



# IMPLEMENTATION OF TUBERCULOSIS LABORATORY SERVICES IN GUYANA

An integral part of the

## PUBLIC HEALTH STRENGTHENING PROJECT IN GUYANA

Undertaken with the financial support of the GOVERNMENT OF CANADA provided through the CANADIAN INTERNATIONAL DEVELOPMENT AGENCY (CIDA)

IMPLEMENTED BY THE CANADIAN SOCIETY FOR INTERNATIONAL HEALTH in partnership with the GUYANESE MINISTRY OF HEALTH

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### ABSTRACT

**BACKGROUND:** Guyana has one of the highest tuberculosis (TB) infection rates in the Americas. TB reemerged in Guyana in the early 1990s, possibly linked to the emergence of HIV/AIDS. The PHSG project, implemented by the Canadian Society for International Health (CSIH) in partnership with the Guyana Ministry of Health, has as one of its key mandates, to improve Guyana's National Tuberculosis Program through strengthening TB laboratory capacity.

**METHOD:** A TB laboratory infrastructure was developed. Laboratories were supplied with equipment and reagents; personnel were trained through workshops with continuing support provided by regular visits from CSIH consultants. TB laboratory services were implemented at three hospitals in Guyana. The TB laboratory at the Georgetown Public Hospital Corporation (GPHC) provides concentrated AFB smears, LJ cultures and preliminary identification of MTB from cultures. Additionally, cultures are sent to CAREC in Trinidad for further identification and susceptibility testing. TB laboratories have also been implemented at hospitals in three other locations, where concentrated smears for AFB are performed.

**RESULT:** Between January and September 2006, 647 of 4391 (14.7%) specimens submitted for TB testing at GPHC were AFB smear-positive. Mycobacterium cultures from 140 specimens were submitted to CAREC for further testing. One hundred and twenty three of these (87.9%) were identified as M. tuberculosis.

**CONCLUSION:** The PHSG project has succeeded in introducing TB laboratory services in Guyana. The program will be expanded and sustained by the National TB Program.

### INTRODUCTION

The PUBLIC HEALTH STRENGTHENING IN GUYANA (PHSG) project is a 4-year, %CDN 5.5 million project.

**Primary project goal:** to improve and maintain the health of the people of Guyana by supporting an integrated approach to disease prevention, diagnosis, management and care at national and regional levels.

A key component of the program is to improve the National Tuberculosis (TB) Prevention and Control Program. This is facilitated in part by:

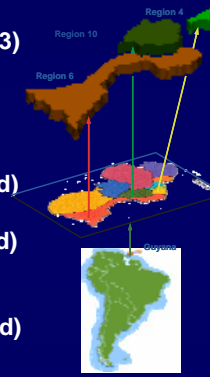
- Strengthening laboratory capacity to support the diagnosis of TB

Prior to the PHSG project, the only TB laboratory diagnostic service available in Guyana was performed at the Georgetown Public Hospital Corporation (GPHC). This service was for hospital patients only and consisted of direct smears for AFB in sputum

### TB IN GUYANA



- 590 TB reported cases nationwide (2003)
- TB detection rate is 54%
- DOTS (Directly Observed Therapy) coverage is only 12% of the total population
- Annual rate of infection : 3.2 (estimated)
- Annual risk of infection : 0.92
- TB infection : 14% (105,000 – estimated)
- Current prevalence : 0.3% (2,400 active cases)
- Annual incidence : 79/100,000 (reported)
- Mortality Rate (reported) : 3.25



### Work performed at the Georgetown Public Hospital Corporation TB laboratory during 10 months in 2006

Specimens (February, 2006 – November 2006) at CML TB Lab, Georgetown:	
Number of specimens processed	4901
Number of specimens AFB Positive	698 (14.2%)
Turnaround time for AFB smear results	24-48 hrs
Cultures	
Number of AFB-positive cultures ( one per patient)	138
Number cultures with M. tuberculosis identified *	118 (84%)
Number of cultures with NTM identified *	20 (16%)
<i>(M. fortuitum, 7, M. goodii, 2, M. intracellulare, 3, Mycobacterium sp., 8)</i>	
* Identification and susceptibility testing was performed at CAREC TB lab, Trinidad W.I.	

Culture Results	Smear Results		
	AFB Smear Positive specimen	AFB Smear Negative specimen	Smear Non-valid
M. tuberculosis (n=118)	92 (78%)	20 (17%)	6 (5%)
NTM (n=20)	1	19	

### SUMMARY

- Four TB laboratories now provide quality diagnostic services in Guyana
- Staff have been trained and can provide ongoing training to others
- It is generally accepted that this program has made tremendous gains in improving the diagnosis and care for TB patients in Guyana
- By assisting in the early diagnosis of tuberculosis in patients, the laboratory service contributes to the prevention of the spread of TB and to enhanced Public Health service in Guyana
- Over the next year, it is envisioned that the TB laboratory program will be further expanded with the collaboration of other funding agencies in Guyana
- This project has contributed to the success of improving health care for the people of Guyana



TB Lab at GPHC



Workshop at the University of Guyana



CSIH consultants at the GPHC TB lab



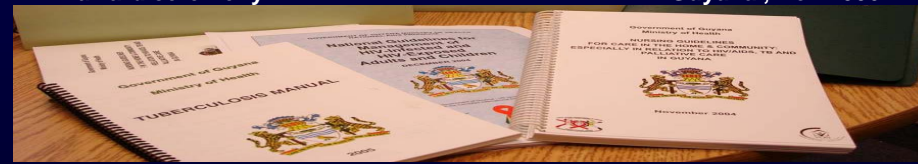
Guyana National Medical Lab - technologist award ceremony



TB Lab at the New Amsterdam Hospital



3rd Annual TB Conference in Guyana, Nov 2006



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[www.csih.org/what/guyana/indexguyana.html](http://www.csih.org/what/guyana/indexguyana.html)

### DEVELOPMENT OF TB LABORATORY SERVICES IN GUYANA : GOALS:

- To develop adequate, safe laboratory facilities for TB diagnostic work
- To provide appropriate, laboratory equipment and supplies
- To train staff in all facets of TB laboratory work and to improve general education regarding tuberculosis
- To create a quality, sustainable TB laboratory service for Guyana.

### ACHIEVEMENTS:

#### 1. Laboratory services

- A new TB laboratory has been developed at the Georgetown Public Hospital Corporation. The laboratory performs concentrated AFB smears and solid media cultures for mycobacteria
- A preliminary identification test (Niacin) for MTB from cultures was introduced in March 2006
- Preliminary niacin test results showed :
  - 13 niacin positive tests confirmed as MTB
  - 6 niacin negative tests confirmed as NTM
  - 1 niacin test false negative ( reported as mycobacteria grown)
- Cultures that show growth of AFB are sent to CAREC in Trinidad for final identification and susceptibility testing
- TB Laboratories have been set up in 3 other locations in Guyana: New Amsterdam; Linden; West Demerara. These laboratories perform microscopy for AFB, using the bleach concentrate method
- The volume of TB work at both the GPHC and the New Amsterdam laboratory has doubled since inception of services. The smear positivity rate is approximately 20%.

#### 2. Infrastructure and Equipment

Infrastructure renovations were provided to the 4 laboratories:

- GPHC:
  - Construction of a separate room for TB work only
  - Negative air pressure
  - Provision of a refrigerated centrifuge, Class II BSC, microscopes, autoclave, incubators and refrigerator
- New Amsterdam hospital laboratory:
  - Class II BSC installed and certified, centrifuge, microscope
- Wismar (Linden) Hospital laboratory :
  - Renovation of a separate room for TB work only
  - Provision of a centrifuge, microscope, Class II BSC installation
- West Demerara Regional hospital :
  - Renovation of a separate room for TB work
  - Provision of a centrifuge, microscope

#### 3. Supplies

- All TB laboratories were provided with reagents and supplies. Staff were trained in supplies management and reagent preparation

#### 4. Staff Training

- A TB Laboratory Manual has been developed and distributed
- Staff training for work in TB laboratories has been provided both by workshops and by on-site visits from CSIH consultants.
- A number of workshops have been held for medical technologists, technicians and lab aides. Workshops have encompassed general education in tuberculosis as well as medical technology, including Biosafety, supplies management, instrumentation, quality assurance and the laboratory diagnosis of TB

#### 5. Safety

- Specific training was provided in Biosafety.
- Job hazard analyses and lab safety audits were performed
- Safety equipment including gowns, gloves and N95 respirators ( for culture work) were provided
- Safety equipment for handling chemicals was provided
- All biosafety cabinets were certified

#### 6. Quality assurance

- Proficiency testing for smear microscopy provided.
- Quality Assurance for AFB microscopy initiated.
- Collaboration with CAREC, Trinidad for EQAS.
- Quality Assurance (QA) staff have been trained, in collaboration with CAREC and the Global Fund project, to provide QA and ongoing training and support.

#### 7. Database

- A database was constructed for record maintenance and statistics
- Computers and printers were provided
- Training in the use of the computer database was provided

#### 8. Further Accomplishments

- A training laboratory at the University of Guyana has been equipped and renovated
- A study was completed to determine the level of drug resistance in MTB, in Guyana. Study results will assist the National TB Program
- An annual Tuberculosis Conference has been held in Georgetown for the past three years
- Recommendations have been provided for expansion to a National TB Laboratory Network in the future