Eric
SMA

Ichimori, Dr Kazuyo (SP)

From: Eric Ottesen [eottese@sph.emory.edu]
Sent: Tuesday, November 02, 2004 09:44 AM
To: Palmer, Dr Kevin (WPRO)
Cc: Mina, Ms Janet (WPRO); Ichimori, Dr Kazuyo (SP); Ichimori, Dr Kazuyo (SP)
Subject: Re: Samoa

Samoa LF
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Dear Kevin,

Attached please find the consultation report from my visit to Samoa in August/September. Sorry that it didn't get to you sooner, but there is, in any case, nothing in it that needs attention before the Samoan survey now underway is complete.

It was a very informative and interesting visit with the team which has really done a very nice job to date. I certainly look forward to following along with them as the additional data from Upolu comes in over the next onths. Please let me know if I should do anything further with the report or whether you will handle everything for me.

With very best regards,

-Eric

----- Original Message -----
From: <PALMERK@wpro.who.int>
To: <eottese@sph.emory.edu>
Cc: <MINAJ@wpro.who.int>
Sent: Sunday, July 18, 2004 7:10 PM
Subject: RE: Samoa

Eric

After the meeting is fine with me. I will make sure that my office knows this and hasn't started the paperwork based on you being there before the meeting.

Hope that you have a good vacation.

Kevin

-----Original Message-----
From: Eric Ottesen [mailto:eottese@sph.emory.edu]
Sent: 17 July 2004 09:37
To: Palmer, Dr Kevin (WPRO)
Subject: Samoa

Dear Kevin,

Good to speak with you this morning. Thanks for the call and the inside-update!

I really think that it will be necessary to do the consultation after the PacELF
mtg as planned, rather than before. There are just too many things to do here
first. I hope that is alright with you; I know that Kazuyo at least is thinking
along those lines anyway.

I look forward to being in touch again after we return to the office(s) by 2 August.

Best,

-Eric

Samoa LF Elimination Program: Evaluation of Assessment Activities after Five Rounds of PacELF-Coordinated MDAs (9/04)

Eric A. Ottesen, M.D.

1. Process

1.1 Terms of reference for this review were the following:

1) To observe ongoing LF survey and provide feedback on procedures used and results to date
2) To review results of previous surveys and reports from the most recent 5 MDAs
3) To recommend future activities for surveillance, morbidity reduction and mosquito control

1.2 Meetings were held on 30 August 2004 with the WR (Samoa), RA (WPRO), Coordinator (PacELF), CEO (Samoa Ministry of Health) and Assistant CEO for Public Health (Samoa Ministry of Health) to ensure that all points of concern would be addressed during the consultation.

1.3 Past data from the extensive records of the Ministry of Health and WHO (Samoa) was reviewed along with current data from the first 6 (of 16 total) health districts ('sub-IUs') that have been surveyed one year following the fifth annual Samoan MDA.

1.4 The technical approach to the survey was reviewed in detail with the filariasis team, team leader and the WHO/MOH liaison.

1.5 A one-day visit to the island of Savaii, where the 6 surveyed sub-IUs lie, was made both to see the village environment where sampling took place and to follow up some of the ICT positive or MF positive individuals identified during that survey.

1.6 An update on clinical advances and management of LF disease was presented to the physicians and surgeons at the hospital in Apia during their weekly conference (1 September 2004). A lively exchange followed and it was clear that these physicians, with their experience in LF management, were interested in both updating and contributing their skills to the program.

1.7 Discussion of the important observations and tentative recommendations (i.e., 'de-briefing') was held with the WR (Samoa) and with the Assistant CEO for Public Health (MOH, Samoa) on 3 September 2004.

2. Past accomplishments of the LF-control and LF-elimination programs in Samoa

2.1 The long, successful history of intermittent and varied MDAs dating back to the 1960s has been extraordinarily well documented by the Ministry of Health and a number of WHO consultants and staff members working in Samoa over the years, most recently and most notably Dr. E. Kimura and Dr. Kazuyo Ichimori. Indeed, there is perhaps no better long-term record of individual and population treatment responses in any active MDA program today. Much analysis of the pre-PacELF data from Samoa has already been carried out; a dramatic decrease in microfilaraemia rates has been evident between the 1960s and the final, pre-PacELF survey in 1998 (~20% initial MF prevalence decreasing to just over 1% in 1998).

2.2 The first PacELF MDA took place in 1999. Baseline surveys were done principally by convenience sampling in 12 villages (totaling ~2600 population) by ICT testing and in 6 villages by MF assessment using the '3-line' method (approximately 60 mcl of blood on a slide). Average ICT positivity at baseline was 7.4%, and average MF rate was 1.5%. Small scale (2-3 villages) sampling for ICT and MF was carried out in some of these villages after the first and second MDAs, and larger assessments after the third and fourth MDAs. A clear downward trend of ICT rates (to 1.6%) and MF rates (to 0.24%) was seen, though the sampling techniques utilized do not permit perfectly rigorous statistical analysis of the serial studies.

2.3 The excellent impact of the MDA on MF and ICT rates reflects program coverage of the population that has been as high as 90+ % in 1999, but as low as 60% or below in other years. Because recording of population coverage was by use of yearly-completed-and-returned 'registers', all coverage estimates are based on 'reported coverage'; no specific coverage surveys to document the level of MDA coverage were performed independently.

3. Current evaluation being undertaken by the Samoa LF Elimination Program (C-survey to identify residual infection)

3.1 An extraordinary amount of very good data has been gathered from villages and individuals during the five rounds of MDA conducted by Samoa according to the PacELF guidelines. Reported coverage rates have generally been good and all measures of impact appeared quite satisfactory through the post-fourth MDA assessment. It was, therefore, appropriate to carry out a statistically valid sampling of the population following the fifth MDA round to look for evidence of residual infection, again in accord with the PacELF guidelines.

3.2 The purpose of the C-survey (outlined in the PacELF manual, PacMAN) is not to determine whether or not transmission has been interrupted [that is done by the D-survey] but to determine whether "all areas are less than 1% prevalence" in terms of antigenaemia rates.

3.3 The Samoa team converted the PacMan guidelines into an operational strategy based on sampling 16 'sub-IUs' or health districts. The population of the country was divided by 16, and the number of individuals required to be sampled "to detect with 95% confidence whether the prevalence is 1% +/- 1%" (Table, page 12 in PacMan) was determined to be 733 (rounded to 800) in each sub-IU (total of 12,800 individuals in the 16 sub-IUs). With a stratified cluster survey strategy, clusters (villages) within the sub-IU were randomly selected. If the population of the selected village (determined by earlier national census data) was < 200, all individuals in that village were sampled. If the size of the village was greater than 200, a random selection of houses was made and all household members *5 years and above* were sampled until the number 200 was reached. Random sampling of the houses was performed either by use of a list of all village houses or by sampling all houses along a straight line determined by spinning a bottle from a randomly selected point in the village.

Comment:

- *This sampling strategy (as outlined in the PacMan) has been discussed and debated at length among consultants in the Atlanta M&E subgroup and at WHO/HQ. The extensive C-survey in Samoa has given extremely useful and detailed information both on the situation in Samoa and on the survey process itself which will be valuable for other endemic countries. For example, consideration might be given to the feasibility of decreasing the number of individuals sampled in each village from 200 to 100 and increasing the number of villages (clusters) being sampled. Further, use of the 'sector sampling' method of household selection in a village is not recommended unless all sectors of the villages in each sub-IU could be determined in advance* and *probability proportionate random sampling of these sectors could be carried out.*

3.4 ICT findings from the 6 health districts (sub-IUs) of Savaii that were sample showed

- zero ICT-positivity in 1 district
- a level of ICT positivity below 1% (0.5%) in 1 district
- levels of ICT positivity greater then 1% (1.2%, 1.3%, 1.3%, and 1.5%) in the remaining 4 districts
- MF rates between 0% and 0.5% in the districts
- 13 of the 14 MF positive individuals being men, and all over 23 years of age (range 23-74; median 36).
- 24 of the 30 ICT-positives who were MF-negative being men, with only 2 being below age 19 (children 5 & 6 years old)

Comment:

- *There is minimal evidence from these findings for ongoing LF transmission* (i.e., *ICT positivity in only 2 young children and very low levels of MF and ICT positivity in the population). While no children under 5 years of age were included in the survey, very large numbers of boys and girls age 5 to 15 were included, and all but the two mentioned above were negative for MF and ICT.*

- *If any transmission actually persists, it is almost certainly the adult male population that is responsible because of their persistent (albeit low-level) microfilaraemia. Indeed, more than 1% of all men 21-50 years old were* microfilaraemic, *compared to only one woman who was MF positive (age 35). Of the small number of men over 60 years of age who were sampled, 3 had low-level microfilaraemia, but clearly the principal source of microfilaraemia, in the community is men between 21 & 50 years of age.*

3.5 A visit to Savaii permitted follow-up of 3 types of individuals of interest because of the findings made during the initial survey;

- the two ICT positive children (to confirm their positive status and to identify any specific epidemiologic exposure to infection they might have had)
- households of the most highly MF positive men (to look for indication by ICT and blood serology that they had 'exposed' those around them to infection)
- ICT positive/ MF negative individuals (to confirm their ICT positive status)

Preliminary findings from these assessments indicated that

- One of the 2 ICT positive children had such a faintly positive 're-test' that confirmation of the positivity by blood serology must be done before her LF status is defined; all around her in the household (3 adults, 3 children) are ICT negative; serologic studies are pending.
- The second ICT positive child lived with an ICT positive/MF negative uncle, and when the father was tested for the first time [he was absent from the home during the survey], he was strongly ICT positive [his MF status was subsequently shown to be positive]; all other household members were ICT negative, but filter-paper blood specimens were collected to look for potential 'exposure antibody'.
- Three other MF-positive men and 1 MF+ woman had households entirely negative for ICT, but filter-paper blood specimens were collected from the household members to look for 'exposure antibody'.
- One MF-positive man who had been tested while living temporarily in one of the sampled villages had his 'real' household screened for ICT positivity; a 65 y.o. man was found to be ICT positive (and subsequently MF positive), and a 6 y.o. boy in the household was also identified as being ICT positive [MF status subsequently defined as negative]; the serologic ('exposure antibody') status of this household is still pending.
- The 1 other ICT-positive/MF-negative individual who was 'retested' was again found to be ICT-positive

4. Next steps for the Samoa MDA programme to eliminate LF

4.1 MDAs: If the assessment on Upolu yields the same generalizations as that from Savaii, it is clear that the MDAs have been highly successful in all segments of the population except the adult males, who still pose a risk to themselves and to the rest of

Samoa. Interestingly, this same segment of the population has shown the same dominance of MF positivity through essentially all the years that such documentation has existed since the 1960s. Earlier, however, other segments of the population (children, women) also showed MF positivity, but now the 'amplitude' of the infection throughout the population has decreased so dramatically that it is 'only' the 21-50 y.o.male population that remains MF-positive, and, even then, with very low MF densities. Therefore,

- ***It is recommended*** that a strategy be developed to reach this group of men for an additional round of treatment to reduce to near zero others' potential exposure to infective mosquitoes; whether women and children are treated during the male-targeted 'MDA' would be optional.

4.2 D-survey: The C-survey design does not directly address the question of whether transmission is ongoing; rather that is the purpose of the D-survey. The D-survey involves testing all 6 year-old children in the country and is scheduled for 2006-7.

- ***It is recommended*** that the D-survey be untaken as scheduled, depending on the final results of the C-survey. If it were of interest to preview potential results of the D-survey, several mini-surveys of approximately 200 randomly selected children could be conducted in advance of the scheduled D-survey to test for serologic evidence of exposure to LF.

4.3 Surveillance: Surveillance guidelines (for the period after the D-survey) have not yet been formulated by PacELF or GPELF. The suggestion of the sub-group considering this issue at the recent PacELF meeting was to monitor easily-accessed children (i.e., those coming to hospital or clinics) for ICT positivity or blood serology ('exposure antibody' when the test becomes available) as an indicator of ongoing transmission. Therefore,

- ***It is recommended*** that planning for such surveillance be undertaken (even potentially testing its feasibility between the C and D surveys), but to delay firm implementation plans until formal guidelines and recommendations are available From PacELF and GPELF.

4.4 Vector Control: The value of vector control for interrupting the transmission of LF in Samoa has not been defined quantitatively. However, vector control *should* be of value, and therefore

- ***It is recommended*** that efforts to encourage the institution of vector control (especially in coordination with American Samoa where CDC-sponsored activities are underway) should be a priority.

4.5 Morbidity Management: The seminar with the medical community at the hospital in Upolu indicated a great deal of awareness, experience and concern for the problems of LF *disease* in Samoa. Currently, there are no agreed 'best-practice'

standards available for LF disease management and no cataloguing of patients with such problems. Because, however, there is an excellent network of community nurses fully in touch with the entire population, it should be possible to acquire this information through their support. Therefore,

- ***It is recommended*** that at least one 'center of excellence' or focus of expertise in managing lymphoedema and elephantiasis be established and, in parallel, a similar center of excellence for the performance of hydrocoele surgery.
- ***It is recommended*** that through these disease management focal points information and educational materials be distributed to the rest of the practicing medical community either for their own patient-care use or for referral of patients to the identified 'center of excellence'.
- ***It is recommended*** that the community nurses be approached and engaged in an effort to gather systematically as much information about the prevalence of LF disease in Samoa as possible and then to serve as a link between the patients and others in the medical community sharing responsibility for their care.

5. Manpower and training

5.1 The current manpower situation for the Samoan LF program is not strong. Though the team performs exceptionally well and works very hard, the number of Ministry of Health employees assigned full-time to the LF program is minimal. Support from WHO and the Japanese Overseas Cooperation Volunteer organization has been essential to bolster the efforts of the Ministry personnel assigned (mostly temporarily) to this project. Therefore,

- ***It is recommended*** that additional staff be assigned full-time to the Filariasis unit for an anticipated 3 years of intensive follow up survey work that will be essential to the success of the Samoan and PacELF efforts.

5.2 Recognizing that training is essential not only for the wise management of MDA and post-MDA monitoring and evaluation activities but also for the development of enhanced morbidity management skills,

- ***It is recommended*** that training in the optimal approaches to lympheodema/elephantiasis management should be made available to both a responsible clinician and community nurse who would coordinate best-practice approaches to morbidity management in Samoa (and perhaps elsewhere for other PacELF countries).
- ***It is recommended*** that a general surgeon be afforded the opportunity for training in newer approaches to surgery for hydrocoele caused by lymphatic filariasis; this surgeon would then provide a 'center of excellence' for training colleagues in Samoa (and perhaps elsewhere in the PacELF countries).
- ***It is recommended*** that epidemiology training opportunities should be made available to one or two MOH staff assigned to the Filariasis unit. Such training

would promote the proper design and implementation of the monitoring, evaluation and surveillance components of the Samoan LF elimination program as well as strengthen the capacity of the team to assess program design and implementation.

6. Ministry of Health policy statement on LF

In order to facilitate the Ministry of Health's interactions within its own national government as well as with international agencies and organizations, policy statements on various diseases important to Samoa have been developed. Because, as emphasized by the Assistant CEO for Public Health, LF is important to Samoa, it too would benefit from a policy statement by the Ministry of Health. As a similar need is likely relevant to other countries in PacELF as well,

- ***It is recommended*** that PacELF assist Samoa in developing a policy statement on LF consistent with the needs of the Samoa Ministry of Health.
- ***It is recommended*** that in this policy statement the issue of coordinating LF activities and policies with American Samoa be addressed, and especially the migration of individuals back and forth between Samoa and American Samoa.

7. Opportunities for programme-oriented research

Samoa has long been a leader in LF programme implementation, and its experience continues to provide valuable lessons for the PacELF countries and for other countries in GPELF as well. Indeed, many research opportunities present themselves in Samoa, and all involved with the programme should be encouraged to support their undertaking. Therefore,

- It is recommended that the Ministry of Health and WHO encourage the development, funding and implementation of operational research issues related to the LF elimination programme; these could include
    1. a comparative study of surgical approaches to hydrocoele,
    2. long-term clinical follow-up of previously microfilaraemic individuals (possible because of the extraordinarily extensive database on the LF program extending back over decades),
    3. utilization of new serologic tests to identify exposure (i.e., *before* infection) to LF as a more sensitive indicator of transmission than ICT testing
    4. optimal community implementation of a morbidity management effort for those with lymphoedema
    5. epidemiologic analysis of changing trends of LF prevalence under pressure of repeated MDAs,
    6. vector management techniques including the use of impregnated cloth to decrease man-vector contact,

7. new strategies for source-reduction of the *Aedes species* responsible for LF transmission in Samoa

8. Acknowledgements

Sincere appreciation for the assistance and warm hospitality afforded during this consultation is due to the following individuals:

- CEO, MOH Samoa – Dr. Eti Enosa
- Asst. CEO for Public Health, MOH Samoa – Dr. M. Nuualofa Tuuau-Potoi
- Filariasis Team Members, MOH Samoa
    - Officer in-charge – Siatua Loau
    - Environment Officer – Iokapeta Setu
    - Technician – Lalomilo Maiava
    - Trainee – Joan Asotasi
    - Trainee – Ualesi Maee
    - Japan Overseas Cooperation Volunteer – Ms. Kazumi Nakamoto
- WHO Representative, Samoa – Dr. Giovanni Deodato
- WHO Scientist, WPRO – Dr. Kazuyo Ichimori
- WHO Project Coordinator – Ms. Fuatai Maiava
- WHO Advisor- Dr. Asaua Faasino

Eric A. Ottesen, M.D.
1 November 2004