

Republic of Sudan
Epidemiological Laboratory (EpiLab)

A collaborating centre of the International Union Against Tuberculosis and Lung Disease

EXECUTIVE ACTION DOCUMENT

November 2008

Summary of the visit

A team of external experts visited the EpiLab from 18 to 28 November 2008 to review with the staff of the EpiLab the progress of work since the last visit in January 2007, and to make a report on its findings with recommendations.

The review team noted substantial progress toward achieving the vision and goals of the EpiLab. This clearly reflects the hard work of the Director, her staff and members and the clarity of purpose of the EpiLab, even though much of the work is carried out as volunteers. The role of the EpiLab is clearly one of pathfinder and is unique in its attempt to bridge the gulf between the academic community and the public services. This is increasingly recognized in the country by the requests for partnership both within government ministries and in academic institutions. The experts particularly noted the following key achievements. EpiLab has:

1. Made excellent progress in strengthening EpiLab and moving forward toward its vision and objective, in spite of limited resources;
2. Clearly displayed the structure and responsibilities within the office with an organizational chart that defines roles, responsibilities and lines of communication. It further has enhanced communication by developing a website.
3. Made impressive improvement in administration capacity and procedures; developing capability for forward planning.
4. Established a fund-raising task force as part of its Board of Directors.
5. Prepared a strategic plan within each of its sections.
6. Shown remarkable success in obtaining additional funded projects including sub-contracts from the Global Fund, the Triage-Plus and the International Tobacco Control Policy Evaluation Survey.
7. Expanded its involvement in teaching and technical assistance at national and international level.

The experts identified the following crucial challenges. EpiLab:

1. Has not spelled out clearly the role of the Technical Advisory Committee nor shown its position within the organizational chart.
2. Faces a risk to its sustainability related to securing long-term finances and lacks an overall strategic budget, focusing rather on development of spending plans.
3. Has neither clear action plan nor system of reporting on fund-raising plans and activities.
4. Has not followed its strategic plans and vision with a practical proposal of a financing plan.
5. Is vulnerable if rapid expansion should take place in that its management structures and procedures are as yet too weak to accommodate extensive expansion of projects.
6. Does not have a regular mechanism to record and report many of its key activities, particularly in technical assistance, teaching and scientific publications.
7. Has not developed sufficient policies and procedures to ensure a high level of quality in its data management.
8. A number of the graduate thesis projects have not led to publications with the result that the new knowledge they created will be lost.

The expert team recommends that:*

1. ***The director spell out the role of the Technical Advisory Committee, develop terms of reference and include it on the organizational chart.***

* 24 November 2008

2. *The administration staff undertake forward planning for activities, budget and spending plan, including a needs assessment and gap analysis to construct an overall budget for the EpiLab as a whole as well as for each of its projects.*
3. *The director and senior management prepare a revenue generation plan with a clear process for review of the progress of the fund-raising committee of the Board.*
4. *All sections, in consultation with the Director, finalize funding proposals for financing their visions and strategic and action plans with a focus on opportunities represented by the Global Fund and that the sections, in consultation with the Director, submit proposals for funding.*
5. *The director develop a plan to strengthen management capacity to prepare for large-scale projects and donor contributions.*
6. *The administrative assistant circulate a form for quarterly reporting of scientific activities including technical assistance, teaching and publications.*
7. *The coordinator of the data management unit strengthen the data management procedures including solid security measures and quality assurance of databases, calling on external expertise to advise on the way forward.*
8. *EpiLab team members must conscientiously follow through their research projects to the point where the results are published in the scientific literature.*

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Report No. 04

18-28 November 2008

Members of the Technical Advisory Committee:

Donald A Enarson, *International Union Against Tuberculosis and Lung Disease (The Union)*;

Gunnar Bjune, *University of Oslo*

Rasmus Malmberg, *Norwegian Heart and Lung Patient Organization (LHL)*

The programme of the visit is enclosed as Appendix 1.

Purpose of the visit

A team of external experts visited the EpiLab from 18 to 28 November 2008 to review with the staff of the EpiLab the progress of work since the last visit in January 2007, and to make a report on its findings with recommendations.

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Appendix 1. Agenda of the visit.

Appendix 2. Brief history of the development of the EpiLab

Appendix 3. Organization structure of the EpiLab

Appendix 4. Strategic plans of the sections

The role of the EpiLab, as spelled out by its leaders, is to act as a facilitator, linking the academic community with the public health sector to promote research as a means to improve and maintain quality of those services.

It is proposed to establish EpiLab as a collaborating centre of WHO. In this area, WHO can sponsor people for short courses in EpiLab. In order to do this, it is important for EpiLab to obtain accreditation to provide certificates for higher education (Diploma in Public Health / Diploma in TB control). EMRO coordinates regional technical assistance activities. To participate, EpiLab needs to send a list of staff who can act as technical consultants, outlining their competencies and CVs (to be sent to Amal Bassilli).

1. FRAMEWORK OF EPILAB

The organizational structure of EpiLab is provided in Appendix 3. Since the last visit, the Board has established a task force on fund-raising to assist the EpiLab to locate financial resources to support its vision and action plan.

The framework of EpiLab is clearly displayed and the structure and responsibilities defined in an organizational chart that defines roles, responsibilities and lines of communication. However, the EpiLab has not spelled out clearly the role of the Technical Advisory Committee nor shown its position within the organizational chart.

EpiLab has further enhanced communication by developing a website.

The sections of the EpiLab have been revised to some extent since the last visit. A small financial subsidy from LHL has been established for the coordinators of the sections. The sections have been differentiated between Scientific Sections and Supportive Sections.

1.1 The Scientific Sections

The Scientific Sections have been revised and those that were previously in place are now structured as follows:

1. Tuberculosis Control;
 - a. HIV / TB Unit;
 - b. Laboratory and MDR-TB Unit;
 - c. Projects Implementation Unit.
 - d. Technical Assistance
2. Child Lung Health;
 - a. Pneumonia Unit;
 - b. Asthma Unit;
 - c. TB Unit;
 - d. TB / HIV Unit.
 - e. Research Unit
3. Asthma Control;
 - a. Project implementation Unit;
 - b. Research Unit;
 - c. Health Education Unit;
4. Tobacco Control;
 - a. Cessation Unit;
 - b. Legislation Unit;
 - c. Health Education and Advocacy Unit;
 - d. Research Unit.
5. Zoonotic Tuberculosis (previously TB in Animals)
 - a. Surveillance Unit;
 - b. Laboratory Unit;
 - c. Wildlife Unit;
 - d. Eradication Unit.

Several new scientific sections have been established since the last visit including:

1. HIV / AIDS Section;
 - a. Public Health Unit;
 - b. Laboratory Unit.
2. Environment and Health Section.

Each of the scientific sections has prepared a strategic plan for activities within its section (appendix 4).

1.2 The Supportive Sections

A group of Supportive Sections have been defined as follows:

1. Logistics
2. Health Informatics and Data Management.
 - a. GIS unit.
 - b. Knowledge Management

The experts recommend that:

1. *All sections, in consultation with the Director, finalize funding proposals for financing their visions and strategic and action plans with a focus on opportunities represented by the Global Fund and that the sections, in consultation with the Director, submit proposals for funding.*

1.3 Funded projects

EpiLab undertakes **funded projects** with a salaried staff. The funded projects that EpiLab is currently involved in are:

1. A comprehensive approach to improved lung health services, in collaboration with The Union and funded by the World Bank.
2. Triage-Plus, in collaboration with Liverpool School of Tropical Medicine, LHL, REACH Trust, funded by NORAD through a grant held by LHL.
3. International Tobacco Control (ITC), in collaboration with Wilfred Laurier University, funded by

Funded projects that have now been completed, have not received further funds or are no longer operating include:

1. TB in the 21st Century, in collaboration with Oslo University and funded by NORAD;
2. National Tuberculin Survey in cooperation with the University of Stellenbosch and funded by LHL, the World Health Organization and charitable organizations;
3. Geographic Information System as a tool for improving access to health services, in association with the LHL and funded by The Union;

EpiLab has shown remarkable success in obtaining sub-contracts from the Global Fund and in participating in new initiatives such as Triage-Plus and ITC.

1.4 Facilitating networks among academic and public institutions

To facilitate its actions in human resource capacity strengthening and its role as coordinator, EpiLab supports a network of national and international academic bodies. These include:

1.4.1 Academic institutions

At National level

Current academic institutions with which EpiLab has an MoU:

1. Academy of Medical Sciences and Technology, Ostaza Asma Al/Wakil
2. Ahfad University for Women; Dr Amina Rahama (Prof Gasim Badri – Stop TB partnership TB Ambassador Sudan)
3. Gezira University, Prof Habour ;

4. Khartoum University Department of Computer Sciences Focal Person Dr. G F Kadoda
5. Education Development Centre for Health Professionals. Dr. A H ElFahal
6. Rabat National University Prof Omer Abdel Aziz
7. Bayan University, Dr Amar Khamis
8. Omdurman University of Technology, Dr Habab Omar, Prof Ahmed Tijani

Previous academic collaborations that are no longer active:

1. Khartoum College of Medicine, Prof Naseredin
2. Institutes of Endemic Diseases

At International level –

MoUs / agreements in continuous operation since last visit:

1. The International Union Against Tuberculosis and Lung Disease, FRANCE, Prof D Enarson

2. University of Oslo, Institute of General Practice and Health, NORWAY; Prof G Bjune Community Medicine, Section for International
3. University of Bergen, Center for International Health NORWAY, Dr SG Hinderaker

New MoUs since the last visit:

1. Liverpool School of Tropical Medicine, Liverpool, UK; Dr Bertie Squire

No longer operational:

1. University of Stellenbosch SOUTH AFRICA; Prof N Beyers
2. Armauer Hansen Institute Addis Ababa ETHIOPIA; A Asefa

1.4.2 Public institutions

At National level

Current public health institutions with which EpiLab has an MoU:

1. Federal MoH National Tobacco Control Initiative 2006
2. Federal MoH National Tuberculosis Programme 2007
3. State MoH, N Kordofan 2007
4. State MoH, Gezira 2008
5. Federal MoH Department of Non-communicable Diseases 2008

At International level –

MoUs / agreements in continuous operation since last visit:

1. World Health Organization Eastern Mediterranean Region EGYPT, Dr A Seita
2. The Norwegian Heart and Lung Patients Organization, NORWAY, R Malmberg
3. EpiLab Congo, DR CONGO, Dr Denis

New MoUs since the last visit:

1. REACH Trust, Lilongwe MALAWI Perth

At national level –

Ten MoUs have been signed (one still pending)

1. National Tobacco Control Initiative 2006
2. National Tuberculosis Programme 2007
3. N Kordofan MoH 2007
4. Upper Nile U / medicine 2008
5. U Sciences and Tech 2008
6. Gezira MoH 2008
7. Fed MoH Non-communicable 2008
8. RD Congo daughter EpiLab 2008
9. Khartoum University Department of Computer Sciences
10. University Khartoum / Department of Community Med (pending)

TAC recommendations of the previous visit:

1. Head of Scientific Activities establish MOUs with existing partner institutions to define respective roles and expectations, by end of June 2007;
2. Dr Amar Salih develop an annual forum to engage partners in exchange of ideas and knowledge and to formulate a broad strategy for advancing public health in the country, by the end of third quarter 2007;

Actions taken:

This has not been done

2. ACCOUNTABILITY OF EPILAB

The EpiLab is situated in a private residence in Khartoum. Since the last visit, the EpiLab has moved from the Academy of Medical Sciences and Technology, first to a private apartment and then to its current location. The rationale for this move was to maintain its independence and role as interlocutor among numerous academic institutions and the state health programmes. By being located at a separate site, EpiLab is able to function more effectively in this role.

a. Administrative Procedures

The quality of the administration and the financial management of the Epi-lab has steadily improved, do to the hard work for the director and the team. Furthermore it is believed that the combination of a well motivated and stable staff has been highly beneficial to the administration and financial management of the Epi-lab. It is believed that the time has come for the financial management team to take upon the task of making financial projections.

During a workshop facilitated by the LHL consultant with the admin/ financial staff of the Epi-lab, the concept and importance of financial projections were discussed. An example of the need for very short term projections is seen below:

There is a need to inform LHL no later than the 10th of October of each year how much funds are expected to be used for the rest of the year. The more accurate this projection is made the smaller the risk of ending up with funds in the bank account on December 31st which will have to be paid back to LHL.

A short term projection (10th October to 31st of December) is based on the expected spending for planned purchases + the running costs of the office.

The ability to do longer term planning projections should, in addition to running costs, include an estimate of maintenance cost versus the cost of purchasing new hardware. Furthermore an inflation adjustment amounting to 2-5% should be added to each budget line when making three year projections.

A planning budget for a three year period is very helpful for assessment of the financial sustainability of the Epi-lab and can be used strategically for fund raising initiatives with potential donors. The planning budget further allows the Epi-lab to systematically record the expected needs of the office, the known income and the funding gaps.

i. Planning

Both the above examples require forward planning which will save the Epi-lab money. Once the annual LHL budget is agreed upon there is still a possibility for the Epi-lab to maximize the output of the received funds, for instance; purchase of plane tickets in advance are usually cheaper than tickets bought close to the date of departure, the same goes for hotel costs and for the fee to attend the annual Union conference.

ii. Reporting

Management report

- Primary responsible is Hanaa (Epi-Lab)

Head of section has to send a report to Hanaa (*Narrative report has to follow the annual financial report*).

TAC recommendations of the previous visit:

1. The Director establish MOUs with existing partner institutions to define respective roles and expectations, by end of June 2007;
2. Dr Amar Salih develop an annual forum to engage partners in exchange of ideas and knowledge and to formulate a broad strategy for advancing public health in the country, by the end of third quarter 2007;
3. The Director collate written action plans for each of the activities of the EpiLab with defined roles and tasks and a formal quarterly review of progress, with written report;
4. The Director empower Drs Mai Ziyada and Amar Salih to use the skills they gained in the management training courses to lead a process of strategic planning, according to the procedures they learned in their training;
5. Mai Ziyada and Amar Salih, in consultation with the Head of Scientific Activities (strategic planning group), draft a short document outlining vision, mission and goals of the EpiLab, by end April 2007;
6. The Director circulate this draft to a limited number of key individuals in EpiLab for comment and development;
7. strategic planning group share the document, after revising it according to the input of the core group, for input from the members of EpiLab, by end July 2007;
8. strategic planning group, after completing the document, draft a more expanded strategic planning document for distribution and input through the same process, to be completed by end September 2007;
9. strategic planning group start a process of 'stakeholder mapping' to identify the key institutions most likely to benefit from its linkages as the strategic planning is rolled out, by end November 2007.

Actions taken:

1. A strategic plan document has been developed by each of the section heads, drafted and presented to EpiLab;
2. A local consultant was engaged to review and finalize the drafts of the strategic plans;
3. A final consultation among EpiLab collaborators was held to develop the current drafts (appendix 4)
4. Actions plans have been drafted but not yet completed;
5. These have been circulated to selected individuals and circulated to the National Tuberculosis Programme;
6. Dr Amar Saleh has shifted his position to work for the United Nations Development Programme;

7. He attended a course in Italy on technical consulting for tuberculosis programmes, completed his MPhil at the University of Oslo and participated in the Union management courses;
8. Dr Mai Ziyada also participated in Union management courses.

The experts recommend that the:

1. **Office manager writes up a draft three year financial projection which is then discussed with the director and shared with the LHL consultant who will give feedback if the director and the office manager want it.**
2. **Director and Head of Sections informs the office manager who will attend the Union conference before the 15th of June.**
3. **Office manager together with the director write up a tentative plan for who is travelling where and when in the following six months. This will allow for purchase of cheaper plane tickets and cheaper hotels.**
4. **Director contacts the Union in order to see the possibilities of having Dr Jose Castro work with the Epi-lab so in order to work towards making the Epi-lab potential Principle Recipient of Global Fund money in Sudan.**

3. RESOURCES

Human Resources

The following staff members work in the EpiLab:

Other than salaried staff:

1. Director: Asma El Sony (70%)
2. Deputy Director: Amar Khamis (30%)

Salaried staff of EpiLab provide logistics and administration. They include the following:

1. Hana ElSadig Finance and Management officer (100)
2. Accountant: Shadia Goma (33%);
3. Assistant accountant: Edna Samuel Erisa (40%)
4. Drivers:
 - a. Mohamed Ibrahim (100%),
 - b. Mustafa Adnan (100%);
5. Messenger and Cleaner: Tesfa Aptop Abraham (50%)

Project-related personnel who are also salaried staff include:

1. Comprehensive Approach to Improved Lung Health Services:
 - a. Manager: Amar Khamis (50%)
 - b. Office Assistant / Cleaner / Guard: Tesfa (50%)
 - c. Coordinator: Nada Mustafa (90%)
 - d. Driver: Hysen (100%);
 - e. Focal persons:
 - CLH, Ibtihal Salah (70%);
 - Asthma, Karmla Hafiz (35%),
 - Moda Mohamed (35%)
 - Tobacco, Ayisha Abbas (70%);
 - Data Manager: Hafiz (70%)
2. LHL core budget patient data project:
 - a. Data Collection supervisor: Khadiga Adam (30%)
 - b. Data collectors:
 - Maha Yahia (50%);
 - Faiza Fathi Ali (50%);
 - Salhal en Nour (50%)
 - c. Data Entry: Edna Samuel Erisa (50%)
 - d. Section Coordinators:
 - Tuberculosis: Aliya al Hatem (not paid)
 - Child Lung Health: Safaa Alim (30%)
 - Asthma: vacant Rashed Kmal 80%

- Tobacco: Imana el Tijani (30%)
 - Zoonosis: Adil de Dumo (30%)
 - HIV: Amjit Farid not paid
 - Environment: Ibtihal Salah (not paid)
3. Triage-Plus
- a. Coordinator: Thoeiba Omer (50%)
 - b. Public Health Researcher: Amjid Farid (100%)
 - c. Health Economic Researcher: Aliya Al Hatem (40%)
 - d. Health Communications Researcher: Mariyam Sherif (55%)
 - e. Consultant Communications: Iman El Tijani (35%)
 - f. Health Communications Researcher: Sahar Upshol (25%)
 - g. GIS: Hajir Ismail (80%)
 - h. Ahmed Abdeeen data Management 80%
 - i. Data Collector: Bedriya Bein (30%)

Financial Resources

A summary of the spending plans for 2006-2008 is included as appendix 5.

The spending plan for the period of 2006 to 2009 is as follows:

2006	2007	2008	2009
USD 200.534,76	USD 238.220,-	USD 399.605,-	USD 420.021,-

Infrastructure

The premises that EpiLab uses have been previously described. EpiLab currently has four vehicles that are operating. Two of the vehicles are very old and hence maintenance costs are high.

There is not, at present, an inventory of equipment in the EpiLab. Following the financial management letter signed by the Epi-Lab and LHL, there must be an updated inventory list which the auditor should sign on an annual bases – the list should include all inventory but with a specification of who the donor was.

The capacity of the administration and financial management has improved impressively; there is a possibility to increase capacity of the administration and financial management even further by having the accountants improve their skills in forward projections

TAC recommendations of the previous visit:

1. the Director prepare a clear description of professional qualifications and terms of reference for a professional administrator to assist the Director, by end of February 2007
2. the Director engage an experienced professional administrator, by end of March 2007;
3. The Professional Administrator develop a clear and written human resource management plan, by end May 2007;
4. The Professional Administrator coordinate planning of staff recruitment using the resources of each and every funded project, by end of July 2007;

Actions taken:

1. Terms of reference for staff have been prepared.
2. Nada Mustafa has taken the post of professional administrator.
3. More senior are required but the salary must be higher than is now possible in the EpiLab (potential candidates have been identified).
4. The human resource management plan is not yet complete.
5. The distribution of staff by project is outlined above.

The experts recommend that the:

1. **The experts agree with the Epi-lab director and office manager that funds should be sought to replace at least one if not both of the old vehicles. LHL is willing to partially fund a new vehicle if there is extra funding available in 2008.**
2. **Office manager of the Epi-lab ensures that an inventory list is written up, handed to the auditor and included in the annual audit report, it must be clear from the inventory report what items have been donated by which donor.**

4. **ACTIVITIES OF THE SECTIONS SINCE JANUARY 2007**

4.1 Tuberculosis Control Section

Head Dr Amar Khamis, *Coordinator:* Dr. Aliya Sir El Hatim,

The Section now contains four units: HIV / TB Unit (Dr Dr Thoeiba Omar Ali); : Laboratory and MDR-TB Unit (Dr Imad El Amin); (Programme Implementation Unit. Technical assistance) carried by different teams from Sections.

EpiLab has become increasingly called upon to provide technical advice to the National Tuberculosis Programme. This service has been, however, quite *ad hoc*, although the EpiLab has developed an MoU with the National Tuberculosis Programme. In addition, over the past few years, the quality of the tuberculosis programme has declined substantially with the poor quality of leadership in the programme several years ago. Moreover, with the expansion of focus associated with the StopTB strategy, the coordination of technical input into the National Tuberculosis Programme is sometimes less than satisfactory.

The objectives of the TB / HIV Unit are to provide technical assistance to the National Tuberculosis Programme, to promote collaboration and to undertake research. The Unit has been recognized as part of the national network for TB / HIV. It carried out a training workshop in 2008. As part of its field epidemiological research, it established 11 centres in which VCT services are provided for TB patients in four states: Khartoum, Gezira, Kassala and North Kordofan. The HIV tests are saliva tests obtained from BioNor. The Unit has prepared a strategic plan that proposes a situation analysis, involvement in the development of national guidelines and the drafting of an action plan.

Collaborative activities between the Sudan National Tuberculosis Programme (SNTP) and the Sudan National AIDS Programme (SNAP) include a plan for monthly meetings (60% are actually held), establishment of VCT services in the TBMs (no HIV treatment is provided in these centres) and recording of HIV test results in the TB Register. There is no written plan for infection control in these locations. This collaboration has, to a large extent, stagnated.

Treatment of HIV takes place in 31 selected sites throughout the country but are the responsibility of the SNAP. All preventive treatment (cotrimoxazole and isoniazid) is the responsibility of the SNAP but neither is currently given on a regular basis. Patients found to be positive in the TBMs are referred to these HIV management centres. There is no established mechanism to monitor whether or not the referred patients actually arrive in the HIV management centres.

Several crucial challenges have been identified as follows:

1. patient referral and follow up
 - a. apparently DOT is no longer routinely practiced for TB treatment
 - b. there is no clear plan for monitoring the progress of ART treatment
2. interruption of drug supplies
3. lack of a plan for prophylaxis
4. no clear outline of the roles of various stakeholders

With regard to care of MDR-TB, there is no DOTS-plus as yet. Using the framework of the thesis of Imad el Amin, it should be possible to set up laboratory support activities. The national survey of drug resistance was included in Global Fund Round 8 which has been endorsed and is under negotiation. It is expected to commence in one or two years. The Institute of Tropical Medicine is the Supra-National Laboratory involved in this survey. MDR-TB treatment will only be put in place following the survey. Currently, second-line drugs are being supplied to Abu Anja Hospital and are handled by three chest physicians who follow a standardized regimen.

TAC recommendations of the previous visit:

1. The Director, in view of the absence of a report of activities for this area, indicate within the organizational chart whether Bacteriology and Immunology functions as a section or is a support function;
2. The Director also indicate the current status of the section on TB / HIV and the members associated with this section.
3. Mai Ziyada identify the focal person for liaison with the National Tuberculosis Programme to work with the international experts to provide technical assistance to the NTP;

4. Hafiz Hussein develop an inventory of quarterly reports by type of report (case finding, new smear positive cases by age, treatment outcome), TBMU and quarter for reports currently in the electronic database, from the start of the programme in 1993;
5. Hafiz Hussein develop an inventory of the hard copies of these quarterly reports;

Actions taken:

1. Bacteriology / Immunology and HIV / TB have now been made Units of the Tuberculosis Section;
2. Dr Amar Khamis is responsible for activities of the TB section; Hafiz Hussein is the focal person in NTP
3. The quarterly reports on case finding and on treatment outcome have been consolidated into databases and have now been entered into the back-up computer. The missing quarterly reports have been entered. The quarterly reports on case finding by age and sex have not been prepared in Excel format so could not be accessed during the visit.
4. The inventory has not yet been prepared.

The experts recommend that:

1. **The EpiLab offer its assistance in the role of coordinator of external technical assistance to the National Tuberculosis Programme.**
2. **EpiLab formalize its technical input into the National Tuberculosis Programme so that its services are documented precisely and that it is remunerated appropriately for the services it provides.**

4.2 Child Lung Health Section (CLH)

Head: Prof. Zein Karar, *Coordinator:* Dr Safaa Alim

The Section has been revised since the last visit with definition of a number of separate units as follows: Pneumonia Unit; Asthma Unit; TB Unit; TB / HIV Unit and Research Unit.

A manual for management of tuberculosis in children has been drafted and presented to the National Tuberculosis Programme.

The section has been working on a comprehensive proposal for child lung health that they have presented to funding agencies. The response has been to revise the proposal, giving an indication of the resources to be provided by the Government of Sudan before external funders will consider it.

TAC recommendations of the previous visit:

1. Dr. Renas El Mubarak CLD Project Coordinator on her return to EpiLab follow-up submitted proposals by visiting local funding agencies and emailing foreign based funding agencies

Actions taken:

1. The proposal for child lung health has been completed and submitted to funding agencies. There has been some interest in the agencies but they have requested a revision of the proposal to reflect that this is now a programme support proposal rather than a pilot project.

4.3 Asthma Management

Head Prof, Omer A. Musa; *Coordinator:* Dr Nada Bakri Osman (acting)

Since the last visit in January 2007, substantial progress has been made. Nada Bakri is now coordinator in place of Mai El Tijani who is on leave completing her thesis at the University of Oslo.

An MoU has been concluded with the Directorate of Non-communicable Diseases in the Federal Ministry of Health (Dr Zainab Suar-ElDahab, Director). This MoU engages the EpiLab to work with the NCD Directorate to establish and extend asthma management in the country. As part of this activity, national guidelines are being developed for endorsement by all stakeholders (3 members of the planning group for the national guidelines are from EpiLab).

The standard case management of asthma has been extended from the pilot project into 14 sites as in Khartoum and El Gezira States (10 and 4) as part of the comprehensive lung health project. It is proposed to expand into all the state hospitals in Gezira State.

Standard case management for asthma was started in EpiLab pilot projects and has been continued in the comprehensive lung health services project. To continue this work, an MoU with the NCD Directorate has identified the EpiLab as the technical advisor. The partnership with EpiLab for asthma standard case management and research involves the following partners: Ribat University, Khartoum State, Gezira State and the NCD directorate (Federal MoH).

The research projects under the Section are discussed below in the section on Funded Projects.

TAC recommendations of the previous visit:

1. The director of Epilab will request the political involvement from the Ministry of health of Khartoum to improve the access to a standardised long term management of asthma and decrease the health cost of the overuse of the emergency room services.
2. Mai Eltigany and Omaima Saad El Din will design a pamphlet for asthma patient education by end of March
3. Rasmus Malmberg provide a simple outline for a process of developing and validating patient and community health education material that could be used for the asthma education material;
4. Pr Omer Musa and Mai Eltigany standardize the questions employed in the further respiratory epidemiological studies to ensure that the questions are those that have been internationally recommended and that the same questions are used in each study

Actions taken:

1. An MoU has been developed with the Directorate of Non-communicable Diseases for extension of standard case management of asthma in Sudan;
2. National guidelines on the management of asthma are being finalized.
3. The guidelines for health communication material will be established in a workshop to be held in April 2009.

4.4 Tobacco Prevention Section

Head : Prof Asma El Sony; *Coordinator* : Dr. Iman El Tijani;

Asma ElSony is the current Head of Section; in place of Dr Khashm ElMouse who is on leave completing his thesis at the Academy of Medical Sciences and Technology. Dr Safaa has taken a part-time job \and is currently on maternity leave. A new Unit has been added to the Section, Tobacco-related cancer.

The section has been doing its work in collaboration with the National Tuberculosis Programme (cessation for tuberculosis patients) and with the WHO focal person for MPower, Dr Imad el Amin. In carrying out its work, it has faced the following constraints: a lack of funding for carrying out activities; a weak health system to support the activities; a fragile coordination body (with conflict of interest within the committee); the perverse influence of the tobacco industry and an absence of political and social support.

A strategic plan has been put together giving a description of background, the situation in Sudan, current activities, a SWOT analysis, goals, objectives, and strategic plan 2007 -15.

4.4.1 Cessation

The centres engaged in the feasibility study on tobacco cessation have been joined by the centres in the project on comprehensive lung health services for a total of 20 centres at which tobacco cessation services for tuberculosis patients are being offered. The centres are visited each month with continuing training of health workers on tobacco cessation interventions. With the end of the project on comprehensive lung health services, there is a need for follow up of these centres to continue the services. However, to date, no further budget has been identified to do this work.

4.4.2 Health Education and Advocacy

The unit on Health Education and Advocacy has focused its work on awareness campaigns and the development and production of materials for health education. In this area of work, the experts on health education from LHL have been providing technical input to ensure that the health education materials are appropriate and effective.

4.4.3 Legislation and economics

The role of EpiLab with regard to legislation and economics is to engage, with partners, in the National Tobacco Control Committee to advise government on national policy and regulations. While Sudan has signed the Framework Convention on Tobacco Control in 2004 and introduced a number of regulations, their breadth and enforcement are sometimes inadequate. To address these issues, the EpiLab and partners target decision makers and engage social advocates (including the media) to advocate for action.

4.4.4 Research and Information

The EpiLab, in addition to its pioneering work on the feasibility of smoking cessation among TB patients and its involvement in the project for comprehensive lung health services, has become one of 15 international partners (very few of which are developing countries) on the International Tobacco Control Policy Survey. This project is coordinated by Sir Wilfred Laurier University in Canada and will be coordinated in EpiLab by Hafiz Hussein. It comprises a cohort study of 2,500 participants to study tobacco use, beliefs and attitudes and knowledge. In Sudan, 20 districts from Khartoum, Gezira, North Kordofan and Equatoria States will be selected from which the cohort will be selected and each provided with an interviewer-administered questionnaire.

4.4.5 Tobacco-related cancer in Sudan

A new initiative is being undertaken under the Tobacco Section to address the problem of cancer. It will aim toward tobacco-related cancers at the outset and focus on research to make an estimation of reporting completeness. Consideration will also be given to explore how the EpiLab can use its expertise to focus on quality of services for cancer management and research.

Using lung cancer as a first topic, the plan is to introduce standard case recording and registration and to strengthen the national cancer registry. For this, it will focus on cancer care with outcomes (not necessarily mortality). This initiative provides opportunities for partnership through a Board to coordinate partners in cancer.

TAC recommendations of the previous visit:

1. Hussein Khashm El Muse meet the manager of the NTP by end June 2007 to recommend the introduction of brief advice for smoking cessation as a routine in the NTP;
2. Rasmus Malmberg provide a brief description of a stepped approach to evaluate health education materials (such as the Manual on Tobacco Prevention and Control);
3. Abeer Osman (in the absence of Safaa al Bashir) obtain guidance from Doreen McIntyre and complete the situation analysis of stakeholders by end February 2007;
4. Hussein Khashm Elmuse prepare a plan for scientific presentations at the next regional (2009 or 2010) and international (2008) conferences of The Union and submit them to the conference planning unit and to the regional conference planning committee.
5. Abeer Osman identify a coordinator for the International Tobacco Control Policy Evaluation Survey (ITC) and inform Doreen McIntyre of the name of this focal person;
6. Doreen McIntyre inform Abeer Osman (acting coordinator until mid February, after which Dr Safaa will return to her post) of the progress of research on the economic aspects of tobacco;
7. Doreen McIntyre report to Hussein Khashm Elmuse on progress made in inclusion of Sudan in other international partnerships;
8. Abeer Osman contacts Doreen McIntyre to determine funding opportunities from the above international partnerships.

Actions taken:

1. Smoking cessation has not yet been included in case management of tuberculosis;
2. A workshop on development and evaluation of health education materials facilitated by an expert from LHL will be held in April 2009;
3. Hafiz Hussein has been identified as coordinator of the ITC Survey and this will be commenced in early 2009;
4. The stakeholder analysis, economic analysis and other international research partnerships nor funding possibilities, other than ITC, were not identified.
5. A presentation was made in the annual the Scientific Conference on Respiratory Medicine, Khartoum, 2007. Previous presentations included three regional conferences – 24th Union Middle East Conference on Lung Health (2002), 25th Regional Conference on Mediterranean Communities Against Tuberculosis and Lung Diseases (Damascus, 2005), The Middle East Regional Conference on Lung Health (Casablanca, 2006 – sponsored national focal point for tobacco to attend) and one global conference – the Union World Conference held in Paris in 2006.

The experts recommend that the section:

1. **Complete the stakeholder analysis for those involved in tobacco control in Sudan and prepare a written report.**
2. **Follow through (with the Union Section and / or the INGCAT and/or the Wilfred Laurier University) on the opportunity to be involved in economic analysis and other global research partnerships.**
3. **Contact the RITC (the Canadian Government research organization that funds research on tobacco in developing countries) to explore funding opportunities for tobacco research (especially for the collaboration with the global research partnerships).**
4. **In roll-out of cessation, consider moving to other vulnerable groups such as families with children hospitalized with pneumonia, patients admitted to hospital for treatment of asthma.**
5. **Contact the Union Tobacco Department (Dr Sinead Jones) to determine what the Bloomberg Global Initiative can do for EpiLab, in particular, how EpiLab can relate to the Union office in Cairo.**

6. Make use of social sciences expertise as a cross-tobacco.

cutting issue in addressing the problem of

4.5 Section of Zoonotic TB

Coordinator: Adil El Douma,

The section has now changed its name to the Section of Zoonotic TB to reflect the interaction between disease in animals and in humans. The EpiLab has completed an MoU with the Ministry of Animal Resources and Fisheries. It has also contacted Dr John Kaneene of the Union's Section and entered into the work of the Section. The Section has established various units as follows: Surveillance Unit; Laboratory Unit; Wildlife Unit and Eradication Unit.

The Section is involved with a series of projects including: Estimation of bovine TB in 4 slaughter houses through meat inspection; a literature review to identify all previous studies undertaken on bovine tuberculosis and phase one of the Union survey developed by Dr John Kaneene.

The survey of the slaughter houses in Khartoum State involved the four registered facilities of the state through which all meat sold in the public market is supposed to be prepared. The survey covered the years 2004-2006 during which approximately 350,000 carcasses of beef were handled. The meat supply comes mainly from the western areas of Kordofan and Darfur (mainly Baggara cattle). The supply is from cattle herders who usually do not bring sick animals for slaughter. These may be slaughtered locally, unofficially – illegally – and their meat may find its way to local consumers, although little information is available about this. Affected carcasses are disposed of without any compensation to the owners. Over this period, 36 carcasses were identified with tuberculosis lesions (1 in 10,000 carcasses). This figure is similar to reported figures from Ethiopia but considerably lower than those reported from Turkey.

There is no regular system for monitoring dairy herds for tuberculosis. Most of the dairy cattle who have come to the end of their productive period are shipped to the abattoir for slaughter (unless they are obviously ill).

Included in its strategic plan is the current project on the epidemiology of bovine in Khartoum State with intention to extend this to North Darfur State. The Section proposes to evaluate the situation of tuberculosis in wildlife in the Dindir National Park.

As part of its action plan, the Section will establish a documentation unit and set up joint meetings with other agencies working in animal health. In addition, it will work with the media to promote messages through posters and radio / TV. It also proposes to explore the possibility of a workshop on bovine TB either at the next Africa Region meeting in Ghana in 2009, at the subsequent meeting or at the World Conference.

TAC recommendations of the previous visit:

1. The coordinator of the section explore a Memorandum of Understanding with the Ministry of Animal Resources and Fisheries;
2. The coordinator explore with Dr John Kaneene, the technical requirements for isolation of *Mycobacterium bovis* from clinical specimens;
3. The coordinator inform Dr Kaneene (coordinator of the international group working on Zoonotic Tuberculosis in The Union).of the plans and activities of EpiLab section on TB in Animals to facilitate communication and collaboration with international partners.

Actions taken:

1. An MoU has been completed with the Ministry of Animal Resources and Fisheries.
2. The Section has coordinated its activities with Dr John Kaneene, the head of the Union's group on Zoonotic Tuberculosis and is participating in the international activities.

The experts recommend that the section:

1. **Complete the literature survey to identify what work has already been done in Sudan, in the Region and coordinate with Dr John Kaneene to access the international literature.**
2. **Report its findings of the survey of bovine tuberculosis in the slaughter houses of Khartoum in a scientific journal.**
3. **Contact other partners (especially the FAO), and in cooperation with The Union group on Zoonotic Tuberculosis, to explore the possibility of setting up a workshop / symposium either at the Africa Region meeting or the Global Conference (or both).**
4. **Engage in the plans for the national survey on anti-tuberculosis drug resistance to ensure that plans for isolation of *M. bovis* are included in the survey.**

4.6 Section of HIV / AIDS

Coordinator: Amjid Farid

4.7 Section on Environment

Coordinator: Ibtehal Salah

5. SUPPORT SECTIONS

Support services are also offered in EpiLab. They include Logistics and Health Informatics

5.1 Logistics;

Several issues were discussed with regards to logistics, it is clear that there has been some frustration with the current handling of the logistics in the Epi-lab office, but it was agreed that the current set up will continue as it is for a period of three months where the agreement between the Epi-Lab and the logistics officer will be evaluated again.

It was further discussed with the administrative personnel that procurement of both Bionor test kits and asthma drugs needs to be done well in advance, in order not to experience a stock out.

The experts recommend that the office manager:

1. As the senior officer in charge of procurement ensures that the head of the TB/HIV unit and the Section Coordinator for asthma keeps a monthly updated drug inventory list and a projection for when stock will run out, based on a combination of use of drugs in the previous quarter and the use of drugs in same quarter of last year.

2. As the senior officer in charge of procurement ensures that orders for Bionor test kits are done at least three months in advance in order to avoid stock out, when it comes to asthma drugs, even from local supplies, the order needs to be put in at least six months in advance.

5.2 Health Informatics and Data Management.

Head: Safaa Atitalla Msc; *Coordinator:* Hafiz Hussein; *Consultant:* G. F Kadouda PhD

Field workers (data collection): Maha Yahya, Faiza Fatih Ali Said,

Data entry: Edna Samuel

This section contains a unit on GIS as well as undertaking data capture, entry and management.

The table lists the databases in EpiLab, according to what could be determined at the time of the visit:

Data topic	Software	Cases 2007	Cases 2008
TB Register	SPSS	100	110
TB quarterly reports	Oracle / Excel	234,000	401,482
TB patient cards	SPSS	8,100	8,100
Tuberculin Survey	SPSS	27,092	27,092
	Epi-data (double entry)	21,000	
Asthma patient cards	Oracle (pilot)	1,200	1,200
	Epi-data (comprehensive package)	132	1,098
Smoking cessation	SPSS (pilot)	272	272
	Epi-data (comprehensive package)	89	316
Child Lung Health	Epi-data (comprehensive package)	112	1,782

Databases are kept on a number of separate computers. Some connect to internet but the computer dedicated to data storage has no connection to internet. Access to the data entry computer is only the coordinator of the comprehensive lung health project and Hafiz Hussein. Access to the back up computer is Hafiz and Asma. Data are not centralized into designated computers – some is kept on a laptop. Data files are mixed with many other files. Not all files are in both computers (there is no complete back up of files).

There is no catalogue of variables or of coding (it was made available for the comprehensive lung project on request)

Following are descriptions of some of the databases in the back up computer in EpiLab.

TB register (temp_CD_03)

EpiLab has already collected almost all tuberculosis and laboratory registers from the basic management units around the country. Photocopies have been made but the hard copies are not yet stocked in one central place – some are kept in a private

house. No further entries have been made since the previous visit in January 2007. There is no catalogue of the available / missing TBMU registers. There is a plan to hire a data entry clerk for entering the data from the tuberculosis registers as well as the laboratory registers.

TB quarterly reports (tb 95-2007)

These files have all quarterly reports entered – on case finding; and on treatment outcome. A total of 7,931 quarterly reports on case finding are in the database.

Comprehensive Lung Health Services

Within this project, there are patient treatment cards from asthma, smoking cessation and childhood pneumonia. The following are the number of asthma patient cards: Preintervention = 104; Year 1 = 171; Year 2 = 88; Year 3 = 325 Gezira; Year 3 = 410 Khartoum. For smoking cessation, the numbers are: Year 1 = 74; Year 2 = 86; Year 3 = 156. For childhood pneumonia they are: Preintervention = 89; Year 1 = 63; Year 2 = 255
Year 3 = 1,375.

On another computer dedicated to data entry with access to Khadiga and Edna only and no internet access, are the following files: 2006.EpiLab.sav (spss) = 747 cases; 2007.EpiLab.sav (spss) = 898 cases ; NTP files, NTPfinal 1997-2001 (word files) containing records of quarterly reports.

TAC recommendations of the previous visit:

- 1 The Director develop a plan and identify resources (preferably from existing project budgets) to develop standard operating procedures for maintenance and security of data by end April 2007;
- 2 The Director carefully thinks through what the prioritized work areas of the informatics department should be.
- 3 The Director prepare a plan and budget for development of capacity to address cross-cutting issues such as health communications, by end August 2007.

Actions taken:

These issues have not yet been addressed.

The experts recommend that the coordinator:

1. **Ensure that all those responsible for each of the databases back-up all files systematically onto the computer designated for this purpose. To carry this out, the following steps will be helpful:**
 - a. **Get Total Commander;**
 - b. **Centralize all databases on back-up weekly;**
 - c. **Set system of access by passwords.**
2. **Prepare manual of standard procedures for data management within EpiLab;**
3. **Complete a catalogue of variables and codes for each database in EpiLab;**
4. **Finalize the strategic plan for the Section;**
5. **Provide the consultant with the quarterly reports of tuberculosis case finding by age / sex file in an excel file;**

6. FUNDED PROJECTS

6.1 Tuberculin survey in a representative sample of school children in Sudan

Funding Agency: LHL, WHO, Charitable donations.

Budget: US\$ 60,000 (2001-2007)

The tuberculin survey has been completed, the report submitted to the donors and technical experts. The technical experts were not enthusiastic about the possibility of publication. It would be possible to improve the chances of publication of the results if the data of the previous surveys could be identified for calculating trend in prevalence of tuberculin reactivity.

TAC recommendations of the previous visit: (world bank)

1. Safaa Atitalla, with assistance of Don Enarson, complete the report of results to be provided to donors, by the end of February 2007;
2. Asma El Sony present the results to Federal and State Ministries of Health, by the end of March 2007;
3. Safaa Atitalla prepare a scientific manuscript of the results of the survey for discussion with co-authors, by the end of March 2007.

Actions taken:

1. The report of the tuberculin survey was prepared, submitted to donors and results presented to international experts;
2. The opinion of the external technical experts was relatively negative concerning the survey.

The experts recommend that:

- 1. The Director coordinates a search for the publications of results of the previous tuberculin surveys.**
- 2. The Director and consultant develop an analysis plan for the data in order to prepare a manuscript using this information.**

6.2 TB in the 21st Century: Interventional studies on the different patient contributing factors of delay of diagnosis and treatment
Focal Person: Amar Salih. Contractor Asma ElSony
Funding Agency: Norwegian Research Council, Program for Global Health Research (project no. 164053)
Budget:13,000 Euros

There is no further funding available in Sudan for TB in the 21st Century. The data that has been collected on delay is currently being entered into the computer. The work is being carried forward by Dr Eslah, State Coordinator for Gedarif.

6.3 The Use of GIS to determine key determinants in quality of tuberculosis care
Focal Person: Hafiz Hussein /Ashraf Elsharif Aboud
Funding Agency: LHL, the Union
Budget: US\$ 3,500

Hafiz Hussein finished his Masters thesis using GIS. The title of the thesis was ‘Investigation of tuberculosis service distribution using GIS’. Within the protocol of this study, he checked 60 consecutive patients and tried to trace addresses – only 32 could be traced. All others moved and no one knew where they had moved. He then interviewed cases about access (mode of transportation, time required, cost of transportation) Found relationship between distance and treatment outcome.

TAC recommendations of the previous visit:

All those working with the GIS software must have access to, and frequently use, the working manual called “Getting started with ArcGis”.

Actions taken:

Hafiz Hussein has used the GIS software to complete his Masters thesis on determinants of default from tuberculosis treatment;
Two students have been sent for training in GIS and are currently doing their masters in geo-informatics at a university in Malaysia.

The experts recommend Hafiz Hussein:

Complete and publish his analysis of his thesis, using GIS to follow tuberculosis patients on treatment.

6.4 Comprehensive Approach to Respiratory Illness Prevention and Lung Health Promotion (CLHS)
Previous coordinators for (CLHS)
2006 Maisoon Hamid
2007 Ubai Kamal
2008 Nada Mustafa
Funding Agency: The Union / World Bank
Budget 2008: US\$

This project is now entering its final phase with the completion of the project at the end of 2008. An external review of the project is being carried out with a visit proposed to EpiLab early next month. EpiLab has been the pioneering centre in this project and has produced a manual reporting its experience in participation in global tobacco research. It is also participating in a Guide on Indoor Air Pollution.

The elements of the comprehensive approach were piloted in Sudan prior to the establishment of the project and it is proposed to continue the comprehensive approach, in collaboration with the implementation of the Practical Approach to Lung Health that will be shortly introduced into Sudan.

Since the previous visit, a new coordinator (Nada Mustafa) has been assigned to this project. A total of 10 sites are currently operating and 4 are being added in Gezira State. Monthly supervision visits are made to new sites, quarterly visits to established sites. The following progress is reported:

- target numbers being reached for cases (asthma exceeded)
- there is improved information flow

- there is a high turn-over of health staff in the health services (but improvement in project indicators is noted where staff is stable)
- MoUs have been completed with the Directorate of Non-communicable Diseases for continuation and expansion of asthma and tobacco activities beyond the scope of the project.

A number of challenges have been identified in the project:

- The high staff turnover (especially in Khartoum and particularly among junior doctors)
- This results in high training demands
- There is a lack of ownership by some managers, especially in Khartoum State
- There has been some rupture of stock
- The question of sustainability must be addressed – (project funding ends in December 2008)

The following next steps have been identified for the way forward:

- There will be an external evaluation in early December
- EpiLab proposes to consolidate existing centres in early 2009
- EpiLab will continue as a support structure to implement the interventions in the existing sites

To date, the following cases have been registered within the project:

1. Childhood pneumonia
 - a. Pre-intervention: No=89. First=10 July 2006; Last=16 Aug 2006
 - b. Date of first record: 26 April 2007
 - c. Date of most recent record: 16 Oct 2008
 - d. Total = FY1=63, FY2=255; FY3=1,375 (pneumonia old is correct file)
2. Adult
 - a. Pre-intervention: No=104 First=1 Jul 2006
 - b. Date of first record: 13 Apr 2007
 - c. Date of most recent record: 24 Sep 2008
 - d. Total FY1=171; FY2=88; FY3=Gezira=325, Khartoum=410 (asthma is correct file)
3. Tobacco
 - a. Date of first record: 26 April 2007
 - b. Date of most recent record:
 - c. Total: FY1=74, FY2=86; FY3=156. (y2=smoking, not smoking old)

As the funding for this project ends at the end of December 2008, there is a need to identify the financial resources to continue the work. Possible sources of funds include the WHO JPRM and to include these activities as complementary to the plans to develop the Practical Approach to Lung Health (PAL).

Steps that have been taken to see this accomplished include a meeting held with NTP and MoH. A workshop has been planned for coordination of PAL / CLHS services to be held in December 2008. Steps forward include:

1. The National workshop: NTP, WHO (Ayid), EpiLab, for which funds are available;
2. Development of a plan for expansion and coordination (interim plan for 2009, long-term 2010);
3. Attempts to identify funds available. These efforts include plans for the Global Fund round for 2010;
4. Maintenance of current PAL / CLHS within JPRM for 2009 (to discuss with Ayid)
5. Insistence on a local component from State Ministries wishing to participate. The major funds needed are for drugs, primarily beclomethasone;
6. Involvement of Directorate of Non-communicable Diseases and Chest Physicians Association;
7. Coordination between child lung health and IMCI. A proposal has already been developed by Child Lung Health section in EpiLab. Clear thought needs to be given on how to incorporate PAL, IMCI and the CLHS activities. For this, it is important to build in all stakeholders from the start in order that they will strengthen one another.

The experts recommend that:

1. **In planning the national workshop, the NTP, WHO and EpiLab involve Dr Salah Ottmani, coordinator for PAL in WHO Geneva, as well as the persons responsible for IMCI in the MoH;**
2. **EpiLab involve itself in the JPRM discussions for 2009-10 and the Global Fund Round for 2010 to include the PAL/CLHS activities;**

6.5 Prevalence of asthma in adults

Focal person: Prof Omer A. Musa, Rabat University

Funding Agency: Rabat University and EpiLab, Shendi and Kassala Universities,

Budget : US\$ 8,200

As part of the collaboration with Ribat University, a number (6) of graduate students from are carrying out a series of studies on asthma. They include the following:

1. Measurement of the burden of asthma and COPD: ISAAC and ‘Asthma in adults’ in University employees. Done in 2006-7, not in 2008.
 - a. The ISAAC study compared Gadarif and Khartoum (asthma was half as prevalent in Gadarif as compared to Khartoum).
 - i. MSc students are taking ISAAC and extending it to Kosti, Medani and Atbara aiming to reach the sample of 2,000. They expect to finish in 6 months (currently collecting data)
 - ii. Continued collaboration with ISAAC / The Union through Nadia Ait Khaled.
 - b. University study of asthma prevalence – (3,760 participants) employees and students with an age range of 18 to 70. All had questionnaires administered and those with symptoms had PEF and FEV1 (a sample of about 10% those who completed the questionnaire). Within this protocol, it is thus possible to look at both asthma and COPD.
 - i. University study also has skin tests that show wide ethnic variation.
 - ii. Plans are to extend to North and West to get a view of whole country.
 - iii. It is limited by the sampling frame but this can be acknowledged in the text of any manuscripts prepared.
2. Cost effectiveness of asthma programme (Comprehensive Lung Health Services project sites):
 - a. It is hoped to engage a health economist (Masters’ student in Oslo and consultant from Triage Plus);
 - b. Designed and implemented in 2010
3. Training / health education
 - a. A Masters’ thesis on implementation of guidelines (University of Oslo, Dr Mai El Tijani):
 - i. Output of asthma control
 - ii. Qualitative study
 - iii. Currently doing field study to finish January 2009, analysis and completion June 2009
 - iv. Interview of defaulters
 - b. Health education development
 - i. There has been no expert input into this work.
 - ii. Suggest linking Triage Plus and develop manual for procedures.
4. Partnership to address environmental risk factors for asthma
 - a. Plan to start end 2009
 - b. Collect existing information
 - c. Contact agencies involved in environment
 - d. Develop plan of action
5. COPD management
 - a. Extend model to COPD in 2010
 - b. Involvement in Delphi Project (German) for COPD

Several scientific publications are being prepared, together with Ribat University:

1. asthma prevalence in Kassala
2. Ethnic variation in asthma and allergy
3. Asthma prevalence in adults

The experts recommend that:

1. **The section ensure, as part of its agreement with EpiLab, that the data from its research projects is stored in EpiLab;**
2. **The data is accessed only by those for whom permission of the partners has been officially obtained, as per the agreement with EpiLab.**

6.6 Global Fund for AIDS, Tuberculosis and Malaria
Focal Person: Dr Mohamed Sid/Ahmed.
Funding Agency: GFATM

6.7 Triage-Plus
Focal person: Dr Thoeiba Omer Ali
Funding Agency: NORAD

This project seeks involvement of the community in identifying and improving access to tuberculosis services. The project is carried out in collaboration among LHL, Liverpool School, REACH Trust and EpiLab. It aims at the identification and care for TB / HIV with community-based persons aiming to:

1. improve health communication and referral from the community
2. compare various service providers based in the community
3. improve capacity for research

The project is a randomized controlled community trial comparing three types of providers:

1. health care workers (nurse ,etc
2. Informal private providers
3. community-based providers

The comparison will include patient cost and cost containment of various approaches

The structure of the project is as follows: Coordinator (started by Gada Kadouda, now Thoeiba Omer):

1. Health economics , (Officer: Ms Aliya Seff)
2. Public health, (Officer: Dr Amjit Farid)
3. Health communication, (Ms Eman El Tijani, Ms Mariam Sherif)
4. Health informatics (Mr Ahmed Abdin, Ms Hajjir Ismail)

The project started in October 2007 and has a duration of 5 years. It is currently in the period of situation analysis.

In obtaining the opinion of the researchers on the nature of the health services, the staff indicated that they suspect that health services are delayed, inconvenient and not friendly. In particular, they suspect that services are

- not responsive to the community
- decisions are top-down without consultation
- they lack resources to meet felt needs

They felt a need to focus on primary care services rather than tertiary centres. The attitude of health care workers is poor because of ignorance. Patients feel a need to be involved in communication and planning of services. Communication should be through community leaders including: tribes, teachers, educated persons in the neighborhood, religious leaders. The staff knew of no current published material on community structures / leadership. There is a need to 'survey' the community – using fora – random focus groups and a need for exploration of 'hidden groups'.

This project provides an excellent opportunity to develop social sciences expertise in the EpiLab, including anthropology, sociology and behavioral sciences.

Do to the late start of the Triage-plus projects, the issue of whether or not it would be possible to do the intended cost analysis at the end of the trial was discussed.

It was agreed that the coordinator, Dr Thoeiba Omer was given more time to work on the Triage project by having some of the workload taken of her shoulders in the Epi-lab, this is expected to strengthen the communication between the Epi-lab Triage team and the other organisations in the consortium. It is further very positive that cooperation between the Epi-lab and REACH Trust has increased in the form of joint workshops on health economics, in addition to the annual meetings between all the involved organisations.

The experts recommend that:

1. **That the members of the Epi-lab Triage team who will be going to Malawi for the annual meeting are appointed as soon as possible in order to facilitate the visa procedures.**
2. **The Triage team members think carefully through what type of data that is needed for the project and to what detail the information should be segregated.**
3. **the Triage coordinator contact the rest of the consortium and LHL in particular no later than June 2009 in order to ensure that if there is a need for a one year extension, this is put into the long term funding application which LHL will forward to NORAD.**

6.8 Digital Chest Radiography

Focal person: Dr Habab K El Kheir

Funding Agency: Delft Company (applied)

Proposed budget: US\$ 30 million (overall); US\$ 250,000 for EpiLab evaluation and support

The Delft Company was not successful in obtaining the funds requested. They, however, will continue to search for funds and propose to provide one digital camera for use in the EpiLab. They expect further information in February 2009.

7 SCIENTIFIC PRESENTATIONS AND

PUBLICATIONS

The following articles have been published in the peer-reviewed literature since the last visit:

Burney P, Potts J, Ait-Khaled N, Sepulveda RM, Zidouni N, Benali R, Jerray M, Musa OA, El-Sony A, Behbehani N, El-Sharif N, Mohammad Y, Khouri A, Paralija B, Eiser N, Fitzgerald M, Abu-Laban R. A multinational study of treatment failures in asthma.

Int J Tuberc Lung Dis. 2008; 12: 13-8

Ait-Khaled N, Enarson DA, Ottmani S, El Sony A, Eltigani M, Sepulveda R. Chronic airflow limitation in developing countries: burden and priorities. Int J Chron Obstruct Pulmon Dis. 2007; 2: 141-50

Ait-Khaled N, Odhiambo J, Pearce N, Adjoh KS, Maesano IA, Benhabyles B, Bouhayad Z, Bahati E, Camara L, Catteau C, El Sony A, Esamai FO, Hypolite IE, Melaku K, Musa OA, Ng'ang'a L, Onadeko BO, Saad O, Jerray M, Kayembe JM, Koffi NB, Khaldi F, Kuaban C, Voyi K, M'Boussa J, Sow O, Tidjani O, Zar HJ. Prevalence of symptoms of asthma, rhinitis and eczema in 13 to 14-year old children in Africa: the International Study of Asthma and Allergy in Childhood Phase III. Allergy. 2007; 62: 247-58

El Sony A, Slama K, Salieh M, Elhaj H, Adam K, Hassan A, Enarson DA. Feasibility of brief tobacco cessation advice for tuberculosis patients: a study from Sudan. Int J Tuberc Lung Dis. 2007; 11: 150-5.

9 presentations were conducted in 2007 ref 2007 Annual report

Presentations:

LIST OF EPILAB PRESENTATIONS - 2007 TO 2008

	<u>PRESENTATION TITLE</u>	<u>PRESENTER</u>	<u>EVENT</u>
1.	Tuberculosis Epidemiology in EMRO, The case of Sudan	Prof. Ammar Khamis	2008 AMST
2.	Women & HIV/AIDS: an overview of the case of Sudan	Prof. Asma Elsony	Workshop on the Status of Women in Sudan - Sudan – November 2008
3.	The role of development partners in TB in the era of globalization and the re-shaping of the global economic map	Prof. Asma Elsony	International TB Symposium “ Toward Elimination of TB in the World – From 2008 Asia to Africa – ”- Japan – July 2008
4.	A Comprehensive Approach to Respiratory Illness Prevention and Lung Health Promotion-Sudan	Prof. Asma Elsony	External Review Mission – China – September 2008
5.	Comprehensive Approach to Respiratory Illness Prevention and Lung Health Promotion (CLHS)- a model for integrated health service delivery	Dr. Nada Mustafa	Joint Epilab-NTP Symposium "Integrated health service delivery" – Sudan – August 2008
6.	TB/HIV in Sudan: a model for integrated health service delivery	Dr. Thoeiba Omer	Joint Epilab-NTP Symposium "Integrated health service delivery" – Sudan – August 2008

8 EDUCATION AND TRAINING

8.1 Current masters students:

At University of Oslo: Mai El Tijani, Mai Ziyada, Aliya Sir El Khatim and Amjid Farid will start in 2009

At the University of Malaysia: Rufida Mohamed, Rana Atta

At the University of Academy and Medical sciences: Hussein Khashim ElMouse

8.2 Completed Degrees since January 2007:

Ms Ishraga Sir el Khatim el Haj Sabed, and Mohamed Moneum Tour MSc.
Ms Sumaya Mohammed Mustafa M. el Amin, PhD
Dr Hamza Mohamed Ibrahim, MD

TAC recommendations of the previous visit:

1. The academic supervisor of each graduate student from the EpiLab ensure that the graduate student commit him / herself to publication of at least the main findings of the thesis in a peer-reviewed journal prior to enrolling the student into graduate studies.

The experts recommend that:

1. **EpiLab undertake a survey to identify the current position and responsibilities of persons who gained graduate degrees with the involvement of EpiLab**
2. **The Director establish, within the contract of those given bursaries and scholarships, the need to publish the main findings of their research as part of the conditions for receiving such grants**

9 TECHNICAL ASSISTANCE

Technical assistance from the EpiLab is focused on modeling the process of public health development based on experience gained in the National Tuberculosis Programme and then applied to other conditions and services. This modeling involves a series of defined steps: the pilot of the initiative, scaling up and rolling out. The modeling is carried out in partnership with the body responsible for policy formulation and service delivery. Traditionally, the partner has been the Ministry of Health at either Federal or State level. The first step in this procedure is to develop a concept paper that is agreed among the partners, followed by a Memorandum of Understanding that spells out the relationship of EpiLab to its partner and the responsibilities of each of the partners. Implementation remains the responsibility of the body responsible for policy and services; the role of EpiLab is as pathfinder to demonstrate the way forward and to assist in research, evaluation and monitoring.

The basis of EpiLab's engagement in technical assistance is its emphasis on health as a human right. In this regard, the network of DOTS centres can form a framework for 'health as human right' and for health education initiatives. Human rights initiatives are strong but lack coordination. What is needed is a form of coordination and communication – there is a need for a concept paper.

Technical assistance is given to public health programs and to universities and academies. In moving forward, the EpiLab is focusing on health systems strengthening for chronic disease management (diabetes, hypertension).

For health systems strengthening, the EpiLab wishes to develop its agenda with a pro poor focus. Possible ways forward are to:

- engage an economist – to reflect on the poverty aspects of each project
- work with the TB patients' association developing microfinancing
- a focus on cost saving is important but should not be the whole agenda

Although EpiLab has many technical assistance activities, it does not keep a systematic record of these activities. The following are some of the activities it has undertaken since the last visit.

9.3.1 National activities

EpiLab has undertaken the following national activities:

- Project for mapping persons living with HIV / AIDS for UNDP
- workshop on Knowledge Management
- seminar for AIDS in Africa on drug resistance

- lecture to Womens' Forum, Society for AIDS in subSaharan Africa
- seminar on health communication, Ahfad University
- seminar on asthma at University of Medical Sciences
- workshop on medical writing, Federal Ministry of Health and Hospital for Tropical Diseases, Omdurman University of Technology
- two workshops on proposal writing in the National Tuberculosis Programme

9.3.2 International

EpiLab has participated in the following international initiatives:

- Global Drug Facility – five sessions;
- Global Fund for AIDS, Tuberculosis and Malaria, Technical Review Panel – three sessions;
- Strategic and Technical Advisory Group, Tuberculosis Programme, Eastern Mediterranean Region Office of the World Health Organization;
- Comprehensive Lung Health Project, Anhui China – technical review;
- Workshop on research methods for HIV, Croatia;
- Coordinating group, TB in the 21st century, Oslo, Norway;
- Research Methods Course, Armauer Hansen Research Institute, Addis Ababa, Ethiopia;
- Global Health Workshop, University of Alberta, Edmonton, Canada;
- Strategic and Technical Advisory Group, WHO Geneva, Task Force on Health Systems Strengthening;
- TBCAP, Workshop on Guidelines for Tuberculosis in Children.

The experts recommend that EpiLab:

- 1. Systematically (quarterly) report the technical activities, scientific presentations and publications of its members;**
- 2. Link with the initiatives of the national poverty-reduction plan;**
- 3. Keep a copy of human rights documentation;**
- 4. Undertake a preliminary stakeholder mapping to identify key players in the poverty reduction area.**

10 NEXT VISIT OF THE TECHNICAL ADVISORY COMMITTEE

During 2009, it is envisaged to carry out an independent technical review of the work of EpiLab. The next regular visit of the Technical Advisory Committee is scheduled for early 2010, after the independent review.

Acknowledgements

The team would like to express its appreciation for the hospitality shown during the visit. In particular, thanks go to Prof Asma El Sony for the efforts expended to ensure that the visit was successful. The hard work of the staff of EpiLab was greatly appreciated.

Oslo and Paris

December 2008

Appendix 1: Program of the visit

Date	Activity
18 Nov	Leave Europe
19 Nov	Debriefing Site visits Discussion of Management Informatics for CLHS
20 Nov	Triage-Plus Tobacco Section MDR-TB TB section
22 Nov	PhD studies NTP database TB / HIV section
23 Nov	Symposium: Poverty and Health
24 Nov	Asthma Section Health Informatics TB in Animals
25 Nov	Report Writing
26 Nov	Debriefing with EpiLab staff
27 Nov	Report Writing
28 Nov	Arrive in Europe

Appendix 2. Historical Development

The Epidemiological Laboratory

The Epidemiological laboratory (EpiLab) was established in 1997 as a public health services research centre, situated in a non-governmental, non-profit organization based in Khartoum, Sudan.

The development of the EpiLab is an example of maximizing opportunities and developing a creative approach to addressing challenges and obstacles in a resource-limited environment. The idea was formulated as part of the doctoral thesis of the then-director of the Sudan National Tuberculosis Programme (Asma I. Elsony) 1996-2004. And the center was established on two corner stones:

- The expansion of the rich data base of that thesis has continued without interruption, and
- the experience gained in establishing, expanding and declaring DOTS-all-over in 2002 and which is currently being used to launch other successful lung health – public health program

The objective was to use the field work of the thesis, which was based in the routine operations of a national public health programme to create an 'epidemiological laboratory' to carry out research (and particularly, operations research) that would identify, characterize and prioritize the challenges and obstacles to health services delivery in a vast and complex country. The framework for routine data collection established for her graduate studies formed a continuing source of information gathering that is available on a continuing basis for evaluation and analysis.

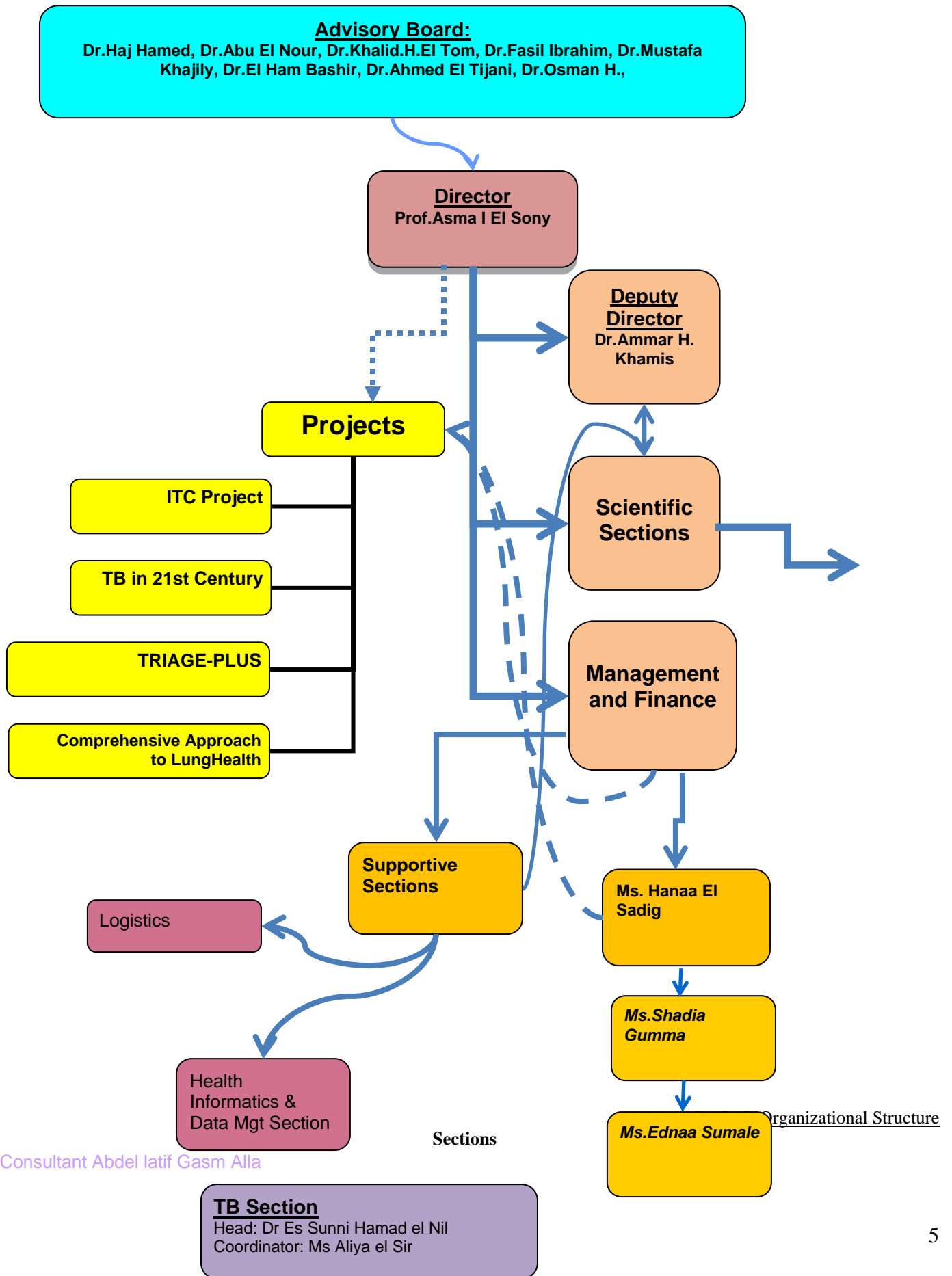
The EpiLab was registered as a not-for-profit organization in Sudan. At the time of its inception, the EpiLab was considered complementary to, but independent from, the structure and governance of the public health service. It was, at first, housed in the premises of the National Tuberculosis Programme, while its Director was also Director of the National Tuberculosis Programme, but was transferred to the premises of the Academy of Medical Sciences and Technology where it remained for two years. Subsequently, to maintain its independent mandate and role as a facilitator of partnerships in research and service among multiple partners, it has moved to its own premises, first in a private apartment and then, for reasons of cost-savings, to its current location in a residential building.

The Epidemiological laboratory is continuing to play a role as a national competence centre created to share its experience with other stake holders and to support national public health projects and programs with the aim to produce efficient and successful outputs guided by the cross fertilization of Academia and Public Health Programs.

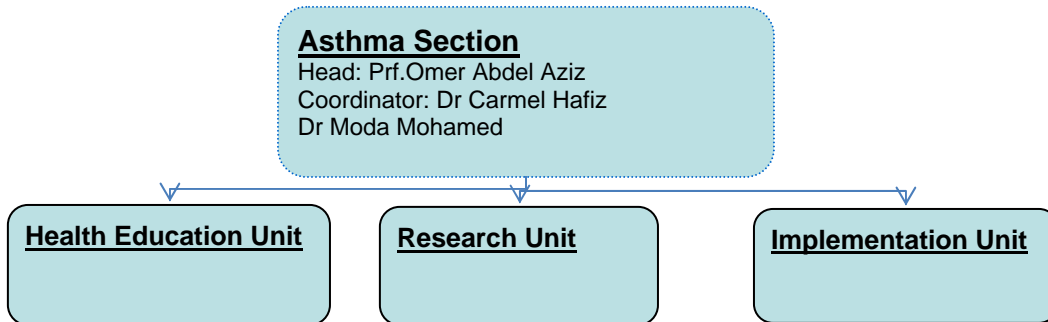
The EpiLab is a collaborating centre of the International Union Against Tuberculosis and Lung Disease (The Union), the University of Oslo, and the Norwegian Lung and Heart Patients Association (LHL) as co-founders.

Epi Lab has no walls and collaborates across all borders without institutional, religious, political, gender, or cultural barriers.

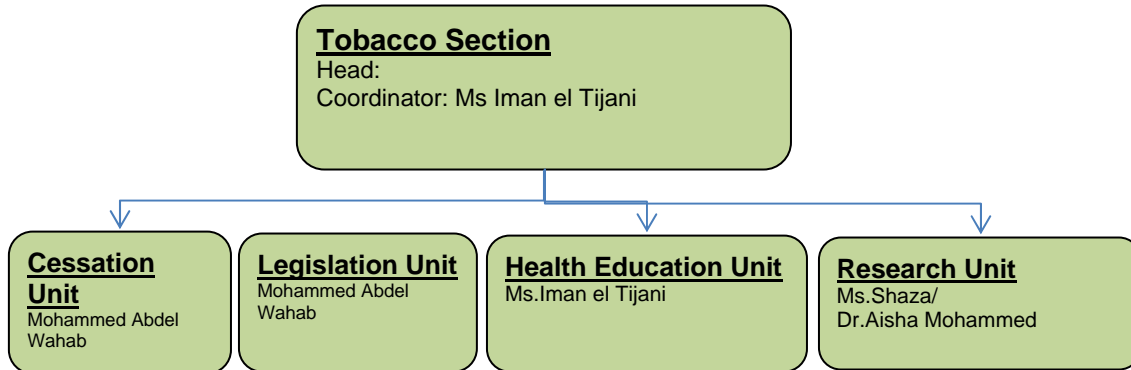
Core structure



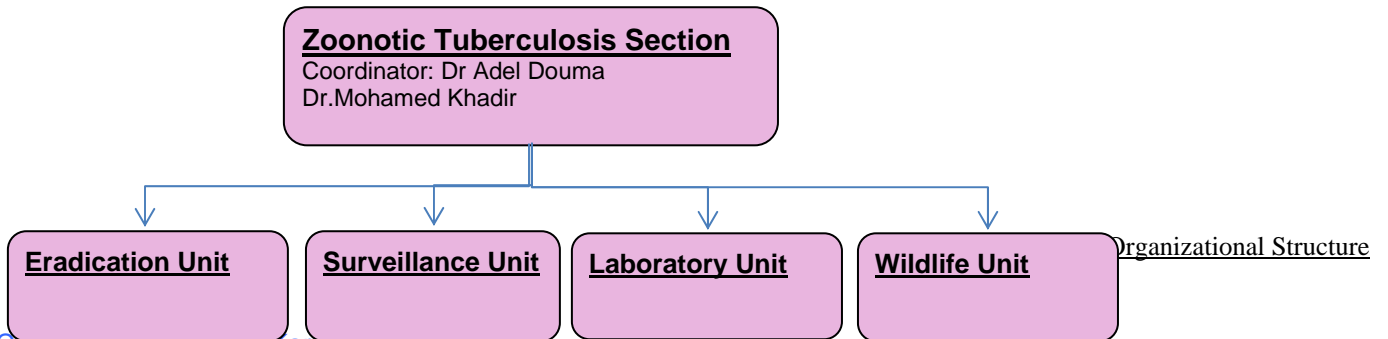
Consultant Dr.Nada Bekri



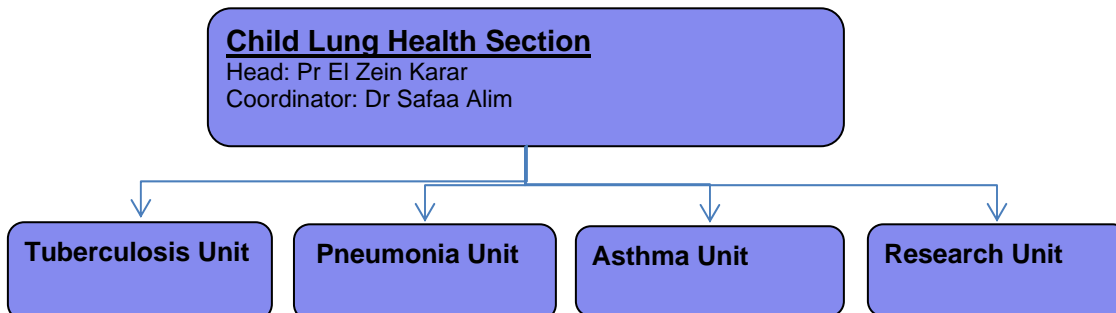
Consultant Dr.Asma Elsony



Consultant Dr.Salah Adam



Consultant Prof.Eizani Karar



Consultant Pr.Ahmed El Tijani

HIV/AIDS Section
Head: Pr Ahmed El Tijani
Coordinator: Dr Amjit Farid

Consultant

Environmental Health Section
Coordinator: Dr Ibtehal Salah

Epi-Lab Section of Tuberculosis Control and Prevention Strategic Plan for 2007-2015

Background:

The focus on strong basic tuberculosis control services is the priority of NTP Sudan; the majority of the countries in the East Mediterranean Region (EMRO) have achieved great progress to confront tuberculosis as key indicators, such as DOTS coverage, the detection rate of new smear positive tuberculosis cases and the treatment success rate have closely approached the global targets. At the same time, the challenges of co-infection with HIV and multi-drug resistant tuberculosis necessitate new approaches to preserve and accelerate the progress that has been made at EMRO and World wide. The Epi-Lab and other partners of the STOP TB Sudan (annex 1) are collaborating in order to reach the Global Targets and consolidate the Quality of DOTs and move towards the Expanded DOTs.

Despite effective case-finding and therapeutic tools and declines in mortality and morbidity rates in some countries, tuberculosis appears to continue as an important communicable disease problem, world-wide, for several decades to come. The chronic nature of the disease, the ability of the tubercle bacilli to remain alive in the human body for years, the concentration of the disease in the older age groups, the increase expectation of life, the high prevalence of infection rate in some vulnerable groups, the relatively high reactivation rate, the emergence of drug-resistant strains, associated of tuberculosis and HIV infection, and above all, the perpetuation of the "non-specific determinants" of the disease in the developing countries impede a rapid conquest of the disease

Goal;

The overall goal of the Tuberculosis Control and Prevention Section is to support national tuberculosis program (NTP) in Sudan and the Region, to reduce the disease burden and suffering attributable to tuberculosis. The Strategic Objectives of the section lie within the **five** Units divisions/initiatives. Relevant targets and related indicators within each strategic objective highlight the anticipated outcomes over this planning period (2007-2015). In some instances, the outputs anticipated during the planning period would, ideally, be available before developing the Departmental Strategic Plan. In such cases, the Plan will be updated and reevaluated as relevant information becomes available.

Objectives

1. Technical assistance

One of the main identified constraints is decentralization with insufficient commitment at local level and limited human resource and technical advisors at central and provincial level. This is followed by the a number of technical challenges to overcome such national and international demands, for example, how to promote the monitoring and evaluation performance as well as the quality of reporting and supervision in all levels.

The role of The Epi-Lab technical assistance should influence Ministries of health to provide increased human and financial resources to strengthen NTPs to that they can play their full role in stewardship of TB control activities. The Epi-Lab and the TB section must be clear on the guiding principles which provide direction to this medium-term planning effort. These principles have defined Epi-Lab in the past and continue to be very relevant for future efforts. The current Epi-Lab staff is being involved increasingly in National and International Technical assistance on Tuberculosis.

Objective 1: Ongoing high-quality technical assistance to national tuberculosis programs including capacity building, resource mobilization and quality assurance.

2. TB and the poor:

Findings show that people living in poor communities tend to have limited knowledge about TB and experience a variety of barriers preventing them from treating and curing their illness. A particular concern for the relevance and accessibility of tuberculosis control services for impoverished communities should influence the TB section activities and directions for the future. While The Epi-Lab's activities span both low- and middle-income populations, both in Sudan and in the near future in the Region; an emphasis on practical and feasible approaches and solutions for low-income settings has, and should continue to define TB section efforts. (Annex 5 & 6).

Objective 2: To develop practical approaches for low income communities. (Annex 3 & 4).

3. Laboratory services for tuberculosis control (Join work with SUD NTP):

The Epi-Lab presently is exploring with JICA avenues to provide support to laboratory services. There is an increasing recognition of the importance of strengthening laboratory services for tuberculosis control. The current status of quality of laboratory services is lamentable and routine methods used are in need of improvement in efficiency and in practicality. There are increased resources available to strengthen this component

Objective 3: To support high-quality of laboratory services

4. MDR-TB

In Sudan, 1.9% of new TB cases multidrug-resistant TB (MDR-TB) and 9.8* of previously treated TB cases emerge every year as a result of under investments in basic activities to control TB, poor management of anti-TB drugs and transmission of drug-resistant strains.

MDR-TB is much more difficult and costly to treat than drug-susceptible TB. Therefore it's essential to obtain a better picture of the magnitude and trends of MDR-TB nationally. This could be done through development and implementation of a simplified programmatic approach to MDR in collaboration with the TB UNION in order to design a comprehensive, yet practical and realistic role for The Epi-Lab in the National and Regional response to MDR-TB.

Objective 4: Expand surveillance of MDR-TB to better understand the magnitude and trends of drug resistance.

Objective 5: Pilot Studies to assist on building a scientific evidence including identification of associated indicators and evaluation of effective policies in various settings.

5. TB/HIV

To strengthen the TB/HIV collaborative activities in Sudan by filling the major constraints in the program implementation utilizing the Integrated HIV Care for Tuberculosis Patients Living with HIV/AIDS. (IHC) (Annex 8)

Objective 6: To promote operational research

Objective 7: To strengthen the policy commitment to TB/HIV collaboration.

* WHO, 2006

SWOT:

Strengths:

- Strong collaboration with the TB national body as well as the international insensitive.
- Previous and ongoing progress on providing scientific evidence and guiding findings to fill the gap in the areas of research and policies.
- Intellectual lesson learned through out the time implementation.
- Technical assistance capacity within Epi-Lab

Weaknesses:

- Lack of M&E tools for reporting staff and project performance.

Opportunities:

- The capacity of the civil society to perform an effective partnership of program implantation and monitoring.
- Windows of strengthen partnership scope with the inline bodies through

Threats:

- Insufficient financial support and political commitment at the state level to ensure suitability.

Point driven by SWOT;

- Epi-Lab has an influential present at the national and international level.
- Integration of the socio-economic factors to obtain better identification of associated problem.
- Sudan National AIDS program is one of the leading programs that initiated new successful policies toward the TB management in the region.

1. Technical Assistance Unit*Objectives, Targets and Indicators***Objective 1: To provide high-quality technical assistance to the NTPs**

Targets	Indicators
➤ Provision of regular, intensive technical assistance to NTP Sudan and countries of the Region; at least three countries per year. (21 countries)	➤ Number of countries receiving, intensive technical assistance from The Epi-Lab.
➤ Delineation of range of technical assistance services to be offered and outputs anticipated	➤ Document published outlining the quality and the scope of technical assistance services offered by The Epi-Lab.
➤ Coordination of technical assistance provided from within The Epi-Lab, the SMoH and external partners.	<ul style="list-style-type: none"> ➤ Epi-lab focal point for technical assistance for each TASK identified ➤ Mechanism in place for notification and coordination of technical assistance within The Epi-Lab, its State, centers and between external partners.

The Epi-Lab has been providing technical assistance to NTP Sudan, by having an officer at WHO and UNDP as well as CCM of Global Fund (GF) at the Federal Ministry of Health. (FMOH); to support the program in optimizing tuberculosis control activities. At the International level the Most recently, the Technical Assistance Epi-Lab provided technical assistance to GF Italy Venice August 2008 in the capacity of TRP, GDF, and Geneva September 2008 as TRC, and CLA China September 2008 as temporary advisor.

Nevertheless, the coordination of various technical assistance activities e.g. tuberculosis, TB- HIV, PAL/CLA, laboratory within The Epi-Lab, between The Epi-Lab and its State centers and State MoHs needs to be improved.

2. TB and Poor

Objectives, Targets and Indicators

Objective 2: Practical approaches for low income populations. The TB model

Targets	Indicators
➤ Roll out of key-findings of the Comprehensive Approach Respiratory Prevention and Lung Health activities to national and Regional levels in collaboration with the UNION. (post the up coming evaluation)	➤ Number states covered, of meetings held, research papers published and presentations given related to CARPLH.
➤ Design result based project activities to promote effective tools and practical approaches on overcoming socio-economic barriers to access TB health care provision.	➤ Number of piloted tools and a documentation of successful stories.
➤ Mobilize resource to invest on the community intervention for TB prevention activities	➤ Number of new project initiative proposals developed by section for tuberculosis.
➤ Political and social mobilization and community sensitization activities to ensure better response.	➤ Number of advocacy meetings and programs communication achieved for information sharing and disseminations.

3: Laboratory Strengthening UNIT in collaboration with NTP

Objectives, Targets and Indicators

Objective 3: To support high-quality laboratory services for tuberculosis control

Targets	Indicators
➤ Provision of training courses for both EQA/microscopy.	➤ Number of courses delivered at national and regional levels
➤ Provision of regular, ongoing laboratory technical assistance to a limited number of states and countries of the region.	➤ Number of states/countries receiving regular, ongoing laboratory technical assistance from The Epi-Lab

- Collaborate and support Clinical Trials on laboratory aspects for current and future Union and Oslo-managed clinical trials
- Number of clinical trials/research efforts supported by Division
- Provision of laboratory component for Union tuberculosis control courses
- Number of tuberculosis control courses supported by Division

The Epi-Lab is well placed to be a among the contributor to National and Regional laboratory strengthening efforts.

- A) To initiate a strong laboratory training courses; on microscopy and EQA
- B) To provide in-service training opportunities in collaboration with the Institute of TB Kyiose city.
- C) To conduct smaller, practical operational research projects related to the laboratory functions.

4: MDR Unit

Objectives, Targets and Indicators

Objective 4: Expand surveillance of MDR-TB to better understand the magnitude and trends of drug resistance.

Objective 5: Pilot Studies to assists on building a scientific evidence including identification of associated indicators and evaluation of effective policies in varies setting.

Targets	Indicators
➤ Development and implementation of a simplified programmatic approach to MDR-TB in collaboration with the UNION	➤ Simplified, programmatic approach to MDR-TB developed and implemented at country level as a pilot, in order to be rolled out by NTP.
➤ Provision of training at international, regional and national levels on MDR-TB management and related issues.	➤ Number of MDR-TB-related courses given at national and regional levels.
➤ Development and implementation (in collaboration with other Units) of a research agenda which addresses MDR-TB, including Surveys of MDR	<ul style="list-style-type: none"> ➤ Research agenda which addresses MDR-TB developed. Number of ➤ Research studies which address MDR-TB designed and implemented

The MDR-TB Unit was conceived in January, 2006 as part of a reorganization of the section of Tuberculosis Control and Prevention. The addition of a ‘Unit’ responsible for MDR-TB issues serves both to coordinate all Epi-Lab future activities related to MDR-TB, as well as increasing the organizational profile for this important global tuberculosis control issue.

Furthermore, to date, a unified approach to MDR-TB management and the appropriate global response to MDR-TB have not been clearly outlined at the EMRO region.

The MDR-TB Unit has the opportunity to strengthen the Epi-Lab response to MDR-TB, particularly that there are 3 Epi-Lab attained MsCs on MDR. Increased global attention to the issue has been translated into increased financial resources which may support some of The Epi-Lab efforts in this field.

5: TB/HIV Unit

Objectives, Targets and Indicators

Objective 6: To promote operational research

Objective 7: To strengthen the policy commitment to TB/HIV collaboration.

Targets	Indicators
<ul style="list-style-type: none"> ➤ To establish a mechanism for collaboration A.1. TB/HIV coordinating body A.2. HIV Surveillance in TB patients A.3. Joint TB/HIV planning A.4. Monitoring and evaluation. 	<ul style="list-style-type: none"> Coordinating body established. Number of patients examined per year. Document available. M and E System in place specifically designed for resource-limited settings.
<ul style="list-style-type: none"> B1. To decrease the burden of TB in PLWHA and their communities. B.2. Intensified TB case-finding B.3. Isoniazid preventive treatment B.4. TB infection control in care and congregate settings. 	<ul style="list-style-type: none"> 1. Conceptual mapping of PLWHA 2. Number of TB cases found. 3. Number put on Isoniazid preventive treatment. 4. To prepare a joint document
<ul style="list-style-type: none"> ➤ To decrease the Burden of HIV in TB patients and their communities. C.1. HIV testing and counseling. C.2. HIV prevention methods C.3. Cotrimoxazole preventive therapy C.4. HIV/AIDS care and support C.5. Antiretroviral therapy 	<ul style="list-style-type: none"> ➤ NTP/HIV/Epi-Lab 1. Number tested. 2. Number oriented 3. Number put on Cotrimoxazole 4. pilot achieved 5. Outcome of those put on ARD
<ul style="list-style-type: none"> • The Epi-Lab need to continue its partnership with other partners to strengthen political commitment to TB/HIV collaboration improve TB infection control in HIV care and engage communities in designing, advocating for, implementing and monitoring the collaborative response to prevent, diagnose, and treat TB in PLHIV. 	

Integrated HIV Care (IHC)

The IHC model aims to assess the feasibility of TB services functioning as entry points to HIV diagnosis and care; improve standardised HIV care, including strengthening access to HIV diagnosis, care for opportunistic infections, scale-up of antiretroviral therapy (ART); and to develop a comprehensive TB/HIV information system. IHC uses the TB control program as an entry point and adapts the precepts of the internationally accepted Stop TB Strategy to the management of HIV infection.

- In 2005, Drs. P.I. Fujiwara, P. Clevenbergh and R.A. Dlodlo published an article, entitled “Management of adults living with HIV/AIDS in low-income, high-burden settings, with a special reference to persons with tuberculosis,” in the State of the Art Series of the *International Journal of Tuberculosis and Lung Disease*.
- In 2005, Drs. R.A.Dlodlo, P.I.Fujiwara and D.A. Enarson published an article, entitled “Should tuberculosis treatment and control be addressed differently in HIV-infected and –uninfected individuals?”, in the series of “Controversial Issues in Tuberculosis” of the European Respiratory Journal.

Triage-Plus for TB-HIV
Improving community based provision of health care for poor and vulnerable
2007 -2012

This is a 5-year, community-based, randomized controlled trial of a policy of engaging informal care providers in the provision of health services for patients with TB and HIV in Malawi and Sudan. A wider range of informal providers will be engaged and appraised for their capacity to take on a more comprehensive role by adding diagnosis and treatment to the initial triage role. This policy of informal provider engagement (Triage-Plus) will be implemented in randomly selected health centre catchments areas matched with control areas where the policy will not be followed. Primary outcome indicators include numbers of TB and HIV notifications and TB treatment success rates using standard WHO outcome categories. Triage-Plus takes the concept of ‘community mobilisation’ to a new level by empowering different community-based providers to act as more than directors of referral patterns and encourages them to interact, engage with, and augment, formal public health service provision.

Linkage to the strategic objectives;

Objective 1: By choosing the key points of entry to the health system that are used by the poor and vulnerable.

The most vulnerable, especially women and the very poor often contact several informal providers such like traditional healers and other informal community health advisors before attempting to approach the organized public health services those providers are often the first port of call. Interventions among such close to community (CTC) agencies are increasingly recognized as a key strategy for health improvement.

Objective 5: By focusing on integrated health care provision for HIV and TB.

Today there is a lack of strong evidence that interventions such as Triage-plus make a difference and therefore such an intervention study is urgently needed. If the research demonstrates a significant effect there are good chances that this may influence health policies in Malawi and Sudan as well as other countries in the region.

In contrast to other health strategies that rely on a top-down approach, Triage-Plus builds on the knowledge and experience of community providers and patients and focuses on those agents most relevant to the health of the poor.

Capacity Development concerns;

The Capacity Development Unit was conceived in January, 2007 (the deputy director is the responsible person) as part of a reorganization of the Department of Tuberculosis Control and Prevention. The rationale behind the creation of a ‘Capacity Development Unit’ was to ensure coordination in Epi-Lab activities related to training and education.

Increased global resources for some aspects of training should provide opportunities to support future Epi-Lab efforts in training and education. In particular, demand for training in MDR-TB-related issues and laboratory strengthening will likely increase during the next five years. The importance of research capacity strengthening activities is also increasingly recognized. However, the shift in funding sources to the country level has given the Epi-lab the opportunity for National, international and regional courses, in collaboration with our partners particularly The UNION.

KEY INDICATORS

TB burden (2006 estimates)

Incidence (all cases/100 000 pop/yr)	242
Trend in incidence rate (%/yr, 2005-2006)	2.1
Incidence (ss+/100 000/yr)	108
Prevalence (all cases/100 000 pop/yr)	419
Mortality (deaths/100 000 pop/yr)	68
Of new TB cases, % HIV+	4.6
Of new TB cases, % MDR-TB	1.9
Of previously treated TB cases, % MDR-TB	9.8

EPIDEMIOLOGICAL LABORATORY
(EPI LAB)

CHILD LUNG HEALTH SECTION STRATEGIC PLAN

2008 – 2015 Years

1. Background:

The millennium development goals are aimed at the reduction of childhood mortality by two thirds between 1990 and 2015 but since the 1990's momentum has been lost. By the year 2000 the gap in childhood mortality between industrialized and sub-Saharan countries had increase from 20 fold to 29 fold with the childhood mortality rates in sub-Saharan Africa being 175/1000 children compared to 6/1000 in industrialized countries.i The mortality reduction targets were met in only 5 of 55 countries who had an under 5 year mortality rate of 100 or more in 1990.1

What can be done about this? Technical solutions for the organization of basic health services in low-income countries are available (2 3 4). It has been shown, for example, that intervention strategies can alter the impact of respiratory diseases on childhood morbidity and mortality, and that those interventions can be simplified to create an algorithmic approach for primary health workers. What is lacking is a means of applying those interventions widely in low-income countries, where most of the burden of death in children is borne. The International Union against Tuberculosis and Lung Disease (The Union) has long and vast experience in sub-Saharan Africa doing just that.

The Union applied it's Model for successful health and public health services for tuberculosis(4) to the problem of respiratory diseases of the children in Malawi as a "model" demonstration project to improve the survival and wellbeing of children in a low-income country in sub-Saharan Africa where HIV infection is highly endemic. The project in Malawi established a sustainable system for the surveillance, diagnosis, and management of the respiratory diseases that afflict children, including acute respiratory infection and pneumonia, tuberculosis; asthma and HIV related lung diseases throughout the country at the first referral level health facility. It is proposed to apply this same model in secondary care hospitals through-out Sudan

The Setting: A demonstration area represents a geographical area of a specific country with a population of 100,000 persons. Such an area, called a district, would be expected to have 15,000 children under 5 years of age. Of these, 2,250 will develop pneumonia each year, 1,440 will come to the district's health facility and 288 will require hospitalization. In the same area, 20 tuberculosis patients and 50 asthma patients are expected to require treatment among the 15,000 children. all districts, including approximately 33 million persons, would ultimately enter the programme over a 6-year period.

The Stepwise Implementation of the Model:

The following steps are proposed for implementation of this programme:

Situation analysis, conducted by a group of expert consultants, to assure that the proposed programme is adapted to the needs of the country.

Select demonstration areas for establishment of the Model programmes.

Train existing health workers at the secondary level of health delivery in management skills to perform the required services.

Collect clinical and epidemiological information using standardized forms.

Focus on the most serious cases at greatest risk of dying admitted to secondary level curative health services.

Introduce a materials management system to ensure medication supply.

Evaluate routine information on burden of childhood respiratory disease and quality of care.

Expand the Model programme to ultimately cover 33 million of the population by the end of a 6-year contract period following the pilot project period of 24 months duration.

Work Packages: Work packages include: Co-ordination, Training, Monitoring, Supply. Each package will have a calendar of activities. In addition to international inputs to the work packages, the Federal Ministry of Health of Sudan will contribute the highest proportion of all financial input.

Budget: Initially a 24 month budget of approximately (\$800) is proposed. The budget is based strictly on the components of the work packages, unit costs and units required to achieve the targets. The expenditures will depend upon the implementation of the plan with training predominating in the early period and supervision and monitoring becoming a greater proportion of the budget in the later period.

Expected Outcome: Child lung diseases constitute a major proportion of the entire burden of childhood diseases in Sudan. A feasible, cost-effective and sustainable model for delivering services to treat and prevent child lung diseases has established the base for wider implementation of this effective public health action with implications for millions of poor children and their families throughout this region of Africa.

Proposed Approach: The programme will be incorporated into the country's existing structure for organization of health services and will be implemented by the personnel already working within the services. These countries should already participate in the activities for control of acute respiratory infections (ARI) and the program for the integrated management of childhood illnesses (IMCI). Policies introduced by this proposal will be coordinated with those already in place in the health services. Coordination with all health management systems as well as other players in the health service will be undertaken.

The model for TB control, on which the model for CLH is based, has now been implemented in many of the poorest countries of the world (11-17) and is feasible under a wide variety of social, economic and geographic conditions. Using this model, it has been possible to account for all inputs. This allows calculation of output per unit of input (the total cost of treatment of a tuberculosis patient is estimated to be approximately US\$ 100, of which local sources provide 60%). It also permits regulation of supply and demand to ensure no disruption of supply. In addition, through standardization of requirements, bulk purchase and competitive bidding, prices of essential supplies (medications) have been reduced to one-quarter of original quotations.

Using an adapted version of this model, applied to lung disease in children, it has been possible to implement accurate accounting for services, materials, and training. This allows calculation of outcome per unit of cost. It also permits regulation of supply and demand to ensure no disruption of supply of essential materials.

2. The Child Lung Disease Burden:

Lung diseases are among the most neglected of all diseases in the world (5). Lung diseases are often under-recognized by health practitioners; further, they rarely receive from health planners and policy-makers the resources commensurate with the size of the problem they represent.

More than 10 million persons die each year from conditions affecting the respiratory tract and lungs, with over three-quarters of the deaths in children occurring in low-income countries.

These deaths are an unnecessary tragedy because most of the responsible respiratory diseases of children can be prevented or effectively treated with inexpensive antibiotics. The condition responsible for the most deaths due to lung disease is acute respiratory infection, including pneumonia. Acute respiratory infection and pneumonia cause more than 2 million deaths per year, well over 80 per cent of which occur in sub-Saharan Africa and primarily affect children (6). That area of the globe constitutes the focal point of deaths from all causes in children and accounts for the majority of avoidable deaths from acute respiratory infection and pneumonia in children in the world. Unfortunately, this situation is likely to deteriorate

further because of the impact of HIV infection in Sub-Saharan Africa and the political and economic instability of the countries in that region of the world.

Poor environmental conditions - such as bad housing, overcrowding, indoor and outdoor air pollution, poor sanitation, and unsafe water - contribute significantly to the acute respiratory infections death burden. More than 10% of preventable health problems in the world today are because of poor environmental quality.

Another frequent cause of death from lung disease is tuberculosis, which is estimated to cause as many as 2.5 million deaths per year. It is the most frequent cause of death from a single agent in young adults in the world. TB is the single biggest infectious killer of women; it accounts for 9 percent of deaths among women in the childbearing years between the ages of 15 and 44 years, compared with war (4 percent), HIV (3 percent) and heart disease (3 percent) (8). Again, over 90 per cent of TB deaths occur in low-income countries. These TB-related deaths are also preventable through the cost-effective case management strategy developed by The Union. More than 1 million children become infected with tuberculosis each year, and both tuberculosis and acute respiratory infections are aggravated by HIV.

In addition to these figures, more than 100 million individuals in low-income countries suffer from asthma, a disease that appears to be increasing globally. While a cure for asthma is not yet available, effective means exist to treat and prevent disability from this disease, through effective community-based management of acute respiratory infection.

The Union model's basic components that make it feasible, sustainable and cost-effective are:

- 1 Technical components are the simplest standardized methods possible and are disseminated in a published Manual.
- 2 Training of personnel implementing the technical components is given in the early phases of implementation.
- 3 Regular monitoring through systematic visits to the implementation sites and routine reporting of activities and outcomes is an integral part.
- 4 All inputs correspond to the burden of disease determined through regular reporting. Thus accountability and transparency can be assured.
- 5 The unit of management of the activities is sufficiently peripheral to ensure access to services but sufficiently central to allow efficient supervision.
- 6 The existing health services deliver all the services.

When The Union adopted the mandate of expanding its scope from tuberculosis to respiratory diseases, acute respiratory infections (ARI) were recognised as the most prominent lung health problem in children. The Union has developed and implemented a child lung health package which has been tailored to the needs of children living in low income countries. This package needs to be tailored to meet local needs and conditions. The Union has responded to this by developing with government health departments a package that is adapted to local requirements.

Although this package has been designed for child lung health needs other interventions central to reducing child mortality, diarrhoea, malaria, HIV infection and nutrition have not been ignored in package.

Although evidence suggests that AIDS is not a substantial issue for the management of childhood illnesses this is probably not true in sub-Saharan Africa and therefore this has been included in the child lung health package.

The Union has considerable experience in developing and delivering public health services especially in collecting and analysing health services data to improve health services. The child lung health package also makes the gathering and analysing of data one of its central strategies.

3. The Current Situation of CLH in Sudan

Quality of Existing Health Services in Sudan:

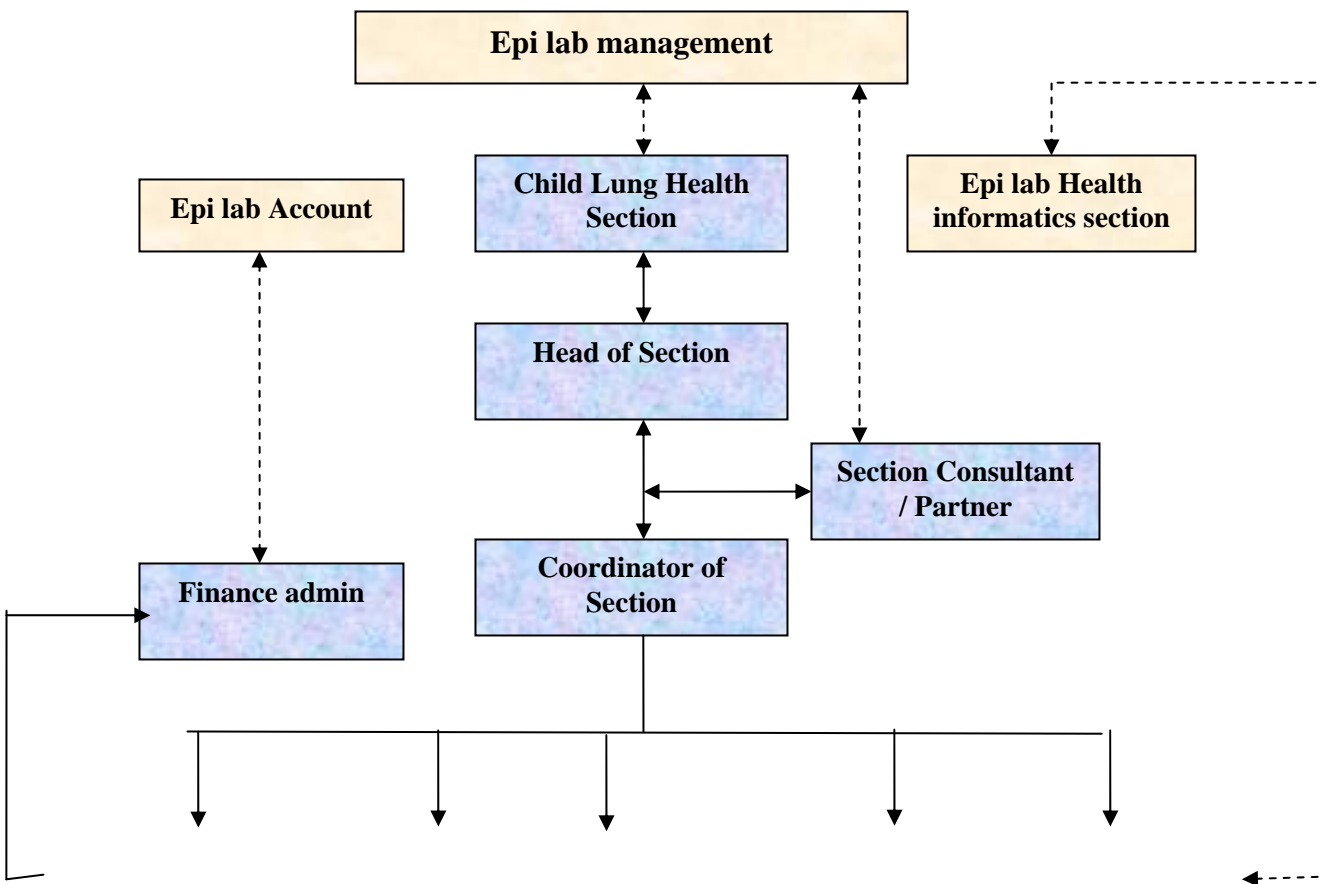
The Head of Child Lung Health Division of The Union has made a technical visit to a number of health facilities in Sudan, where the technical components of the WHO Programme for Integrated Management of Childhood Illness (IMCI) had been adopted. Infant mortality rate (IMR) is 68 and under-five mortality rate (UFMR) is 105. In 2001 the deaths among children under five were caused by malaria (17%), pneumonia (14%), malnutrition (13%) and diarrhea (9%) which is highly correlated with life style, living conditions and the nutritional deprivations experienced by the poor. In 2004 pneumonia became the number one cause of death (17%) of hospitalised children. In 2007 pneumonia was still the leading cause of hospital admissions (30%) but the second common cause if death in children under 5 years (13%) preceded by septicaemia (15%). As regards to asthma and tuberculosis they present 2.5% and 0.2% of hospital admissions respectively in children under 5 years. These childhood lung diseases are seen to affect males (60%) more than females (40%) in general.(23)

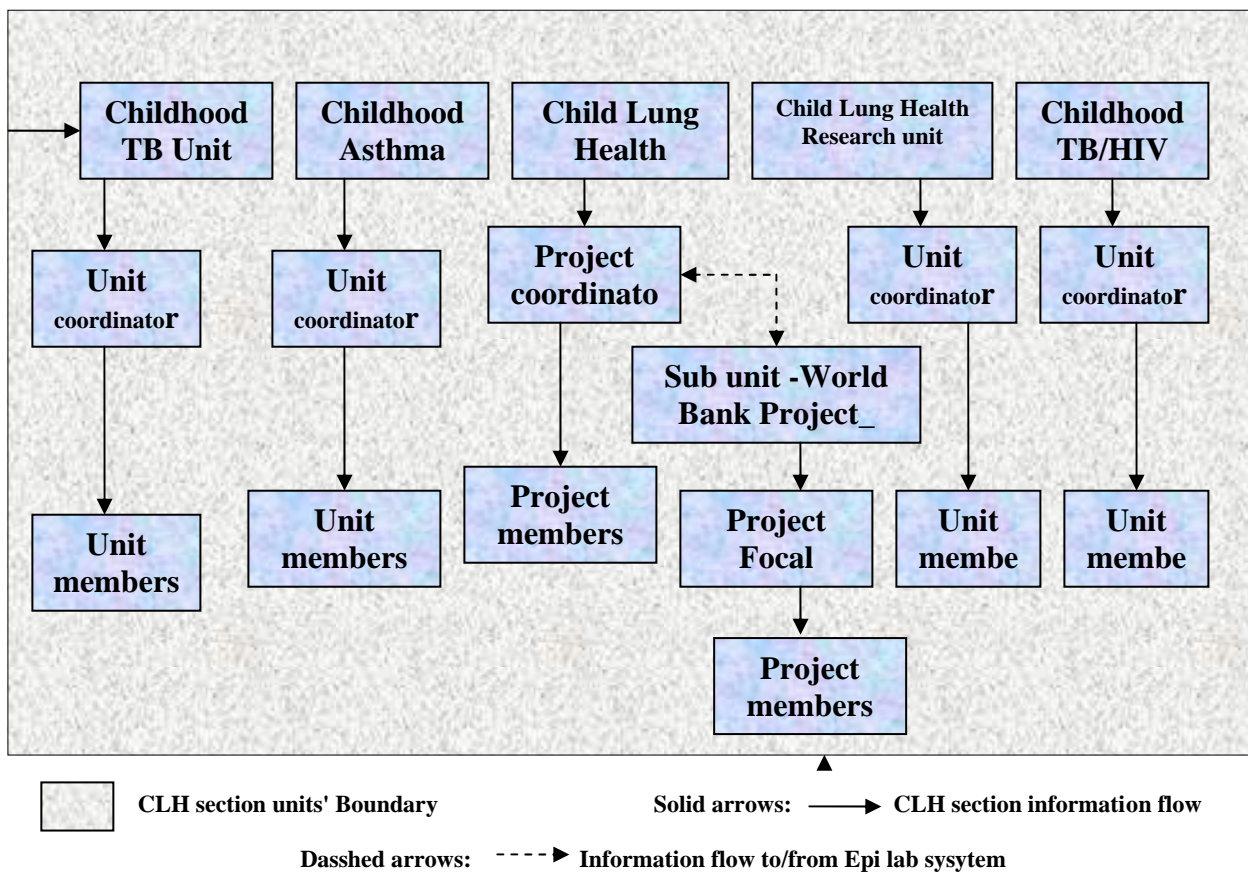
Some states, such as South Kordofan, Kassala, Blue Nile and Red Sea, have higher rates than the average for the rest of Sudan, comparable or higher than Sub-Saharan Africa. Standard case management, as recommended by the WHO, was not being followed, especially antibiotics dosage, frequency of administration and length of course. She found that up to 80% of children seen in the out patient departments of the tertiary level paediatric hospitals should have been seen at the primary and secondary level health facilities. Between 30% and 50% of visits to most health facilities, at all levels of care, were the result of acute respiratory infections and other lung diseases, especially asthma and tuberculosis, pneumonia being the number one reason for admission.(23)

In most facilities, at all levels, children regardless of age or pneumonia classification, were discharged within 48 hours. Vital information was missing from records, especially regarding follow-up of the patients discharged to complete their course of antibiotics at home. At the rural hospital level all categories of pneumonia admitted were reported to MOH as just pneumonia

4. The institutional set-up of the CLH project:

4.1 CLH Organigram:





4.2. Collaborating Partners

The programme will be a partnership of a number of collaborators: The FMOH and State MOH ,the Epidemiology Laboratory (EPI-LAB) with the Union providing technical assistance, with the assistance of other developmental

partners and NGO's National and International involved in improving child health e.g Save The Childrens Fund, Mielenda and Gates Foundation , UNICEF and UNFPA etc.

The overall objective of the partnership is to promote better lung health in children through the implementation of a cost-effective, sustainable programme for the surveillance, diagnosis, and management of respiratory disease in children, the building of sustainable management and technical capacity for these activities in the Sudan, and the ultimate establishment of national self-sufficiency for this model of health services delivery for childhood respiratory disease.

The donor foundation will be asked to provide financial and technical support for this programme in child lung health proposed by The Union, which is designed to alleviate suffering and prolong the lives of the children of Sudan.

In addition, the donor will participate in the development of new methods and procedures that will be applicable in a wider variety of other locations and circumstances. thereby contributing to international capacity building of technical and scientific expertise in low-income countries.

4.3 The Epidemiology Laboratory:

The lead responsibility for the project will be vested in the Child Lung Health Section (CLHS), Epidemiology Laboratory. The project has been implemented pending strengthening more demonstration sites what we need to do know is following out please see me or Prof Zein for that The CLHS will be responsible for the timely and orderly adaptation and implementation of the project, including the responsibility for accounting for the finances provided by the donor, for the proper utilization of materials and services obtained within the agreement, and for preparing and submitting required reports of its work under this contract.

4.4 The International Union Against Tuberculosis and Lung Disease:

The Union /Epi-Lab will be responsible for the regular provision of technical support to the CLHP. The benefits of this project to The Union will be the opportunity to expand its mission to provide technical assistance to its constituent member countries, and to advance scientific and public health knowledge in the prevention of death due to childhood respiratory diseases in low-income countries.

4.5 Ministry of Health (Ministries):

The FMOH will provide the framework, including facilities and staff, to deliver the health services being provided. It will act as an advocate to encourage neighbouring countries to implement the efficient programmes developed.

The state ministry of health (SMOH) will provide support regarding provision of health services in the form of proper health facilities and human resources.

The Federal Government will gain an improvement in the health of the next generation of its citizens through the provision of efficient services to improve lung health. It will also be recognized as a pioneer in the development of appropriate policies and procedures that will be widely applicable in other locations. This country will gain experience and recognition through presenting this experience to national and international audiences in the International Training Courses and International Scientific Conferences.

5. Guiding principles and Key strategies:

5.1 Guiding principles:

- Patients' involvement and community participation.
- Contribution to poverty reduction.
- The CLH control services should be integrated within the general health services.
- Effective and dynamic collaboration between all partners is essential for effective control approaches.
- The individual's rights of the CLH patients should be upheld.
- Making the best use of the currently available tools for diagnosis, treatment and prevention of CLH.

5.2 Key strategies:

- Commitment of the host government to implement the disease control strategies countrywide into the existing primary health care system, and a donor partner to assist until the programme is self-sustaining
- Diagnostic guidelines and clinical staff trained in the standardized approach to the intervention

- Logistics to purchase standardized drugs and supplies at the management level of the District Health Office to distribute them to ensure uninterrupted
- Recording and reporting outcomes of the intervention
- Supervision and evaluation of the programme
- Develop Innovative approaches to improve compliance of patients to treatment Upgrade existing drug supply.
- Expand the coverage of the project to all states.
- Raise the community awareness towards CLH control policies and service

6. Priority areas and key interventions:

6.1 Quality of CLH service delivery areas:

Key interventions:

1. Political commitment with sustained financing at both the federal and state level.
 - Formulation and finalization of the national policy document for CLH control.
 - Advocate among the policy and decision makers to address the CLH control as a priority in order to mobilize resources at both the federal and state levels.
2. Develop CLH service standards to address the quality within the provided services:
 - Formulate a technical task force for development of the CLH service standards.
 - Identify the specialists and experts at the hospitals and other health facilities.
 - Finalize and document the CLH service standards
3. Operationalize CLH service standards to address the quality within the provided services.
 - Translate the standards into protocols and guidelines.
 - Develop a plan for training the CLH staff, the coordinators and the health care providers on the service standards.
 - Incorporate and monitor the service standards implementation within the provided services
4. Upgrade of the current supervisory and monitoring systems:
 - Assess the performance and efficiency of the current monitoring and supervisory systems.
 - Train the CLH staff on the reviewed and upgraded monitoring and supervisory systems.
5. Establishment of coordinating channels and mechanisms with the concerned sectors:
 - Identify a focal point within each sector.
 - Conduct jointly situational analysis for the current CLH control activities and CLH services provided within each sector.
 - Identify the available and the potential human, physical and financial resources for CLH control within each sector.
6. Integration of the CLH activities within the health care delivery systems of the other sectors:
 - Incorporate and implement CLH within the health care delivery systems of the other sectors.
 - Train the health care providers on CLH service standards.
 - Monitor and evaluate the implementation of CLH within each sector.
7. Inclusion of the CLH system within the health services:
 - Develop and finalize plans of action for incorporation of the DOTS system.
 - Implement the scheduled activities to deliver services to the T.B. patients, their contacts and families.
 - Monitor and evaluate the progress.

6.2 The drug supply system:

Key interventions:

1. Expansion of the revolving drug fund to all states
 - Purchasing and distributing standardized drugs to ensure uninterrupted supplies at the management level of the District Health Office
 - Identify the available/potential resources for the revolving drug fund at the state level.
 - Involvement of the CLH coordinators in planning, implementation, monitoring and evaluation of the fund.

2. Mobilization of extra resources for the drug supply system:
 - Advocate among the policy-makers, the partners and the donors to obtain extra resources.
3. Improvement of the drug management capacity:
 - Capacity building of the CLH coordinators on drug management.
4. Incorporation of the stock standards and procedures
 - Develop and operationalize the stock standards and procedures

6.3 Training:

Key interventions:

1. Capacity building of the staff of the CLH and state units:
 - Identify the training needs of the CLH staff in different priority areas.
 - Develop standard packages of training to be used at all levels of the Project.
2. Mobilization of extra resources for support of the training units
 - Identify the available physical, financial, human resources and the needs of the training units.
 - Develop and implement a plan of action for mobilization of extra resources for the units.

6.4 The supervisory system:

Key interventions:

1. Avail information about the system performance, efficiency and coverage at different levels:
 - Examine the supervisory system coverage, efficiency, resources and needs.
2. Mobilize extra resources for support of the system:
 - Improved supervision capability of the CLH staff at different levels.

6.5 The information and reporting system:

Key interventions

1. Capacity building of the data management at different levels of the Project:
 - **Improved data management capacity at different levels of the project**
 - Introduction of the computerized packages for recording and reporting at the federal and state level.

6.6 Promotion of research:

Key interventions:

1. Capacity building of the CLH staff on research methodology and surveys
 - Establishment of an operational research unit within CLH section.
 - Development of an action plan for the implementation of operational research according to the priority areas of CLH section.
2. Establishment of collaboration channels between CLH section and academic institutes
 - Identify the national researchers and national academic institutes and societies for collaboration with CLH section in planning and implementation of operational research.
 - The conduct of joint activities for initiation of operational research activities.

6.7 Contribution to health system development

Key interventions:

- Strengthening the partnerships with other stakeholders.
- Addressing the health system priorities and approaches within CLH section plans and activities.
- Coordination of the CLH section activities with other actors at different levels.

6.8 Childhood tuberculosis:

Key interventions

1. Inclusion of the childhood TB within the national child lung health service standards
The intermediate steps:
 - Nomination of the consultants with experienced in childhood TB within the technical taskforce for the national child health service standards.
 - Preparation and finalization of the childhood TB service standards.

- Translation of the childhood TB service standards into protocols and guidelines.

6. 9 Childhood Asthma:

Key interventions

1. Inclusion of the childhood Asthma within the national child health service standards

The intermediate steps:

- Nomination of the consultants with experienced in childhood asthma within the technical taskforce for the national child health service standards.
- Preparation and finalization of the childhood asthma service standards.
- Translation of the childhood Asthma service standards into protocols and guidelines.

6. 10 Childhood TB/HIV:

Key interventions

1. Inclusion of the childhood TB/HIV within the national child health service standards

The intermediate steps:

- Nomination of the consultants with experienced in childhood TB/HIV within the technical taskforce for the national child health service standards.
- Preparation and finalization of the childhood TB/HIV service standards.
- Translation of the childhood TB/HIV service standards into protocols and guidelines.

7. Goals and objectives

7.1 The Goal:

A feasible, cost-effective and sustainable model for delivering services for treatment and prevention of child lung diseases

7.2 The Objectives:

By the end of the 8 years:

1. *To increase the Case Finding (CF) of childhood TB by 40%*
2. *To reduce the mortality from pneumonia among children under five, childhood asthma, childhood TB and childhood TB/HIV by 30%.*
3. *To reduce the morbidity from pneumonia among children under five, childhood asthma, childhood TB and childhood TB/HIV by 30%.*
4. *To reduce the inappropriate use of medications for the treatment of ARI, Asthma and TB in children and irrational use of antibiotic by communication of knowledge to mothers and doctors.*
5. *To improve health worker's practice through training and follow up.*
6. *To disseminate lessons and best practices (improving partnerships with stakeholders)*
7. *To establish/ strengthen monitoring and evaluation (M&E) and surveillance system for asthma and TB/HIV in children.*

8. SWOT analysis:

8.1 Strengths:

- 1- *Availability and cooperation of the successfully implemented standard case management of pneumonia for children under 5 years at PHC levels (Integrated Management of Childhood Illness – IMCI)*
- 2- *Existence of a comprehensive National TB Manual with a chapter for management childhood TB_ Sudan National TB Program -SNTP.*
- 3- *Availability of Training manual for Comprehensive approach to improve lung Health Services (CLHS) _ Epi lab.*
- 4- *To make use of WHO guidelines for Childhood TB for developing countries _Generic.*
- 5- *Drafted manual for management of TB in children _ Gazera University/ Epi lab.*

8.2 Weaknesses:

- 1- Poor recording and reporting system (surveillance).*
- 2- No national guideline compendium for CLH, Asthma, childhood TB and childhood TB/HIV...*
- 3- The drafted manual for management of TB in children by Medani Paediatric Hospital / Epi lab is not ratified yet with FMOH.*

8.3 Opportunities:

- 1- Under utilization of successful National TB control model_ Sudan National Tuberculosis Program.*
- 2- Availability of international guideline of TB program manual and IUATLD ARI training manual.*
- 3- To make use of good recording, reporting and surveillance system for TB in NTP.*
- 4- Epi- lab experience of CLHS, and previous experience in launching a successful NTP. Ref 1.*
- 5- Enabling policy environment (Board established of Childhood TB and negotiation around the way to adopt CLH)*
- 6- Utilization of child health being an MDG's priority.*
- 7- Comprehensiveness and successful implementation of IUATLD model towards lung health.*

8.4 Threats:

- 1- Few training opportunities.*
- 2- Continuous staff turnover.*
- 3- Weak political commitment towards CLH diseases.*
- 4- Limited funding for CLH.*
- 5- Sectoral competition.*

OBJECTIVE	TARGET	INDICATOR	TARGET PERIODICITY (YR)								Budget	SOURCES OF INFORMATION	
			1	2	3	4	5	6	7	8			
To reduce the CLH burden of lung disease by reducing the morbidity due to pneumonia by 10% and mortality due to pneumonia by 2% annually	Prevent and control Pneumonia and childhood Asthma.	% of pneumonia and asthma morbidity reduction % of pneumonia and asthma mortality reduction											Surveillance reports
To increase the Case Finding (CF) of childhood TB from 35% to 70% by the end of year 2015.	Prevent and control childhood TB and child hood TB/HIV.	% of Case finding of childhood TB % of Case finding for childhood TB/HIV											
To standardize the case management for CLH by MDG	Improve coverage of CLH services (high quality diagnosis and treatment)	% of HF providing CLH services											Surveillance reports
To survey the level of inappropriate use of medications for the treatment of ARI, Asthma and TB in children in year two.	Ensure sustainable supply of drugs at all health facilities providing CLH services with zero percent stock out.	Number of CLH health services with improved drug procurement system % of health facilities report stock out											Supervisory reports Supervisory reports
To strengthen the CLH planning, monitoring and evaluation system by adopting the TB Model	Strengthen the capabilities of CLH coordinators to plan, manage, and supervise CLH project.	Number of CLH services capable of conduct of quality training											Supervision reports. Feed-back training reports.
	Strengthen monitoring and evaluation system	% of supervisory visits conducted to CLH services delivery areas per year. (two supervisory visits per units)											Supervisory visits reports. Assessment survey reports Surveillance reports
	Ensure at least ...% of the CLH units are regularly reporting	% of HF regularly reporting CLH section											

Milestones:

The Child Lung Health section was created in 1996 and has focused its activities on developing a method of delivering health services in low-income countries to care for children with acute respiratory infections (ARI), primarily severe/very severe pneumonia, tuberculosis, HIV related lung disease and asthma in children under five in low-income countries.

- ❑ **2003:**
 - The Head of of the Scientific section (IUATLD) invited Director of Epi-Lab to visit Malawi to observe experience in CLH.
Informal discussion with Head of IUATLD, Director of Epi-Lab as to the involvement of the Epi-Lab in CLH project in Sudan
 - Director of Epi-Lab asked to review the experience of the Malawi project and a report was written
 - Draft proposal for Child Lung Health (CLH) Project written by Head of CLH Section, and Director of Epi-lab
 - Situation analysis for CLH was carried out by Ms Penny Enarson (Head of CLH Division - IUATLD) ,Head of Paediatric CLH section and Director of Epi-Lab
- ❑ **2004**

Discussion initiated between Director of Epi-Lab and minister of health which lead to the agreement for CLH between the Government of Sudan (FMOH) and Technical Advisor: Epidemiological laboratory (Epi. Lab.) and the International Union Against TB and lung diseases (IUATLD)

 - CLH Orientation Workshops for senior pediatricians
 - Set up of the first draft of the budget for the CLH project.
- ❑ **2004 -2005:** Sudan National Tuberculin survey was conducted in a collaboration with Sudan National TB Program
- ❑ **2005:**
 - Orientating meetings and seminars for senior pediatrician, registrars, pediatric hospital directors and policy makers (FMOH, SMOH) facilitated by Ms. Penny Enarson based on Malawi CLH project experience
- ❑ **2006:**
 - Adaptation of Sudan CLH project documents by the committee.
 - Manual of Childhood TB in Sudan (Draft).
 - Formulation of CLH Adaptation committee from Senior pediatricians and directors of pediatric teaching hospitals
 - Beginning of raising fund for Sudan CLH Project.
- ❑ **2007:**
 - Collaboration with the World Bank for CLH project (focal person was assigned, CLH recording and reporting forms were used, on service training was facilitated in addition were supporting follow up visits and supervision of the pilot sites for CLH .
 - Development of the first draft of CLH section strategic plan.
- ❑ **2008:**
 - Finalization of the budget for CLH pilot project.
 - Participation in the training workshop of the World Bank project _CLH project
 - Participation in monthly meetings for hospital directors of Khartoum State.
 - Translation of in patient pneumonia card and register book
 - Development and adaptation of pneumonia drug dose posters
 - Development of pneumonia booklet (draft).

- Participation in supervision of visits for pilot project in Khartoum and Gazera. States

The CLH experience with the World Bank

The Comprehensive Approach to improve Lung Health Services (CLHS) project in Sudan which is funded by the World Bank commenced in 2006 initially with five hospitals in Khartoum State as a pre-intervention and intervention phase in year one in the following hospitals: Academy Hospital, Haj El Safi , Umdawban , Ibrahim Malik and Al Jabal Hospital.

The number of cases of pneumonia initially were 89 and 63 in the pre-intervention and intervention phases respectively in the first year. Whilst in year two it expanded to include 5 more (a total of 10) hospitals in Khartoum State. These were: Ombada, Al Buluk and El Naw, Al Ban Jadeed, Bashair and Al Turkey Hospitals. Moreover a pre-intervention phase was started in El Gezira. State (Managil , Hasahesa ,Rufaa and Medani Hospitals) A total of 275 cases were recorded. In year three the number of cases increased dramatically to reach more than 1500 cases and an intervention phase was started in El Gezira State.

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EpiLab

Section of Asthma

Introduction:

Asthma affects both children and adults. It is estimated that 300 million people of all ages suffer from asthma. A world map of the prevalence of asthma has been produced based on results of two large multi-national studies including developing countries: The European Community Respiratory Health Survey (ECRHS) in adults and the International Study of Asthma and Allergies in Childhood (ISAAC) in children.(1)

The prevalence of asthma in children aged 13-14 years varies among countries and in the same country among centers.

The results of ISAAC Phase I showed that the highest prevalence of asthma was observed in industrialized countries (between 10 and 25%), and that this prevalence is already worryingly high in Latin America, in the Eastern Mediterranean and in Africa (more than 10%). In addition, an upward trend in asthma symptom prevalence was observed in the majority of big cities in developing countries.

With the projected increase in the proportion of the world's urban population from 45% to 59% in 2025, it is estimated that there will be an additional 100 million persons with asthma by 2025. Asthma morbidity has increased world-wide over the last 20 years, and is reflected in increased hospitalization and emergency room visits.

The burden of asthma assessed in 2001 by the number of Disability-Adjusted Life Years (DALYs) is 15 x106 (1% of total DALYs) and is similar to other chronic diseases such as diabetes or schizophrenia diseases.

Last decades witnessed tremendous improvement in the understanding of asthma pathology, nevertheless what cause asthma is still unknown, therefore intervention to decrease asthma burden gives the priority to the provision of control therapy and avoidance of allergens.

In many areas of the world persons with asthma do not have access to basic asthma medications or medical care. Increasing the economic wealth and improving the distribution of resources between and within countries represent important priorities to enable better health care to be provided. And particular resources need to be provided to improve the care of disadvantaged groups with high morbidity, including certain racial groups and those who are poorly educated, live in large cities, or are poor. Resources also need to be provided to address preventable factors, such as air pollution, that trigger exacerbations of asthma.

Asthma in Sudan:

In Sudan asthma affects 12, 2% of the children in Khartoum state (ISAAC III).(2) Asthma ranks as the third cause of hospital admission following pneumonia and Malaria (federal ministry of health data-2004).

The last ten years witnessed dramatic increase in the number of patients visiting asthma emergency room (20000 patients in 1998 compared to 80000 in 2004).

While medical care for asthma has improved a great deal all through the world, asthma in Sudan is often uncontrolled or poorly controlled creating a substantial burden on individuals and health system.

Emphasis of the health policies on the communicable diseases rather than non communicable diseases has affected asthma negatively, though it is justifiable but does not rule out the reality that non communicable diseases including asthma and other chronic respiratory disease are increasing, in alarming rate, and this increase demands intervention before it becomes tomorrow's pandemics as expected in many African Sub Sahara countries. Emergency room survey conducted by the section (not published) has addressed factors that contribute to the poor control of asthma in Sudan; which include the absence of asthma management plan due to lack of asthma guideline, under-use of corticosteroid inhalers, tendency of the care to be acute rather than a long term one and lack of organization and coordination within the structure. Also the absence of the political will and commitment to fight asthma is contributing to all of the factors listed above. Moreover, the situation of asthma emergency room and the lack of certain items within it, leads to premature discharge of the patient in acute attacks and the repeated visits of the same patients within the same day. And this may be also due to the absence of standardized case management for asthma which contributes to lack of control. (Emergency room survey unpublished data).

Sudan has witnessed rapid social and environmental changes including urbanization, displacement, deforestation, climate change. These rapid changes lack the mechanism of coping and resulted in increased poverty, bad housing conditions and poor environmental condition. All these factors have influenced adversely the morbidity from asthma.

Addressing asthma effectively requires a public health approach that includes long-term coordinated and multifaceted approaches, which are concerned with improving the outcomes in all persons with asthma. This is only accomplished through attention to equity and the most efficient use of resources in ways that enhance patient and community quality of life.

Asthma section strategic plan aims at building a center of confidence within the Epi-lab, a center that can participate effectively in alleviating suffering from asthma. The strategy will consider the complexity of asthma, it will be on line Millennium Development Goals (MDGs) of poverty reduction, ensuring sustainable environment and making available the benefit of new technology especially information and communication. Also it has considered the federal ministry of health 25 years plan of action which aims at improving the coverage and the quality of the health services and decreasing the burden of the disease (mortality, morbidity and disability), in addition to the control of social economic and environmental factors that affect the health in the community. Furthermore it will consider the goal of directorate of non communicable disease (NCDs); NCDs goal is to develop national policies, strategies and plans for NCD prevention and care and capacity-building and that is through health protection (interventions that reduce health risks by changing the physical or social environment in which people live) and health promotion (interventions that aim at encouraging individual behaviors believed to produce positive health effects and discouraging behavior that produces negative health effects) .

No specific intervention has been mentioned in the Sudan 25 years plan or NCDs strategic plan to decrease asthma burden, but the general issues raised by both strategies can help guiding the section activities in addition to the close collaboration with the NCDs directorate.

Milestones:

Asthma section achievements:

1. Situation analysis done through:
A. GASP study identification of barriers mainly organization of services for long term treatment and poor affordability to asthma drugs.[A multinational study of treatment failures in asthma management 2^{6th} January 2005]

Peter Burney, James Potts (London UK), Nadia Ait Khaled (IUATLD, Paris), Ricardo Sepulveda (Santiago, Chile), Noureddine Zidouni (Alger, Algeria), Rachid Benali (Annaba, Algeria), Mohammed Jerray (Sousse, Tunisia), Omer Abdel Aziz Musa, Zein A. Karrar (Khartoum, Sudan), Nasser Behbehani (Safat, Kuwait), Nuha El-Sharif (Ramallah, Palestine), Youssef Mohammad (Lattakia, Syria), Abdallah Khouri (Aleppo, Syria), Paralija Belma (Sarajevo, Bosnia), Noemi Eiser (Lewisham, UK), Mark Fitzgerald, Riyad Abulalaban (Vancouver, Canada), Tim Clark (London, UK)

B. Survey conducted by the section: ISAAC III (Prevalence study: 12,5% of children). The International Study of Asthma and Allergies in Childhood (ISAAC) (2)

2. Guidelines of standardized management of asthma in Sudan published. Management of Asthma in Sudan <2000> in collaboration with IUAT-LD. Authors: Dr. Asma I. Elsony, Prof. Omer Abdel Aziz, Prof. Ali Habour]

3. Pilot study on implementation of asthma standardized management with essential drugs done with the following results:

- The feasibility and the efficacy of standardized management demonstrated with high rate of success for patients following their treatment demonstrated;
- lack of organization of health services for long term management and poor affordability to asthma drugs identified as the main barriers for implementation of asthma management (more of 40% of defaulters with stock out of free drugs in the first pilot study).

4. Publication:

- **Chronic airflow limitation in developing countries: burden and priorities** Nadia Ait-Khaled¹, Donald A Enarson¹, Salah Ottmani², Asma El Sony³, Mai Eltigani³, Ricardo Sepulveda⁴ Author's affiliations (3)
 1. International Union Against Tuberculosis and Lung Diseases, Paris, France
 2. World Health Organization, Geneva, Switzerland
 3. Epidemiological Laboratory, Khartoum, Sudan

National Institute of Thoracic Diseases, Santiago, Chile

- **ISAAC III (Prevalence study: 12,5% of children). The International Study of Asthma and Allergies in Childhood (ISAAC) isaac.auckland.ac.nz/ - 10k (2)**

5. Implementation of the WB project: Asthma standard case management has been implemented in 14 hospitals; 10 in Khartoum and 4 in Algazira. Health care providers have been trained in two workshops, patients sought treatment in these clinics have been provided with treatment and followed up.

1.4 Network and Partnership

Experts of "The Epi-Lab Asthma Section", asthma section has received a strong support from experts of the Respiratory Disease Section at the UNION and particularly from Prof Nadia Ait Khalid and D Enarson.

At the initiative of the GERMANS we participated on a study on COPD.

Lessons learned:

The main lessons learned from the activities conducted by the Asthma Division are the following:

- Asthma is a public health problem even in developing countries where the majority of patients live. The prevalence of asthma will increase in the coming decades in low-and-middle-income countries
- The standardized model recommended by The Union using only 2 main essential drugs is feasible, efficacious and cost-effective.
- One of the main barriers identified is the high cost of asthma drugs, particularly inhaled steroids
- The implementation of standardised management of asthma using effective essential medicines can significantly reduce costs for patients, their families, societies and governments
- This implementation will increase the quality of services for respiratory patients; it will enhance the credibility of public health services in general, and attract more patients with respiratory symptoms in particular, especially those with chronic cough.

Goal:

Promotes the understanding and management of asthma in Sudan, the region and internationally through preparation of models for asthma control and scientific research in asthma and COPD.

Objectives:

1. Measure the burden of asthma and COPD in Sudan.
2. Demonstrates cost-efficacy of a strategy for management of asthma in 14 pilot areas in Khartoum and Aljazira states.
3. Develop Epi-lab capacity for training, health education and research by developing a team of five trainers / researchers for asthma.
4. Develop partnership for asthma management and research (at country at regional and international level)
5. Increase awareness on asthma and promote standardized management of asthma.
6. Assist the Ministry of Health in State and Federal for implantation of asthma program (Provide a framework for the extension of the model at country level, technical assistance, training, monitoring, and evaluation).
7. Develop partnership to address risk factors and environmental hazards of asthma in Sudan, and to design interventions to reduce exposure to the environmental hazards.
8. Expand the model to COPD

SWOT Table

Strengths	Weaknesses
<ul style="list-style-type: none"> • Presence of 8 members • Presence of members with different proficiencies. • Partnership • Finance: (LHL, WB funds). • Close coordination with NCDs directorate/And Gazira and Khartoum ministries of health. • Prevalence survey done • Survey in Emergency room done • Pilot study done • Experience in other program development • Support by epilab team 	<ul style="list-style-type: none"> • Underutilization of volunteer work. • Finance: maintenance? Adequacy? • Political commitment FMOH • Lack of organization of services for long term treatment • Lack of personal trained • Lack of equipment • Lack of standardized case management • Lack of awareness of the environmental hazards
Opportunities	Threats
<p>The Work Bank project will boost the expansion of the model</p>	<ul style="list-style-type: none"> • Limited resources • Political environment • Asthma care usually based on emergency room and pharmacists • Lack of organization and coordination within the structures • Poor affordability of patients for drugs • Poor affordability for patient to pay for regular visits • The limited resources of health authorities are directed mainly towards communicable diseases with neglecting the non-communicable ones. And thus the difficulty to role out the project into a Nation Wide Program

Strategic Plan 2007-2012:

Objective1: Measure the burden of asthma and COPD in the five regions of Sudan.

Mapping of asthma in Sudan has been established when Epi-Lab joined ISAAC phase III, which is followed by asthma in adult workers community (universities). ISAAC phase III has shown that the prevalence of asthma in Khartoum state is 12.2% which is similar figure to other neighboring countries; provided that Khartoum is representing an urban area, it is mandatory to conduct community based surveys in other urban and rural areas along with in service studies to complete mapping of asthma in Sudan, to achieve this target serial of surveys will be conducted , participant in these resein the five regions of sudan (North, center, east, west and south). Within these regions the data will be collected from rural and urban areas simultaneously

Objective 1. Measure the burden of Asthma and COPD in Sudan. This objective will be achieved through the following researches	
Strategies/ Targets	Indicators
Prevalence survey of asthma in children in a rural area	Number of children included Publication done
Prevalence survey in adults in Sudan.	Number of regions included in the survey Publication done
Trend of asthma in emergency room	Research conducted Publication done
Prevalence survey on COPD in Sudan	Number of regions included in the survey Publication done

Annex publications or list them at least

Objective 2: Demonstrate cost-efficacy of 3 years asthma management strategy implementation in 14 pilot areas in Khartoum and Algezira states.

Asthma management strategy adopted and recommended by The Union for management of asthma, will be established and evaluated in several pilot areas in Sudan. The cost-efficacy of this strategy has been demonstrated in some pilot areas in developing countries by The Union Asthma Division (ref: publication of The Union). (4;5) This strategy is based on the successful DOTS strategy model recommended for TB. The components of this “4S” strategy (Standardised inhaled Steroids Salbutamol Strategy) are:

- Political commitment
- Standardised diagnosis based on lung function
- Standardised long term treatment based on essential drugs (inhaled steroids and inhaled Salbutamol)
- Permanent supplies of drugs and lung function equipment
- Permanent recording and reporting

The demonstration of the strategy efficacy

Objective 2. Demonstrate cost-efficacy of a strategy for management of asthma in 14 pilot areas in Khartoum and Algezira states.	
Targets	Indicators
Standardized management implemented in 15 pilots areas in Khartoum and Algezera states	Number of sites where the strategy is implemented Quarterly reports on case finding available for each site Quarterly reports on treatment outcome available for each site
Improve affordability to inhaled steroids	Price of one inhaler offer to patient at less than 5US\$
Evaluation of the model feasibility	Publication done
Evaluation of the model efficacy	Publication done
Evaluation of the cost-efficacy	Publication done

Objective 3: Develop Epi-lab capacity for training, health education and research by developing a team of five trainers / researchers for asthma.

Training for establishment of 'best practices' in health services for targeted conditions is one of the main Epi-lab objectives; building asthma section capacity in training through formulation of training team which is capable of conducting training, supervision , monitoring and evaluation besides dissemination of knowledge through health education will be the main tools to achieve best practice of asthma management.

Objective 3. Develop Epilab capacity for training, health education and research by developing a team of five trainers / researchers for asthma	
Targets	Indicators
Develop training capacity	Material for training available (training manual, booklets, posters) Pools of at least 5 persons trainers and supervisors constituted
Develop health education capacity	Material for health education established (pamphlets, taped cassettes) Publication on KAP and mapping done
Develop research capacity	Number of staff attended research methodology and epidemiology courses. Number of publication on asthma done

Objective 4: Develop partnership for asthma management and research with governmental and non governmental agencies.

In Sudan, over the past decade, the importance of research and innovation in the process of implementation has been represented within the National Tuberculosis Programme in Sudan (SNTP). The NTP data proved to be essential for understanding the picture of TB in Sudan, and for modifying internationally recommended policies to suit the situation on the ground within the country. Learning from the TB experience, asthma research has the priority designed to measure the problem and to identify appropriate intervention methods in Sudan. A list of research priorities has been identified and over the last three years two researches has been conducted n collaboration with IUATLD; the Emergency Room Survey and the International Study of Asthma and Allergic Disease in Childhood (ISAAC).

Objective 4. Develop partnership for asthma management and research with governmental and non governmental agencies.	
Targets	Indicators
Partnership at country level with FMOH, Thorax society, agencies work on environment and universities.	Number of individual partners involve in asthma section
	Number of institution at country level involve in asthma section work
Partnership at international level	Number of activities developed with each international partners (The Union, ISAAC, Other international partners)

Objective 5: Increase awareness on asthma and promote standardized management of asthma

Asthma is a neglected disease and policy makers must be informed that this condition pose/ create an increasing health problem in Sudan. The inadequate treatment increases the poverty of the patients and their family and increase dramatically the cost of health for the government. The second message should explained that with a standardized treatment with essential drugs the patients could have a good quality of life without symptoms with an important cost-saving for the patients , their family and the government.(6)

Objective 5. Increase awareness on asthma and promote standardized management of asthma	
Targets	Indicators
Information of policy makers about the public health problem of asthma	Advocacy document for policy makers done
Organise meeting, workshop and/ or lectures in Sudan for the promotion of standardized management of asthma based on essential drugs	Number of asthma workshop done Number of lectures done
Inform general population on long term treatment	Number of spot on asthma done in TV Number of spot on asthma done on radio Number of press conference done on asthma
Technical assistance for training, monitoring and evaluation	Trained personal available for this task at EpiLab

Objective 6: Assist the Ministry of Health in State and Federal for implantation of asthma program
The main tasks of the Epi-lab are:

- to convince the government about the need and the cost efficacy of the implementation of a standardized management of asthma in Sudan
- to propose a framework for the extension of the program at country level based on the lessons learned at Epi-lab on asthma and on tuberculosis program
- to provide a technical support to the Ministry of health for technical assistance for training, heath education, monitoring and evaluation.

Objective 5. Assist the Ministry of Health in State and Federal for implantation of asthma program	
Targets	Indicators
Advocacy to set up a National asthma program	Document elaborated and given to the authorities
Technical assistance to develop national asthma guidelines	National guidelines adopted
Develop a framework for the extension of the model at country	Framework developed
Technical assistance for training, monitoring and evaluation	Trained personal available for this task at EpiLab

Objective 7: Develop partnerships to address risk factors and environmental hazards of asthma in Sudan and to design interventions to reduce exposure to the environmental hazards.

The effect of environmental factors on inducing and triggering asthma and the importance of its control is well established. Therefore the main goals environmental health components of the strategy have to include identification of environmental factors that are important contributors to asthma prevalence and morbidity and reduction of eliminating exposure to those factors. To attain these goals it is crucial to have a collaboration with all relevant stakeholders e.g. (e.g., between health, housing, and environmental protection agencies) and to run a joint activities including;

education, outreach activities, direct interventions, policy initiatives, monitoring, and research—at least in the broad sense of keeping abreast of the most current state of knowledge related to asthma causation and exposure reduction.

The Environmental approach to reduce the asthma burden relied on basic public health principles of risk reduction and disease prevention. Formulation of partnerships with local environmental groups is essential to avail data about environmental hazards e.g. indoor and outdoor allergens and hazards at work place and to come up with intervention tools that can reduce asthma burden in Sudan.

7 .Develop partnership to address risk factors and environmental hazards of asthma in Sudan, and to design interventions to reduce exposure to the environmental hazards.	
Targets	Indicators
Partnership at country level	One committee present o coordinate activity. Number of institution at country level involved in the work. Number of activities developed with international partners.
Risk factors and environmental hazards identification	Publication of the results of environmental questionnaire. 5 years plan to reduce the exposure to indoor , outdoor and work place allergens is written

Objective 8: Expand the model to COPD

The prevalence of COPD is lower in developing countries than in industrialized countries, one of the factors attributed to this phenomenon is the limited life expectancy at birth, COPD is already a major public health problem in several middle income countries. Data are not yet available in Sudan; however the increase of this condition will be expected during the next decades with the increase of life expectancy at birth, the increase of tobacco consumption and of pollution and the increase of urbanization. At long term Epi-lab will expand its activities to COPD using the same methodology used for asthma.

Objective 8. Expand the model to COPD	
Targets	Indicators
Situation analysis	Prevalence survey in 5 regions of Sudan done Survey in utilization of services for COPD done in 5 regions of Sudan
Provide a strategic model for management of COPD	Guidelines published
Implement the strategic model in 10 pilot areas	Quarterly report available
Evaluation of the strategic model	Publications done

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**The EPILAB
Tobacco Section - Strategic Plan
2007 - 2012
Draft**

Background

Tobacco is considered to be a second biggest cause of avoidable death worldwide. Currently, it leads to the death of between one and ten adults. The number of annual deaths is expected to increase from 5 million to 10 million by 2020.⁽¹⁾ Active smoking causes a wide range of health conditions and fatal diseases, including cancer, respiratory diseases and cardiovascular diseases.⁽²⁾ It is the most important risk factor for chronic obstructive pulmonary disease and lung cancer. Passive smoking harms health and worsens existing health problems, including respiratory conditions. It causes diseases such as lung cancer, coronary heart disease and cardiac death.⁽³⁾ It is estimated that over 540 million people will die due to smoking or other tobacco use by 2050 unless tremendous progress is made in tobacco control. Moreover, Tobacco is the single most important avoidable cause of disease and the most common cause of death in adults over the age of 35 years.

Tobacco Situation in Sudan

Prevalence and cost impact tobacco usage in Sudan. Usage in Sudan is defined as the consumption of cigarettes, snuff and the traditional snuff called toomback. Toomback is registered as more highly addictive than other oral snuff. Observation has proven that there are few women who admit to tobacco use, in general, but there is no documented study related to female smoking information. The only smoking study targeted female physicians.

The study has presented that the prevalence of smoking among female physician is about 1.8. In the 1990s, a study among males estimated that the prevalence was round 20%². Moreover recent, studies indicate that tobacco use among school students between the ages of 13 and 15 is 20.2%. The same study showed that the estimated prevalence of males who use Toomback was around 35%.

Although Sudan has ratified the FCTC, the current tobacco control legislation has not been implemented and there are few programmes related to tobacco control in place. Many patients in tuberculosis treatment are smokers or toombak dippers. A systematic programme to brief tobacco cessation intervention could aid patients to stop smoking, but is rarely used in tuberculosis case management.

Current Programmes Activities

The Tobacco Section has continued implementing the cessation activities as part of the health education programme. The integration with the World Bank project, the cessation activities include the close monitoring field visits and intervention to the respiratory diseases around Khartoum and Al Gezira hospitals will continue. The education section has implemented different activities to promote awareness among specific targets group and special consideration had been given to the International Tobacco Days. Meanwhile, supportive activities have been carried out at the legislation level and according to research need.

² ref 6 feasibility study

Recent Programmes Activities

Conferences

- Middle East UNION Conference 2002
- Collaboration on the Quit and Win Campaign in 2003 and 2004
- Regional Conference in Mediterranean against TB and Against The Disease

Achievements

- Developed a manual for smoking cessation and intervention
- Developed a proposal to make information available to smoking users in Sudan
- Developed health education materials for awareness activities
- Modification of the regular smoking cessation intervention (cards) and the inclusion of females as a target.
- Trained 32 health workers from TBMU in Khartoum

Workshops

- Four-day Workshop targeting NTP and Epi-Lab staff in 2002
- Five training workshops conducted between 2003 to 2008
- Three-day workshop continue training in Friends Hole I 2007
- Two-day workshop in North Kordofan State 2007
- Two-day workshop in AL-Gezira State 2008

Lectures

- Three lectures at the Radiation Hospital
- One lecture at The Military Hospital
- One lecture at Kosti Hospital
- One lecture at Al-Azhary University
- One lecture at Eltigana University
- One lecture at Alfad University for Women

Seminars

- Al Shagara Hall in 2005

Press conference and Media Coverage

- Press conference in the NTP building 2003
- Radio programme in FM 100 radio
- Radio programme in Khartoum state radio
- TV programme in Nile Channel

Lessons learned in 2007-2008

- The most important lesson learned from previous experience is that annual workshop is not enough for building the capacity and reaching the targets. The experience approved that the job training is more effective and sustainability of the training will has value impact.
- Feedback from the targets patients is recommended as most out the default patients leave the treatment centre with out future contacts. Therefore, a feedback mechanism is needed

through different approach such as patient's phone number and information share with patients.

The SWOT Analysis (Strengths, Weaknesses, Opportunities & Threats)

The enclosed table demonstrates the SWOT Analysis for Tobacco and presents the way forward in the project activities.

Strengths	Weaknesses
<ul style="list-style-type: none"> • A Pilot Model for cessation and intervention has been created • Publication and dissemination of the results of the feasibility study of brief advice • Pre-intervention Phase of the Comprehensive Lung Health Approach finalized. • Experience in other program development • Support by EPI Lab team 	<ul style="list-style-type: none"> • Lack of organization of services for introduction of cessation interventions • Lack of funding • Weak health system and lack of trained health workers • Lack of societal support
Opportunities	Threats
<ul style="list-style-type: none"> • The Work Bank project will boost the expansion of the model • Support from researchers and other organizations working in tobacco control and prevention • New interest in tobacco control in low income countries 	<ul style="list-style-type: none"> • Lack of coordination with other organizations working in tobacco control (conflicts of interest) • Influence of the tobacco companies in Sudan • Lack of political support

Goal

The Goal is to reduce tobacco-caused morbidity and mortality by reducing the prevalence of tobacco use. The Tobacco Section will work to promote the understanding and implementation of brief cessation interventions in health services through a rollout of the programme in Sudan and reduce the prevalence especially among high-risk targets, which includes the respiratory affected population.

Objectives

1. To demonstrate the feasibility and cost-effectiveness of the strategy to include tobacco cessation and intervention into Tuberculosis case management by the end of 2009.
2. To expand the implementation of a trial of brief tobacco cessation advice in tuberculosis to two other countries by the end of 2010. These countries to be decided based upon the consultation with Epi-Lab technical advisors.
3. To continue developing the Epi-Lab capacity and provide a technical assistance for the implementation of the tobacco program. Two expert workshops will be conducted annually until the end of 2015.

4. To conduct capacity training for tobacco control, particularly brief cessation intervention in health services. Monthly training sessions will be conducted until the end of 2012.
5. To continue building the research capacity for tobacco control and prevention.
6. To continue to be innovative in conducting health education activities and producing programme materials.
7. To provide technical assistance to the Ministry of Health concerning the implementation of tobacco control and prevention.

Strategic Plan 2007-2012

Objectives

A. Cessation Programmes

A.1 Roll-out of established cessation intervention in tuberculosis case management. (Model in Annex) Extend the demonstration of feasibility and sustainability of a strategy of implementation of brief tobacco cessation interventions in tuberculosis care in Sudan with a pilot project followed by progressive implementation throughout the country.

Objective: Roll out of Pilot Cessation intervention	
Targets	Indicators
Maintenance of level of use	Correctly filled in forms and rates of inclusion over time
Extension of the programme	Number of health districts using the programme over two years of roll-out
Effective support for cessation	Initial and sustained cessation rates among patients seen, similar or growing rates over time

A-2 Comprehensive Lung Health Approach (in Annex)

The Approach is an on-going initiative to train health workers in child lung health, asthma treatment and tobacco cessation intervention and to evaluate its efficacy.

Objective: Tobacco Cessation in the context of the CLHA	
Targets	Indicators
Correct use of procedures	Correctly filled in forms, rates of inclusion
Maintained use of procedures	Inclusion rates over time, correctly filled in forms over time
Effective support for cessation	Initial and sustained cessation rates among patients

B. Health education and advocacy

B.1 Innovative Health Education: E-health

Develop a new approach to providing health information about tobacco use and advice about cessation through access to a mobile phone line and on the Internet.

Objective: Innovative Health Education Activities

Targets	Indicators
Testing the health education materials	Assurance of the materials in relation to the targets
Develop distribution plan	Follow up for the programme reach
Training plan for the target capacity	Organise training plan in coordination with the stockholder

B.2 Public Awareness Campaign

Objective: Public Awareness Campaign	
Targets	Indicators
Organisation awareness activities	Initiate awareness activities associate with ongoing activities
Preparation for international day	Participate in the international day under the international theme
Introduce new partners	Implement integrate activities with possible partners

C. Legislation

Encourage and participate in efforts to strengthen the registration and endorsement by the Minister of Health for a Forum for the implementation of the Tobacco Control and Prevention Act.

Objective: National Forum to promote legislation to tackle Tobacco	
Targets	Indicators
Advocate for the national legislation toward the Tobacco Cession	Meeting with government official and discussion makers
Engage politician and community leaders	Initiate regular gatherings for Tobacco legislation activities

C.2 Implementation of National TC Law

Work as a member of the Forum to achieve implementation of National Tobacco Control laws in light of the ratification of the Framework Convention on Tobacco Control (FCTC).

Objective: National Tobacco Laws and the FCTC	
Targets	Indicators
Encourage the implementation the national Tobacco Control laws	Disseminate the law and provide technical explanation for the general population
Envisage the general population perspective toward the law	Conduct a general opinion study among the general population and the targets

D. Research

Conceptual mapping of tobacco section information needs and targets interaction with Cessation Programme

Objective: ITC Research	
Targets	Indicators
Maintain ongoing research activities	Conduct research study benefiting the Tobacco
Develop research plan for the Tobacco programme activities	Initiate research activities parallel to the other Tobacco programme activities
Build the research capacity	Provide research training methodology

Potential Associate Activities

- Develop fund raising plan to secure funding for running activities
- Engage interest Donors to fund future proposals
- Research on traditional healers' role in tobacco control
- Training for Research Management and Research Writing: Project Management course

Epidemiological Laboratory

Section of Scientific Activities

HIV Section Strategic Plan

2008-2012

Forward:

HIV/AIDS is still a complicated problem in developing countries especially in Sub-Saharan Africa. The extent of the problem remains mysterious in the absence of the routine surveillance and management systems in these countries. Sudan, although regarded as a country of low-(medium in some literature) HIV prevalence is at high risk for HIV infection spread. Reasons contribute are several: Stigma, The considerable mobility of population (extensive internal displacement), the huge boundaries with nine countries many of them considered as high prevalence areas (the prevalence in Sub-Saharan Africa is estimated by UNAIDS as 6.1% “*UNAIDS, 2006 Report*”, long armed conflicts over large geographical areas, the extremely low socio-political and economic status of women, the poor social and public health infrastructure,... etc. These multi-factorial risks report of the urgent need for early affirmative interventions to prevent the potentially rapid spread of HIV in Sudan.

The direct link of the spread of HIV/AIDS to poverty and under-development status (*health awareness as a simple indicator for this relation*) raises the vital need for adopting preventive strategies to fight the epidemic. The impact of delayed actions is in a viscous cycle which affects the development goals that lead to more spread of the disease.

The rationale of HIV section in the Epi-Lab is to Guide, Support and facilitates the implementation of practical prevention and management methods designed to resolve the local obstacles in the community by the experience gained from the work within the local community.

Country Profile “*World Bank 2005*”

Sudan is located in northeastern Africa. It borders the Red Sea between Egypt on the north and Eritrea and Ethiopia on the southeast; it borders Chad and the Central African Republic on the west. The total area covered by the country is 2,505,813 Sq. kilometers. The land boundaries to the nine neighboring countries extent over 7,687 of kilometers: Central African Republic (1,165 kilometers), Chad (1,360 kilometers), Democratic Republic of the Congo (628 kilometers), Egypt (1,273 kilometers), Eritrea (605 kilometers), Ethiopia (1,606 kilometers), Kenya (232 kilometers), Libya (383 kilometers), and Uganda (435 kilometers). While the length of Sudan’s Red Sea coastline is 716 kilometers. From the topographic point of view, the country is generally a broad, flat plain, with low mountains in the northeast near the Red Sea coast, in the west, and on the southeast. An outcropping of low mountains in the south-central region is known as the Nuba Mountains. The Nile River system divides the eastern third from the western two-thirds of the country. In the North, the Nubian Desert lies to the east of the Nile, the Libyan Desert to the west. Both are stony, virtually rainless, and dune-covered. South of Khartoum, the vegetation gradually changes from dry grassland and woodland to verdant savannah. The total population of the country is estimated between 37.7 millions by the end of 2006 (population annual growth rate of 2.3%), with male to

female ratio of 1.02. Life expectancy at birth was an estimated average of 57 years (56 years for men, 58 years for women).

For most of the period since independence in 1956, Sudan has experienced civil war, which has diverted resources to military use that otherwise might have gone into health care and training of professionals, many of whom have migrated in search of more gainful employment. In 1996 the World Health Organization estimated that there were only 9 doctors per 100,000 people, most of them centralized in regions around the capital Khartoum. The percentage of Urban population out of total population is 36%. The Total expenditure on health of GDP is about 4.3%, and Ministry of health budget as % of government budget is 2.4%.

HIV Situation:

The Sudan National AIDS Control Program (SNAP) was established in 1987 as part of the national response to HIV and AIDS. With support from the World Health Organization, two short term and two medium-term plans were developed between 1987 and 1998 to guide the country's response. It was not until 2001 that a Task Force was constituted to conduct a national epidemiological, behavioral and response analysis survey that would form the basis for the development of a comprehensive multi-sectoral strategic plan. The Sudan National AIDS Control Program (SNAP) located within the Federal Ministry of Health, is the technical department with the responsibility for national level policy, planning and coordination.

There is a giant contradiction between the figures that describe the HIV situation in Sudan. The United Nations placed the rate of human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) infection in late 2003 at 2.3 percent "*Sudan UNAIDS/WHO*", which was quite low by regional standards. UNICEF suggests estimated adult HIV prevalence rate (aged 15-49), by the end of 2005 to be 1.6% "*UNICEF Sudan statistics 2007*". The United Nations in 2003 suggested, however, that the rate could be as high as 7.2 % "*Sudan UNAIDS/WHO*" i.e. the range is between 400,000 and 1.3 million adults and children were living with HIV, and AIDS deaths numbered 23,000 "*Sudan UNAIDS/WHO*".

There are currently 56 VCT centers in North Sudan "*SNAP progress report 2007*" that by the end of December 2007 had provided HIV counseling and testing services to about 12,702 people. The intervention for Prevention of Mother to Child Transmission of HIV (PMTCT) was started as a pilot program in 2005 at 5 health facilities within in 3 states "*SNAP progress report 2007*". The pilot phase stopped at the end of 2005 and during 2006 there were no PMTCT services in the country. However they are efforts to re-introduce PMTCT services as routine and localized PMTCT guidelines were developed and finalized. The services for antiretroviral treatment were first introduced in 2003 at 3 facilities in Khartoum State "*SNAP progress report 2007*". The Integrated Management of Adult and Adolescence Illnesses modules were adapted in 2006 and formed the basis for all training that is conducted at national and State levels to prepare health care providers for HIV and AIDS treatment, care and support. The technical support from WHO and resources from GFATM resulted in the establishment of centres for provision of ART services in all other 14 states during the period between 2006 and 2007 "*SNAP progress report 2007*". The adoption of a policy for provision of free drugs that includes ARVs, drugs for management of opportunistic infections, STI and tuberculosis to all AIDS patients overcame the principal challenge that was posed by the cost sharing policy. The total number of people ever started ARV since January 2006 is 1,561, and currently 908 are under antiretroviral treatment which is still low when compared to the estimated number of people in need of treatment. A cohort analysis was conducted during 2007 for patients enrolled on ART in 4 centers in Khartoum state, a total of 377 patients were enrolled and only 179 of them are still on ART (47.5%). However, data on opportunistic infections for PLWH is currently only received from the ART sites and as of September 2007, 1,973 clients were reported to have received Cotrimoxazole prophylaxis from 21 service delivery points. Limited sentinel surveillance conducted in 2004 revealed HIV prevalence between 2.3% to 4% among

patients with tuberculosis, which underscored the close relationship between TB and HIV. In December 2007, 184 TB clients had received HIV counseling services out of whom 183 were tested for HIV and 38 were found positive which accounts for 20.7%.

Sudanese Association of People Living with HIV was formed in 2004.

EpiLab in collaboration with UNAIDS, UNDP and SNAP conducted a conceptual mapping workshop for HIV patients and results were shared between the partners.

HIV strategies’ Strength and. Weakness analysis

Strength	Weakness
~ Highly motivated staff. ~ Well experienced in other programs development. (coordination) . ~ Multi-specialized team. (Epi -Lab)	~ Limited integration in HIV service provision. ~ Stigma and Low uptake of service ~ Denialism of HIV status in community. ~ Gender inequity. ~ Low community involvement.
Opportunities	Threats
~ Political commitment.	~ Under-estimated (and unknown) risk groups. ~ Military conflicts. ~ Lack of accurate figures.

Vision:

heading for a society in which people do not die because of HIV/AIDS.

MISSION:

THE HIV SECTION WILL WORK TO PROMOTE THE UNDERSTANDING AND MANAGEMENT OF HIV IN SUDAN VIA DESIGNING AND TESTING LOCALIZED INTERVENTION ACCEPTED TO THE COMMUNITY

Objectives:

✚ TO ENDORSE AND ADVOCATE THE APPROACH OF INTEGRATE HEALTH SERVICE DELIVERY ESPECIALLY IN THE FIELD OF HIV/AIDS CONTROL.

The infection with the human immunodeficiency virus usually revealed it’s self by variety of symptoms and signs mostly connected to other infections. These opportunistic infections (led by TB) are usually well-recognized and easier for diagnosis by the health facilities. Thus it could be a potential entry point to the HIV service delivery.

❖ Strategies and Methods adopted:

The rationale of integrated health policy Vs. Vertical structure of control programs (scientific symposium).	November 2008
The impact of TB/HIV joint activities (workshop).	May 2009 NTP premises
A study of the HIV patients prospective in regard to the joint HIV management plans.	Dec. 2009 Epi-Lab premises
To evaluate the outcomes of the integrated TB/HIV joint activities.	March 2010

External Quality Assurance :

❖ Methods:

Assessment of the refusal rate and reasons behind refusing the provided HIV testing.	Feb. 2009
Study of the impact assessment of the recent HIV safety procedures in dealing with blood and blood Products	May 2009
A cross-sectional Study of HIV prevalence in TB patients	August 2009
To develop a national guidelines on HIV and blood handling and transfusion	December 2010
To assess and revise the national counseling guidelines	August 2010
To develop a model of Training of community health workers “e.g. midwives” in HIV related procedures(including counseling, safe practices and health messages)	Dec. 2010
Monitoring peri-natal exposure to HIV infection (cross-sectional study in mother – child transmission)	June 2011
To study the HIV Symptomatology and staging in Sudan in order to reach A local clinical definition for the suspect.	August 2011

✚ TO adopt the community behaviors modification in regards to HIV/AIDS :

Having ARV and VTC centers to which patient do not come is almost useless. Barriers to Access must be over come in order to have effective HIV service delivery.

❖ Methods:

To map the socio-cultural barriers to HIV testing	Several studies to be conducted to study the barriers among different groups; Youth, women, drivers...etc including both the KAP element and offering the test	Dec.2008 – Dec2010
Advocacy	To create HIV media group used to publicize the knowledge in regard to HIV issues.	Dec. 2008
A Study HIV patients Pathway to care in the local community and assessment of Risk Factors & Vulnerabilities		August 2009
To create HIV partnership network with the grass root stake –holders specially those in high risk groups (Drivers trade union)		May 2009
To design and pilot a practical model for community involvement at the grass-root level in HIV management system		Jan. 2010

Assessment of the refusal rate and reasons behind refusing the provided HIV testing.	Dec.2008
To conduct a content analysis for the health education materials used in the time being from the patient prospective	March. 2009
To pilot a model of health education which implemented by the community	Dec. 2009

✚ Capacity building:

Epi-lab aims at building the capacity of young highly motivated personnel in the field of HIV/AIDS management, Policy and implementation.

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| <ul style="list-style-type: none"> ▪ To have 1 section member attending the training course in research methodology of the SRC in the AUC or AUB annually. ▪ To have 1 section member attending HIV course per annum. ▪ To develop a proposal for HIV course presented locally by the Epi-Lab via the section members from the experience and knowledge gained in the third year. |
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Structure:

HIV section will be part of the three dimensional structure of the Epi-Lab i.e: the section as topic related will be connected to both function oriented: education, training, research and technical assistance, and the supportive dimension: Informatics, Project Management, Epidemiology, Statistics and Laboratory.

References:

- SNAP progress report. Jan. 2008.
- Sudan Household survey , FMOH-UNCEF 2006.
- Sudan statistics UNICEF 2007.
- Sudan UNAIDS/WHO Epidemiological Fact Sheet - 2004 Update.
- World Bank Country Brief, August 2005
- UNAIDS, [2006 Report on the global AIDS epidemic](#)

Republic of Sudan
Epidemiological Laboratory
Zoonotic tuberculosis section
Strategic plan

Background:

Bovine tuberculosis is an infectious disease caused by *Mycobacterium bovis* (*M.bovis*) and infects both humans and animals. In a number of countries bovine tuberculosis is a major infectious and contagious disease among cattle and other domesticated animals. Although the main reservoir and natural host of *M.bovis* is cattle, human's beings and a wide range of mammals are susceptible to the bacterium.

Bovine tuberculosis (BTB) is a disease of both economic and zoonotic importance and has resulted in the adoption of country –wide control programmes in western countries. Developing countries in contrast, know little of the disease's prevalence, particularly as the contribution of BTB to human TB has found limited attention.

In Africa and Middle East, especially in rural area, people have a close contact with their animals. Yet, these are socio – economic benefits accruing from animal ownership, but animals are sources of many zoonotics disease such as tuberculosis. Poverty and poor health – often interrelated – and can affect both men and women a like.

In developing countries, as indicates previously, human and animals are sharing the same environment and premises, especially in rural areas. HIV/AIDS now becoming a serious, especially where BTB prevalent in rural area. So, this represents an other health threat for people living in these areas. The incidence of tuberculosis has increased in recent years as a result of HIV/AIDS epidemic impact. But, the picture of prevalence of BTB among people infected with HVI/AIDS is not clear. The incidence of the BTB in much lower than that caused by the human tubercle bacillus; this organism after declining in incidence for many years, is now responsible of resurgence of pulmonary diseases that in 1995 the World Health Organization declared it to be a global emergency

So, removing of the constrains imposed by ill – health, capacity for hard work can be restored – an essential prerequisite for escaping the poverty trap. All these Major constraints, beside lack of resources to study the disease pattern and implement control measures, have led to the current situation in Africa and the Middle East.

In Sudan as in many developing countries, the prevalence of BTB is unknown and its contribution to human tuberculosis has received scant attention.

About 50 millions of cattle are found in Sudan. In spite of this number of cattle in Sudan, there was no established policy to control bovine tuberculosis. In addition to that, no data-base found regarding the prevalence of this disease in the national cattle herds and wildlife in country. It is obvious that the number of slaughterhouses and abattoirs are increasing due to the increase of meat consumption. For that reason, it is crucial issue to test slaughtered cattle for bovine tuberculosis by using tuberculin test beside meat inspection. Also, this policy could by applicable in order to control movement of cattle from high risk area to low risk area by conducting pre-movement test. There are many diary farms which provide milk for people in rural and urban area. Bovine tuberculosis can be transmitted through milk consumption, so it is so important to know factors that contribute in preventing bovine tuberculosis transmission from infected animal to other animals finding in the same farm or to human being. It is so important that cattle owners know what to do in order to reduce the risk the introduction of the diseases onto their farms.

Bovine tuberculosis is serious diseases for both animals and human being the control efforts need involvement of farmers, vets, animal health medical authorities.

Goal:-

To eradicate bovine Tuberculosis from animals and human.

Objectives:

1. to determine the epidemiology of bovine tuberculosis in cattle road in Khartoum state in the second year of the strategic plan.
2. To determine the epidemiology of bovine tuberculosis in live stock in cattle road in north Darfur in the first year of the strategic plan.
3. To estimate the prevalence of bovine tuberculosis in wildlife animals in Dinder Park by the end of 2011.
4. To study the prevalence of bovine tuberculosis in human in the fourth year of the plan.
5. To set up vaccination policy for uninfected cattle and wildlife in the fifth year of the plan.

SWOT analysis**Strength:**

- 1- availability of fund from funding organizations
- 2- competent researchers in bovine tuberculosis
- 3- Availability of data in bovine tuberculosis in Ministry of animal resources.
- 4- Availability of cooperation of EPI - LAB

Weakness:

- 1- Lack of budget
- 2- Lack of adequate No. of researchers.
- 3- Lack of baseline data in bovine tuberculosis in the country.
- 4- Lack of awareness among customer towards meat and milk consumption.
- 5- Absence of bovine tuberculosis control programme in the country.

Opportunity:

- 1- funding from international organization
- 2- finding of international network in bovine tuberculosis
- 3- Existence of bovine tuberculosis researchers.

Threat:

- 1- Lack of training of researchers.
- 2- Lack of budget
- 3- Lack of coordination between different institutions working in controlling bovine tuberculosis.
- 4- Lack of control policy.

Plan duration:

- 1- Short term: one year (2008 – 2009)
- 2- Long term: five years (2008 – 2012)
- 3- 2012 - 2015

Tools for strategic plan:

- 1- Tools to raise awareness about the TB among vet staff and communities
- 2- Tools for information collection and sharing.
- 3- Tools for coordination and communication between different organizations working in the bovine tuberculosis.

Indicators:

- 1- Policy

This includes political commitment, inter-sectoral collaboration and compliance to global precautions of bovine tuberculosis.

2- Demographic:

Prevalence of incidence and risk factors of bovine tuberculosis.

3- inputs:

Availability of resources such as; well trained staff, well established slaughter houses and abattoirs, and budget.

Formulating policy:

The TB policy depends mainly on finding all cases, determine the disease in animals and then eradicate the disease from animal herd.

Clear policy for controlling TB should be found.

At slaughterhouse level.

1- Prevent illegal slaughtering

2- Compensation policy

3- Establish a small abattoir in remote areas lack this services.

At research level

1- Encourage and fund bovine tuberculosis epidemiological studies

2- Encourage the economical impact studies of bovine tuberculosis

Policy implementation:

Target groups

Stakeholders, veterinary official and veterinarian, veterinary related personnel

This will be implemented through:

1- Raise the awareness of stakeholders and communities toward bovine tuberculosis control issues

2- Coordination between different institutions working in bovine tuberculosis

3- Systemic approach to address the interest of stakeholders and beneficiaries.

Capacity building:

1- Increase the skills and practices of veterinarian in meat inspection with coordination of animal resources authorities centrally and at the level of states

2- Bovine tuberculosis Research methodology training for researchers working in this field.

Participation:

Allow all people working in TB to take responsibility

Partnership of different institutions in TB activities e.g.

- Epi Lab

- Ministry of animal resources

- Animal Resources Research corporation

- Faculty of veterinary science

- Ministry of Health

- NGOs

- International Organization