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FEASIBILITY STUDY

Conducted by

Tulane School of Public Health

Prepared by:

Naomi Baumslag, M.D., MPH
Assoc. Prof. Nutrition Tulane
School of Public Health
Prof. of Community Medicine
Emory Medical School
Atlanta, Georgia

FEASIBILITY STUDY REPORT

SUMMARY

Major Findings of Feasibility Study

- There is a widespread recognition of the urgent need for a regional Institute of Public Health.
- There is a general mandate among BLS countries for regional training.
- No health manpower training infrastructure exists.
- The BLS Universities offer few if any, health degree programs.
- The myriad of certificates and courses available only allow lateral mobility and this constitutes a waste of resources.
- Public health training is obtained overseas.
- Overseas training costs approximately \$50,000 per year which is out of proportion to the few benefits gained. Three-fifths or more of the invisible costs born by the countries themselves with no return other than a minimal number of qualified personnel frequently inappropriately trained.
- In the BLS countries an average of 10 Public Health students at the Masters level are sent overseas each year.
- There is a dearth of health resources in public health.
- Donor agencies work on their own programs even though there is a directive for coordinated regional programs.
- There is no critical mass of public health trainers for developing the Primary Health Care plans.
- Localization is progressing very slowly and a Public Health Institute would promote this.
- Self-sufficiency is not possible without institution building.

- Conservative estimates place the student pool for the SADCC region at close on 900 candidates for the masters level public health training and 2400 for the bachelors level. The data analysed suggests a formula of 3 doctors per million population and 10 nurses per million population and 1 bachelors level professional in health related activities per million.
By the year 2000 this will have increased markedly as the population in the SADCC region increases from 60 million to 100 million

- In the US there are 23 schools of public health ~~and for~~ serving 230 million people .-one school of public health per 10 million.

In the Southern Africa region there are no schools of public health for 60 million and by the year 2000 the situation will

have become worse as the population is expected to be close to 100 million. unless

some active steps are taken. regionally to promote regional training.

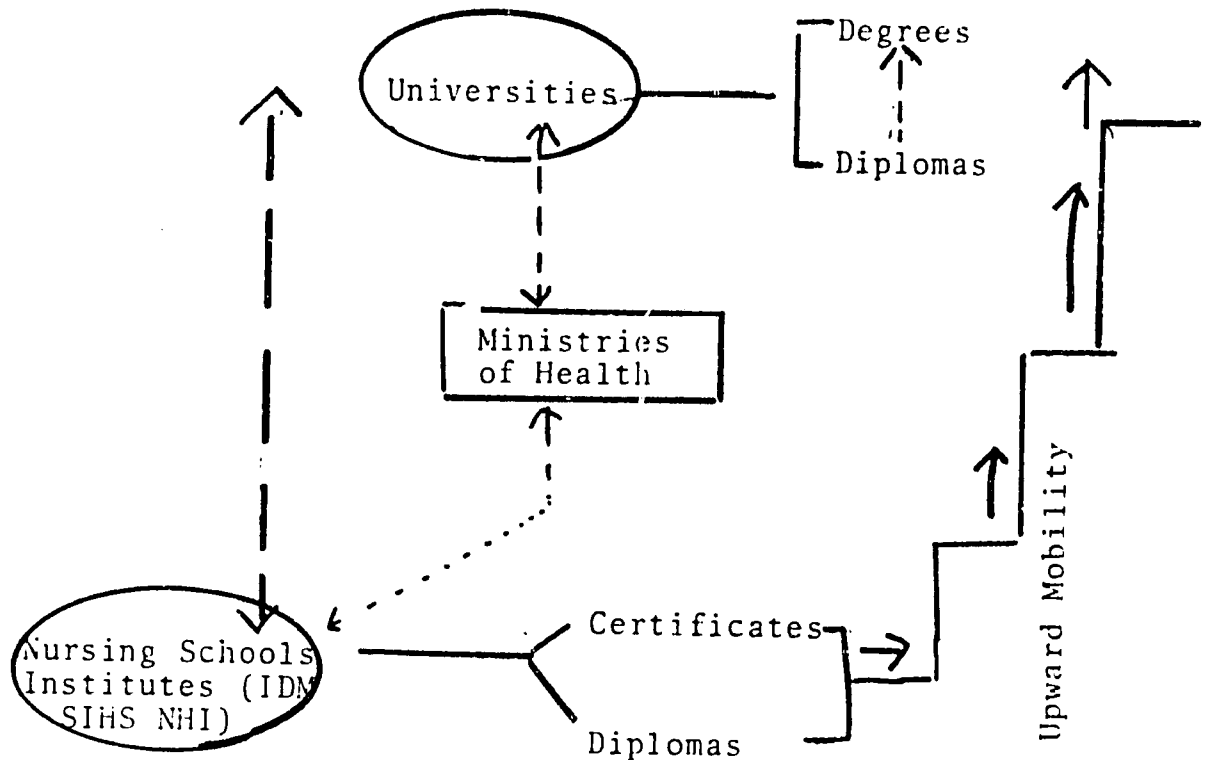
- If the donor agencies were to give ten cents for each of the 60 million people in the Southern Africa region, it would result in six million dollars. This amount would suffice for the building of an institution dedicated to the promotion of health.

- Currently training is even obtained from the Republic of South Africa', UNISA's, correspondence courses; diploma and certificate courses in RSA. Literature searches and such are also obtained from the Republic of Southern Africa.
- The brain drain is a problem as well as defection to the private sector. Bonding is in place in several countries, but there is no measurement of its effectiveness.
- Training of public health specialists in epidemiology, statistics, health planning and public health administration in particular are needed.
- Public health training at the BA level and MPH level could be achieved over 12 week periods for 3 consecutive years by mobilizing faculty from overseas and the regions and using existing, and where necessary upgraded, courses. Regional experts would be available especially as the proposed project is to be carried out during the school vacation.
- Research could be strengthened considerably by a public health training program.

Recommendations

1. The development of a committee for the region to develop equivalency and accreditation mechanisms so students can move up the career ladder.

Figure 1



Career Development
For BLS Public Health Pro-
Professionals

2. Establish a regional Institute of Public Health with paid faculty from each of the countries concerned. Each country should have one faculty member from the University who would work with the Institutes of Nursing and Institute of Development Management (I.D.M.). To begin with this person would spend half time with the Institute of Public Health Staff. The staff should form the nucleus of the Institute.
3. Donors should provide funding and expertise for the Institute as a ten year investment. The Institute should develop:
 - a. Capacity for research
 - b. Training
 - c. Data collection and analyses
 - d. Education
 - e. Resource centre and information exchange

1.1 Background to Study

Throughout Africa manpower training is recognized as a priority. There is a considerable shortage of health workers for the population. The need for special public health training has become more evident as countries begin to implement Primary Health Care and a new orientation is required. In discussions with colleagues in the Southern Africa region, Ministry of Health Personnel, regional advisors and trainers, leaders in public health, WHO, UNICEF, World Bank and USAID officials a mobile public health training concept was born. It was hypothesised that if instead of sending students overseas for public health training at considerable cost, expert faculty come from a U.S. Public Health School to train faculty and students, more students would be trained for the same expenditure, institutional building would result, regional capability and resources would be increased, relevance would be controlled, the brain drain would be stopped and research stimulated. If regional cooperation was possible then a permanent regional Institute of Public Health could be developed.

After consultation with colleagues in the Ministries of Health in Southern African region in Zimbabwe, Malawi, Botswana, Lesotho, Swaziland, (Appendix A) all concurred that a feasibility study should be carried out. A proposal was submitted to the USAID Office of Science and Technology and funded in September 1982 as an innovative project. It must be stressed that this proposal grew out of the region and not out of some bureaucratic response to some request for proposal on a predecided area. The purpose of the study was to determine the 1) technical, 2) financial, and 3) political feasibility of Mobile Public Health Training at the certificate and masters level. The mobile part was to be primarily faculty from the U.S. Public Health School.

It was proposed that the Masters of Public Health degree could be obtained on a part time study basis for 12 weeks period each year over three consecutive years. In this way long absences from high level posts would be avoided as well as hardship on the African family and in some cases, the acquisition of a life style not characteristic of the sponsoring country. Most important the content of the training and experiences could be controlled and made relevant to the African scene. Furthermore, it was proposed to attempt to enlist the cooperation of regional donors in training, funding, and expertise. Discussions were also held with WHO Manpower Division Geneva and regionally. The plan was to utilize the maximum regional expertise and resources in order to develop a program that is uniquely African and responsive to the needs of the area.

1.2 The study was conducted in several phases:

- a. Preparatory phase - review of public health training programs in the U.S. and Africa regions.
- b. Site visits
- c. Regional feasibility workshop.

USAID mission directors in Malawi and Zimbabwe did not consider manpower training a priority area and hence the study was limited to Botswana, Lesotho, Swaziland (Appendix). The literature on American and African public health programs was reviewed. Data on the African programs was sparse so questionnaires had to be developed and sent to African medical schools. The results of the studies conducted are in Appendix p.

2. Site Visits

The site visit was conducted in January and February 1983 by a faculty team from Tulane, Ministry of Health staff and a USAID regional representative. The Tulane faculty team were:

Naomi Baumslag, M.D. MPH
Assoc. Prof. of Nutrition
Codirector of project

Elizabeth A. Bennett, R.N., Ed. D.
Asst. Dean, Director of Admissions
Assoc. Professor, Maternal & Child Health

John Vaughn, D.V.M., M.P.H.
Chairman and Professor of
Applied Health Sciences

Ms. Elaine Boston, R.D., M.P.H.
Instructor, Department of Nutrition

2.1 The site visit was conducted using a specially designed Needs Resource Assessment Instrument (Appendix) and the Delphi technique. The training institutes and personnel to be interviewed were selected by the Ministries of Health in Botswana, Lesotho, and Swaziland.

2.2 The objectives were to obtain first hand - country specific information measure parameters affecting the costs and planning of training such as:

- The size of the pool of student at certificate, diploma and masters level.
- The admission criteria for students to the programs.
- Available programs, curriculae, and faculty.
- Educational resources e.g. library, computer center, laboratories and health centers and clinics for field experience.
- Type of teaching. (rote, problem oriented, experiential, practical,
- Opportunities for on-the-job training.
- Current stop-gap measures being used to supplement public health training deficits.

2.5 Owing to the tight schedule the site visit team was modified and only in country representatives were added to the team. Unfortunately this precluded the cross exchange of representatives as hoped for.

3.0 Study Findings

3.1 In the last decade there has been a tremendous increase in regional educational facilities, short term training programs and the development of the universities. Health care is primary care oriented and governments have taken action to provide health care in the rural areas generally unserved. New cadres of workers have been trained such as village level health workers, physician extenders (nurse clinicians, nurse practitioners) as well as health administrators.

3.2 Health care is expanding and so are its needs. The trickle to public health trainers educated overseas will not fill the increasing gap. Large numbers will have to be trained with regional relevance to fill the vacuum created if localization takes place and in view of the population increase. This need for health manpower has resulted in a wide array of certificates and diplomas for health professionals as stop gap measures. Unless a health manpower training infrastructure is developed, the situation will become uncontrollable. This tied in with an increasing expectation of more qualified personnel for placement and promotion makes it incumbent that some structured form of accreditation for the various certificates, diplomas and university and high school credits be organized. A BS nursing is emerging as a new degree and the enrolled nurse is being phased out. A mechanism to allow nurse training institutes to receive credit from university or matriculation boards would alleviate educational wastage and professionals could move upwards instead of laterally.

3.3 Public health training is generally obtained from the 'developed countries' where health care is labor intensive, extensive, specialistic and chronic disease oriented and resource exist in relative abundance.

3.4 Our findings reveal that on the average 10 students are sent from the BLS countries to the USA each year for a year's masters training in especially epidemiology, biostatistics and public health administration. Occasional students are sent for post graduate nutrition training or health education.

4.0 U.S. Public Health Training Programs

4.1 These are traditional in schools of public health; generally associated with schools of medicine. A few programs are in departments of community medicine or preventive medicine in schools of medicine. There are 25 schools of public health in the U.S. - accredited by the Council of Education for Public Health. Schools of public health cater to American students and generally have a foreign student population of not more than 10 percent. More than half the foreign students attend three schools - Loma Linda (834); Johns Hopkins (704); and Tulane (364). Loma Linda School of Public Health and Tulane has a large foreign students intake of 37%; Johns Hopkins has 29% and Harvard 21%. How many of these students come from each region is not known. Few schools have specially adapted programs for students from foreign countries. While this may not be a problem in biostatistics it can constitute a real problem in areas such as Nutrition or Public Health Administration as courses are more oriented to the U.S. setting and concentrate on U.S. conditions. Selection of schools for training is hard to analyze. Public health training is donor sponsored and donors send students to their home country programs.

Table 1 shows the MPH foreign students enrolled in different schools and the variable duration of the programs. Whilst the figures quoted are averages many students are required to spend extra time at the school. This has important implications for cost calculations and time away from the job.

Tuition fees are also included in Table 1 and range from a low of \$1,417 in the state school of Hawaii and a high of \$14,130 at the private pretigious Yale. The dollar value has not been calculated.

Selection of areas of specialization by foreign students - Table 2 - shows that a large number of students were specializing in a variety of areas classified as 'other' which includes population studies, international health, behavioral science, family planning, tropical medicine, parasitology and maternal health.

The next most frequent specialty was health administration comprising 11 percent of the student body. If combined with other related fields of public health practice and program management they together would account for one fifth of areas of specialty selected by foreign students. Next in line are the conventional public health standbys - biostatistics and epidemiology.

It is notable that nutrition, long recognized as a problem of major importance in the Third World with the high prevalence of Protein Energy Malnutrition (PEM), can only claim 2.5 percent of all foreign students and ranked last. One wonders why this placement

Table 1

MPH FOREIGN STUDENTS ENROLLMENT AND TUITION COSTS
IN SELECTED U.S. SCHOOLS OF PUBLIC HEALTH****

| | Total Student Enrollment ** | Number of Foreign ** | Average Length Length (Months) ** | Tuition Fees (\$) * * |
|----------------|-----------------------------------|----------------------------|---|-----------------------------|
| Alabama | 165 | 13 | 18 | 3,830 |
| UCLA | 580 | 44 | 9 | 3,901 |
| Columbia | 193 | 24 | 11 | 11,690 |
| Harvard | 403 | 86 | 11 | 6,999 |
| Hawaii | 338 | 43 | 9 | 1,417 |
| Illinois | 216 | 15 | 11 | 4,160 |
| Johns Hopkins | 834 | 242 | 11 | 6,230 |
| Loma Linda | 704 | 274 | 11 | 6,365 |
| Massachusetts | 95 | 5 | 18 | 5,250 |
| Michigan | 742 | 72 | 11 | 6,280 |
| Minnesota | 448 | 33 | 9 | 3,752 |
| North Carolina | 600 | 52 | 9 | 2,540 |
| Oklahoma | 225 | 35 | 18 | 3,445 |
| Pittsburgh | 500 | 37 | 9 | 3,999 |
| Tulane | 364 | 134 | 12 | 6,905 |
| Washington | 321 | 31 | 24 | 2,400 |
| Yale | 287 | 12 | 24 | 14,130 |
| ----- | | | | |
| Total | 7,040 | 1,156 | | |

* Figures are for the 1981-1982 school year based on school bulletins or personal communication. In the cost data travel, per diem and books and learning materials are not included.

** Educational Data Report 1981-1982 Licwinko, M. et. al. Association of Schools of Public Health.

*** Enrollment total does not include several other school as tuition costs were not readily available (Boston University, University of California at Berkeley, University of Puerto Rico, University of S. Carolina and University of Texas) and represents an additional 326 students of which 143 were from overseas.

Source: Public Health Training from Concept to Feasibility: Review and Guidelines. Baumslag, N., Boston, E. Tulane School of Public Health Publications, January 1985.

Table 2
 AREA OF SPECIALIZATION SELECTED BY FOREIGN STUDENTS ENROLLED IN
 U.S. SCHOOLS OF PUBLIC HEALTH

Fall 1981

| | | |
|-----|---|-------|
| 1. | Other ** | 33.5% |
| 2. | Health Service Administration | 11.6% |
| 3. | Epidemiology | 10.8% |
| 4. | Public Health Practice & Program Management | 10.0% |
| 5. | Biostatistics | 8.5% |
| 6. | Environmental Science | 7.8% |
| 7. | Biomedical & Lab. Science | 6.3% |
| 8. | Occupational Safety & Health | 4.5% |
| 9. | Health Education | 2.8% |
| 10. | Nutrition | 2.5% |
| 11. | Unknown | 1.6% |

** other as defined by the AASPH includes population studies, international health behavioral sciences and family planning.

Source: Modified from M. Licwinko et. al. Educational Data Report 1981-1982. in Public Health Training From Concept to Feasibility. Association of Schools of Public Health.

occurs. Is it the sponsoring agency, the ministry of health or the student that makes the choice? Loma Linda University which has the greatest number and highest percentage of foreign students has over one half of its students in the 'other' category and as many as 41 percent in health service administration. At Johns Hopkins, 19 percent of its foreign students take studies in management fields.

4.2 In the U.S. in addition to traditional public health programs at the Masters level there are also non traditional programs called 'extended degree' or external degree or non resident degree and are comprised of a creatively structured degree program of planned sequence of both on and off campus courses and other learning experiences which carry academic credit and allow the candidate a longer time to complete the degree requirements without having to be resident for the whole period. A variety of these programs exist (Appendix p. 9). These programs allow students to continue their jobs for the major part of the year. The work study programs are offered at University of Michigan School of Public Health, University of Washington and in the western part of the U.S. five schools, Berkeley, UCLA, Hawaii, Loma Linda, and Washington formed a cooperative to offer a health services administration degree to working professionals in that part of the country. Cincinnati University has a individualized self-paced program for students that live too far to be part time resident students. There are a large number of different programs and there is an increasing number of work study degree programs. To date most of them have been in the area of health administration obviously foreign students cannot avail themselves of these programs, however, they could be implemented in developing countries with advantage.

The length of time required to complete a masters degree may vary depending on the program, the students educational background, and work experience. The minimum period can be so short as five months or as long as 21 months. In two schools training is as long as 21 months; in the schools with nine months degree program two-thirds of the schools assume that students enter with previous public health experience. However, there have been no studies to show the effect of duration of training on performance, leadership or job effectiveness.

Condition of Admission

All programs require a bachelors degree from an institution of acceptable standing (an above average undergraduate record) with substantial knowledge in a discipline relevant to public health either through study experience or a combination of these. In some schools for non-medical types a MSPH - Masters of Science in Public Health is offered and usually takes longer. Often the students take the same courses as the others but have to write a thesis. Many students resent this.

Whilst most ministries of health in Africa require sponsored staff to have at least two years field experience, 20 percent of more of U.S. schools of public health don't require it. Requirements vary in each school. Students generally have to have an acceptable GRE score (Graduate Record Examination); English proficiency, proof of financial support.

4.3 In addition to the Masters of Public Health program four schools in the U.S. offer (p.) a Bachelors degree in public health. This is a four-year college program and forms the last two years of a four-year college program. This degree is awarded, for example, in North Carolina and Massachusetts.

U.S. schools of public health training generally:

- Offer a wide range of courses -- vary from school to school.
- Require core courses in epidemiology, biostatistics and public health administration.
- Are multidisciplinary and include a wide variety of health professionals.
- Are chronic disease oriented and geared to the U.S. delivery system.
- Are technology dependant and labor intensive.
- Focus on populations not patients.
- Have a preventive orientation.
- Concentrate on sophisticated research and often provide no practical experience.
- Flexible.
- Stimulating or (narrow and restrictive).
- Aren't primary care oriented.
- Have no special programs for foreign students.
- Allow for great student exchange especially where foreign student population is high and the school is relatively large.
- Foster dependency training.
- Too costly for sufficient numbers to be trained to create change.

- Are not specially designed for the African scene and do not take cognisance of the need for adaptation and imagination.

Costs of Training Foreign Students in the U.S.

(See Table 3)

Tuition costs for the 1,156 foreign students in the U.S. in 1981 amounted to seven million dollars. This speaks for itself. Training is a big industry. In addition to tuition costs the cost of food and lodging, books and fees; travel; salary while away and of a replacement. The cost of leaving one's family and of learning a new way of life cannot be accounted for. It is estimated that for U.S. public health training for African students the costs are not \$20,000 as is commonly stated but in the range of \$50,000 or more if the student stays in the U.S. for one year and much more if longer. Costs include salary of 'student' and expense of a replacement. (The cost of training three masters level students in public health per year in each of the nine SADC countries would over three years be at least \$2,450,000.

Calculated as follows:

| | |
|--------------------------|-----------------------|
| Tuition Travel Board | |
| 27 students x \$20,000 | \$540,000 |
| Replacement Staff costs: | |
| 27 students x \$10,000 | <u>\$270,000</u> |
| | \$810,000 per yr. x 3 |

A regional institute could be supported and developed at this price. It is our contention that the figure cited is an underestimate.

Table 3
AFRICA - PUBLIC HEALTH TRAINING PROGRAMS

| Program Characteristics | Nigeria | Benin | Uganda | Ethiopia | Tanzania | Ghana | Zimbabwe |
|--|---------------------|-----------------------------|-------------------------|--------------|-------------------------|----------------------|-------------|
| Location of Program | U | I | U | U | U | U | U |
| Connection with MCH | .. | .. | .. | jurisdiction | funding | on curriculum | .. |
| Courses Offered | MPI(21 months) | DPI(1 year) MPI(2 years) | DPI | MPI | DPI | on curriculum MPI | DPI - |
| Control of Health Centers or Field Training | direct | direct | direct | arranges | direct | direct | direct |
| Faculty(ft. fulltime pt. parttime) | 2ft.; 3pt. | 5ft.; 16pt. | 7ft.; 4pt. | 4ft.; 2pt. | 2ft.; 4pt. | 10ft.; 21pt. | na |
| Students (F foreign N national) | 10 | 10 N:24 F | 10 | .. | 5 | 5 | 7 |
| Tuition Fee | 230 Nairas \$340 | na | 5000 shillings \$500 | free | 3045 shillings \$304 | na | na |
| Condition for Admission | 1,4 | 1,2,3,4 | 1,2(12 months) | 1,2(2 years) | 1,2(2 years) | 7 | 1(9 months) |
| Thesis Required | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Public Health Qualification Required for MCH, Academic, health professional jobs | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Key: NA=not available; U = university department of preventive, social or community health; I=institution; 1 MD or equivalent medical degree; 2 professional experience; 3 baccalaureate degree - pharmacists, teachers, administrators; 4 medical and or baccalaureate; 5 approved internship; 6 letters or recommendation; 7 entrance exam

Source: Data for 1979-80 except for Zimbabwe program stated to start 1984.
Baunslag, N., Boston, E. Results of Survey, Dec. 1982.

Leave us is please

14

5.0 Public Health Training in the African Region

Whilst Africa has just recently emerged from colonial rule the traditions, links, associations with the former rulers still exist and so do the educational prejudices. In Anglophone Africa a degree from the UK has more prestige than one from the U.S. and job promotion may be affected by this. The London School of Hygiene has just changed its Diploma in Public Health (DPH) for physicians to a MPH for a wide variety of health professionals yet in Africa the degree offered by three of the six schools of medicine, Nigeria, Benin, Uganda, Ethiopia, Tanzania, Ghana, that provide some public health training is still the DPH (Table 3). The training period for the public health degree varies for example, Nigeria has a 21 month course, Benin a two-year course. Ethiopia offers an MPH of shorter duration. Zimbabwe is planning to start a DPH in 1984 and this will be only for physicians or medical students. South African offers public health degrees and diplomas. Many of which are available on a part-time basis would mean a two-year residence. These are, however, being used, the extent and degree are not known.

Most programs have direct control of rural health centres and community field training centres for practical training of students. External examiners are used for final exams. A thesis is required in all these public health training programs not so in U.S. programs.

These possession of a post-graduate qualification in public health is a requirement for the post of district or regional medical officer.

Criteria for admission to the public health program vary. Generally the programs are for physicians although some accept nurses, or pharmacists with a professional baccalaureate degree. Some programs require professional experience varying (from 6 months - 2 years). Some programs are exclusively for doctors or medical students whereas in other health professionals are include, the mix is generally limited. Only one program Benin accepts a wide range of professionals, teachers, sociologists and health administrators as well as doctors and nurses and has an innovative program (Appendix). Preference is generally given to nationals and since classes are small the foreign students have little chance of being accepted. Students from other areas have difficulty obtaining entrance to African public health training programs and are sent to countries such as Israel or even to South Africa to Medunsa or University of Witwatersrand for further training. Even if it was ideologically acceptable the South African Government is very restrictive with regard to the required educational criteria for admission.

Most curriculae are traditional. The program in Benin (Appendix) is trying a new modular approach. Mutimbile Medical Centre of United Republic of Tanzania offers public health training

fulltime (1 year) or part time (over 3 years) and has opened its course to a wide variety of professionals in the health field but requires two years health experience in addition to a degree. (See Appendix) Candidates that are admitted are MDs or equivalents; assistant medical officers; engineers; BA in Mathematics or Statistics and other bachelor degrees with two years health or health research experience and public health nurses. Public health training while important is not generally perceived as such and this makes it difficult to compete with better financially endowed programs.

Much has been written on the increasing gap of trained health professionals. It is expected (conservative estimates indicate that) for the growing African population the number of physicians needed will increase by 13 percent. (Picard)¹ In no way will going abroad solve this situation. Currently the training capacity of the region is limited and unable to produce the needed trained professionals. The capacity of African public health training programs is overextended and this has a danger of limiting the quality of the product. A large initial investment will have to be made to provide the region with a critical mass of primary care oriented public health trainers. Their impact on the medical schools, university and ministry of health too could be immeasurable.

It is absolutely amazing how inventive and productive overworked understaffed faculty are. We believe that research productivity is related to the time and facilities faculty have. In African institutes and universities visited we found they were overextended with heavy teaching loads, have little research assistance and limited access to a wide variety of current educational materials, journals, reviews, reports, etc. They often have to wait for inordinate periods till they get a copy of an article or report, if they can. Staff student ratio in schools of public health like Johns Hopkins is high. Costs may be low in African schools but economic straight jackets that they have to face affect the quality of the teachers, their teaching load and the teaching quality. For field studies close supervision is needed and enough faculty to work with students in some situations on a one to one basis. Given the shortage of highly trained overextended staff in Africa it won't help to add further loads to overworked staff.

At least 27 new medical schools have come into being in Africa. Fifteen are in countries which previously had no medical schools. There are 42 medical schools in 23 African countries serving a population of 400 million people. One school for 9.5 million people. One medical school for every 27 million Africans in Sub-Saharan Africa in 1961 and one for every two million in developed countries.

Since 1971 there has been an increase -- 42 medical schools in 23 African countries serving 400 million but this will not be sufficient to cover increased need due to a population increase and expanded services.

¹Picard, L.A. and Endresen, K. A Study of the Manpower and Training Needs of the Unified Local Government Service, 1982-1992. Vol. 1, 1983.

Africa has still far to go, considering that in India, there is one medical school to every 5.6 million people and in Pakistan one medical school to every 8.6 million. One to every two million in Japan, United Kingdom, Italy, Holland, Belgium, both Germanies, United States, & Mexico. While its down to 1.5 million in Australia and France and one to 1.3 million in Canada one to 1.2 million in Brazil. Doctors are being trained overseas mainly.

The world optional average is one school to every two million people. On this basis Africa should have medical schools. It has.

In itself, the number of medical schools is not an important figure, but what it signifies is important. It stands for the degree of development of medical services available to a community: and reflects the degree and quality of hospital services; the number of clinics, the qualified medical personnel needed to control infections, to contact and better still, prevent epidemics and to deliver primary health care; the number of members of allied health workers and the development of a community in the modern world. There are no figures for schools of public health but surely one in Africa wouldn't be too much to hope for. Doctors trained at Meduna and some African schools tuition at Medicine R1400 compared to \$11 - \$13,000 in Zimbabwe, Zimbabwe Medical School is very curative oriented and the research esoteric.

- Training availability in the Africa region leaves a lot to be desired.
- Too few places for public health training.
- Not primary health care oriented.
- No elastacity of programs for the growing need.
- Gap will increase unless some centers of excellence are established.
- These may form the nucleus for changing medical school training.

6.0 Institutional Capacity of BLS Countries

6.1 Lesotho

Lesotho is a small country with a population of 1.4 million, a population increase of 2.9, a large migrant population, and an infant mortality of 114/1000 live births. Ninety-five percent of the population is rural and the GNP per capita is \$538. Lesotho has just had a severe drought. The major health problems are malnutrition, tuberculosis, venereal and communicable diseases. Upper respiratory tract, skin and genito-urinary infections are frequently seen in clinics and outpatients. The causes of hospital deaths are tuberculosis, heart disease and hypertension and acute respiratory disease. In children malnutrition, measles, tuberculosis and gastroenteritis still prevail. Recent figures on the expanded immunization program indicate that measles immunization now covers close to 60 percent of children. The EPI program has reduced the incidence of communicable diseases appreciably. Malnutrition is still an overriding problem. Over 25 percent of children were stunted in a recent survey (less than 90% height for age). Acute malnutrition had its highest peak in the six to eleven month age group. Anemia in children is prevalent in 25 percent of under fives (Hb less than 11 gms %). Goitre is prevalent, in some areas affects up to 15 percent of the population. Iodized salt has, it is believed, reduced the prevalence considerably. Pellagra is also prevalent. Health problems related to environmental control are of paramount importance. Cancer of the cervix has an extremely high incidence and cancer of the liver is also high.

6.12 Manpower Situation

Lesotho has acute manpower shortages and is dependant on expatriates as are Botswana and Swaziland for professional staff.

Lesotho is committed to primary care and is currently working on a manpower development plan. Analysis of the 1982 health manpower data indicates that Lesotho has 100 doctors; (many of whom are in the private sector); 477 nurses (346 are doubly qualified). Of the nurse 63 are Public Health Nurses/Midwives and Nurse Clinicians and nine of these are public health nurses -- one in every district except for Theba Tseka. The 17 nurse clinicians are spread out approximately two per district. Lesotho has a great shortage of public health expertise. Whilst it has two health planners in the MOH the Ministry of Planning even though it deals with health projects, does not have such expertise on its staff. Many of the physicians and senior nurses in the Ministry and at the district level do not have any public health training. This is especially of concern for primary care.

Manpower training is a priority in Lesotho. Several initiatives are underway to achieve this for example:

- teaching professionals how to teach;
- a study to develop mechanisms for upward mobility in training and career development as opposed to current lateral mobility;
- equivalency tests for experience to allow upward mobility;
- the establishment of a Faculty of Health Science jointly sponsored by the MOH and NUL (National University of Lesotho). This faculty utilizing expertise in the University and in the Ministry of Health will develop new health training programs and improve existing ones. It currently has responsibility for laboratory techniques, X-ray technicians, pharmacists and anethetists. The Faculty of Health Science awards a nurse clinician Diploma in Primary Health Care. Special facilities are being built near Maseru to house the Faculty of Health Science and a library is just getting started. However the potential is there. Linkages with the MOH, NUL and the Nutrition Coordinating Committee are excellent.
- The Ministry of Health and Ministry of Education are sending students overseas for specialty training. USAID has sponsored 3 "students" per year for public health training mainly in the area of Public Health Administration. MEDEX program has also funded an additional three students last year in this area.

It is not known how many other persons were sent overseas by other donors. One or two students were sent to Ireland for laboratory technician and medical school training. Lesotho has no medical school. WHO sponsors a few students for specialty training especially in the region. However, scholarships are few and far between and in constant demand. Public health experts are needed for research and with a capability to write research and grant proposals. Dependency on foreign consultants is still high in this area.

Lesotho is no longer training enrolled nurses yet another indication of higher educational level needed. Furthermore, the IEMS Institute of Extramural studies which is the extension service of the NUL is to be reorganized and upgraded. The program aims to offer health courses as a part time basis and serve rural areas. The advantage of extension education is that it gets to the rural areas through outreach programs; is cheaper and the person remains on the job. Elective could be devised for rural health professionals to enable them to obtain credits and upgrade their qualifications. Currently several nurses in the region are using UNISA, a correspondence University in Pretoria Republic of South Africa for baccalaureate and nursing programs.

6.13 National University of Lesotho

Until 1976 was part of a regular University of Botswana, Lesotho, and Swaziland, but for a variety of reasons each country now has its own University.

The student population (1982) was 1,139 of which 1,041 (91.4%) are enrolled in baccalaureate programs and 98 (8.6%) are in diploma programs. It is expected that 272 students will graduate with degrees and 48 will complete diplomas. Of the students completing diploma programs all are citizens of Lesotho.

There are 115 members of the faculty (staff) assigned to one of 22 departments. The departments of Biology, Business Administration, Economics, Mathematics and Computer Sciences, Education, Statistics, Sociology and Social Anthropology could be resources from which to draw qualified faculty and electives at the Baccalaureate level. In these nine departments, there are 15 faculty prepared at the doctoral level. Three strong departments of relevance to health are statistics, social studies and business administration.

Are this time there are no graduate level courses being offered in the university. The graduate degree is conferred on the basis of Thesis or Thesis and Examination. The graduate degrees are currently being revised to include course work. Analysis of available courses reveals that there are courses that would be appropriate for students enrolled in the Public Health Diploma Program at the baccalaureate level. Courses that would be suitable for such program include Health and Society offered through General Pharmaceutics, Interpersonal Skills offered in the Certificate Program in Primary Education, Essential Mathematics offered through the Department of Mathematics and Computer Sciences. There are numerous other courses that would be appropriate for the diploma students.

In all of these courses the prerequisite is the completion of the common First Year. The university, however, would be prepared to provide special courses, waive prerequisites or make recommendation for individual students who have necessary background and capability to complete assigned work at any level. These countries could be available to those students who meet the requirements. Students who do not have the prerequisites would be evaluated individually by the faculty for admission into selected courses. Some of the suggested courses are computer science, entomology, parasitology, and bacteriology.

The Academic Year closely parallels that of Tulane with the months of June, July and August being the long vacation period. Teaching facilities and housing would be available. The School of Agriculture also has teaching facilities and housing.

Administration indicated that there would be interest in the Masters of Public Health program among the graduates of offered.

6.14 Lesotho Institute of Extra Mural Studies (IEMS)

This institute which is part of the NUL is currently undergoing reorganization. There is a study underway to examine the labor turnover and mechanisms for upgrading training and giving credit for relevant experience. It is hoped that credits will be transferable to the University of Lesotho ultimately resulting in a degree for those who choose to obtain one. The program will reach students in rural areas.

It is also envisaged that the Institute provide continuing education and integrate needed allied health programs. These allied health programs to non-baccalaureate students should provide associate degrees which could be turned into BA degrees or BS programs if the prescribed courses were picked up. Degree programs for health assistants, environmental health specialists nursing, dental and X-ray technicians and health inspectors were specifically mentioned. Degrees should not be terminal and students should have the option of moving up in the system through obtaining the necessary additional credits. Through the use of modules students will be enabled to build credits leading to advanced degrees. This appears to be a key issue.

Table 16. The Health Workers in Lesotho (in a pyramid graph), 1982.

NOTE: The PHN/M/NC sector of the "nurses" line includes public health nurses, matrons, and nurse clinicians (including the second NC class.

Doctor N= 100

NURSES N = 477
 PHN M/NC Other Double Qualified other (63) (346) (68)

NURSE ASSISTANTS AND WARD ATTENDANTS N = 550
 Nurse Ass't.s Ward Attendants (200) (350)

Currently supervised N = 1,192
 VILLAGE HEALTH WORKERS

210

6.15 Library

The NUL has an operational research program. It has 132,000 volumes. There are health journals until the Faculty of Health Sciences comes into existence. The University library could add 100,000 volumes without necessitating the purchase of new shelves or new facilities. Binding is done in through commercial binders in South Africa. Fourteen of the 28 librarians are qualified in library science. Outside access - use is made of the South African interlibrary loan scheme, clearing house state library in Pretoria, and list of periodicals in South African libraries. Coupons are purchased for photocopying.

6.16 Nurse Training Institutes

Three hospitals, Queen Elizabeth II, St. Josephs Hospital and Malubi Hospital train registered nurses and registered nurse midwives. These training programs were not visited. In 1982 there were 160 nursing students total enrolled in the registered nurse programs; and in 1982 there were 62 graduates. This is a three year course. Admission requirements are 12 years of school CGE and 0 levels. In the nurse midwifery program (1982). 23 students were enrolled. The Nurse Clinician Training Centre is in the MOH facilities. The training period is 15 months and is offered to registered nurse midwives with at least two years experience in a health centre. In 1981 there were 19 students enrolled. There are 17 graduates thus far. These graduates are awarded a Diploma in Primary Health Care from the Faculty of Health Science. The Food and Nutrition Coordinating Organization (FGNO) have identified a gap of public health nutritionists for primary health care in Lesotho -- they estimate that at least 10-15 public health nurse nutritionists are needed.

6.17 Institute of Development Management

The Institute provides training in Health Care Administration and Nursing Administration and has graduated eleven Basuthos in health care administration and one in nursing administration. This fulltime course lasts eight months.

The course admits 12th grade 0 level students and those who have an adequate experience. The class is (1/2 high school and half university level) very mixed and difficult to teach. Linkages with the university are being sought to provide diploma and degree level programs and upgrade courses as they are currently not at the university level. (See pg.)

6.18 Field Experiences

Some of the opportunities available are:

a. Tskolol Rural Health Centre

This has the potential for operational research and could accommodate 24 students in its residential facility. It serves an area of 35,000, all within 10 kilometers of the clinic and varied population. It has innovative programs such as oil selfsufficiency through a sunflower seed and press project. It also has a day care centre for working mothers. There is good census data on the area and excellent baseline information for supervised research.

b. Expanded Immunization Program

This serves as a regional training model for primary care prevention and could be utilized for supervised field studies and as a teaching model.

c. Lesotho Flying Doctor Services.

6.19 Meetings with USAID, National University of Lesotho and Ministry Personnel (List of contacts in Appendix p.) revealed a general consensus that public health manpower development was much needed. That the NUL was very supportive and saw public health training as essential for Public Primary Health Care orientation. (See Appendix NUL Comments on the Proposed MPHT. The way the proposed Tulane diploma level course or masters level course could be made to fit in the NUL diploma and degree requirements was addressed. It was noted that the proposed training was 1/7 shorter than required at NUL it might be made up by adding 55 minute lectures instead of 50 minutes. (See below -- operational analysis).

Operation. Tulane will offer diploma and Master level courses of a total of 36 units* made up as follows:

3 years of 12 weeks Winter Schools (2 x 6 weeks)
(mid-May to mid-August) - offering 12
units per year.

divided into:

Core courses: 3 x per week = 3 unit courses
Other courses: 2 x per week = 2 unit courses

(NB: The semester at the NUL is theoretically 14 weeks teaching length (excluding revision and exams). The course units in the DPH and MPH course are therefore 1/7 shorter than those at the NUL or more, if the examinations are part of the 12 weeks. This might be made up by having, for example, 55 minute lectures instead of 50 minutes.

Admissions

This is probably the area in which the greatest amount of controversy is likely. It will be necessary to determine clearly

- a - what admission level for DPH
- b - how a DPH holder can proceed to MPH if at all
- c - for admission to MPH the entrance qualification must be at least a bachelor's degree or equivalent (nursing degree)
- d - how the content of DPH and MPH differ.

Lesotho was in vavor of having the MPHT based in Lesotho. The source of funding was a major concern. People didn't want to be faced with a program that started with a bang and then fizzled out.

* Lesotho terminology is units.

In summary then -

1. There is institutional capacity at the Baccalaureate level. Several courses at the NUL appear suitable for the baccalaureate level training.
2. The faculty of Health Science when it is established will also add to the strength and capability of the program.
3. There are a good number of people who could provide training at both the baccalaureate level and the masters level providing there is funding available. WHO representatives and down experts could also be utilized. IDM courses could also be utilized if they were upgraded to a University level.
4. A number of electives available have been identified.
5. Operational research is also available at the NUL:

Estimates of the Lesotho student pool for the Masters in Public Health per year:

- o 15 registered nurses - as public health nutritionists
 - o 5 medical doctors
 - o $\frac{17}{2}$ registered nurse/midwives PHN and nurse practitioners (10% of 300)
6. Diploma level undergraduate program*

Assuming that 50 percent of the graduates remain in the country over a period of three years there would be approximately 300 potential students. Further assume that a minimum of five percent of the baccalaureate graduates would be interested in a Masters of Public Health there could be 15 candidates from the University of Lesotho.

A large number of BSC students that don't get into medicine would also be eligible for this degree and might increase their acceptance at medical schools. On the nursing side there are registered nurses in training (70); graduate registered nurses: 160 and 24 RN/Midwives and 17 nurse clinicians). There will be a steady pool of nurses in these categories.

* Possibility of leading to BA PHS (4 yr. program).

6.2 Swaziland

The Kingdom of Swaziland is surrounded by South Africa and Mozambique. Its population is 600,000 and the population growth is 5.3 by the year 2000 Swaziland is expected to have a population of one million. Eighty-five percent of the population is rural. Infant mortality is 134. Eighteen percent of the males work outside the country.

Major causes of morbidity are diseases of the digestive and respiratory tract. Malnutrition, parasitic disorders and venereal disease are prevalent. Certain controllable diseases particularly TB, malaria and measles and increasingly bilherziasis are very common. Obstetrical and gynecological complications, TB, gastroenteritis, nutritional and parasitic disorders as well as accidents are major causes of death.

The birth rate is one of the highest in the world 49/1000. About 25 percent of births are _____ and only 15 percent of children under five are seen at government clinics.

The general policy is to train preventive personnel as a first priority. In the public health sector the number of posts in the Ministry of Health was 901 (1975/77) and this increased to 1252. (1981-82) - an increase of 38 percent. This figure includes medical manpower and support personnel. The change is due to 1) an absolute increase in the number of health (11% increase in professionals and a 152 percent increase in auxiliaires; 2) change in focus. There has been an increased emphasis on clinic and out-reach services as evidenced by increased allocation of funding. In some sectors projections indicate that increased needs will have to be met. Swaziland is short of the 24 public health nurses it needs in 1982/85 but by 88/89 the need will be greater 32 or more public health nurses. Tutors too are in short supply. There were 10 vacancies listed for the Swazi Institute of Health Science (SIHS). Looking at the qualifications of staff at the SIHS public health training is a distinct weakness. In April 1981 an evaluation of the nursing curricula at the institute carried out by a consultant from WHO Brazzaville recommended that post basic programs on maternal and child health and family planning (MCH/FP) and in family health should be terminated and a single comprehensive course in public health be substituted.

The massive expansion of the rural health visitors cadre requires supervision and training of a special orientation.

Estimates of the number of health professionals in the country pertain to 1979¹. A new study is underway as many of the assumptions

¹Manpower Study, Swaziland, 1981.

made in the 1981 study are not clear. Data indicates that Swaziland has 52 medical doctors (16 in Government and 10 in Missions and Voluntary Agencies). There are 383 nurses, 297 are in the Government and 86 in missions and voluntary agencies.

| | Swaziland 1979 | | Voluntary Agencies & Missions |
|-----------------|----------------|------------|----------------------------------|
| | | Government | |
| Medical doctors | 52 | 16 | 10 |
| Nurses | 383 | 297 | 86 |

Of note is the fact that 20 medical officers; four family nurse practitioner nurses, six MCH/FP NP and 179 registered nurses are clinic based where the need for public health training is great. A large number of these health professionals are expatriates.

6.21 Training Outside Swaziland

The policy of the GOS is to require all who can do so to obtain technical and professional training in country. If external study is mandatory, students are sent to the nearest training site that will accept them. Although preference is given for other African countries e.g. Ghana, Nigeria and Kenya the majority of students studying medicine are at the Medical University of Southern Africa (Medunsa), Pretoria, an institution for black students. Of the 12 students studying medicine 9 are at Medunsa. Only if admission to a suitable program in Africa is not possible, will a student be sent to the UK or USA. Scholarships provided by external donors place no restrictions on study location. Since January 1980, MOH has sent two nurses for clinical instructor training in two to three year programs in the UK, supported by British technical assistance; one by WHO in 'orientation to administration', to Nigeria; and one in 'epidemiology and the control of communicable diseases in Czechoslovakia.

The government also provides loans which cover surety, cost of tuition fees, one round trip fare by the most economical means and a subsistence allowance. On return active service in the field of training is required for at least five years. If the student complies only 50 percent of the indebtedness is repayable over a period of twice the duration of the training program. Simple interest at the rate of five percent per annum is chargeable. Although generally this works fairly satisfactorily a system of government bonding is being contemplated. Each country has its own arrangements but generally they are similar.

6.22 Projection of Manpower Needs

Estimated Number of New Posts Needed in Addition to Currently Available

| | 82/83 | 88/89 |
|-----------------------|----------|----------|
| Medical Officers | 40 | 71 |
| Public Health Nurses | 27 | 40 |
| Health Inspectors | 14 | 71 |
| Health Administrators | <u>1</u> | <u>2</u> |
| Technical Subtotal | 98 | 427 |

6.23 Overseas Training

The MOH estimates that at least 10 people are sent overseas every year for public health training in the USA. This does however not include trainees sponsored by other donors. Analysis of the types of training sponsored by USAID reveal that since 1979, four students were sent for BA Nursing one for BA Nursing Education and four for health planning and health administration -- three at the diploma level and one at the masters level. One for an MA Nursing.¹ Expansion and upgrading of programs in the BLS countries could cover most of this training sponsored. The BA nursing education for example is provided in Botswana, whether the program has little elasticity, restrictive admission requirements, is educationally wanting or less prestigious is what has to be determined. What is clear is that a BA in nursing is becoming a sought after degree and the relationship between University and Nursing Institutes should be strengthened. Of note is the fact that IDM's training was bypassed. IDM's Health Administration Course should be upgraded to provide the much needed degree and diploma level health administration qualifications.

6.24 Potential Students

The MOH's estimates that there are approximately 20 + baccalaureate level degree holders presently working in the health services who are potential candidates for the Mobile MPH training program. In addition there are 100+ non degree personnel who are potential students for the undergraduate diploma program.

¹ Summary Report for Swaziland Health Manpower training grant to institutionalize training and strengthen the planning and administration capability of the MOH.

6.24 Training in Swaziland

University of Swaziland

The University offers Bachelor Degrees in Art, Commerce, Education, Science, Agriculture and Law and post graduate degrees at the Master's level in Arts (Humanities, Economic and Social Sciences), Education and Science. It also offers Diplomas and Certificates in education, agriculture, accounting, law, teaching and animal health.

Total enrollment at the University of Swaziland is 1000, with a full time faculty of 101. There are no graduate level courses, nor any health courses offered. Dependence on expatriates has led to difficulty in even having continuity in graduate supervision. Until there is reorganization, stable and sufficient number of faculty masters degrees are to be offered. One third of the diploma program graduates complete courses in agriculture and home economics.

The table below shows the number of students enrolled in the B.Sc. (Science) degree program:

Swazi Citizens Enrolled in B.Sc. (Science) Degree Programme

| <u>Anticipated Year of Graduation</u> | | | | |
|---------------------------------------|-------------|-------------|-------------|--------------|
| <u>1981</u> | <u>1982</u> | <u>1983</u> | <u>1984</u> | <u>Total</u> |
| 20 | 28 | 37 | 61 | 146 |

The students graduating with high marks will apply for admission to medical or dental school. Probably 10-15 percent of the groups of B.Sc. (Bachelor of Science) students will be accepted.

Students that aren't accepted could take a BSc in public health while studying. This then could provide them with other options or a better chance of getting into medical school. The public health diploma course could count towards baccalaureate credit for the four year B Sc. degree. The university also awards a diploma to health inspectors. The University provides the syllabus and moderates the exams. The Swazi Institute of Health Science provides tuition. The university awards a diploma for health inspectors. This arrangement however, does not exist for nurses studying at the SIHS even when they have the same entry requirements. The gap in years between a diploma nurse program and a baccalaureate program at the university is three to four years. In other words a diploma in nursing is generally equivalent to the first year baccalaureate program. Education waste could be reduced if the University and Institute of Health Science were able to assist students to have upward mobility in the career ladder.

Research at the University of Swaziland is very limited and currently is in the area of population studies, demography and rural social work. Chemical analysis of traditional medicine is also an area of research at the University. The University budget for research is \$8,000/year.

6.25 Division of Extra Mural Studies

The Division of Extra-Mural Services (D.E.M.S.) was established in 1964, and is an autonomous body within the university, the objective of which is to provide adult education through extension courses throughout the country. Its methodologies include part-time study courses, in-service education, mass-media education through radio, correspondence courses and conferences, workshops, seminars and public lectures.

D.E.M.S. has two activities for training in the health field. One of these is for the in-service training of staff of the Health Education Unit and extension workers of the MOH and of selected Health Assistants and Rural Health Visitors in topics including latrine construction and maintenance, teaching methodologies etc., related to the Water-Borne Disease Project of the Ministry of Health funded by the U.S. Agency for International Development with technical assistance from WHO.

The other health-related project concerns the training of field officers and extension workers in the use of theatre as a tool for development and for promoting community participation in development programs.

More than 1000 students are enrolled in this program. The division could give logistical support to the Mobile MPH training program and has innovative educational approaches.

6.26 Swaziland Institute of Health Sciences

The Swaziland Institute of Health Sciences was officially opened in 1980. Its purpose is to train nurses and other health personnel for employment in the Ministry of Health Services in order to fill recognized serious deficits.

The project was assisted by donor agencies that included the U.S. Agency for International Development (buildings, audio-visual materials and equipment, library books, two contract nursing educators and resources for training seven Swazi educators); the World Health Organization (laboratory equipment and one contract health inspector educator); the Danish International Development Agency (a contract nurse practitioner educator); and the Overseas Development Administration of the United Kingdom (a contract midwife educator and mental health educator).

The institute trains a variety of health professionals, registered nurses, health inspectors, nurse practitioners. Entry requirements for the registered nurse (3 year program): a minimum of third class pass at 'O' level in five subjects. English language (compulsory) three science subjects and one other subject. Health Inspectors should have Cambridge Overseas School Certificate or equivalent, with passes in five subjects three of which must be English, Mathematics and Science. The nurse practitioners are requested to have a registered nurse midwife double certification. Post basic courses in preparation - registered nurse midwife program and psychiatry/ community mental health.

In 1981 an evaluation on the nursing curricula at the Institute was carried out by a consultant from WHO/Brazzaville. The report recommended that:

- post basic programmes in maternal and child health and family planning (MCH/FP) and in family health should be and that a single comprehensive course in public health be substituted.

The institute is very new. The library is extremely limited. The number of journals are minimum and books too are few in number.

A regional resource of journals and library could enhance the programs immeasurably. Students have to rely on texts and are denied access to current literature.

Nazarene College of Nursing, a mission training school, also trains registered nurses. We did not visit this centre.

SIHS courses that the mobile public health training could use as possible electives are:

- o Nursing ethics - registered nurse course
 - o Introduction to Research and Evaluation in Community care (Community Health Nursing Program)
 - o Environmental health
 - o Sociology
 - o Epidemiology
 - o Nutrition
- Nurse practitioner courses

As none of these courses were looked at in detail an evaluation would be necessary. Swaziland Institute of Health Science and Nazarene College of Nursing trained registered nurses. There are 220 nurses. The total of 1982 enrollment indicates 220 registered nurses and midwifery 27 midwifery students were enrolled and 26 students in the nurse practitioner program.

6.27 Institute of Development Management

The health inspectorate diploma program in (1982) had a total of 43 students enrolled, and nine graduates.

The institute has at the Certificate level since 1979 awarded 11 nurse administrators, and one health care administration certificate over three years. i.e. five per year on the average.

6.28 Field Experience

Some excellent field experiences exist in the rural health centres at Sethobela, Mlatckulu and Siphofaneni.

The MOH estimates that there are approximately 15 people in the country who could be proposed as candidates for faculty positions. As it was premature to do this -- none were asked directly for their credentials and their interest. Most of the people proposed, do a lot of teaching already. There was general agreement that public health training was needed to enhance or improve health in Southern Africa. "For a long time emphasis in the health field has been on curative health care. This type of training will highlight preventive and promotive health care."

It was the opinion of the MOH that the program should have a rotating seat to give all the countries in the region an opportunity to award the certificates/diplomas/or degrees.

Swaziland stated the MPHT program should have a rotating seat to give all the countries in the region an opportunity to award the certificates, diplomas and/or degrees.

The Mobile MPH needs to be housed in the local University. To this there was general agreement.

The degree should be awarded by the University that is hosting the program the year of graduation.

"This program is very innovative and has great potential for having a greater impact on health status since it will concentrate on preventive and promotive programs.

Emphasis should be more on the certificate and diploma since the cadre that will be recruited will be mostly clinic nurses based in the rural clinics and health centres. Caution will have to be exercised that not too many students are overtrained because there will be a problem securing posts for those who will eventually graduate. Some measure of saturation point will have to be determined. However for the BLS countries alone there appears a pool of students that can warrant an institute of public training health. The institute will

provide required training, as well as a host of other services including upgrading of public health training another area much neglected. if the program is excellent then it will be utilized.

6.29 Pool of students will increase as projected in 1981 Swaziland study of Manpower and Training needs.

| | | Public health nurses needed |
|----------------------|-------|-----------------------------|
| Rural clinics | 82/83 | 88/89 |
| Public health nurses | 24 | 32 |

The elasticity of the Institute of Health is limited by the 1) size of the facility which currently accommodates 150 (only 30 meals); 2) shortage of tutors; 3) shortage of tutors in this specialty area. It is also anticipated that by 1989 the number of health inspectors needed will increase five fold, from 14 to 71.

Faculty of the Institute believe that 8-10 doctors would be candidates for the mobile MPH.

Summary

- o Swaziland recognizes the importance of this project in terms of increasing much needed manpower in public health.
- o The program should be offered on a rotating basis.
- o The resources that such a program could give the region could be tremendous.
- o There are several courses suitable for electives.
- o There are problems with upward mobility and need for University credits for Institute courses.
- o This program could help with the localization of Swaziland and reduce the manpower gap.

6.3 Botswana

Botswana has a population of 0.9 million. By the year 2000 it will be 1.6 million in view of the high population growth rate of 5.4 percent. Some estimates suggest this may be close to four percent! Botswana has reduced its infant mortality to 82. This is much lower than Lesotho and Swaziland. Botswana has a large migrant population. Forty percent of households or more are women headed; half the population is under 15 and 70 percent live in the rural areas. Only 25 percent of the rural population have access to a safe water supply. The most common communicable diseases are tuberculosis, measles, sexually transmitted diseases. Malaria and sleeping sickness are endemic to Northern Botswana. Bilharzia is also prominent. Increasing recognition that malnutrition is a major problem in Botswana. As an index of scope of improvement for Botswana life expectancy at birth is 20 years, less than in the most developed countries. Health care has expanded rapidly due to an increase in number of clinics and locally trained staff.

Botswana has an official manpower training policy for the next four years according to manpower studies carried out in 1982. Botswana's health plan places manpower development as the first priority.

As much training as possible will be done in Botswana but it will continue to be necessary to send trained abroad for very specialized or heavily technical courses that cannot be economically provided in the country. Botswana has 120 physicians, 1170 registered nurses; 20 health administrators; seven pharmacists and three nutritionists and a large cadre of lower level health professionals.

Botswana needs public health training for: epidemiologists; regional medical officers; nutritionists; health education and occupational health officers. There is a high degree of dependency on expatriates. This has resulted in a high staff turnover. Many do not have public health training. The country has an official manpower training policy for the next four years and manpower training is a top priority. The Ministry of health has recommended more MPH training.

6.31 Institutional Capability

6.311 University of Botswana

This University has 1,100 students and a well qualified faculty of 120. The University has strong departments in the faculties of Humanities, Science, Education and Economic and Social Studies. Intakes into degree courses in the Faculties of Humanities and of Economics and Social Studies will be held at the levels of 50 and 65

Botswana students a year respectively. This is government policy. New degree level programs include business administration, commerce, anthropology, demography and environmental science.

Ohio State University has 11 million dollars (seven from USAID and four from Botswana) to upgrade teacher training in Botswana. They are doing this by upgrading the Education department in the University to offer a two year diploma; Bachelor's in Education, and ultimately a Master's and inservice training sessions. Many of their teachers only have standard seven training. The grant provides for four University of Ohio faculty to teach in the education department. At present a student in the diploma program cannot enroll in the B.Ed. program to get a degree. This is to be worked out in time. The mechanism of high school equivalency will be used to admit mature learners to the higher level programs. A person who takes the three year diploma in England can only be admitted to the University as a Freshman. There are, in addition to the university, three teacher training colleges plus one being built for graduates and provide a mature entry scheme for entry into the university. This is a "special process" for those 25 and older. In general these people have had three years post primary education but may have failed their junior certificate. They intake a high school equivalency type exam. The Primary Improvement Program at the University is working on giving credit for life experiences as well. Through this mechanism unnecessary repeat training is avoided and experienced teachers are upgraded. Similar mechanisms need to be developed for upward mobility of nurses and other health professionals.

Current education problems in the country are that secondary schools cannot cope with increased enrollment and there are shortages of places. However, this also means that more students are completing school which provides a wider choice of qualified students.

The University of Botswana offers a three year degree (B.Ed.) in Nursing Education to registered nurses. Thirty-two enrolled (1980) and six graduated. This degree really takes seven years (4 years for basic registered nurse midwife training and three years for the B.Ed. Nursing an educational waste of three years!)

6.312 The Institute of Adult Education

The Institute of Adult Education (I.A.E.), established in 1978, is the part of the University that is primarily concerned with extending its resources beyond the campus and developing its contribution to adult education services in Botswana. Its main functions are:

- university extension;
- the training of adult educators;
- experimentation and research in, and evaluation of new ideas and methods in adult education;

- consultancy work in adult education;
- in-service work for teachers and other professional groups.

The Institute works closely with central and local Government, including the Ministries of Education, Agriculture, Commerce and Industry, Local Government and Lands, District Councils, Radio Botswana, the brigades movement, the Botswana Enterprises Development Unit and other agencies.

In the immediate future particular emphasis will be placed on the following activities:

- The new two year Diploma in Adult Education at the University.
- The "Cultural Development Project," an experimental program designed to stimulate interest and production in the performing arts.
- In-service education for people whose work has an adult education component.
- The development of links between adult education and production activities, aimed at promoting economic development.

The IAE also organizes a variety of seminars and workshops. The most recent was one on Alcoholism -- a problem of great magnitude in Lesotho. The Institute has been inundated with requests for a Masters degree level program in Education. Most applicants were in the Government Department of Non-Formal Education. However, there were four from the National Health Institute (NHI). There are plans afoot to provide this degree as well as ways to award university credit for recognized evaluated training -- once again to permit the growing need for career advancement.

University College of Botswana is strongly committed to a program of staff development so academic and other senior posts may be held by citizens. However, as well as being a national institution a university must be part of the international network of universities and its graduates must be accepted internationally. It is therefore important for any university to maintain provision for some expatriates because it needs the stimulus of some staff from other academic and social backgrounds. Hence it is intended that eventually some 80 percent of academic and other senior positions will be held by citizens.

6.313 National Institute of Research (NRI) is autonomous in the University of Botswana. The institute is charged with gathering all information on research done regarding Botswana. The key areas at present are: rural development; education; health; and migration and rural settlement. The institute serves as evaluators for government projects. They would favorably examine any proposal that would suggest they serve as proctors for health students.

The institute has several studies under way for example "Attitudes toward Handicapped in Botswana," "Women Headed Households in Botswana," and a malaria study to determine if people take their malaria medication.

Their staff at present consists of nine faculty members of which four are funded externally. The research budget is \$10,000 per year funded from local sources plus a two year grant of \$250,000 from Sweden.

6.314 The National Health Institute

The National Health Institute (NHI) trains a variety of health professionals. Of particular interest to the Mobile PHTP and are the registered nurses, registered nurse midwives and pharmacy technicians. At the more advanced level there is the post basic community health nurse diploma (double qualified registered nurse midwife plus one year post basic). This cadre is to improve health care through the provision of promotive preventive and curative health care at all levels. Family nurse practitioners are also trained here.

In 1982 the number of nurses enrolled in the NHI were: 95 registered nurses; 69 nurse midwives; 14 community nurse practitioners; and 14 family nurse practitioners. The number of graduates were: 137 registered nurses; 91 registered nurse midwives; 14 community health nurses and 14 family nurse practitioners. In addition the MOH through the family health division runs a health education nutritionist program for high school level plus practical experience. Twenty-six health educator nutritionists enrolled of whom 11 graduated. A certificate was awarded by the NHI, however, students were desirous of a diploma. This two year course illustrates some of the regional problems that require a clear policy ruling and should have credits towards university, high school or nursing school degrees for certificates.

Courses suitable for the MPHT diploma program are: a) RN courses: social science, sociology, introduction to anthropology, health education, statistics, nutrition in relation to the community; b) Practicum in Role Development Mother and Child Health which includes a wide variety of interesting courses that could be expanded e.g. Traditional customs and beliefs, maternal and child health, sociology of the family, community health, leadership and management. These courses have however, at this stage, not been examined in detail nor looked at in terms of availability. However, they do exist and if suitable could be offered during the year through the University Education Extension Services, with the cooperation and concurrence of the

NHI. However, they would have to meet the standards of excellence required by both Tulane and the University of Botswana.

6.315 The Institute of Development Management

The Institute of Development (IDM) was established in 1974 as a regional institute train to mid-career and senior management in Botswana, Lesotho, and Swaziland, and to undertake research, consultations, and public education with a view to improving management capability in the region. It operates under the direction of a Governing Board composed of two senior representatives from each government, one from the educational sector and one representing the industrial/commercial sector of each country, and the IDM director. The IDM maintains offices, classrooms, hotels and staff in all three countries.

When IDM classes are too large, government accommodations at SIMPA in Swaziland are used. In the Botswana facility two classes at least are in progress at any one time. A class of under 10 not feasible. The Lesotho facility can accommodate only eight so the institute uses the School of Agriculture to accommodate a class size of 10 or more.

At present, there are 45 people on the IDM staff. Twenty-two are administrative positions, eight of the local academic staff are in training abroad. Canada sponsored the initial development of the Institute and provided personnel and funding to develop local staff to replace the expatriates. The World Bank, NORAD and Ford Foundations also contributed as well as USAID. Ford Foundation was principally responsible for the excellent facilities.

The regional office is in Botswana and training takes place in all three BLS countries. The tuition, which includes transport to the institute and living accommodations is \$380 for two weeks and \$130 a week thereafter. The Health Care Administration course costs a total of \$5,900. The certificate programs are of nine months duration. For students from other countries the charge is higher \$4,200-\$4,400 for the nine month course. Students are responsible for their own travel to the institute. The out-of-region student is accepted only if places are available. The two major courses are Nursing Administration and Health Care Administration. In the later course, 80 classroom hours course are devoted to epidemiology, MCH, nutrition and environmental health.

Courses have not been evaluated in terms of depth, duration and content, however depending on the level they could be provided as electives, or if upgraded as a core course for example: principles of administration, project planning and evaluation; communication skills; personnel management; social aspects of health; health care in developing countries; psychological aspects of health and legal aspects of health.

Entry requirements are variable. It is estimated that 50 percent of students have "0" levels. The rest have experience. A number of students from other SADCC countries attend the Institutes in the BLS countries. Six were from Zambia and three from the Cameroun. In 1982, IDM trained 19 Botswana in Nursing Administration and 17 in Health Care Administration (1982).

The faculty is expected to generate its own salaries from student fees. This hasn't been accomplished to date. IDM faculty were of the opinion that there were at least 10-15 people in the BLS countries that would be interested in the MPHTP at the Masters level.

A sparse budget has limited IDM to acquiring only the most essential textbooks and teaching aids for the health sector program. There are very few teaching materials that have been adapted to the local situation. Clearly, a more complete library is needed.

A mini computer has been recommended to enable the IDM to process data from the health services research which the Institute carries out. IDM had an unsatisfactory experience using a mainline computer for analyses. There was no appropriate software packages available and communication between the IDM team, the programmer, and the computer service was very poor. A small computer, with the appropriate software, located in IDM would be better adapted to the specific processing needs. It would be more cost-effective and would provide a learning opportunity for IDM faculty and students.

Tulane University views the Institute of Development Management health administration training program as a fundamental component of public health training in the BLS region. In planning public health training at the Baccalaureate and Masters Degree levels, Tulane wishes to ensure that the Certificate and planned Diploma level courses offered by IDM will be compatible with the higher level training. Courses taken at IDM would be evaluated, if necessary upgraded, and together with the University credited toward a bachelors or masters degree as appropriate.

In the meeting that was held in Swaziland on February 7, 1983 between the Tulane team, the ISTI team, representatives of the IDM, and Charles DuBois, USAID, the following points were agreed upon:

1. Tulane would assist all decision makers in the region to plan a comprehensive public health training program that would avoid duplication and facilitate the development of a complementary range of courses.
2. IDM would continue to offer public health training at the certificate level and plan to introduce a diploma course.
3. Tulane would provide assistance to the BLS countries to develop a Baccalaureate and Masters degree program in public health.

4. Tulane would be available to provide short term consultants to work with ISTI in assisting IDM to upgrade the health training curriculum.

In ensuing planning efforts in relating to IDM and the proposed BA and MA public health programs we intend close communication to ensure coordination.

6.520 Botswana Manpower Policy and Training

Botswana's health manpower study was conducted in 1982. There was no data on the number of vacancies or retirees. Furthermore, over 40 percent of health professionals are expatriates and that this is even higher for some categories such as doctors (80%).

Epidemiologists, regional medical officers, nutritionists, health education officers, occupational health officers are in short supply. Training at the MPH level is needed. Botswana has an official health manpower training policy. Training and manpower development is priority number one. Particular importance is attached to training cadres which are vital to the improvement of rural health services that is enrolled nurses, midwives, health educators, nutritionists and family welfare educators. As much training as possible and will be done in Botswana but it will continue to be necessary to send trainees abroad for very specialized or heavily technical courses that cannot economically be provided within the community.

Government employees could obtain 12 weeks leave per year for region training. In Botswana there are however, problems about accumulating leave beyond a two year entitlement. This will obviously have to be resolved.

Candidates sent overseas must have a basic baccalaureate qualification and two years post basic experience. The Ministry of Health estimates overseas training costs to be \$20,000 to the USA and UK. This figure however, does not include the salary of the candidate nor the cost of a replacement. Even if the individual has a donor scholarship the costs borne by the Ministry of Health are considerable (See p.).

Botswana would have five or more candidates for the Mobile Public Health Training program at masters level per year. Supervised field experience could be provided for Mobile Public Health Training through:

1. Regional Health Teams.
2. The Family Health Division (MCH/FP).
3. Nutrition and Health Education Program of the MOH.

4. Occupational Health Program in the MOH.

This will be a useful step in localization program and is needed to improve public health in the region. There should be a permanent seat for the program and Botswana would be the logical place. The program needs to be housed in the local university. The degree should be awarded by the local university in conjunction with Tulane University.

Summary

Botswana has excellent institutional capability for Mobile Public Health Training. The presence of an occupational health division directed by a WHO physician, a National Research Institute and IDM makes a strong case for building on the existing foundations in Botswana.

7. Other Regional Training Institutes

The severe shortage of available regional public health training at the degree level and the lack of elasticity of BLS institutions and other African training institutions has created a dependence on South African programs for example University of South Africa for correspondence degrees and Medunsa for medical training. The need will increase unless definite steps are taken to provide degree and diploma public health training in the SADCC region. Results of a public health training questionnaire (SADCC countries) indicates that there would be at least three physicians and eight nurses per year interested in regional public health training per country. Zambia for example would have, many doctors available if the course is 'in-service' and especially for upgrading.

7.1 University of Southern Africa (See Appendix)

This University is headquartered just outside Pretoria, in the Republic of South Africa. through correspondence courses it provides diplomas, degrees (B.A., honors, masters and Doctoral). Currently there are 60,000 students enrolled of whom 48,000 are undergraduates and 12,000 are postgraduates. It has a huge staff of 2½ thousand members--half are academic and the other half are administrators. All the academic staff have doctoral degrees. Faculty are placed in offices in Pretoria but do move around to regional centers where they hold discussions with individual students and in some cases offer lectures or discussion groups which are optional. There is a very large library which is available for enrolled students and requests for publishers are mailed to students.

Students are charged a fee of R 130/course and for a degree require 12 credits placing the total tuition cost of a baccalaureate degree at R 1,560. There is an additional levy for foreign students to cover costs of dispatching materials. Tuition costs at UNISA are half the cost of tuition at any University in South Africa for equivalent training.

There are a wide variety of degree programs provided ranging from BA, Arts and Science, Law, Nursing, Anthropology, Indigenous Law, Classics, Communication, Psychology, Sociology and Behavioral Sciences.

In addition to degrees the University offers diplomas and certificates. Requirements for these differ. Generally degrees are more subscribed to than diplomas and certificates. There is a Baccalaureate in Nursing Science which offers several different tracts e.g. a) Community Health Nursing Science b) Nursing Administration c) Nursing Education Practical. Work is prescribed for each of the courses and supervision and logging is clearly defined. In addition competence in clinical practice is also tested. In 1981 academic year there were 115 BA Nursing Science students; 15 were honors students and only one was for the Masters of Nursing Science. In this program one year of honors is required before entry into the Masters degree.

Of all the Honors students enrolled, half were black students indicating the rising numbers of postgraduate black students. The extension education services of the region could provide such a service. Its necessary to have such a facility.

7.2 Medunsa (See Appendix)

Medican University of Southern Africa is located 30 km from Pretoria bordering on the Republic of Bophuthatswana and adjoining the township Ga-Rankuwa. This school came into being in 1978 and has faculties of Medicine, Dentistry and Veterinary Science. Diplomas are offered in Physiotherapy, Occupational Therapy, Radiography, Dietetics and Dental Therapy. There is also a degree in nursing science and paramedical diploma courses were changed in 1981 to degree programs. Optometry, Audiology with Speech Pathology is also offered. This teaching hospital has 3,000 admissions per month, 20,250 outpatients/month and more than 1,500 surgical operations/month. The school of medicine has an active department of Community Health with emphasis of practical aspects of community health. (Course outline, See Appendix) Students have supervised field projects and work in health clinics. Discussions were held with the Dean of the Medical.

8.0 Indigenous Faculty

Over the last decade there has been an increase in the number of health professionals in the region and expertise. Through localization policy more nationals are being trained. In addition, there are a large number of expatriate experts provided by donor agencies and also on contract to the Ministries of health and universities. The universities do recognize the need for international exchange and interchange and do not boast to isolate their students or staff. There are a number of health professionals suitable for Mobile Public Health training in the region. Their availability was not assessed at the time of the feasibility study as it was decided it was too premature to gauge this.

It should however, be recognized that the faculty are overextended. The elasticity of local institutions bears testimony to this.

Severely limited resources self-learning modules, up to date literature searches, reviews, a lack of a wide selection of medical journals, inaccessibility of sources such as Index Medicus, Med Line and other researches severely restrict the progress of knowledge and learning. The faculty alone without a strong educational resource centre will be extremely limited.

An incomplete list of faculty that could serve on the teaching staff of a public health training institute are listed below merely to illustrate that the potential is there:

Botswana -

- Dr. D. Sabina - MPH - Premier Secretary
- Dr. S. Moeti - DPH - Chief Medical Officer
- Dr. P. Mashalaba - MCH - Child Health, Education and Nutrition
- Dr. E. Motaang - DPH - Health Planner Certificate
Johns Hopkins
Epidemiologist
- Dr. Meriweather - Maternal and Child Health
- Dr. J. Finlay - Health Education and Nutrition
- Dr. K. Jones - Educationist
- T. Finlay - Research Techniques
- J. Moelisi - Health Administration
- M. Kam - Health Planner
- Dr. P. Rohaus - WHO Regional Occupational Health Director

Lesotho -

- Dr. P. Ngakane - Dean Health Science Faculty
- Dr. A. Maruping - Director Medical Services MOH
MCH and Nutrition
- Dr. Ramatlapeng - Epidemiologist
- Ms. C. Phafane - Nutrition
- Dr. M. Tembo - WHO Consultant
- Ms. Borotho - Health Planner

Swaziland -

- Dr. M. Dlamini - Director Medical Services
- Dr. M. Owens - Deputy Director
- Dr. F. Freeman - Public Health Administration
- Ms. R. Pula - Public Health Educator

Mr. V. Simelane - Sociology Demography
Prof. L. Makhubu - Traditional Medicine
D. Nxumalo - Health Planning

There are also a number of in country experts working in the Mission hospitals and on assignment from the various donor and voluntary agencies.

In the region some of the available personnel include:

Dr. A. Mkondowere - (retired from MOH, Malawi)
Epidemiologist, Disease Control

Dr. J. Bennett - World Health Organization, UNICEF
Regional Medical Advisor - Nairobi, Kenya

Dr. M. Were - Primary Health Care Expert
Ass. Prof. Community Health
Kenyatta Medical School, Nairobi

Dr. I. Aiken - Director Paraprofessional School
Bo, Sierra Leone

Dr. D. Sanders - Dept. Pediatrics Zimbabwe Medical School,
Harari, Zimbabwe

Dr. Norbert Mgwagwe - Nutrition Planner MOH, Zimbabwe

Dr. Brew-Graves - WHO MCh and Primary Care: Sierra Leone

Prof. Carlos Marzagoa - Director, Faculty of Medicine
Central Hospital Maputo
(Speaks English fluently)

Prof. Nholi - Arusha, Tanzania

Dr. J. Bennett - Regional Medical Advisor UNICEF
Nairobi, Kenya

In addition to MOH staff there are a number of excellent faculty at the Nursing Institutes and the University. (For further lists see Appendix).

The faculty and Ministry of Health Staff listed have extensive teaching and practical field experience and have served as consultants and reviewers for international organizations and meetings. The nursing schools have nursing tutors overseas for training. Regional

workshops on teaching methodology are also being conducted. The capability and interest is there. The funding will have to allow for staff development, resources and a student faculty load that will allow for maximal student faculty contact.

9.0 Costs of Training

Any discussion on costs is complicated and comparability is difficult - nevertheless there are some clear facts:

1. Training overseas is expensive and the bulk of the costs are borne by the scholarship donor but by the country sponsoring the program.

While it is generally accepted that training costs \$20,000 overseas there are large hidden costs which include replacement of a health professional and the cost of the salary. Travel may also have to be an add on. The yearly cost per student is from \$45-\$50,000 per year.

2. Scholarships are few and far.
3. Loans are not easy to come by.
4. The money spent on training has no spin offs. The dependency cycle is perpetuated and educational, institutional and resources are not developed. A field of staff trained.
5. Quality education is costly but in the long run worthwhile.
6. Tuition for non-resident students is considerably higher than for nationals.
7. Part time training cheaper than full-time but quality may be a question.

The estimation of training costs is complicated by the fact that with one single exception (the Institute of Health Sciences), other training programs are supported within the general budget of the institution of which they are a part. Thus arbitrary decisions are made necessarily in order to isolate costs associated with training (tutor salaries, value of part-time lecturer's services, value of food, hotel accommodation, building maintenance, etc.). In the case of the Institute of Health Sciences, an institution uniquely dedicated to teaching with an independent budget, cost estimations are thought to be more reliable. These costs are shown in the Table 4 reflect not only the different length of training, but also the teaching methodology and funding mechanisms at different training institutions.

Table 5

Training Costs of Some Categories of Health Personnel

| <u>Category</u> | <u>Institution</u> | <u>Training Cost</u> | <u>Training Period</u> |
|-------------------------|------------------------------|----------------------|------------------------|
| State Registered Nurse | Nazarene College of Nursing | E 7,536 | 36 months |
| State Registered Nurse | Institute of Health Sciences | 9,774 | 36 months |
| State Certified Midwife | Nazarene College of Nursing | 2,512 | 12 months |
| Nurse Practitioner | Institute of Health Sciences | 3,258 | 12 months |
| Public Health Inspector | Institute of Health Sciences | 6,516 | 36 months |

Costs

A number of factors that contribute to educational costs include the 1) faculty student ratio; 2) the number of students - under a certain number it is not economical to train. Generally the larger the class the more cost effective - 30 students per public health unit (a unit being 12 credits/year or whatever) would appear an optimal number. 3) types of resources; 4) research and development; 5) recurring costs; and 6) level of support.

If a program were developed in the region: --

1. Replacement staff would not be necessary. This could reduce costs of training considerably. Money could be used towards institutional building.
2. Travel to Botswana, Lesotho or Swaziland would be a mere fraction of the cost (if a motor vehicle is used for example) compared to air travel to and from the U.S.A.
3. Tuition costs for Masters level public health ranges from \$1,500 in the State Supported institutions like University of Hawaii to \$14,000 at the privately owned school such as Yale.

In general then costs in the PLS countries and the Southern Africa region are in the vicinity of \$3000 for full time students (tuition and board and lodging). Costs are higher for foreign students. For diploma courses costs are less and for part time courses tuition is half or less than the cost of full time training.

Training costs with the exception of Zimbabwe Medical School where the cost is U.S. \$13-14,000 per year of study, the training programs are much less expensive than training outside the region. However, low cost may indicate scarce teaching materials, resources, and lack of staff. Some costs of other programs are listed in (Table 4).

Great accomplishments have been made in the region in a short time, however, there is still an acute shortage of health educational resources which we believe is very evident in the BLS countries. No stop gap measures will alleviate this. A considerable amount of start up costs will be essential. It is believed that over a 10-year period these investment will be cost effective, reduce dependency and increase regional training capacity significantly.

Currently the countries pay tuition to some institution not in the BLS countries, loose on resource development, loose on replacement costs and travel. This can be an astronomical amount each year.

Let us assume that 30 students are trained in the Mobile Public Health Program. The cost will be:

| | | |
|----|--|------------------------|
| 1. | Replacement for 1 year 30 x \$10,000 = | \$300,000 |
| 2. | Institutional development (re- source centers and capability) -- invaluable long term. Library worth will be in- creased by over three years net saving | \$ 45,000 \$ 45,000 |
| 3. | Tuition fees at usual rates prevailing in BLS countries e.g. 30 x \$5,000 = | \$150,000 |
| | Net gain in country of | \$150,000 |
| | Total net gain | \$459,000 |

Invisible loss could be
\$500,000

In comparing training in the region the advantages to regional training are obvious:

Overseas Training
(1 year)

Effects Students go overseas
Few students trained
Institution deprivation
Research stunted
No resource centre
Data processing static

Trickle effect
Dependency
No elasticity

In Country Training
(3 consecutive yrs. 12 week)
blocks

Faculty to region
Many students trained
Institutional growth
Research stimulated
Resource center burgeons
Increased data processing
capability
Critical manpower mass
Selfsufficiency
Elasticity

In conclusion:

The study clearly indicates that mobile public health training is technically and politically and financially feasible and superior to overseas training.

Candidates will be able to make some contribution in their own country by even evaluating similar activities, or available courses e.g. the Nairobi Epidemiology Course (5 months). A cadre of teachers in the BLS countries and other participant countries could be developed. The training has innumerable spin offs including creating learning material which is locally relevant.