A qualitative evaluation of the immunization program in Papua New Guinea

C. John Clements1, Christopher Morgan1, Enoch Posana2, Hilda Polume3 and Chieko Sakamoto4

Centre for International Health, The Macfarlane Burnet Institute for Medical Research and Public Health Ltd, Melbourne, Australia, Health Improvement Branch and Family Health Services, Department of Health and Women's and Children's Health Project, Port Moresby, Papua New Guinea

SUMMARY

Objective. An in-depth evaluation of rural immunization services in Papua New Guinea was conducted to determine the reasons for poor immunization coverage, as well as to document the impact of recent efforts to strengthen the national immunization program. Method. A qualitative process was used to complement quantitative monitoring data. An interview process, based on open-ended questions, active listening and observation, was designed whereby a team of program supervisors collected information from rural health staff. The teams interviewed health staff in 30 health centres that were selected to provide examples of contrasting field situations. Results. This qualitative review provided valuable detail about why immunization services were failing, encompassing locally specific weaknesses, such as logistic reasons for not conducting outreach, and generic systemic problems such as lack of access to funding. In addition, the information gathered provided details on local solutions developed by better-performing facilities. Both these aspects added significant value to quantitative measures of program performance (derived from national health information system data and analysis of supervision checklists). The review also captured a number of behavioural reasons that will need to be overcome before an improvement in the services can be expected. Conclusions and implications. This in-depth evaluation provided valuable information about problems in peripheral immunization clinics and identified local solutions. The high level of detail collected will be important for planning future strengthening of the health system. The study modelled a supportive form of supervision with the potential to improve outcomes from future supervisory visits. Some of the major barriers to improved immunization were locally specific organizational issues, as well as complex human problems. While some issues can be remedied through further strengthening of immunization systems, others lack easy, rapid solutions.

Introduction

For some years there has been low and faltering immunization coverage throughout Papua New Guinea (PNG) and this has been a prime target of attention of the government health sector, non-government organizations and development assistance agencies. Despite enormous efforts, DTP-3 (third dose of diphtheria and tetanus toxoids and
pertussis vaccine) coverage has not risen significantly over the last decade. Half the 20 provinces have achieved immunization coverage of only 60% or less, and only four provinces have reached 80% or more. The Department of Health (DOH) and the Women's and Children's Health Project (WCHP) planned a number of immunization program evaluation activities in 2003 and 2004 in order to better understand the reasons for poor immunization coverage, as well as to document the impact of recent efforts to strengthen the national immunization program. There have been annual reviews of monitoring data for some time, but their analysis has not always revealed clear trends or causes for lack of progress.

An international review coordinated by the World Health Organization (WHO) in November 2001 (1) and the findings of the Public Sector Reform Management Unit (PSRMU) review in July 2001 (2) are

| TABLE 1 |

**Findings of the Public Sector Reform Management Unit 'Functional and Expenditure Review of Health Services' in July 2001 (2)**

- Coverage of rural health services has declined
- Quality of rural health care is declining
- Immunization rates are not improving
- Health statistics are worsening
- National Department of Health is constrained by systemic problems from addressing these issues
- The organic law has had a negative impact on services delivery
- The organic law needs to be changed if services are to be improved dramatically
- The vertical integration of health services has been destroyed
- Clinical supervision has been fragmented
- Resources for rural health services are inadequate
- Funds do not get down to districts
- Budgeting for rural health is poor
- Planning for rural health is poor
- Cash flow to provinces is erratic
- Rural infrastructure is collapsing
- There are inefficiencies in service delivery
- Donors are keeping the system from collapsing
- In many provinces, church health services perform better
- Community involvement is vital
summarized in Table 1. In addition, the DOH was aware that the validity of routinely reported coverage data from health centres in other settings was questionable (3) and wanted to avoid relying too heavily on such reported data in an evaluation.

Through consultation between the National Immunization Committee, WHO Country Office and WCHP advisers, the DOH decided that an evaluation was needed and that the methods used in the survey would be in-depth, qualitative assessments down to health facility level in selected sites, supplemented by observation, examination of financial accounts, and possibly a review of client perceptions. Qualitative data are normally collected as an open-ended narrative without predetermined standardized categories that typify questionnaires (4). A range of qualitative methods is well documented in health research including key unstructured interviews, informant interviews, participant observation, ‘most significant change technique’ and focus group discussions (5-8). Unremarkably, qualitative research has its critics and supporters, and readers are referred elsewhere for such a discussion (9).

It is recognized that delivery of immunization services is particularly difficult in Papua New Guinea for a number of reasons, including:

a) **Lack of infrastructure.** The lack of good roads or regular, reliable plane or boat services impedes supply to many rural health centres. Great difficulties are experienced supplying gas cylinders to many remote clinics that depend on gas-powered refrigerators for the cold chain.

b) **Law and disorder.** Serious law and order issues exist in North Solomons Province and highlands provinces. Staff are unwilling to venture out of the building to undertake outreach in certain places because of civil unrest.

c) **Remoteness and rugged terrain.** PNG has some of the most difficult terrain in the world to cope with. It includes vast coastal marshy areas where access is only by boat. Days of trekking are required to reach other clinics in remote highland areas.

d) **Climate.** The rainy season washes out roads or makes them too muddy to be passable. High ambient temperatures mean that ice melts quickly in the vaccine carriers during long journeys to clinics.

e) **Political.** Devolution of political and administrative control to the provinces has hampered development of efficient management.

**Methods**

**Sampling**

30 rural health centres were selected on a purposive basis for evaluation. They were chosen to provide information about a variety of geographical areas, areas of high and low reported coverage, and non-government (church) and government-run facilities. This non-random selection was intended to provide as varied and contrasting a picture as possible from which general conclusions might be drawn about the whole country. At least two health centres were selected from each of eleven provinces (Central, Milne Bay, Oro, Western Highlands, Eastern Highlands, Simbu, Morobe, East Sepik, East New Britain, West New Britain and North Solomons).

**Team**

A team of 14 expatriate and national staff was already functioning as immunization supervisors through the Women’s and Children’s Health Project. This team was trained to undertake the interviews.

**Data recording and collating**

The interviews were conducted by the team in clinic settings and generally took a whole working day. The logistics of arranging permission and travelling to the clinics were considerable. For those clinics in remote areas, travel took more than a day and required air, sea and motor vehicle transport as well as often walking over rough terrain for hours. The team visited each of the 30 clinics in pairs.

The interviews were recorded onto specially designed forms that took the interview process through nine key topics (Table 2). One member of the team asked
the questions and the second recorded answers on the form. Tape recorders were also used and found to be helpful in reminding staff of discussions.

The interview process was designed whereby information was collected from individual staff based on open-ended questions and active listening. The nine general areas of work selected were based on the immunization supervisor checklist already in use by the WHCP team (Table 2). Within each subject area, a number of open-ended questions were devised that were designed to stimulate discussions. Team members participated in a one-day workshop where they were taught skills of active listening and body language to facilitate their administration of the instrument. They were taken through each open-ended question and taught how to probe to obtain a more in-depth response. For instance a question such as “Tell me how you conduct outreach services” (an open-ended question), might draw a response “We couldn’t because we had no transport”. The team member would then be encouraged to probe further, eg “Why didn’t you?” The questioning would continue in this way until a problem had been clearly identified that the staff member could not solve, such as the failure to allocate funds at a higher administrative level. The staff member being interviewed would then be asked if they could think of a solution that had either been used locally, or which might be used. In this way, the evaluation attempted to identify a range of problems experienced by clinic staff, along with attempted or possible solutions. The procedures were modified as a result of the workshop and on the basis of a field test. The input from the team increased their ownership of the evaluation tool.

Analysis

All information was transcribed onto a word processor. It was tabulated by type of clinic, ie high/low coverage, remote/easy access, highland/coastal/island location, government/church clinic. The responses were compared for each type of clinic to see if there was a pattern that emerged. Where possible, a numerical summation was made, eg, of the five health centres that had more than 100% DTP-3 coverage (coverage of more than 100% was reported from some clinics due to inaccurate population catchments used as denominators), all were

| TABLE 2 |
| ISSUES COVERED IN THE SURVEY, BASED ON THE WOMEN’S AND CHILDREN’S HEALTH PROJECT’S SUPERVISOR CHECK LIST |

1. Cold chain equipment and maintenance system
2. Procurement and distribution of vaccines and supplies
3. Immunization program operations
4. Training
5. Health information system
6. Community issues
7. Any effect of new national Department of Health strategy for EPI, including a focus of under-performing provinces
8. Organization, management and financing of EPI
9. Type of service, ie government vs church facility

EPI = expanded program on immunization
church facilities with access that was considered easy.

Results

Findings in six key areas confirmed much of what had been suspected from national health information data as well as providing vital additional details through the anecdotal reports. The detail in the in-depth evaluation went beyond generic descriptions of issues and included locally specific root causes for obstacles to high coverage and local solutions that had been devised. It also provided clear descriptions of attitudinal factors contributing to success and failure of immunization services (Table 3). Issues affecting immunization program performance are summarized.

Service delivery strategies

Staff were clear that outreach services were essential to achieving adequate vaccine coverage. Many facilities had ceased conducting outreach due to constraints including lack of funds, transport or staff and poor security. The evaluation clarified the varying roles these different problems played in each place, and also highlighted the critical link between outreach and staff motivation and morale. Despite

TABLE 3

PERSONAL AND ATTITUDINAL BARRIERS TO HIGH PERFORMANCE REVEALED BY THE EVALUATION

- Low morale
- Poor housing
- Poor staff attitude and behaviour towards clients
- Poor attendance record
- Unreliable performance and service delivery
- Diverting resources for personal gain
- Lack of accountability for clients’ wellbeing and a lack of passion for the health and wellbeing of the children of Papua New Guinea
- Reluctance to delegate
- Reluctance to pass on training to others
- Reluctance to perform or participate in supervision
- Lack of example and leadership
- Circular blame mentality – lack of personal responsibility and an expectation that someone else will provide the means to get a task done
- Lack of personal initiative
- Lack of trust from the community towards the immunization services
- Inadequate community participation
- Culturally determined behaviour patterns that lead to community violence and a sense of personal insecurity
- Wantok system of favouritism
obstacles, there were clinics still able to conduct outreach, particularly where staff were motivated, local planning was functional, and means for communication with communities were found. Facilities were discovered conducting outreach even when provincial health systems did not support it, and even when access was difficult. Successes were associated with good micro-planning and the mobilization of new vaccinators, particularly aid post workers.

Training and supervision

A high level of penetration of the recently conducted district-level inservice training in immunization was confirmed. However, the critical factor required to convert training into better coverage was supervision, an activity (along with on-site training of staff) that was much more difficult to deliver, but crucial to staff performance and motivation.

Cold chain and vaccine distribution

The evaluation documented great progress in improving the cold chain, with nearly all facilities having appropriate equipment in place and functioning. Vaccine supply had recently become more reliable due to new national distribution systems. The evaluation also documented local issues, such as reliability of gas supply for refrigerators, and the way some facilities have solved supply problems using resources outside the health sector. Specific difficulties in determining vaccine supply needs and ensuring appropriate ordering varied from place to place and were highlighted in the evaluation.

Involving the community

The lack of community involvement in immunization was found to be a key factor in limiting the success of immunization in PNG. The evaluation provided a mechanism, in some places, to increase community engagement, and also highlighted locally specific issues that had eroded community trust. The quality of staff communications with community members was often cited as a critical factor in determining community use of services.

Staff attitudes, motivation and morale

The evaluation reliably demonstrated the critical link between staff attitudes, motivation and morale. Where these were good, communities sought services and outreach was more regular. Where they were lacking, the reasons often related to poor working conditions, lack of funds and absence of supervision.

Funding

Lack of funding was quoted numerous times in the evaluation as the reason why an activity was not taking place, particularly for outreach. The evaluation was able to document that often it was not lack of money per se that was the real constraint. Staff were frequently unable to access the funds for a number of reasons, often very specific to local arrangements for financial planning and management.

Enriched understanding generated by the qualitative approach

Feedback from the team after the survey indicated the open interview process with probing questions and active listening went deeper than staff were used to – they felt it provided much greater insight into problems. They were also able to use the occasion to speak to the community, a process that local staff perceived as giving their health centre high status because they were being visited by national-level staff. Local people were impressed that they spent the whole day there. Staff found it a chance to complain and be honest about a range of things beyond the specific questions they were asked. The team indicated that they would use this technique in subsequent supervisory visits.

Sometimes community members were disparaging about health centre staff, and vice versa, and the team found themselves in the middle of old feuds (which had to be handled as part of the visit). Some health centre staff expressed concern that the information might be used against them in some way. However, after appropriate explanations, clinic staff did not generally feel threatened and in fact they mostly indicated being grateful for a chance to express themselves.

For team members who were not familiar with clinics, tremendous insight into the problems besetting the peripheral health workers was obtained through the
interviews. The process of open, active listening helped them document narratives rich in detail on constraints and solutions. Mostly, such techniques revealed the best and the worst practices or situations. A selection is provided below.

“We cover all our clinic points in one month. One patrol takes 16 hours walk, another 8 hours and another 4 hours. We send out a tok save (public announcement) and people always receive our message. We send the messages by paper with mothers who come for treatment and ask them to give it to the churches to announce. Also we send the message to community health workers in the aid posts to pass on. We don’t rely much on vehicles as there is only one for the district so we go by foot. I have good staff – they never complain about walking. We have to climb big mountains and cross rivers without bridges. We take out our health committee members as carriers and interpreters. We have a health committee of 6 people and we pay them 2 kina (60 US cents) per hour to accompany us.”

Lack of supervision seems to have had a direct effect on morale.

“The Provincial Vaccine Stores Officer has been to check equipment and drugs but no-one has been to do a proper supervisory visit. If someone comes to pass on information or if there are areas where the work is not good and you need guidance, if nobody comes to visit – you feel neglected and working in the dark.”

A margin note from a team member remarked that:

“The building looked very untidy, dirty and dusty with lots of cobwebs. There have been no vaccines since January because the gas ran out. There is no standby gas cylinder. Training materials were locked away in a cupboard. Injection practices were not safe as needles were still attached to vials and were left there for maybe hours or days. There were no displays of any health policies on the board.”

Almost any form of supervisory visit would have detected the serious state this health centre was in and would have been able to intervene.

The enormous problem of transport was highlighted.

“We have a dinghy but no engine. The motor is still in repair since October 2001, under the care of the Health Secretary. We have 4 clinic points which were accessible by sea transport – we are often forced to skip over monthly clinics and have to reschedule them; whenever we have easy access of transport we go out and do the immunizations and the other 5 clinic points are accessible by road – we do regular monthly clinics by walking from 1 hour to 4 hours at the furthest end. We use the parish priest’s vehicle to get vaccines from the distribution centre – we can also ask for his assistance to use the vehicle to do mobile clinics that are accessible by road transport.”

Health centre staff are unwilling to venture far to do outreach clinics in certain places because of civil unrest.

“Outreach is carried out when it is safe. Tribal fighting in some areas prevents us going there.”

Serious law and order issues exist in certain locations. Staff in one island clinic described the severe disruption from civil unrest to immunization as follows:

“Staff feared to go to fighting zones as people have been killed and there is disruption of the clinic programs because of road blocks.”

Discussion

This study was undertaken by those who are familiar with running health services, many of whom had little or no experience with social science methods or qualitative analysis. Mays and Pope (9,10) describe ways to validate qualitative studies. When judged critically against such benchmarks, this study falls short. A longer training period or use of social scientists to conduct the study would have improved validity but were not realistic options. In addition, we chose to use a tool that would be useful in future supervision activities. The training and systematic recording of responses was fairly
consistent throughout the team, but individual skills of interviewing and recording varied greatly. Nonetheless, there was a consistency in findings across a wide number of issues that lent support to the validity of the process. The responses of the clinic staff to some questions were clearly at variance with those of the villages they served on key issues such as quality of service. This triangulation is reassuring to an extent, but many issues discussed could not be verified by third-party sources.

Much time, energy and resources are spent each year in evaluating the quality of immunization programs. For the most part, this consists of analyzing routine data or conducting special surveys in the field. Even when evaluation teams visit peripheral health facilities, they usually have limited time, and go armed with check lists of impersonal questions. Such conventional surveys reveal the ‘technical’ barriers to improving immunization services. Many such blocks, however, do not have technical ‘fixes’. Some barriers will not show up at all in conventional studies. For example, a lack of transport is one of the commonly stated reasons why outreach was not accomplished (and which contributed to low coverage in virtually every district where coverage was low); the reasons given for why there was no transport were multiple and generally included a social or personal dimension. More important, supplying more vehicles would not solve the problem, or would solve it for only a short time. Standard questionnaire would not have demonstrated that low morale was affecting many health centre staff. Staff felt lonely, unsupervised and cut off from facilities in the towns, often separated from family and their cultural community. Given the nature of the country and the service, it is not surprising that absenteeism is high in these remote clinics. The solutions are not obvious, but staff rotation may help solve the situation.

The process had limitations and was very dependent on the listening and interviewing skills of the evaluation team. These skills varied greatly, as did the team members’ ability to record the interviews appropriately. The health staff interviewed also varied depending on the day of the visit – the officer in charge was the intended subject but sometimes other staff were interviewed instead due to his/her absence. Because the interviews were conducted on site during normal working days, events sometimes interrupted the discussions, usually resulting in having to abort the review.

An important product of the evaluation was proposed solutions to problems that emerged from the staff themselves. The solutions documented may well have been missed by evaluations based on standardized checklists that are often biased towards a description of problems, rather than documenting local responses.

The evaluation process generated rich narrative descriptions of constraints and solutions. This enhanced the understanding of the team members to a significant degree. In industrialized settings, narratives are not commonly used to document issues or suggest strategies. However, it seems likely that in PNG such narratives may be a more effective means of communication, both to document problems and to disseminate potential solutions.

The use of open, active listening that included both problems and solutions, as the first step in evaluation, was useful in changing, to a degree, the attitudes and understanding of team members. The evaluation process thereby provided an example of supportive communication that staff would use in future supervisory visits.

As with any purposive sample, there was the possibility that the selection was unhelpfully biased and the results not representative of the whole. The likely direction of bias in this situation is not self-evident. Comparison of the findings with other data sources suggests, though, that the information gained was valid and representative. Although statistical analysis was not appropriate, it was useful to contrast the problems and solutions of health facilities in light of their selection criteria – particularly criteria of remoteness and local record of immunization coverage. It was important to use locally validated criteria, as visits revealed that some facilities were in fact performing better than their centrally recorded coverage rates demonstrated, because of flaws in the information reporting system. The outcomes of these comparisons are reported in the full evaluation document held by the DOH.

This qualitative evaluation method is not suitable to administer without other forms of
monitoring and evaluation. The evaluation process was a useful complement to data gathered from standardized supervisory checklists and through the national health information system. One outcome of this multi-pronged approach to evaluation was an altered strategy for outreach services – it was clear that there were many sites where outreach could not easily occur, even if funds and infrastructure were improved. As an alternative, a previously under-used community-based cadre of health staff, the aid post worker, is being trained and mobilized to extend the reach of immunization services.

Conclusion

The information collected revealed problems that would not normally show up in rapid assessments, and emphasizes the importance of dealing with the human aspect of running a health service. It showed that some of the major barriers to improving immunization services were actually complex human problems. Technical problems often have quick technical solutions – human problems rarely do. The study also enabled those at the community level to demonstrate their own solutions, and to communicate problems in a form that significantly improved understanding by senior staff. In particular, the lack of involvement of communities indicated the urgent need for social mobilization that would raise awareness and demand for vaccination at the community level, and strengthen community participation in the long term. The evaluation itself emerged as a good tool to initiate the process of social mobilization.

Because so much useful information was harvested in this evaluation that would have been missed in a strictly quantitative review, we consider that its use should be extended. In middle- and poorly-performing national immunization programs, an in-depth evaluation can provide structured qualitative information on peripheral problems and local solutions, and is an important additional tool to standard quantitative evaluation methods.

ACKNOWLEDGEMENTS

The authors acknowledge the contributions of the many national and expatriate staff in the Department of Health and the Women’s and Children’s Health Project in Port Moresby, PNG, who took part in the evaluation or gave valuable advice. We also acknowledge the contributions of all those health centre staff who willingly gave of their time when they had so much else to do. Finally we want to salute the mothers and fathers of PNG who literally walk through hell-and-high-water every day to get their babies immunized. They are the heroes of this paper. The Women’s and Children’s Health Project was supported by the Australian Agency for International Development (AusAID). Three authors (CJC, CM, CS) were employed as advisers on the WCHP.

REFERENCES