THE ROLE OF

TOTAL QUALITY MANAGEMENT

IN RAISING THE SERVICE QUALITY OF

PUBLIC HEALTH LABORATORIES

IN

DEVELOPING COUNTRIES

A thesis submitted in fulfilment of the requirements of the University of Derby for the degree of Master of Science in Health Services Management.

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ABSTRACT

The role of total quality management in raising the service quality of public health laboratories in developing countries
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In 1998, the World Health Organisation (WHO) renewed its appeal to support the Health for All strategy in less developed countries. This underlines the realisation, that two decades after the Alma-Ata declaration, the implementation of Primary Health Care strategies has come far short of the set targets. While physical health infrastructure has expanded in the past 20 years, actual provision of care has been limited and certain public health services are not available to large segments of the world's population.

Today, we find that public health laboratory services are deficient and poorly managed in many of the developing countries. In a recent Delphi study, WHO has identified public health laboratory services as an essential public health function, vital for maintaining and improving health. Diagnostic laboratory services are particularly important in developing countries, where according to WHO's estimates, 43% of total deaths are still claimed by infectious and parasitic diseases.

New and innovative approaches to health care management are needed to achieve the goal of Health for All in the 21st Century. The public sector in industrialised countries has recognised this need and has successfully applied modern management tools such as Total Quality Management (TQM) to continuously improve quality of its health services. This thesis presents the TQM concept as a feasible framework to support implementation of the Health for All strategy in less developed countries. While the action plan is specifically designed for public health laboratory services, it may also be adapted to other sectors.

TQM, as described in this thesis, calls for better management of available resources and a service-wide, comprehensive quality improvement led by central health planners. It appeals to donor agencies and health policy makers to address the long-time unattended needs of public health laboratory services in less developed countries, starting with pilot work on TQM.

TABLE OF CONTENTS

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ACRONYMS

AMREF	The African Medical and Research Foundation
EPHF	Essential Public Health Function
EQA	External Quality Assessment
GIS	Geographic Information Systems
HFA	Health for All
IQC	Internal quality control
ISO	International Organisation for Standardisation
LDCs	Less Developed Countries
MCH	Mother and Child Health
NVQs	National Vocational Qualifications
OSS	Operational Support System
PHC	Primary Health Care
QA	Quality Assurance
QC	Quality Control
SOPs	Standard Operating Procedures
STD	Sexually transmitted diseases
TQM	Total Quality Management
UNICEF	United Nations Children Fund
WHA	The World Health Assembly
WHO	The World Health Organisation

FIGURES

INTRODUCTION

On the eve of the 21st Century, millions of people in the developing world still lack access to reliable laboratory services. This situation prevails in defiance of the facts that laboratory services are vital, for the appropriate treatment of common diseases; for epidemiological studies; and for the identification, prevention and control of prevalent health problems.

Meager prospects of growth in health sector resources, high population demands and new health problems oblige health planners in developing countries to resort to new and innovative approaches to health care management in order to be able to meet the challenges of the 21st Century.

Public health organisations in industrialised countries have introduced the Total Quality Management (TQM) approach since the early 90s, mainly to facilitate change, increase team involvement and improve quality of services while containing costs. I (the author) would like to argue that the TQM approach might benefit public health organisations in less developed countries as well. Particularly as it does not conflict with the bureaucratic structure of public health organisations, while it facilitates the decentralised approach of the Primary Health Care (PHC) philosophy.

The first chapter of this thesis gives a brief policy background of the Health for All (HFA) strategy and the PHC approach. It elaborates reasons for poor service quality in the public health laboratory field and its effects on other public health functions. Finally, it points out current quality-improvement efforts and highlights future prospects.

The second chapter introduces the TQM theory, its major players and most

prominent features. By adapting “Dr. Edward Deming’s 14 points for quality improvement”, it identifies ways of applying TQM to public health sector organisations in less developed countries. Finally, it reviews particular benefits of the TQM approach in uplifting the service quality of public health laboratories in developing countries.

The third chapter presents an action plan for the quality transformation process. It describes a comprehensive quality-improvement plan of the entire public health laboratory system that is led by central health planners. The action plan is divided into the situation analysis, the planning and documentation process, prioritising of action and evaluation.

Finally, the fourth chapter discusses the rationale for the application of TQM techniques. It provides concluding remarks on the necessity of a concerted effort by the donor community and health policy makers to improve the quality of laboratory services in a comprehensive and sustainable manner.

CHAPTER 1

1.1 Policy Background

In1977, the Thirtieth World Health Assembly (WHA) adapted the revolutionary Health for All (HFA) strategy. The members of the WHA decided that the main social target of Governments and the World Health Organisation (WHO) in the coming decades should be, "*to achieve a more equitable distribution of health resources and the attainment by all the citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life"* (WHA, 1977). Thereafter in 1978, a joint WHO-UNICEF conference in Alma-Ata, Kazakhstan took place, where Ministers of Health from throughout the world agreed on a major statement and declared Primary Health Care (PHC) as the key to attaining this target (WHO, 1978).

The call for HFA was, and remains fundamentally, a call for social justice, universal access and intersectorial action. As Green (1994, p. 7) points out, *"health is viewed by some as a right, analogous to justice or political freedom"*. At the time of the Alma-Ata declaration, Bennett (1979, p. 513 quoted in MacPherson, 1982, p. 111) expressed a very optimistic view as he stated, *"primary health care is the outcome of collective human conscience - a recent awareness that there has been inequality in the distribution of health which is a human right"*.

Two decades after the Alma-Ata declaration, the implementation of PHC strategies in less developed countries (LDCs) has come far short of the set target. Today, WHO (1997a, p. 6) acknowledges that, *"Millions of people still do not have access to certain elements of primary health care and, in many places, effective primary health care services do not exist. While health infrastructure has physically expanded in the past*

20 years, actual provision of care has been limited...".

Why do millions of people still lack access to certain elements of primary health care?

The answer lies in the fact that HFA strategies are collectivist ideals, whereas health policies in less developed countries are influenced by an anti-collectivist world climate. Multinational companies, the World Bank, the World Health Organisation and donor agencies have had considerable effect on health policies all over the world. Especially in less developed countries, through their political power and control of external funds, foreign donors have a clear influence over policy decisions (Green, 1994; Walt, 1996 and Koivusalo & Ollila, 1997). However, we also have to recognise that policy adoption or transfer under pressure from aid agencies, such as the World Bank, often reflects surface imitation and very little real commitment. For example, Cook and Kirkpatrick (1988) argue that in developing countries, policy measure to adapt the market-based approaches often simply reflect the policy-maker's judgement as to the token measures needed to ensure the inflow of foreign assistance.

In the late 1970s and early 1980s, at the time of the adaptation of the HFA strategy, Keynesian-welfarist ideologies shifted towards Anti-collectivist ideas. Furthermore, the long boom of the post-war period ended in a global recession and less foreign aid money was available. At the same time, the World Bank decided to begin direct lending for health services. This move was justified on the grounds that the Bank could provide valuable support to health policy development and get the opportunity for dialogue on population issues (World Bank, 1980). As Koivusalo & Ollila (1997, p. 114) argue, *"the HFA initiative and the Alma-Ata declaration were to suffer, right from the*

beginning, from lack of resources and from competing viewpoints on health policies".

1.2 The Situation of PHC Laboratory Services

Why do laboratory services belong to the "certain elements of primary health care" to which millions of people still do not have access?

In 1976, the World Health Assembly adapted resolution 29.74 requesting WHO to develop a programme of health technology relating to primary health care and rural development as part of the overall primary health care programme (WHA, 1976). This effort was further strengthened in 1979 by the resolution 32.16 (WHA, 1979). This resolution urged member-states to give due attention to the development of health laboratory technology for the use in health laboratories in less developed countries, particularly in support of PHC.

Following these resolutions, WHO prepared a standard manual of basic techniques for a health laboratory geared towards the needs of PHC laboratories in LDCs (WHO, 1980). Furthermore, WHO expanded and increased its technical support to less developed countries to establish and strengthen PHC laboratory services at the various levels of the health care system. By the mid 1980s some countries such as Indonesia, Malaysia, Nepal, Morocco, Sudan, Kenya and Cameroon, established health laboratories in peripheral health centres.

Today, in the majority of less developed countries, laboratory services at the intermediate and peripheral level are limited, poorly managed and lack qualified personnel. Three main reasons for this development may be pointed out:

First, there is generally an urban bias in the resources distribution in developing

countries. The urban bias applies to both facilities and health manpower. For example, the 1998 World Health Report states that, *"in Africa, many countries made the development of infrastructure the focus of their health policy, but .....hospitals continue to consume the largest share of the health budget, sometimes at the expense of health centres"* (WHO, 1998, p. 150).

Second, shortly after the Alma Ata conference, international health policies shifted from the comprehensive PHC approach, to a more selective approach with emphasis on disease-oriented programmes (Koivusalo & Ollila, 1997, Vaughan et al., 1995). The disease-oriented programmes were seen by some as more cost-effective, as quantitative success indicators were more readily available. This selective approach still prevails today, e.g., sexually transmitted diseases (STD) and tuberculosis.

Third, a tendency to allocate limited resources to sectors where professional pressure is strongest, i.e., doctors and nurses; and where needs are perceived most pressing, i.e., mother and child health (MCH) and population control programmes.

To support the above statements further, I (the author) would like to give the example of Jordan. Through World Bank provided loans, Jordan has an excellent coverage of health centres all over the Kingdom. During inspection visits to more than 24 health centres, mainly in the Karak and East Amman region, I (the author) (Mallapaty, 1996) observed that:

- Laboratory facilities and equipment were available at all health centres;
- Many laboratories were understaffed;
- Laboratory personnel lacked basic skills;
- Work processes were not documented; and

- Supply management was flaw.

Similar observations were made in the African Medical and Research Foundation's (AMREF) laboratory programme in Kenya. Carter (1992) states that there was clearly a need to provide more intensive refresher training in basic techniques to laboratory staff.

In an effort to ensure equitable access to comprehensive, quality health care, basic and reliable diagnostic laboratory services must be included at all levels. Failure to do so will hamper the attainment of several of the original eight primary health care goals. In particular:

- Appropriate treatment of common diseases;
- Prevention and control of locally endemic diseases;
- Maternal and child health;
- Identifying, preventing and controlling of prevailing health problems.

When taking into account the poor prospects of growth in health sector resources, high population growth rates and new health problems, governments have to reassess their resources allocation and health planning strategies to meet the needs of the entire population, and especially the disadvantaged segments of the population. New and innovative approaches to health care management are needed to meet the challenges of the 21st Century.

1.3 Current Efforts

The new concept of essential public health functions (EPHFs) is one major component for developing sustainable health care systems. Public health functions are considered essential if they are cost-effective and vital for maintaining and improving health.

According to the HFA policy paper, countries at all levels of development should be encouraged and supported to provide these public health services to at least a minimum standard (WHO, 1997a).

Public health laboratory services were identified as an essential public health function (WHO, 1997b). In a recent article about WHO's laboratory programme, Dr. Heuck (1998) highlights WHO's achievement and regional efforts, especially in the quality assurance programme. Programmes complimented by training on laboratory management, reagent production, equipment maintenance and good laboratory practice. He points out that modern laboratory technology is costly, requires high technical skills and is almost solely produced in industrialised countries and sees this as a hindrance of technology transfer to developing countries. Heuck (1998, p. 70) further notes, "*This partially explains the relatively slow evolution of laboratory services in most of the developing countries*".

While I (the author) agree with Dr. Heuck's assessment of the current situation concerning modern laboratory technology, I believe, a more holistic, technical support for laboratory services in developing countries is required, besides better information exchange on technology production. World health advocates need to provide leadership and guide national health authorities towards an organisation-wide approach to quality transformation.

Since the early 1980s, the most enduring management theory in the industrialised countries has been total quality management (TQM). TQM does not limit itself to standard setting and quality control only; it is concerned with all aspects of the organisational management, concentrating on the processes as well as the product and

making user satisfaction a priority. As Johnson (1993) points out, while TQM is a top-down approach, it makes "customer satisfaction" its top priority and incorporates the philosophy of "kaizen", continuous improvement.

How can this business-oriented approach be applied to the public health sector in less developed countries?

The key to success in TQM is leadership and clear commitment from the top. Dr. Edward Deming, one of the quality gurus has developed 14 points that highlight what is necessary for businesses to prosper and be competitive (Deming, 1990). Johnson (1993) gives an updated version that highlights leadership and training as requirements for the quality revolution and points out that Deming's statements can be applied to any organisation.

CHAPTER 2

2.1 Total Quality Management

Since the early 1980s, TQM has proved the most persisting management theory in industries and businesses. The total quality concept and the term "total quality management" was first introduced to the western business world by Armand Feigenbaum in 1957, in the first edition of his book "*Total Quality Control*". A number of widely recognised approaches to quality management followed. Some of the most famous "quality gurus" are Phillip Crosby, Joseph Juran and W. Edwards Deming. Crosby is known for his work on the cost implication of poor quality and his book "*Quality is Free*". Juran emphasised that quality is a continuous process and introduced the "*pareto principle*" or "*85/15 rule*"*. Deming is often referred to as the father of quality control in Japan, he is known for his *"14 points for quality improvement"* (Slack, et al., 1995 and Varnadoe, 1996).

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*Note:

The pareto principle of the 85/15 rule:
There is a widely held belief that an organisation would have few, if any, problems if only workers would do their jobs correctly. As Dr. Joseph M. Juran pointed out years ago, this belief is incorrect. In fact, the potential to eliminate mistakes and errors lies mostly in improving the systems through which work is done, not in changing the workers.

This observation has evolved into the rule of thumb that at least 85% of problems can only be corrected by changing systems (which are largely determined by management) and less than 15% are under a worker's control – and the split may lean even more towards the system.

For example, a surgical nurse cannot do a good job with gloves that do not fit. *(A laboratory assistant can not produce reliable results with out-of-order equipment or low quality reagents.) (Italics added).*

Even when it does appear that an individual is doing something wrong, often the trouble lies in how that worker was trained, which is a system problem.

Once people recognize that systems create the majority of problems, they stop blaming individual workers. They instead ask which system needs improvement, and thus are more likely to seek out and find the true source of improvement".
(See Scholtes, et al., 1998, p. A-4)

The TQM philosophy evolved from the earlier concepts of quality control (QC), which applies statistical methods to monitor specific service outcomes; and quality assurance (QA), which provides a framework for establishing quality standards. Basically, TQM is concerned with establishing a quality management system that brings quality into work processes, (preventing mistakes rather than detecting them), involves everyone, (internal and external customers), values staff training and puts special emphasis on service-user satisfaction. TQM is a comprehensive, top-down and continuous approach to quality management.

2.2 TQM and Public Health Organisations

How can the TQM approach be applied to the public health sector in less developed countries?

On the eve of the 21st Century, health planners and policy-makers face the global challenge to improve health outcome and access to care for the millions that are still denied essential health services. Especially countries that are facing poor prospects of growth in health sector resources, high population growth rates and competing health problems need to plan for better resources allocation and cost control measures. Since the early 90s, public health organisations in western countries have introduced TQM, primarily to facilitate change, increase team involvement and enhance service quality while containing costs. Shortell and Kaluzny (1997) point out that, *"team-oriented approaches for providing patient care and programs to continuously improve quality such as total quality management and continuous quality improvement have attracted increasing attention in health services organisations"*.

I (the author) would like to argue that the TQM approach might also benefit public health organisations in less developed countries. It is an organisation-wide approach, encourages teamwork, puts special emphasis on training, strives for service-user satisfaction and is a management-led process. The TQM approach does not conflict with the highly centralised, bureaucratic structures of public health organisations in less developed countries, while it facilitates the decentralised approach of a PHC system.

Supporting this argument, following are Deming's (1990) "14 points for quality improvement" adapted to public health care organisations in less developed countries:

1 Create and publish to all employees a statement of aims and objectives of the organisation:

Public health planners must display constantly and consistently their commitment to quality services and make it known to all stakeholders, i.e., the service-users, employees and suppliers.

2 Learn and adapt the philosophy:

The private sector is increasingly realising that change is necessary. It is now time for public sector organisations to adapt business-like practices to meet the needs and challenges of the 21st Century. Doing better with less!

3 Understand the purpose of quality control systems:

Cease dependence on quality inspection and quality assurance alone by building quality into every aspect of the organisation. Improve processes through standardisation and better training of staff. Define quality with the service-user in mind.

4 Minimise total costs:

Identify ways of cutting costs by changing work practices that involve material, method,

manpower and machine. Provide Value-for-Money!

5 Improve constantly and forever the system of services:

Establish an effective supervisory system, it is a way of keeping in touch, knowing about problems and solving them early before they become endemic. The supervisory system might also be used to bring formal learning opportunities and competency-based assessment to the workplace.

6 Institute training:

Health services rely heavily on personnel, therefore, training and development of staff could be considered the most efficient and cost-effective way of quality improvement. Both on-the-job training and curriculum development in line with PHC needs are required. In less developed countries, basic training provided is often not sufficient to meet the needs of the workplace.

7 Teach and institute leadership:

Bring leadership to all levels of the organisation. Leadership at the national level. Teach leadership to supervisors. Teach leadership and managerial skills to staff at the periphery.

8 Drive out fear:

Create trust and a climate of learning. People fear less if they know what lies ahead. Each staff member must be clear about the organisational objectives and share in achieving these objectives. Build a learning organisation.

9 Brake down barriers between departments:

Increase communication and collaboration among members of the health team. Cross-functional team meetings at the national, regional, district and peripheral level might

help to brake down barriers.

10 Do not blame incompetence on the work force alone when most causes for low quality are systemic:

Most causes for low quality belong to the system and thus lie beyond the capacity of the workforce. Causes for low quality performance such as, insufficient training, lack of essential supplies or irregular pay are de-motivators and outside the control of the workforce.

11 Improve work processes:

Standardise work processes and encourage competency-based training. Prepare written documents of the organisational setup and of work processes, so that all members of the team know and can refer to national standards.

12 Give people pride in their job:

Develop a sense of belonging to a profession. Encourage forming of professional groups and links to international professional associations.

13 Institute education and a self-improvement programmes:

Transform the organisation into a learning organisation. Expenditure for training and education will increase, "*this is the price to pay for quality that should bring more than equivalent reduction in other cost categories"* (Slack, et al., 1995, p. 827).

14 Act to accomplish the transformation:

Pilot projects or studies that incorporate the above points of quality transformation might be worth a trial. It should be in everybody's interest.

2.3 TQM and Health Laboratory Services

Based upon a review of these and other relevant materials and my personal experiences, I (the author) thought it important to apply the TQM principle to the specific area of public health laboratory services (See Figure 2.1).

Under the constraints of scarce resources, why should PHC laboratory services be improved and expanded?

In 1998, WHO, the world's health advocate, pronounced a renewed call to support the HFA strategy in less developed countries. This call underlines the realisation, that two decades after the Alma-Ata declaration, the implementation of PHC strategies in LDCs has come far short of the set targets.

The 1998 World Health Report states that, based on available information, WHO estimates that in 1997 infectious and parasitic diseases still claimed 17 million deaths or 43% of the total deaths in developing countries. In 1985, this figure was estimated at 16.5 million deaths or 45% of the total deaths in developing countries. Communicable diseases are still a major cause of death in the developing world (WHO, 1998).

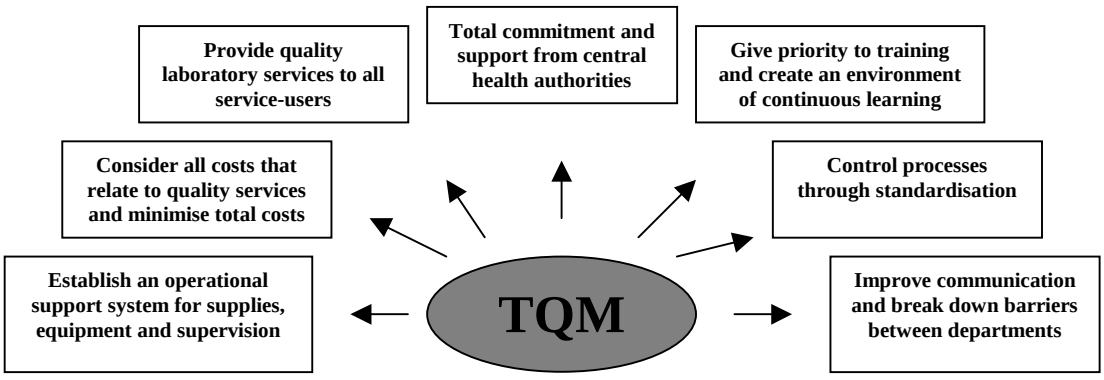
We need to question, how do health workers in developing countries diagnose and treat such common conditions as anaemia, malaria, tuberculosis and intestinal parasites, without reliable diagnostic laboratory tests? King (1973, p. 4) elaborates as he states, "*unless the diagnosis of such diseases is routinely confirmed in a laboratory, the medical care provided for the millions who suffer from them must inevitably be inadequate*".

Laboratory services give the health worker essential diagnostic tools for correct case finding and consequently targeted treatment. Today, reliable diagnostic laboratory

services are still inadequate or missing at the intermediate and peripheral level in many less developed countries (Mallapaty, 1992).

Comprehensive service improvement strategies are rare. The majority of funds and efforts are spent on selective, disease-oriented programmes, e.g., leprosy, tuberculosis, malaria and STD. AMREF's essential laboratory programme in eastern Africa is an exceptional example (Carter, 1992). Unfortunately few initiatives are known, where studies are carried out, which provide cost-effective and sustainable laboratory services integrated in the structure of PHC systems.

The Umbrella of Total Quality Management



. Figure 2.1

2.3.1 Total commitment and support from central health authorities

TQM requires top management support.

Public health care services in LDCs operate under constraints of limited resources, high demands and competing health problems. Furthermore, we often find unequal allocation of resources between different levels of facilities, workforce categories and various departments. This particularly affects PHC laboratory services. Often, central laboratories receive the lion's share of financial support or funds are directed towards disease-specific programmes. Staff training is insufficient and few unifying professional organisations exist. Particularly at the peripheral level, laboratory units are understaffed, underutilised and do not receive the importance they deserve. In the scenario described above, quality is an alien word.

Central health planners have to work and operate within these given constraints. The first step towards changing the status quo, is for central health planners to define national objectives and display total commitment to a quality transformation process.

Organisational objectives for PHC laboratory services can be defined as follows: "In support of the clinical staff, laboratory services are provide to carry out diagnostic tests in a reliable, reproducible and timely manner". This implies that adequate laboratory facilities are available at all levels, that facilities are staffed with trained personnel, and have the required equipment and supplies.

2.3.2 Provide quality laboratory services to all service-users

TQM means service-user satisfaction.

In the context of PHC laboratory services, our customers are patients, physicians,

health care workers and epidemiologists. Limited resources might not allow to meet the immediate needs of all service-users. Priorities will have to be set, based on the availability of financial and human resources, disease pattern and current health concerns of the population. Service-user satisfaction in this sense means, reliable, reproducible and timely test-results and service delivery in line with organisational objectives.

2.3.3 Give priority to training and create an environment of continuous learning

TQM puts special impetus on training.

Well-trained employees make more efficient team members. PHC laboratory services need a workforce of competent, responsible, autonomous and flexible employees to accomplish organisational objectives and provide the quality of service required. As stated by Green (1994), health services rely heavily on personnel, which often represent up to 75% of revenue expenditure. Therefore, training and development of laboratory personnel is the most efficient and cost-effective way of quality improvement.

Often identified training needs for PHC laboratory personnel are to reinforce technical skills and to acquire managerial and organisational skills. Given that resources are limited, special efforts are required to ensure that training resources are effectively used. Health planners have to identify training programmes with minimal financial implications and non-monetary training resources, such as existing staff skills (Mallapaty, 1999a).

2.3.4 Consider all costs that relate to quality services and minimise total costs

TQM prevents failure and saves costs.

Crosby (1980, p. 250 & p. 11) points out the cost implications of poor quality as he states, *"Quality is free. It's not a gift, but it is free"*, and *"The cost of quality is the expense of doing things wrong"*. Examples of cost implications for "doing things wrong" are numerous in the laboratory sector, e.g., laboratory-acquired infections, redo doubtful test results, damaged equipment and waste of supplies.

The remedy, develop a culture of cost-consciousness. In such an environment, the team members will recognise that increasing the quality of service can occur not only through the provision of additional resources, but also through better management of available resources. Through changes in work practices that involve:

- Material, i.e., bulk purchases, appropriate selection, inventory and stock level management, correct storage and consideration of self-life;
- Methods, i.e., following standard operating procedures, internal and external quality control programmes and health and bio-safety procedures;
- Machines, i.e., regular preventive maintenance and following operating instructions; and
- Manpower, i.e., staff training and development.

For example, using a test-kit with 100 tests and a self-life of two months in a laboratory unit where five tests are performed per month has serious cost implications. The costs, due to a laboratory worker not following bio-safety instructions and consequently acquiring an infectious disease, are certainly high.

2.3.5 Control processes through standardisation

TQM brings quality into work processes.

TQM decreases the reliance on quality assurance alone by building quality into every aspect of the organisation. Improving work processes through standardisation and better training of staff.

Standard operating procedures (SOPs) are a major component of any quality system. SOPs are written instruction protocols that include all aspects of work practices and reduce the chances of process variability. SOPs are effective only if used with rigorous training. Training enforces the standardisation of practical skills. The initial investment for preparing SOPs might seem high, but over time, the return on the investment might prove higher than expected.

Internal quality control (IQC) controls daily quality variances to guarantee reproducibility of test results. When test results are out of the control range or show a certain trend, causes are identified and the method is brought back on track. External quality assessment (EQA) is concerned with comparability of test results. Both are important components of the standardisation process.

2.3.6 Establish an operational support system for supplies, equipment and supervision

TQM is continuous improvement.

TQM is not a one-time-fix, it is a continuous effort. A crucial factor for the success or failure of any quality improvement programme is, what I (the author) like to call, the operational support system (OSS). The OSS creates a work environment where seeds of

team spirit and quality service can take roots and develop. It brings continuity and long-term success to organisational objectives. The OSS includes equipment maintenance, replenishment of consumables, supervisory systems, on-the-job training, expansion of services and most important communication systems. Failing to establish an OSS could be a major cause of frustration and de-motivation to staff, counter productive to the efforts of team building.

2.3.7 Improve communication and break down barriers between departments

TQM is empowerment and includes everybody.

The notion of TQM is still relatively new to health care workers in less developed countries. However, it might prove to be an effective tool in improving the quality of services. TQM requires systematic and nationwide efforts, to transform the group of laboratory personnel into a productive and efficient team.

Supporting the forming of professional group could prove beneficial. The idea that well organised professional groups can exert considerable pressure on policy makers is not nurtured, and sometimes even unwelcome.

Establish effective channels of communication. Team identity is strongest when, like in a sports team, all members know the common goal and are clear about how to achieve it. For example, monthly or quarterly newsletters are a good medium to generate a sense of belonging among employees. Such newsletters can be used to highlight problems, commend good performance, enhance training efforts or introduce new test methods. Cross-functional team meetings help to brake down barriers between departments and are a good channel of informing other health professionals about service improvements.

CHAPTER 3

3. The Action Plan

Critics often point out various weaknesses in Deming's approach to quality improvement. They highlight that action plan and methodological principles are vague, that his approach to leadership and motivation is idiosyncratic and that the principles of adult learning and group dynamics are not adequately addressed (Slack, et al., 1995, p. 815 and Knowles in Scholtes, 1995).

Therefore, following the review of suggested issues, I (the author) would like to suggest a detailed action plan for a comprehensive quality improvement of the entire public health laboratory system in less developed countries (See Figure 3.1). It combines philosophies such as value-for-money, continuous improvement, building skills through training, leadership and teamwork, then applying them to all aspects and at all levels of the organisation.

The Action Cycle

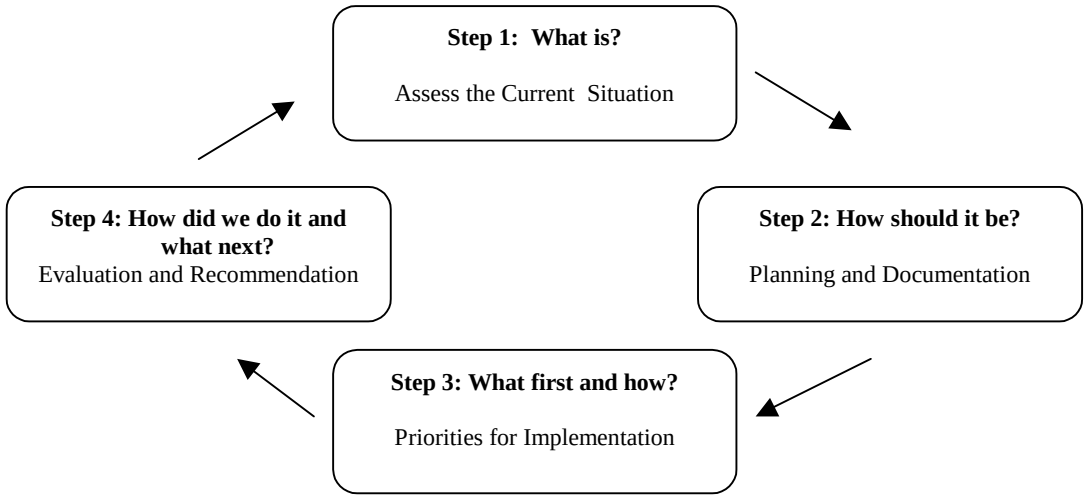


Figure 3.1

3.1 **What is?** Assess the Current Situation

The first step is to assess the current situation. This assessment will provide the baseline data for the next step in the quality transformation process. It requires a comprehensive review of the current system considering both internal and external aspects that could affect the quality of services. It should be clearly understood by all involved that this assessment is a "what is" document, a collection of quantitative and qualitative information. How the organisation should be and what must be done first, belong to the second and the third step, respectively.

While it might not be possible to involve a large group in this data collection exercise, it is the beginning of the team building process. This situation analysis demands collaboration with a number of officials in various government departments and non-governmental organisations, operating in the health sector. It is an opportunity of getting to know the players at the national, regional and local level and to identify future members of the team. This process of information sharing will bring attention to the notion of quality management and should reiterate the importance of laboratory services.

Green (1994) advises that data from a situation-analysis should be documented. The information obtained can serve as reference for health sector managers and donor agencies when planning and prioritising actions.

Data collection can never be complete and must be time-bound. As John Adair (1985) suggests, a decisive person is one who has the power to stop thinking and start acting. In an ideal situation, most data should be available with national health authorities. However, any data obtained must be verified as they might represent

outdated information and not reflect the status quo.

The list below is only a guideline and needs to be adapted to country-specific needs. Data collection is divided into four categories. Data pertaining to: the organisational structure, the work processes, the educational system and the operational support system.

3.1.1 Data concerning the organisational structure

Data concerning the organisational structure include:

- The number and geographic distribution of laboratories in the country;
- The number and category of staff at each level;
- Equipment inventory lists, where possible, brand names and state of repair;
- List of test procedures at the various levels;
- National health problems and locally endemic diseases;
- Budget figures for the public health laboratory sector.

3.1.2 Data concerning work processes

Data concerning work processes include:

- Standard operating procedures;
- Internal quality control procedures;
- External quality assessment programmes;
- Health and bio-safety procedures;
- Patient and specimen referral systems.

3.1.3 Data concerning the educational system

Data concerning the educational system include:

- Training institutions and educational requirements;
- Number of additional qualified staff each year;
- Proportion of total number of staff working in the private and public sector;
- Curriculum structure;
- Workplace learning and assessment related information.

3.1.4 Data concerning the operational support system

Data concerning the operational support system include:

- Supply order and supply distribution systems;
- Supervisory system;
- Equipment maintenance system;
- Refresher training courses;
- Communication and transport modes;
- Information flow both inter-departmental and intra-departmental;
- Water and energy supplies;
- Salary system and regularity of pay;
- Other important constraints.

3.2 **How should it be?** Planning and Documentation

The second step involves planning and documentation, bringing structure into the system and reducing the possibility of leaving things to chances, in line with Deming's

basic philosophy, which assumes that quality increases as process variability decreases (Slack, et al., 1995).

The ultimate goal is to prepare written documents of the organisational setup, work processes, the education system and operational support functions, so all members of the team know and can refer to national standards. This might sound easy but could be very difficult and time-consuming. Data collected during the situation analysis would provide the baseline data for this extensive exercise.

According to Green (1994, p. 16), *"planning is a suspect word"* for health professionals both in industrialised and in developing countries. Many health professionals are apprehensive when it comes to planning, as most have experienced examples of planning disasters. For example, building PHC centres but failing to plan for staffing and running costs; equipping laboratories at the peripheral level with expensive and sophisticated machines without providing user training and supply replenishment.

Nevertheless, Green (1994, p.18) concludes that, *"weighing all odds, a health care system without planning is likely to be worse than one with it"*. He further stresses the importance of *"exposing a broad range of health professionals to the importance and concepts of planning so that they can participate in the process."* Especially in developing countries, the concept of a comprehensive health planning system is still relatively new and needs to be cultivated.

It might be more cost-effective, to initially prepare draft documents at the national or regional level involving a small group of experts. After that, distribute the draft documents to a larger number of laboratory staff at the regional, district and peripheral

level for additional ideas and suggestions, (e.g., Delphi study). Finally, hold a larger group meeting with representatives from each level to review and comment, before writing the final national or regional document.

Looking into the not-so-distant future, data of the organisational structure could be stored in a national health database using geographic information systems (GIS) technology. The use of geographic information systems has grown steadily over the last decade. *"GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e., data identified according to their locations"* (U.S. Geological Survey, 1997). In the public health field GIS applications range from the active surveillance of acute and infectious diseases to the development and maintenance of geo-referenced health databases, resources management and development planning.

Following are guidelines for the planning and documentation process that need to be adapted to country-specific requirements. Again, the planning and documentation process is divided into organisational structure, work processes, the educational system and operational support system. Remarks point out particulars of the quality transformation and team building process.

3.2.1 Plan and document the organisational structure

Documents of the organisational structure include:

- The number and geographic distribution of laboratories in the country:

Including data on already existing and required facilities, and/or restructuring of the existing laboratory network.

- The number and category of staff at each level:

Specify the number of staff required at the various levels, i.e. central, regional, district and peripheral. With a total number of available staff and total number of required staff.

- Health problems and locally endemic diseases pattern:

Specify national variation in disease pattern and health problems based on which essential test procedures would be selected.

- Essential test procedure lists for the various levels:

Prepare a standard list of essential test procedures for the various levels, i.e. central, regional, district and peripheral, with appraisal of factors such as clinical usefulness, cost-effectiveness, supply limitations and appropriate technology.

- Essential equipment lists for each level:

Based on the selection of essential test procedures, prepare a standard list of essential equipment for the various levels, i.e. central, regional, district and peripheral.

- Budget allocations for the public health laboratory sector:

Specify budget figures allocated for the public health laboratory sector as a whole and the individual laboratory units. Individual laboratory units might not control a specific budget. However, it is important to consider each unit as an independent cost control centre to which costs are attributed and where the person in charge assumes responsibility for costs. Such costs are not defined in monetary values but more in terms of resources necessary to deliver a service (Drury, 1990).

Furthermore, the costs and revenues allocated to the laboratory unit should be classified as controllable or non-controllable. The objective behind classifying costs

into controllable and non-controllable elements is to help the manager plan, control and take full responsibility.

Controllable costs are costs that the manager of a particular cost centre can control, e.g., the efficient use of consumables, material usage variance, equipment use and preventive maintenance. If the manager of the cost centre has no control over the occurrence of costs, then she or he should not be made accountable for it. These costs are non-controllable, like the choice of test-kits usually controlled centrally, the number of staff at the unit, salaries and the cost or quality of centrally supplied consumables (Broadbent & Cullen, 1993).

3.2.2 Plan and document work processes

Documents of work processes include:

- Standard operating procedures:

Standard operating procedures (SOPs) are a major component of any quality system. SOPs are written instruction protocols that include all aspects of laboratory work practices. Laboratories preparing for certification* or accreditation* in western countries have to abide strictly to the International Organisation for Standardisation, ISO 9000 series of standards or in the European Union, the EN 45000 series of standards.

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*Notes:

Accreditation:
Procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks.

Certification:
Procedure by which a third party gives written assurance that a product, process or service conforms to specific requirements.
(ISO/IEC Guide 2, general terms and their definitions, see Burnett, 1996, p. 1)

For medical laboratories, the ISO/IEC Guide 25, and its revisions; and the European Standard EN 45001 apply. (Burnett, 1996).

Critics frequently point out that the ISO 9000 and EN 45000 standard systems are too elaborate and costly to implement in developing countries. Medical laboratories in countries were national guidelines do not exist are best advised to follow international set guidelines and adapting them to local conditions and needs. Burnett (1996, p. 13) points out that *"no quality or accreditation system can be successfully organised without a great deal of thought being given to the standards* upon which such a system is dependent"*.

Health planners must keep in mind that writing SOPs involves great efforts, regarding manpower and time. Initially, SOPs could be prepared for all essential test procedures and equipment. As a general guideline, SOPs have the following features:

- SOPs are written in accordance with a standard format;
- SOPs are written in simple language, readily understood by employees;
- SOPs must contain sufficient procedural details to enable trained staff to perform the task without supervision;
- SOPs are written by qualified and experienced laboratory officers and must be followed exactly by all members of staff;
- SOPs are reviewed and updated on a regular basis.

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*Note:

Standard as a normative document:
A Document, established by consensus and approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.
(EN45020:1993 Glossary of terms for Standardization and related activities, see Burnett, 1996, p.13)

The bottom line is, the advantages of SOPs greatly outweigh the problems and difficulties encountered with writing them. SOPs reduce the chances of process variability, especially if used with rigorous training. SOPs can be used as a tool for both work-based and institution-based training. In this way, they increases staff flexibility without reducing quality as all staff are working to national set standard methods. While it might need a large investment at first, it could prove highly costs saving over time.

- Quality control systems:

All laboratories, whether in developed or less developed countries, need quality control systems to ensure that test results are reliable and reproducible. The general terms quality control*(QC), quality assurance*(QA), internal quality control*(IQC) and external quality assessment*(EQA) are often confused and misused. See notes, for the

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*Notes:

Quality control:
The operational techniques and activities that are used to fulfil requirements for quality.
(ISO 8402:1994 Quality management and quality assurance-Vocabulary, see Burnett, 1996, p. 221)

Quality assurance:
All the planned and systematic activities implemented within the quality system and demonstrated as needed, to provide adequate confidence that an entity will fulfil requirements for quality.
(ISO 8402:1994 Quality management and quality assurance-Vocabulary, see Burnett, 1996, p. 218)

Internal quality control:
IQC is the set of procedures undertaken by the staff of a laboratory for continuously assessing laboratory work and the emergent results, in order to decide whether they are reliable enough to be released (either in support of clinical decision making or for epidemiological or research purposes). Thus quality control procedures have an immediate effect on the laboratory's activities and should actually control, as opposed to merely examining the laboratory output.
(WHO External Assessment of Health Laboratories (1981) see Burnett, 1996, p. 200)

External quality assessment:
External quality assessment refers to a system of objectively checking laboratory results by means of an external agency. The checking is necessarily retrospective, and the comparison of a given laboratory's performance on a certain day with that of the other laboratories cannot be notified to the laboratory until some time later. This comparison will not therefore have any influence on the tested laboratory's output on the day of the test. The main object of EQA is not to bring about day to day consistency but to establish between-laboratory comparability.
(WHO External Assessment of Health Laboratories (1981) see Burnett, 1996, p. 234)

official definition of these terms. Often, when referring to quality control or quality assurance, actual reference is made to IQC procedures and/or EQA programmes. In the laboratory, IQC and EQA are central and important activities, but in itself can not ensure the quality of test results.

IQC procedures control daily quality variance of test results, problems are identified immediately and the method is brought back on track. EQA programmes are organised on a regional, national or international level and are concerned with comparability of test results. EQA is a retrospective evaluation of quality.

QA is described by WHO (1992) as a quality system that includes, IQC, EQA, the pre-analytical phase, standardisation of test methods, the post-analytical phase, management and organisation.

TQM is concerned with establishing a comprehensive quality management system that brings quality into work processes, (preventing mistakes rather than detecting them), involves everyone, (internal and external customers), values staff training, puts special emphasis on service-user satisfaction and is a continuous efforts (See figure 3.2).

Quality Control Systems

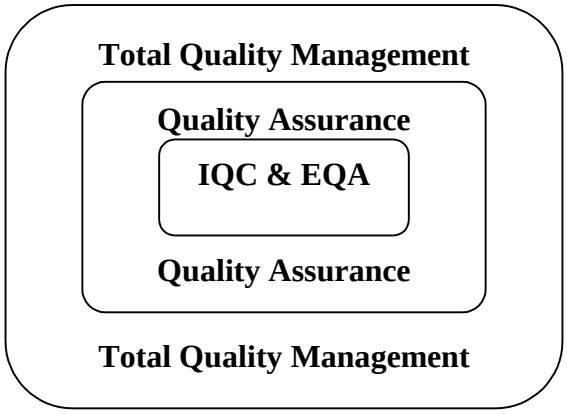

Figure 3.2

In less developed countries, under the constraints of financial resources, EQA programmes often take prominence over IQC procedures. However, when setting priorities health planners might want to keep the following statement in mind, "*Undoubtedly introduction of EQA can stimulate an improvement in quality, but earlier experience indicates that EQASs alone have not been useful in producing major, sustained improvements"* (WHO, 1994, p. 81).

- Health and bio-safety procedures:

Health and bio-safety procedures include general safety instructions, chemical, fire and electrical safety, medical waste disposal and first-aid instructions. Reference is made to guidelines in the WHO publications, "*Safety in Health-care Laboratories*" (WHO, 1997c) and "*Laboratory Biosafety Manual, 2nd ed*." (WHO, 1993a). Where available, consult national regulations and guidelines.

For a work environment such as a medical laboratory, health and safety precautions are essential. The staff must understand and apply such procedures, otherwise, through ignorance, carelessness or neglect, staff can endanger their own health and the health of their patients, co-workers and the environment.

- Patient and specimen referral systems:

Specify the referral procedures of patients and/or specimens to the next higher level laboratory, including instructions on sample collection and transportation.

3.2.3 Plan and document the educational system

Documents of the educational system include:

- Training institutions and educational requirements:

Including the structure of the educational system, entrance requirements for the various levels, and accreditation procedures for public and private training institutions. TQM calls for heavy investment in training. People are our most valuable and costly resource!

At training institutions, students are taught theoretical knowledge, but not enough practical skills (Abbatt, 1980). The challenge for teachers and health planners lies in:

- Finding cost-effective (using minimum resources for the highest possible number of trainees) and flexible (concerning time, place, individual needs) training solutions; and
- Developing learning resources suitable for basic course training at training institutions and at the laboratory unit for workplace, self-paced learning.

Based on the principles of andragogy and the empirical example of the National Health Services in the UK, health planners in less developed countries could adapt and use work-based and learner-centred staff development techniques. Training strategies that are geared to the needs of the individual learner and offer pay-off for the organisation and the economy as a whole. However, while promoting more flexible and individualised approaches to workplace learning, in developing countries, where training needs are enormous and resources are limited, training effort must be cost-effective and focus on national needs rather than individual wants. Health planners must create a cooperative learning climate, where learners are aware of the organisational objectives and see staff training as a means to meet the objectives (Mallapaty, 1999a).

- Number of additional qualified staff each year:

Specify the annual number of graduates and compare it with the requirements of vacant

positions. Identify the number of graduates lost to the private sector and find means of keeping graduates with public sector organisations. Plan for staffing in remote areas of the country.

- Curriculum structure:

Continuous improvement of laboratory personnel has to start with curriculum development at national training institutions. A criterion-based view of curriculum development, in line with PHC needs, would ease the knowledge transfer between training institutions and the workplace (Fletcher, 1992). This ensures that graduates have both knowledge on the subject and sufficient practical skills to do test procedures independently, while working to national standards (See figure 3.3).

The Criterion-based View of Curriculum Development

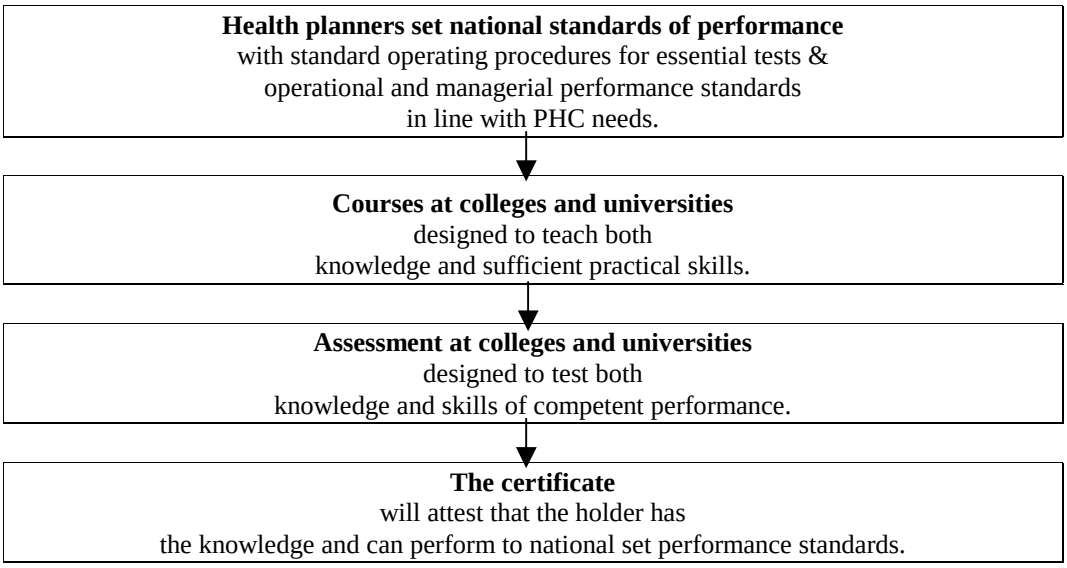

Figure 3.3 Adapted from Fletcher (1992, p. 34) The criterion-based view of curriculum development.

- Workplace learning and assessment:

Establish a framework for continuous learning in the workplace. Work-based training programmes should reinforce basic skills and teach managerial and organisational skills. At present, health care workers in less developed countries perceive that learning and assessment belong to colleges and universities, where training and assessment is associated with certificates and degrees. With a TQM approach, this perception should change towards the acceptance of workbased-learning opportunities and competency-based assessment. Dorrell (1993) points out that formal learning opportunities on-the-job bring motivation and better performance.

3.2.4 Plan and document the operational support system

Documents of the operational support system include:

- Supply order and supply distribution systems:

Including the quality and cost assessment of the supply system, the supply distribution and inventory management. Assessment of local production of consumables, reagents and equipment (Free, 1992; Free, et al., 1993). Where resources are limited, restricting services to the basic minimum might be better than failing to replenish supplies when required.

- Supervisory system:

Establish a system of supervisory visits by qualified staff to all peripheral laboratory units on a regular basis. It is a way of keeping in touch, knowing about problems and solving problems early before they become endemic. Visits can be combined with quality control programmes, on-the-job training, competency-based assessment and

equipment preventive maintenance programmes.

- Equipment maintenance system:

Specify the structure of national and/or regional equipment maintenance centres and organisational details of a laboratory equipment preventive maintenance system.

"*The purpose of a preventive maintenance programme is to minimize instrument breakdown and reduce the number of costly (and often inefficient) services for instrument repair, through appropriate planning for maintenance and repair*". "*The ultimate objective of the preventive maintenance programme is to provide an optimally operating instrument, the performance of which meets established criteria/standards*" (WHO, 1993b, p. 95).

Well functioning equipment is essential for the smooth running of a laboratory. Staff must be familiar with basic maintenance procedures, such as, changing the bulb of a microscope, cleaning of a centrifuge or changing a fuse of a photometre.

In addition, regular preventive maintenance of laboratory equipment by a biomedical instrument technician is required to prolong the life of costly equipment. Many countries have established biomedical equipment maintenance centres, but regular visits to PHC units are often poorly organised.

- Refresher training courses:

Specify details on course venue, duration and frequency of training and the course content. Refresher training courses can take various forms:

- On-the-job training: Where a group of trainers moves from unit to unit and conducts individual on-the-job training courses. Such courses should be time limited and well structured. On-the-job trainers can also take up the responsibility of supervisors.

- Regional training courses: Training courses at regional laboratory training facilities, where trainees receive both theoretical and practical training. A major disadvantage of regional training courses is having a large number of staff out-of-post for a prolonged period. Transportation costs and allowances must be considered in addition to training expenses. The required grouping of trainees according to knowledge level can prove difficult.

- In-service-training: Trainees learn at the side of an experienced laboratory worker. It might be difficult to find sufficient laboratories with experienced staff to provide in-service-training. This type of refresher training is useful for training of new staff and for staff who do not meet performance standards.

- Management training: Managerial responsibilities at a laboratory unit are diverse. They include work planning and organisation, supply management and inventory control, record and report keeping, equipment maintenance, health safety procedures and communication. Management training can be organised on a regional or national level and should be tailor-made to the requirements of PHC laboratory managers.

- Communication and transport modes:

Specify and outline communication links. The foundation of successful TQM systems is excellent communication both within the organisation and with external stakeholders. Some useful communication channels are:

- Newsletters: Newsletters can reduce the isolation factor, faced by far-off and scattered health centres. Through newsletters, members of the team can share common problems and concerns, management can inform about objectives, achievements and future plans.

- Supervisory visits: Supervisory visits support the important aspect of informal communication and ensure social contact with far-off laboratory staff.
- Cross-functional teams meetings: Cross- functional team meetings create trust and understanding among co-workers. Within a PHC system, the laboratory is not an independent unit, but part of an organisational structure. Usually the head of the health centre is the direct supervisor of the laboratory worker. However, lack of technical knowledge on the subject, often prevents effective guidance and supervision.
- Lectures: Lectures are a forum to pass-on information and encourage discussions.

3.3 **What first and how?** Setting Priorities for Implementation

The third step is to decide what first and how. We have to be realistic, not every aspect of the quality transformation plan can be implemented at once. Action requires planning as well.

How do we select priorities? Priority selection is a subjective process, as the perception of immediate needs various among the different stakeholders, i.e., service-users, educators, employees, policy makers and donor agencies. Objectivity can be brought into the decision making process when two major issues are addressed:

- First, decisions on priority setting are based on solid information; and
- Secondly, immediate and long-term financial and human resources limitations are considered.

Initially, the well informed group of experts involved in the preparation of the planning documents could brainstorm and prepare a priority list for action (Asher, 1996). Thereafter, the group might consider applying the Pareto principle (See Chapter 2.1)

to identify problem areas in the organisation that give most benefit to quality improvement with least resources involved. Dr. Joseph Juran applied this principle to management and advised to concentrate on the "*vital few*" sources of problems and not to be distracted by those of lesser importance (Scholtes, 1998 and Slack, et al., 1995).

Furthermore, health planners must consider that an important aspect of TQM and continuous improvement is investment in training. The workforce can only be as good as the training they received.

In a recent survey that I (the author) (Mallapaty, 1999b) conducted among international experts, health planners and teachers, a consensus emerged. International experts agreed that in the past training needs of laboratory personnel were not adequately addressed. They supported the notion, that learning resources should enhance knowledge transfer from the classroom to the work place and reflect PHC needs. They also agreed that service quality improvement required regulative national policies. I (the author) believe that we have to find cost-effective (using minimum resources for the highest possible number of trainees) and flexible (concerning time, place and individual needs) training solutions to meet the challenges of the 21st Century.

3.4 **How did we do it and what next?** Evaluation and Recommendation

The fourth step is evaluation. Evaluation has to be seen as the final step of the quality transformation process and the first step in the continuous improvement cycle. Amonoo-Lartson, et al. (1994) state that for health programmes, "*the objective of evaluation is to improve the services for delivering health care and to guide the allocation of resources. Thus evaluation is closely linked with decision-making both at*

the operational as well as at policy level".

The evaluation of an ongoing project can generate valuable information for improving future projects. This is also called "formative evaluation". Formative evaluation is concerned with monitoring action and examines whether or not project objectives are met.

Evaluation at the end of a project is called "summative evaluation". Summative evaluation is concerned with outcome and effect. It appraises service quality improvements through measurable indicators. Ultimately, evaluation is a tool to improve future projects.

CHAPTER 4

4.1 Discussion

The notion of applying the TQM approach to public health laboratory services in developing countries and the suggested action plan are based on the following principle assumptions:

First, public health laboratory services are an essential public health function (EPHF*), vital for maintaining and improving health (WHO,1997b). Therefore, to ensure equitable access to comprehensive and quality health care to all, essential diagnostic laboratory services must be available at all levels. This is particularly important in developing countries, where communicable diseases are still a major cause of mortality and morbidity. WHO (1997a, p. 28) states that, *"The role of governments with respect to sustainable health systems is to guarantee equity of access to health services and to ensure that essential health system functions are available to all"*.

Second, in the majority of less developed countries, laboratory professionals represent an occupational group with limited political force. Considering the importance of diagnostic tests in patient management and epidemiological studies, international agencies and professionals with experience in the PHC laboratory field need to take a lead for change.

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*Note:

Essential Public Health Functions:
These functions are a set of fundamental and indispensable activities to protect the population's health and treat disease, targeted at the environment and the community. They are vital for maintaining and improving health. Countries at all levels of development should ensure that these functions are performed at least to minimum standards, and that their implementation should be monitored by government agencies. Functions are considered essential if they promote health and prevent or protect the population from major health hazards. The execution of these functions requires strong partnerships.
(Health for all in the twenty-first century, policy paper, WHO, 1997a, p. 36)

Third, resources constraints in the public health sector call for new and innovative approaches to health care management to meet the challenges of the 21st Century. Human resources development plays a pivotal role in providing quality services. The challenge lies in finding cost-effective (using minimum resources for the highest possible number of trainees) and flexible (concerning time, place and individual needs) training solutions. In addition, learning resources must be suitable for basic training at national educational institutions and for self-paced workplace training. WHO (1997a, p. 40) states that, *"The health sector should develop national policies that contribute to self-sufficiency in human resource development, appropriate career development and deployment of the health workforce"*.

Fourth, poverty has a devastating impact on health. The consequence of poverty is poor health status resulting in weakened economic capacity. Health is central to all human development. An analytical review in the Economist (1998), of the recent World Bank publication: "Assessing Aid: What Works, What Doesn't, and Why", states that, *"Foreign aid could help to reduce poverty if it were spent on the right countries. Unfortunately, it isn't"*. It emphasises that, *"the key to development is good economic policy, and that this is something which only governments concerned can put into effect, aid can play a useful role. It is up to donor governments to see that it does"*. Therefore, the review concludes that foreign aid is effective only in countries with sound national policies.

What applies to economic policy applies to health sector policy as well. If exercised as a service-wide improvement process, TQM ensures that national policies are based on an extensive situation analysis and a sound planning process. Seaman (1995), in an

analysis of international aid to health systems in developing countries, points out the problem of 'recurrent costs'. He states that frequently donors cover capital expenditure in the form of buildings, equipment and training, but expect the recipient country to supply 'recurrent costs' such as salaries, supplies and maintenance. Donor agencies, often guided by donor governments' policies and pressures, find it difficult to address the situation of poor countries' inability to cover recurrent costs resulting in the declining effectiveness of aid. In countries like China, where strong national policies are in place and donor agencies have to follow a congruous national plan of aid distribution, aid seems to have been more effective (Seaman, 1995).

The real problem is to convince donor agencies to shift from the largely capital expenditure approach of development aid towards guiding governments to adapt quality health policies with service-wide management improvements. The capital expenditure approach to development aid does not adequately consider 'recurrent costs' and the long-term effects of the intervention. As Smithson (1994, p. 10) concludes in a review of five country case studies on health financing and sustainability, *"Sustainable health sector development comprises two features: effectiveness and continuity"*.

In its HFA policy paper, WHO (1997a, pp. 41-45) states that the keys to successful implementation of the new health policy are: strong policy-making capacity; good governance; participatory planning; setting priorities using an open and consultative approach; productive partnerships; global action and evaluation.

I (the author) believe that the TQM concept, as described in this thesis, could provide the framework to put the new HFA policy into action. TQM is an organisation-wide approach, which encourages teamwork, puts special emphasis on training, strives for

service-user satisfaction and is a management-led process. The TQM approach does not conflict with the highly centralised, bureaucratic structures of public health care systems, while it facilitates the more decentralised approaches of PHC and HFA. Although explicitly applied to public health laboratory services, this framework may also be used to improve the service quality of other sectors.

In a recent survey (Mallapaty, 1999c) of international health policy makers, some experts argued that, to be effective, TQM must be applied to the entire primary health care unit and especially at district level. As pointed out in Chapter 2.2, I (the author) do believe that TQM can benefit the whole public health sector in less developed countries. However, I would like to argue that the quality improvement effort must be led by central health planners and be applied to the entire service sector. TQM practiced at one district hospital or at district level only would not bring the desired results. It would improve internal management systems but leave out important managerial support functions and fail to build necessary infrastructure (in the scenario of public health laboratories that would include, human resources development and planning, supply management and equipment maintenance) that improve the health care delivery system as a whole. As Smithson (1994, p. 64) points out, *"the capacity of health systems to function effectively over time must remain the central goal of governments and donors. … If this goal is to be made reality, the legitimacy and importance of using external assistance to sustain health service operations must be explicitly recognised, and mechanisms must be found to improve the continuity and utility of health sector aid"*.

TQM has been successfully applied to industries and in public health organisations in industrialised countries, especially to facilitate change, increase team involvement, and

improve service while containing costs. Hughes (1994, p. 167) argues that in the industrialised world, *"to an increasing extent public policy and policy analysis are being replaced by economics, allied with modern management, as applied to the public sector. In other words, they are being replaced by new public management"*.

TQM and the suggested action plan do not call for huge additional capital expenditures but rather for better management of available resources. After an extensive needs analysis, funds are spent on specific and most cost-effective interventions. TQM as a service-wide improvement process also calls for better donor coordination guided by national health authorities.

A pilot study, as suggested in this thesis, applied to the specific sector of public health laboratories would bring twofold benefits. First, it would address the long time unattended need for service-wide quality improvements of public health laboratory services in less developed countries. Public health laboratory services have been greatly affected by what MacPherson (1982) describes as unequal distribution of resources between workforce categories, e.g., doctors versus medical auxiliaries, between levels of facilities, e.g. hospitals versus health centres and between departments.

Second, the experience gained and lessons learned from such a pilot study would provide useful information for future projects. Similar approaches might be applied to other service sectors, i.e., nursing, pharmaceutical sector, community health workers, midwives. The TQM approach would also assure that other sectors are involved and that the laboratory is not seen as a department in isolation.

4.2 Conclusion

The 1998 World Health Report states that 43% of total deaths in developing countries are still claimed by infectious and parasitic diseases (WHO, 1998). Medical care for the millions who suffer from these diseases must be insufficient if diagnostic laboratory services are not available.

Today, in the majority of less developed countries, laboratory services are poorly managed and understaffed. At the peripheral and intermediate level, public health laboratory services suffer further due to urban bias of resources distribution, the emphasis on disease-oriented programmes and the general resources constraints. While a number of disease-oriented projects do include laboratory components, this has often led to parallel management and support structures. It has brought project specific service improvements but over time failed to bring long-term and service-wide improvements. Comprehensive quality improvement efforts of the entire public health laboratory network are rare. Hiscock (quoted in Smithson,1994, p. 63), as he describes the situation in Ghana, rightly states that, *"in a health system that is comprised of a collection of disparate units or programmes, funds are likely to be wasted through duplication, and scarce resources may be focused solely on meeting programme targets rather than strengthening the capacity of the entire health system"*.

Donor agencies, through their control of external funds have considerable influence over health policy decisions in less developed countries (Koivusalo & Ollila, 1997). I (the author) hope that this thesis would provide international health policy makers and donor agencies with better insight of the problems and constraints affecting health laboratory services in less developed countries. It should reiterate the benefits that

modern management theories such as TQM could bring to public sector organisations in less developed countries, as has been the case in industrialised countries.

Neglect has had its tolls. The sad truth is that, in less developed countries, a large segment of the population are denied equitable access to reliable diagnostic laboratory services. If we are to achieve the new goal of HFA in the 21st Century, it is mandatory that we put all efforts into changing the status quo. Public health laboratory services must get the attention and support they deserve.

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