Tech.

[Quantific". of contrib of India to TB. Knowledge]

Ref: Tuberculosis Research Centre, Chetpur, Madras, Silver Jubilee Report 1981, 79 pp, ICMR

Analysis of Publications: in 1st 25 yrs

Total No. - (127) research reports ~~on~~ in (174) journal articles

On
a) Primary Chemotherapy — (14) articles in — (some were published in 2 journals) — 5 publ in 2 jour.

Bull WHO -	6	Bull. of IUAT	— 1
Tubercle. —	4	Amer. Rev. Resp. Dis.	— 1
Ind J Tub —	4	Lancet.	— 2
		BMJ	— 1

(19) journals

b) Toxicity — (8); 4 publ. in 2 journals

Bull WHO	— 5	Tubercle.	— 3
Ind J Tub	— 4		

(12) journals

c) Follow-up after Primary chemotherapy + Relapse — (12); 3 publ. in 2 journals

Bull WHO	— 7	Tubercle.	— 2
Ind J Tub.	— 4	I JMR.	— 2

(15) journals

d) Reserve regimens — (7); 2 in 2 journals

Ind. J. Tub.	— 3	I J M R	— 1
Tubercle.	— 5		

(9) journals

e) Contacts — (5)

Bull. WHO	— 5	Ind. J. Tub.	— 1

(6) journals

f) Drug Sensitivity — (8); 1 in 2 journals,

Bull. WHO	— 1	I J M R	— 6
Tubercle.	— 2		

(9) journals

g) Urine Tests — (6)

Tubercle.	— 5	Ind. J. Tub.	— 1

(6) journals.

h) Methodological — (13)

Tubercle	— 7	J JMR	— 5
Ind J. Tub.	— 4	Bull. WHO.	— 1
Leprosy Review	— 1		

(18) journals

(i) Virulence (10); 5 in 2 journals

Tubercle — 5 Ind J Tub. — 5

Bull. WHO — 5 (15) journals

(j) Rate of inactivation (8); 2 in 2 journals

Bull WHO — 2 BMJ — 1 Tubercle — 1

Ind J. Tub. — 1 IJMR — 5 (10) journals

(k) Biochemical Pharmacology — (4)

Bull. WHO — 1 Anti-microbial Agents + chemotherapy — 1

Tubercle — 1

Symposium on Clinical Pharmacology — 1 (4) journals

(l) Statistical — (4)

Applied Statistics — 1 The Statistician — 1

Biometrics — 1 Ind J Tub — 1 (4) journals

(m) Operational — (5)

BMJ — 1 Tubercle — 4. (5)

(n) Miscellaneous — (23); 7 in 2 journals

NAPT Bulletin — 1 Bull. WHO. — 9

Tubercle — 4 IJMR — 4

Ind J Tub. — 5 Ind J Chest Dis. — 1

Lancet. — 2 Amer. Rev. Resp. Dis. — 1

Advances in TB. — 1 Textbook of TB - TAI. — 1 (30) journals

WHO/TB/80 — 1.

Some ref:

Oct 1955 – at GOI request, WHO sponsored visit by 3 BMRC reps to advise on studies designed to provide info re on mass domiciliary applic of chemotherapy in Rx of pul TB. (Based on earlier work in missions UNITS & N. Delhi TB sanatorium in response to social need, a political-economic decision was made by GOI to provide domicil. Rx, need for national, low cost feasible appr. – research was called in to prove this). This was a prob. of great imp., Since Then there were 23,000 beds for TB in India & est. 1½ million infected pts (prob in absolute no's has doubled – make a table.

1947, 5
55,
96,)

Authorities were disturbed by the possibility that suppt Rx might be inadequate & that a high proportion of pts might become chronic excretors of drug resistant org's. – an old fear – resurging in RNTP! Also sanatoria background of TB advisers/specialists) & was felt that this might pose a serious public health risk if domiciliary chemotherapy were widespread. BMRC reps (Dr J. G. Scadding, Dr P D'Arcy Hart & Dr Wallace Fox) had a series of discs in India & WHO authorities. Agreed that in Knowledge then available, it would be premature to begin mass domiciliary applic of chemotherapy, even in a limited area. Limitations of 'knowledge' – whose knowledge is superior – practitioner – Theoretic – pts. decided to undertake a controlled comparative study of Rx of pts at home & in sanatoria & to foll. up. fam. contacts. Pts to be admitted to study from among those routinely faced by chest clinic service of a large city. To implement this TCC was established in Madras in 1956 as a 5 year project under joint auspices by ICMR, Govt of TN, WHO & BMRC. Thus the initiative was the pol. decision of GOI.

Dr C P , Prof V Ramalingaswamy of ICMR, Dr PV Benjamin Advisor TB GOI, Col Sanjeevan Lal, Dir Med Services TN, Dr C Mani Reg. Dir WHO - SEARO played key roles in estab. of centre on a fine footing.

Arrangement of ICMR + WHO, BMRC undertook overall responsibility for the studies. WHO provided 8 international staff members, equip for X-ray + lab sections, vehicles for transport for domiciliary services - supplies & included anti TB drugs X-ray films + lab chemicals.

TN Govt provided 40 staff members initially, 100 sanctioned beds + newly constructed premises for the Centre. + 50% expenditure on certain items (underwritten by State Govt). ICMR provided the rest of the money + several medical, technical + admin. staff members. 61-62 - crisis - proposed to close centre / move it to Bangalore - overcome & in 1964 it became a permanent ICMR estab. In April 1966 TN Govt employees were absorbed by ICMR. In '81 centre largely funded by ICMR. (funds from Min of H+FW, GOI), Land from TN Govt + on smaller scale from WHO.

1 1/4 hectares campus + 1 block of 4 TN govt owned on long lease to ICMR. 2nd & storeyed bldg - constr by ICMR in 1978.

Activities started in 1956 under dynamic leadership of Wallace Fox. 1961 - Dr Hugh Stott succeeded Dr Fox as WHO Senior MO. + guided research for 6 yrs., Dr NK Menon (FRCP - astute clinician & research bent of mind) assumed charge in 1964 + was first National Director. Succeeded by Dr SP Tripathy in Sept 1969. (MD, FAMS) ? bacteriologist (by Dr R. Prabhakar, MD, bacteriology Div. became Div-in-charge in 1983, when Dr SPT was made Sr DDG, ICMR, Div of Epidemiology + Com. Dis, Dr Prabhakar was Director till. became Fac. during this time, end 1995 // Dr Paramasivan, PhD from Div of Bacteriology was made acting Div.) CN Long term appts of Div's + Research oriented people since it was under ICMR. — as against NTI & C CHS.

Conforming c̄ WHO policy reg. provision of technical expertise, WHO staff members were withdrawn when national counterparts were trained

Choice of counterparts by Westerners — often based on social compatibility

Last WHO bacteriologist + MO left in end 1965, WHO Sr MO in July 1966, + LT in 1970. However it still provides expertise + supplies not available in India.

From '56–'69 work guided + assessed by a Project Committee c̄ DG + 3 ICMR reps, DMS-TN, WHO + BMRC rep + Director. From 1970 on a Scientific Advisory Committee of eminent Indian multidisciplinary scientists + TB workers – guide / review the research work

Ethical Committee constituted in 1976.

BMRC – notable contribution in Scientific dirn by Dr P D'Arcy Hart, Dr Wallace Fox, Dr Ian Sutherland + Dr D A Mitchison. Close relt maintained c̄ periodic short term consultant visits by Prof Fox (MRC TB & Chest Dis Unit, London) + Prof. Mitchison, MRC Unit for Lab. studies in TB. Recent links c̄ National Institute of Allergy + Infectious Diseases, Bethesda, USA. (immunity in filarial pts) (International research community – epistemic communities)

[basic pol-eco-social obj.] Main aim of studies at centre – to evolve inexpensive, effective, practical methods of Rx of TB pts in India – however work has resulted in invaluable knowledge of principles of chemotherapy + bacteriology of TB. Research findings have had world wide acknowledgment + some have had a great impact on formulⁿ of TB control progs in Asia, Africa, S. America + parts of Europe. eg.

a) value of domiciliary Rx c̄out added risk to fam. contacts

b) supervised intermittent chemotherapy – esp. for urban areas + large cities

c) Short course regimens.

Since most pts do not take drugs regularly.

d) for pts in semi-urban areas, not nearby chest clinics, TRC investigating mobile clinics in collabor. c Govt TB Sanatorium, Tambaram.

While there are many effective chemoth. regimens – satisfactory results are not attained so far under progr. cond's. – reasons are poor case holding + irregularity in self administration ∴ operational studies initiated since 1976 c Inst. of Chest Dis, Madras, IRMH + Prof W. Fox. – demonstr. value of more personal appr. of home visit by health visitor as against posting a letter in retrieving defaulters + method of obtaining accurate home addresses (by writing a letter to a neighbour asking for correct address)

clinical v. public health appr.

Also studies of extrapul TB – TB spine, TB meningitis, TB lymphadenitis.

In 1978 GOTN granted 1 hectare of land on long lease + ICMR constr. 4 storeyed bldg for labs + stati. centre. + ICMR TPT + ICMR – IRMS (Madras Chapter)

Evolving objectives of research progr. of TCC/TRC (by studying selected grps of pts intensively)

1. To obtain unimpeachable info. on value of chemoth. at home in comparison c the same chemoth in a sanatorium, in pts c infectious pul TB.
2. To obtain epidem. info. on TB in fam. contacts.
3. To carry out controlled clinical trials on chemoth. of TB in infectious pts living at home in order to evolve inexpensive effective + acceptable drug regimens
4. To study intensively bacteriology of TB.
5. To train national staff as well as staff from elsewhere in region in methodology of contr. cl. trials + bacteriology of TB.
6. Apply prin. of contr. cl. trials to extrapul. TB.
7. study metabolism of anti TB drugs in Indian pts.
8. " immunology of TB
9. ctr. reference lab. for bacteriology of TB in region.
10. ctr. epidem. unit for TB in Indian cond.

Are the directors active researchers or political appointees
Why do good researchers leave — NSP, JOT, TRC / NTI
Need to build up a research culture & tradition

Total staff strength 300. Of these 84
4 subcentres in city since 1970.
Pts come from radius of 10 km for centre.

Leprosy

On the basis of experience gained in chemotherapy of TB it was presumed that multiple drug therapy is essential for achieving success in bacteriologically positive lepromatous pts.

The bacteriology lab. serves as a reference lab. for centres abroad.
Immunology section started in 1974 — grown into a full fledged dept.
WHO gave 6 vehicles (1 Volkswagen, 3 Renault, 2 ambulance
external agencies always prefer European goods
& source of marketing their products.
4 centre bought 10.

Achievements:

Functioning of — PTD

Efficacy of Home Treatment — Also linked to economics.

economics of pt + economics of country.

The functioning of the centre is largely linked ē the economics of the TB problem in India. ½ million people die of TB every year while over 8 million suffer incl. 3 mill. who are infectious + spread Kochs.

Estimated economic loss to the nation d/o death of 500,000 annually (considering the cost of bringing up to the age of 18) is abt Rs 1,500 crores + the loss d/o disablement of 8 million sufferers is abt Rs 300 crores. Thus total estimated ec. loss from death + disablement d/o TB is abt Rs 1,800 crores/yr. From the economic point of view alone there is an urgent need to combat the disease on a war footing by launching efficient + energetic control measures on a country wide scale. In this context the economics of sanatorium Rx compared ē domiciliary Rx assumes imp.

With the capital outlay upto construct + equip a sanatorium ē 10 beds it is possible to build + equip a clinic ē can handle on a domiciliary basis an annual case load of 1000 new cases. Further with the expenditure incurred in treating one patient in the sanatorium, it is possible to treat 15 patients on a domiciliary basis through a well organised clinic service. In other words the expenditure involved in organising mass domiciliary Rx is only 1% of the cost of sanatorium treatment in capital outlay + about 7% in recurring expenditure. From the economic point of view therefore there is no doubt that for the control of TB we should embark on clinic construction + domiciliary Rx rather than on sanatorium construction + Rx.

∴ Classic Madras Study done

- pts ↑ previously unRxed sp +ve pul TB admitted
- from poorest sections in Madras ↑ overcrowded houses + low nutritional status
- prescribed std oral regimen of PAS + INH for 1 yr
½ Rxed at home on ambulatory, outpt basis + ½ in Govt TB sanatorium in Tambaram.
- little diff found bet 2 grps in immediate therapeutic response, assessed in terms of radiographic improvement, cavity closure + bacteriological quiescence at the end of 1 yr Rx + in the likelihood of relapse over a 4 year period of follow up. No evidence that dietary intake or physical activity of pts materially improved the response to Rx. Intensive follow up of fam. contacts of pts over a 5 yr period showed that they were at no greater risk of dev. TB than contacts of sanatorium pts. Indeed the main risk to contacts in both series was before Dx + start of Rx, children below 5 being esp. vulnerable. These findings proved conclusively that dom. Rx can be just as effective in sp +ve pts + as safe to their contacts as sanatorium Rx. Thus rest, diet, ocean + nursing are remarkably unimportant, provided adequate chemotherapy is prescribed + taken by pt.

These findings revolutionised the approach to Rx of TB. Dom Rx meant substantial ↓ in capital expenditure as well as in cost of Rx per patient. Bed shortage in sanatoria were no longer a limiting factor. Pts in rural areas, far from sanatoria could also be Rxed. Mass chemoth prog became feasible. Dom. chemoth became the shibboleth of TB control progs in India + other developing countries.

(2) Studies of self administered daily chemoth. regimens

Apart from organisational cost of Rx, one has to consider cost of drugs prescribed. Well known triple drug regimen of SHPAS daily for 6 mths followed by H+PAS daily for 6 mths is virtually 100% effective.

(From INH alone, they have talked of effectivity of all possible regimens — criteria for effectivity & effectivity in proper conditions are imp. to consider.)

∴ necessary to evolve inexpensive, effective, non toxic regimens.

INH alone — INH is the most effective, least toxic, least expensive anti TB drug. Since regimens of INH alone were unwittingly being used in many Rx centres in India, it was decided to investigate the efficacy of, in relation to SR of, H+PAS, in a controlled study — H, 400 mg daily — 73% efficacy.

PAS+H — 91%.

↑ H to 650 mg/day did not ↑ efficacy.

Findings emphasised needs of 2 drug regimen for newly detected pts in the sp.

T+H Main adv. of H alone is that it is inexpensive.

A 2 drug regimen is not much more inexpensive is T+H.

1 yr supply of T+H costs 1/10th as much as PAS+H. Controlled study showed that it was therapeutically as effective ∴ has been incorporated into NTP.

(3) Supervised intermittent chemotherapy. Centre discovered + reported for the first time irregularity in self administration of drugs in pts who were otherwise considered fully cooperative. Problem can be overcome only by supervising the administration of drugs. Daily supervision is impractical under domiciliary conditions — might be possible to organise supervised admn of drugs at less frequent intervals — once a twice a wk.

S 1gm + INH 650 mg together as single dose twice wkly
with supervision of a clinic nurse — 94% efficacy
self administered PAS + H — 85% efficacy
"cost 1/4", is highly effective + physician knows exactly how
much chemotherapy the pt received.
The value of this has been confirmed by several multipolar

Once a week SH — substantially inferior to twice wkly
Addition of 4 wk course of daily SH to once wkly rodent
as effective as biweekly regimen in slow inactivators but
substantially less effective in rapid inactivators of INH. Since the
latter form 40% of pop": in Hadras operational adv. offset by
lower efficacy. Addition of PAS failed to compensate for INH
inadequacy in rapid inactivators ∴ research directed at
evolving regimens containing slow release preps of INH (matrix
INH) & could compensate for def. of INH in once wkly regime.

PAS + H (thyldosel) biweekly — as effective as daily self administered
regimen of PAS + H. This is encouraging as it can be employed in
rural areas where injection facilities are limited.

E + H 3 supervised intermittent regimens of E + H were compared
to oral self administered regimen of E + H daily. Favourable response
in 88% to 96% of pts in biwkly or daily R. Almost all pts had
roadiographic improvement & in 50% cavity closure. Relapse rates
9% in daily regimen & bet 16% & 20% in 2 biweekly regimens
E + H once wkly was unsatisfactory both in response at 1 yr (75%)
& relapses in 4 yr period (54%)
Search: This direction still continues.

Slow Release INH – Matrix Isoniazid, Smith + Nephew HS82
failure to confer any benefit in rapid inactivators

Dur of Prim. Chemotherapy

Optimum dur of chemoth – 2 yrs c̄ std drugs. Combined chemotherapy usually administered for 2 yrs in technically advanced countries. TRC's research showed that if chemoth. is limited to one year – likelyhood of relapse during subsequent 4 yr follup varied bet 5–15%. Most relapses occurred in 1st year of followup & nearly 80% c̄ INH sensitive organisms. Relapse can be prevented in pts c̄ no residual cavitation at 1 yr by giving INH alone daily x 2nd yr or 2 drug regimen S + H once wkly for 6 mths. In pts c̄ residual cavitation at 1 yr (approx 1/3rd of pts) S + H once a week x 2nd year – found satisfactory in preventing relapses.

SCC c̄ ↑ evidence that pts become irregular in drug taking in later mths of 1 yr Rx, there was urgent need for effective SCC in developing countries. ↓ dur can be expected to ↓ defaulter rate in NTP. In last decade several effective 6–8 mth regimens were developed. Most incl. R. c̄ is prohibitively costly & unsuitable for mass applic'.

Rif 5m Series of studies started in 1974 towards SCC.

a) R + S + H + P daily x 2 mths foll S + H + P biwkly x 3 mths.

b) Rif. 7m as above but biwkly phase ↑ 5 mths.

c) Non Rif. 7m – As in (b) but c̄out R.

All 3 highly effective in pts c̄ drug sensitive org's. Sp. conversion v. rapid & complete resolution of X ray shadows in many pts. – all had a favourable response at end of Rx. Relapse rates upto 4 yrs – 6% Rif 5m, 2% Rif 7m, 9% in non Rif. 7m. Thus

[redacted]

overall efficacy (How is efficacy cal)
was 95%, 98% + 90%. ē compare favourably ē 75-80% overall efficacy ē std 12 mth regimen
Findings of non R regimen are particularly encouraging for developing countries.

ISM. The foll studies initiated

R/3 – R+S+H+P daily for 3 mths

R/5 – as R/3 but foll by S+H+P biweekly x 2 mths

2/5 – as R/~~5~~ but not R

Prelim findings suggest that R/5 is highly effective + has low relapse rate. 2/5 also highly effective but has a moderate relapse rate (10-15%)

Reserve Regimens

Pts failing on primary regimens ē H almost always end up having H-resistant cultures. Reserve regimens

a) daily S + P + cycloserine + ethionamide or] expensive + rel. toxic.
P + C + E

b) considering efficacy, toxicity + acceptability daily regimen of S+PAS less satisfactory than S+T.

~~Re TB~~

Sputum smears ē mang't of pul TB – Response to a y's R ē SR can be predicted ē confidence by results of sp. smear ex's at 6 wks or any subsequent mth + only a marginal gain is obtd from culture ex's in assessment of progress during chemoth.

C + S cost 10-20 times as much as sp test. Many have to be relieved when SCC intro to NTP ∴ of appreciable inci of sm +, culture -ve results in early mths of R ē SCC whether or not R is used (eg 22% + 16% resp at 3 mths) unlike SR

[redacted] [redacted]

* Manag. of Spinal TB — Started May 1975 – 10 yr study.

* Study of adverse reactions — due to higher dose in intermittent therapy.

S 0.75 mg. better esp. in those < 40 yr., giddiness also, vestibular dysfunction

H per. neuropathy — give 6 mg pyridoxine c̄ every dose

* chemoprophylaxis in children 1 in 4 ~~ch~~, under 5 child contacts of 400 .. dev. TB due in 5 yrs i.v. vulnerable.

c̄ INH syp 4.5–6 mg/kg — attack rate of TB in 5 yr follow-up considerably less (9 of 111) in INH series than in placebo syp 21 of 116. Prophylactic effect of H was 60%.

* TBM — SHR x 2 mths as in pts foll by
1–12 yrs age
EHS x 4 mths
EH x 6 mths

At 1 yr – 37% of 54 pts – complete recovery
24% recovered c̄ mild / moderate residual damage
15% severe residual damage
24% died.

* Operational studies pertaining to NTP.

a) prac. prob – poor accuracy of home addresses — new efficient sys giving a card to a pt with a written request to a neighbour / friend / relative to enter the pt's accurate home address on it. Sys. intro into several clinics in Madras + Adviser in TB to GOI indicated willingness to recommend use of sys in all urban areas.

b) Home visit by HE visitor more effective than postal reminder.

c) Mobile clinics for semiurban areas.

*

Tech - TCC

1970 - 71 - Report on Research Activities

a) Oral intermittent chemotherapy with PAS plus isoniazid.

efficacy both short term & long term of a twice weekly regimen of SM + high dosage INH in the Rx of newly diagd PulTB is well established by earlier studies. ∴ if limited facilities for giving inj is used once oral therapy tried.

2 wks daily supervised S(1G), PAS(6g) INH 6or6mg) followed by 50 shs twice wkly PAS + high dosage INH (PHTW) or daily PAS + low dosage INH

- Intermittent regimen found to be as effective therapeutically (87%). Total daily dosage of PAS in twice wkly regimen was less than a third than daily regimen ∴ toxicity less, also cheaper cost ∴ effective for NTP

ICMR - Tech. Institutions

ICMR, NDelhi

a) Meeting of Subgroup on TB, 27/5/82

Chaired by Dr Gothi, Dir, NDelhi TB Centre - To finalise protocol for study on 'operational monitoring of NTP thru sleeper epidem. tools viz
i) infection rate in children below 5 years
ii) Sputum positivity rate among symptomatics
prep. by NTI (Dr Chandrashekhar) Dir - in charge.
Operational monitoring cannot be done thru epidem. tools, but thru reports & NTI has been doing since many years.
WHO Seminar on "Eval of TB control Progs" in Copenhagen in June '72
"epidem. surveillance consists in the continuous follow up thru' appropriate indices of the magnitude of TB prob. in the pop" & its trends" (another reference where WHO went off the mark! ? Its credentials to give advice & developing nations - ? analyse of country of origin of members of TB Divs at HQ & WHO (SEARO)
"For a chr. dis like TB repted estimates of the epidem. situ. by measurement of a suitable index at regular intervals would be more desirable than continuous follow up. this is (a) changes from year to year are so small & require elaborate machinery to measure them. (b) feedback should may not influence shape & methodology of NTP (c) interval for repted follow up of tuberculin situ can be arbitrarily taken as 5 yrs" in Bangkok study, prevalence of bacillary cases showed a decline in trend in younger age grps over a period of 5 yrs.
Prev of bacillary dis does not represent the most recent epidem. situ. since these cases have been infected a long time ago. ∴ more desirable to study prev of inf. in 0-9 yr age grp & thereby get on the most recent changes in TB epidem. Decline in trend in prev of inf was reported in younger age grps by Bangkok study over a period of 5 yrs
Hence, practical aim at repted estimates of prev of TB inf in 0-9 yr age grp in community on a countrywide basis at 5 yr intervals to find out any poss. decline in the trend of the dis.

6 zones, 20,000 children 0-9 yr., PPD RT 23 c Tween 80
expected that 12,000 - 15,000 unvaccinated reactor children would
be available for analysis. 19 mth study incl. 4 mths trg at NTI
for 6 survey teams — started 5 July

ICMR
(b) Meeting of TB subgrp on 21/10/82, to finalise details of proposed multi-
-centric study of SCC under field condi's
(Public sector superiority in TB research ie in policy making.
However in real life drug co's + private practitioners alter / distort
the implementation: tho they may have good pts the negative consequences
of their activities / involvement need disc.)
Prof Ramalingaswami, DG ICMR stressed urgency + relevance of study
to NTP + 20 point progr. Stated that Planning Commission was likely to
allocate funds for intro. of SCC on a mass - scale (many editors
? provide checks + balances ? also delay action or ensure
well thought out action) — Study may not give sol's but may
raise new questions) Need to keep drug costs to lowest min. c high
efficacy so that c limited funds available, benefits of SCC could be
available to largest no of pts. Study shd be conducted using existing
health services infrastructure c only small additional inputs for
monitoring / data collection. Findings will then have a bearing on
applicability of regimens under routine conds. Regimens —
a) S, H, R, Z biweekly x 2 mths, RH biweekly x 4 mths - supervised
To be employed in urban areas where supervised intermittent
chemoth. could be organised.
(Findings of this study — imp. for current RNTP debate.
Also: to pts pts views rep. supervised therap.)

b) $(R,H,P)_2$ + $(RH)_4$ - self administered for rural areas

c) SHRP daily x 1 mth, + TH daily x 7 mths - at NTI

Dr S. Radhakrishna to coordinate study. Participant centres

a) TB demo & T.C., Agra - Dr ML Mehrotra - in 3 dts

b) NTI, B'lore - Dr A Banerjee - No. of dts to give intake of 200 cases/yr.

c) Lady Wellington TB Clinic - Dr Iqbal Begum, JD(TB) 60 K.

d) TBT, Tirunelvelee, Taluk, (? Dr Mayurnath)

Dr SP Tripathy present.

Study to start on 1st Jan 1983. Recommended that IRMS, Madras chapter & TRC to visit project areas & supervise conduct of studies.

Role of Institutions - TCC/TRC Tech. TCC

TRC Madras - Report on Research Activities during 1994, ICMR, NDelhi

Operational R. studies completed

1. Feasibility of utilis of villagers in implementing DTP - a pilot study '89-94
Sriperumbudur Taluk - 44 villages, 26,413 pop^n, Chengleput Dist.
Usage 'PREPARE' training class for PHC. They were trained by an MO, SW + Nurse to identify chest symptomatics + collect sputum specimens for transportation to Centre. 5 yr study period showed that it was possible to train illiterate class for case finding and drug delivery at the door step of pts. Can be utilised in rural areas. Villagers expected compliance. prem. letter. Initial enthusiasm ↓ not sustained ↑ quality sp. exams.
(diff. methods of Knowledge gained - research, Tech)

2. Utilis^n of NSS volunteers to augment case holding in Madurai city TB prog.
Male student volunteers from an Arts College utilised for (a) drug distribution thro' centres close to their home (b) defaulter retrieval / home visit + same week + successive week.
Briefing given + field trg in house visits + in motivation of pts. Willingness + ability to communicate assessed
8 mth. SCC (2EHRZ$_7$/6EH$_7$ - once weekly drug supply
23 pts admitted to study - due 792 drug collections
In 80% of those occasions pts collected drugs on date
Pts returned by students on 63 occasions
In all 83% of pts completed > 80% of Rx
Thus feasible to use student force! Where case finding activity had been practically nil

3. Feasibility of involving literate youth for case finding in TB in a Tribal area in TN. - To ascertain participation in a tribal area (Javadu Hills) study investigated feasibility of involving literate youth (12/24) volunteers in DTP - for identification of symptomatics, sp. collection, drug distribution to sputum + documentation of drug supply. 4 random SC's in Tamanamarathur PHC chosen. Incl interior + roadside hamlets. 4 SC's covered 61 hamlets ≈ 11,000 pop^n. Total of 12 sp. true PT pts started on Rx
Eligible pop 5755; No. of chest symptomatics identified by LY - 338 (5.9%), among sp. specimens examined AFB +ve - 12 (3.6%) of 338 specimens. Rx initiated for LY drug assistants satisfactorily except during monsoon.

4 Feasibility of involving NGO's in TB Control Progs.

In 1994, TRC & TN Slum Clearance Board (TNSCB) invoked & trained NGO's to explore done. Trg of grass root level workers / animators on 21/12/94 (a) to disseminate info on TB to public thru' com. awareness (b) equip & skills to identify chest symptomatics + refer to TRC for investn (c) evolve strategies for ensuring Rx compliance for entire Rx period thru measures the NGO's can evolve themselves eg village head leaders, youth, women etc (case holding)

progs (CF)

3 com. awareness campaigns conducted at YMCA (Otteri), Arka Nivas (Abhiramapuram) + Gems Found^n (Velachery) 40 slum dwellers, 50 maids + 50 slum dwellers resp. participated NGO response encouraging. Could serve as an effective task force. Could be trained to supplement TB control activities of Govt.

—X—

Several other clinical trials etc.

- Quinolones + combs of beta-lactam antibiotics & beta-lactamase inhibitors - appear the most promising among new drugs & anti-mycobacterial activity. Ofloxacin + Sulbactam / ampicillin alone & in comb^n have to be evaluated further for bactericidal action on actively growing (log-phase) + dormant & semi-dormant (stationary phase) TB bacilli - could be useful esp. in multidrug
- Rifabutin, Clofazimine

- Bioavailability of anti TB drugs from triple drug formulations - Refer 125 SCI - found as good as with drugs in its bioavailability indices.

Surveillance of indi's infected c̄ HIV for devⁿ of TB. (1989-99)
A longitudinal cohort study - since July 1989
HIV +ves on ELISA testing from Madras, Vellore & Pondicherry included.
Regd at TRC - 6 mthly followup c̄ clinical exⁿ, sociol. assessⁿ + detailed investⁿ. Fam. members, spouse & sexual partners regd & followed up to study pattern of HIV transmission
Cohort - 238 HIV +'s of whom 8 96 had TB (82 at regisⁿ & 14 during followup) - & Rxed c̄ 2EHRZ7/7RH7 from TRC or routine 8 mth SCC. 4 had MDR.
41 pts died over 54 mths followup, of whom 26 had TB. ∴ Superinfⁿ c̄ TB appears to ↑ the risk of mortality at least 4 times in HIV infected cases. Various causes of death were ascertained.

Epidem. studies

a) Devⁿ of surveillance methodology for TB. 1990-2000
b) To identify simple, inexpensive tool for TB surveillance in community
Studying a) Age sp. prevalence of infection & its trend
b) Age sp. rates of dis prevalence, inc + trend.
c) Proportion of chronic excretors among prevalence cases + their drug sensitivity status

An. Rep. 1990-91 - methodology
Planned intake of 100,000 not complete. dislodge of x-ray units
30 mthly selective followup - could not be taken up.
1st resurvey initiated.

In all - 172 sp. +ve sp +ve cases ∆sed during 1994 - of these 72 were from follow-up rounds & rest from resurvey.
- 59% cases +ve only on culture, 13% +ve on smear only + -ve on culture
- Of 135 culture +ves for whom drug sensitivity results were available 22 had a H/o previous Rx. 90% cultures were sensitive. MDR seen only in 3
- 636 symptomatics regd in all PHC's + sp. collected. Of these 42 (7.2%) became sp +ve

Symptomatic + bacteriological status of X-ray cases in the community. (completed 1994)

In an epidemiological study for developing a methodology for surveillance of TB at Tiruvallur, White-ppn (aged 10 yrs or more) is screened by MMR once in 3 yrs. And is classified as X-ray cases of TB if they have

a) 'tuberculous' abnormality on a single occasion by 2 independent readers & are Sp +ve, or

b) 'tuberculous' abnormality on 2 consecutive occasions by at least one reader & are Sp. +ve

The following guidelines (non-mandatory options) were also adopted for referring these pts for Rx in consultation with the JD for TB (Directorate of Medical Services)

1. Adequately Rx'ed, asymptomatic, leave them alone

2. " " & symptomatic, (as per DTP definition) collect Sp. give antibiotic, review after 2 wks. If smear is +ve, restart Rx. If -ve, collect Sp. & review after 1 mth. If still symptomatic & Sp +ve - Rx as X-ray case.

3a. Irregularly Rx'ed, or on Rx elsewhere & symptomatic or Rx discontinued within last 2 mths. Continue Rx

3b. Irregularly Rx'ed > 2 mths ago & asymptomatic: Wait for results & treat as in (5) below

4. UnRx'ed, symptomatic: Initiate Rx after collecting one more specimen of sputum, & adequate motivation. Make provision for pt to continue Rx at nearest centre.

5. UnRx'ed, asymptomatic. Collect Sp. + & review after 2 wks. If Sp +ve or if symptoms develop initiate Rx.

Abovelay cases detected in survey & satisfying either of definitions were visited in their houses & motivated to attend the Passive case Finding centre (PCFC) at Tiruvallore, in order that therapy may be

examined by a MO & their clinical status documented before they are referred for Rx. Pilot study undertaken to document symptomatic status + proportion of x-ray cases liable to progress to bacillary status within a follow-up period of 3 mths.

306 cases reported who had been examined by MO. One specimen of sputum was collected for ex^n. by smear + culture at time of clinical exam^n. - there were 9% symptomatics among the 306 at time of clinical exam^n. 25 of the 306 x-ray cases had progressed to bacillary status from abacillary.

Total of 77 cases would have been Rxed by management option of these 9 were bacillary & only 6 of these had been ref. for Rx on clinical grounds. Of those 77 cases 33 were considered to be normal by the clinicians & 18 were Xsed as having non TB lung dx.

IMP

Present def^n of x-ray cases foll. in the survey leads to a gross over-estimate of the burden of abacillary cases. Empirical management guidelines also not over-ridden even 1/3rd of those cases & clinical sense tells that only 35 (11%) of 306 cases needed to be Rxed.

TRC, Madras, Report on Research Activities during 1993

1. Pt. to patient motivation - an additional effort to improve compliance (completed 1991-93) Using a pt regular for Rx to talk to a new pt. Motiv^n done by RTOD pts in addition to clinic staff motiv^n, on admission & at 1 & 4 mths.

All 297 pts admitted to study completed full Rx. Excluding 16 pts (4 died, 12 had change of Rx) there were 281 pts in the analysis. Of these 106 were lost to Rx.

Rx read	Pr. to Pr. motivn (PM)		Routine Motivn (RM)		
	No.	%	No.	%	
≥ 90	57	40	55	40	
75-89	22	15	24	17	ie abt much diff bet the 2
< 75	6	4	11	8	
Lost	58	41	48	35	
Total pts	143	100	138	100	

Distn of 'lost' pts acc. to mth of Rx

Month lost	PM		RM		Total		
	No.	%	No.	%	No.	%	
1	17	29	8	17	25	24	ie nearly 60% lost the Rx in first/last of Rx in both grps
2	17	29	21	44	38	36	
3	9	16	12	25	21	20	
4	4	7	5	10	9	8	
5	10	17	2	4	12	11	
6	1	2	0	0	1	1	
ATT	58	100	48	100	106	100.	

Shows that pr. to pr. motivn has not resulted in any greater improvement in pt compliance. However these findings may have to be confirmed by replicating the study.

2. Health seeking Behavior among tribal community + their acceptability of health facilities in W. Godavari dist. A.P.
(completed 1983)

In Buttayagudem Mandal - pop: 46,489., of ē 58% (27,000) tribal. Total no. of villages in mandal is 53 of ē 34 predominantly occupied by tribal communities, covering a pop - of 18,000 were selected. A random sample of 429 households (abt 10%) selected for study. Head of household or next responsible person interviewed using a questionnaire in Telugu ē ITDA (Integrated Tribal Dev - Agency) school teachers. Those teachers were trained by the Central staff for this work.

Tho' 67% of respondents were illiterates + 61% had superstitious beliefs (½) yet 86% approached available health facilities (personnel) when they fell sick. This appears to be contrary to the general belief that tribals favour indigenous medicines (6%), faith healing (13%) etc

Q to Dr Prabhakar / Dr Tripathy

① Origin of SCC study – was it ∵ of intro of TB centre 20 pt. progr. & Dr SPT's 'shift to Delhi.

Tech TCC.

TRC, Madras: Report on Research Activities during 1992, ICMR Bull.
(Contents of this report shd not be reviewed, abstracted or quoted)

* Short Course Chemotherapy under DTP (completed study '83-92)

SCC initiated in 18 Dts, over 10 States, during Mar 1983 – March 1985. TRC given resp. of implemen^n + monitoring. Periodic Analysis based on returns rcd, presented in Annual Reports 1983 onwards.

1992 – ~~Stopped~~ monitoring 14 dists, based on SAC advice, these transferred to NTI.

Brief review of main findings of 18 dists are:

TRC – 1983 report

Efficacy of several SCC regimens has been well estab. in controlled clinical trials. However their acceptability & efficiency under progr. conds have not been studied so far. In order to assess these a study was started in March 1983 as part of regular DTP in N. Arcot Dt. SCC initiated in a phased manner in dist – all medical institutions incl PHC's were covered by Aug 1983. Progr. directly administered by DTC. Centre staff visit various institutions periodically to guide staff in implemen^n of regimen, clarify doubts, obtain data on progress of scheme, case finding activity + pt compliance.

All new sputum Pt cases offered SCC. – 2RHZ/4RH – twice wkly 6 mths regimen R 450mg, INH 600mg, Z 2g for first 2 mths, followed by R – 450mg + INH 600mg x 4 mths. – Supervised administration. Those unable to attend the clinic given SR.

Drugs packed as individual doses & supplied at regular visits to participating clinics. Staining, reagents supplied as necessary. Centre helps in repair & maintenance of microscopes & X-ray machines + arranges for staff training with a view to improving CF activity.

As drug packets supplied to some centres may be stored for long periods at room temp, efforts are made to replace old stocks by fresh drug packets. Drug Assays of drugs from several centres after varying periods of storage carried out at Centre Bombay. Lab to detect loss in potency

Sputum specimens before start of chemoth & at end of Rx in a few centres & sent for smear, C+S to TRC.

Upto end year (1993) - 1044 pts prescribed SCC Impleman of prop & acceptance of regimen by pts have been encouraging

Proposed to conduct DR on NTP. Also proposed to monitor entry of SCC of 6-8 mths duration in 7 selected dts in 7 States phased manner.

(extension of research atmosphere & facilities at field

To check annual budgets of TRC & for SCC study

To check reg. SCC monitoring & NTI)

1982 Report

In prefce - Dev of effective chemotherap. regimens for PT continues to be main objective of the centre - 3 SCC studied undertaken 1st 2 investigated regimens in initial daily phase of Rx in R for 2-3 mths. Current study employs fully intermittent regimens of mid. duration that are substantially less expensive. This feature is of considerable imp. from pt. of view of finance when regimens are applied in national prgm.

Regimens in proven efficacy in controlled cl. trials are usually much less effective under field conds. There is ∴ a need to estab. the efficacy of chemotherapeutic regimens under prgm conds before they can be applied on a national scale. TRC has finalised a plan for undertaking pilot projects in selected Dts in the country - NARKOT chosen for SCC in DTP. in collabor in GOI & GOTN & is expected to be a forerunner & trendsetter for simi. studies in other states

1981, TRC - Report on Research Activities - Silver Jubilee Year.

Preface - SP Tripathy, MD FAMS

(*) Inclusion of TB Control in the Revised 20 Point Prog has provided the necessary fillip to the NTP. The research progr. of the TRC has accordingly been geared towards strengthening diff. components of the control progr. so that the Centre makes its due contrib. for HFA 2000

(+) Dr BNM Barua, Adviser in TB to GOI passed away this year.
SAC, TRC member.

(*) TRC Silver Jubilee
- Sri. B. Shankaranand, Union Minister for Health & FW.
Prof. V. Ramalingaswami - DG ICMR
- Ongoing controlled trial on scc. for pul. TB in adults at pts from Madras, Bilaspur & Tambaram - to compare efficacies of several fully intermittent 6 mth regimens in vary widely in cost.
- Keeping in mind that operational aspects such as ability to follow up cases for long durations have considerable impact on the effectiveness of the TB control progr. - TRC has collaborative studies to assess accuracy of home addresses obtd from adult pts & initiate measures to improve defaulter retrieval
- est. an Epidemiology Unit to coordinate studies on TB & Leprosy by ICMR in Tiruvallur. - plan to develop it into an epidem. centre.
- Bacteriology, biochem & immunology labs continue - are being modernised

* Clinical study completed - prescription of medicaments to pts at their first attendance at chest clinics - 956 pts in large chest clinic studied
a) prescrip. of medicaments on day of registr. necessary only in 47 (5%),
b) incl. 9 (0.9%) adv. immed. attention
c) 906 (95%) physician did not consider it necessary to prescribe medicaments on first day.
d) of those 807 (89%) did not represent medicaments,
e) of 102 who did, only 30 (3.3% of 70%) persisted in regular & rec. medicaments

Thus it is possible to curb unnecessary medic. to a large extent & adverse consequences - a finding of significance for developing countries & urgent need to economise on use of scarce resources - to be opted elsewhere in India - but of relevance also to advanced countries

(*) Address Card

To the postman or any responsible person

O.P. No.

It is imp. for us to have the postal address of _____. We will often be writing letters to him reg. his health - It is essential that our letters shd reach him without delay. Please enter his complete & correct postal address on the reverse of this card.

Many thanks.

Acceptability over 95%, efficacy under study cond - obs 85%. Under study conditions - completed address cards available in about 95% cases. Diff. bet study cond & routine conds was however quite substantial (60 - 89% in 6 clinics i.e. av. 75.6%) & underlined the imp. of testing out all new procedures under real-life conds.

(*) 6 mth intermittent regimens - pharmacokinetic studies at TRC esh. that R, S, H, P given together daily for 2 mths had high bactericidal activity. A Hongkong study suggested that bactericidal activity would be just as high even if these drugs are given thrice or twice a week.

R - 15 mg/kg body wt, INH - 15 mg/kg, P 50 mg/kg.

S - 0.75 gm

Intermittent regimens - a) less expensive than daily Sch. (b) pt. compliance likely to be higher: less freq. of attendance necessary (c) adverse reac. likely to be less frequent

(*) Study of efficacy of BCG vaccine in preventing TB in fam. contacts
earlier TRC studies showed that children < 5 yrs who are family contacts
of pts with infectious pul TB are very vulnerable grp. 20-25% develop
active TB in a 5 yr period. Finding that intermittent chemoprophylaxis with
INH prevented dev. of active TB in contacts who were initially Tuberculin
negative suggested that BCG vaccine may also be effective as a prophylactic
measure in these contacts. BCG vaccine is less expensive than chemoprophy
toxic + much less diff. to operate. Study undertaken to assess protection
given by BCG vaccine to fam. contacts of infectious pts under Rx of TRC.

1 Eto

(*) Characteristics of strains of M. tuberculosis from pts in the BCG-Trial area

The Chingleput BCG-Trial - showed that BCG offered v. little protection against bacillary forms of TB. Further, despite high ARI, there was a low incidence of disease among those previously uninfected. This suggests that infection ~ TB bacilli rarely gave rise to frank primary dis. There was however a high incidence of TB among tuberculin true reactors, suggesting that TB is then resulted from break-down of existing TB foci - ie TB was d/t endogenous reactivation. It is likely that the low virulence of the South Indian strains of tubercle bacilli might be influencing the course of primary infection + the endogenous reactivation - years later. The few cases of TB post. prim. inf. might be d/t infection ~ strains of higher virulence. To test these hypotheses, strains of M. tuberculosis isolated from pts in the trial area who were initially tuberculin-positive (>16 mm) + those who were initially tuberculin-negative (0-7 mm) have been obtained. The virulence markers of these strains (eg virulence in guinea pig, phage type, sensitivity to Thiopene-2-carboxylic acid hydrazide) proposed to be studied.

(4) Study of non-tuberculous mycobacteria identified to species level.

Studies conducted in several recognised labs indicate that M. Tuberculosis is resp. for approx. 95-98% of human pul TB, other 2-5% being caused by other species of mycobacteria, although in some areas incidence of NTM (non-tuberculous mycobacteria) has been reported to be as high as 10%. NTM may have biological significance as many workers believe that infection with mycobacteria may cause immunity against TB. Hence important to know frequency with which such mycobacteria are isolated from clinical material + from the environment.

* pts on intermittent high dose (R) dev a reaction known as 'flu' syndrome'. Intravascular haemolysis is believed to be either the cause or result of the flu' syn.

* TB reported to be the most common cause of adrenal failure leading to Addisons dis in a large no of pts

Tech - TCC.

Ref ICMR, 1967, TCC – A Review of Research Activities 1956-66, ICMR, Medical Enclave, (Ansari Nagar), New Delhi 16, (See 1981 – Silver jub. report) TCC Started in 1956

* Since chemotherapy in INH alone was being used on an increasing scale in India, the efficacy of INH when used alone, was studied in relation to that of standard combined chemotherapy.

TCC – 3 main divs – a) lab & bacteriology & biochem

b) Statistical div & clinical div i.e. outpt & radiographic sections & a well organized domiciliary service. In addition 100 beds are at the Centre's disposal in the govt Sanatorium at Tambaram.

• 8 initial staff members belonged to WHO, the WHO Senior MO acted as Dir. of Centre till July 1964, when a national Director appointed by ICMR took over. In the same year TCC was made a permanent estab. under ICMR, staff employed by Madras State govt were taken over by ICMR w.e.f. 1/4/66.

All pts seen are ref. from the city's TB clinics or from EST dispensaries. During past 10 yrs, 2,300 pts were admitted for Rx & foll. up. of 5 yrs at TCC & all contacts of these pts were followed up for at least 1 yr.

During last 2 yrs – there was substantial addition to scientific staff made, no. of existing posts upgraded, separate bldgs constructed for biochem & x-ray section, additional wards to animal house & statistical section, upgraded need for TCC.

Efforts of TCC will continue to shed more light on principles of chemotherapy & would be of national & international interest as well as help in

* inexpensive, non-toxic, effective regimens evolved for more applicn in India & other developing countries.

Analysis of TCC / TRC Staff

Directors (1) W. Fox from BMRC (WHO)

(2) H. Stott (WHO)

(3) NK Menon, MBBS, MRCP, TDD, DTM+H (1964 -

(4) S.P. Tripathy, MBBS, MD (Microbiology) later FAMS, (

(5) R. Prabhakar, MBBS, MD (Microbiology)

(6) · Paramasivan (Microbiology) 1995 Nov? - Acting Dir.

a) Menon → Dir NTI (?1970) → Advisor in TB

→ WHO SEARO - Kathmandu.

b) SP. Tripathy → DDG ICMR → DG, ICMR → WHO-SEARO i/c Research
developed US links.

c) W Fox → BMRC - TB + LD Unit - maintained links c TCC / MCVI / formed Hong Kong.

Clinic (1) RH Andrews (WHO)

(2) JH Angel (WHO)

(3) JJY Dawson (WHO)

(4) CP Evans (WHO)

(5) A. Gerhardsen (WHO)

(6) C.M. Lomasney (WHO)

(7) Ibison (WHO)

(8) D. Ernberg (WHO)

(9) S.R. Kamat

(10) S.P. Ueba.

1967. 4 medico's. + 5 Sisters

(1) S. Velu BSc, MBBS, TDD.

(2) C.V. Ramakrishnan MBBS, TDD

(3) S. Devadatta, MBBS

(4) MOY Nazareth, MBBS

1971 7 medicos + 6 Sisters

2, 3 + 4 as above

(5) R. Parthasarathy, BSc, MBBS, TDD

(6) T. Santhadevi MBBS.

(7) V. Narayanan MBBS

(8) R. Uma Parvathy MBBS.

1972.

(7) above left. + replaced by G Suryakanth, MBBS

1973 Devadatta died after 15 yrs in TCC cl. studies, Narayanan left, replaced by
(6) D.C. Arumainayagam, MBBS + (7) Ravi Balasubramaniam, MBBS, DGO

1974 CV Ramakrishnan left - replaced by K Radha, MBBS.

1975 Dr. Ramakrishna Beck, Radha left.
Dr. Rathnasabapathy MBBS joined → Suryaprakash left.
Began to be called Div. of Chemotherapy
8:- Dr Manjula Datta MBBS joined.

→ Review
- Rapid growth.

1978 13 medical Staff. + 11 Others.
Shantha Devi did DTCD.
Manjula Datta " - DCH
+ Padma Ramachandran - BSc, MD, DCH. A Thomas, MD
VK Vijayan, MD, DTCD. NS. Rajeshwari MD.
A Balakrishnan MBBS

79 14 MD's - new ones RVSN Sarma MD
+18 Others. V Kumaraswamy - MD, MNAMS

'80 17, MD's + 24 Others.
new ones - A Balakrishnan MBBS, MS Jamadar MD, S Rama Krishnan MD
K Rajaram MBBS

Laboratory

1956-66 D.A. Mitchison (WHO), J.B. Selkon (WHO), E.M. Mackay-Scollay (WHO)

L. Eidus (WHO), E Holst (WHO), K.L. Thomas (WHO), P Hinchliffe (WHO)

8 Indians

1971 R. Prabhakar MD + 13 staff (c̄ 1 PhD) T.S. Vaidyanathan

1971 end " + 14 " "

1972 " + 15 " (c̄ 3 PhD's) G Raghupathi Sarma, Z Mathew, M. Naseema.

1973 " + 15 " (c̄ 4 ") " + Felicia Williams

1974 " + 13 " (" 2 ") Sarma & Naseema.

1975 " + 13 " (3 ") " + K Prema

1976 " + 13 " (3 ") " "

1977

1978 " + 19 " (2 ") Sarma + Prema Gurumurthy + 1 MD – Rajiswamy

Called Divn of Bacteriology, Biochemistry + Immunology

1979 " + 24 " (3 ") 1 MD + P. R. Narayanan PhD DIISc

1980 Div of Bacteriology –

" + 16 " (3 ") C N Parameswaran, N Selvakumar, M Naseema

Div of Biochem

G R Sarma PhD + 5 – 1 PhD – P Gurumurthy, 1 MD Rajiswamy.

Div of Immunology

P.R. Narayanan PhD, DIISc + 3

Institutional growth – Their linkages, infusion of project money, ↑ in staff + infrastr.

TRC seems to have maintained a more dynamic growth than NTI

Statistics

1956-66 → K. Ramachandran (no foreigners!)
N. Nataraja

1971 — PR Somasundaram, BA, Strat Dip ISI + 8 staff
1972 — " "
1973 — " + 7 "
1974 — " + 9
1975 — " + 9
1976 — " + "

→ ICMR Regional Statistical Bureau started by
S. Radhakrishna PhD, who was Asst Dir from 1971? earlier

Library — Khurshead Ara Begum - BA BLibSc.

~~Administration~~

TRC Studies — Ten Year Report 1956-66

* Chemotherapy Studies

Home & Sanatorium studies.

Role of diet in Rx & maintenance of quiescent pul. TB

Isoniazid study

Studies on prev. of isoniazid induced peripheral neuropathy

Thiacetazone study

Intermittent Chemotherapy

Twice Wkly chemotherapy

Once Wkly "

Role of maintenance chemotherapy in the prev. of bacteriological relapse

Rescue Regimens

S+PAS, S+PAS, Cycloserine + T, Cycloserine + Ethionamide

New studies.

Chemotherapy study

Chemoprophylaxis study.

Laboratory Studies — Basic Science research — How far it helped the progr?

Methodologic studies.

Studies on characteristics of Madras tubercle bacilli: virulence

Susceptibility to hydrogen peroxide, sensitivity to PAS,

Thiacetazone sensitivity, Assoc. of virulence & other characteristics

Studies on isoniazid metabolism in Madras pts.

Investigations in toxicity of anti TB drugs

Tests for detection of anti TB drugs in urine.

Prevalence of drug resistance in TB pts in diff parts of India

Investigations under the U.S. Pub. Hlth Service grant.

A number of international visitors + trainees came to TCC.
WHO Geneva / SEARO / Sweden Prague Czechoslovakia, WHO fellows
Iran, Korea, Sweden, Mexico, Canada, USA, Research Institute
of TB Tokyo,