

ABSTRACTS

MYCOBACTERIAL DISEASE IN SOUTH AFRICAN GOLD MINERS IN THE ERA OF HIV INFECTION

G. J. Churchyard, * I. Kleinschmidt, E. L. Corbett, D. Mulder, K. M. De Cock

* Aurum Health Research, Welkom, Centre for Epidemiological Research of Southern Africa, Medical Research Council, Durban, South Africa, Department of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, London, UK, Tropical Epidemiology and Public Health, Institute of Social Medicine, University of Amsterdam, Netherlands, Division of HIV/AIDS-Surveillance and Epidemiology, National Center for HIV, STD & TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA

SETTING: Mining company tuberculosis (TB) clinic, Freestate Province, South Africa.

OBJECTIVES: To investigate the impact of the human immunodeficiency virus (HIV) on tuberculosis case rates and case detection methods in miners.

DESIGN: Demographic and clinical data were extracted from the central computerized TB database for the period 1990-1996.

RESULTS: A total of 7450 miners had TB, which was smear or culture-positive in 81% of pulmonary cases. Incidence rates more than doubled between 1990 and 1996, from 1174 to 2476 per 100 000 per year. Non tuberculosis mycobacteria, predominantly *Mycobacterium kansasii*, were isolated more commonly from retreatment than from new cases (19.5% and 1.5%) respectively, $P < 0.001$). HIV prevalence

in TB patients increased from 15% in 1993 to 45% in 1996 ($P < 0.001$). There was no significant association between HIV and smear status, but HIV-positive patients were more likely than HIV-negative patients to present passively with symptoms rather than through the active radiological screening programme (OR 1.9, $P < 0.0001$). The overall proportion of patients presenting passively increased from 23% in 1990 to 51% in 1996 ($P < 0.001$).

CONCLUSION: The HIV epidemic has led to increased TB incidence in South African Miners to very high rates, and appears to be impacting on the efficacy of the active radiological screening programme.

KEY WORDS: Tuberculosis; non-tuberculous; HIV; gold miners; case detection; radiological screening (CHEST 1998; 144:549-555)

EMERGENCE OF MULTIDRUG-RESISTANT TUBERCULOSIS IN A COMMUNITY-BASED DIRECTLY OBSERVED TREATMENT PROGRAMME IN RURAL SOUTH AFRICA

G. R. Davies, * M. Pillay, A. W. Sturm, D. Wilkinson

* Hlabisa Hospital, KwaZulu/Natal Department of Medical Microbiology, University of Natal, KwaZulu/Natal, South Africa, South Australian Centre for Rural and Remote Health, University of South Australia and University of Adelaide, Australia

OBJECTIVE: Although little studied in developing countries, multidrug-resistant tuberculosis (MDR-

TB) is considered a major threat. We report the molecular epidemiology, clinical features and outcome

of an emerging MDR-TB epidemic.

METHODS: In 1996 all tuberculosis suspects in her rural Hlabisa district, South Africa, had sputum cultured, and drug susceptibility patterns of mycobacterial isolates were determined. Isolates with MDR-TB (resistant to both isoniazid and rifampicin) were DNA fingerprinted by restriction fragment length polymorphism (RFLP) using IS6110 and polymorphic guanine-cytosine-rich sequence-based (PGRS) probes. Patients with MDR-TB were traced to determine outcome. Data were compared with result from a survey of drug susceptibility done in 1994.

RESULTS: The rate of MDR-TB among smear-positive patients increased six-fold from 0.36% (1/275) in 1994 to 2.3% (13/561) in 1996 ($P=0.04$). A further eight smear-negative cases were identified in 1996 from culture, six of whom had not been diag-

nosed with tuberculosis. MDR disease was clinically suspected in only five of the 21 cases (24%). Prevalence of primary and acquired MDR-TB was 1.8% and 4.1%, respectively. Twelve MDR-TB cases (67%) were in five RFLP-defined clusters. Among 20 traced patients, 10 (50%) had died, five had active disease (25%) and five (25%) were apparently cured.

CONCLUSIONS: The rate of MDR-TB has risen rapidly in Hlabisa, apparently due to both reactivation disease and recent transmission. Many patients were not diagnosed with tuberculosis and many were not suspected of drug-resistant disease, and outcome was poor.

KEY WORDS: Multidrug resistance; community treatment; DOT

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ANTI-TUBERCULOSIS DRUG RESISTANCE SURVEILLANCE IN UGANDA 1996-1997

G. Bretzel, * M. Aziz, U. Wendl-Richter, F. Adatu, F. T. Aisu, A. van Wijnen, * V. Stich-Groh*

* Armauer Hansen Institute/German Leprosy Relief Association, Wurzburg, Germany, German Leprosy Relief Association (GLRA)/ National Tuberculosis and Leprosy Control Programme (NTLP), Kampala, Uganda

SETTING: Drug resistance surveillance conducted by the National Tuberculosis and Leprosy Control Programme (NTLP) Uganda from 1996-1997 in collaboration with the Armauer Hansen Institute/German Leprosy Relief Association (GLRA), Germany, for the WHO/IUATLD Global Project on Anti-Tuberculosis Drug Resistance Surveillance.

OBJECTIVE: To determine the prevalence of primary and acquired anti-tuberculosis drug resistance in Uganda.

DESIGN: The survey area covered three GLRA-supported operational NTLP zones, corresponding to 50% of the Ugandan Population. A representative random sampling of individual patients was chosen as sampling procedure. Altogether 586 smear-posi-

tive TB patients (537 new cases and 49 previously treated cases) were included in the survey.

RESULTS: For primary resistance the results were as follows: isoniazid (H) 6.7% rifampicin (R) 0.8%, ethambutol (E) 6.1%, streptomycin (S) 13.4%, thioacetazone (T) 3.2%, pyrazinamide (Z) 0%, multidrug resistance (MDR) 0.5%; for acquired resistance they were: H 37.8%, R 4.4% S 22.2%, E 11.1%, T 20.0%, Z 0%, and MDR 4.4%.

CONCLUSION: According to these data the NTLP Uganda has been effective in preventing high levels of primary drug resistance. If it is assumed that the sampling process reflects the distribution of new patients and previously treated patients in the study areas, the amount of acquired resistance (any resistance)

in the community of smear-positive patients is approximately 5%. To further monitor programme performance the NTLP will embark on a nationwide

survey in 1998/1999.

KEY WORDS: Tuberculosis; drug resistance; Uganda

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TUBERCULOUS PLEURISY AS A MANIFESTATION OF PRIMARY AND REACTIVATION DISEASE IN A REGION WITH A HIGH PREVALENCE OF TUBERCULOSIS

C-K. Liam, K-H. Lim, C. M-M. Wong

Department of Medicine, University of Malaya Medical Centre, Kuala Lumpur, Malaysia

SETTING: A teaching hospital in Malaysia.

OBJECTIVE: To review the demographic and clinical features of patients with pleural tuberculosis (TB).

DESIGN: Retrospective chart and chest radiograph review.

RESULTS: The chest radiograph of 54(61.4%) of a total of 88 patients with pleural TB did not show any lung infiltrate (considered a manifestation of primary TB), while that of 32 (36.3%) patients showed infiltrates in the upper lobes or superior segment of the lower lobes, or the presence of parenchymal scarring in the upper lobes (typical of reactivation TB). Additionally, the chest radiograph of two (2.3%) patients showed miliary mottling (also classified as having primary TB). The mean age of patients with

primary versus reactivation tuberculous pleurisy was 36.3 (\pm 14.8) years and 44.6 (\pm 19.3) years, respectively ($P=0.041$). the median duration of symptoms before presentation was 14 days and 60 days in patients with primary and reactivation disease, respectively ($P=0.001$).

CONCLUSION: In Malaysia, where the prevalence of TB is high, tuberculous pleurisy is more commonly a manifestation of primary rather than reactivation disease. Patients with primary TB pleurisy are younger and have a shorter duration of symptoms than those with reactivation TB pleurisy.

KEY WORDS: Primary; reactivation; pleural, tuberculosis

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REPRODUCIBILITY OF SPUTUM SMEAR EXAMINATION FOR ACID-FAST BACILLI: PRACTICAL PROBLEMS MET DURING CROSS-CHECKING

A. Van Deun, * F. A. Roorda, N. Chambugonj, Md. Hye, Md. A. Hossain

* Damien Foundation, Brussels, Belgium, Health Care & Disease Control, Royal Tropical Institute, Amsterdam, The Netherlands, Damien Foundation, Dhaka, Bangladesh

SETTING: A TB control programme in Bangladesh with proficiency testing of sputum smears for acid-fast bacilli (AFB) using cross-checking of routine

smears.

OBJECTIVE: To document factors that may adversely affect repeatability of the AFB smear, and

which should be taken into account for interpretation of cross-checking.

DESIGN: A number of simple experiments falling within the scope of small routine laboratories in a developing country.

RESULTS: Fuchsim staining is not stable, fading quickly in direct sunlight and combinations of high temperature and humidity. Diffuse daylight, immersion oil or xylene did not have the same effect. Contamination of smears by saprophytic mycobacteria may occur during staining or rinsing, with contami-

nants becoming visible only after restraining and cross-checking. Finally, AFB may be dislodged from smears during soaking in xylene or restraining, especially if the smears are made from thin, liquefied sputum.

CONCLUSIONS: These possible interfering factors should be taken into account when organizing proficiency testing and interpreting its results.

KEY WORDS: Mycobacterium; quality control; stains and staining

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DIRECT DETECTION AND IDENTIFICATION OF MYCOBACTERIUM TUBERCULOSIS IN SMEAR-POSITIVE SPUTUM SAMPLES BY FLUORESCENCE IN SITU HYBRIDIZATION (FISH) USING PEPTIDE NUCLEIC ACID (PNA) PROBES

H. Stender, * T. A. Mollerup, * K. Lund, * Petersen, * P. Hongmanee, S. E. Godtfredsen*

* DAKO A/S, Glostrup, Denmark, Department of Pathology, Ramathibodi Hospital, Bangkok, Thailand

SETTING: Peptide nucleic acid (PNA) probes designed for specific detection of mycobacteria of the *Mycobacterium tuberculosis* complex (MTC) and other non-tuberculous mycobacterium species (NTM) are shown to be able to penetrate the mycobacterial cell wall and subsequently hybridize in situ to complementary rRNA.

OBJECTIVE: To demonstrate the use of fluorescein-labelled PNA probes for detection and identification of *M. tuberculosis* in smear-positive sputum samples.

DESIGN: The sensitivity and specificity of the PNA

probes were investigated by fluorescence in situ hybridization (FISH) using cultures of mycobacterium strains representing species of the MTC and NTM, respectively.

RESULTS: *M. tuberculosis* strains were detected by FISH using specific fluorescein-labelled PNA probes directly in smear-positive sputum samples without changing the morphology of the cells.

CONCLUSION: PNA probes allow for rapid diagnosis of tuberculosis in smear-positive cases.

KEY WORDS: PNA; TB; FISH; diagnosis; *Mycobacterium tuberculosis*

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TRADITIONAL HEALERS AS TUBERCULOSIS TREATMENT SUPERVISORS: PRECEDENT AND POTENTIAL

D. Wilkinson, * L. Gcabashe, M. Lurie

* South Australian Centre for Rural and Remote Health, University of South Australia and University of Adelaide, Australia; and Centre for Epidemiological Research in Southern Africa, South African Medical Research Council

SETTING: Hlabisa, South Africa.

OBJECTIVE: To determine precedent and potential for traditional healers to act as tuberculosis (TB) treatment supervisors.

METHODS: Literature review to describe precedent for the involvement of traditional healers in TB treatment supervision. Interviews with 100 TB patients to determine use of healers and their acceptability as supervisors. Interviews with 24 healers in the project sub-district to determine willingness to act as supervisors.

RESULTS: Despite extensive literature on the interaction between traditional healers and conventional health services, including descriptions of traditional understandings of TB, no published work was identified that reported supervision of TB patients by traditional healers. Of 100 patients interviewed, only 10% had used a healer as the first health provider for their illness, but 40% had attended a healer at some

time prior to diagnosis. Although only 4% believe healers can cure TB, 84% would consider choosing a healer as a treatment supervisor. Of the 24 healers, 15 (63%) distinguished between two types of diagnosis made among patients with symptoms suggestive of TB: TB and idliso. Idliso is poisoning or bewitching, and is said to be best cured by healers, while TB is infectious and cannot be cured by healers. Most healers (88%) reported having referred patients with possible TB to hospital in the past; all were keen to negotiate collaboration with health services, and 92% were willing to act as treatment supervisors.

CONCLUSIONS: While there is little reported precedent for traditional healers to interact formally with tuberculosis treatment services, the potential for collaboration seems to be high, at least in our setting.

KEY WORDS: Tuberculosis; traditional healer; community care

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117-PD DOTS IN PRISONS OF IVANOV OBLAST, RUSSIA

A G Khomenko,¹ V V Punga,¹ A N Starikov,¹

M A Shudrova,^{2,1} Central TB Research Institute, Moscow;

²Medical Dept of Ivanovo oblast Punishment Execution Board,
Ivanovo, Russia

From 01.01.97 to 01.01.99 were registered 674 patients with tuberculosis, including 636 new pulmonary TB cases, of which 202 sputum-positive ones (Ziehl-Neelsen), 12 extrapulmonary cases, and 26 relapse cases. Patients were distributed by category

and treatment results were studied using cohort analysis. Category I included 245 patients; Category II, 26; and Category III, 403 cases. All the patients underwent standard treatment for each Category using combined fixed-dose tablets-rifater in intensive

KGZ covering 230 000 people. Until June 1998, 700 TB cases have been detected in the pilot areas. The cure rate was 87.7%. the positive results of DOTS in KGZ influenced by expansion of pilot areas in KGZ and implementation of DOTS in other CAR. In July 1998, DOTS in KGZ has been expanded to 50% of the country population. Owing to the successful collaboration of the government, WHO, World Bank, and USAID it was decided to implement DOTS in 17 oblast centres of KAZ as a part of the Health reform project. In July 1998, the implementation of DOTS has been started also in two pilot areas

in UZB covering 140 000 of the population of Karakalpakstan (autonomic republic of UZB). New DOTS pilot projects were established in TKM and UZB (one and three pilot areas respectively), covering 540 000 and 550 000 of the population respectively. DOTS implementation in TJK is currently in developing phase.

CONCLUSIONS: The successfully results of the DOTS pilot projects in KGZ proved the efficacy of the DOTS strategy, and the feasibility of its implementation in other CAR. The government of CAR, WHO, and other international agencies should combine their efforts towards the gradual implementation of DOTS in all countries of Central Asia.

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149-PD DOTS: 3 YEARS EXPERIENCE AT OJHA INSTITUTE OF CHEST DISEASES (OICD) KARACHI, PAKISTAN

A Ansari. Ojha Institute of Chest Diseases, Karachi, Pakistan

Pakistan is one of those 16 countries who according to WHO harbour half the world's T.B. cases. Although National guidelines for control of Tuberculosis in Pakistan were issued in year 1995, the N.T.P. is not yet effective due to paucity of funds OICD situated in mega city of Karachi, however, implemented NTP guidelines including DOTS in April, 1995. Treated outcome results on patients enrolled on DOTS from April 1995 to December 1997 at five outdoor chest clinics of institute will be presented in the conference. The total patients enrolled on DOTS were 10430, out of which 47% were smear positive

new 33% smear-negative new, 4% Relapse and 16% Re-treatment cases. The cure rate in new smear+ve patients is 69% and in re-treatment group is 58%. The failure in re-treatment cases (suspicious MDR cases) who completed treatment is 16%. The relapse in new smear +ve patients till December 1998 is less than 2%.

The treatment outcome results in such a large group of patients treated under DOTS imposes confidence in WHO recommendations about treatment of tuberculosis.

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phase, rifinah-in continuation phase. Smear conversion after intensive phase was observed in 75,2% new cases and 64,3% relapse ones. 12-15 months after registration 90,2% patients were cured, treatment failures were 8,6%, 3 patients (1,2%) died. Main rea-

sons for treatment failure were mycobacterial drug resistance to H and R, accompanying diseases. DOTS programme in prisons proved to be very effective.

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128-PD THE WAY DOTS IS WORKING IN TOMSK REGION OF THE RUSSIAN FEDERATION

VT Golubchikova, TV Lyagoshina, N Bahtvala,
M Kammerling. Luxembury St., 17, Tomsk, 634001, Russia

The partnership between Tomsk Region TB Services and MERLIN has successfully evolved from a short term humanitarian package into a multilateral development project which covers all aspects of TB control for over a million people in the Tomsk Region, including the closed city of Seversk and prisoners. As a result of the partnership, DOTS has been effectively implemented throughout the Region. There has been a substantial reform of the health sector. The programme has been approved by the Ministry of Health and local authorities, and is considered a major pilot project whose outcomes may effect whether

DOTS is widely adopted throughout the Russian Federation. As well as improved treatment effectiveness, the community services have taken on a greater role, and there is much greater involvement of general medical services than is usual in Russia. Current activity to further improve the situation includes plans for a MDR TB (DOTS+) treatment programme, improved social support for disadvantaged TB patients, a health education programme, review of the financial support for the services and the opening of Tomsk Regional Training Centre for dissemination of the Tomsk experience to other territories.

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147-PD DOTS IMPLEMENTATION IN THE CENTRAL ASIAN REPUBLICS

R Zaleskis,¹ A Alisherov,² R Hamrakulov,³ A Zhangireev,⁴ C Nazarov.⁵ ¹WHO/EURO Almaty, Kazakhstan; ²National TB Institute, Bishkek, Kyrgyzstan; ³National TB Institute, Tashkent, Uzbekistan, ⁴National TB Centre, Almaty, Kazakhstan; ⁵National TB Hospital, Ashgabat, Turkmenistan

OBJECTIVES: To evaluate the efficacy of the DOTS strategy in the WHO pilot projects in Kyrgyzstan (KGZ) and the feasibility of DOTS expansion in KGZ and other Central Asian Republics (CAR)-Kazakhstan (KAZ), Tajikistan (TJK), Turkmenistan (TKM), Uzbekistan (UZB). **METHODS:** The efficacy of DOTS in KGZ (evaluation of case finding and treatment results)

and the possibility of DOTS implementation in other CAR were conducted by WHO and National programme managers.

RESULTS: In 1997, the case notification rates in CAR ranged from 55 per 100 000 in UZB to 113 in KGZ. In 1996, two DOTS pilot projects as a part of a World Bank-supported general health reform were implemented in 4 districts in

160-PD A CREATIVE COMMUNITY-BASED DIRECTLY OBSERVED TREATMENT PROGRAM (DOT) FOR TUBERCULOSIS IN A HOMELESS SHELTER

J MacMorran, J Riedel, A Draffin-Jones. Tuberculosis Control, Winnipeg, Manitoba, Canada

From 1990-1994, over fifty persons diagnosed with active pulmonary tuberculosis gave the Main Street Project (MSP), a community shelter for the homeless, as their contact address. Because of their transient lifestyle, the population at the MSP provided a challenge for health care professionals to ensure compliance with the tuberculosis treatment program. A creative method of administering the antituberculo-

sis drugs using Directly Observed Therapy (DOT) was initiated. A training course was developed for the staff with the support of the management and Board of MSP. A hot-line to the TB Nursing Consultant was implemented. Staff were pleased to be partners in the delivery of care especially when they saw many of their clients' health improving and completing their drug therapy.

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293-PD TB WITH DOTS IN DAMIEN FOUNDATION LEPROSY PROJECTS IN INDIA

P K Murthy, P Vijayakumaran. Damien Foundation India Trust, 27, Venugopal Avenue, Chetpet, Chennai-600 031, India

Seven projects in South India with a total population of about 1 million implemented combined Leprosy-Tuberculosis programme. Subcentres manned by Para Medical Workers (PMWs) were made nodal points for combined leprosy and TB programme. Screening of respiratory symptomatic was done by PMW at the subcentre.

Paramedical Worker, local general practitioner or a Volunteer supervised the daily consumption of drugs. Four projects used daily regimen and three used intermittent regimen.

RESULTS: Of the 3138 suspects 537 (17.11%) were sputum positive. In total 457 cases were registered for treatment in the seven projects of which 427 (93.4%) were pulmonary and 30 (6.6%) were extra-pulmonary. Of the 427 pulmonary cases 370 (86.6%) were sputum positive and 57 (13.4%) were negative. Of the 370 sputum positive cases 310 (83.8%) were new cases.

The different strategies employed for supervision of therapy and outcome of the treatment of these cases would be discussed.

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332-PD INTRODUCTION OF DOTS IN NAIROBI

A Oyoma Odongo. Mbagathi Dist. Hospital, PO Box 20725
Nairobi, Kenya

It was introduced in Nairobi in 1997 (3rd Quarter 1997) at Mbagathi District Hospital and Rhodes Chest Clinic, and later spread to 40 centers in Nairobi.

What was gained by DOTS: Medical personnel especially nurses who carried out Directly observed Treatments Short-Course (DOTS) came to know patients better. Patients came regularly and at set times to take treatment. These encouraged each other as they waited for treatment also discussed with health personnel.

The number of sputum Smear results at 2/12 was increased.

DIFFICULTIES ATTAINED: Due to aware-

ness of DOTS patients increased to even more than 200 in some centres so supervision not properly done. Some centres not too near the people who are sickly but not bedridden. DOTS is also being done for smear negative patients so work load is increasing rapidly for health staff.

IN FUTURE: We want to train people on home based care so that relatives or neighbors will take care of their patients.

Programme may withdraw streptomycin when home-based care takes effect.

Pilot studies of Home based care have already started in Machakos Province.

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402-PD ENQUIRY SURVEY ON THE AWARENESS OF DOTS PATIENTS AND SUPERVISORS IN HENAN, CHINA

Z Guolong,¹ S Tateishi,² D Changmei.¹ ¹Henan Anti-Tuberculosis
Institute, Weiwu Road, Zhengzhou, China;
²National Hira Hospital, Wani naka, Shiga-gun, Japan

SETTING: Provincial DOTS operation in Henan, China.

OBJECTIVE: Determine what patients and supervisors think of modified DOTS operation.

DESIGN: Six hundred thirty-four TB cases completed DOTS and 236 village doctors engaged in DOTS have been interviewed or investigated through letter in order to obtain hampering factors.

RESULTS: Supervision subsidy (village doctor's allowance)

39.8% of village doctors replied that 30 yuan (3.6 US dollar) of allowance for supervision of patients is too small.

2 16.1% of doctors replied it is satisfactory.

3 44.1% of doctors replied it is not necessary

What is your aim of supervision?

90.1% of doctors replied they work as a doctor's duty

HEALTH EDUCATION:

1. 31.4% of village doctors and 80.4% of TB patients did not know TB is caused by TB bacilli.
2. Only 8.8% cases complained normal feeling when diagnosed as TB.
3. 60.2% of cases wished to share TB knowledge and to enhance health education.

CONCLUSION:

1. For village doctors, existing allowance is not satisfactory. It should be increased.

2. Health education should be enhanced both to patients and village doctors.

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411-PD TUBERCULOSIS CONTROL IN DISPLACED POPULATIONS IN SUDAN: SUCCESS OF DOTS STRATEGY

A I Elsony, M Pitta, G Bjune. Sudan National Tuberculosis Programme, PO Box 193, Khartoum, Sudan.
Tel: 0024911772182. Fax: 0024911774412.
E-mail: aelsony@hotmail.com.

SETTING: Tuberculosis (TB) has been a major public health problem in Sudan for many decades. National control efforts in the past in displaced populations have not been successful, with less than 30% of detected cases being cured.

In 1994 a project on the DOTS (Directly Observed

Treatment, Short Course) strategy was initiated for a displaced population of approximately a million in rural Khartoum. Following a 72% cure rate in the initial cohort of new smear positive patients, the project was expanded in phases to cover a population of 2 million in 1995.

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reatment results displaced camps (1995-1998)

Year	State	Cured	Completed	Died	Failure	Defaulted	Transferred	Total
1996	Khartoum SCC	126	91	7	9	14	13	260
	Bahr El Jebel	314	348	58	64	99	39	922
	Upper Nile	21	56	10	16	21	0	124
	Total	461	495	75	89	134	52	1306
1997	Khartoum SCC	232	117	16	21	37	18	441
	Bahr El Jebel	409	470	89	97	153	45	1263
	Upper Nile	30	47	3	3	17	0	100
	Total	671	634	108	121	207	63	1804
Grand Total		1132	1129	183	210	341	115	3110

429-PD TB DIRECTLY OBSERVED TREATMENT (DOT) BY HEALTH STAFF NON-SPECIFICALLY TRAINED OR FAMILY MEMBERS, EXPERIENCE IN LOME, TOGO

M P Valenti, N Tignokpa. National Leprosy/Tuberculosis Program MOH Togo

INTRODUCTION: In Lome town in '97, the Togo TB program decided to involve private and public health facilities and family members in administering DOT, in order to cope with the increasing workload at hospital level and to improve the TB treatment accessibility. A health

facility (HF) or a family member chosen by the patients was entrusted to supervise the daily treatment after adequate health education.

OBJECTIVE: To assess the effectiveness of DOT administered by non-specifically trained staff in Lome town.

METHODOLOGIES: Data of all patients diagnosed during April '97-September '98 were introduced in EP16 and analyzed with the same software. The adherence to the intensive phase of new cases PTM+ and the treatment outcome of the cohort April '97-March '98 were considered as indicators of performance.

RESULTS: Among 600 new cases PTM+ diagnosed,

168 (28%) received DOT from non-specifically trained people: 38 in 20 public health facilities, 49 in 40 private clinics and 81 were supervised by a family member. Among the 168 patients, 134 (80%) completed the intensive and 82 had the 2nd month sputum examination, 32 (19%) defaulted, 2 (1%) died during the intensive phase. The treatment results of the cohort are shown below.

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	Cured	Complete	Failure	Defaulter	Died	Total
Public HF	9 (26%)	9 (26%)	2 (6%)	14 (42%)	0	34 (100%)
Private HF	11 (27%)	9 (22%)	2 (5%)	17 (41%)	2 (5%)	41 (100%)
Family	12 (39%)	5 (16%)	1 (3%)	11 (36%)	1 (6%)	31 (100%)
Total	32 (30%)	23 (22%)	5 (4.7%)	42 (40%)	4 (3.7%)	106 (100%)

COMMENTS: The results of the 18 month experience are highly discouraging. However we learned that before involving non-specifically trained people

in DOT administration, monitoring, supervision and health education activities should be carefully planned and the adequate means should be available.