

MEDLARS BIBLIOGRAPHY

PUBLICATIONS OF RELEVANCE TO PAPUA NEW GUINEA AND MELANESIA

Bibliographic Citation List generated from MEDLARS

- 1 **Alexander ND, Perry RT, Dimber ZB, Hyun PJ, Alpers MP, Kazura JW.**
Acute disease episodes in a *Wuchereria bancrofti* endemic area of Papua New Guinea.
Am J Trop Med Hyg 1999 Aug;61(2):319-324.
Acute disease episodes of bancroftian filariasis were monitored prospectively in a rural area of Papua New Guinea. The frequency and duration of episodes were recorded for the leg, arm, scrotum, and breast. A very high incidence of acute disease was observed, 0.31 episodes per person-year in the leg alone. Incidence generally increased with age, except in the breast, where episodes were concentrated in the reproductive age range. Males had slightly higher incidence than females in the leg and arm. Chronic disease was strongly associated with acute disease incidence in all locations. Microfilaremia had a statistically significant association with acute disease in the leg, arm and breast, but not the scrotum. This study again demonstrates the high burden of acute manifestations of lymphatic filariasis, and provides new information on risk factors, which may lead to better understanding of etiology and control prospects.
- 2 **Allen SJ, O'Donnell A, Alexander ND, Mgone CS, Peto TE, Clegg JB, Alpers MP, Weatherall DJ.**
Prevention of cerebral malaria in children in Papua New Guinea by Southeast Asian ovalocytosis band 3.
Am J Trop Med Hyg 1999 Jun; 60(6):1056-1060.
Southeast Asian ovalocytosis (SAO) occurs at high frequency in malarious regions of the western Pacific and may afford a survival advantage against malaria. It is caused by a deletion of the erythrocyte membrane band 3 gene and the band 3 protein mediates the cytoadherence of parasitized erythrocytes in vitro. The SAO band 3 variant may prevent cerebral malaria but it exacerbates malaria anemia and may also increase acidosis, a major determinant of mortality in malaria. We undertook a case-control study of children admitted to hospital in a malarious region of Papua New Guinea. The SAO band 3, detected by the polymerase chain reaction, was present in 0 of 68 children with cerebral malaria compared with 6 (8.8%) of 68 matched community controls (odds ratio = 0, 95% confidence interval = 0-0.85). Median hemoglobin levels were 1.2 g/dl lower in malaria cases with SAO than in controls (p = 0.035) but acidosis was not affected. The remarkable protection that SAO band 3 affords against cerebral malaria may offer a valuable approach to a better understanding of the mechanisms of adherence of parasitized erythrocytes to vascular endothelium, and thus of the pathogenesis of cerebral malaria.
- 3 **Alto WA.**
Primary health care in Melanesia: problems and potentials.
PNG Med J 1996 Dec;39(4):315-320.
Locally directed, decentralized health services offer opportunities for empowerment by defining priorities based on community-derived policies. These are the components of the Primary Health Care Approach still missing in Melanesia.
- 4 **Beracochea E.**
How can we improve postgraduate training in community health?
PNG Med J 1996 Dec;39(4):310-314.
The Diploma Course in Community Health was developed by the Department of Community Medicine of the University of Papua New Guinea in 1982. This is a one-year course for about 10-12 middle-level managers of the health system. This brief communication reports the first attempt to assess the course. Although most of the content of the diploma course is relevant to the respondents' activities, the emphasis on research methods and community diagnosis seems to leave little time for solving the researched management topics, according to the perceived needs expressed by our small number of respondents. The question that remains unanswered seems to be how much of each of the topics that comprise the multidisciplinary field of community health is necessary to prepare mid-level health managers for their work and to assist them in making informed decisions. The methodology used failed to assess the course due to a low response rate, but some of the issues brought up by the respondents indicate that it may not be fully meeting the participants' needs. The report concludes that the improvement of the Diploma Course in Community Health will rely on the regular use of effective assessment methodology and the joint efforts of the Department of Health and the University.
- 5 **Bradley J.**
A case of malaria. Letter.
NZ Med J 1999 Mar 26;112(1084):105-106.
- 6 **Bugawan TL, Mack SJ, Stoneking M, Saha M, Beck HP, Erlich HA.**
HLA class I allele distributions in six Pacific/Asian populations: evidence of selection at the HLA-A locus.
Tissue Antigens 1999 Apr;53(4 Pt 1):311-319.
The distributions of HLA-A alleles in six Pacific/Asian populations, Malay, Papua New

Guinea (PNG) Highlands, two Indonesian groups, and two PNG Lowland groups, as well as the distribution of the HLA-B alleles in the PNG Highlands population, were determined using polymerase chain reaction (PCR) immobilized sequence-specific oligonucleotide (SSO) probe typing methods. The allele frequency distributions at the HLA class II loci DRB1, DQB1 and DPB1 were also determined by PCR/SSO methods in an additional study of the same populations. In most of these populations, the HLA-A*2402 allele was the most frequent, attaining a frequency of 0.78 in the PNG Highlands. A*1101 was the next most frequent allele, followed in frequency by the *3401 allele. The HLA-B*1506, *4001, *5601 and *5602 alleles comprised 73% of the allele diversity at the B-locus in the PNG Highlands. 2 previously unreported HLA-A alleles were identified in Indonesians and Malays, based on novel probe reactivity patterns. Cloning and sequencing identified these as A*1104 and *2410. Sequence comparisons show that these new alleles differ at codon 187 from their putative parental alleles (*1101 and *2403) by dinucleotide changes in the first two codon positions. These changes involve a Thr to Arg (CG to AC) and an Arg to Thr substitution (AC to CG) at position 187; residues at this position participate in pocket A of the peptide binding groove. Comparison of the HLA-A allele frequency distributions indicate that Malays are the most diverse (heterozygosity (h)=0.88) and the PNG Highlanders are, by far, the least diverse (h=0.37) of the groups studied. However, the diversity of B-locus alleles in the PNG Highlanders (h=0.91) was greater than that observed at the A-locus of any of the populations reported here. The remarkably high allele frequency of A*2402 in the PNG Highlands could reflect founder effects and population bottlenecks, genetic drift, or positive directional selection. The distribution of the HLA-B locus alleles and class II alleles, as well as mtDNA sequence data in the PNG Highlands indicates a reasonably high level of diversity at other loci, arguing that the high frequency of A*2402 cannot be attributed entirely to founder effects, bottlenecks, or drift and suggests the operation of positive selection for the A*2402 allele in this population.

7 **Cheng AC.**

Other people's practices: a world close to home. *Med J Aust* 1999 Apr 5;170(7):323-324.

8 **Curtin TR, Nelson EA.**

Economic and health efficiency of education funding policy. *Soc Sci Med* 1999 Jun;48(11):1599-1611.

Public spending programmes to reduce poverty, expand primary education and improve the economic status of women are recommended priorities of aid agencies and are now gradually being reflected in third world governments' policies, in response to aid conditions imposed by the World Bank and OECD countries. However, outcomes fall short of aspiration. This paper shows that donors' lending policies, especially those

restricting public spending on education to the primary level, (1) perpetuate poverty, (2) minimise socio-economic impact of public health programmes and (3) prevent significant improvement in the economic status of women. These effects are the result of fundamental flaws in donors' education policy model. Evidence is presented to show that health status in developing countries will be significantly enhanced by increasing the proportion of the population which has at least post-primary education. Heads of households with just primary education have much the same probability of experiencing poverty and high mortality of their children as those with no education at all. Aid donors' policies, which require governments of developing countries to limit public funding of education to the primary level, have their roots in what is contended here to be an erroneous interpretation of human capital theory. This interpretation focuses only on the declining marginal internal rates of return on public investments in successive levels of schooling and ignores the opposite message of the increasing marginal net present values of those investments. Cars do not travel fastest in their lowest gear despite its fastest acceleration; life's long journey is not most comfortable for those with only primary schooling.

9 **Deka R, Guangyun S, Wiest J, Smelser D, Chunhua S, Zhong Y, Chakraborty R.**

Patterns of instability of expanded CAG repeats at the ERDA1 locus in general populations. *Am J Hum Genet* 1999 Jul;65(1):192-198.

A highly polymorphic CAG repeat locus, ERDA1, was recently described on human chromosome 17q21.3, with alleles as large as 50-90 repeats and without any disease association in the general population. We have studied allelic distribution at this locus in five human populations and have characterized the mutational patterns by direct observation of 731 meioses. The data show that large alleles (≥ 40 CAG repeats) are generally most common in Asian populations, less common in populations of European ancestry, and least common among Africans. We have observed a high intergenerational instability ($46.3\% \pm 5.1\%$) of the large alleles. Although the mutation rate is not dependent on parental sex, paternal transmissions have predominantly resulted in contractions, whereas maternal transmissions have yielded expansions. Within this class of large alleles, the mutation rate increases concomitantly with increasing allele size, but the magnitude of repeat size change does not depend on the size of the progenitor allele. Sequencing of specific alleles reveals that the intermediate-sized alleles (30-40 repeats) have CAT/CAC interruptions within the CAG-repeat array. These results indicate that expansion and instability of trinucleotide repeats are not exclusively disease-associated phenomena. The implications of the existence of massively expanded alleles in the general populations are not yet understood.

10 **Destro Bisol G, D'Aloja E, Spedini G, Scatena R, Giardina B, Pascali V.**

- Brief communication: Resistance to falciparum malaria in alpha-thalassemia, oxidative stress, and hemoglobin oxidation.
Am J Phys Anthropol 1999 Jun;109(2):269-273.
- A recent survey conducted on Vanuatu Island suggests that resistance to *Plasmodium falciparum* in alpha-thalassemic individuals may have an immunological basis. This study is important since it seems to undermine the current idea that red-cell genetic defects give protection against falciparum malaria by reducing intraerythrocytic growth and development of the parasite. However, the mechanisms underlying these clinical and genetic observations are not yet fully understood. Based on a review of the relevant literature, we first show that the model based on the interaction between hemoglobin (Hb) and membrane components may provide a molecular basis for the involvement of the immune response in genetic adaptation to malaria. Second, we discuss the main evolutionary implications of the model. Finally, we suggest two approaches by which anthropological studies could provide a useful way of testing the model: 1) analysis of the interactions of malaria-resistance genes with genetic polymorphisms which affect the erythrocyte redox status and 2) study of the antimalarial effects of natural products (introduced as a part of a diet or for traditional antimalarial therapy) capable of interfering with the Hb-membrane interaction.
- 11 **Dryden R.**
Can birth defects be prevented?
PNG Med J 1997 Mar;40(1):1-3.
- 12 **Dryden R.**
Birth defects recognized in 10,000 babies born consecutively in Port Moresby General Hospital, Papua New Guinea.
PNG Med J 1997 Mar;40(1):4-13.
- A daily record was made of defects recognizable at birth or soon afterwards in 10,000 babies born consecutively at Port Moresby General Hospital, Papua New Guinea, between January 1985 and May 1986. The overall prevalence of birth defects in this series was 1.16%. All of the affected babies were singletons, 27% presented with multiple defects, and 14% were stillborn. There was a predominance of male babies in the series as a whole and more particularly in the group of affected babies (female:male ratios 1:1.15 and 1:1.50 respectively). The parts of the body most commonly affected were the limbs, head and neck, and central nervous system. The majority of the mothers originated from provinces neighbouring Port Moresby, although all the provinces were represented. Defects were more common in babies of mothers from island provinces (1.9%) than from highland (1.1%) or coastal/lowland (1.0%) provinces. The mean birthweight for all the babies in the series for whom records were available was 3.03 kg (SD 0.57), and for the abnormal babies 2.86 kg (SD 0.70). The highest mean birthweight was recorded for babies of highland mothers and the lowest for babies of coastal/lowland mothers.
- 13 **Dubey SP, Murthy DP, Cooke RA, Chaudhuri D.**
Primary osteogenic sarcoma of the tongue.
J Laryngol Otol 1999 Apr;113(4):376-379.
- A 56-year-old man presented with the difficulty of swallowing and respiratory distress due to a large tumour arising from the tongue and occupying the entire oral cavity. Histological examination revealed it to be an extraskeletal osteogenic sarcoma. The tumour was excised. After six weeks, he came back with massive local recurrence and bleeding from the tumour, but died despite chemotherapy. Review of the literature revealed only four other such cases of this rare tumour. A brief review of these four cases is also made.
- 14 **Dubey SP, Murthy DP, Kaleb LK, Vele DD.**
Malignant tumours of the nasal cavity and the paranasal sinuses in a Melanesian population.
Auris Nasus Larynx 1999 Jan;26(1):57-64.
- Malignant tumours of the nasal cavity and paranasal sinuses are usually associated with poor prognosis. From 1986 to 1995, 50 such tumours were managed in Papua New Guinea. 29 of these arose in the maxillary sinus, 15 in the nasal cavity, 4 in the ethmoid sinus and 2 in the frontal sinus. Males were more frequently affected than females. No specific carcinogenic factor was apparent in these patients who were uniformly distributed all over the country. Advanced local disease with multiple symptoms and signs was common during presentation. Systemic and neck node metastases were infrequent. Histopathologically, squamous cell carcinoma was the commonest type of tumour. Satisfactory results were obtained by combination therapy consisting of surgery, irradiation and systemic chemotherapeutic agents. Better health consciousness and health care delivery systems are essential for early diagnosis, regular post-treatment follow-up and improved survival of these patients.
- 15 **Duke T, Mai M.**
Meningitis or madness: a delicate balance.
J Paediatr Child Health 1999 Jun;35(3):319-320.
- A child with meningitis who developed a psychosis 2 weeks after commencing treatment with antituberculous therapy is described here. The psychosis resolved with cessation of isoniazid, but the meningitis returned. The meningitis was treated by re-introduction of daily doses of isoniazid, but the psychosis recurred. Successful treatment of the meningitis, with minimal psychotic symptoms, eventually was achieved using isoniazid at 48 h dose intervals. The psychosis resolved completely after completion of therapy for tuberculous meningitis and cessation of isoniazid. This is the first case of isoniazid-associated psychosis reported in a child.
- 16 **Duke T, Michael A.**
Increase in sepsis due to multi-resistant enteric gram-negative bacilli in Papua New Guinea.
Letter.
Lancet 1999 Jun 26;353(9171):2210-2211.
- 17 **Erasmus RT, Murthy DP, SenGupta SK, Ogunbanjo BO.**
Basics of molecular biology and its applications:

- III. Polymerase chain reaction and in situ hybridization.
PNG Med J 1996 Dec;39(4):321-328.
- 18 **Erasmus RT, Ray U, Nathaniel K, Dowse G.**
Reference ranges for serum creatinine and urea in elderly coastal Melanesians.
PNG Med J 1997 Jun; 40(2):89-91.
Mean values and reference ranges are presented for serum creatinine and serum urea in Melanesian men and women aged over 50 years from coastal Papua. The values are presented separately for three age groups, 51-60, 61-70 and 71-85 years, but there was no significant difference between them. The values for women were lower than for men in all age groups.
- 19 **Friesen H, Vince J, Boas P, Danaya R.**
Protection of breastfeeding in Papua New Guinea.
Bull World Health Organ 1999;77(3):271-274.
In Papua New Guinea the bottle-feeding of babies has been increasing, predominantly among unemployed women of low educational status. Many women are unaware of their legal right to have breaks at work for the purpose of breastfeeding, and a high proportion of workplaces have no facilities for mothers who wish to breastfeed their children. The laws on the feeding of infants should be updated and implemented, and an effort is needed to explain the benefits of breastfeeding and the rights of working mothers.
- 20 **Fuimaono A, Vince J.**
Screening contacts of children with tuberculosis: an important and worthwhile part of case management.
PNG Med J 1997 Jun;40(2):69-73.
The outcome of screening the household contacts of 49 newly diagnosed tuberculous children as currently practised in the Paediatric Unit of the Port Moresby General Hospital is described. The screening program generated 182 chest X-rays and 67 Mantoux tests. 32 (39%) of 83 child contacts and 11 (11%) of 99 adults were commenced on antituberculous therapy, and 2 children aged 6 months were started on INAH chemoprophylaxis. Adult contacts were identified in 11 (22%) of the 49 families screened. Such a program is an extremely important part of the case management of children with newly diagnosed tuberculosis and their families.
- 21 **Furusyo N, Hayashi J, Kakuda K, Sawayama Y, Ariyama I, Eddie R, Kashiwagi S.**
Markedly high seroprevalence of hepatitis B virus infection in comparison to hepatitis C virus and human T-lymphotropic virus type 1 infections in selected Solomon Islands populations.
Am J Trop Med Hyg 1999 Jul;61(1):85-91.
To determine the prevalences of hepatitis B virus (HBV), hepatitis C virus (HCV) and human T-lymphotropic virus type-1 (HTLV-1) infections in residents of the Solomon Islands, we surveyed 1610 serum samples from 1113 outpatients and 497 healthy volunteer blood donors at the Central Hospital in Honiara, the Solomon Islands. The prevalence of hepatitis B surface antigen (HBsAg) by radioimmunoassay (RIA) (n = 315, 19.6%) was significantly different from that of antibody to HCV (anti-HCV) by a second-generation enzyme immunoassay (EIA) (n = 4, 0.2%) and antibody to HTLV-1 (anti-HTLV-1) by an ELISA with Western blot analysis to verify the positivity (n = 49, 3.0%) (p < 0.0001, respectively). There were no significant differences in the prevalences of these markers between outpatients and blood donors. Hepatitis B e antigen (HBeAg) was detected by RIA in 130 (41.3%) of 315 HBsAg-positive samples. The distribution of HBsAg subtypes by EIA was 190 adr (60.3%), 111 ayw (35.2%), and 14 (0.4%) other subtypes. The HBeAg prevalence decreased with age in all groups for each subtype. There were no significant differences in the prevalence of HBeAg among HBsAg subtypes. We conclude that HBV infection is highly endemic in selected Solomon Islands populations, and that the high prevalence of HBeAg may be associated with the spread of HBV infection there.
- 22 **Gao R, Kini RM, Gopalakrishnakone P.**
Purification, properties, and amino acid sequence of a hemoglobinuria-inducing phospholipase A(2), MiPLA-1, from *Micropechis ikaheka* venom.
Arch Biochem Biophys 1999 Sep 1;369(1): 181-192.
Dark-colored urine is one of the clinical symptoms of envenomation by *Micropechis ikaheka* (New Guinea small-eyed snake). We have purified a phospholipase A(2), MiPLA-1, which induces dark-colored urine in experimental mice, to homogeneity. The analysis of the dark-colored urine by electrophoresis and N-terminal sequence determination indicated that the color of mouse urine is due to hemoglobin in the urine but not myoglobin. MiPLA-1 is the first hemoglobinuria-inducing toxin. Insignificant hemolytic activity of MiPLA-1 indicates that hemoglobinuria is not due to lysis of erythrocytes by MiPLA-1. This suggests that hemoglobinuria induced by MiPLA-1 may be due to kidney leakage caused by unknown mechanisms. MiPLA-1 also showed other biological effects, including myotoxicity as well as anticoagulant and antiplatelet effects. Structural studies show that MiPLA-1 is a basic protein with a molecular mass of 14041.60 ± 1.78 as determined by electrospray mass spectrometry. We have determined the complete amino acid sequence of MiPLA-1. It is a 124-amino-acid protein with a 'pancreatic loop' and belongs to group IB phospholipase A(2) enzymes. Two short segments flanked by proline brackets are found in the sequence of MiPLA-1. These segments are on the surface of the molecule and hence may be involved in protein-protein recognition.
- 23 **Graham JC.**
EMST in Papua New Guinea: more than just a course. Early management of severe trauma.
Aust NZ J Surg 1999 Aug;69(8):557-560.
BACKGROUND: Trauma in Papua New Guinea (PNG) is a major reason for acute hospital

admission. The Early Management of Severe Trauma Course (EMST) of the Royal Australasian College of Surgeons was introduced to PNG in 1993 to help in trauma education. **METHODS:** Four EMST courses have been held in Port Moresby since 1993 with the support of the Department of Surgery of the University of PNG. **RESULTS:** 62 doctors have attended a course and three PNG doctors have been trained as course instructors. Trauma workshops were held in other provincial hospitals extending the course principles to nurses and health professionals in these areas. **CONCLUSION:** The introduction of EMST to PNG has proven to be a worthwhile endeavour and the program is now firmly established in PNG.

24 **Hagelberg E, Goldman N, Lio P, Whelan S, Schiefenhövel W, Clegg JB, Bowden DK.**

Evidence for mitochondrial DNA recombination in a human population of island Melanesia.

Proc R Soc Lond B Biol Sci 1999 Mar 7;266(1418):485-492.

Mitochondrial DNA (mtDNA) analysis has proved useful in studies of recent human evolution and the genetic affinities of human groups of different geographical regions. As part of an extensive survey of mtDNA diversity in present-day Pacific populations, we obtained sequence information of the hypervariable mtDNA control region of 452 individuals from various localities in the western Pacific. The mtDNA types fell into three major groups which reflect the settlement history of the area. Interestingly, we detected an extremely rare point mutation at high frequency in the small island of Nguna in the Melanesian archipelago of Vanuatu. Phylogenetic analysis of the mtDNA data indicated that the mutation was present in individuals of separate mtDNA lineages. We propose that the multiple occurrence of a rare mutation event in one isolated locality is highly improbable, and that recombination between different mtDNA types is a more likely explanation for our observation. If correct, this conclusion has important implications for the use of mtDNA in phylogenetic and evolutionary studies.

25 **Hanna JN, Ritchie SA, Phillips DA, Lee JM, Hills SL, Van Den Hurk AF, Pyke AT, Johansen CA, Mackenzie JS.**

Japanese encephalitis in north Queensland, Australia, 1998.

Med J Aust 1999 Jun 7;170(11):533-536.

OBJECTIVE: To describe the circumstances of two cases of Japanese encephalitis (JE) in north Queensland in 1998, including one acquired on the Australian mainland. **DESIGN:** Serological surveillance of sentinel pigs for JE virus activity; serological surveys of humans and pigs and viral cultures of mosquito collections. **SETTING:** Islands in the Torres Strait and communities in the Northern Peninsula Area (NPA) and near the mouth of the Mitchell River in Cape York, Queensland, in the 1998 wet season (December 1997-May 1998). **RESULTS:** Sentinel pigs in the Torres Strait began to seroconvert to JE virus in February 1998, just before onset of JE in an unvaccinated 12-year-old boy on Badu island. By

mid-April, most sentinel pigs had seroconverted. Numerous JE viruses were isolated from *Culex annulirostris* mosquitoes collected on Badu. In early March, a person working at the mouth of the Mitchell River developed JE. Serological surveys showed recent JE virus infection in 13 young pigs on a nearby farm, but not in 488 nearby residents. In NPA communities, sentinel pigs seroconverted slowly and JE viruses were isolated from three, but none of 604 residents showed evidence of recent infection. Nucleotide sequencing showed that 1998 JE virus isolates from the Torres Strait were virtually identical not only to the 1998 isolate from an NPA pig, but also to previous (1995) Badu isolates. **CONCLUSIONS:** JE virus activity was more widespread in north Queensland in the 1998 wet season than in the three previous wet seasons, but ecological circumstances (e.g., less intensive pig husbandry, fewer mosquitoes) appear to have limited transmission on the mainland. Nucleotide sequencing indicated a common source for the 1995 and 1998 JE viruses. Circumstantial evidence suggests that cyclonic winds carried infected mosquitoes from Papua New Guinea.

26 **Hii J, Dyke T, Dagoro H, Sanders RC.**

Health impact assessments of malaria and Ross River virus infection in the Southern Highlands Province of Papua New Guinea.

PNG Med J 1997 Mar;40(1):14-25.

Malaria at an elevation of 1050 metres is common and highly endemic in the Tagari Valley in the Southern Highlands of Papua New Guinea. Health impact assessments showed that the risks of malaria and epidemic polyarthritis at a gasfield development project in this area were high. Baseline malariometric surveys were conducted in four villages in June and August 1990 and two follow-up surveys (May and December 1991) were made in the village of Nogolitogo near the gasfield pioneer base camp. A total of 941 blood smears were examined. Average malaria prevalence rates decreased with altitude from 56% (at 1050 m) to 9% (at 1700 m) for children 1-9 years of age and from 45% (at 1050 m) to 8% (at 1550 m) for those aged 10 years or more. The spleen rate for children less than 10-years-old did not vary significantly with altitude, but average enlarged spleen for all ages decreased with altitude. Mean packed cell volume increased with altitude. *Plasmodium falciparum* was the most common malaria parasite found and *Anopheles punctulatus* the predominant vector. Ross River arbovirus (RRV) antibody prevalence was 59%. These results indicate frequent or constant transmission of malaria and pathogenic arboviruses. Entomological and epidemiological data suggested that the vulnerability of the valley community, the receptivity of the environment and the health hazards from malaria and RRV were high. Nonimmune Papua New Guineans and expatriate employees face high health hazards; therefore effective preventive measures are required to mitigate epidemics and avoid the likely heightened transmission of malaria and arboviruses caused by the development project.

- 27 **Hombhanje FW.**
Parasitological response of *Plasmodium falciparum* infection to chloroquine treatment in malaria patients in Port Moresby.
PNG Med J 1997 Jun;40(2):74-78.
A 7-day in vivo test system was applied to assess the parasitological response to chloroquine treatment in patients with falciparum malaria in the Central Province and National Capital District of Papua New Guinea. 30 patients were investigated but only 23 took a full course of chloroquine and were completely followed up. Of the 23 patients, 13 (57%) were negative for malaria parasites on day 2, 4 (17%) had significantly reduced parasitaemia by day 2 and cleared parasites by day 7, and 1 (4%) showed a partial response (R2). In 5 (22%) of the patients resistance at the R3 level was observed. The indication from this study is that chloroquine should continue to be the first-line drug for the treatment of uncomplicated falciparum malaria. However, judicious use of chloroquine in uncomplicated falciparum malaria is required to halt the spread of chloroquine-resistant strains of *Plasmodium falciparum*.
- 28 **Hombhanje FW.**
Prevalence of malaria species observed at Port Moresby General Hospital from 1988 to 1996. Letter.
PNG Med J 1997 Jun;40(2):96.
- 29 **Johnson FYA.**
Ward Six Psychiatric Unit at the Port Moresby General Hospital: a historical review and admission statistics from 1980 to 1989.
PNG Med J 1997 Jun;40(2):79-88.
OBJECTIVE: The objective of this study was to document the acute psychiatric service offered by the Ward Six Psychiatric Unit at the Port Moresby General Hospital by means of admission statistics. METHODS: The study was designed to cover the period 1980 to 1989, for which reliable medical records were available. Data were collected on the total number of psychiatric admissions per year, diagnostic classification, occupation, province of origin of the patients, age and sex. A brief history of Psychiatric Ward Six is added. RESULTS: The results showed that the total number of admissions to Ward Six from 1980 to 1989 was 725. There were 462 (64%) male and 263 (36%) female patients. The ratio of male to female patients was 1.8 to 1.0. Diagnostic classification of the patients was done by the International Classification of Diseases (Ninth Edition). The most common diagnosis was schizophrenia with 358 patients (49%). The majority (63%) of the patients were unemployed. A large number of the patients, 295 (41%), were from Central Province. The young age group 21-30 years accounted for 267 (37%) of the patients. The mean annual incidence for the ten-year period of the study was 5.4 patients per 10,000 population. There was an increase in the annual incidence from 3.6 per 10,000 population in 1983 to 7.9 per 10,000 population in 1989. CONCLUSION: In developing countries, including Papua New Guinea, hospital utilization studies and statistics provide an initial source of information. These may be followed later with community surveys and field surveys when more resources including funding become available.
- 30 **Johnson FY, Ambihaipahar U.**
Child abuse in Papua New Guinea.
Med Law 1999;18(1):61-76.
This paper is a report on two children who suffered severe abuse including sexual abuse who were referred to the Port Moresby General Hospital for consultation and treatment. Two case reports are discussed on the basis of literature review of Child Abuse in Papua New Guinea. This is followed by conclusion and recommendations for preventing child abuse in Papua New Guinea.
- 31 **Kaneko A, Bergqvist Y, Taleo G, Kobayakawa T, Ishizaki T, Bjorkman A.**
Proguanil disposition and toxicity in malaria patients from Vanuatu with high frequencies of CYP2C19 mutations.
Pharmacogenetics 1999 Jun;9(3):317-326.
The increasing resistance of falciparum malaria to common antimalarial drugs has renewed interest in the compound proguanil normally metabolized to cycloguanil, a strong dihydrofolate reductase inhibitor, via the cytochrome P450 isozyme CYP2C19. The relationship between CYP2C19 genotypes and proguanil metabolism was therefore studied in 100 uncomplicated malaria patients on Malakula island in Vanuatu, where a CYP2C19-related poor metabolizer genotype status was known to be frequent. The patients (median age, 7 years) with *Plasmodium falciparum* or *P. vivax* infections, received proguanil treatment for 3 days in daily doses corresponding to adult doses of 300-500 mg. Capillary blood samples were collected on filter paper for determining both human CYP2C19 mutations by polymerase chain reaction and mutation-specific restriction enzyme digestion and blood concentrations of proguanil and its metabolites by high-performance liquid chromatography. The frequencies of the defective alleles, CYP2C19*2 and CYP2C19*3, were 0.57 and 0.25, respectively. The patients were genotyped as 68 CYP2C19-related poor metabolizers and 32 extensive metabolizers. Proguanil concentrations were higher and cycloguanil and 4-chlorophenylbiguanide concentrations were lower in poor compared to extensive metabolizers. Among the extensive metabolizers, 27 were heterozygous and 5 were homozygous for unmutated alleles. The tendency of an intermediate degree of proguanil metabolism in heterozygous extensive metabolizers as compared to homozygous extensive metabolizers and poor metabolizers suggests the trend towards the existence of a gene dose effect. Mild adverse events (mainly gastro-intestinal symptoms) were often reported and positively correlated with proguanil concentrations. The incidence was, however, similar in poor and extensive metabolizers. In conclusion, our data demonstrate an association between CYP2C19 mutations and poor metabolism of proguanil.

32 **Keohane C.**

The human prion diseases. A review with special emphasis on new variant CJD and comments on surveillance.

Clin Exp Pathol 1999;47(3-4):125-132.

The transmissible spongiform encephalopathies or prion diseases represent a new group of diseases with unique clinical and neuropathological features, the transmission of which is both genetic and infectious. The responsible agent is unconventional and appears to be largely composed of a glycoprotein, the prion protein PrP. This is normally present on different cells. In prion diseases, it becomes converted to the pathogenic form PrPres which is resistant to proteinase and accumulates within the brain and this process is accompanied by the development of spongiform change, gliosis and neuronal loss. The human prion diseases include kuru, a progressive cerebellar degeneration with late dementia affecting Fore tribes in New Guinea, now almost extinct, regarded as being related to cannibalism. Creutzfeldt-Jakob disease is the more frequent human prion disease. Its incidence is approximately one case per million per year. Four variants are now recognized: sporadic, familial, iatrogenic and the new variant. The latter represents a distinct clinico-pathological entity. It is now widely accepted that it is due to the same agent responsible for bovine spongiform encephalopathy in cattle. Gerstmann-Sträussler-Scheinker disease is a very rare inherited disorder due to a number of different mutations in the PRP gene, characterized by abundant deposits of plaque PrPres in the cerebral grey matter. Fatal familial insomnia is another inherited disorder due to a mutation at codon 178 of the PRP gene associated with methionine on codon 129 of the mutant allele. The main neuropathological change is neuronal loss in the thalamus with little or no spongiosis and usually no PrPres deposition. Following the emergence of new variant CJD in 1996, surveillance of all forms of prion diseases has now been actively introduced in many European nations in order to determine the true incidence and geographic distribution of these rare disorders in humans.

33 **Klufio CA, Amoa AB, Kariwiga G, Rageau O.**

A case-control study of meconium staining of amniotic fluid in labour at Port Moresby General Hospital to determine associated risk factors and perinatal outcome.

PNG Med J 1996 Dec;39(4):297-309.

AIM: To identify sociodemographic and obstetric characteristics which could be used as markers for thick meconium staining of the amniotic fluid (MSAF) in labour. METHODS: The design was an unmatched case-control study. The setting was the Port Moresby General Hospital labour ward. The eligibility criteria were: patients with a singleton pregnancy, cephalic presentation and baby alive at the time of admission in labour. Cases were parturients who had MSAF during labour. The cases were sequentially enrolled according to the time of delivery recorded in the labour ward register. A control was a patient who

did not have MSAF and who was the first to deliver after a case. Data were collected using an interviewer-administered questionnaire and patients' hospital records. RESULTS: Logistic regression analysis showed the following variables to have a positive significant association with MSAF: low social status, betelnut chewing, grand multiparity, past history of perinatal death and rupture of membranes to delivery interval. Preterm delivery was negatively associated with MSAF. Compared with the controls, the cases had a higher caesarean section rate; more of their babies were admitted to the Special Care Nursery (SCN); the mean stay of their babies in the SCN was longer; and the perinatal mortality was higher.

34 **Klufio CA, Amoa AB, Rageau O, Mola G, Kariwiga G.**

A survey of under-18 year old and 20-29 year old primigravidae delivered at the Port Moresby General Hospital: a comparative study of their sociodemographic and sexuality characteristics and contraceptive knowledge and experience.

PNG Med J 1997 Mar;40(1):26-38.

From July 1992 to August 1993, 330 under-18 year old primigravidae (cases) and 330 randomly selected 20-29 year old primigravidae (controls) who were delivered at the Port Moresby General Hospital were sequentially studied, using a standardized, pretested, precoded questionnaire. In stepwise logistic regression analysis, significantly more of the cases had menarche at less than 15 years of age, learned before menarche that sex causes pregnancy, were of highland origin, were unemployed, or had partners who were unemployed; significantly fewer of the cases thought that one sexual act could cause pregnancy, had knowledge of or had ever used a family planning method, or had planned this pregnancy.

35 **Kuska B.**

Breast cancer increases in Papua New Guinea.

J Natl Cancer Inst 1999 Jun 16;91(12):994-996.

36 **Lehmann D, Heywood P.**

Effect of birthweight on pneumonia-specific and total mortality among infants in the highlands of Papua New Guinea.

PNG Med J 1996 Dec;39(4):274-283.

A cohort of 1711 children born in Tari, Southern Highlands Province, Papua New Guinea was followed to determine the effect of birthweight on total and cause-specific mortality at varying ages during infancy. Mean birthweight was 3.04 kg, males were significantly heavier than females and first offspring significantly lighter than other offspring. Children weighing ≤ 2.5 kg at birth accounted for 15% of all births and 32% of all deaths and were 2.7 times more likely to die in infancy than heavier children. Infant mortality was negatively associated with birthweight ($p < 0.001$). Mortality was very high among children with birthweight ≤ 2 kg and was lowest in the 3.1-3.5 kg birthweight category. Pneumonia mortality declined with increasing birthweight in the 1-5 month age group, but in the 6-11 month age group

the risk of death from pneumonia was the same among children with birthweight > 3.5 kg as those with birthweight ≤ 2.5 kg. While control of infectious diseases will have a marked impact on infant mortality in the short term, longer-term interventions aimed at improving socioeconomic status are needed to improve nutritional status of both adults and children (including birthweight) and hence sustain the lower mortality levels achieved in young children.

- 37 **Lord CC, Barnard B, Day K, Hargrove JW, McNamara JJ, Paul RE, Trenholme K, Woolhouse ME.**

Aggregation and distribution of strains in microparasites.

Philos Trans R Soc Lond B Biol Sci 1999 Apr 29;354(1384):799-807.

Recent research has shown that many parasite populations are made up of a number of epidemiologically distinct strains or genotypes. The implications of strain structure or genetic diversity for parasite population dynamics are still uncertain, partly because there is no coherent framework for the interpretation of field data. Here, we present an analysis of four published data sets for vector-borne microparasite infections where strains or genotypes have been distinguished: serotypes of African horse sickness (AHS) in zebra; types of *Nannomonas* trypanosomes in tsetse flies; parasite-induced erythrocyte surface antigen (PIESA) based isolates of *Plasmodium falciparum* malaria in humans; and the merozoite surface protein 2 gene (MSP-2) alleles of *P. falciparum* in humans and in anopheline mosquitoes. For each data set we consider the distribution of strains or types among hosts and any pairwise associations between strains or types. Where host age data are available we also compare age-prevalence relationships and estimates of the force of infection. Multiple infections of hosts are common and for most data sets infections have an aggregated distribution among hosts with a tendency towards positive associations between certain strains or types. These patterns could result from interactions (facilitation) between strains or types, or they could reflect patterns of contact between hosts and vectors. We use a mathematical model to illustrate the impact of host-vector contact patterns, finding that even if contact is random there may still be significant aggregation in parasite distributions. This effect is enhanced if there is non-random contact or other heterogeneities between hosts, vectors or parasites. In practice, different strains or types also have different forces of infection. We anticipate that aggregated distributions and positive associations between microparasite strains or types will be extremely common.

- 38 **Maouris P.**

Review of 17 cases of ectopic pregnancy at the Vila Central Hospital in Vanuatu.

PNG Med J 1997 Mar;40(1):39-43.

A review of cases of ectopic pregnancy operated upon at Vila Central Hospital during 1992

with an analysis of clinical presenting features and diagnostic factors is presented. Comparison is made between hospital, regional and national figures and possible explanations for the differences are given. Recommendations are made to ensure that ectopic pregnancy is always at the forefront of differential diagnosis in women presenting with abdominal pain.

- 39 **Malcolm RL, Hanna JN, Phillips DA.**

The timeliness of notification of clinically suspected cases of dengue imported into north Queensland.

Aust NZ J Public Health 1999 Aug;23(4):414-417.

OBJECTIVE: Evaluate the timeliness of notifications by medical practitioners of clinically suspected dengue importations into north Queensland (NQ). Describe the features of the disease and determine the likely duration of viraemia prior to implementing public health measures. **METHOD:** Since December 1994, the Tropical Public Health Unit (TPHU) has maintained a register of all imported cases of dengue into NQ. Only confirmed viraemic cases were included in the study. Timeliness of notification was defined as the interval between the first medical consultation in NQ and notification to TPHU. An Epi info database was developed and used to analyse data. **RESULTS:** There were 31 confirmed dengue importations into NQ during the study period, including all four dengue serotypes. The largest source (39%) was Papua New Guinea. The median time for notifications was 5.5 days. Doctor notifications ranged from 0 to 21 days (median 2 days), remaining notifications range from 1 to 42 days (median 10 days) ($p < 0.05$). The mean duration of viraemia of public health importance was 7 days (2-12 days). **CONCLUSIONS:** Of concern, doctors failed to notify > 50% of suspected cases and only 26% of notifications were received within 48 hours. Notification delays led to prolonged viraemia of public health importance increasing the potential risk of secondary infections. **IMPLICATIONS:** General practitioners need to promptly notify all clinically suspected cases of dengue in travellers recently arrived in NQ. The TPHU intends to reemphasise to general practitioners the importance of timely notifications and develop an orientation package for new doctors.

- 40 **McAdam KP, Raynes JG, Alpers MP, Westermark GT, Westermark P.**

Amyloidosis: a global problem common in Papua New Guinea.

PNG Med J 1996 Dec;39(4):284-296.

The increase in different precursor proteins that have been shown to form amyloid fibrils and the identification of common properties have not yet led to any unifying theory or mechanism for the pathogenesis of amyloidogenesis. Papua New Guinea holds a unique place in the story of amyloidosis and in this article we review the current status of amyloidosis research indicating how this relates to those forms relevant to Papua New Guinea. This review concentrates on

secondary reactive amyloid (AA), which is found in the highest frequency in the world in parts of Papua New Guinea, and kuru, in which the amyloid protein itself is infectious. The history, pathogenesis and future prospects for these diseases are discussed in the light of what is known about other forms of amyloidosis.

- 41 **Merriwether DA, Kaestle FA.** Mitochondrial recombination? Letter. *Science* 1999 Aug 6;285(5429):837.

- 42 **Merriwether DA.** Freezer anthropology: new uses for old blood. *Philos Trans R Soc Lond B Biol Sci* 1999 Jan 29;354(1379):121-129.

Archived blood fractions (plasma, settled red cells, white cells) have proved to be a rich and valuable source of DNA for human genetic studies. Large numbers of such samples were collected between 1960 and the present for protein and blood group studies, many of which are languishing in freezers or have already been discarded. More are discarded each year because the usefulness of these samples is not widely understood. Data from DNA derived from 10-35-year-old blood samples have been used to address the peopling of the New World and of the Pacific. Mitochondrial DNA haplotypes from studies using this source of DNA support a single wave of migration into the New World (or a single source population for the New World), and that Mongolia was the likely source of the founding population. Data from Melanesia have shown that Polynesians are recent immigrants into the Pacific and did not arise from Melanesia.

- 43 **Meyer W, Marszewska K, Amirmostofian M, Igreja RP, Hardtke C, Methling K, Viviani MA, Chindamporn A, Sukroongreung S, John MA, Ellis DH, Sorrell TC.**

Molecular typing of global isolates of *Cryptococcus neoformans* var. *neoformans* by polymerase chain reaction fingerprinting and randomly amplified polymorphic DNA: a pilot study to standardize techniques on which to base a detailed epidemiological survey.

Electrophoresis 1999 Jun;20(8):1790-1799.

A total of 356 clinical isolates of the encapsulated basidiomycetous fungus *Cryptococcus neoformans* var. *neoformans*, obtained from Australia, Argentina, Brazil, India, Italy, New Zealand, Papua New Guinea, South Africa, Thailand and the USA, were analyzed to lay the basis for a comprehensive evaluation of the global genetic structure of *C. neoformans*. Two polymerase chain reaction (PCR)-based typing techniques were standardized: PCR fingerprinting using a single primer specific to minisatellite or microsatellite DNA, and randomly amplified polymorphic DNA (RAPD) analysis using two combinations of three 20- to 22-mer random primers. Previous studies showed that the resultant profiles are reproducible and stable over time. Identical results were obtained in two different laboratories and by different scientists in the same laboratory. Both typing techniques separated the isolates into four major groups (VNI and VNII,

serotype A; VNIII, serotype A/D; and VNIV, serotype D). The majority (78%) of isolates belonged to VNI, compared with 18% VNII, 1% VNIII and 3% VNIV. All US isolates could be differentiated by a unique, strain-specific PCR fingerprint or RAPD pattern in contrast to most of the non-US isolates, which showed a substantially higher degree of genetic homogeneity, with some clonality, in different parts of the world. Isolates obtained from the same patient at different times and from different body sites, had identical banding patterns. Both typing techniques should provide powerful tools for epidemiological studies of medically important fungi.

- 44 **Mola G, Permezel M, Amoa AB, Klufio CA.**

Anaemia and perinatal outcome in Port Moresby. *Aust NZ J Obstet Gynaecol* 1999 Feb;39(1):31-34.

In 1987, a computerized obstetric database was set up at the Port Moresby General Hospital. Between 1987 and 1992, 27,117 births took place. The mean haemoglobin value amongst the 83% of women in whom a haemoglobin value was tested was 10.0 ± 1.7 g/dL. High stillbirth rates (94 per 1000) were associated with a haemoglobin value < 6 g/dL. The stillbirth rate was slightly lower (14 per 1000) in woman whose lowest haemoglobin value was in the range 10.0-10.9 g/dL than in those with a haemoglobin value ≥ 11 g/dL (18 per 1000). The stillbirth rate was increased in women with haemoglobin values ≥ 14.0 g/dL. With respect to low birthweight (< 2500 g), the rates were also higher when the haemoglobin value was above 14.0 g/dL. The reason for these findings is not apparent and may be due to the impact of an uncharacterized confounding variable rather than the haemoglobin value.

- 45 **Ohkura S, Yamashita M, Cartier L, Tanabe DG, Hayami M, Sonoda S, Tajima K.**

Identification and phylogenetic characterization of a human T-cell leukaemia virus type I isolate from a native inhabitant (Rapa Nui) of Easter Island. *J Gen Virol* 1999 Aug;80(Pt 8):1995-2001.

Human T-cell leukaemia virus type I (HTLV-I) is endemic in Melanesia, one of the three ethnogeographic regions of the Pacific; in the other two regions, Polynesia and Micronesia, the incidence of the virus is relatively low. In an effort to gain new insights into the prevalence of HTLV-I in the Pacific region, we did a seroepidemiological survey on Easter Island, which is located on the eastern edge of Polynesia. Of 138 subjects surveyed, including 108 Rapa Nui (the native inhabitants of this island), we identified one HTLV-I-seropositive Rapa Nui. The new HTLV-I isolate derived from this carrier (E-12) was phylogenetically analysed to ascertain the origin and past dissemination of HTLV-I in the island. The analysis demonstrated that isolate E-12 belongs to subgroup A of the Cosmopolitan group, and that it differs from HTLV-I's found in Melanesia, which are highly divergent variants. In subgroup A, E-12 grouped with South American HTLV-I's including those from Amerindians. This result suggests that this isolate originated in South America rather than in Melanesia.

- 46 **Ohkura S, Yanagihara R, Yamashita M, Hayami M.**

Phylogenetic relatedness of HTLV type I from Bellona, a Polynesian outlier within the Solomon Islands, to HTLV type I from Japan and far Eastern Asia.

AIDS Res Hum Retroviruses 1999 Jul 20;15(11):1041-1045.

- 47 **Prescott LE, MacDonald DM, Davidson F, Mokili J, Pritchard DI, Arnot DE, Riley EM, Greenwood BM, Hamid S, Saeed AA, McClure MO, Smith DB, Simmonds P.**

Sequence diversity of TT virus in geographically dispersed human populations.

J Gen Virol 1999 Jul;80(Pt 7):1751-1758.

TT virus (TTV) is a newly discovered DNA virus originally classified as a member of the Parvoviridae. TTV is transmitted by blood transfusion, where it has been reported to be associated with mild post-transfusion hepatitis. TTV can cause persistent infection, and is widely distributed geographically; we recently reported extremely high prevalences of viraemia in individuals living in tropical countries (e.g. 74% in Papua New Guinea, 83% in Gambia; Prescott & Simmonds, *New England Journal of Medicine* 339, 776, 1998). In the current study we have compared nucleotide sequences from the N22 region of TTV (222 bases) detected in eight widely dispersed human populations. Some variants of TTV, previously classified as genotypes 1a, 1b and 2, were widely distributed throughout the world, while others, such as a novel subtype of type 1 in Papua New Guinea, were confined to a single geographical area. Five of the 122 sequences obtained in this study (from Gambia, Nigeria, Papua New Guinea, Brazil and Ecuador) could not be classified as types 1, 2 or 3, with the variant from Brazil displaying only 46-50% nucleotide (32-35% amino acid) sequence similarity to other variants. This study provides an indication of the extreme sequence diversity of TTV, a characteristic which is untypical of parvoviruses.

- 48 **Pritchard DI, Brown A, Kasper G, McElroy P, Loukas A, Hewitt C, Berry C, Fullkrug R, Beck E.**

A hookworm allergen which strongly resembles calreticulin.

Parasite Immunol 1999 Sep;21(9):439-450.

Immunoglobulin E-rich plasma from patients from Papua New Guinea infected with *Necator americanus* has been used to probe an adult *N. americanus* cDNA library for the presence of hookworm allergens. Using this approach, one hookworm allergen has been identified as calreticulin, which was subsequently expressed in *Escherichia coli*. Little serological cross reactivity was seen between the recombinant calreticulins of this hookworm and its host. Prospective roles for hookworm calreticulin in the host-parasite relationship are discussed in depth.

- 49 **Redd AJ, Stoneking M.**

Peopling of Sahul: mtDNA variation in Aboriginal Australian and Papua New Guinean populations.

Am J Hum Genet 1999 Sep;65(3):808-828.

We examined genetic affinities of Aboriginal Australian and New Guinean populations by using nucleotide variation in the two hypervariable segments of the mtDNA control region (CR). A total of 318 individuals from highland Papua New Guinea (PNG), coastal PNG and Aboriginal Australian populations were typed with a panel of 29 sequence-specific oligonucleotide (SSO) probes. The SSO-probe panel included five new probes that were used to type an additional 1037 individuals from several Asian populations. The SSO-type data guided the selection of 78 individuals from Australia and east Indonesia for CR sequencing. A gene tree of these CR sequences, combined with published sequences from worldwide populations, contains two previously identified highland PNG clusters that do not include any Aboriginal Australians; the highland PNG clusters have coalescent time estimates of approximately 80,000 and 122,000 years ago, suggesting ancient isolation and genetic drift. SSO-type data indicate that 84% of the sample of PNG highlander mtDNA belong to these two clusters. In contrast, the Aboriginal Australian sequences are intermingled throughout the tree and cluster with sequences from multiple populations. Phylogenetic and multidimensional-scaling analyses of CR sequences and SSO types split PNG highland and Aboriginal Australian populations and link Aboriginal Australian populations with populations from the subcontinent of India. These mtDNA results do not support a close relationship between Aboriginal Australian and PNG populations but instead suggest multiple migrations in the peopling of Sahul.

- 50 **Reid S, Husein A, Hutchinson G, Copeman D.**

A possible role for rusa deer (*Cervus timorensis russa*) and wild pigs in spread of *Trypanosoma evansi* from Indonesia to Papua New Guinea.

Mem Inst Oswaldo Cruz 1999 Mar-Apr;94(2):195-197.

Movement of transmigrants and livestock from western Indonesia to southeastern areas of Irian Jaya near the border with Papua New Guinea may pose a risk of introducing *Trypanosoma evansi* into Papua New Guinea via feral Rusa deer (*Cervus timorensis russa*) and wild pigs which inhabit these areas in large numbers. Pilot experimental studies were conducted to observe infection in pigs and Rusa deer with a strain of *T. evansi* isolated in Indonesia. Parasitaemia and signs of clinical disease were monitored each second day for 120 days. Trypanosomes were observed in haematocrit tubes at the plasma-buffy coat interface of jugular blood of deer and pigs on 86% and 37% of sampling occasions respectively. Parasitaemia was at a high level in deer for 35% of the time but for only 11.5% of the time in pigs. Results indicate that both Rusa deer and pigs have a high tolerance for infection with *T. evansi*. The deer suffered mild anaemia evidenced by a 25% reduction in packed cell volume (PCV) 14 days after infection which coincided with the initial peak in parasitaemia. However, PCV had returned to pre-infection values

by the end of the experiment. The pigs showed no change in PCV. There were no visual indications of disease in either species and appetite was not noticeably affected. It was concluded that both Rusa deer and pigs were capable reservoir hosts for *T. evansi* but that Rusa deer, with their more persistent higher levels of parasitaemia, have more potential to spread *T. evansi* into Papua New Guinea from West Irian than pigs.

51 **Roberts Thomson L.**

Letters from Papua New Guinea. Helping in a natural disaster.

Aust Fam Physician 1999 Apr;28(4):394-396.

52 **Roberts Thomson L.**

Japanese encephalitis.

Aust Fam Physician 1999 May; 28(5):480.

53 **Sapuri M, Amoa AB, Kariwiga G, White J.**

A case of factor V deficiency presenting as menorrhagia.

PNG Med J 1997 Jun;40(2):92-95.

Factor V deficiency is a rare hereditary disorder. We report a patient with factor V deficiency who presented with menorrhagia and pelvic haematoma. The Haematology Department at the Royal Brisbane Hospital performed the definitive factor assays leading to the diagnosis. The challenges of her management were obtaining adequate supplies of factor V and her socioeconomic circumstances. The main future challenge will be the supervision of her pregnancies.

54 **Sapuri M, Klufio C.**

A case of advanced viable extrauterine pregnancy.

PNG Med J 1997 Mar;40(1):44-47.

Advanced extrauterine pregnancy with a successful outcome is a rare event. A case is presented of a 34-year-old woman at 35 weeks gestation whose abdominal pregnancy was successfully managed. The diagnostic and management problems associated with abdominal pregnancy are discussed, and especially the controversial issues of the treatment of the placenta after delivery. The reasons for the high maternal and perinatal mortality associated with the condition are analyzed.

55 **Shankar AH, Genton B, Semba RD, Baisor M, Paino J, Tamja S, Adiguma T, Wu L, Rare L, Tielsch JM, Alpers MP, West KP Jr.**

Effect of vitamin A supplementation on morbidity due to *Plasmodium falciparum* in young children in Papua New Guinea: a randomised trial.

Lancet 1999 Jul 17;354(9174):203-209.

BACKGROUND: Many individuals at risk of malaria also have micronutrient deficiencies that may hamper protective immunity. Vitamin A is central to normal immune function, and supplementation has been shown to lower the morbidity of some infectious diseases. We investigated the effect of vitamin A supplementation on malaria morbidity. **METHODS:** This randomised double-blind

placebo-controlled trial of vitamin A supplementation took place in a *P. falciparum* endemic area of Papua New Guinea. Of 520 potentially eligible children aged 6-60 months, 480 were randomly assigned high-dose vitamin A (n=239) or placebo (n=241), every 3 months for 13 months. Malaria morbidity was assessed through weekly community-based case detection and surveillance of patients who self-reported to the health centre. Cross-sectional surveys were also done at the beginning, middle, and end of the study to assess malariometric indicators. Analyses were by intention to treat. **FINDINGS:** The number of *P. falciparum* febrile episodes (temperature ≥ 37.5 degrees C with a parasite count of at least 8000/microL) was 30% lower in the vitamin A group than in the placebo group (178 vs 249 episodes; relative risk 0.70 [95% CI 0.57-0.87], p=0.0013). At the end of the study *P. falciparum* geometric mean density was lower in the vitamin A than the placebo group (1300 [907-1863] vs 2039 [1408-2951]) as was the proportion with spleen enlargement (125/196 [64%] vs 148/207 [71%]); neither difference was significant (p=0.093 and p=0.075). Children aged 12-36 months benefited most, having 35% fewer febrile episodes (89 vs 141; relative risk 0.65 [14-50], p=0.0023), 26% fewer enlarged spleens (46/79 [58%] vs 67/90 [74%], p=0.0045), and a 68% lower parasite density (1160 [95% CI 665-2022] vs 3569 [2080-6124], p=0.0054). Vitamin A had no consistent effect on cross-sectional indices of proportion infected or with anaemia. **INTERPRETATION:** Vitamin A supplementation may be an effective low-cost strategy to lower morbidity due to *P. falciparum* in young children. The findings suggest that clinical episodes, spleen enlargement, and parasite density are influenced by different immunological mechanisms from infection and anaemia.

56 **Shaw JE, De Courten M, Boyko EJ, Zimmet PZ.**

Impact of new diagnostic criteria for diabetes in different populations.

Diabetes Care 1999 May;22(5):762-766.

OBJECTIVE: For epidemiological purposes, it has now been recommended that a fasting plasma glucose value of 7.0 mmol/l can be used to diagnose diabetes, instead of a 2-h value of 11.1 mmol/l. This study assesses the impact of making this change on the prevalence of diabetes and on the phenotype of individuals identified. **RESEARCH DESIGN AND METHODS:** Data were collated from nine population-based southern hemisphere studies in which a 75-g oral glucose tolerance test was performed. Comparisons were made between the prevalence derived from fasting values only and the prevalence derived from 2-h values only. Cardiovascular risk was assessed in all individuals. **RESULTS:** There were 20,624 subjects in the nine surveys of whom 1036 had previously diagnosed diabetes and 1714 had newly diagnosed diabetes, according to either fasting or 2-h glucose. The differences in prevalence within each population resulting from changing the

diagnostic criteria ranged from +30 to -19% (relative difference) and +4.1 percentage points to -2.8 percentage points (absolute difference). BMI was the most important determinant of disagreement in classification. A total of 31% of those individuals who were diabetic on the fasting value were not diabetic on the 2-h value, and 32% of those with diabetes on the 2-h value were not diabetic on the fasting value. Apart from obesity, there were no differences in cardiovascular risk between those identified by the fasting and the 2-h values. CONCLUSIONS: Changing the diagnostic criteria is likely to have variable and sometimes quite large effects on the prevalence of diabetes in different populations. Furthermore, the fasting criterion identifies different people as being diabetic than those identified by the 2-h criterion.

57 **Siba PM.**

The important role of medical researchers in Papua New Guinea.

PNG Med J 1996 Dec;39(4):271-273.

58 **Stephen M.**

Consuming the dead: a Kleinian perspective on death rituals cross-culturally.

Int J Psychoanal 1998 Dec;79(Pt 6):1173-1194.

The author argues that Melanie Klein's theories of mourning shed light on certain funerary practices encountered widely in ethnographic literature, namely 'second burial'. Pointing out that the death of a loved person is experienced in fantasy as the destruction of the internalised mother imago, the author shows how various Kleinian processes involved in infantile fears of maternal loss - such as persecutory anxiety, guilt, depression, and attempts at reparation - are clearly expressed in rituals of mourning cross-culturally. The argument is illustrated with two extensive case studies, Bali (Indonesia) and the Mekeo of coastal Papua New Guinea. A number of other cultures are considered briefly to indicate the relevance of Kleinian theory to the symbolism of death rituals more broadly, including the role played by sorcery and witchcraft beliefs, fears of malevolent ghosts, repeated re-burial, mortuary gift exchange, cremation, mortuary cannibalism, and the denial of death in modern western funeral rites.

59 **Stirnadel HA, Beck HP, Alpers MP, Smith TA.**

Heritability and segregation analysis of immune responses to specific malaria antigens in Papua New Guinea.

Genet Epidemiol 1999;17(1):16-34.

Familial patterns of inheritance of immune responses to specific *Plasmodium falciparum* antigens were studied in 214 adults in an area of Papua New Guinea highly endemic for malaria. Preliminary variance component analysis indicated familial aggregation in both humoral and cellular immune responses against the ring-infected erythrocyte surface antigen (RESA) and the FC27 allele of the merozoite surface antigen 2 (MSA-2). Including a term for sharing houses in the models affected only the antibody response to RESA. Segregation analysis of the antibody responses

against RESA indicated inheritance via a multifactorial model and analysis of the proliferation response suggested a possible recessive major gene. The best fitting models for the immune responses against MSA-2 (FC27) postulated dominant major gene inheritance. We found no significant associations between HLA class I or II alleles and these two antigens in this population. Although there was evidence of familial aggregation of antibody responses to MSA-2 (3D7), the segregation analysis failed to identify a mode of inheritance. There was little or no heritability of either humoral or cellular immune responses against the NANP repeats of the circumsporozoite protein (NANP), the synthetic malaria vaccine SPf66, or a preparation of MSA-2 (3D7) from which the repetitive part was deleted (MSA-2 (d3D7)). Although it is often difficult to separate genetic effects from the effects of living in the same environment, it appears that some immune responses against certain malaria antigens may be partly influenced by genetic factors.

60 **Sullivan JS, Morris CL, Richardson BB, Galland GG, Jennings VM, Kendall J, Collins WE.**

Adaptation of the AMRU 1 strain of *Plasmodium vivax* to *Aotus* and *Saimiri* monkeys and to four species of anopheline mosquitoes.

J Parasitol 1999 Aug;85(4):672-677.

A chloroquine-resistant strain of *Plasmodium vivax* (AMRU-1) from Papua New Guinea has been adapted to grow in 4 species of *Aotus* monkeys (*Aotus lemurinus griseimembra*, *Aotus vociferans*, *Aotus nancymai* and *Aotus azarae boliviensis*), hybrid *Aotus* monkeys, and *Saimiri boliviensis* monkeys. Whereas it was possible to infect *Saimiri* monkeys with this parasite by inoculation of parasitized erythrocytes, only 42% of *Saimiri* monkeys became infected, compared to 92% of *Aotus* monkeys attempted. Comparative mosquito feedings showed that only *A. vociferans*, *A. l. griseimembra*, and *Saimiri boliviensis* monkeys produced infections in mosquitoes. Oocysts were observed on the guts of the 4 species of mosquitoes used (*Anopheles gambiae*, *Anopheles stephensi*, *Anopheles freeborni* and *Anopheles dirus*), but sporozoite transmission was effected only with the intravenous inoculation of sporozoites from *An. dirus* into an *A. l. griseimembra* monkey.

61 **Usuda S, Okamoto H, Iwanari H, Baba K, Tsuda F, Miyakawa Y, Mayumi M.**

Serological detection of hepatitis B virus genotypes by ELISA with monoclonal antibodies to type-specific epitopes in the preS2-region product.

J Virol Methods 1999 Jun;80(1):97-112.

An ELISA was developed for serological determination of the six genotypes of hepatitis B virus (HBV) designated A, B, C, D, E and F. Monoclonal antibodies were raised against genotype-specific epitopes in the preS2-region product, and labeled with horseradish peroxidase. Hepatitis B surface antigen (HBsAg) in sera was

captured by immobilized antibodies against the common determinant, and evaluated for reactivity with genotype-specific monoclonal antibodies labeled with the enzyme. Serological genotyping was in complete accord with genotypes determined by S-gene sequences in a panel of 68 sera containing HBV/HBsAg of different genotypes. Of 514 sera with HBsAg from Japan, 507 (98.6%) were genotyped serologically: genotype A was identified in 24 (4.7%); B in 196 (38.1%); C in 282 (54.9%); D in 2 (0.4%); and F in 3 (0.6%). There were no sera containing HBV of genotype E. Likewise, 425 of 446 (95.3%) sera with HBsAg from Brazil, China, India, Indonesia, Kenya, Korea, Nepal, Papua New Guinea, the Philippines and Thailand were classified into A (25.6%), B (24.2%), C (33.9%), and D (11.7%) genotypes; there were no sera with HBsAg of genotype E or F among them. Some sera unclassifiable by ELISA revealed mixed infection with HBV of distinct genotypes, or contained HBsAg deprived of genotype-specific epitopes by point mutations. The ELISA would be useful for large-scale surveys, because it allows serological detection of HBV genotypes without sequencing nucleotides.

- 62 **Vandamme AM, Salemi M, Desmyter J.**
The simian origins of the pathogenic human T-cell lymphotropic virus type I.

Trends Microbiol 1998 Dec;6(12):477-483.

At least four, and possibly six, molecular subtypes of human T-cell lymphotropic virus type I (HTLV-I) exist: one is confined to Melanesia/Australia, one is ubiquitous, and the others are found only in Africa. Molecular epidemiology suggests that all subtypes arose from separate interspecies transmissions from simians to humans.

- 63 **Vince JD.**
The management of asthma in children in Papua New Guinea.

PNG Med J 1996 Dec;39(4):329-337.

In the last decade advances in knowledge of the aetiology and pathogenesis of asthma, and the availability of metered-dose inhalers and nebulisers, has led to a change in emphasis in both the preventive and curative aspects of the management of children with asthma. Metered-

dose inhalers are available in Papua New Guinea, and can be used successfully, with spacing devices, even in children less than 2 years of age. Inhaled beta-sympathomimetics, now widely available and relatively inexpensive, may be all that is required for the majority of children with infrequent episodic asthma. For those with frequent episodic and chronic asthma, preventive therapy with inhaled steroids is available and should be given wherever practicable. In the management of acute severe asthma inhaled beta-sympathomimetics should be combined with a short course of oral or parenteral steroids (covered with isoniazid in areas where tuberculosis is prevalent). Whilst asthma classically presents with wheeze, medical personnel should be aware of its other presentations. It is possible, and should be the aim, to achieve a very high level of control for the majority of asthmatic children using currently available therapy.

- 64 **Williams TN, Maitland K, Rees DC, Peto TE, Bowden DK, Weatherall DJ, Clegg JB.**

Reduced soluble transferrin receptor concentrations in acute malaria in Vanuatu.

Am J Trop Med Hyg 1999 May;60(5):875-878.

Soluble transferrin receptor (sTfR) concentration is a sensitive index of iron deficiency when used in conjunction with ferritin measurements in adults. One advantage of this assay is that unlike ferritin it does not appear to be affected by a range of infectious and inflammatory conditions or by pregnancy, rendering it a promising adjunct to the diagnosis of iron deficiency in tropical populations. We have measured plasma sTfR concentrations in a group of malaria patients (n=21) and asymptomatic (18) and a parasitemic (76) controls in Vanuatu. Plasma sTfR concentration was significantly reduced in individuals with acute malaria (p = 0.003). While this observation provides evidence that erythropoietic suppression may be an important etiologic component in malarial anemia, it also suggests that malaria may be a confounding factor when interpreting sTfR concentrations in such populations. The role of sTfR in the diagnosis of iron deficiency in tropical populations remains to be established.

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