Major mental illness in the Pacific: a review

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Introduction

Among the chronic, non-communicable diseases affecting the health of Pacific people, the major mental illnesses constitute a relatively minor problem compared to, for example, diabetes or obesity. However, with increasing urbanization and the concomitant decrease of traditional care practices and kin-based support networks, it is very likely that mentally ill individuals will be forced to congregate in larger population centres and are thus more likely to be viewed as a "problem". In addition, the complex interaction among migration, mental illness and treatment will be of increasing relevance to the dispersed communities of Pacific people located in several Pacific rim nations.

In 1978, the pioneering transcultural psychiatrist H.B.M. Murphy published a survey of "mental health trends" in 13 Pacific territories[1]. This remains the most substantive single, broadly-based study of mental illness in the Pacific. Murphy divided his report into the "major" and "minor" mental illnesses. Included in the major mental illnesses were schizophrenia, major affective disorders and psychosis associated with other conditions, such as epilepsy. Suicide was also included in this category, although its relation to psychiatric illness is not at all direct. In the minor mental illnesses, Murphy included alcohol and substance abuse, possession states, epidemic hysteria, folie-a-deux, other types of hysteria and acute anxiety states.

With reference to major mental illness, Murphy's most surveyed had hospitalization rates for these diseases that were only about one-fifth the rates observed in developed countries. He suggested two possible explanations for this: 1) the majority of psychotics in the Pacific are not reaching hospital; or 2) the rates of major mental illnesses actually are lower. To resolve this issue, Murphy looked at the distribution of mental illness within Pacific nations (i.e., did more patients come from administrative districts that had mental health facilities?) and also carried out field surveys in select islands. He concluded that "many Pacific Island populations have incidence and active-prevalence rates of major mental disorder which are considerably below what one would expect in many parts of the world, including parts where I have done similar surveys".

The relative scarcity of major mental illness in Pacific nations may explain the sparse and scattered literature on the topic currently available. However, urbanization and migration, which are coupled with population growth, will undoubtedly increase the profile of chronic mental illness in Pacific communities in the coming years.

This brief review of major mental illness in Pacific people represents a survey of the literature by island group/territory/nation. With the exceptions of Papua New Guinea and New Zealand, the amount of information available by population is quite limited. The populations reviewed are listed alphabetically.

Chuuk (Truk)

Chuuk is one of the Federated States of Micronesia, and the island group has a total population of about 46,000[3]. In 1981, Dale[4] reported the results of a psychiatric epidemiological survey of the main island, Chuuk, as part of a broader survey of mental illness in Micronesia. Using DSM-II criteria, he reported the prevalence rate for schizophrenia as 2.2/1000 persons over age 15 and the manic-depressive rate as 0.05/1000. The rate for psychotic depression was 0.16/1000. The Micronesian survey by Hezel and Wylie[2], published in 1992, striking general finding was that the Pacific territories he

vided particularly good data for Chuuk, since that was
ere the Micronesian Seminar was located at the time.
ey found 92 individuals with schizophrenia (DSM-III/III-r)
psychosis in a total population of 24,290 (15+years), giving
overall specific rate of 3.8/1000. As is common in
cronesia, the male rate was much higher than the female:
/1000 versus 1.1/1000. Along with Pohnpei, Chuuk had
lowest rates of major mental illness in Micronesia. Average

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age of onset for males was 24.1 years; for females, it was 33.2 years. Hezel and Wylie also found that individuals with schizophrenia in Chuuk were better educated than average and that they were well-travelled. Marijuana use was much higher in the male patients compared to the rest of the population; female patients used both alcohol and marijuana much more than females in the general population.

Youth or adolescent suicide in Micronesia has been extensively studied in Chuuk[5-9]. In 1982, Rubinstein[5] reported that suicide was the primary cause of death between the ages of 15 and 30 years, with half of these deaths in the 15- to 24-year old male cohort. Suicide rates in this age group in Chuuk was some 20 times higher than in the U.S. Rubinstein attributed the primary cause of suicide to "anger...[and] a pervasive mood of apathy, disinterest, and inactivity among this group". A secondary cause is the breakdown of traditional ways of life, which itself is a result of major cultural, economic and political changes in Micronesia since World War II. An account of traditional medical practices in Chuuk is available in Mahony[10].

Cook Islands

In 1978, Murphy[1] reported that the "mental health of Cook People appears to be unusually good". His survey in Aitutaki revealed an active prevalence rate for schizophrenia of 2.7/1000 (15+years population of 1,100), which is a relatively low rate by global standards. He cautioned that his survey focused only on "publicly recognised schizophrenia" and therefore may have missed "latent" cases. The prevalence in Rarotonga was reported to be similar to that in Aitutaki. Murphy also reported, however, that Cook Is. people living in Auckland had twice the first admission rate for mental illness as Samoan or Tongan immigrants, and that depression was particularly common. There are no data available to indicate whether or not this remains the pattern in the 1990s.

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Fiji

Several studies on major mental illness in Fiji have been published over the past 30 years. Wilson[11] looked at psychiatric admission statistics by "race" (Fijian, Indian, and "other") over the period 1941-1962. He found that the admission rate for Fiji Indians was about twice that for Fijians, and the rate for "others" (Europeans, Chinese, Rotumans, etc.) was higher still. Wilson argued that the greater "Europeanisation" of the Indians made them more likely to be admitted for psychiatric treatment; he suggested that the Fijians were still being take care of at the "tribal level". Compared to New Zealand, the hospitalisation rates for all groups were much lower: in 1940, the New Zealand rate was five times higher, and by 1962 it was nine times higher. A survey of the 301 patients in hospital in 1962/63 indicated that 62% had schizophrenia and 15% had "mania". As a proportion, these were much higher hospitalization rates for "functional psychoses" compared to New Zealand (26%).

Price and Karim[12] reported on a follow-up of the first 200 registered psychiatric patients who were recorded during the period 1965-1971. Fiji Indians comprised 63% of those registered, although they were only 51% of the total Fijian population; in contrast, Melanesian Fijians comprised 31% of those registered although they were 43% of the population. Of the sample of 200, 65.5% were diagnosed with schizophrenia; 24.5% were diagnosed with affective illness. Of the 126 Fiji Indians in the sample, 72.2% had schizophrenia and 14.2% had affective illness. For the 62 Melanesian Fijians, 52% were diagnosed with schizophrenia and 44% with affective illness. Schizophrenia was thus both relatively and absolutely more common in the Indian population. In the analysis of the success of after-care, Price and Karim found that of those receiving "adequate treatment", individuals who had been hospitalised more than once for schizophrenia were most likely to benefit. Access to adequate care did not decrease the liability for relapse in affective patients.

Murphy[1] reported only first admission figures (determined over the period 1972-1975) for Fiji. There were few ethnic or sex differences in these per annum rates: all ranged from 2.4-2.7/10,000 aged 15 and over. A major difference was seen in the days of hospitalisation: the Fijian patients spent more than twice as long per patient in hospital compared to the Fiji Indian patients. Price and Karim[12] alluded to this pattern in a slightly different context, and attributed it to the fact that Indians tended to live in nuclear as opposed to extended families, thus the loss of an adult member of the household was particularly difficult to sustain. In contrast, the extended family pattern seen in the Fijians allowed for the absence of an adult. Murphy also noted that admission rates for the Suva-Rewa district, where the mental hospital is located, was only the third highest in the country; this was taken to be evidence against simple accessibility arguments for determining rates of mental illness in a region.

In an interesting paper, Price and Karim[13] collected information using a questionnaire on matiruku, a "Fijian madness...[that] means literally 'low tide in the morning' and figuratively somebody periodically insane". They concluded that matiruku is a mood disorder corresponding to hypomania. The results from the questionnaire revealed that the (Fijian)

respondents identified it as a condition affecting adults, typically in the morning, with elevated speech as a primary feature. Price and Karim asked the respondents to name individuals with the illness in the community whom they knew. Eight were named, and 5 of them had been treated at the psychiatric hospital at some point for hypomania. This sort of "bottom-up", community based approach to understanding a specific traditional disease entity seems to be very useful. In Western medicine, variation in defining different psychiatric illnesses leads to ongoing debate, and it should come as no surprise that behavioural illnesses in traditional medical systems may also be subject to variable interpretations.

Suicide in Fiji has been the subject of a few studies [14-17]. Suicide is by far more common in the Indian population, especially among rural dwellers. Paraquat poisoning emerged in the 1980s as significant problem, with more than ten patients per year (in the period 1976-1981), mostly males between the ages of 15 and 24, admitted to hospital for treatment. At least two-thirds of the cases were attempted suicides[15].

Hawaii

Published information on major mental illness in Native Hawaiians is surprisingly hard to come by. Discussions of mental health issues in the context of Hawaiian cultural history[18], concepts of the individual[19] and "culture sensitive" mental health services[20] are available. The most comprehensive review of the mental health of Native Hawaiians is provided by Takeuchi et al[21]; this paper is quite useful in providing clear statements describing complementary approaches towards understanding mental illness in the Hawaiian context and in identifying limitations of various data sources. Their major findings of relevance to this review are: Native Hawaiians do not differ substantially from other ethnic groups for most "psychological problems" although they seem to suffer less from anxiety and depressive disorders; there was a 130% increase in suicide rate of Native Hawaiian males between the periods 1958-1962 and 1978-1982, making their rates the highest among ethnic groups in Hawaii and higher than for any other groups in the US.

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Weiner and Marvit[22] provide a mortality analysis based on a cohort of patients with schizophrenia registered with the Mental Health Division, Hawaii Department of Health, between 1962 and 1972. This cohort was broken down by ethnicity, including "part-Hawaiians". Individuals of Japanese and Chinese descent had the highest prevalence rates for schizophrenia, while individuals of Caucasian descent had the lowest rate and were underrepresented in this population relative to their frequency in the overall population. The part-Hawaiians had prevalence rates of 2.4-2.5/1000; they were somewhat underrepresented in the patient population. The nature of the study and the register did not allow the authors to provide a definitive explanation for the variation among groups in prevalence rates. Part-Hawaiians were unique among the ethnic groups studied in that for both males and females, there was no significant increase in mortality ratios for the patients relative to the general population (for males the ratio was 1.0; for females, it was 1.2). The patient sample as a whole had a mortality ratio of 1.9. Mean ages of first diagnosis for the part-Hawaiian males and females were no different from the other ethnic groups (32.3 years for males and 33.1 years for females), with the exception of Filipinos, who were substantially older at first diagnosis.

Very complete census data collected in Hawaii in 1942 became the basis of a 1980 pedigree study of schizophrenia by Carter and Chung[23]. The 1942 data again showed that individuals of "Oriental" descent had the highest rates for schizophrenia, while the other ethnic groups listed, including "Polynesians", had rates similar to one another. Using a multifactorial genetic model for the transmission of schizophrenia, Carter and Chung determined a heritability (H) of 0.621 (±0.064) for the entire sample; this figure is in keeping with other pedigree data analyzed using a multifactorial model. However, when analyzed separately, the Polynesians in this sample were calculated to have a heritability of 0.408 (±0.28), which was beyond the 95% confidence level for the total sample. There were 51 Polynesian probands in the study. This is an interesting, albeit limited result, in that it identifies an aspect of the expression of schizophrenia in Polynesians that may differ from that seen in other ethnic groups.

Kapingamarangi–Nukuoro

These two atolls are Polynesian outliers located in southern part of central Micronesia and, traditionally, they have affinities with the peoples of Tonga and Samoa. Many Kapingamarangi and Nukuoro people now live on the high island of Pohnpei where they maintain their cultural identity. Dale[4] reported a total population (over age 15) for the two communities of 1044. He found no cases of schizophrenia nor were there any records of anyone ever having suffered from schizophrenia in these two populations. He reported one case of manic-depression. In contrast, mental retardation was relatively common with 11 cases observed. Given the circumscribed nature of the populations, the absence of schizophrenia would seem to be a very robust negative finding. Dale speculated: "Could it be that the few men and women

making the long canoe voyage from Tonga and Samoa to Kapingamarangi and Nukuoro, and from whom most of the subsequent atoll inhabitants descended, had no genetic predisposition to schizophrenia?"

Kiribati (Gilbert Islands)

Murphy[1] provides some information on mental illness in Kiribati; unfortunately, neither Dale[4] nor Hezel and Wylie[2] provide any additional information concerning this Micronesian population in their more recent surveys. Murphy reported admission rates to mental hospital of 8.1/10000 for adult males and 2.2/10000 for adult females (over the period 1972-1977). These figures are not broken down by diagnosis; however, Murphy stated that they represent "all quite disturbed psychotics". The male admission rate is quite high, and is even comparable to rates seen in Europe and North America. The preponderance of male admissions is a pattern observed throughout Micronesia for schizophrenia[2,4]. It seems likely, given Murphy's qualitative observations, that the situation in Kiribati may be typically Micronesian, and is especially reminiscent of Yap and Palau, which have relatively high rates of schizophrenia compared to other Pacific populations.

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Kosrae

Information on psychiatric illness in Kosrae is available in both Dale[4] and Hezel and Wylie[2]. In 1981, Dale found that schizophrenia and manic-depressive illness were relatively rare there, with 3 cases of schizophrenia and one case of manic-depressive illness in an adult population of 2568. The schizophrenia prevalence rate of 1.2/1000 puts it at the low end of the distribution within Micronesia. In striking contrast to Dale's results, Hezel and Wylie reported 26 cases of male schizophrenia in 1990, in an adult male population of 2027; in addition, they reported *no* cases of females with schizophrenia in a population of 2034. Although there were no females with schizophrenia at the time of their survey, Hezel and Wylie reported that there had been in the past. As in other Micronesian populations, the Kosrae schizophrenic patients were better educated than the general population and also more likely to be moderate to heavy users of drugs, especially alcohol.

In general, Dale's and Hezel and Wylie's Micronesian surveys, conducted about 10 years apart, provide congruent results; Kosrae is an exception, with the more recent survey giving a prevalence rate for schizophrenia nearly ten times higher. Hezel and Wylie indicate that while this could be a "real" increase, it could also be the result of differences in case-finding or definition. It seems highly unlikely that such a great increase in so short a time could be due to a "real" increase in illness. In fact, looking at the age distribution of individuals with schizophrenia reported by Hezel and Wylie, it is apparent that there must have been more than three individuals with schizophrenia in Kosrae at the time of Dale's survey. However, the rate of schizophrenia in men aged 20-28 was very high (28.4/1000). Hezel and Wylie allowed for the application of less-than-strict diagnostic criteria in some locations: "In determining whether a person for whom we had no formal diagnosis should be regarded as a psychotic, we adopted a loose community-based norm. Our field workers asked informants whether the individual had been acting 'crazy', at least intermittently, for a period of a year or longer". Kosrae is relatively isolated, even in the Micronesian context, and the application of community standards may have taken precedence there over more strict psychiatric definitions of schizophrenia. This may explain the difference in the two surveys, and the high number of males identified with schizophrenia in the 20-28 year age bracket.

Marshall Islands

The Marshalls are an eastern Micronesian archipelago with a total adult population in 1990 of 21,244 individuals. Both Dale[4] and Hezel and Wylie[2] provide information concerning the prevalence of schizophrenia there. As in the case for Kosrae, Dale indicates a much lower prevalence (0.82/1000) than Hezel and Wylie (4.2/1000). Dale reported only one case of manic-depressive illness. Both surveys indicate a large male:female ratio for schizophrenia and psychosis.

New Caledonia

New Caledonia has an ethnically diverse population of about 150,000 inhabitants; approximately 43% are of Melanesian descent, 37% of European descent, and there are also reasonably large communities of Wallisians and Futuna'ns, Tahitians, Indonesians, Vietnamese and Vanuatuans[24]. Zeldine[25] provides a statistical analysis of the records of 2616 psychiatric patients admitted to hospital in Noumea between 1965 and 1977. This analysis suggests that overall psychiatric morbidity for Europeans is three times that of Melanesians; Vietnamese have a similar rate to Europeans; and Indonesians and Wallisians are similar to Melanesians. Europeans and Vietnamese had similar rates for schizophrenia, which in turn were double the rates for Melanesians and Polynesians; schizophrenia was rarer still among Indonesians and Wallisians. There were 127 cases of schizophrenia in the total sample. There were also 127 cases of "chronic psychosis"; in contrast to schizophrenia, these were more evenly distributed across ethnic groups. Murphy[1] reported that the admissions rate for

Europeans for psychiatric illness (in 1973-74) was double that for Melanesians. Middle-aged Melanesian males seemed most prone to serious mental disturbance. Murphy also reported that compared to other Pacific populations, New Caledonia had a well-developed psychiatric care system, which allowed hospitalisation for even relatively minor ailments.

Recently Poinso and Vedié[24] reviewed the records of 315 patients admitted to the psychiatric hospital in Nouville in 1987. They found that Europeans were more likely to be admitted for depression, suicide and neurotic disorders, while Melanesians and Wallisians were more likely to suffer from acute and chronic psychosis (diagnosis of schizophrenia was avoided in this study). As Murphy found, the overall admission rate to hospital for Europeans was about double that for Melanesians. Manic-depressive illness (25 cases out of the 315) was represented in all ethnic groups and less affected by cultural influences. Poinso and Vedié speculated on the Melanesian cultural factors that might in particular influence the apparently low rates for depression and suicide; Berthomieu[26] and Seck, Poinso and Gepner[27] also discussed traditional medical practice in New Caledonia and its relevance to Western psychiatric disease.

New Zealand

A thorough discussion of major mental illness in Maori and European New Zealanders is beyond the scope of this review. A major recent survey of Maori (and European) mental health is available from Te Puni Kokiri (Ministry of Maori Development[28] and Bridgman[29]). This valuable report provides a compilation and analysis of Ministry of Health statistics over the period 1984 to 1993. As the authors note, the major shortcoming of the analysis is that it is based on institutional data; a more community-based understanding of the situation was beyond the scope of the statistics available. Of particular interest here are ethnic comparisons of admission and readmission rates for affective and other psychoses. Over most of the period analyzed, Maori rates ran slightly below that for European, but were substantially higher than those seen in Pacific people. Maori readmission rates were slightly higher than European rates, however, and substantially higher than for Pacific people. For schizophrenia, Maori men had higher admission rates than Maori women for each year of the survey, and admission rates for men reached as high as 30/100000. Maori first admission rates for schizophrenia were slightly higher than for European, and substantially higher compared to Pacific people. Maori readmission rates for schizophrenia were also much higher; however, Maori spent an average of 85 days in hospital when admitted for schizophrenia, compared with 220 days for European and 152 days for Pacific peoples. These are striking differences. The authors of the report offer two explanations:

1. Maori with psychotic illness are being discharged from hospital far too early...with the consequence that they are soon readmitted. Under this analysis, it is important that Maori get much improved treatment for psychotic illness, possibly within the hospital setting.
2. Maori admitted with psychotic illness are, in fact, misdiagnosed, and are much less mentally unwell than their European counterparts with the same diagnosis. They are let out earlier because they have recovered or were not as seriously mentally ill (they might have had mate Maori rather than schizophrenia) in the first place. However, they return to the systemic problems that brought them to the attention of mental health services in the first place (unemployment, drug and alcohol abuse, discrimination, etc) with the consequence that they become unwell again.

Comparisons of mental illness rates between Maori and European New Zealanders dates back to Ernest Beaglehole's 1939 report[30]. He reviewed mental hospital data over the period 1925-1935 and found that "incidence of psychosis is definitely lower among Maori as compared with the European cultural group in New Zealand". As a percentage of first admissions, Maori females were more likely to be diagnosed with manic depressive illness, while Maori males were more likely to suffer from schizophrenia. This was the opposite to what Beaglehole had observed in Hawaii in an earlier study[31]. Beaglehole's paper is of particular historical interest in its theoretical discussion of the relationship between modernisation, madness and primitive society (see Lucas and Barrett[32] for an interesting recent review of this topic).

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Sachdev[33] provides an interesting longitudinal study of Maori psychiatric admissions during the 1960s, 70s and early 80s. Over the period 1965-1985, Maori first admission rates for schizophrenia were relatively flat and the increase in affective psychoses was small. Over this same period, however, there was a twenty-fold increase in hospitalisation rate for alcohol abuse and dependence. Sachdev points out that the first admission rate for Maori for schizophrenia in 1983 (23.7/100000) was substantially higher than for the total population (11/100000). However, there was no

accumulation of Maori suffering from schizophrenia in hospitals, in part due to the fact that their average stay was 191 days versus 290 days for non-Maori. It is useful to compare these figures with those given in the 1996 Te Puni Kokiri. While reported average hospitalisation lengths for non-Maori are somewhat lower, the Maori schizophrenic patients are apparently only spending one-third as long in hospital in the early 1990s compared to the early 1980s.

Several other studies are of relevance to understanding the relationship between ethnicity and psychosis in New Zealand. Ritchie[34] reviewed Maori ethnopsychiatry and therapeutic practices for mental illness, some of which, he suggested, may be of wide applicability. Dawson et al[35] analyzed demographic and diagnostic data for psychiatric committal (ie, the subset hospitalised under legal compulsion) in 1984. About 21% of all psychiatric admissions were in this category, and male Maori and Pacific people, between the ages of 20 and 29 and suffering from schizophrenia or affective illness were significantly more likely to be committed than other population subgroups. Smith et al's[36] study of housing and mental health found variation in the relationship between housing and health among European, Maori and Pacific New Zealanders. Stanton and Joyce's[37] report on the stability of psychiatric diagnosis in New Zealand, while not explicitly concerned with ethnic issues, provides some essential information on the broader context in which psychiatric illness is identified. Allen et al[38] compared the expression of a biocognitive marker (antisaccadic performance) for schizophrenia in New Zealand with two other populations (Papua New Guinea and Palau), and also showed that another "culture-neutral" biocognitive maker (eye tracking dysfunction) is present at similar frequency in groups of European and "Polynesian" New Zealanders[39].

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Information on the mental health of "Pacific people" can be found in a widely available 1994 Public Health Commission Report[40].

Niue

Little has been published on mental health in Niue. Murphy[1] indicated that "the rate of mental disorder among the Niueans is higher than among other Polynesian peoples visited". He also speculated that Niue was different from other Pacific communities in that New Zealand was their frame of reference rather than Tonga or Samoa. In this sense, he seemed to suggest that Niue was in effect more like a developed country and hence displayed rates of mental illness consistent with that status.

Norfolk Island

Murphy[1] reported that the schizophrenia prevalence rate in the predominantly European-derived population of Norfolk Island was low (2 cases in an adult population of 1200), in keeping with other Pacific communities. This figure was shown to be lower than rates in rural Canadian villages. Certainly the "tempo of life", as Murphy suggested, may have something to do with the low rate observed on Norfolk Island. On the other hand, genetic factors or other stressors could play a generalised role in the etiology of schizophrenia in the region. Murphy pointed out that a simple racialist correlation cannot be used to explain variation in schizophrenia rates in the Pacific region.

Palau

Even though epidemiological studies and statistics are not always comparable, it seems likely that Palau has the highest rates for schizophrenia and psychoses of any Pacific population; only neighbouring Yap has rates that approach those reported for Palau. In 1981, Dale[4] reported a total of 61 cases of schizophrenia (and 5 of manic-depressive illness) in an adult population of 8264; this yielded a prevalence rate for schizophrenia of 7.6/1000. In their 1992 survey, Hezel and Wylie[2] reported an overall rate for schizophrenia and chronic mental illness of 16.7/1000, with males at 22.5/1000 and females at 10.5/1000. When these diagnoses were broken down by age, the most striking finding was a rate of 54.4/1000 for males between the ages of 30-39. It is again apparent that Hezel and Wylie's definition of schizophrenia and chronic mental illness is more inclusive than Dale's. Nonetheless, the rates of chronic mental illness in Palauan males especially is alarming.

In 1979-80 survey, Kauders et al[41] identified a total of 73 Palauans with schizophrenia; according to them, their most striking finding was that there was a 4:1 sex ratio, with 58 males and only 15 females. Kauders et al argued that the forces of modernisation and Westernisation in Palau had a much greater impact on males than on females, whose "roles appear to have remained more stable over time". Males were in a bind trying to integrate the traditional role with those derived from the "mainland". In addition, Palauan females were traditionally seen to be "more stable and sensible than males, who are considered given to impulsive acting out". Certainly Palauan males were more likely to be alcohol and drug abusers. The potential relationship between drug abuse and psychosis in Palau was also discussed by Hezel and Wylie : "It is no secret that during the 1980s Palau experienced a drug problem, including the use of heroin and cocaine, that was unparalled in other parts of Micronesia". Again, the epidemic of drug abuse was largely, although not exclusively,

a male problem. Certainly, Hezel and Wylie found that in Micronesia people with schizophrenia use drugs: 88% of the males and 36% of the females reported using at least one drug. Although data are lacking, compared to the general population, drug and alcohol use among females with schizophrenia is apparently much higher than in the general population.

In their useful descriptive study of schizophrenia in Palau, Hammond et al[42] first noted that the crude prevalence rate (4.76/1000) was equivalent to that reported in a study in Monroe County, New York (4.6/1000), and much higher than in other Micronesian populations. Overall, features of schizophrenia in Palau were not found to be remarkable; culture-specific delusions were limited. They concluded: "Schizophrenia in the rapidly changing Palauan culture presents a recognizable symptom pattern, but is unusual in the high rate of violence, marked affectivity and male predominance seen". With reference to co-morbidity with substance abuse, they point out that "many of the male patients seem to have chosen marijuana and alcohol for relief".

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More recently, research on schizophrenia in Palau has involved biocognitive markers[38] and efforts to combine some of these markers with chromosomal genetic studies based on well-documented pedigrees (M Waldo and H Coon, personal communication). In a 1988 study, Jensen and Polloi assessed the mental and physical health of Palauans over the age of 90[43]. They found that dementia was relatively common: 25% were mildly demented and 42% were moderate or severe.

Papua New Guinea

A comprehensive discussion of the literature on psychiatric illness in Papua New Guinea (PNG) is beyond the scope of this review. The central figure in the history of psychiatry and psychiatric research in PNG is the late Sir Burton G Burton-Bradley (1914-1994)[44-45]. An Australian, Burton-Bradley started working in PNG in 1959, and over the course of the next thirty years, established a mental health service and a training programme for mental health professionals. In addition to his medical background, Burton-Bradley also had degrees in anthropology, and he published prodigiously in the field of "transcultural" psychiatry. Among many other topics, his work included papers on the psychosocial implications of betel chewing [46-47], the psychiatric status of the cargo cult leader[48], and the expression of "amok" in PNG[49]. Overviews of his work in PNG can be found in longer works such as *Longlong! Transcultural Psychiatry in Papua and New Guinea*[50] and *Stone Age Crisis: A Psychiatric Appraisal*[51]. Perhaps his most unusual work involved his collaboration with Otto Billig on uncovering universalistic patterns in schizophrenic graphic expression [52-53].

Transcultural psychiatric research in PNG dates back to 1929, with a publication by the physician-anthropologist CG Seligman on "Temperament, conflict and psychosis in a stone-age population"[54]. Based on studies of Papuan peoples living in the southeast part of the island of New Guinea, Seligman concluded: "The population studied...is admittedly of an excitable and extrovert disposition. In spite of this and the frequency of suicide, there is no evidence of occurrence of mental derangement, other than brief outbursts of maniacal excitement among natives who have not been associated with White Civilization". As Burton-Bradley's own work in PNG later demonstrated (see also Benedict and Jacks[55] and Ross[56]), serious mental illness can indeed be found in populations which have had only limited contact with "White Civilization". According to Lucas and Barrett[32], this has given rise to the concept of the "'Seligman error'—a failure to recognize mental illness by falsely attributing bizarre behaviour to other people's culture".

Studies of major mental illness in PNG have been relatively few. Hoskin et al[57] reported on the first 300 referrals to a new psychiatric service set up in Rabaul, New Britain, in 1965. At that time, the catchment area had a population of 50000 Tolai, who are the local people, and 6000 "immigrant indigenes". The rate of psychiatric referral was much higher for the immigrant group than for the local Tolai: 1.5% versus 0.2%. Furthermore, the rate of psychosis (schizophrenia and transitory delusional state) was also significantly higher ($p<0.01$) for the immigrant group: 0.63% versus 0.036%. Hoskin et al suggested that one difference between the groups is that the immigrant is more likely to be a employee rather than self-employed, and thus more likely to be referred by an employer. They also suggest that since Tolai "ecologically relationships are fundamentally satisfactory", they may be less developmentally susceptible to mental illness than others from less benign environments. However, this study goes against the notion that Westernized elites may be most susceptible to mental illness, since the Tolai were at the time the wealthiest and most Westernized people in New Guinea.

The most comprehensive epidemiological study of major mental illness in PNG was conducted by Torrey, Torrey and Burton-Bradley[59]. This study was based on thorough examination of the records of all psychiatric patients seen in the country between January 1970 and May 1973. In total,

478 cases of psychosis were identified: 332 cases of acute psychosis, 121 cases of schizophrenia and 25 cases of manic-depressive psychosis. There was great variation between provinces in schizophrenia prevalence rate, with coastal districts of Morobe, Gulf, Central and Milne Bay having rates up to ten times higher than in the Highlands or Sepik region (approximately 0.2/1000 versus 0.02/1000). Although there were many limitations to the study, Torrey et al concluded that the overall rate for schizophrenia in PNG appeared to be low. In 1984, Dohan et al[60] retrospectively analyzed health survey data collected in the late 1950s in the Highlands of PNG. Although these were not psychiatric surveys, they did involve direct examination of more than 60000 adults; only two individuals with schizophrenia were identified. Although these results have to be considered a minimum estimate of major mental illness, they certainly indicate that schizophrenia was rare in those populations at that time.

In a 1969 paper outlining the first 1000 psychiatric referrals in Papua and New Guinea, Burton-Bradley[61] reported that 47.4% had schizophrenia and 10.4% suffered from manic-depressive illness (out of a total of 454 patients). In a more recent (1990) survey of the first 100 referrals to the Port Moresby psychiatric liaison service[62], Johnson identified 17 cases of schizophrenia, 13 of acute organic psychosis and 5 manic-depressive psychosis. It is obvious that patients with schizophrenia are making up a smaller percentage of the total number making use of psychiatric services in PNG. Another profound difference between the two surveys is that while Burton-Bradley found that mood disorders almost always took the form of mania and that depression was very uncommon (0.7%), Johnson found that 13% of his patients suffered from depression. Several studies have been published on suicide in PNG [63-66]. As would probably be true in other Pacific communities, suicide is not linked to depression or major mental illness, but is rather more likely to be seen as an outcome of interpersonal conflict or social disintegration.

Several other studies related to mental illness in PNG are also of interest. Fascinating narrative accounts of individuals with mental illness or psychosis can be found in Langness[67] and Goddard[68]. Both of these anthropologists spent extended periods of time in the Highlands, and their accounts place the mentally ill individual in an appropriate socio-cultural context. Buchanan[69] provides a very interesting study of 31 "longlong" individuals from the Southern Highlands province. One finding of the study was that only half of these individuals had received treatment at a local health centre, and that this treatment was generally deemed a failure by the relatives of the affected individual. Goddard's[70] critical history of psychiatry in PNG provides a useful introduction to the field from a perspective other than Burton-Bradley's, while Pataki-Schweizer has applied transcultural psychiatry in an urban anthropological context [71-72]. My own work has emphasized the universalistic aspects of schizophrenia by detailing the presence of biocognitive markers for the disease; however, these markers may be at lower frequency in schizophrenia subject samples in PNG compared to other populations [38,73].

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Pohnpei

Data on mental illness in Pohnpei (Ponape) are available in the surveys by Dale[4] and Hezel and Wylie[2]. In a total adult population of 12162, Dale identified 17 cases of schizophrenia (1.4/1000) and 2 of manic-depressive psychosis (0.16/1000). These rates put Pohnpei in the group of Micronesian populations (including the Marshalls and Kosrae) with relatively low rates of major mental illness. In Hezel and Wylie's later survey, Pohnpei had a total adult population of 17474; they identified 56 cases of schizophrenia and psychosis, for a specific rate of 3.2/1000. Although as seen in other populations, their rate was higher than Dale's, Pohnpei's status as a Micronesian population with a relatively small amount of major mental illness was maintained. The male:female sex ratio was 3:1, which was slightly less than for the total Micronesian sample. Per capita expenditure on alcohol in Pohnpei is substantially less than in other Micronesian populations.

Samoa

Published studies on major mental illness in Samoa seem to be rare, which is unfortunate, given that much work has been done in other areas that would allow such research to be put into a proper cultural context. Of interest here are: Schoeffel's analysis of rural woman's associations and the development of public health programmes in Western Samoa under New Zealand colonial administration[74]; Hanna et al's comparative studies of American Samoans and Samoan immigrants to Hawaii [75-76]; and Kahn and Fua's study of adjustment problems in immigrant Samoan and Tongan children in Australia[77]. Unlike other Pacific communities, Samoan ethnomedical practices and beliefs have been researched in some detail. Macpherson and Macpherson's comprehensive account of indigenous Samoan medicine[78] and Kinloch's analysis of Samoan medical beliefs in contrast to, and in the context of, Western medical practice[79] are two foremost examples. Clement's discussion of Samoan folk knowledge

and classification of mental disorders should be particularly relevant to psychiatric research and practice[80].

Epidemiological studies indicate that rates for mental illness in Samoa are not extraordinary in the Pacific context. Murphy[1] reported first admission rates for the adult Western Samoan population over the period 1972-76 (1973 missing) of 3.2/10000 for men and 1.9/10000 for women. It had been indicated to him that rates for psychosis were much higher in American Samoa, but he did not believe the data were reliable enough to make a firm conclusion. Grigor[81] analyzed all of the inpatient (n=1472) and outpatient (n=1601) consultations at Apia General Hospital, from March 1973 to February 1974. Mental diseases did not constitute a major problem, with only 4% of outpatients and 1% of admissions being judged to suffer from psychiatric diseases. Nine patients were admitted following deliberate ingestion of Paraquat; seven of these died for further discussion of suicide in Samoa, see Macpherson and Macpherson[82] and Paksoy[83]). In a study done at about the same time in Tutuila, American Samoa, Walters[84] found, or surmised, that mental illness was "underreported" in the Samoan populations. In a population of approximately 30000 people, he estimated that over 1973-74, there should have been 595 cases of schizophrenia or psychosis diagnosed; instead, there were only 52 seen in the mental health clinic between 1973-1975. Walter speculated that "the underreporting of mental illness in primitive cultures noted by many authors is present in the developing society of American Samoa. This is a direct result of the social system, which tends to view under performance and quiet insanity with calm disdain". It does seem unlikely, however, that such a profound discrepancy between the expected and observed could have been due to just this factor. In a later discussion of transcultural psychiatry in American Samoa, major mental illness was again not seen to be a major problem; rather, alcohol abuse, child abuse and violent behaviour were seen to be the major issues[85].

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In an apparently singular report, Yamamoto et al[86] tested 100 Samoans in California and 100 in Samoa using the SCL-90R, a self-completed, 90-item symptom checklist, which scored for 9 items (somatization, obsessive-compulsive, anxiety, interpersonal sensitivity, depression, hostility, phobic anxiety, paranoid ideation, and psychoticism). They found that compared with 1000 Americans, the Samoans in America scored significantly higher on each scale; 57% of the males and 48% of the females had scores on one or more scales 2 SD above the American mean. Furthermore, they found that the Samoans in Samoa scored even higher than the Samoans in America on every scale. The language the test was administered in did not have an effect on score. It would be interesting to see this work replicated or analyzed in the context of Samoan culture.

Solomon Islands

Murphy[1] reported that rates of mental illness in the Solomons were low, although he noted that the prevalence of "acute transitory psychosis" was probably more common than the admission statistics indicated. According to Murphy, over the period 1967-1976, rates of first admission were 1.3/10000 for males and 0.3/10000 for females; these rates are low even in the Pacific context. However, in a more localised survey of schizophrenia prevalence in the Malu'u district of Malaita, Murphy identified 5 cases in an adult (15+ years) population of 1700; this yields a prevalence rate of 2.9/1000, which is a low-to-moderate rate in a global context. Dohan et al[60] reported that there were no individuals with schizophrenia among several thousand East and West Kwaio adults living on the interior of Malaita. Among more coastal populations on Malaita, 70 schizophrenia patients were identified out of an adult population on 32000 (with a 4:1 male:female ratio). Dohan et al argued that the difference was due to increased consumption of grain by the coastal dwellers. The coastal prevalence rate was still a relatively modest 2.2/1000.

Pridmore[87] has recently published a short study of suicide in the Solomons. It is relatively uncommon there, with an overall rate of 3.9/100000. Suicide in the Solomons is distinguished by being at least as common in women as in men, and the common use of chloroquine as the agent. Pridmore reported that "the common belief is that 'more than twelve tablets' is fatal".

French Polynesia (Tahiti)

In contrast to New Caledonia, little information on major mental illness in Tahiti and French Polynesia is apparently available. Vigneron's[88] study of the level and distribution of health services in French Polynesia indicates that psychiatric illness is not a major public health concern. Out of 140 physicians working in the private sector, only 1 was identified in the category "psychiatrists and neurologists". No specialized psychiatric unit or organisation was identified in the public

health sector.

In a psychological study of 52 admissions to an internal medicine service, depression was diagnosed in half the admissions, most of whom were Polynesian women[89]. The authors generalised that Polynesian depressed patients tend to be young, and that their illness is manifest not only be suicidal behaviour but also by somatic symptoms as well.

Taiwan

A very interesting psychiatric survey of Formosan "Malayo-Polynesian" aboriginal populations was published by Rin and Lin in 1962[90]. The survey included over 11000 individuals from four of the nine recognised tribes: the Atayal, the Paiwan, the Saisiat and the Ami. The survey of the aboriginal peoples was conducted from 1949 to 1953, and the results were compared to a survey of three Chinese communities in Taiwan conducted between 1946 and 1948. Rin and Lin found that schizophrenia was more than twice as common in the Chinese communities compared to the aboriginal communities (2.1/1000 vs 0.9/1000). Among 1302 Saisiat examined, there were no cases of schizophrenia; both the Paiwan and Atayal had rates of 1.1/1000. Manic-depressive illness rates were similar for both the Chinese and aboriginal communities (0.7/1000 vs 0.9/1000). However, all of the aboriginal manic-depressive cases were from the Atayal ethnic group (1.9/1000), and the authors suggested that familial clustering may indicate the role of genetic factors. "Other psychoses" were more common in the aboriginal groups than the Chinese; the majority of these were attributed to malarial psychoses. Overall rates for psychoses were similar between the Chinese and aboriginal groups, although the difference in schizophrenia rates was statistically significant. As has been observed in other non-developed societies, prognosis for psychosis in the aboriginal communities was apparently good (p 145): "the psychotic cases tend to follow a relatively favourable clinical course and prognosis, and schizophrenic reaction was no exception in this regard...If left alone untreated in the aborigine communities, a large proportion of schizophrenic cases recovered within two years".

Tonga

Murphy[1] reported psychiatric first admission rates for Tonga over the period 1969-1976 of 2.0/10000 for males and 1.5/10000 for females. Overall, Murphy reported that psychiatric problems were slight, nor was there any indication that Tongans overseas were arousing much concern from a mental health perspective. The low rate of schizophrenia and mental illness in Tonga prompted Murphy and Taumoepeau[91] to review the mental health situation in more detail. They looked upon the situation as a test case for the notion that mental illness tends to be rare in traditional societies. In addition to hospital admission data, Murphy and Taumoepeau tried to ascertain the "untreated" prevalence and answer the question: could the apparently low rate for mental illness in Tonga be due to the fact that treatment and care of mentally ill individuals remained in the community and family rather than in the health system? In 1979, they performed a detailed psychiatric survey of Eua (adult population approximately 2200 individuals); this followed Murphy's preliminary survey in 1977. The two surveys uncovered 7 individuals who had been clinically active in the 12 months prior to the surveys; 5 were identified in both surveys. One was given the diagnosis of schizophrenia and two were schizo-affective; there was one each of manic-depressive psychosis, organic psychosis, hysterical psychosis and mania. Several of the affected individuals had never been treated in hospital; on the other hand, the rate of mental illness was still very low. Murphy and Taumoepeau were confident of their case-finding strategy (which had been developed for surveying mental illness in villages in Canada), and they provide a lengthy discussion of the prevalence of mental illness in Tongan society and of the relationship between rates of mental illness and change in traditional societies in transition.

" The low rate of schizophrenia and mental illness in Tonga prompted Murphy and Taumoepeau to ... [use this] as a test case for the notion that mental illness tends to be rare in traditional societies. "

Price[92] provides instructions for psychiatrists working in a developing country, which are based on first-hand experience in Tonga. Although not a report about mental illness in Tonga, it does present a few clinical examples of interest.

Vanuatu (New Hebrides)

Published reports on major mental illness in Vanuatu are apparently rare. Murphy[1] reported psychiatric first admission rates for adult males and females of 2.6 and 0.7/10000, respectively (over the period 1970-1977). These are not exceptional figures in the Pacific context. Murphy also used Vanuatu to test the notion that proximity to the single mental hospital in an island group would be a determining factor in the geographical distribution of admission rates. He found that "there are two islands with higher rates than that for Efate where the asylum is situated". Proximity to hospital apparently does not have a large effect on admission rates; this pattern was also observed in Fiji, the Solomons and Tonga. At the time of his report, Murphy found that mental health problems in Vanuatu were minor relative to other health issues.

Yap

Both Dale[4] and Hezel and Wylie[2] reported relatively high rates of schizophrenia and psychosis in Yap; along with Palau,

Yap has some of the highest reported rates of major mental illness in the Pacific. In his 1981 survey, Dale reported a prevalence for schizophrenia of 9.7/1000 adults; the rate for manic-depressive illness was 0.32/1000. In 1992, Hezel and Wylie reported a rate 8.4/1000 for schizophrenia and chronic mental illness, with males at 12.1/1000 and females 4.6/1000; the total population at the time was 6289 individuals over the age of 15. Rates of schizophrenia and chronic mental illness were highest in the 40-49 year age group for both men and women. Hezel and Wylie found that the individuals with mental illness averaged two more years of schooling than the general population (10.1 vs 7.8 years). Along with Palau, drug use in Yap is among the highest in Micronesia, and Hezel and Wylie suggested that this could offer an explanation for the high rates of psychosis observed there.

" ... there [are] no studies looking ... at ethnic variation in response to neuroleptic medication, including side effects. ... further research is needed ... "

Dohan et al[60] used Yap (along with PNG and the Solomon Islands) as one of their examples of a population that had had a great increase in schizophrenia upon the adoption of a cereal-based diet. From Dale's report, they noted the relatively high rate of schizophrenia in Yap in the contemporary context. In contrast, citing Hunt et al's[93] classic demographic work in Yap after World War II, they claimed that schizophrenia was virtually absent at that time. There are two problems with relying on Hunt et al's data for this kind of inference: 1) they were not looking specifically for mentally ill individuals, therefore only those who were actively mentally ill at the time of examination would have drawn their attention; 2) the context of Hunt et al's study was the "depopulation of Yap". Yap's population fell from approximately 7800 in 1899 to about 2700 in 1951; birth rates had only just started increasing after WWII. Therefore, the age structure and small size of the Yapese population may have been critical factors in the apparent low rate of schizophrenia. In addition, male absenteeism could have also been a contributing factor: young Yapese males used to commonly leave the island to work elsewhere, and given the skewed sex ratio for schizophrenia in Micronesia, this also could have led to the apparent absence of schizophrenia at that time.

Conclusion: suggestions for future research

Major mental illness in the Pacific is relatively rare, and the literature on the topic is correspondingly sparse. Nonetheless, there are quite literally thousands of people in the Pacific who suffer from schizophrenia and other major mental illnesses, and given the often chronic nature of these conditions, they constitute a potentially major health problem. Rather than draw any specific conclusions or generalisations based on this review of the literature, I suggest some areas for future research that I think would be particularly useful.

Epidemiological Studies - Although studies of this kind vary in type and quality, they still provide a baseline for beginning to understand the expression of a disease in a given area. Of critical importance in psychiatric research, epidemiological studies force diagnostic criteria to be made explicit. There are also undoubtedly large amounts of data in national health reports that are not generally available. Increased epidemiological analyses of such data published in widely distributed publications would be very helpful.

First-Admission and Longitudinal Studies - Very little longitudinal information is available on the course of major mental illness in the Pacific. While there are numerous indications in cross-sectional and retrospective studies of the varying course of illness, case-by-case follow-up studies are rare. These would also give some indication of the stability of diagnosis as well, which may be a critical factor in some regions, especially those not regularly served by a psychiatric consultant.

Ethnopsychopharmacology - Although drugs are used to treat mental illness in virtually every community reviewed above, almost no quantitative information is available on the amount or efficacy of drugs used. In addition, there appear to be virtually no studies looking specifically at ethnic variation in response to neuroleptic medication, including side effects. In addition, further research is needed on the use of drugs for treatment in the context of other forms of therapy, traditionally-based or otherwise.

Experiential Narratives - Understanding psychiatric illness requires the perspective of the patient and of his or her immediate caregivers, family and friends. This is recognised by the journal *Schizophrenia Bulletin*, which features a regular "First Person" section written by an individual suffering from the disease or by a family member whose life has been affected by the illness. Very little has been written in the Pacific context on what it is like to suffer from major mental illness, of the effect of that illness on family members and of the course of the illness and treatment throughout the lifetime of an individual. Longer narratives, going beyond typical clinical case histories, would provide information on both the nature of the illness and the social response to it.

Marker Studies - Numerous biological markers are available that correlate (at a population level) with major mental illness. These can be used to look at cross-cultural variation in the

expression of disease, and may be useful in identifying differences in diagnostic practice. Some Pacific populations (eg, Palau) may be particularly useful for searching for genetic markers for psychiatric illness.

Schizophrenia in Micronesia – The relatively well-studied populations in Micronesia raise some interesting issues in understanding the expression of schizophrenia. First, the male:female sex ratio seems to be quite robust; while it is typical for developing countries to evidence an excess of males with schizophrenia initially, the difference often decreases over time. This does not seem to be happening in Micronesia. Second, the variation within Micronesia, with the Western Micronesian populations of Yap and Palau having high rates, may provide insights for understanding specific factors in the development of schizophrenia.

" Mental illness sits at the intersection of several important factors in the lives of Pacific people: development, "Westernisation", migration, urbanisation. "

Immigrant Studies – An increasing percentage of Pacific people, especially Polynesians, live outside of their communities of origin. As can be seen in New Zealand, mental illness is present in these immigrant communities, and if the affected individual is young and male, there is a good chance that the medical problem will also be a legal one. Paralleling research done in the islands, we need more epidemiological, first-admission, longitudinal, pharmacological, experiential and marker research done in immigrant communities, as well.

These are a few suggestions for future research. Mental illness sits at the intersection of several important factors in the lives of Pacific people: development, "Westernisation", migration, urbanisation. In other populations, each of these factors has been associated with an apparent increase in major mental illness. Whether this increase is a direct or secondary result of some or all of these factors is not important. What is important is that we may justifiably predict that major mental illness will be an increasing public health concern in Pacific Island communities.

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