

CONCURRENT ASSESSMENT DURING THE SMALLPOX ERADICATION AND MEASLES

CONTROL PROGRAMME IN GUINEA - DECEMBER 1967 TO FEBRUARY 1969

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I. INTRODUCTION

The directors of the Smallpox Eradication and Measles Control Programme (SMP) began planning the mass vaccination of Guinea in October and November 1967. From the start, the continual evaluation of programme progress was given the highest priority. There are several justifications for having a systematic current critique of the programme.

Guinea has reported smallpox every year for as long as such data have been collected. More than 3,000,000 smallpox vaccinations have been done since 1958. However, the epidemic of 1966-1967 was one of the most serious in history. During that period the incidence of smallpox in Guinea was one of the highest in the world. But why?

Until the mid 1960's most of the vaccine used was not freeze-dried; vaccine refrigeration was almost impossible in a country where over one third of the surface area is immediately sub-Saharan. Major reactions among primary vaccinees during that period were estimated at 20 to 30%. Therefore, even though the more stable lyophilized vaccine was being used with improved methods of vaccine conservation and application, we did not want to repeat the earlier unsuccessful effort and leave the population unprotected.

Secondly, demographic information for West African countries is understandably inexact. Guinea may have a more accurate village by village census than many nations, developing and developed, because of her excellent internal organizational hierarchy. Nevertheless population flux due to seasonal occupational migration, and growth, dependent on migration, birth and death rates led us to conclude that we needed a more current estimate of population coverage than simple comparison of vaccination tally sheet totals to the administrative census. Such a comparison does not provide age specific group coverage or a precise evaluation of vaccine potency and team technique. These determinations require the reading of major vaccination reactions among primary vaccinees.

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II. ASSESSMENT TEAM ORGANIZATION

Virtually the entire assessment of the more than 3,000,000 smallpox vaccinations given in Guinea since December 1967 has been done by one team. The team leader, Mr. Kourouma Famba, is an Agent Technique de la Sante and was a Chef du Secteur of the Service National des Grandes Endemies, before he joined the SMP as Assistant Programme Director for Assessment. Mr. Kourouma has had more than twenty five years of public health experience in the West African bush and is fluent in the three major national languages.

During the ten day comprehensive training period before the mass campaign began, all personnel received an orientation on assessment as part of their course. The Chief Assessor studied assessment principles and methodology in greater detail and, in fact, presented this section of the course during the refresher meetings which preceded the second phase of vaccination activities. He was assigned a chauffeur and Land Rover. For more than a year the assessment team has had only these two permanent workers. Recently a nurse has been added.

At first it was suggested that the assessment team leader could train regional health personnel to perform the evaluation independently in their own regions. This approach proved unworkable because: 1) regional authorities had other primary responsibilities; 2) there was concern that local officials would be biased, and favour giving their domains higher coverage than actually obtained; 3) transportation at the regional level was unreliable; and 4) accuracy in reading major reactions would be decreased because of the lack of experience. Each of these limitations was observed in one such evaluation performed by regional workers. Regional health personnel have nevertheless, worked with the SMP assessors, serving capably as sources of information, coordinators, guides, interpreters, and recorders.

Therefore, early in the programme the assessment became an independent, relatively autonomous activity, responsible only to the programme directors in Conakry.

III. THE ASSESSMENT

There are twenty-nine administrative-medical regions in Guinea. The region serves as the individual vaccination and assessment unit because it is a geographic, administrative, political and medical entity. Each region is further divided into arrondissements, and these are composed of committees or villages, which are the smallest organizational units.

During the first year of field operations, the assessor chose thirty villages for assessment in each region. The villages and number of persons examined in each village was dependent on village size as listed in the most current administrative census (1967). All cities with more than 5,000 were individually assessed.

Since October 1968 the number of sampling units within a region has been dependent upon the estimated regional vaccination coverage. When the estimated coverage is poor, more sites are chosen. A cluster of 33 persons are visited at each site. Cities with more than 5,000 persons are evaluated separately in the same way as during the first phase. As many major market centres as possible are also visited.

Initially, the acceptable regional vaccination coverage was set at 80% of the general population. The finding of 97% major reactions among primary vaccinees was established as the acceptable level for vaccination takes. As the programme progressed the goals were refined and percentages raised. At present we attempt to vaccinate 90% of persons in all age groups and to obtain 98% major reactions in primary vaccinees.

IV. RESULTS

For ease in appreciating programme progress, assessment results have been divided into the two vaccinating seasons. The first phase began in December 1967 and continued to June 1968. Following the rains, the second phase began in October 1968 and is continuing. The findings are divided into seasons because programme operations were quite different during each phase. Throughout the first phase, all teams would work in an arrondissement for only one or two days. Traditional collecting points were used extensively as vaccination centres. During the second phase we have tried to send teams to as many villages as possible, extending their stay in the arrondissement.

A. The Systematic Assessment

Consideration of a few selected regions is worthwhile to indicate what changes if any were implemented when initial objectives were not achieved.

Forecariah was the pilot project vaccination zone. Despite intense publicity generated from the regional capital, initial coverage was below 80% by tally sheet figures and by systematic assessment. At that time three things were done.

1. An advance information team was created, responsible to the SMP Director, but which worked harmoniously with regional officials ahead of the teams.
2. A permanent follow-up team (equipe de secours) was established to work in areas identified by tally sheet or by assessment to be less than optimally covered.
3. An Assistant Director for Field Operations was created who would coordinate team vaccination activities. This allowed programme directors more time to publicize the programme well ahead of the teams.

At Kindia, the second campaign focus, major reactions were found to be 94%, an unacceptably low value. At that time a medical officer from the SMP performed two market surveys and found major reaction rates of 99%. Nevertheless, vaccine conservation and team technique were carefully scrutinized.

Because of technical difficulties, regional authorities did their own assessment in Dabola. Tally sheet comparison showed 66% regional vaccination coverage. Assessment by Regional personnel showed an 86% coverage and 94% major reactions. A review of the Dabola assessment showed that several procedural errors had been made. Subsequently, the Chief Assessor remained in each region throughout the evaluation.

Before considering other specific immediate programme changes which were made following a regional assessment, let us look at the sum of information gathered (Table 1).

TABLE 1

Summary of Assessment Results

<u>Age</u>	<u>First Vaccinating Season (Dec. 67-June 68)</u>		<u>Second Vaccinating Season (Oct. 68-Mar.69)</u>		<u>Total (Dec. 67-March 69)</u>	
	<u>Number Examined</u>	<u>% Vaccinated</u>	<u>Number Examined</u>	<u>% Vaccinated</u>	<u>Number Examined</u>	<u>% Vaccinated</u>
0-4	19,551	88	4,913	89	24,464	88
5-14	28,772	88	7,169	91	35,941	89
15-44	41,738	86	10,066	87	51,804	86
45 +	11,140	78	2,548	85	13,688	79
TOTAL	101,201	86	24,696	88	125,897	86

In examining each age group during the first vaccinating season, we observed that persons 45 years and older had the poorest coverage. We noticed this in region after region throughout the first year and were convinced that this was because of the inability of the aged to walk long distances to collecting points. Some attempts were made to send teams out to as many villages as possible. Major limitations in reaching each village included the poor state of the vehicles, centralized vaccine conservation, difficult terrain and time.

In preparing for the second vaccinating season, two major alterations were made:

1. Each team was assigned to at least one arrondissement for the duration of the campaign. Their stay in the arrondissement was usually about 10 days but varied from one to three weeks.
2. Each team was to visit every accessible village in the region regardless of size or distance.

To implement these modifications the appropriate support was arranged.

The age group coverage for persons over 45 years is now 85% compared to 78% for the first phase. Coverage in younger persons has also increased, but the major success has been in reaching persons who, we have found, will not walk more than two to three kilometres to be vaccinated.

B. Tally Sheet Comparison

More than passing reference must be made to assessment using only tally sheet coverage. As stated earlier, administrative censuses in Guinea have proved extremely reliable. These data are used in several ways.

The vaccinating team recorder and team leader tally the number of villagers presenting for immunizations. The team leader informs the village or committee president how many people appeared. If the percentage is low, the

president may send for the rest of his village; he may make arrangements for the team to return to the village; or he may send the late comers to another nearby village which has not yet been vaccinated.

When teams finish their regional work they present the Assistant Director with a village by village census and tally of vaccinations performed at each village. This list is shown to regional medical and governmental officials. It serves as the basis for estimating the number of sites for the assessors to visit. It is also the initial guide for follow-up team activities. The Assistant Programme Director uses this information in leaving supplies of dried vaccine for regionally performed vaccination activities. The number of doses for vaccino-style application is dependent on local refrigeration, expected follow-up team assistance, smallpox endemicity or threat, and the number of travelers passing through the region.

A comparison of regional coverage by tally sheet-census data and systematic assessment is shown in Table 2. One is impressed that during the first year of activity the tally sheet generally showed a much lower regional coverage than was found during assessment. In many of the regions the assessor did not visit an adequate distribution of sampling sites to make his findings completely reliable.

TABLE 2

A Comparison of Vaccination Coverage
Estimated From Vaccination Tally Results
and From Assessment Surveys

	First Vaccinating Season (Dec. 67 - June 68)	Second Vaccinating Season (Oct. 68 - March 69)
1) Vaccination Tally Results/1967 Census	77%	88%
2) Assessment Survey Results	86%	88%

V. SUMMARY OF ACTION TAKEN BECAUSE OF POOR COVERAGE OR UNACCEPTABLE TAKE RATES

It was found worthwhile to intersperse assessments with immediate and subsequent action. This was done because it was felt that when the findings were summarized and interpreted quickly, the appropriate response could be made immediately.

The considerations which affect follow up actions are the following:

- A. The overall and age specific coverage within the vaccinated unit. (Regions are often broken down into smaller geographic-population components for the follow-up effort).
- B. The percent of major reactions within the population assessed.
- C. The smallpox threat to the region.
- D. The availability of local resources to continue vaccinating by vaccino-style and assurance of proper vaccine conservation.

- E. The availability of SMP personnel and resources to assist regional authorities.

Approaches to poor coverage are standardized in the Guinean programme.

- A. Reasons are sought to determine why there was poor coverage (i.e. poor advance publicity, closed routes, vehicle malfunction, limited gas or oil supplies, vaccination done on holidays, etc.) and attempts to resolve the specific causative operational factors are immediately made.
- B. A regional follow up vaccination programme is established and a supply of lyophilized vaccine is left.
- C. A follow up team(s) is sent to the region.
- D. In areas where take rates have been below 97%:
 - 1. The SMP Medical Officer has visited the region to verify this finding and to evaluate the level of immunity to smallpox. In no instance has he found major reactions below 98% in primary vaccinees.
 - 2. Vaccine conservation and team technique is scrutinized in the field by the Programme Director, Assistant Directors, and technical advisors. All team members are constantly urged to reevaluate their own methods of vaccine conservation and vaccination technique.
 - 3. It has not yet been necessary to discard any particular supply of smallpox vaccine or to submit any samples for titration although some measles vaccine has been submitted for potency testing and subsequently discarded.

VI. MAJOR ASSESSMENT PROBLEMS

Our systematic assessment is often begun more than two weeks after the vaccinating teams have left, precluding the possibility of reading major reactions.

Under these circumstances, evidence of a fresh vaccination scar (which can usually be identified for at least a month in primary vaccinees), can be used.

VII. SUGGESTIONS

- A. Stratification of villages into groups greater and less than 500 persons has been contemplated. Close to 90% of smallpox cases in Guinea over the past two years have been found in villages of less than 500 persons. It seems reasonable, therefore, to make a biased effort to determine how well the populations of small villages are protected. Presently, the larger the village size, the greater chance it has of being chosen as one or more sampling sites by the assessors.
- B. It would be quite easy for assessors to do smallpox pock mark surveys. This information can be used to evaluate the surveillance system and to identify areas where surveillance techniques need reevaluating.
- C. Assessors can be used to perform not only smallpox immunity surveys but can contribute to evaluation of many other diseases. Any disease survey depends upon many of the same skills utilized by SMP assessors.

VIII. SUMMARY

In closing, I would like to quote from a World Health Organization smallpox unit publication.

"The total absence of reported cases in the context of an effective surveillance system represents, of course, the ultimate assessment of the programme. Measurements of vaccination coverage provide interim information on the progress of the programme."

The assessment in Guinea has had philosophical and scientific justification and priority despite the realization that one can vaccinate without assessors. It has been the purpose of this presentation to show that an assessment, be it tally or systematic, can reflect exactly how well the programme has achieved its stated objectives. Areas of improvement can therefore be easily and promptly delineated.