

THE NORTHERN TERRITORY COMMUNICABLE DISEASES BULLETIN



**NT DEPARTMENT OF HEALTH
AND COMMUNITY SERVICES**

Vol. 2, No. 1, March 1994

Hepatitis E (HEV) in the Northern Territory: One Confirmed and One Possible Case

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30 MAR 1994

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N.T. DEPT OF HEALTH &
COMMUNITY SERVICES

Recently a case of Hepatitis E virus (HEV) infection was reported in Australia in a traveller returning from Pakistan¹. We now report the first locally acquired case of Hepatitis E and a second possible case. The implications of the detection of locally acquired Hepatitis E infection are discussed.

Case 1. The patient is a 57 yo non-Aboriginal woman who has travelled and worked in remote Aboriginal communities in the Top End of the Northern Territory for several years, including up until one month prior to her first presentation. Her past history included radiotherapy following bilateral mastectomies in 1980

and a subsequent right brachial plexopathy and right axillary artery stenosis. She had not been overseas, had no history of blood transfusions or of injecting drug use. She presented to Royal Darwin Hospital in October 1993 with a four week history of malaise and alcohol intolerance and a two week history of dark urine and pale stools. In the week preceding admission she developed increasing jaundice, anorexia and weight loss. She had no fevers but described transient arthralgias involving the knees and ankles. There was no history of diarrhoea. She was taking Ogen (piperazine oestrone sulphate), Provera (medroxyprogesterone acetate) as hormone replacement therapy and Coumadin (5, 6 benzo-alpha-pyrone) for arm lymphoedema.

On examination she was jaundiced and her liver was slightly tender but not enlarged. The spleen was not enlarged. There were no signs of chronic liver disease. Liver function tests on admission: AST 1233 U/L (0-40), ALT 1762 U/L (5-44), Bilirubin 186 mmol/L (0-20) and alkaline phosphatase 110 U/L (39-117). Liver ultrasound was normal. Serology for Hepatitis A (HAV) IgM, Hepatitis B (HBV) (surface antigen, core IgM antibody, surface antibody), Hepatitis C (HCV), EBV IgM and CMV IgM was negative. No auto-antibodies were detected. Ceruloplasmin and alpha-1 anti-trypsin were within normal limits. Serum ferritin was 3,135 mg/L (18-200), a saturation ratio of 0.94 (0.2-0.5) and a total iron binding capacity of 48 mmol/L (45-81), which was attributed to an acute phase reaction rather than haemochromatosis. HEV serology using the commercial Genelabs EIA and "in-house" tests at the

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Victorian Infectious Diseases Reference Laboratory (VIDRL) was positive on the first and subsequent samples taken. The results are summarised in the table:

End suggest that HEV may be present in several remote Aboriginal communities (unpublished data). However more specific assays for HEV are considered

Specimen date	Genelabs EIA* (S/CO)	VIDRL Anti-HEV IgG (synthetic peptide** (OD)	Western Blot** (ORF2 & 3)
12/10/93	Positive (3.4)	Positive (0.77)	Positive
8/11/93	Positive (2.8)	Positive (0.82)	Positive
30/11/93	Positive (1.4)	Positive (0.70)	Positive

* This is the commercially available kit for the detection of HEV IgG.

** These tests have been developed at VIDRL.

Her clinical course has been protracted with malaise and cholestatic jaundice persisting for several months. ERCP performed at the Royal Melbourne Hospital excluded an extrahepatic cause of jaundice. Liver biopsy revealed subacute hepatitis and cholestasis.

Case 2. A 20 year old Aboriginal woman from East Arnhem Land developed fever, jaundice and hepatosplenomegaly in June 1993. Her AST was 1800 U/L (0-40). Her jaundice never completely resolved and in July she had an incomplete septic abortion at 6 weeks gestation. In August 1993 she developed cholestatic jaundice and progressive hepatic encephalopathy ensued. Copper and iron studies were normal. Alpha-1 antitrypsin levels were within the normal range. Serology showed evidence of past infection with HAV and HBV. Antibodies to HCV were not detected. Screening for HEV was negative using the commercially available test. Liver biopsy revealed submassive necrosis with some degeneration and non-specific changes in keeping with drug or viral injury.

Her condition continued to deteriorate and she died in November 1993 as a consequence of sub-acute fulminant hepatic failure despite intensive intervention. Following her death, repeat testing of two serum samples using "in-house" tests at VIDRL was equivocal for HEV on EIA and positive on Western Blot.

Discussion:

Further studies are underway on specimens obtained from both cases to confirm that HEV is the agent responsible. The failure to detect HEV antibodies in the second case using the Genelabs kit may reflect the presence of a different strain of the virus. Alternatively the positive VIDRL result may represent the test's cross reaction with another virus. Preliminary results of a serosurvey using a combination of tests of the Top

necessary as seropositivity on the current tests may reflect cross reaction with other viruses such as calicivirus.

The finding of locally acquired HEV raises several important public health issues. HEV, although an enterically transmitted pathogen, is epidemiologically distinct from HAV. The majority of cases of HEV which are reported from the developing world are related to a common source, usually a contaminated water supply and, in contrast to HAV, documented secondary cases are rare². Also unlike HAV, it is not clear if long term immunity always follows acute HEV disease^{3,4}. Additionally, HEV may cause serious illness and the mortality rate in pregnant women may be as high as 20%².

Since over 95% of remote Aboriginals will have been exposed to HAV by the age of 5 (unpublished data), HEV should be considered in especially young Aboriginal people presenting with an undiagnosed hepatic illness. Hepatitis E should enter the differential diagnosis of all undiagnosed hepatitis.

References

1. Moaven LD, Fuller AJ, Doultree JC, Marshall JA, Bowden DS, Moeckli RA, Locamini SA. A case of acute hepatitis E in Victoria. *Med J Aust* 1993; 159:124-125.
2. Bradley DW. Enterically-transmitted non-A, non-B hepatitis. *Br Med Bull* 1990; 46:442-461.
3. Dawson GJ, Mushawar IK, Chau KH, Gitnik GL. Detection of long-lasting antibody to hepatitis E virus in a US traveller to Pakistan. *Lancet* 1992; 340:426-427.
4. Goldsmith R, Yarbough PO, Reyes GR et al. Enzyme linked immunosorbent assay for diagnosis of acute sporadic hepatitis E in Egyptian children. *Lancet* 1992; 339:328-31

Melioidosis and the Wet Season 1993-94

Bart Currie, Royal Darwin Hospital and Menzies School of Health Research

From Christmas 1993 until mid March 1994 there have been 23 cases of melioidosis in the Top End. Patients have come from remote communities and from Darwin urban and rural areas. Of the four patients who have died, two were diabetics and two had a history of heavy alcohol intake. All four had septicaemia and pneumonia. Clinical and epidemiological features are similar to the 1990-91 "outbreak" which also followed heavy monsoonal rains. Abstracts of recent publications about the earlier outbreak are included below.

The cases this wet season have highlighted -

1. The predisposition of diabetics to melioidosis and to severe infection. (Relative risk 13 compared with non-diabetics from Angela Merianos' study).
2. That unusual presentations of melioidosis occur during "outbreaks"
 - a) a child with a PUO and subsequent liver abscess
 - b) a woman with an acute abdomen from a ruptured uterus following melioidosis endometritis
 - c) melioidosis chest infection resolving clinically before specific antibiotic therapy and
 - d) a young man with acute nephritis and pulmonary haemorrhage with culture negative serologically positive presumptive melioidosis.
3. The importance of looking for visceral abscesses, especially in patients not responding to specific therapy. Prostatic abscesses often require surgical drainage and CT imaging (requesting prostate views) has been more sensitive than clinical rectal examination of the prostate.
4. That use of selective media such as Ashdown's broth (with gentamicin for preventing overgrowth of other organisms) has increased the positive culture rate. This is particularly useful for culturing non sterile sites such as throat, wound and rectal swabs and also for sputum and pus culture.
5. That melioidosis serology may be negative, especially in the first week of acute melioidosis. Serology should be repeated if clinically indicated, but a repeat negative result does not exclude melioidosis. Royal Darwin Hospital now does melioidosis serology twice weekly during the high risk season.

The 1990-1991 Outbreak of Melioidosis in the Northern Territory of Australia: Clinical Aspects., Bart Currie et al. S.E. Asian Journal of Tropical Medicine and Public Health, Vol. 24 No. 3 September 1993 p 436

Abstract. From November 1990 to June 1991, 33 cases of acute melioidosis were diagnosed in tropical

Northern Territory, Australia during an exceptionally wet monsoon. Eighteen (55%) were alcoholic, 16 (48%) diabetic and only 4 (12%, all survivors) had no risk factors. Twenty-seven (82%) were considered recent infection, with an incubation period of 3 - 21 days (mean 14) documented in eight cases with presumed cutaneous inoculation. Fourteen patients presented with pneumonia (4 septicemic) and of 11 others with septicemia 4 had genitourinary foci. Three of 4 with splenic abscesses required splenectomy. Three had only skin/soft tissue infection. One patient with brainstem encephalitis needed prolonged ventilation. Overall mortality was 36% (12 cases, including three relapses), despite therapy with ceftazidime and intensive care facilities. *Pseudomonas pseudomallei* is the commonest diagnosed cause of fatal bacteremic pneumonia at Royal Darwin Hospital and emphasis is placed on early appropriate antibiotic therapy and compliance with maintenance therapy for at least three months.

The 1990-1991 Outbreak of Melioidosis in the Northern Territory of Australia: Epidemiology and Environmental Studies. Angela Merianos et al. S.E. Asian Journal of Tropical Medicine and Public Health, Vol. 24 No. 3 September 1993 p 425

Abstract. From November 1990 to June 1991 33 acute cases of melioidosis occurred in the Northern Territory, Australia; 25 cases were reported in the capital city, Darwin. We carried out an epidemiological investigation to exclude a common source outbreak, describe the risk factors for disease, and develop and institute appropriate control measures. We compared population based attack rates among various risk groups using logistic regression, and the demographic, medical and behavioural risk factors for melioidosis by a matching case-control study. Environmental Health Officers collected soil, surface water and cooling tower water specimens for *Pseudomonas pseudomallei* culture. The crude attack rate of melioidosis during the outbreak was 52 per 100,000. Age, gender, race, diabetes and alcohol abuse were independent risk factors for disease. The relative risk of disease in diabetic patients was 12.9 (95% CI 5.1 - 32.7; $p < 0.001$) and 6.7 in alcoholic patients (95% CI 2.9 - 15.2; $p < 0.001$). We found no significant difference between cases and controls in matched pair analysis for any of several exposure factors studied. We isolated *Pseudomonas pseudomallei* from 4% of soil samples and 9% of surface water samples. Our study confirms the importance of host factors in the development of melioidosis, and attempts to quantify the risk of disease during the Darwin epidemic. *Pseudomonas pseudomallei* is widespread in the soil of urban Darwin.

Malaria Screening and Surveillance in the Northern Territory -Protocols for active screening of students from high risk areas

Tiina Voolman, Bart Currie, Mahomed Patel, Peter Whelan, Vicki Krause
NT Department of Health and Community Services

In the past malaria was endemic in the Northern Territory (NT), resulting in numerous deaths in the Aboriginal and mining communities. Extensive programs to eradicate malaria included active case surveillance, mass drug therapy and vector control. The last endemic case was reported in 1962 and the World Health Organisation declared Australia malaria free in 1981. However, the Top End of the Northern Territory is still receptive to re-establishment of indigenous malaria. In addition to increasing numbers of imported malaria cases, introduced malaria (brief local transmission) occasionally occurs in tropical Australia^{1,2}, justifying concerns about indigenous malaria. To help decrease this risk in the NT and to decrease the morbidity from malaria, a passive surveillance program has been complemented with an active screening and surveillance program for students arriving from countries with endemic malaria.

Passive surveillance

A protocol with aggressive anti-malaria measures has been in place for a number of years for notified cases. The measures include:

- all laboratories immediately notifying cases to the NT Disease Control Centre (DCC),
- initial admission to hospital of all malaria cases to minimise parasite-mosquito contract and to supervise drug therapy,
- staff from DCC interviewing the patient for a detailed travel history before and after arrival in Australia,
- notifying the Medical Entomology Branch for assessment of the need for initiating vector investigation and control measures,
- contacting co-travellers and offering a blood test for malaria,
- home follow-up by Community Health staff to ensure compliance with primaquine eradication therapy.

Active screening and surveillance

In 1991, when five cases of malaria were diagnosed in 17 students from Papua New Guinea (PNG)³, it became apparent that there was a need to monitor persons from high risk malarious areas who will spend prolonged periods of time in the Top End. (High risk areas are defined as PNG, Solomon Islands, Vanuatu, Burma, Laos, Cambodia, Vietnam and parts of Thailand, Malaysia and Indonesia¹.) These persons are more likely to have partial immunity to malaria with asymptomatic parasitaemia, but some will also develop severe clinical malaria while in Australia. Since secondary school students from high risk areas are

readily identifiable when compared with other migrants, an active malaria screening and surveillance program was introduced.

Initially, screening was introduced into the secondary school system with the Department of Education. Students from high risk malarious areas were targeted with the following measures:

- a blood test to screen for malaria in initial entry into Australia. This measure was modified early in 1993 to include screening on every entry into Australia,
- recommending malaria prophylaxis during holidays at home, noting the loss of partial immunity when the students are out of a malarious area for prolonged periods, and
- a letter to students and their 'foster' parents alerting them to think of malaria and to seek medical advice for any illness.

Data were collected over the last three years from secondary school students in Darwin (Table 1). Of the 17 cases of malaria in secondary school students, asymptomatic infection was detected in five on screening. Eight developed clinical malaria soon after arrival in Australia before screening took place. Three students treated for clinical malaria subsequently relapsed with *Plasmodium vivax* malaria despite 14 days of 22.5mg daily primaquine. One student with asymptomatic *P. vivax* malaria on screening subsequently developed clinical *P. falciparum* malaria. One student with clinical *P. malariae* malaria in 1991 was reinfected during holidays in PNG and presented with clinical *P. falciparum* malaria soon after return to Darwin in 1993. It seems likely that in the NT we can expect malaria to be detected each year in at least one in 10 secondary students from high risk malarious areas such as PNG and the Solomon Islands.

Two problems have been identified since the introduction of this policy. Self-medication prior to arrival in Australia is common and compliance with malaria prophylaxis is poor in the holidays. Both problems are being addressed with educational efforts. However, with the new prophylactic guidelines recommended by the National Health and Medical Research Council⁴, compliance in the future may be even more problematic since doxycycline requires daily administration and mefloquine costs around \$8 for each weekly tablet. These concerns led to the recent change of our screening policy from initial entry only to screening on every entry into Australia.

The active screening program was extended in 1993 to include students at the NT University from malarious countries (Table 2). However, problems are anticipated in this setting also. These students are adults and possibly more likely to refuse screening. They are also accustomed to self-medicating at home when clinical malaria occurs and therefore may be more reluctant to seek medical advice or treatment. In contrast, the 'foster' parents of secondary school students usually actively seek help. Some adult students are accompanied by a spouse and children. Arrangements have been made for the students' family members to be tested free of charge at Community Health Clinics. The uptake and acceptance of these measures remain to be seen. Education is again necessary to obtain the voluntary cooperation of both students and their families. It will take several years to raise awareness among overseas students, local education staff and fellow students to a level where screening will be generally acceptable and self-treatment uncommon.

Of note is that few cases of malaria have to date been notified from NT University students (Table 2). This may in part reflect self-medication. However, many of these students are from areas of substantially lower malaria risk when compared with the majority of the secondary students who come from PNG and the Solomon Islands¹. It is anticipated that overseas student numbers in the NT will continue to increase, including more university students from high risk malarious areas.

In summary, we have delineated the NT malaria screening and surveillance system. The passive surveillance with its attendant protocol is now routine and well accepted. We are still in the process of initiating active screening and surveillance into the educational system. The initial measures appear to be tolerated by secondary students and to be acceptable to the school nurses and local student liaison officers who are vital to the program.

References

1. Forsyth S, Leoskow K, Pearce M, Riley I, Sleight A, Srinivasa M, *Final Report of the Australian Malaria Register for 1990*. Herston: Tropical Health Program University of Queensland Medical School, 1991.
2. Currie B. The diagnosis and treatment of malaria in Australia. *Aust Fam Physician* 1993; 22: 1773-1779.
3. Currie B, Whelan P, Dyer M, Beeby J, Noonan C, Patel M. Malaria in visiting Papua New Guinean students in the Northern Territory. *Comm Dis Intell* 1991; 15: 116-118.
4. National Health and Medical Research Council, Recommendations on malaria chemoprophylaxis. *Comm Dis Intell* 1993; 17: 594-601.

Table 1. Overseas secondary students from high risk malarious areas in Darwin, and cases with malaria, by year

	1991	1992	1993
Students from high risk areas	17	34	54
Students treated for clinical malaria ¹	4	4	4
Students treated for asymptomatic malaria ¹	1	1	3
NT total malaria cases	45	30	34

1. 17 total cases in 12 students

Table 2. Overseas students from malarious countries¹ attending university in Darwin, and cases with malaria, by year

	1991	1992	1993
Student numbers	78	81	90
Reported cases of malaria	0	0	2 ²

1. Low and high risk malaris countries combined

2. One official notification and one self-medication admitted to the student health service doctor.

Rare Complication of a Preventable Disease - Rubella Encephalitis

Gabrielle O'Kane and Bart Currie RDH, Liam O'Connor SHLA, Perth

A 12 year old boy was admitted to Katherine District Hospital in status epilepticus on 25.1.94. There was no previous personal or family history of epilepsy. He had been well until three days prior to presentation when he developed a fine rash involving limbs, trunk and face. There was a one day history of fever, myalgias and headache.

On transfer to Royal Darwin Hospital, he was paralysed and sedated. His temperature was 39.3°C. There were no focal neurological signs. The white cell count on the CSF was $123 \times 10^6/L$, of which 90% were mononuclear cells. The CSF protein was raised at 2.45 g/L (0.15-0.45), as was the glucose 5.1 mmol/L (2.7-4.2). The

full blood count was within normal limits. An EEG revealed a generalised disturbance lacking local features, consistent with encephalitis. A CT scan of the brain was normal.

He was initially commenced on ceftriaxone and acyclovir pending further investigations. He improved clinically over three days and had recovered fully by one week. Rubella IgM was detected on initial screening of blood and CSF and follow-up serology revealed a rise in rubella IgG from 48 units to 238 units. Murray Valley encephalitis and other arbovirus serology was negative. Adenovirus, CMV, mumps, measles and Varicella zoster serology were all negative by CFT.

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Editorial Comment

Postnatal rubella is usually a mild disease. It is characterised by a maculopapular rash, sometimes resembling measles, prominent lymphadenopathy (specifically posterior auricular and suboccipital nodes) and slight fever. Up to 50% of those infected are asymptomatic. Rubella's significance, which was first recognised in the 1940's, has been in its deleterious effect on the developing foetus. Infections early in pregnancy, in non-immune women, pose the greatest risk of intra-uterine death and congenital anomalies affecting sight, hearing, the heart and mental function. In addition, infants with congenital rubella shed large quantities of virus for up to 30 months.

Complications of postnatal rubella are generally uncommon and fall into three categories; 1.) Encephalitis, as seen in this case, is extremely rare. It occurs more frequently in adults and mortality is reportedly 20-50%. Rates of 1/5000 have been reported during epidemics. 2.) Haemorrhagic complications secondary to thrombocytopenia and vascular damage are also rare and, in contrast, are seen more frequently in children. 3.) Polyarthrititis or polyarthralgia, specifically of fingers, wrists and knees, is reported in up to one third of young women with rubella and is less frequent in children and men. Resolution of symptoms may take up to one month but chronicity is rare.¹

Congenital rubella and postnatal rubella, with or without complications, need not occur as they are both vaccine preventable. Rubella monovalent vaccine has been used in Australia (including the NT) since 1971. Emphasis was placed on vaccinating women of child bearing age and a schoolgirl rubella program was also begun. Measles, mumps, rubella (MMR) vaccine was

introduced in Australia in 1989 and the NT schedule recommended MMR vaccination 9 months for Aboriginal and at one year for non Aboriginal infants. However, this has left a large pool of males and older children susceptible to rubella.

The National Notifiable Diseases Surveillance System and the CDI Laboratory Reporting Schemes have documented increased rubella activity in Australia since the spring of 1992. In 1992 and 1993 there were 3810 (89.6% male) and 3633 (85.2% male) cases of rubella notified, respectively.

Only congenital rubella is officially notifiable in the NT, however, laboratory based notifications of all rubellas have been recorded in recent years. In 1992 there were no cases, in 1993 13 postnatal cases (77% male) with a mean age of 17. So far in 1994, there have been 19 postnatal cases (89% male) with a median age of 22

With MMR vaccination at 9 or 12 months for Aboriginal and non Aboriginal infants, respectively, and a second dose of MMR commenced by the NT (and recommended by NH & MRC) this year for both males and females age 10 to 16 years, the level of immunity to rubella should increase. This will provide greater protection to unborn foetuses and for the community at large.

1. Gershon A.A. Rubella Virus (German measles) Principles and Practice of Infectious Diseases (Eds GL Mandell; R.G. Douglas, J.E. Bennett. Churchill Livingstone. New York, 1990.

Hepatitis A vaccine, who would benefit?

Nan Miller and Vicki Krause, DCC, Darwin

Hepatitis A is an acute illness characterised by brief fever, anorexia and malaise, followed by onset of jaundice. Disease varies in its clinical severity from a mild illness lasting one to two weeks to severely disabling disease lasting several months (rare). Convalescence is often prolonged but complete recovery without complications is the rule. Most infections in children are asymptomatic (about 80%) but in adults clinical symptoms occur in at least 50% of the cases.

Epidemiology

Hepatitis A virus (HAV) is found in the faeces of all infected patients with the major route of transmission being faecal-oral and person to person, often within families. Common source outbreaks do occur related to contaminated water or food prepared by infected food handlers.

In developing countries infection is endemic with HAV usually acquired in the first decade of life. By adulthood there is almost universal immunity and epidemics are uncommon. As sanitation and personal hygiene improves young adults become susceptible and outbreaks in this age group occur.

In developed countries HAV disease occurs in specific at risk groups i.e. day care centre attendees and staff, household and sexual contacts of acute cases and travellers to endemic HAV countries. Nosocomial outbreaks of HAV disease with transmission to health care workers have occurred but are considered rare.

In the NT little is known about the epidemiology of HAV or the prevalence of anti HAV in the general community. Recent unpublished data suggests a greater than 95% prevalence of anti HAV in children under five years of age in Top End Aboriginal communities. A review of NT HAV notifications from October 1991 to date (29 months) revealed 17 cases of HAV in personnel in health care establishments. Seven cases (41%) reported paediatrics as their major work area. The other ten were distributed among catering, general med surg, general med surg paed, laboratory and dental work areas. Two of these ten were considered to be day care centre acquired as both had toddlers at centres with an HAV outbreak.

The vaccine

Havrix™, the only HAV vaccine licensed in Australia became available in July 1993. Havrix™ contains

formalin-inactivated HAV virus which is grown in tissue culture and absorbed onto aluminium hydroxide. It is not a blood-derived product. Havrix™ has been in use in several European countries and was found to be safe and highly immunogenic. It is currently recommended for persons older than 5 years of age.

Havrix™ has been licensed at a time when the incidence of infection has been increasing in many developed countries. In 1990 in England and Wales 7316 of 9005 (81%) viral hepatitis infections notified were due to HAV.¹ In Sydney in 1991 400 cases of hepatitis A were reported compared to 15 for the same period in 1990.²

The vaccine is highly immunogenic with detectable antibody documented as early as two weeks after one dose of vaccine. Seroconversion rates of 95% to 97% have been reported after a single dose of vaccine and 99.7% one month after two doses.

Provisional data from an efficacy study in Thailand shows a protective efficacy of 97%.³

Dosage and administration

Primary course

- Two intramuscular doses of 1ml Havrix™ administered two weeks to one month apart provides anti-HAV antibodies for at least one year.

Booster dose

- A 1ml dose, 6-12 months after the first dose, provides extended immunity.

The duration of immunity is unknown but mathematical modelling suggests 8 to 10 years.

The vaccine is well tolerated with side effects being generally mild and self limited consisting mainly of local reactions at the injection site (pain, tenderness, swelling). Frequency of symptoms decreases with successive doses.

Havrix™ must be stored at 2°C to 8°C. It is reasonably heat tolerant but **do not freeze**.

What about the cost of Havrix™ brand of HAV vaccine?

The government price for the vaccine will be between \$30 - \$36/dose.

Seroprevalence studies

WHO recommends epidemiological studies to obtain data and determine optimal immunisation strategies. In developed countries, seroprevalence studies suggest that cost effective screening for evidence of immunity to HAV may be limited to persons over 50, those who have lived or travelled extensively abroad or those with a history of jaundice. In the NT this may also be true of individuals who have worked in Aboriginal communities or have regular contact with Aboriginal people, particularly children.

The current cost for a screening anti-HAV test is \$12 to \$15/test through RDH but will be considerably higher through private laboratories.

So, what policy for the NT?

Laboratory notifications indicate that we have the highest incidence of hepatitis A in Australia (September 1991-1993, 83/100000 per annum). A recent survey showed that 97% of Aboriginal people living in rural communities had IgG antibodies to HAV and that 90% of the infection occurred before the age of six. The prevalence of antibodies in the urban and non Aboriginal communities is not known.

Therefore, following WHO recommendations and recognising the need for further epidemiological studies to guide optimum HAV vaccination strategies the following is recommended:

For the NT Department of Health and Community Services:

For the first year of implementation pretesting should be carried out on all those considered for the vaccine to establish those who are susceptible to HAV.

Who?

- All permanent paediatric staff - RNs, MOs and ENs
- All permanent rural health staff - RNs, MOs and AHWs

Note: Permanent = greater than 3 months service to the area is proposed

How?

- Pretesting offered through RDH and Alice Springs Hospital for the above.
- A laboratory slip and a questionnaire will be distributed by district Disease Control Centre (DCC) staff and analysed by the NT DCC to optimise the subsequent HAV vaccination policy.

All identified susceptibles will be encouraged to accept vaccination.

Vaccination will be administered via staff clinics for hospital based personnel and rural health centres for rural staff.

Who pays?

Test and vaccines will be cost coded to the relevant hospital for hospital staff and to the relevant health centre for rural staff.

The above policy will provide the needed epidemiological data, reduce the pool of susceptibles in high risk groups by vaccination with Havrix™ and will be cost effective if even 26 % of those screened are already immune.

For outside the NT Department of Health and Community Services:

Pretesting should be considered. HAV vaccination is recommended for those found to be susceptible.

Who? • Paediatric staff in private hospitals,

- Staff in paediatric practices,
- Staff of Aboriginal controlled health services,
- Staff in day care centres,
- Residents (>5 years of age), staff and family of residents in institutions for the developmentally disabled,
- Travellers to intermediate or high endemicity areas,
- Homosexually active men,
- Injecting drug users and
- Persons with chronic liver disease.

How?

Pre-testing and vaccination through private medical practitioners or the Australian Government Health Service.

Who pays?

Employers or individuals.

1. Hepatitis A: a vaccine at last. *The Lancet* 1992. 339:1198-1199.
2. Stokes M-L & Manning W. Dramatic increase in hepatitis A. *New South Wales Public Health Bulletin* 1991. 2; 8: 77.
3. Innis BL, Snitbhan R, Kunasol P, et al. Field efficacy trial of inactivated hepatitis A vaccine among children in Thailand (an extended abstract). *Vaccine* 1992 10 (supp.1): S159.

Echovirus Type 30 Meningitis Outbreak in Darwin

Gabrielle O'Kane, Dale Fisher, RDH and Liam O'Connor - State Laboratory Services, Perth, W.A.

As part of a recent Australia-wide trend, an outbreak of Echovirus type 30 meningitis occurred in Darwin between December 1993 and February 1994. During this period there were 13 confirmed cases of enterovirus meningitis, of which so far 11 are CSF culture positive for Echovirus type 30.

The age of the patients ranged from one month to 61 years, one quarter of the patients being less than 12 months of age. Adult patients presented with standard features of fever, headache, stiff neck and photophobia. Only one adult complained of diarrhoea. Children presented with non-specific features including fever and irritability. One child who had been treated with antibiotics also developed watery diarrhoea. The patients were not routinely isolated.

All 13 patients had a lumbar puncture. The CSF leucocyte count ranged from 0-200 cells/mm³, three of which showed a predominance of neutrophils. Nine patients had raised CSF protein. Five patients had a

raised white cell count on peripheral blood. Liver function tests were performed in 7 patients, and these were all normal. Virus was recovered from throat swabs of the three patients tested but not from the one nasopharyngeal aspirate done. Virus was grown in the faeces of all eight patients tested.

There was no apparent epidemiological clustering, however one patient reported that all his family had diarrhoea and another patient noted an outbreak of diarrhoea in the caravan park where she resided. There were no reports of travel to or from other states.

Echovirus type 30 is one of the nonpolio enteroviruses. Spread of enteroviruses is usually faecal-oral but may also be by respiratory droplets. The incubation period is usually 2 days to 2 weeks but usually 3-5 days. A high proportion of infections with enteroviruses are subclinical. Most patients recover completely but there is a risk of serious neurological sequelae among infected infants during their first year of life.

and

Viral Meningitis (Coxsackievirus B) at Gove Hospital

CDC and Hospital Staff Gove and CDC Darwin

Between December 11 and December 29, 1993 six patients were admitted to Gove Hospital with the diagnosis of viral meningitis. The age range was from 3 to 47 years with the five adults being 27 to 47 years of age. All patients were male.

All adult patients presented with fever, headache, nausea and/or vomiting and photophobia. The child had fever, lethargy, irritability and a stiff neck. The patients were hospitalized in single rooms.

Only two patients (including the child) had a lumbar puncture performed. The CSF leukocyte counts were 340 and 358 cells/mm³ with 96% and 98% lymphocytes. The CSF had no growth on routine culture and neither were sent for viral culture. All patients had an FBE and WBCs ranged from 6.1 to 12.2 x 10⁹/L. Four cases had nasopharyngeal aspirates but all were negative on viral

cultures. Four cases had acute and convalescent serum assayed and three were positive for IgM Coxsackievirus B₂, B₃, or B₅ on one or both sera. No faecal cultures or rectal swabs were obtained.

Two patients reported employment at the same location and all adults reported frequenting the same social venues in town. Nhulunbuy (Gove Hospital's town) is small with a population of approximately 4 000. One patient reported his spouse had a similar illness the previous week.

All patients were discharged within 3 days and had a complete recovery.

The IgM serology suggests that at least three of the six patients who presented to Gove Hospital over an 18 day period had Coxsackievirus B meningitis.

.....

Editorial Comment

The enteroviruses are divided into three categories. These include the polioviruses, the coxsackievirus group A and B, and the ECHOviruses (initially unassociated

with disease states and hence "orphans" - enteric cytopathic human orphan viruses)¹. Approximately 80% of all viral meningitis is caused by the coxsackieviruses or the echoviruses with echoviruses being the most common. Enterovirus transmission is

not completely understood but the faecal-oral route is felt to predominate. The virus is excreted in throat or faeces just before onset of symptoms and lasts for several weeks. Communicability is felt to be greatest, however, early in the illness and enteric precautions are indicated for the seven days following the onset of illness.

Specimens for viral isolation should be taken from throat, rectum/faeces and CSF when viral meningitis is suspected.

1. Modlin, J. Picornaviridae. Principles and Practice of Infectious Diseases (Eds GL Mandell, R.G. Douglas, J.E. Bennett, Churchill Livingstone. New York 1990.

Improving Our Knowledge of Hepatitis C - Establishment of a Case Register

Doug Lush and Staff, CDC Darwin

There is little known about the distribution of Hepatitis C in the Northern Territory. In the last issue of the Bulletin a review of the clinical aspects of Hepatitis C raised questions about the mode of transmission within the Northern Territory. We have now undertaken a review of notifications over the past three years which shows a male to female ratio of two to one. The most represented ages of notifications were from 20 to 50 years. Unfortunately many notification forms were incomplete and made information on ethnicity, reason for testing and risk factors difficult to analyze.

Of the 10,000 blood donations made each year in the N.T. 0.25% test positive for antibodies to Hepatitis C and are discarded. This low prevalence is in line with the national experience and reflects the low risk of the donor population.

Testing of 77 clients at STD clinics in Darwin showed an 8% sero-positivity by second generation Ortho enzyme immunoassay (EIA). Testing of 1300 de-linked sera from Arnhem Land Aborigines collected for other reasons showed a 2% sero-positivity by EIA. It is difficult to determine the risk factors as the reasons for testing are not recorded for this group. Half of the

EIA positive samples are confirmed by polymerase chain reaction (PCR) and Radio immunoblot assay (RIBA).

In order to learn more about the epidemiology of Hepatitis C, a register of cases is to be set up initially in CDC Darwin and later in Alice Springs. When new notifications are received the treating doctor will be contacted and a request will be made for information about the patient's clinical status and about risk factors.

A questionnaire has been sent to all medical practitioners in the greater Darwin region requesting information about their current management of Hepatitis C. This includes details of indication for Hepatitis C testing and the follow up that is carried out on seropositive patients.

It is hoped that increased knowledge about the distribution of disease and risk factors will help in the formulation of preventive strategies. The proposed register will aid in coordination of investigations and will facilitate optimal patient management as treatment strategies and preventive measures become better understood.

Leprosy in Sumba, Indonesia

Dr John Hargrave and Dr Doug Lush, Basedow Unit, CDC Darwin

In December of 1993 we visited the Indonesian island of Sumba at the invitation of Dr Stef, Head of the *Dinas Kesehatan* (Department of Public Health) of East Sumba (*Sumba Timur*). The aim was to observe Sumba's leprosy management and to assess whether we could offer assistance in their control program.

Waingapu, the capital of *Sumba Timur*, is one hour west of Kupang by plane. The population of *Sumba Timur* is

about 160 000. The economy of the region is agriculturally based. There is a well equipped hospital in Waingapu and a number of rural clinics (*puskesmas*) that are staffed by doctors, most of whom have trained in Java.

The first day was spent in the hospital in Waingapu meeting with staff and discussing the various services offered by the hospital. Good X-ray services were

available as well as microscopy facilities for common conditions like tuberculosis, malaria and leprosy. The operating theatres were well equipped for routine surgery. Most of the hospital beds were occupied by patients with malaria and tuberculosis.

We then visited rural areas where the clinic staff had organised as many leprosy patients as possible to be reviewed. Many patients were seen in their own homes; others were seen in the clinics. We discussed each case with the *doktors* and nursing staff. In this way we were able to gain some understanding of leprosy management in Sumba and to appreciate some of the problems that are hindering its control.

We saw many young patients with advanced disease and marked deformities. There was no program in place to prevent or treat disability and no footwear for patients with anaesthetic feet. Multidrug treatment (MDT) was available, but patients had to wait for individual allocation of medicines from the mainland of Timor before commencing treatment. In many cases this meant waiting three to six months for MDT after diagnosis.

A *doktor* in charge of a *puskesmas* generally had 18 000 - 24 000 patients in his or her district to care for with minimal facilities at the *puskesmas*. Most of the clinic work is centred around infant and child health including immunisations. There is presently no immunisation program for rubella. Although we did not see any tetanus on this visit it reportedly does occur sporadically. Tuberculosis by observation and discussion with health staff is extremely common, although we were given no official figures.

The most common illnesses amongst children were respiratory and diarrhoeal disease.

Dr Hargrave will be returning to Sumba in June of 1994 to perform surgery on some of the patients seen during our visit. Reconstructive surgery was offered to patients who would benefit most from it and will be performed at the hospital in Waingapu. Dr Stef has kindly offered to help in the training of new staff of the Basedow Unit. We look forward to continued contact with Sumba Timur and the increased knowledge and understanding that this will bring.

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(Note: Bulletin numbers in bold type indicate major articles)

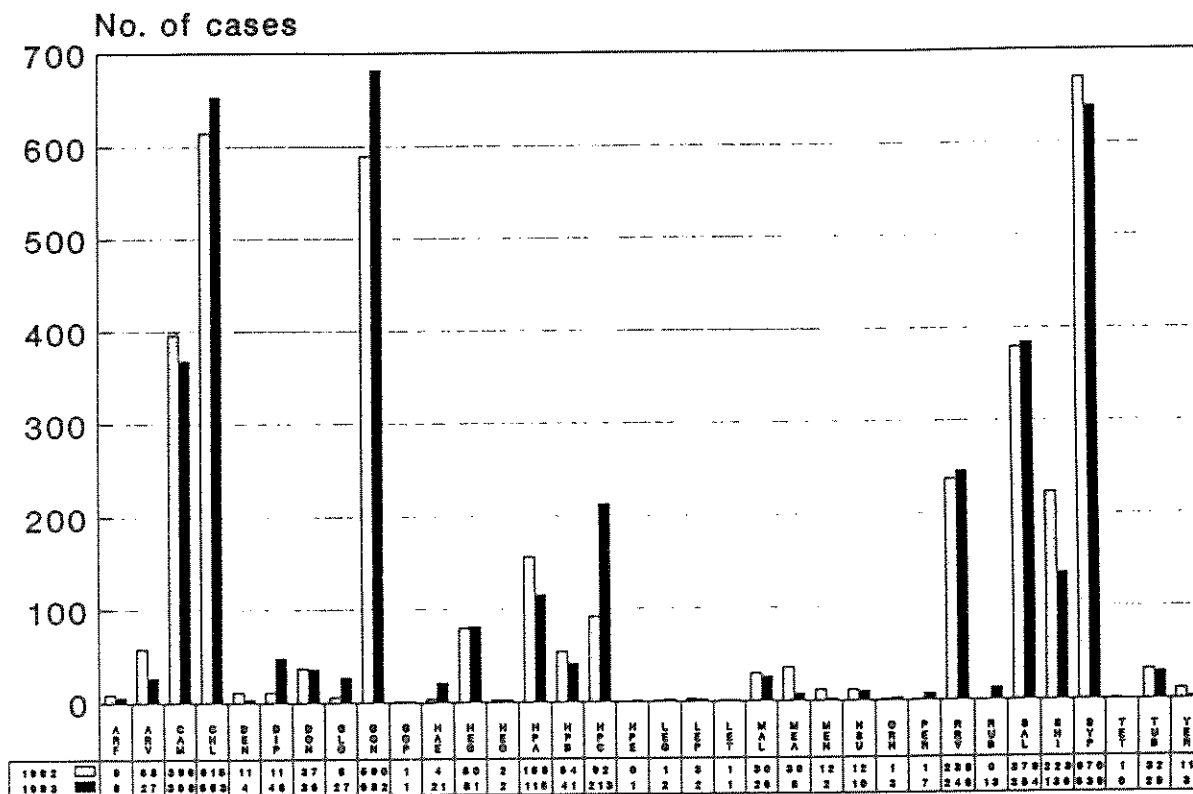
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NT NOTIFIABLE DISEASES

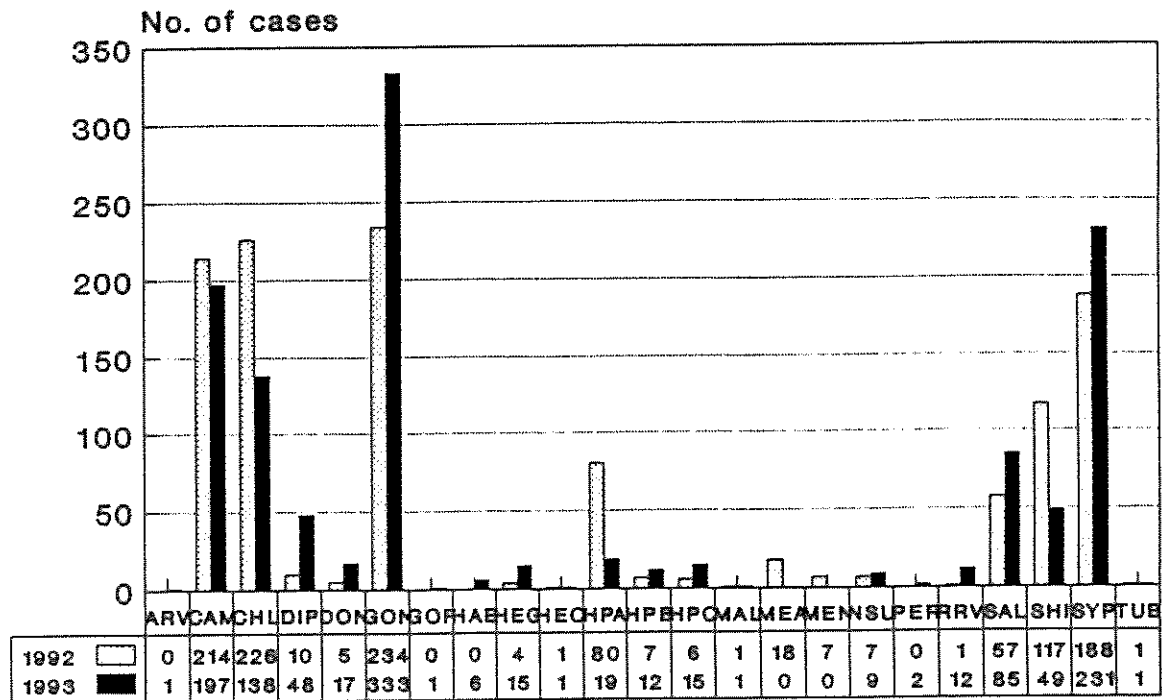
Total for 1993 as compared to 1992

NT wide 1992 and 1993

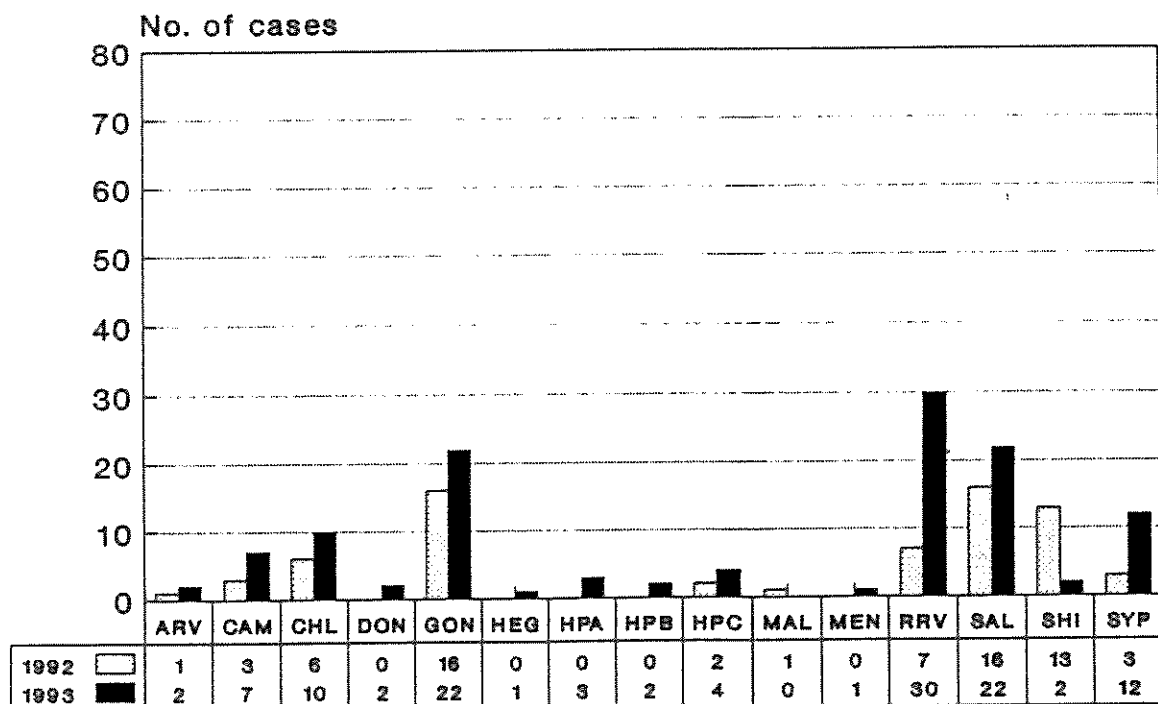


AME - Amebiasis	HAE - Haemophilus Influenza type b	LYV - Lymphogranuloma Venereum	RRV - Ross River Virus
ARF - Acute Rheumatic Fever	HEG - Herpes genital	MAL - Malaria	RUB - Rubella
ARV - Arbovirus (not RRV)	HEO - Herpes other	MEA - Measles	SAL - Salmonella
BRU - Brucellosis	HIV - HIV Infections	MEN - Meningitis	SHI - Shigella
CAM - Campylobacter	HPA - Hepatitis A	MUM - Mumps Parotitis	SYP - Syphilis
CHA - Chancroid	HPB - Hepatitis B	NSU - Non specific urethritis	TET - Tetanus
CHL - Chlamydia	HPC - Hepatitis C	ORN - Ornithosis	TUB - Tuberculosis
CHO - Cholera	HPE - Hepatitis E	PER - Pertussis	TYF - Typhoid
DEN - Dengue Fever	HYD - Hydatid Disease	PLA - Plague	VHF - Viral Haemorrhagic Fever
DIP - Diphtheria	LEG - Legionnaires Disease	POL - Poliomyelitis	VHU - Viral Hepatitis (Unspecified)
DON - Donovanosis	LEP - Leprosy	QFE - Q Fever	YEF - Yellow Fever
GLO - Glomerulonephritis	LET - Leptospirosis	RAB - Rabies	YER - Yersiniosis
GON - Gonorrhoea	LIS - Listeriosis		

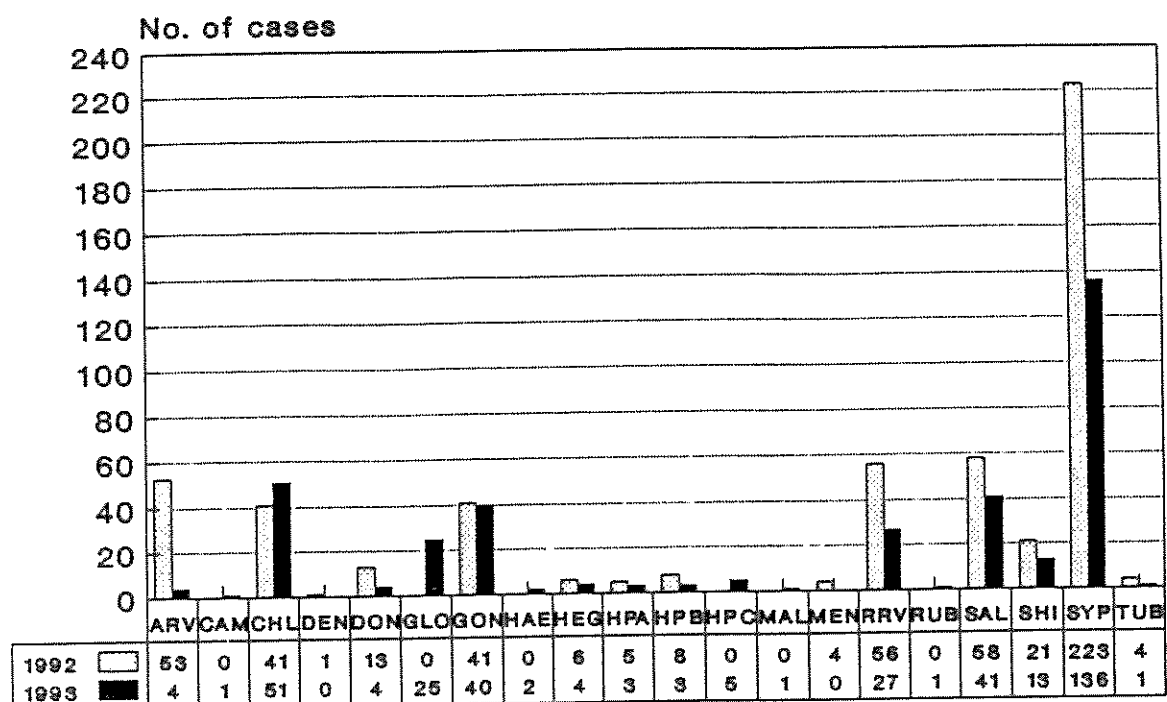
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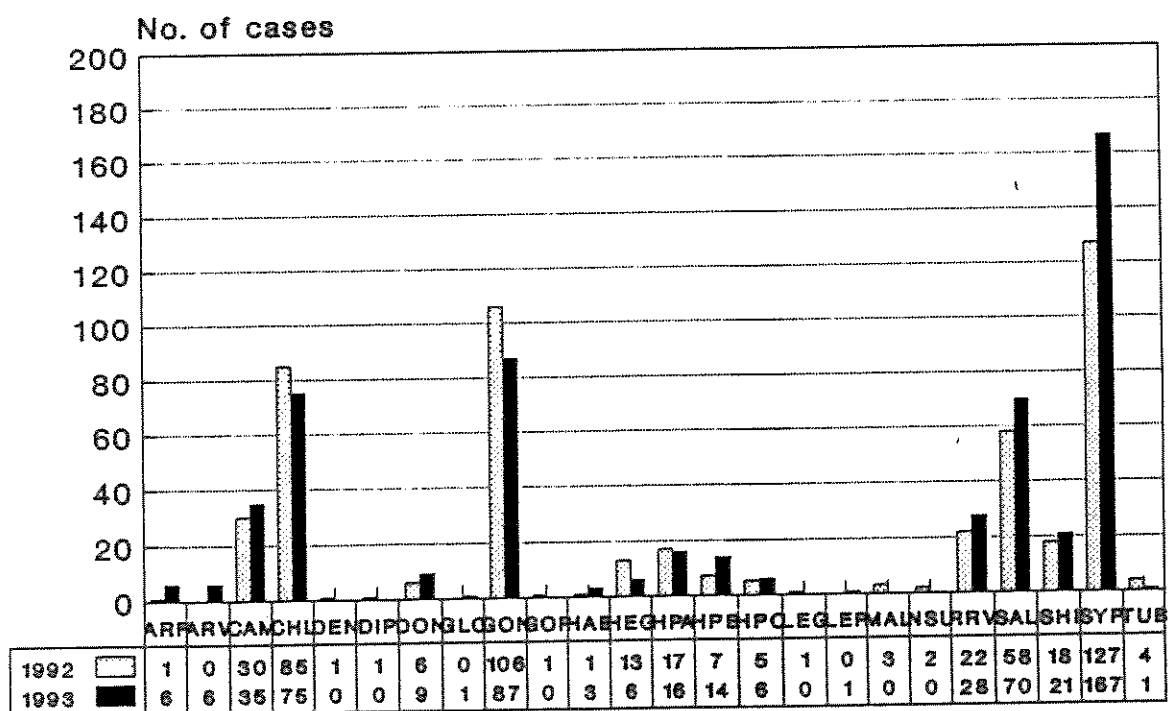
Barkly Region 1992 and 1993



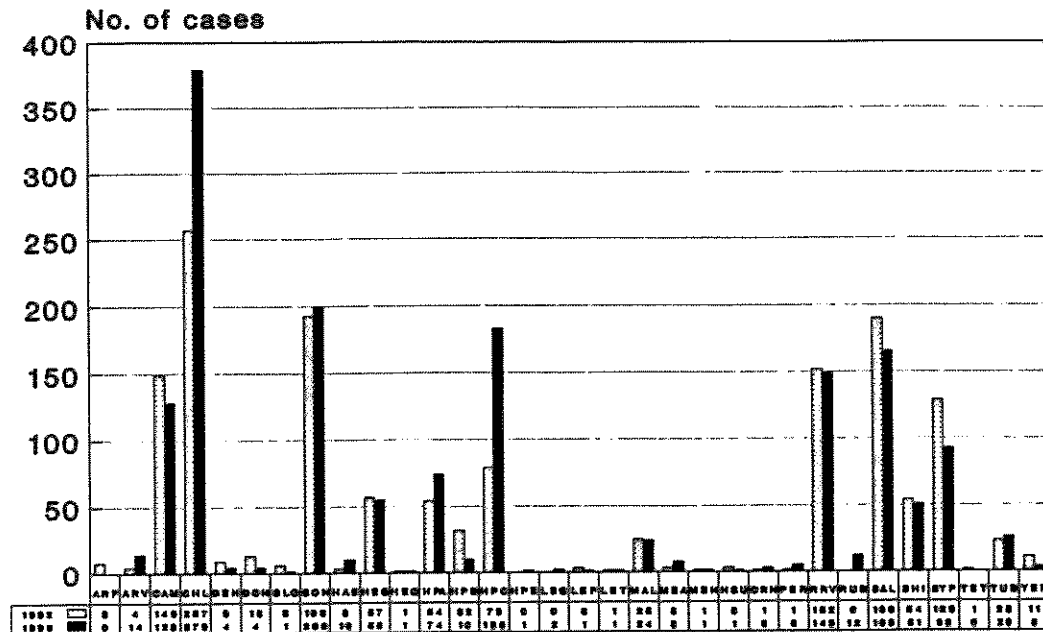
East Arnhem Region 1992 and 1993



Katherine Region 1992 and 1993



Darwin Region 1993



Editorial Comment:

Changes in the surveillance of RRV in the NT

The intensive surveillance for RRV supported by general practitioners over the last three years has provided valuable information about seasonal trends in disease incidence. The largest number of notifications occur from January to March, peaking in February. This peak actually reflects virus transmission during the preceding 4-6 weeks. These data have enabled us to determine when public health messages of mosquito bite prevention would be of greatest benefit in preventing cases of RRV, Barmah Forest virus (BFV) and other pathogenic arbovirus infections, and guide the intensity of mosquito control measures.

CDC no longer requires doctors to complete the detailed clinical and entomological surveillance forms supplied through the laboratories in collaboration with the Disease Control Unit and the Medical Entomology Branch. Instead we request that doctors include details

of the *possible date* and *place of infection* and the *symptom onset date* on the pathology request form at the time of blood collection. The laboratories have agreed to make these details available to CDC when a positive result is obtained.

We remind doctors that an increasing number of BFV infections are being diagnosed in the Top End including urban Darwin, and it should be considered in the differential diagnosis of RRV. Both infections cause the symptoms and signs of epidemic polyarthritis, although BFV is more commonly associated with a florid maculopapular to vesiculopapular rash. Both infections can result in chronic joint symptoms and fatigue. Rubella (see Editorial comment, p. 6) should also be considered in the presentation of a fever, maculopapular rash and polyarthritis.

Profiles and Staff Updates

Edited by Darren Mitchell

New staff within Disease Control

Alice Springs

Marion Moloney
CNC - Communicable Diseases

After seven and a half years in Tennant Creek as the AIDS/STD Educator Marion has made "the big move" to Alice Springs to replace the irreplaceable Sue Reid (Marion's own words!) as the Clinical Nurse Consultant - Communicable Disease. "A position I am enjoying very much" says Marion.

The Tristate Project

The Tristate Project has been developed as a pilot model of intervention covering remote area communities within the cross-border area of the NT, SA and WA.

Geographically, there are 700,000 square kilometres which cover approximately 60 communities and outstations, each with varying access to health services.

This project aims to reduce STD/HIV rates by co-ordinating efforts and expertise in the Tristate area and recognising language groups over state borders. This project is responsible to the Central Australian Disease Control Coordinating Committee (CADCCC)

Kerry Arabena
Coordinator, Tristate Project
Disease Control Alice Springs

Kerry has been desert bound for the past five years, spending three of those years in a remote Western Desert community. During that time she was both an Adult Educator and Administrator for a community-controlled health organisation. Positions wherein Kerry gained considerable experience in developing, implementing and evaluating remote area health oriented programs at the local and regional level.

She notes "It is an interesting and challenging charter that the Tristate team have undertaken, and we look forward to keeping you posted."

Steven Skov
Medical Officer, Tristate Project

Steven has recently taken up the position of Medical Officer for the Tristate Project. Steven has lived in central Australia for seven and a half years having worked as the Senior District Medical Officer, District

Medical Officer and Paediatric Medical Officer for Rural Health in Alice Springs as well as a hospital resident at the Alice Springs Hospital. He has had considerable involvement with CARPA and is a member of the Standard Treatments Manual editorial committee. He says "Although I have limited experience in STD/HIV medicine, I do bring to the project a considerable knowledge of Aboriginal health in central Australia and a good working relationship with most of the organisations involved."

Steven is currently completing the thesis for a Master of Public Health degree on the subject of childhood diarrhoea.

Darwin

Angela Merianos
Head, Immunisation and Surveillance

Angela has recently returned to Disease Control as Head, Surveillance and Immunisation from her position as Research Fellow with National Centre for Epidemiology and Population Health (NCEPH) in Canberra. During 1991 and 1992 Angela was holder of a NCEPH Scholarship, on placement within Disease Control, to undertake the Master of Applied Epidemiology. Previously she had been project Manager with the Communicable Disease Centre in Alice Springs.

Among her interests she notes: "communicable disease epidemiology especially arboviral infections; vaccine preventable diseases and surveillance; and applied epidemiology training."

Doug Lush
Epidemiology Registrar
Disease Control, Darwin

Born in New Zealand
Lucky number: eight
Favourite colour: blue
Student of applied epidemiology working within Disease Control. Special interest in leprosy control.
Favourite holiday location: Humpty Doo.
Favourite food: squid.

Jackie Mein
AIDS/STD Medical Officer

Jacki is a recent arrival to Disease Control from Victoria, where she graduated in medicine in 1990 from the University of Melbourne. After completing her intern year Jacki worked at the Fairfield Infectious Diseases Hospital caring for HIV and AIDS patients, as well as gaining experience at the Melbourne Sexual Health Centre with sexually transmitted (STD) diseases.

She says: "Even as an undergraduate I had already been infected (in a manner of speaking!) with a keen interest in venereology, picked up from attendance at the Sexually Transmitted Diseases Clinic. In my official capacity, of course."

Jacki's interest in sexually transmitted disease burgeoned, much to her parents consternation, and now she finds herself working in a region noted as having Australia's highest rates of STDs.

She says: "We welcome referrals for anyone who would like a full STD check-up in relaxed and confidential surroundings or would just like to chat about safe sex, condoms or other STD issues."

Jacki may be contacted on telephone 228 834 or 228 007 or Clinic 34, Block 4, Royal Darwin Hospital.

Philip McMahon
Clinical Nurse Specialist

Philip has recently joined Disease Control after working for several years in the NT rural area. For the last two years he has worked in Katherine with the NT Air Medical Service and living in Borroloola. In between he also completed his midwifery qualification.

He says "I have enjoyed working in Rural Health particularly with the Aboriginal people and am fully committed to developing primary health care strategies".

Alan Ruben

Alan Ruben has recently commenced as Community Paediatrician within the Community Health Directo-

rate. He has an input into Disease Control paediatric matters.

Mary Verus
Secretary TB Unit

Mary commenced her position as TB secretary in January. She also provides admin support for Angela Merianos. She had previously worked as a receptionist with the Adoptions and Substitute Care Unit and Human Resource Management in Health House. Mary is also the contact person for the Coeliac Disease Support Group in Darwin and is very happy to be used as a resource on this disease.

Nhulunbuy

Farewell to Rachel Jordan who is off to Russia to study Russian at St Petersburg University. This Russian interest followed time spent on a kibbutz in Israel where she befriended Russian immigrants.

Rachel has been in the NT off and on for 17 years spending her time in East Arnhem Land. She has been with CDC in Nhulunbuy since 1986. Rachel is well known throughout the Arnhem Land communities and will be missed.

EAR CDC unit has moved to a house on the hospital grounds and amalgamated with the AIDS/STD educational counselling units.