トンガ・日本／ＷＨＯ合同
保健衛生検査所プロジェクト
日本／ＷＨＯ合同事前調査報告書

昭和56年10月

国際協力事業団
医 療 協 力 部

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はじめに

日本政府とＷＨＯとのマルチ・バイ協力方式による医療協力の可能性を探るため、昭和５６年３月２８日より４月１１日までの１５日間にわたり、フィジー、トンガ、ソロモンの３ケ国を対象に、日本・ＷＨＯ合同プロジェクトファインディング調査を行った。

この結果、上記３ケ国から提出された要請案件のうち、トンガの中央保健衛生検査所拡充計画が、最も実施の可能性が高いことが判明した。

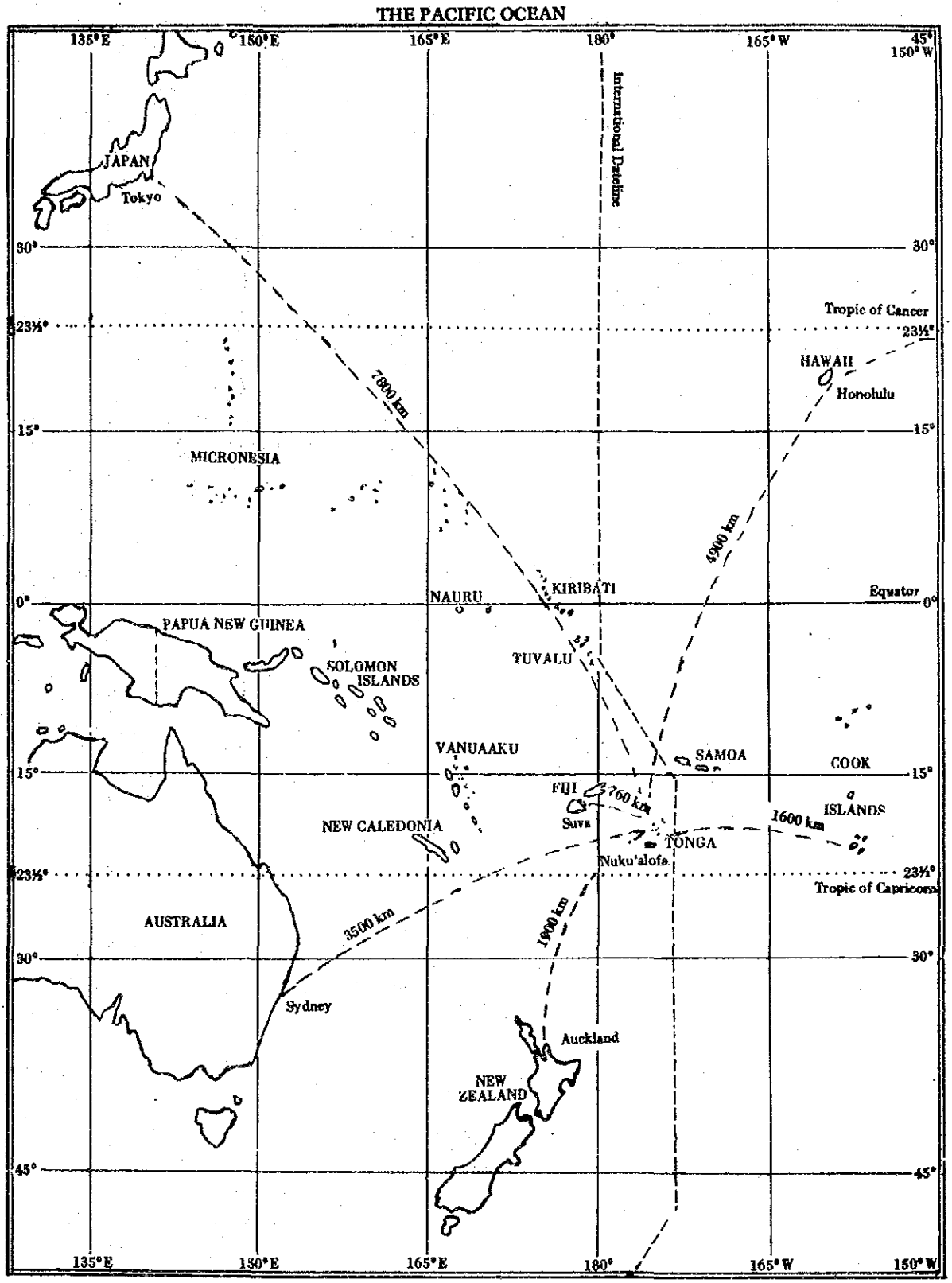
今回の日本・ＷＨＯ合同事前調査団は、上記プロジェクトファインディング調査の結果を受け、トンガの中央保健衛生検査所案件が、わが国の技術協力の対象として、特にＷＨＯとのマルチ・バイ協力方式による技術協力プロジェクトとして妥当か否か、また妥当な場合の協力計画概要等を調査すべく、昭和５６年８月１４日から同２９日までの１６日間にわたりトンガ及びフィリピンに派遣された。

本報告書は、上記調査団に参加した日本側専門家の報告をとりまとめたものである。

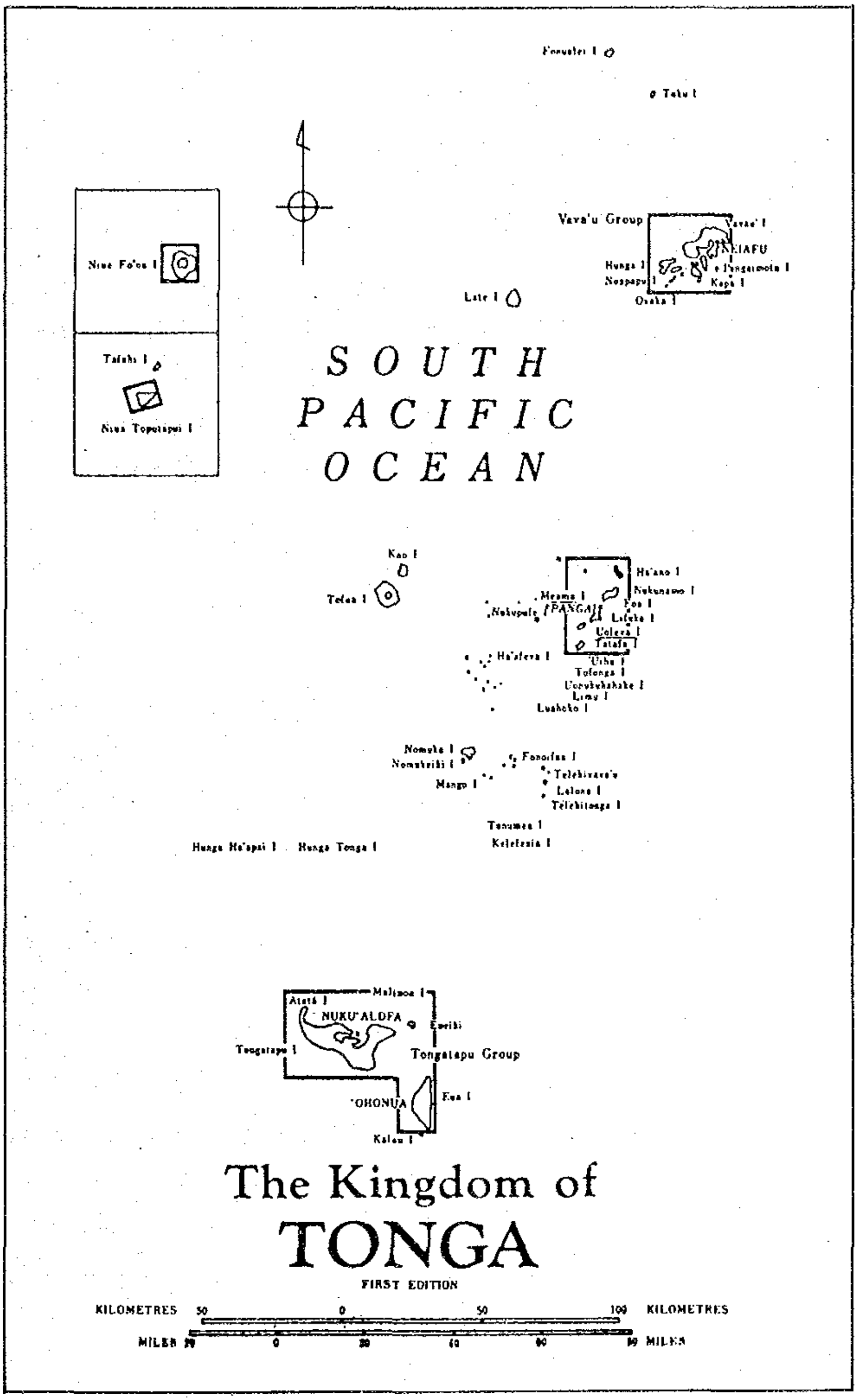
ここに調査団各位ならびに調査団の派遣にご協力を賜った関係諸機関の各位に、深甚なる感謝の意を表する次第である。

国際協力事業団

理事　長谷川正男


THE PACIFIC OCEAN
135°E
150°E
165°E
180°
165°W
150°W
International Dateline
JAPAN
Tokyo
30°
23½°
Tropic of Cancer
HAWAII
Honolulu
7800 km
15°
MICRONESIA
4900 km
NAURU
KIRIBATI
Equator
0°
PAPUA NEW GUINEA
SOLOMON ISLANDS
TUVALU
VANUAAKU
SAMOA
COOK ISLANDS
FIJI
3760 km
Suva
1600 km
NEW CALEDONIA
TONGA
Nuku'alofa
Tropic of Capricorn
AUSTRALIA
3500 km
1900 km
Sydney
Auckland
NEW ZEALAND
45°

トンガ王国


SOUTH
PACIFIC
OCEAN
Vava'u Group
NEIAFU
PANGAI
NUKU'ALOFA
Tongatapu Group
'OHONUA
The Kingdom of
TONGA
FIRST EDITION
KILOMETRES
MILES

目　　次

調　査　団　構　成

日　本　側

団　　長　　金　井　興　美　（国立予防衛生研究所細菌第一部長）

団　　員　　入　山　文　郎　（厚生省公衆衛生局保健情報課長）

　　曾　我　紘　一　（厚生省環境衛生局水道環境部計画課課長補佐）

　　塚　田　幸　三　（国際協力事業団医療協力部医療協力課）

WHO　側

Dr. L. R. L. V. Verstuyft (WHO, Programme Coordinator, Suva)

Dr. C. Palmer (WHO, Country Liason Officer, Tonga)

Dr. P. N. Wang (WHO, Microbiologist, Tonga)

Dr. R. Wainwright (WHO, Medical Officer, Tonga)

Mr. A. Tow (WHO, Architect, WHO/WPRO, Manila)

関　係　者　リ　ス　ト

トンガ政府側

Hon. Deputy Prime Minister, Dr. Baron Tuita

Hon. Minister of Health, Dr. S. Tapa

Dr. S. Foliaki (Director of Health)

Mr. T. T. Tupou (Secretary for Foreign Affairs)

Mr. P. Lavulo (Acting Director of Planning)

Mr. A. A. Matoto (Secretary for Finance)

Mr. D. Keith (Director of Works)

Mr. B. S. Kautoke (Assistant Secretary, Mimistry of Health)

Mr. G. Aho (Assistant Secretary, Foreign Affairs)

Mr. L. Harkness (Ministry of Finance)

Dr. S. Founa (Senior Medical Officer, Ugu Hospital)

WHO 西太平洋地域事務局側

Dr. S. T. Han（地域事務局次長）

Mr. Y. Sato（情報分析官、本件プロジェクト担当）

Dr. I. Geizer（検査技術専門）

Dr. S. J. Krister（医療協力専門家）

調　査　日　程

月　日	曜日	内　容
56.8.14	金	東京→Guam
15	土	Guam → Nauru
16	日	Nauru ↗ Apia
15	土	
16	日	Apia ↗ Tongatapu 16：45（Mr. B. Kautoke, Assistant Secretary/Health, Dr. C. Palmer 及び Dr. P. N. Wang, WHOの出迎え）
17	月	
18	火	午前　保健省にてDr. S. Foliaki, Director of Health, Dr. C. Palmer, WHO Liaison Officerと打合せ会議 視察—Vaiola病院
		午後　視察－Programme on Urban Sewage and Drainage, Dr. L. Belz, WHO Sanitary Engineer, Water Supply Scheme at Puke Vill., Kolovai Health Centre Hon. Minister of Health, Dr. S. Tapa主催カクテルパーティ出席
56.8.19	水	午前　第1回会議（日本、WHO及びトンガチーム出席） Hon. Minister of Health表敬訪問
		午後　Dr. P. N. Wang, WHOと打合せ会議
20	木	午前　第2回会議
		午後　Hon. Deputy Prime Minister, Dr. Baron Tuita 表敬訪問
21	金	午前　第3回会議
		午後　Hon. Minister of Health主催夕食会出席
22	土	午前　Tongatapu 09：00→Vavau 10：30 視察－Prince Uelingatoni Ngu病院（Dr. S. Fonua,

		Senior Medical Officer他） 午後　Rain Water Catchment System (Longomapu Vill.), Tefisi Health Centre, Reticulated Water Supply (Leimatúa Vill.)
23	日	視察－Falevai Health Centre
24	月	午前　Vavau 10：30→ Tongatapu 12：00 午後　Dr. C. Palmer, WHOと打合せ会議
25	火	午前　最終会議 午後　Dr. C. Palmer. WHOと打合せ会議
26	水	午前　Dr. C. Palmerと打合せ会議 Tongatapu 13：45→ Noumea
27	木	Noumea → Nauru → Manila 21：25　（広瀬一等書記官、佐藤、WHO情報分析官の出迎え）
28	金	午前　Dr. S. Han WHO西太平洋地域事務局次長表敬訪問 田中大使表敬訪問、三浦ＪＩＣＡ事務局長と打合せ会議 視察－熱帯医学研究所　（金子専門家） 午後　三浦ＪＩＣＡ事務所長主催昼食会出席 ＷＨＯ関係者との会議 ＷＨＯ主催夕食会出席
29	土	Manila→東京

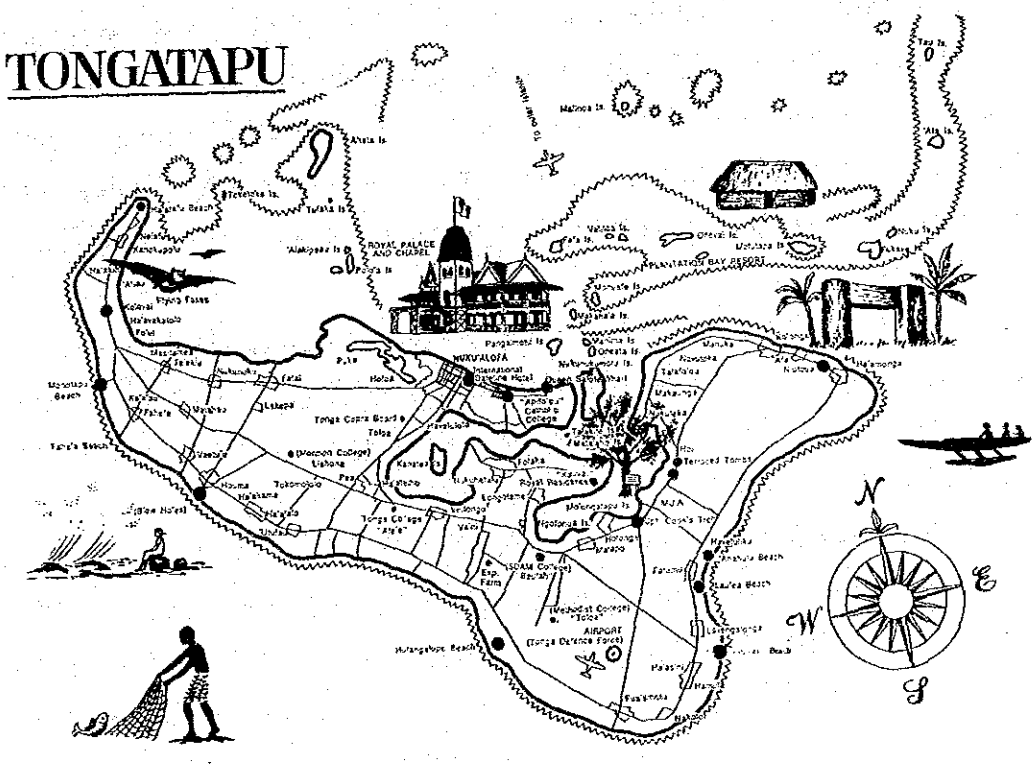
I　調査団派遣の経緯

WHOは、プライマリー・ヘルスケアー部門での途上国援助に於いて、従来より先進諸国との協力を呼びかけて来ており（マルサ・バイ方式）、日本側に対しても種々のアプローチがあったが、昭和５５年８月に中嶋WHO西太平洋地域事務局長が訪日した際、日本側でグローバル・スキームによるWHOとの協力の実現が容易でなければ、リージョナルな具体的プロジェクト、例えば南太平洋地域を対象に具体的案件をテスト・ケースとして取り挙げられないか提案があった。

これに対し日本側は、南太平洋地域を対象に、日本とWHO合同で予備調査を行うことを提案し、その後のWHOとの折衝により、調査の対象をフィジー、トンガ、ソロモンの３ケ国とすることに決定した。

この決定を受けて、昭和５６年３月２８日より４月１１日まで、日本・WHO合同プロジェクトファインディング調査団が派遣され、その結果上記３ケ国より要請のあった案件のうち、トンガの中央保健衛生検査所拡充案件が、日本／WHO合同技術協力プロジェクトとして最も実現の可能性があることが判明した。

これを受けて、同案件が日本／WHO合同技術協力の対象として可能かつ妥当なものであるか否かを調査するため、今回の日本・WHO合同事前調査団が、昭和５６年８月１４日から同２９日までの１６日間にわたり、トンガ及びフィリピンに派遣された。



Ⅱ　調査の概要と総括

当事前調査団は上述のような経緯のもとにトンガに派遣され、ＷＨＯとのマルチ・バイ方式による対トンガ技術協力の可能性について、中央保健衛生検査所の機能の拡充整備を対象プロジェクトとして調査検討した。

詳細は後続の項に述べる通りであるが、本項ではその概要を述べ、調査団としての結論ならびに勧告を加えて総括としたい。

調査団はトンガ滞在中、視察を行いつつ前後４回にわたってトンガ政府ならびにＷＨＯ関係者との合同会議をもち、要請プロジェクトの性格、内容、実施方法等について意見を交換した。それらの発言はNotes of Discussionとして記録され、最後にそのSummaryをつくって私たちの到達した基本的見解とした。以下その線に沿って述べることにする。

1. 当プロジェクト案はトンガ政府が前回の合同プロジェクトファインディング調査団に提案した要請のうちのプログラムⅠに基づいている。その目的とするところは、トンガの保健医療における検査室機能を充実・整備して疾病対策及びプライマリーヘルスケアーに寄与することにある。具体的には現在Vaiola病院にある検査室機能を拡充するのみならず、国家的要請の高まっている公衆衛生検査に対応しうる機能をこれに附加し、トンガの総合的な中央検査機構をつくることである。

このように病院検査と公衆衛生検査とを一体化し、さらに国内の４ケ所の病院、６ケ所の保健所（ヘルス・センター）検査室を加えた検査組織網を用意することが期待される。この機構は一般にヘルスラボラトリーサービスと呼ばれているので、プロジェクト名としては、プロジェクトファインディング調査の結果、採用したThe Institute of Public Healthに代えてHealth Laboratory Projectとするのが適切であると判断した。

2. 技術協力の中心は専門家派遣や研修生招聘による技術伝達にあると考えられるが、今回のプロジェクト案においては、ラボラトリー施設の建設も含まれる。これは現地の状況にかんがみて、施設援助なくしては上述の技術伝達そのものも実施困難であり、定着不可能と判断するためである。

Vaiola病院構内に建設が要請される中央保健衛生検査所は、過去の臨床検査実績におけるワークロードの増加傾向を考慮し、さらに飲料水や食品の品質管理の現状とその将来像をも検討して基本設計が試案された。これをたたき台とし、さらに検査内容と現地環境についての討議内容をふまえて修正を加え、一応の素案をうるに至った。その規模はかならずしも大きいものではないが、人口１０万の当国の中央保健衛生検査所としては必要にして充分なものと判

断される。設計の仕様については、現地の事情に詳しいトンガ側にまかせてほしいとの要請があったことをつけ加えておきたい。

3. 検査用機器、機材の供与要請については、耐久性のよいもの、操作の簡単なもの、そしてspare partsを含め、現地の状況下において保守管理の容易な機種が選ばれるよう意見の一致をみた。

提出された要請リストは試験検査に加え、指導訓練をも含めた当プロジェクトの目的に合致するごく基本的な機器をカバーしている。日本側の専門家派遣に際しては、多少の小備品の追加が必要であろうと推定されるが、これはその段階で検討されてよいと思われる。

4. 日本からの専門家派遣は技術協力としての本プロジェクトの中核をなすものである。トンガ側から提案された望しい形としては、はじめにチームリーダーとして広い検査室経験をもつ上級専門家の2年間の滞在を期待している。その間検査室の完成を待つが、それと前後して特定の分野の専門家を5年間にわたって数人求め、それぞれ6～12ケ月の滞在中に現地検査員の指導訓練にあたるものである。

カウンターパートについては、留学中の技術者の修了帰国予定をも含めるならば、当プロジェクトに必要な人材は一応用意される筈である。問題は、日本ならびにWHO側の協力をトンガ側が効果的に同調しうるかという点と、いかにして日本側が専門家を確保するかにあろう。

5. トンガ側においては、以上のような施設、設備、機器の供与そして人材養成の援助を効果的に受け入れる体制として、中央保健衛生検査所の管理組織を整備する必要がある。疫学あるいは臨床病理を専攻する医官を検査室の総括責任者としてDirector of Healthの直下におき、臨床検査と公衆衛生検査にそれぞれ責任をもつ2人の上級検査技師を監督する体制が望しい。これらの上級検査技師にはカウンターパートの役割が期待される。

6. 当プロジェクトが実施されるならば、トンガ側においても当然運営費の上昇を招くことになる。この点についてはさらに詳細な検討が必要である。

7. 本プロジェクトは、マルチ・バイ方式をとる点で日本側にとり最初の事例である。その形態に関しては、R／D方式による2国間技術協力の枠内で、日本政府がトンガに貢献する一方、WHOはその協力関係を一層効果的にするために側面より協力するということで基本的に意見の一致を見た。トンガ政府は日本政府、WHOの貢献が適切かつ効果的であるよう責任をとることが要望される。

しかし、マルチ・バイという初めての方式において、WHO側がその一般的な枠組をこえた

特別の貢献をなすのか否か、また、この方式における日本とＷＨＯとの関係を文書か覚書きで残すか否か、またその形式については関係者間で最終的な詰めが必要である。

8. 本プロジェクトはその規模において決して大きいものではないが、それだけにきめの細かい対処が可能ともいえる。これがしかるべく運営されるならば、トンガ国民の健康と福祉に寄与するところは大変大きいと考えられる。

Ⅲ　トンガの保健医療の現状と問題点
（協力要請分野に則して）

1　トンガの保健医療事情

トンガの保健医療事情については"南太平洋地域日本・ＷＨＯ合同プロジェクトファインディング調査報告書"に詳しいが、補遺的に若干述べておくこととする。

(1)　医療・保健衛生

トンガでは医療費は無料であるが、入院治療の場合は若干自己負担が必要である。また私的診療機関（開業医）における医療費は有料である。

トンガでは病院４ケ所、一般開業医及びキリスト教ミッションの経営する病院併せて５ケ所のほかに６ケ所の保健所（Ｈｅａｌｔｈ　Ｃｅｎｔｒｅ）が設置されており、診療、家族計画相談、一般的公衆衛生サービスなどを実施している。医介補（Ｍｅｄｉｃａｌ　Ａｓｓｉｓｔａｎｔ）および看護婦が主力メンバーである。保健所で扱っている疾患では、皮膚疾患、下痢性疾患などが主要な疾病であるが、ペニシリン、クロラムフェニコール、テトラサイクリン等の薬剤も常備されており地域医療の中心となっている。

(2)　環境衛生

トンガでは近年地下水の開発が進められ、パイプによる給水が行われている。トンガタブ島では５６ケ所の給水施設があり、ほゞ全域をカバーすることが可能である。塩素消毒設備は有しているが塩素の入手が困難であるため、首都付近でしか実施されていない。また実施されている給水栓からも時々大腸菌群が検出されることがあり、未だ不十分な状態であるといえよう。

首都ヌクアロファの中心部ではＷＨＯの援助により個別し尿浄化槽（消化処理）が設置されつつあり、極一部の地域ではあるが下水道処理も行われている。しかしながら家畜（馬、牛、豚、鶏）が至る所に放飼いされていたり、多くの家庭の便所が非衛生的なものであるなど環境衛生対策は遅れているといわなければならない。

食品監視は監視員によって行われているが状態監視にとどまっており、検査は行っていない。ココナツ、バナナなどは輸出上の問題もあり検査体制の確立強化が望まれている。また、ココナツ工場で砒素の流出事件があるなど水質汚濁を生ずる危険も存在する。

2　Vaiola病院の現況

(1)　一般的事項

Vaiola病院はトンガにおける医療の中心的な存在で、内科・外科・産科・小児科・精神科・結核・伝染病棟などからなっており、２０２床[1]を有す病院である。入院のほかに外来、救急外来の治療が行われている。外来は科別に分かれていないで患者はGeneral Outpatient として扱われる。専門的な診療や精査の必要な患者はSpecial Clinicと称して病室で診療を受ける仕組になっている。救急外来は昼間は医師３人、夜間は医師１人が受持っている。救急外来では酸素ボンベ、吸引装置、輸液セットなどが常備されている。

Vaiola病院の設備はＸ線装置、手術室、中央滅菌室等である。Ｘ線装置は西独シーメンス社製の装置が活躍しているが、断層撮影装置がない、放射線防護にやゝ不安があるなどの問題がないわけではない。手術室は２室あり、笑気による全身麻酔が行われている。中央滅菌室ではガス滅菌装置の設備はないが、オートクレーブ、乾熱滅菌装置は完備している。心電計は２台が稼動しているが脳波計は保有していない。

また、Vaiola病院はOpen Systemをとっており、開業医も利用している。

(2)　検　査　室

Vaiola病院検査室はトンガの全検査を請負っているといっても過言ではない。全国の８０％以上の検体を扱っており、測定機器も一応は揃っている。しかしながら、検査室は約１８０㎡しかなくトンガの医療を支えるには貧弱であるといえよう（図－１　参照）。

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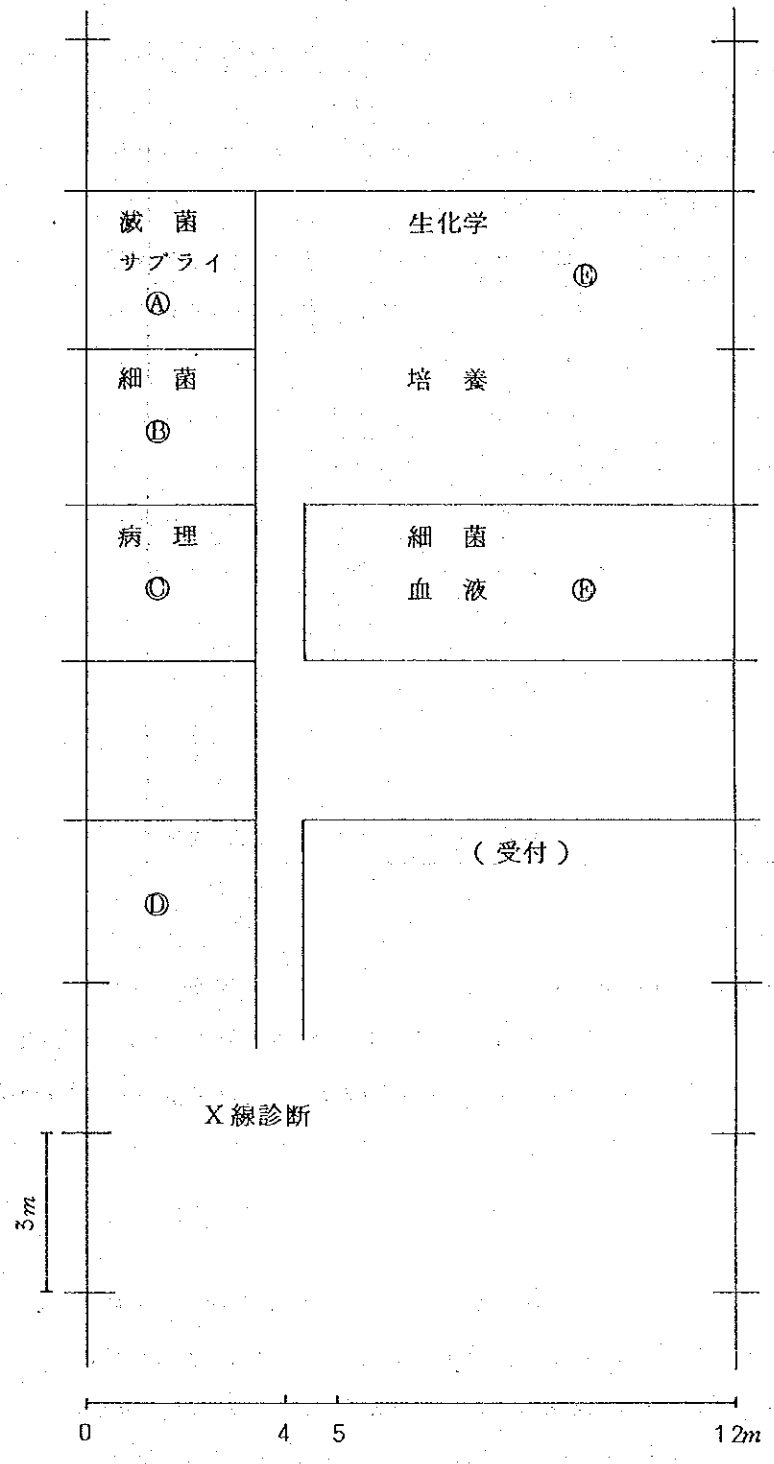
1)　この数字はReport of the Minister of Herlth for the year 1979によるが、Forth Five Year Development Plan, Health Sectorによると１９８床とある。

図－１　Ｖｉｏｌａ病院検査室の現況



主な機器類

Ⓐオートクレーブ

Ⓑ恒温器

ふらん器

双眼顕微鏡

Ⓒ蒸留器

ⒹＵＶ殺菌装置

双眼顕微鏡

Ⓔドラフト

炎光光度計

光電比色計

上皿直示天秤

（メトラーP1210 d=10mg）

インキュベーター

培養器具

ミリポア細菌検査器具

双眼顕微鏡

直示天秤

（メトラー　d＝0.01mg）

ディープフリーザー(－20℃)

冷蔵庫

遠心機（3,000rpm）

１９７１年完成

当時、公衆衛生、環境衛生部門は予定されていなかった。

１９８０年の検査統計は表－１のとおりである。

表－１　検　査　統　計

	全　国		Vaiola病院	
	検体数	検査数	検体数	検査数
血　液	16,406	50,652	13,933	43,510
尿	2,439	4,469	2,212	4,065
大　便	935	1,699	906	1,669
喀　痰	882	1,376	775	1,267
髄　液	215	354	213	351
その他体液	131	283	124	272
膿その他	637	1,035	622	1,020
皮膚 scrapings	36	41	36	41
皮膚 biopsy	13	13	1	1
鼻腔粘膜スメア	13	13	1	1
精　液	7	21	7	21
水質検査	111	111	111	111
計	21,825	60,067	18,941	52,329

技術水準、設備などの問題から海外（主としてニュージーランド）に検査を委託しているものもあり、１９８０年７月から１９８１年６月までの１年間に総検体数21,825、総検査数60,067のうち検体数８０５、検査数1,７６４が海外に委託された。また、Vaiola病院で行われている検査項目および海外委託の状況は下記のとおりである。

検査項目

血液：

ＡＢＯ型、Ｒｈ型、クロスマッチテスト、抗体検査、クームス試験、ヘモグロビン、ＰＣＶ、ＭＣＨＣ、ＭＣＶ、ＲＢＣ、ＥＳＲ、ＷＢＣ、白血球分類、好酸球数、血小板数、網状赤血球数、出血時間、擬固時間、Ｌ．Ｅ細胞、ミクロフィラリア、レプトスピラ症、マラリア（WET FILM. THIN & THICK FILM）、ＶＤＲＬ、血液培養、感受性テスト、血糖、尿素、クレアチニン、Ｎａ、Ｋ、ビリルビン、尿酸、蛋白、アルブミン、R. A. Factor

尿　：

PH、胆汁色素、糖、蛋白、培養、ＡＦＢ、妊娠反応、沈渣

大便：

寄生虫、潜血、ＰＨ、浮遊物

喀痰：

グラム染色、ＺＮ、ＡＦＢ、培養、感受性テスト

髄液：

細胞数、グラム染色、培養、ＺＮ、ＡＦＢ、感受性テスト

その他体液：

上に同じ

膿その他：

ＷＥＴ　ＦＩＬＭ、グラム染色、培養、感受性テスト、ＺＮ、ＡＦＢ

皮膚scrapings：

ＷＥＴ　ＰＲＥＰ、グラム染色、培養、感受性テスト

皮膚biopsy：

Leprosy → ZN

鼻腔粘膜スメア：

Leprosy → ZN

精液：

量、粘性、形態、運動、数

水質検査：

Coliform数

海外委託検査項目

細胞診・組織：

組織、パパニコロー（喀痰、骨髄、他）

血液：

甲状腺機能、Ｃａ、Ｓ－ＧＯＴ、Ｓ－ＧＰＴ、Al－phos、Acid－phos、尿酸塩、ビリルビン、重炭酸塩、蛋白、電気泳動、尿素、クレアチニン、クレアチニンクリアランス、アミラーゼ、PO_4、Ｎａ、Ｋ、Cl、リチウム、ディランチン、デイゴキシン、フエノバルビタール、コレステロール、リピド、コルチゾール、鉄T.I.B.C.、V．B_{12} & Folate、ハプトプロビン、T_4、T_3、ブルセラ、レプトスピラ、A．S．O．T．、A．H．T．、プロトロンビン、A．N．F．、イムノグロブリン、甲状腺抗体、ＦＳＨ、ＬＨ、Ｐ．Ｂ．Ｉ．、Ｉ．Ｎ．Ｆ．、ＬＤＨ、ＣＰＫ、デング熱

尿　：

カテコールアミン、蛋白、クレアチニン

臨床検査室の職員は総数１４名でLaboratory Technician ２名、Ass. Lab. Tech. ５名、X線検査と資格を兼ねているLab. ／X-ray Ass. ４名、Lab. maid ２名、Clerk／Typist １名である。職員総数は１４名ということになっているが、ローテーション、海外研修、長期有給休暇などのため実際に働らいているのは７～９名である。

最近では水質検査、食品検査などが要請されており、公衆衛生関係の検査室の拡大整備、技術レベルの向上が緊急な課題となっている。

Ⅳ　技術協力要請内容

トンガ政府は上述のような現状と問題点を踏え疾病対策及びプライマリー・ヘルス部門に寄与す可く、保健医療における検査室機能の充実・整備を計画している。具体的には、現在Vaiola病院にある検査室機能を拡充するのみに止まらず、国家的要請の高まっている公衆衛生検査に対応しうる機能をこれに附加し、トンガの総合的中央検査機構をつくることであり、本計画に対して日本の協力を要請している。協力要請期間は１９８２年から５ケ年である。

1　検査所建設の要請

次の７部門での検査機能の整備・拡充のため、検査所の建設が要請されている。尚、これらのうち④⑤⑦の３部門は現在の検査室に収められる計画である。

①公衆・環境衛生部門

- ○水質検査（化学検査、微生物検査）
- ○水質汚染モニタリング
- ○食品検査

②微生物学部門

- ○細菌学、血清学、寄生虫学、菌学などの分野（サルモネラ、赤痢、ビブリオ、大腸菌、性病検査、肝炎、デング熱、レプトスピラ、麻疹、ブルセラ症、アメーバ、フィラリア、トリコモナス）

③結核部門

- ○ＺＮ染色、培養（耐性試験および非定型菌類の同定は海外委託とする）

④血液部門

- ○一般血液検査

⑤免疫・輸血部門

- ○ＡＢＯ型、Ｒｈ型、クロスマッチテスト
- ○血液銀行

⑥生化学部門

- ○臨床化学

⑦細胞診断部門

- ○骨髄サンプルの処理及びパパニコロー

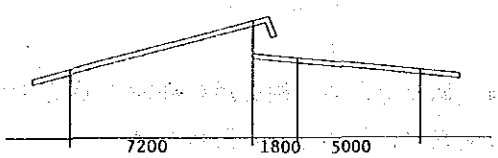
将来予定している検査項目は次のとおりである。

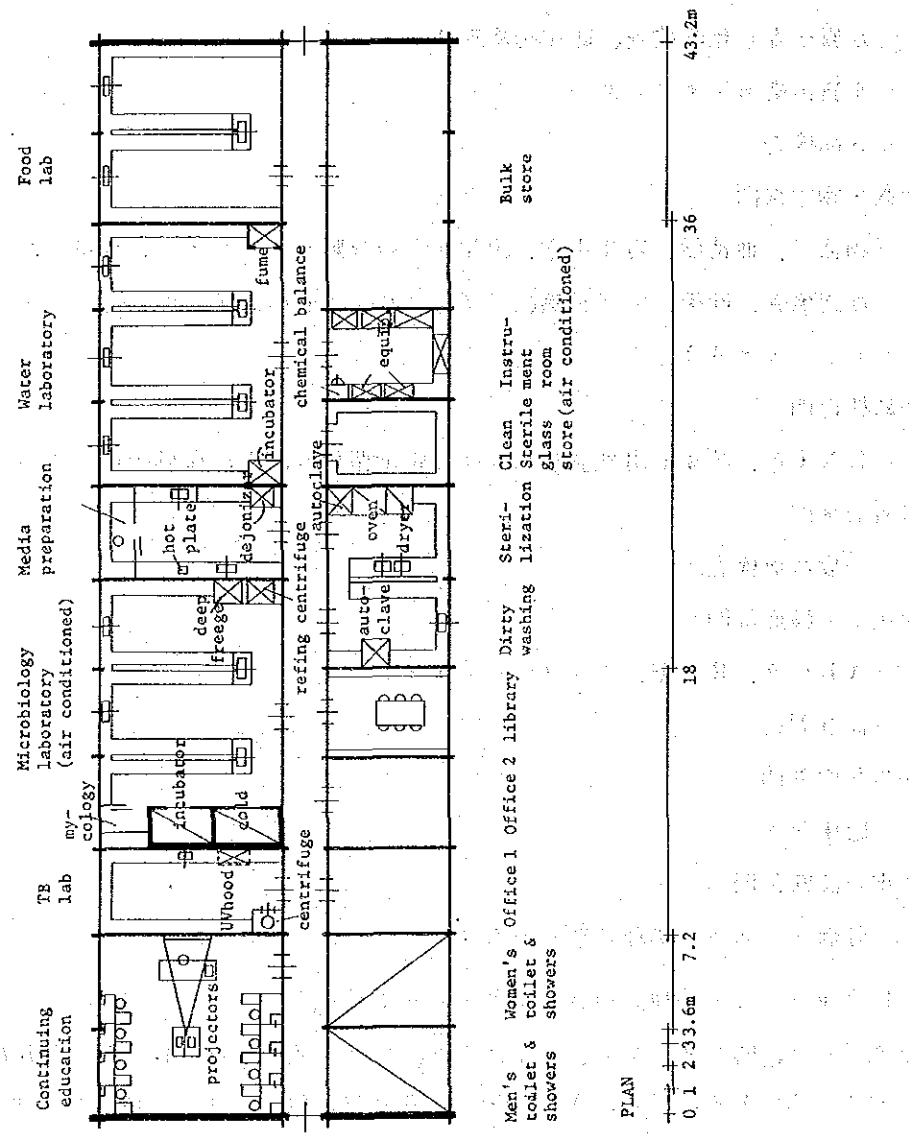
総タンパク、総ビリルビン、アミラーゼ、コレステロール、ＢＳＰ、重炭酸塩、Ｓ－ＧＯＴ、フィブリノーゲン、Ｃａ、Ａｌ－ｐｈｏｓ、塩化物、燐、サリチル酸塩、トリグリセリド、

D－xylose吸収試験、ペンタガストリン、アスコルビン酸飽和試験、トリプシン、ポルフィリン、ＣＳＦ塩化物、総脂肪（便）、システィン、骨髄関係、プロトロンビン時間、ＯＲＰ、異常ヘモグロビン

トンガ側の希望する検査所の建物は４３.２×１４.０ｍで平屋建であり、上記７部門の検査室の他、洗浄・滅菌室、図書室、講議室、幹部居室などが計画されている（図－２）。建設費はＵＳ＄２８０,０００と見積られている。ただし、建設資材、設備をどの程度とするかによって建設費は変動し得るであろうが、スペースとしてはほぼ妥当であるといえる。

図－２　トンガ側要請の検査所案





2　専門家派遣の要請

最終的に提出された専門家派遣要請は次のとおりである。

① チームリーダー

広い経験を持つ上級専門家で、特定の分野を専攻している人、それも微生物学専攻であれば尚望しい。派遣期間は１９８２年後半より２年余り。

② 公衆・環境衛生部門

化学分析専門家で主に水質・食品検査に当る。派遣期間は１９８３年に６～１２ケ月、１９８５年には３～６ケ月で各１名である。

この部門では他に微生物分野での専門家の必要性もあるが、これはチームリーダーの専門分野、或は次に述べる微生物学部門の専門家を考慮している。

③ 微生物学部門

この部門では、細菌学、血清学、寄生虫学、菌学などが扱われる計画であるが、専門家の要請は１名で１９８４年から１年間である。但し、これはチーム・リーダーの専門分野とのかねあいで変わりうる。

④ 血清学部門

フィルス病の血清学的診断（特に肝炎）指導のために、専門家１名を１９８３年に６～１２ケ月間要請している。

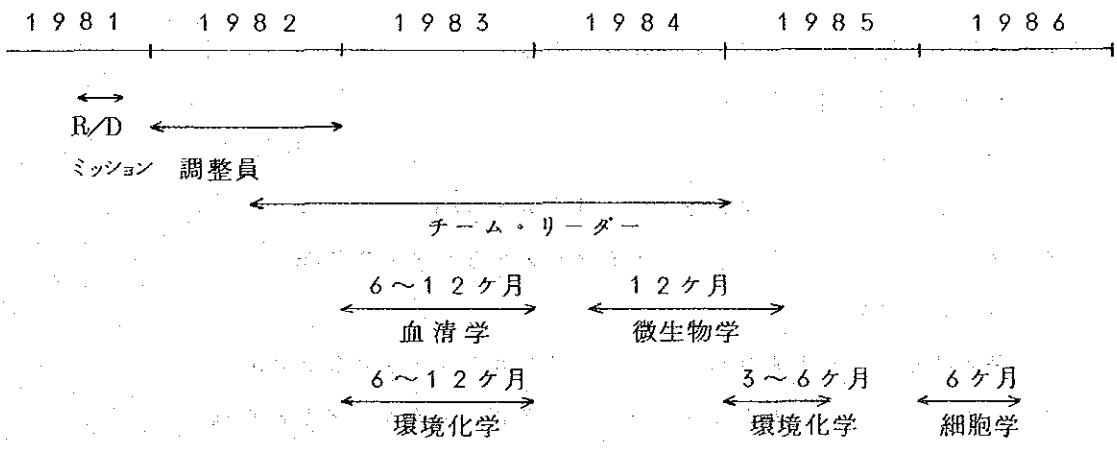
⑤ 細胞診断部門

この部門では、パパニコローを中心とする骨髄サンプルの処理が予定されており、専門家の派遣要請は１９８６年に６ケ月間である。

⑥ 調整員

プロジェクト発足頭初から１年間、調整員の派遣を希望している。

以上の専門家派遣要請を図示すると次のとおりである。



3　研修員受入の要請

研修員受入要請は次のとおりである。

①　公衆・環境衛生部門

現在１名がトンガ政府の将学金により、フイジーのSchool of Medicineに留学中で、１９８３年に卒業の予定であるが、その後更に水・食品化学の研修を要請している。

②　微生物学部門

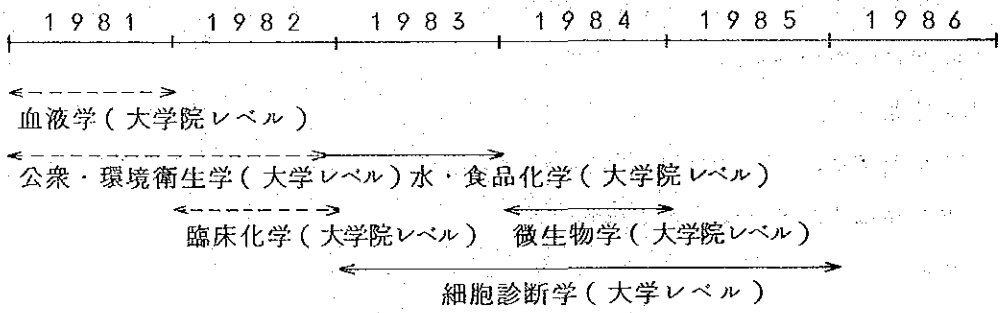
現在既に大学卒業資格を有する技師１名の大学院レベル、１年間の研修を、１９８４年に要請している。

③　細胞診断部門

１名の大学レベルの研修を１９８３年から１９８５年まで（３年間）希望している。

尚、血液部門では、１名がＷＨＯのフェローシップにより、ニュージーランドで大学院レベルの１年間の研修を受けており、１９８１年末には研修を終了する予定である。また、臨床化学の分野では、大学院レベル、１年間、１名の研修をＷＨＯのフェローシップにより１９８２年に実施す可く申請中である。

以上の研修員受入要請を図示すると次のとおりである。



（注）------　現在研修実施中或は申請中

————　新規研修員受入要請

4　機材の要請

トンガ側の希望する機材リストは次のとおりである。

1. 卓上電子計算器　（３台）
2. 電子複写器
3. オートクレーブ　（２台）　　４０×８０cm
4. オーブン　（９０℃）　　１３８０×８００×７００㎜
5. 脱イオン装置
6. 乾熱滅菌器　（１６０℃）　　５００×１０００×５００㎜
7. ウオーター・バス　（１００℃）　　７００×３６０×３６０㎜
8. ワゴン　（６台）

9. 双眼顕微鏡 （４台） オリンパス、ＢＨ型
10. 位相差顕微鏡
11. 高速冷却遠心分離機
12. ディープ・フリーザー （－２０℃） １３００×６００×９００㎜
13. ウオーター・バス （２台） ３７℃～５６℃
14. 分光光度計
15. 分光光度計スキャナー （ＥＬＩＺＡ Ｔｅｓｔ用）
16. ＰＨメータ
17. 電気泳動装置、デンシトメーター
18. ビリルビン測定装置
19. 血液貯蔵庫 （２－６℃）
20. 天 秤 （０.１mg） メトラー
21. マッフル炉 （７５０℃） １００×１３０×１５５㎜
22. 伝導度計
23. 濁度計 Hach model ２５１１
24. ＢＯＤインキュベーター （２０℃）
25. 乾燥器 （１０３－１０５℃） ５００×４００㎜
26. 実習用双眼顕微鏡 （８台）
27. ＰＣＶ測定器 Arthur － Thomas
28. タイプライター （２台） Long － Carriage
29. 自動車（検体、血液輸送用）
30. 定電圧装置

V　要請内容の評価と問題点

1　国家開発計画に於ける位置付け

トンガ政府は保健医療分野に大変力を入れており、保健省の予算は国家予算の１２％以上を占めている。１９８０年の予算によりこれを一人当りに換算すると約ＵＳ＄１８となり、他の途上国に比べて非常に高い数値である。*

第４次開発５ケ年計画（１９８０.７～１９８５.６）は、現地調査の時点ではまだ"最終的に決定されていなかったが、保健省の作成した保健医療部門の素案（"Forth Five Year Development Plan, Health Sector" 附録参照）に、トンガの保健医療状況及び今後の計画が総括されており、これによると第４次開発計画期に於ける保健医療部門での主な問題は次のとおりである。イ）情報管理の問題（開発の目標を明確にし、途中経過を追跡し、評価を行い、計画遂行状況及び経費の支出につき調整する為に、或は政策決定上不可欠である。）、ロ）要員不足の問題、ハ）保健医療サービスの公平な分配の問題、ニ）まだ完全には解決されていない問題、ホ）新しく予想される問題、ヘ）治療医療の問題、ト）行政管理の問題、また地方への保健医療サービスの普及が強張されている。

上記ニ）まだ完全には解決されていない問題、として挙げられているのが、安全な水の供給の問題、人のし尿処理の問題、及び昆虫やげっ歯類などの病原媒介物対策の問題、であり、ホ）新しく予想される問題、としては、国が進めている軽工業開発による事故の発生及び化学物質による環境汚染、農業開発による農薬等の中毒の問題、そして観光開発に伴う食品衛生、し尿処理問題及び新しい病気の導入の問題などが挙げられている。

以上のような主要問題に対する対策の項目のみを列挙すると、イ）プライマリーヘルスケアー対策、ロ）家族計画、母子保健対策、ハ）保健医療情報対策、ニ）保健医療教育対策、ホ）疾病対策、ヘ）看護対策、ト）環境衛生対策、チ）行政管理対策、リ）要員対策、であるが、疾病対策及び環境衛生対策上基本的なものとして重要視されているのが、Vaiola病院にある検査室の拡充計画であり、これは又、プライマリーヘルスケアー対策の上でも、不可欠な機能を担うものである。

上述したように、本件要請は、開発計画に沿ったものであり、且つ保健医療の実態に則した適切な要請であると考えられる。

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*　世界開発報告１９８１、世銀、に従い、各国に於ける一人当りの中央政府保健支出（１９７７／７８、ＵＳ＄）を例示すると次のとおりである。

ネパール　１，タンザニア　４，ケニア　５，フィリピン　３，パプアニューギニア　１２，ブラジル　２０，米国　１７９，西ドイツ　４３３

2　トンガ側の人員配置及び業務計画

検査所長（仮称）にはMedical Officerが予定されているが、部門別の予定は表－２のとおりである。なおこの員数はLab. Tech., Ass. Lab. Tech., Lab. /X-ray Ass. のみであり、Lab. maid, Clerk, Cleanerは含まれていない。

また全体の人員配置予定は表－３のようになっているが表－２の充当可能数と表－３のEXISTING欄の数字が一致していない。これは部門別にふり分けたことと、Lab. /X-ray Ass. の任務がはっきりしていないためである。

人員配置及び業務範囲の計画は概ね妥当と考えられる。但し、３年勤続で約１００日の有給休暇が与えられる為、３人の職員で２人分の仕事しか出来ないこと、上司の都合で職場を変更されること等、トンガ側の制度につき充分な配慮が必要と思われる。

3　検査所の建物

現在の業務量の約１５％増を見込んでいるためにやゝ大きいが、この程度の広さは必要である。

エアコン装置、実験台、低温実験室、インキュベータ室などを本建築に含むのか、Unitとして入れるのかなどによって建設コストが変動するので今後検討を要する。

また検査所の建設、業務の遂行に当っては、水の質的・量的不足を考慮しなければならない。例えばビペット洗浄等に工夫が必要である。

4　機　　材

機材の要請も概ね妥当であると考えられる。希望リストに記載されていないが将来必要となる機器には次のようなものが考えられる。

細胞診断実習用顕微鏡

硬水軟水化装置

再留水製造装置

ティープフリーザー（－８０℃）

ミクロキエルダール用ガラス器具

その他のガラス器具（多種類、相当量）

また消耗品、交換部品はあらかじめ相当量（１年分位）用意する必要がある。機器類の保守点検に関しては高級技術者を含めた全ての人々に充分訓練する必要がある。

表－２　人員配置予定

部　　門	現要員で充当可能な員数	計　画　数
1. 公衆・環境	1	2
2. 微　生　物	2	3
3. 結　　核	1	1
4. 洗浄・滅菌	1	1
5. 血　　液	2	3
6. 免疫・輸血	1	1
7. 生　化　学	1	2
8. 細胞診断	0	1
計	9	14

表－３　List of Staff (Tentative) for Possible Health Laboratory Services Project

Area	Required	Existing	New Post
Administrative	1	0	1 (Medical Officer) candidate-1983
Environmental & Food Laboratories	2	1 (Ass.Lab.Tech.)	1 (Ass.Lab.Tech)[1]
Microbiology	3	3 (Lab.Tech.) (Ass.Lab.Tech.) (Lab./X-Ray Ass.)	
TB Laboratory	1	1 (Lab./X-Ray Ass.)	
Media Service	1 (Lab.Ass.)	1 (Lab./X-Ray Ass.)	
	3 (Lab. maids)	2 (Lab. maids)	1 (Lab. maid)
Haematology	3	3 (Lab.Tech.) (Ass.Lab.Tech.) (Lab./X-Ray Ass.)	
Cytology	1	0	1 (Ass.Lab.Tech)[2]
Clin.Chemistry	2	2 (Ass.Lab.Tech)	
Storage	1 (Clerk)	0	1 (Clerk)
Cleaner	1	0	1 (Cleaner)
Clerk/Typist	1	1	
Total	20	14	6

Remarks: 1) Candidate under study at School of Medical Technology. Available in 1983. Further training in Water and Food Chemistry is needed.

2) Scholarship (undergraduate training) should be sought as soon as possible.

5 研　　修

研修希望についてはほぼ希望通りに実現可能であると思われる。

但し、現有職員の技術レベルは高いとはいえず、従って再研修を必要とする職員数、研修期間を修正する必要が出て来るかも知れない。

6 専 門 家

専門家の要請については、分野を整理して化学系、生物系、病理系などに分類すれば少人数の派遣で目的が達せられるものと考えられる。

細胞診関係は現在、検査技師にも医師にも経験者がいないので、出来るだけ早い時期に訓練を開始した方が良いように思われる。

Ⅵ　日本側技術協力の可能性
および実施上の問題点

1　国内支援体制

前述したように研修の受入れ、専門家派遣についてはトンガ側の要請を整理する必要がある。しかしながら原則的にはほぼ妥当な計画であると考えられるので、日本側がどの程度まで協力可能であるかを具体化させる必要があると思われる。特に調整員ないしはチーム・リーダーの派遣要請が１９８２年に予定されており、派遣期間も１年～２年と長期であることなどから早急に検討しなければならない。従って、国内支援体制を確立するために関係機関による委員会を設置することが必要であると思われる。

2　実施上の問題点

専門家の生活環境について、専門家に対する特権、免除、便宜供与等について、また機材供与及び通信運搬等に関しては、現在トンガには派遣中の専門家が２名（漁業専門家）、協力隊員が３名（漁業隊員）活躍しており、対応は可能と考えられる。但し、トンガは在フィジー日本大使館の管轄下にあり、ＪＩＣＡの事務所も在外公館も無く、プロジェクト運営上調整員を駐在させることが望しいと思われる。

Ⅶ　WHOとのマルチ・バイ方式協力の可能性

1　マルチ・バイ方式協力の意義

日本の実施してきた医療技術協力は、日本国内の実状、つまり分野が高度に細分化、専門化していることを反映して、比較的高度な技術の伝達が主であったと言える。

ところが、近年、プライマリー・ヘルスケアと表現される、地域住民の日常生活に密着し、その健康維持に貢献する、より基本的な保健医療サービスが重要視されるようになった。

そこで、国連の保健医療に関する専門機関として、このプライマリー・ヘルスケア部門に於いても豊富なノウ・ハウを保有しているWHOの技術協力と日本のより専門化した技術協力を相互補完的に結び付けられるならば、相方の協力を一層効果的にし得ると期待される。またWHOをコーディネイターとして、各国の2国間協力を有機的に組織することができれば、協力形態としてより望しいと考えられる。

トンガの保健衛生検査部門に於いても、WHOは既に5年以上の協力実績を有しており、日本が協力を実施する際に不可欠の助言者であると思われる。また、人口僅か9万余りのトンガに於いて必要とされる保健衛生検査所は、それ程大規模なものではなく、日本がWHOとは独立してプロジェクトを実施するのは妥当ではないと考える。更にトンガの保健医療分野に対して、イギリス、オーストラリア、ニュージーランド、アメリカ合衆国等が2国間協力を実施しており、これらの協力を結合・調整することが緊要と思われるが、WHOは最も応しいコーディネイター、或は政府への助言者であろう。

以上のように、本件協力に対して、WHOとのマルチ・バイ方式を取ることは非常に望しく、日本の最初のケースとして、試みる意義は充分あると考えられる。

2　協力の枠組

WHOとの共同協力の枠組に関しては、合同プロジェクトファインディング調査の結果を受けて、昭和56年6月17日、東京に於いて、中嶋WHO西太平洋地域事務局長と日本側関係者が協議し、下記のような枠組とすることで合意されたが、今回の事前調査に於いても、トンガ政府関係者、調査団のWHO側メンバー、及びWHO西太平洋地域事務局関係者（中嶋事務局長は不在）と協議をし、6月に検討された枠組に問題の無いことを確認した。但し、最終的には、調査団の報告を受け、関係者間で更に検討の上決定することとした。

協力の枠組

(1)　2国間技術協力を基本とする。

その基礎は、JICAとトンガ政府のRecord of Discussions (R/D)とし、そ

れを受けて日本政府は、専門家派遣、研修員受入、機材供与他を、トンガ政府との国際約束に基き実施する。

(ロ) ＷＨＯは２国間協力を一層効果的にするために側面より協力する。

(ハ) 別途、ＪＩＣＡとＷＨＯとの間で、協力の形式、分担等を定めたMinutesを作成する（トンガ側も署名）。

(ニ) トンガ政府は日本及びＷＨＯからの協力を調整し、プロジェクト運営の最終的責任を負う。

３ 役割の分担

ＷＨＯとの役割の分担に関しても、上記中嶋ＷＨＯ西太平洋地域事務局長との協議に於いて(イ)日本側の負担としては、技術協力の枠内での施設及び機材の供与、専門家派遣、及び研修員受入、(ロ)ＷＨＯ側の負担としては、機材供与、専門家派遣並びに研修のためのフェローシップ供与、研修の実施（現地及び第３国）、とすることで意見の一致を見ていたが、今回の事前調査では、提出された要請内容に対し、上記以上に詳しい役割分担を取り決めるには至らなかった。

その主な理由としては、(イ)日本人専門家の派遣に関し、専門家の確保が容易ではないという実状並びに、要請内容を更に整理すると、専門家によっては１人で幾つかの分野をカバーできる可能性があること等により、明確な見通しを述べることが難しかった。(ロ)ＷＨＯ側の負担としては、本件マルチ・バイ方式プロジェクトに対しての特別な予算措置が期待できず（マニラでのＷＨＯ側関係者との会議に於いて、この特別な予算措置について追求した処、特別な配慮も限られた範囲内で可能であろう旨回答あったが、具体的数字は提出されなかった。）、主としてカントリィ・アロケィションを使用すること、研修に関してはフェローシップの供与に並んでインターカントリィ・プログラムの利用が考えられるとのことであった。然しながら、ＷＨＯの次期会計年度（１９８２～８３年）に対するトンガ政府の予算要求の中に、本件プロジェクトのための特別措置を折り込むには既に遅すぎるし、ＷＨＯ側の本プロジェクトに対する負担、役割がもう一つ不明瞭であった。

尚、日本での研修員受入については、専門家派遣よりは対応が容易と考えられる。建物施設の供与に関しては、日本側がほぼ全面的に負担せねばならないと思われるが、具体的対応方法については、更に検討が必要である。

上記のように、役割分担に関して更に進んだ取り決めには至らなかったが、問題を打開するため、マニラでのＷＨＯ側関係者との会議に於いて、日本側、ＷＨＯ側及びトンガ側の負担区分を明らかにするためのフォーマットを作成したが、それに基づき日本側とＷＨＯ側が役割分担案を調整作成し、トンガ側に提示することを検討することとした。

（附録参照）

4 結　　論

以上述べてきたように、保健衛生検査所に対するトンガ側の協力要請に対して、日本側が、ＷＨＯとのマルチ・バイ方式でプロジェクトを実施することは、日本側の技術協力を一層効果的にし、意義のあるものと考えられる。

マルチ・バイ方式協力の基本的枠組に関しては、関係者間で同意が成り立っており、大きな問題はないと思われるが、具体的内容については、日本側専門家の確保の問題、検査所の建物の問題、ＷＨＯ側の負担役割の問題等が残っており、Ｒ／Ｄ及びMinutesを結ぶためにはこれらの問題を解決しておかねばならないと考える。

附　　録

I トンガ政府協力要請内容

(a) NOTES FOR THE DISCUSSION BETWEEN TONGA/ JAPAN/WHO MISSION ON POSSIBLE PUBLIC HEALTH LABORATORY PROJECT

The Japan Government has indicated its interest in developing a joint Japan/WHO project here in Tonga, to be known as the "Japan - Who Joint Technical Co-operation Project in the Kingdom of Tonga, Institute of Public Health".

Basically this project consists of:

1. Public Health Laboratory consisting of several subcomponents. The facility and function of each subcomponent is described below, including the number of staff required for each component.

The size of each subcomponent is determined by the following factors:

(1) space required for equipment,
(2) the minimum laboratory bench space required for one person to perform one test specimen,
(3) additional space for possible increase in workload (say for next 10 years) including space for specimens before and during processing.
(4) the laboratory supports required in the future to bring up those activities Public Health Services would require.

Training and continuing education will be one of the essential functions of this laboratory. This is absolutely necessary for all levels of existing laboratory personnel and will be carried out in groups of 5 or 6 persons. The undergraduate training of Laboratory and X-Ray Assistants, when formalized, will be the responsibility of the Tonga Health Training Centre, but their practical training will be carried out in this laboratory.

A well stocked and equipped library is an essential subcomponent if laboratory staff are to maintain their knowledge and technical capabilities.

FACILITY AND FUNCTION OF EACH SUBCOMPONENT OF THE LABORATORY COMPONENT OF THE INSTITUE OF PUBLIC HEALTH

1. ENVIRONMENTAL LABORATORY & PUBLIC HEALTH LABORATORY

Size: a total of 10 x 10 sq. meters for water and food labs.
Staffing : Tongan staff (2 - 1 available)
Oversea technologist (1) (Public Health Laboratory Technologist)
Function : Routine bacteriologic quality control of drinking water for Tongatapu water supplies - 100 samples per month

2.* Periodic chemical quality control of drinking water for the whole country - complete analysis of all water supply in the Kingdom and short analysis of water sources at least once every month for Nuku'alofa and at least once every six months for other piped water systems in whole country.

3. Water pollution

4. Sanitory inspection of Restaurants and Food products for the safety and protection of consumers - bacteriologic, chemical (food additives, preservatives and possibly pesticides) no matter whether sanitary law is imposed or not).

2.* Periodic chemical quality control of drinking water

2a. Routine physical and chemical analysis

Type of Tests : Turbidity, pH, chlorides, total dissolved solids; nitrates, nitrites, albuminoid nitrogen, ammonia, color and residual chloride (for chlorinated system only)

Methods to be adapted :

pH.....: Ph meter
Turbidity.....: Turbidimeter
Chlorides.....: Argenometric method (Standard method)
Total dissolved solids : Total Filtrable Residue Dried at 180°C
nitrates.....: Nitrate Electrode Screening method
nitrite.....: Colorimetric with spectrophotometer
nitrogen, organic...: Semimicro-Kjeldahl method
nitrogen (ammonia)..: Titrimetric method
color.....: Visual comparison method
free residual chlorine : DPD colorimetric method
Salinity.....: Hydrometric method

Sample size and frequency

Nukualofa water supply system : once every month (12 sample/year)
Other piped systems in Tongatapu: once every six months (72 samples/year)
Vava'u piped system : once every six months (sample /year)
Ha'apai piped system : once every six months (10 samples/year)

2b. Complete chemical and physical analysis

Methods .... Hach Direct Reading Colorimetric

Sample size and frequency

Nukualofa	: once every three years
System serving population above 500 in Tongatapu	: at least once for each system (31 samples)
Vava'u	: at least once for each system (5 samples)
Ha'apai	: at least once for each system (4 samples)

II. MICROBIOLOGY (Bacteriology, Serology, Parasitology and Mycology)

Size : 12 x 5 sp. meters

Staffing : Tongan staff (3 - 3 available)
Oversea technologist (medical microbiology) (1)

Function :
1. Isolation and identification of Salmonella and Shigella including Vibrios, Enteropathoganic E. coli
2. Laboratory diagnosis of STD, particularly Gonorrhea and syphlis
3. Isolation and identification of microorganisms from clinical specimens (the field of mycology, anaerobic culture should be developed.)
4. Serodiagnosis
   a. Syphilis (VDRL and TPHA)
   b. Leptospirosis (Macroslide with Pathoc II) screening
   c. Brucellosis Nacroagglutination test
   d. Screening serology for Mepatitis, Dengue favor and measles
5. Referral activities to Vava'u, Ha'apai and 'Eu' eiki Hospital labs
6. Laboratory diagnosis of intestinal parasites, Amoeba, Giardia Microfilaria and Trichomonas

III. T.B. Laboratory

Size : 5 x 5 sq. meters

Staffing : Tongan staff (1)

Function :
1. Examination of sputum specimens by ZN staining for Tongatapu (Hospital wards, Health centres, OPD, private practitioners)
2. Quality control of stained smears for the whole country.
3. Culture of urins, gastric lavage, biopay, CSF

Note: Drug Resistance test and identification of atypical mycobacteria depends upon overeca Reference Lab.

IV. Media service Unit (Washing, sterilization and media preparation)

Size : 12 x 7.25 sq. meteres

Staffing : Tongan staff (1) Laboratory maids (3-2 available)

Function : 1. Supplies of glassware and decontamination of infected material

2. Preparation of media and reagent needed for outer islands.

V. Library

Size : 2.5 x 5 sq. meters

Function : 1. Maintenance of Textbooks and Laboratory Manuals needed for all subcomponents of the Laboratory components

2. Laboratory supply catalogues

VI. TEACHING LABORATORY

Size : 7 x 5 sq. meters

Function : Lecture, demonstration and practice when new method is introduced or refresher training of staff is required, Staff meeting for management and review of scientific matters

VII. STORAGE

Size : 12 x 2.5 sq. meters

Function : 1. Storage of one year (at least) of laboratory supplies

2. Maintenance of inventory, stock ledger and record and annual stock-taking

3. Despatch of supplies to outer islands of laboratory supplies and prepared reagents.

Staffing : One Clerk to be trained in laboratory supplies

VIII. Offices for Head International staff and senior Tongan staff

Head : 4 x 5 sq. meter

International and senior staff : 6 x 5 sq. meters

IX. HAEMATOLOGY

Size : 7 x 3 sq. meters

Staffing : Tongan staff (3 - 2 available)

Function : 1. Routine haematological examination

X. BIOCHEMISTRY

Size : 7 x 3 sq. meters

Staffing : Tongan staff (2 - 2 available)
Oversea technologist (clinical chemistry)

Function : 1. Routine clinical chemistry
2. Referral

XI. Immunohaematology and BLOOD TRANSFUSION SERVICE

Size : Two rooms of 3 x 4 sq. meters

Staffing : Tongan staff (1)

Function : 1. ABO grouping and Rh typing
2. Donor's bleeding and cross-matching
3. Examination of transfusion reaction
4. Maintenance of Walking blood bank for Tongatapu

XII. Exfoliative cytology

Size : 3 x 4 sq. meters

Staffing : Tongan staff (1) - not available at present
Oversea technologist (1 in cytology)

Function : Preparation of bone marrow and Pap smears
Diagnosis for whole country

In order to prevent the Public Health Section of the Laboratory being dominated - financially and in staffing - by the clinical division, it is proposed to have a Senior Laboratory Technician each to be in-charge of each section. The eventual head of the Laboratory will be a Medical Officer - either an Epidemiologist or Clinical Pathologist.

From the beginning the nervices of 3 Technologists will be required to be supplied, wither by Japan or WHO, in the following fields:-

1. Public Health Laboratory Technologist
2. Microbiologist
3. Biochemist
4. Cytology (short term only)

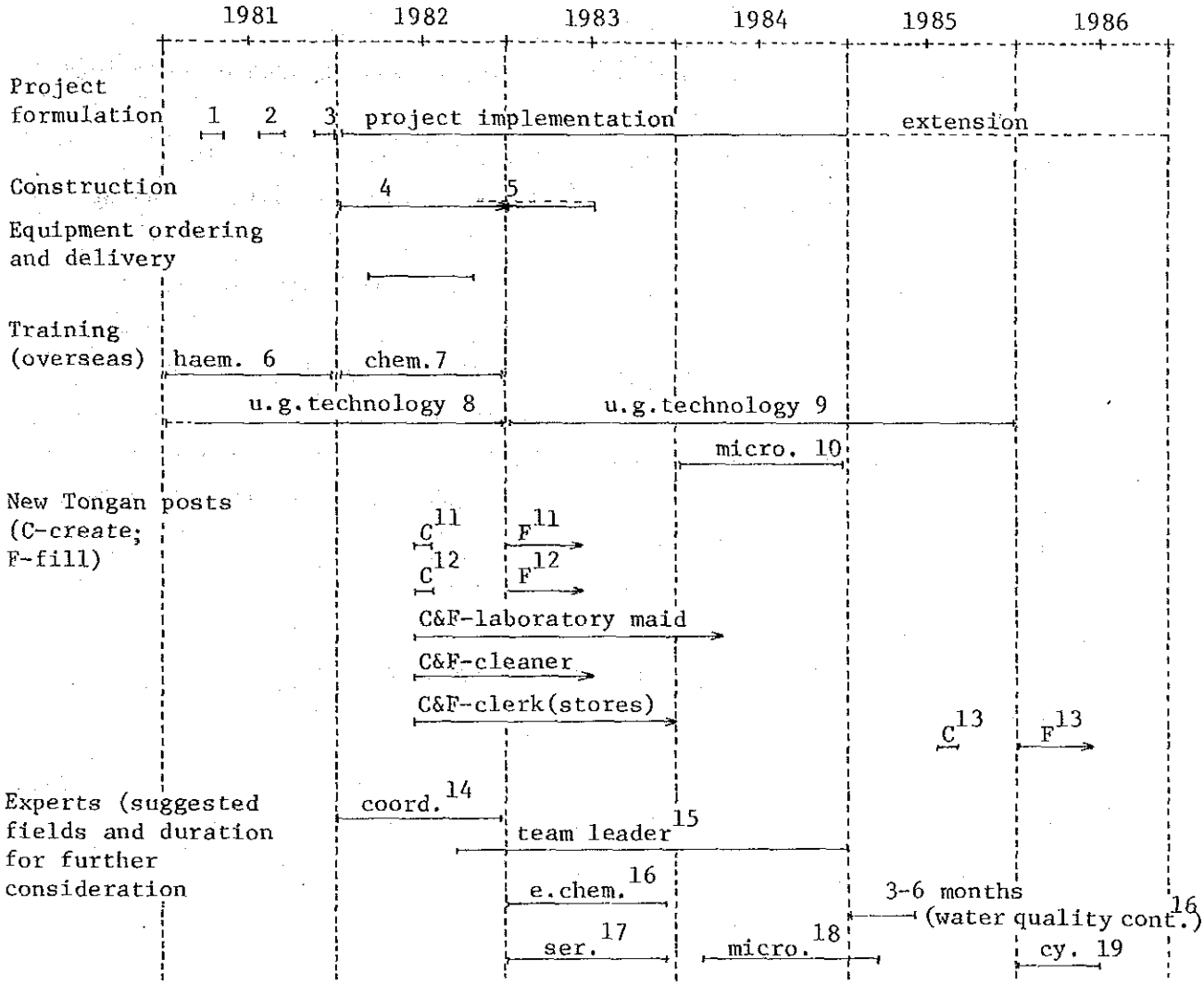
Total duration of time required for these staff may be 3 to 4 years.

Because housing is one of the problems currently encountered by Tonga it is requested that staff quarters (including furnitures etc.) be included in total cost of project. These quarters are preferably be built near the hospital.

Overseas training of existing staff and new staff will be an important part of the project. Details to be worked out later.

? Transport.

DRAFT SCHDULE OF ACTIVITIES FOR THE PROJECT OF HEALTH LABORATORY SERVICES AND TRAINING



Notes:

1. Joint Fact-finding Mission
2. Joint reliminary Survey Team
3. Implementation Mission (sign agreements & prepare for implementation).
4. Design and construction of public health laboratory
5. Renovation of existing laboratory
6. Implemented WHO fellowship in haematology for existing graduate technologist- in New Zealand
7. Proposed WHO fellowship in clinical chemistry for existing graduate technologist
8. Implemented Tongan Government scholarship for undergraduate technology study in Fiji
9. Undergraduate technology study- funding source to be determined
10. Training in microbiology for existing graduate technologist- funding source to be determined
11. Assistant laboratory technician for environmental health laboratory
12. Laboratory-X-ray assistant for haematology
13. Assistant laboratory technician for exfoliative cytology
14. Coordinator (administrative for implementation).
15. With broad senior experience but probably with a specialized field of technology- perhaps microbiology- which might influence the plans for fields and duration of other experts
16. Chemical technology, environmentatl health- 6-12 mos.
17. Serology technology 6-12 mos.
18. Microbiology technology 12 mos. (depending on note 15)
19. Cytology 6 mos.

(c) LIST OF STAFF (TENTATIVE) FOR POSSIBLE HEALTH LABORATORY SERVICES PROJECT

Area	Required	Existing	New Post
Administrative	1	0	1 (medical Officer) candidate-1983
Environmental & Food Laboratories	2	1 (Ass.Lab.Tech.)	1 (Ass.Lab.Tech.)[1]
Microbiology	3	3 (Lab.Tech.) (Ass.Lab.Tech.) (Lab./X-Ray Ass.)	
TB Laboratory	1	1 (Lab./X-Ray Ass.)	
Media Service	1 (Lab.Ass.)	1 (Lab./X-Ray Ass.)	
	3 (Lab.maids)	2 (Lab.maids)	1 (Lab.maid)
Haematology	3	3 (Lab.Tech.) (Ass.Lab.Tech.) (Lab./X-Ray Ass.)	
Cytology	1	0	1 (Ass.Lab.Tech.)[2]
Clin. Chemistry	2	2 (Ass.Lab.Tech.)	
Ctorage	1 (Clerk)	0	1 (Clerk)
Cleaner	1	0	1 (Cleaner)
Clerk/Typist	1	1	
Total	20	14	6

Remarks: 1) Candidate under study at School of Medical Technology. Available in 1983. Further training in Water and Food Chemistry is needed.

2) Scholarship (undergraduate training) should be sought as soon as possible.

(d) RECOMMENDATIONS 17 August 1981 by Dr. P.N. Wang, WHO Adviser, ONCLINICAL LABORATORY TESTS TO BE DONE AT VAIOLA HOSPITAL IN FUTURE

Biochemistry

Serum urea*
" sodium*
" potassium*
" glucose*
" Creatinine*
Total protein
Total bilirubin
Uric acid*
amylase
cholesterol
Bromsulphalein (BSP)
Bicarbonates
SGOT (Kit)
Plasma fibrinogen
calcium
Alkaline Phosphatase
Chloride
Phosphorus

Serum salicylates
Triglyeerides
D-xylose absorption test
Pentagastrin (or histamine) test
Ascorbic Acid saturation test
Faeces: trypsin and porphyrins
CSF chloride
Faeces: total fat excretion
Urine : protein*, glueose*, pH*, sp. gravity*, bilirubin*, urobilin* and urobilinogen*, ketone bodies*, cysteine, analysis of calculi
Blood Gases

*- currently being performed

Haematology

Hb estimation*
Total WCC*
PCV*
Reticulocyte count*
Platelet count*
Bone marrow examination
Blood film*
Prothrombin time
Sickle cell*
LE*
CRP
Abrocmal haemoglobin

*- currently being performed

(e) LIST OF EQUIPMENT (REVISED) FOR POSSIBLE HEALTH LABORATORY PROJECT

(1) Three Electronic Calculators, Office type
(2) Copying machine (one) with spare phototubes
(3) Two automatic, horizontal, steam-operated autoclaves, Internal chamber approx. 40 x 80 cm
(4) Low temperature drying oven (one), 90°C
Size approx. 1380 high x 800 wide x 70 deep (mm) with spare heaters
(5) Deionizer, medium size, with built-in conductivity meter with mixed rainings enough for two years' operation
(6) One Hot Air Oven (Sterilizer), 160°C, with fan and spare heaters
Size: approx. Internal dimensions 500 (h) x 1000 (w) x 500 (d) mm
(7) One water bath, 100°C, Size: approx. 700 (h) x 360 (w) x 360 (d) mm with spare heaters
(8) Six Supply Trolleys
(9) Microscope, binocular, Olympus, BH type (4) with spare lamps
(10) One Phase-contrast microscope with spare lamps
(11) Centrifuge, refrigerated, with a high speed attachment (one) with spare carbon brushes and spare belts
(12) Deepfreezer, -20°C, Size: approx. 1300 x 600 x 900 mm high, Chest type
(13) Two Water Baths, medium Size, 37°C and 56°C (for serology) with spare heaters
(14) One Spectrophotometer with spare phototubes and cuvettes
(15) One Spectrophotometer scanner for ELIZA test (microplates) with spare Phototubes
(16) pH meter, expanded scale or digital (one) with spare electrodes
(17) One Serum Protein Electrophoresis apparatus and scanner with apare phototubes
(18) One Bilirubinometer (micro) with spare cuvettes and phototubes
(19) One Blood Bank Refrigerator, 2-6°C, medium Size with spare thermostats
(20) One Analytical Balance, sensitivity 0.1 mg, Mettler or equivalent
(21) Muffle Furnace, 750°C, medium size: approx. Heating chamber 7500 x 7500 x 1500 with spare heaters
(22) Conductivity meter, self-contained (one)
(23) Turbidimeter with standards, Hach model 2511 or equivalent (one) (Nephelometer) with spare lamp bulbs
(24) BOD incubator, 20°C, medium size (one) with spare heaters
(25) Drying oven, 103 -105°C, small (500 x 400 mm) (one) with spare heaters

(26) 8 Microscope, student, binocular with spare lamp bulbs

(27) Packed Cell Volume (PCV) Instrument, direct- reading (Arthur-Thomas) (one) with spare cuvettes

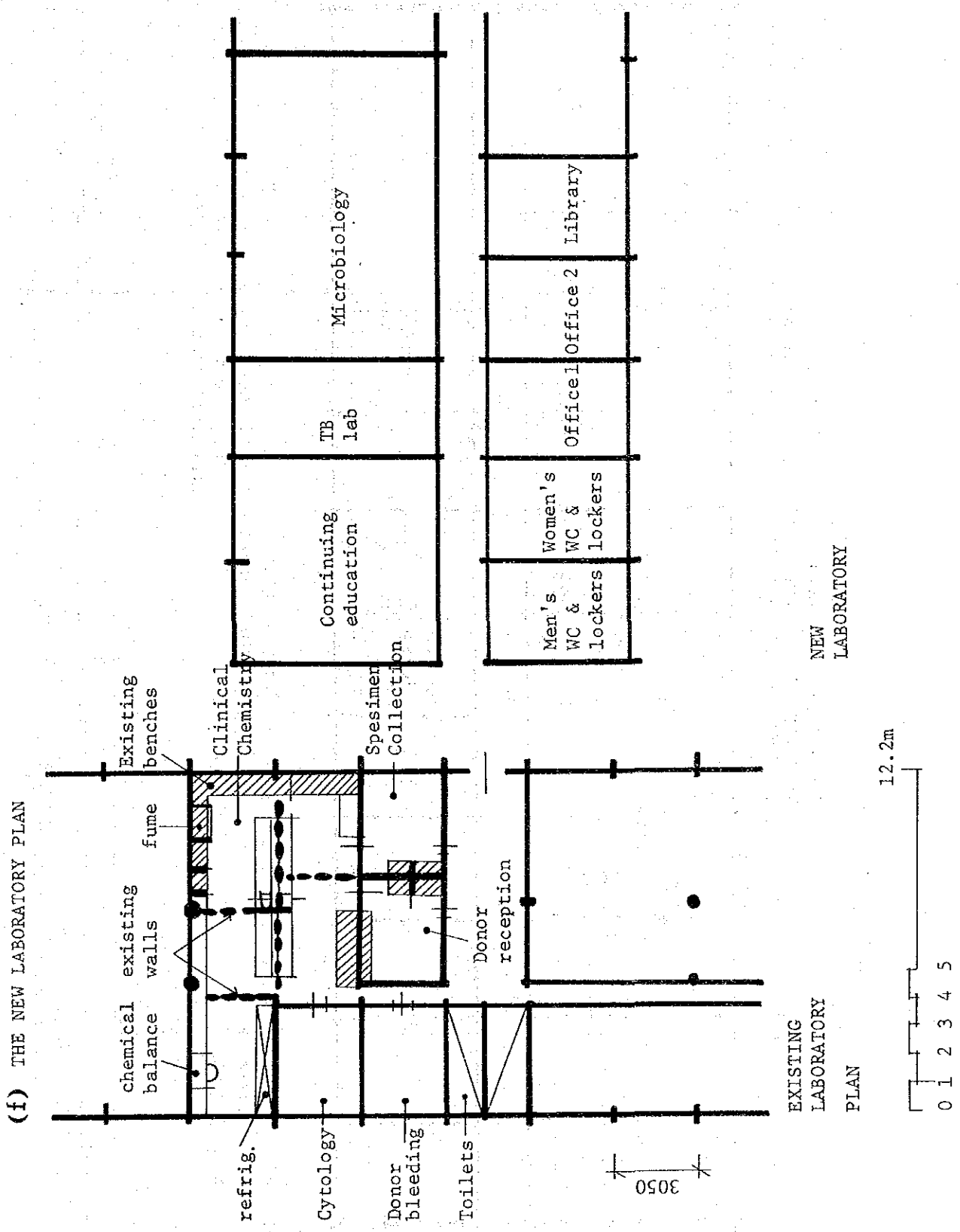
Remark : The Power Supply in Tonga is 240 V, 50 Hz

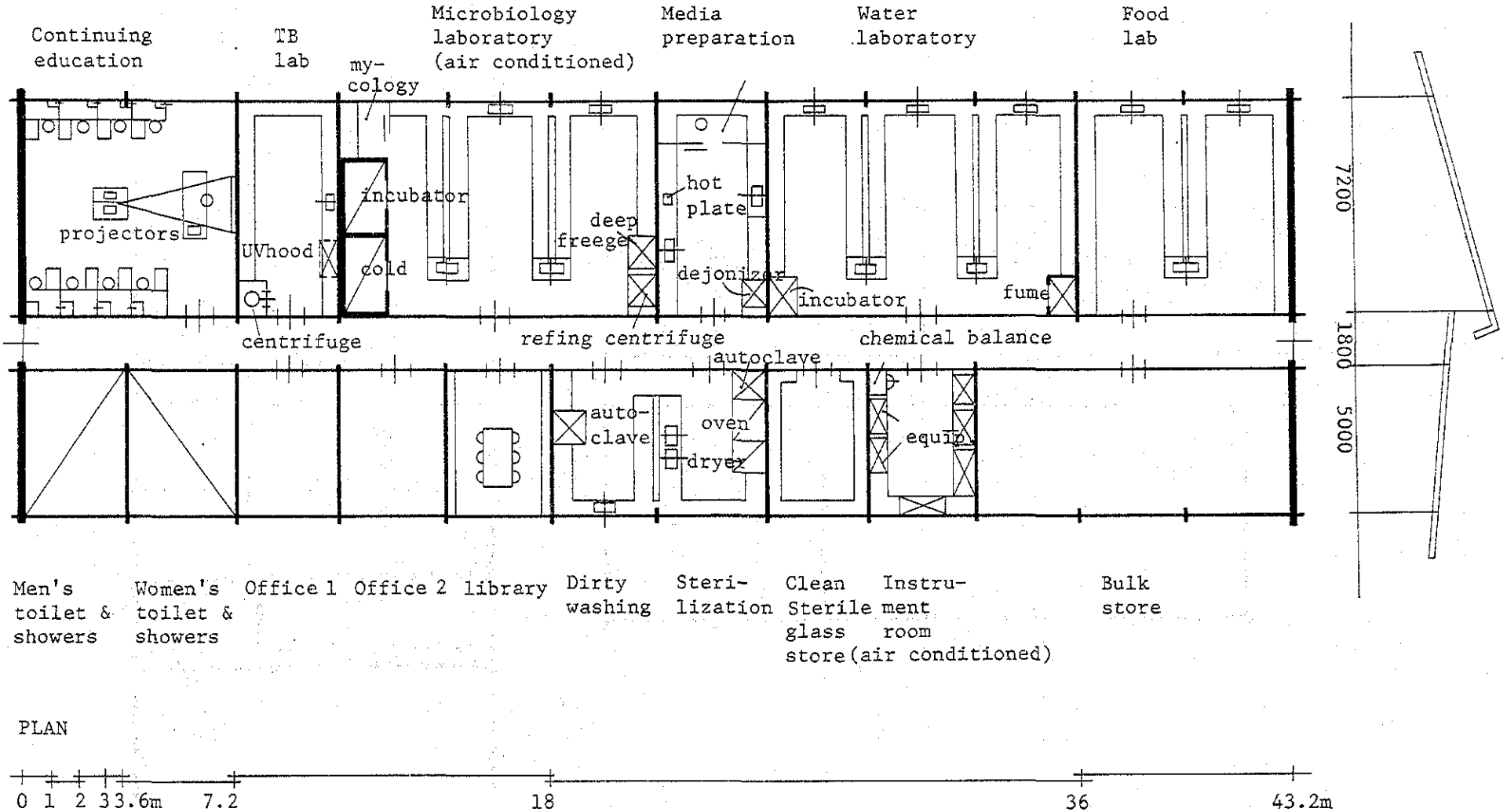
(28) Two typwrigters, long-carriage, 24"

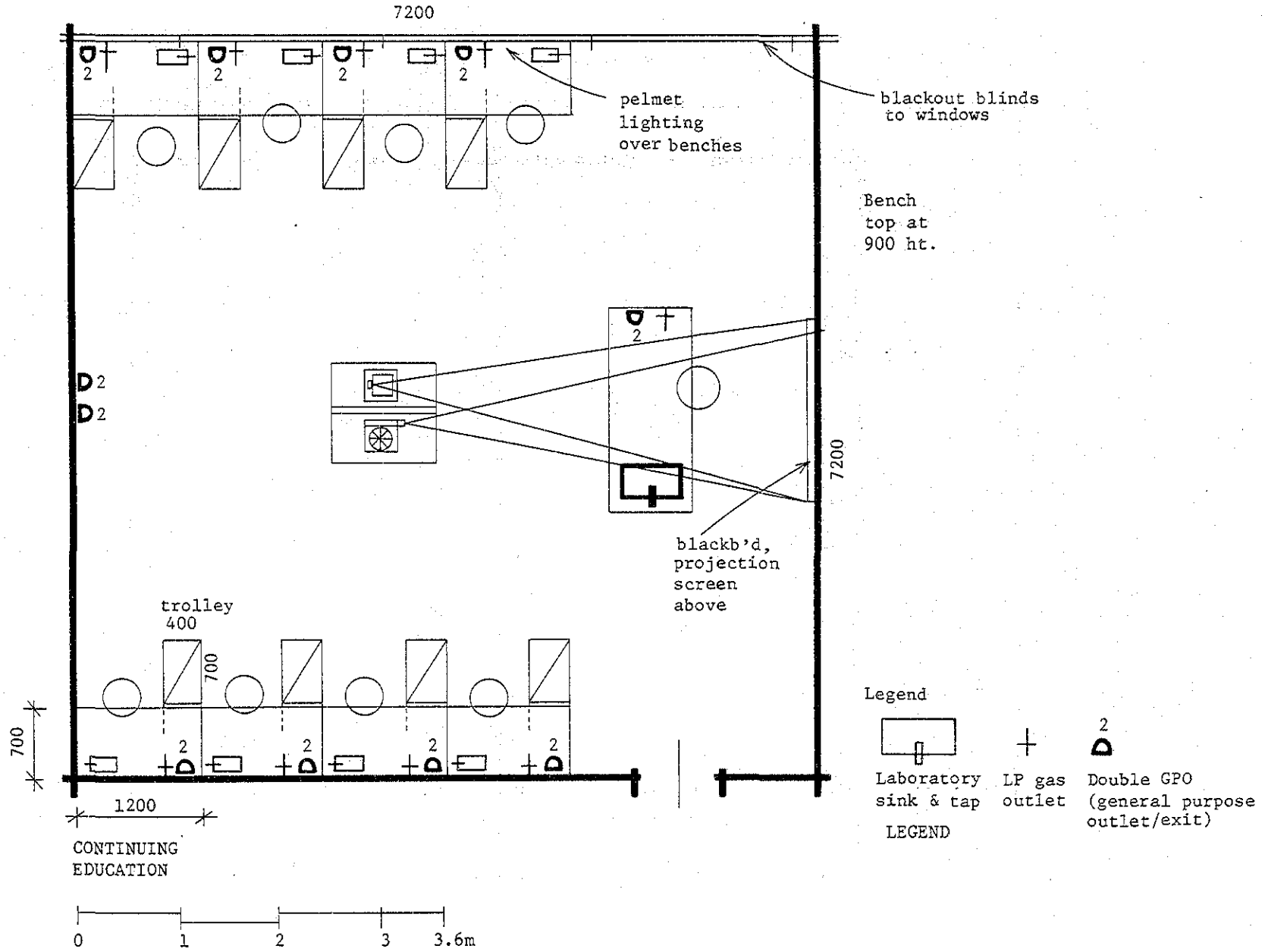
(29) Vehicle (one)

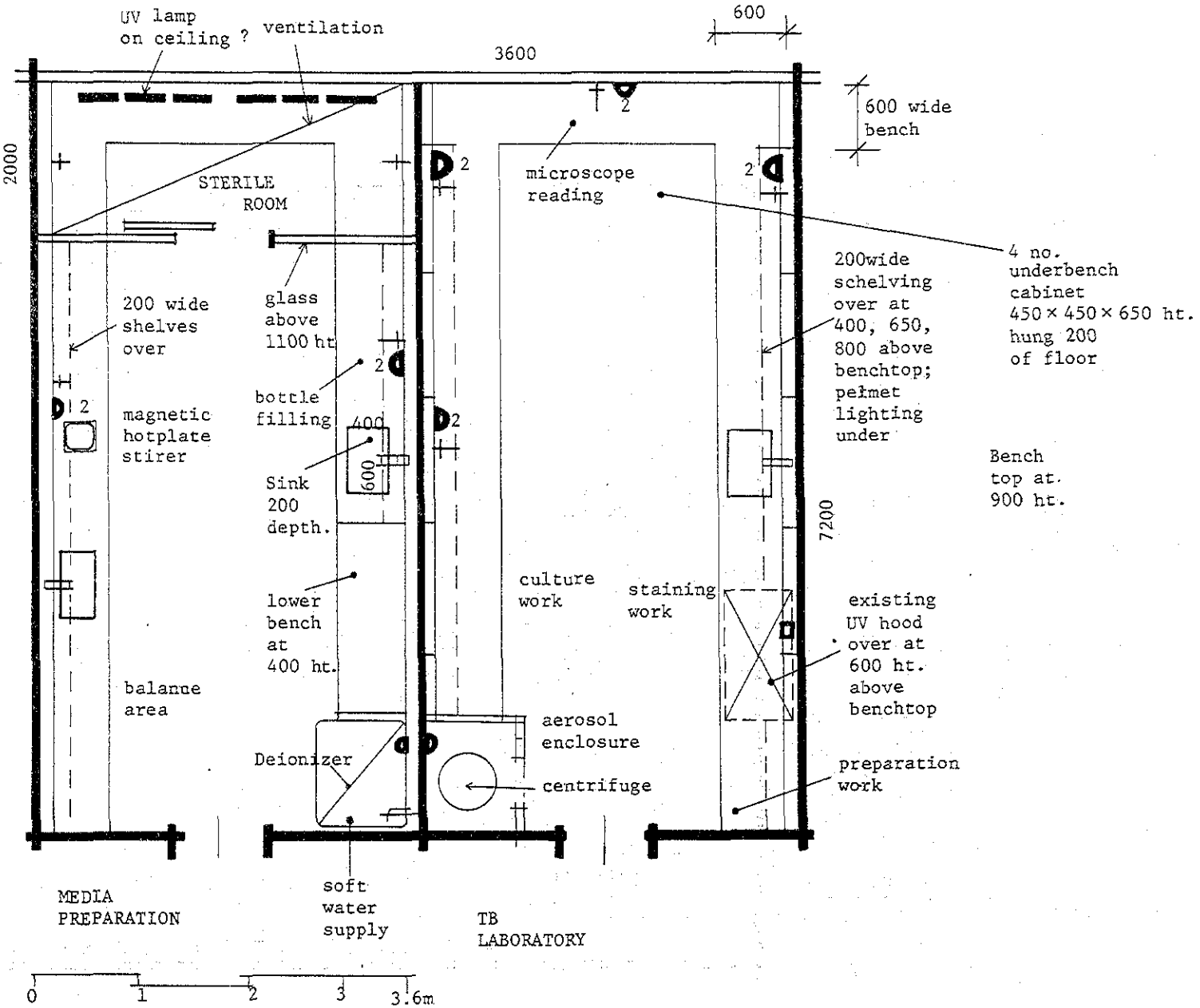
(30) Requlators (Stabilizer) for the main or individual instruments

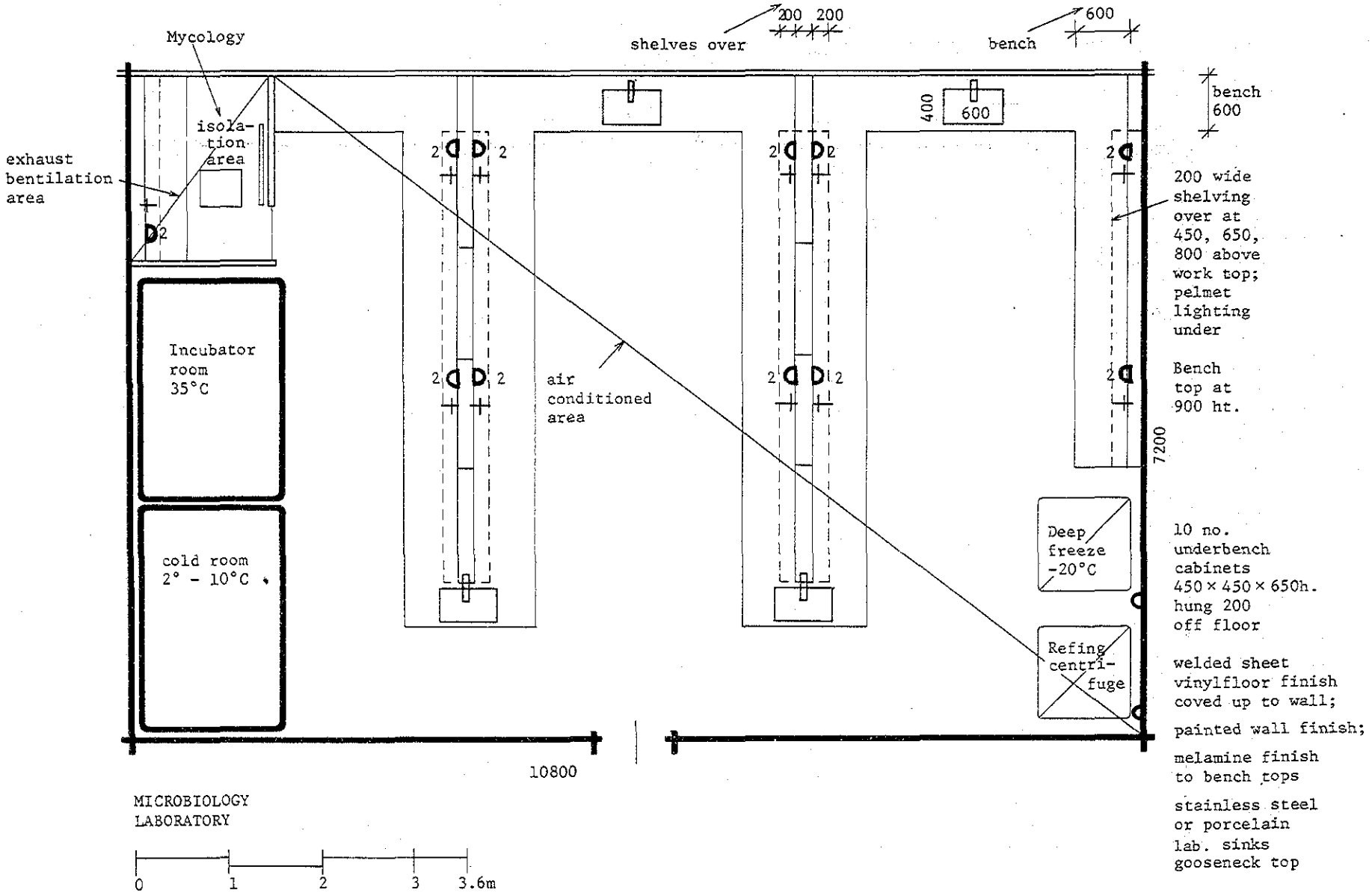
(f) THE NEW LABORATORY PLAN

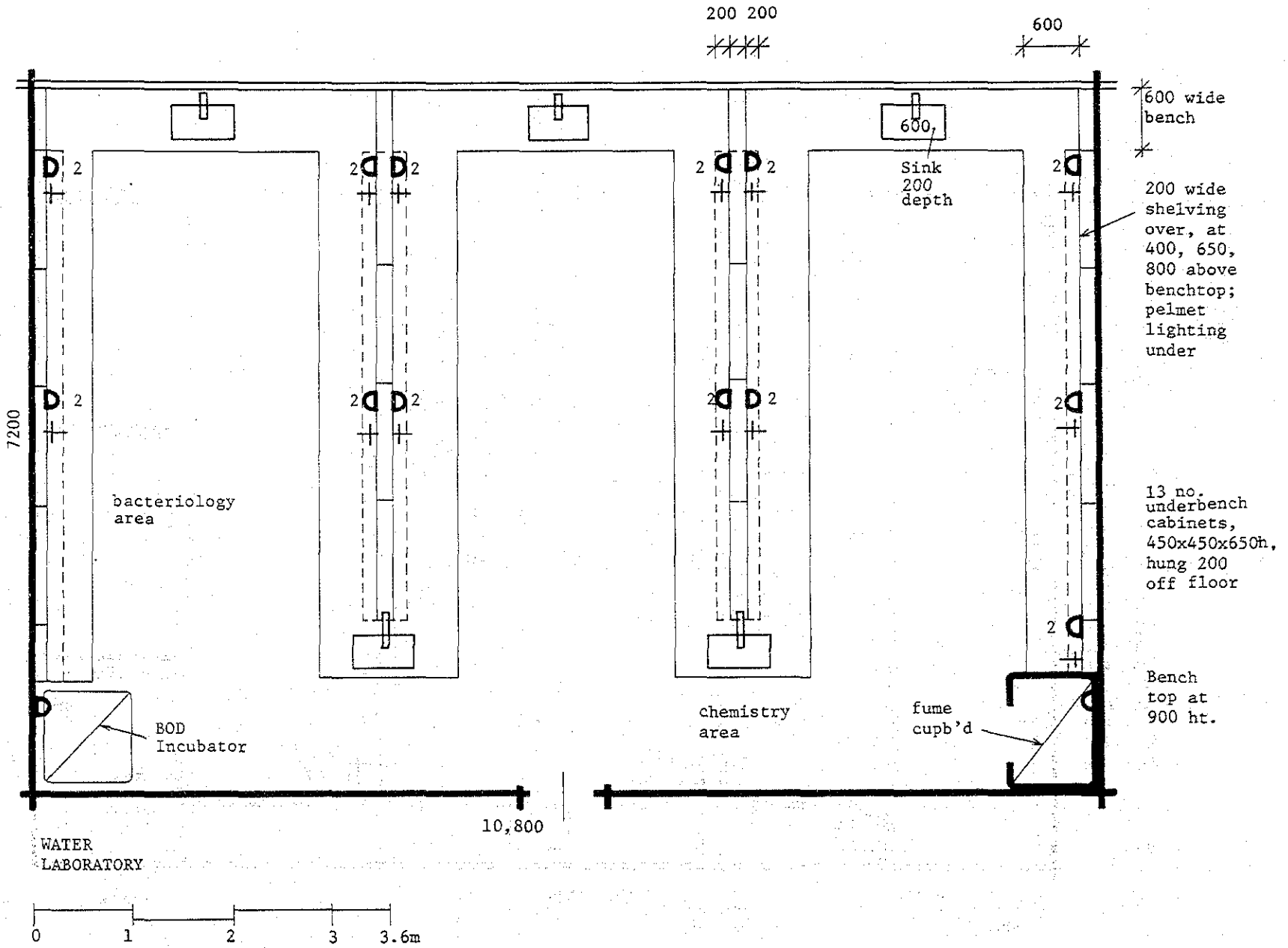


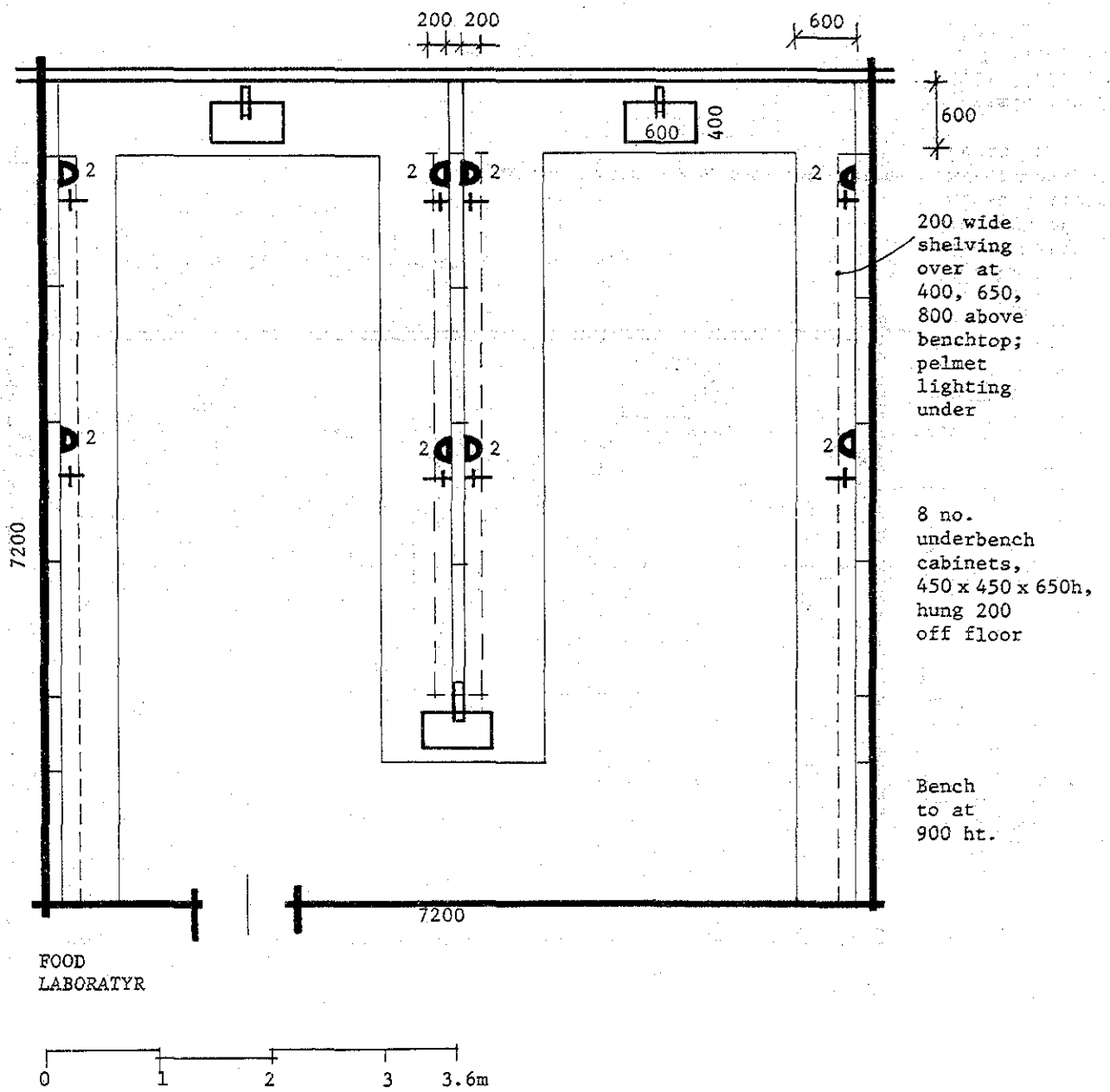

Continuing education
TB lab
my-cology
Microbiology laboratory (air conditioned)
Media preparation
Water laboratory
Food lab
projectors
UVhood
incubator
cold
deep freeger
hot plate
dejonizer
incubator
fume
centrifuge
refing centrifuge
chemical balance
autoclave
auto-clave
oven
dryer
equip.
7200
1800
5000
Men's toilet & showers
Women's toilet & showers
Office 1
Office 2
library
Dirty washing
Steri-lization
Clean Sterile glass store
Instru-ment room (air conditioned)
Bulk store
PLAN
0 1 2 3 3.6m 7.2 18 36 43.2m

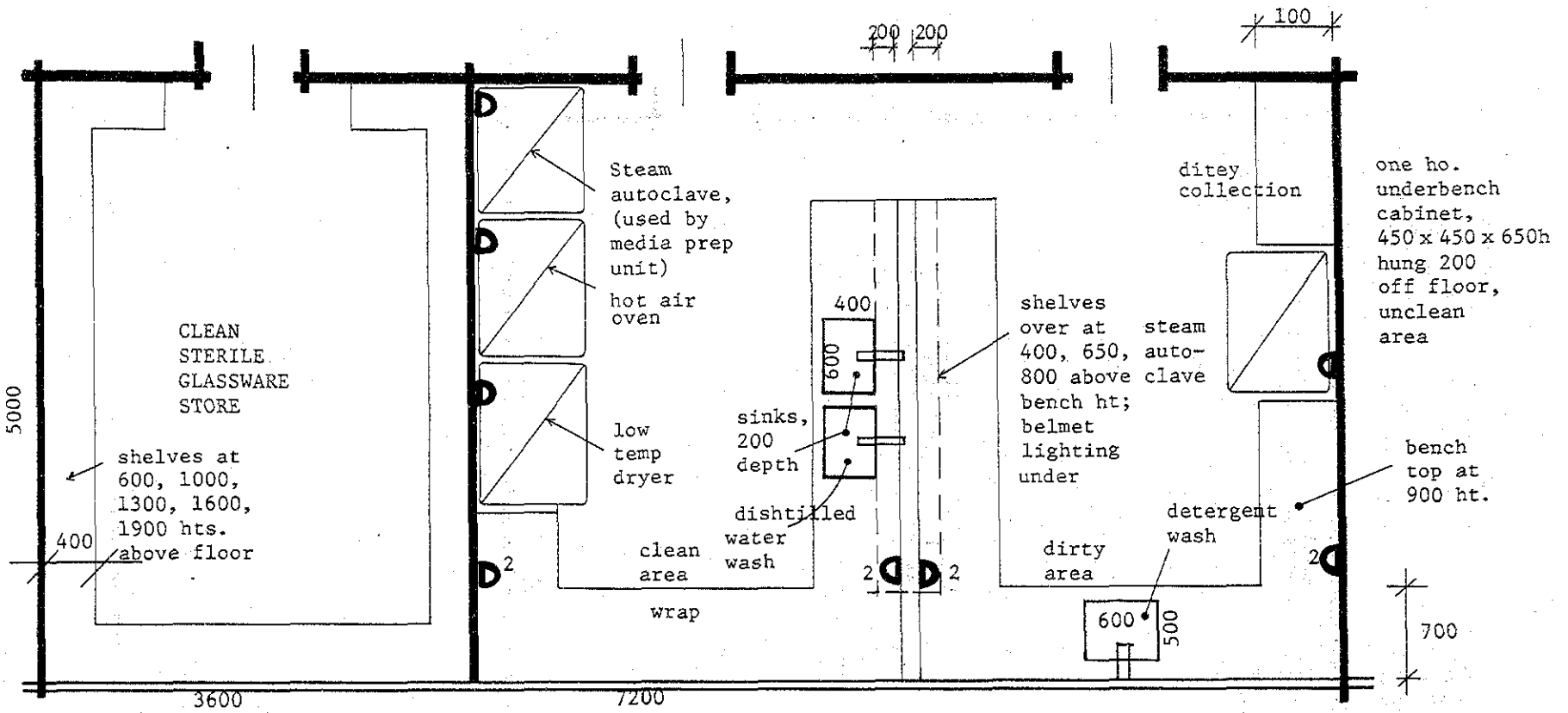

7200
2
2
2
2
pelmet
lighting
over benches
blackout blinds
to windows
Bench
top at
900 ht.
2
2
2
7200
blackb'd,
projection
screen
above
trolley
400
700
700
2
2
2
2
1200
CONTINUING
EDUCATION
0
1
2
3
3.6m
Legend
Laboratory
sink & tap
LP gas
outlet
2
Double GPO
(general purpose
outlet/exit)
LEGEND


UV lamp
on ceiling ?
ventilation
3600
600
600 wide
bench
2000
STERILE
ROOM
microscope
reading
4 no.
underbench
cabinet
450 × 450 × 650 ht.
hung 200
of floor
200wide
schelving
over at
400, 650,
800 above
benchtop;
pelmet
lighting
under
200 wide
shelves
over
glass
above
1100 ht
bottle
filling
magnetic
hotplate
stirer
400
600
Sink
200
depth.
Bench
top at.
900 ht.
7200
lower
bench
at
400 ht.
culture
work
staining
work
existing
UV hood
over at
600 ht.
above
benchtop
balance
area
aerosol
enclosure
Deionizer
centrifuge
preparation
work
MEDIA
PREPARATION
soft
water
supply
TB
LABORATORY
0
1
2
3
3.6m


Mycology
shelves over
200 200
bench
600
isola-
tion
area
exhaust
bentilation
area
Incubator
room
35°C
cold room
2° - 10°C
air
conditioned
area
400
600
bench
600
200 wide
shelving
over at
450, 650,
800 above
work top;
pelmet
lighting
under
Bench
top at
900 ht.
7200
Deep
freeze
-20°C
Refing
centri-
fuge
10 no.
underbench
cabinets
450 × 450 × 650h.
hung 200
off floor
welded sheet
vinylfloor finish
coved up to wall;
painted wall finish;
melamine finish
to bench tops
stainless steel
or porcelain
lab. sinks
gooseneck top
10800
MICROBIOLOGY
LABORATORY
0
1
2
3
3.6m


200 200
600
600 wide bench
600
Sink
200 depth
200 wide shelving over, at 400, 650, 800 above benchtop; pelmet lighting under
7200
bacteriology area
13 no. underbench cabinets, 450x450x650h, hung 200 off floor
Bench top at 900 ht.
BOD Incubator
chemistry area
fume cupb'd
10,800
WATER LABORATORY
0
1
2
3
3.6m


200 200
600
600
400
600
2
2
2
2
2
2
2
2
2
200 wide shelving over at 400, 650, 800 above benchtop; pelmet lighting under
8 no. underbench cabinets, 450 x 450 x 650h, hung 200 off floor
Bench to at 900 ht.
7200
7200
FOOD LABORATYR
0
1
2
3
3.6m

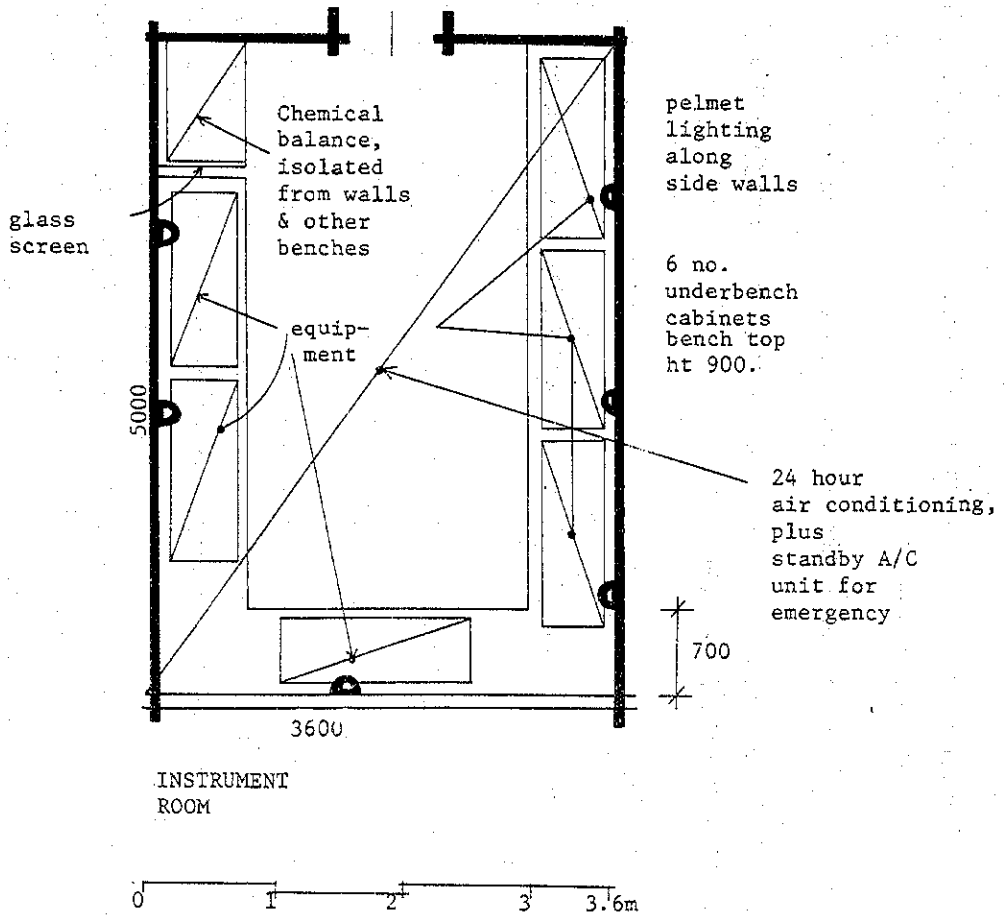


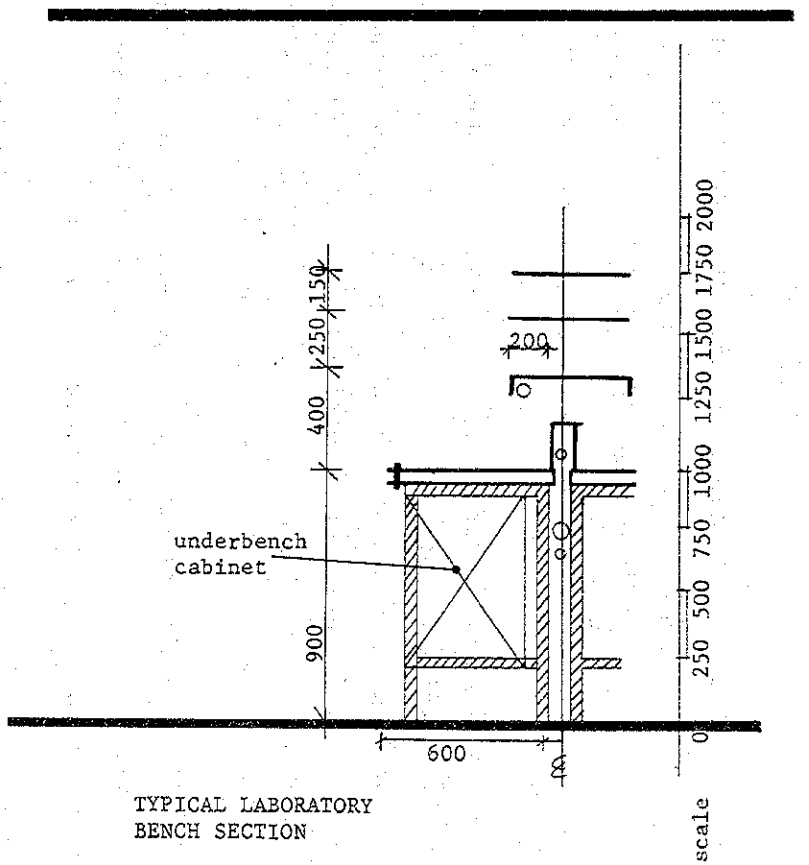
WASHING/STERILIZATION SERVICE UNIT

(This plan is to be reversed all exactly.)

one no. floor waste in cash of clean & dirty areas, under benchtop.

Ceramic floor tile finish, wall tiles to 1300 ht.





TYPICAL LABORATORY BENCH SECTION

Ⅱ 会議議事録

(a) SUMMARY OF DISCUSSION BETWEEN TONGAN GOVERNMENT TEAM AND JOINT WHO/GOVERNMENT OF JAPAN PRELIMINARY SURVEY TEAM

HEALTH LABORATORY PROJECT

1. The Proposed Project

The discussion aimed at development, to the extent needed to expedite further consideration leading to approval and implementation, of a proposal of the Government of Tonga in a health laboratory project. The proposal of the Tongan Government is based on a portion (Programme I, Elements A and B) of a proposal previously submitted to the Joint Fact-finding Mission, with the following clarifications which were developed during the discussion:

Both clinical and public health laboratory services are included. This requires a new facility, and also continued use of the present laboratory facility, which needs relatively miner renovations.

Equipment is to be provided, with consideration of durability and simplicity of operation and maintenance appropriate to local conditions.

Expert assistance from the Government of Japan is desirable in selected fields of laboratory technology.

Further details concerning the project are contained in:

NOTES FOR THE DISCUSSION BETWEEN TONGA/JAPAN/WHO MISSION FOR POSSIBLE PUBLIC HEALTH LABORATORY PROJECT

LIST OF EQUIPMENT

DRAFT SCHEDULE OF ACTIVITIES FOR THE PROJECT OF HEALTH LABORATORY SERVICES AND TRAINING

PRELIMINARY ARCHITECTURAL BRIEFING

2. Ideas Concerning Implementation

The Tongan Government plans to administer the health laboratory services by designating a medical officer (to be determined whether epidemiologist or clinical pathologist) to be in charge and to report to the Director of Health. The medical officer will supervise two senior Laboratory Technicians, respectively to be in charge of clinical and of public health services, each to have both administrative and technical duties. This is the framework within which to designate counterpart relationships with experts from

Japan.

For the project, the Government of Tonga will coordinate training supported by the Governfment of Japan with that supported by WHO, in order to meet the goal of developing capacity for full operation of the service by Tongan staff.

The Government of Tonga expressed its wish to have a major role in design and building of the laboratory, and the importance of building working drawings to be done in Tonga was also suggested. The discussions noted that this would facilitate adaptation to local circumstances. The Japanese team is expected to take these proposals to Japan for consultation and to try to send the results of its discussion there promptly to Tonga.

Implications for increased operating costs to Tonga that the project will necessitate were considered. These will need to be examined in further detail before implementation.

3. Framework of Cooperation

It is anticipated that the notes of discussion and supporting documents will enable final documentation to be prepared between the Governments of Japan and Tonga through the normal channels of Japanese Embassy in Suva and Ministry of Foreign Affairs in Tonga. Further information or documentation, if needed to complete this process, can be provided through these channels.

All parties concerned saw no major difficulties with the framework of Japan-WHO joint technical cooperation previously agreed between concerned authorities of the Government of Japan and WHO. That is to say, the Government of Japan will make a contribution within its framework of bilateral technical cooperation based on Record of Discussion forms, while WHO will make a contribution within its own framework to make the above bilateral cooperation more effective.

It is expected that the Government of Tonga will assume the responsibility to make the contributions from the Government of Japan and WHO appropriate and effective.

The possibility and suitability of developing some form of document or minutes expressing the relationship of WHO and the Government of Japan is expected to be further discussed in Manila. Pending the outcome of these discussions, it is expected that available resources in the WHO Country Programme in Tonga, as well as from relevant Intercountry Programmes, will

cooperate with this project as requested by the Government of Tonga. This cooperation might include consultation by WHO staff, support of fellowship and other training activities, and a limited amount of supplies and equipment.

The full details of discussion, covering each meeting, are attached to this summary.

It was agreed that if this project could be put into practice successfully, it should contribute significantly to the health and welfare of the Tongan people.

(b) NOTES OF DISCUSSION (as corrected and approved 20 August 1981)

First meeting 10:00 AM-12 noon Wednesday 19 August 1981 of Tongan Government Team with Joint WHO-Government of Japan Joint Preliminary Survey Team.

Present:
Tongan team: Dr. Supileo Foliaki, Director of Health, Chairman of Tongan team (and Chairman of Meeting); Mr. Tu'a Taumoepeau Tupou, Secretary for Foreign Affairs; Mr. 'Alo 'Afo Matoto, Secretary of Finance; Mr. Paula Lavulo, Acting Director of Planning; Mr. David Keith, Director of Works; Mr. Busby Kautoke, Assistant Secretary/Health. Japanese Government Members of Joint Team: Dr. Komi Kanai, Chief of Japanese Mission, National Institute of Public Health; Dr. Fumio Iriyama; Dr. Koichi Soga; Mr. Kozo Tsukada, Coordinator.
WHO members: Dr. L.R.L.Verstuyft, WHO Representative for the South Pacific; Dr. C. Palmer; Mr. A. Tow; Dr. P.N.Wang; Dr. R. Wainwright.

Dr. Foliaki made introductions and welcome and suggested that timing of future sessions be determined flexibly at the end of each session. He drew attention to the role of WHO, and especially of Dr. Hiroshi Nakajima, Regional Director for the Western Pacific, in stimulating the development of this project and seeking the assistance of the Japanese Government for it.

He suggested the meeting attempt to decide at an early stage the achievement to be aimed at by the end of the Joint Team's visit, with regard to minutes of discussion needing signature.

He understood that the meeting would be discussing a proposal of reduced scope as compared to the proposals presented to the previous Fact-finding Mission; the scope now being a health laboratory services project. It aimed at meeting needs in clinical and public health laboratory services,

including providing a public health laboratory facility. The project should address laboratory needs as a whole particularly as some fields such as microbiology and serology should to considerable degree serve both clinical and public health needs. Public health aspects include food and water surveillance and testing. For food, Government is currently planning separate laboratories in connection with manufacture of edible products (e.g., desiccated coconut), but the Ministry of Health needs capacity in food testing to back this up, and perhaps to do directly if it is not otherwise provided. Health has responsibility for surveillance of food, restaurants, food handlers, water supplies.

Facility for training of technicians is needed, including a well designed library. Also office space, stores, etc. For staffing of the new facility, he would favour requesting the Japanese Government to provide expert assistance such as laboratory technologists for an initial period. Also to be requested is laboratory equipment including vehicular support. He would also suggest construction of housing near the hospital in connection with the Japanese experts, since Government has a shortage of available housing for expartriate experts, as something that might be considered as part of the project.

Dr. Kanai stated that these proposals were not very different from what his team had been urged to obtain agreement on, including development of both clinical and public health laboratory services and dispatch of technical experts- within the framework of availability of budget and experts.

Dr. Verstuyft expressed appreciation to both Tongan and Japanese Governments. To organize the process, he suggested minutes of each discussion meeting, which could be initialed. He understood the proposal to include facilities and equipment, and also "software" such as the contribution of the experts. The latter could either be done bilaterally, or it might be considered via funds in trust from Japanese Government through WHO.

Mr. Tsukada said, although he could not make a final decision, staff via funds in trust may be difficult to arrange under JICA's umbrella.

Mr. Tow asked if it was intended that design and construction would be initiated and mainly conducted locally, with Japanese Government review, or, at the other extreme, be done entirely from Japan.

Mr. Tsukada responded that it might be possible to have a local architect

initiate, depending on the monetary ceiling involved. The Japanese Government does projects both ways; for the laboratory, it would probably not be above the ceiling for local initiation, although he can not make the final desision.

The Directors of Health and Works stated that Tonga would like to have a major role in design and building. Design could be sent to Japan where working drawings, fittings, etc., might be done. Local design would have the advantage of matching types of materials easily available and of blending with the environment of the hospital. Government would probably like to tender with a local contractor, using materials as stipulated within Japanese Government guidelines.

Mr. Tsukada agreed with this proposal but couldn't make a final decision.

The Director of Health understood from information received from Japanese Government and WHO that a final proposal was desired; if so, he would like to see if a sketch could be made during this visit and for that reason would like to know if the previously mentioned amount of approximately US$250,000 for building and equipment was still the same.

Mr. Tsukada said generally that amount should be easy to cover, though the role together with WHO might affect this, requiring a different arrangement than usual.

Dr. Verstuyft clarified that funding of buildings and heavy equipment was not possible through WHO funds; on the other hand, fellowships and training were possible from WHO if Government requested and funds were available.

Dr. Kanai asked if WHO had standard designs for laboratories.

Dr. Verstuyft and Mr. Tow responded that laboratories needed specific design for the situation although there might be standards with respect to specific space uses, benches, etc.

Dr. Kanai reviewed the discussion: the budget ceiling is somewhat flexible; what is most important is determining the need with respect to laboratory services. The equipment also is not much of a financial problem. The biggest problem is the dispatch of experts- difficult to arrange for 1 to 2 year periods of service; periods of 1-3 months are not so hard. Thus housing should not be a problem requiring major project attention. He asked about what kind of experts are to be considered.

Mr. Lavulo suggested a possible solution might be repeated short visits by the same experts.

Mr. Tsukada said it depended on what kind of expert.

The Director of Health invited Dr. Wang's comments on this. Dr. Wang indicated there were some areas where Government does not have a technician ready to operate; in such fields, the Japanese Government might provide an expert to work and train local staff before leaving; depending on the field, this might require 6 months to one year. Examples are water and food chemistry. Also food bacteriology where there has been some training but improvement is needed. Water bacteriology is not so much needed.

Dr. Wainwright suggested that it might be best first to define the increased services in detail before specifying the training and also before specifying facility and expert requirements. It was also important to consider recurrent cost implications.

A paper "NOTES FOR THE DISCUSSION ..." was then distributed and Dr. Wang explained this showed the details of the proposed increased services.

The Director of Health explained how this paper showed the areas in which combined clinical and public health purposes were served. He also explained that parts IX, XI, and XII of the paper were intended to be housed in the existing laboratory which should be renovated.

Mr. Tow found this paper a good start towards a briefing, as regards space needs, but he would like more detail on bench size, sinks, hoods, etc. The Director of Health suggested he get these details from Dr. Wang.

Mr. Tow asked if a sketch was needed this week for costing purposes; Mr. Tsukada indicated the exact cost was not needed. Mr. Tow then thought there might be danger of misleading impressions if a sketch were done in such a short time; it would be preferable to concentrate on preparing a full briefing to leave for local design and review. The Director of Works agreed and thought this could give an order of costs; the Director of Health also agreed.

Mr. Soga inquired about whether there were hazards supporting the need for chemical testing of water; this was discussed by the Director of Health, Dr. Palmer and Dr. Wang to the effect that there were potential hazards, more or less remote, but still requiring surveillance through testing

although it might be fairly infrequent chemical testing.

Mr. Tsukada asked if the Foreign Affairs and Central Planning representatives could comment on Government channels to be followed for the project- were usual JICA procedures acceptable? This referred to the bases for support of the project, matters such as duty examption, etc. He suggested Colombo plan forms but that might be changed if they were not in use here.

Dr. Kanai pointed out that for specific fields in microbiology, Japanese experts were subspecialized, for example one in enteric pathogens, another in leptospirosis. This might lead to shorter visits by different experts. The Director of Health and Dr. Wang explained that experts might not be needed so much in certain subfields but more needed in others such as mycology, anaerobic culture and serology.

Dr. Soga inquired whether EKG and EEG laboratories should be included; the Director of Health explained that in Tonga these were treated as clinical rather than laboratory duties (though there is no EEC now).

Dr. Verstuyft asked Dr. Kanai's technical opinion on the paper presented; Dr. Kanai requested time for further study on this.

Dr. Palmer asked that it be kept in mind that especially for equipment the need is for technology appropriate to local conditions- durability, simplicity. Initial listings have been made with this in mind. There was discussion of proposals on siting and layout. Dr. Kanai mentioned need for attention to equipment maintenance and spare parts. Dr. Wainwright said this was a component of recurrent costs needing attention.

It was agreed to resume session at 10:00 on 20/8/81.

NOTES OF DISCUSSION (as corrected and approved 21 August 1981)

Second meeting 10:00 AM- 12 noon Thursday 20 August 1981 of Tongan Government Team with Joint WHO-Government of Japan Preliminary Survey Team.

Present:

Tongan team: Director of Health (Chairman); Mr. George 'Aho, Assistant Secretary/Foreign Affairs; Secretary of Finance; Acting Director of Planning; Director of Works; Assistant Secretary/Health.

Japanese Government members: Dr. Kanai, Dr. Iriyama, Dr. Soga, Mr. Tsukada.

WHO members: Dr. Verstuyft, Dr. Palmer, Dr. Wang, Mr. Tow, Dr. Wainwright.

The notes of Discussion of the meeting of 19 August 1981 were corrected and approved.

Matters arising from the notes:

Dr. Kanai asked for clarification concerning WHO's limitations in providing "heavy" equipment. Dr. Verstuyft explained that WHO sometimes provides equipment in connection with projects when requested by Government, but it is usually of moderate scale rather than extremely large equipment expenses. For example equipment components of projects, if provided, are usually not more than $10,000 in a 2 year period.

Mr. Tsukada commented on housing and vehicular support proposals. Vehicles are usually not difficult to include but construction of housing for experts is not possible in the present system of Japanese development cooperation. There are budgetary arrangements for experts' housing costs possible, but limited and not sufficient to cover construction.

Mr. Tow asked clarification on page 2, paragraph 4. Should working drawings be done in Tonga or in Japan? The Director of Works indicated it could be either place; the idea of doing working drawings in Japan would be in case that met Japanese Government requirements for approval of fittings. Mr. Tow suggested that even if internal working drawings had to be done in Japan for this reason, it might be important for building working drawings to be done in Tonga. Mr. Tsukada said he would take the alternatives in this matter to Japan for consultation, and would try to send the results of his discussions there promptly to Tonga in view of Tonga's need for early clarification of this point.

Concluding matters arising from the notes, the Director of Health suggested later further discussion of this matter as it relates to the Plan of Action which is desired as a result of the Joint Preliminary Survey Team visit.

Dr. Kanai stated that the paper "Notes for the Discussion..." and the layout presentation are good enough to give a clear image of the expected functions of the laboratory. He believes this combined type of laboratory including hospital and public health functions can be more economical and also effective in producing information. The tentative design seems to match the function well. The size seems neither too large nor too small.

Dr. Soga asked in connection with Function No. IV, Environmental Health Laboratory, whether Government has problems of legislation, regulation, administrative policy concerning restaurants and food processing. The Director of Health metnioned existing legislation covering such facilities and examination of food handlers. There is quarterly registration with the Ministry of Health, not renewed unless complying and each employee must have a certificate of good health. The law is old and not detailed, but considered adequate for present needs in restaurants, bakeries, etc.

Dr. Kanai asked about the lack of specification of stairway space; Dr. Wang explained he was awaiting architectural advice on this.

Mr. Tow said that for ventilation to be adequate, a one-room width of building was desirable. With this in mind, a single story building probably could be designed. He discussed British standards, which are widely used concerning bench space and related considerations. Details concerning power points, etc., will have an effect on layout. Dr. Wang indicated need for further discussion on relation of bench size to work flow. Layout matters have implications on choice of two story versus one story. Dr. Kanai added that harmony of building with surroundings should also be considered.

Dr. Wang stated as a laboratory worker point of view, investment in furnishing and equipping was important and a relatively simple building was acceptable to hold cost down. Mr. Tow pointed out the importance of adequate, though not fancy, building for safety and to reduce future maintenance cost. It is especially important to design maintenance access to the building services which can block up and need repairs.

Dr. Kanai said the distribution of services in the layout was good, with public health upstairs and microbiology, needing more frequent communication with clinical areas, downstairs. However comparable distribution of services in a one story building would also be satisfactory.

Dr. Verstuyft asked if airconditioning was foreseen. The Director of Health said Government policy was to air condition only where needed for maintenance of equipment. He believed this would apply only to biochemistry.

Dr. Wang mentioned the need for screening against insects.

Mr. Tow asked about the amount of book and reading space needed for the building library. From discussion by the Director of Health and Dr. Wang, it appeard that twice the shelf space of the eastern bookshelf in the present

"Conference Room" might be appropriate, providing for lab books, lab teaching books and journals. For the teaching laboratory, Dr. Wang indicated a usual group size of 5 or 6, and suggested providing space for eight using microscopes.

Dr. Kanai asked clarification of the meaning of "cold room." Dr. Wang indicated preference for a refrigerated walk-in area for cool storage for all units of the laboratory as a more efficient space use than separate refrigerators in each lab room. The same applies to an "incubator room." On the other hand, there was discussion of power or equipment failure losses being less in separate refrigerators. Mr. Tow suggested at this stage it was more important to indicate total storage shelf spaces needed for these functions then make the decision in connection with overall layout.

Dr. Wang explained that mycology room should be closed to deter contamination by spores. Also answering Dr. Kanai, he agreed that there should be a sink specified in media preparation area, and that a combined type still and deionizer should be adequate for distilled water needs, although he would appreciate technical consultation on whether this is the proper solution for the Tongan problem of extremely hard water.

Dr. Wang answered Dr. Kanai that concerning laboratory hazards such as brucellosis, typhoid and tuberculosis Tongan experience has not disclosed any problems, although it was hard to separate hazards within from those outside the laboratory. For the future, perhaps typhoid vaccination of laboratory staff should be considered. Tuberoulosis laboratory hazard was relatively low since the most hazardous process of culture transfer was infrequent and done only by experienced staff under hood.

Mr. Tsukada asked about the present unavailability of staff for exfoliative cytology; Dr. Wang indicated a new staff position should be created by Government to prepare for this. Further questions on additional staffing needs were raised but deferred for later discussion in connection with recurrent cost implications.

Dr. Kanai mentioned the need for emergency exit if a 2 story building. Dr. Kanai mentioned that since budget for equipment might be easier to increase than for construction, it might be considered whether to include benches, sinks, etc. under equipment. If this means movable benches, which Dr. Wang prefers, the Director of Works indicated the cost would probably be only slightly higher. However plumbing and electricity also relate to

benches. If classification as equipment is used for budgeting, however, Mr. Tow would need clarification of purchasing implications, since it is important that benches and fittings be part of the building contractor's responsibility. Mr. Tsukada indicated he would have to clarify this issue with regard to the Japanese framework. The Director of Health suggested preparation of 2 costings, one listing these with and one separately from construction costs. The Director of Works agreed this could be done, but the point on contractor responsibility is important.

Mr. Tow inquired about the safety of bringing laboratory wastes to autoclave without prior neutralization. Dr. Wang indicated the main need was to disinfect tuberculosis organisms in the tuberculosis room; brucellosis precautions might also require study.

On the present layout drawings, the right side is nearest the present laboratory.

On the question of whether to consider a 1 story building, Mr. Tow suggested it was worth considering depending on decision by the Ministry of Works. The Director of Health indicated preference for 1 story if other factors are equal and access to maternity, views of the building, etc., are satisfactory. However he would depend on guidance of architects. On the Acting Director of Planning's query on relative costs, the Director of Works indicated that factors such as reinforced floor and stairs were more or less balanced by less roof space. Mr. Tow indicated the strong interrelation with master planning for future needs of the whole hospital.

The Director of Health stated that although a final decision in Japan must be awaited, he could state a preference that the Tongan Government have major involvement in facility design and in supervision of construction and that construction be done by local contracting. Working drawings could be done in Japan if that is desirable. In any case the Tongan Government has a responsibility to supervise construction in Tonga.

Mr. Tsukada, personally speaking, agreed, though it would have to be decided later.

The Director of Health asked for WHO comments. Dr. Verstuyft indicated these were primarily arrangements for facility construction between Tonga and Japan, but that WHO would be glad to provide the consultation of Mr. Tow or any other available staff member.

The Director of Health asked Dr. Wang to discuss staffing, training and experts. Present staffing, transferrable Laboratory-X-ray assistants, leaves and study time were mentioned. Most additional staff would be at lab-X-ray assistant level but up to 2 graduates of technology training would be needed for chemistry and cytology. Not all additional staff would be needed immediately. One more maid and a cleaner would be desirable. A cleark/typist is needed for which the present non-typing clerk is not entirely adequate. Responding to Dr. Wainwright, Dr. Wang indicated separate new supervisory positions were not needed; rather 2 technicians each should spend about 30 % of their time in administrative duties and 70 % in technical duties. Responding to the Secretary of Finance, Dr. Wang indicated that the proposed increased staff did take into account the servicing of anticipated increased volume of work. The Secretary of Finance indicated that time of adding new staff depended on their availability as they would have to have completed training.

Dr. Kanai asked if it was necessary to separate bacteriology of water from other bacteriology. Dr. Wang prefers separation as the Millipore filter process is essentially self-contained.

The Director of Health summarized the discussion of staffing as indicating that an additional 10 staff members might be needed. (Note: after the meeting Dr. Wang wished to correct some of the numbers presented, now indicating a probable addition of 6: 2 graduates in technology, 2 Laboratory-X-ray Assistants and a maid and cleaner. If another clerical position is needed it would be 7.)

The Secretary of Finance indicated that other recurrent cost calculations besides staffing should include: increases in lighting, water, books and publications, probably stationery, equipment maintenance, probably some increased travel. Dr. Wang metnioned steam autoclaving as an economy measure. The Director of Health mentioned the need for this detailing of recurrent costs.

The Director of Health indicated recurrent costs would have to be at a figure acceptable to the Tongan Government.

Glassware, reagents, etc., were discussed. Possibly some such supplies could be supplied by the Japanese Government for a certain period, but eventually they were to be responsibility of the Government of Tonga. Cost is a consideration and it would be helpful to have a list of media and supplies

if possible.

Dr. Verstuyft mentioned that for equipment maintenance, training through the WHO project in Upper Hutt, New Zealand, might be considered. The Director of Health reported that 1 Tongan had graduated from that course and one is now studying.

The Acting Director of Planning inquired about the framework of cooperation documents, including where training is to be provided.

The Director of Health said there would be 1 graduate in technology from Fiji next year; 1 postgraduate is training in New Zealand this year and one expected to next year.

Dr. Verstuyft described WHO arrangements on training, based on Government requests within the funds approved by World Health Assembly action for the 1982-1983 biennium. There can also be provisions, as well as for fellowships, for national training within projects. Dr. Palmer detailed that WHO had provided the fellowship this year mentioned by the Director of Health for study in New Zealand in Haematology. Next year's fellowship requests have been submitted by Government and include one in biochemistry. There is also a small provision in 1982 budget for national training, intended for training in utilization of laboratory services. The Acting Director of Planning asked about possible increased WHO allocation; Dr. Verstuyft answered that it appeared unlikely as the budget had already been agreed to on Government's request.

Mr. Tsukada mentioned that the Japanese Government training scheme also needs Government request, using Colombo plan forms or similar. Training in Japan can be considered if budget and appropriate training arrangements are available. Japan also has a third country training system. The systems are annual.
It was clarified that the officials between Japan and Tong involve the Japanese Embassy in Suva and Tonga's Ministry of Foreign Affairs.

Mr. Tow asked about overlapping between Japanese and WHO previsions.
Dr. Verstuyft suggested that it is Government's responsibility in making requests to assure that no overlap occurs. The Director of Health agreed and added that all parties should keep in close touch.

Dr. Verstuyft asked if it would be acceptable for him to brief the Japanese embassy in Suva since the Japanese membrrs would not be traveling through Suva. Mr. Tsukada indicated that his channel was to inform Suva after his

meetings in Manila, so it would not be appropriate for him to report through Dr. Verstuyft.

The next meeting was scheduled for 10:00 AM Friday 21 August 1981.

NOTES OF DISCUSSION (as corrected and approved 25/8/81)

Third meeting 10:00 AM-12 noon Friday 21 August 1981 of Tongan Government Team with Joint WHO-Government of Japan Preliminary Survey Team.

Present:

Tongan team: Director of Health (Chairman); Mr. George'Ahe, Assistant Secretary/Foreign Affairs; Mr. Lee Harkness for Secretary of Finance; Acting Director of Planning; Director of Works.

Japanese Government members: Dr. Kanai, Dr. Iriyama; Dr. Soga; Mr. Tsukada.
WHO Members: Dr. Verstuyft, Dr. Palmer, Dr. Wang, Mr. Tow, Dr. Wainwright.

The draft notes of the meeting of 20 August 1981 were corrected and approved.

Matters arising from the draft notes of the second meeting:
Mr. Tow explained that the concept "one-room width of building" meant a cooridor at one side of building, with rooms opening onto it on only one side, rather than a central corrider with rooms on both sides of the corrider.

Mr. Tsukada asked about the system of supervision with special interest in who will assume the final responsibility for the project. The Director of Health explained that not only would there be the 2 senior technicians in charge of clinical and public health laboratories, but also both would be supervised by a medical officer (still to be decided whether an epidemiologist or a clinical pathologist, depending on timing of their training which is not yet complete). That medical officer would be responsible directly to the Director of Health. He did not foresee the administrative burden to be so heavy as to require all of the time of the senior technologists, thus they would have time for technical duties which is also useful for keeping up their skills. Dr. Wang defined the 30 % administrative time as involving paperwork, statistics and the like, and the 70 % technical time to include technical supervision and technical teaching as well as direct technical duties. He felt that the medical officer in charge could spend more time in administration, perhaps 80 to 100 % of time.

Mr. Tsukada noted that it appeared that Dr. Wang had made a major contribution to the proposal, and asked whether the proposal may be taken as a Government proposal. The Director of Health stated that it is Government's proposal. Although at this meeting Dr. Wang represents WHO, prior to the meeting Dr. Wang has been serving as a consultant to Government, and in that capacity contributed to Government's proposal. Dr. Wang reported that he had done drafting work on the proposal after discussion with the Director of Health in which he learned what Government desired; the present proposal also reflects the results of the Director's review of earlier drafts.

Mr. Tsukada asked whether in the future, say in 10 years, the situation would still involve contributions of consultants to Government proposals. The Director of Health said it would depend on the needs of Government. Dr. Wang's service is scheduled to end June 1982. In the future experts from Japan might be asked to contribute, and other consultants might also be used if needed. The Acting Director of Planning said this was a reason for his questions about fellowship arrangments, which might facilitate training of Tongans for work such as that of Dr. Wang. The Assistant Secretary/Foreign Affairs confirmed the general idea that Tongans should be trained to take over posts of expatriate experts. The Acting Director of Planning asked if Japan and WHO might react favourably to requests for training at that sort of level.

Mr. Tsukada indicated that these were important questions which he would take to Japan for study. Unless proper arrangments in these matters are made, the cooperation of Japan could not be helpful.

The Director of Health inquired whether a full plan of training for the next 5 years was needed for this survey team; this could be done, but he thought that at present the need might be for an agreement in principle that Japan and WHO would assist in training as part of the project, and that there could be detailed submissions later. Dr. Wainwright suggested that what is needed might be a presentation such as a PERT chart relating training to facility development and to service of experts. Mr. Tsukada said that would be desirable. The Director of Health said this would be provided, also specifying local counterpart arrangements for any expert.

Dr. Verstuyft commented that early next year the planning would start for 1984-1985 WHO country programme budgets, which would be a good time to provide for increased portions of WHO resources that might be allocated in relation to this project.

Dr. Kanai agreed that the head of the laboratory should be an epidemiologist or clinical pathologist. He then asked what experts are needed. Dr. Wang said a chemical expert and a microbiologist. Also probably in cytology if that is to be developed.

Mr. Tow commented that with regard to ventilation of the building, after further study he considered that another arrangement with "clere-story" type of roof might allow rooms on 2 sides of a central corridor. This might result in a building 40 metres by 14 metres. Rooms on 1 side could be 7.2 metres deep for laboratory use and continuing education; corridor could be 1.8 metres; rooms on other side 5 metres deep for functions such as media preparation, offices, library, toilets and storage. However he needed further discussion bearing on this concept. Dr. Wainwright referred to experiences in Tonga with "clere-story" construction where there was difficulty in sealing against the types of wind and rain that occur. This might produce serious problems of exposure of delicate or expensive equipment. The Director of Works agreed this could be a problem with this type of design for ventilation, but suggested that it is a detail that could be left until doing the actual design.

Dr. Iriyama asked for confirmation of the concept that the project would possibly provide a few experts and that the Government of Tonga would assure the experts would have good conditions for their activities in matters such as transport, accommodation and sufficient personnel to work under their guidance. The Director of Health saw no problem with this; it is what Government provides for other bilateral experts. Mr. Harkness said housing arrangements vary among projects; housing may or may not be provided and may or may not be rent-free. Mr. Tsukada noted conditions provided by Tongan Government for Japanese experts are to be indicated on the document. Dr. Wainwright asked if all experts would have short terms of 1 to 3 or 4 months, or some longer. Dr. Kanai said he would be happy if it were possible to arrange 1 to 2 year stays, but it depended on individual recruiting possibilities. He understood Dr. Soga was optimistic about this in public health technology, but Dr. Iriyama had some question about its possibility in his field. Dr. Kanai as a laboratory person was interested in making a good laboratory service here, so would like to see efforts made for recruitment of proper duration; meanwhile perhaps early budgetary emphasis on the facility could be made. Mr. Tsukada siad that dispatching personnel depends on timing of the project; if it is next year there would probably be time to find suitable persons, but it also depends on the individual persons.

Dr. Wainwright said that a primary function of any WHO or Japanese expert is training, so it is important to know whether sufficent continuity is possible to facilitate the best training arrangements. The Director of Health indicated preference for greater continuity than 3-4 months, but understood the difficulties for long assignments. Dr. Wang suggested a relationship to the area needed especially if there is a team leader for continuity, others could be of shorter duration; for example, 6 months might be adequate for water chemistry; other fields might be either shorter or longer. He could prepare a rough estimate of the durations needed in different fields. Mr. Tsukada siad that would be good for consideration in connection with availability. Dr. Palmer agreed with what he understood Dr. Kanai to have suggested- early concentration on construction, which would allow time for recruitment and also for having sufficient facilities for the experts' work. The Director of Health agreed.

Dr. Kanai asked about Tongan experience with length of service of technologist The Director of Health and Dr. Wang said technologists usually spent their whole career in the laboratory, although there is more turnover at the level of X-ray laboratory assistants. Dr. Wainwright agreed lower levels of staff generally had more turnover not only in laboratory and not only in Tonga. Thus in the long term it would be good for a laboratory to be staffed completely with technologists, but this is difficult to do before a very long term. Meanwhile the core group of technologists is very important; some turnover at lower levels should be expected but efforts could be made to lesson this such as through continuing education and providing skills that would facilitare their movement upward to technologist level. He clarified that this did not mean he advocated a school in Tonga for complete training to technologist level.

The Director of Health concluded matters arising from the draft record, and asked if Mr. Tow had points to raise as a result of his work. Mr. Tow said that in order to arrive at a broad order of costs before the end of the mission (perhaps specifying benches separately from building), he needed to consult with the Ministry of Works. The Director of Works agreed and suggested consultation on Monday when the Government architect would be available. This consultation would deal with costs of building and fittings, not with equipment.

The Director asked about the possibilities and desires for time of completion of the equipment list. Mr. Tsukada said that although helpful it seemed less

urgent than the basic design and fitting information. Dr. Wang believed the equipment list could be finalized at the end of the mission.

The completion of answers to questions on the forms was discussed between Mr. Tsukada, Mr. Harkness and the Acting Director of Planning. Mr. Harkness stressed that excessive operating costs of projects would have adverse effects on Tonga. It was confirmed that the Ministry of Foreign Affairs had the responsibilities to transmit the answers for the forms to the Japanese Government.

Mr. Tsukada asked if there might be problems in the Director of Health's recommendation that all parties keep in close touch. Since he could not at present change the basic bilateral form of cooperation, would WHO have difficulty in relating to that system? Neither the Director of Health nor Dr. Verstuyft saw this as problematic. Dr. Verstuyft explained how the normal procedures of WHO-Government cooperation did not conflict with bilateral arrangements. Dr. Palmer agreed that WHO local staff saw no difficulty in relating to the bilateral cooperation; however he understood that there might be some interest in developing some form of document or minutes expressing the relations of WHO and the Governments of Japan and Tonga to this project. Dr. Verstuyft suggested this should be discussed in Manila, and also noted WHO's role in facilitating the development of the bilateral arrangement, and WHO's Constitutional role as the coordinating agency in Health, which has been accepted by Japan and Tonga. Mr. Tsukada saw no problem with these concepts. The Director of Health agreed that there might be decisions in this regard in Manila, but foresaw no problems from the Tongan point of view.

Mr. Tow noted that the proposal also contemplated renovation of the present laboratory facilities; thus there needs to be plans for phasing when after completion of the new building certain existing functions would be moved temporarily to the new building during the renovations. The Director of Health and Dr. Wang agreed but noted it would not be very difficult as certain new functions such as cytology would not yet have been developed.

The Director of Health mentioned that operating cost estimates could not be immediately finalized as housing costs depended on learning the Japanese Government's requirements. Mr. Tsukada described the different arrangements utilized according to the situations in different countries. Tongan team members described several current arrangments in Tonga, but noted that in view of difficulties in availability of Government housing, it might be best

for Japan to provide housing allowances for the experts so that they could rent private housing. Mr. Tsukada thought that this could be done.

The Director of Health suggested aiming at some agreement on a plan of action involving targets for when submissions are due, when approval might come from Japan, when construction would be expected- on a tentative basis.

Mr. Tsukada said that if all the information is provided for the forms, the Japanese Joint Survey Team members could take the full proposal to Japan. If no problems develop as regards the system of cooperation and WHO's relationwhip to it, a full document could be developed in Japan detailing construction, expert, training and equipment aspects which, if acceptable to the Government of Tonga, would lead to sending an Implementation Survey Team for signature and starting the project. That might be this fiscal year, depending on whether there are or are not problems. He did not presently see problems which would cause delay.

The Director of Health asked what requirements there were for Tongan action during the time this was being developed. Mr. Tsukada said he would later advise of any actions needed between the Mission's end and the document development in Japan; otherwise no specific action during that period.

Dr. Kanai mentioned that if laboratory construction costs were too high, JICA might have to apply for special funding, but probably this would not be necessary. Mr. Tsukada could not be sure on this matter at this point. For equipment, he saw no particular problem with JICA funding procedures.

The Director of Health reviewed immediate goals, by Tuesday: Government's proposal is already available as previously presented and discussed; there should be a list of equipment, there should be a briefing or a sketch drawing or both, there should be a presentation on staffing relating to the need for experts- anything more?

Mr. Tsukada did not at the moment see anything more needed.

Respondeing to the Acting Director of Planning, Mr. Tsukada predicted that even without delaying problems it might require three months for the Japanese work on developing the proposed project to be done properly.

Mr. Harkness indicated need for information of the lifetime of equipment function in order to calculate cost of provisions for replacement. Dr. Wang indicated that the usual specifications should be modified to allow for

conditions in Tonga- which could be generally estimated but not with complete reliability. Accelerated molding and corrosion of copper instruments must be considered.

Dr. Kanai said that in Japan the Mission will report on its discussions to JICA; then the Mission's duty ends and further responsibility will rest with JICA. However the rest of the team would have continuing input in the search for experts. He asked whether if a suitable expert can not be found in Japan, WHO could help in recruitment. Dr. Verstuyft said that a funds-in-trust arrangement might enable WHO to help in recruitment in such a situation. Mr. Tsukada understood this idea. Dr. Verstuyft suggested that this might be discussed with the WHO Regional Director for the Western Pacific.

It was agreed to begin the next meeting at 9:00 AM on Tuesday 25 August.

Dr. Verstuyft suggested that in addition to other maters for Tuesday's agenda, there could be consideration of a summary statement of what had been discussed and decided to date. The Director of Health agreed with that suggestion and indicated he might ask Dr. Palmer's help in drafting a summary. Mr. Tsukada suggested his team might also submit their ideas for a summary; this suggestion was welcomed.

NOTES OF DISCUSSION

Final meeting 9:00 AM-12 noon Tuesday 25 August 1981 of Tongan Team with Joint WHO-Government of Japan Preliminary Survey Team

Present:

Tongan Team: Director of Health (Chairman); Secretary of Finance; Acting Director of Planning; Director of Works; Assistant Secretary/Foreign Affairs (Mr. George 'Aho); Assistant Secretary/Health.
Japanese Government members: Dr. Kanai, Dr. Iriyama, Dr. Soga, Mr. Tsukada.
WHO members: Dr. Verstuyft, Dr. Palmer, Dr. Wang, Mr. Tow, Dr. Wainwright.

The draft notes of discussion of the third meeting were corrected and approved.

Matters arising from the notes:
To avoid duplication of terms, "notes of discussion" is now being used, since "Record of Discussion" is the title of the forms used by the Japanese Government together with the Tongan Government to document the project. Forms similar to the Colombo Plan forms will be used in addition to the Reocrd of Discussion between Japan and Tonga.

The List of Staff (Tentative), Draft Schedule of Activities..., and List of Equipment (Revised) were discussed. Mr. Tow noted from his discussions with the Ministry of Works that construction alone would probably take 9 months, and additional time would be needed for design. To the list of equipment should be added spare parts. Another list could specify equipment not specifically laboratory equipment, such as vehicle and typewriters. Supply lists could be prepared later. Dr. Wang made an additional suggestion on experts- a return visit of 3-6 months in 1985 by the environmental health technology expert, to focus on quality control. It was suggested that Tonga's main needs in serology related to hepatitis and dengue, and, if practical, post-immunization antibodies. Arrangements must be made for Tongan voltage of 220, plus voltage stabilizers (regulators) to protect delicate instruments such as pH meters and spectrophotometers.

Draft sketches prepared by Mr. Tow in consultation with Dr. Wang were explained and discussed. They showed a one story building 43.2 x 14 metres. Detailed suggestions were considered for further study. At an estimate for building and fittings of T$400 per square metre, the cost would be T$242,000 or, at current rate of exchange, US$280,000. This does not include equipment.

Concluding matters arising from the notes, the meeting turned to consider draft no.2 of the Summary of Discussion...

The title "Health Laboratory Project" had been used because, both to the Director of Health and to Dr. Verstuyft, the term "Institute of Public Health" could imply a much larger project including a teaching faculty and other public health activities far beyond laboratory. It was recognized that the term "Institute of Public Health" had been developed between concerned authorities of Japan and WHO during the preparation of the preliminary survey, and that this matter might be discussed further at other levels. However the term had not been used in the request of the Tongan Government.

In the summary concerning Framework of Cooperation, although it was not recommended that the text be changed, there was concern that the differing channels of contact with Tonga of WHO (via Ministry of Health) and of Japan (via Ministry of Foreign Affairs) might lead to problems. WHO and Tongan members thought such problems could be avaoided. However it was decided that it might be less confusing if the subtitle "Japan-WHO Joint Technical Cooperation in the Kingdom of Tonga" were deleted.

The Tongan and WHO members were satisfied with the summary statements concerning framework of cooperation, because they believed it was workable for the Tongan Government to coordinate the bilateral cooperation between Tonga and Japan with the multilateral programme of cooperation between Tonga and WHO. Thus they saw no need at this level to propose a new formal agreement involving all three parties. However the Japanese members noted that previous documents implied some arrangement between the three parties which might be better to be specified in detail in order to avoid future misunderstanding. It was agreed to leave the summary as drafted in this regard. But since the project was triggered by the interest of WHO's Regional Director for the Western Pacific, it would be appropriate for the Japanese members to discuss the summary as clarified by these notes in Manila. Any suggestions emerging from those discussions should be communicated to the Tongan Government.

It was agreed to adopt Dr. Kanai's suggestion to conclude the summary by noting that if the project could be put into practice successfully, it should contribute significantly to the health and welfare of the Tongan people.

The meeting concluded with an exchange of sincere expressions of appreciation for the frank discussion and hard work of all involved, as well as for the hospitality of the Tongan Government, and gratitude for the progress made in the direction of supporting Health for All by the Year 2000.

(c) WHO西太平洋地域事務局での会議要旨

日時　昭和５６年８月２８日　午後２時～５時

場所　WHO西太平洋地域事務局４階会議室

出席

日本側	WHO側
金井団長	Dr. S. T. Han（地域事務局次長）
入山団員	Mr. Y. Sato（情報分析官 本件プロジェクト担当）
曾我　〃	
塚田　〃	Dr. I. Geizer（検査技術専門家）
広瀬フィリピン日本大使館 一等書記官	Dr. S. J. Krister（医療協力専門家）
	Mr. A. Tow（WHO側事前調査団員）

1. Dr. S. T. Hanの挨拶

本件マルチ・バイ方式協力はWHOとして、最初の試みであり、今回の事前調査は、その点で重要であること、また本件協力案件が実施され実り多いものとなることを強く望む旨述べられた。

2. 金井団長よりトンガでの合同事前調査の情況説明があった。

3. トンガでの会議々事録に対する訂正があり、次に合同調査結果につき質疑応答が行われた。(イ)プロジェクト名の変更につき問題ないことが確認された。(ロ)専門家、ローカルスタッフの調整が主要問題点であろうとの疑問が提出された。(ハ)運営費及び機材のメインテナンスの問題に対し注意が喚起された。(ニ)トンガ側の要請に入っていない中毒学分野等への協力の必要性に対し質問があった。これに対しては、差し当り重要度が低いと考えられているためであろうが、協力過程で必要に応じ対応して行ける見通しである旨述べた。(ホ)建設予定の検査所について技術的質疑応答が行われた。

4. WHOとの協力形式について

WHO側より、日本側で専門家の確保が難しい場合にはFund in Trust制により、日本の経費負担によりWHOは専門家の確保に協力できる旨発言あった。これについては、トンガでの会議でも言及されており、日本側としては応じられないであろうと述べた。

本件プロジェクトに対するWHO側の特別の負担につき日本側が質した処、その用意のある

旨回答があったが、詳しい説明はされなかった。

5. ＷＨＯとの役割分担について

役割分担を明確にするため、フォーマットを作成したが、その利用については、日本側及びＷＨＯ側で更に検討することとした。（７０～７１ページ参照）

FIELDS OF ASSISTANCE OF PARTIES FOR THE

JOINT JAPAN/WHO TECHNICAL COOPERATION PROJECT IN TONGA

PROJECT PHASE	TONGA	JAPAN	WHO
1. Facility Planning			
- needs assessment			
- functions of facility			
- architects brief			
- design (building and internal special design)			
2. Construction			
- contracts/tenders			
- specifications			
- building structure			
- technical fitting out			
- materials, local/import			
3. Equipping			
- major plant			
- transport			
- special costly equipment			
- laboratory equipment			
- initial supplies			
4. Commissioning			
- facilities			

PROJECT PHASE	TONGA	JAPAN	WHO
4. Commissioning (cont'd.) - supplies - procedures - forms and data handling - publicity - operational routines 5. Staffing - experts - recruitment of experts - local staff - training - housing - transport 6. Budgeting - operational cost/income (completed facility) - salaries - energy - supplies - transport - maintenance 7. Evaluating - monitoring of work load - quality assurance - effectiveness			

Ⅲ　トンガ保健医療関係資料

1　一般事項

①　国　土……６９６㎢（１６９の島々よりなり３６が有人島）、
１５°S－２３$^{1}/_{2}$°S & １７３°W－１７７°W

②　県（District）……６

③　人　口……９０,０８５人（１９７６年国勢調査）

④*　人口の自然増加率……１.６％（１９７６－１９７７）

⑤*　粗出生率……２８.３／１,０００（１９７９）

⑥*　粗死亡率……３.０／１,０００　（１９７９）

⑦*　乳児死亡率……１１.５／１,０００（１９７９）

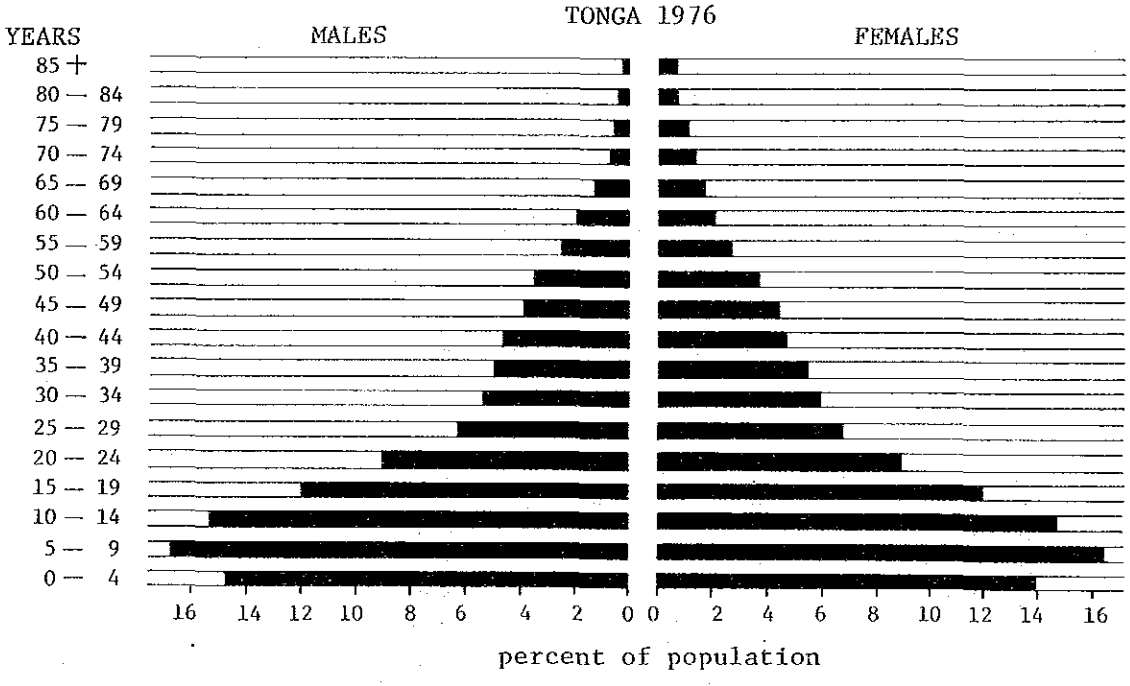
⑧**０才平均余命……６４才（１９７６）

⑨　その他

１人当りの国民所得……４３０米ドル（１９７８、世銀）

文盲率……７％

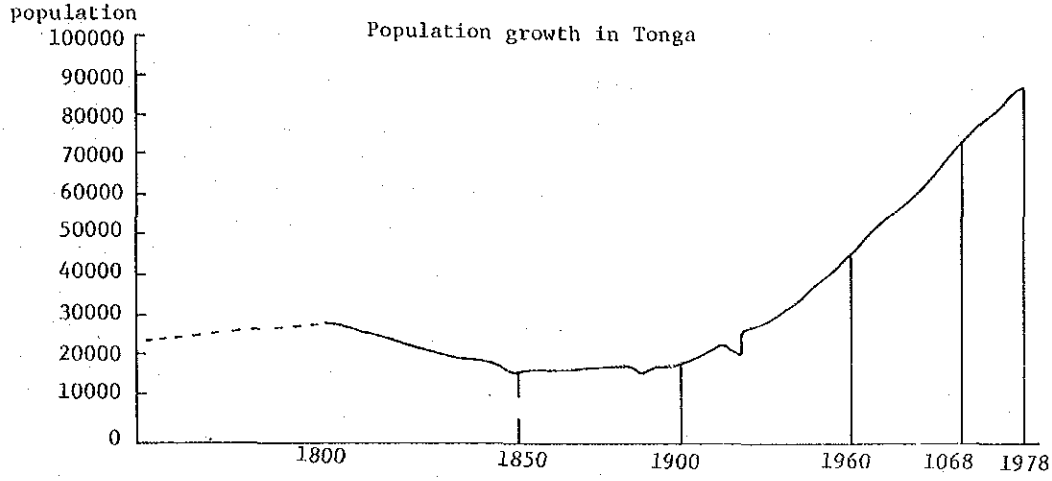
年令別人口構成



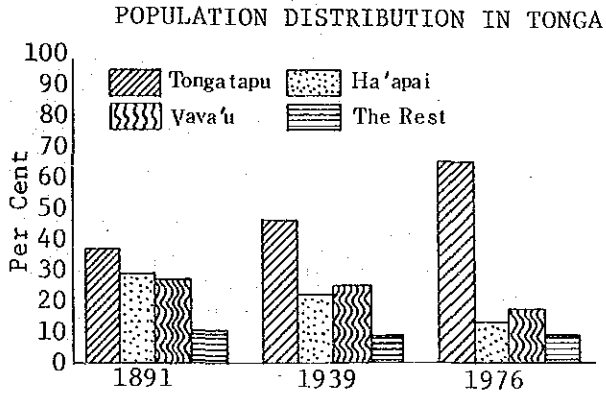
*　Report of the Minister of Health, 1979による。
国連のDemographic Year Bookによると１９７６年の数値は次のとおり。
人口の自然増加率１.１％、粗出生率１３.０、粗死亡率１.７、乳児死亡率２０.５。

**　国連のDemographic Year Bookによる。

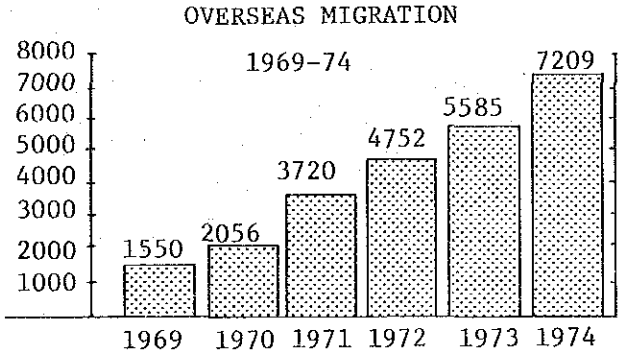
人口増加曲線



人口分布



国外移住



2. 保健医療財政

MINISTRY OF HEALTH'S EXPENDITURE AND REVENUE (IN THOUSAND PA'ANGAS): KINGDOM of TONGA, CALENDAR YEARS 1975 - 1979

Year	Gross Recurrent Expanditurs	Total Revenue	Net Recurrent Expanditure	Mid Year Population (in thousands)	Net Expenditurs per Head
1979	1,143	45	1,098	96	11.43
1978	935	42	893	94	9.50
1977	-	51	-	92	-
1976	-	33	-	90	-
1975	-	39	-	88	-

- Not available
Ministry of Health Figures

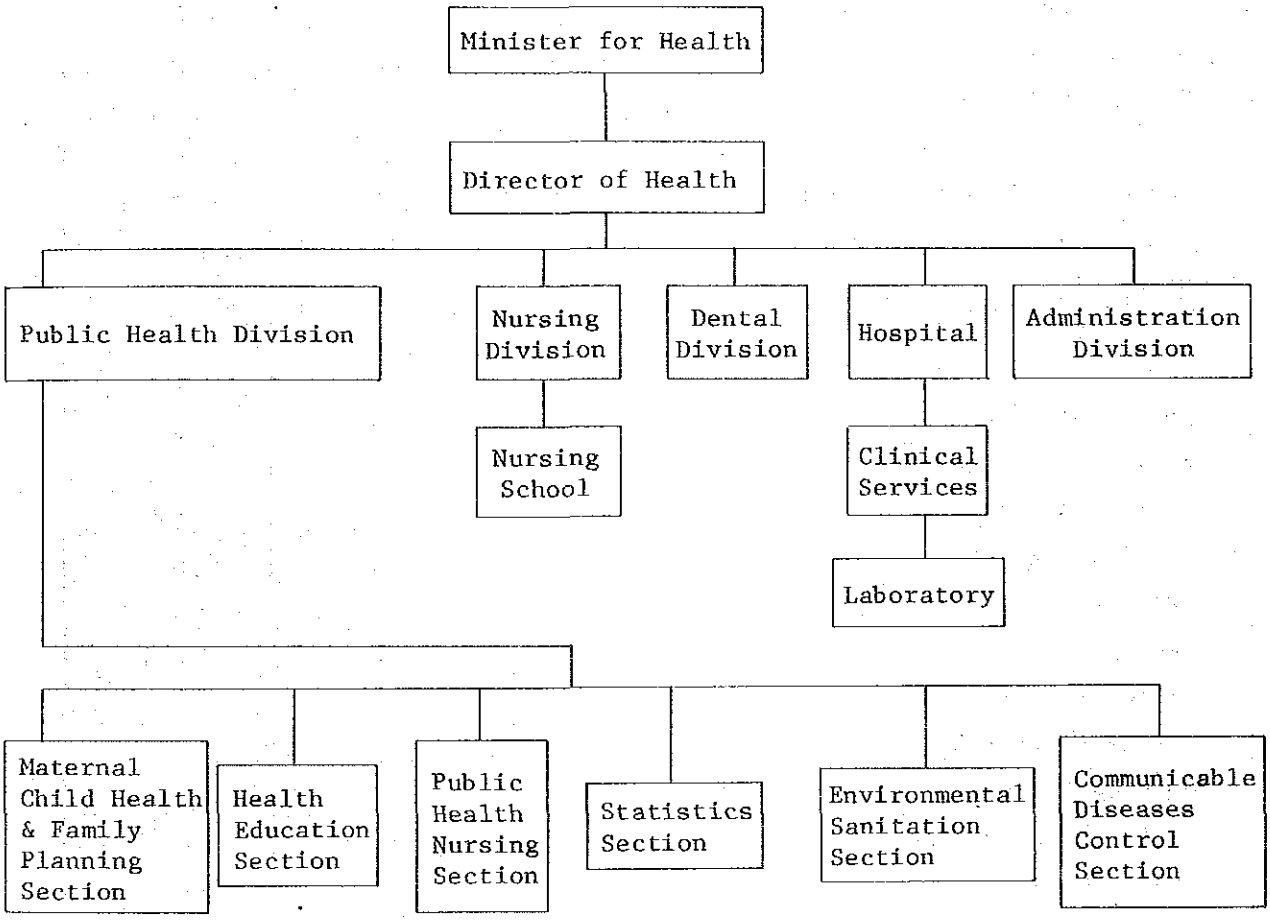
AMOUNT AND PROPORTION OF RECURRENT ESTIMATES FOR HEALTH SERVICES: KINGDOM OF TONGA, FINANCIAL YEARS ENDING JUNE 1975 - 1979

Year	Estimates for Health Services	Total Recurrent Budget	Health Estimates Expressed as % of Total Budget
1979	1,297,759	9,850,081	13.2
1978	1,142,027	8,601,988	13.3
1977	1,034,441	7,640,100	13.5
1975	750,600	6,685,384	11.2
1975	720,345	5,896,568	11.9

Source: Estimates of Revenue and Expenditure and Development Estimates 1975 - 1976 to 1979 - 1980

3. 保健医療行政機構

Organizational Chart-Health Department



4. 保健医療要員

OFFICIALS AND PERSONNEL OF THE MINISTRY OF HEALTH: KINGDOM OF TONGA, 1979

Position	Establishment	At Post 31 December
1. Minister of Health	1	1
2. Administrative Staff		
Director of Health	1	1
Assistant Secretary of Health		
3. Medical Staff	55	41
Senior Medical Officers	5	5
Medical Officers, Special Grade	7	2
Medical Officers	23	21
Senior Medical Assistant	4	4
Medical Assistants Grade I	6	2
Medical Assistant Trainee	10	7
4. Dental Staff	22	19
Chief Dental Officer	1	1
Senior Dental Officer	1	1
Dental Officers	9	8
Senior Dental Assistant	1	1
Dental Assistant	10	8
5. Nursing Staff	278	233
Chief Nursing Officer	1	1
Matron	1	1
Assistant Matron	1	1
Sanior Nursing Sister	1	1
Nursing Sisters	15	14
Senior Staff Nurses	11	9
Staff and Student Nurses	203	165
Senior Public Health Sister	1	1
Public Health Sisters	2	2
Senior Public Health Nurses	5	5
Public Health Nurses	30	27
Chief Tutor Sister	1	1
Supervising Tutor Sister	1	1
Tutor Sisters	2	1
Public Health Tutor Sister	1	1
Clinical Nurse Tutors	2	2

Position	Establishment	At Post 31 December
6. Technical Staff	66	47
Senior Health Inspector	1	1
Public Health Inspectors	3	2
Assistant Public Health Inspectors	7	3
Trainee Assistant Public Health Inspectors	4	4
Health Education Assistant Grade II	2	2
Public Health Assistants Grade II	2	1
Laboratory Technician	1	1
Laboratory & X-ray Assistant Grade I	1	1
Laboratory & X-ray Assistant Grade II	9	9
Assistant Laboratory Technician	8	8
Radiographers	2	-
Assistant Radiographers	3	3
VSA. Laboratory Technician	1	1
Sterile Supply Supervisor	1	1
Sterile Supply Assistants	3	3
Assistant Physiotherapist	1	1
Psychiatric Assistants Grade II	2	2
Dispensary Assistants	7	
Pharmacists	2	1
Assistant Pharmacists	2	2
Assistant Dietician	2	-
VSA Dietician	1	-
VSA Pharmacist	1	1
7. Accounting and Clerical Staff	31	29
Accounting Officer	1	1
Executive Officer	1	-
Chief Clerk	1	1
First Class Hospital Clerk	1	1
Second Class Clarks	4	4
Junior Clerks	10	10
Chief Clerk Medical Records	1	1
Second Class Clerks (Records)	2	2
Junior Medical Records Clerks	3	3
Health Statistica Clerk 1st Class	1	1
Health Statistics Clerk 2nd Class	1	-
Health Statistics Clerk, Junior	1	1
Shorthand/Typist Grade III	1	1

Position	Establishment	At Post 31 December
Typist/Clerk	3	3
8. Supervisory and Domestic Staff	90	82
Telephone Operators	2	1
Transport Supervisor	1	1
Driver	12	12
Groundkeepers	6	5
Caretakers	2	2
Handyman	1	-
Medical Storeman	1	1
Storeman/Clerk	1	1
Laboratory maids	2	2
Chief Cook	1	1
Cooks	3	3
Assistant Cooks	5	5
Housekeeper	2	2
Housekeeper Cook	1	1
Seamstress Supervisor	1	1
Seamstresses	2	2
Domestic Supervisor	1	1
Laundry Supervisor	1	1
Male Orderlies	12	8
Wardsmaids	19	18
Laundry Maids	11	11
Laundry Men	3	3

5. 保健医療教育施設

Medical Assistant Training School …… 2年制（第1回生7名、1978）

Queen Salote School of Nurging …… 3年制、定員40名

6. 保健医療施設

① 病　院…… 4

② ヘルス・ポスト…… 6

③ 病院ベッド数…… 296（304人／ベッド）

ESTIMATED POPULATION BY HEALTH CENTRE/HOSPITAL DISTRICT: KINGDOM OF TONGA, 1979

District	%*	Population
Whole Kingdom	100	96,491
Vaiola Hospital (202 beds)	47.3	45,640
Mu'a Health Centre	11.8	11,386
Kolovai Health Centre	4.6	4,439
'Eua Health Centre	5.0	4,824
(Niu'eiki Hospital - 16 beds)		
Ha'afeva Health Centre	2.0	1,930
Nomuka Health Centre	1.4	1,351
Niu'ui Hospital (28 beds)	8.6	8,298
Ngu Hospital (50 beds)	16.7	16,114
Niuafo'ou Health Centre	0.8	772
Niuatoputapu Health Centre	1.8	1,737

* Geographical percentage distribution of the 1976 census population.

Note: Population distribution is determined primarily by analysis of the flow of public transportation.

7. 主要疾病

TEN (10) LEADING CAUSES OF REPORTED NOTIFIABLE DISEASES: KINGDOM OF TONGA, 1979

Diseases	Number of cases	Rate
1. Influenza	8,621	902.7
2. Gastro Enteristic	3,574	374.2
3. Diarrhoea, Infantile	1,296	135.7
4. Pneumonia, Broncho	833	87.2
5. Measles, (Morbilli)	523	54.8
6. Septic Sore Throat	244	25.5
7. Dysentry, Bacillary	203	21.3
8. Pneumonia, Lobar	187	19.6
9. Pertussis (Whooping Cough)	147	15.4
10. Chicken Pox	135	14.1

Rate is per 10,000

REPORTED CASES OF NOTIFIABLE DISEASES: KINGDOM OF TONGA, 1975 - 1979

Diseases	1979	1978	1977	1976	1975
Chicken Pox	135	151	-	416	54
Dengue	30	-	5	29	10,657
Diarrhoea, Infantile	1,296	1,217	1,194	871	1,400
Diphtheria	-	-	-	-	-
Dysentery, Bacillary	203	31	1	5	15
Dysentery, Unclassified	33	26	25	53	116
Filariasis	15	-	12	115	482
Fish Poisoning	11	18	50	25	19
Food Poisoning	33	26	24	6	-
Gastro Enteritis	3,574	2,720	2,513	1,967	2,440
Gonorrhoea	63	33	63	59	50
Infectious Hepatitis	35	9	13	11	81
Influenza	8,621	13,670	10,098	12,982	17,305
Leprosy	-	-	-	-	-
Leptospirosis	8	-	-	-	-
Measles (Morbilli)	523	17	84	2,487	-
Meningitis, Meningococcal	5	-	-	1	-
Meningitis, other forms	-	-	2	8	17
Mumps	48	4	9	10	5
Ophthalmia	-	-	-	-	-
Pertussis (Whooping cough)	147	210	-	-	-
Pneumonia, Broncho	833	1,180	1,340	899	570
Pneumonia, Lobar	187	245	372	277	144
Poliomyelitis	1	-	-	-	-
Puerperal Fever	1	-	3	10	11
Rheumatic Fever	4	-	4	3	17
Rubella (German Measles)	5	-	-	-	35
Septic Sore Throat	244	464	279	59	14
Tetanus	5	2	7	6	15
Trachoma	2	-	-	1	2
Tuberculosis, other forms	17	28	8	6	6
Tuberculosis, Pulmonary	52	60	71	60	83
Typhoid and Paratyphoid Fever	52	15	31	41	35
Yaws	-	-	-	7	6

REPORTED NOTIFIABLE DISEASES BY DISTRICT: KINGDOM OF TONGA, 1979

Diseases	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai	'Eua	Niua Fo'ou	Niua Topu-tapu
Chicken Pox	135	127	8	-	-	-	-
Dengue	30	23	7	-	-	-	-
Diarrhoea, Infantile	1,296	986	177	110	18	-	5
Diphtheria	-	-	-	-	-	-	-
Dysentery, Amoebic	-	-	-	-	-	-	-
Dysentery, Bacillary	203	25	168	-	-	10	-
Dysentery, Unclassified	33	1	-	4	-	28	-
Filariasis	15	6	8	1	-	-	-
Fish Poisoning	11	7	-	4	-	-	-
Food Poisoning	33	24	-	9	-	-	-
Gastro-Enteritis	3,574	2,581	501	440	-	8	44
Gonorrhoea	63	57	2	4	-	-	-
Infectious Hepatitis	35	6	4	25	-	-	-
Influenza	8,621	4,059	1,717	1,664	507	314	360
Leprosy	-	-	-	-	-	-	-
Leptospirosis	8	8	-	-	-	-	-
Measles (Morbilli)	523	502	1	19	-	1	-
Meningitis, Meningococcal	5	4	-	1	-	-	-
Meningitis, other forms	-	-	-	-	-	-	-
Mumps	48	35	13	-	-	-	-
Ophthalmia	-	-	-	-	-	-	-
Pertussis (Whooping Cough)	147	2	-	3	-	142	-
Pneumonia, Broncho	833	679	41	43	-	48	22
Pneumonia, Lobar	187	125	5	53	-	-	4
Poliomyelitis	1	1	-	-	-	-	-
Puerperal Fever	1	-	-	-	-	-	1
Rheumatic Fever	4	1	3	-	-	-	-
Rubella (German measles)	5	5	-	-	-	-	-
Septic Sore Throat	244	217	-	27	-	-	-
Tetanus	5	3	1	-	-	1	-
Trachoma	2	-	2	-	-	-	-
Tuberculosis, other forms	17	10	6	1	-	-	-
Tuberculosis, Pulmonary	52	43	9	-	-	-	-
Typhoid and Paratyphoid Fever	52	38	12	10	-	-	-
Yaws	-	-	-	-	-	-	-

8. 予防接種

IMMUNIZATIONS BY TYPE OF VACCINE: KINGDOM OF TONGA, 1979

Vaccine	Whole Kingdom		District					
	Number	%	Tonga-tapu	Vava'u	Ha'apsi	'Eua	Niua-topu tapu	Niua-fo'ou
B.C.G.	1,027	8.3	590	437	...	-	...	...
New born	1,027		590	437	...	-	...	...
Others	-	-	-	-	...	-	...	...
Triple Antigan*	5,490	44.2	4,352	727	...	411	...	-
1st Dose	1,413		1,042	225	...	146	...	-
2nd Dose	1,578		1,214*	222	...	142	...	-
3rd Dose	2,124		1,721*	280	...	123	...	-
Booster	375		375	-	...	-	...	-
Poliomyelytis	3,294	26.5	1,274	737		283	-	-
1st Dose	1,782		1,210	425	...	147	-	-
2nd Dose	1,462		1,064	262	...	136	-	-
Booster	50		-	50	...	-	-	-
Tetanus Toxoid**	2,325	18.7	1,890	-	304	131	-	-
1st Dose	1,019		842	-	107	70	-	-
2nd Dose	789		652	-	90	47	-	-
3rd Dose	89		43	-	42	4	-	-
Booster	428		353	-	65	10	-	-
Typhoid	113	8.9	75	38	...	-	...	-
1st Dose	69		49	20	...	-	...	-
2nd Dose	44		26	18	...	-	...	-
Small-pox	76	0.6	76	-	-	-	-	-
1st Dose	76		76	-	-	-	-	-
Cholera	138	1.1	138	-	-	-	-	-
1st Dose	44		44	-	-	-	-	-
2nd Dose	10		10	-	-	-	-	-
Booster	84		84	-	-	-	-	-

* Includes 284 second and 1,021 third doeses given to those who had received first doses in the previous year.

** Does not include injections given at the Out-Petiant Departments of the hospitals and health centres.

9. 環境衛生対策

NUMBER AND PERCENTAGE DISTRIBUTION OF ENVIRONMENTAL SANITATION ACTIVITIES: KINGDOM OF TONGA, 1979

Activities	Number	%
ALL ACTIVITIES	293,618	100.0
Sanitary Inspection	200,298	68.2
Registration of Establishments and Food Handlers	3,808	1.5
Approval of Plans	952	0.4
Water-Sample taking	19	0.0
Food Condemnation	4,383	1.5
Insect Control	57,705	19.7
Rodent Control	3,453	1.2
Issuance of Written Notices	4,945	1.7
Health Education	115	0.0
Quarantine Service	17,940	6.1

ENVIRONMENTAL SANITATION SERVICES BY ACTIVITY IN EACH HEALTH DISTRICT: KINGDOM OF TONGA, 1979

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai
1. SANITARY INSPECTION				
Water Supply				
Piped	12,331	12,269	17	45
Well	598	416	57	125
Rain water	5,944	4,526	1,028	390
Toilet facilities				
Water-seal latrine	12,017	11,661	80	306
Pit latrine	10,043	4,571	3,666	1,806
Septic-tank	6,259	5,762	402	95
Premises without sanitary accomodation	1,720	1,128	370	222
Town Allotments	34,010	24,414	6,693	2,903
Dwellings (Public)	443	196	222	25
Dwellings (Private)	32,855	23,952	6,302	2,601
Bath facilities	25,167	19,322	3,927	1,918
Kitchens	27,411	20,650	4,543	2,218

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai
Carbage and Refuse Disposal				
Pit	75	-	-	75
Burn	27,101	17,516	6,693	2,892
Collection services	1,839	1,839	-	-
Wholesale foodstors	52	31	10	11
Retail foodstors	1,467	1,154	158	155
Restaurant	43	43	-	-
Bakery	39	21	10	8
Aerated water factory	9	9	-	-
Ice-cream manufacturing	3	2	1	-
Snack Bar	15	15	-	-
Hawkery	60	32	-	28
Institution				
Schools	28	14	13	1
Medical and Health Facilities	-	-	-	-
Hair dresser shop	-	-	-	-
Abattoir	-	-	-	-
Butcher Shop	3	-	2	1
Meat				
Ante-mortem				
Bovine	11	-	-	11
Post-mortem				
Bovine	645	555	79	11
Hog	110	61	38	11
2. REGISTRATION OF ESTABLISHMENT AND FOOD HANDLERS				
Wholesale foodstors	23	13	5	5
Retail foodstors	1,735	1,444	165	126
Restaurant	27	27	-	-
Bakery	18	6	7	5
Aerated water factory	4	4	-	-
Ice-cream factory	-	-	-	-
Snack bar	23	11	12	-
Hawkery	39	23	2	14
Butcher shop	4	1	1	2
Food handler	1,935	1,501	209	225
3. APPROVAL OF PLAN				
Site	359	307	33	19

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai
Dwelling (Public)	48	28	19	1
Dwelling (Private)	383	336	31	16
Septic-tank	162	149	2	11
4. WATER SAMPLE TAKEN	19	19	-	-
5. INSECT CONTROL	57,705	37,200	19,235	1,270
6. RODENT CONTROL	2,453	1,240	1,151	1,062
7. FOOD CONDEMNATION				
Meat (Lbs.)	1,132	488	644	-
Tinned food (tins)	1,631	1,526	-	105
Flour (Lbs.)	1,620	-	1,620	-
8. ISSUANCE OF WRITTEN NOTICE				
Cases taken to court	222	46	100	76
Cases dropped	131	5	68	57
Conviction obtained (T$)	4,542	40	32	4,520
9. HEALTH EDUCATION				
Meetings	93	36	31	26
Radio Talk	22	22		-
10. QUARANTINE SERVICE				
Pratiques issued	190	130	60	-
Aircrafts	818	644	174	-
Health certificates	16,900	15,537	1,363	-
Bill of Health	32	-	32	-

10. 検査業務

NUMBER AND PERCENTAGE DISTRIBUTION OF LABORATORY EXAMINATIONS BY TYPE OF TEST PERFORMED AND HOSPITAL: KINGDOM OF TONGA, 1979

Type of tests	All Hospitals		Vaiola	Ngu	Niu'ui	Niu'eiki
	Number	%				
TOTAL	51,674	100	47,735	3,097	683	159
Urine	5,833	11.3	5,511	228	51	43
Stool and rectal swabs	2,422	4.7	2,401	20	1	-
Wound and other swabs	2,109	4.1	2,098	7	3	1
Blood	37,390	72.3	33,964	2,734	577	115
Sputum	1,998	3.9	1,911	77	10	-
Cerebro-spinal fluid	217	0.4	212	-	5	-
Pleural and other body Fluid	300	0.7	380	-	-	-
Skin scraping	46	0.1	46	-	-	-
Water and others	352	0.7	336	16	-	-
Tests performed overseas	927	1.8	876	15	36	-

NUMBER AND PERCENTAGE DISTRIBUTION OF LABORATORY EXAMINATIONS BY TYPE OF SPECIMEN: KINGDOM OF TONGA, 1979

Type of Specimen	All Hospitals		Vaiola	Ngu	Niu'ui	Niu'eiki
	Number	%				
TOTAL	21,515	100	19,294	1,730	389	102
Urine	2,887	13.4	2,722	110	33	22
Stool and rectal swabs	1,536	7.1	1,515	20	1	-
Wounds and other swabs	754	3.5	743	7	3	1
Blood	13,867	64.5	11,970	1,486	332	79
Sputum	1,442	6.7	1,355	77	10	-
Cerebro-spinal fluid	53	0.2	50	-	3	-
Pleural and other body fluids	76	0.4	76	-	-	-
Skin scraping	19	0.1	19	-	-	-
Water and others	312	1.5	296	16	-	-
Specimens sent overseas	569	2.6	548	14	7	-

11. 家族計画

NEW ACCEPTORS OF FAMILY PLANNING METHODS BY METHOD: KINGDOM OF TONGA, 1975 - 1979

Year	Whole Kingdom	METHODS							
		IUD (Loop)	Pill	Tubal Ligation	Vasectomy	Condom	Rhythm	Depo-Provera	Others
1979	1,644	113	286	65	-	399	73	580	128
1978	1,778	218	230	51	-	354	94	729	102
1977	1,619	251	165	49	-	335	68	647	104
1976	2,159	225	298	97	-	546	265	638	90
1975	2,067	187	159	64	5	593	189	687	183

12. 母子保健

HEALTH SERVICES RENDERED BY MCH CLINICS BY TYPE OF ACTIVITY AND DISTRICT: KINGDOM OF TONGA, 1979

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai	'Eua	Niua-topu tapu	Niua-fo'ou
1. CLINIC							
Service Group Attandance							
Ante-Natal:							
First Visits	2,468	1,699	408	234	109	18	
Revisits	11,668	9,054	1,250	827	471	66	
Post-Natal							
First Visits	807	589	72	84	49	13	
Revisits	346	172	96	68	-	10	
Family Planning							
First Visits	1,266	896	268	41	61	-	
Revisits	2,784	2,065	573	109	37	-	
Under 1 year:							
First Visits	2,972	2,040	464	291	97	80	
Revisits	16,378	9,408	4,496	1,529	805	140	
Pre-School							
First Visits	1,083	592	244	188	49	10	
Revisits	12,408	6,955	3,224	1,314	898	17	
Other Ages							
First Visits	2,798	1,773	36	765	84	140	
Revisits	3,683	2,629	65	884	35	70	
2. HOME VISITS							
Ante-Natal							
New	26	3	1	5	17	-	
Old	403	168	33	59	143	-	
Post-Natal							
New	384	203	23	89	69	-	
Old	278	119	36	97	26	-	
Family Planning							
New	290	208	25	22	17	18	
Old	2,410	1,858	358	151	38	5	
New-born							
New	1,029	545	129	201	133	21	
Old	3,777	2,290	493	460	528	6	

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai	'Eua	Niua-topu tapu	Niua-fo'ou
Child							
New	420	268	33	45	59	15	
Old	5,082	3,235	362	945	538	2	
Tubarculosis							
New	1	-	1	-	-	-	
Old	90	8	60	5	17	-	
Leprosy							
New	-	-	-	-	-	-	
Old	5	-	5	-	-	-	
Other Communicable Diseases							
New	270	185	15	62	8	-	
Old	302	207	30	65	-	-	
All Others							
New	1,320	1,114	-	168	36	2	
Old	1,547	1,363	-	149	35	-	
3. IMMUNIZATION							
Tetanus Toxoid							
1st Dose	1,019	842	-	107	70	-	
2nd Dose	789	652	-	90	47	-	
3rd Dose	89	43	-	42	4	-	
Booster	428	353	-	65	10	-	
4. DELIVERIES REPORTED							
Attendant							
Total	1,215	788	220	109	135	42	21
Medical Officer	3	3	-	-	-	-	-
Medical Assistant	37	1	-	21	-	-	15
Health Nurse	182	49	43	25	45	20	-
Other Nursing Personnel	61	25	21	15	-	-	-
TBA	861	603	152	43	63	-	-
Others	75	7	4	58	-	-	6
Unknown	49	-	-	-	27	22	-
5. HEALTH EDUCATION							
Attendance							
Nutrition	1,237	506	46	582	-	103	
Communicable Disease	508	79	14	317	-	98	
MCH/FP	1,041	398	15	462	-	166	
Sanitation	602	100	-	362	-	150	
Others	1,058	730	-	202	-	126	

Activity	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai	'Eua	Niua Topu-tapu	Niua-fo'ou
6. DEATHS REPORTED							
Under 1 Year	9	4	1	4	-	-	
1 - 4	2	1	1	-	-	-	
5 - 9	3	2	1	-	-	-	
10 - 14	-	-	-	-	-	-	
15 & Over	70	36	10	22	2	-	

CERTIFIED LIVE BIRTHS BY ATTENDANT AND PLACE OF DELIVERY: KINGDOM OF TONGA, 1979

Attendant	Total		Hosp./Disp.		Home	
	Number Attended	% Attended	Number	%	Number	%
Total births attended	2,698	100.0	1,483	55.0	1,215	45.0
Medical Officer/Medical Assistant	395	14.6	355	13.1	40	1.5
Sister	2	0.1	2	0.1	-	0.0
Staff Nurse	1,102	40.9	1,041	38.6	61	2.3
Public Health Nurse	206	7.6	24	0.9	182	6.7
T.B.A.	872	32.3	11	0.4	861	31.9
Others	23	0.8	1	0.0	22	0.8
Unknown	98	3.6	49	1.8	49	1.8

Source: Ministry of Health

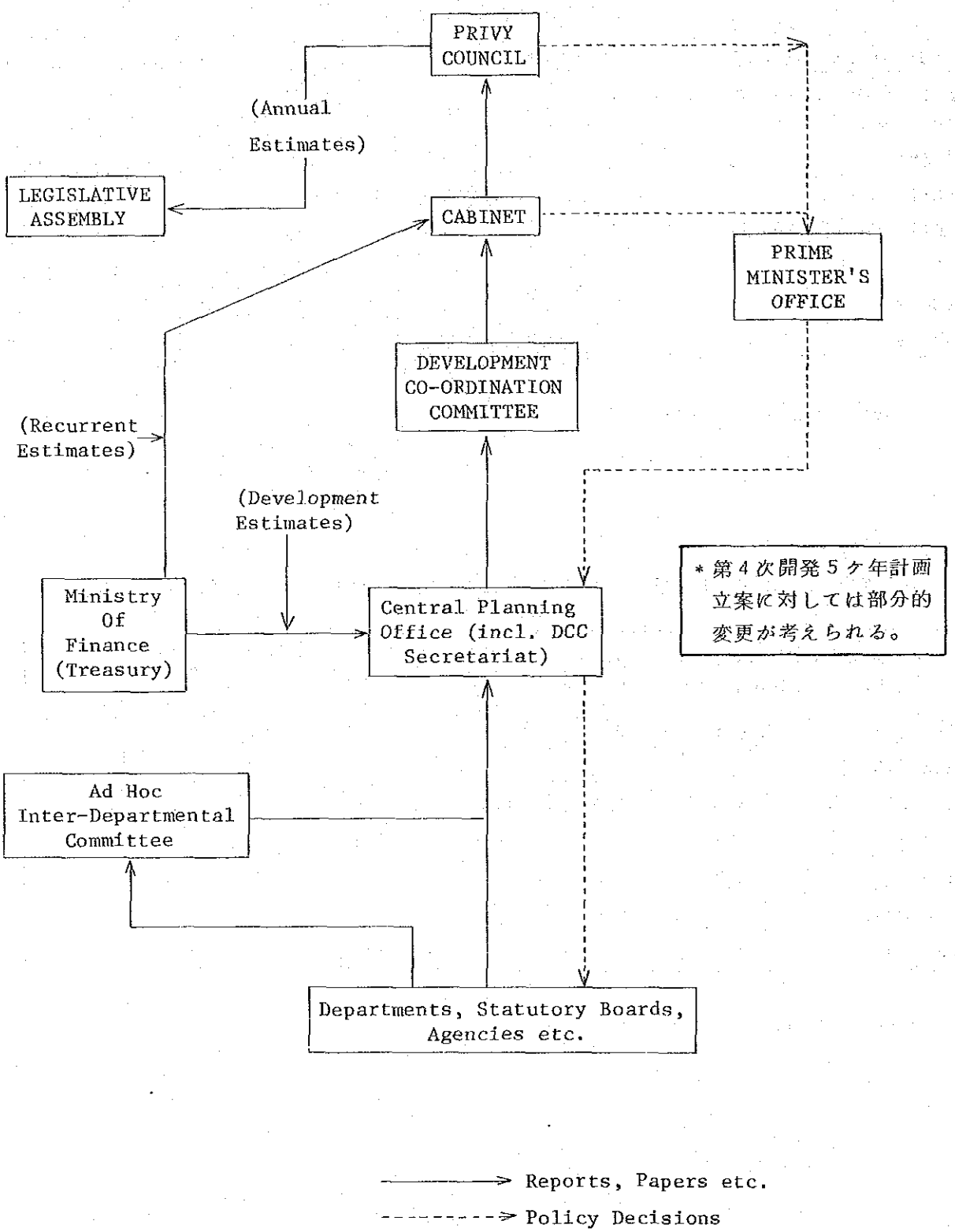
CERTIFIED LIVE BIRTHS BY AGE OF MOTHER AND DISTRICT: KINGDOM OF TONGA, 1979

Age of Mother (Year)	Whole Kingdom	Tonga-tapu	Vava'u	Ha'apai	'Eua	Niua-topu tapu	Niua-fo'ou
All Ages	2,698	1,767	441	292	135	42	21
Under 15	-	-	-	-	-	-	-
15 - 24	866	605	127	99	36	-	4
25 - 34	1,156	814	195	86	47	-	14
35 - 44	460	309	69	52	29	-	3
45 - Over	9	8	1	-	-	-	-
Unknown	207	31	51	60	23	42	-

Source: Ministry of Health

Ⅳ　トンガ第３次開発５ケ年計画、計画立案機構

THE ORGANIZATION OF PLANNING*



* 第４次開発５ケ年計画立案に対しては部分的変更が考えられる。

V MEMORANDUM

FOR

DEVELOPMENT CO-ORDINATION COMMITTEE

NATIONAL DEVELOPMENT PLAN : PRIORITIES AND STRATEGY

Background

On 18 October 1979 Cabinet approved the following national development objectives for the Kingdom's Fourth Development Plan (DRIV):

(1) To achieve a sustained increase in the production of goods and services, and the real incomes of the people;
(2) To achieve effective management of the national economy;
(3) To achieve a fair distribution of goods, services and income between people in different parts of the Kingdom;
(4) To enhance the quality of life and security of the people, the cultural heritage of the nation, and the preservation of the environment;
(5) To develop harmonious relations and mutual cooperation in economic, social and related spheres with all nations and international organisations.

This paper sets out a number of key issues facing Tonga as it embarks on DPIV, and recommends priorities and strategies to be adopted during the Plan period.

Key Issues

(i) Opportunities

- fertile productive land capable on significantly higher agricultural utilisation and production;
- large and relatively untapped fisheries resources;
- the potential for a significantly larger tourist and visitor industry which would be consistent with the preservation of Tongan values, customs and lifestyle.
- a literate, adaptable workforce;
- a mild, benevolent climate that is suitable for the production of both tropical and temperate crops.

(ii) Constraints

These remain, as stated in DPIII

- small, scattered land area;
- geographic isolation;

- high internal and external t ansport costs;
- small domestic market;
- low levels of incomes, domestic saving and investment;
- an acute, and growing, shortage of professional, technical, managerial and skilled staff.

(iii) Recent Key Developments

During the course of DPIII a number of developments occurred, which have serious implications for the direction, pattern and pace of development during the five years of DPIV, and beyond. The most important of these are:

- Stagnant, or possibly declining agricultural output;
- A slow rate of economic growth supported entirely by the direct effect of external aid and remittances. In the absence of foreign aid, GDP would have been stagenant or even declined in real terms during the period of DPIII;
- A marked deterioration in the recurrent budget
- Rising domestic consumption and declining savings;
- A deterioration in the structure of the balance of payments;
- A serious imbalance in the allocation of resources between Tongatapu and outer island groups, and between urban and rural areas and consequent migration from those areas to Nuku'alofa and nearby villages.

Priorities

The programmes, policies and projects for implementation during DPIV must be fully justified in terms of their contribution towards meeting the Kingdom's National Development Objectives. Priority should be given to those programmes, policies and projects which meet all, or most, of the following criteria:

(1) generate an acceptable internal rate of return or are otherwise cost effective;
(2) contribute positively to the country's balance of payments by increasing exports or reducing imports;
(3) create new jobs for Tongan people;
(4) raise the level of professional, technical, administrative and trade skills;
(5) encourage rural production;
(6) improve, or have a neutral impact, on the recurrent budget;
(7) distribute resources equitably on a regional and rural basis;
(8) do not have an unduly adverse impact on the environment.

Strategy

The following broad strategy will be adopted for DPIV:

(I) Production

(i) The expansion of exports, and export earnings, to strengthen the Kingdom's external trading position;

(ii) The expansion and diversification of agricultural output to meet the growing domestic needs for food, and for exports, with emphasis on the need to harmonise traditional rural agriculture with market oriented commercial production;

(iii) Increased emphasis on the development of the outer island groups and of rural areas, by encouraging rural based production, including handicrafts;

(iv) The development of a viable fisheries industry with emphasis placed on artisanal fishery;

(v) The further development and utilisation of the country's natural resources, in particular:

(a) mineral resources;

(b) alternative energy sources;

(c) forest resources;

(vi) The continued expansion of manufacturing industry;

(vii) The controlled expansion of the tourism;

(viii) Emphasis on the provision of training within Tonga and elsewhere, for professional, managerial, technical, administration and trade skills to meet the rapidly growing needs of the country.

(II) Economic Policy and Management

(ix) The continued expansion and diversification of the private sector;

(x) The selective use of foreign aid to ensure that it contributes to the Kingdom's development objectives and does not reduce self-reliance;

(xi) An improvement in the effectiveness of government administration and of the government budget through:

(a) more effective control over expenditure;

(b) appropriate taxation and revenue measures;

(xii) The provision of additional infrastructure required to support the Kingdom's development objectives and in line with the government's priorities and strategy;

(III) Distribution and Quality of Life

(xiii) A reduction in unemployment and under-employment through the

creation of new job opportunities in Tonga;

(xiv) A reduction in the rate of growth of population;

(xv) The continued provision of essential social and cultural services.

RECOMMENDATION

That the Development Coordination Committee recommend to Cabinet that the criteria and strategy outlined in this paper be adopted for DPIV.

T P Lavulo
ACTING DIRECTOR OF PLANNING
30 March 1981

CP/ta

VI FOURTH FIVE YEAR DEVELOPMENT PLAN

HEALTH SECTOR

(The Ministry's Plan)

Background

The Ministry of Health is administered by the Director of Health who is responsible directly to the Minister of Health. The Ministry is divided into four technical divisions, namely Medical, Public Health, Dental and Nursing. For administrative purposes, the Kingdom is divided into ten medical/public health districts based upon four hospitals and six health centres.

The four hospitals are: Vaiola at Nuku'alofa with a bed capacity of 198: Ngu at Neiafu, Vava'u, with 61 beds (on completion of current renovations); Niu'ui at Hihifo, Ha'apai, with 28 beds and Niu'eiki at 'Eua with 16 beds. The Health Centres are at Nomuka and Ha'afeva in Ha'apai, Mu'a and Kolovai in Tongatapu, and one each at Niuatoputapu and Niuafo'ou. Some of these Health Centres have in-patient wards - six beds at Nomuka, six beds at Ha'afeva and ten beds at Niuatoputapu. Thus currently there are 325 hospital beds available throughout the Kingdom and with a population estimated to be 96,491 at year-end 1979, this gives a ratio of one bed per 297 persons.

Health services are mostly the responsibility of government. There are five private outpatient clinics found in Tongatapu run by the church missions and retired medical officers.

At the beginning of DPIII, the Ministry had 378 employees and at the end of this plan period the number of employees had increased to 456.

Achievements During DPIII

During the Third Five Year Development Plan period, the following major projects for the Ministry of Health were completed:

(i) Psychiatric Ward and Equipment, Vaiola Hospital - a 12 bed psychiatric ward was added to Vaiola Hospital with all necessary equipment and furniture. This was made possible through a loan from the United Kingdom. The total cost was T$ 295,141.

(ii) Niu'ui Hospital - the old Niu'ui Hospital was replaced by a new 28 bed hospital of a more modern nature. This was financed under New Zealand aid and the total cost was approximately T$ 620,000.

(iii) Health Clinics - clinics at Vaini, Nukunuku, Lotofoa and 'Uiha were completed during the plan period and funds were made available from UNFPA and New Zealand aid.

(iv) Public Health Nurse Quarters - quarters at 'Uiha, Lotofoa, Fakakakai, Ha'afeva and Nomuka are now completed and made possible under UNFPA and New Zealand aid.

(v) Garbage Trucks - the three garbage trucks requested under Australian aid arrived during 1979. The cost was T$54,000.

(vi) Rural Water Schemes - rural water schemes have been completed at Pelehake, Falevai, Leimatu'a, Pangai-Hihifo, Holonga, Tu'anuku, Houma, Pangaimotu, 'Utui, Lotofoa and Kala'au.

The rest of the projects planned for DPIII are either incomplete and to be completed during DPIV or not yet started and hoped to be implemented during DPIV.

Aims of the Health Sector

Increased social and economic productivity as a result of improved health of the population. Good health is of major importance in promoting productive work and study, as well as for social development and quality of life. Improved health can be expected from further reductions in preventable diseases, from prompt, effective diagnosis, treatment and rehabilitative services, and from the development of more healthful habits of living. This aim involves the avoidance of premature mortality as well as of morbidity and impairment.

Improved quality of family life through education and opportunities for families to be planned. Natural growth rate of population brought into balance with socioeconomic development. These aims are combined because it is believed that the benefits to Tonga from moderation of growth rate are closely related to the benefits to individuals and families of having the desired number and spacing of children.

Increased equity in the health service system

- maximal development of the abilities of Tongan nationals within the system
- greater equilization of levels of service to all island groups and rural areas

Equity in these matters is a social benefit in itself, and also contributes to improving levels of health as talents are fully employed and as the population segments with greatest health needs are better served.

Increased efficiency in the health service system. The aim is to achieve the greatest possible results from the limited resources available, while combatting waste and the inflation of costs.

Increased protection of the population from hazards of the environment. Protection will always be needed against the threats of pollutants, epidemics, accidents and other hazards.

Key issues

The following are expected to be key issues in the health sector during the period 1980-85:

Issues of health information. Present systems are insufficient in providing data on health problems for the purposes of defining objectives and monitoring progess toward objectives. Management information systems are also inadequate for the needs of monitoring, evaluating and controlling programmes' activities, achievements and expenditures. Closely related to the information systems is the question of policy formulation, which needs to be based on more adequate data. Once formulated, information on health policy needs to be communicated more adequately to staff at all levels and to the public.

Issues of personnel. The number of personnel in many categories is either currently inadequate or threatening to become so through retirements and resignations. Attrition during training compounds the problem. Productivity of personnel is of particular importance and is heavily influenced by the need for more effective supervision and for appropriate delineation and assignment of tasks to the various categories of personnel.

Issues of fair distribution of services. Much greater emphasis on primary health care and public health services is needed to bring them into proper balance with inpatient hospital services. Also needed is an increase in the delivery of services at rural locations. Appropriate staffing and supplies are particularly important in isolated places with problems of communications. Fair distribution of services between island groups requires further attention. Another issue of balance is that between government, private sector, communities and individuals. There is need to clarify the nature and extent of goverment encouragement of such broadened participation in the health care system. Healthy living habits and effective use of primary care both depend upon individuals assuming greater responsibility for their own health.

Issues of old problems incompletely resolved. There are several areas still in need of safe water supplies, and others where more capacity is required. Sanitary disposal of human wastes is still inadequate in many locations, and is a major issue where combined with poor drainage in urban locations. Appropriate control of insect and rodent vectors of disease is another issue.

Issues of new problems anticipated. The growth of small industries is expected to create health problems such as accidents and the risk of chemical poisoning, and poses the issue of compensation for occupational disease and injury, although prevention of such harm is even more important. Agricultural schemes may also increase the risks of poisonings, and the lack of registration of agricultural chemicals is an issue. The expected growth of tourism will require assurance of food sanitation and sewage disposal, and may increase risks of introduction of new diseases.

Issues of curative medical care will continue to demand proper attention. Care must be taken to avoid indulgence in costly treatment approaches of doubtful benefit. Greatest attention must be given to prompt treatment that can prevent progression of disease, such as, for example, hyportension control before complications, adequate treatment of streptococcal disease to avert rheumatic fever, cure of ear infections to lesson deafness, and so on.

Key issues of management (in addition to those discussed above) include technology and systems which may be inappropriate for the future, such as whether mass campaigns for disease control may need to be replaced in some situations by greater emphasis on epidemiologic surveillance and control. Continuing rise in costs must be dealt with in areas such as drugs, supplies, fuel and diagnostic testing.

Regional and Rural implications

As pointed out in discussing the key issues, the Fourth Development Plan period must stress the placement of new service facilities in underserved rural and regional locations. Appropriate government consultation with and support to communities is important in assisting them to solve their own problems. Better management in matters such as supervision and supply is required in order to improve the effectiveness of services to rural areas and outer island groups.

Strategies

Primary health care strategies have been adopted as the highest priority service element in the health delivery system. Primary health care involves services provided at community level in which the promotive and preventive aspects are featured elements in combination with the curative and rehabilitative aspects. Among the several primary health care strategies, the greatest attention during 1980-85 will be given to the new medical assistant programme, the training for which began in 1979-80 (because the training will aim to prepare for new functions and capabilities required for the future, a new name - Health Officer -

will in the future be applied to this category of staff). The numbers of medical assistants will be expanded, as fast as training capability allows, so that most health centres in rural areas will be staffed by them, and later certain hospital and other urban posts as well. The first class, in which 7 trainees are enrolled, will by the 1981-82 fiscal year be filling vacancies created in rural health services by retirements and resignations of medical officers and previously trained medical assistants; thus significant increases in numbers of staff at this level will occur only with subsequent classes late in the plan period.

As present facilities are inadequate for the planned medical assistant functions, the construction of rural health centres early in the plan period is a priority for coordination.

Another primary health care strategy is the modification and strengthening of the recording and reporting systems. Individual and family health records systems will be developed in collaboration with the medical assistant programme to provide a basis of continuity and comprehensiveness in health information needed for improved health promotion and care. There will be tests of giving health information to families to use for improved self-knowledge of health practices. Modification of reporting from health centres will be introduced, aimed at enhancing reliability and completeness of data.

A related primary health care strategy is the development of the role of individual and community. Self-help not only conserves costs but is often the most effective way to improve health when it leads to new healthful ways of life. Through the medical assistants as well as with nursing, health education and other staff, communication with the public will be expanded in matters of their health needs and desires and the best use and support of the health services. The Ministry of Health, in collaboration with other sectors of society such as education and agriculture, will give the necessary encouragement and support to strengthen the role of local groups (women's committees, etc.).

Collaboration will be renewed with traditional birth attendants to increase their role in promoting health and to bolster their quality of service. More emphasis will be given to coordination with tranditional healers for their possible useful role in primary health care.

In certain isolated rural communities where the size of population would not justify presence of a medical assistant, other ways of strengthening primary health care will be fostered. The expanded function of the public health nurse

is one such way, in coordination with construction proposals to upgrade four health clinics. Another approach will be a pilot study of training a new category of primary health worker, a community person who can help very small, very isolated villages meet their daily health needs. This would be an attempt to meet the special needs in certain island group areas such as parts of Ha'apai.

An essential feature of the primary care strategies is that well motivated staff be present in the communities continuously. The incentives for rural service will be analyzed and modified accordingly. Appropriate staff quarters must be provided for the rural health centres, health clinics and the smaller hospitals. Reliable transport (particularly boats in the case of island locations) is another factor. Adequate communication is needed. The need for other incentives will be studied.

Family planning/maternal and child health strategies cannot be separated from primary health care because of the people's need to receive integrated services. Because of government priority for family planning, however, it is discussed in detail in the following chapter. Maternal and child health services are of particular importance because mothers and children make up about 65 % of the population. Construction proposals for MCH,FP are modest during the 1980-85 plan; the emphasis will be on training and supervising staff so that services are given in ways most acceptable and helpful to the people.

Maternal and child health workers share with all primary care staff and with the public health leadership the concern for areas such as immunization, nutrition, school health, diarrhoeal disease control and communicable disease control. All of these areas must be studies so that the most effective and complete coverage can be provided without duplication. A probable result of this study is that much of the service will be provided by primary care/ maternal and child health staff at community level, with the guidance of explicit procedures from the public health leadership.

With the completion of Ngu Hospital serving the Vava'u group early in the plan period, a reasonable supply and standard of inpatient hospital beds will be achieved for all parts of the Kingdom. The main focus will then be on efficiency and effectiveness of hospital service. Niu'eiki Hospital Extension in 'Eua will be the principal project, adding facilities for dental and MCH services, X-ray and office for health inspector. At Vaiola Hospital, the physiotherapy building will allow more effective rehabilitative services to inpatients and outpatients. The Vaiola Rainwater Reservoir will promote efficiency. The Vaiola Laboratory Extension will allow additional clinical testing of inpatients where cost-

efficient, but will concentrate principally on meeting public health needs such as systematic testing to assure drinking water quality and certain clinical bacteriological tests brought in from the sites of primary care services. It will also be a secondary-level laboratory in support of the more basic services at Niu'ui, Ngu and Niu'eiki Hospitals. More specialized public health laboratory functions are also anticipated to develop during the period, such as relate to food sanitation and sewage treatment.

Also at Vaiola Hospital, it is planned to construct flats for the use of staff on call and performing emergency services after hours. A minimal number of staff quarters at the hospital are also needed for relatively short term use by officers arriving and lacking residence in the Nuku'alofa area.

For dental services, the emphasis will be on better distribution of service to rural areas and on the attempt to maintain adequate staffing. There has been no permanent service to 'Eua, Niuatoputapu or Niuafo'ou; this will be corrected by the previously described Niu'eiki extension, and by constructing a room and quarters as part of the Niuatoputapu rural health centre, with portable chair and equipment which can be shared with Niuafo'ou. Rural service in Tongatapu will be increased through providing sufficient transport to supplement the mobile dental unit. This will strongthen the school dental public health work and provide dental services at health centres and other community locations, scheduled so as to make fuller use of the time of dental personnel. A mobile unit is also planned to allow similar rural extension of dental services in Vava'u. Dental Assistants will increase the productivity of dental officers through chairside and preventive duties. Also needed for increased productivity is the establishment of dental mechanic positions, and of a clerical position for reception and fiscal control duties.

Health information strategies are a major priority, as they provide the basis for health policy formulation and execution. For birth and death data, the Ministry of Health will continue collaboration with the Ministry of Justice to achieve more complete registration, testing new methods to solve current problems particularly of death registration. For morbidity data, notifiable disease reporting methods will continue with periodic revision and strengthening. Other morbidity reporting methods will require significant changes to relate them to activity reporting for managerial analysis. Modified "lay reporting" methods will be tried. Periodic in-service training will extend beyond statistical staff to other health workers, particularly at primary care level. To motivate more effective performance, information and policy explanations will

be communicated back from central to community level.

Health education strategies aim to achieve the understanding people need in order to support improvements in health practices and use of public health and medical services. With relatively modest increases in staff, equipment and working space, the Health Education Unit will rely chiefly on helping all other health workers communicate health information. In addition it will continue collaboration with other departments and agencies in spreading health messages. This will involve both formal education in the schools and non-formal education working with non-governmental organizations. Radio, posters and written material will supplement face-to-face discussions. The 1980-85 priority for health education will be in primary health care. This will require expansion of activities particularly at village level. In order to strengthen health education in primary care and in other important areas such as family planning, communicable disease control and dental public health, it is vital that the health education unit be closely involved in programme planning. To satisfy those responsibilities, there is need for advanced training of an experienced staff member and for the addition of three assistant health educators, including one skilled in audiovisual aids.

Disease control strategies will be based on the epidemiologic intelligence function which analyses routine data and special studies. This analysis leads to decisions such as, for example, when and how filariasis control will be integrated into general health services, what immunization strategy to employ, and whether to shift emphasis to more contact and followup investigation to control typhoid, tuberculosis and/or sexually transmitted diseases. Next the public health leadership will establish the procedures to be followed, and organize poriodic in-service training in support - for example, on proper use of refrigerators, cold boxes and vaccine expiry dates to make immunization effective.

Nursing strategies will concentrate on procedures for assuring quality of care and effective achievement of objectives. This will be pursued through supervisory techniques, plans of work, job specifications, written procedures, etc. To support the planned new health centers and the upgraded hospitals, additional nursing posts will be needed. Filling those and the vacancies created by current staff turnover will be a major challenge. Strengthening the School of Nursing to lesson student attrition will be a partial solution. Further exploration will be needed on other possible solutions, such as the shortening of the duration of the present nursing course and/or the training of

nurse aides. The part-time employment of previously resigned nurses will be considered. To support Ministry priorities, the curriculum will be strengthened particularly in areas such as public health and primary care, and the school will collaborate with the nursing services to provide an increased level of in-service training. It is expected that the school will begin to accept male students. International collaboration, particularly with neighboring countries, will begin to develop selected specialized nursing education programmes during the 1980-85 period.

Environmental health strategies will feature solidifying the gains in rural water supplies by:

a) completing new schemes for unserved areas, to achieve 100 % coverage with safe water supplies by 1985,
b) upgrading existing schemes to make them adequate for the growing population,
c) providing standy equipment so that prolonged interruption of water supply is avoided during repairs, and
d) training staff for functions such as water quality control and equipment maintenance.

RURAL WATER PROJECTS FOR DPIV

Project and external funding source	Population served		Estimated costs - T$			
	villages	persons	total	ext.	gov't	village
New schemes - Ha'apai and the 2 Niuas - United Stated A.I.D.	22	5086	172675	154125	8775	9775
New Schemes - Vava'u - New Zealand Aid	24	5744	277418	251078	8050	18290
Improvement and expansion of existing schemes - funding source not yet identified	59	41572	383350	314750	18800	49800
Total	105	52402	833443	719953	35625	77865

The above table shows details on strategies a) and b). Most of the new schems are in villages where rainwater catchment systems are required. The expansion of existing schemes will serve villages in Tongatapu, Vava'u, Ha'apai and 'Eua. For the standby equipment, UNICEE aid of T$27500 is being requested, and WHO assistance is expected for training.

Large segments of the population still do not have satisfactory methods for excreta disposal.

Correction of this will require large expenditures as well as proper attention to public acceptance and use of improved methods. Therefore the approach will be through operational studies to test for efficient and effective solutions. For example, testing of pour- flush septic tank arrangements will be done in Nakolo as one possible answer for rural needs. A variety of engineering approaches will be applied to specific problem urban areas where poor drainage poses health hazards.

New environmental health functions will be handled by training and assignment of staff for vector control and occupational health. Vector control equipment will be needed, and arrangments explored for regional response to vector-borne epidemics through international cooperation. Similar regional support will be sought if feasible for handling problems of pesticides and poisonings, in cooperation with agricultural authorities. Improved methods of solid waste handling and pollution control will be strengthened with the added collaboration of the Medical Assistants' Training Centre.

Management strategies include strengthened personnel procedures with particular emphasis on supervision, aided by training in supervisory methods. Trining is likewise needed for improved supply management, supported by extension of the medical store and pharmacy. Drug cost control will be helped by pharmacopoceias, and by improved drug purchasing and quality control, through regional international approaches if feasible. Transport effectiveness and cost control will be promoted by programming of vehicle replacement stressing fuel efficiency, and by improved maintenance, aided by construction of the Vaiola garage. Cost accounting by activity centres will be introduced to aid managerial efficiency. Planning activities will include continuation of the National Health Planning Committee, and annual updating of the health plan and programmes with participation from all levels of management. Consideration will be given to strengthening the planning capability of the Ministry. Clearly defined job descriptions and lines of command will be put into practice.

Manpower stractogies will give top priority to the training of Tongan nationals in all needed categories of health work, both at undergraduate and postraduate level. The aim of full localization of staffing is combined with the aim of delivering services of the highest level of quality achievable within the economic situation of the country. Efficiency will require full use of the abilities of each level of staff. Thus careful job analysis and task assignment will be a basic step, leading to early concentration on local training, where possible, of auxiliary levels of staff. Because of the acute shortage of

medical staff, the new Tonga Health Training Centre will be training chiefly Medical Assistants (Health Officers) during this period. There will, however, be sharing of certain training with other categories such as the health inspectorate, since development of teamwork abilities is especially important. When local training is not feasible, preference will be given to the training most suitable to Tongan needs, often in cooperation with neighboring South Pacific countries. International and bilateral support through fellowships and other means will continue to be very important in DPIV.

Control of quality of staffing will require considering establishment of Councils responsible for registration of medical, dental, nursing and perhaps other categories of staff. Equally important is strengthening of in-service training and continuing education arrangements.

The 1985 manpower targets tabulated below are based on the criteria of filling the most serious present deficiencies (even while the population is growing), and staffing to bring service at rural and island group facilities up to national standards. Full manpower development will take longer - at least 10 years - so that local training capacity can be built to full strength, and because of the long time required, for example, for the training of dental officers, and for the postgraduate training to consultant level in the main medical specialities. Meanwhile during DPIV Tonga will continue to welcome overseas personnel to fill special needs on a volunteer or similar basis.

MANPOWER TAGETS - MINISTRY OF HEALTH

Classification	Posts Filled November 1979	Targets June 1985
Medical Officers	26	36
Medical Assistants	6	23
Total Medical	32	59
Dental Officers	9	12
Dental Assistants	9	14
Total Dental	18	26
Nurses	176	235
Health Inspectorate	10	19
Technical*	36	74

* including X-ray, laboratory, dieticians, physical and occupational therapists, pharmacy and stores, medical records, health education, health statistics.

FAMILY PLANNING

Background

Government support for family planning began in the 1960's and has been aided since 1972 by WHO and UNICEF with UNFPA funds. Other sources of assistance include the United Kingdom, New Zealand, University of Hawaii School of Public Health, ESCAP, South Pacific Commission, the U.S. Peace Corps and the International Planned Parenthood Federation. Within government services, family planning is integrated with maternal and child health and is part of the general public health programme. In the private sector, family planning services are available through the Tonga Family Planning Association, the Catholic Family Planning Clinic, and private clinics.

Achievements during Development Plan III

Following the completion of the projects listed in the previous chapter, family planning is now available at the four hospitals, at six dispensaries and 19 district health clinics. The number of district nurses has increased from 24 in 1975 to 29 in 1979. Post-partum health education has been conducted at hospital and district clinics. In-service training, seminars, workshops and fellowships have supported the programme. In 1979, however, the birth rate is estimated to remain above 30 per thousand.

Aims

To support the health sector aims of quality of family life and balanced population growth, family planning is to be extended to cover more eligible females, so that an annual birth rate target of 25 per thousand population will be achieved by 1985.

Key issues

The quality of information is a key issue for family planning. Incomplete registration creates uncertainties about birth and fertility rates, and service data is not yet fully utilized for programme evaluation.

Continuity in family planning practices is a problem, probably related to effectiveness of administration of services in such matters as adequacy of staffing and supply. Also affecting continuity as well as acceptance is the issue of adequacy of health education, in need of strengthening at community level and for key groups such as males, school leavers and church youth groups.

An issue for the Development Plan IV period is the growing size of the group entering the reproductive age period.