

# PREVENTIVE THERAPY IN FEDERATED STATES OF MICRONESIA

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## 1. BACKGROUND

### Federated States of Micronesia



a constitutional confederation in free association with the United States.

Achieved independence (from U.S.-administered UN trusteeship) in 1986.

population of 129,000

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- consists of 607 islands (65 inhabited) scattered over 1,000,000 square miles of the Pacific Ocean
- The four states are the island groups of Pohnpei, Chuuk, Yap, and Kosrae. The Federal capital is Palikir, on Pohnpei
- Leprosy has been endemic for a long time. In addition to intensified leprosy elimination campaigns, total population screening, health education and prophylactic treatments were carried out from 1996 to 1998.
- has still to eliminate leprosy as a public health problem registering a prevalence rate of 13/10,000 at the end of 2008

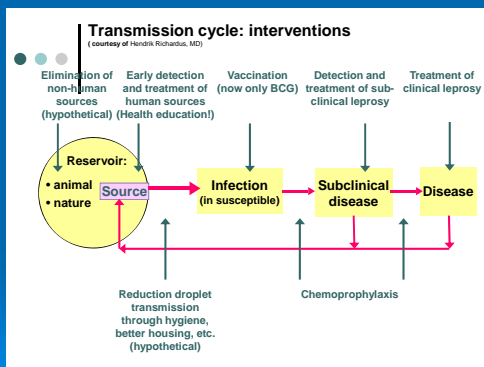
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## 2. INTRODUCTION

### Critical issue in leprosy epidemiology:

- Data available are prevalence rates, not incidence rates
- Difficulty to establish the role of *M. leprae* found in the environment and in animals as possible source of infection of humans.
- Limited data on risk factors and susceptibility for leprosy infection.
- No reliable test for infection and test to predict disease.
- Limited data for thorough calculation of transmission risks
- **Prevention of the full blown leprosy by Intervention at the sub-clinical stage**

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## 3. FSM PREVENTIVE THERAPY PROJECT

In 1995 survey of selected endemic villages showed,  
NCDR –Pohnpei - 68/10,000 , Chuuk – 56/10,000

### SPECIAL PROJECT:

Federated States of Micronesia (FSM)  
Republic of Marshall Islands (RMI)

- Total Population Survey
  - MDT treatment to detected leprosy cases
  - Preventive Therapy to Healthy Household Contacts
- Time Frame: March 1996 – May 1998 –FSM  
1998 – 2000 – RMI

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## STUDY DESIGN

### HYPOTHESIS:

Prevention of Leprosy by chemoprophylaxis of high risk population group

### OBJECTIVES:

Accelerating the attainment of elimination of leprosy as a public health problem in FSM and RMI by prevention of development of new cases through chemoprophylaxis of household contacts.

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## PREVENTIVE THERAPY

**TARGET POPULATION:** ALL persons living in the same household with a leprosy patient (Index case)

**Index case** — include all newly detected, currently on treatment and those completed treatment (MDT / Dapsone monotherapy)

### Exclusion Criteria:

- Pregnant women
- Children under 1 year of age
- Persons with liver or kidney disease
- Persons known to be allergic to any of the drugs used

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## Drug Regimen

Persons above 15 years old	Persons below 15 years old
Rifampicin 600 mg Ofloxacin 400 mg Minocycline 100 mg	Children 10-14 years old Rifampicin 450 mg
	Children 5-9 years old Rifampicin 300 mg
	Children 1-4 years old Rifampicin 150 mg

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## DURATION OF TREATMENT

One dose per year for two (2) consecutive years

First Dose- March 1996 – March 1997

Second Dose – March 1997 – April 1998

### Limitations:

- Not designed as a research
- Not randomized
- No control group
- Not blinded
- Not placebo-controlled

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## ACTIVITIES

- Social preparation/ advocacy in the community
- Training of screeners and validators
- Use of maps and household listing in the villages
- Identification of index cases in the villages using treatment registry
- Preparation of forms / Schedules
- Resource mobilization – (FSM –Federal Govt / WHO/ SMHF)
- Actual screening administration of preventive therapy

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## FOLLOW-UP ACTIVITIES:

### Screening of Selective High Prevalent Population

- Total household screening in selected villages according to the number of new cases detected during the early 2 rounds of mass screening
- Scheduled every (2) years after the initial screening - 1999, 2001, 2003
- A team of 5 skilled/ trained health workers divided into 2 groups performed the screening
- Special notification on new cases detected in terms of previous history of intake of preventive therapy

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## 4. RESULTS

### Leprosy Elimination Project in FSM: First round

Coverage of the population screened, preventive therapy and new cases detected

States	Population Census 1994	Population Screened	%	Preventive Therapy	%	New cases			
						PB	MB	Total	<15
Pohnpei	33,692	22,303	66	20,993	62	127	26	153	50
Chuuk	53,319	41,718	78	40,849	77	112	36	148	61
Yap	11,178	7,669	68	7,571	68	7	3	10	1
Kosrae	7,317	4,176	57	4,103	56	9	2	11	4
<b>Total</b>	<b>105,506</b>	<b>75,866</b>	<b>72</b>	<b>73,516</b>	<b>70</b>	<b>255</b>	<b>67</b>	<b>322</b>	<b>116</b>

Pohnpei from March 1996 to February 1997  
 Chuuk from April 1996 to June 1997  
 Yap from October 1996 to March 1997  
 Kosrae from October 1996 to January 1997

21% 36%

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### Leprosy Elimination Project in FSM: Second round

Coverage of the population screened, preventive therapy and new cases detected

States	Population Census 1994	Population Screened	%	Preventive Therapy	%	First Dose	New cases			
							PB	MB	Total	<15
Pohnpei	33,692	23,844	71	23,323	69	9,102	16	11	26	6
Chuuk	53,319	40,933	77	40,295	76	5,692	37	16	53	26
Yap	11,178	6,951	62	6,893	62	1,579	0	0	0	0
Kosrae	7,317	5,471	75	5,354	73	2,358	0	1	1	0
<b>Total</b>	<b>105,506</b>	<b>77,199</b>	<b>73</b>	<b>75,865</b>	<b>72</b>	<b>18,731</b>	<b>52</b>	<b>28</b>	<b>80</b>	<b>31</b>

Notes:

Population Screened: the population that were examined for signs/symptoms of leprosy

Preventive Therapy: people that received the preventive medications

First Dose: people that received preventive therapy for the first time during the 2nd round, they were missed in the 1st round

New cases: number of new cases detected during the screening of the 2nd round, including the self-reported new cases

PB=Paucibacillary; MB=Multibacillary; <15= less than 15 years

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### Leprosy Elimination Project - FSM

Consolidation and Comparison data of Preventive Therapy: 1st and 2nd round  
 March 1996 to April 1998

States	Population Census 94	Preventive Therapy 1st round	%	Preventive Therapy 2nd round	%	First dose 2nd round	%	% One dose	% Two doses	New cases	
										1st round	2nd round
POHNPEI	33,692	20,993	62	23,119	69	9,102	89	42	153	26	
CHUUK	53,319	40,849	77	40,295	76	5,692	87	65	148	53	
YAP	11,178	7,571	68	6,893	62	1,579	82	48	10	0	
KOSRAE	7,317	4,103	56	5,354	73	2,358	88	41	11	1	
<b>Total</b>	<b>105,506</b>	<b>73,516</b>	<b>70</b>	<b>75,661</b>	<b>72</b>	<b>18,731</b>	<b>87</b>	<b>54</b>	<b>322</b>	<b>80</b>	

Decrease of 75%

Notes:

Column 1: Population census 1994. It is the denominator of all the percentages.

Column 2: number of people that received preventive therapy during the 1st round.

Column 3: number of people that received preventive therapy during the 2nd round.

Column 4: people that received preventive therapy for the first time during the 2nd round, those that were missed in the first round.

Column 5: Percent of people that received at least 1 dose of preventive therapy during 1st and 2nd round: (2+4)/1x100.

Column 6: Percent of people that received 2 doses of preventive therapy: (2+4)/2x100.

New Cases: Number of new cases detected during the 1st and 2nd round, including the self-reported.

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### Leprosy Elimination Project in FSM

Consolidation data - first and second round

Coverage of the population screened, preventive therapy and new cases detected

FSM	Population Census 1994	Population Screened	%	Preventive Therapy	%	NEW CASES			
						PB	MB	Total	<15
1st Round	105,506	75,866	72	73,516	70	255	67	322	116
2nd Round	105,506	77,199	73	75,865	72	52	28	80	31

Decrease of 75%

Total new cases 307 95 402 147  
 24% 37%

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### NEW CASES DETECTED - SPECIAL PROJECT FSM 1999\*\*

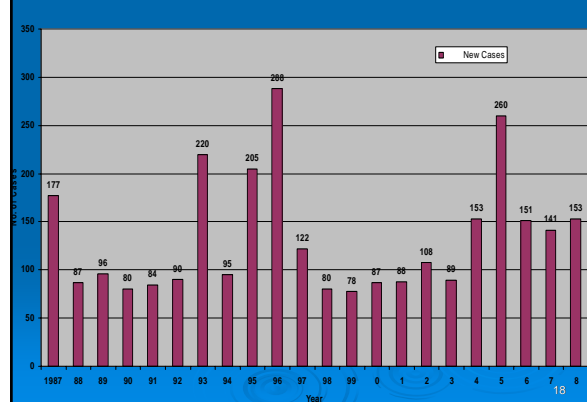
	NEW CASES						PREVENTIVE THERAPY COVERAGE	NEW CASE DETECTION RATE
	TOTAL	MB	%	Child (15 years old)	%	Grade 2 dis.		
FIRST (1996-97)	322	67	21	116	36	0	70 %	27/10,000
SECOND (1997-98)	80	28	35	31	39	0	72 %	11/10,000
THIRD** (1999-2000)	51*	25	49	20	39	0	-	4.6/10,000

\*26 (51%) New Cases Detected Received at Least 1 Dose of Preventive Therapy.  
 In 86 Percent (36) of New Cases the Duration of the Disease is Less Than 1 Year, Remaining 14 Percent (15) is 2-3 YEARS  
 No Available information on classification and age of cases

\*\* 2 year post preventive therapy

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### New Cases Detected FSM 1987-2008



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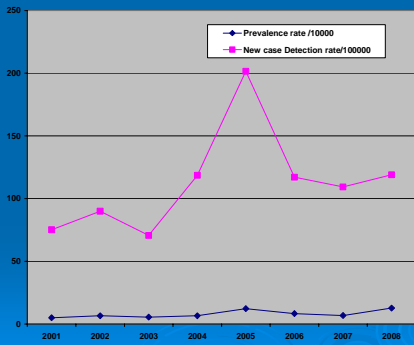
Table Showing Characteristics of New Cases Detected in FSM 2001-2008

Year	Total Number of New Cases Detected	Total number of MB	Percent	Total Number of Children (less than 15 years old)	Percent	Total Number with Grade 2 Disabilities	Percent
2001	88	43	48.9	44	50	0	0
2002	108	57	52.8	44	40.7	8	0.9
2003	89	42	47.2	37	41.6	0	0
2004	153	63	41.2	69	45.1	1	0.65
2005	260	78	30	83	32.3	2	0.78
2006	151	70	46	39	26	1	0.7
2007	141	65	46	38	27	0	0
2008	124	72	58.1	49	40	0	0
<b>TOTAL</b>	<b>1114</b>						

Table Showing Prevalence and New Case Detection Rates in FSM from 2001-2008

Year	Total No of Registered Cases at end of year	Prevalence Rate per 10,000	Total Number of New Cases Detected	New Case Detection Rates per 100,000	Total Number of Cases Cured
2001	58	4.96	88	75.21	
2002	79	6.58	108	90	112
2003	70	5.56	89	70.6	105
2004	85	6.59	153	118.6	120
2005	158	12.25	260	201.6	-
2006	107	8.3	151	117.1	134
2007	87	6.74	141	109.3	-
2008	163	13.7	153	119	-
<b>TOTAL</b>			<b>1143</b>		

Trend of Prevalence and New Case Detection Rates in FSM 2001-2008



SUMMARY TABLE -RMI

Atoll	Date of screening	Total population	Total households	Total population screened (78%)	Total no. of household screened	Total of cases detected			Total Household Contacts given Preventive Therapy	
						Old		New		
						MB	PB			PB
MAJURO	5/27-11/30/98	27083	2376	26224	2376	1	0	8	39	1663
UTRIK	12/12/98	296	55	286	55	0	0	0	0	52
JALUIT	3/13-26/99	1487	172	1353	172	0	0	2	2	32
AILINGLAP LAP	3/19-20/99	973	128	961	128	0	0	0	3	177
EBON	9/8-14/99	757	116	623	116	0	0	0	2	0
AUR	9/24-27/99	438	73	395	73	0	0	1	2	44
NAMU	11/16-21/99	829	118	639	118	0	0	0	0	0
ARNO	1/14-30/00	1123	148	896	148	0	0	0	5	0
MALOELAP	3/9-17/00	875	139	779	139	0	0	3	1	0
UJAE	3/5-7/00	446	54	426	54	0	0	0	0	42
MEJIT	3/17/00	391	58	358	58	0	0	0	1	0
AILUK	3/28/00	293	45	283	45	0	0	0	0	0
LIB	4/4/00	164	17	162	17	0	0	0	0	0
WOTHO	4/7-13/00	128	20	128	20	0	0	0	2	0
MILIJ	4/17-27/00	829	105	776	105	0	0	0	1	28
JABOT	4/22/00	83	15	83	15	0	0	0	0	0

Household Contacts who received Preventive Therapy Who developed Leprosy

Name	C/A	Year received preventive therapy	Date diagnosed/started with Leprosy	Class		WHO disability grading on diagnosis				Date started MDT
				MB	PB	0	1	2	3	
Malton Amua	mv/20	4/3/98	12/7/99	x	x					3/7/01
Kalemon Jimena	MA/52	4/17/98	5/15/00	x	x					11/10/00
Willie Swain	MA/15	4/25/98	12/6/02	x	x					6/9/03
Johnny Lard	mv/7	4/25/98	4/4/03	x	x					4/2/04
Emlyen Clement	U23	7/23/98	2/4/05	x	x					2/19/06
Aime Jorak	mv/47	8/21/98	5/18/99	x	x					4/17/00
Berrie Ralimngito	U26	8/24/98	11/15/07	x	x					6/30/09
Arland Koonu	mv/25	9/2/98	12/12/01	x	x					2/23/03
Lolin Elias	mv/13	9/11/98	8/15/00	x	x					10/25/01
Gabriel Jaik	U10	9/11/98	2/11/99	x	x					8/6/99
Miko Lokobol	U15	11/12/98	10/28/99	x	x					4/21/00
Gabriel Jaik	mv/10	1/4/99	4/5/02	x	x					2/5/03
Randy Baalos	mv/45	1/9/99	1/21/04	x	x					10/6/04
Ruth Baalos	U7	1/9/99	10/6/04	x	x					4/20/05
Milon Jikkolong	mv/6	1/11/99	1/7/05	x	x					2/27/06
Matthew Yamamngito	mv/13	1/11/99	12/6/04	x	x					12/5/05
James Mokuang	mv/13	2/15/99	10/17/00	x	x					10/1/01
Ila Leo Jelo	mv/13	3/29/99	3/20/07	x	x					10/17/07
Ila Noel Nathan	mv/15	3/29/99	9/25/08	x	x					6/22/09
Liben Enoch	U25	8/21/99	12/11/06	x	x					5/20/08

SUMMARY

NEW CASES WITH HISTORY OF PREVENTIVE THERAPY IN MARSHALL ISLAND 1998 – 2008

N= 20  
 14 ( 70%) = MB  
 0 = Grade 2 Disability  
 9 (45%) = Children less than 15 years old  
 Duration from receiving Preventive Therapy and diagnosis:  
 Range = 1- 9 years  
 1 year = 5 patients      5 years = 4      9 years = 2  
 2 years = 2                6 years = 1  
 3 years = 2                7 years = 2  
 4 years = 1                8 years = 1

## 5. CONCLUSIONS

- That population-based prophylaxis was believed to be associated with the reduction in leprosy incidence (NCDR) in the first 3 years after implementation. However the decrease in the number of new cases detected between the first and second and third screening and administration of preventive therapy maybe attributed to the intensified case detection activities per se more than the effect of chemo intervention while the reduction in prevalence was mainly because of the reduction in the duration of MB regimen to 12 months.
- That longer follow-up of the population could tell more about the true effect on new case detected annually and the longer term effect of preventive therapy (chemoprophylaxis), however there was a loss opportunity due to poor record management , follow up and documentation
- That there is a continuous increase or stable number of new cases detected annually up to 2008, almost similar with the pre-chemo era

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## Continuation

- That the characteristics of the new cases in terms of MB and children proportions is not changing as before the preventive therapy period
- The grade 2 disability proportion among new cases detected have been very consistent ( very minimal visible grade 2)
- That although early diagnosis (diagnosis of pre-clinical infection) and treatment is the single important intervention that can be expected to impact on the transmission of *M. leprae* in the population, the FSM experience did not show significant reduction or impact on transmission
- The possibility of household contacts who received preventive therapy developing re-infection
- That the preventive therapy may have just prolonged the incubation or progression from sub-clinical disease to full blown leprosy, although more studies is needed

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## 6. RECOMMENDATIONS

To continue further the retrospective analysis /study of the new cases detected and healthy household contacts in FSM and RMI in relation to the preventive therapy received to further determine the impact of such intervention in the prevention of leprosy in the population.

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## 7. ACKNOWLEDGEMENT

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