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An outbreak of acute post-streptococcal glomerulonephritis in an Aboriginal community

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Outbreaks of acute post-streptococcal glomerulonephritis (APSGN) have occurred in one Top End Aboriginal community in 1980 and 1987 [1, 2]. APSGN outbreaks are recognised to occur in six to eight year cycles in some places [3], so it was predicted that a further outbreak may occur in this community in 1994. Informal conversations between health-care professionals in early June 1994 alerted staff at the Menzies School of Health Research (MSHR) that a number of cases of APSGN had apparently been noted in the community in March and April. The DMO for the community confirmed that there had been five cases admitted to Royal Darwin Hospital (RDH) and a further four cases incompletely investigated, but which were highly suspicious of APSGN. Following discussions with Disease Control it was decided to conduct an on-site investigation, although it seemed likely that the outbreak was over.

The objectives of the outbreak investigation were:

- To ascertain individual cases of APSGN having occurred in this community in 1994.
- To describe the illnesses suffered by these individuals and to ensure that appropriate medical follow-up had occurred.
- To describe the extent of the outbreak.
- To determine if there remained a risk of further cases stemming from this outbreak and to decide on appropriate interventions to reduce the risk of this happening.

The community involved has a population of 1,046 residents according to 1991 Census figures. Case-finding was undertaken using details provided by the

community DMO and Health Centre Staff of confirmed or suspected cases of APSGN. The case definitions used were:

Confirmed case:

1. Clinical picture consistent with the diagnosis (eg puffy face).
2. Abnormal urinary sediment ($>10 \times 10^6/L$ red blood cells with $>40\%$ dysmorphic cells).
3. Evidence of a recent streptococcal infection (elevated ASOT or antiDNAase B).
4. Reduced C3 level.

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Letters to the editor are welcome

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• Possible case:

1. Clinical picture consistent with the diagnosis.
2. Abnormal urinary sediment or heavy haematuria, +/- proteinuria on urinalysis.
3. Absence of result for C3 level or streptococcal serology.

Results

Between March 7 and April 27, 1994 there were five confirmed cases of APSGN, four possible cases, and one further case which although suspicious was thought unlikely to be APSGN. There was one further possible case in mid-June, seven weeks after the previous case. Most of the possible cases were unable to be confirmed due to incomplete investigation at the time - particularly the absence of formal urine microscopy and C3 levels. Of the ten confirmed and possible cases, nine were female. The age range was three to twenty-one years, with four cases being older than ten years. Six cases were admitted to Royal Darwin Hospital. The clinical features of the confirmed and possible cases are summarised in Table 1.

Table 1: Clinical features of APSGN cases

Clinical feature	Number of cases*
Facial puffiness only symptom	7
Hypertension present	4**
Required antihypertensive medication	1
Elevated urea or creatinine	4**
Required dialysis	0

* Total ten confirmed and possible cases

** All of these were hospitalised

During the outbreak investigation, hypertension was found in only one young adolescent. At subsequent follow-up of this individual, the blood pressure had normalised. In addition, this person and another case, also an adolescent, were found to have markedly elevated urinary albumin:creatinine ratios. This measure of proteinuria is thought to be a marker of underlying renal disease. These two people are first-cousins and have a strong family history of end-stage renal disease. They have been referred for ongoing review.

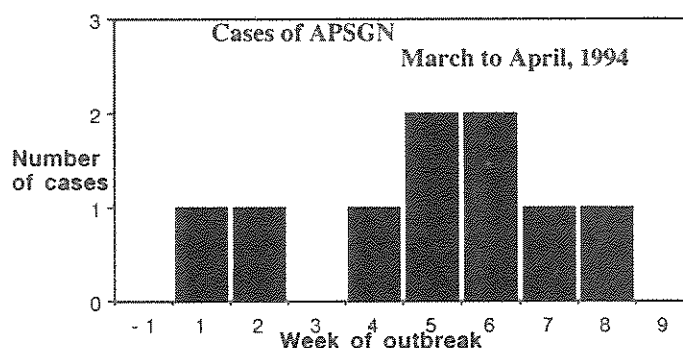
All other individuals were well and appeared to have fully recovered from their illness. Of the eight cases whose urine was re-checked, persistent glomerular haematuria was found in six.

Discussion

Because of the retrospective nature of the investigation,

the true extent of this outbreak, in particular the actual number of mild clinical cases (which may not present to the clinic or be noted by health staff) and subclinical cases is not known. This lack of information on the more subtle cases may explain the outbreak curve (Figure 1) which demonstrates an even spread of cases over the weeks of the outbreak instead of the more usual rapid increase in the early weeks followed by a prolonged tail of secondary cases.

Figure 1: Epidemic curve of APSGN outbreak



Previous outbreaks of APSGN in this community have been documented as more extensive. In 1987 there were fifty-seven cases and in 1980 over forty cases were found. The reports of these outbreaks do not detail the proportions of symptomatic and asymptomatic cases. During epidemics of APSGN, particularly among families, asymptomatic APSGN episodes exceed symptomatic episodes by a factor of 3 or 4 to 1 [4].

As one means of attempting to assess the true extent of this outbreak, the MSHR Renal Disease Survey team kindly allowed us to scrutinise their records of urine dipstick screening of children from the local school. Although this survey has always found a number of children at any one time with blood in their urine, examination of the results (Table 2) reveals an apparent increased rate of haematuria in the paediatric population of this community since March 1994. This screening did not take place during the period of the clinical cases, but such results may indicate a number of children in the active or recovery phase of APSGN.

Table 2: Urinalysis screening of children in community.

Period of screening	Total screened	Large blood	Small blood	Total blood >trace
10.11.93 to 7.12.93 No outbreak	60	6 (10%)	7 (12%)	13 (22%)
25.5.94 to 16.6.94 Just post outbreak	257	53 (21%)	42 (16%)	95 (37%)

As suspected, it was concluded that the outbreak was over by the time of the outbreak investigation, and no program of widespread screening or administration of prophylactic benzathine penicillin was carried out. However, as it was possible that the responsible Group A streptococcus (GAS) was still circulating in the community, the Health Centre staff were encouraged to be extra vigilant about detecting and treating scabies and skin sores.

An interesting feature of this outbreak was the relatively large proportion of cases over the age of ten years. This has been noted in previous studies of APSGN outbreaks in Aboriginal communities [2]. The literature implicates the three to ten year-old age group as being the most at-risk [3, 5, 6]. Whilst the reasons for this age-factor in Aboriginal communities are not clear, such information must be taken into account when planning screening and intervention programs for future outbreaks.

The clinical presentation of these cases was typical, in that the majority of clinical cases did not present with the full "nephritic syndrome" (frank haematuria, reduced urine output, hypertension and oedema) but rather with facial puffiness and microscopic haematuria. The excellent outcome also is in keeping with what is known about the disease [4, 7]. In general the prognosis of APSGN is good. In most people, symptoms and signs will resolve within a week, although persistent urinary abnormalities may be noted for months or years. In a New Zealand study [5], proteinuria was found in 20% of patients two years after APSGN, although haematuria had virtually disappeared by 12 months. Epidemic (outbreak) APSGN has a better outcome than endemic (sporadic) disease, with a mortality of less than 1% [4].

The question of whether APSGN can lead to lasting or progressive renal impairment is unresolved. Most studies have found very little evidence that such progression occurs [4, 8-11], although few studies have occurred in populations exposed to persistent GAS infection as is found in Aboriginal communities of Northern Australia. It is possible that the extremely high rates of end-stage renal disease seen in this population may be explained to some extent by recurrent clinical and subclinical episodes of APSGN in early life.

The textbook diagnosis of APSGN requires evidence of nephritis, evidence of current or preceding GAS infection, and in most cases reduction of serum C3 levels. In Aboriginal communities, GAS infection is endemic and serological evidence of GAS infection (ASOT and antiDNAase B) is almost invariably present. Moreover, due to reasons unknown, glomerular haematuria and/or proteinuria is also widespread in non-epidemic circumstances. In many cases, therefore,

the most important diagnostic criterion is a reduced C3 level.

It is apparent that the health care staff from the community and from RDH were not aware of the need to notify cases of APSGN. Had such notifications occurred at the time it may have been possible to properly assess this outbreak, and to intervene to prevent further cases. This has resulted in two further strategies. Firstly, Disease Control will be alerting staff at all levels about the diseases which are notifiable, and the importance of notification. Secondly, a comprehensive protocol is presently being drawn up for investigation and intervention in future outbreaks of APSGN, so that health staff can be assured that notification of this disease will result in practical action to stem the outbreak.

There is the further issue of the reasons for a number of these cases being incompletely "worked-up" and followed up. In questioning the community health staff, it was apparent that the main limitations to their ability to perform these duties were lack of time and staff. This illustrates that even in a community with an on-site DMO the workload is extreme and the provision of facilities may be inadequate. This staffing problem is a long-term one for most remote communities and requires continued emphasis. Service-providers in communities need support from researchers, hospital staff and rural health / disease control staff in making their situation a priority for health bureaucrats to address.

SOME IMPORTANT POINTS ABOUT APSGN

1. It is a notifiable disease.
2. Investigation of possible cases should include urine microscopy and serum for ASOT, antiDNAase B, and C3 levels.
3. If 2 or more cases occur within one month, this should be discussed with Disease Control, as a possible outbreak may be occurring.
4. If an outbreak occurs, something can and will be done if Disease Control is notified.

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Measles Outbreak in Alice Springs

Disease Control Centre, Alice Springs

Since Show Day (Alice Springs), July 1, 1994 to date August 31, 1994 there have been 156 cases of measles in the Southern Region. The outbreak is into its ninth week. The age range has been from five months to 43 years. 55% have been less than ten years. 49% have been Aboriginal. There have been 16 admissions to hospital mainly with measles pneumonia. The outbreak started with three adult cases; two from Queensland and one from Darwin. Initial cases were mainly confined to Alice Springs but the last two weeks have seen a shift out into the Communities. Management of the measles outbreak has gone through three phases:

Phase 1 occurred for approximately the first three

weeks and revolved around confinement of cases and follow up of immunisation of contacts with MMR.

Phase 2 occurred when it became obvious that the epidemic was continuing and included immunisation of persons from six months to 30 years with MMR if unimmunised and five to 30 years if not immunised in the past five years. This mostly took place in the Alice Springs urban area. The Communities had been informed about the measles outbreak and were encouraged to see that immunisation of children under five and in the ten to 15 year age group were complete.

Phase 3 is the current situation which is an extension of Phase 2 out into the Communities.

Editorial

The epidemiology of measles has changed since the introduction of the measles vaccine. Preschool aged children are now the more highly immunised population and the disease has shifted somewhat to older children and adolescents. Monovalent measles was introduced in Australia in 1968 followed by bivalent measles-mumps (MM) vaccine in 1983 and trivalent measles-mumps-rubella (MMR) vaccine in 1989. In Australia, vaccine uptake has failed to reach the 95% level required for adequate herd immunity and the blocking of transmission. In the NT, coverage in preschool aged children exceeds 95% in remote communities and smaller urban centres, but is difficult to estimate in urban Darwin and Alice Springs.

The 1994 measles outbreaks in Alice Springs and Darwin reflect problems in both vaccine coverage and vaccine effectiveness. Of the 156 reported cases in Alice Springs, 45% have occurred in adolescents ten years and over and adults. In the recent Darwin outbreak of 41 cases, approximately 20% of cases

were adolescent or adult, and the average age was eight years. Most of the confirmed cases in Darwin were unvaccinated but a notable proportion of cases in Alice Springs occurred in children with documented MM or MMR vaccination. Secondary vaccine failure (i.e. waning immunity after a successful immunisation) is associated with the age at initial vaccination, the time since vaccination, vaccine potency at the time of vaccination (including cold chain maintenance), and the initial measles antibody titre. Further evaluation of the Alice Springs epidemic is ongoing.

A high rate of secondary vaccine failure has policy implications for the NT Immunisation Schedule. At present, Aboriginal infants are vaccinated at nine months of age thereby offering protection against early onset of disease, and then revaccinated at ten years (the second dose of MMR for all children aged 10-16 years was introduced in January 1994). This policy may need revision if early vaccination is associated with secondary vaccine failure. Cold chain maintenance will also need to be reviewed.

Scabies Treatment

Christine Connors, Disease Control Centre, Darwin

Scabies is endemic within Aboriginal communities, with prevalence rates amongst schoolchildren ranging from 30% to 65%. Scabies infestation is irritating and often disturbs sleep, but it can have significant morbidity associated with it. Animal studies implicate moderate - severe scabies infestation in the malnutrition cycle. (1) Streptococcal skin infection is commonly associated with scabies, and the prevalence of skin infection increases with the prevalence of scabies. (2,3) Acute post streptococcal glomerulonephritis (APSGN) is a consequence of skin infection (see first article). (4,5) Skin lesions due to minor trauma or mosquito bites may become colonised with streptococcus, but scabies causes a greater number and duration of lesions which are therefore more problematic. Scabies lesions have also been implicated in facilitating spread of infections such as Hepatitis B in children. (6)

Studies overseas assessing efficacy have concluded that most treatment failures occur due to two reasons:

- *scabicide is not properly applied to whole body* (3)
- *household contacts are not fully treated*

Although most staff are aware of the need to treat household contacts, it is often unknown how many, particularly asymptomatic people, actually comply with treatment. In one study the secondary attack rate in household was 38% indicating the importance of ensuring all potential contacts are treated. (9) Fully supervised treatment of patients and all household contacts will provide the best opportunity for treatment success. Proposing fully supervised treatment may seem an unreasonable request to impose on understaffed rural health centres, but Aboriginal Health Workers in a number of communities have successfully done this. As skin infections are amongst the commonest health centre presentations, appropriate scabies treatment should ultimately decrease clinic workload.

Scabies infestation is not related to hygiene, but is strongly associated with overcrowding. Children usually have more mites and are more infectious. Patients with Norwegian scabies have thousands of mites (>1400/cm² skin!) are highly infectious (10) and are probably the main transmitters in their community. Patients with Norwegian scabies have the usual scabies mite, but they are present in much greater numbers. These patients appear to have a decreased immune response, thus allowing the growth of thousands of mites. Full treatment of these "key transmitters" will decrease scabies transmission in these communities.

Skin infection with Group A streptococcus (GAS) is strongly associated with poor personal hygiene and daily washing of children should be actively promoted. Scratching of scabies lesions very commonly leads to

secondary infection with GAS. Experience has shown that treatment with antibiotics such as Bicillin AP or Bicillin LA (see following article) rapidly clears the infection, but without treating the scabies infestation, the infection will recur. Infected lesions will have a yellowish heaped crust, or be moist and weeping. Crusts should be removed by the use of vigorous rubbing with soap and water. Dry, flat scabs need no treatment.

The role of fomites (ie: bedding, chairs, clothes) in transmission is not as important as close body contact, but studies have demonstrated live mites in bedding, clothing and furniture of patients with scabies. (11,12) Survival of scabies mite is approximately 56 hours off the human host, although survival time is enhanced by increased humidity. Therefore, use of bed linen, regular washing of linen and clothing as well as airing of bedding should be promoted to minimise reinfestation. This can be done the day following treatment. Simple cleaning of the house is all that is required, except for patients with Norwegian scabies, whose houses need special attention.

Permethrin 5% (a synthetic pyrethrum) is a "vanishing" cream which is easy to apply, able to be applied safely to head and face, and produces only a very mild transient sting on application. Benzyl benzoate, which is the commonly used scabicide in remote communities, can only be applied from neck down, which misses lesions on the head of young children, and often produces intense skin irritation. Pyrethrum has been extracted commercially from flowers of the genus *Chrysanthemum* since 1840. Synthetic pyrethroids were developed in 1949. Studies have demonstrated permethrin's safety profile. It is rapidly metabolised in the skin, by carboxylesterases with less than 1% absorbed. One application is usually sufficient, with cures of 91 - 98%. The few failures are most common in children with multiple lesions particularly on palms and soles of feet. (8) It is recommended that it be applied to the head and face as well as body in children under two years. Permethrin is also a very effective treatment for head lice and the current treatment used in bush clinics contains permethrin. The head lice preparation however contains only permethrin 1% and should **not** be used to treat scabies due to the possibility of resistance developing.

With the introduction of a potentially more effective, although more expensive, scabicide the treatment of scabies should be facilitated in Aboriginal communities. New protocols for Top End rural health centres recommend the use of permethrin 5% for children. Young children (<2 years) require treatment to head and face as well as body. For children less than 6

months, a medical officer must be consulted prior to use of permethrin. Neonates less than 2 months can be treated with sulfur 5% or crotamiton 10%. Adults should continue to be treated with benzyl benzoate, unless they have multiple lesions or in cases of Norwegian scabies which need treatment with permethrin.

Programs to control scabies at a community level, have been tried in some Top End communities with reasonable success. Treating all infested individuals and their households will significantly decrease scabies prevalence in the short term, however the prevalence usually increases after a number of months to the same rate as pretreatment level. Programs are currently underway to treat whole communities, which has been shown overseas and in institutions to be the most effective means of controlling high prevalence rates.(3,7,12) This type of mass treatment is an extension of current principles in scabies treatment. It is well documented and accepted that unless close contacts are treated, then the individual has a high risk of being reinfested. In the context of remote communities with extremely high prevalence rates, close family relationships, and young children moving freely between houses, it is more appropriate to consider the community as a "household" when attempting to treat scabies. Success control will depend upon not only on initial treatment but measures to prevent reinfestation from other areas. Following the success (hopefully) of control in small communities, the experience and data will be available to other communities to implement.

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The impending demise of Bicillin AP

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

The Australian supplies of BICILLIN AP (All-purpose) are likely to run out in several months. It may no longer be imported into Australia by Wyeth as the original manufacturers overseas have ceased production. An interim batch from another overseas manufacturer has been imported, but it appears that this supplier will also cease production.

BICILLIN AP has had an essential role as a single dose injection for the treatment of skin sores and sore throat. Its efficacy is predominantly due to the long acting

benzathine penicillin G (BPG) component. The BPG in the injection has a long half life enabling adequate penicillin levels for at least the ten days that are recommended for eradication of Group A streptococcus (GAS) organisms. These are the predominant organisms in skin sores and are the organisms associated with acute post-streptococcal glomerulonephritis (APSGN) from skin and throat infections. Throat infections from this organism also lead to acute rheumatic fever. The additional components in the BICILLIN AP are the rapidly absorbed benzyl penicillin and the

intermediately absorbed procaine penicillin. These additional components give higher initial blood level of penicillin but it is the BPG which is important for eradication of the streptococcal organisms. It is important to note that there is little evidence that the higher penicillin levels achieved early from the faster absorbed penicillin components are actually associated with a faster resolution of symptoms and quicker eradication of GAS organisms in pharyngitis and probably in skin sores. However, it should be noted that in tissue infections such as cellulitis from GAS and in pneumonia which is commonly caused by *Streptococcus pneumoniae*, it is important to have rapidly achieved higher levels of penicillin in the blood. In these infections therefore it is more appropriate to use benzyl penicillin or procaine penicillin as single agents than to use the mixed low dose combination in BICILLIN AP.

The advantage of BICILLIN AP has been that it is a heat stable powder which does not require refrigeration. This makes it very useful for "bush" protocols. On the other hand, procaine penicillin alone is only available in Australia as a syringe preparation requiring refrigeration. Efforts over recent years to obtain a powder form of procaine penicillin by itself for use in Australia were unsuccessful.

With BICILLIN AP no longer available, the only current form of BPG available in Australia will be the BICILLIN LA (Long-acting) syringe, which comes in a 4ml syringe with a 19-gauge needle containing 2,400,000 units of BPG and requires refrigeration. For the reasons mentioned above BPG alone is adequate and acceptable for management of skin sores or sore throats as a single injection. The problem is the current formulation which requires re-allocation into smaller syringes with smaller needles. In the current edition of the Remote Areas section of Antibiotic Guidelines (8th edition 1994/1995) there is provision in the table on page 206 for doses by weight range of BPG. Having to transfer from the 4ml syringe of BICILLIN LA for each treatment of skin sores or sore throat is very impractical and particularly difficult in large scale interventions for skin sores in community programs.

Wyeth also manufactures in the USA BICILLIN LA (BPG) in 1ml and 2ml units. These are in the same concentration of BPG as in the current 4ml syringe; that is 600,000 units of BPG per ml. If the 1ml and 2ml units were available then the treatment of skin sores and sore throat could follow the guidelines on page 206 of Antibiotic Guidelines with same volume as in the table. For instance the volume required for a child of 3kg to under 6kg would be 0.5ml which is 300,000 units of BPG.

It should also be noted that if the 2ml BICILLIN LA is available then this would be also able to be used in the

secondary prophylaxis for rheumatic fever for four-weekly injection. The prevalences of rheumatic heart disease in Top End NT Aboriginal communities are amongst the highest in the world, with rates up to 30 per 1000 documented. BPG remains the choice of WHO for secondary prophylaxis for rheumatic fever. At present we have to transfer aseptically 2ml from a 4ml BICILLIN LA syringe. The only current use for a full 4ml injection of BPG is for the syphilis protocols. The current lack of an appropriate formulation (2ml) of BPG for secondary prophylaxis for rheumatic fever in Australia is incongruous when compared with the widespread availability overseas. It represents a failure by us and our public health structures to adapt the international experience in recognising and addressing a specific clinical need.

Although the 1ml and 2ml syringes of BICILLIN LA are available in the USA it is going to require a co-ordinated approach to enable their approval for use within Australia and their rapid importation before we run out of BICILLIN AP. Both Wyeth and the authorities in Canberra are sympathetic but it is important to remember that efforts in the past to procure specific drugs needed for remote communities have been generally unsuccessful.

As a final comment the availability of appropriate doses of BPG (1ml, 2ml and 4ml) is a minimum requirement. Efforts over the last few months to find alternative supplies of heat stable preparations have been unsuccessful but any further information in this area would be appreciated.

SUMMARY AND RECOMMENDATIONS

1. In a co-ordinated response to the impending cessation of BICILLIN AP availability we use benzathine penicillin (BPG) in protocols for skin sores and sore throats (see dose page 206, Antibiotic Guidelines).
2. We request Wyeth to seek approval for importation of 1mL and 2mL units of BICILLIN LA (BPG).
3. We directly approach the Health Care Access Division of the Commonwealth Department in Canberra to facilitate the process (as recommended in the Baume Report on the future of Drug Evaluation in Australia, recommendation 125, p145.)
4. Should any obstacles arise then we mobilise support through the various lobbying channels available.

What is the contribution of dogs to disease in Aboriginal communities?

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

Adapted from a presentation at the Western Pacific Veterinary Conference, Darwin August 1993

Zoonoses from dogs include bacteria, viruses, mycoses, protozoa, helminths and ectoparasites. Dog treatment programs in Aboriginal communities with ivermectin/ivermectin, which are active against filariae, gut helminths and ectoparasites, have been accompanied by anecdotal reports of improved child health. However, sustainability of the programs has been problematic in some communities and there is a dearth of objective human data. The critical question is how much of the burden of infections and malnutrition in Aboriginal children is really attributable to dog-human interactions in comparison with human-human and environment-human interactions?

There has been considerable confusions over species involved primarily in human disease. Human hookworms, *Ancylostoma duodenale* and *Necator americanus*, remain important causes of anaemia. The dog hookworm, *Ancylostoma caninum*, has been implicated in eosinophilic enteritis in non Aboriginals but is yet to be associated with disease in Aboriginal communities. While a degree of cross infestivity of *Sarcoptes scabiei* var *canis* to humans is well recognised, the high prevalences of scabies in many communities suggests the human variety is of prime concern. Group A streptococci (GAS) are responsible for much of the skin sepsis in Aboriginal children as well as for the non suppurative sequelae of rheumatic heart disease and acute post-streptococcal glomerulonephritis (APSGN). GAS are rarely found on dogs, whereas group G and C streptococci, which are occasionally associated with human APSGN, are more common.

Ongoing studies involving organism genetics and molecular epidemiology will hopefully unravel the important issues of host-species specificity and the zoonotic capabilities of *Giardia duodenalis* and *Strongyloides stercoralis*. These technologies should also be applicable to scabies varieties and species of *Cryptosporidium* and *Campylobacter*. In the meantime it is important to remember that the infections mentioned do occur in the absence of dogs and that there is a wealth of literature connecting diarrhoeal and skin diseases to overcrowding, poverty and poor hygiene.

Only a carefully planned longitudinal controlled trial can hope to objectively ascertain the impact of dog programs on child health. In the meantime it needs to be recognised that many of the infections in children are amenable to child health programs; most notably

community based age-targeted antihelminth (worm) therapy and scabies and skin sore protocols. Albendazole (a single dose anthelmintic) and 5% permethrin cream are recognised overseas as the most effective agents for these programs and both have recently been approved for use in Australia.

CONCLUSIONS

1. There is a lack of objective data on the magnitude of the contribution of dogs to human infections and malnutrition in Aboriginal communities.
2. Conversely, there can be no doubt about the role of human to human transmission of pathogens and about the potential benefits of child health programmes based on the wealth of documented international and local experience.
3. A review of the literature and local experience in tropical Australia shows there is little clinical evidence in Aboriginal communities of the classical dog zoonoses hydatid disease, visceral larva migrans, cutaneous larva migrans and disease from *Dirofilaria immitis*. Transmission from dogs to humans of *Campylobacter jejuni*, *Salmonella* spp., *Cryptosporidium* spp. and *Sarcoptes scabiei* var *canis* probably occurs to some degree, and *Giardia duodenalis* may prove to be an important zoonosis.
4. Given the above, child health programmes should take priority. This includes community based routine deworming and scabies programmes and also resources for sanitation, water supply, housing and education.
5. Financial constraints in public health and competition for resources justify concerns that dog health programmes:
 - i) not be implemented at the expense of child health programmes; or
 - ii) not be implemented at the expense of consideration of health hardware infrastructure such as housing, sanitation and water supply.
6. With the above considerations in mind, dog programmes in parallel to child health and environmental programmes may then provide additional benefits to humans as well as the obvious benefits to dogs.

Putting the Bite on! Malaria in the Northern Territory

Peter Knibbs - Disease Control Centre Darwin, Bart Currie - Royal Darwin Hospital and Menzies School of Health Research.

As of mid August 1994, 27 cases of malaria have been notified through CDC for the Northern Territory. This compares with 24 cases for the same time last year. As is usual for the Territory nearly all cases are *Plasmodium falciparum* and *P. vivax* with only one case of *P. malariae*. (table 1.)

Table 1. Cases of malaria for the NT 1994 (Year to date)

Species	No of cases
<i>Plasmodium falciparum</i>	15
<i>Plasmodium vivax</i>	11
<i>Plasmodium malariae</i>	1
Total	27

Eighteen cases (67%) have been reported in NT residents who have contracted malaria while overseas for holidays or work. However these cases include seven Papua New Guinean resident students completing their secondary education at Darwin schools. These students return to PNG for the Christmas vacation and also for the mid-year, four week semester break. Malaria amongst the PNG students also contributes to PNG being the commonest reported source country this year. (Table 2). This is no doubt a reflection of the highly endemic nature of malaria in PNG and the links being established between the NT and PNG through the expatriates living in Darwin and returning for holidays, family reunions etc.

Table 2. Source Country for Notified Malaria in the NT 1994.

Country	No of Cases
PNG	16
Indonesia	7
Solomon Islands	3
Ghana	1
Total	27

PNG students have been completing their secondary education in Darwin since 1991 under the sponsorship of the Australian International Development Assistance Bureau (AIDAB). Of the initial seventeen students commencing studies in January/February 1991, five were admitted to RDH with symptomatic malaria soon after arrival.(1) Since that time a program has been implemented so that all students are given malaria

prophylaxis before returning to PNG and they are all screened for malaria upon return to the NT. However all of the seven cases notified this year amongst the PNG students failed to be fully compliant with the prophylaxis offered. This varied from missing one week of medication, usually the last week, to failing to get prescriptions filled and not taking any medication at all.

This year all PNG student cases have presented with symptomatic malaria, including some who were blood slide negative on initial screening. No cases were detected from the screening program, unlike previous years.(1,2) It remains uncertain when is the optimal time for screening after arrival in Darwin, as early screening may miss subsequent emerging cases and late screening may allow early clinical cases to develop. We currently aim to screen at 7-10 days after arrival. It is reassuring that the school nurses and families involved with the students, together with the students themselves, are highly aware of malaria and the students are presenting early after the onset of fever and headache.

Of concern are 2 definite and 1 probable relapse cases of *P. vivax* malaria in patients who had been treated, and were compliant, with primaquine (30mg alternating with 15mg daily for 14 days).(3) Primaquine is given as radical treatment to eradicate the "hidden" liver phase (hypnozoites) of *P. vivax*, but it is not 100% effective, especially for *P. vivax* acquired in South East Asia and the South West Pacific ("Chesson" varieties). In one case the person relapsed twice despite increasing the dose of primaquine to 30mg daily after the first relapse. All patients with malaria need to be informed of the possibility of relapse, particularly if they have proven *P. vivax* infection, and to present for a blood test for malaria if they develop fevers. Relapse of *P. vivax* malaria can be months or even years from the original infection.

References

1. Currie B, Whelan P, Dyer M, Beeby J, Noonan C and Patel M. Malaria in visiting Papua New Guinean Students in the Northern Territory. Communicable Disease Intelligence 15/7 116.
2. Voolmann T, Currie B, Patel M, Whelan P, Krause V. Malaria Screening and Surveillance in the Northern Territory - Protocols for Active Screening of Students From High Risk Areas. Communicable Disease Intelligence 18/5 106-7.
3. NT Department of Health and Community Services, Disease Control. MALARIA PROTOCOL Guidelines For Health Professionals in the Northern Territory -2nd Ed. 1994

EDITORIAL

In Australia overall 728 cases of malaria were reported for 1992(1). Unofficial national data from the end of 1993 shows the number of cases to be equally as high (2). The 1992 cases were not evenly distributed throughout the country and "malaria receptive" Far North Queensland had the highest rate(40.6/100 000).

From 1986 to 1993 the NT has recorded 272 cases of malaria. The average number of cases reported for the four years 1986 to 1989 was 25 and for the four years 1990 to 1993 it was 36. As the NT and Australia become more a part of the Southeast Asia and Pacific Region and educational and workforce exchanges in addition to recreational travel become more commonplace, so will the number of imported cases of malaria increase. Where possible policies and services should be in place to address this increasing import of malaria. Policies and services required include the following:

1. Appropriate travel medicine advice (i.e. malaria prophylaxis) should be readily accessible, accurate and up to date.
2. Screening and/or education programs should be in place to provide for students and workers going to and from malarious areas.
3. Health care providers should be educated "To Think of Malaria" when faced with the possible clinical scenario.
4. "Malaria receptive" areas (i.e. north of the 19th parallel) require vigilant malaria surveillance and control programs to be in place to keep the zone free from malaria transmission.
5. The NT and Australia must support global efforts towards malaria control and research.

1. Communicable Diseases Surveillance, National Notifiable diseases Surveillance System, Comm. Dis. Intell. 1993; 17:613.
2. Annual Report of the National Notifiable Diseases Surveillance System, 1992, Malaria, Comm. Dis. Intell. 1993; 17:485.

Hepatitis A vaccination program for 'at risk' HACS staff

Nan Miller, Senior Project Officer, DCC Darwin

I am writing to remind you of the hepatitis A vaccination program. The program got underway on 2 August but has attracted only a moderate amount of interest to date. The program goal is to reduce the number of susceptible health care workers who are 'at risk' of exposure to hepatitis A infection and to gain information on previous exposure and seroconversion in this group to hepatitis A.

Since epidemiological information on hepatitis A in the NT is limited, it was decided to offer the vaccine to identified 'at risk' health care workers in the first instance. The 'at risk' classification is based in part on past acute hepatitis A notifications in the NT and the National Health and Medical Research Council recommendations. The program is also available to other Department of Health and Community Services staff and to non-Departmental 'at risk' occupational groups (eg. child care centre staff) but payment at the base Government price is required.

The program has defined criteria and adherence is necessary before the vaccine will be made available.

Completion of the survey questionnaire is a requirement for enrolment in the program. A pre-vaccination blood test will identify those who need the protection of vaccination and those who are already protected from a previous natural infection.

East Arnhem has had a good response (71), Katherine, Tennant Creek and Darwin have had less than half of eligible 'at risk' staff enrol to date and Alice Springs had to postpone their starting date due to the measles outbreak.

Don't delay, contact your District co-ordinator for information and to enrol in the program.

Alice Springs	-	Marion Maloney	51-7554
Darwin	-	Nan Miller	22-8564
Katherine	-	Belinda Farmer	73-8766
East Arnhem	-	Ivor Alexander	87-0356
Tennant Creek	-	Jan O'Neil	62-4303

Editorial

The NT Department of Health and Community Services is one of the first health services nationwide to provide free hepatitis A vaccine to 'at risk' health care staff and

to promote other 'at risk' groups to be vaccinated at the base Government price as a public health initiative. 'At risk' workers should be encouraged to take advantage of the program and guard against this vaccine preventable disease

Contact Tracing

Frank Bowden

Head, AIDS/STD Unit, Darwin

Contact tracing (or partner notification) is a concept that evokes very strong opinions. While many pay lip-service to the practice but do not actually do it, others condemn the idea outright. The first (and only) Australian conference on contact tracing in relation to HIV was held in 1991 - nearly ten years into the HIV epidemic! While contact tracing for syphilis or gonorrhoea might be acceptable (just), there has been a dominant view that contact tracing for HIV is simply not appropriate. This attitude is now rapidly changing.

Contact tracing is a fundamental part of any STD program and encompasses every aspect of STD management. The image that many have of contact tracing is of Health Department agents in unmarked cars arriving on the doorstep of a suspected or named contact, and proceeding to mercilessly interrogate the poor subject. This image is widely held but erroneous. Although there is a definite role for mobile contact tracers, the vast majority of contact tracing is actually done by the patient. The patient is assisted in determining who should be contacted and how. The clinic may provide the patient with a letter to be handed to the contact(s) which gives a brief explanation and the address of the nearest STD clinic.

If the patient feels that they can't notify the contacts personally, the contact tracer can offer to do it for them. Clearly if the patient does not want to give names of contacts, then the process stops there: names of contacts cannot be extracted from an unwilling patient. A trusting relationship between patient and health-worker is the best way to successfully contact trace.

Contact tracing has been classified into three major types: A, B and C. This can be summarised in the table above.

Type A refers to screening. In areas where STDs are endemic this may be the most effective and efficient means of contact tracing. Screening recognises that most of the STD organisms have the ability to remain silent (or asymptomatic) and the detection of disease is dependent upon the practice of identifying individuals who are at risk but who would not otherwise present for medical attention. (For more information see CDC Bulletin Vol 1, No. 10, December 1993).

Type B is the type of contact tracing that is familiar to most people. This has been referred to as "downstream" contact tracing. The sexual contacts of the index patient are sought through various means. No particular emphasis is placed upon whether the contacts caught the disease *from* the index patient or were responsible for *infecting* the index patient.

Type C deals with the latter point. It attempts to identify the *source* of the index patient's infection. This is referred to as "upstream" contact tracing. It is much harder to do as the people it seeks to identify are

CONTACT TRACING OF SEXUALLY TRANSMITTED DISEASES		
(Heterosexual transmission model)		
TYPE A	Screening:	• Detects asymptomatics • Only useful in high prevalence areas
TYPE B	"Downstream" Contact tracing:	• Detects the contacts of the index patient
TYPE C	"Upstream" Contact tracing	• Detects the source of index patient's infection

likely to belong to the "core-group" or be "super-spreaders" of infection. These people are often substance abusers, are socially isolated and may be unwilling to cooperate with health staff.

The cost-effectiveness of the three strategies is determined by the underlying prevalence of infection; in general, Type B is inferior to Type A which is inferior to Type C but each has its place in a control program. The distinction between Type B and C is subtle but represents a fundamental difference in approach which is likely to lead to a more efficient and cost-effective use of resources in contact-tracing.

Many practitioners report that there are significant barriers to effective contact tracing in Aboriginal communities e.g. it is not culturally appropriate, it leads to serious recriminations for the index case when contacts are identified, patients are said to be reluctant to divulge names. Sometimes these barriers are more perceived than actual and are used as excuses for not attempting contact tracing in the first place. To be successful in endemic areas the contact tracing must be

part of an overall STD control strategy which includes appropriate screening protocols. Nevertheless, experienced contact tracers can make major differences in the course of epidemics and their skill should be drawn upon.

For further information on contact tracing as it relates to STDs please contact your local Communicable Disease Officer.

Annual CDC Workshop Disease Control Darwin 25 -29 July 1994

Eleanor Wilshire - Disease Control

The Annual CDC Communicable Diseases Workshop was held recently in Darwin. The workshop has traditionally provided rich opportunities for receiving, updating and exchanging health information that relates to control and management of disease in the NT. Following discussion at the workshop and feedback from Communicable Disease Officers, several topics emerged for further development.

The Certification Program for Vaccine Providers will be developed as a certified training program for all vaccine providers in the NT. The recommendations set out by the National Immunisation Strategy describe national goals to improve the efficiency, quality, accessibility and accountability in the existing childhood vaccination programs. Nan Miller is directing this project with assistance from Terry O'Brien and Eleanor

Wilshire. The group plan to develop a self-directed learning program. It will be suitable for use in the NT for all practitioners who will administer vaccines. Consultation will be sought at various planning stages before implementation of the program occurs.

A second project underway is to work towards the development of an NT Infection Control position. This position is to respond to Infection Control issues faced by NT health care providers in community settings. The Infection Control Officer would operate out of DCC, liaise with the Hospital Infection Control Officers and provide resources, support and education to a group of health care providers in the community not adequately covered through present hospital based policies.

Influenza A in Darwin

DCC Staff, Darwin

In mid to late July 1994 the Darwin area, as reported by the media, was noting increasing numbers of residents with flu-like illnesses. At this time no cases of influenza were being reported in Royal Darwin Hospital (RDH) and no deaths or severe illnesses were attributed to influenza. A call around to Darwin laboratories revealed only one positive serology for Influenza A in the previous few weeks. Calls to GPs indicated that few had taken serology or nasopharyngeal swabs to establish a specific diagnosis for the suspected flu illness. In the ensuing few weeks more tests were carried out specifically by hospital based doctors and in the two and a half week period, 26/7/94 to 5/8/94, there were

20 laboratory notifications of Influenza type A reported from RDH (blood collected from both patients and employees with flu-like illness). These were all based on single high titres. CFT of $\geq 1:80$ was considered positive, though the majority were $> 1:320$.

For a similar two week period the Communicable Diseases Intelligence (CDI) Virology and Serology Reporting Scheme, a laboratory surveillance scheme, received 161 reports of Influenza A from Victoria (41), Western Australia (25) Queensland (22) New South Wales (17) and South Australia (56).

Pilot Peer Education Program Alice Springs

Sue Smith, AIDS/STD Educator DCC Darwin

Community health education in AIDS/STD issues has provided valuable information to students in local high schools. Single sessions in particular health areas have commonly been sought, but ongoing health programs provide a greater potential for lifestyle modification. The Youth Peer Education Program was initiated in Alice Springs because during adolescence the peer group is an important influence upon decision making behaviour. Educators from Family Planning, AIDS Council of Central Australia and the DCC AIDS/STD Unit approached Anzac Hill High School. In conjunction with the school's Student Representative Council and the school community, a pilot program was launched in first term this year.

The program aimed to train a group of high school students in the many aspects of sexual health so that they could educate and support their peers with accurate information. Program objectives included:

- increasing participants knowledge of HIV/AIDS, STDs, sexual health issues and local services; and
- exposing students to several methods of presentation and communication to assist them with their peer education.

Having a number of educators allowed for the students to be divided into small groups. This strategy encouraged participation and students teaching one another.

The program was conducted over a ten week period for four lessons per week. The following topics were covered:

- | | |
|-------------------------|-------------------------------|
| •communication | •body awareness |
| •body image | •HIV/AIDS |
| •self-esteem | •sexuality and values |
| •sex and the law | •conception and contraception |
| •relationships | •STDs and safer sex |
| •sexual decision making | •assertiveness |

- education resource development/peer program planning

A total of twenty-two voluntary students from year nine and ten participated in the program. The group consisted of seventeen females and five males. An information session was organised for parents. The parents who attended responded favourably to the program.

Program evaluation included a pre test survey to establish the initial level of sexual health knowledge. This survey indicated that whilst most students had a good understanding of HIV transmission, there was a poor understanding of other STDs. The post-test survey indicated that the majority of students had increased their sexual health knowledge by the end of the program. Student journal documentation and evaluations, together with their attendance and participation in excursions and group activities indicated a high level of interest and participation. Follow-up interviews with students will be required to establish whether they are informally acting as peer educators on sexual health issues.

One of the many positive outcomes of the program included a luncheon and certificate presentation held at the school. A group of students assisted in the planning and organisation of this event. The Principal, school staff, students and the local press attended. Some students made speeches and organised a display of the work and resources produced for the school library. The event and the program received positive publicity in the *Centralian Advocate*. The Assistant Secretary of the Department of Education for the Southern Region, responded favourably to the evaluation report. He also expressed support for future programs in this important area of health education.

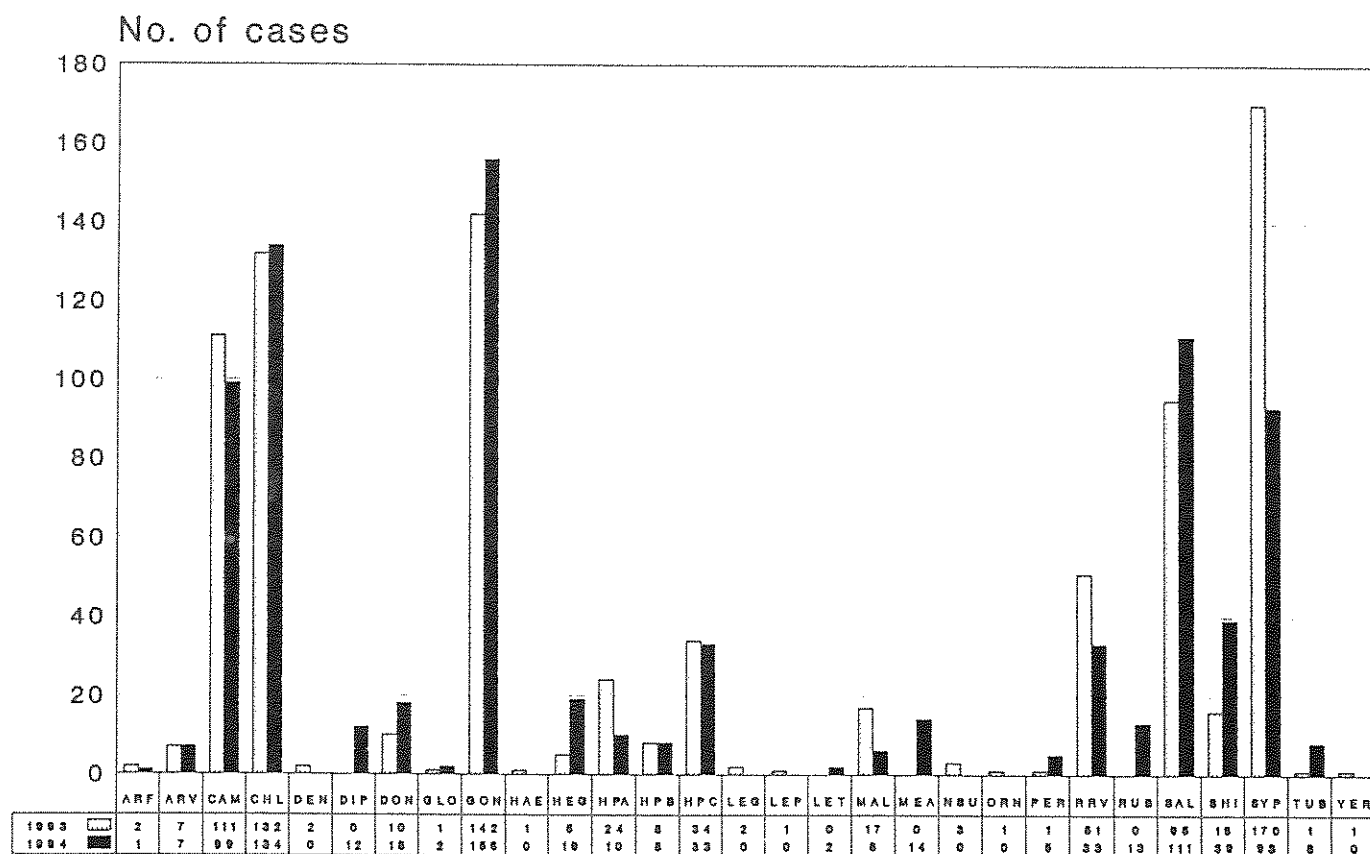
For further information about the program or for a copy of the evaluation report, please contact Sue Smith on 228 814.

***Australasian Society for Infectious Diseases
Annual Scientific Meeting at the
Beaufort Hotel, Darwin
21 - 24 May 1995***

NT Notifiable Diseases

Quarterly report of the NT Notifiable Diseases with a comparison to the previous year's report for the same quarter

NT wide
1 April to 30 June
1993 and 1994

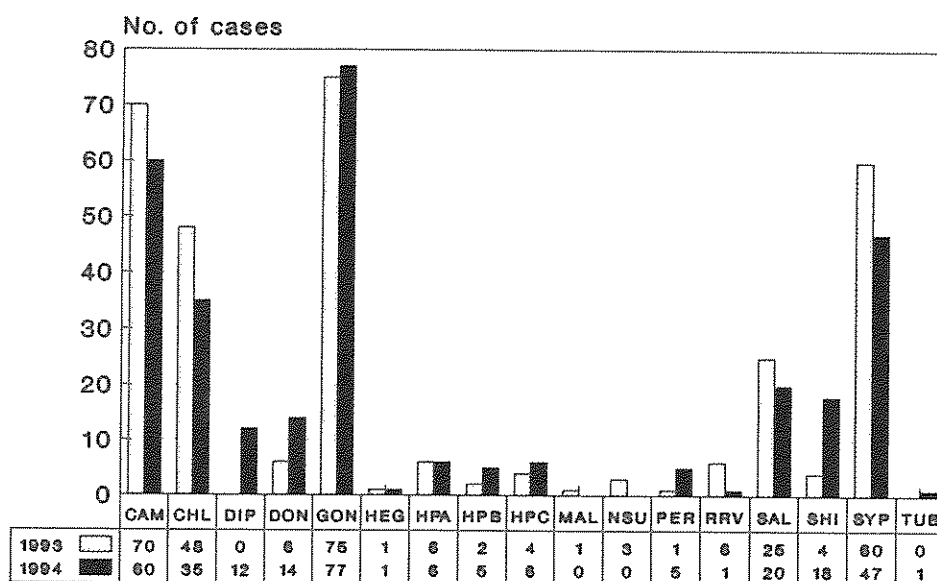


AME - Amebiasis
ARF - Acute Rheumatic Fever
ARV - Arbovirus (not RRV)
BRU - Brucellosis
CAM - Campylobacter
CHA - Chancroid
CHL - Chlamydia
CHO - Cholera
DEN - Dengue Fever
DIP - Diphtheria
DON - Donovanosis
GLO - Glomerulonephritis
GON - Gonorrhoea
HAE - Haemophilus Influenza type b
HEG - Herpes genital
HEO - Herpes other
HIV - HIV Infections

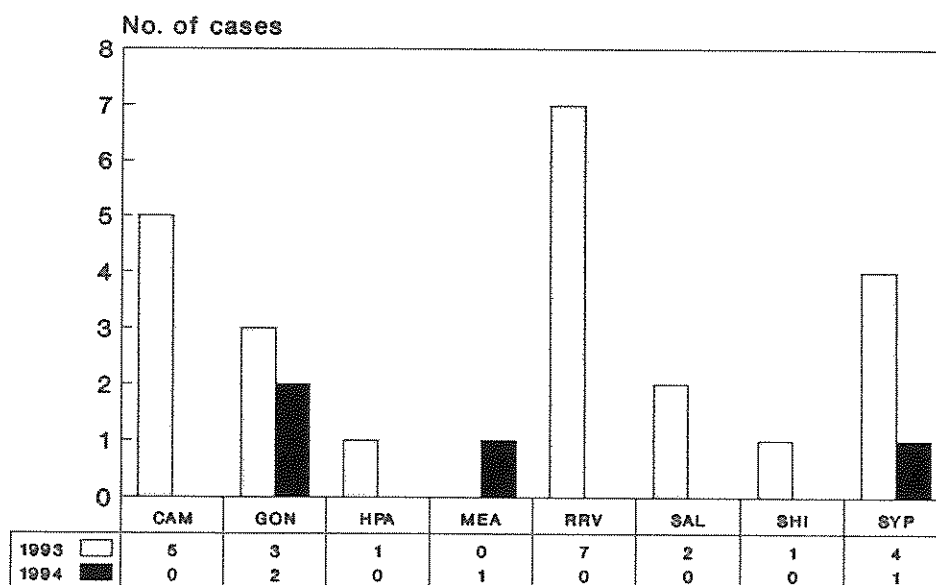
HPA - Hepatitis A
HPB - Hepatitis B
HPC - Hepatitis C
HPE - Hepatitis E
HYD - Hydatid Disease
LEG - Legionnaires Disease
LEP - Leprosy
LET - Leptospirosis
LIS - Listeriosis
LYV - Lymphogranuloma Venereum
MAL - Malaria
MEA - Measles
MEN - Meningitis
MUM - Mumps Parotitis
NSU - Non specific urethritis
ORN - Ornithosis
PER - Pertussis

PLA - Plague
POL - Polymyelitis
QFE - Q Fever
RAB - Rabies
RRV - Ross River Virus
RUB - Rubella
SAL - Salmonella
SHI - Shigella
SYP - Syphilis
TET - Tetanus
TUB - Tuberculosis
TYF - Typhoid
VHF - Viral Haemorrhagic Fever
VHU - Viral Hepatitis (Unspecified)
YEF - Yellow Fever
YER - Yersiniosis

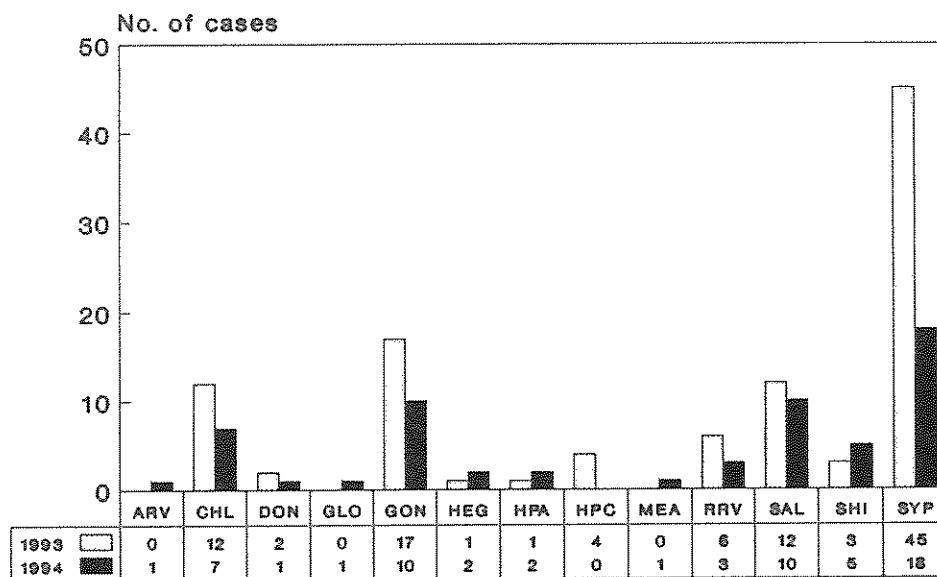
Alice Springs Region
1 April to 30 June
1993 and 1994



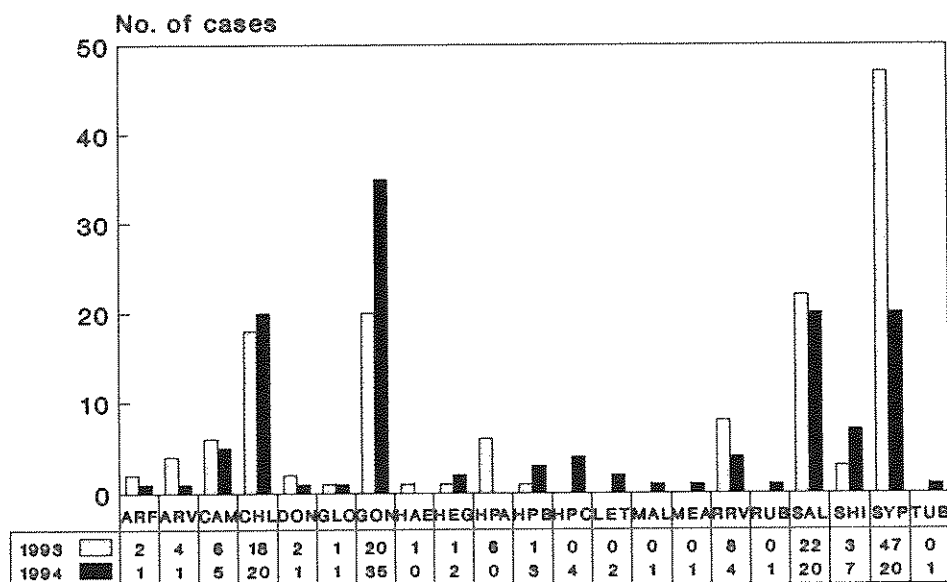
Barkly Region
1 April to 30 June
1993 and 1994



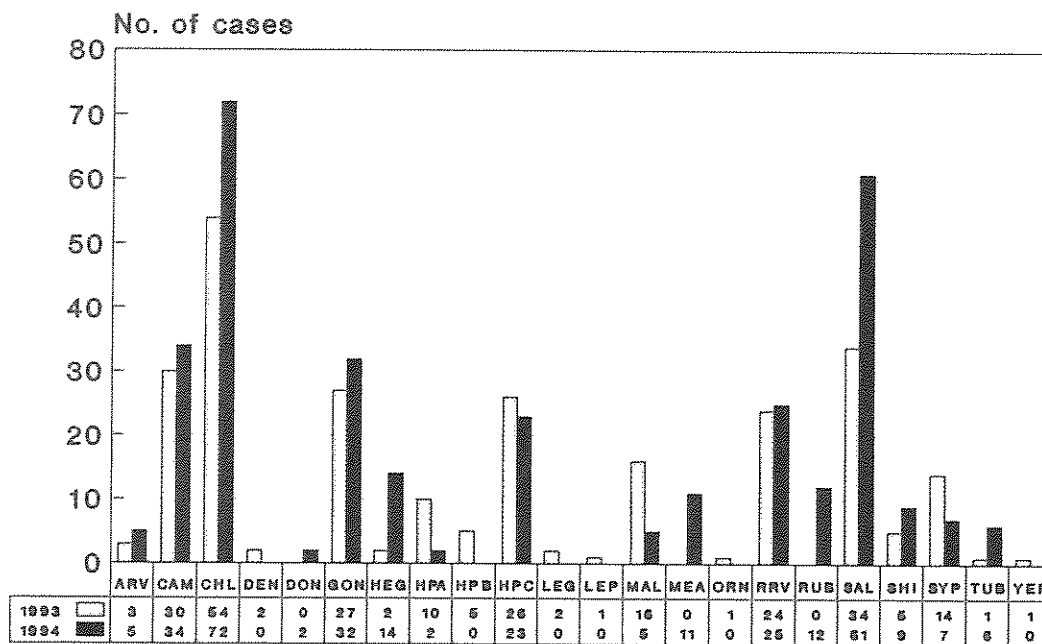
East Arnhem Region
1 April to 30 June
1993 and 1994



Katherine Region
1 April to 30 June
1993 and 1994



Darwin Region
1 April to 30 June
1993 and 1994

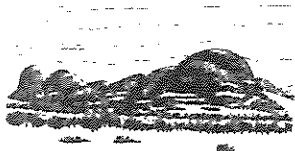


PROFILES AND STAFF UPDATES

Edited by Eleanor Wilshire

New staff within Disease Control

ALICE SPRINGS



Steve Rawson

Aboriginal HIV/AIDS and STD Men's Educator

Steve has recently transferred from the Department of Education where he worked as Liaison Officer. The position involved extensive travel to rural communities to work with parent groups, teaching staff and students.

In his current position as Men's Educator, Steve anticipates a "big challenge" in providing culturally

relevant information and educational programs to urban and rural Aboriginal men's groups within the Southern Region.

Kate Brooks

Reception / Administration

Kate comes to Disease Control with a variety of administrative experience. She spent three months as Acting Executive Assistant to the Urban District Manager, five months as Centre Receptionist and eight months at the Community Health Centre. The latter position was a temporary promotion transfer from the Education Department. Kate now works in reception and performs other administrative duties.

Kate is also secretary to the *Alice Springs Action Group*. After extensive lobbying to the NT Government, the group was successful in assisting in the introduction of SBS Television to Alice Springs.

Annette Coppola

Clinical Nurse Consultant AIDS / STD

Annette has been working in Rural Health in Alice Springs for the past five and a half years.

With experience as Co-ordinator in Women's Health, Annette has taken up the position of Clinical Nurse Consultant in the AIDS / STD Unit. In 1993, she completed post graduate studies in *Sexual Health and Venereology* at the Sydney Hospital. Her new role encompasses co-ordination of the unit, running the DCC Sexual Health Clinic and educator with the Occupational Risk Program.

Kirsty Smith

Registered Nurse in STD

Kirsty is new to the Territory having recently arrived from Melbourne. She has a background in community nursing and family planning, both in Melbourne and country NSW. Her role at DCC is primarily associated with recording and interpreting syphilis serology. Work is currently underway to set up a database for other STD.

Kate Merry

AIDS/STD Urban Educator

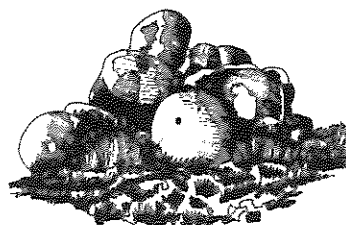
Kate joins the AIDS/STD Unit to provide the urban community with educational information on AIDS/STD issues through request or by the identification of gaps in current community awareness. Kate has a background in teaching. She has experience across a range of age, rural, urban, remote, Aboriginal and non Aboriginal groups but has primarily provided or established children and youth services.

Kate says she is new to the area of AIDS/STD, but "wants a job with motivation".

Sue Ffoulkes

Rural Liaison Clinical Nurse Consultant for AIDS/STD Unit

Sue's new position has a focus on staff development and provision of resources for rural health staff in client care. This is in the AIDS/STD area. Sue also participates in clinical services at DCC. Her background in family planning, midwifery and community health in Darwin in combination with work as a nurse practitioner, have all been a natural progression toward her present position.



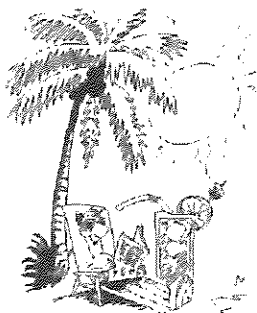
TENNANT CREEK

Janet Stewart

DON Community Care

Farewell to Janet who has taken six months of well deserved long service leave. She will be back on board with vigour in February 95.

DARWIN



Christine Connors

Public Health Registrar

For the last five years, Christine has worked with Rural Services as a District Medical Officer. She commenced work with CDC in March 94. Her new twelve month position as Public Health Registrar, will include responsibility for leprosy control, analysis of pneumococcal disease and implementing a model for the reduction in the prevalence of scabies.

Carole Whittles

Registered Nurse

Carole has been a familiar face around RDH for many years. She has a background in education but is presently working in a variety of areas around DCC. As a clinical nurse, Carole is involved in the AIDS / STD Unit and Tuberculosis Chest Clinic. She is also working in maternal syphilis research.

Carole enjoys computer graphics and is an excellent teacher for the graphic novice.

Sue Smith

AIDS / STD Urban Educator

Sue has recently crossed the Berrimah Line to work in the AIDS / STD Unit as an Urban Educator. An Alice Springs expatriate, Sue has worked with the Family Planning Unit, but more recently as Urban Educator with the AIDS / STD Unit. With a background in community based organisations and experience in community development projects, Sue brings a practical approach to AIDS / STD education and a desire to elevate these issues within the community. Sue hopes to focus her innovative educational programs on young people, based on the Youth Peer Education Program she developed in Alice Springs.

Vicki Chamberlain

AIDS / STD Clinical Nurse Consultant

Vicki has worked in the Territory for the last six years. Working as a registered nurse at the Gove District Hospital, Nhulunbuy, Vicki transferred to Darwin and commenced work in urban health with the Darwin Community Care Centre. Short term relieving stints in palliative care, women's health and the Barkly mobile

clinic provided more versatility in Vicki's skills. In 1993, she completed eight months in the AIDS / STD Unit working as a Health Educator before a twelve months transfer / promotion to Groote Eylandt. Her Clinical Nurse Consultant role in the Groote Health Centres has held her in good stead for her present position at DCC in the AIDS / STD Unit.

Peter Miller

Evaluation Consultant

Peter arrived in Darwin from Thailand. He has been working in Research Program Management, using media interventions. Other field backgrounds include Laos, Somalia and Melbourne. Peter is working for DCC in evaluating an Aboriginal health AIDS / STD educational program. The evaluation is due for completion by the end of August 94 when Peter's brief will end.

Eleanor Wilshire

Research Officer

Like Peter - another short term appointment! Eleanor came to Darwin recently from Melbourne. With a nursing background in infectious diseases, health education, community and public health, specifically in tuberculosis, Eleanor has temporarily replaced Darren Mitchell as Research Officer for the Program Directorate.

Darren is currently jetsetting overseas and taking in "heaps" of countries. His return is anticipated in early September 94.

Russell Cubillo

AIDS / STD Aboriginal Educator

Russell has lived in Darwin all his life. His family name is one of the well known names in Darwin and one that extends throughout the Northern Territory. His father is Larrakeyain and his mother Jawoyn.

Russell said "I am an Aboriginal and I have always wanted to work with Aboriginal people. Working with the Aboriginal AIDS / STD team has been a good experience for me and is one job that is important to Aboriginal people's health. In the NT we have the highest rates of STD in Australia and there is a lot of work to be done in STD in Aboriginal communities."

Russell has worked in Aboriginal health for the Aboriginal Islander Medical Service and the Darriba Nurri Centre. "I have had the pleasure of meeting some very interesting people through DCC and I hope I will meet many more and do more for Aboriginal health in the future."