society Publishers, Philadelphia, 1988.
 22. Haraway [20] points out that the trope of "space invasion" when coupled to the trope of "infection" evokes the important question of directionality: in which direction is the invasion? Is it the colonized who are perceived as the invader, or he who colonizes? Put less abstractly, when one travels across national borders one requires a series of vaccinations. How is this read? Do the vaccinations protect you from the other, or them from you?
 23. While it may be argued that some international agencies/groups have been overzealous in their efforts to promote vaccination programs without considering opportunity costs, it is somewhat misleading to suggest that there is a conspiracy to coerce foreign governments into accepting vaccination programs. For such an argument see Banerji D. Crash of the immunization program: consequences of a totalitarian approach. *Int. J. Hlth Services* 20, 501, 1990; Banerji D. Politics of immunization programme. *Economic and Political Weekly*. 7 April 1990. Incentives have been offered to countries which accept vaccination initiatives and provisions of U.S. aid have been tied to vaccination goals. At the same time, researchers in less developed countries associated with groups such as the International Network of Clinical Epidemiology (funded by the Rockefeller Foundation) have been encouraged to test the local effectiveness and efficiency of technological fixes including vaccines. Such groups are by no means rubber stamps for the positions of international agencies. They are not hapless victims of technocentric domination as recent local criticism of vitamin A programs attests. See Sadjimin T., Dabble N. and Kjolhede C. Impact of high dose vitamin A supplementation on inudemic and duration of episodes of diarrhea and ARI in preschool Indonesian children. *INCLIN Conf. Report*, Cairo, Egypt, 1993.
 24. Kunitz echoes this concern by drawing attention to the "seductiveness of an apparently democratic science which cures/protects everyone equally" while deflecting attention away from diseases as "signs of social and ecological settings negatively disposed toward human survival." Kunitz S. The value of particularism in the study of the cultural, social and behavioral determinants of mortality. *Health Transition Vol. II* (Edited by Caldwell J., Finley S., et al.), pp. 92-109, 1990.
 25. Other Indian scientists I have spoken to have questioned the importance of establishing herd immunity through vaccinations. Herd immunity to an infectious disease refers to the phenomena wherein a majority of the population is rendered immune thereby protecting those who are susceptible from acquiring the infection by making the transfer of infection less likely to occur across the population. These scientists questioned the ability to reach and sustain levels of vaccination sufficient to insure herd immunity given the size of India's population and social mobility. The extent to which immunity established by vaccinations achieved herd effect (compared to that established by natural disease) was also questioned, given that weak organisms are used in vaccines.
 26. Walsh J. and Warren K. Selective primary health care: an interim strategy for disease control in developing countries. *N. Eng. J. Med.* 301, 18, 1979.
 27. A distinction may be made here between a disease prevention model which views people in difficulty (at risk) as like children, an advocacy rights model wherein people are treated as citizens who contract the assistance of experts, and an empowerment model based upon decentralized problem solving and community diagnosis. On this distinction see Rappaport (1981) as well as the community participation literature. Rappaport J. In Praise of paradox: a social policy of empowerment over prevention. *Am. J. Commun. Psychol.* 9, 1, 1981. See also Rifkin S. and Walt G. Why health improves: defining the issues concerning "Comprehensive Primary Health Care." *Soc. Sci. Med.* 23, 559, 1986.
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- by Caldwell J., Findley S., *et al.*, pp. 628–643. Australia National University, Canberra, 1990.
29. Kutty V. R. Women's education and its influence on attitudes to aspects of child-care in a village community in Kerala. *Soc. Sci. Med.* **29**, 1299, 1989.
 30. High literacy rates and political will are held accountable for much of Kerala's success. See Franke and Chasin (1989, 1992) for a review of articles which speak to Kerala's more extensive health services and dedicated physicians and health workers who are directly responsible to a militant and informed public subject to left-wing radicalism. Kerala's public are more proactive in demanding better health facilities than are the public in other Indian states, an observation I have made over a 20 year period working in neighboring Karnataka State. I do question, however, the literature which suggests that there is high public demand for public health services. The ratio of doctors to population is higher in Kerala than anywhere else in India and a large majority of the public consult private rather than government physicians for most routine health complaints. What needs to be examined is whether existing immunization rates are linked to mothers' privately and voluntarily attending vaccination clinics, or whether this is the result of encouragement and follow-up by health workers or private doctors.
 31. Krishnan T. N. Health Statistics in Kerala State, India. In *Good Health at Low Cost* (Edited by Halstead S., Walsh J. and Warren K.). Rockefeller Foundation, New York, 1985.
 32. Kutty determined mothers' attitude toward vaccinations based upon 10 forced choice questions. While the utility of this method is open to question, the results of the study are suggestive [see ref. 29].
 33. On the basis of a 12 district all-India KAP survey of vaccination behavior, a team of marketing researchers estimated that roughly 20% of all respondents were positively predisposed to vaccinations and 5% negatively disposed. The large majority—75%—were passive in attitude, 50% being indifferent and fatalistic, and 25% aware of benefits, but without conviction (IMRB 1988, p. 90). See IMRB (Indian Market Research Bureau). Immunization: Knowledge, Attitudes and Practices. Final Report to UNICEF. UNICEF, New Delhi, 1988.
 34. For example, see Kulkarni's (1992) assessment of issues affecting vaccination program sustainability in India. Kulkarni M. Universal immunization programme in India: issues of sustainability. *Econ. Polit. Weekly* **17**, 1431, 1992.
 35. Boniar A., Rosenfield P. and Tengvald K. Medical technologies in developing countries: issues of technology development, transfer, diffusion and use. *Soc. Sci. Med.* **28**, 769, 1989.
 36. For example, Basu (1985), reviewing a wide range of health service research in India, concludes that reasons for failure to vaccinate entails (a) lack of awareness (20–44%), (b) timing inconvenience (9–29%), (c) the child not being well (16%), and (d) missed opportunities related to a reluctance among health workers to vaccinate mildly ill children (unspecified). Basu R. India's immunization programme. *World Health Forum* **6**, 35, 1985.
 37. At issue is which children's illnesses are perceived as aggravated by vaccinations. While the literature draws attention to fever, cough, and colds, I have encountered reluctance to receive vaccinations in South India associated with skin rashes, earache, and digestive complaints associated with excessive heat in the body.
 38. Nichter M. The Primary Health Center as a social system: PHC, social status, and the issue of team-work in South Asia. *Soc. Sci. Med.* **23**, 347, 1986.
 39. Kulkarni M. Universal immunization programme in India: issues of sustainability. *Econ. Polit. Weekly* **17**, 1431, 1992.
 40. For example, health social scientists at Gaja Madha University, Indonesia, have studied vaccination acceptance in terms of both the characteristics of mothers and children. Mothers who worked outside the home and were subject to more time constraints were found to have lower acceptance rates than those who worked only inside the home. Mothers who were active members of social groups were more likely to vaccinate their children than were mothers who did not belong to such groups (Kasniyah, 1993). The differences between acceptance of vaccinations among mothers who share common work-time constraints is not accounted for. Why did some mothers working outside the home seek vaccinations for their children while others did not? Moreover, why did group membership have a positive effect on vaccination acceptance? Was this related to social identity (an affiliation with development mandates or a sense of modernity) or was it the result of increased information on the purpose or timings of vaccinations? A second researcher (Zulaela, 1993) studied the influence of children's characteristics (sex and birth order) as well as family size and found no statistically significant differences. Notably, distance to the health center and the number of times a mother received information about vaccination schedules or clinic timings made little difference in terms of vaccination acceptance. What did make a difference was who told a mother to get her child vaccinated (health staff vs a cadre of community volunteers) and a mother's education, which may well have been a proxy for other variables. Kasniyah N. Socio-demographic determinants of non-use of measles immunization services among Javanese mothers. INCLEN Conf. Report, Cairo, 1993. Zulaela D. Factors related to children aged 12–51 months not being immunized against measles in Purworejo, Central Java, Indonesia. INCLEN Conf. Report, Cairo, Egypt, 1993.
 41. Ahluwalia I., Helgerson S. D. and Bia F. J. Immunization coverage of children in a semi-urban village Panchayat in Nepal, 1985. *Soc. Sci. Med.* **26**, 265, 1989.
 42. See for example Kasniyah N. Social psychological determinants of Javanese mothers failure to immunize their children against measles. Unpublished Master's thesis. Centre for Clinical Epidemiology and Biostatistics, University of Newcastle, N.S.W., Australia.
 43. Needed are positive deviance studies which attend to why some people seek out vaccinations when a majority of their peers do not deem it worth their inconvenience.
 44. I have placed emphasis on the impact of culture on vaccination demand as distinct from an examination of cultural barriers to vaccination programs. The former draws attention to factors which have a positive as well as a negative influence on vaccination acceptance. Examined are factors which lead people to seek out vaccinations, not merely accept them passively. Cultural barrier research typically identifies factors which interfere with program operations.
 45. Vaccination acceptance rates near health posts are not necessarily high. For example, Malison *et al.* report that in Uganda health workers were surprised to find that only one third of children aged one to four and one fifth of children under one were fully vaccinated despite easy access to vaccines. Malison M. D., Sekeito P., Henderson P. L., Hawkins R. V., Okware S. I. and Jones T. S. Estimating health service utilization, immunization coverage, and childhood mortality: a new approach in Uganda. *Bull. WHO* **65**, 325, 1987.
 46. Ciardi P. Qualitative survey of utilization of health sciences, participation and health needs in Burkina Faso's rural communities. World Bank Report, Washington D.C., 1993.

47. Hanlon P., Byass P., Yamuah M., Hayes R., Bennett S. and M'Boge B. H. Factors influencing vaccination compliance in peri-urban Gambian children. *J. Trop. Med. Hygiene* 91, 29, 1988.
48. Arthur P. Evolution of the expanded programme of immunization in Kassena-Nankana district, upper east region, Ghana. Unpublished Report London School of Hygiene, 1991.
49. Coreil J., Augustin A. *et al.* Use of ethnographic research for instrument development in a case-control study of immunization use in Haiti. *Int. J. Epidemiol.* 18, 901, 1989.
50. Bonilla J., Gamarra J. and Booth E. Bridging the communication gap: how mothers in Honduras perceive immunization. *Assignment Children* 69, 443, 1985.
51. Streatfield K. and Singarimbun M. Social factors affecting use of immunization in Indonesia. *Soc. Sci. Med.* 27, 1237, 1988.
52. Cutts F., Rodrigues L., Colombo S. and Bennett S. Evaluation of factors influencing vaccine uptake in Mozambique. *Int. J. Epidemiol.* 18, 427, 1989.
53. Friede A., Waternaux C. *et al.* An epidemiological assessment of immunization programme participation in the Philippines. *Int. J. Epidemiol.* 14, 135, 1985.
54. The all-India IMRB KAP survey reported that among those who were aware of "preventable injections" 35% did not know that different injections were associated with different types of diseases. Respondents "expected the preventive injections to protect against a wide range of diseases (diarrhoea, dysentery, vomiting, fever, pneumonia, malaria, cough, and cold)" (1988, p. 66). See IMRB (Indian Market Research Bureau) Immunization: Knowledge, Attitudes and Practices. Final Report to UNICEF. UNICEF. New Delhi, 1988.
55. However, when these mothers were probed about measles vaccinations, several reported hearing of them. These data are discussed subsequently.
56. The IMRB [53] study recorded an impression that if a mother has had no trouble during pregnancy, she did not require a tetanus toxoid (TT) vaccination. In South Kanara, the injection was associated with toxins which enter the body with a wound or build up in the body during pregnancy especially if the wrong foodstuffs are consumed. Swelling of the legs and wounds not healing promptly were associated with these toxins (*nanju*). Not all women were perceived to suffer these problems.
57. Raharyo Y. and Corner L. Cultural attitudes to health and sickness in public health programs: a demand-creation approach using data from West Ocheh, Indonesia. *Health Transition* 2, 522, 1990.
58. The prevalence of this perception is unknown and constitutes an area for further research.
59. See Hardon A. *Confronting Ill Health: Medicines, Self-Care and the Poor in Manila*. Health Action Information Network, Quezon City, 1991. See Tan M. Traditional or transitional medical systems? Pharmacotherapy as a case for analysis. *Soc. Sci. Med.* 29, 301, 1989.
60. Before use of local terms may be considered in EPI education programs, the sensitivity and specificity of terms (in an epidemiological sense) needs to be established. See Nichter M. Diarrhea and dysentery: using social science research to improve the quality of epidemiological studies, interventions and evaluations of impact. *Rev. infect. Dis.* 13(S4), 265, 1991. Nichter M. Social science lessons from diarrhea research and their application to ARI. *Human Organiz.* 52, 53, 1993. This requires taxonomic as well as taskonomic assessment of term use and sensitivity to intracultural variation. The latter does not necessarily preclude local term use in health education. Specificity of term use may be enhanced in an environment where term ambiguity is high. See Nichter M. *Anthropology and International Health: South Asian Case Studies*. Kluwer Press, Dordrecht, 1989.
61. On local terms for pertussis encompassing other forms of ARI of long duration in India, see IMRB (1988) [53]. See Nichter M. and Nichter M. Acute Respiratory Illness: popular health culture and mothers knowledge in the Philippines. *Med. Anthropol.* 15, 353, 1994.
62. In my earlier article I noted a similar case in North Kanara District, Karnataka State, India. Once the community found out that whooping cough (*nayi kemmu*) could be prevented, the local primary health care worker was scolded for not informing the community. In the Philippine case, school teachers and mothers alike showed great interest in a vaccination for *tuspirina*.
63. Prevention and cure are often confused. See Adekunle L. Child immunization—what are the impediments for reaching desired goals in a transitional society? *Soc. Sci. Med.* 12, 353, 1978, Nichter M. Toward a "People Near" primitive health within primary health care. *Proc. First Int. Symp. Publ. Hlth in Asia and the Pacific Basin*. Honolulu School of Public Health, University of Hawaii, 1984. Prevention can mean preventing an illness from occurring (protection) or preventing it from manifesting or becoming worse. See also Ciardi (1993) who cites the work of Jaffre in stating that in Burkina-Faso, prevention is equated with protection. Ciardi P. Qualitative Survey of Utilization of Health Sciences, Participation and Health Needs in Burkina Faso's Rural Communities. World Bank Report, Washington D.C., 1993.
64. In South Kanara, for example, both talismans and vaccinations are perceived to provide the user a protective fence (*bund*) which limits the entry of malevolent agents. Stronger fences are needed against more powerful agents of destruction, and like fences, talismans need to be periodically repaired—replaced as a result of environmental damage (e.g. exposure to an eclipse or source of impurity). While vaccinations were not presented by primary health workers as requiring renewal, they were perceived by many as having a time limited effect.
65. Hsu F. L. A Cholera Epidemic in a Chinese Town. In *Health, Culture, and Community* (Edited by Benjamin Paul), pp. 135–154. Russell Sage Foundation, New York, 1955. Hsu describes how cholera vaccinations may be used for magical purposes to reduce anxiety at times of cholera epidemics. For another example of how science is used as magic (in a Malinoskian sense) see McCombie S. The cultural impact of the "AIDS Test": the American experience. *Soc. Sci. Med.* 23, 455, 1986.
66. Imperato P. and Traore D. Traditional beliefs about measles and its treatment among the Bambara of Mali. *Trop. Geograph. Med.* 21, 62, 1969.
67. The Bambara perceived a vaccination to be an amulet which works where Koranic charms and diviners' incantations have failed. Just as amulets need to be renewed, so vaccinations were perceived as time bound. In the case of measles, it was believed that this illness could affect one several times. For this reason the demand for revaccination could lead to problems of overuse.
68. An example of how vaccinations are interpreted within local conceptual frameworks is provided by Mull, Anderson and Mull. Virtually all mothers surveyed in the Hindu Kush region of Pakistan reported that vaccinations could prevent or cure *khudakan*, an illness associated with neonatal tetanus. Vaccinations were popular despite the fact that the illness was believed to be caused by spirits. One reason the vaccination was accepted was because it was administered to mothers for the health of children. According to indigenous belief, this spirit linked illness is passed on from mother to child. Vaccinations offered protection in a manner which was an extension of existing health belief and

- practices. See Mull D. S., Anderson J. W. and Mull J. D. Cow dung, rock salt, and medical innovation in the Hindu Kush of Pakistan: the cultural transformation of neonatal tetanus and iodine deficiency disease. *Soc. Sci. Med.* **30**, 675, 1990.
69. On the similarities between diagnosis and divination and the need for a broader appreciation of magic see Jules-Rosette (1978), and O'Keefe (1982). Jules-Rosette B. The veil of objectivity: prophecy, divination and social inquiry. *Am. Anthropol.* **80**, 549, 1978. O'Keefe D. *Stolen Lightning: The Social Theory of Magic*. Vintage, New York, 1982. On the importance of appreciating analogic forms of thought as they are applied in development contexts, see Nichter (1989) Chap. 11 [61] and Fuglesang A. The myth of the people's ignorance. *Development Dialogue* Nos 1–2, pp. 42–62. Dag Hammarskjöld Foundation, Uppsala, 1984. On local interpretation of biomedical resources and indigenous criteria of efficacy see Etkin N., Ross P. and Muazzamu I. The indigenization of pharmaceuticals: therapeutic transitions in rural Hausaland. *Soc. Sci. Med.* **30**, 919, 1990.
 70. The association between talismans and vaccinations has been exploited in a Sri Lankan health education program. An analogical approach to vaccination education was piloted by a member of the Health Education Bureau of the Ministry of Health (Mr B. A. Ranaverra). Each type of vaccination offered to children under five was compared to one of five symbolic weapons displayed on a popular amulet. At a recent meeting with my former colleague in 1992, I was informed that this education approach proved to be successful. An image of an amulet had been used on a national vaccination poster.
 71. Arthur P. Evolution of the expanded programme of immunization in Kassena-Nankana District, upper east region, Ghana. Unpublished Report London School of Hygiene, 1991.
 72. Odebiyi I. and Ekong S. C. Mother's concept of measles and attitudes towards the measles vaccine in Ile-Ife, Nigeria. *J. Epidemiol. Community Hlth* **36**, 209, 1982.
 73. See Aaby P. Determinants of measles mortality: host or transmission factors? *Med. Virol.* **10**, 83, 1991; Aaby P., Pedersen I. R., Knudsen K., da Silva M. C., Mordhorst H. C., Helm-Petersen N. C., Hansen B. S., Thårup J., Poulsen A., Sodemann M. and Jakobsen M. Child mortality related to seroconversion or lack of seroconversion after measles vaccination. *Pediat. infect. Dis. J.* **67**, 443, 1989.
 74. Aaby *et al.* note that 95% of mothers of children who experienced measles after being vaccinated went on to vaccinate their next child, a rate significantly higher than the general population. Aaby P., Bukh J., Leerhoy J., Lisse I. M., Mordhorst C. H. and Pedersen I. R. Vaccinated children get milder measles infection: a community study from Guinea-Bissau. *J. infect. Dis.* **154**, 858, 1986.
 75. Some informants spoke of different types of *kora* distinguishable by the size of spots. *Ame kora* is a term used to refer to the rash some infants experience soon after birth. This rash is deemed a good sign that excess heat and poison are leaving the body.
 76. Asked why *kora* troubled some people and not others during an epidemic, I was told that many people experienced *kora*, but did not know it. The illness only manifested if the person was weak or their body became hot. Twenty years ago when I first conducted fieldwork in this area of India, fevers which occurred during summer season were not treated for three days to make sure the illness was not *kora*. Nowadays there is a propensity to treat any fever as soon as it is noticed.
 77. Medicines are taken to assist the rash come out and to reduce other symptoms. Such medicines are known as *shamana* medicines which assist the body, but do not interfere with (or control) the illness process.
 78. The concept of latent illness is not limited to pox diseases in South Kanara. For example, see a discussion of *krani* and *tamare* (illness associated with states of malnutrition) in Nichter 1989 (Chap. five [61]). Research is needed on how perceptions of latency impact on health care behavior over time as well as in relation to an understanding of lay perceptions of vulnerability. Critics of vaccination programs in the West have also focused attention on the possibility that "artificial immunity" might "drive the disease deeper into the body where it might later manifest in more dangerous and disabling ways" (James 1988, p. 33). James W. *Immunitization: The Reality Behind the Myth*. Bergin and Garvey, New York, 1988.
 79. A few mothers spoke of a child getting fat after measles as the illness was thought to purge the body of impurities which would impede the digestive process.
 80. In the local language of illness, the names of pox illnesses are not directly referred to for fear of calling them into presence. To convey the idea that experiencing *kora* would prevent other pox illnesses, the Tulu phrase *malla borugi* (big not falling) was used.
 81. Of three cases of adult onset *kora* seen by a local doctor, only one was measles. One of the other two cases was chickenpox. Chickenpox, an illness which affects older children in less developed countries (around years 10–12), is uncommon in South India for some unknown reason. When adults visit North India they often contract this disease. A popular ayurvedic practitioner linked the "outbreak of *kora*" with *amlapitta*, a condition characterized by excess heat and poor digestion. This was associated with increased use of chemical fertilizer and insecticide. Juxtaposed to the public health idea that failure to maximize biotechnology (vaccinations) resulted in measles was his idea that biotechnology (chemicals) fostered the epidemic.
 82. A few mothers believed that *kora* was protected against by "DPT." One mother noted that she gave her child only two doses of DPT as she was afraid that three doses would suppress *kora* to the point that it would remain latent in the body causing intermittent skin rashes (*kajji*). Two doses, she believed, would lessen the severity of the illness, plus the child would get the illness only once. She also believed that DPT protected against "all sudden sicknesses."
 83. Two distinct perceptions of the effect of vaccinations were framed around the concepts of *sthambhana* and *upasamana*—denoting total protection and protection which minimizes a problem's severity.
 84. The impression that measles vaccinations renders the illness less severe was also encountered in Java. Remaining to be studied is whether acceptance/demand of measles vaccination is greater among those who think it (a) prevents measles or (b) reduces its severity. Consideration also needs to be given to whether "reduction of severity" is perceived as interfering with the illness process.
 85. Nabarro D. After 1990: The Politics of EPI. Paper presented at the 15th NCIH International Health Conference, 19–22 May 1988.
 86. Lankester T. E. Health for the people or cash for the clever? *Br. Med. J.* **293**, 324, 1986.
 87. Das Veena. What do we mean by health. *Health Transition Vol. II* (Edited by Caldwell J., Fendle S., *et al.*), pp. 27–46. Australia National University, Canberra, 1990.
 88. Trust of the motives of those advocating and administering vaccinations has been addressed in this paper. Trust of the skills of those administering vaccinations has been addressed in Nichter (1990) [10].
 89. I am not saying that selective neglect in the form of

- non-acceptance or late and incomplete use of vaccinations does not occur. My point is that health concerns based on cultural reasoning and communication underdevelopment lead some people who maximize other preventive health measures to use vaccinations cautiously.
90. This perception emerged during exploratory interviews directed toward factors which motivate people to get vaccinations. Information generated by this question frame may differ from that produced by interviews which focus on why child caretakers had not sought out vaccinations for their children in a timely manner. The latter frame is more commonly reported in the literature and may cause informants to be defensive.
 91. History is rife with examples of how such thinking has served the cause of racism, especially when epidemics have emerged. It is diseases of foreign origin which are perceived to be especially dangerous.
 92. This quote is taken from Nabarro [86]. Nabarro goes on to suggest that of the six antigens regularly offered through EPI, "only measles—and perhaps polio—can be considered to have major public health importance in most societies." See Hirschhorn N., Dunn C. and Claquin P. Universal childhood immunization: issues and obstacles. Unpublished Discussion Paper, Resources for Child Health, John Snow Inc., Arlington, VA, 1986.
 93. Vaccinations of children in the U.S. is largely achieved by state coercion—children not being allowed to enter school until they are fully vaccinated. The degree to which state coercion translates into citizen demand and perception of need may be ascertained by a more careful look at vaccination statistics. Approximately half of U.S. children are not fully vaccinated before the age of three, the stage of life when they most need the protection. Community surveys in Arizona suggest the public has poor knowledge of what diseases specific vaccinations protect against. While the press plays up clinic accessibility and cost as reducing vaccination rates, demand factors are relatively unexplored.
 94. Sperber D. Anthropology and psychology: toward an epidemiology of representations. *MAN* 29, 73, 1985.
 95. Bateson G. *Steps to an Ecology of the Mind*. Ballantine Books, New York, 1972.
 96. I am not suggesting that social marketing has no important role to play in promoting health resources and concepts. Market segmentation, product positioning and placement, attention to imagery, and the creation of a sense of what is normative and valued behavior are important lessons to be learned from marketing. What is questioned is an approach which 'short changes' local populations by selling instead of educating. Vaccinations are not Coca-Cola and the goals of business and public health are not identical. There is a difference between citizens and consumers. Social marketing typically attends to one target at a time and measures success by increases in product use or message retention. The impact of marketing campaigns on coexisting health practices and conceptualizations of health and illness is overlooked. Apparent marketing success may deflect attention away from unintended negative outcomes. For example, Wyatt (1992) discusses how the symbol of the syringe commonly used in the promotion of vaccinations has contributed to a false impression that injections enhance health. Wyatt notes that up to 150,000 cases of paralytic polio a year may be associated with unnecessary injections in India alone. Approaches to the marketing of vaccinations need to be more broadly contextualized and responsible. If syringes are utilized as a powerful well recognized symbol in vaccination messages, Wyatt suggests that the message advanced should index the dangers of injecting young children. Wyatt raises the thorny issue of how appropriate vaccination behavior may be advocated in a context where considerable inappropriate behavior and mixed messages already exist. Wyatt H. V. Mothers, injections and poliomyelitis. *Soc. Sci. Med.* 35, 795, 1992.