

1979

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By Robert W. Morgan

W.P. No. 11

African Studies Center

1979

**WORKING PAPERS
NO. 11
AFRICAN STUDIES CENTER**

Boston University
10 Lenox Street
Boston, MA 02146

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Introduction

This paper examines the question of how African societies view conditions which Western society calls "disease," and how Africans respond to Western-oriented medical efforts to deal with "disease." This paper is based on data obtained before and during an international smallpox vaccination campaign in West Africa, among husbands and senior wives in a random sample of households. All of the data were obtained in metropolitan Lagos, and the analysis focuses on members of the large Yoruba tribe who comprised 81 percent of the sample.

It is recognized that an urban sample cannot be considered characteristic of either African or Yoruba society. At the same time, Lagos is regarded as peculiarly intensive in blend of African and Western influences (see especially Mabogunje, 1968), and the analysis also focuses on this aspect and derives special interest because of this concentration of social forces in one compact geographical area.

Sopono

In traditional Yoruba society, one of the most feared Orisas or major deities has been Sopono, a god who is viewed as expressing the wrath on earth of the supreme creator, who is associated with fever and delirium, with malignant skin ailments, and especially with the dreaded and often fatal affliction, smallpox.

Smallpox is an unpleasant subject, and perhaps because of this, relatively little has been written about Sopono in comparison with the other major Yoruba Orisas. As almost any visitor to southwestern

Nigeria knows, Sopono is spoken of in hushed terms or not at all, or by indirection, the god being called Baba, or "Father;" Oluwa, "The Lord of the Earth;" Olode, "The Lord of the Open;" or similar terms. In one of the most extensive accounts of Sopono in the literature, Idowu speaks of Yoruba who throw water from inside the house as saying, "Excuse me, Olode," and when they gather to dance, of seeking permission from Olode, and he relates this to respect for Sopono (Idowu, 1962: 95-97).

Almost all of the sources refer to Sopono as one of the five or six universal Orisas, from among the hundreds, many of them local, in Yoruba oral tradition. And just as the oral accounts differ from place to place, so the literary sources differ. It appears that Sopono is an ancestor, one of the earliest in the origins of the tribe, described by some of the respondents in the Lagos survey as having come from the north and of being related to the Tapa cult or the Igunnuko cult among the Nupe tribe to the north. Idowu traces Sopono further north to the Hausa and ultimately to Islam, and Lucas (1948) suggests a connection with Egypt. Whatever the origin, the important thing is that Sopono like all the ancestors is very much present in Yoruba life today, and just as many of the conditions known as "disease" are viewed by the Yoruba as affronts against the Orisas or the ancestors, so an affront against Sopono may bring the god's wrath in the form of smallpox.

"Smallpox is not considered a disease, but a punishment by Shopona," writes Bascom (1969). Respondents in the Lagos survey also attribute the disease to affronts against the followers of Sopono, described variously as worshippers or members of the Sopono

Cult. The deity "was supposed to be responsible for infecting people with smallpox when not adequately appeased," writes Ojo (1966). Furthermore, the vengeance of the god is supposed to be accepted, not with resignation alone, but with manifest gratitude. Relatives "must put on a festive and cheerful appearance and show that they are happily thankful for what the 'king' has done for them! If not, they are asking for more of the 'king's' scourge!" (Idowu, 1962). Nor is the wrath of the god reserved for persons committing what might be considered as major offenses, for example those discovered with poisonous medicines in the house. Those who whistle or laugh at him (Bascom, 1969: 91-92), who wear red, his color (Idowu, 1962), or who appear to mimic him, are subject to the disease. Some of the oral legends depict Sopono as extremely sensitive, Lucas relating the myth in which the god, when old and limping with a stick, attempted to join a dance and fell. "All the gods and goddesses thereupon burst out laughing, and Shankpanna in revenge strove to infect them with smallpox." But he was driven away instead, and from that day "he became an outcast, who has lived since in desolate and uninhabited tracts of the country" (Lucas, 1948: 112). For reasons such as these, perhaps, respondents are extremely reluctant even to discuss the god, and lower their voices when they do.

The most publicized aspect of Sopono, in the literature and in popular image, is the activities of his followers in allegedly spreading the disease. All of the literary sources describe in lurid detail the collecting of bodies of smallpox victims, since relatives are required to surrender them to members of the cult, and the preparation of lethal powders or fluids from the infected .

scabs which are scraped from the bodies, in order to spread the fear and power of the cult. Only Bascom denies that such activity takes place, though noting that the British colonial government outlawed the cult. Idowu describes the activities of "a very proficient undertaker," during one of the frightful smallpox epidemics of the past, who was revealed after some time to be hanging corpses from trees and collecting the infected fluids which fell from the bodies in large pots. According to the harshest reports, the cult demands what amounts to "protection" money from the families of the victims, and if this is not forthcoming, uses the infected substances to spread the disease. During an interview in Lagos, the Eletu Odibo (traditional prime minister of the Oba, or king) stated that "wicked people use the dried scabs of victims to spread the illness. People believe the cult controls the spirit -- probably 90 percent of the people believe this." He said several branches of the cult were extremely active in Lagos, that families might not know if one of their number was a member of the cult since such activities were a secret, and that no evil stigma attached to such behavior.

Whatever the strengths or weaknesses of the Sopono cult, or what the Western mind might call its good or bad points, it does appear that the followers of the god as well as members of traditional Yoruba society did have an appreciation of the communicable nature of smallpox, even if they did not recognize the physiological manifestations of the disease. Bodies of the victims were not buried in the home or other customary place, but were claimed by cult members and taken into the bush or some other remote place for burial. The Sopono priests also claimed the clothing and other

belongings of departed victims, and frequently ordered the patient's room swept out with a special broom.

Possibly because of the increased blowing about of infected dust, smallpox was recognized as being more prevalent during the dry season, and a number of preventive or cautionary behavior patterns arose in response to Sopono. The god was thought to dwell in the deepest forests during the rains, but to come near to the towns during the dry season, to prowl in the hot sun, and to seek shelter in the shade of certain trees (Bascom, 1969; Idowu, 1962). These locations were therefore to be avoided. During the dry season, the god was also said to go about at night, often with a barking dog, and to be attracted by music, dancing and drumming. He was angered by the burning of corncobs, benniseed, or palm kernel oil which were tabooed, and the house was not to be swept with a certain type of palm leaf, because this was his symbol (Bascom, 1969). Whistling attracted the spirit, but cigarette or pipe smoke drove him away. All of these chance encounters were less serious however, and the patient, if he contracted the disease, had a reasonable expectation of recovery. Should one's enemy contract with the cult to infect one with the disease, however, then the outcome was always fatal.

The Vaccination Program

It was with this background that the Nigerian Federal Ministry of Health confronted the problem of attempting to vaccinate every person in Africa's largest country against smallpox. The program, as readers are probably aware, was part of a twenty nation effort in West Africa conducted during the later 1960s in association with the United States AID program. Based on projections from the 1952

and 1963 censuses, both of which had been called into doubt for one reason or another, the population of Nigeria was estimated at the time to be around 55 to 65 million persons, of whom the Yoruba comprised over 11 million, or about 20 percent (Olusanya, 1973). Like the Yoruba, however, most other Nigerian societies are described in the literature as regarding smallpox as a supernatural rather than physiological force. We have seen that Sopono has been traced to the Nupe and the Hausa and ultimately to Islam in the north. The Hausa, for example, are said to wash the ink from Arabic writing, usually a sacred passage from the Koran, into a solution mixed with onion, and drink this as protection (Eleto Odibo, interview). In the east, the Ibos refer to smallpox as a "flying sickness" that enters the villages as a result of unfriendly spirits who must be satisfied via periodic rituals and sacrifices, and the Ibos place a screen of palm leaves at the entrances to villages or compounds to prevent the entry of smallpox (Basden, 1966: 50, 58, 148, 408). It is interesting that among the Yoruba, palm leaves are regarded as Sopono's symbol and are to be avoided, whereas among the Ibo they ward off smallpox. The Hausas further regard smallpox as a dry season occurrence, caused by the supreme creator rather than a lesser god, and spread the breath of an infected person rather than by the activities of a cult. (Chief Dogon Kede, Hausa community in Agege). The point to be made here is that all of these interpretations point to a supernatural rather than physiological basis for smallpox, and raise the question as to how vaccination, which is regarded in Western medicine as a physiological treatment, would be viewed by the Nigerian population.

The Ministry of Health had precedents to arouse its concern.

In the eastern Nigerian community of Calabar, Hope Waddell (1863) wrote:

Vaccination for the smallpox had been more than once attempted in vain. The people knew and dreaded the disease.... When the king and his household, seventy-two in all, were vaccinated, the other gentlemen of the town followed his example. Was it owing to fear or respect that they waited for him? He said the former, they the latter. His confidence certainly confirmed theirs; for it was a new thing, and the very name of smallpox infection was enough to alarm them.

It is of course well known that throughout Africa, "injections" of every type have become enormously popular. Western-trained physicians often are required to give them to patients as a matter of routine, even when they are not considered necessary. Efforts in Nigeria to ban injections at government hospitals except where medically indicated have met with patient revolts and failure. "Injections" are sold in the public markets, by persons claiming to be medical practitioners of some kind or other, or sometimes by persons claiming simply to give injections. Government efforts to prohibit what the Nigerian press calls "the injection artists" have not always been successful. Deaths in the markets after injections have often been reported in the Nigerian press. Reasons for the popularity of the injections are not well known. They appear to be demanded and given without reference to any specific condition or disease. In Nigeria, one often hears that they are popular because of the highly successful yaws eradication campaign earlier this century, which is credited with eradicating a sickness previously considered widespread and unavoidable. But yaws did not occur in other areas of Africa where the injection has become similarly popular.

In any event, given this background, one might say that the Nigerian Federal Ministry of Health should not have been worried about the probability of success of its forthcoming vaccination campaign. But the Ministry of Health was worried. In a way, the Ministry was stepping into uncharted waters, in a highly important enterprise that would also be highly visible in international medical circles, and probably also in international circles generally. In welcoming United States physicians and epidemiologists who had come to assist in the vaccination campaign, the Principal Medical Officer, the late Dr. G.A. Ademola, cited what he called witchcraft beliefs as a possible obstacle to the success of the program, and he added that these beliefs were prevalent in the rural areas of Nigeria, "and might even be found in Lagos."

Because three areas in Lagos, and what was then Western Nigeria, all predominately Yoruba in population, were among the seven sections of Nigeria chosen for pilot vaccination programs, Dr. Ademola asked the Department of Community Health of the University of Lagos College of Medicine to conduct an attitude survey in a random sample of the Lagos metropolitan population, to determine what proportion of the population would come to be vaccinated, and what obstacles to vaccination might be found. (The Department of Community Health was conducting an extensive random sample sociodemographic and medical survey in the metropolitan area, including several peripheral villages. Known as the Lagos Family Health Project, the research activity program was being carried out jointly by the College of Medicine and the Department of International Health, Johns Hopkins School of Hygiene and Public Health, and was supported by the Ford Foundation. The author of this paper was principal investigator of the research portion of the project.)

9

In the former Federal Territory of Lagos, the central city area comprising about twenty-seven miles, immunization against smallpox has, in theory at least, been compulsory for all residents since the nineteenth century, and during 1965 as an example, over 350,000 vaccinations were performed in this area (that is, prior to the international campaign which began in 1967). Elsewhere in Nigeria, however, vaccination was irregular, migrations in and out of Lagos were extensive, and the metropolitan area itself extended into numerous contiguous or adjacent towns or villages. Within the Federal Territory, 250 cases of smallpox were reported during 1964 and 1965. In what was then Western Nigeria, 868 cases of smallpox were reported, with 107 deaths, during this same period immediately prior to the mass vaccination campaign (memos from Dr. E. Ademola Smith, Medical Epidemiologist, United States Public Health Service, December, 1966). As previously noted, the Sopono cult was reported to be active in a number of sections of Lagos, and it was with this background that the attitude study began.

Lagos Attitudes Toward Smallpox

The Lagos Family Health Project sample consisted of thirty population blocks, randomly chosen on the basis of population densities as shown in the 1963 census and so as to be representative of most major sections of the city. Each block contained between 400 and 500 persons and was defined according to more or less permanent geographical features such as streets, walls, streams, etc. Thirty interviewers were trained for the project, most of them having a background of an incomplete secondary education and several years work experience, such as selling or teaching. All spoke Yoruba,

English, and Pidgin English, and all respondents in the attitude study spoke one of these three languages, usually Yoruba or Pidgin. Eighteen of the interviewers were Yoruba, six were Ibo, five were from various Mid-Western Nigerian tribes, one was Efik. Twenty were male and ten female. All were recruited for the continuing demographic study and had developed good rapport with respondents in their sample blocks. Three spoke Hausa.

When the Ministry made its request for an attitude study, time was short before the vaccination program's first pilot program was to begin in Lagos, and some short cuts were taken in the sampling. From the 3,500 or so regular households in the sample, we would normally have drawn a true random selection of adults to be interviewed. In this case, interviewers were asked to select either a husband or senior wife, one or the other from each household in the sample blocks, and to interview as many respondents in these categories as they could find at home in the time allowed. A total of 1,849 persons were interviewed, including 1,017 husbands and 832 senior wives.

The interview schedules were designed by the project staff and the interviewers, translated into Yoruba and Pidgin, and pretested in a village outside Lagos. Respondents were shown photographs of smallpox patients, and the first five questions, open-ended with probes, were designed to find out whether respondents were in fact oriented to this particular condition or illness and whether they believed that they had the condition, whether they had been vaccinated previously, and at what ages these events had occurred. There followed twenty-one questions designed to determine how persons viewed smallpox, what causes and preventive measures they perceived,

and, for those who mentioned the existence of a smallpox cult, what ideas they had about the existence of such a body. Another eleven questions were asked about attitudes toward vaccination and its effectiveness, whether respondents had heard about the forthcoming government program, whether they planned to take part, and whether they thought most other persons in their community would take part.

Among the respondents, 80.9 percent were Yoruba, 8.0 percent Ibo, 4.9 percent Edo or other Mid-Western groups, 3.1 percent Hausa, and 3.1 percent other tribes. These figures reflect very closely the overall population in the sample and the ethnic proportions shown in the 1963 census. Because the overall sample was drawn to permit studies including infectious diseases in Lagos, no stratification was attempted, and because of tribal tensions in Lagos at the time, there was, in particular, no attempt to stratify along ethnic lines. In general, the analysis has also been carried out without regard to ethnic divisions. While it is likely that greater refinement would have been possible with ethnic stratification, it does not appear that the general findings would have been altered very much.

Of the respondents, 93.8 percent said they had been vaccinated in the past, and what seems like the high proportion of 24 percent said they had had smallpox. The age distributions reported for these events were as follows:

TABLE 1: Reported Ages, Smallpox and Smallpox Vaccinations, Lagos Metropolitan Sample

AGE (YEARS)	HAD SMALLPOX ^a	WAS VACCINATED ^a
0-9	120 (6.6%)	38 (2.2%)
10-19	157 (8.6%)	307 (17.5%)
20-29	81 (4.5%)	621 (35.4%)
30+	53 (2.9%)	674 (38.4%)
TOTALS ^a	411 (22.6%) ^b	1,640 (93.5%) ^c
^a Age or other data not complete for all respondents		
^b Computed from N of 1816 ^c Computed from N of 1,754		

These figures are interesting but can be considered as indicative only, since in general accurate ages were not known by respondents, and chicken pox or measles or other conditions might have been mistaken for smallpox. A number of respondents said they had been told by their parents either that they had survived smallpox or that they had been vaccinated at an early age. The interviewers did discuss chicken pox and measles with respondents, most of whom claimed to be able to distinguish between these conditions. As a further check, respondents were examined for smallpox marks, or vaccination scars. Slightly less than half of the respondents who claimed to have had smallpox also appeared to have smallpox marks on their bodies (only three percent were "false positives", i.e. persons who had marks but did not claim to have had smallpox.) The Yoruba claim to be able to prevent pitting or marking of the skin as a result of smallpox by rubbing the body with palm oil while the person is ill, and this may be effective. Mary Kingsley, writing

13

in Ibadan at the turn of the century, said:

Small-pox is a vile scourge to Africa. The common treatment is to smear the body of the patient with the pulped leaves of the meuzil palm and with palm oil; but I cannot say that the method is successful, save in preventing pitting, which it certainly does. (Kingsley, 1901: 158)

What does seem apparent from these responses is that smallpox loomed large in the lives of these respondents at the time of the campaign. With respect to history of prior vaccinations, over eighty percent of those who claimed to have been vaccinated were able to show a vaccination scar to interviewers.

With respect to causation, the great majority of respondents attributed smallpox in one way or another to the weather, usually the dry season (73.6 percent). Typical answers included "Walking in the hot sun," "The dry season," "Frying palm kernels in the dry season," "Roasting corn in the dry season," and so on.

The next most frequently cited causative agent was the spirit or god of smallpox, or the followers of the spirit, or one's enemies who invoked cult members to attack one (20.8 percent). Most of these respondents also cited the weather as a cause of smallpox, multiple answers being recorded in this set of responses (54.7 percent cited the weather only, 2.0 percent cited the spirit or cult members only, and 18.9 percent cited both). Another 18.3 percent cited various reasons not related to physiological illness, such replies including activities at night ("Walking late at night," "Breaking firewood at night," "Unusual barking of dogs at night"); noise ("Too much noise," "Dogs barking," "Whistling"); sexual acts not socially condoned ("Two males having contact with a woman," for example); and a range of other replies such as "The fruiting of the Iroko

tree," "Constipation," "The smell of gunpowder," "Dog bites," and "Snake bites."

Only 6.1 percent of respondents described smallpox as a germ-borne or communicable disease. A number of others gave replies which might have suggested some understanding of communicability, though without mentioning communicability as such ("Wearing dirty clothes," "Overcrowding," "Poor ventilation," and similar). Included in the range of answers relating to Sopono were a number of respondents who stated that one could avoid smallpox by entering an infected person's room to pay homage to the spirit, an activity which apparently has not been otherwise mentioned in the literature, and which, if carried out, would certainly cause consternation among the officers of public health.

These responses were elicited following the open-ended question, "Do you think smallpox has any particular cause? ... Or are there many causes? ... Or does it just happen?" (asked in Yoruba or Pidgin, all respondents as previously noted being conversant in one of these two languages). Following recording of the replies to the open-ended questions, a series of twenty closed questions were asked, for example, "Do you think smallpox is caused by any of the following: Because of having offended or injured someone? By cult members? By bad food? By poisoning? By the weather?" and so on, respondents being encouraged to enlarge upon any reply and all answers being recorded. After each interview, the interviewer was asked to score each respondent according to whether he or she understood smallpox to be a communicable disease, had mentioned the idea of communicability along with supernatural or other causes, or had no idea of physical communicability

at all and apparently attributed smallpox entirely to other causes. Following the survey period, the entire project staff including all interviewers went over the schedules evaluating these replies, and as a result, 1,804 of the 1,849 respondents were scored according to these criteria, with the findings being shown in Table 2.

Interesting variations, but only minor ones, are found if one stratifies for ethnic group, education or social status (data on these variables being available for the respondents from the larger demographic survey). Among the Ibo respondents, a higher proportion of 13.1 percent described smallpox as a communicable disease, but the rest give other reasons. With respect to education, a higher proportion of 20.2 percent of respondents with a completed secondary school education, or higher, attribute smallpox to communicability, but the rest give other reasons (the percentages for "No School," "Primary Only," and "Some Secodary" are 4.2, 5.9 and 6.3 respectively). The small proportion of respondents in the higher socioeconomic bracket give a 24.3 percent communicability response, but the rest in the higher status bracket give other reasons, as do more than 90 percent in all of the other social brackets. If one stratifies for age, almost no variations are found in any bracket (this would seem to be contradictory with the education finding, though only slightly so; unfortunately the analysis up to now has not explored this relationship). With respect to religion, a lower proportion of Moslems (4.1 percent) and members of the Separatist sects (3.0 percent) attribute smallpox to communicability, in comparison with Protestants (9.1 percent) and Roman Catholics (8.5 percent). For each religious group, more than 90 percent give other answers. The religious composition of the sample

TABLE 2: Reasons Given for Causation of Smallpox
Lagos Sample

		NUMBER	PERCENT
COMMUNICABILITY	SUB-TOTAL	110	6.1
Respondent understands communicability or physical contact and/or association with an infected person, to be only cause of smallpox			
MIXED BELIEFS	SUB-TOTAL	1,020	56.6
Mentions activities akin to communicability, but gives supernatural or other cause of non-physiological nature, including:			
(a) Smallpox god or spirit, and/or the followers of the spirit, or the cult members;		25	1.4
(b) The weather		629	34.9
(c) Both spirit and/or cult and weather;		203	11.3
(d) Other non-physiological reasons.		163	9.0
NON-PHYSIOLOGICAL BELIEFS	SUB-TOTAL	674	37.3
Respondent does not mention communicability in any form, and mentions only non-physiological causes of smallpox, including:			
(a) Smallpox god or spirit, and/or the followers of the spirit, or cult members;		10	0.6
(b) The weather		358	19.8
(c) Both spirit and/or cult, and weather;		138	7.6
(d) Other non-physiological reasons.		168	9.3
TOTAL		1,804 ^a	100.0

^aTotal is less than 1,849 because data was incomplete on some respondents.

included 51.6 percent Moslems, 46.0 percent Christians of one denomination or another (26.7 percent Protestants; 11.5 percent Roman Catholics; 7.8 percent Separatists; again, these figures reflect general census figures).

In interpreting these findings, are we to believe that the majority of people in Lagos think smallpox is caused by the weather (73.6 percent)? This hardly seems likely, particularly since members of this society are widely reported in the literature and by senior informants to have believed only recently that smallpox was brought about by the anger of a god or his followers. It should also be recalled that our interviewers had reasonably good rapport with the respondents, because of their medically-related roles in the larger project, and that the interviewers had been trained to probe gently but firmly if not satisfied with the given replies. The more likely interpretation is that respondents were following their practices of the past, in not referring to the smallpox spirit by name, but rather by indirection. It was also necessary, according to local custom, that they be polite and gracious to our interviewers, and accordingly one suspects that a logical reply to questions about the causation of smallpox was the weather.

If we examine the replies in the light of the traditional literature, furthermore, we find close parallels with the past. The smallpox god was always thought to go about in the dry season, to be offended by noise (although he himself was often accompanied by a barking dog), to seek shelter from the hot sun in the shade of certain trees, to be angered by the use of palm leaves and other tabooed substances, and particularly if the latter were being heated in the

sun, to be offended by whistling, and so on. Virtually all of the replies given by respondents who did not mention communicability fell into one of these categories. The most likely interpretation of these findings would seem to be that the Eletu Odibo or traditional prime minister of Lagos is right, and that more than ninety percent of respondents were attributing smallpox to the work of a god or spirit, or the followers of a god.

Another set of questions dealt with attitudes toward vaccination. Rightly or wrongly, the questions were framed in terms of what respondents thought other persons believed and would do with respect to vaccination, rather than what the respondents themselves believed. Respondents were asked, "Do people not get vaccinated for any of the following reasons?" and a number of possible reasons were cited. The results appear in Table 3.

Answers to three other closely related and essential questions about vaccination were as follows:

"I have said that there is a new program of vaccinations being planned in Nigeria ... to prevent smallpox. Has anybody told you that there is such a program being planned to take place later this year?" (YES, 13.6 percent; NO, 86.4 percent).

"Do you think most of the people living in this particular area will be vaccinated, or not?" (YES, 68.5 percent; UNDECIDED, 30.0 percent; NO, 1.5 percent).

"Do you think you would like to take part yourself?" (YES, 96.3 percent; NO, 1.9 percent; NO REPLY, 1.9 percent).

Table 3: Reasons for Avoiding Smallpox Vaccination
Lagos Sample

DO PEOPLE <u>NOT</u> GET VACCINATED FOR ANY OF THE FOLLOWING REASONS:	YES (%)	NO (%)	OTHER ^a
(a) "Because they don't think vaccination really prevents smallpox?"	31.2	48.6	20.2
(b) "Because they fear it may cause them to have smallpox, be sick, or die?"	59.0	27.2	13.8
(c) "Because they fear vaccination may be painful?"	80.5	8.8	10.7
(d) "Because vaccinators have not come to work in this area before?"	26.8	55.7	17.5
(e) "Because other members of their families have not been vaccinated?"	14.0	61.8	24.2
(f) "Because they are afraid to offend the smallpox god or other spirit?"	11.2	58.6	30.2
(g) "Because they are advised against vaccination by cult members?"	7.9	58.0	34.1
(h) "Because they think they are lucky and will not get smallpox themselves?"	17.6	53.3	29.1
(i) "For any other reason you now can think of?"	7.7		
(1) "Ignorance" or similar	15.6		
(2) Dislike vaccination mark or sore	0.4 (four respondents)		^b
(3) Not needed after previous vaccination	0.4 (four respondents)		^b
(4) "Against one's beliefs"			

^a "Other" includes WON'T ANSWER or DOESN'T KNOW

^b Not further specified in the interview schedule. Probably these were members of one of the Separatist sects believing in faith healing.

The replies to this set of eleven questions about vaccination seemed entirely inconsistent, and we reported to the Federal Ministry of Health the somewhat uncertain news that the majority of respondents in Lagos attribute smallpox to non-physiological causes; that a large proportion seemed to have doubts as to whether vaccination was effective in preventing smallpox; but that, surprisingly, well over ninety percent said they would come forward to be vaccinated. Privately, we thought it was possible that the interviewers had done their job wrong!

This inconsistent set of replies received reinforcement from many places as preparations for the great campaign began. Members of the Sopono cult came forward to assist in the campaign, advising their people to be vaccinated. Some (but not all) of the members announced that they would be vaccinated themselves. The cult members seemed to be harmless, elderly people, not the diabolical collectors of infected bodies.

At the palace of the Oba (traditional king) of Lagos, we were introduced to the head of the cult in Lagos, a pleasant, elderly gentleman who assured us that vaccination did not prevent smallpox, and that many persons contracted smallpox after being supposedly immunized. In a nearby village, the representative of Sopono was a priestess, who welcomed us in her home, and respondents described Sopono as a goddess who controlled the disease.

At Lagos University Teaching Hospital, junior staff members became alarmed when they heard we had visited with the Sopono cult. A secretary-typist attached to the project, a bright young man with an advanced level secondary school certificate, assured us that vaccination did not prevent smallpox, and that we should watch our step.

Results of the Campaign

As elsewhere throughout the world, the smallpox eradication campaign in Lagos appears to have been a total success. On the opening day of the pilot program, 809 persons were vaccinated in the first two hours at one post in one village, teams using high speed ped-o-jet injectors, and long lines greeted the vaccinators at almost every point in the campaign. The program in central Lagos, with a population then estimated to be about three quarters of a million persons, was completed in three months, and a subsequent ward-by-ward assessment by the Federal Ministry of Health and the U.S. advisory team disclosed a 90.3 percent coverage rate.

The interviewers of the Lagos Family Health Project thus appear to have been right in the responses obtained to their most important question, that more than ninety percent of the Lagos population would come to be immunized. The question then arose as to why more than half of the respondents seemed to have doubts about the efficacy of vaccination, and if they had these doubts, why had they then been vaccinated? Following the campaign, we re-interviewed a number of respondents and key informants who had previously told us that vaccination did not prevent smallpox. In every case we seemed to get the same response. The person in question would pull up his sleeve to show us the new vaccination mark. He would re-affirm his belief that vaccination would not prevent smallpox. Why then had he been vaccinated? Well, vaccination was good. It gave one power. And so on. The most intensive probing by interviewers failed to produce a more specific response.

Conclusion

At the time of the smallpox eradication campaign, more than ninety percent of the residents of tropical Africa's largest city attributed the condition of smallpox to non-physiological causes, based on our random sample survey prior to the actual vaccinations, with twenty percent of respondents attributing the condition to the activities of a god or spirit, or the followers of the god, and almost seventy-five percent of respondents attributed smallpox to events such as the weather, which in oral traditions of the societies involved were closely linked to the smallpox god. Referring to the god by indirection in this way was also part of traditional practice. About one-third of respondents said people did not believe in the efficacy of vaccination against smallpox, and a majority were uncertain about the efficacy of vaccination. When the campaign took place, more than ninety percent of the urban population came forward to be vaccinated. Many, and perhaps a majority, of these persons did not associate vaccination with smallpox, and apparently valued vaccination for other reasons.

This set of events raises the general question of how Africans view conditions which in Western medical science are called "disease," and how they view Western medical efforts to deal with "disease." Many forms of Western medicine are clearly valued in Africa, but they may be valued for reasons other than those associated with physiological causation. The patient may be taking the "right" pill for the "wrong" reason, and the question that then arises is, "Does this make any difference?" For the public health officer and the health education officer trained in the ways of Western science, an

ethical approach to this question is to be expected. For advertisers and for some less scrupulously motivated medically-related practitioners, the ethical boundaries may be stretched. Beer and a whole range of other commodities are being sold in Nigeria because they "give power," injections of various kinds are pedalled in the markets because they are supposed to give one "power," and expensive powdered milks are sold to mothers whose babies don't need them on the grounds that they are "good" or similar. One wonders if more serious examples of promoting the "wrong" pill for the "wrong" reason may not crop up in the future.

According to the World Health Organization, smallpox has been eradicated from the world, or virtually so. On a recent visit to Lagos, the author was told by several informants that the Sopono cult continues in existence, that its members pray and observe rituals, but that its power is in decline. The questions raised by this paper remain, however, and are perhaps central in the expanding efforts throughout Africa to deal with what Western science calls "disease."

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