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APPLICATION OF CHEMOTHERAPY IN THE INTEGRATED TUBERCULOSIS CONTROL PROGRAMME IN ETHIOPIA

by

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INTRODUCTION

This paper was prepared on the basis of experiences collected in Ethiopia, a large, mostly mountainous country with a population of over 25 million living on more than one million square kilometers of African territory with poor communications, very low national income ($ 75 per capita yearly) and therefore extremely low health budget (including international help around $ 1 per capita yearly). To illustrate further the unfavourable circumstances for more rapid development of efficient anti-tuberculosis organization it should be mentioned that having a tuberculosis prevalence of 1 per cent and tuberculosis infection prevalence of over 40 per cent, the country launched its first organized anti-tuberculosis action only sixteen years ago in the framework of the joint WHO/Government Tuberculosis Control Project with the opening of its first Tuberculosis Demonstration and Training Centre in Addis Ababa. Even today the three existing Tuberculosis Centres (Addis Ababa, Asmara and Harar) with adjoint three small sanatoria (together 320 beds)

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represent the only specialized tuberculosis institutions for routine work and training in tuberculosis control. There has never been created a Central Tuberculosis Department, but gradually the Addis Ababa Tuberculosis Centre has become recognized as the leading institution in professional and organizational tuberculosis control matters.

General and Basic Health Services of Ethiopia located in towns and larger villages (62 general hospitals, 98 health centres and 582 health stations and mission clinics) of fourteen provinces, definitely insufficient in number, have more or less successfully collaborated with tuberculosis centres especially in case-finding and treatment, receiving from them professional advice, material help and training for their personnel, long before the Ministry of Public Health officially ordered in 1971 Tuberculosis Control Integration into General and Basic Health Services.

IMPLEMENTATION OF THE INTEGRATED TUBERCULOSIS CONTROL PROGRAMME

Extensive tuberculosis control training and briefing of Ethiopian health workers on all levels (over 3 000 vaccinators, dressers, laboratory and X-ray technicians, nurses, health officers and doctors participated in seminars, courses, conferences, on-the-spot instructions carried out by tuberculosis centres during the last ten years), has raised gradually the interest for tuberculosis control in General and Basic Health Services and approached their working methods to standard WHO techniques and recommendations. Substantial UNICEF help in tuberculosis drugs, BCG vaccine and laboratory material distributed to General Health Services through tuberculosis centres on the basis of their reported work performance has essentially furthered their initiative.

It has been always clear that the three specialized Tuberculosis Centres could not cover efficiently any larger part of the country without help of General Health Services in the provinces and therefore there has never been any competition dispute. It became clear years ago that without obligatory and as much as possible independent tuberculosis control work in Basic Health Services no change in serious tuberculosis epidemiological situation could be expected. Numerous written instructions, descriptions of different methods, posters, pamphlets, tuberculosis registration and reporting forms were distributed through fourteen Provincial Health Departments down to the last Government and Mission health institution.

The Ministry of Public Health officially approved and ordered in August 1971 the first National Integrated Tuberculosis Programme, which prescribes for all health institutions in Ethiopia obligatory duties in tuberculosis control on their respective territories according to their equipment and health staff professional level: Programme A for hospitals, Programme B for health centres and larger mission clinics and Programme C for health stations and smaller mission clinics. Each of fourteen Provincial Health Departments assigned an Integration Health Officer for supervision of integrated programmes in their province, a referral system has been established (less equipped institutions to higher qualified and vice versa according to the task), and a standardized documentation and reporting system in tuberculosis bound to Addis Ababa Tuberculosis Centre introduced.

We were aware that this all-comprising Tuberculosis Control Integration Programme also cannot cover the entire country, not only because of great distances and the fact that some regions are still without health institutions, but also because many were still organizationally and financially too weak to start immediately according to the programme. Further development of tuberculosis control became therefore dependent on further development and strengthening of Basic and General Health Services, and, of course, efficient field supervision and operative actions of tuberculosis centres in co-operation with them.

Nevertheless, the summary of tuberculosis control performances in the country for 1973 showed already promising results in tuberculosis diagnosis and BCG vaccinations as seen from Table I.

TABLE I

Tuberculosis Control Performance of Ethiopian Health Institutions for 1972 / 1973
(According to MPH Statistics Division)

	Reporting (existing)	First exam. (all causes)	AFB examin. Total	AFB examin. Posit.	Diagnosed and treated Pulm.TB	BCG vaccin. given
Health Centres	87 (95)	591.651	5 075	1 236	2 448	206.093
Hospitals	64 (91)	752.728	11 891	1 783	9 308	38.008
Total:	151 (186)	1 344.379	16 966	3 019	11.756	244.101
TB Centres	3 (3)	75.239*	26.082	4 096	2.552**	124.444
Clinics	34 (515)	-	-	-	-	37.877
Grand total:	188 -	1 419.618	43.048	7 115	14.308	406.422

* Selected material of tuberculosis centres

** Only bacteriologically proved tuberculosis cases

Some of these figures may not be completely reliable if we compare the number of AFB positive sputum examinations with declared number of newly diagnosed tuberculosis patients. Many health centres and hospitals did not report their laboratory performance, but that they really started treatment of these patients can be taken for granted.

APPLICATION OF CHEMOTHERAPY IN THE INTEGRATED TUBERCULOSIS CONTROL PROGRAMME

Medical Documentation: To keep tuberculosis patients under supervision for at least one year during the treatment, with all relevant data regularly registered, demands in tuberculosis control integrated health services a specially simple medical documentation, easy to survey and handle. One single card, we call it "TB Index and Follow-up Card", was introduced. It has rubrics for all findings on which diagnosis was made, for registration of drug collection and for check-up results. Every nurse or even a dresser can easily keep these cards in order. There is enough space for detailed description or orientation map of patient's dwelling locality (many hamlets have no name at all). If these cards are kept in boxes with divisions according to due appointments all treatment defaulters can be noticed in time. The card is used as a treatment card, but as it gives all necessary information no other tuberculosis medical documentation is necessary in health centres, out-patient departments or other clinics. (See Annex I).

Regular Tuberculosis Drug Supply System: Great distances with poor communications, especially during the rainy season, represent often enormous difficulties to deliver drugs from Addis Ababa in time, with the regretful result that sometimes here or there in remote areas some patients have to interrupt treatment. All Provincial Health Departments must have a sufficient reserve of tuberculosis drugs (and laboratory material) to intervene immediately through rather complicated unscheduled local communication systems.

Diagnosis: Diagnosis before treatment starts has to be proved bacteriologically. General hospitals are all too eager to make diagnosis on basis of X-ray shadows and refer such doubtful tuberculosis patients for treatment down to health centres or clinics. No wonder that often health centres complain that many patients do not respond properly to chemotherapy and nurses expertly declare that this is probably due to bacterial resistance, while the patient has never been AFB positive out of his chronic lung abscess, bronchiectases, cysts - or whatever the lung shadow really was.

Follow up and motivation

The need for detailed explanation about the disease, treatment course, importance of regular drug taking, prevention of new infections of healthy surrounding and information regarding adverse life habits during the treatment - cannot be strongly enough underlined. Not all, but the majority of our treatment failures happen because this essential, educational part of tuberculosis control has not been carried out sufficiently. Of course, there are many, but not unsurmountable, difficulties - one of the most important being language difficulties (over fifty languages are spoken in Ethiopia), and very low educational standard of our patients.

Chemotherapy Regimens: The great number of newly diagnosed tuberculosis cases yearly in tuberculosis centres and integrated tuberculosis control services made ambulatory and self-administered chemotherapy conditions sine qua non. It became also apparent that great flexibility is needed in selection of chemotherapy regimens for each patient not only regarding the tuberculosis process, but also regarding numerous difficulties almost every Ethiopian patient is facing during the treatment. Most of them are discovered when already in an advanced stage of their tuberculosis process, often having additional diseases disabling them more then tuberculosis itself, and living far from widely scattered health institutions, in a very poor social condition. To make out of our tuberculosis case-finding work some real profit every diagnosed tuberculosis patient wherever he is living and whatever his condition must be treated in the best possible way. Many published controlled chemotherapy trials, however successful they might be, have only limited influence on our decisions in situations, when we have in front of us a great number of very sick and exhausted tuberculosis patients, sometimes hardly movable, from a far away place without means even to return there, and have even political problems in dealing with their destiny.

Treatment schemes currently used in general hospitals, health centres, health stations and mission clinics are seen from Table II.

TABLE II

Chemotherapy of Tuberculosis in Ethiopia
(Integrated Tuberculosis Control Services)

Process and general condition	Initial treatment		Maintenance treatment
	I. TB Ward 4 - 6 weeks Daily STR + INH or INH/TB1 + supporting th.	II. Ambulatory A.STR twice w. + INH or INH/TB1 daily at home for 2 - 3 months B.twice-weekly 1 yr.	III. Self-administration A.INH/TB1 daily B.INH 5-8 mg/Kg/b.w.dly. Supplies for 2-3 months Up to 1 year or 18 mths.
Far advanced, complications, poor gen. condition	Whenever possible	If I. impossible: A.	If I.-II. impossible or afterwards: A. or B.
Regardless of extension, but relatively good gen. condition	-	A. or B.	If II. impossible or afterwards A. or B.
TB suspects, Primary TB	-	If gen.antibiotics without effect: A.	B.

There are twenty-four small tuberculosis wards (total around 350 beds) in provincial general hospitals which are offering short initial hospitalization and strong initial treatment to a great number of newly diagnosed, very sick tuberculosis patients who cannot start treatme on ambulatory basis because of their poor condition. That a great turnover of curable tuberculosis patients on a small number of beds can contribute essentially, almost in epidemiologically important proportions, to close a great number of sources of infection, are proving our figures. Tuberculosis wards of general hospitals together with three tuberculosis sanatoria (total around 700 beds in whole of Ethiopia) offered a strong initial chemotherapy and really helped to relieve human suffering to 5 409 tuberculosis patients in one single year, almost to half of the yearly diagnosed pulmonary tuberculosis cases. Fortunately all are not the same sufferers. That a good motivation for later ambulatory and domiciliary treatment could easier be presented to patients is understandable.

Twice-weekly controlled chemotherapy regimen with STR and INH is a recognized treatment method in Ethiopia, but not so widely used as it probably could be. The main reason is the too great a distance between the patient's home and the nearest clinic. Our experience shows that any distance of more than two kilometres is almost unfeasible with this method for the majority of our patients. It is probably better, if not preventable, that the patient misses one or two streptomycin injections, but is taking daily INH/TB1 than to miss both drugs. We have tried twice-weekly controlled chemotherapy in more than 100 tuberculosis patients under relatively good Addis Ababa public transportation conditions. After three months almost half of the patients started to be irregular and finally asked for change of their treatment regimen. Most of them living three or more kilometres from the tuberculosis centre, could not afford 25 or 35 Eth.cents for the bus twice-weekly or had other acceptable reasons. We have in Addis Ababa at the Tuberculosis Centre no more than thirty-five patients currently on this regimen.

In the last two years we organized co-operation with ten general clinics scattered in Addis Ababa region, which are giving on our request streptomycin to our patients living near these clinics. The co-operation is functioning well, patients are regular, but the clinics refused to bother with the preparation of glasses of water and patients' swallowing their tablets in the presence of the personnel.

Regarding ambulatory tuberculosis drug distribution we have to mention the importance of adequate containers for two to three months' drug supplies. Without good plastic containers with a screw (we use different drug bottles and often plastic sputum containers) tablets are soon pulverized under damp atmosphere during the rainy season. Many of our patients have in their miserable dwellings not a single dry place or a secure shelf.

As seen from Table II, which is only an orientation scheme for our provincial health workers, a treatment possibility exists for all patients. Decision where the patient will be treated is taken by the institution where the diagnosis was made (tuberculosis centre, general hospital, health centre, larger mission clinic) after precise investigation of patient's general condition, locality of his home or better the distance between his home

and the nearest health institution. A list with exact addresses of all health services in the country was distributed. It is interesting from how far some patients are travelling to a certain health institution for examination, passing on the long way many much nearer and equally qualified. Therefore an obligatory referral system especially for treatment was introduced and is gradually improving.

In spite of all difficulties, the tuberculosis programme in Ethiopia has achieved the position where all diagnosed tuberculosis patients can have a chance of being cured, but health education must persuade tuberculosis cases to present themselves for treatment.

Ambulatory chemotherapy of tuberculosis became in spite of limited resources a mass enterprise of all provincial health institutions as shown in Table III.

TABLE III

Pulmonary Tuberculosis Cases Under Chemotherapy
(Tuberculosis Control Integrated Health Services in Ethiopia 1972/73)

Province (Population)	Reporting(Existing) - Tuberculosis patients under chemotherapy			Total
	Prov.Gen.Hospitals	Health Centres	Clinics	
1. ARUSSI (818 200)	2 (3) -163	4 (4) - 401	6 (6) - 73	637
2. BALE (194 000)	1 (1) - 24	2 (2) - 75	-(6) - -	99
3. HEGEMDIR (1 294 600)	2 (2) -399	8(11) - 106	1 (1) -127	632
4. ERITREA (1 836 800)	7 (12)-1204	3 (5) - 314	1 (9) - 79	1597
5. GEMU GOFA (668 100)	1 (2) - 53	3 (4) - 49	1 (6) -234	336
6. GOJAM (1 668 100)	2 (2) -226	4 (7) - 77	- (2) - -	303
7. HARAR (3 215 600)	5 (7) -264	4 (8) - 141	- (1) - -	405
8. ILLUBABOR (659 600)	- (1) - -	6 (6) - 270	- (4) - -	270
9. KAFFA (1 224 300)	1 (2) -106	6 (6) - 289	2 (11) - 25	420
10. SIDAMO (2 369 200)	3 (5) -130	4 (5) - 93	5 (10) -373	596
11. SHOA (5 051 400)	6 (7) -164	7(13) -216	2 (20) - 23	403
12. TIGRE (1 748 700)	2 (5) -206	6 (7) -243	- (2) - -	449
13. WOLLEGA (1 214 200)	3 (4) -237	6 (6) -151	9 (18) 269	657
14. WOLLO (2 355 600)	2 (2) -269	10 (11)-210	3 (14)-151	630
	37(55)-3445	73 (85)-2635	30(110)-1354	7.434
TB Centres: Addis Ababa, Asmara and Harar:				5.721
			GRAND TOTAL	13.155

Our reporting system is still incomplete, but if we take that those not reporting institutions did not have anything to report, we nevertheless can see that integrated tuberculosis control services throughout the country treated with chemotherapy a large majority of known pulmonary tuberculosis cases in Ethiopia.

Only AFB positive cases were included in Table III, the number of tuberculosis suspects, glandular tuberculosis and primary tuberculosis cases under INH treatment is substantially higher, but, of course, of less importance.

("Quarterly TB Control Report Form" used in integrated health services, on the basis of which Table III was prepared is shown as Annex B).

Treatment Results: Regarding results of ambulatory chemotherapy in tuberculosis centres we know from random samples taken since 1968 that one year after diagnosis cavitary tuberculosis cases become AFB negative in 70 per cent and non-cavitary in 85 per cent. We still could not start to collect reliable data on treatment results from integrated tuberculosis control services in provinces. From individual institutions and during the supervision visits collected data show that up to 40 per cent of patients become irregular or are lost before the sixth month of treatment. But, because a high percentage of migrating tuberculosis patients join again treatment in another institution, it is impossible to present any reliable treatment results at this stage.

The increasing number of OPD clinics, health centres and mission organizations are using health stations (Adv. Dresser in charge) or smaller mission branch-clinics (visited by a nurse once or twice weekly) for administration of tuberculosis drugs, which represents for the central institutions even more difficulties in collection of reliable treatment results.

The next step in our integrated tuberculosis control programme will be treatment result reporting at least from major provincial institutions. Our programme went in large extension and needs improvement in many fields.

CONCLUSION

In spite of all shortcomings of an integrated tuberculosis control programme in an underdeveloped country, it is the only way to organize a nationwide anti-tuberculosis action with present-day and probably also future financial resources. With further development, strengthening and improvement of basic and general health services - the integrated tuberculosis control programme will succeed.

ANNEX A

MINISTRY OE PUBLIC HEALTH

HEALTH CENTER ..... PULMONARY TB: AFB positive / negative

OUT-PATIENT DEPART. ..... TB OTHER FORMS .....

X-ray No. (if done) ..... Minimal—Moderately—Far advanced

Family folder No. ..... Date of issue .....

TB INDEX AND FOLLOW-UP CARD No. .....

1. Name ..... (add grandfather's name) 2. Age ..... 3. Sex .....
4. Occupation ..... 5. Address ..... (add house location plan)
6. Place of diagnosis .....
7. Place of treatment .....
8. History of disease: ..... (symptoms: duration & description)

9. Results of bacteriological examinations

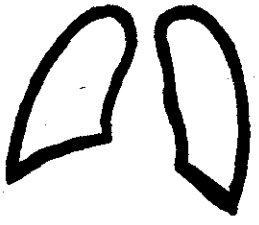
Date:	Smear:	Culture:

11. X-ray examination (if done)—Date .....

10. Physical examination (type of breathing, rales etc.)

.....
.....
.....

Temp: ..... Weight ..... Height .....



O-Infiltrations
O-Cavities
O-Suspected cavities
O-Hilar glands-atelectasis
O-Pleurisy-empyema
O-Disseminations-miliary TB
O-Spont. pneumothorax
O-Bone & Joint TB

12. Previous BCG vaccination: Scar-Yes/No
Previous TB treatment: Yes/No

13. Tuberculin (2TU) test ..... (mm of induration)

14. Household members	Age	Examined (date)	Household members	Age	Examined (date)

15. TB treatment ordered .....

16. TREATMENT AND FOLLOW-UP

Appointments		Quantity of drugs				Sputum control (date-result)	X-ray control (date-result)	Remarks Gen. condition home visits hospitalization
Due	Reported	TB 1	INH	STR	Others			

ANNEX B

NATIONAL TB CONTROL PROGRAMME YEAR: ..... QUARTER .....

Province: ..... Health Centre: ..... Clinic/Hospital .....

QUARTERLY TB CONTROL REPORT

A. Diagnosed new TB patients in this quarter

- Pul. TB cases (AFB positive) .....
- Pul. TB suspects (AFB negative) .....
- Children TB cases (up to 10 yrs) .....
- Non-pulmonary TB cases .....
- Pul. TB cases diagnosed elsewhere - (referred not included above) .....

B. Pul. TB patients under Amb.treatment

- At the start only or still AFB pos. .....
- Always AFB negative TB patients .....

Remark: This report has to be sent regularly at the end of the quarter to: TB Centre, A/A, P.O. Box 21494. Future UNICEF help depends UPON EXACTNESS AND REGULARITY OF THESE REPORTS

C. Total No. of new and old TB patients registered up to now (No.of TB cards)

- Pulmonary TB cases .....
- Non-pulmonary TB cases .....

D. BCG vaccinations performed in this Quarter

0	1-4	5-14	15+	Total

E. No. of sputum exam. this Quarter

- AFB positive .... AFB negative .....

F. Total No. of all first examinations this quarter (for all diseases - including tuberculosis)
.....

Signature of the responsible officer

.....

(Seal of the institution and title)