The status of optometry in Oceania

William A. Knutson
Pacific University

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The status of optometry in Oceania

Abstract
The question of whom gives what type of care in the South Pacific Islands (Oceania) is a largely unanswered question. This thesis has investigated this question by surveying residents, doctors of the area, and various agencies. It has been found that the problems of money, distance, lack of desire for care, and lack of practitioners has resulted in minimal care. Available care is supplied at the primary level by medical officers trained for two years; and at the secondary level by traveling teams of health care providers. Tertiary care is practically non-existent.

Degree Type
Thesis

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The Status Of Optometry In Oceania

by

William A. Knutson

In Partial Completion of the Doctorate of Optometry

College of Optometry

Pacific University

Advisor - Larry R. Clausen O.D.
Assistant Dean of Optometry

February 6, 1981
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ACKNOWLEDGEMENT

Great thanks go to Dr. Larry R. Clausen, O.D., of Pacific University for his selfless advisement toward the completion of this thesis. Also, of the knowledge and labors of Cynthia Gibson, Dr. David Savage, O.D., of the University of Washington, Paula Strother from Brigham Young University, Hawaii, Major Opland, of Tripler Army Medical Center, Hawaii, and many others who devoted their time and energy.
Abstract

The question of whom gives what type of care in the South Pacific Islands (Oceania) is a largely unanswered question. This thesis has investigated this question by surveying residents, doctors of the area, and various agencies. It has been found that the problems of money, distance, lack of desire for care, and lack of practitioners has resulted in minimal care. Available care is supplied at the primary level by medical officers trained for two years; and at the secondary level by traveling teams of health care providers. Tertiary care is practically non-existant.
PROBLEM STATEMENT

The status of eye care in the Pacific Islands is largely unknown. The goal of this research is to determine to what extent, what quantity, what quality, and by what mode eye care is being provided in these islands. Furthermore, it is hoped that some identification of a viable role for optometry can be made in this area of the world.
BACKGROUND

Health Needs

To understand the future of optometry and how optometric care is delivered today in Oceania (also called the Pacific Islands), a more general understanding must be had of the health care systems, cultures, and socio-economic conditions. Especially important is the change that is occurring in most of the islands of the Pacific Ocean. Prior to the cultural overthrow of the past two centuries, most of the islands had self-sufficient peoples living a subsistence pattern of life. This was necessary because the islands are very fragile and have very low capacity to sustain humans. In fact, many islands don't have fresh water and are considered uninhabitable. As alien cultures invaded, "a social breakdown occurred in community and family living patterns and in individual behavior".¹

In Micronesia, an area with health care provided by the United States, the population of 105,000 (1975 estimate)², is served by 56 medical and dental officers. These providers reach 78% of the population. There are no known private practitioners.³

Also speaking of Micronesia, is Dr. D.M. Reed, M.D., current Chief
of Epidemiology Branch of the National Institute of Child Health and Human Development, saying of Guam, "Now the fertilizer runoff from the lovely green lawns of the tourist hotels streams down to the lagoon where it feeds the algae blooming on the dead reefs that the tourists came to explore."

He also states, "...people (moving ) into the cities have created extensive slum areas... characterized by crowding, lack of fresh water, and accumulation of rubbish and raw sewage; in New Guinea, for example, over 10,000 people live in this kind of squatter settlement. More than 40% of the urban population of Tahiti has no sewage system or refuse collection."4

These unsanitary living conditions are reported to produce diarrheal diseases, hepatitis, tuberculosis, and respiratory diseases which cause a major portion of the hospitalizations in these areas. A growing concern is the switch in diets of the people, from mainly carbohydrates, to diets greater in fats and proteins, which is associated with an increase in diabetes and cardiovascular disease. Modernization has made automobile and industrial accidents leading causes of mortality and morbidity.

In conclusion, Dr. Reed points out that bigger and better hospitals and more doctors is not a solution, but rather a whole community action, guided by a substantially different philosophy, is needed.
Economy

Hawaii, New Zealand, and Nauru have well developed economies. Most of the people of the other islands earn little or no money. What little money is made comes from tourism, agriculture, and mining. The most important crops are copra (coconut meat), bananas, and sugar. There are only a few islands where mining is important.

Recent History

By the late 1800's the islands had been colonized by the various powers in the world. Germany maintained control of New Guinea, Western Samoa, and parts of Nauru. The United States had Hawaii and American Samoa. France controlled New Caledonia and French Polynesia as well as sharing control of New Hebrides with Britain. Britain held large areas including Fiji, the Gilbert Islands, Papua, the southern Solomons, Tonga and Tuvalu.

After two world wars and a long struggle towards independence, most of the South Pacific islands have achieved self rule. However, the language, religion, and cultures still reflect the attributes of the colonizing country.
Island Type

The islands of the Pacific are divided into two main types, high and low islands. The high islands are generally larger and volcanic in origin. They include the main islands of such groups as Fiji, Hawaii, the Marianas, the New Hebrides, Samoa, and the Solomons.

The low islands are built up from the growth of coral and many of these islands are only a meter above sea level. There are usually a number of low islands surrounding the high islands. However, they also exist by themselves forming such chains as the Gilbert, Marshall, Phoenix, Tuamotu, and Tuvalu groups. Geologic lifting of the reefs gives larger islands such as Nauru and Niue.

Climate

The islands of the South Pacific are in the tropics, so the temperature seldom gets below 21°C (70°F) or above 27°C (80°F). The amount of rainfall varies from island to island. The higher islands tend to get much more rainfall than the atolls. In the islands of Micronesia the wet season lasts from May to December, whereas, in Polynesia and Melanesia the wet seasons extends from December to March.
Geography

Oceania, often referred to as the South Pacific, is a general term describing the 20-30 thousand islands between the America's and Asia, excluding Australia, the Aleutians and the Japanese Archipelago. This area is divided into Melanesia, Polynesia, and Micronesia (see Appendix A). Melanesia is given the name due to the tendency of the populations of the area to be darker pigmented.

Micronesia is given this name due to the very small size of land masses scattered throughout a very large area. Micronesia includes the Gilbert Islands (British dependencies), Guam and Wake (U.S. possessions), Nauru (independent), and the U.S. Trust Territory of the Pacific Islands. The Trust Territory consists of the Caroline, Marshall and Marianna Islands.

Polynesia, literally meaning "many islands", consists of the Hawaiian, Line, Phoenix, Marquesas, Samoan, Tonga, Cook, Tahiti, Tuamotu, New Zealand and other island groups.5
METHODS

The methods used to arrive at the information needed for this thesis included personal interviews, correspondence, and questionnaires.

The persons interviewed were people whom may possibly have had knowledge of the area in question. The interviews were open-ended, that is leaving the interview free-flowing to obtain a broader base of information concerning the particular situation. The people interviewed included doctors having served the areas, residents, and administrators of various health agencies.

The questionnaires were administered primarily to two groups, students of Brigham Young University (BYU), and specific patients at Tripler Army Medical Center (TAMC). BYU at Laie, Hawaii, has a number of clubs representing students from various islands. It was at these club meetings that the questionnaires were given out. Patients from all over the Pacific are shipped to TAMC for treatment, during which time the family is often housed in the officers quarters. It was at these quarters that the questionnaires were administered.

Correspondence was addressed to health agencies, islands' officials,
and to others to whom a more personal appeal could not be made. Some examples of the agencies queried were:

- International Federation of the Blind
- World Medical Relief
- World Rehabilitation Fund, Inc.
- International Eye Foundation
- International Association for the Prevention of Blindness
- World Council for the Welfare of the Blind
- South Pacific Commission (Health Division)
- American Foundation for Overseas Blind Inc.
- World Health Organization
- International Federation of Ophthalmological Societies

An analysis of the data derived from these three techniques consisted of comparing the manpower to population ratios, the norms for the United States. This was compared further to an estimation of need ratio. Also qualitative information was compared to existing literature.
RESULTS

Interviews

Fifteen interviews were conducted and a summary of pertinent information follows. The detail of the interviews can be found in appendixes B through M. The following are the number and types of interviewees:

- 4 Residents of various islands
- 3 Visiting optometrists
- 2 Visiting ophthalmologists
- 1 Optical sales representative
- 1 Head of laboratories
- 1 Head of medical statistics
- 1 Head of statistics and research
- 1 MEDEX (physician's assistant)
- 1 Former Secretary General of South Pacific Commission

These interviews had some specific questions such as, "Do you know of any practitioners in the South Pacific?" However, for the most part the interviews were left open-ended to elicit a broader expression of these persons views and experiences.

The letters behind each statement indicates the appendix in which the statement is made.

- The main eye diseases are cataracts, presbyopia, trachoma, angle closure, glaucoma, and diabetic retinopathy. B,E
- Hyperopia is the most frequent refractive anomaly (approx. 98%). B,E,K
- On most islands vision care is given free or for a token fee. M,
- The largest problem is the expense of the glasses. B,M,
- "Island fever"-a social and geographic isolation seems to be an impediment in retaining foreign practitioners. B,C,
- Casual attitude toward eye care unless disease is present. D,L,
- Antagonistic attitude toward glasses; either for "addictive" or cosmetic effects. B,J,
- Optometrist is considered as refractionist on American Samoa. B,
- Vision training doesn't appear in demand, however, low vision care would be useful. E,
- There is more health care given in Polynesia due to sex roles of their cultures. H,
- Diabetes and diabetic retinopathy is a serious and growing problem, especially in Micronesia. F,G,I,J,
- Eye care is virtually non-existent and the future will probably be status quo. C,
Table 1 identifies the number of practitioners that are reported to be functioning in the various areas.

<table>
<thead>
<tr>
<th>AREA</th>
<th>PRACTITIONERS</th>
<th>POPULATION</th>
<th>RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Samoa</td>
<td>Formerly one ophthalmologist and one optometrist</td>
<td>36,000</td>
<td>18,000/1</td>
</tr>
<tr>
<td></td>
<td>Presently, none</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fiji</td>
<td>Five ophthalmologists, four optometrists, has own medical school</td>
<td>590,000</td>
<td>65,000/1(6)</td>
</tr>
<tr>
<td>French Polynesia</td>
<td>French physicians</td>
<td>142,000</td>
<td></td>
</tr>
<tr>
<td>Guam</td>
<td>Has optical clinics</td>
<td>107,000</td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td>75 ophthalmologists, 220 optometrists</td>
<td>3,189,000</td>
<td>10,810/1</td>
</tr>
<tr>
<td>Trust Territories of the Pacific Islands</td>
<td>One optometrist, two MEDEX, ten day visits by one optometrist, two ophthalmologists</td>
<td>114,973</td>
<td>32,849/1</td>
</tr>
<tr>
<td>Solomon Islands</td>
<td>Annual visits from Melbourne</td>
<td>209,000</td>
<td></td>
</tr>
<tr>
<td>Tonga</td>
<td>Ophthalmology resident, three optometrists</td>
<td>115,000</td>
<td>29,000/1</td>
</tr>
</tbody>
</table>


The questions below were administered to 23 Micronesians and 40 Polynesians. The actual number answering each part and resultant percentages are depicted.

The mean age of each group is at the top, and U.S. government figures on the right.

<table>
<thead>
<tr>
<th>Question</th>
<th>Micronesia</th>
<th>Polynesia</th>
<th>Combined</th>
<th>Age 36 %</th>
<th>Age 27 %</th>
<th>Age 39 %</th>
<th>Age 29 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has your vision ever been tested other than reading letters from an eye chart?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>9= 41%</td>
<td>16= 62%</td>
<td>25= 41%</td>
<td>91%</td>
<td>93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>12= 59%</td>
<td>22= 58%</td>
<td>34= 59%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>By whom?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ophthalmologist (eye surgeon)</td>
<td>4= 36%</td>
<td>7= 39%</td>
<td>11= 39%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>optometrist (non-surgical eye doctor)</td>
<td>3= 27%</td>
<td>4= 22%</td>
<td>7= 24%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>med x (physician's assistant)</td>
<td>4= 36%</td>
<td>7= 39%</td>
<td>11= 39%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Have you ever worn...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glasses</td>
<td>10= 43%</td>
<td>4= 10%</td>
<td>14= 23%</td>
<td>56%</td>
<td>48%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contact lenses</td>
<td>1= 4%</td>
<td>0= 0%</td>
<td>1= 2%</td>
<td>4%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>glasses and contact lenses</td>
<td>0= 0%</td>
<td>1= 3%</td>
<td>1= 2%</td>
<td>2%</td>
<td>.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>12= 53%</td>
<td>34= 87%</td>
<td>46= 74%</td>
<td>41%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. When did you wear them? You may check more than one.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>all the time</td>
<td>4= 40%</td>
<td>0= 0%</td>
<td>4= 33%</td>
<td>44%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for reading or close work</td>
<td>5= 50%</td>
<td>1= 50%</td>
<td>6= 50%</td>
<td>85%</td>
<td>83%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>for distance vision</td>
<td>0= 0%</td>
<td>1= 50%</td>
<td>1= 8%</td>
<td>57%</td>
<td>65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>other sunglasses</td>
<td>1= 0%</td>
<td>0= 0%</td>
<td>1= 8%</td>
<td>51%</td>
<td>58%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. If you've never received a complete vision exam, what are the reasons?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no need for exam</td>
<td>5= 38%</td>
<td>16= 47%</td>
<td>11= 45%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no available care at home</td>
<td>5= 38%</td>
<td>1= 3%</td>
<td>6= 13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>high cost of eye examinations and glasses</td>
<td>1= 8%</td>
<td>5= 15%</td>
<td>6= 13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don't desire to wear glasses</td>
<td>2= 15%</td>
<td>4= 12%</td>
<td>6= 13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>don't know</td>
<td>0= 0%</td>
<td>8= 24%</td>
<td>8= 17%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. What group do you feel would best be able to provide vision examinations?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>government</td>
<td>4= 27%</td>
<td>7= 22%</td>
<td>11= 23%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>private practitioners</td>
<td>4= 27%</td>
<td>3= 9%</td>
<td>7= 15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hospitals</td>
<td>5= 40%</td>
<td>16= 50%</td>
<td>21= 45%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>private pre-paid total health care program volunteers (e.g. peace corps)</td>
<td>2= 13%</td>
<td>5= 16%</td>
<td>7= 15%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Do any of your friends have an eye that turns in or out?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>6= 35%</td>
<td>8= 22%</td>
<td>14= 30%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>11= 65%</td>
<td>29= 78%</td>
<td>40= 70%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Has anything been done to correct this?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>3= 23%</td>
<td>3= 10%</td>
<td>6= 14%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>no</td>
<td>10= 77%</td>
<td>26= 90%</td>
<td>36= 86%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If yes, what?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgery</td>
<td>2= 66%</td>
<td>1= 33%</td>
<td>3= 50%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glasses</td>
<td>1= 33%</td>
<td>1= 33%</td>
<td>2= 33%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>eye training</td>
<td>0= 0%</td>
<td>1= 33%</td>
<td>1= 17%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESULTS

Correspondence

Of the 39 letters of inquiry, only seven were answered. Four of these were referrals to others and three responses contained some useful data. The first response from the International Federation of Ophthalmological Societies, stated they had nobody functioning in the South Pacific. The second response came from Jonathan S. Goldman O.D., M.B.A., Secretary of the Vision Care Section of the American Public Health Association. He reported that there had been a journal advertisement wanting an optometrist in American Samoa. The third response from Region IX of the Public Health Service, provided a list of addresses for the Directors of Health in the Pacific basin territories and a statement concerning the total lack of vision care providers. In conclusion, the method of correspondence was of minimal use in gathering data.
Eye Care Provider Statistics

Optometry should be involved in any developing country and as pointed out by Edwin C. Marshall O.D., "Optometry is a relatively young profession and is emerging as one of the world's major health disciplines. As part of its development and growth, optometry should seek to play a vital role in the socio-economic emergence of third world countries, especially with respect to the enhancement of the visual welfare and the subsequent productivity of its peoples." Optometry is playing a vital role in Oceania. From the questionnaire results (page 15) it appears that optometrists and ophthalmologists practice in approximately the same numbers. This is supported by statistics reported in Public Health and Community Optometry which states there are 5 ophthalmologists, 4 optometrists, and no dispensing opticians in Fiji. This calculates to 1 practitioner to 65,000 people. In contrast, the Philippines, not a part of Oceania, reports having 260 ophthalmologists, 1,700 optometrists, and 1,000 dispensing opticians. This results in a ratio of 1/15,000. This shows that optometry plays a very vital role in the Philippines.

An analysis of the population and number of eye care practitioners in Oceania indicates that the number of practitioners is inadequate. The U.S. average is one optometrist per 4,132 (need based ratio), and 1/7,143 by professional judgement ratio. For ophthalmologists the ratio is 1/20,000 by professional judgement. For comparison an average was computed for American Samoa, Fiji, New Zealand, the
Eye Care Provider Statistics

Trust Territories and Tonga gives a ratio of 1/31,100 for the whole area. This is inadequate by U.S. standards.

There are confounding variables to be considered in the above analysis. One of these is the problem of attempting to determine accurately the number of practitioners. An example of this problem is illustrated by a report in Oversights on Territories and Insular Affairs. This report mentions an optometrist who also functions as the pathologist and psychiatrist. It must be wondered if the "optometrist" was a misprint for ophthalmologist. This same report mentions an oculist in private practice in the Marianas Islands. Another variable to be considered is the very low incidence of myopia in Oceania. This affects the actual need for vision care. Major Opland (appendix E) reports that there were only a few myopes in the 175 patients examined. A study done by Crawford and Hammers showed that native Hawaiians had myopia at a the rate of 3%.\textsuperscript{12} Whereas a report by Hirsh in 1964 stated that 10-15\% of United States adults exhibited simple myopia over -1.00 diopter.\textsuperscript{13} Despite the difference in myopia between Oceania and the U.S., there is not enough of a difference to explain the low level of care in Oceania.
DISCUSSION

Questionnaires

Casual observation of the questionnaire results (page 15) yields self-explanatory conclusions for the most part. One result that is not very self-explanatory is why a much larger proportion of Micronesians wear glasses than Polynesians. One difference may be the age difference between the two sample groups. The Micronesians averaged 36, whereas the Polynesians averaged 27 years of age. From the graph below, published by the Department of Health Education and Welfare, it is seen that as age increases there is a dramatic increase in the percentage of people wearing glasses.

Figure 15. Percent of U.S. population wearing glasses or contact lenses by age in 1971-1972 compared with percent in 1960-1970
DISCUSSION

Questionnaires

With the consideration of the graph the number of Polynesians with glasses is still low. It is even more intriguing considering that 38% of the Micronesians stated that there was no available care at home, whereas only 3% of the Polynesians marked that care was not available.

The question of which group would best provide vision care, brought some interesting results. Only 15% felt that private practitioners would best provide care. The majority, 68%, felt that government or hospitals would be more desirable. This is understandable since on most of the larger islands eye care can be received, if it is available, for a very nominal fee at a government hospital. Also there appears to be a trend toward introduction of comprehensive insurance systems in Oceania.

Another result was that 70% of the respondents of the questionnaires stated they did not have a friend that had an eye that turned in or out. It's possible there are fewer strabismics in Oceania, or the people are not sensitized to notice this. Also the question could have been misunderstood. The incidence of strabismus in the United States is widely quoted as being between 4-6%. The incidence of strabismus in Oceania is not deducible from this study. The number of friends of each person answering the questionnaire is not known, and the number of questionnaires is not adequate to make inferences.
Possible Solutions

The problems of attracting more vision care providers to Oceania are money, isolation, and the poor socio-economic levels. The financial rewards are not great. American Samoa is offering $10,767 to $16,617 per annum based on training and experience, on a two year contract. Additional benefits are a shipping allowance and low cost government housing. Although this is good pay by Samoan standard, the salary is not very attractive compared to the mean income of mainland optometrists.16

The Office of Manpower Resources of the American Samoan government warns prospective mainland employees not to expect a beautiful and peaceful area as depicted in novels; but rather all the frustrations of a modern city.

Also, as noted by Dr. Savage and Kearney (appendixes B and C), a feeling of social and geographic isolation often develops. This is commonly referred to as "island fever", much like "cabin fever". These are some of the problems in retaining the services of optometrists in Oceania.

One solution to the South Pacific eye care problem that this
Possible Solutions

The author is investigating is a vision care program especially geared for the South Pacific and its needs. As noted above, American Samoa has been without eye care for some time. Normally, the L.B.J. Tropical Medical Hospital employs one optometrist and one ophthalmologist. It is felt by this author that externships from the various colleges of optometry could be arranged at the hospital, which would benefit the people of American Samoa, and also benefit the externs by providing clinical experience.

Another possibility is to have a training program for two-three medical officers in refracting at L.B.J.. The United States government and the Micronesian government have already shown willingness to fund such students. Appendixes E and J describe Mr. Joe Saull, a medical officer, whose training in refraction and contact lenses is being paid for by the United States Army and the Marianas government.

Another component to the solution could be the increased production of eye care practitioners utilizing existing resources available for the training of health personnel. An example of this would be the two year medical officer program in Fiji, which could be expanded to produce eye care practitioners. Realizing that these types of programs have come about because
Possible Solutions

of workable systems, expansion rather than new creation, may lead to easier production of necessary eye care personnel. Some reasons these programs would be more successful, include the following:

- pre-existant funding system
- pre-existant recognition of need
- pre-existant facilities
- pre-existant source of students
- pre-existant bureaucracy

If bureaucracy and programs are true to history, this program would grow after initiation to provide more practitioners.

Still another component to the solution would be the timely creation of an organization to coordinate the efforts of eye care practitioners in the South Pacific toward upgrading service, advancing education, and a vehicle for political expression. One example of how this organization would be beneficial, is the education of the public as to eye health, and possibilities of visual performance. As found in the analysis, this is an area in which Oceania has a problem.

The above partial solutions would not fill all the needs of Oceania, but would make a significant addition to the care given in this area.
CONCLUSIONS

The original question of this thesis was what quantity, quality, and in what mode is eye care delivered in Oceania?

In terms of quantity, there are approximately 31,100 people per practitioner in Oceania. This includes medical and dispensing opticians as practitioners. The need is at least 10% less than the United States due to the very low incidence of myopia. There is a problem in attracting and retaining practitioners due to the low income and isolation of this area.

The quality of eye care is basic and the facilities limited. A refraction often consists of trying on various glasses. There is often a delay of days for emergency eye care.

The most common mode of delivery is via government hospitals and boat/air transported health care teams. In remote areas medical officers travel from island to island working through dispensaries. The private practitioner mode of practice is essentially non-existent.

The people of Oceania often have a casual attitude toward eye care. The life styles don't usually demand optimum visual performance. The attitude towards eye-glasses is often antagonistic, especially concerning the presumed addictive and cosmetic effects.

The immediate prospects for substantially improved vision care is improbable.
REFERENCES


3 Hearing Before the Committee on Energy and National Resources: *Oversight on Territories and Insular Affairs*, United States Senate, 96th Congress, Pub. #96-41, June 25, 1979.


5 Inder S, p. 10.

6 Ibid, p. 8e.


10 Ibid, p 186.

11 Hearing Before the Committee, p 113.


REFERENCES

14 Vital and Health Statistics, p 27.

15 Coden R: The Development of Social Insurance in Asia and in Oceania, Rev Infort Mal Prof. 61(4-5):567-589, 1974.


APPENDIXES

A through M
The Pacific Islands can be divided into three main groups: (1) Micronesia, meaning small islands; (2) Melanesia, meaning black islands; and (3) Polynesia, meaning many islands. This grouping is based on the race and customs of the native peoples and on the islands' geography.
Though modern, Dr. Savage states that the Samoans are living a 50's culture. Although L.B.J. Tropical Medical Hospital is very modern, being rated "the best in the South Pacific other than Fiji".

Dr. Savage states there is a class structure, adding that the approximately 3,000 whites and educated Samoans are in the upper class, then the uneducated Samoans, and then approximately 2,000 Koreans, whom the Samoans consider lower class. The Koreans are considered the lower class because they will eat dog meat whereas the Samoans feel this is vulgar, and not worthy of superior people.

Dr. Savage felt that practicing at the L.B.J. Tropical Medical Hospital was a rewarding one. Although optometrists are considered refractionists there, the people tend to treat you in a special way. Dr. Savage also points out that some people have moved to places like Micronesia or even American Samoa, taken one look and then returned to the mainland on the next plane. To curb the boredom and subdued way of life, Dr. Savage explained that he spent a lot of time snorkeling, sailing a catamaran, fishing with natives, enjoying the "fantastic whale races".
and traveling to such neighboring islands as Tau (90 miles east) or Fiji to prevent "island fever". This seems to be a type of island claustrophobia. The smallness of the various islands and the lack of outside contact gives a longterm feeling of isolation.

Dr. Savage informed this author that the Samoans are proud to be Americans and Flag Day is a very important holiday in American Samoa. Another interesting fact is that the Samoans may have a whole village living in one large building, as many as 40. Despite the number of people the social isolation tends to force a foreigner to develop a few very strong friendships. He states that it will make or break a marriage.

One aspect that tends to work against the optometrist, as Dr. Savage points out, is that American Samoan women are even more concerned with the cosmetics of glasses than mainland women.

Dr. Savage found that the main eye diseases that were encountered in American Samoa were trachoma, angle closure glaucoma, and presbyopia. The refractive errors tended to be hyperopia in the great majority of cases.

There is no private practice on America Samoa, and no fee is required for an examination. The glasses are often the problem in terms of money.
Dr. Kearney, M.D., ophthalmologist
Head of Ophthalmology
Tripler Army Medical Center
Honolulu, Hawaii

Dr. Kearney has been on many trips to Micronesia, usually leading a team of two or three ophthalmologists and an optometrist from the Tripler staff.

Dr. Kearney states that Ponape has a medical officer, David Amminis, who was trained for two years in Fiji. Mr. Amminis apparently handles the referring of patients to be seen by the Tripler team when they visit.

One interesting tid-bit brought up by Dr. Kearney was that often times M.D.'s destined for Truk are dismayed by the primitiveness and end up in Ponape, at least until they get "island fever".

Of Micronesia in general, Dr. Kearney states: "Eye care is almost nil and the future will be status quo."
During a number of trips to Micronesia, Dr. Black was struck by the "casual attitude" of the people towards eye care. He states that it's not uncommon to see people running around with one eye. Emergency care may not be instituted for a ruptured globe for 8-9 days. The people don't even bother making the trip for care unless vision is down to perhaps 20/800 or worse. It is also not uncommon for the person to be aphakic and not have the subsequent correction. However, the local governments do provide approximately $1150 to each practitioner for traveling expenses in order to have them come and do refractions and surgery.

Speaking of various areas, Dr. Black explains that the Carolinas are mountainous, making health care delivery difficult. Tahiti's health care is provided primarily by French physicians in accord with its French colonization. American Samoa and Saipan are more sophisticated, according to Dr. Black, in regards to more modern medical facilities, as opposed to that of the Marshall and Truk islands. Western Samoa seemed rather uncivilized, although pleasant, and it does have a primitive hospital. Dr. Black points out that many Western Samoans have never been off these islands.
Major Opland reported a trip to Micronesia made in the month of December, 1980. This Micronesian sponsored trip was made by Major Opland and two ophthalmologists. They made two stops on this trip, one at Majuro, Marshall Islands for the duration of one week and the other at Ebi, Marshall Islands for a total of two days. During this trip Major Opland sited that he performed 175 refractions and all but two or three of these were given plus lenses. The eye exam included:

1. Visual Acuities
2. Glaucoma Check
3. Retinoscopy
4. Best Subjective
5. Two Phorias
6. Near Point Lens Determination
7. Dilation
8. Indirect Internal Exam

There were 39 surgeries performed during this vision care trip. One of these was a polyp excision, one a pterygium excision, and 37 extracapsular cataract extractions. Much diabetic retinoscopy was observed by Dr. Opland, and five or six of these will be making referral trips to T.A.M.C. for laser treatment. Also, some cases of glaucoma were sited and treated.
Due to the great need for eye care, future trips to Ebi will be made for more than the two days previously allotted. The trips will be scheduled for each June and December and will be financed by the Micronesian governments.

Twenty pair of +12.00 loaners were left with the islanders along with adjustment tools and spare parts. The prescribed glasses will be sent to the islanders as soon as an official signature is given for payment.

According to Major Opland the vision needs are too basic to require visual training. However, treatment for low vision would be useful in some instances.

Presently, Mr. Joe Saull from Majuro, Marshall Islands is taking basic training in refraction and contact lenses under the optometric staff at T.A.M.C. Mr. Saull is receiving a stipend from the Marshall Island government. Mr. Saull will not receive any type of degree, but as Major Opland put it, "He may be the optometrist of the future for that area."

Major Opland also reports that Dr. Robert Baker, O.D., is a Seventh Day Adventist missionary practicing at McDonald Memorial Hospital in Koror, Palau Island of the Western Caroline Islands. This author was able to reach Dr. Baker but could not interview him by telephone because of the poor connection.
Major Arnot, O.D.
Optometrist
Tripler Army Medical Center
Eye Clinic
Honolulu, Hawaii

Major Arnot has made trips to the Marshalls-(Majuro, Ebi),
the Marianas-(Saipan and Rota), and also the Truk and Ponape areas.

Major Arnot feels that the various islands definitely have
a problem in regards to its health conditions. Majuro seemed
very dirty; evidenced by the popularity of the disposable
diapers littered about the island. The majority of the food
supply comes from the United States Army. The canned food
and the lack of green vegetables being suspected of leading
to the prolific increase in diabetes and subsequent diabetic
retinopathy by the ages 40-45. Near Majuro is Arno, which
has no electricity; not to mention other modern conveniences.
A description of a stop at Ebi (near Kwajalein) is as follows:
Each doctor sees perhaps 50 patients the first day, getting
visual acuities, retinoscopy, dilation, and ophthalmoscopy
on everyone. The next day all the surgeries would be done
and six to eight months later the prescribed spectacles
would arrive.

In the Marianas, the island of Saipan receives better care
than others because of its close proximity to Guam. In contrast to this is the island of Rota (also of the Marianas' group) which is underdeveloped, for instance, they have no telephone or radio. Dr. Arnot related a description of some very nicely braided coconut strands in temples which depicts the atmosphere of the lesser developed islands.

According to Major Arnot, the Seventh Day Adventists are instrumental in giving medical care in the Marshall Islands area, even to those outside their religion. Also, the Shriners have sponsored an orthopedic surgeon in the Marshalls.
Dr. M. Salatto  
Professor, East West Center  
University of Hawaii  
Honolulu, Hawaii  
-formerly-  
Secretary General  
South Pacific Commission  
Fiji

Dr. Salatto expressed the opinion that serious diseases of the South Pacific are fairly well under control, except malaria in New Guinea and diabetes in various other areas. He felt the diabetes was due in large to the change of diet and lifestyle. Dr. Salatto states medical care of the islands is better than that in Africa and Asia. He points out that Fiji has an arrangement with Australia and New Zealand for sharing of medical resources. Also, ophthalmologists from Fiji are sent to India for training; which is applicable because they share the same types of tropical diseases. The Solomon Islands, (near Australia), has annual visits from practitioners from Melbourne. Tonga has an ophthalmology resident and also visiting teams from New Zealand and Australia. Dr. Salatto went on to say there are a network of medical routes to various islands, although not formalized.

The South Pacific Commission is supported roughly by:

- Australia 33%  
- New Zealand 16%  
- United Kingdom 16%  
- France 14%  
- United States 25%  
- Other islands as they can afford
Dr. Phil Smith  
Head of Statistics and Research  
Brigham Young University  
Laie, Hawaii

Dr. Smith, in looking over the survey that was to be given to the Polynesian students, stressed one point very strongly: Polynesians are very male-female oriented in their society, even today. Dr. Smith felt that males were much more likely to receive health care than females, due to the roles they play in Polynesian culture. A question that should have been on the survey, as pointed out by Dr. Smith, is the notation of sex.

Head of Medical Statistics  
T.A.M.C.  
Honolulu, Hawaii

The Head of Medical Statistics pointed out that only in recent years has an optometrist been sent with the ophthalmologist to Micronesia. This has been possible due to the extra help at T.A.M.C. provided by optometric externs from the various schools of optometry.

In attempting to receive records from prior eye care trips, it was learned that only the number of patients and the dates were recorded. These records were used primarily for manpower assessment purposes only.
Dan Parsons
Laboratory Director
L.B.J. Tropical Medical Hospital
American Samoa

In a discussion with Dan Parsons, he expressed the opinion that L.B.J. Hospital was one of the best in the Pacific, even though he does state that the hospital is understaffed in some areas. At the time of this discussion, he was at Tripler Army Medical Center to learn the use of a complicated blood gas analysis machine that had been sitting at L.B.J. "rusting" because no-one there knew how to use it. He pointed out that the population of American Samoa seemed to be decreasing, because the patient census at the hospital was increasing, but many of these patients were from neighboring islands.

Uteli Tosi
Education Student, Pacific University, Oregon
Resident of American Samoa

Uteli Tosi is doing college work towards a teaching degree. She states that there is a distinct class structure in American Samoa and that being a teacher would place her in the upper class, as would being an optometrist. Miss Tosi states she had not had an eye exam until coming to the United States and still does not wear glasses for the expressed reason that she is afraid she will become dependant on them; even though they seem to re-
lieve the headaches she gets while studying. She also relates that the lack of vision care has not been a problem, emphasizing the new modern life of the American Samoan. To dispel any thoughts of primitive huts and topless natives, she displayed a Samoan newspaper with display ads of Frigidaire refrigerators, movie theatres etc.

Dr. Davis M.D., ophthalmologist
Dr. Almquist M.D., ophthalmologist
Tripler Army Medical Center
Honolulu, Hawaii

Requests came from the Trust Territories, and were paid for by these governments; Dr.'s Davis and Almquists answered these requests twice in 1977. Generally these ophthalmologists were accompanied to the islands by an operating room technician and a medical officer. Results of the eye care included the following:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cataracts</td>
<td>3</td>
<td>1/2 of the 56 had end stage eye disease</td>
</tr>
<tr>
<td>Pterygium</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Corneal Ulcer</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Chronic Conjunctivitis</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Refractions</td>
<td>100+</td>
<td>94</td>
</tr>
<tr>
<td>Total</td>
<td>125+</td>
<td>160</td>
</tr>
</tbody>
</table>
Mr. Saull was trained at the University of Hawaii Medical School in the 1950's. Mr. Saull states that he has the use of a phoropter where he does eye exams. At the time of the interview he was staying at the officer's quarters of Tripler Army Medical Center, Honolulu, Hawaii and was taking continued training in refraction and contact lenses. He states that there are training programs being initiated in the Micronesia area, adding that the need for vision care is there. He states that he sees a good deal of diabetes and cataracts. He also, mentions that there is one other physician's assistant on Truk that has training in cataract surgery. The patients return about ten days post-op to try out glasses. The glasses are supplied from the American Optical Company, who sends about 20-30 pair per week. The primary mode for determining the correct power of glasses, relied solely on the patient trying on glasses until he found a pair in which he felt that he could see properly. All in all, Mr. Saull seemed optimistic about the future of eye care in Micronesia.
Loren W. Gately
Representative from Island Optical Company
Honolulu, Hawaii

Loren W. Gately has done sales work in Tonga over the last few years. He states there are at the present time three optometrists from Australia who provide vision care for that island. He states that Tonga is the only remaining monarchy in Polynesia, and as such, vision care is provided on a status system, with the Royal Family being treated first, and then the common people. He further states that as far as vision care goes there appears to be a low incidence of myopia and cataracts.

Mr. Gately's impression of Tonga was that it is maintaining a very controlled growth and doesn't appreciate outsiders. Furthermore, whites are considered "haoles", as in Hawaii (a rather vague derogatory term similar to "honkie" as some American blacks label whites).
Jeff Tubbs  
Communications Student  
Pacific University, Oregon  
•formerly•  
Resident of Saipan, Mariana Islands

Jeff grew up on Saipan, his father being a United States government employee. Jeff's father is currently employed by the same as the Finance Minister of Ponape.

Jeff states that Saipan was quite civilized, although the electricity and water would routinely fail daily. Life was very relaxed and sometimes down right dull. The Saipan people were not keenly motivated to seek the care of an eye doctor even though the opportunity was there. Also, there seemed to be a low incidence of eye disease, according to Mr. Tubbs. The older people rather accepted a decrease in vision as the course of old age and did not seem to be concerned about it. The older people didn't read much and gained most of their information by listening to the radio.

The only doctors that Mr. Tubbs remembered on Saipan where two-year medical officers. These medical officers also travelled to the outer smaller islands on the Rock Island, a commercial ship. The arrival of a doctor was generally greeted with a party and much hospitality. The incidence of medical lawsuits were virtually unheard of.

Mr. Tubbs also stressed the feeling that the United States was inducing lassitude in the people of Micronesia by making it a welfare state.
This woman reported that she felt that vision care was adequate in Western Samoa. She said a person only needed to pay a nominal fee to see the eye doctor in the local hospital. The eye exam itself was gotten for the nominal fee, but the expense of the glasses were a stumbling block for many when it came to receiving the glasses for their needs. This woman stated that she had previous eye exams, but could not relate what kind of eye doctor she had seen.

This lady felt that her vision care had been adequate. She pointed out that there was a strong British influence in Tonga. Most of the eye doctors had been trained in Britain, New Zealand, or Fiji. English is the second language in Tonga.