

# ソロモン諸島マラリア対策 事前調査報告書

1986年2月

国際協力事業団

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国際協力事業団

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## 序 文

南太平洋メラネシアに所在するソロモン諸島においては、マラリア罹患率は同国人口約25万人の約3分の1にも達し、マラリアは同国最大の健康問題となっている。

本調査は、在マニラWHO/西太平洋地域事務局と共同して、1985年12月時に行われたものであるが、同国のマラリアの現状と対策について多くの情報を得、今後の技術協力の可能性をさぐり、合わせて、懸案のマラリア関係の無償資金協力事業の推進にも役立てることができた。本報告書は、さらに同国のマラリア対策事業を支える医療行政の機構と機能についての資料も収録しており、同国の医療事情一般の理解に資するものと思料する。

ここに事前調査団の団員各位および調査団派遣に協力を賜った関係機関ならびにWHO西太平洋地域事務局の協力なる謝意を表する次第である。

昭和61年1月

国際協力事業団  
理事 末永昌介





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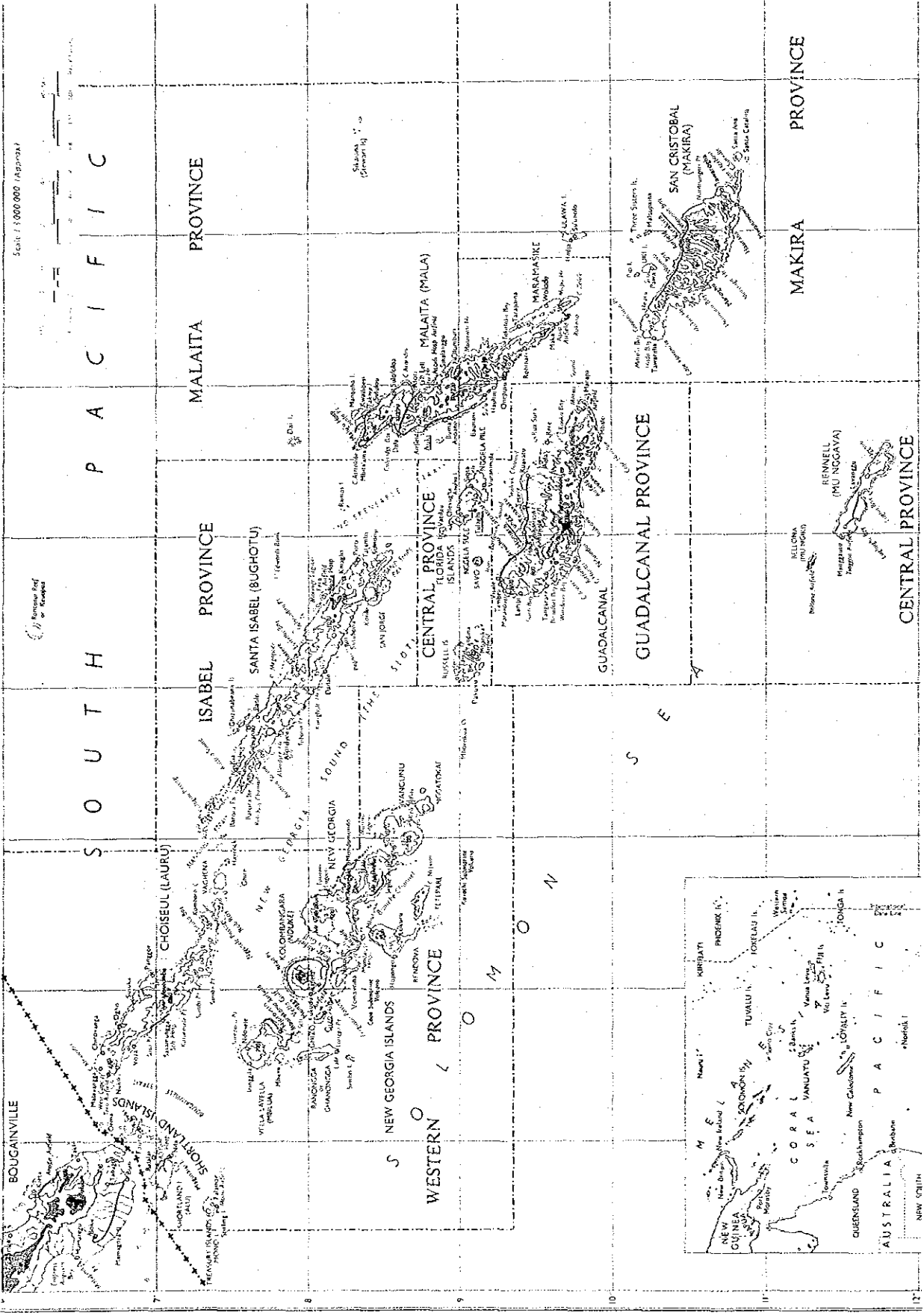
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## ソロモン諸島マラリア対策事前調査団名簿

- 1) 佐々 学 (団長)  
富山医科薬科大学学長
- 2) 中 林 敏 夫  
大阪大学微生物病研究所教授
- 3) 矢 野 三 郎  
富山医科薬科大学内科第一教授
- 4) 村 越 俊 雄 (業務調整)  
医療協力部医療協力特別業務室長



昭 60. 12. 17

## ソロモン諸島マラリア対策事前調査

(調査日呈及び概況報告)

- 11/30 (土) 1) 成田～シドニー (JL 771)
- 12/1 (日) 1) シドニー～ブリスベン (TN 436)  
2) 夜、在ブ増井総領事主催夕食会に招かれる。
- 12/2 (月) 1) 総領事館にて渡辺医務官 (ソロモン、フィジー東南太平洋地域医務担当) の  
ソロモンのマラリア関係オリエンテーションを受ける。  
2) ブリスベン～ホニアラ (FJ 502)  
3) WHOマニラ駐在松島医務官及び佐藤情報分担官が合流
- 12/3 (火) 1) 医療保健省 (Ministry of Health and Medical Services) に  
Alfred Maetid 大臣を表敬訪問  
2) 同省にて第一回会議開催
- ① 出席者
- ソロモン政府側：○ Permanent Secretary Mr. Philip S. Funifaked  
○ Under Secretary Br. Nathem Kere  
○ Under Secretary / Health Dr. Eritara Tekieru
- W H O 側：○ 松島医務官 (マニラ駐在)  
○ 佐藤情報分析官 (マニラ駐在)  
○ Country Liaison Officer Dr. David Parkinson
- 日 本 側：○ 調査団全員  
○ 在ソ平賀日本国臨時代理大使
- ② 会議内容
- マラリアは罹患率  $\frac{3.00}{1,000}$  (1984) をこえる国最大の問題である。
  - マラリア対策は他の医療保健対策事業との統合化を図りたい。
  - 日本へは、ソロモン政府のマラリア抑制 (Control) 事業への支援をたのみたい。
  - 日本の無償約 250 千 U.S. \$ 分のマラリア対策関係車輛供与について意見交換
  - 1986 年度供与予算のマラリアラボラトリーの無償案件

について意見交換

3) 大蔵省 ( Ministry of Finance ) を訪問

① 相手側 Under Secretary ( Budget & Operations )

Mr. Mathias Pepona ( 大臣は国会予算審議で不在 )

② 訪問内容 ○マラリア対策はこの国最大のプロジェクトである。  
○当方からは保健省との話し合い内容を伝達

4) 運輸公共事業省 ( Ministry of Transport Works and Utilities ) に Under Secretary Mr. Nathaniel Waeuk を訪問

訪問内容 ○マラリアラボ建設について意見交換、先方よりは一般論として建築資材の現地調達  
の困難さ、サブコン起用の困難さについてコメントがあった。

12/4 (水) 1) 経済計画省 ( Ministry of Economic Planning ) に Emmanuel T. Harihiru 大臣を  
表敬訪問

訪問内容 ○従来マラリア対策ではアメリカ、オーストラリア、WHO等の協力を受けて  
いたが、この事業の早期本格化を計りたい旨要望があった。

○双方は無償協力の供与の計画と手続きについて意見交換をした。

○同省の Permanent Secretary Mr. S. David Keve 等同席

2) 外務省 ( Ministry of Foreign Affairs ) に Permanent Secretary Mr. Wilson Itonaon  
を表敬訪問

訪問内容 ○専門家派遣、研修員受入れ、ラボ建設等の無償案件等に意見交換。

3) 国立病院及びマラリアラボ建設予定地視察。

○サイトは市より東5km 空港へ行く途中のゴルフ場敷地内 ( Site Plan あり )

4) ガダルカナル島中部 Ranada Beach にそぐ Buvs Creek の蚊の発生地帯視察。

5) 中央病院 ( Central Hospital Honiara ) 視察

○ベッド数250、医師15名、1日50～200名の外来患者のある総合病院。

マラリア研究、検査部門を併設し、WHO専門家在勤。日本政府寄贈の各種  
機器あり。院長は Dr. John Wesley Keve 。

12/5 (木) マライタ島 ( Malaita ) 視察、約8万5千人の人口

○チャーター便 ( 往復 \$ 684 ) で行き、保健省より Chief Antimalaria Officer の Mr. J. B. Seijamd 及び WHO より松島医務官、経済計画省より Sr. Planning Officer ( Social Services ) の Mrs. Stephanil Knox ( 豪 ) が同行。  
現地では Provincial Chief Medical Officer Dr. S. Ball ( 英 ) の説明案内があった。

1) Kilu'uti Provincial Hospital (Auki)

○外国人医師3名勤務の州の中央病院でマラリア調査部門あり。

2) Malu'u Clinic

州都 Auki より約 30km、車で約 3 時間半、島の西北端に所在。ベッド数 10 登録看護師 (Registered Nurse) 1 名が在勤。この診療所は上記州病院の次位にあり、診療、投薬の他 MCH、Ante Natal 診療、家族計画関係諸業務の他、マラリアでは血液採取、スライド作成 (検査は上記 1) へ送付、一斉投薬行政 (MDS ~ Mass 1) Drug Administration)、及び同所を拠点として DDT 散布を行っている。この診療所には電気なし、顕微鏡あり。

3) Bitama Clinic

上記 2) の支所で、1) と 2) の中間地点に所在。登録看護師 (RN) 1 名がマラリア関係業務も合せ行っている。電気、顕微鏡ともになし。

4) Fouambu Clinic

ミッション系団体により設置、維持されていた各種施設の中の診療所であるが、外人不在となってから細々と業務を続けている。RN 1 名配属、電気、顕微鏡ともになし。

12/6 (金) 5) Buna Station

島の中央南西部にあり、船外機付カヌーで約 1 時半で到着。1940 年代まではミッション系団体に寄宿学校とともに維持、運営され、担当の事業規模であったが、施設のほとんどは閉鎖され、現在は RN 1 名が在勤しているのみ、電気なし。ここにも州財政の破綻ぶりが現われており、“No Potatos means No Drug” のはり紙が痛々しい。

6) Talakalt Clinic

5) と Auki の中間地点に所在。RN 1 名おり、電気なし。

7) マライタ州首相 Mr: Harold Maomatekwa を表敬訪問。4-u 事項の趣旨を伝える。同州保健局長同席。

12/6 (金) 1) ホニアラ～ポートモレスビー、PNG (PX 081)

○所轄大使館である日本国大使館へ中林、村越両団員が報告に赴く。無償案件及び技協の可能性案について説明。

2) 佐々団長、矢野団員はホニアラにて資料整理。

12/8 (日) 1) ポートモレスビー～ホニアラ (PX 080)

中林、村越両団員はホニアラに帰任。

- 2) 佐々団長、矢野団員は、WHO 専門家 ( Dr. W. Samarawickruna スリランカ人 ) と打合せ、及びガ島の西方の蚊の発生地帯視察。
- 12/9 (月) 1) ガ島東方の蚊の発生地帯を視察。  
2) 夜 経済計画大臣主催夕食会、外務大臣、保健大臣等出席。
- 12/10 (火) 1) Mbalesuna Clinic 視察  
市より西方 20 km に所在、合併企業 Solomon Islands Plantations Ltd. 所属の完備した医療施設。RN 3 名が配属され、地区の住民約 1,000 名を受け持っている。電気あり。  
2) Provincial Binu Ared Health Center  
RN 3 名、マラリア技師 1 名の陣容で、1 日約 50 名の外来を受付ける他、RN 育成研修も行っている。このセンターの下には 5 カ所の診療支所、7 カ所の救護所 ( Aid Post ) がある。このセンターには、WHO による蚊の生態研究施設もある。電気、顕微鏡あり。  
3) Central Hospital にてマラリア蚊の研究活動視察。意見交換。  
4) 保健省の Water Project を視察 ( 次官案内 )
- 12/11 (水) 1) 大使館との最終打合せ。  
日本からの Parasitologist, Entomologist 陣による技術協力の可能性と有効性を確認。  
2) 医療保健省にて最終討議  
次官、局長、マラリア対策官、WHO 専門家大使館同席  
討議内容 ○日本側がマラリア関係の実情を調査し、そして、技協を含んで積極姿勢を示してくれたことはうれしい。日本の協力によりわれわれのマラリア対策の能力を高めたい。  
○ラボ運営に係り、日本の専門家派遣の諸条件について ( 住居、交通手段、特権、カウンターパート、執務室など ) 日本側のコメント。  
○WHO はこの国で 20 年以上のマラリア対策事業を進めてきたが、日本の協力を歓迎し、それを支援したい。WHO のコメント  
○無償供与の予定されているラボには訓練生用となるドミトリーを加えてもらいたい。( ソロモン側発言 )  
3) 経済計画省に大臣を訪問  
大臣は日本の今後の協力を大いに歓迎し、技協実施に際してのソ側の協力を約した。  
4) 夜、日本側チーム主催夕食会、外務、経済計画、保健各大臣等出席。



12/12 (木) 1) ホンアラ～ブリスベン ( F J 501 )

2) ブリスベン総領事館

渡辺医務官に調査内容及び今後予想される協力の動きについて報告。

3) ブリスベン～シドニー ( T N 453 )

シドニー総領事官及び J I C A 事務所の出迎えを受ける。

12/13 (金) 1) J I C A 事務所にて WHO ソロモン諸島マラリア対策官 ( 前記 ) と最終討議。

WHO 松島医務官、佐藤情報分析官同席。

討議内容 ○ 3月10日からはじまる一斉投薬 ( M D A ) に供与予定の車輛の半分を是非入手したい。

○ マラリア関係技師の育成が必要であることに双方合意。

○ 現在使用されている D D T は生態系への影響の問題があって、いつ製造中止となるかわからない。次の手段を考えておく必要がある。( Dr. Parkinson 発言 )

○ マライタ島への J O C V 女性隊員 ( M C H 等 ) 派遣については常時、身の安全を計ることに懸念がある。( Dr. Parkinson 発言 )

○ ラボ設置の無償資金チームの来島は3月、5月は都合悪いと思われる。( 5月には病院関係の台湾チーム来訪予定 )

2) シドニー～東京 ( O F 021 )

12/14 (土) 成田帰着。

( 以 上 )

( 1985年12月20日 )

## ソロモンのマラリア事情とその対策

佐々学・中村敏夫・矢野三郎

### 1 はじめに

このたび、ソロモン諸島のマラリア対策について、同国政府から日本政府への資材供与および技術協力の要請が1985年9月に呈出されたのに応じて、国際協力事業団から、佐々学、中林敏夫、矢野三郎、村越俊雄の4名より成る調査団が11月30日より12月14日にわたり派遣された。この調査団に協力するためWHO/WPROより松島立雄、佐藤良也両専門官がソロモンに派遣され、現地の政府関係者、およびWHO駐在員を加えて、マラリアに関する情報集収と現地調査をおこなった。以下はこの調査団の報告書の一部としてソロモンのマラリア事情の過去、現在、および将来への展望につき私見をとりあえずまとめたものである。

### 2 ソロモンのマラリア概況

マラリアは古くからソロモン諸島に流行していたものと思われる。スペイン人メンダナMendanaがこの島を1568年に発見したときにそれらしき熱病が隊員に発生したといわれ、かつこの地に残る民話などにもはげしい熱病のエピソードが伝えられているという。しかし、これが医学的にたしかめられたのは1942年に日本軍および連合軍兵士がガダルカナル島に上陸して以来のことで、両軍併せて数万人にのぼる上陸者の大多数がマラリアに罹り、とくに日本側に多数の死亡者が出たが、詳細な数字は明らかでない。アメリカ側では、上陸した兵士1,000人あたりのマラリア罹患率が1942年は722、1943年は630、1944年は86、1945年は20であった。米軍は上陸いらいDDTの空中撒布、発生源への油撒布Oiling、発生源除去のための土木工事、患者の治療、予防内服などをおこなったのがこのような減少をもたらしたものと推定される。しかし、このようなマラリア予防対策も1948年に米軍が撤収したために中断した。(Thevasagayamら、1984)

その後、1962年から1969年にかけて英領ソロモン諸島政府とWHOの協力によるマラリアの試験的駆除計画が施行された。これはDDT屋内面撒布を主体としたものであった。次で1970年からマラリア根絶計画Malaria Eradication Programmeが実施になり、全地域に対しDDT屋内面撒布がおこなわれた。その結果表1に示すように血液塗抹標本のマラリア原虫陽性率(SPR)は1969年の11.7%から次第に低下して1975年には3.5%にまで下がった。また、検出されたマラリア原虫のうち、熱帯熱P.f.の割合は1969年の37.5%から1973年の8.7%にまで低下した(表1 p 73 参照)。

そこで、今後はマラリア患者の発見と治療は容易に実施できると考えられ、1974年から76

年にかけては DDT 撒布の約 40% が中止され、かつ抗マラリア剤の集団投薬などの補助的方法も一部を除いて中止された。しかし、この頃よりマラリア患者は次第に増加の傾向がみられ、1983 年には S P R が 28.2%、陽性者数 84,343 名という高い数字に達した。陽性者のうち 56.7% が熱帯熱マラリアであった(表 1)、また、この間の各地方のマラリア患者実数は表 2 に示す通りである(ソロモン政府資料 1985 より引用)。

ソロモン政府厚生省が 1982 年 12 月にまとめた保健計画 National Health Plan においても、マラリアは最重要問題であって、今後も(a)残効性殺虫剤の屋内面撒布が重点対策であるが、そのほかに(b)抗マラリア剤の全員集団投薬 mass drug administration (MAD)(c)媒介蚊の発生源除去、殺虫剤、天敵利用などによる幼虫駆除(d)フォッグ法、ULV 法などによる成虫駆除、(e)寝室の防虫網設置、蚊帳の使用等による蚊の吸血予防、(f)マラリア患者、保虫者の徹底治療等を補助手段として実施することが提称されている。

### 3 ソロモンのマラリア原虫

マラリアという病気は、Plasmodium 属の原虫が病原で、ハマダラカ Anopheles 属の蚊が媒介する。人に寄生するマラリア原虫には 4 種があるが、そのうち重要なのは熱帯熱 Plasmodium falciparum (P. f.) と、三日熱 P. vivax (P. V) で、後者はかつて日本、ヨーロッパ、北アメリカなどにも分布していたが、熱帯地方にはこの両者が共存し、とくに前者は急性期に脳症状をおこして死亡する患者が多いので、悪性マラリアとして恐れられている。また、近年全世界の流行地で問題となっているクロロキン耐性熱帯熱原虫も、ガダルカナル島およびマライタ島で検出されている。

ソロモンでは表 1 に示されるように、熱帯熱原虫の比率が 1973 年の 8.7% から、患者の増加と共に次第に大きくなり、1982 年からは 50% をこえるに至っている。近年のソロモンにおける熱帯熱マラリアの増加は、DDT 撒布による三日熱のより効果的な減少と、クロロキン耐性熱帯熱の発現が主因と推定された。

ソロモンにおけるマラリアの診断、治療、予防対策は医療保健省 Ministry of Health and Medical Service を中心に全国医療機関のネットワークを通じて実施されている。各州では州立病院 Provincial Hospital が中心となり、各地に Health Center (Clinic)、Mission Hospital、末端組織として Aid Post を置いている。医師数の不足から、nurse あるいは technician がその任に当たっている。大部分の Health Center、Aid Post には顕微鏡が無い場合、輸送手段が乏しいため、マラリア検査結果が判明するまでに、4~5 日あるいはそれ以上を要することが、患者対策遂行上の大きな隘路となっている。

このような背景の元では、マラリア対策がはかどらぬのは当然で、窮余の策として昨年より前述の集団薬剤投与 (MAD) が実施されるようになった。この方法は地域全住民を対象として、

4日間に3種類の抗マラリア剤を投与するもので、確実に一時的な患者の減少を期待することができる。しかし、抜本的な蚊対策、生活環境対策が伴わない限り、恒常的なマラリア対策とはなりえない。今後、MDA効果の評価を含め、診断法の技術的検討や耐性原虫の検出、ネットワークの確立等が要望される。

#### 4 ソロモンのマラリア媒介蚊

ソロモンには Belkin ら (1945) の調査、およびその後出版された Belkin (1962) の南太平洋の蚊のモノグラフによれば、合計して6種の Anopheles 亜属が分布しているが、そのうちの主要マラリア媒介蚊は、フネローティ・ハマダラカ Anopheles farauti という種類とみなされている。これは広義の Punctulatus 群に属するが、くちばしが先端を除いて全部黒いのが特徴である。この地域には夜間強周期抗のバンクロフト系状虫によるフィラリア病も流行しているが、これもマラリアと同じ種類の蚊が主要媒介者とみなされている。Webber (1977, 1979) は、マラリア駆除の目的でDDT撒布が実施されているうちにフィラリア病がソロモン諸島から激減したと報告している。

ソロモンの主要マラリア媒介蚊の An. farauti はその発生源が陸上のほとんどあらゆる水域にひろがっており、成虫の発生密度がきわめて大きく、人吸血性がいちじるしく、寿命も長いため、アフリカの An. gambiae とならんで世界中で最もマラリア伝搬能の高い蚊とみなされ、この地域の高度のマラリア流行は主としてこの種類が分布しているためと考えられている。

van Dijk (1983) はその典型的な発生源として、(a)人家の近くの小さい永続的な水たまり、(b)川口が砂でせきとめられることによりおこる川の停滞部、(c)平野部の村落周辺の湿地滞、(d)市街地の下水たまり、(e)水田、をあげているが、このほか海岸の塩水湿地や、塩分が海水より濃い岩穴などにも発生するという。このような生態は Anopheles 属の蚊のうちでも大へん特異的なものといえよう。

#### 5 ソロモンのマラリアに関する調査報告書

ソロモンのマラリア問題については巻末文献にあげたようにかなりの学術論文ないし調査報告がある。とくにWHO西太平洋地区本部はこの国のマラリア対策に強い関心を示して、1979年から相次いでいろいろな分野の専門家を派遣し、その評価と指導をおこない、かつ1985年12月現在でこれにA.D. Parleinson (医学)、W.A. Samaraweckrama (昆虫学)、L. Swillen (技術)の3名の専門職を常駐させている。その他に、今回の我々のJICAチームの日程に合わせて、マニラ本部より松島立雄(マラリア専門職)、佐藤良也(情報分析官)をソロモンに派遣されて、今回の日本側の計画とWHOとの協調をはかってくれることとなった。

ソロモンのマラリア情勢については、Ch'en (1982)、Van Dijk (1983)、

Thevasagayam ら ( 1984 ) が相次いでWHO顧問とし派遣された際の調査結果や将来への提言をまとめている。

これらの報告を通じて最も注目をひいているのは、1975年以後のマラリア増加の主因として An. farauti が屋内吸血型から屋外吸血性に変化してきたこと、吸血のピークも深夜型から早晩型に変わり、従って住民たちが屋外で感染する機会がふえて来たことを示すデータである。しかし、この媒介蚊がDDT抵抗性を獲得したという証拠はまだ得られていない。Van Dijk ( 1983 ) は各地域別にマラリア発生の現状を解析し、かつもしDDT撒布がおこなわれていないとしたら、もっとひどいマラリアの流行がおこなっているであろうことを疫学的に推定している。

DDT撒布が1976年以降マラリアの爆発的な流行を食い止められない状況に対して、これらWHO顧問ないし専門職の人々は二つの新しい対策の導入を考えた。その第1はDDTに代るフェニトロチオン(商品名スミチオン)の屋内壁撒布の試験と、第2は全住民に対するマラリア治療剤の集団投薬MDAの実施である。

マラリア媒介蚊の駆除のためにフェニトロチオンを屋内壁撒布する試みはWHO/TDRの研究費65,568ドルを資金にガダルカナル島北部、ホニアラ市から15Kmないし50Km隔たった海岸ぞいの平地帯で実施され、この地域では201の村に約6,000人が14,000の家に住んでおり、そこに新しく広大な水田が造成されていた。これに隣接する約15,500人がすむ地域にはDDT撒布がとどけられ、比較研究がおこなわれた。フェニトロチオン撒布にはその中毒防止のための作業員の訓練とコリンエステラーゼ計測によるその健康管理がおこなわれた。この殺虫剤は40%水和剤を使用し、原体としてDDTと同じく壁面1m<sup>2</sup>あたり2gとし、4カ月間隔(DDTは6カ月間隔)で撒布した。この作業は1980年から1982年にかけて5回撒布のくりかえしでおこなわれた。その結果、DDT撒布地域ではその前後に媒介蚊の吸血襲来数などにはほとんど変化がみられなかったが、フェニトロチオン撒布地域では60~70%の吸血蚊数の減少のほか、ゴキブリ等の害虫消失はもとより、住民のアタマシラミまで絶滅したという。しかし、マラリア患者発生数は両地区とも減少するどころか、撒布剤のはず2倍にふえたという。

この意外な結果に対してVan Dijk ( 1983 ) はフェニトロチオンの媒介蚊駆除効果がDDTよりすぐれていたことを認め、かつその実験地域が急速な水田造成のため媒介蚊の異常発生とからあったことが残念だと述べている。

Mahon ( 1984 ) はソロモンにおける主要マラリア媒介蚊 Anopheles farauti の姉妹種 sibling species (この著者の定義によれば、外形上は差がないが、生物学的に異った種を意味する)について報告した。もともと、形態的に An. farauti とされているものには異なった biological species があることはBryan ( 1973、1977 ) が認めており、Mahon ( 1983、

1984) はこれに少なくともNo 1、2、3、4の4姉妹種がふくまれていると述べている。これらは染色体の構造と、電気泳動像とで区別される。それらのうち、ソロモンでは、No 1とNo 4が見出された。前者はガダルカナル島に最も広く分布し、主として川の緑の水が淀んだ所や地表の水たまりに幼虫が発生し、成虫は屋外吸血性が強く、かつ夜の20時ころと3時ころに吸血のピークがみられる。後者は屋内吸血性が強く、吸血のピークは深夜にみられ、DDT散布前にひろく分布した型のものと思われる。

全住民に対するマラリア治療剤の集団投薬の試みは、第1回が1984年6月から8月にかけてガダルカナル北部で、第2回は1985年3月から7月にかけてガダルカナル北部およびマライタ北部で実施され、第3回は1986年3月から開始されるという。それは、対象地域の全住民に、マラリアの有無にかかわらず、たとえば成人量としてクロロキン1日1回4錠(1錠150mg)を3日間、そのあとプリマキン4錠(1錠45mg)を投与するというもので、このような濃厚マラリア流行地においては非常手段としてその効果が注目されるものである。これを効果的におこなえば、少なくとも一時的にはマラリア患者をへらし、かつ新感染を少なくすることはたしかであるが、その効果がどのくらい続くか、これを主なる対策としたときに何カ月おきにくりかえしたらよいか、使用する薬剤の種類、量、回数をどうしたらよいか、今後の重要な研究課題の一つであろう。

## 6 ソロモンのマラリアに対する今後の対策案

ソロモンのマラリアは、現在のところイギリス、オーストラリア等よりの医療協力、WHOなどの技術協力のもとに、同国政府がいれば必死になってその抑圧に努力しているにもかかわらず、hyperendemic “超蔓延状態”にあるといえよう。それは主としてこの地域のマラリア媒介蚊 Anopheles farauti などが、(1)ほとんどあらゆる水域に多数に発生し、成虫の生息密度が大へん高いこと、(2)この蚊の人嗜好性が強いこと、(3)寿命が長いこと、さらに(4)屋外吸血性のものが多くなり、かつ早晚、早朝吸血性に變化して殺虫剤の屋内壁残留意露の効果があうられていること、などにもとづくものと推定される。

このような状況は、ソロモンに限らず、ひろくニューギニア地区全般、および熱帯アフリカなどに共通するものと推定され、そのようなマラリアを効果的に抑圧する方法の開発は今後の重要な研究テーマの一つといえよう。

そして、ソロモンは人口こそわずかに約25万人という小国であるが、集落が多く、島々に分散して各集落ごとに異なった方式を用いて効果の比較がなしうること、その成果をひろく数億人のすむマラリア流行地についてより効果的な抑圧方策をすゝめる対策を立てうること、などの諸面を考慮して、重点的な施設・資材の供与と技術協力をすゝめるべきものとする。

今回ソロモン政府より日本政府あてに正式に呈出された資材供与の要請(1985年9月)は、

WHO 専門家のアドバイスを受けて具体的、かつ合理的に組み立てられた案とみなされるので、原則としてそれを受け入れるよう、日本政府としても配慮していただきたい。

ソロモンに対しては、そのほかに日本人専門家の現地派遣を伴う技術協力の計画をすゝめられるよう要請する。現状においては、施設、資材を供与しただけで同国のマラリアが抑圧できるとは考えられない。どんな物を、どんな方法に、どれだけ供与したら、有効な駆除ができるかを検討するフィールド研究をすゝめる必要がある。

マラリア抑圧対策として検討すべき具体的方策として、次のような問題が考えられる。

#### A. 媒介蚊対策

- A.1 媒介蚊の分類、生態、発生源の分布、成虫の吸血活動性などの解析、殺虫剤に対する感受性テストなど
- A.2 新しい殺虫剤、とくにフェントロチオンの有効で経済的な撒布法の開発、およびピレスロイド剤、昆虫ホルモン剤などの応用の研究
- A.3 天敵利用など、生物学的、遺伝学的な媒介蚊駆除法の実地研究、とくにガンブシア、グッピーなど、胎生メダカ類の導入の実地試験
- A.4 その他の有望な方法の検討

#### B. 保虫者対策

- B.1 抗マラリア剤の各種に対する効果判定、耐性原虫の分布調査、などにもとづいて有効な治療、予防法の確立
- B.2 免疫学的な診断法、予防法（ワクチンの試用）などをふくむ方策の検討。ただし、この分野にあてる資材、人員は当分の間、必要最小限にとどめるべきである。
- B.3 マラリア原虫検出のための人員、施設の充実、とくに全国ネットワークの確立
- B.4 マラリア治療剤の配布、供給のネットワークの確立
- B.5 マラリア患者、保虫者の記録と動向を推定する疫学体制の整備
- B.6 マラリア患者をふくむ、有熱患者、慢性貧血者などに関する臨床診断施設、設備、人員の充実、プライマリ・ヘルス・ケアのネットワークの整備

ソロモンのマラリアに関する文献

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HEALTH SECTOR SUBMISSION  
FOR  
NATIONAL DEVELOPMENT PLAN - 1985 - 1989

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## ABBREVIATIONS

MHMS	-	Ministry of Health and Medical Services
MHA & PC	-	Ministry of Home Affairs and Provincial Government
EPI	-	Expanded Programme of Immunization
ORT	-	Oral Rehydration Therapy
WHO	-	World Health Organization
UNDP	-	United Nations Development Programme
MOF	-	Ministry of Finance
MDA	-	Mass Drug Administration
NZLTB	-	New Zealand Leprosy Trust Board
ATC	-	Administrative Training Centre
ADAB	-	Australian Development Assistance Bureau
OSAS	-	Overseas Staffing Assistance Scheme
HFA	-	Health for All by Year 2000
PHC	-	Primary Health Care
MCH	-	Maternal and Child Health
RWSS	-	Rural Water Supply and Sanitation Programme

## BACKGROUND AND DEVELOPMENT OF THE HEALTH SERVICES

### Demographic Factors

The population growth rate of Solomon Islands is presently estimated at 3.4% p.a., one of the highest growth rates in the world. Decreasing infant mortality and maternal mortality with increasing fertility presents serious problems for maintenance of adequate health services within a limited budget. Table 1 shows a comparison of demographic indicators over a 13 year period:

Table 1 Demographic Indicators

Indicator	1970	1976	1983
Population	160,998	196,823	249,000
Crude birth rate	42	44.6	46
Crude death rate	14	11.7	11
Population growth rate	2.8	3.3	3.4
Infant mortality rate	75	60	46
Total fertility rate	7.0	7.3	7.6
Life expectancy - male	50	54	54
- female	46	54	54
Population below age 15 (%)	44.6	48	50
Population age 15-60 (%)	50	47.2	
Population over age 60 (%)	5.4	4.8	

Source: 1970 and 1976 derived from census data, 1983 MHMS estimates

The 1986 National census will give the current general picture but counts have been taken in specific areas. Guadalcanal Plains shows an average annual population increase of 7% between February 1976 and April 1983 and the Honiara Town Council area 6%. Central Province 4.4% and Guadalcanal Province 4.7%. (projections) These Provinces form the main primary and secondary catchment for Central Hospital and the available statistics (Table 2) are considered important for the development of Central including the high number of women of child bearing age.



Table 2 Inter-Censal Studies

Population	Feb. 1976 Census	Nov. 1981 Census	Apr. 1983 Projection	Average annual growth rate
<u>HONIARA TOWN COUNCIL</u>				
Male	8043 (53.4%)	12466 (58.5%)	13594 (as'81)	
Female	6963 (46.6%)	8850 (41.5%)	9644 (as'81)	
Total	15006	21316	23238	6%
CBA*	2743 (39.4%)°	3917 (44.25%)°	4262	
<u>CUADALCANAL PROVINCE</u>				
Male	16759 (53.4%)		23307 (53.4%)	
Female	14642 (46.6%)		20340 (46.6%)	
Total	31401		43647	4.7%
CBA*	5564 (38%)°		7691 (38%)°	
<u>CENTRAL ISLANDS PROVINCE</u>				
Male	7255 (53.6%)		9534 (53.6%)	
Female	6288 (46.4%)		8254 (46.4%)	
Total	13543		17788	4.4%
CBA*	2477 (39.4%)°		3246 (39.4%)°	
<u>NATIONAL POPULATION</u>				
Male	102741 (52.2%)		130198(52.2%)	
Female	94082 (47.8%)		119224(47.8%)	
Total	196823		249422	3.4%
CBA*	37351 (39.8%)°		47451(39.8%)°	

\*Child Bearing Age group (15-44) accepted limits for statistical purposes.

°Percentages are of females only

Source: Statistical Bulletin 18/82, MOF, Honiara

Table 2 shows relevant socio-economic indicators with various implications for the health sector:

- 1) Population is increasing with the resulting increase in demand for health care
- 2) A high percentage of the population are under 15. This implies an increasing need for mother and child health services and an increasing need for a well regulated school health service
- 3) The numbers of young going through the education system to form

5 and 6 is not encouraging for supplies of nurses, doctors and higher level health workers. Out of the small numbers very few choose the health field and there is an need for better promotion of careers in health.

- 4) The increasing GDP and slowly increasing numbers of the work force indicate the possibilities of introducing small fees for medical services.

Table 2.1 Socio-Economic Indicators\*

Year	1977	1978	1979	1980	1981	1982
Total population	206400	213400	220600	228100	235900	244000
Honiara	16100	16900	17800	19100		22000
GDP per head SI\$**	336	397	511	522	600	643
Working age population	94000	97200	100500	103800	107400	111000
Formal employment	17400	18500	20000	21200	21900	21600
Employment (Govt & Prov)	6300	6700	7100	7400	7800	7600
<u>Education</u>						
School-age (5-19 years)	80100	83500	86700	90300	94100	98000
Children in school-Prim.	26400	26700	27000	28900	30200	31328
Sec.	2635	2984	3154	3547	4258	4537

Future manpower Source\*\*\*

Gross progression rates through Primary and Secondary education. It is estimated:

of (100%)	8777	School enrolments in 1984
(75%)	6582	will reach standard 6 Primary School only
(8.25%)	725	will advance to form 3 (source of nurse aide entrants)
(7.35%)	645	will reach form 4
(6.6%)	579	will reach form 5 (Source of Registered Nurse entrants)
(1.9%)	173	will reach form 6 (Source of Undergraduates)

Sources: \* from 1983 Budget for S.I.  
 \*\* Indexed to 1982 prices  
 \*\*\* Ministry of Finance - Government Statistician

### History of National Health Services

The general policy of National Health Services, principally due to financial shortcomings, has been based on preventive/community care in trying to provide health care to the majority of the national population who live in rural areas.

The last two decades saw the establishment of a network of health centres clinics, aid posts and village health worker posts in the periphery, from where health services are executed. These now form the referral system in the National Health Services - Table 3.

Table 3 The Referral System of National Health Services 1983/84

Administrative Authority	Health Institution	Principal Health Worker
Central Government	National Hospital (1) (255 beds)	Specialist (5) Doctor (5)
	Mental Hospital (1) (16 beds)	Nurses (100)
Provincial Government	Provincial Hospitals (7) (Government 334 beds, Mission 133 beds)	Doctors/Nurses (18) (115)
Area Councils	Health Centres (3)	Nursing Officers (3)
Area Councils/Ward Committees	Clinics (133)	Registered Nurses (190)
Area Councils/Ward Committees	Aid Posts (69)	Nurse Aids (81)
Village Committees	Village Health Worker Post (86)	Village Health Worker (86)
Families	Homes	Family Members/ individuals

The present emphasis on PHC opens another door to National Health Services development; to function in cooperation and in coordination with all other organizations contributing either directly or indirectly to health care and promotion. The organisations could be either governmental (central

or provincial) or non-governmental. This is an attempt to provide appropriate and affordable care that is acceptable to everyone.

PHC has been envisaged as the appropriate approach in the social revolution of health care to attain 'Health for All in Year 2000', a target set by WHO and the member States including Solomon Islands.

### Health Legislation

Much of the Health Legislation in use today was passed in the era of colonial administration and is out of date for the situation of today. Amendments are urgently needed in order to make legislation more suitable to the practice of health care in Solomon Islands. It is hoped that some will be amended within this plan period.

The most recent legislation is: Health Services Act 1979 which needs amendments to cater for devolution processes to the Provinces; the Environmental Health Act 1980, which should be repealed as the Public Health Act 1970, now seen to be more suitable. The Health Services (Hospitals) Regulations 1980 of Health Services Act 1979 needs to be amended to cater for the high and rising cost of hospital care.

Other legislation affecting the health care services are badly in need of amendment. These include the Pharmacy and Poisons Act, 1969, the Medical and Dental Practitioners Act, 1969, the Nurses and Midwives Act, 1969. Whilst work on amendment of many of these Acts is ongoing there is a lack of available manpower to speed up the process.

The Provincial Government Act, 1982 puts a lot of stress on the Provinces for the running of the National Health Services.

### HEALTH STATUS

An accurate pattern of morbidity and mortality is made difficult due to inadequacies of the health information surveillance system.

#### 1) Mortality

The current estimated crude death rate is 11 per 1,000, therefore annual deaths for the whole of S.I. should be around 2,750 p.a. Reporting of deaths is very low with the average annual notified deaths for both hospitals

and provinces averaging only just over 300. There is no efficiently organized registration of deaths. Table 5 below refers only to deaths registered by health workers.

Table 5 Notified Deaths by Provinces, 1981 - 1983

<u>Province</u>	1981		1982		1983		Total
	Hos- pital	Our- patient	Hos- pital	Out- patient	Hos- pital	Out- patient	
Western	1	35	15	27	9	22	109
Ysabel	0	32	0	28	0	31	91
Guadalcanal	0	7	0	7	0	3	17
Malaita	6	107	0	132	0	118	363
Makira	1	23	1	5	0	11	41
Temotu	6	14	0	18	0	0	38
HTC	0	0	0	0	0	1	1
Central	0	32	0	23	0	35	90
Central Hospital	67	0	78	0	42	0	187
TOTAL	81	250	94	240	51	221	937

Source: S.I.E.R.

some estimates of infant mortality and morbidity can be made. In 1984 out of 8221 births so far recorded in all Province, 39 were still births or 0.5 %. Table 6 shows relative frequency of causes of mortality for 1980-1983 and Table 6.1 the commonest causes of hospital deaths.

Table 6 - RELATIVE FREQUENCY OF CAUSES OF DEATH - SOLOMON ISLANDS, 1980 - 1983

	1980		1981		1982		1983	
	No.	%	No.	%	No.	%	No.	%
- INFECTIOUS/PARASITIC D.	54	17.8	57	18.7	56	21.4	46	19.7
- NEOPLASMS	3	1.0	10	3.3	5	1.9	-	0
- ENDOCRINE, NUTRITIONAL METABOLIC D. and IMMUN. D1	2	0.7	4	1.3	5	1.9	2	0.9
- D. OF BLOOD/B. FORM. ORG.	-	0	1	0.3	-	0	1	0.4
- MENTAL DISORDERS	-	0	-	0	-	0	-	0
- D. OF NERVOUS SYS. ORGANS SENSE	7	2.3	9	3.0	10	3.8	5	2.3
- D. OF CIRCULATORY SYST.	42	13.8	24	7.9	37	14.1	22	9.4
- D. OF RESPIRATORY SYST.	41	13.5	37	12.1	21	8.0	13	5.6
- D. OF DIGESTIVE SYST.	7	2.3	16	5.2	12	4.6	7	3.0
- D. OF GENITOURINARY SYST.	8	2.6	2	0.7	8	3.1	5	2.4
- COMP. OF PREGNANCY, ETC	8	2.6	8	2.6	6	2.3	6	2.6
- D. OF SKIN/SUBCUT. TISS.	1	0.3	-	-	-	0	-	0
- D. OF MUSCULOSKEL. ETC	-	0	2	0.7	1	0.4	-	0
- CONGENITAL ANOMALIES	-	0	4	1.3	1	0.4	2	0.8
- CERTAIN CONDITIONS ORIGI- NATING IN THE PERINATAL PERIOD	13	4.3	25	8.2	6	8.8	8	3.4
- SYMPTOMS, SIGNS AND ILL DEFINED CONDITIONS	96	31/6	87	28.5	NA	NA	96	41.7
- INJURY and POISONING	22	6.9	19	6.2	17	6.5	20	8.6
TOTAL	304	100.0	305	100.0	262	100.0	233	100.0

Table 6.1 Commonest Causes of Hospital Deaths 1981-1982

<u>Deaths</u>	<u>1981</u>	<u>1982*</u>
Respiratory Disease	8	12
Meningitis	1	4
Birth injuries	18	2
Congenital anomalies	2	2
Diarrhoeal disease	4	4
Anaemia	2	2
Accidents	5	2
Malaria	1	5
Measles	0	5
TOTAL	41	38

Source: Hospital Returns.

The crude death rate has fallen in recent years, the most important health factor likely to be linked to this is wider coverage of the PHC network including health education and environmental health.

## 2) Morbidity

Whilst health information/statistics in S.I. is generally unsatisfactory, the main health problems are clear. Much of the prevailing disease can be effectively tackled through preventive and simple curative intervention at village level. To this effect SI is attempting to reduce emphasis on urban hospital-based curative care and develop community medicine through an integrated PHC service with a back-up referral system, providing increased access to health workers in rural areas. The success of this approach which was fully adopted in 1983 is critically dependent on the development of community participation and redirection of present rural health services toward greater involvement in promotive health.

## 3) Malaria

The major public health problem at the present time is malaria. Table 7 shows the actual cases of malaria in SI 1970-1984. Success of the malaria eradication program in the 1970's led to cessation of intradomicilliary spraying. This possibly coincided with the beginning of a long term epidemic cycle and the withdrawal of other supportive anti-malarial measures. Malaria started to increase again the late 1970's reaching epidemic proportions,

peaking in 1983. During the epidemic there was however no apparent significant increase in mortality rates. Spraying was reintroduced in 1981 and a more integrated approach to malaria control taken through PHC and gradual decentralization of activities. Reduction is being attempted through concentration on continued adult vector control and source reduction through community participation in minor engineering works, hygiene sanitation, health education and larviciding. In addition a wider provision of diagnostic and treatment service has been undertaken to meet the needs of the rural population. Apart from relieving suffering and alleviating pressure on health services, control of this single major health problem results in socio-economic benefits of saving in number of days lost from both cash and subsistence work.

Table 7 Actual Cases of Malaria in Solomon Islands 1970-1983

PROVINCE	CENTRAL	WESTERN	MALAITA	EASTERN	COUNTRY
<u>YEAR</u>					
1970 (Est. Colbourne)	59040	19830	27300	11800	118990
1970	4523	520	1451	-	6494
1971	1923	422	1070	1928	4343
1972	1887	413	1047	1477	4824
1973	4635	297	1123	1652	7707
1974	2533	101	503	544	3681
1975	2195	101	1088	170	3554
1976	2848	327	568	55	3798
1977	7729	87	2650	124	10590
1978	13835	993	5210	199	20237
1979	14949	3512	6495	1401	26357
1980	20967	3518	8548	1995	35028
1981	37526	6590	14158	2595	61169
1982	36347	7150	21838	4499	69829
1983	53086	4899	22515	3843	84343
1984	39945	7221	19698	3120	69984

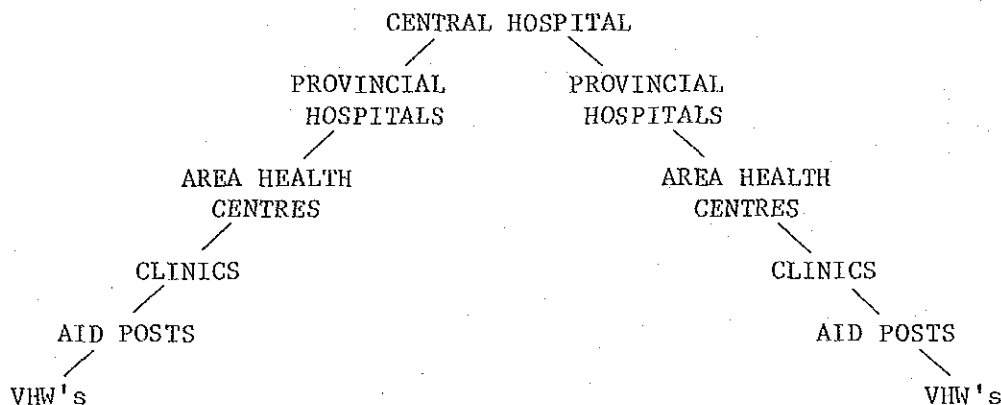


Table 8 SUMMARY OF BASIC HEALTH FACILITIES IN PROVINCES 1983

	Western	Ysabel	Central	Guadalcanal	Honiara	Melaita	Mekira	Temotu	Total
<b>A FACILITIES</b>									
1. Hospitals	2	1	-	-	1	2	1	1	8
- beds	96	36	-	-	256	219	72	34	713
2 Clinics	27	14	11	20	10	23	14	5	124
- beds	122	53	96	64	18	211	95	26	685
3 Aid Posts	12	1	1	1	8	11	-	-	34
4 VHW Posts	19	6	10	15	-	5	2	21	78
<b>B MEDICAL STAFF</b>									
1 Doctors	4	2	1	1	20	7	2	1	38
2 Nurses	70	31	20	37	125	88	28	21	420
3 Nurse Aides (Trained)	49	4	6	10	38	58	8	6	179
4 Nurse Aides (untrained)	13	-	2	8	4	16	-	-	43
5 VHW's (working)	19	6	10	15	-	5	2	21	78
<b>C OTHER HEALTH WORKERS</b>									
1 Environmental	8	7	13	15	76	25	10	10	164
2 Anti-malaria programme	38	15	39	25	29	21	21	6	194

STRUCTURE OF THE HEALTH CARE SERVICES

The health care delivery system comprises different health facilities (Table 8) forming a pyramid of health care through which patients can be referred:



1) Central Hospitals

Central Hospital is the Notional referral hospital for Solomon Islands and provides the most comprehensive medical care services. Central Hospital has specialist facilities in internal medical, surgery, anaesthetics, paediatrics, obstetrics and gynaecology, dentistry, physiotherapy, pharmacy, X-ray and laboratory (including malaria) and has units for TB and leprosy and leprosy and a polio workshop run by the Cripple Society. As well as taking referral cases (approx. 8 % per annum) Central Hospital acts as a local hospital for Guadalcanal and Central Provinces and Honiara Town Council (HTC). The hospital ran an overcrowded outpatient clinic (Table 9) until mid 1984 when it was closed on week days to all except emergencies. Outpatients during working hours now attend HTC Clinics (Table 10)

Table 9 Central Hospital Outpatient Attendances 1980-1984

Year	1980	1981	1982	1983	1984	
					Jan.-May	June-Oct.
Total attendances	74184*	91019	108225	105512	40720	8278
Monthly Average	6182	7585	9019	8793	8144	1653

Average annual growth 1980-1983, 4.0 %

\* Incomplete returns, figures estimated

Source: Central Hospital Statistical Returns

Table 10 Honiara Town Council Urban Clinics - Attendancies

Outpatients	<u>1982</u>	<u>1983</u>	<u>1984</u>
Total Attendancies	26,665	36,833	After may - average 11,000 per month

Central Hospital has a total of 255 beds, Table 16 shows existing areas which are grossly overcrowded. A generally accepted minimum standard for bed space is 15 m<sup>2</sup>/bed

### 2) Provincial Hospitals

Each province has a Provincial referral hospital controlled by Provinces and Malaita and Western each have a second church controlled hospital. Hospitals are in the charge of medical officers who also undertake touring duties to outlying health centres and clinics.

Table 11 shows the distribution of hospital beds by Province for 1984.

### 3) Area Health Centres

Area health centres are the first step down from hospitals, however, at present there are only 3 fully functioning AHCs and one about to be built. AHCs are situated in Malaita, Guadalcanal and Western Province and supervise VHWS and aid posts and clinics in their area. They are generally staffed by an ANO and RN and have slightly larger inpatient facilities than the clinics, see Table 12. Anti malaria workers are also situated at the 3 AHC's.

Table 11 BED/POPULATION RATIO BY HOSPITAL AND PROVINCE 1984

Province Served	Population (Estimate)	Hospital	No. Beds	Bed/Population Ratio.
Guadalcanal (1)	39,835			
Central,	18,462	Central	255	1 : 321
Honiara	23,500			
Western	55,490	Gizo	46	1 : 603
		Helena Goldie	46	
Isabel	13,988	Buala	40	1 : 350
Malaita (2)	74,036	Kilu'ufi (2)	111 (+15 mental hosp.)	1 : 364
		Atoifi	92	
Makira/Ulawa	18,954	Kira Kira	100	1 : 189
Temotu	13,928	Lata	46	1 : 302
	258,193	Solomon Islands	751	1 : 344

Notes: (1) Although Central Hospital is the referral hospital for all provinces only about 10 percent of admissions come from outside the area directly served by Central Hospital.

(2) National mental hospital with 15 beds attached to Kilu'ufi hospital has not been included.

Source: MHMS, Health Statistics 1984.

Table 12 Area Health Centres

<u>LOCATION</u>	<u>MEDICAL* STAFF</u>	<u>BEDS</u>	<u>AVERAGE MONTHLY</u>	
			<u>INPATIENTS</u>	<u>OUTPATIENTS</u>
Guadalcanal Province	1 ANO 3 RH 2 NA Doctor visits weekly.	12		
Malaita Province (Malu'u AHC)	1 ANO 3 RN 3 NA Doctor visits weekly.	20	72	425
Western Province (Choiseul Bay AHC)	1 ANO 3 RH 1 NA Doctor visits every 6 weeks.	6	15	600

\* Not including Anti Malaria workers.

#### 4) Clinics

These are controlled by the Provinces, Churches and Commercial companies and usually staffed by, 2 RHs or a nurse and nurse aides. Most clinics have small inpatient facilities. They serve mainly for diagnosis and treatment of common diseases ante and post natal service, MCH, follow up of infections diseases, school health, health education, family planning and sometimes antimalarial and environmental health services.

The more difficult problems are referred up to Provincial hospitals. Most clinics serve a population of 1500+. Church and industrial clinics have a similar service to Government clinics mainly to serve a specific group

of people, but are extended to serve the near by communities.

Satellite clinics are carried out at any determined accessible location, by the staff of a clinic or AHC on a particular day at regular intervals.

In 1983 there were 124 clinics, (see Table 13 for members over the past 13 years) with 685 beds in all. Of these clinics, 8 are urban clinics controlled by HTC which have no inpatient specialities but see an average of 11,000 outpatients per month. There are four other private clinics in the urban area. Table 14 shows clinics and staff by Province for 1983.

Table 13 Clinics by ownership, 1970-1983

	CLINICS (1)			Total
	Provincial	Industrial(2)	Church	
1970	78	10	39	128
71	78	10	32	120
72	78	10	32	120
73	89	10	32	131
74	89	10	32	131
75	89	10	32	131
76	95	11	29	135
77	89	10	29	138
78	93	14	26	135
79	96	16	23	135
80	96	16	23	135
81	-	-	-	-
82	89	17	16	122
83	90	19	15	124

(1) 1983 figures include one dental and one family planning clinic.

(2) Including private clinics.

Source: 1983 Statistical Year Book.

#### 5) Aid Posts

This represents a more widespread level of health service. Operated by Provinces, aid posts are staffed by one or two nurse aides who have

Table 14 CLINICS BEDS AND STAFF BY PROVINCE 1983

	Western	Ysabel	Central	Central	Guadalcanal*	Honiara	Malaita	Makira	Temotu	Total
A CLINICS	27	14	11	20	10	23	14	5		124
- Beds	122	53	96	64	18	211	26	-		667
B STAFF										
Nurses - male	21	6	9	13	1	23	5	5		83
female	16	14	10	20	15	24	7	1		107
total	37	20	19	33	16	47	12	6		190
Nurse Aides - male	10	-	-	2	1	1	1	-		15
(trained) female	17	1	6	7	4	11	5	2		53
total	27	1	6	9	5	12	6	2		68
NURSE Aides - male	-	-	-	-	-	-	-	-		-
(Untrained) female	-	-	2	7	1	9	-	-		19
total	-	-	2	7	1	9	-	-		19

\* Excluding mobile clinic unit at Head Office manned by four nurses (three males, one female) and one male nurse aid (untrained).

Table 15

	WESTERN	ISABEL	CENTRAL ISLANDS	CUAZAL-CANAL	MALAITA	MAKIRA	TEMOTU	TOTAL PROVINCE	HONLARA	TOTAL
Province/Government Aid Posts										
Aid Posts	5	-	-	-	7	-	1	13	-	13
Staff	5	-	-	-	7	-	1	13	-	13
Industrial Aid Posts										
Aid Posts	2	-	1	-	-	-	-	3	2(a)	5
Staff	2	-	1	-	-	-	-	3	2	5
Mission Aid Posts										
Aid Posts	3	-	-	-	5	-	-	8	-	8
Staff	3	-	-	-	5	-	-	8	-	8
Other (Private) Aid Posts										
Aid Posts	1	-	-	-	-	-	-	1	4(b)	5
Staff	1	-	-	-	-	-	-	1	5	6
Total Aid Posts	11	-	1	-	12	-	1	25	6	31
Staff	11	-	1	-	12	-	1	25	7	32

Notes: (a) Forts Authority and PWD  
(b) At Educational Establishments

Table 16 VILLAGE HEALTH WORKERS - 1982

	WESTERN	ISABEL	CENTRAL ISLANDS	GUADAL-CANAL	MALAITA	MAKIRA	TEMOTU	TOTAL PROVINCES
1. VHMs in Post								
- Working								
Male	15	4	11	7	18	2	9	66
Female	6	4	1	2	3	-	4	20
Total	21	8	12	9(a)	21(a)	2	13	86
- Not Working								
Male	5	-	1	-	9	-	-	15
Female	-	-	1	-	4	1	-	6
Total	5	-	2	-	13(b)	1	-	21
- On Initial Training								
Male	-	-	-	7	-	-	7	14
Female	-	-	-	2	-	-	4	6
Total	-	-	-	9(c)	-	-	11	20

(a) Excluding two VHMs in Guadalcanal and one in Malaita now working as nurse aids in rural clinics

(b) Including 4 VHMs whose status was not clearly defined

(c) Completed initial training and are awaiting to be posted



Table 17 COMPARISON OF HOSPITAL STATISTICS FOR  
RIGHT MAJOR HOSPITALS IN SOLOMON ISLANDS

IN 1981

NAME OF HOSPITALS

	Central	Kilu'ufi	Atoifi	Cizo	Helena Goldie	Kira <sup>2</sup>	Santa Cruz	Euala	All Hospital
1. Estimated population covered	74750	67100	47450	17050	12758	11950	231050		
2. Admissions during year	5180	3275	1867	1663	1409	911	611	658	15574
3. Discharge during year	4949	3150	1693	1497	1368	768	614	654	14693
4. In-patient day	58382	28306	9263	13268	6826	9666	11378	7574	144693
5. Average Bed occupancy	160.0	77.5	25.4	36.4	18.7	26.5	31.2	20.8	46.3
6. Bed capacity 30th June	222	122	93	45	46	72	32	30	662
7. Occupancy Rate (%)	72.0	63.5	27.3	80.9	40.7	36.8	98.5	69.3	61
8. Deliveries	1787	512	221	432	280	245	215	133	3805
9. Out-patient Attendances									
(a) First Visits	71525	11052	10100	15786	1813	3815	9639	7523	130453
(b) Revisits	19494	NA	13667	7550	5834	1417	10218	6843	6523

generally undergone a one year nurse aide training program before returning to their community to work as full-time health workers. Simple curative and preventive health services are given at aid posts, which usually consist just of a leaf or semi-permanent building. There were 31 ARs in 1982, 13 government and 5 industrial, 8 mission and 5 privately controlled aid posts.

#### 6) Village Health Workers (VHW)

This is the first level of the health services and at present about 86 VHW's operate in the villages, whilst approx 154 have been trained.

VHW's are controlled by area councils or communities and given a monthly contribution. Special VHW training and refresher courses are held annually. Village health workers are generally village people who have volunteered or are chosen by the community for training for the post. They perform simple curative tasks and provide some preventive health care, all other problems are referred up to a higher level of the referral system. The VHW's receive a basic medicine box which is replenished by the health services. Table 16 shows VHW's in post in 1982. The numbers since have dropped slightly due often to the communities not maintaining their monthly contribution to the VHW so that the VHW left to seek a better paid job.

#### 7) Utilization of Health Facilities

Data collected suggests that in general health facilities are well utilized.

The bed occupancy rate at Central Hospital despite the addition of two new wards in 1984 is around 100 %. For Provinces it is lower, Table 17 shows comparative annual statistics for all 8 hospitals in Solomon Islands in 1981.

### ORGANIZATION

#### 1) Government

The MHMS is the overall authority of the National Health Service with the PS a lay administrator and the 2 undersecretaries the top level health advisors to the PS on all health matters and responsible for health policy making, planning and coordination. The undersecretary responsibilities

are divided into health improvement activities and health care activities.

Supporting the National Health Service under the Health Improvement Division are: Environmental Health; Health Education; Malaria Control; PHC and Social Welfare Development, while under health care are nursing, pharmacy, dental, radiology, laboratory, hospitals and health clinic services. In function there are common overlaps in these two divisions.

Much of the implementation of the health services is organised by the Provinces.

Functions which are controlled centrally are as follows:

- Manpower, training and promotions
- recruitment of established staff, postings, disciplinary actions and termination of appointments
- Overall planning of health services, technical and professional and supervisory visits, national statistics and policy
- pure food and quarantine inspection
- drugs and special medical equipment and stationary purchase

Functions of the Provinces are:

- Daily management of the health care services, facilities and equipment
- assistance to communities on construction and maintenance of water supplies and sanitation including feasible ways of waste disposal
- Promotion and implementation of public health programmes and necessary remedial measures in any disease outbreak
- To recruit and finance from the annual services grant such necessary manpower that cannot be provided centrally.

## 2) Non-Government Input

The non-government organizations such as churches, industries and private practitioners contribute to health services. It is impossible to identify the cost and activities of all NGO inputs at present, however a survey is presently being conducted by MHMS. Coordination of different contributions to health services is difficult and is under review.

The churches run 2 hospitals, 16 clinics and 8 aid posts. The SDA mission hospital at Atoifi also has a small nurse training school and SDA contribute in the running of many clinics throughout Solomon Islands. The Roman Catholic Mission also runs a natural family planning clinic in

Honiara as well as several clinics but has withdrawn some of its services as has the Church of Melanesia due to staffing and financial problems. The United Church continue to manage Helena Goldie Hospital and other clinics and the SSEC Mission also runs a clinic.

Industry run 19 clinics and 5 aid posts to provide health and medical services to their employees and dependents. All clinics have a percentage of non-employees attending for care e.g. SIPL provided services at their 3 clinics to 3289 people in January 1985 of which 938 (28.5%) were non-company,

The Private sector in Honiara also includes 3 private clinics, a private dental practitioner and pharmacist and a family planning clinic -SIPPA, and 4 aid posts in educational establishments.

Solomon Islands Development Trust (SIDT) - a NGO in Solomon Islands works mainly at village level but much of their village outreach program is related to preventive health activities. Other NGO's working in Solomon Islands especially IHAP and FSP also contribute both directly in small amounts and indirectly through village level projects toward health promotional care.

Voluntary organizations contributing to health in Solomon Islands are:

- Red Cross - active in welfare of disabled and handicapped
- Solomon Islands Cripple Society - rehabilitation mainly associated with polio victims.
- New Zealand Leprosy Trust Board - financial assistance to control of leprosy and communicable diseases.
- St. Johns Ambulance Brigade - active in first aid and training
- Lions Club - contribute financial assistance especially in development in Central Hospital

Traditional practitioners continue to provide services especially in rural areas. Coverage of traditional healers and custom midwives is difficult to assess. Custom medicine falls into 2 broad areas:

- common simple herbal treatment known to many
- more powerful traditional remedies known only to few

Some remedies of the first group might be assimilated into health services especially at VHW level with appropriate research and education.

### 3) Primary Health Care Services

Solomon Islands has accepted the WHO goal of HFA 2000 and over the last

4 year period has been reorganizing and restructuring the health system toward this aim.

PHC is considered to be an integral part of the country's health system as well as a force for overall social and economic development of the community. Special emphasis is given to preventive medicine, health education, environmental health and malaria control and includes curative and rehabilitative services. The strategy aims for complete coverage of the population by the community and individuals in improving their own and family's health. This participation is being encouraged through health education and village meetings.

The first National PHC seminar was held in 1977, participated intrasectorally by government officials, church leaders, politicians, and other 60 representatives. Nothing of the present trend was organized except the training of village Health Aids (now known as Village Health Workers) till 1983. However the VHW system gave rise to the establishment of more local responsibilities for their health care services.

In 1983 the PHC programme was accelerated by the formation of a National PHC Committee and designation and training of PHC coordinators. PHC workshops were conducted, firstly at National level, followed by Provincial and now down to Area Council Level where local villages participate.

Courses, training and other seminars were conducted for key personnels particularly from provinces to supervise and coordinate all activities. The increased participation of and coordination and cooperation with NGO's is encouraging and in all, the activities are gaining favourable momentum at a well coordinated pace.

The major elements of the PHC programme in Solomon Islands are:

- health education concerning prevailing health problems and preventive measures and concerning good nutrition and hygiene.
- Appropriate measure to combat common diseases such as malaria, TB/leprosy etc. and treatment of simple injuries.
- expanded program of immunization.
- maternal and child health
- promotion of environmental health especially through safe water supplies and sanitation.
- promotion of community participation and decentralized decision making in health areas.
- cooperation and coordination with all levels of government, all

sectors and all NGO's involved in provision of health care.

#### 4) Health Information System

The present reporting system even though designed primarily to meet the needs of the health system, does not work efficiently to produce a comprehensive picture of health activities, resources and the health impact of certain interventions. Reporting from the rural areas is still poor mainly due to the lack of an effective feedback.

Attempts have recently been undertaken to design methods to improve the mortality statistics, vital statistics and other health information that is available. The feedback could be improved through training and retention of competent statistical clerks.

#### 5) Drug Procurement and Distribution

All procurement of medicines dressings, equipment surgical sundries etc. is undertaken by the Pharmacy Division. Stores are usually bought in bulk once or twice a year and stored in the Medical Store at the Government Supply Organization at Ranandi. Worldwide tendering is undertaken by the Principal Pharmacist for the main bulk supplied, using international standards of the British Pharmacopoea and the United States Pharmacopoea.

All distribution is controlled by the Principal Pharmacist. Orders are sent to all Provincial Hospitals every 2 months. Quarterly clinic boxes are prepared at Central Hospital for all clinics in Solomon Islands. They are sent out via Provincial Hospitals. Supplementary orders are supplied direct from Provincial Hospitals which have Pharmacy staff. Many other non-government organizations are also supplied. The Solomon Islands Approved Drug List contains medicines normally available but necessary drugs for particular patients are also procured. Various recommendations for the improvement of the drug supply support system suggested in a workshop will be published soon.

#### Manpower

The ability to carry out strategies depends on the availability of appropriately trained manpower.

The key categories of health manpower are:

- medical officers

- dental officers
- nurses and nurse aides
- village health workers
- environmental health workers (health inspectors)
- health education workers
- anti-malarial workers
- social welfare officers
- women's interest officers.

Support services are provided to health workers through the following key categories:

- pharmacy workers
- radiography workers
- laboratory technicians (including malaria microscopists)
- physiotherapy workers.

Table 18 show the increase in health staff since 1975.

Table 18 Health Staff in Post in 1975 and 1980 and 1985 (1)

	1975	1980	1985 (estimate)
	In post	In Post	
Medical Officers	23	31	37
Dental Staff	5	9	11
Nurses:	238	409(2)	335
Environmental Health Staff	14	21	30
Health Education Staff	-	3	12
Village Health Workers	-	62	78
Other	10	41	54
<b>Total</b>	<b>290</b>	<b>576</b>	<b>557</b>

Source: MHMS Statistics Division

- Notes: (1) Malaria staff are not included but numbered about 315 (including administrative staff) in 1980 and 373 in 1983
- (2) Includes some health and nurse aids.

There is a continuing dependence on expatriates to fill the senior and more specialised posts. Increases in general in health workers reflects the increasing emphasis on PHC.

In 1983 38 doctors were registered or one doctor per 6,000 of population. The distribution is however very inequitable with 19+ of the doctors in Central Hospital, Honiara. There is approximately one health worker to every 300 people however due to inequity of distribution the more realistic figure is 1:1800 in rural areas and 1:150 in the urban area. It is aimed to maintain the ratio of doctors to population at 1:6000 through to 1990 in line with the development of PHC services.

#### TRENDS AND PATTERNS OF HEALTH EXPENDITURE

Estimates of expenditure on health care covers only expenditure by MHMS and MHA & PG through their grants to Provinces and the RWSS programme. Whilst most Government expenditure is under these Ministries other ministries spend indirectly on health and many NGO's directly spend significant amounts on health related programs.

WHO is the major aid donor in the health sector in Solomon Islands and the estimate for the WHO regular budget expenditure 1984/85 and 1986/87 in Solomon Islands is shown at Table 19. In addition WHO spent approximately another \$650,000 through their inter-country budget over the last two years. WHO expenditure is generally direct and does not appear in MOF accounts.

The priority areas of finance within the WHO budget reflect the support for the PHC strategy and improvement of access of basic health services for all.

Total health care expenditure in 1982 amounted to about SI\$4,100,000 or just over 4% of GDP. In per capita terms health expenditure reached SI\$17 national average but varied from around \$0.50 to \$6.50 in the Provinces (see Table 20)

The structure of the MHMS budget is not very helpful for planning purposes, identification of money spent on different services is not easy. Almost the total of the recurrent budget goes to support of health care services and administration and on analysis of the capital budget expenditure



for 1983, 16.3 % went to medical care services, 7.1 % to PHC and 71.8 % to malaria control with 4.8 % not identified as shown in Table 21 (this excludes the majority of WHO contributions)

Table 19 WHO BUDGET

Programme	1984 - 1985	1986 - 1987
	US\$	US\$
Essential drugs and vaccines	10,000	
<u>Disease prevention and control</u>		
Malaria	173,000	179,700
Total - Solomon Islands	849,700	1,000,000

Table 20

SOLOMON ISLANDS	Regular Budget	
Programme	1984 - 1985	1986 - 1987
	US\$	US\$
<u>Health system development</u>		
Health situation and trend assessment		13,500
Managerial process for notional health development		
Costs of WHO programme coordina- tor's Office located in Suva, Fiji	104,700	
<u>Organization of health systems based on primary health care.</u>	213,000	426,500
<u>Health Manpower</u>	329,000	200,900
<u>Public information and education for health</u>	100,000	18,100
<u>General health protection and promotion</u>		
Nutrition	10,000	
Oral health		23,200
<u>Protection and promotion of the health of specific population groups</u>		

SOLOMON ISLANDS	Regular Budget	
	1984 - 1985	1986 - 1987
Programme	US\$	US\$
Maternal and child health, including family planning		
<u>Protection and promotion of mental health</u>		
Prevention and treatment of mental and neurological disorders		6,800
<u>Promotion of environmental health</u>		
Community water supply and sanitation		81,600
<u>Diasnostic, therapeutie, and rehabi- litative technology</u>		
Clinical, laboratory and radiolo- gical		49,700

#### 1) Recurrent Expenditure

Table 25 shows the recurrent expenditure problem for health services over the period 1980 - 1984. Provinces have their own health allocations, also shown in Table 22 for 1980 and 1982. A breakdown of recurrent expenditure is at Table 23.

The steadily declining Central Government recurrent allocation to the health sector in the first half of 1980's reflects the increased devolution of responsibility for health services to the Provinces, the recurrent expenditure in the Provinces rose considerably. The overall picture for the health sector recurrent funding is of financial constraint which has tied to the seeking of more cost effective methods of health care as reflected in the development of the PHC services. Solomon Islands cannot afford costly maintenance of a large number of modern hospitals as this represents the most expensive way of providing selective health facilities for the fewest number of people.

With the falling pattern of recurrent funding and the general overspending on Health Services leading to the need for supplementary appropriation,

consideration must be given to other methods of financially supporting the health system. The churches have in general tended to withdraw or hand over services due to financial and manpower constraints. Industry have begun to play an important role in health services and extended cooperation between private sources of health services and Government should be sought. There is a need to seriously review the continuance of a free health service, consideration must be given to the introducing of fees for certain services.

## 2) Capital Expenditure

Health services capital expenditure from 1978-1983 has not grown in real terms and the percentage of the central capital budget allowed to health has remained static at 7.54 % in 1978 and 7.55 % in 1983. A large percentage of the capital expenditure each year is consumed by the malaria control programme, much of the remaining capital expenditure is consumed by Provincial and Central Hospital equipment projects and improvements.

Between 1979 and 1983 the capacity of MIMS to expend the amounts approved under the capital budget for health has risen from 48.77 % to 69.8 %, however the actual amount expended has remained around SI\$ 1.2 million. This implies that due to constraints set out in the following section that the capacity to expend funds has not risen in real terms.

Table 21 DIVISION OF CAPITAL EXPENDITURE MHMS 1979-83\*

	1979 (%)	1980 (%)	1981 (%)	1982 (%)	1983 (%)
Medical services	127,561 10.5	206,397 14.8	177,264 14.2	223,945 16.9	227,578 16.3
Malaria control	868,185 71.6	955,479 68.6	973,462 78.0	969,829 73.3	1,003,756 71.8
WHC (including rural supplies and sanitation)	187,008 15.4	199,887 14.4	86,039 6.9	85,799 6.4	99,629 7.1
New Zealand Leprosy inrast Board.	25,978 2.1	26,987 1.9	8,590 0.7	42,665 3.2	67,392 4.8
Planning	2,882 0.23	-	1,243 0.09	-	-
<b>TOTAL</b>	<b>1,211,614</b>	<b>1,388,710</b>	<b>1,246,598</b>	<b>1,322,238</b>	<b>1,398,355</b>

\* WHO Contribution of DHC does not appear

SOURCE:- Annual accounts MF.

Table 22 Central and Provincial Government Recurrent and Capital Expenditure-Selected Years

	(\$'000)				AO %
	1980	1981	1982	1983	1984
					(estimate)
					80-84
<u>RECURRENT EXPENDITURE</u>					
Central Government	2612(9.55%)	3053(8.81%)	219( 5.7%)	2344(5.51%)	2651(5.21%)
Provincial Governments	145( 4.1%)		465( 9.1%)		
<u>CAPITAL Expenditure</u>					
Central Government	1218(6.85%)	1184(7.27%)	1203(7.13%)	1270(7.55%)	1920( 6.4%)
Provincial Government	24( 4.9%)		263(12.2%)		

Table 23 · RECURRENT EXPENDITURE, HEALTH SERVICES 1984  
(net including MHA & PG PROVINCIAL GRANTS)

I T E M	MHMS	C.H.	PROVINCE	TRAINING/ OTHER	TOTAL
Total Staff Pay	227,000	1,360,500		74,660	1,662,160
Office Expenses	6,000	9,000	-	-	15,000
Transport travel	10,000	43,000	3,000	-	56,000
Vehicle/Plant Hire	13,000	47,000	-	-	60,000
Telephones	10,000	20,000	-	-	30,000
Utilities	20,800	174,200	-	-	196,000
Administration and other health service costs	-	11,134	24,666	17,500	53,300
Medical supplies - Honiara	-	196,570	-	57,100	196,570
Medical Support Services (Central & Provinces)	-	153,500	38,200	-	196,700
Nurse Training				84,855	84,835
Others				28,000	28,000
Total	286,800	2,019,904	65,866	262,095	2,636,165

10.8%

9.9%

A number of these health workers are posted in provinces.

## CONSTRAINTS AND ISSUES

### 1) MANPOWER

Whilst this is a constraint in all sections it is felt to be particularly important in the health sector. At present out of 38 doctors only 14 are Nationals and the situation is not improving. This means over one third of OSAS manpower for S.I. are directed to health, mostly to specialised medical services which is extremely costly to SI and expatriate recruitment is becoming more difficult as OSAS cut down their allocation. Demand in overseas training in medical fields especially in medicine, pharmacy and dental fields is high. A high percentage suffer failures and change courses and of those who complete a percentage do not for various reasons return to SI. There are several approaches suggested to improve the situation:

- a) bonding of students
- b) better selection of students for courses
- c) better conditions of service for medical specialists who return.
- d) train more intermediate workers and lessen workes of hospital based specialists.

### 2) FINANCE

A steadily reducing percentage of recurrent expenditure is devoted to health services centrally. An increasing percentage of expenditure on Provincial programs reflects the decision of decentralization but does not alter an overall pattern of decreasing expenditure in real terms in health services. This situation means that maintaining existing services and financing new ones are to a large extent competing. It seems likely that a level of cost recovery for certain services provided by Government must be initiated in the near future. Although the Government is committed to provision of social services there is new a need to assess the raising of some revanue by the health services to contribute to their maintenance. There are three categories of health services to consider:

1. Preventive services
2. Routine outpatient adult curative services
3. Inportient services

Imposition of user charges for preventive servises would tend to worsen the efficiency of resource allocation. Outpatient services may however be

overburdened at present because of poor preventive health knowledge imposing unnecessary costs on health services. A small user fee might make this more efficient. The fee should not have to equal the marginal cost of providing the service but discourage the bulk of unjustified usage.

A study of utilization of outpatient and inpatient services and assessment of the desirability of introducing flat user charges and ways of identifying the poor so that they may be exempted charges should be undertaken. Patients of private doctors utilising public facilities should be charged at full cost for the use of facilities.

### 3) HEALTH INFRASTRUCTURE CONSTRAINTS

The population of Solomon Islands is widely scattered and divided into numerous small and isolated communities. Indications are that the numbers of small communities are increasing. The poor transportation and communications network makes access for all levels of health care very difficult. A survey undertaken on travelling time to clinics in 1979, indicated at least a quarter of rural households have a 2 hour trip to visit a clinic whilst it is believed this has been greatly improved over the last 5 years in line with findings in other countries there is a steep decline in numbers attending clinics as the travel distance increases. Both suitable road and sea transport devoted to medical services is in low supply and maintenance of existing transport is poor. This results in difficulties for touring of outlying areas and results in reduction in care for the sick and less support from remote health services. The transport difficulties and uneven dispersion of clinics and scattered population also cause problems in maintaining regular supplies of drugs, vaccines and medical supplies.

Many health centres of all levels in rural areas are in need of improvements and repairs in order to maintain and improve services. This work is constrained by transport difficulties and a lack of construction capacity throughout the Provinces. At a lower level such as aid posts, self-help projects have been successfully undertaken in Provinces, however as buildings become more specialised higher up the referral system this becomes impossible.

### 4) Social Problems

The rapid population growth places increasing stress on the development of the social services including health:



- a growing demand for maternal and child care
- tendency of mothers to have babies at close intervals places stress on the health and nutrition standards of the family and reduces resistance to infection
- observed malnutrition amongst children is growing
- recurrent expenditure must rise steeply to maintain current levels of health care
- an increasing movement to urban employment thus weakening the ties of traditional practices and values, results in the increasing concern of single parents, whose babies are most susceptible to malnutrition as most are fed artificially
- an increasing alcohol intake amongst young people especially in urban areas giving rise to increased injuries through fights and traffic accidents including between couples and families

Low educational levels and a high rate of illiteracy amongst adults in the rural areas makes health education through school curriculum of value only in the long term. An increase in health educators to work in villages is a necessity to ensure the rural population have awareness of simple preventive health, hygiene and child care and nutrition. At present there are not enough adequately trained health educators to tackle the problem.

#### 5) Intersectoral Coordination

The principle of its importance especially in relation to PHC is firmly established. A central body must take a lead in assisting sectors in Government to define their role in the health field. Competence and expertise in areas of water supply and sanitation, food production and distribution, construction, housing and education are of special importance and mechanics for intersectoral cooperation and coordination at all levels must be set up.

#### 6) Health Management and Planning

Specific management capabilities are required at all levels in the decentralized health services including within the PHC programme for supervision, operational planning and securing community participation. Management of supportive services is essential in health care.

Long term forward planning had not been required by the previous government but is now seen to be essential and especially for the coordination of

of health services including the expansion of PHC services at the periphery.

Again at Ministry level the capability in policy and strategy development and forward planning for long term specific goals of an integrated health care service including PHC is being hampered by appropriate shortages. Those few with the capability are fully committed with other responsibilities.

The establishment of an efficient and effective health information system would be necessary for monitoring, evaluating and planning of health care services. This is being looked into and would be further improved including the development of appropriate health statistics manpower needed.

Overcoming the management capabilities constraints, reorientation of health care services to the right direction and formulation of appropriate policies, programmes and legislative support based on the relevant information extracted and analysed would mean more meaningful national health development in response to social needs and as an integral part of socioeconomic developments.

#### 7) Central Hospital Redevelopment

With the addition of two new wards in 1984, Central Hospital now has a bed capacity of 255. This has reduced bed occupancy from an average of 120% (with the use of makeshift beds) to around 100%.

Central Hospital has an average of around 5000 inpatient admissions per annum with an average stay of 10.9 days. Of these patients around 8% are referrals and the remainder from the local catchment area.

Central Hospital is the only hospital providing more sophisticated therapeutic and diagnostic services in Solomon Islands, therefore adequate maintenance of facilities is essential. The hospital at present is overcrowded and conditions are below standard for patient treatment and comfort and the operation of the curative services provided are constrained.

The site is small and suffering seriously from erosion by the sea. The threat of cyclone damage on a site so close to the sea is always present and poses a serious threat to the hospital.

In order to maintain standards of curative care and safety of staff, patients and medical equipment the hospital must be resited at as early a

date as possible.

## HEALTH PROGRAMMES

Health programmes are directed toward three main areas:

- Health improvement including PHC which is mainly concerned with prevention and promotion of health
- Health care which is mainly concerned with maintenance and improvement of the curative services particularly hospital and clinic development.
- Appropriately trained national manpower to relieve the present dependence on expatriate manpower and adequately fill all levels of the medical service and PHC services. Much of the manpower training is an integral part of health improvement and health care programmes.

## PROGRAMME 1

### Health Improvement

This programme is basically involved in the development of the PHC services aiming for a more equitable and easy of access distribution of health services in an acceptable and affordable way with the involvement of the communication maintenance and improvement of their own health and health needs. The programme is implemented through the following major projects which have a PHC approach.

#### 1. CONTROL OF COMMUNICABLE DISEASES

The objective of this programme is to control and where possible eradicate the endemic diseases. The projects are basically to protect the population against the diseases. Malaria, TB and leprosy and the immunisable diseases are major problems and have special control projects while other communicable diseases are dealt with as an integral part of health services.

##### 1.1 Malaria Control

This programme was changed from one of eradication to one of control in 1980 when eradication was obviously not feasible with an increase of cases

from 6494 in 1970 to 35028 in 1980 and 84343 in 1983. Malaria still ranks as the major public health problem and takes up a large percentage of capital health expenditure and of national effort.

The aim is to control malaria by all available measures to a level where it is no longer a major public health problem and maintain that level until other measures become available to achieve eradication.

#### Activities

- Intra-domicillary spraying operations and in specific areas ULV spraying
- entomology and reduction of breeding sites
- extension of diagnostic and treatment services in line with PHC
- mass drug administration programmes and regular administration of drugs to specific groups e.g. pregnant women
- health education for understanding of the importance of malaria and effective means of control and achieving of community cooperation and participation in control, especially source reduction and reduction of man-mosquito contacts
- monitoring and evaluating the programme and compiling statistics including surveillance and geographical reconnaissance to determine the coverage of the interventions
- research and training

Statistics for 1984 indicated an improvement in reduction by the MDA programme on Guadalcanal, mainly due to community participation. The project is ongoing for the foreseeable future with 2 MDA projects in areas of high incidence underway in 1985 and research projects for consideration of other interventions. The spraying programme will continue.

#### 1.2 Anti-Malaria Project

This project is designed as an extension of the malaria-control project, commencing in 1986 and phased over three years.

The aim is to extend the malaria control project through the continuation of interventions but directed toward PHC approaches.

Activities - a national training and research laboratory will be constructed and equipped along with peripheral provincial laboratories and increased training and research activities will be undertaken. The project will be phased over three years.

## 2. ENVIRONMENTAL HEALTH

This consists of the Rural Water Supply and Sanitation Project (RWSS), urban water supplies and sanitations, quarantine, food inspection, village hygiene and other environmental health measures which all contribute to the control of diseases and management of health care.

The aim is to ensure and safeguard a healthy environment for everyone and through intersectoral cooperation to determine appropriate health and areas in all major developmental projects.

### 2.1 Rural Water Supply and Sanitation Project

This project commenced in 1978/79 and is planned through to 1990 in conjunction with the UN declared International Drinking Water Supply and Sanitation Decade.

The aim of the project is to improve the health and well-being of the rural population through the provision of potable water supply and construction of sanitation facilities in rural areas so that all people would have access to these basic needs by 1990.

Activities - An analysis of water and sanitation in 1978 showed only 24% of the rural population were served with potable water and 19.5% had some adequate means of sanitation. RWSS facilities are being constructed by the Provinces with technical advice from MHMS who also monitor progress. At the end of 1984 coverage had increased to 60% served with potable water and 22% with sanitation. An increase in health education aims to assist in the acceptance of sanitation facilities and in education for proper use of facilities.

### 2.2 Food Hygiene

The environmental Health Division undertakes food inspection activities mainly in urban areas with the aim of maintaining surveillance of areas where food is prepared and consumed and processed in large quantities and mounting

food safety measures.

### 2.3 Port Health Services

This involves quarantine health measures at the sea ports and International airports aiming to protect people against the introduction of new communicable diseases.

## 3. FAMILY HEALTH

The third Family health project commenced in 1982 and is now an integral part of the PHC approach. Available data suggests much of the maternal, infant and child morbidity and mortality could be reduced by improving and strengthening MCH services, health education, adequate ante-natal and post-natal care, child spacing, immunization, improved nutrition and hygiene. These are areas where the community can make a large contribution and family health projects a directed toward upgrading of health programs through extension of MHC services, appropriate training and retraining of health workers, introduction of expanded family health care projects and provision of back-up services for planning and implementation.

### 3.1 Family Health Project IV

Phase IV of this project commencing in 1985 is scheduled to cover a 5 year period to 1989. It is directed toward building on past projects in organising self-sustaining, efficient and effective PHC services and a family health service readily available throughout the country and integrated with MCH services to raise the general standards of health in the family, in communities and nationally.

The overall aim is to make available family health care services including wider usage of family spacing techniques MCH and immunization through the facilities of the PHC services and to continue promoting organized community participation in and support of such activities. To support this the project also aims to assist in the development of an appropriate health information system suitable for recording, reporting, monitoring and evaluating of the project and health care system in general.

Activities - Refresher courses for all nurses and nurse aides each year to include all aspects of family health.

- overseas courses for nurses in contraceptive technology
- training courses for a further 16 health education assistants and provision of a UNV health educator
- provision of a health statistician and development of statistics capability within MIMS.

The project is ongoing in training activities and it is hoped what the statistics segment will commence in 1985/86.

### 3.2 Maternal Child Health Care (MCH)

In 1985-1990 it is proposed to further extend training and retraining of health workers in MCH with the assistance of NGO's and to provide the back-up equipment for extension of MCH services.

### 3.3 Primary Health Care Project

This project is particularly concerned with dissemination of information on PHC and initiation of community awareness in health care matters.

The aim is to develop strong community participation and self-reliance in PHC and organize and coordinate the appropriate level of services.

Activities - PHC workshops, village health worker training and associated activities.

The project is ongoing, PHC information is becoming more widely disseminated and a review of coverage is proposed in 1987/88.

### 3.4 ORT/EPT Promotion through Information Dissemination

The aim is to increase awareness of the community in use of oral rehydration therapy and the need for immunization and protection from immunizable diseases.

Activities - to provide health education materials and equipment in support of health education programs at village level.

The project will commence in 1985 and be implemented over a 2 year period.

### 3.5 Study into the Situation of Solomon Islands Children

This project includes health and education and is administered by the USP Centre in Honiara.

The aim is to provide information on the health/educational status of children to aid in planning for infant and child services in the future.

Activities - a research assistant is presently collecting data and a report is expected in 1985/86

### 3.6 Health Education

This is an integral supportive part of all the preventive health programs providing the necessary support to the various health projects and has a major part to play in the programmes of nutrition, environmental health, hygiene and control of communicable diseases. Health education has to promote and provide information to the population so they can take an active part in improving and safeguarding their health. To accomplish this health education must break down established behavioural barriers to health improvement.

Activities - Two health education training courses have been held in 1983 and 1984 resulting in 13 trained health education assistants. These are new spread.

- Improved health education support for health programmes
- development of health education resources
- health education in schools
- organization of health activities in villages including teaching of community leaders
- provision of material for media and for health campaigns
- over the next five years additional training will be provided to give the most effective input possible toward overall aims of preventive health care.

### 3.7 Social Development and Womens Interest

This supports family health both in the urban and rural environment through welfare programmes and training programmes specifically womens' projects. It is treated fully in a separate section.



## PROGRAMME 2

### HEALTH CARE SERVICES

#### 1. Hospitals

##### 1.1 Central Hospital

The present hospital built in 1953 and 1960 with some more recent additions was developed from the former World War II army hospital. The hospital placement is an uncoordinated piecemeal development of hospital buildings resulting in congestion, lack of security and long travelling distances between areas. Inpatient accommodation is overcrowded, facilities are faulty and in general standards are far lower than desirable for comfort, hygiene and security of patients and for provision of special medical and para-medical services.

##### New National Hospital Development Project

This project aims to develop a new National referral hospital on a site to be identified. The hospital will provide specialised services for the whole country and continue to act at present, as the local hospital for Guadalcanal Province, Central Province and Honiara Town Council. The hospital will act as the top tier of the referral service.

Activities - A preliminary situational assessment of the functions of the new National Hospital and sketch designs for planning purposes have been undertaken by a consultant. It remains for a site to be identified and designs finalized and submitted to Cabinet.

- Identification of possible donors is hoped for in 1985/86 with appraisal and commencement of building in 1987-1990.

##### 1.2 Provincial Hospitals

Improvement and extension of facilities and equipment will continue in order to maintain the top level of provincial curative services. The Government will also support agreed improvements to church hospitals in cooperation with the Missions. Improvement of Provincial facilities will reduce the need for referrals to Central Hospital, however specialist consultants will not be attached to Provincial Hospitals.

Consideration is being given to the development of a Provincial Hospital at Choiseul due to its remoteness and high population.

## 2. Area Health Centres

A further AHC will be constructed at Afio and consideration will be given to redesignating some clinics in areas of high population as AHC's and improving them accordingly.

## 3. Clinics

Replacement and extension of existing clinics will take place during the plan period, however it is unlikely any significant expansion of number of government clinics will take place due to manpower constraints.

Government with Provinces will further cooperate and coordinate activities of missions and industries in provision of clinics and improving the level of health care for the people.

Two new clinics will be constructed in Honiara to account for the increase in demand for outpatient services especially with the closing of central Hospital outpatient clinics on weekdays to all but emergencies.

## 4. Aid Posts

There will be a continued slow expansion of aid posts particularly through self-help projects to continue to improve access to health care for the rural population. Attempts will be made to construct at least semi-permanent buildings.

## 5. Pharmaceutical Services

Drug supplies and vaccines are a costly factor within the medical service.

The aim of the service is to obtain drugs and supplies as cheaply as possible consistent with quality safeguards and to ensure regular supplies of drugs and vaccines to all health facilities and maintain the cold chain. As well as direct purchase of drugs some are supplied under development programmes and occasionally in times of unusually high need some are supplied as gifts.

UNICEF maintain a continuing supply of vaccines as part of their regional programme, WHO and NZLTB are assisting over the next 2 years in supply of high cost drugs for TB and leprosy and some anti-malaria drugs are supplied

under aid.

#### 6. Laboratory and X-Ray Services

Laboratory and X-ray services provide diagnostic services both in central and Provincial Hospitals with the aim of better diagnosis of disease leading to more efficient treatment and better control of diseases in Solomon Islands.

Major services of each are in Honiara, however Provincial hospitals offer less sophisticated services and it is planned that all Provincial hospitals will be staffed and have adequate equipment for their needs in the next 2 years.

A new X-ray unit will be provided for Central Hospital in 1986/87 to replace the present worn-out machine.

At present the malaria laboratory operates within the overall laboratory facilities. A new malaria laboratory will be constructed in 1986/87 allowing for expanded training and research facilities in laboratory work.

### PROGRAMME 3

#### TRAINING

The aim of this programme is to train:

- A small number of specialists with overseas training in all health categories: medical officers, senior nurses, health educators, environmental health workers, social development workers, radiographers, pharmacists dentists, laboratory supervisors and health administrators/technicians etc.

- The majority of health workers in both *preservice* and *in-service* training in Solomon Islands using local and expatriate trainers and long and short courses. This will include nurses through SICHE and a variety of paramedical courses to be developed at SICHE. Practical training will continue to be given as far as possible in the health services in Solomon Islands.

## Doctors

All doctors are at present trained in basic medicine at Fiji School of Medicine or University of Papua New Guinea, Faculty of Medicine. The majority of doctors in Solomon Islands need to be persons trained professionally to give a full range of health services to the community. Specialist doctors are only in Central Hospital and should be a minority in number. Post graduate training for National doctors is undertaken overseas in various institutions. At present Solomon Islands has 14 national doctors in the Government health services of whom 3 are consultants, 2 chief medical officers and 5 principal/senior medical officers at Central Hospital, who have or are presently undertaking some undergraduate training. In addition there are 3 national doctors at MHMS Headquarters advising on policy and management of the health services.

Numbers of doctors presently in training are as follows:

Completion date	1985	1986	1987	1988	1989	1990	Total
Numbers	5	1	5	7	4	7	29

Out of the 29 medical students due to complete by 1990, there would be an expected loss of 30-40% due to failures, course changes and occasionally non-return to Solomon Islands. It would be hoped that by 1990 approximately 15 new doctors would be available but sometimes attrition rates can be expected.

The length of the course at both medical schools is 5 years plus 2 extra years in PNG before full registration is granted. The requirements for registration for graduates from Fiji are determined by Solomon Islands Medical and Dental Registration Board.

There is a need for postgraduate training in the following areas in the near future to relieve reliance on expatriate doctors:

- medicine
- paediatrics
- surgery
- anaesthetics

At present National doctors are undergoing specialist postgraduate training in surgery and anaesthetics.

## Nursing

The nursing training basic qualification is undertaken at the Solomon Islands School of Nursing which is now a part of SICHE. Atalti also has a small nursing school.

The School of Nursing trains Solomon Islands Form 5 leavers to require the appropriate skills, attitudes and knowledge necessary to function in the health network as Registered Nurses.

Suitable overseas courses are selected for post-basic training at certificate or diploma level for selected candidates who are to hold key posts in the nursing service or who will specialise in particular areas of nursing.

In-service refresher courses for nurses are held annually by the Provinces. In-service courses also train prospective candidates for promotion to assistant Nursing Officers. Management courses are also held and nurses also attend management courses at ATC.

### S.I. School of Nursing - Student Statistics

R.N. Programme	1978	1979	1980	1981	1982	1983	1984	1985
Intake	24	17	16	17	23	24	-	22
Qualified	19	13	8	12	9	20	-	
Loss	5	4	8	5	14	2	-	
Community Nurse Programme (2 years)								
Intake						25		

The community nurse programme is now operating as a nurse aide program taking form 3 leavers who do not qualify for RN training.

## Nurse Aides

Whilst many are retired nurses so have qualifications others are trained on a one year nurse aide training course at Central Hospital, Helena Goldie Hospital and Kilu'ufi Hospital. The level is basic preventive and curative medicine. A standard curriculum is being drawn up for 1986.

## Village Health Workers

The present policy is a 3 month training course conducted by respective Provincial health staff. A VIW Manual has been produced which assists in the

basic training in simple preventive and curative measures and is being revised.

### Paramedical Training

The paramedical services include pharmacy, X-ray, laboratory, physiotherapy health education, environmental health officers and malaria control workers. In general the types of training being used are:

- 1) Overseas undergraduate and postgraduate training for higher level workers. Wherever possible degree and diploma courses are being undertaken in the Pacific region.
- 2) Local training for lower level and less highly skilled workers. A proposed course for SICHE is a one year core health course followed by specialisation in particular paramedical fields. In-country courses for, health educators, microscopists, pharmacy assistants, dental therapists and technicians and health inspectors are proposed either in conjunction with SICHE or with assistance from consultant specialised trainers.
- 3) Specialised short courses and refresher courses for all health areas are run annually in Honiara and Provinces and selected representatives are sent on short courses overseas.
- 4) In-service training is undertaken in the paramedical areas to give school leavers a level of practical skill for which they may in the future proceed to formal courses or be competent in particular operational areas of health services.
- 5) The Administrative Training Centre is used by the medical services for general administrative and managerial training.

## MALARIA CONTROL PROJECT

### BACKGROUND

Malaria has been, and still is the most serious public health problem in the Country. During the second world war, malaria took a heavy toll of both Japanese and allied troops and it was during the period of the war that the US Army undertook extensive antimalaria measures in Guadalcanal by aerial spraying of DDT, oiling of water courses and by extensive source reduction measures as well as as some indoor spraying of residual insecticide and extensive prophylaxis. The control activities ceased with the departure of the troops in 1948. (Avery 1973).

A country-wide Malaria Eradication Programme was launched in 1970 spraying with DDT residual insecticide and the initial results were encouraging, there being only about 3500 reported cases in 1975. Spraying was withdrawn from areas in which 40% of the population lived i.e. Western Province, Ysabel Province part of Makira Province and all of Temotu Province and islands such as Ontong Java, Rennell & Bellona where it was considered the case load had been reduced sufficiently to warrant cessation of spraying. From then on there has been an increase of cases with 10 590 in 1977, 19 987 in 1978, 26 357 in 1979, 35 028 in 1980, 61 108 in 1981, 69 680 in 1982 and 78 414 in 1983. There is at present an epidemic of malaria which appears to have almost reached its peak.

In 1980 because of the realisation that under the prevailing circumstances and available methods a time limited malaria eradication programme could not be brought to a finite conclusion, policy was changed and the concept of a malaria control programme was accepted.

### PROBLEMS

Administrative and sociological problems e.g. lack of adequate number of senior staff, poor supervision, bad spraying coverage, refusal of spraying and migration between different islands, particularly between the principal island of Guadalcanal (the most infected island of the archipelago) and all the other islands were considered major problem affecting the programme.

The deterioration in the coverage of spraying as well as the non-spray-

ing of garden huts and the non spraying of the underneath areas of the houses were considered for a long time as the only problems but it has been shown subsequently that they are only partly responsible for the deteriorating malaria situation in the country.

It is also necessary to add the lot of man-made malaria due to some developmental projects e.g. rice fields, logging and deforestation, taro ponds etc., which are contributing to the increase anopheles mosquitoes. To remedy these problems cyclical spraying of residual insecticide (DDT) was recommenced in 1981 in eastern and western island groups of Solomon Islands following its withdrawal in 1975 from 40% of the population. During 1981 and 1982 attempts were made to improve cyclical spraying in other areas and to make a thorough assessment of the situation. This has resulted in reduction in the number of cases in the east and west and Central Province but to date has had little or no effect on the malaria situation in Guadalcanal or Malaita Provinces. On the entomological side it was noted that after the first years of spraying An. farauti, the main vector and now in most areas the only vector present changed its behaviour and showed a predominance of outdoor over indoor biting. Falciparum malaria which represented about 10% of the total cases a few years ago now represents about 70% of cases in some areas.

#### POLICIES ADOPTED

The MHMS with the assistance of the WHO Malaria Advisory Team developed a national policy which gives the control of malaria a high priority rating. The policy will remain a prerogative of Central Government although it will be discussed from time to time with provincial government and many activities of the programme will be devolved in keeping with national policy on devolution of central government functions to provincial authorities.

Basically the policy states that "malaria be controlled by every available means to a level at which it ceases to be an important health problem in any part of the country." The means by which control is achieved is primarily by the intradomiciliary spraying of residual insecticide and supplementary measures such as:

- a) Mass drug administration of prophylaxis to selected groups (e.g. pregnant women, school children and economic development groups)
- b) The reduction of breeding sites and other anti-larval measures.



- c) Focal methods of adulticiding e.g. Fogging and the use of ULV insecticides.
- e) The screening of sleeping quarters and encouragement of the use of mosquito nets.
- f) The treatment of overt malaria cases and those discovered on surveys.

### STRATEGIES

The aim of the Ministry of Health and Medical Services is to reduce malaria disease to an incidence of 40 cases per thousand per year in the provinces of Western, Ysabel, Temotu and Makira. In Central, Malaita and Guadalcanal Provinces an acceptable incidence would be 80 per thousand per year.

During the 9th South West Pacific Malaria Conference in February 1983 in Sydney a recommendation was strongly made by all participants that in view of the present world-wide malaria situation and concentration on primary health care, the diagnosis and chemotherapeutic service should be strengthened at the grass roots level. Likewise it was noted that attention should be given to high risk groups such as children, pregnant mothers and visitors from non malarious countries. This is underway but requires adequate supplies of antimalarial drugs and means of distribution.

Over the years the programme has been dependent to a large extent on overseas aid for the supply of all equipment of a supportive nature, and specific equipment peculiar to the programme. Much of this equipment is required for logistic support and communication and that in the laboratories is old and worn out due to lack of an organized rolling replacement scheme. Due to this and the planned extension of the integrated service bringing diagnosis and treatment closer to the periphery there is an urgent need for supply.

Antimalarial drugs are vital to the programme primarily for the treatment of malaria cases and use in mass drug administration (Table 1) and in certain situations for prophylaxis. However care must be taken in the use of these drugs due to the development of drug resistant strains of the parasite.

Nowhere have drugs been successful when used alone and we consider that without vector control the mass use of drugs would result in selection for

resistant strains of the parasite and the rapid spread of these strains. This has already been seen on Choiseul Island and in Malaita Province during 1980 and 1981.

In summary the strategies adopted provide the basis for an urgent need to boost resources to continue the programme of malaria control in the Solomon Islands. It is also devised to develop a system of forward projection for operational aspects, budgetary requirements and evaluation and training. There will of necessity be a split between S.I. Government and contribution towards financing of the programme and that from external aid sources. The plan will also take into account individual provincial needs in keeping with devolution policy.

During this field visit, several representative problems that are being encountered will be demonstrated to illustrate the difficulties such a programme is facing.

TABLE 1

MALARIA IN THE SOLOMON ISLANDS1. Malaria Cases Detected From 1969 to 1982

Year	Population	Slides Examined	Positives	SPR %	PF %
1969	155,705	46,889	5,486	11.7	37.5
1970	160,998	50,350	6,494	12.9	35.0
1971	166,471	55,075	5,343	9.7	19.6
1972	172,131	78,765	4,824	6.1	18.0
1973	177,983	86,367	7,507	8.9	8.7
1974	184,034	98,022	3,681	3.8	36.7
1975	190,291	101,207	3,554	3.5	29.7
1976	196,760	89,512	3,798	4.2	16.1
1977	202,951	109,273	10,590	9.7	28.0
1978	210,312	188,727	19,987	10.6	14.8
1979	217,463	205,569	26,357	12.8	15.6
1980	224,856	178,536	35,028	19.9	16.8
1981	232,502	225,279	61,108	27.1	49.3
1982	240,408	274,246	69,680	25.7	56.9

SPR = Slide Positivity Rate

PF% = Positive Cases due to Plasmodium Falciparum

SEE NOTE ON TABLE 2

TABLE 2

Changes in blood films examined, positive cases  
and slide positivity rates for the first quarter  
from 1979 to 1983

	BLOOD FILMS EXAMINED	MALARIA POSITIVE BLOOD FILMS	SLIDE POSITIVITY RATE
1979	65,411	8,015	12.3
1980	52,655	10,607	20.1
1981	51,291	12,477	24.3
1982	75,494	22,533	29.8
1983	80,515	21,835	27.1

Note: Due to problems with the recording of numbers of blood films examined in Guadalcanal province the numbers of blood films examined has been understated. The period over which the error has been made in recording is unknown but has probably continued as an understatement for at least 7-8 years.

SOLOMON ISLANDS  
ANTI-MALARIA PROGRAMME  
EPIDEMIOLOGICAL REPORT

Annual Summary Jan - Oct 1985

PROVINCE	POPULAT.	NO. EXAMINED				NO. OF POSITIVES			SPECIES			MIXED INFECT.	INFANTS			EPI. DATA	
		PCD	OTHERS	TOTAL	PCD	OTHERS	TOTAL	Pf	Pv	Pm	EXAM.		+	BER	SPR	API	
WESTERN	53,307	32,651	4,290	36,941	4,086	197	4,283	1,429	2,859		5	1,301	70	61.3	11.6	80.3	
YSABEL	13,504	8,201	1,342	9,543	575	38	613	365	248		-	398	2	60.7	6.4	45.5	
CENTRAL	17,782	14,210	1,703	15,913	5,348	238	5,586	3,949	1,690		23	552	234	79.9	35.1	314.1	
GUADAL.	60,923	56,569	322	56,891	16,014	67	16,081	10,339	5,782		40	2,891	403	92.9	28.3	264.0	
MALAITA	74,047	24,520	2,347	26,867	7,172	312	7,484	4,564	2,936		16	2,990	552	33.1	27.9	101.1	
MAKIRA	18,699	10,003	3,015	13,018	1,467	258	1,725	1,378	351		4	356	19	53.5	13.3	92.3	
TEMOTU	13,509	9,202	5,684	15,186	1,344	413	1,757	917	862		22	354	52	70.3	11.6	130.1	
TOTAL	251,771	155,656	18,703	174,359	36,006	1,523	37,529	22,941	14,728		140	8,842	1,332	61.8	21.5	149.1	

## 資料 2.

## Comparison of 1/2 yearly malaria indices by years 1975-1984

YEAR	PERIOD	EXAMINED	POSITIVE	P. FALCIPARUM	P. VIVAX	INFANTS +VE	S.P.R.	P.I
1975	JAN-JUNE	84,448	1,992	684	1,306		2.4	10
	JULY-DEC	89,467	1,562	371	1,199		1.8	8
1976	JAN-JUNE	79,526	2,026	175	1,848		2.5	10
	JULY-DEC	83,966	1,776	437	1,340		2.1	9
1977	JAN-JUNE	98,060	7,164	2,123	4,963		7.3	35
	JULY-DEC	95,984	3,426	740	2,692		3.6	16
1978	JAN-JUNE	109,547	11,452	1,781	9,691		10.5	54
	JULY-DEC	79,180	8,535	1,221	7,328		10.8	40
1979	JAN-JUNE	121,045	15,851	4,882	10,989		13.1	72
	JULY-DEC	84,584	10,505	3,488	7,028		12.4	48
1980	JAN-JUNE	99,239	20,567	2,674	17,913		20.7	91
	JULY-DEC	79,393	14,459	3,249	11,235		18.2	64
1981	JAN-JUNE	114,555	28,256	12,049	16,349		24.7	121
	JULY-DEC	110,871	32,913	18,565	13,635		29.7	141
1982	JAN-JUNE	149,608	43,519	26,176	17,585	1,107	29.1	181
	JULY-DEC	124,720	26,310	12,790	13,980	920	21.1	109
1983	JAN-JUNE	145,182	45,182	25,746	19,810	2,986		181
	JULY-DEC	39,161	39,161	22,065	17,150	1,460		157
1984	JAN-JUNE	146,923	47,264	26,916	20,147	1,792	32.2	187
	JULY-DEC	113,803	22,720	11,416	11,420	870	20.0	90
1985	JAN-JUNE	114,802	26,095	16,319	9,877	980	22.7	103

資料 3.

COMPARISON OF SLIDE POSITIVITY RATES IN AREAS WHERE SPRAYING WAS CONTINUED WITHOUT MASS DRUG ADMINISTRATION AND WHERE BOTH SPRAYING AND MASS DRUG ADMINISTRATION WERE DISCONTINUED.

Year	Population	Blood films Examined		Positive Slides	Slide Positivity	Proportion of total population pos. cases	Population	Blood films Examined	Positive Slides	Slide Positivity rate	Proportion total positive cases
		Examined	Examined								
1975		104,870	3,250	3.1 %	91.4 %		69,045	304	0.4 %	8.6 %	
1976	120,238	93,714	3,404	3.6 %	89.6 %	76,585	69,778	397	0.6 %	10.4 %	
1977		122,398	10,265	8.4 %	97.0 %		71,586	325	0.5 %	3.0 %	
1978		119,429	17,994	15.1 %	90.0 %		69,208	1,993	2.9 %	10.0 %	
1979		128,447	20,964	16.3 %	79.5 %		77,182	5,392	7.0 %	20.5 %	
1980		108,860	28,137	25.8 %	80.3 %		69,772	6,889	9.9 %	19.7 %	
1981		142,376	50,693	35.6 %	82.9 %	91,803	83,067	10,476	12.6 %	17.1 %	
1982		168,038	57,385	34.2 %	82.2 %	95,212	106,270	12,444	11.7 %	17.8 %	
1983		53,220	18,961	35.2 %	86.8 %	98,675	27,295	2,874	10.5 %	13.0 %	
1984											
1985											
1986											

SPRAYING CONTINUED MASS DRUG ADMIN. DISCONTINUED 1976  
 (GUADALCANAL PROVINCE) )  
 (CENTRAL PROVINCE) )  
 (MALAITA PROVINCE) )  
 (HONIARA) )  
 (WESTERN PROVINCE)  
 (MARIRA PROVINCE)  
 (TEMOTU PROVINCE)  
 (YSABEL PROVINCE)

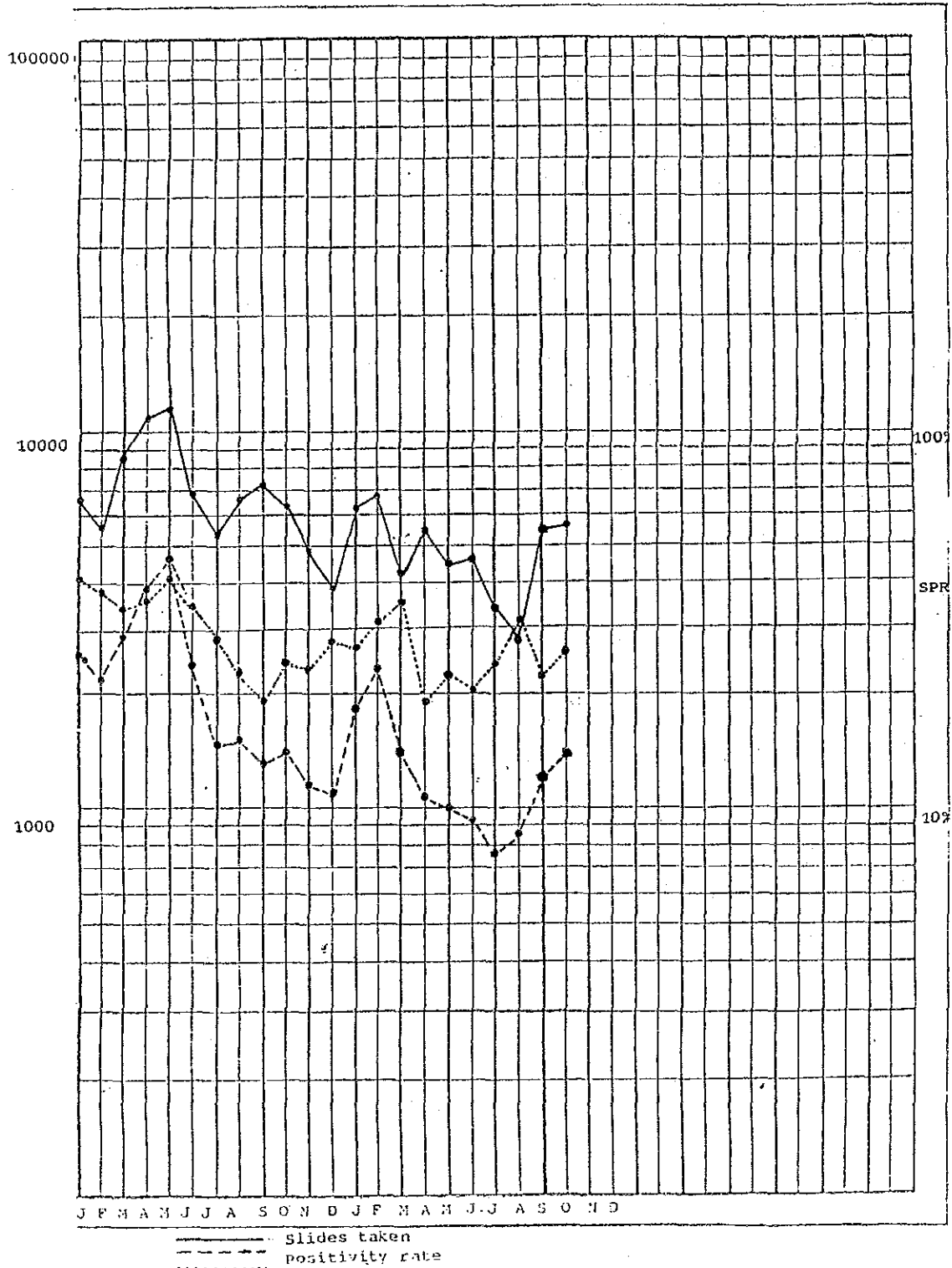
PROPORTION OF S.I. POPULATION IS 39%  
 PROPORTION OF S.I. POPULATION IS 61%  
 DISCONTINUED 1975

資料 4.

GUADALCANAL PROVINCE (MDA AREA)

MONTHLY SLIDES TAKEN - POSITIVITY RATES & POSITIVE SLIDES

1984-85

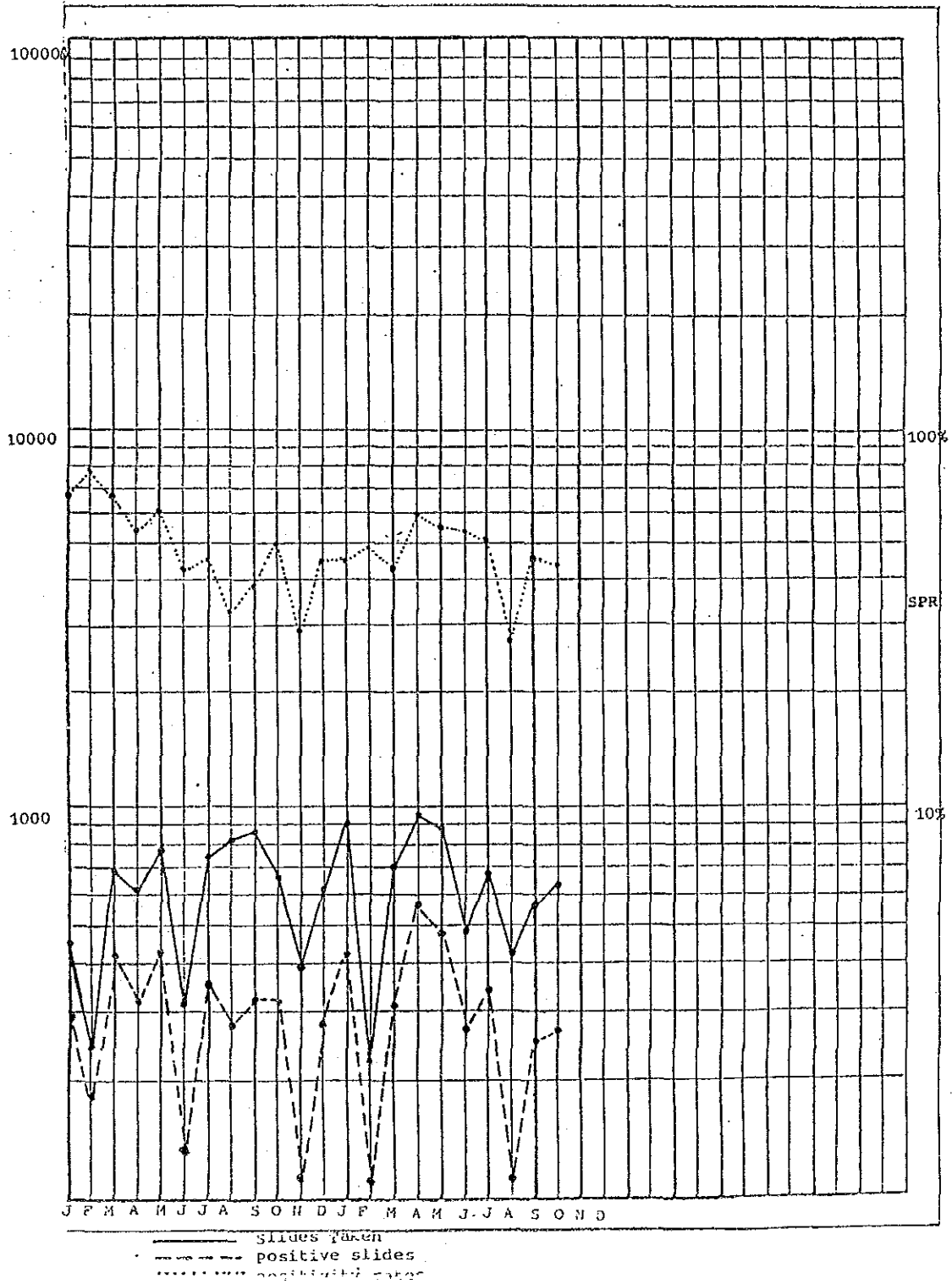




資料 5.

GUADALCANAL (NON MADA AREA)

MONTHLY SLIDES TAKEN -- POSITIVITY RATES & POSITIVE  
SLIDES 1984-85



資料 6.

EXPECTED NUMBER OF MALARIA CASES PER YEAR PER PROVINCE  
1985 - 89 USING CURRENT METHODS OF MALARIA CONTROL BASED  
ON 80/1000/YEAR AND 40/1000/YEAR

WESTERN	1985	2310	1987	2508
	1986	2405	1988	2614
YSABEL 40/1000/YEAR	1985	580	1987	623
	1986	600	1988	646
CENTRAL 80/1000/YEAR	1985	1534	1987	1652
	1986	1592	1988	1614
GUADALCANAL 80/1000/YEAR	1985	4880	1987	5188
	1986	5000	1988	5350
MALAITA 80/1000/YEAR	1985	6067	1987	6401
	1986	6232	1988	6574
MAKIRA 40/1000/YEAR	1985	781	1987	858
	1986	804	1988	886
TEMOTU 40/1000/YEAR	1985	574	1987	611
	1986	592	1988	632

EXPECTED NUMBER OF MALARIA CASES  
1985 - 1988

1985	16730	UNACHIEVABLE DUE TO LACK OF COVERAGE OF PROGRAMME
1986	17225	UNACHIEVABLE DUE TO INCOMPLETE COVERAGE
1987	17841	MAYBE ACHIEVABLE
1988	18316	SHOULD BE ACHIEVABLE AND SHOULD BE OF LOWER ORDER IF COMMUNITY COOPERATION IS GOOD.

資料 7.

AREAS FROM WHICH SPRAYING OF DDT WAS WITHDRAWN BY YEAR

PROVINCE	AREA	1974	1975	1976	1977	1978	1979	1980	1981	1982
Western	Rendova	xxx	xxx						xxx	xxx
	Kolombangara	xxx	xxx						xxx	xxx
	Simbo	xxx	xxx						xxx	xxx
	Ranongga East	xxx	xxx						xxx	xxx
	Ranongga West	xxx	xxx						xxx	xxx
	Vella East	xxx	xxx						xxx	xxx
	Vella West	xxx	xxx						xxx	xxx
	Wona Wona	xxx	xxx						xxx	xxx
	Munda	xxx							xxx	xxx
	Roviana	xxx							xxx	xxx
	Viru	xxx							xxx	xxx
	Seghe	xxx							xxx	xxx
	Batuna	xxx							xxx	xxx
	Gatukae	xxx							xxx	xxx
	Bokavu	xxx							xxx	xxx
	Ysabel	Keru	xxx							xxx
Visu Visu		xxx							xxx	xxx
Choiseul		xxx	xxx						xxx	xxx
Makira	Ulawa	xxx	xxx	xxx	xxx				xxx	xxx
	Ugi	xxx	xxx	xxx	xxx				xxx	xxx
	3 Sisters	xxx	xxx	xxx	xxx				xxx	xxx
Malaita	Ontong Java	xxx	xxx	xxx						
	Ndai	xxx	xxx	xxx						

SOLOMON ISLANDS NOTES ON MALARIA

Dear Visitor,

We hope that you will enjoy your stay in our country. There are many things to do wherever you go in Solomon Islands, but please remember that this is MALARIOUS COUNTRY. In this leaflet you will find some commonsense precautions regarding malaria. If you follow them you will enjoy your stay in Solomon Islands to the full.

WHAT IS MALARIA?

Malaria is a disease of the blood caused by a group of parasites which live in and destroy the red blood cells. It may be fatal. It is spread by the female anopheles mosquito. This mosquito is found in most parts of Solomon Islands and can infect YOU with the disease unless you take appropriate steps to protect yourself. These steps are not difficult and rely on your commonsense. They involve protecting yourself from bites from infective mosquitoes and regularly taking tablets called anti-malarials.

PROTECTIVE MEASURES

(a) Malaria mosquitoes bite mainly from dusk to dawn so that the greatest danger of becoming infected is during that period. The risk of this in town areas in screened quarters is almost negligible.

If you are outside during those hours it is wise to ensure that as little of your body is exposed as possible, i.e. wear long sleeves and trousers or slacks. While sleeping in unscreened quarters use a mosquito net.

Should you be unable to keep yourself well covered at any time and this will occur for reasons of comfort etc., carry with you and use an insect repellent.

(b) Anti-Malarials

There are various types of anti-malarials available to the visitor to Solomon Islands and these may be obtained prior to your visit or from the Pharmacy in Honiara. Solomon Islands Government hospitals in all provincial centres only have very limited supplies, but will supply in an emergency.

At the present time Maloprim or its equivalent is the drug of first choice. If you are unable to obtain this or you cannot take it for any reason, take Fansidar or its equivalent.

Neither drug is totally recommended for prophylaxis in pregnancy nor in infants under 1 month of age. However there is no evidence that either drug is harmful to these 2 groups. These 2 drugs must not be taken if you have an allergy to sulpha drugs. In all these cases, a 3rd anti-malarial, Chloroquine is used.

This or an equivalent anti-malarial, Amodiaquine can be obtained in both adult and children's packages. Should you decide to take either of these two anti-malarials you must be aware that some resistant strains to these drugs do exist and that in the unlikely event that you develop a fever you must report for medical attention.

All of these anti-malarials mentioned above are taken WEEKLY.

A further anti-malarial, Proguanil (Paludrine) is also available and is effective and safe but must be taken DAILY.

All anti-malarials must be taken in the correct dosage and regularly as prescribed. On returning to a non-malarious country you must continue taking your anti-malarials for six weeks. If you are in any doubt consult your doctor for advice.

#### THE SYMPTOMS OF MALARIA

Malaria is a common disease and mimics other diseases. Often a person with malaria may be thought to have influenza or a common cold. It is far better to err the other way and think you have malaria and seek medical attention. When someone suffers from malaria he feels ill for a few days to a week before the classical form of the disease shows itself. This ill feeling is often accompanied by aches and pains and a slight to a high temperature. When the classical symptoms appear the person will react in the following way:

- (a) There is a feeling of intense cold which lasts from half to two hours. During this time shivering occurs which is sometimes very marked.

- (b) This is followed by the hot stage. The patient has a high temperature and feels hot stage. The patient has a high temperature and feels hot and dry. He may vomit a lot and become delirious.
- (c) After 4-5 hours the sweating stage begins. The patient sweats profusely and the temperature falls.
- Following the first attack, similar attacks will occur at intervals of 48-72 hours unless the sick person is treated. If he is not treated he may die.

#### TREATMENT OF MALARIA

If you think that you have contracted malaria, then you should seek immediate medical attention and treatment. Final diagnosis will be dependent upon microscopic examination of a small specimen of your blood.

#### WHEN YOU GET HOME

If you suffer an attack of fever or febrile illness after you leave the Solomon Islands, you should report this to a doctor and tell him that you have been in a malarious country and you think you may be suffering from malaria. Malaria is not the only disease that produces fever, but your information will help the doctor to ensure the possibility of malaria is not overlooked. If it is shown you do have malaria, your doctor will prescribe a further course of anti-malarials to ensure that you do not suffer another attack.

#### A FEW DON'TS

1. DO NOT FORGET TO TAKE YOUR TABLETS REGULARLY IN THE RECOMMENDED.
2. DON'T BELIEVE PEOPLE WHO SAY THEY DON'T TAKE TABLETS AND NEVER GET MALARIA. IT IS NOT WORTH THE RISK.
3. DON'T SPOIL YOUR STAY IN SOLOMON ISLANDS BY GETTING MALARIA. PROTECT YOURSELF AND YOUR FAMILY BY TAKING ANTI-MALARIALS REGULARLY.









JICA