Quality Assurance in a District Health Service, Process and Results of a Comprehensive Operational QA Program in Yap State, Federated States of Micronesia

A Mark Durand[1]
Mary Cowan[2]
Anna Boliy[1]
Lucy Bigelow[1]

Abstract:

Background: District health services in developing countries are faced with financial constraints, shortages of appropriately skilled health and support workers, and high burdens of disease in their communities. Quality assurance programs can help to optimize the capacity of the health service to address challenges such as these. We describe an operational quality assurance program that has been established in the Department of Health Services in Yap State.
Methods: The program was organized by health service unit (lab, X-ray, medical records, outlying dispensary, immunization program, etc.). A set of operational quality standards was first established for each unit, then performance indicators for each standard, and policies, procedures and job descriptions for each unit staff member, then an audit tool to measure performance indicators for each unit were developed with input from health service leaders, unit supervisors, and front-line staff. Audit tools were designed to yield a summary performance score for each unit. Average unit scores across the health service from baseline to 1 year after program implementation were compared.
Results: Performance scores improved from baseline for nearly all units. Composite scores for the health service as a whole improved by 8-14.5% over baseline. This improvement appeared to be stable over time.
Conclusions: An operational quality assurance program can improve the performance of a district health service. Key features of the program, including extensive involvement of front-line workers, focus on unit teams, the use of a contracted auditor to gather data and facilitate post-audit corrective planning meetings, and the use of staff performance incentives, may have contributed to the success of the program.

Introduction:

Many of the public sector health services in the Pacific region are underperforming, with medication and supply shortages, facility maintenance problems, patient dissatisfaction, lagging staff morale, uneven cleanliness standards, and missed opportunities to address high burdens of disease in their communities. Inadequate funding is the factor most often blamed for poor performance. However, adequate funding, while necessary, is not sufficient to produce good performance.[1,2] Within the district health service care is delivered by people who are organized into units (inpatient wards, tuberculosis program, medical records, laboratory, etc). Health workers of various specialties within each unit must cooperate with one another and the work of each team must be coordinated with that of other teams in order for services to be provided effectively. For example, in order for children to be protected from measles, a public health program manager must keep abreast of vaccine inventory levels and request appropriate supplies to be ordered; a procurement officer must generate a purchase order and place it; a finance officer must correctly and consistently process payments for vaccines; storeroom and clinic staff must handle vaccines and monitor storage correctly; maintenance staff must assure functional refrigeration and power supplies to preserve the cold chain, and clinical staff must correctly identify eligible clients and administer the vaccine properly. If any one of these steps fails, then so will the health service fail to perform one of its basic functions- to protect children from common outbreak-prone diseases. This interdependence of multiple categories of teams and health workers creates complexity. Disorganization

[1] Department of Health Services, Yap State, Federated State of Micronesia
(corresponding author- A. Mark Durand at: durand@att.net)
[2] Cowan Consulting Services, Brisbane, Australia

within this complex system is one of the principal reasons that health services fail. Such disorganization is pervasive in many developing country district health services and almost guarantees that any endeavor that the health service undertakes will be beset with problems.

In recent years there has been great interest in the use of various quality assurance/performance improvement models for developing country health services.* Most of these have taken an approach of identifying a high priority issue (often a clinical one such as post-partum hemorrhage or treatment of tuberculosis) and focus upon addressing gaps between clinical best practices vs. current practices.[3,4] These initiatives have been quite successful at improving outcomes for their target issues but are not well suited for addressing the pervasive disorganization that cripples so many district health services. For this purpose a more comprehensive approach is needed. This paper describes such an approach which focuses upon operational standards and coordination unit-by-unit across all of the units within the health service.

Prior experience:

One of us (M.C.) developed this approach in the mid-1990's. It has been refined through its implementation in several of the district health services (Kosrae, Pohnpei and Yap) in the Federated States of Micronesia.

In Yap state the program was first introduced 1997-8. The Yap Department of Health Services (DHS) is a government agency with 160 employees staffing a 43 bed district hospital, 4 affiliated health centers and 17 outer island dispensaries. The QA program which was introduced at this time covered only the inpatient and outpatient nursing units at Yap State Hospital (YSH). Initially, this program was considered to be quite successful, but the effects were short-lived. By 2001 the system had largely disintegrated. Staff members on the nursing units were discouraged by the failure of other units, including the medical staff, custodial staff and supply unit, to provide the support that was needed for the nursing units to meet their performance targets. Scheduled quarterly performance audits, (which had been assigned to unit supervisors to perform) were not being done regularly. The occasional performance audits that were done were not being followed by action plans, and program performance indicators, policies and procedures were becoming outdated by changes in staffing and program organization. There was no provision for ongoing review of the program by senior leadership.

Between July 2005 and September 2006 the QA program was revived, overhauled and extended to all units in the department, including public health programs, dental, lab, business office, medical supply, pharmacy, outer islands support, X-ray, medical records and administration units. Some features were also redesigned in order to improve program sustainability. We present our revised process used for program set-up, implementation and consolidation. We also present our experience with this program, including our results to date.

Establishment of a comprehensive operational QA program at Yap DHS:

The process for establishing a QA program consisted of three phases: setup, implementation and consolidation.

Setup: The setup phase consists of 15 steps (Figure 1) which are described in detail in the QA manual "Quality Assurance for Healthcare Services in Developing Countries".[5] Together, the 15 steps serve to raise staff awareness of deficiencies, improve lines of communication, throughout the organization, clarify staff roles and lines of authority, define new standards and change staff behaviors.

Setup is conducted unit-by-unit and starts with an assessment of the physical environment within the unit, focusing on cleanliness, orderliness and efficiency. Culture swabs are taken from sites such as desk tops, exam tables, medical equipment surfaces and sinks to detect contamination with Staphylococcus Aureus and enteric bacteria. Next, each staff member in the unit is interviewed to gather information about perceived problems on the unit and suggestions for improvement. An inventory of their role, responsibilities and the procedures (either written or implicit) is also taken. The notes from all of the interviews within the unit form a database from

---

* Quality assurance (QA) is system with three components: the setting of appropriate standards (defining quality), the use of data to monitor performance (measuring quality) and the use of interventions to repeatedly strive for improvement (quality improvement). [From the QA Model. Quality Assurance Project Available at: http://www.qaproject.org/methods/resqamodel.html (accessed Jan 31, 2007)].

which a picture of the current state of unit operations and opportunities for process improvement emerge. This database is used by the facilitator in collaboration with the unit supervisor and department director, to revise (or generate for the first time) job descriptions for each staff member, operational procedures and policy standards for the unit. Particular attention is paid to improving the capture and flow of needed information related to the work of the unit (including patient care information). Forms are often revised to improve handling of information.

Figure 1: 15 Steps for the Setup of a Quality Assurance Program

1. Unit cleanliness survey/ culture swabs
2. Meet with unit staff for orientation
3. Interview individual staff members
4. Report on identified deficits
5. Clean and reorganize unit
6. Establish uniform guidelines
7. Re-design forms if needed
8. Write draft copy of unit policy and procedures manual
9. Share draft manual with staff for review and amendments
10. Authorization of unit policy and procedures manual by division chief and department director
11. Authorized job descriptions presented to staff
12. Unit policy and procedures manual read and signed by staff
13. Staff instruction/ education
14. Audit instrument for unit written
15. Review and revise policies and procedures as needed according to experience using them

A statement of the unit's goals and revised policy standards, procedures, forms, and job descriptions are compiled into a unit manual. This manual is presented to all unit staff members, the unit supervisor and department director. Last minute revisions may be suggested at this stage. The manual is finalized once each staff member has signed his or her position description and the unit supervisor and department director have signed approval of the manual. Copies of the completed manual are kept on the unit and in the QA office (in addition, Yap DHS has electronic copies posted on the computer system local area network).

The next step in the set up phase is to design an audit tool which assesses the unit for compliance with policies and procedure standards. The tool includes a set of "yes-no" questions for each unit standard. An example of a performance standard and its audit items is shown in Table 1. Audit data are collected by direct observation or by interview with staff, both within and outside the unit. Data items which are primarily process-related are designed to be as objective as possible. Together, the audit tools comprise over 800 of these items. A unit's audit score is computed by adding total points awarded for the audit divided by total points possible (if all items were "yes") and multiplying by 100%. Most "yes" answers are awarded one point. It is possible to emphasize more important policies by assigning higher point scores to items that relate to them. For example, an item such as "All staff members are wearing prescribed uniform at time of audit" may carry one point while "Hospital inpatients have a visit by a doctor every day (as reflected in progress notes on charts)" may warrant a point score of five or ten. A one page, 22 question patient satisfaction survey is also completed for 6 clinic outpatients each month (with questions such as "Did the doctor take time to listen to your medical complaint?", "Did the pharmacist explain the medication side effects?" and "Was the billing office staff polite?"). These are not scored but are shared with the doctors and ancillary staff involved in the outpatient encounters. Audits are designed to be performed for each unit every three months. A local auditor may be trained in this process if an experienced QA officer is not available.

Table 1: Example of a part of an audit questionnaire

MEDICAL RECORDS

Standard 6

To ensure that all patients are issued with a Hospital number.

AUDIT ITEM	YES	NO	PROBLEM	CORRECTIVE ACTION TO BE TAKEN	BY WHOM	BY WHEN
1. All new patients are entered into the specific Log Book - & given a hospital # in order						
3. Index cards are in alphabetical order & are accurate & up to date.						
4. All new patients have been entered into the database (database is up to date)						
5. Following a birth :- - Hospital number is issued. - Baby name is written in Log Book for Births. - Chart is prepared with all the required forms.						
6. All new patients are issued with a laminated card showing their name & Hospital						

Implementation: The second phase, implementation, involves a physical makeover of the unit, performance of a baseline audit, replacement of outmoded forms with new ones, stocking of supplies, close monitoring and staff training. The unit is cleaned thoroughly, walls are painted if needed, accumulated clutter is discarded, new forms and needed supplies are stocked and uniforms (if provided) are distributed. The baseline audit is performed by the QA facilitator together with the new auditor, reinforcing the training of the auditor. The baseline audit highlights which standards are and which standards are not being met. A post-audit meeting is held with all unit staff. The unit supervisor chairs the meeting with the assistance of the QA auditor. The auditor presents audit findings and clarifies any areas for which there are questions. Unit staff members are encouraged to develop specific plans (who, what, when) for correcting deficiencies. These plans may involve clarifying work assignments, in service education, submission of maintenance work orders or supply requisitions or referral to higher management levels for resolution. The product of this meeting is a clear, written plan for improving performance, as reflected in audit scores. The unit's audit score and improvement plan are used to guide change over the three months leading up to the next audit. Audit scores and a copy of the improvement plan are also submitted to senior management as contract deliverables by the auditor. In this way, senior management is kept informed on a regular basis of the level of performance, planned changes, and support needs of each unit.

Consolidation: During the third phase, consolidation, emphasis is put on correcting any system defects and on capitalizing on the feedback provided by the system. The months following the baseline audit may be stressful for front-line staff members, who are changing familiar ways of doing things. The unit supervisor must closely monitor the work of the unit during the period of implementation to reinforce new policies and procedures, to become aware of staff training needs and to relay suggestions for additional, needed policy and procedure changes to senior management. At Yap DHS, these proposed policy changes are brought to the weekly department supervisors' meeting for discussion and possible approval. In the implementation phase

senior management also asks (and answers) the question: “How can results of the audit process be used to bring about maximal positive behavior change within the organization?”
Strategies for using QA system feedback to maximal effect include:

- Share patient satisfaction surveys with physicians and ancillary staff
- Hold effective post-audit meetings. These should be held promptly following the completion of the audit. All unit staff should attend. Senior management should monitor the quality of the post-audit improvement plans to be sure they are substantive and appropriate.
- Make QA a standing agenda item for senior management meetings. This raises the profile of the QA program, gives opportunity to discuss any problems with both the QA program itself and with the revised policies and procedures (especially those which involve coordination between units).
- Plot unit scores on a bar graph in a prominent location, reminding staff of their most recent audit scores and allowing them to see how their unit compares with others (Figure 2).
- Set audit score targets and provide performance incentives related to targets. At Yap DHS a unit quarterly audit score of 80% or better qualifies staff on that unit for a “commendable service bonus” of US $100 (though an individual may be disqualified for gross disregard of policies or unexcused absences).
- Provide letters of congratulation to supervisors and staff of units which meet performance targets.
- Conduct problem discussion meetings with supervisors of units with substandard performance and consider additional support to or reassignment of supervisors and other staff as needed.
- Make annual staff performance evaluations an integral part of the QA program. Include the assurance of supervisors’ completion of staff performance evaluations in the QA auditor’s list of deliverables. This can assure that they are done on a timely basis. Including the staff member’s unit’s audit scores over the year as one of the criteria on which he or she is evaluated encourages staff to heed audit results and also to strengthen identification with the unit team.

Without deliberate and sustained effort to apply the findings of a QA program, the program is likely to fail to bring about substantial performance improvement. The principal role of senior management in the consolidation phase is to link audit findings to behavioral incentives for staff and supervisors.

Figure 2: Bar graph of quality assurance audit scores posted in outpatient waiting area of Yap State Hospital.

Performance of the Yap QA program to date:

Since September, 2005 QA manuals and audit tools have been composed for 36 units at Yap DHS. Using the methods described above, a single unit's manual and audit tool requires 1-2 weeks of time for assembly by an experienced QA consultant. To date some units have been audited as many as five times, while the most recently composed ones have received only a single baseline audit. (Table 2)

To measure the change in health service performance since implementation of this program, we use the QA audit scores at baseline vs. follow-up for the various Yap DHS units. Since the program was rolled out over a period of 15 months, to date some of health service units have had only a single baseline audit performed, while others have had as many as 5 completed. Statistical comparisons between the average baseline and subsequent scores of all units audited were performed using the paired T-test. Since only some of the units were audited a 2^{nd}, 3^{rd}, 4^{th}, and 5^{th} time, only the scores from the audited units were included in the averages for the average baseline scores for each audit cycle. For example, only 8 of the 36 units completed 5 audits. In this case, both the average scores for both the baseline and 5^{th} round follow-up were computed using the results for these 8 units.

There is significant improvement overall between the average baseline and more recent audits for those units which have had more than a single baseline audit ($P<0.001$ for comparison of each subsequent audit round with baseline, by paired t-test). There was no significant change in average audit scores for subsequent audit rounds, after the second round, indicating that the improvement in standards with this program is durable. (Table 3 & Figure 3).

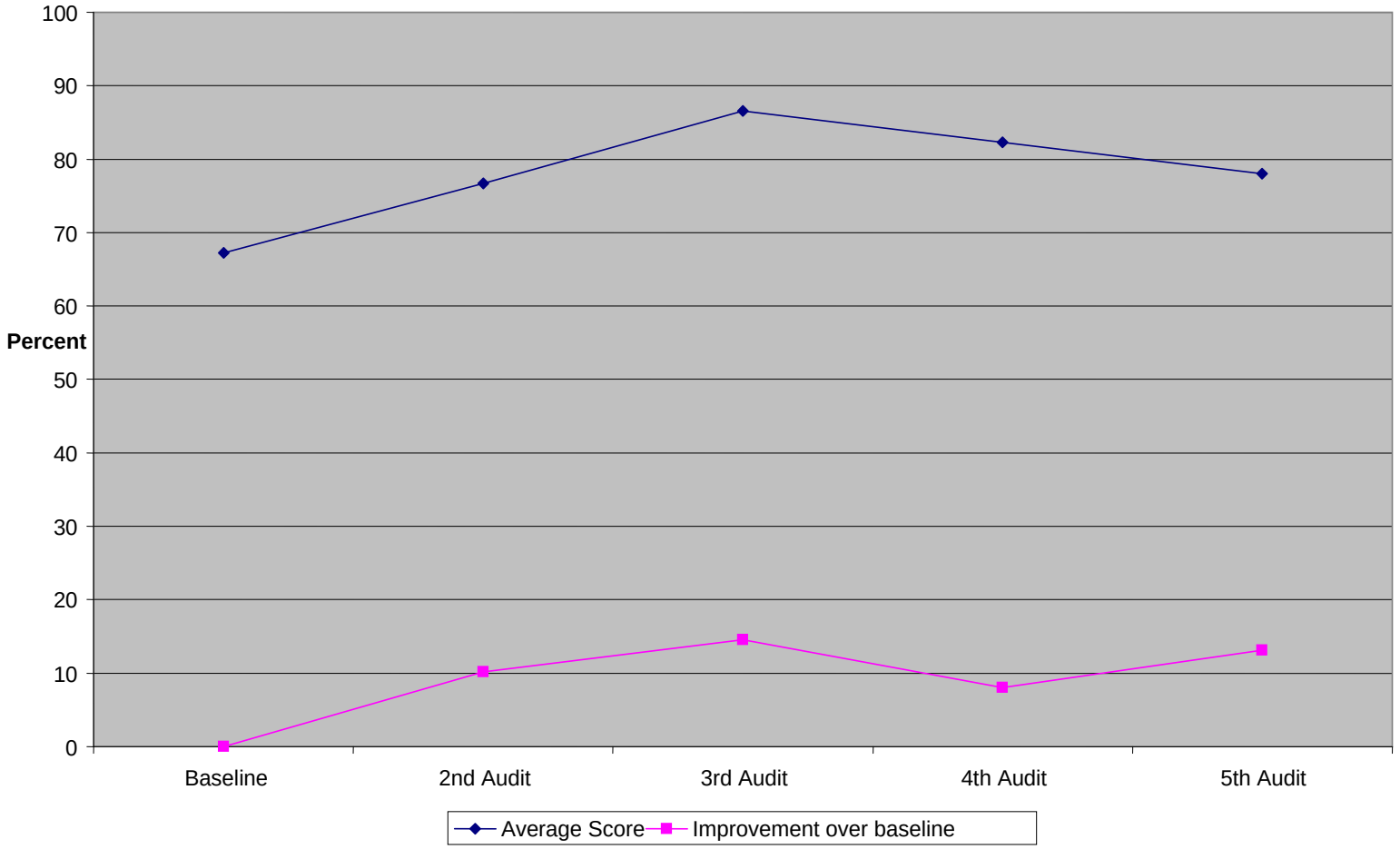
In addition to improving care as measured by the audit scores, the QA process has stimulated several organizational changes. Several staff members and supervisors have been reassigned; weaknesses of staff in job fundamentals have been brought to attention (nursing staff in handling medication, public health staff in counseling skills) stimulating formal remedial educational interventions; available clinic rooms have been re-outfitted and re-assigned among competing uses to fit better with the revised outpatient and public health procedures. A number of forms, procedures and policies and job descriptions and audit item weight scores have had further adjustments since the manuals were approved, reflecting needs that have become apparent during the implementation phase. A total of 43 unit awards (some of the 18 winning units have received more than one award) have been granted for audit scores of 80% or above. On the basis of their units' scores, 86 staff members have qualified for approximately $14,000 in performance bonuses over the first year of the program.

Table 2: Results of QA audits (in %), Yap Department of Health Services, September, 2005 to December, 2006.
(maximum score for each audit =100%)

	Sept 2005	Oct	Nov	Dec	Jan 2006	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec 2006
Lab				78		88			90			93			89	
Pharmacy				75		86			89			76			70	
Ward	61			78			85			73						
Rehabilitation	70			85						90						
Labor & Delivery	57			93			93			94						
Business Office				67			79			78						
Surgical Supply		76			88			91			83			86		
Medical Records				81				83			86					
Medical Supply				57				79			73			76		
Dental											61			78		
Operating Room		78			79			86			75			85		
Emergency Room		89			88			91			91			75		
Outpatient Clinic		72			55			81			78			42		
X-Ray		89			88			92			94			93		
Medical Staff				60	79			88		72	84					
Custodians				75						87						
Maintenance														59		
General Public Health												51			59	
Family Planning												35			64	
Immunization												58			76	
Mental Health												65			75	
Phys Exam Clinic												65			87	
Well Baby												57			67	
School Health												86			91	
Outer Island Coord.												81			94	
TB/Hansen's												85			95	
STI/HIV												86			96	
NCD												34			69	
Environmental Health												40			52	
Antenatal												39			43	
Wa'ab CHC Administration																67
Wa'ab Dental																70
Nimigil CHC																76
Tomil CHC																69
Gagil CHC																74
Maap CHC																75

TB=tuberculosis, STI=sexually transmitted infection, HIV=Human Immunodeficiency Virus, NCD=non-communicable disease, CHC=community health center

Figure 3: Changes in Audit Scores from Baseline, Yap Department of Health Services



Audit #	# of Units Audited	Baseline Composite Average Audit Score*	New Composite Average Audit Score, % (range)	Change from Baseline (95% CI)	P-value
Baseline	36	67.2 (34-89)	-	-	-
2nd	29	66.5 (34-89)	76.7 (43-96)	10.2 (6.7-13.7)	<0 001
3rd	14	72.1 (34-86)	86.6 (73-91)	14.5 (8.9-20.1)	<0.001
4th	11	74.3 (34-82)	82.3 (72-94)	8.0 (1.6-14.4)	<0.001
5th	8	64.9 (34-87)	78.0 (42-93)	13.1 (5.3-34)	<0.001

* Baseline composite average audit score on each line includes only those units that were audited during that quarter (for example, the baseline score for Audit #2 includes only the 29 units that received at least 1 additional audit since their baseline audit)

Discussion:

The institution of a QA program at Yap DHS has measurably improved performance and has resulted in a health service which is cleaner, better supplied, and better maintained. Note that the baseline audit scores cited in the results section of this paper were gathered only after a thorough overhaul of policies, procedures and job descriptions had been performed with detailed input by staff members from the front line to the top leadership. Much of the improvement in performance became apparent during this phase of system re-design, even before the "baseline" audits were conducted. Thus, the increments in performance scores from baseline that are reported here likely capture only a fraction of the benefit attributable to the institution of the QA program at Yap DHS.

There are several mechanisms by which a QA program of this design may improve performance. Cooperation and the alignment of effort by staff within and among units are achieved by clarifying job responsibilities and by creating explicit channels of communication. A prompt and proactive approach to solving problems is fostered by detecting them early, before they come to crisis, and by providing a structured approach to addressing them. The system makes the job of supervisors and managers much easier by replacing subjective, ad hoc judgments about staff and system performance with objective feedback that is more comprehensive, systematic, and occurs at regular intervals. The program allows managers to follow performance trends quantitatively over time. It provides opportunities to reward good performance in the form of staff recognition and pay bonuses on an even-handed and regular basis, and rewards team work by basing this recognition on the performance of the work unit.

The process of setting up a QA program such as this one is a lot of work, however. It is time consuming to interview each staff member and clearly define the functions and work flow within each unit, to translate these into written policies and procedures and to fit these together with other units in the health service. Careful review and revision by unit supervisors and health service managers is essential, both to assure that policies and procedures are realistic and also to increase decision makers' investment in the finished product.

Health service managers who embark on the development of a comprehensive QA program can expect a transitional period of some chaos and resistance while staff members become accustomed to new ways of doing things and increased accountability. Managers must be willing to arrange for lots of training and to be willing to change policies that are found not to work well.

It is desirable to include all units within the health service, including non-clinical areas, in the QA program. The advantage of a broad approach is analogous to that for clinical processes wherein broader approaches often function better than more fragmented ones (e.g. the integrated management of childhood illness as opposed to separate approaches for the control of diarrheal diseases, acute respiratory diseases and malnutrition). A broad approach brings synergy and balance to QA. It guards against the tendency for attention to one issue to divert attention from other important priorities and helps to foster a culture of change throughout the organization. One of the reasons that the 1999 attempt at QA failed when set up for just the nursing units at YSH was that other units- medical staff, custodians, medical supply- often failed to support the policies and procedures of the nursing units, making it impossible for the nursing units to meet their standards and thereby discouraging staff.

Another downfall of the earlier attempt was the delay in performing post-audit meetings, needed to formulate post-audit improvement plans. When audit findings are not acted upon, supervisors and staff members soon learn to disregard audit results. In 1999, though results of audits were shared with nursing staff, formal post-audit meetings were not conducted so that improvement plans were never produced. A related issue during this earlier attempt was the failure of QA findings to be linked to staff incentives. These factors together decreased staff accountability and compromised the relevance of the program. Finally, the earlier attempt failed because the task of performing the audits was assigned to staff supervisors who had other administrative and clinical responsibilities. It is very easy to postpone performance improvement tasks when others are competing for attention. The longer that audits are delayed, the more staff members tend to deviate from stated policies, procedures and standards, and the bigger the job of correcting deficiencies becomes. Having a mechanism to assure that audits are done carefully and on-time is a critical feature for sustainability. In our view, this requires that funds and personnel should be specifically earmarked for the upkeep of the QA process.

Probably the best way to accomplish this is to train and then contract with a local but non-staff auditor, rather than to use an employee of the health service. The contractor can be paid upon the completion of deliverables, rather than put on a fixed salary. This reinforces the auditor's independence and assures that deliverables are produced on time. Assigning the conduct of audits to salaried health workers who have other duties, results in audits being postponed and eventually dropped, in our experience. The ideal auditor is a person with excellent verbal and written communication skills, a high degree of attention to detail, investment in the concept of guaranteeing excellent care for the community, the diplomacy needed to assist unit staff with formulating post-audit corrective plans and the self-assurance to report objective findings, even when they are negative and unpopular. It is not necessary to have a background as a health worker to be an excellent auditor.

The careful selection of standards and indicators is very important and more difficult than for QA systems that strive for best practice for clinical topics. In clinically-focused QA programs there is usually a body of empirical literature to guide the selection of standards and indicators (and often procedures) needed to improve outcomes. For an operational QA program, one must rely largely on informed judgments to make these decisions. In essence, a QA program is an applied data feedback system. Judgments regarding the selection of indicators can best be guided by the principal which should be applied to all data collection within a health service- that only items which have a clear implications for action and a bearing on outcomes should be collected. The incorporation of irrelevant items into audits wastes resources and distracts staff attention from more substantive measures. Selected standards and indicators, by influencing staff behavior, also implicitly influence the relative attention devoted to the various priorities of the health service. For this reason, care should also be taken so that they reflect the strategic goals and objectives of the health service.

The operational QA program described in this paper can be considered as a self-performed accreditation system- but is distinguished by the use of front-line workers within each unit both for system development and for making improvement plans. This program design feature, as compared with accreditation systems and conventional QA programs which use of a change team composed of more senior health service leaders, has the advantage of leveraging the creativity of the entire workforce toward performance improvement. This feature also favors "buy-in" by the staff members who must implement most of the changes made. Not only is the number of people engaged in planning improvement increased, but the people who are most

intimately familiar with the process of service delivery are the ones who generate ideas for improvement. For this reason, this program is especially suited to improving the work processes which build operational effectiveness, but less suited for developing the "big-picture" changes in program strategy which may also enhance performance. However, by reducing the stream of operational problems, a QA program such as the one described can liberate more senior leaders to address strategic issues and focus on priority clinical topics. For these latter purposes change teams composed of more senior leaders can be created. An operational QA program is complementary to a more conventional approach to QA that addresses high priority issues individually.

Future Directions:

Longer follow-up to assess the durability of improvements from this program are needed as is the development of approaches to preserve the system in the face of health service leadership changes, which are frequent in the Pacific islands jurisdictions. Investigations of this approach in a broader variety of district health services are also needed. Future studies at new sites using a generic performance assessment tool that can be applied before QA activities are instituted (then repeated after program implementation) would be better able to measure the full impact of this program at new sites.

The use of a "template" set of generic baseline standards, indicators and audit instruments may also allow a less painstaking approach to setting up QA programs at new sites. Such a template could be quickly adapted to the leaders' preferences and the organizational structure of a district health service and then put to work immediately for conducting serial audits and performance improvement plans. Rather than developing a full set of policies and procedures in advance to support these standards, policies and procedures could be "back-filled" into the system over time as the need for them to address particular issues becomes apparent.

The use of techniques for efficiently scaling up this approach to other districts should also be explored. In the Pacific region, with its relatively small and isolated populations, high travel costs, and uneven telecommunications infrastructure, scaling up is likely to be especially challenging. The use of the Pacific Open Learning Health Network (WHO's decentralized web-based course delivery system for the Pacific)[6], the incorporation of courses in QA for health service leaders, supervisors and QA auditors into regional college nursing and public health programs, and the use of the health improvement collaborative model[7] might all be useful for spreading QA programs throughout the region.

[1] Regional Strategy on Human Resources for Health 2006-2015. WHO- Regional Committee of the Office for the W. Pacific. Pg. 5, Report of the Fifty-seventh session, Auckland, New Zealand 18-22 September, 2006.
[2] The World Health Report, 2006- Working Together for Health. P70-71. WHO Press, Geneva, 2006. ISBN 92-4-156317-6
[3] Quality Assurance in Low and Middle Income Countries: Experiences from the Quality Assurance Project. Special Supplement to the International Journal of Health Care Quality. Volume 14, Supplement 1, 2002.
[4] Quality of Care, a Process for Making Strategic Choices in Health Systems. ISBN 978 92 4 156324 6, WHO, Geneva, 2006.
[5] Mary Cowan. Quality Assurance for Healthcare Services in Developing Countries. Cowan Consulting Services, PO Box 690, Summer Park BC Q 4074, Australia, 2007.
[6] See POLHN home page at: http://www.polhn.com (accessed January 18, 2007)
[7] Massoud MR, Nielsen GA, Nolan K, Schall MW, Sevin C. A Framework for Spread: From Local Improvements to System-Wide Change. IHI Innovation Series white paper. Cambridge, MA: Institute for Healthcare Improvement; 2006. (Available on www.IHI.org accessed January 18,2007).