



# THE NORTHERN TERRITORY COMMUNICABLE DISEASES BULLETIN

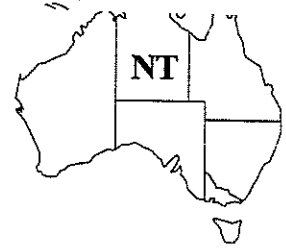


Central Library

19.11.1998

1369

266



ISSN 1323-8612

Vol. 4, No 4, December 1997

## Immunisation coverage of children 12 - 14 months in real time

*Sandra Thorman and Angela Merianos, CDC, Darwin*

### Introduction

This report presents the immunisation coverage of children resident in the Northern Territory (NT) in November 1997 and born between 1 January and 31 March 1996.

NT Childhood Immunisation data are maintained in seven discreet databases administered by Territory Health Services (THS). The Barkly and Darwin Urban databases are both maintained by the Centre for Disease Control (CDC), Darwin. The other databases are maintained by CDC in East Arnhem, the Population Health Unit in Alice Springs, CDC Katherine (Rural and Urban data are separate) and Darwin Rural is maintained by Rural Health in Darwin.

Since January 1996, CDC Darwin has regularly collected data from the seven databases for transmission to the Australian Childhood Register (ACIR) that is administered by the Health Insurance Commission (HIC). Data are filtered and cleaned before transmission. Some of the Aboriginal Medical Services in the NT share data with THS but have not yet given THS the authority to transmit their data to the HIC (approximately 15% of NT immunisation providers).

In November 1997, the National Centre for Disease Control, Commonwealth Department of Health and

Family Services, informed the States that the HIC was preparing to announce national immunisation coverage rates for this group of children derived from the ACIR. Denominators used by the HIC for the calculation of immunisation coverage rates are the Australian Bureau of Statistics' population estimates and numerators are the data provided by

### Contents

Immunisation coverage of children 12 - 14 months in real time .....	1
Ongoing NT funding for DTPa.....	4
Summary of recommendations from the Pertussis Working Party for the Communicable Diseases Network of Australia and New Zealand .....	5
Nationwide pertussis figures.....	5
Hepatitis B vaccination policy in the NT.....	8
Is the Hong Kong 'Bird Flu' a threat to Australia? .....	13
Guidelines for meningococcal meningitis/septicaemia chemoprophylaxis.....	15
Lyssavirus prevention strategy update .....	17
Update: NT retrospective search for lyssavirus in humans.....	19
The Child Care Ear Project - a community project in Darwin .....	21
Rheumatic Heart Disease Program .....	22
The Clinical Management and Continuity of Care COAD project.....	23
NT Notifications of diseases by districts, 1 July to 30 September 1997 and 1996 .....	24
Notified cases of vaccine preventable diseases in the NT, 1 July to 30 September 1997 and 1996 .....	25
NT wide notifiable diseases, 1 July to 30 September 1997 and 1996 .....	25
Malaria notifications, NT, July to September 1997.....	26
Dengue 3 in Cairns .....	26

EDITOR

Vicki Krause

PRODUCTION DESIGN Sue Reid

ASSISTANT EDITORS Angela Merianos, Sue Reid, Nan Miller

PRINTED Forms & Resources

Centre for Disease Control, Block 4, Royal Darwin Hospital

PO Box 40596, CASUARINA NT 0811 Phone (08) 8922 8044 Fax (08) 8922 8310

E-Mail: [vicki.krause@casrdh.health.nt.gov.au](mailto:vicki.krause@casrdh.health.nt.gov.au)

the ACIR. Statistics prepared for the NT indicated that coverage for DTP and OPV is 65% and 69% for Hib, with only 61% of NT children in this age group age appropriately immunised for all vaccines.

To provide an accurate snapshot of NT immunisation coverage rates for this group of children and as a counter to the adverse report generated from ACIR data, the Surveillance and Immunisation section of the Disease Control Program conducted its own audit. This is the first comprehensive audit of NT-wide immunisation data conducted by THS using a select group of children's immunisation records.

### Methods and Results

Data from the seven databases were collected in Darwin. After identifying which clients fulfilled the birth criteria (age 12-14 months inclusive), filters were applied to eliminate those children who had moved from the NT or had died. The data were copied into one table and checked again to filter out duplicate records created as mobile clients move between regions. 1034 records were identified initially.

Using these data a table was created for each region showing the immunisations due and given for the crucial primary course of immunisation. Children should have received three doses each of DTP, OPV, Hib and hepatitis B vaccines and one dose of MMR by 15 months of age.

The resulting dataset showed which clients' records were incomplete. In the first round of analysis, we discovered that coverage for MMR and Hib3 was much lower than expected. In addition, there were apparent inconsistencies in immunisation practice with injectable vaccines; vaccine providers administered DTP and Hib or hepatitis B vaccine at the same time for doses within the first 6 months of life, but seemingly failed to do so with MMR and Hib at 12 months of age. For example, some children's records showed they had received MMR (due at 9 months for Aboriginal children and 12 months for other children) but not Hib3 (due at age 12 months) and vice versa. Other records showed that MMR was given but not the third dose of hepatitis B vaccine, due at age 6 months of age. We assumed that some of these apparent inconsistencies were data entry errors rather than a failure to immunise opportunistically or parental refusal or two injections on the same day. Unreported migration out of the NT was another possible reason for missing data.

We tested these assumptions by sampling records using "MMR not given" as the search criterion. This involved the examination of clinical records at the Darwin Urban, Alice Springs and Tennant Creek Community Health/Care Centres that had last provided immunisation services to the child.

145 Darwin Urban clinic records revealed the following:

- 27 clients had received the MMR and three doses of Hib vaccine (18.6%)
- 59 clients had moved from NT (40.7%)
- 33 clients had not received MMR but had received Hib3 (22.8%)
- 7 files could not be found (4.8%)
- 6 clients attended an Aboriginal Medical Service and records were not available for examination in the time frame of the review (4.1%)
- 2 clients conscientiously objected to all immunisations (1.4%)
- 1 client conscientiously objected to all immunisations except CDT (0.7%)
- 1 record duplicated under a different HRN and DOB (same name/mother, same immunisation record)
- 5 clients have not been sighted since birth and have a caravan park address so it is assumed they have left the NT (3.4%).

Files checked in Alice Springs and Tennant Creek showed similar results and the records for all three regions were updated accordingly.

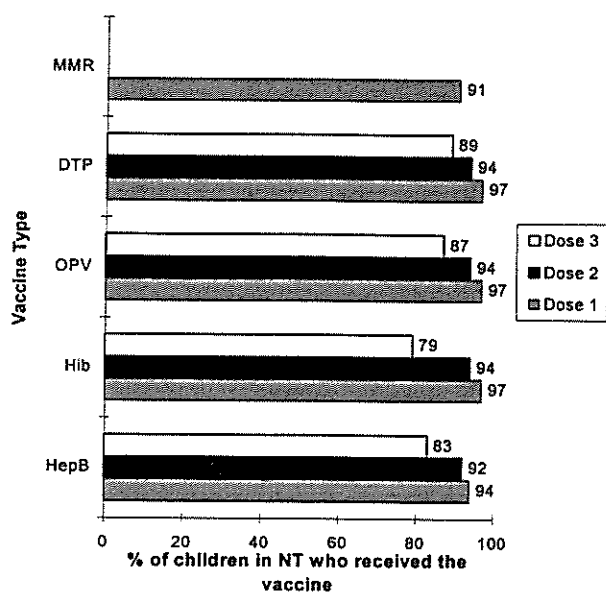
This process resulted in a final dataset of 902 children, a reduction of 12.8% of the original denominator estimate. Time constraints prevented checking any records in Katherine and East Arnhem.

Table 1 shows the coverage rates in each region before and after the audit. The final dataset of 902 children born between 1 January and 31 March 1996 residing in the NT in November 1997 revealed that 89%, 87%, 83% and 79% had received three doses of DTP, OPV, hepatitis B and Hib vaccines respectively. 91% have received one dose of MMR. Analysing data for each district revealed 75% of children have received all of the crucial primary set of immunisations (Figures 1 and 2). Figure 1 confirms that for the first three doses of DPT, OPV, the third dose of hepatitis B vaccine and the first two doses of Hib, vaccine providers make every effort to faithfully administer all vaccines due at the same time. The difference between vaccine uptake for MMR and Hib3 widened after the chart audit.

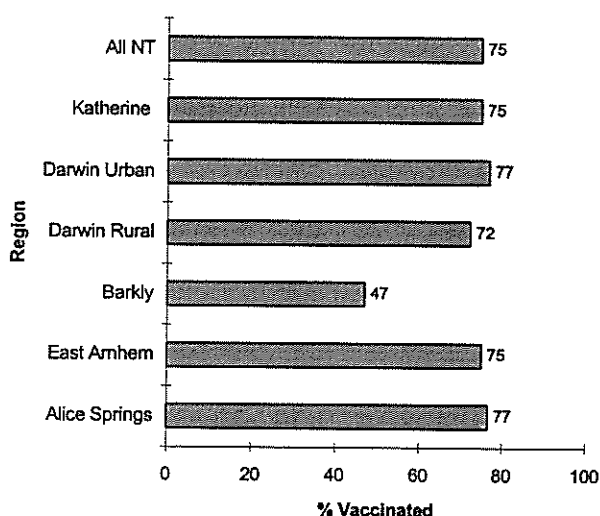
**Table 1 Coverage rates (%) of the third dose of DTP, OPV, Hib and hepatitis B and the first dose of MMR among children born between 1 January and 31 March 1996 and resident in the NT in November 1997**

Total children (n)	Alice Springs n=169	East Arnhem n=79	Barkly n=39	Darwin Rural n=69	Darwin Urban n=456	Kath Rural n=40	Kath Urban n=50	Before audit (NT wide) n=1034	After audit (NT wide) n=902
Hepatitis B	80	92	69	91	81	95	65	77	83
Hib	76	75	44	78	81	76	78	69	79
OPV	86	94	65	84	87	93	80	82	87
DTP	86	94	62	87	89	93	80	83	89
MMR	90	95	78	91	88	95	79	77	91

**Figure 1 Coverage rates for each dose of the NHMRC vaccines in children born between 1/1/96 and 31/3/96 currently residing in NT**



**Figure 2 Percentage of NT children born between 1/1/96 and 31/3/96 who have received three doses of OPV, DTP and Hib and one dose of MMR by district of residence**



**Conclusions**

Coverage data from the ACIR indicate that the Australian averages for three doses of DTP, OPV and two doses of HibTITRE are 77% for each vaccine with a range of 66-83% (excluding the NT)<sup>1</sup>. NT immunisation coverage for these vaccines following our audit is above the national averages, as shown in Table 1, but still falls short of the National Health and Medical Research Council (NHMRC) recommendations of over 95% coverage for all childhood vaccines. NT health professionals, parents and other child care providers, eg child care centres following the immunisation guidelines recommended under the child care accreditation process, have ensured among the highest immunisation coverage rates in Australia for this age group of children.

Two issues clearly emerged from this audit.

1. Providing current data about individual and community immunisation status is dependent on maintaining the flow of information between immunisation providers and CDC. Checking clinical records showed that vaccines are being given to children but not always being reported to the regional immunisation database.
2. To be fully immunised a child needs to receive all the vaccines on the recommended schedule, and for optimal protection the vaccines should be administered at the recommended times (NHMRC *The Australian Immunisation Handbook, 6th Edition* p 42). This review indicates that children are not receiving all vaccines recommended at a particular age eg 91% of children have received MMR but only 79% of children have received the third dose of Hib due at twelve months of age. This significant difference and the difference between DTP/OPV coverage and that of hepatitis B may in part reflect in-migration of children born in other States and started on different immunisation regimens. The NT is the only jurisdiction that currently universally offers PedvaxHIB

(administered at 2, 4 and 12 months of age) and hepatitis B immunisation to new borns. HibTITRE, the other main form of Hib vaccine used in Australia, is administered at 2, 4, 6 and 18 months of age and hepatitis B vaccine is only offered to high risk neonates in other jurisdictions. Parental refusal to have all vaccines due administered on the same day may be another reason why some doses were missed. However, this seems an unlikely explanation given the discrepancy in coverage only occurs for vaccines administered at 12 months of age, MMR and Hib3.

These limitations of our immunisation dataset result in underestimation of immunisation coverage. This misrepresents the NT Immunisation Program on a national level and also has funding implications as a result of bilateral agreements between the NT and the Commonwealth to work towards the NHMRC immunisation goals and targets.

The key recommendations from this review directed at vaccine providers are:

1. Communicating all the details about each client's immunisation and residential status. This is vitally important so that immunisation and demographic data can be kept up to date, but also helps you, the vaccine provider to provide good client care by neither under nor over immunising a child. It also assists program evaluation and planning by providing accurate epidemiological data. When a client receives an immunisation, moves to a different region within the NT, moves to an interstate address or dies, vaccine providers should record the information on the *Vaccine*

*Record Form* and Freepost to their regional Immunisation Database Support Officer.

We need to think about new ways to enable parents to notify us when they are leaving the NT. The issue of current addresses has also been brought up with the HIC that should be able to provide this information from the ACIR.

Attention to these work practices and data cleaning are essential before a new immunisation information system is introduced. Even with the most sophisticated software, GARBAGE IN will still equal GARBAGE OUT.

2. Vaccine providers should adhere strictly to the NT Childhood Vaccination Schedule unless there is a medical contraindication preventing immunisation with a specific vaccine on the day. The vaccination schedule is a standing medical order. Any changes to the schedule that deviate from the *Australian Immunisation Handbook* recommendations should be discussed with a medical officer. Being "kind" to a child by staggering immunisation runs the well documented risk of missed and delayed doses which may result in vaccine preventable illness. Difficulties with access, client mobility and infrequent outreach services in some regions, especially the Barkly, means missing one immunisation opportunity may result in the delay of immunisation by months.

### Reference

1. Commonwealth Department of Health and Family Services. *Immunise Australia Quarterly*. December 1997, p2.

## Ongoing NT funding for DTPa

The first three doses of DTPa (primary course) administered at 2, 4 and 6 months of age, will continue to be offered free to all NT infants. On 1 October 1997, the Federal Health Minister announced that the Commonwealth would not fund the primary course. The NT and South Australian Governments decided to continue to fund the DTPa while WA and the ACT reverted to the use of DTPw (whole cell pertussis containing vaccine) due to financial constraints. The remaining States have not yet adopted the NHMRC recommendation to change to DTPa.

The Commonwealth has agreed to fund the 18 month and 5 year boosters, and DTPa for children

with specific medical contraindications to DTPw. National recommendations for the use of DTPa are being prepared and will be published in the *Bulletin* when they become available. DTPa should not be given to:

- children with an anaphylactic reaction to either DTPa or DTPw vaccines; or
- children with evolving neurological disease until their condition has stabilised (on the advice of a paediatrician).

The NT Government should be congratulated for its progressive approach and commitment to immunisation.

## Summary of recommendations from the Pertussis Working Party for the Communicable Diseases Network of Australia and New Zealand

Sue Skull<sup>1,2</sup>

<sup>1</sup>CDC, Darwin, <sup>2</sup>MAE Program, ANU, Canberra

The Pertussis Working Party (PWP) was convened by the National Health and Medical Research Council (NHMRC) in 1996 to advise on strategies to reduce the unacceptably high incidence of pertussis in Australia. New recommendations from September 1997 are as follows:

### Key recommendations:

1. Full vaccination of all (>95%) children remains the most important preventative measure in maintaining control of pertussis.
2. Once an outbreak of pertussis has occurred, prevention of community transmission is unlikely to be feasible. The main objective should be to provide protection for those at highest risk of severe disease and its complications through:
  - case confirmation
  - identification of high risk contacts, especially infants
  - antibiotics for close contact settings (eg household members, day care centres) to prevent transmission (see below).

### Specific recommendations:

1. Medical practitioners who suspect a case of pertussis should:
  - arrange appropriate diagnostic tests (culture or PCR) to confirm the diagnosis;
  - give antibiotics to the case and household contacts while awaiting confirmation of diagnosis (within time period);
- advise the public health authority immediately by telephone without waiting to confirm the diagnosis, if the case attends or works in a high risk setting where there are susceptible individuals (eg child care).
2. On receiving a notification of pertussis, public health authorities (in consultation with the medical practitioner) should:
  - determine vaccination status of the case if child under 10 years;
  - ensure contacts from high risk setting (family, child care) receive antibiotic prophylaxis;
  - advise exclusion criteria for cases and contacts in high risk settings;
  - identify additional cases among family members and contacts in high risk settings;
  - consider an accelerated pertussis vaccination program in communities where ongoing transmission is occurring.
3. Erythromycin (40-50mg/kg/day - max 2g - for **10 days**) is recommended for suspect, probable and confirmed cases (see form) of pertussis and also for prophylaxis of contacts.
4. Standardised criteria be developed for laboratory identification of pertussis.
5. Establishment of a pertussis laboratory network is supported.
6. States and Territories collect the information specified in the new **Pertussis Data Collection Form** (see over) - this is important for surveillance of pertussis.

---

## Nationwide Pertussis Figures

Up to 25 November 1997, there were 8368 notifications of pertussis with onset in 1997.- The previous highest was 5443 for the whole of 1994. Source: *Comm Dis Intell* 1997; 21(23):359.

Pertussis Data Collection Form

State/Territory use

Reporting GP/Clinic/Laboratory/Hospital \_\_\_\_\_ Address \_\_\_\_\_ Phone \_\_\_\_\_

Patient Surname \_\_\_\_\_ First Name \_\_\_\_\_ Medicare No. \_\_\_\_\_

Address (No. & Street) \_\_\_\_\_ Town/Suburb \_\_\_\_\_ Phone \_\_\_\_\_

Patient details

Post code \_\_\_\_\_ State/Territory \_\_\_\_\_ Notification date \_\_\_\_\_

\_\_\_\_\_ day month year

Date of birth \_\_\_\_\_ If D.O.B unknown specify \_\_\_\_\_

\_\_\_\_\_ day month year Age \_\_\_\_\_ Unit \_\_\_\_\_

Unk = 999 Y=Years M=Months (if < 2 yrs) U=Unknown

Sex \_\_\_\_\_ M=Male, F=Female, U=Unknown

ATSI origin \_\_\_\_\_ A=Aboriginal or Torres Strait Islander N=Not Aboriginal or Torres Strait Islander U=Unknown

State/Territory Identification No. \_\_\_\_\_

Clinical data

Any cough? \_\_\_\_\_ Date of cough onset \_\_\_\_\_ Cough at final interview? \_\_\_\_\_

Coughing paroxysms? \_\_\_\_\_ \_\_\_\_\_ day month year Y=Yes, N=No, U=Unknown

Inspiratory "whoop"? \_\_\_\_\_ Final interview date \_\_\_\_\_ Days of cough at final interview \_\_\_\_\_

Post-tussive vomiting? \_\_\_\_\_ \_\_\_\_\_ day month year Unk=999

Y=Yes, N=No, U=Unknown

Complications

Hospitalised \_\_\_\_\_ Y=Yes, N=No, U=Unknown

Days hospitalised \_\_\_\_\_ Unk = 999

Pneumonia documented by chest x-ray \_\_\_\_\_ Y=Yes

Seizures due to pertussis \_\_\_\_\_ N=No

Acute encephalopathy due to pertussis \_\_\_\_\_ X=X-ray not done U=Unknown

Died \_\_\_\_\_ Y=Yes, N=No, U=Unknown

Laboratory

Was laboratory testing for pertussis done? \_\_\_\_\_ Y=Yes, N=No, U=Unknown

Culture \_\_\_\_\_ Date specimen taken \_\_\_\_\_ Result \_\_\_\_\_

PCR \_\_\_\_\_ \_\_\_\_\_ day month year P=Positive N=Negative I=Intermediate

IgA serology \_\_\_\_\_ E=Pending X=Not done U=Unknown S=Parapertussis

Note: IgG and IgM serology should not be accepted.

Treatment

Were antibiotics given? \_\_\_\_\_ Y=Yes, N=No, U=Unknown

1st antibiotic received \_\_\_\_\_ Date 1st antibiotic started \_\_\_\_\_

E=Erythromycin C=Cotrimoxazole O=Other U=Unknown

Days actually taken \_\_\_\_\_ Unk=99

2nd antibiotic received \_\_\_\_\_ Date 2nd antibiotic started \_\_\_\_\_

(see choices for 1st antibiotic) Days actually taken \_\_\_\_\_ Unk=99

Epidemiological

Date case investigation started \_\_\_\_\_

Outbreak related? \_\_\_\_\_ Y=Yes N=No U=Unknown

Epi-linked? \_\_\_\_\_ (see Notes at rear)

Where did this case acquire pertussis? (1-10) \_\_\_\_\_ Unk=99

Was there further documented spread within the home from this case? Y=Yes, N=No, U=Unknown

To where was there further documented spread outside the home from this case? (2-12) \_\_\_\_\_ Unk=99

Outbreak name \_\_\_\_\_

Number of contacts in any setting recommended antibiotics (Unk=999) \_\_\_\_\_

1=Home 2=Family day-care 3=Other child-care 4=Pre-school 5=Primary school 6=Secondary Sch./Uni. /Work 7=Health care facility 8=Closed setting 9=Remote community 10=Other 11=Spread to > 1 setting 12=No further documented spread 99=Unknown

Pertussis vaccination

Complete this section if child < 10 yrs

Ever had any vaccines against pertussis? \_\_\_\_\_ Y=Yes, N=No, U=Unknown

No. of doses of pertussis-containing vaccines prior to illness onset \_\_\_\_\_

Date given \_\_\_\_\_ Vaccine type \_\_\_\_\_ Information source \_\_\_\_\_

1st \_\_\_\_\_ 2nd \_\_\_\_\_ 3rd \_\_\_\_\_ 4th \_\_\_\_\_ 5th \_\_\_\_\_

\_\_\_\_\_ day month year

Type Codes W=Wholecell A=Acellular U=Unknown

Source Codes 1=Parent recall 2=Parent record 3=Provider record 4=ACIR record 5=State/Local govt. register 6=Other 9=Unknown

## Pertussis Data Collection Form

## Comments

## Notes

**Patient details**

Age

ATSI origin

**Clinical data**

Coughing paroxysms

Inspiratory "whoop"

Post-tussive vomiting

Final interview date

Cough at final interview

Days of cough

**Complications**

Chest x-ray

Seizures

Acute encephalopathy

Died

**Epidemiological**

Outbreak related

Epi-linked

No. of contacts  
recommended antibiotics

Closed setting

- Age of patient at onset of cough in years or, if the patient is aged < 2 yrs, in months.
- Ask "Are you (is the person) of Aboriginal or Torres Strait Islander origin?"
- Sudden attacks of severe repetitive coughing where one cough follows the next without a break for breath.
- High pitched noise heard on breathing in after a coughing spasm.
- Vomiting that follows coughing spasms.
- Date of the last interview conducted with the patient or provider to obtain case information.
- Was the patient still coughing at the time of the final interview?
- The total number of days the patient has coughed by the time of the final interview. If cough < 14 days when the case is reported, a follow up interview must be undertaken to identify persons with a cough  $\geq$  14 days.
- Documented pneumonia from chest x-ray = Yes; chest x-ray done but no pneumonia = No.
- Generalised or focal seizures due to pertussis.
- Acute illness of the brain manifesting as decreased level of consciousness (excluding postictal state) and reduced level of nervous system functioning. Seizures may or may not occur. Such patients are always hospitalised and have undergone extensive evaluation. (This should be verified by a medical practitioner).
- If patient died from pertussis, verification with the medical practitioner is recommended.
- The case is part of a documented outbreak where there has been at least one PCR or culture confirmed case and an increase in the number of pertussis cases above that normally expected to occur.
- The case has had close contact with a PCR or culture confirmed case during the incubation period (6-20 days), with cough onset in the case between 30 days before to 30 days after cough onset in the "laboratory confirmed" case.
- Indicate the number of contacts of this case for whom antibiotics were recommended. If this case is part of an outbreak, only count the additional contacts associated with the case not those that have already been counted for other cases.
- Includes boarding schools, school camps and military barracks where individuals sleep in the same room, dormitory or tent.

## Hepatitis B vaccination policy in the NT

### Background

The frequency of hepatitis B infections and the carrier state has striking geographic and ethnic variability.

**Table 1 Prevalence of HBsAg**

HBsAg Prevalence	<2% (low)	2-10% (Inter-mediate)	>10% (High)
Geographic examples	W. Europe	E. Europe	China
	N. America	S. Europe	SE Asia
	Australia	Middle East	Pacific Islands
	NZ	Japan	Africa
	S. America (partly)	S. America (partly)	S. America (partly)

In Australia, there is evidence that some population groups are at higher risk of hepatitis B infection than the general population. They include:

- Aboriginal people;
- migrants/refugees from intermediate and high prevalence areas;
- patients on haemodialysis;
- HIV positive individuals;
- recipients of blood products;
- hepatitis C antibody positive individuals;
- long term inmates of correctional facilities;
- household contacts and regular sexual partners of individuals with acute or chronic hepatitis B;
- injecting drug users;
- recipients of tattoos;
- health care professionals with frequent patient contact; and
- clients of sexually transmitted disease clinics.

In April/May 1988, hepatitis B (HB) vaccination was introduced into the NT vaccination schedule for infants from high risk populations.

In 1990, HB vaccination was offered to all infants in the NT born after 1 August 1990 and incorporated into the routine NT Childhood Vaccination Schedule in August 1993.

### THS Policy for HB vaccination

The NT has vaccination programs to prevent HBV infection in:

- 1) neonates;
- 2) selected occupational risk groups; and
- 3) other high risk groups.

**NOTE:** A school based program will be implemented in 1998/99 for children aged 6 to 16 years.

THS does not provide free HB vaccination services for adults not included in the above groups. They should be referred to a medical practitioner.

Two hepatitis B vaccines are currently available in Australia: Engerix™ (SmithKline Beecham), 10 mcg and 20 mcg single dose vials; and H-B-VAX II™ (Merck, Sharp & Dohme) 5 mcg and 10 mcg single dose vials. Table 2 shows the standard recommended dosage and injection site by age group for each brand of vaccine.

**Table 2 Standard hepatitis B vaccine dosage and injection site by age group for Engerix™ and H-B-VAX II™.**

Brand	Age group	Dose	Injection site
Engerix™	0-19 years	10 mcg IM	0-1 years antero-lateral thigh > 1 year old deltoid
	≥ 20 years	20 mcg IM	deltoid
H-B-VAX II™	0-19 years	5 mcg IM	0-1 years antero-lateral thigh > 1 year old deltoid
	≥ 20 years	10 mcg IM	deltoid

### 1. Neonates

All pregnant women should be tested for HBsAg. If the mother is HBsAg positive, the neonate should be given HB immunoglobulin (HBIG) at birth in addition to the first dose of a series of three injections (refer to schedule). The vaccine and HBIG can be given at the same time but at different sites.

### 1.1 Vaccination schedule

Three injections over a six month period. Injections should be given deep IM into the antero lateral aspect of the thigh. The routine schedule is the same for all neonates.

<b>first injection</b>	-	<b>birth (in hospital)</b>
<b>second injection</b>	-	<b>1 month**</b>
<b>third injection</b>	-	<b>6 months**, #</b>

\*\* After the first dose.

# At least 3 months after the second dose.

When the vaccination is commenced at a community health centre, the schedule should be adjusted to coincide with other childhood vaccinations whenever possible. A minimum of three months should elapse between the second and third dose.

**NOTE:** If the three doses are not completed according to schedule, do not restart the series, but continue with the next scheduled vaccine even if more than 1 year has elapsed since the previous dose. Vaccine doses administered at longer intervals provide equally satisfactory protection, but optimal protection is not conferred until after the third dose.

### 1.2 Informed consent

The responsibility for informed consent will be at the point of the first injection ie. hospital neonatal staff.

Health centres may be the first point of vaccination for eligible infants who did not receive the first dose in hospital. The responsibility for informed consent will then be with the community health nurse or Aboriginal health worker. . .

### 1.3 Vaccination record

The vaccination should be recorded on the hospital discharge summary and a record given to the parents. The departmental '**Personal Immunisation Record**' should be given to the parent in hospital at the time of the first injection (document number 40-445/1, HM8-5/96). A vaccination record form should also be forwarded to the regional THS Immunisation Database.

## 2. Children 6 to 16 years of age

The National Health and Medical Research Council recommends hepatitis B vaccination for adolescents. The NT will implement this recommendation through a school based program with the first dose coinciding with the second dose MMR (10 years of age). THS supports this recommendation. However, since the NT has been vaccinating infants since 1988 (Aboriginal) and 1990 (non-Aboriginal), the NT will run a program for one year only and target children 6 to 16 years of age. An additional team of two nurses will help plan and implement this program in 1998.

### 2.1 Vaccination schedule

Three injections of 10 mcg of Engerix™ vaccine or 5 mcg of H-B-VAX II™ over a six month period are recommended for this program.

<b>first injection</b>	-	<b>0</b>
<b>second injection</b>	-	<b>1 month after first</b>
<b>third injection</b>	-	<b>6 months after first *</b>

\* A minimum of three months should elapse between the second and third dose.

**NOTE:** If the three doses are not completed according to schedule, do not restart the series, but continue with the next scheduled vaccine even if more than 1 year has elapsed since the previous dose.

## 3. Occupational groups

- a) Health care professionals including:
- Doctors, nurses, physiotherapists, occupational therapists and pathology laboratory staff;
  - Dentists and dental assistants;
  - Aboriginal health workers.

Vaccination is provided free of charge to THS staff in all districts.

- b) Members of selected occupational groups (refer to list) and in some instances their dependents, where the employer pays for the vaccine which is administered at THS or Aboriginal Medical Service community health centres. Groups or individuals requesting vaccination who are not on the list should be referred to a medical practitioner or Health Services Australia, ph: 8981 7492.

### 3.1 Vaccination schedule

Three injections as per the standard schedule (refer to Table 2) over a six month period are recommended for optimum protection.

- first injection** - 0  
**second injection** - 1 month after first  
**third injection** - 6 months after first\*

\* A minimum of three months should elapse between the second and third dose.

**NOTE:** If the three doses are not completed according to schedule, do not restart the series, but continue with the next scheduled vaccine even if more than 1 year has elapsed since the previous dose.

### 4. Other high risk groups

Vaccine is provided free of charge for:

- patients on haemodialysis\*;
- HIV positive individuals\*;
- hepatitis C antibody positive individuals;
- regular recipients of blood products;
- household contacts and regular sexual partners of cases with acute or chronic hepatitis B;
- long term inmates of correctional facilities;
- injecting drug users;
- persons on methadone programs; and
- clients of sexually transmitted diseases clinics.

**NOTE:** The vaccine dose is doubled for all three doses for patients on haemodialysis and for HIV positive individuals as follows:

- Engerix™:** less than 20 years of age, 20 mcg IM (1.0 ml), and  
 20 years and over, 40 mcg IM (2.0 ml).
- H-B-VAX II™:** less than 20 years of age, 10 mcg IM (1.0 ml), and  
 20 years of age and over, 20 mcg IM (2.0 ml).

### Pre and post vaccination testing

Pre and post vaccination testing for hepatitis B markers is not recommended except for the following groups listed. And in these groups details of vaccination status and conversion status should be obtained to avoid unnecessary testing.

**Pre-vaccination testing** for HBsAg, HBcAb and HBsAb is recommended for:

- sexual and household contacts of acute or chronic HB individuals;
- patients on haemodialysis;
- HIV antibody positive individuals;
- injecting drug users;
- long term inmates of correctional facilities;
- hepatitis C antibody positive individuals; and
- regular recipients of blood or blood products eg. for haemophilia.

**If:**

- ⇒ HBsAg -ve, HBcAb -ve and HBsAb less than 10 IU/ml offer primary HB vaccination course or a single booster (if previously vaccinated).
- ⇒ HBsAg -ve, HBcAb -ve and HBsAb greater than or equal to 10 IU/ml, no further action is required, recommend booster every 5 to 10 years
- ⇒ HBsAg +ve and HBcAb +ve, do not vaccinate, refer to medical practitioner for clinical assessment.
- ⇒ HBsAg -ve, HBcAb +ve and HBsAb -ve most often represents remote resolved infection with selective loss of HBsAb. May also represent the 'window' period of acute infection, chronic infection with HBsAg below the limits of detection, or a false positive result. Refer to an infectious diseases physician or liver clinic.
- ⇒ HBsAg -ve, HBcAb +ve and HBsAb +ve. Person is immune, record in notes, no further follow-up.

**Post-vaccination testing** for HBsAb +/- HBsAg is recommended for:

- sexual and household contacts of acute or chronic HB individuals;
- patients on haemodialysis;
- HIV antibody positive individuals;
- hepatitis C antibody positive individuals;
- regular recipients of blood or blood products eg. for haemophilia; and
- health care professionals with direct patient contact.\*\*

\*\* The risk of acquiring hepatitis B infection from occupational exposure is dependent on the frequency of percutaneous and permucosal exposures to blood and blood products, therefore, health care staff with direct patient contact are at high risk. Health care professionals who do not have direct patient contact are at low to moderate risk.

## Schedule for post vaccination testing and boosters

### a) Sexual and household contacts of acute or chronic HB individuals

Post test for HBsAb 3 months after the third dose of vaccine.

If:

- ⇒ HBsAb greater than or equal to 10 IU/ml - booster every 5 to 10 years.
- ⇒ HBsAb less than 10 IU/ml - booster now and every 5 to 10 years.

### b) Patients on haemodialysis

⇒ as per Haemodialysis Unit protocol.

### c) Other high risk groups

- HIV antibody positive and other immunocompromised individuals;
- hepatitis C antibody positive individuals;
- regular recipients of blood or blood products eg. for haemophilia; and
- health care professionals with direct patient contact.

Individuals in the first three groups are at increased risk of infection if exposure occurs. Health care professionals with direct patient contact are at high risk due to frequent contact with hepatitis B infected blood or body fluids. Therefore, it is important for individuals from any of these groups to know if they have immunity to the HB virus so that prophylaxis with HB immunoglobulin (HBIG) is not delayed following a blood or body fluid exposure. Refer below to determine when to post test and what action to take.

#### 1) Post test for HBsAb 3 months after the third dose of vaccine -

- ⇒ If HBsAb greater than or equal to 10 IU/ml - no further action, booster every 5 years.
- ⇒ If HBsAb less than 10 IU/ml - give **first booster** and

#### 2) Post test for HBsAb 3 months after the first booster dose -

- ⇒ If HBsAb is greater than or equal to 10 IU/ml - no further action, booster every 5 years.
- ⇒ If HBsAb is less than 10 IU/ml - give **second booster** and

#### 3) Post test for HBsAb, HBcAb and HBsAg 3 months after the second booster dose -

- ⇒ If HBsAg and HBcAb are -ve and HBsAb is greater than or equal to 10 IU/ml - no further action, booster every 5 years.
- ⇒ If HBsAg and HBcAb are +ve - refer to a medical practitioner for clinical assessment.
- ⇒ If HBsAg and HBcAb are -ve and HBsAb is less than 10 IU/ml - **no more boosters should be given** as the individual is a **non-responder\***.
- ⇒ If HBsAg -ve, HBcAb +ve and HBsAb -ve - refer to refer to an infectious diseases physician or liver clinic. This could indicate a resolved infection with selective loss of HBsAb. It may also represent the 'window' period of acute infection, chronic infection with HBsAg below the limits of detection, or a false positive result<sup>1</sup>.
- ⇒ If HBsAg -ve, HBcAb +ve and HBsAb +ve. Person is immune, record in notes, no further follow-up.

\* **non-responders** should carry information with the recommendation to receive HBIG if a percutaneous or permucosal exposure to blood or blood products

#### HBIG schedule for non-responders is:

- ⇒ first dose - within 72 hours of exposure; and
- ⇒ second dose - thirty days after the first dose.

#### Booster doses for low to moderate risk groups (including approved non-THS occupational groups)

Booster doses are recommended every 5 to 10 years after completion of a primary course.

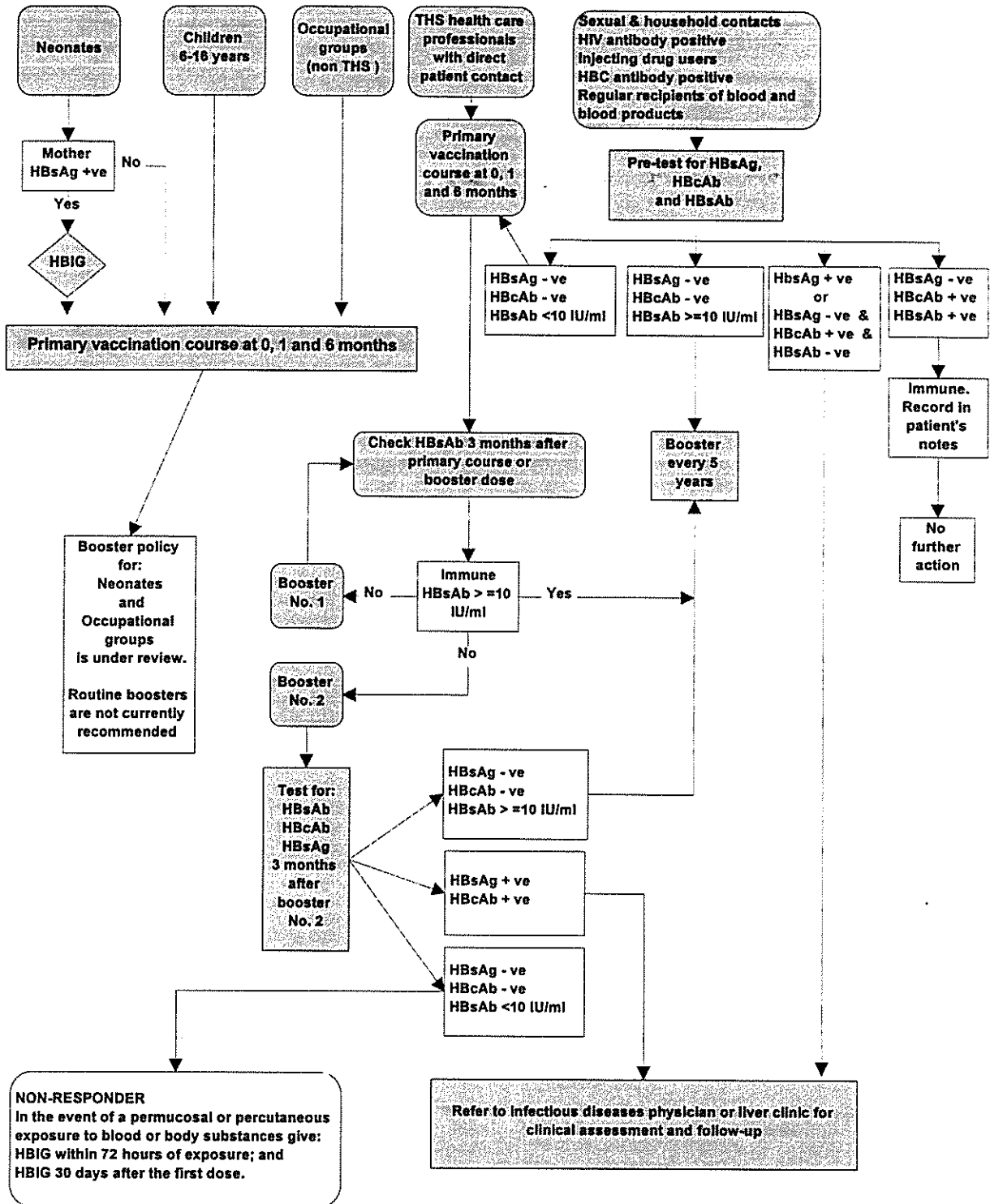
Studies show that vaccine induced antibody levels decline steadily with time but clinical protection may not be lost.

The need for booster doses will continue to be assessed as additional information becomes available and will also depend on the recommendations from the National Health and Medical Research Council of Australia.

#### Reference

1. McIntyre A, Nimmo GM, Wood RD, et al. Isolated hepatitis B core antibody - can response to hepatitis B vaccine help elucidate the cause? *Aust NZ J Med* 1992;22:19-22.

## NT HEPATITIS B VACCINATION POLICY



## Occupational groups

authorised to receive hepatitis B vaccination at health centres  
(vaccine paid by employer or individual)

- Police field officers (families of police based in rural areas)
- Correctional Services
- St John Ambulance
- Kokoda Industries
- ACCORD
- NT Fire and Emergency Services
- THS dentists and dental assistants
- THS health care staff
- Carpentaria Community Services
- Department of Education:
  - urban teachers and students in schools for developmentally disabled;
  - rural teachers and their families; and
  - Katherine School of the Air teachers
- NT AIDS Council, staff and volunteers
- Sex workers
- Adoption and Substitute Care foster parents
- St Vincent de Paul, Pzananam House staff
- Air Medical pilots

## Is the Hong Kong 'Bird Flu' a threat to Australia?

Fay Johnston<sup>1</sup> and Angela Merianos<sup>2</sup>  
<sup>1</sup>Remote Services, Darwin, <sup>2</sup>CDC, Darwin

### Summary

*A new strain of influenza virus A (H5N1), with the potential to cause a global epidemic (pandemic) of influenza has been identified in Hong Kong. Pandemic influenza is likely to affect Australia before countries of the northern hemisphere and within Australia the Top End is usually one of the first areas to detect new strains. Enhanced surveillance of influenza, particularly viral culture of cases with clinical influenza, is essential for the detection of strains. Early detection is important because development and production of a vaccine takes several months. Australia has established a working party to develop our strategy for a pandemic of influenza.*

### Introduction

In Hong Kong 14 cases of a new strain of influenza virus have been confirmed so far with four deaths since May 1997. This outbreak is important because the strain has been characterised as an H5 subtype which has not previously been known to have caused illness in humans.

An epidemic of the H5 strain, believed to have originated in mainland China, killed several thousand chickens on the island earlier this year. While there is no immediate threat to the health of Australians from this virus, it has the potential to mutate into a more transmissible form causing a pandemic. There is already some evidence of person to person transmission of this H5 strain in Hong Kong.

Strains of influenza virus are characterised according to the structure of two antigens on their surface, haemagglutinin (H) and neuraminidase (N). To date only the H1-3 subtypes are known to have become successfully established in humans, although a further 12 sub-types (H4-15) have been characterised in ducks and other birds. These are known as 'avian' strains of influenza. New pandemics are thought to arise when there has been genetic reassortment (new combinations) between circulating human and avian influenza subtypes. Reassortment may occur in an intermediate host such as pigs.

Genetic reassortment will cause a major change in the antigenic subtype of the influenza virus (antigenic *shift*). There will be little or no population immunity to the new subtype, thus laying the foundations for a potential pandemic. Morbidity and mortality from influenza can be expected to be much higher in this situation than that seen with the yearly influenza epidemics caused by minor antigenic changes due to mutation and evolution of a particular subtype (antigenic *drift*). At present, the Hong Kong "bird flu" is a pure avian virus, ill adapted to spread in humans, and spreads by bird to human transmission. Rapid spread can occur once this virus recombines with human influenza strains that are well adapted to human populations.

There have been three pandemics this century, all of which were thought to have originated in South East Asia. Agricultural practices in Asia bring chickens and pigs into close proximity with each

other and with humans, thereby creating an environment in which genetic reassortment of influenza subtypes and transmission between species can occur. In each pandemic, Australia was thought to have been affected before Europe and North America, although data from the 1918 pandemic is limited. The 1918 pandemic caused more deaths than World War I among previously healthy people.

### Influenza surveillance in Australia

Australia has established a working party to prepare our response to a pandemic of influenza. Our first task in a strategic approach to the Hong Kong "bird flu" is to enhance influenza surveillance Australia wide and particularly in the Top End. Active surveillance for influenza is planned to start in mid-January 1998 nationally.

The Top End is in a unique position within Australia. Each year, since the commencement of Tropical Influenza Surveillance, we have been one of the first areas to document outbreaks due to new strains of influenza from minor antigenic drift. Some of these outbreaks have occurred several months ahead of the expected winter epidemics in southern Australia. It is therefore likely that we will be one of the first areas to be affected by a new pandemic subtype. Heightened influenza surveillance will require the participation of sentinel general practices, rural and remote communities,

hospitals (eg high dependency wards, A&E and paediatrics) and laboratories in the public and private sectors. Unlike the annual influenza epidemics that cause severe disease mainly among people in high risk groups (Box 2), pandemics cause significant morbidity and mortality in previously healthy people of all age groups. Other groups that provide useful information about the spread of influenza are industry and schools; a sudden increase in absenteeism can be monitored in these populations as an early warning of possible influenza activity.

Specific guidelines and protocols for enhanced influenza surveillance in the NT in 1998 are being prepared. In the interim, clinicians are asked to collect a throat swab or nasopharyngeal aspirate for viral culture from all patients with acute clinical influenza (refer Box 1 for clinical case definition of influenza) or primary viral pneumonia. Serology alone is unhelpful because it does not allow for characterisation of the strain of influenza virus causing the illness. The NT is also fortunate to have an arrangement with the WHO Collaborating Centre for Influenza Reference and Research in Melbourne. Non invasive throat wash fluid requiring a simple gargle and spit are available for rapid identification of perceived influenza outbreaks (eg in communities). These gargles are available from Sue Reid, CDC, Darwin on 8922 8089 or fax 8922 8310.

### Box 1

The Australian Sentinel Practice Research Network (ASPREN) requires *six or more* of the following symptoms and signs to fulfil the clinical case definition of influenza:

- Sudden onset of symptoms (within 12 hours)
- Cough
- Fever
- Rigors (shakes) or chills
- Prostration and weakness
- Myalgia or widespread aches and pains
- No significant respiratory physical signs other than redness of the nasal mucosa and throat
- Influenza in close contacts

### Box 2

Annual vaccination is recommended for individuals in the following groups:

- non-Aboriginal people over 65 years of age
- Aboriginal people over age over 50 years of age
- adults with chronic debilitating diseases (especially those with chronic heart, lung, kidney and metabolic disorders such as diabetes)
- children with cyanotic congenital heart disease
- adults and children receiving immunosuppressive treatment
- residents of nursing homes and other chronic care facilities
- staff of nursing homes, chronic care facilities and carers of immunocompromised patients
- health staff in remote communities, or other situations in which there is limited relief available for ill staff

## Guidelines for meningococcal meningitis/septicaemia chemoprophylaxis

### Background

Meningococcal disease is a rare, but serious bacterial infection caused by *Neisseria meningitidis*. Invasive infection can result in meningitis, septicaemia and sometimes death. With prompt diagnosis, appropriate treatment and supportive measures the case fatality rate is between 5 and 15%. Children under five years, adolescents and young adults are at highest risk of the disease.

### Clinical features

Meningitis and/or septicaemia which may progress rapidly to purpura fulminans, shock and death.

### Case definition

#### • *Confirmed case*

Clinical disease with laboratory confirmation.

#### *Laboratory criteria for diagnosis*

- ⇒ isolation of *N. meningitidis* from a normally sterile site (eg blood, CSF, or less commonly, joint, pleural, or pericardial fluid); or
- ⇒ detection of Gram negative intracellular diplococci in blood, CSF or skin lesion; or
- ⇒ isolation of *N. meningitidis* from a skin lesion in the absence of positive blood cultures.

#### • *Probable case*

- ⇒ clinical purpura fulminans in the absence of positive blood cultures; or
- ⇒ detection of meningococcal antigen in CSF (useful as a surveillance tool but limited in use for individual management).

Note: Positive antigen test results from urine or blood samples are unreliable for diagnosing meningococcal disease.

### Confirmed and probable cases require public health response/contact tracing

### Contacts

All household and other *close* contacts of a confirmed or probable case of meningococcal disease caused by *N. meningitidis* should be offered antibiotic chemoprophylaxis. Since transmission is

from person to person through infected droplets of respiratory secretions, the purpose of the chemoprophylaxis is to eliminate nasopharyngeal carriage of the organism from asymptomatic contacts, thereby preventing subsequent transmission and secondary invasive infections.

A contact is defined as:

#### 1. Anyone who has spent:

*4 hours or more each day for 5 consecutive days, or more than 24 hours in total with the index case in the week preceding the onset of illness.*

#### 2. Anyone who has had significant contact with oral secretions of the index case during the 10 days preceding onset of disease, ie mouth-kissing, or any staff member who performed mouth-to-mouth resuscitation.

Household contacts have up to 1000 times the community risk of meningococcal disease in the first week after illness in the index case.

Chemoprophylaxis is not guaranteed to prevent contacts from acquiring disease by directly inhibiting colonisation (although it may do so for the short duration of chemoprophylaxis), and there is no evidence that chemoprophylaxis can treat and thereby abort disease in those already incubating the infection. The bacteria may also be resistant to the rifampicin. For these reasons, all contacts need to be educated regarding signs and symptoms of meningitis and active surveillance needs to be maintained for the following 7-10 days so that should disease occur, early diagnosis and treatment are enhanced.

### Index Case

Respiratory isolation is indicated for 24 hours after initiation of effective treatment as patients are considered capable of transmitting infection for approximately 24 hours after the initiation of treatment. Penicillin will temporarily suppress the organisms but it does not necessarily eradicate them from the nasopharynx. The index case should therefore receive rifampicin chemoprophylaxis before discharge. If ceftriaxone has been used rifampicin chemoprophylaxis is not necessary.

### Meningococcal Vaccine

This may be considered if there is more than one case of the same serogroup in the community or in a

day-care centre within a defined period and will be decided after discussion with the Director of Disease Control and consulting NHMRC and CDC, Atlanta Guidelines. There is a vaccine available for disease caused by group A, C, Y and W135 meningococci. The vaccine induces antibodies in 10 to 14 days in 90% of recipients over the age of two years.

The vaccine has significant limitations however. These include:

- the lag time between vaccination and the time when adequate levels of protective antibodies are produced (10-14 days) making it inadequate for protection of direct contacts;
- the poor immunogenicity of serogroup C polysaccharide vaccine in young children;
- the need for booster doses every 2 to 3 years, even in adults;
- the significantly lower protective efficacy in children under the age of four years, compared with that in older children;
- the failure to eliminate nasopharyngeal carriage of *N. meningitidis*.

*First line management of contacts is antibiotic chemoprophylaxis*

### Drugs for Chemoprophylaxis

The drug of choice for chemoprophylaxis in most instances is rifampicin. Alternatives include ceftriaxone and ciprofloxacin. A single dose of intramuscular (IM) ceftriaxone is a preferable option, if there is doubt that completion of the course of oral rifampicin will occur.

### Rifampicin

#### *Recommended dosage schedule:*

- Adults: 600 mg orally, 12 hourly for 2 days
- Children (> 1 mth): 10 mg/kg/dose (maximum of 600 mg) orally 12 hourly for 2 days.
- Neonates (< 1 mth): 5 mg/kg/dose orally 12 hourly for 2 days.

#### *Preparation:*

- Rifampicin syrup: 20 mg/ml (60 mls in a bottle).
- Rifampicin capsules: 150 mg, 300 mg and 600 mg.

Rifampicin chemoprophylaxis should be supervised. If this is not possible contacts should be given the exact dosage in clearly labelled containers.

Resistance to rifampicin can occur after a single dose so all isolates should be sent for antibiotic sensitivity testing, *especially* if chemoprophylaxis is administered more than once in a community.

#### *Precautions*

Rifampicin should not be given as prophylaxis during pregnancy. It is contraindicated in persons with active liver disease and known rifampicin hypersensitivity. As rifampicin can permanently stain soft contact lenses, they should not be worn during treatment.

#### *Side effects of rifampicin*

Possible side effects of rifampicin should be explained to contacts at the time rifampicin is dispensed and include the following:

- ⇒ Orange discolouration of soft contact lenses (therefore do not wear them for 2 days), tears and urine.
- ⇒ Gastrointestinal disturbances, drowsiness, headache and fever.

#### *Interactions with other medication*

Rifampicin can interact with other medication such as anticoagulants, digoxin, quinidine and oral hypoglycaemics. It also interferes with the oral contraceptive Pill. Women should continue to take the Pill while on rifampicin but should use additional barrier contraception for the duration of that particular menstrual cycle.

### Ceftriaxone

Ceftriaxone is an appropriate alternative if rifampicin is contraindicated or good compliance is considered unlikely. It is safe to use in pregnancy, but should not be given to infants below six weeks of age.

#### *Recommended dosage schedule:*

- Weight ≤ 25 kg: 125 mg dissolved in 1% lignocaine hydrochloride, as a single intramuscular dose.
- Weight > 25 kg: 250 mg dissolved in 1% lignocaine hydrochloride, as a single intramuscular dose.

## Ciprofloxacin

Ciprofloxacin given as a single, oral dose of 500 mg to adults is also effective in eradicating meningococcal carriage. Ciprofloxacin should not be prescribed to children under 12 years of age or less than 40 kg body weight, or to pregnant women.

The following appendices are included in the guidelines:

- Appendix 1 Case report form
- Appendix 2 Consent for chemoprophylaxis
- Appendix 3 Dosage schedule for antibiotic chemoprophylaxis
- Appendix 4 List of contacts
- Appendix 5 Contact management - summary

For a full copy of the revised NT guidelines, contact Sue Reid on 8922 8089 or fax 8922 8310.

## NHMRC Guidelines

Detailed recommendations for the public health management of both sporadic cases and outbreaks of meningococcal disease, including antibiotic therapy, chemoprophylaxis and the use of meningococcal polysaccharide vaccine are available in *Guidelines for the control of meningococcal disease in Australia* (NHMRC 1996). This publication also provides guidelines for communication with the public and the media during an outbreak of meningococcal infection. Reference can be made to the appendices section for examples of sample letters and bulletins. CDC, Darwin on 8922 8044 for a copy.

## Lyssavirus prevention strategy update

*Nan Miller, CDC, Darwin*

In 1996 the lyssavirus was discovered in Australian bats. One death occurred in a human due to lyssavirus infection. These events were a catalyst for a National Prevention Strategy including: a public awareness campaign; pre-exposure prophylaxis for individuals handling bats regularly; and post-exposure prophylaxis for individuals bitten or scratched by bats.

Initially, the recommended post-exposure prophylaxis was based on a risk assessment of the type and location of the wound (eg. facial bites or scratches and those drawing blood were classified as higher risk than those sustained in the extremities and without drawing blood).

The National recommendations were updated in November 1997 for post-exposure prophylaxis. The changes are:

- no risk assessment; and therefore
- all individuals bitten or scratched by an Australian bat should be given rabies immunoglobulin plus post exposure vaccination as per schedule.

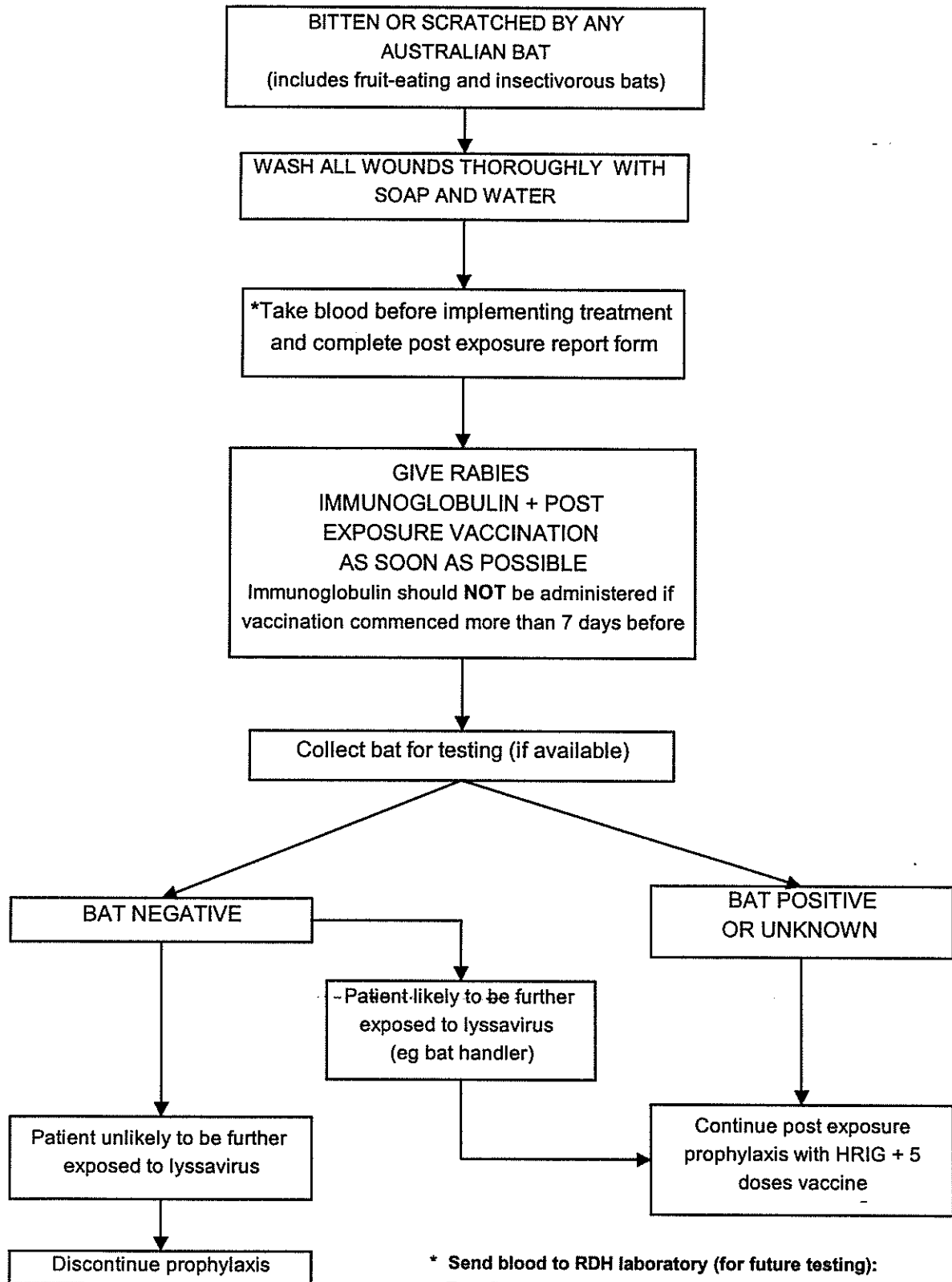
In addition to the above changes, CDC recommends collecting blood before initiating post-exposure prophylaxis (refer to flow chart).

THIS implemented a pre and post-exposure prophylaxis program in 1996. Occupational groups whose work brings them into regular contact with bats are encouraged to receive pre-exposure vaccination where the cost of the vaccine is met by the employer or the individual. The table below shows participation in the program and number receiving pre-exposure prophylaxis or both up to 18 December 1997.

**Table Number of individuals participating in the NT lyssavirus pre and post-exposure prophylaxis program by occupation**

Occupation	Pre-exposure (no.)	Post-exposure (no.)
Bat handler (private)	8	1
Primary Industry & Fisheries	9	0
Parks and Wildlife	30	2
Museum	2	0
Student	0	8
Quarantine	2	0
Power & Water Authority	1	0
Other or unknown	0	11
<b>TOTAL</b>	<b>52</b>	<b>22</b>

## BAT EXPOSURE FLOW CHART



## Update: NT retrospective search for lyssavirus in humans

Sue Skull,<sup>1,2</sup> Jo-Anne Manski,<sup>1</sup> Vicki Krause<sup>1</sup>

<sup>1</sup> CDC, Darwin <sup>2</sup>NCEPH, MAE Program, ANU, Canberra

### Background

Following the first human case of Australian bat lyssavirus in 1996<sup>1</sup>, it was unclear whether this represented a new epizootic or simply an unrecognised, previously existing disease. In response, and to help complete the national picture, the Centre for Disease Control, Darwin (CDC) initiated a retrospective review of hospital separations in the NT that may be attributable to undiagnosed bat lyssavirus. We presented preliminary results from our initial search of all NT cases from January 1994 - September 1996 data in the June 1997 *NT Communicable Diseases Bulletin*. This communication presents the results of our extended search from January 1992 - September 1996 for Royal Darwin Hospital (RDH).

### Aims

To determine the number of cases of unexplained encephalitis at RDH since 1992; to test available clinical specimens from these cases for Australian bat lyssavirus and to review the use of diagnostic tests for rabies by clinicians investigating unexplained encephalitis.

### Methods

We searched the NT hospital morbidity database (Caresys) for patients discharged between January 1992 and September 1996 with any of eight ICD-9 codes encompassing encephalitic illness or viral meningitis (Table 1). We searched all nine diagnostic categories for each patient on the database. For all cases, we reviewed hospital records to determine the final diagnosis based on review of clinical notes and investigations. For cases of unexplained encephalitis, we assessed the use of investigations for rabies and located available clinical specimens for testing. Testing of specimens for lyssavirus-specific inclusions via immunohistochemistry, immunofluorescence and reverse-transcriptase polymerase chain reaction (RT-PCR) was conducted at the Centers for Disease Control, Atlanta and the Australian Animal Health Laboratories, Geelong.

**Table 1 ICD-9 codes for encephalitis, first review, all NT hospital discharges, January 1994-September 1996**

ICD-9 code	Descriptor
323	encephalitis, myelitis, encephalomyelitis
048	other enterovirus diseases of the central nervous system
049	other non-arthropod-borne viral diseases of the central nervous system
054.3	herpetic meningo-encephalitis
062	mosquito-borne viral encephalitis
063	tick-borne viral encephalitis
064	other and unspecified viral encephalitis transmitted by arthropods
047	viral meningitis

### Results

For the period January 1992 until September 1996, there were 175 admissions for 159 people with these ICD-9 codes at RDH. We located 154 of 159 (97%) hospital records. All five missing records had viral meningitis listed as the code of interest. Thirty four persons (34/154, 22%) had encephalitis. Of these, 18/34 (53%) did not have a cause for their encephalitis (Table 2).

All eighteen cases of unexplained encephalitis had their ICD-9 codes of interest in position one. None were tested for rabies during admission. Of the 18 patients, four died and two of these had autopsies. These were the only two cases with specimens available for further testing, and they were both negative for bat lyssavirus.

Addition of ICD-9 code 047 for viral meningitis added 71 admissions to the total. On review, 66 had a diagnosis of viral meningitis (one had partially treated bacterial meningitis, two had headache only and two had a febrile illness with headache, no meningism and no lumbar puncture performed). None had unexplained encephalitis and none died.

**Table 2** Diagnosis on review of cases found using eight ICD-9 codes for potential encephalitis, RDH, January 1992-September 1996

Review diagnosis	No. of cases	%
<i>Congenital/Chronic</i>		
Lead encephalopathy secondary to petrol sniffing	37	24.0
Cerebral palsy unknown cause	3	1.9
Congenital HSV infection	1	0.6
Familial leucoencephalopathy	1	0.6
<i>Non-infective</i>		
Steroid encephalopathy	1	0.6
Cerebrovascular accident	1	0.6
Unstable epilepsy	1	0.6
Fractured base of skull with secondary encephalitis	1	0.6
<i>Infectious</i>		
Unexplained illness with headache and fever	8	5.2
Murray Valley encephalitis	8	5.2
Pneumococcal meningoencephalitis/brain abscess	2	1.3
Partially treated bacterial meningitis	2	1.3
Herpes encephalitis	1	0.6
Cryptococcal meningitis	1	0.6
Rotavirus encephalitis	1	0.6
Meningococcal meningitis	1	0.6
<i>Unexplained encephalitis</i>	18	1.7
Total	154	100.0

## Discussion

There is a high proportion of unexplained encephalitis in the NT. Rabies-like illness is not currently being considered in the differential diagnosis of encephalitis by clinicians. Few specimens are currently being collected or stored from any patient with unexplained encephalitis. Although no clinical specimens tested positive for bat lyssavirus, only two were available for testing. On the basis of these results, it is not possible to exclude this disease from the NT. Since this review was conducted, the potential for this disease in the NT has been confirmed as bats carrying lyssavirus have been found in the Top End.<sup>2</sup>

If we are to be prepared for newly emerging infectious diseases, the collection, testing and storage of clinical specimens is paramount. With the advent of the first human case of bat lyssavirus occurring in Australia, it is appropriate to now be testing for this disease in patients with encephalitic symptoms. A presumptive diagnosis of lyssavirus infection is made by specific fluorescent antibody (FA) staining of frozen skin sections taken from the back of the neck. Serologic diagnosis is based on neutralisation tests in cell culture. Post mortem diagnosis is made by FA staining of brain tissue or by virus isolation in cell culture.<sup>3</sup>

It is recommended that future searches for encephalitis do not include ICD-9 code 047 (viral meningitis) as it is not likely to yield cases of unexplained encephalitis. All cases had the code of interest in diagnostic category one. It is efficient to review only the first two or three diagnostic category positions of hospital morbidity databases.

## Acknowledgments

Dr Charles Rupprecht and the Viral and Rickettsial Zoonoses Branch, National Center for Infectious Diseases, Center for Disease Control and Prevention, Atlanta, USA for advice and laboratory testing. Many thanks also to Dr John Condon from the Epidemiology Department of Territory Health Services, the Forensic Pathology Department at RDH, the staff of the Northern Territory CDCs and the Medical Record Department of RDH for their valuable assistance in conducting this study.

## References

1. Allworth A, Murray K, Morgan J. A human case of encephalitis due to a lyssavirus recently identified in bats. *Comm Dis Intell* 1996; 20:504.
2. Bryce A. Department of Primary Industry and Fisheries, 1997; Media release: Rabies-like virus found in NT bat.
3. Benenson AS. Rabies. In: Benenson AS, Chin J, editors. Control of communicable diseases manual. 16th ed. Washington: American Public Health Association, 1995:382-390.

## The Child Care Ear Project - a community project in Darwin

Sue Skull<sup>1,2</sup>

<sup>1</sup>CDC, Darwin, <sup>2</sup>MAE Program, ANU, Canberra

*Streptococcus pneumoniae* (SPn) is the most common bacterial cause of otitis media (OM), pneumonia and meningitis in young children around the world. SPn resistance to antibiotics is increasing throughout the world, including Australia. As a result, there has been global interest in developing a preventative conjugate vaccine against SPn which is effective in young children. Such vaccines are currently undergoing trials overseas. Before conjugate vaccines are introduced to Australia, it is appropriate for us to determine baseline SPn carriage, resistance and serotype patterns for urban Australian children. This would enable an estimate of the potential impact of the vaccines under consideration to be made. Serotype data would contribute to choosing an appropriate vaccine for our setting. Knowing the burden of SPn infections to families and the community in terms of extent of disease and associated costs is also important. In combination with resistance data, this information could help us lobby for the early introduction of an appropriate conjugate vaccine in Australia. There are currently no adequate data addressing these issues for urban Australian children.

The *Child Care Ear Project* has the following aims:

1. To determine baseline SPn carriage, resistance and serotype patterns for urban Australian children.
2. To determine the incidence and associated costs of otitis media and the proportion due to SPn.
3. To use this information to propose an appropriate choice of conjugate vaccine and to lobby to make this available as soon as possible in Australia.

A limited window is available to fulfil these aims before the introduction of conjugate vaccine trials in Australia. Darwin child care centres were chosen therefore as a likely high risk environment in which to measure SPn carriage and OM for the following reasons:

1. Children who attend child care have more infections than children who do not;
2. Tropical environments predispose to bacterial infections;

3. Aboriginal children of the NT have one of the highest rates of invasive SPn infection in the world, and
4. SPn carriage isolates in Darwin children already have relatively high antimicrobial resistance levels.

It was very encouraging that the project received an enthusiastic response from the community. All child care centres approached agreed to participate and 75% of eligible children enrolled. Between March and September 1997, approximately 250 children aged under 4 years attending 9 child care centres in Darwin were examined each fortnight.

Each visit, children had otoscopy and tympanometry performed followed by saliva and nasopharyngeal swab collection. A report was also sent home to parents each visit and a paediatrician discussed abnormal findings by telephone on the same day. Separate telephone interviews about child illness, health professional visits, medications required and parent time off work each fortnight were also conducted on the same day as the visit where possible.

The project was successfully completed on September 15 this year. Parent feedback evenings for each centre occurred in October and November. Early results suggest that ear infections are indeed common and a significant burden to families; and that SPn carriage and resistance are high. Analysis of data will continue over the next few months, and families and child care staff of participating centres will be regularly updated as results come to hand. It is hoped that a significant contribution will be made to the understanding of SPn carriage, resistance and serotype patterns in Australian children and towards choosing and obtaining an appropriate conjugate SPn vaccine as soon as possible.

This study was an unfunded community project which relied on the goodwill of a number of participating organisations and volunteers. These included the National Centre for Epidemiology and Population Health, Darwin CDC, the Menzies School of Health Research, NT Hearing Services, NTU and of course families and staff from child care centres in Darwin and Palmerston. Thanks are

extended to all those who participated and without whom the project would not have been possible.

*The Child Care Ear Project:*

Amarjit Anand, Angela Anderson, Sree Aithal, Robyn Attewell, Nadia Chaves, Craig Dalton, Bob Douglas, Tina Gill, Alison Goodfellow, Mike

Gratten, Bev Hayhurst, Vicki Krause, Aaron Leach, Amanda Leach, Louise Martin, Coralie Mathews, John Mathews, Tina McKinnon, Peter Morris, Sue Reid, Leslee Roberts, Angela Salter, Jeanette Scott, Patrick Scott, Tania Shelby-James, Sue Skull, Janine Spencer, Jaqui Sutcliffe, Al Yonovitz, Wyeth Australia.

---

## Rheumatic Heart Disease Program

*Sara Freund, CDC, Darwin*

The Menzies School of Health Research (MSHR) has in recent years more accurately quantified the size of acute rheumatic fever (ARF) and rheumatic heart disease (RHD) among Aboriginal people in the Top End of the Northern Territory. An ongoing study demonstrated that the incidence of ARF in this area has not improved in 30 years ... "the incidence of acute rheumatic fever in Aboriginal children today exceeds that of poor areas of urban Australia 50 years ago". The report identified two main areas of concern:

- that initial diagnosis of RHD is commonly being made in people with established valve lesions, but no known history of ARF. Many of these people would have had episodes of ARF in the past which were not properly diagnosed.
- the issue of poor adherence to the regimen of monthly injections (secondary prophylaxis) required for people with a history of ARF. (IM Benzathine penicillin 1.2 million units remains the most effective way of preventing ARF and RHD).

The World Health Organization (WHO) recommends that countries with high rates of ARF and RHD institute a coordinated, register-based control program. A number of countries have set up programs with varying success. New Zealand initiated a control program after it was noted that during the period 1972-80 Auckland had ARF recurrence rates of 22%. By adopting the register-based approach, and setting up an innovative delivery system for benzathine penicillin, the recurrence rate dropped to 6% for the period 1982-1992.

A submission was made to the Commonwealth Government by the MSHR and the National Heart Foundation for the funding of a 2 year program to set up a similar program in the Top End, and this was successful. The program commenced in mid-November, 1997. Expansion to other areas will depend on the success of this 'pilot' program. Program guidelines will closely follow the recommendations of the WHO. The Register will initially be held and maintained at the Centre for Disease Control, Darwin. Informed consent will be sought from those people whose medical information is to be included, and this proposal is being put to the Ethics Committee. It is anticipated that the Register, together with ongoing education for people with ARF/RHD and their families will improve adherence to follow-up treatment. An education program has been initiated by the MSHR and will comprise a package of books, videos, and a series of face to face sessions for health clinic staff and people with ARF/RHD and their families/carers. Education for community health workers and other key personnel is also a priority.

An Advisory Committee has been formed, and its members will guide the program and undertake regular evaluation.

The computerised database is still being established. In the meantime, however, referrals and reports can be sent to me and urgent cases will be dealt with accordingly. If you encounter anyone with new or existing diagnoses of ARF or RHD, please contact me via telephone on 89228026 or cc:Mail: sara.freund@casrdh.nt.gov.au for assistance with resources and support.

---

## The Clinical Management and Continuity of Care COAD Project

Jo Frampton, CDC, Darwin

Chronic Obstructive Airways Disease (COAD) is one of the top three causes of premature death, illness and disability in Northern Territory Aboriginal people. Up until now, very little attention has been focused on this medical condition.

The Clinical Management and Continuity of Care COAD Project will focus on exploring hospital and community services that are currently offered and developing an appropriate mix of services for clients who suffer with Chronic Obstructive Airways Disease (COAD). The Continuity of Care - COPD Project, its previous title, was briefly discussed in the August 1997 edition of *The Chronicle*, the newsletter of the Chronic Diseases Network of the Northern Territory.

Management of COAD is a complex process. Clinicians and prescribers often are unsure of the exact diagnosis (chronic bronchitis and/or emphysema and/or bronchiectasis and/or asthma). Prescribers and dispensers have limited awareness of the advantages and disadvantages of various medication dispensing systems and some may not be robust enough to suit rural and tropical conditions.

Compliance with medication and treatment regimens is affected because clients are inadequately informed about their treatment options, such as lifestyle issues, drug side effects and correct usage of medication devices. Allied health professionals and non pharmacological options are underutilised, leading to suboptimal maintenance management and terminal management. These non-pharmacological options include regular exercise, nutrition, energy conserving strategies,

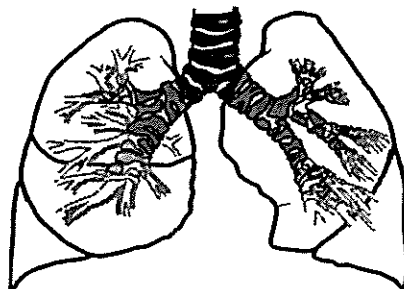
rehabilitation, self care techniques and treatment of depression and anxiety.

Continuity of care between the hospital (acute phase) and community (maintenance and terminal phases) is not clearly defined and is at times fragmented. Limited knowledge is available about the most appropriate mix of services (hospital and community) to improve the client's quality of life. All of these issues contribute to further confusion, uncontrolled disease with subsequent morbidity and mortality.

Members of the Project Management Group from policy and clinical streams have been meeting since May 1997. Work has commenced on specific tasks, including medication guidelines (both in hospital and the community), guidelines for medication dispensing systems for urban and rural communities, standardised assessment, clinical pathways, functional assessment and rehabilitation needs.

The following terms and definitions are all interchangeable: Chronic Obstructive Pulmonary Disease (COPD), Chronic Obstructive Airways Disease (COAD), and Chronic Airflow Limitation (CAL). All are characterised by chronic slow progressive airways obstruction which is irreversible and may be due to Chronic Bronchitis and Emphysema.

If you would like more information about this project or have specific issues relating to COAD which need to be considered by this group, please contact Jo Frampton, Project Officer via cc:Mail or telephone 8922 8693. My office is located on the first floor, Building 4, Royal Darwin Hospital.



**NT NOTIFICATIONS OF DISEASES BY DISTRICTS  
1 JULY TO 30 SEPTEMBER 1997 AND 1996**

DISEASES	ALICE SPRINGS		BARKLY		DARWIN		EAST ARNHEM		KATHERINE		TOTAL	
	'97	'96	'97	'96	'97	'96	'97	'96	'97	'96	'97	'96
Acute Rheumatic Fever	3	6	0	0	0	4	0	4	1	3	4	17
Adverse Vaccine Reaction	2	0	0	0	0	2	0	0	0	1	2	3
Amoebiasis	0	0	0	0	0	0	0	0	0	1	0	1
Arbovirus infections												
Barmah Forest Virus	0	0	0	0	5	3	0	0	1	2	6	5
Kunjin Virus	0	0	1	0	0	0	0	0	0	0	1	0
Dengue	0	0	0	0	0	1	0	0	0	0	0	1
Ross River Virus	3	0	0	0	8	13	0	0	3	2	14	15
Campylobacter	12	11	0	0	32	41	1	0	1	5	46	57
Chlamydia	80	60	7	12	61	98	5	11	17	24	170	205
Donovanosis	5	1	0	2	1	1	0	0	2	1	8	5
Gastroenteritis	0	0	0	0	3	1	0	0	0	7	3	8
Glomerulonephritis	2	0	0	0	4	2	0	2	0	0	6	4
Gonococcal Disease	137	69	12	3	35	118	9	24	18	35	211	249
Gonococcal Conjunctivitis	4	0	4	0	0	0	0	0	0	1	8	1
Haemophilus Inf type b	1	0	0	0	0	0	0	0	1	0	2	0
Hepatitis A	3	1	1	2	13	14	0	3	2	4	19	24
Hepatitis B	1	0	1	0	2	1	0	0	2	0	6	1
Hepatitis C (incidence)	0	0	0	0	1	1	0	0	0	0	1	1
Hepatitis C (prevalence)	10	3	2	1	88	35	0	2	1	0	101	41
HIV infections	0	0	0	0	1	0	0	0	0	0	1	0
HTLV-1	7	4	0	0	1	1	0	0	0	0	8	5
Legionnaires Disease	0	0	0	0	0	1	0	0	0	1	0	2
Malaria	4	1	0	0	2	2	0	0	0	0	6	3
Measles	0	2	0	0	1	2	0	0	0	0	1	4
Meningococcal Infection	0	0	0	0	2	1	1	0	1	1	4	2
Mumps	0	1	0	0	4	1	0	0	0	0	4	2
Pertussis	2	0	0	0	2	0	0	0	1	0	5	0
Pneumococcal Disease	22	7	0	0	8	9	0	0	0	2	30	18
Rotavirus	29	9	8	0	143	39	30	0	12	2	222	50
Rubella	1	0	0	0	1	1	0	0	0	0	2	1
Salmonella	13	22	4	3	35	40	25	7	10	10	87	82
Shigella	6	22	7	4	13	13	9	2	6	8	41	49
Syphilis	47	42	14	1	7	15	3	7	7	9	78	74
Tuberculosis	1	2	0	0	5	2	1	1	1	1	8	6
Typhus	0	0	0	0	0	2	0	0	0	0	0	2
Yersiniosis	0	0	0	0	2	2	0	0	0	0	2	2
<b>Total</b>	<b>395</b>	<b>263</b>	<b>61</b>	<b>28</b>	<b>480</b>	<b>466</b>	<b>84</b>	<b>63</b>	<b>87</b>	<b>120</b>	<b>1107</b>	<b>940</b>

**Points to note regarding notifications:**

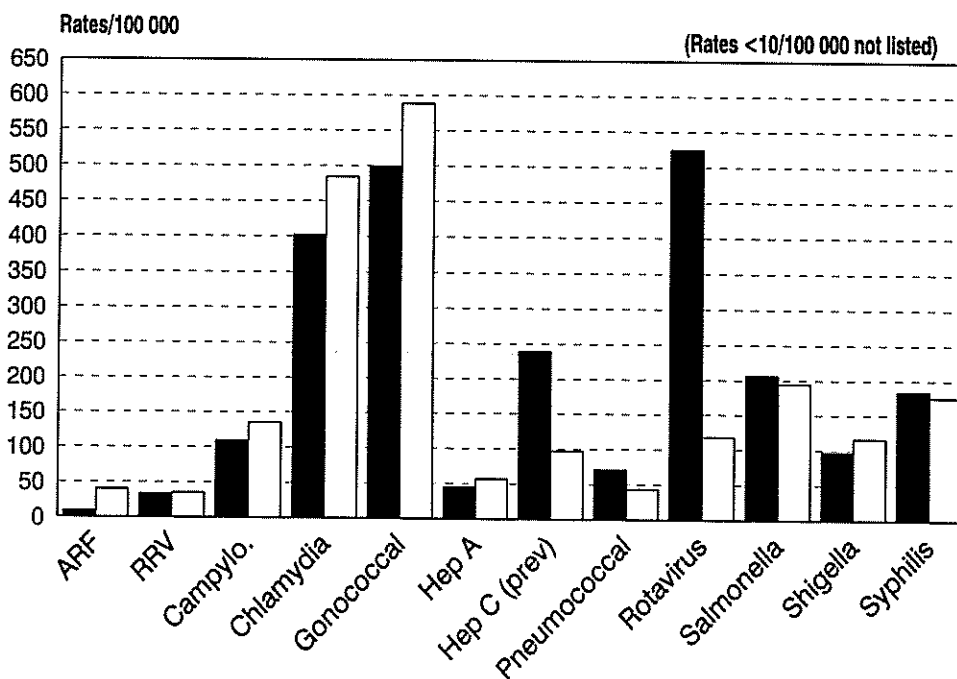
- Australian Encephalitis (MVE), Botulism, Brucellosis, Chancroid, Cholera, Congenital Rubella Syndrome, Congenital syphilis, Diphtheria, Hepatitis D and E, Hydatid Disease, Leprosy, Leptospirosis, Listeriosis, Lymphogranuloma venereum, Poliomyelitis, Typhoid, and Viral Haemorrhagic Fever are all notifiable but had "0" notifications in this period.
- The increase in the 1997 3rd quarter HCV notifications over 1996 in the Darwin district may have been due to a Hepatitis C awareness campaign which was conducted throughout August and early September. Forty-two percent of the cases were reported in September. There are no other readily identifiable factors contributing to this increase.
- The 22 cases of invasive pneumococcal disease in the Alice Springs district were comprised of 12 adults and 10 children. Six of the children were under the age of 2 years, one was 4 years old and the other was a chronically ill 6 year old who had three separate episodes (serotypes 6A, 7F and 19F) during the quarter. This child has now been vaccinated. Chronic conditions and any previous pneumococcal episodes are indications for vaccination for anyone over 2 years of age.
- The large increase in number of rotavirus cases for July to September 1997 is explained by the fact that the yearly rotavirus epidemic occurred during that time period (dry season) whereas the previous years epidemic occurred in the wet season (December 1995 - January 1996).

**Notified cases of Vaccine Preventable Diseases in NT  
by Report Date 1 July to 30 September 1997 and 1996**

DISEASES	TOTAL		No. cases among children aged 0-5 years	
	'97	'96	'97	'96
Congenital rubella syndrome	0	0	0	0
Diphtheria	0	0	0	0
<i>Haemophilus influenzae</i> type b	2	0	2	0
Hepatitis B	6	1	1	0
Measles	1	4	0	3
Mumps	4	2	3	1
Pertussis	5	0	3	0
Poliomyelitis, paralytic	0	0	0	0
Rubella	2	1	1	1
Tetanus	0	0	0	0

- Mumps is largely under-reported.

**NT wide Notifiable Diseases  
1 July to 30 September 1997 and 1996**



NT est. resid. pop - 169 304 as of 30 June 1993,  
ABS cat. no. 3201.0 pub 19 Jan 1995

■ 1997 □ 1996

## MALARIA NOTIFICATIONS, NORTHERN TERRITORY JULY TO SEPTEMBER 1997

*Compiled by Merv Fairley, CDC, Darwin*

Six notifications of malaria were received for the third quarter of 1997. The following table provides details about where the infection was thought to be acquired, the infecting agent and whether chemoprophylaxis was used.

ORIGIN OF INFECTION	REASON EXPOSED	AGENT	CHEMO-PROPHY-LAXIS	COMMENTS
<b>PACIFIC</b>				
PNG	Holiday	<i>P. vivax</i>	Yes	Diagnosed Alice Springs. Previous attack in PNG 6 years ago, treated with chloroquine.
PNG	Holiday	<i>P. vivax</i>	Yes	Diagnosed Alice Springs. Previous attack in PNG 6 years ago, treated with chloroquine.
PNG	Holiday	<i>P. vivax</i>	No	Diagnosed RDH. On holiday from PNG; has been treated for malaria several times.
PNG	Study	<i>P. vivax</i>	Yes	Diagnosed Alice Springs, 10 months after returning to Australia. Chloroquine and maloprim taken weekly whilst travelling. ? eradication treatment on return.
<b>AFRICA</b>				
GHANA	Holiday	<i>P. falciparum</i>	No	Diagnosed RDH.
NORTH and SOUTH	Holiday	<i>P. vivax</i>	Yes	Diagnosed Alice Springs after 3 months of extensive travelling. Not admitted to hospital but treated appropriately.

### Dengue 3 in Cairns

Queensland Health's Tropical Public Health Unit (TPHU) has confirmed that the dengue fever outbreak in Cairns is continuing with 4 new cases reported since 1 January 1998. TPHU Medical Director, Dr Jeffrey Hanna said that there are now thirty seven (37) confirmed or highly probable cases of dengue fever in Cairns.

Mosquito control teams from TPHU and Cairns City Council will be spraying in and around homes in the Dengue Warning Area this week.

Many of the cases have been visitors to Cairns and have become symptomatic since returning home. Health professionals are advised to consider dengue in the differential diagnosis of an acute febrile illness in visitors to Cairns characterised by sudden onset, fever for 3-5 days (rarely more than seven),

intense headache, pain behind the eyes, muscle aches and pains, arthralgia and rash. Dengue fever is also called "Breakbone fever" because of the intensity of joint and muscle pain.

Exposure to more than one strain of dengue virus (four exist) predisposes to the development of dengue haemorrhagic fever that ranges from relatively mild to life threatening disease.

The differential diagnosis of dengue includes illness caused by other mosquito borne viruses, measles, rubella and other rash illness.

Inquiries and any Queensland acquired cases should be directed to Dr Jeffrey Hanna, Medical Director, Tropical Public Health Unit Network (07) 4050 3600 or Dr Scott Ritchie, Medical Entomologist, ph: (07) 4050 3600

## STAFF UPDATES

**Jo Frampton** recently joined Non Communicable Diseases - CDC, Darwin as Project Officer for the Chronic Obstructive Airways Disease Clinical Management and Continuity of Care Project. She has previously worked in Royal Darwin Hospital and for the past 7 years as the Respiratory Nurse Specialist with Darwin Urban Community Health. Jo and her family spent several years at Galiwinku prior to commencing employment with Territory Health Services.

**Sara Freund** recently commenced as the Coordinator for the new Rheumatic Heart Disease Control Program, based in CDC, Darwin. After training at Royal Darwin Hospital in the 1980's, she spent 3 years (1992-95) setting up the school health program for the Marshall Islands' Ministry of education (in the Pacific) and more recently worked as an asthma educator at the Asthma Foundation of the NT.

**Jan Savage** who has worked in the AIDS/STD Unit, Darwin for 2 years has been appointed Head of the Unit (formerly held by Frank Bowden who is now the public health program leader for the THS Cooperative Research Centre (CRC) for Aboriginal and Tropical Health.

**Merryn Hare** will return to her position as Assistant Co-ordinator of the AIDS/STD Unit on 12 January 1998. **Sue Dubow**, who has been acting in Merryn's position will resume her role of CNC in the AIDS/STD Unit. **Liz Stephenson** (who has been acting in Sue Dubow's CNC position), after a period of maternity leave, will take up one of the Public Health Nurse positions in the Disease Control Unit in Nhulunbuy.

**Karen Edmond** is the new Community Paediatrician (formerly held by Alan Ruben who has gone to work in Fiji for two years). **Fiona Russel** will commence as the new Community Paediatric Fellow on 20 January 1998.

**Jocelyn Garrard** (Public Health Nurse, CDU, Katherine) has transferred to Community Care in Katherine where she will be acting manager until mid June 1998. **Margaret Carnegie-Smith** will act in Jocelyn's position in the interim.

**Nora Broughton** (RN from Kalkaringi) will cover the TB position in Katherine for **Margaret Cooper** while she is on long service leave until March 1998.

**Kylie Parsons** will be acting AIDS/STD Educator in Katherine from 1 February until 30 June 1998 and **Dorothy Sing** (RN from Pine Creek) recently commenced in the STD position in Katherine.

---

### New subscribers/change of address

I wish to be placed on the mailing list for the **Northern Territory Communicable Diseases Bulletin**

I wish to change my address

Name: .....

Organisation: .....

Address: .....

.....

**Please mail to:** Sue Reid  
Centre for Disease Control  
PO Box 40596  
Casuarina NT 0811

**OR**

Phone: (08) 8922 8089  
Fax: (08) 8922 8310  
E.mail: sue.reid@casrdh.health.nt.gov.au