

# Journal Abstracts

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We include abstracts of articles relevant to the Pacific to re-emphasize materials found in widely circulated journals and to bring to your attention articles from many, other less commonly available sources, regardless of the date of publication. Topics highlighted will include scientific advances, community health, historical reviews, and political and sociological issues relevant to health in the Pacific.

The assistance of all readers of this section in locating materials would be most appreciated. In deciding to include an abstract, the relevance and quality of the article are more important than the date of publication. You may also submit an abstract of someone else's article with your own comments. Your contribution will be acknowledged.

## Re-emerging pathogens and diseases out of control. Heymann D, Rodier G. *Lancet*. 1997. 349 (supp III): 8-10.

A twenty year perspective of various emerging infections including Monkeypox, Ebola Hemorrhagic Fever, Legionellosis, HIV infections, Hantavirus Pulmonary Syndrome, Lyme borreliosis, a new variant of Creutzfeldt-Jakob disease, *E. coli* 0517 gastroenteritis and Tuberculosis is made within a global context. The challenges of controlling infectious disease outbreaks within political and socioeconomic constraints are highlighted using the recent monkeypox outbreak in the Republic of Congo as an example. The difficulty of predicting immune response to vaccination in an HIV-infected individual has complicated the control of monkeypox infections in heavily HIV infected communities. Population growth and movement, changing behavioural patterns, modified agricultural and animal husbandry practices have contributed to the emergence and reemergence of several of these infections. The failure of mosquito control programmes in Central America has led to increasing problems with Dengue Hemorrhagic Fever. The poor sanitation conditions that accompany densely populated urban com-

munities have enabled the reemergence of cholera after almost a century in Latin America. On the other hand, the eradication of worldwide smallpox and the elimination of poliomyelitis from the America region herald public health achievements with incidence rates of Dracunculiasis and Hansen's Disease also markedly decreasing. Antibiotic resistance has become a worldwide problem for the management of infections with high rates of quinolone resistance detected in the Western Pacific region.

**Editorial Comment:** This short, information-compacted review is well-written and captivating. While it highlights a number of the emerging infections that have drawn intense attention on the global center stage, it also tries to succinctly explain the reasons for their appearance or reappearance in various countries. Although one realises that with an article of such brevity, total comprehensiveness is almost impossible, it does seem to lack adequate discussion of the impact of climatic and environmental factors on the emergence and reemergence of certain infections. However, this article is worth reading to update oneself on the challenges facing infectious disease medical personnel throughout the world as well as to be reminded of the need for persistent coordinated global public health action.

## Assessment of worldwide tuberculosis control. Raviglione M, Dye C, et al. *Lancet*. 1997. 350: 624-629.

This article summarizes the findings of the global tuberculosis surveillance and monitoring project of the World Health Organization which was established to determine the achievements of worldwide tuberculosis control, the performance of National Tuberculosis Control Programmes and the extent to which countries had implemented the WHO control strategy. The WHO Tb control strategy comprises government endorsement and political commitment; symptom driven case-detection and sputum microscopy; standardized short term chemotherapy with directly observed therapy undertaken in initial two month period; regular supply of antituberculosis medication; and a standard reporting and recording system.

Comparison was made of the performance of national tuberculosis programmes that implemented and did not implement WHO recommendations through various performance indicators such as case-detection rates, percentage of cases not assessed, percentage cured, percentage completed treatment, percentage failed or interrupted treatment. Of the 180 countries, areas or territories that WHO had received data on, 84 (47%) had not yet accepted WHO control strategy. Only 23% of worldwide population had access to services following WHO control strategy. Sixty four percent of new pulmonary cases in WHO control areas were sputum-smear positive as opposed to 33% in other areas. Treatment success rates in WHO areas among sputum-

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smear positive cases was 76% with China showing highest treatment success. With a large number of cases remaining undetected and untreated, there is a great need for improvement of tuberculosis control throughout the world.

**Editorial comment:** No discussion of emerging and reemerging infections is complete without the mention of the changing global patterns of tuberculosis. A worldwide assessment of tuberculosis control provides a current update of region-specific and country-specific failures and successes. The implementation of WHO control strategy allows for greater intercountry collaboration, standardization of protocols that enhance ease of administration and evaluation, and increased case finding and treatment success. This article presents compelling data on the success experienced by countries that are committed to resolving their tuberculosis problems. While beyond the scope of this overview of the worldwide Tb control programmes, of particular interest is the emergence of INH-resistant, Rifampin-resistant, and other antibiotic-resistant tuberculosis. This is of special concern as more patients are treated in both developing and developed countries and as therapy becomes more widely available. Not only will the demand for alternative anti-tuberculous therapeutic agents arise but also the requirement for enhanced monitoring to detect such cases will need to be addressed on a global basis.

**Invasive infections due to a fish pathogen, *Streptococcus iniae*. Weinstein M, Litt M, et al. *New England Journal of Medicine*. 1997. 337(9): 589-594.**

A retrospective and prospective surveillance of cases of *S. iniae* in humans was undertaken in the greater Toronto area following a cluster of four individuals with invasive infection and bacteremia due to this organism. An investigation of the epidemiology and clinical spectrum of the illness involved a medical record review of twelve hospitals over a twelve month period. Once additional cases of *S. iniae* were detected, a standardised questionnaire was conducted for determination of epidemiologic and clinical features. Cultures taken from the surface of tilapia from aquaculture ponds were also studied. A total of nine patients were identified suffering from *S. iniae* invasive disease, all of whom were of Asian descent. Eight cases recalled puncture wounds in their hands while preparing fish and six remembered the fish as tilapia. Clinical spectrum of illness included cellulitis of the hand, fever and lymphangitis, and one patient developed endocarditis, meningitis and arthritis. There were twelve suspected cases of *S. iniae* infections. No single farm was identified as the source of the infections. The question of the

emergence of a new pathogen affecting humans or the detection of previously unrecognised disease was raised. Difficulty in diagnosis through culture growth and isolation was discussed as a possible reason for nondetected cases. Given the changes in food preparation, storage and distribution, it was considered not surprising that new food-related infections are identified, especially in the light of increased opportunities for human exposure to such pathogens.

**Editorial comment:** With the more widespread utilization of aquaculture farms as a way of providing high-protein foods in mountainous and interior settings of larger islands in the Pacific, tilapia-associated *S. iniae* may be more likely to become a pathogenic cause of invasive disease in Pacificans who handle the fish properly. While such infections are rare, the possibility that this new pathogen may be involved in fish-related infections may now need to be considered by physicians serving these areas.

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**Update: Influenza Activity: United States and Worldwide, 1996-1997 Season, and Composition of the 1997-1998 Influenza Vaccine. Center for Disease Control. *MMWR*. 1997. 46(15): 325-330.**

This CDC update summarises the results of surveillance by a network of collaborating laboratories of influenza activity both in the USA and worldwide. In the USA, influenza activity peaked in late December-early January. Of specimens tested by collaborating laboratories, 81% were influenza type A (H3N2) while 19% were influenza type B. The number of deaths due to influenza exceeded the epidemic threshold for ten consecutive weeks during this period. In North America and Europe influenza type A was the predominant type during the early part of the season while type B predominated later in the season. In most Asian countries, influenza type B was the predominant type. During August-November period in Colombia the influenza epidemic caused by type A (H3N2) was the most severe since the 1968 pandemic. Type A (H3N2) was reported by numerous countries and sporadic influenza type A (H1N1) was also reported by some European countries. Fiji was among several Asian and European countries reporting type B. The composition of the 1997-1998 trivalent vaccine for the USA was: A/Wuhan/359/95-like (H3N2), A/Bayern/07/95-like (H1N1), and B/Beijing/184/93-like viruses.

**Editorial Comment:** This is an example of a disease that afflicts millions worldwide throughout the year and requires constant surveillance to determine the antigenic changes of the circulating strains of the virus. The several subtypes of

Influenza A are due to the changes in the two surface proteins; hemagglutinin(H) and neuraminidase(N). Surveillance of the various strains allows for the composition of a vaccine appropriate for the prevention of the particular strains circulating in the population in which it is to be used. Results of investigations using molecular virology techniques have implicated interspecies transmission with pigs, ducks and turkeys and genetic reassortment of influenza viruses in the origin of novel strains. While small island populations of the Pacific may seem remote from the possibility of pandemic spread, increased international travel through airplanes and ships ensures that few communities will be protected from invasion of prevalent or virulent strains. With the most recent emergence of a 'chicken-influenza' in Hong Kong (H5N1), with four related deaths, and the subsequent elimination of more than a million chickens, ducks and geese in Hong Kong in an attempt to control the epidemic, all countries must remain aware of the possibility of transmission of new strains of this virus among/to human populations.

**Hepatitis B virus infection. Lee W. New England Journal of Medicine. 1997. 37(24): 1733-1743.**

This review article documents medical progress in the detection and treatment of Hepatitis B infections. In South East Asia, China and Africa more than half the population is infected with this virus through either vertical or horizontal transmission at some time in their lives and more than 8% are chronic carriers. The number of worldwide infections estimated by the World Health Organization by the year 2000 is 400 million. The immunopathogenesis of HBV infections is described with the aid of a colored diagram and the lifecycle of HBV in infected patients is discussed in four stages with reference to particular disease markers. If infected during the neonatal period, 95% become asymptomatic carriers but if infected after the neonatal period and before six years of age 30% become chronic carriers. Hence viral clearance is a function of the immune system. Associated clinical syndromes include Hepatitis D, Hepatitis C, Human Immunodeficiency Virus infection, extrahepatic disease, infection with mutant virus and hepatocellular carcinoma. A recent study in Taiwan has demonstrated that vaccination to decrease the population carrier rate is associated with a decreased incidence of hepatocellular carcinoma. Treatment with interferon is aimed at hastening progression from the symptomatic hepatitis stage to stage of viral clearance or cessation of active viral replication. Meta-analysis of interferon treatments have illustrated response rates among interferon treated patients at 33 percent and 12 percent in nontreated individuals. Decision analysis reveals

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that for a thirty five year old man life expectancy is increased by 3.1 years when treatment is given for chronic hepatitis. Other nucleoside analogues for treatment are also discussed. While universal vaccination is recommended for all newborns and adolescents in order to eliminate transmission of Hepatitis B, lack of enthusiasm is noted for worldwide eradication of Hepatitis B.

**Editorial comment:** This review article is an excellent resource for medical students and physicians struggling with understanding the updated immunopathogenesis of this disease. A clearly illustrated diagram of the pathogenesis of the immune response in acute and chronic hepatitis B is accompanied by colour illustrations of the genome of the HBV and the surface antigen and colour illustrations of histologic patterns of HBV. This article reinforces the need for adherence to universal HBV vaccination and the prevention of transmission through blood and body tissue media; these are well known control measures advocated in Pacific communities.

**Epidemiology of hepatitis B infection in the Western Pacific and South East Asia. Gust I. GUT. 1996. 38:S18-S23.**

There are more than 75% of the world's estimated 350 million carriers of Hepatitis B living in the Western Pacific and South East Asia region. Carrier rates range from 2-35% with most countries considered hyperendemic. Landmark discoveries such as the Hepatitis B surface antigen (HBsAg) detection, Beasley's studies on the impact of active and passive immunization on perinatal infection, and the association of chronic carrier status and chronic liver disease occurred in this region. The first country to introduce universal childhood immunization was Nauru. Strikingly different infection rates and carrier rates among different racial groups within the same countries exist. For example, the difference in rates between indigenous Fijians and Indo-Fijians in Fiji, and Aborigines and Anglo-Saxons in Australia. In hyperendemic countries, the virus is predominantly transmitted at or around birth, before school and in early adulthood. The prevalence in HBsAg positive mothers of HBeAg positivity varies within the region. A highly controversial issue that was highlighted in the article relates to transmission of the virus in schools that contain children of traditionally high risk communities and children of low risk communities. Policy issues within the region in the past two decades have included the introduction of screening for HBsAg for blood transfusions; prevention of accidental transmission in the laboratory setting; immunization strategies. These latter strategies differ throughout the region ranging

from selective immunization practices in Japan to universal childhood immunization starting at birth. Obstacles to successful eradication of Hepatitis B in the region include the difficulty in preventing all perinatal infections through immunization and the practical limitations to widespread early complete immunization coverage in all countries.

**Editorial Comment:** This excellent review article references 50 articles and is an excellent resource for all health personnel including medical and nursing students in the region. Clearly written and logically developed with anecdotal examples of historical importance of the region's discoveries, it discusses the epidemiology and control of hepatitis B throughout the region. While brief, Gust has been able to discuss important discoveries such as Beasley's classic studies as well as quote results of seroprevalence surveys in the Pacific. The barriers to complete eradication of Hepatitis B within the region are dealt with pragmatically and suggest that time and considerable public health efforts for prevention through immunization are vital for control of this endemic situation.

**Epidemiology of leptospirosis in New Caledonia(South Pacific): a one year survey. Perrocheau A, Perolat P. European Journal of Epidemiology. 1997. 13: 161-167.**

Through a case series study of leptospirosis cases in 1989, the authors describe the epidemiological features of human leptospirosis in New Caledonia. The report quoted an incidence rate of 90 per 100,000 person years and a case fatality rate of 4% with predominance of cases among males and in rural areas. Annual variation in cases were noted with peaks corresponding to rainy periods. The majority of the cases were aged between 20 and 40 years, reflecting the possibility of occupational exposure. Contact with rats, dogs and river water were reported for the majority of cases. Case definition was microscopic agglutination test (MAT) greater than 1:100 or identification of strains from blood, urine, or cerebrospinal fluid. While 60% of the cases were treated as outpatients, 40% were admitted for acute forms of the illness. Sixty one percent of the patients reported myalgia while 36% suffered from renal syndrome and 35% suffered from icterus. A combination of fever-myalgia-fever was found in more than half the patients. Of the 57 persons admitted, only 37% had an initial diagnosis of leptospirosis and 70% received antibiotics. Predominant leptospiral serogroups included icterohemorrhagiae, tarassovi, sejroe and canicola.

**Editorial Comment:** While classic epidemiological features of leptospirosis in island populations were described in this study, a number of design issues are of concern. The reported clustering of cases may have been due to referral bias, the possibility of false negative seroconversions among cases or false positive seroconversions among noncases may

affect incidence rates and reported disease patterns, and the lack of validity of data related to occupation as most people in rural area were subsistent dwellers may preclude proper conclusions related to occupations. However, the identification of problems in diagnosis and treatment of cases in the clinical management setting and the description of the type of symptomatic profile of less serious cases seen in outpatients may aid medical personnel to better identify patients and appropriately treat them in the future.

**Geographic distribution and evolution of Ross River fever in Australia and the Pacific Islands. Sammels L, Coelen R, Lindsay M, et al. Virology. 1995. 212: 20-29.**

A member of the alphavirus genome, the Ross River virus is limited to Australia but has been detected in Fiji, American Samoa and the Cook Islands. These RNA viruses evolve slowly and are genetically stable over time within a geographic region. Sequencing of cloned DNA and PCR-amplified cDNA of the E2 gene of 56 isolates from a period of 33 years shed light on the molecular epidemiology of the RR virus. Phylogenetic trees were developed through cluster analysis and revealed three clusters corresponding to genotypes with a sequence divergence of 0-1.8% within the E2 gene fragment. The first cluster contains strains from Northern Queensland and South Central Queensland. The second cluster contains the majority of the strains with strains originating from Queensland, NSW, Victoria, Northern Territory, Western Australia, Tasmania and the Pacific Islands. The third cluster contains strains from Southwest of West Australia, Northern Australia and two Kimberlie isolates. Hence, certain genotypes appear in certain geographic areas. It appears that the virus was transmitted to the Pacific by air travel of an infected human from Eastern Australia. There appears to be a low rate of evolution as all strains retain a nucleotide sequence similarity of greater than 95% however independent evolution within isolated areas appears to occur with the five Pacific strains having a particular nonconservative change at one nucleotide region.

**Editorial Comment:** While this article is highly technical in virological terms, a nonvirologist can gain some information about the evolutionary patterns and the molecular epidemiology of the Ross River virus. Through genetic sequence analysis, it is possible to determine the genotypic variation of the strains and isolate them to areas, retrospectively tracing their origins. This technology has enabled the discovery of patterns of disease distribution beyond phenotypic expression. Furthermore, the discovery of the emergence of new strains of organisms or slightly different strains of organisms is possible through the collaboration between persons involved in epidemiology and virology, bacteriology etc. Molecular epidemiology offers the small island populations of the Pacific contemporary ways of tracing disease distribution and pattern of spread. □