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*Leslee Roberts*

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## 1.1 Development of LabDOSS

Surveillance may be defined as the timely, ongoing collection, analysis and dissemination of information to those who need to know. The World Health Organisation defines surveillance as the continuing scrutiny of all aspects of the occurrence and spread of disease that are pertinent to control; it is characterised by methods distinguished by their practicability, uniformity, and frequently by their rapidity, rather than complete accuracy<sup>1</sup>.

Important features in any surveillance scheme are:

- useful data,
- accessible data,
- simple reporting process and
- timely feedback.

A surveillance scheme entitled the "pathogen scheme" had been in operation by *CDI* for 4 years. The aim of this scheme was to extend the successfully established virus reporting scheme to other pathogenic organisms. However, the "pathogen scheme" had struggled to gain acceptance because reports encompassed all "pathogens" from reports of *Candida* species in vaginal isolates to *Giardia* in stool and meningococcus in cerebrospinal fluid. This meant that only small laboratories contributed to the scheme as directors of larger laboratories found the exhaustive, encyclopaedic number of pathogens to report was prohibitive. Therefore, the data in this scheme was not representative as only small country laboratories contributed.

My approach to the "pathogen scheme" was to establish objectives for the scheme and limit isolates reported to those obtained from normally sterile sites. This allowed for organisms causing invasive disease to be reported, eg organisms from cerebrospinal fluid, blood cultures, peritoneal dialysate, joint fluid aspirates.

### 1.1 Development of LabDOSS

This approach had an added advantage in that collection of surveillance information by site of sepsis, rather than specific organism coincides with the processing function of the laboratory. For example blood cultures are all processed in the same section of the laboratory. Site based surveillance means that surveillance of common invasive pathogens as well as rare and new pathogens can occur. More information may be obtained than is currently provided through the notifiable diseases system. For example in cases of meningitis, *Neisseria meningitidis* and *Haemophilus influenzae* are notified to each State Health department which is appropriate as both these diseases may require immediate public health intervention. However, other causes of meningitis are not notified, for example *Streptococcus pneumoniae* which may be prevented by immunisation is not under surveillance.

Reference 1 Last JM. *A Dictionary of Epidemiology*. New York: Oxford University Press, 1988

### 1.1.1 Development of LabDOSS, Objectives of the Scheme

The goal of any surveillance system is to prevent or control disease. Within this major goal the LabDOSS scheme has a number of objectives;

- **To improve understanding of the epidemiology of disease caused by invasive organisms in Australia;**

Unlike the United Kingdom, Australia has no central agency that collates and reports on invasive organisms. Victoria is the only state with an organised system for sterile site reports and this is through the Victorian Hospitals Pathogen Surveillance Scheme (VHPSS). Studies of reports of bacteraemia and meningitis are occasionally reported in the literature. Similarly, epidemiology of disease caused by invasive organisms are presented at professional meetings of the Australian Society for Microbiology and the Australian Society of Infectious Diseases.

- **To monitor trends of disease caused by invasive organisms over time;**

Recognition of trends in disease may lead to modification or evaluation of public health interventions. Seasonal patterns may be identified; it could mean timely identification of emerging trends and changes in pattern of disease due to other environmental factors could become more obvious.

- **To identify emerging pathogens causing invasive disease;**

With the increased use of antibiotics, emerging pathogens in the United States and United Kingdom include enterococcus species, and fungi.

- **To identify outbreaks;**

Epidemics of disease such as pneumococcal septicaemia may occur in Australia and remain unidentified. Outbreaks of septicaemia from contaminated infusate have been widely reported in the US and UK but currently not likely to be identified in Australia.



### **1.1.1 Development of LabDOSS, Objectives of the Scheme**

- **To use the knowledge gained from surveillance to develop public health policy.**

For example, improved vaccines for pneumococcal and meningococcal disease are being developed. Incorporation of these vaccines in Australia, appropriate risk groups and expected outcomes may be suggested and evaluated by the LabDOSS scheme.

### 1.1.2 History of Development of LabDOSS

In the six months prior to my placement Dr Robert Hall had written to laboratories around Australia raising the issue of expansion of CDI surveillance. There was negative feedback from the laboratories because of the prohibitive numbers of pathogens requested to be reported. I proposed a scheme more focused on invasive disease. The response from medical microbiologists was supportive and suggested a sterile site surveillance scheme was attainable.

I was kindly invited by Dr Joc Forsyth director of the VHPSS to observe the VHPSS functioning, and discuss the role of a *CDI* surveillance scheme. I discussed the possible virtues of a national scheme and the practicalities of development. Doctors Forsyth and Hogg considered that collection of such data would be best managed at a local or state level. If all states were collecting such information then the data could be collated nationally.

I reviewed the method by which the VHPSS obtain, collate and report data. Data are entered on a VHPSS card by laboratory staff and then mailed to VHPSS located at the Microbiological Diagnostic Unit, University of Melbourne. There is a delay in the receipt of cards which may be received weeks to months after the onset of the sepsis. Reporting from some hospitals was intermittent. When received, the cards are viewed by a scientist and computer operator, the organisms are coded and the data are then entered into a database. Feedback of data is through VICBUG, published every three months.

### 1.1.2 History of Development of LabDOSS

The experience of observing the operation of a sterile site surveillance system was invaluable and I identified the following issues.

- What was the viability of national scheme ?

The continuation of the virus surveillance scheme for over 10 years suggested surveillance of sentinel laboratories could be co-ordinated from one centre.

- Would data be reliably sent to Canberra , a location far from the laboratory ?

This occurs in the *CDI* virus scheme.

- Should efforts be directed to establishing state based surveillance schemes that could be subsequently be collated nationally?

This would probably be the ideal arrangement. However, establishing surveillance in this manner would be beyond existing resources.

- What data are reasonable to collect e.g. date of admission, clinical information, hospital acquired, significant organism ?

The date of admission of the patient provides a useful reference for determining onset of hospital acquired infections. However, the date of admission may not be readily available to laboratory scientists.

Clinical information is useful for analysis and interpretation. However, this must be viewed with awareness that the clinical information is provided by laboratory staff who do not have direct contact with the patient.

It is important to assess the clinical significance of organisms identified by culture as contaminating organisms are frequent and may not be a cause of sepsis. In the VHPSS scheme some laboratories refuse to comment on whether an organism was significant as this was considered a clinical decision. Laboratory staff gain information from the requesting physician , nursing staff or microbiology registrars. For this reason organisms in LabDOSS may be coded by the laboratory staff as "probable contaminants". These data are analysed separately. This obviates the need for laboratory staff to make a definite decision on significance, yet allows *CDI* to consider the significance doubtful.



## 1.1.2 History of Development of LabDOSS

### 1.1.2.1 Pilot Scheme, LabDOSS Version 1

#### 1.1.2 History of Development of LabDOSS

As a surveillance scheme was functioning well in Victoria's Laboratories, it was decided that a similar scheme should be implemented in NSW. Three laboratories were involved in the pilot scheme. The *CDI*, at this stage, only received hand completed forms. Similar reporting forms could be collected for sterile sites.

- How would the data be collected?

The options were in the peripheral laboratory or *CDI* central office. *CDI* Virus reports are mostly coded in the periphery with additional codes added if data are incomplete. VHPSS reports are all coded centrally. It was suggested that coding needs to be performed centrally to avoid inappropriate coding and extra work by the laboratories. Central coding required greater resources than the *CDI* section was able to commit.

Recent data to send to *CDI*. Selecting data by date proved to be a confusing and time consuming process. I established a two tier system of LabDOSS data files (Figure 1 and Appendix A). LabDOSS data could then be entered into an interim file. When the mail was ready to send data to *CDI*, a program placed interim data on floppy disk. At the same time this program merged the interim file data into the main file stored on the laboratory computer. This two tier approach has been very successful and readily allows the system to be tailored for individual laboratory use. Only core *CDI* data are copied onto floppy disk. More detailed data for example the whole patient name are kept in the main LabDOSS file.

Patient confidentiality is ensured in the LabDOSS scheme, names are not forwarded to the *CDI*. Two initials of the surname, two initials of the first name, the date of birth of the patient and a laboratory specimen code are used to remove duplicate records and follow up incomplete data.

### 1.1.2 History of Development of LabDOSS

#### A Pilot Scheme, LabDOSS Version 1

As a surveillance scheme was functioning well in Victoria I elected to trial a sterile sites surveillance pilot program in NSW. Three laboratories were involved in the pilot project from June to December 1991. One laboratory stated they would prefer to enter data directly into a *CDI* computer program rather than complete paper forms. I designed LabDOSS version 1, in EpiInfo. The data collected included demographic, clinical (patient diagnosis and risk factor for sepsis) and microbiological information. The pilot showed the laboratory staff were able to enter information easily and quickly. Data were provided by mailing floppy discs to *CDI* on a monthly basis.

Although data were entered easily into LabDOSS version 1, there was difficulty in extracting recent data to send to *CDI*. Selecting data by dates proved to be a confusing and time consuming process. I established a two tier system of LabDOSS data files (Figure 1 and Appendix A LabDOSS Manual). Data could then be entered into an interim file. When the staff were ready to send data to *CDI*, a program placed interim data on floppy disc. At the same time this program merged the interim file data into the main file stored on the laboratory computer. This two tier approach has been very successful and readily allows the system to be tailored for individual laboratory use. Only core *CDI* data, are copied onto floppy disc. More detailed data for example the whole patient name are kept in the main LabDOSS file.

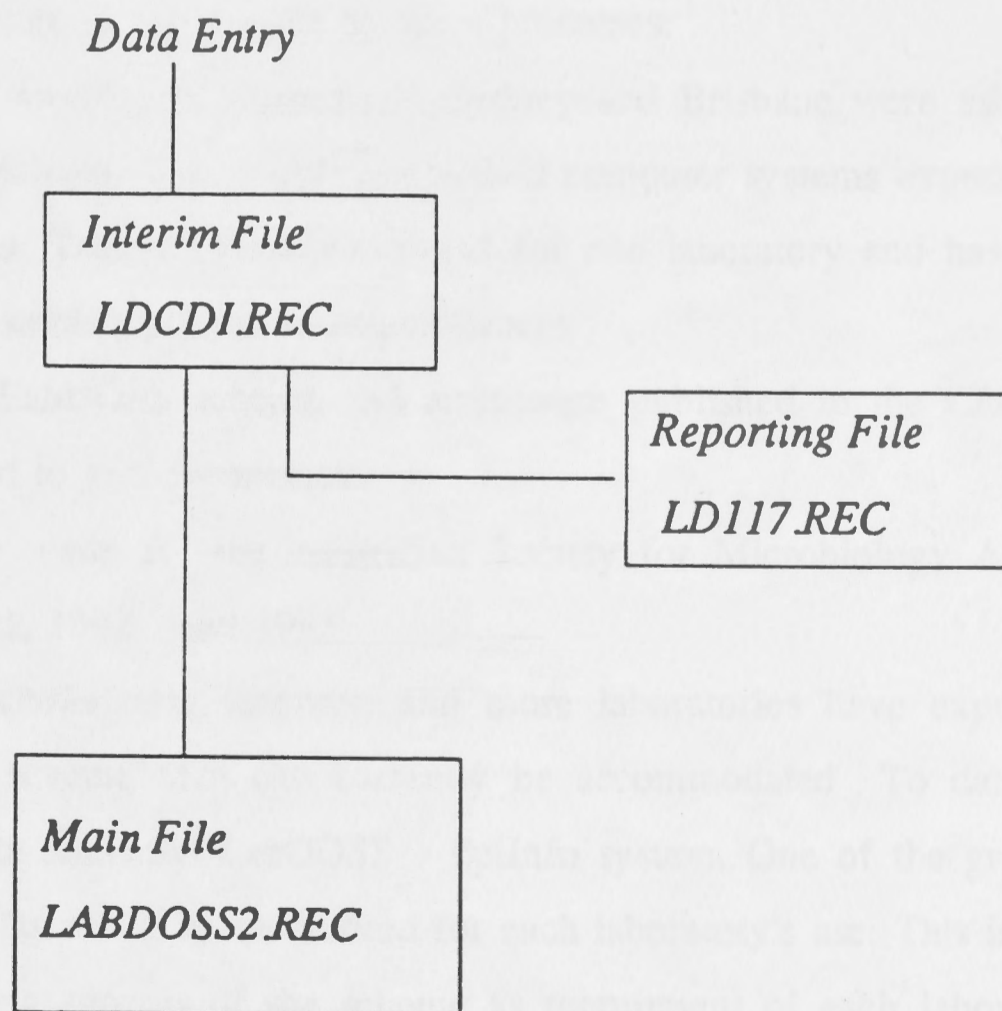
Patient confidentiality is ensured in the LabDOSS scheme, names are not forwarded to the *CDI*. Two initials of the surname, two initials of the first name, the date of birth of the patient and a laboratory specimen code are used to remove duplicate records and follow up incomplete data.

### 1.1.2 History of Development of LabDOSS

Figure 1 . Two Tier Approach of Data Entry and Extraction , *CDI* , LabDOSS

The LabDOSS system is two tiered, as follows:-

- i) An interim file (*LDCDI.REC*) is created for entry of data and for reporting via a file (*LD###.REC*) on diskette to the Communicable Diseases Intelligence bulletin (*CDI*). (The *###* refers to the laboratory number.)
- ii) A main file (*LABDOSS2.REC*) is created for your own laboratory, in which you may do your own analysis, by incorporating the interim file into it.



**Note:** *LDCDI.REC* is used for entering all records.  
*LABDOSS2.REC* is the main file that is used to analyse data.  
*LD###.REC* is copied to diskette for *CDI*.



### 1.1.2 History of Development of LabDOSS

#### Development of a generic CDI form for paper reports

Until 1992 all data provided to the *CDI* were on paper forms. Two forms of different structure were used; a virus reporting form and pathogen reporting form. It would have been inappropriate and confusing to create a third reporting form for the next *CDI* scheme. The obvious, but not necessarily simple solution was to consolidate the existing forms into one. This was a difficult process. Introduction of the generic *CDI* form took place in July 1993. ( Appendix B )

#### LabDOSS versions 2 and 3

The pilot program provided testing of the LabDOSS system in EpiInfo. David Evans and I developed LabDOSS version 2. A further refinement, LabDOSS version 3, was developed in 1993. Full operation of the Lab DOSS scheme began in 1992. A LabDOSS manual was distributed with each installation disc, along with EpiInfo installation discs and manual.

Laboratories were recruited to the scheme by three processes:

- Individual teaching hospital laboratories in Sydney and Brisbane were asked if they would like to participate. Those with established computer systems expressed a wish to download data. This has been successful for one laboratory and has been shown to be a time consuming process in establishment.
- Description of the LabDOSS scheme and aims were published in the *CDI* and laboratories were invited to join the scheme.
- Presentations were made at the Australian Society for Microbiology Annual Scientific Meetings 1991, 1992 and 1993.

There has been an overwhelming response and more laboratories have expressed interest in joining the scheme than can currently be accommodated. To date, all laboratories provide data from the LabDOSS - EpiInfo system. One of the greatest assets of the scheme is its ability to be tailored for each laboratory's use. This is also the most time consuming process of the scheme as recruitment of each laboratory requires alteration of the system and follow up.

### 1.1.2 History of Development of LabDOSS

#### LabViSe

Success in the implementation of the LabDOSS scheme in EpiInfo stimulated the creation of an EpiInfo system for the virus reporting scheme. LabViSe, Laboratory Virology and Serology system, is a copy of the LabDOSS system; identical in structure to LabDOSS with altered look up tables for viruses and clinical history codes. I assisted with the development of LabViSe.

#### Reporting Process

LabDOSS Data are provided fortnightly to the *CDI* on floppy disc. The closing date for receipt of files is two days before *CDI* is forwarded for printing, four days prior to mailing to recipients. After processing the discs all files are deleted and discs are returned to the laboratory. One laboratory sends data via telephone line. I check data fortnightly to exclude duplicate records, to ensure results are correctly coded and the organisms are fully identified.

A two step analysis program has been developed in a process of continual evolution. ( Appendix C LabDOSS analysis programs) Data are decoded, grouped into age groups and organism type for preparation of the fortnightly report. Some laboratories elect to report all organisms, including those classed as probable contaminants. Contaminant organisms are not included in the *CDI* report, however the contaminant list is searched for unusual organisms or an unusually large number of common organisms.





# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 4 - 24 February 1992

### LABDOSS (Laboratory Database of Organisms from Sterile Sites)

LabDOSS is a new CDI laboratory reporting scheme which has been set up to monitor significant isolates from sterile sites. A pilot for the scheme has been operating in several Sydney laboratories for the last six months, and it is hoped that eventually it will be expanded throughout Australia.

Regular reports of the Scheme will be published in the Communicable Diseases Surveillance section of *CDI*, starting with this issue.

#### Aims of the CDI LabDOSS Scheme

Laboratory reports collected in the scheme will supplement the National Notifiable Diseases reports and the limited number of reports of significant isolates collected in the 'Pathogens Reporting Scheme'. (It is planned that LabDOSS will eventually take over the collection of sterile site data from the 'Pathogens Reporting Scheme,' and that the 'Viruses Reporting Scheme' will incorporate the serological reports from the pathogens scheme to become a more general virus and serology reporting scheme.)

The scheme will collect information which is not normally collected or compiled for cases

reported in the National Notifiable Diseases Reports. For *Haemophilus influenzae* for example, it will collect type information, and the clinical characteristics (meningitis, bacteraemia, cellulitis) of each infection. This type of information is currently unavailable Australia-wide, and will prove invaluable in any future assessment of the impact of *Haemophilus influenzae* type b vaccination of children.

Reports of organisms which cause diseases which are not notifiable will also be collected, enabling the surveillance of meningitis and other invasive disease caused by organisms such as *Streptococcus pneumoniae*, *Cryptococcus neoformans* and Group B *Streptococcus*. When the Scheme is fully operational, epidemiological patterns of these organisms will be able to be characterised for the first time on an Australia-wide basis.

LabDOSS sterile sites surveillance also has the potential to enable recognition of outbreaks of unusual organisms causing bacteraemia or other invasive disease. For example, the recent cases of non-toxicogenic *Corynebacterium diphtheriae* endocarditis (*CDI* 15:277) were brought to the attention of *CDI* through this scheme.

Table 2. LabDOSS reports of blood isolates for January 1992<sup>1</sup>

Organism	Number of Isolates	Clinical Information	Risk Factors
GRAM POSITIVE BACTERIA			
<i>Staphylococcus aureus</i>	14	Gastrointestinal 1	Diabetes 2, IV central line 2, Trauma 1, Preterm neonate 1, IV peripheral line 2, Malignancy 1, Neutropaenia 1, Other vascular prosthesis 1, Urinary tract surgery 1
<i>Staphylococcus epidermidis</i>	12	LRTI 1	Malignancy 4, Preterm neonate 1, IV central line 3, Neurological surgery 1
<i>Staphylococcus coagulase negative</i>	7	LRTI 3, Osteomyelitis 1	Other immunocompromised 1
<i>Streptococcus pneumoniae</i>	2	LRTI 1	Neutropaenia 1
<i>Streptococcus milleri</i>	4		Neutropaenia 1
<i>Streptococcus bovis</i>	1	Endocarditis (native valve) 1	Abdominal surgery 1
<i>Streptococcus viridans</i>	1		IV central line 1
<i>Streptococcus alpha-haemolytic</i>	1		
<i>Streptococcus sp.</i>	1		Other Immunocompromised 1
<i>Enterococcus faecalis</i>	1	Endocarditis (prosthetic valve) 1	Other vascular prosthesis 1, Preterm neonate 3
<i>Bacillus sp.</i>	1		Postnatal 1
<i>Corynebacterium JK</i>	1		Neutropaenia 1
<i>Corynebacterium sp</i>	1		

The system will also provide research opportunities through the provision of data, published in *CDI* and otherwise supplied.

LabDOSS is thus similar to the Bacteraemia and Meningitis Surveillance scheme of the Victorian Hospital Pathogens Surveillance Scheme of the Standing Committee on Infection Control of the Health Department of Victoria. This scheme publishes reports of Victorian blood and CSF isolates in its regular report, *VICBUG*.

#### Data Collected in the *CDI* LabDOSS Scheme

Reports in the LabDOSS scheme are of significant isolates cultured from normally sterile sites. One report is made for each episode of infection and comprises three types of data:

1. Clerical data: laboratory patient identification, the first two letters of the patient's first two names (to allow for checking for duplicates), date of specimen collection, sex, date of birth or age, and patient location information (postcode);
2. Clinical data: for example endocarditis, meningitis or cellulitis, risk factors such as recent surgery or an immunocom-

Table 2. LabDOSS reports of blood isolates for January 1992<sup>1</sup>, continued

Organism	Number of Isolates	Clinical Information	Risk Factors
GRAM NEGATIVE BACTERIA			
<i>Escherichia coli</i>	22	LRTI 11, Gastrointestinal 3, UTI 6, Diabetes 1, IV central line 1, Malignancy 2, Transplant 1, HIV infection 1	
<i>Klebsiella oxytoca</i>	1	Gastrointestinal 1	
<i>Klebsiella pneumoniae</i>	4	UTI 1	Trauma 1
<i>Proteus mirabilis</i>	2	LRTI 1	
<i>Proteus vulgaris</i>	1		Urinary tract surgery 1
<i>Gitrobacter</i> sp.	2		Malignancy 1
<i>Enterobacter cloacae</i>	2		Transplant 1
<i>Enterobacter</i> sp.	5	Endocarditis (prosthetic valve) 1	IV central line 1, Preterm neonate 1, Other immunocompromised 1
<i>Morganella morganii</i>	1	Gastrointestinal 1	Abdominal surgery 1
<i>Serratia liquefaciens</i>	1		Malignancy
<i>Pseudomonas aeruginosa</i>	4	UTI (catheter, instrumentation) 1	Neutropaenia, Abdominal surgery 1
<i>Pseudomonas fluorescens</i>	1		Neutropaenia 1
<i>Xanthomonas maltophilia</i>	2	Gastrointestinal 1	IV central line 1
<i>Pseudomonas</i> sp.	1		Neutropaenia 1
<i>Salmonella typhi</i>	1		
<i>Aeromonas hydrophila</i>	1		Preterm neonate 1
<i>Haemophilus influenzae</i> (not typable)	2	LRTI 2	
<i>Haemophilus influenzae</i> type b	2	Skin/cellulitis/wound 1	Diabetes 1
<i>Neisseria meningitidis</i> group B	1		
<i>Neisseria sicca</i> /subflava	1	Thyroglossal cyst 1	
<i>Acinetobacter</i> sp.	1		Preterm neonate 1
<i>Flavobacterium</i> sp.	1	Gastrointestinal 1	Other vascular prosthesis 1
<i>Cardiobacterium hominis</i>	1	Endocarditis (native valve) 1	
ANAEROBES			
<i>Bacteroides fragilis</i>	1	Gastrointestinal 1	Malignancy 1
<i>Peptostreptococcus</i> sp.	1		
<i>Clostridium perfringens</i>	1		
FUNGI			
<i>Candida albicans</i>	1		
<i>Torulopsis glabrata</i>	1		Transplant 1
Total	119		

1. LRTI - Lower respiratory tract infection/pneumonia  
UTI - Urinary tract infection



Table 3. LabDOSS CSF isolates and meningitis reports for January 1992

Organism	Number of Isolates	Age (years)	Source Specimen	Risk Factors
<i>Cryptococcus neoformans</i>	1	31	Blood	HIV infection
<i>Staphylococcus epidermidis</i>	1	25	CSF	Neurological surgery
<i>Klebsiella oxytoca</i>	1	25	CSF	Neurological surgery
<i>Acinetobacter calcoaceticus</i>	1	34	CSF	Neurological surgery

promised state, and whether or not the patient died as a result of the infection;

3. Microbiological data: source specimen, method of diagnosis (isolation, antigen detection, antibody detection) and an identification of the organism which is as full as the laboratory has determined.

LabDOSS reports can be provided to *CDI* on paper forms, or data can be entered into a computer using the LabDOSS program and then sent on floppy disk.

The LabDOSS program has been written in EpiInfo, a program which was developed at the Centers for Disease Control in Atlanta, USA. It combines word processing, database management, statistical analysis and graphics into a package which can be used by those with minimal experience with computers. The EpiInfo software, LabDOSS programs, EpiInfo manual and LabDOSS manual are all provided free of charge to laboratories that may wish to contribute to the LabDOSS scheme. (An IBM compatible personal computer is required.)

An important feature of the system is that the LabDOSS programs can be tailored to the individual needs of the laboratory whilst retaining the ability to generate reports for *CDI*. Laboratories can record data other than those required for *CDI* reports, for example, full names and addresses of patients, refer-

ring practitioners, and details of 'contaminants'. They can then use the programs to store and analyse both the data that are sent to *CDI* and their supplementary data.

Enquiries from laboratories wishing to join the LabDOSS Scheme, or general enquiries on the system are welcome. The contact person is Dr Leslee Roberts, phone (06) 289 7217.

Tabulated LabDOSS data will be published regularly in *CDI* as will assessments and reviews of the data. Data for January 1992 from the pilot scheme is presented in this edition of *CDI* in three groups; bacteraemia reports (Table 2), meningitis and CSF reports (Table 3) and other sterile site isolate reports (Table 4).

Contribution laboratories for January were the Institute of Clinical Pathology and Medical Research, Sydney (47 reports), the South-west Area Pathology Service, Liverpool (26 reports), and the Royal Prince Alfred Hospital, Camperdown (54 reports).

Table 4. LabDOSS reports from other sterile sites for January 1992

Site	Organism	
Peritoneal dialysate	<i>Pseudomonas aeruginosa</i>	1
	<i>Staphylococcus epidermidis</i>	1
	<i>Candida tropicalis</i>	1
Peritoneal fluid	<i>Staphylococcus aureus</i>	1



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 6 - 28 March 1992

### LabDOSS (Laboratory Database of Organisms from Sterile Sites)

The data are from the three Sydney laboratories in the pilot scheme. Since so many types of organisms are reported each month, the tables of blood isolates and CSF/Meningitis reports will include only organisms which have been reported 5 or more times from now on. Other isolates will be briefly mentioned in text.

The format of the blood isolates table has been changed by grouping the risk factors and clinical information categories. The details of these data, and other data such as age, sex and postcode, will be presented periodically, and is available to those who are interested.

The response to the invitation for laboratories to join LabDOSS has been very positive; 12 laboratories in 3 capital cities have indicated their interest in joining the scheme. Further information on the scheme was included in CDI 16:80-81, and enquiries are welcome on (06) 289 7217.

Interesting isolates reported for February were a *Gemella haemolysans* isolated from

blood samples of a patient with a central IV line, a *Corynebacterium aquaticum* from the blood of an immunocompromised patient, a *Staphylococcus epidermidis* from the CSF of a 17 year old neurological surgery patient, a *Yersinia enterocolitica* from blood of a pregnant woman and *Salmonella typhi* from blood of two patients who had travelled overseas (India and the Philippines).

Other reports not included in the Table were 3 *Streptococcus pneumoniae*, 1 *Streptococcus* Group A, 2 *Streptococcus* Group B, 1 *Streptococcus* Group G, 1 *Streptococcus sanguis*, 1 *Streptococcus milleri*, 1 *Streptococcus mitis*, 2 *Enterococcus faecalis*, 1 *Enterococcus* sp, 1 *Corynebacterium* JK, 1 *Bacillus cereus*, 1 *Morganella morganii*, 1 *Citrobacter freundii*, 1 *Enterobacter cloacae*, 4 *Enterobacter* sp, 1 *Serratia* sp, 1 *Pseudomonas cepacia*, 2 *Pseudomonas* sp, 2 *Xanthomonas maltophilia*, 2 *Aeromonas hydrophilia*, 1 *Neisseria meningitidis* group C, 1 *Acetivobacter* sp, 1 *Acetivobacter calcoaceticus*, 2 *Bacteroides fragilis*, 1 *Propionibacterium avidium*, 1 *Candida albicans*, 1 *Mycobacterium* sp, 1 *Klebsiella* sp (from CSF of a 22 year old), and 1 *Staphylococcus aureus* and 1 *Staphylococcus epidermidis* from peritoneal dialysates.

Table 8. LabDOSS reports of blood isolates for February 1992<sup>1</sup>

Organism	Total <sup>1</sup>	Risk Factors						Clinical Information						
		Surgery	Immunosuppressed	IV line	Perinatal	Neonatal	Nosocomial	Overseas Travel	Lower Respiratory	Meningitis	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint
<i>Staphylococcus aureus</i> <sup>2</sup>	22	2	5	4									1	1
<i>Staphylococcus epidermidis</i>	24	1	3	4		2	2				3			
<i>Staphylococcus</i> - coagulase neg	7		2								1			
<i>Escherichia coli</i>	21		3		1	2			2		4	2		
<i>Klebsiella</i> spp <sup>3</sup>	8		1	1							1			
<i>Pseudomonas aeruginosa</i>	7	1	4	1								1		

1. Only organisms with 5 or more isolations are included in this Table.

2. Includes 3 MRSA (Methicillin-Resistant *S. aureus*).

3. Includes 2 *K. pneumoniae* and 1 *K. oxytoca*.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 8 - 20 April 1992

### Sterile Sites Surveillance

There has been continued support of and interest in LabDOSS (Laboratory Database of Organisms from Sterile Sites), and the system has now been sent out to 16 laboratories. Data for March have been provided by five laboratories, with the welcome additions of the Central Queensland Pathology Laboratory and the Central Coast Area Health Service (NSW).

A total of 180 reports were received for March (Westmead 48, Liverpool 28, Royal Prince Alfred 83, Central Queensland Pathology 4 and Central Coast Area Health Service 17).

Organisms reported 5 or more times from blood are detailed in Table 2. Other interesting blood isolates reported include *Vibrio cholerae* in a male (unknown age) with a history of watery diarrhoea and travel to Tonga 5 weeks previously. There were two reports of *Haemophilus influenzae*: type B in a 2 year old male with epiglottitis, and no type provided for a 30 year old female.

Other blood isolates not included in the Table were:

**Gram positive:** 4 *Streptococcus pneumoniae*, 1 *Streptococcus* Group A, 2 *Streptococcus* Group B, 1 *Streptococcus* Group G, 1 *Streptococcus sanguis*, 3 *Streptococcus viridans* group, 3 *Streptococcus 'milleri'*, 1 *Streptococcus constellatus*, 1 *Streptococcus mitis*, 1 *Streptococcus* sp, 1 *Lactococcus cremoris*, 1 *Gemella* sp, 1 *Bacillus* sp.

**Gram negative:** 2 *Proteus mirabilis*, 1 *Citrobacter diversus*, 2 *Citrobacter freundii*, 3 *Xanthomonas maltophila*, 3 *Salmonella* spp, 1 *Eikenella corrodens*.

**Anaerobes:** 3 *Bacteroides fragilis*, 1 *Bacteroides uniformis*, 1 *Peptostreptococcus* sp, 2 *Clostridium perfringens*.

**Fungi:** 2 *Candida parapsilosis*, 1 *Candida guilliermondii*, 3 *Candida albicans*, 1 *Candida* sp, 1 *Torulopsis* sp.

**Mycobacteria:** 1 atypical and 1 not identified.

Table 2. Sterile sites surveillance reports of blood isolates for March 1992<sup>1</sup>

Organism	Total <sup>1</sup>	Clinical information						Risk Factors					
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal	Nosocomial
<i>Staphylococcus aureus</i>	19 <sup>2</sup>	1				2	1	2	4	5			1
<i>Staphylococcus epidermidis</i>	22		1				1	1	5	7	1		
<i>Staphylococcus coagulase negative</i>	10		1						2	2			
<i>Enterococcus</i> species	7 <sup>3</sup>		1				1		3			2	
<i>Escherichia coli</i>	25			1	15			3	8	1			2
<i>Klebsiella</i> species	5 <sup>4</sup>				1				1	2			
<i>Enterobacter</i> species	11 <sup>5</sup>			1	5		1	1	4	2			
<i>Pseudomonas aeruginosa</i>	8								2	1	1	2	

1. Only organisms with 5 or more isolations are included in this table

2. Includes 1 MRSA

3. *E. faecalis* (6) *E. faecium* (1)

4. *K. pneumoniae* (4), *Klebsiella* sp (1)

5. *E. cloacae* (7) *E. aerogenes* (2) *Enterobacter* sp (2)



**CSF Isolates and Meningitis Reports**

*Listeria monocytogenes* in a 49 year old male.  
*Neisseria meningitidis* group C in a 32 year old male.

*Klebsiella* sp in a 16 year old male.

*Staphylococcus epidermidis* in males aged 64 years, 31 years, 56 years and 23 years, and females aged 45 years and 28 years. Five of these were associated with neurological surgery.

*Acinetobacter calcoaceticus* in a 2 week old

male with a IV central line.

*Pseudomonas aeruginosa* in a 77 year old male.

**Isolates from sites other than blood or CSF**

**Peritoneal dialysate:** 2 *Staphylococcus epidermidis*, 1 *Streptococcus viridans*, 1 *Klebsiella oxytoca*.

**Joint fluid:** 1 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*, 1 *Streptococcus* group G.

**Other:** *Escherichia coli* (prosthetic joint tissue) and *Streptococcus* group A (retro-peritoneal abscess).

A total of 153 reports were received for April from Prince Alfred 15, Liverpool 27, Glenfield 14, Royal North Shore 49, Central Queensland Pathology Laboratory 3 and Queensland 11.

Grams reported 5 or more from blood are detailed in Table 2. Other blood isolates reported include 27 *Streptococcus* group B. One was from a 4 year old female with meningitis and the other was from a 3 month old female with systemic catarrhs.

Other blood isolates not included in Table 2 were:

Group positive 2 *Staphylococcus epidermidis*, 1 *Streptococcus pneumoniae*, 1 *Streptococcus* Group B, 1 *Streptococcus anginosus*, 1 *Streptococcus* milk 17, 1 *Streptococcus* 2, *Enterococcus* species, 1 *Corynebacterium* 1K, 1 *Corynebacterium* species, 2 *Bacillus* spp., 1 *Bacillus* species.

Gram negative 1 *Proton mirabilis*, 1 *Morganella morganii*, 1 *Enterobacter aerogenes*, 2 *Escherichia* species, 1 *Pseudomonas* species.

Table 2: Details sites surveillance of reports of blood isolates for April 1984

Organism	Total	Clinical Terminals				Other Sites			
		Prince Alfred	Liverpool	Glenfield	Other	Prince Alfred	Liverpool	Glenfield	Other
<i>Streptococcus</i> group B	27	3	3	1	1	1	2	2	2
<i>Streptococcus</i> group A	1			2					
<i>Streptococcus</i> group G	1			1					
<i>Streptococcus</i> group D	1			1					
<i>Streptococcus</i> group C	1			1					
<i>Streptococcus</i> group E	1			1					
<i>Streptococcus</i> group F	1			1					
<i>Streptococcus</i> group H	1			1					
<i>Streptococcus</i> group I	1			1					
<i>Streptococcus</i> group J	1			1					
<i>Streptococcus</i> group K	1			1					
<i>Streptococcus</i> group L	1			1					
<i>Streptococcus</i> group M	1			1					
<i>Streptococcus</i> group N	1			1					
<i>Streptococcus</i> group O	1			1					
<i>Streptococcus</i> group P	1			1					
<i>Streptococcus</i> group Q	1			1					
<i>Streptococcus</i> group R	1			1					
<i>Streptococcus</i> group S	1			1					
<i>Streptococcus</i> group T	1			1					
<i>Streptococcus</i> group U	1			1					
<i>Streptococcus</i> group V	1			1					
<i>Streptococcus</i> group W	1			1					
<i>Streptococcus</i> group X	1			1					
<i>Streptococcus</i> group Y	1			1					
<i>Streptococcus</i> group Z	1			1					

1 Only specimens with 2 or more positive blood cultures.  
 2 Includes 12A, pneumoniae and 2K, agalactiae.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 10 - 18 May 1992

### Sterile Sites Surveillance

The LabDOSS (Laboratory Database of Organisms from Sterile Sites) system has now been sent out to 24 laboratories. Data for April have been provided by six laboratories, of which repatriation General Hospital, Concord, Royal North Shore Hospital and Toowoomba General Hospital are new additions to the Scheme.

A total of 183 reports were received for April (Royal Prince Alfred 53, Liverpool 27, Concord 43, Royal North Shore 49, Central Queensland Pathology Laboratory 3 and Toowoomba 8).

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates reported include 2 *Haemophilus influenzae* type B. One was from 4 year old female with pneumonia and the other was from a 6 month old female with forearm osteomyelitis.

Other blood isolates not included in Table 2 were:

**Gram positive:** 3 *Staphylococcus coagulase* negative, 4 *Streptococcus pneumoniae*, 2 *Streptococcus* Group B, 1 *Streptococcus sanguis*, 1 *Streptococcus 'milleri'*, 3 *Streptococcus* species, 1 *Enterococcus* species, 1 *Corynebacterium JK*, 1 *Corynebacterium* species, 2 *Bacillus cereus*, 1 *Bacillus* species.

**Gram negative:** 1 *Proteus mirabilis*, 1 *Morganella morganii*, 1 *Enterobacter aerogenes*, 2 *Enterobacter* species, 1 *Pseudomonas* species,

2 *Aeromonas hydrophila*, 1 *Acinetobacter calcoaceticus*, 3 *Acinetobacter* species, 1 *Citrobacter freundii*, 1 *Camylobacter jejuni*, 2 *Xanthomonas maltophilia*, 2 *Serratia liquefaciens*.

**Anaerobes:** 3 *Bacteroides fragilis*, 2 *Bacteroides corporis*, 2 *Bacteroides* species, 1 *Fusobacterium* sp.

**Mycobacteria:** 1 *Mycobacterium* species.

**Fungi:** 3 *Candida albicans*

### CSF Isolates and Meningitis Reports

There were two reports of meningitis due to *Streptococcus pneumoniae* isolated from blood. One was a 7 month old female and the other was a 15 month old child. Other CSF isolates were *Acinetobacter iwoffii* from a 32 year old male, *Propionibacterium acnes* from a 67 year old male, and *Staphylococcus epidermidis* from a 75 year old male.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Enterobacter cloacae*, 1 *Escherichia coli*, 5 *Staphylococcus epidermidis*, 1 *Micrococcus* species, 1 *Pseudomonas stutzeri*.

**Joint fluid:** 1 *Acinetobacter* species, 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.

**Pleural fluid:** 1 *Bacteroides* species, 1 *Pseudomonas* species, 1 *Staphylococcus aureus*.

**Other:** *Escherichia coli* (peritoneal swab from perforated appendix), *Staphylococcus aureus* (thoracic diskitis).

Table 2. Sterile sites surveillance of reports of blood isolates for April 1992<sup>1</sup>

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors			
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal
<i>Staphylococcus aureus</i>	20	1	1		1	1	7	2	3	9	
<i>Staphylococcus epidermidis</i>	17		1				1	1	1	13	1
<i>Enterococcus faecalis</i>	6			2				1	3	1	
<i>Escherichia coli</i>	29			4	15			2	13	1	1
<i>Klebsiella</i> species <sup>2</sup>	15			4	3		1	2	4	2	
<i>Pseudomonas aeruginosa</i>	7	1		2	3			1	4		
<i>Enterobacter cloacae</i>	8	2		2	2		1	2	3	1	

1. Only organisms with 5 or more reports are included in this table.

2. Includes 12 *K. pneumoniae* and 1 *K. oxytoca*.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 12 - 15 June 1992

### Sterile Sites Surveillance (LabDOSS)

Data for May have been provided by eight laboratories, of which Nambour General Hospital, Royal Brisbane Hospital (with Royal Women's and Royal Children's Hospitals, Brisbane) and Gosford Hospital are new additions to the Scheme.

A total of 462 reports were received (Royal Prince Alfred 47, Royal North Shore 51, Gosford 15, Concord 35, Brisbane 244, Central Queensland Pathology Laboratory 3, Nambour 2 and Toowoomba 16). Most of the reports were for May isolates, but the Royal Brisbane Hospital's report covered the period January to May.

#### Blood Isolates

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** 4 *Streptococcus* Group A, 3 *Streptococcus milleri*, 3 *Streptococcus* Group G, 4 *Streptococcus* species, 1 *Enterococcus* species, 1 *Corynebacterium xerosis*, 1 *Listeria monocytogenes*.

**Gram negative:** 3 *Klebsiella* species, 2 *Klebsiella oxytoca*, 1 *Enterobacter aerogenes*, 2 *Enterobacter cloacae*, 2 *Enterobacter* species, 1 *Pseudomonas cepacia*, 1 *Pseudomonas fluorescens*, 1 *Pseudomonas paucimobilis*, 4 *Pseudomonas* species, 2 *Serratia liquefaciens*, 1 *Proteus* species, 1 *Citrobacter diversus*, 3 *Salmonella* Typhi, 1 *Neisseria meningitidis*, 3 *Xanthomonas maltophilia*, 4 *Acinetobacter* species, 1 *Kingella kingae*, 1 *Gemella* species, 2 *Flavobacterium* species.

**Anaerobes:** 4 *Bacteroides fragilis*, 1 *Bacteroides corporis*, 1 *Bacteroides melaninogenicus*, 1 *Bacteroides thetaotaomicron*, 1 *Bacteroides ovatus*, 1 *Peptostreptococcus* species, 3 *Propionibacterium* species, 3 *Clostridium perfringens*, 1 *Clostridium* species.

**Fungi:** 2 *Candida* species.

Table 2. LabDOSS reports of blood isolates for May 1992

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/ Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	51	3	1	2		3	9	11	15	10	1	1
<i>Staphylococcus epidermidis</i>	49	7	1	1	1		7	5	10	19		1
<i>Staphylococcus coagulase negative</i>	52	8	1	4	2	2	4	7	14	6		2
<i>Streptococcus pneumoniae</i>	12	6					1		1			
<i>Streptococcus group B</i>	7				1					1		2
<i>Streptococcus viridans</i>	5								3	1		1
<i>Streptococcus sanguis</i>	5	1		1				1	1			
<i>Enterococcus faecalis</i>	5	1					2	1	1	2		
<i>Corynebacterium</i> species	6			2			1		3	1		
<i>Bacillus</i> species	6	1					1		2	1		
<i>Escherichia coli</i>	64	3		6	24	1	1	11	4	3		1
<i>Klebsiella pneumoniae</i>	16	5		2	3			4	5	2		
<i>Proteus mirabilis</i>	6				3			2	2	1		
<i>Enterobacter cloacae</i>	16			4	1			3	4	4		2
<i>Pseudomonas aeruginosa</i>	26	5		1	3		4	7	13	1		
<i>Haemophilus influenzae</i>	9				1		2					



**CSF Isolates and Meningitis Reports**

There were eight cases of meningitis reported during this period. One was an isolate of *Haemophilus influenzae* type B from a one year old female. Other CSF isolates were *Corynebacterium* species in a male after surgery, *Cryptococcus neoformans* in a immunocompromised female, *Escherichia coli* in a female, *Staphylococcus aureus* from a 14 year old female, *Staphylococcus epidermidis* from a 23 year old female, and *Staphylococcus sanguis* and *Streptococcus mitis* from males after surgery.

**Isolates from Sites other than Blood or CSF**

**Peritoneal dialysate:** 1 *Klebsiella pneumoniae*, 1 *Streptococcus viridans*, 2 *Staphylococcus epidermidis*.

**Joint fluid:** 1 *Streptococcus* Group G, 3 *Staphylococcus aureus*.

**Other:** 1 *Escherichia coli*, 3 *Staphylococcus aureus* (1 MRSA), 1 *Candida albicans*, 1 *Proteus mirabilis*, 1 *Xanthomonas maltophilia*.

Table 1. CSF Isolates and Meningitis Reports for June 1992

Table 2. Isolates from Sites other than Blood or CSF for June 1992

Table 3. CSF Isolates and Meningitis Reports for July 1992

Table 4. Isolates from Sites other than Blood or CSF for July 1992

Table 5. CSF Isolates and Meningitis Reports for August 1992

Table 6. Isolates from Sites other than Blood or CSF for August 1992

Table 7. CSF Isolates and Meningitis Reports for September 1992

Table 8. Isolates from Sites other than Blood or CSF for September 1992

Table 9. CSF Isolates and Meningitis Reports for October 1992

Table 10. Isolates from Sites other than Blood or CSF for October 1992

Table 11. CSF Isolates and Meningitis Reports for November 1992

Table 12. Isolates from Sites other than Blood or CSF for November 1992

Table 13. CSF Isolates and Meningitis Reports for December 1992

Table 14. Isolates from Sites other than Blood or CSF for December 1992

Table 1. CSF Isolates and Meningitis Reports for June 1992

Case No.	Age	Sex	Site	Organism
1	1	F	CSF	<i>Haemophilus influenzae</i> type B
2	14	F	CSF	<i>Staphylococcus aureus</i>
3	23	F	CSF	<i>Staphylococcus epidermidis</i>
4	1	M	CSF	<i>Corynebacterium</i> species
5	1	M	CSF	<i>Streptococcus mitis</i>
6	1	M	CSF	<i>Staphylococcus sanguis</i>
7	1	F	CSF	<i>Escherichia coli</i>
8	1	F	CSF	<i>Cryptococcus neoformans</i>

Table 2. Isolates from Sites other than Blood or CSF for June 1992

Table 3. CSF Isolates and Meningitis Reports for July 1992

Table 4. Isolates from Sites other than Blood or CSF for July 1992

Table 5. CSF Isolates and Meningitis Reports for August 1992

Table 6. Isolates from Sites other than Blood or CSF for August 1992

Table 7. CSF Isolates and Meningitis Reports for September 1992

Table 8. Isolates from Sites other than Blood or CSF for September 1992

Table 9. CSF Isolates and Meningitis Reports for October 1992

Table 10. Isolates from Sites other than Blood or CSF for October 1992

Table 11. CSF Isolates and Meningitis Reports for November 1992

Table 12. Isolates from Sites other than Blood or CSF for November 1992

Table 13. CSF Isolates and Meningitis Reports for December 1992

Table 14. Isolates from Sites other than Blood or CSF for December 1992



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 14 - 13 July 1992

### Sterile Sites Surveillance (LabDOSS)

Data for June have been provided by seven laboratories. The Prince Charles Hospital, Brisbane, Northern Tasmania Pathology Service and Royal Hobart Hospital are new additions to the Scheme this month.

A total of 155 reports were received (Royal Prince Alfred 63, Royal Hobart Hospital 21, Liverpool 28, The Prince Charles Hospital 10, Northern Tasmania Pathology Service 1, Nambour 10 and Toowoomba 22).

Organisms reported 5 or more times from blood are detailed in Table 5. Other blood isolates not included in Table 5 were:

**Gram positive:** 1 *Streptococcus* Group A, 1 *Streptococcus* Group B, 1 *Streptococcus* Group C, 3 *Streptococcus milleri*, 2 *Streptococcus* Group G, 2 *Staphylococcus* coagulase negative, 1 *Aerococcus* species, 1 *Enterococcus faecium*, 1 *Corynebacterium* species.

**Gram negative:** 3 *Klebsiella* species, 2 *Klebsiella oxytoca*, 2 *Klebsiella pneumoniae*, 1 *Enterobacter* species, 1 *Pseudomonas cepacia*, 4 *Pseudomonas aeruginosa*, 1 *Serratia liquefaciens*, 1 *Proteus* species, 2 *Proteus mirabilis*, 1 *Neisseria meningitidis*, 1 *Xanthomonas maltophilia*, 2 *Acinetobacter* species, 3 *Haemophilus influenzae* type b, 1 *Citrobacter freundii*, 1 *Moraxella* species.

**Anaerobes:** 2 *Bacteroides* species, 1 *Bacteroides theta*, 1 *Peptostreptococcus* species, 1 *Clostridium* species.

**Fungi:** 1 *Candida albicans*, 1 *Pseudallescheria boydii*, 1 *Torulopsis glabrata*.

**Mycoplasma:** 1 *Mycoplasma* species, 1 *Ureaplasma urealyticum*.

### CSF Isolates and Meningitis Reports

There were seven reports of meningitis during this period. One was an isolate of *Haemophilus influenzae* type b from a 10 month old male. Other CSF isolates were *Neisseria meningitidis* in a 5 month old female, *Cryptococcus neoformans* in an immunocompromised female and in a 57 year old immunocompromised male and *Nocardia* species in a 24 year old male. Both *Staphylococcus aureus* and *Staphylococcus epidermidis* were isolated from a 44 year old male following neurosurgery.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Staphylococcus aureus*, 2 *Staphylococcus epidermidis*, and 1 *Enterobacter agglomerans* from persons with peritonitis complicating chronic ambulatory peritoneal dialysis. *Escherichia coli* was isolated from a 45 year old female with gastrointestinal illness.

**Joint fluid:** *Clostridium perfringens* from a 88 year old male with no history of injury.

**Other:** 4 *Staphylococcus aureus* (1 from femur tissue, 1 MRSA from a patient with endocarditis who died) 1 *Streptococcus* Group B, 2 *Pseudomonas aeruginosa* following orthopaedic surgery.

Table 4. LabDOSS reports of blood isolates for June 1992

Organism	Total <sup>1</sup>	Clinical Information					Risk Factors				
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	20	1	1	2		3	7	1	8		1
<i>Staphylococcus epidermidis</i>	15	1		2		1	2	2	4		3
<i>Streptococcus pneumoniae</i>	5	3									
<i>Streptococcus sanguis</i>	5		1	1			1	1			
<i>Enterococcus faecalis</i>	6			2			2	1	1		
<i>Escherichia coli</i>	27	2		5	10		4	7		2	
<i>Enterobacter cloacae</i>	6			2				1	4		

1. Only organisms with 5 or more reports are included in this table.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 17 - 24 August 1992

### Sterile Sites Surveillance (LabDOSS)

Data for July have been provided by ten laboratories, and Concord Hospital, Gosford Hospital, Northern Tasmania Pathology Service, Central Queensland Pathology Laboratory and Royal Hobart Hospital have also provided data for June.

A total of 394 reports have been included for this report (Royal Prince Alfred 53, Royal Hobart Hospital 14, Liverpool Hospital 90, Concord Hospital 91, Royal North Shore Hospital 33, Gosford Hospital 56, Northern Tasmania Pathology Service 25, Central Queensland Pathology Laboratory 10 Nambour Hospital 9 and Toowoomba Hospital 13).

Sixty four isolates of *Staphylococcus aureus* were reported during this period. Of these, thirty isolates were further identified as methicillin resistant *Staphylococcus aureus* (MRSA) and were reported by six laboratories (Liverpool Hospital 3, Royal Prince Alfred Hospital 17, Gosford Hospital 3, Toowoomba Hospital 2, Northern Tasmania Pathology Service 4 and Royal Hobart Hos-

pital 1). These isolates were obtained from patients aged between 40 and 89.

Concord Hospital reported a case of enteric fever in a 12 year old male. *Salmonella paratyphi* was isolated from a blood sample of this patient who probably acquired the infection in Sri Lanka.

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates not included in Table 3 were:

**Gram positive:** 2 *Streptococcus* Group A, 4 *Streptococcus* Group B, 1 *Streptococcus* Group G, 1 *Streptococcus milleri*, 2 *Streptococcus viridans*, 1 *Streptococcus mitis*, 1 *Listeria monocytogenes*, 1 *Corynebacterium* Group JK, 1 *Corynebacterium xerosis*, 1 *Corynebacterium* species.

**Gram negative:** 2 *Campylobacter jejuni*, 1 *Campylobacter* species, 3 *Klebsiella* species, 1 *Enterobacter aerogenes*, 1 *Serratia marcescens*, 1 *Proteus* species, 4 *Xanthomonas maltophilia*, 4 *Acinetobacter* species, 2 *Citrobacter freundii*, 1 *Citrobacter diversus*, 1 *Citrobacter* species, 1 *Aeromonas hydrophila*, 1 *Aeromonas* species, 1 *Flavobacterium* species.

Table 3. LabDOSS reports of blood isolates for July 1992

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors					
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal	Nosocomial
<i>Staphylococcus aureus</i>	64	4	7	1	2	6	8	3	10	16		1	
<i>Staphylococcus epidermidis</i>	22			1	2		1	2	3	10		1	
<i>Staphylococcus coagulase negative</i>	8								1	1			
<i>Streptococcus pneumoniae</i>	33	23							3				
<i>Streptococcus sanguis</i>	7		2			1			1				
<i>Streptococcus</i> species	7			3			1		4				
<i>Enterococcus faecalis</i>	9		1	1	4				3	1			
<i>Escherichia coli</i>	60			8	21	1		5	11	1			
<i>Haemophilus influenzae</i> type b	9	1					1						
<i>Klebsiella oxytoca</i>	6				1			1		1		1	1
<i>Klebsiella pneumoniae</i>	5			1	1					2		1	1
<i>Proteus mirabilis</i>	9				3		2		3	2			
<i>Pseudomonas aeruginosa</i>	13	2		1	2			1	7		1		
<i>Candida albicans</i>	6								1	4		1	

1. Only organisms with 5 or more reports are included in this table.



**Anaerobes:** 1 *Bacteroides* species, 4 *Bacteroides fragilis*, 1 *Bacteroides loescheii*, 1 *Peptostreptococcus* species, 2 *Clostridium* species, 1 *Clostridium perfringens*, 1 *Fusobacterium nucleatum*, 1 *Fusobacterium* species.

**Fungi:** 2 *Candida* species, 1 *Debryomyces hansenii*.

#### CSF Isolates and Meningitis Reports

There were 20 reports of meningitis during this period. *Haemophilus influenzae* type b was isolated from 5 cases. All were under the age of 4 years and one isolate was reported as methicillin resistant. There was one isolate of *Haemophilus parainfluenzae* reported, from a 23 year old male following surgery. *Neisseria meningitidis* was isolated from 5 cases. Three cases were under the age of 1 year and one isolate was reported in a 15 year old female. One *Staphylococcus aureus* was reported in a 67 year old male following lower respiratory tract infection. *Streptococcus pneumoniae* was reported in 2 females under the age of 1 year. *Streptococcus sanguis* was reported in a 77 year old female following surgery. *Corynebacterium* species was isolated from 2 females, aged 25 and 28, following shunt surgery. *Cryptococcus neoformans* was isolated from 2 immunocompromised males. *Salmonella* species was reported from a 29 year old female.

#### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 9 *Staphylococcus aureus* isolates were reported during this period; chronic ambulatory peritoneal dialysis was the risk factor for 7 of these. *Staphylococcus epidermidis* was reported from a 76 year old with chronic liver disease. *Enterobacter faecalis* was reported from a male and a female, both aged 74 years. Other isolates were *Escherichia coli* in a 70 year old male, *Klebsiella pneumoniae* in a 74 year old female, *Acinetobac-*

*ter* species in a 42 year old female with peritonitis, *Citrobacter freundii* in a 70 year old male with chronic renal failure, 1 *Streptococcus sanguis*, 1 *Streptococcus* Group B, 1 *Streptococcus* species, 1 *Pseudomonas aeruginosa*.

**Joint fluid:** 5 *Staphylococcus aureus* reported from males whose ages ranged from 28 to 64 years. There were 2 reports of *Staphylococcus epidermidis*, one from a 70 year old male with an infected prosthetic knee joint, and the other from a 78 year old male with osteoarthritis. *Streptococcus* Group A was reported from a 23 year old male with pre-patellar bursitis, *Peptostreptococcus* species was reported from 84 year old female, *Pseudomonas* species reported from a 69 year old male, and *Yersinia enterocolitica* from a 27 year old female with chronic ambulatory peritoneal dialysis as a risk factor.

**Pleural fluid:** 5 *Staphylococcus aureus* reported from males whose ages ranged from 56 to 87 years. Clinical diagnosis of these cases included lung abscess, empyema, perforated oesophagus and mediastinitis. *Staphylococcus epidermidis* was reported from a 66 year old male with aspiration pneumonia, *Streptococcus sanguis* from a 21 year old male with lower respiratory tract infection, *Streptococcus milleri* from a 39 year old male with empyema, 1 *Pseudomonas aeruginosa*, 1 *Klebsiella pneumoniae*, 2 *Enterobacter aerogenes* (one from a 71 year old male with a perforated oesophagus), and 1 *Candida albicans* from a 71 year old male with empyema.

**Other:** 1 *Candida albicans* and 1 *Candida* species from renal cysts of 2 male patients.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 19 - 21 September 1992

### Sterile Sites Surveillance (LabDOSS)

Data for August have been provided by nine laboratories, and Dr TB Lynch, Pathologist, Rockhampton is a new addition to the LabDOSS system.

A total of 285 reports have been included for this report (Royal Prince Alfred 54, Liverpool Hospital 70, Concord Hospital 44, Royal North Shore Hospital 63, Northern Tasmania Pathology Service 16, Central Queensland Pathology Laboratory 2, Nambour Hospital 14, Toowoomba Hospital 9 and TB Lynch Pathologists Rockhampton 13).

- Sixty-six isolates of *Staphylococcus aureus* were reported during this period. Of these, nine isolates were further identified as methicillin resistant *Staphylococcus aureus* (MRSA) and were reported by three laboratories (Liverpool Hospital 2, Concord Hospital 6 and Nambour Hospital 1). Eight isolates were obtained from patients aged between 70 and 90 years.
- Liverpool Hospital reported a case of enteric fever in a 12 year old female.

*Salmonella* Typhi was isolated from a blood sample of this patient.

- Two cases of *Plasmodium vivax* were reported in males aged 31 years and 36 years, following travel to the Solomon Islands.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 3 are:

**Gram positive:** 2 *Streptococcus* Group G, 2 *Streptococcus milleri*, 1 *Streptococcus viridans*, 3 *Streptococcus sanguis*, 1 *Corynebacterium* Group JK, 1 *Corynebacterium* species, 1 *Staphylococcus saprophyticus*, 1 *Enterococcus* species.

**Gram negative:** 3 *Klebsiella* species, 1 *Klebsiella oxytoca*, 1 *Enterobacter aerogenes*, 3 *Enterobacter cloacae*, 1 *Enterobacter* species, 2 *Serratia marcescens*, 3 *Proteus mirabilis*, 3 *Proteus vulgaris*, 1 *Xanthomonas maltophilia*, 1 *Citrobacter freundii*, 1 *Citrobacter* species, 1 *Aeromonas hydrophila*, 2 *Pseudomonas* species, 2 *Neisseria meningitidis*, 1 *Salmonella* species.

**Anaerobes:** 1 *Bacteroides* species, 1 *Bacteroides theta*, 1 *Clostridium* species.

**Fungi:** 2 *Candida* species, 1 *Candida albicans*.

Table 2. LabDOSS reports of blood isolates for August 1992

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	54	2	2	1		4	13	5	12	6		
<i>Staphylococcus epidermidis</i>	25			1			5	2	4	13		4
<i>Staphylococcus coagulase negative</i>	5		1	1		1		1	1	1		
<i>Streptococcus pneumoniae</i>	23	12					1		1			
<i>Enterococcus faecalis</i>	9			2	2		1	2	2	1		1
<i>Escherichia coli</i>	48	1		7	14		1	6	15			
<i>Bacteroides fragilis</i>	5			2			1					
<i>Haemophilus influenzae</i> type b	5	1		1	1				1			
<i>Klebsiella pneumonia</i>	8	1			3		1		1			
<i>Pseudomonas aeruginosa</i>	9	1		2	1		1	3	1	3		2

1. Only organisms with 5 or more reports are included in this table.

### CSF Isolates and Meningitis Reports

There were 15 reports of meningitis during this period. *Haemophilus influenzae* type b was isolated from a 2 year old male child. There was an isolate of *Klebsiella pneumoniae* reported from a 54 year old female following surgery for multiple trauma injury. *Neisseria meningitidis* was isolated from 2 cases. One isolate was from a 2 year old male and other isolate was from a 22 year old immunocompromised female who later died. One *Staphylococcus aureus* was reported in a 4 month old immunodeficient infant. There were 4 cases of *Streptococcus pneumoniae* reported from patients whose ages ranged from 34 to 84 years. Immunodeficiency was reported as the risk factor for 2 cases. The 84 year old male (no risk factor) died. *Streptococcus epidermidis* was reported in a 25 year old female following shunt surgery. *Streptococcus viridans* was reported in a 28 year old female following shunt surgery. A *Streptococcus* Group B isolate was reported from 42 year old female following delivery. *Cryptococcus neoformans* was isolated from 2 immunocompromised males, aged 32 and 53. *Actinobacillus urea* was reported from a 58 year old male with a skull fracture.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 3 *Staphylococcus aureus* isolates were reported during this period; chronic ambulatory peritoneal dialysis was the risk factor for 2 of these. *Staphylococcus epidermidis* was reported from 7 cases, all

with chronic ambulatory peritoneal dialysis as the reported risk factor. *Escherichia coli* was reported in a 65 year old male with peritoneal dialysis.

**Joint fluid:** 7 *Staphylococcus aureus* reported from 5 males and 2 females whose ages ranged from 28 to 64 years. *Staphylococcus epidermidis* was isolated from a 24 year old male with synovitis in both knees. *Enterococcus faecalis* was reported from a 55 year old female with a fractured femur. *Neisseria gonorrhoea* was reported from 17 year old female with septic arthritis.

- **Pleural fluid:** 1 *Klebsiella pneumoniae* from a 69 year old male following oesophagus rupture, 1 alpha-haemolytic *Streptococcus* from a 89 year old female with plural effusion, and 2 *Serratia marcescens* isolates, from a 56 year old male and an 81 year old female following surgery.
- **Other:** *Streptococcus* Group B and *Bacteroides* species were isolated from tissues around renal stone of a female patient. *Enterococcus cloacae* was reported from a 32 year old male with granuloma following the removal of plate in the humerus. *Staphylococcus aureus* was isolated from the anterior chamber fluid of 30 year old male with endophthalmitis. *Pseudomonas aeruginosa* isolated from the bile fluid of a 69 year old male.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 21 - 19 October 1992

### Sterile Sites Surveillance (LabDOSS)

Data for September have been provided by nine laboratories, and Gosford Central Coast Area Health Service also provided data for August.

A total of 238 reports have been included for this report (Royal Hobart Hospital 8, Liverpool Hospital 49, Concord Hospital 34, Royal North Shore Hospital 25, Northern Tasmania Pathology Service 14, Nambour Hospital 11, Toowoomba Hospital 19, TB Lynch Pathologists, Rockhampton 4 and Gosford Central Coast Area Health Service 74).

Thirty nine isolates of *Staphylococcus aureus* were reported during this period. Of these, eight isolates were further identified as methicillin resistant *Staphylococcus aureus* (MRSA) and were reported by two laboratories (Gosford Central Coast Area Health Service 4 and Concord Hospital 4). Seven isolates were obtained from males aged between 69 and 80 years.

Gosford Central Coast Area Health Service reported a case of enteric fever in a 38 year old Philippino male. *Salmonella typhi* was isolated from a blood sample of this patient.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** 1 *Streptococcus* Group A, 1 *Streptococcus* Group B, 4 *Streptococcus* Group G, 3 *Streptococcus milleri*, 2 *Streptococcus* species, 2 *Corynebacterium* species, 1 *Enterococcus* species, *Aerococcus* species, 1 *Listeria monocytogenes*.

**Gram negative:** 3 *Klebsiella* species, 4 *Klebsiella oxytoca*, 2 *Enterobacter aerogenes*, 2 *Enterobacter cloacae*, 1 *Enterobacter* species, 1 *Serratia marcescens*, 1 *Citrobacter diversus*, 1 *Pseudomonas* species, 1 *Neisseria meningitidis*, 1 *Salmonella typhi*, 1 *Yersinia enterocolitica*, 3 *Morganella morganii*.

**Anaerobes:** 2 *Bacteroides* species, 3 *Bacteroides theta*, 2 *Clostridium* species, 1 *Clostridium clostridium*, 2 *Clostridium perfringenes*, 1 *Peptostreptococcus* species, 1 *Propionibacterium* species.

Table 2. LabDOSS reports of blood isolates for September 1992

Organism	Total <sup>1</sup>	Clinical Information					Risk Factors				
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	39	1		3	4	9	7	9	8		
<i>Staphylococcus epidermidis</i>	9		1		1		1	2	1		
<i>Staphylococcus coagulase negative</i>	14	1	1			2		1	2		1
<i>Streptococcus pneumoniae</i>	18	15	1					1			
<i>Streptococcus sanguis</i>	6	1	1					1			1
<i>Enterococcus faecalis</i>	9		1	1	3			2			1
<i>Escherichia coli</i>	37		2	6	15		4	10			
<i>Haemophilus influenzae</i>	6	2									
<i>Bacteroides fragilis</i>	5			1			1	3			
<i>Klebsiella pneumoniae</i>	5			2	1			1			
<i>Proteus mirabilis</i>	6				3		1	1			
<i>Pseudomonas aeruginosa</i>	7	1		1	1	1	2	3			1
<i>Candida albicans</i>	5						3		2		

1. Only organisms with 5 or more reports are included in this table.



### CSF Isolates and Meningitis Reports

There were 12 reports of meningitis during this period. *Haemophilus influenzae* type b was isolated from six of these cases. Four isolates were reported from children under the age of 1 year and two were reported from children under the age of 2 year. Two 1 year old children were reported by Liverpool Hospital from an area with same postcode. *Neisseria meningitidis* was isolated from 2 cases. One isolate was from a 3 year old male and other isolate was from a 18 year old male. There were 3 cases of *Streptococcus pneumoniae* reported from patients whose age ranged from 3 to 34 years. Immunodeficiency was reported as the risk factor for the 34 year old male. *Cryptococcus neoformans* was isolated from a 45 year old immunocompromised male.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** *Campylobacter jejuni* isolate was reported from a 56 year old immunocompromised male following gastrointestinal illness. The patient later died. *Staphylococcus epidermidis* was reported from a 27 year old male with chronic ambulatory peritoneal dialysis. *Alcaligenes faecalis* was reported in a 45 year old immunocompromised female.

**Joint fluid:** *Staphylococcus aureus* reported from a male with no risk factors. *Streptococcus* species was isolated from a 63 year old male with discitis.

**Pleural fluid:** *Escherichia coli* was reported from a 66 year old female following colectomy and ileostomy. *Pseudomonas aeruginosa* also reported from this patient.

**Other:** *Staphylococcus aureus* was isolated from a paraspinal abscess for a 61 year old male patient.

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# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 16, Number 23 - 16 November 1992

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### Sterile Sites Surveillance (LabDOSS)

Data for October have been provided by eight laboratories, and Royal Prince Alfred Hospital also provided data for August and September (Table 3). A total of 433 reports have been included (Royal Brisbane Hospital 245, Royal Prince Alfred Hospital 48, Central Queensland Pathology Laboratory 8, Royal Hobart Hospital 44, Liverpool Hospital 41, Northern Tasmania Pathology Service 13, Nambour Hospital 8, and Gosford Central Coast Hospital Services 26).

Sixty-six isolates of *Staphylococcus aureus* were reported during this period. Of these, five isolates were further identified as methicillin resistant *Staphylococcus aureus* (MRSA) and were reported by 3 laboratories.

Organism reported five or more times from blood are detailed in Table 3. Other blood isolates were:

**Gram positive:** 4 *Clostridium* species, 4 *Streptococcus milleri*, 3 *Corynebacterium* species, 1 *Micrococcus* species, 1 *Enterococcus faecium*, 2 *Listeria monocytogenes* and 1 unidentified gram positive bacillus.

**Gram negative:** 1 *Citrobacter freundii*, 1 *Enterobacter aerogenes*, 2 *Enterobacter cloacae*, 2 *Enterobacter* species, 1 *Flavobacterium* species, 4 *Klebsiella* species, 2 *Neisseria meningitidis*, 1 *Pseudomonas cepacia*, 1 *Pseudomonas paucimobilis*, 3 *Salmonella* species, 1 *Serratia liquefaciens*, 2 *Serratia* species, 1 *Yersinia enterocolitica* and 1 *Xanthomonas maltophilia*.

**Anaerobes:** 4 *Bacteroides fragilis*, 1 *Bacteroides meanimogenicus*, 1 *Bacteroides theta*, 1 *Bacteroides* species, 1 *Fusobacterium* species and 1 *Propionibacterium* species.

**Yeasts:** 1 *Candida* species, 1 *Saccharomyces* species.

### CSF Isolates and Meningitis Reports

There were 23 reports of meningitis during this period. *Haemophilus influenzae* type b was isolated from one of these cases. One isolate (non b) was reported from a 26 year old female who had previously had a splenectomy. The organism type was not recorded for the other cases.

*Neisseria meningitidis* was isolated from 7 cases. Five of the isolates were from children under the age of 3 (3 male, 2 female), one was from a 3 year old male and one from a 19 year old female.

There were 4 cases of *Streptococcus pneumoniae* reported. One was from a 3 month old female, one from a 16 year old female, and one from a 72 year old male. One isolate was from a 21 year old male who had had a splenectomy and hypogammaglobulinaemia.

*Cryptococcus neoformans* was isolated from two immunocompromised males, aged 31 and 47. A *Klebsiella* species was isolated from a 70 year old male.

#### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 3 *Staphylococcus aureus*, 2 *Staphylococcus epidermidis*, 1 *Escherichia coli*. A nosocomially acquired *Corynebacterium* species was isolated on 3 occasions from a 65 year old female.

**Joint fluid:** 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*, 1 coagulase negative *Staphylococcus*.

**Pleural fluid:** *Escherichia coli* and *Pseudomonas aeruginosa* were reported from a 66 year old female following colectomy and ileostomy.

**Other:** *Staphylococcus aureus* was isolated from a paraspinal abscess of a 61 year old male.

Table 3. LabDOSS reports of blood isolates for October 1992

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors					
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal	Nosocomial
<i>Acinetobacter</i> species	8				1			4	1				
<i>Candida albicans</i>	5				2			1	2				
<i>Enterococcus faecalis</i>	7			1				2	2			1	1
<i>Escherichia coli</i>	35			3	31			3	16		2	1	
<i>Haemophilus influenzae</i>	5	3					2		1				
<i>Klebsiella pneumoniae</i>	11	3		1	1		1	1	7				
<i>Proteus mirabilis</i>	9			1			1	2					
<i>Pseudomonas aeruginosa</i>	19	2			3			2	6		1		
<i>Pseudomonas</i> species	6	1							1				
<i>Staphylococcus aureus</i>	66	4		3	1	3	6	6	13	9			1
<i>Staphylococcus epidermidis</i>	33	1							7	1			
<i>Staphylococcus coagulase negative</i>	29	2	1				1	2	9	3			
<i>Streptococcus</i> group A	5						2	1					
<i>Streptococcus</i> group B	5						2		1			2	
<i>Streptococcus pneumoniae</i>	30	19					1		1			1	
<i>Streptococcus sanguis</i>	6		1				1		4				
<i>Streptococcus viridans</i>	5		1				1		1				
<i>Streptococcus</i> species	6		1					1					
<i>Streptococcus</i> group G	5	1	1				2						

1. Only organisms with 5 or more reports are included in this table.



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# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 1 - 11 January 1993

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### LabDOSS

The Laboratory Database of Organisms from Sterile Sites (LabDOSS) was established in 1992 to monitor significant isolates from normally sterile sites. It will be used on a national basis to compile more detailed information than is available to the National Notifiable Diseases Surveillance System on infections such as those caused by *Haemophilus influenzae* type b. It also collects information on diseases which are not notifiable, such as meningitis caused by *Streptococcus pneumoniae* and by *Cryptococcus neoformans*.

Ten to fifteen laboratories from around Australia contribute reports to this scheme on a monthly basis. As for LabVISE, each report is an anonymous modified line listing including the laboratory identification, the data of specimen collection, the organism identification, and data on the source specimen and any identification methods used supplementary to the isolation. The reports usually contain the postcode of the patient, data on the patient's age and sex, and information on the clinical diagnosis and risk factors, and can also contain additional relevant information as comments. Partial or coded patient identification is also included to enable further follow-up with laboratories, as required, and duplicate reports to be deleted or amalgamated.

The LabDOSS data are published monthly as *Sterile Sites Surveillance* in the *Communicable Diseases Surveillance* section of *CDI*. Organisms (or genus groups) reported five or more times from blood are presented in a table which details the total number of reports for the month, and selected information on the reported clinical information and risk factors. Other organisms reported fewer than five times from blood are listed in the text. Listings and some further information of isolates from CSF (and meningitis reports) and other sites, such as peritoneal dialysate and joint fluid, are also presented as text.

It is proposed that annual reports for LabDOSS will be published each year, and, as more laboratories begin to contribute, the commentary on the reports received will be expanded.

As for LabVISE, the number of reports of isolates made to LabDOSS is influenced by various factors, including the number, type

and location of participating laboratories, and current diagnostic techniques and habits, as well as the actual occurrence of infections. These factors must always be taken into account and the data interpreted with appropriate caution. The delay between the date of specimen collection and the date of publication ranges from two weeks to a few months.

The *CDI* Laboratory Reporting Schemes rely on the voluntary participation of laboratories and we wish to acknowledge our gratitude to them for their contributions. The participation of additional laboratories in both the public and private sectors in these schemes is welcomed (see *CDI* Notice to Readers in this issue).

### Sterile Sites Surveillance (LabDOSS)

Data received in the December to January period have been provided by nine laboratories, to make a total of 231 reports (Liverpool Hospital 37, Concord Hospital 37, Royal North Shore Hospital 46, Nambour Hospital 7, Central Queensland Pathology Service 5, Toowoomba General Hospital 26, T.B. Lynch Pathologists - Rockhampton 4, Gosford Central Coast Hospital Services 25, and Mackay Base Hospital who provided 44 reports from April 1992).

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** 1 *Streptococcus* Group A, 2 *Streptococcus* Group B, 3 *Streptococcus* Group G, 1 *Streptococcus milleri*, 2 *Streptococcus sanguis*, 2 *Streptococcus viridans*, 1 *Streptococcus* sp, 2 *Corynebacterium* species.

**Gram negative:** 3 *Acinetobacter* sp, 2 *Aeromonas* sp, 4 *Enterobacter* sp (1 *E. aerogenes*, 1 *E. cloacae*), 4 *Haemophilus influenzae* (3 type b, two cases of epiglottitis), 1 *Haemophilus parainfluenzae*, 1 *Proteus mirabilis*, 3 *Serratia* sp (2 *S. marcescens*, 1 *S. liquefaciens*), 1 *Citrobacter* sp, 1 *Pseudomonas* sp, 1 *Neisseria meningitidis* (no serogroup provided), 1 *Morganella morganii*, 1 *Flavobacterium* sp.

**Anaerobes:** 1 *Actinomyces odontolyticus*, 3 *Clostridium* sp (1 *C. perfringens*), 1 *Ureaplasma urealyticum*.

**Fungi:** 4 *Candida* sp (3 *C. albicans*, 1 *C. krusei*), 1 *Torulopsis glabrata*.

Table 2. LabDOSS reports of blood isolates for December 1992

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors					
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone/Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal	Nosocomial
<i>Bacteroides</i> sp	7 <sup>2</sup>			1			1	4					
<i>Escherichia coli</i>	49			7	15		1	1	11			2	
<i>Pseudomonas aeruginosa</i>	9			1	1			1	3				1
<i>Klebsiella</i> sp	6 <sup>3</sup>												
<i>Salmonella</i> sp	5 <sup>4</sup>			3									
<i>Staphylococcus aureus</i>	42 <sup>5</sup>	2	2	1	1	4	14	3	13	3		1	
<i>Staphylococcus</i> coagulase negative	13 <sup>6</sup>		3				1						
<i>Streptococcus pneumoniae</i>	15	7		1									
<i>Enterococcus faecalis</i>	6				1	1	1	2	1	1			

1. Only organisms with 5 or more reports are included in this table.

2. 2 *Bacteroides fragilis*, 2 *B. theta* *tomicon*.

3. 4 *Klebsiella pneumoniae*.

4. 2 *Salmonella* Virchow.

5. 9 MRSA.

6. 9 *Staphylococcus epidermidis*, 1 *S. scheiferi*.

#### CSF Isolates and Meningitis Reports

There were 2 *Haemophilus influenzae* (1 type b, both isolates from children aged 2 years), 1 *Neisseria meningitidis* (no group provided), 1 *Streptococcus pneumoniae* and 2 *Cryptococcus neoformans*.

#### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Staphylococcus aureus*, 2 coagulase negative staphylococci, 1 *Chaetomium globosum*.

**Joint fluid:** 1 *Corynebacterium* species, 8 *Staphylococcus aureus*, 1 *Pseudomonas paucimobilis*.

**Pleural fluid:** 1 *Enterococcus faecalis*, 1 *Pseudomonas aeruginosa*.

**Other:** 1 *Acremonium* sp, 1 *Corynebacterium* species D2, 1 *Pseudomonas aeruginosa*, 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 2 - 25 January 1993

### Sterile Sites Surveillance (LabDOSS)

Additional data received in the last fortnight for specimens collected in November and December 1992 have been provided by six laboratories. A total of 203 records have been included (6 Royal Hobart Hospital, 115 ICPMR Westmead, 39 Royal Prince Alfred Hospital, 38 Royal North Shore Hospital, 4 Nambour Hospital, 1 Dr T B Lynch Pathologist, Rockhampton).

A total of 705 records were provided by ICPMR Westmead for the period May to October 1992. These retrospective data have been included in the total year database; a report of 1992 LabDOSS data will be published in the near future.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** 1 *Streptococcus* Group A, 3 *Streptococcus* Group B, 1 *Streptococcus* Group G, 2 *Streptococcus* 'milleri', 2 *Streptococcus pneumoniae*, 1 *Streptococcus sanguis*, 1 *Streptococcus* species, 2 *Corynebacterium* JK, 4 *Enterococcus* species, 1 *Bacillus cereus*.

**Gram negative:** 1 *Serratia* species, 1 *Serratia marcescens*, 1 *Citrobacter freundii*, 4 *Haemophi-*

*lus influenzae* (3 type B) 1 *Neisseria meningitidis* serogroup C (5 months old), 2 *Xanthomonas maltophilia*, 1 *Flavobacterium* species.

**Anaerobes:** 1 *Bacteroides corporis*.

**Fungi:** 4 *Candida* species (3 *C. albicans*).

### CSF Isolates and Meningitis Reports

Fourteen reports of meningitis were received: 2 *Haemophilus influenzae* type b (males aged 7 months and 1 year), 1 *Listeria monocytogenes* (76 year old female), 1 *Neisseria meningitidis* serogroup B (16 year old female), 3 *Streptococcus pneumoniae* (ages 1 month, 8 years, and 57 years), 1 *Cryptococcus neoformans* (23 year old immunocompromised male), 1 *Corynebacterium* species (65 year old male - shunt), 1 *Staphylococcus aureus* (51 year old male), 1 *Streptococcus* group A (5 year old female), 1 *Xanthomonas maltophilia* (11 year old male - shunt), 1 *Streptococcus* 'milleri' (52 year old male).

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Candida albicans*, 1 *Corynebacterium* species, 1 *Bacteroides corporis*, 1 *Klebsiella pneumoniae*, 2 *Escherichia coli*.

**Joint fluid:** 3 *Staphylococcus aureus*.

Table 5. LabDOSS reports of blood isolates

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Bone / Joint	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Acinetobacter</i> sp	5			1		1		2	2	1		
<i>Enterobacter</i> sp	15 <sup>2</sup>				1		1	4	4	2		
<i>Escherichia coli</i>	31			3	13		1	3	9	1		1
<i>Klebsiella</i> sp	14 <sup>3</sup>			3	2				7	1		3
<i>Pseudomonas</i> sp	11 <sup>4</sup>			1			2	3	5			
<i>Staphylococcus aureus</i>	21	2		1	1	1	8	5	7	4		
<i>Staphylococcus</i> coagulase negative	22 <sup>5</sup>		1				2	5	5	4		4

1. Only organisms with 5 or more reports are included in this table.

2. 1 *E. aerogenes*, 6 *E. cloacae*, 4 *E. faecalis*.

3. 2 *K. oxytoca*, 7 *K. pneumoniae*.

4. 9 *Pseudomonas aeruginosa*.

5. 7 *Staphylococcus epidermidis*.



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# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 3 - 8 February

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### Sterile Sites Surveillance (LabDOSS)

LabDOSS data will be presented fortnightly from this issue of *CDI*. Data for the fortnight ending 3 February have been provided by four laboratories. A total of 55 reports have been included (36 Northern Tasmania Pathology Service, 4 Dr T B Lynch Pathologist, Rockhampton, 6 Central Queensland Pathology Service, 9 Toowoomba General Hospital). There are fewer reports than usual because of the change to fortnightly reports; no table has been included. There were no reports of meningitis.

#### Blood Isolates

**Gram positive:** 6 *Staphylococcus aureus*, 4 *Staphylococcus epidermidis*, 1 *Staphylococcus coagulase negative*, 1 *Streptococcus Group B*, 2 *Streptococcus sanguis*, 1 *Corynebacterium jeikeium*, 1 *Bacillus* species.

**Gram negative:** 2 *Haemophilus influenzae* type b (a 6 month old female with osteomyelitis and a 6 year old female with

epiglottitis), 1 *Yersinia kristensenii* (73 yr old male, no clinical history), 1 *Acinetobacter* species, 4 *Escherichia coli*, 3 *Klebsiella* species (1 *K. oxytoca*, 2 *K. pneumoniae*) 1 *Proteus mirabilis*, 1 *Citrobacter diversus*, 1 *Morganella morganii*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 3 *Bacteroides fragilis*, 1 *Bacteroides thetaiotomicron*.

#### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 2 *Acinetobacter* species, 1 *Bacteroides fragilis*, 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.

**Peritoneal fluid:** 1 *Bacteroides* species, 1 *Candida albicans*, 1 *Citrobacter freundii*, 1 *Xanthomonas maltophilia*, 1 *Staphylococcus aureus*, 1 *Streptococcus 'viridans'*, 1 *Escherichia coli*.

**Joint fluid:** 3 *Staphylococcus aureus*.

**Other:** 1 *Klebsiella pneumoniae*, 1 *Staphylococcus aureus*, 1 *Streptococcus 'milleri'*.

Table 4. LabDOSS reports of blood isolates for the fortnight period 4 to 17 February 1993

Isolate	Source	Age	Sex	Diagnosis
6 <i>Staphylococcus aureus</i>	Blood			
4 <i>Staphylococcus epidermidis</i>	Blood			
1 <i>Staphylococcus coagulase negative</i>	Blood			
1 <i>Streptococcus Group B</i>	Blood			
2 <i>Streptococcus sanguis</i>	Blood			
1 <i>Corynebacterium jeikeium</i>	Blood			
1 <i>Bacillus</i> species	Blood			
2 <i>Haemophilus influenzae</i> type b	Blood	6 months	Female	Osteomyelitis
2 <i>Haemophilus influenzae</i> type b	Blood	6 years	Female	Osteomyelitis
1 <i>Yersinia kristensenii</i>	Blood	73 years	Male	Epiglottitis
1 <i>Acinetobacter</i> species	Blood			
4 <i>Escherichia coli</i>	Blood			
3 <i>Klebsiella</i> species	Blood			
1 <i>K. oxytoca</i>	Blood			
2 <i>K. pneumoniae</i>	Blood			
1 <i>Proteus mirabilis</i>	Blood			
1 <i>Citrobacter diversus</i>	Blood			
1 <i>Morganella morganii</i>	Blood			
1 <i>Xanthomonas maltophilia</i>	Blood			
3 <i>Bacteroides fragilis</i>	Blood			
1 <i>Bacteroides thetaiotomicron</i>	Blood			
2 <i>Acinetobacter</i> species	Peritoneal dialysate			
1 <i>Bacteroides fragilis</i>	Peritoneal dialysate			
2 <i>Staphylococcus aureus</i>	Peritoneal dialysate			
1 <i>Staphylococcus epidermidis</i>	Peritoneal dialysate			
1 <i>Bacteroides</i> species	Peritoneal fluid			
1 <i>Candida albicans</i>	Peritoneal fluid			
1 <i>Citrobacter freundii</i>	Peritoneal fluid			
1 <i>Xanthomonas maltophilia</i>	Peritoneal fluid			
1 <i>Staphylococcus aureus</i>	Peritoneal fluid			
1 <i>Streptococcus 'viridans'</i>	Peritoneal fluid			
1 <i>Escherichia coli</i>	Peritoneal fluid			
3 <i>Staphylococcus aureus</i>	Joint fluid			
1 <i>Klebsiella pneumoniae</i>	Other			
1 <i>Staphylococcus aureus</i>	Other			
1 <i>Streptococcus 'milleri'</i>	Other			

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 4 - 22 February 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by six laboratories. Records have only been included in this report if the specimen collection date, and therefore the date of illness, is later than the first day of the previous month. Records in this report are therefore for specimen collection dates no earlier than 1 January 1993.

A total of 152 reports have been included for this report (56 Royal Prince Alfred Hospital, 33 Royal North Shore Hospital, 23 Concord Hospital, 22 Royal Hobart Hospital, 17 Northern Tasmanian Pathology Service, 1 TB Lynch, Pathologist, Rockhampton).

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates were:

**Gram positive:** 2 *Streptococcus pneumoniae*, 1 *Streptococcus* Group A, 1 *Streptococcus* Group B, 2 *Streptococcus sanguis*, 1 *Streptococcus mitior* (endocarditis), 1 *Streptococcus*, pyridoxal dependent, 1 *Streptococcus* species, 1 *Corynebacterium jeikeium*, 1 *Listeria monocytogenes* (21 year old pregnant female with chorioamnionitis).

**Gram negative:** 2 *Acinetobacter* sp, 1 *Aeromonas hydrophila*, 1 *Haemophilus influenzae* (not type b), 1 *Salmonella paratyphi* A (history of travel), 2 *Salmonella* species, 1 *Salmonella* Panama, 1 *Morganella morganii*, 4 *Proteus mirabilis*, 2 *Xanthomonas maltophilia*, 1 *Hafnia alvei*, 1 *Alcaligenes xylosoxidans*, 4 *Pseudomonas aeruginosa*, 1 *Ps. fluorescens*, 1 *Ps. pseudomallei* (59 year old male, no risk factors reported).

**Anaerobes:** 1 *Bacteroides fragilis*, 1 *Bacteroides distasonis*, 1 *Bacteroides thetaiotaomicron*.

**Fungi:** 2 *Candida albicans*, 1 *C. tropicalis*.

### CSF Isolates and Meningitis Reports

1 *Neisseria meningitidis* group B (male aged 15 years), 3 *Cryptococcus neoformans* (immuno-compromised males aged 28, 37 and 43 years), 1 *Proteus mirabilis*.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Staphylococcus aureus*, 4 *Staphylococcus epidermidis*, 1 *Bacillus* species, 1 *Bacteroides* species, 2 *Candida albicans*, 1 *Corynebacterium* species, 1 *Enterococcus avium*, 1 *Escherichia coli*.

**Joint fluid:** 1 *Staphylococcus aureus*.

**Other:** 1 *Flavobacterium* species, 1 *Xanthomonas maltophilia*.

Table 4. LabDOSS reports of blood isolates for the reporting period 4 to 17 February 1993

Organism	Total <sup>1</sup>	Clinical Information					Risk Factors					
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	21	3		1			7	4	4	5		1
<i>Staphylococcus epidermidis</i>	28	1	1				1	1	6	6		1
<i>Enterococcus</i> species <sup>2</sup>	5								3	1		1
<i>Escherichia coli</i>	23				4	14			4			
<i>Klebsiella</i> species <sup>3</sup>	8		1		3			2	1			
<i>Enterobacter</i> species <sup>4</sup>	6		1			1	2	2	1		1	

1. Only organisms with 5 or more reports are included in this table.

2. 4 *E. faecalis*, 1 *E. faecium*.

3. 6 *K. pneumoniae*, 1 *K. oxytoca*, 1 *Klebsiella* species.

4. 2 *E. aerogenes*, 4 *E. cloacae*.

One *Bordetella pertussis* isolate was also reported, from a 4 month old female. This was an isolate from a pernasal swab, and therefore not from a sterile site, but has nevertheless been included in the database. Laboratories wishing to report such isolates though LabDOSS are welcome to do so, and *B. pertussis* diagnoses made by immunofluo-

rescence or serological techniques can be reported through the CDI Virology and Serology Reporting Scheme (LabVISE).



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 5 - 8 March 1993

### STERILE SITES SURVEILLANCE REPORTS, 1992

(Leslee Roberts, Communicable Diseases Section, Department of Health, Housing and Community Services, and National Centre for Epidemiology and Population Health, ANU)

In 1992, 16 laboratories provided 3,936 reports of organisms from sterile sites to LabDOSS (CDI Sterile Sites Laboratory Reporting Scheme). Reports for 1992 yet to be submitted to CDI will be added to the dataset as provided. Isolates reported to CDI but coded as contaminants are not included in the analysis of LabDOSS data.

The numbers of reports provided by each laboratory were: 947 from ICPMR Westmead; 596 from Royal Prince Alfred Hospital; 578 from Royal Brisbane Hospital; 460 from Liverpool Hospital (South West Area Pathology Service); 342 from Royal North Shore Hospital; 284 from Concord Hospital; 197 from Gosford Central Coast Hospital Services; 129 from Toowoomba General Hospital; 110 from Royal Hobart Hospital; 99 from Northern Tasmanian Pathology Service; 69 from Nambour Hospital; 43 from Central Queensland Pathology Laboratory, Mackay; 43 from Mackay Base Hospital; 29 from T.B. Lynch Pathologist, Rockhampton; 10 from Prince Charles Hospital Brisbane.

1992 was the first year of the LabDOSS Scheme and therefore there is not a large

volume of data. However, the utility of the LabDOSS database will improve in time with anticipated increase in contributions. Analysis of several aspects of the 1992 data will be included in the next few issues of CDI. In this edition, an overview of the 1992 data is presented, followed by reports of meningitis, and reports of bacteraemia without meningitis caused by *Haemophilus influenzae*, *Neisseria meningitidis* and *Streptococcus pneumoniae*.

The 1992 reports originated largely from New South Wales as this was where LabDOSS was initially trialled. The number of reports for each month ranged between 181 and 422 (Figure 1). (Data for December from some laboratories are yet to be received.) The month of each report is based on the collection date of the specimen rather than the date the isolate was reported. It is therefore a better indication of the date of illness than the reporting date and allows more valid interpretation of seasonal trends.

There were more reports of isolates from males than from females, with a ratio of 1.3 males to 1.0 female.

As expected there was a predominance of reports of organisms isolated from normally sterile sites in the elderly (Figure 2).

### Meningitis Reports, 1992

There were 173 cases of meningitis reported in 1992 (Table 1). Most reports were in children under the age of five years (Figure 3).

Figure 1. LabDOSS reports, 1992, by month of

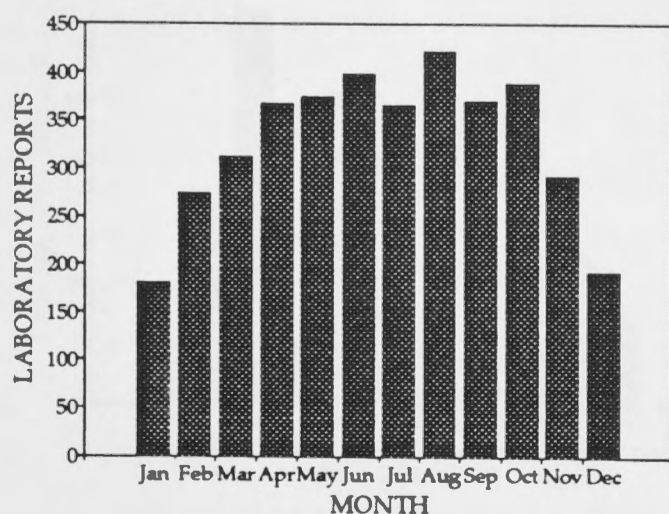


Figure 2. LabDOSS reports, 1992, by age group

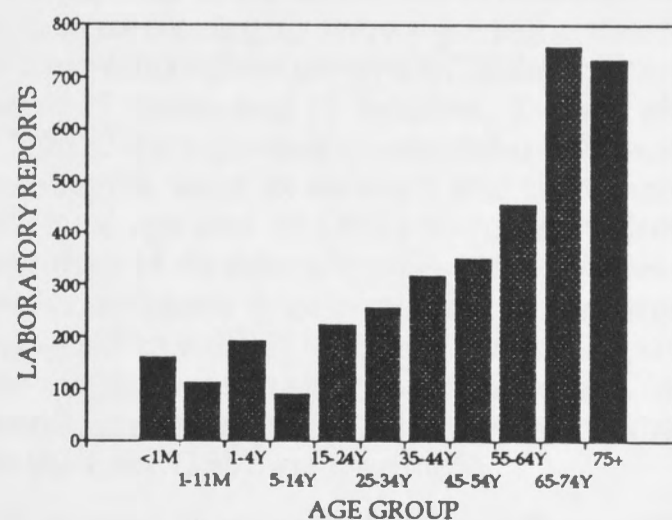
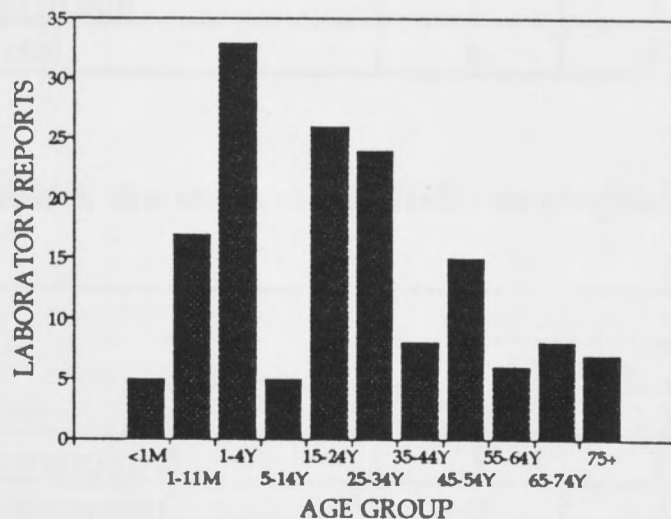


Table 1. LabDOSS reports of meningitis, 1992, by organism and age group

	Age												Total	
	Months				Years									
	<1	1-11	1-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75+	Unknown		
<i>Acinetobacter</i> species	1					2		1					1	5
<i>Actinobacillus</i> species									1					1
<i>Candida albicans</i>	1													1
<i>Corynebacterium</i> species						2				1			1	4
<i>Cryptococcus neoformans</i>						4	1	5	1	1	1		3	16
<i>Enterobacter</i> species						1							1	2
<i>Escherichia coli</i>	1				1									2
<i>Haemophilus influenzae</i>		6	21			3		1					5	36
<i>Haemophilus parainfluenzae</i>					1									1
<i>Klebsiella oxytoca</i>						1								1
<i>Klebsiella pneumoniae</i>								1						1
<i>Klebsiella</i> species					3					1	1		1	6
<i>Listeria monocytogenes</i>								2				1		3
<i>Morganella</i> species					1									1
<i>Neisseria sicca subflava</i>							1							1
<i>Neisseria meningitidis</i>		5	10		8	1							2	26
<i>Nocardia</i> species					1									1
<i>Propionibacterium acnes</i>								1		1				2
<i>Pseudomonas aeruginosa</i>								1				1		2
<i>Salmonella</i> species						1								1
<i>Staphylococcus aureus</i>	1	1		1	2		1	1		1			2	10
<i>Staphylococcus coagulase negative</i>				1			1	1	1				1	5
<i>Staphylococcus epidermidis</i>					5	5	1	1	2	1				15
<i>Streptococcus</i> group A				1										1
<i>Streptococcus</i> group B							1							1
<i>Streptococcus "milleri"</i>								1						1
<i>Streptococcus pneumoniae</i>	1	5	2	2	2	3	1		1	2	2			21
<i>Streptococcus sanguis</i>											1		1	2
<i>Streptococcus "viridans"</i>					1	1							1	3
<i>Xanthomonas maltophilia</i>					1									1
<b>Total</b>	<b>5</b>	<b>17</b>	<b>33</b>	<b>5</b>	<b>26</b>	<b>24</b>	<b>8</b>	<b>15</b>	<b>6</b>	<b>8</b>	<b>7</b>		<b>19</b>	<b>173</b>

Figure 3. LabDOSS reports of meningitis, 1992, by age group



The three most frequently reported organisms are well recognised as the common causative agents of meningitis: *Haemophilus influenzae*: 36 cases, *Neisseria meningitidis*: 26 cases and *Streptococcus pneumoniae*: 21 cases.

Twenty-four of the 36 reports of *Haemophilus influenzae* meningitis were reported as due to *Haemophilus influenzae* type b (Table 2). There were 19 males and 17 females. Twenty-six (72%) of the reports of *Haemophilus influenzae* meningitis were in children less than three years of age and 14 (38%) were in children less than 18 months of age (Figure 4). *Haemophilus influenzae* type b meningitis has been reported to exhibit a biphasic seasonal pattern with peaks in spring and autumn. This trend was not apparent with the few reports in the LabDOSS data (Figure 5).

There were 26 reports of *Neisseria meningitidis* meningitis. Fifteen (57%) of these were in

Figure 4. *Haemophilus influenzae* meningitis reports, 1992, by age group

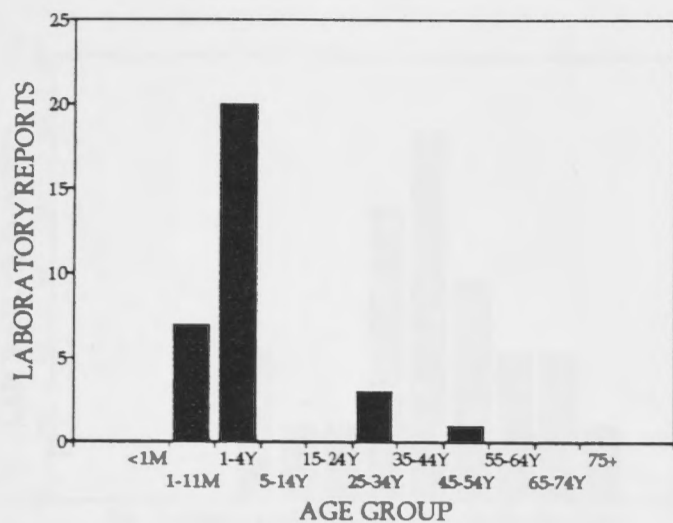


Figure 6. *Neisseria meningitidis* meningitis reports, 1992, by month of specimen collection

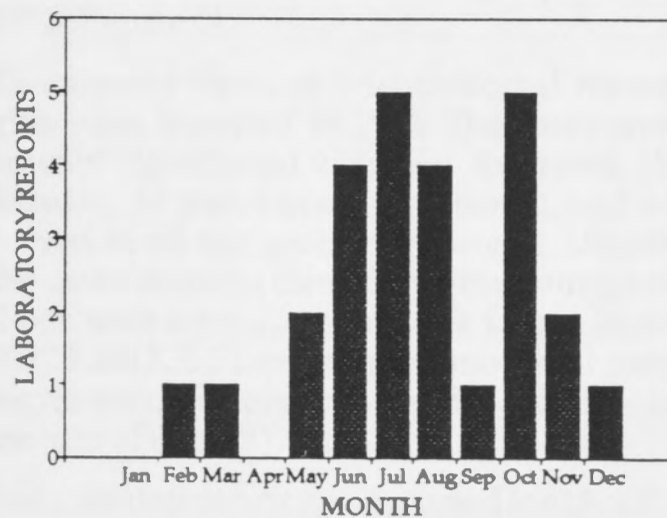


Figure 5. *Haemophilus influenzae* meningitis reports, 1992, by month of specimen collection

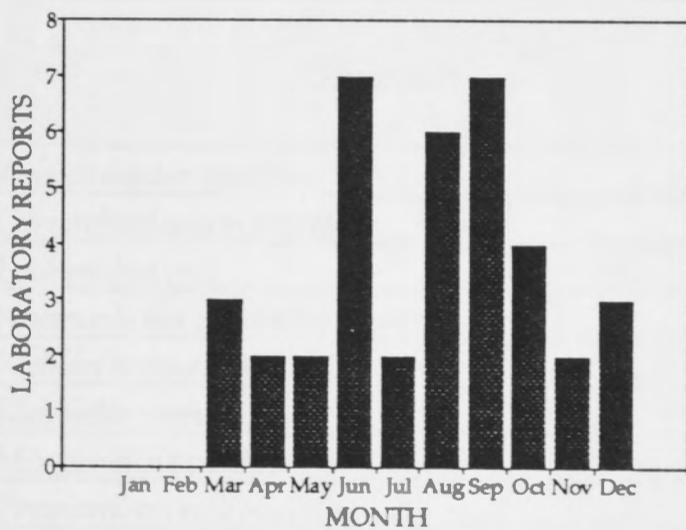


Figure 7. *Streptococcus pneumoniae* meningitis reports, 1992, by age group

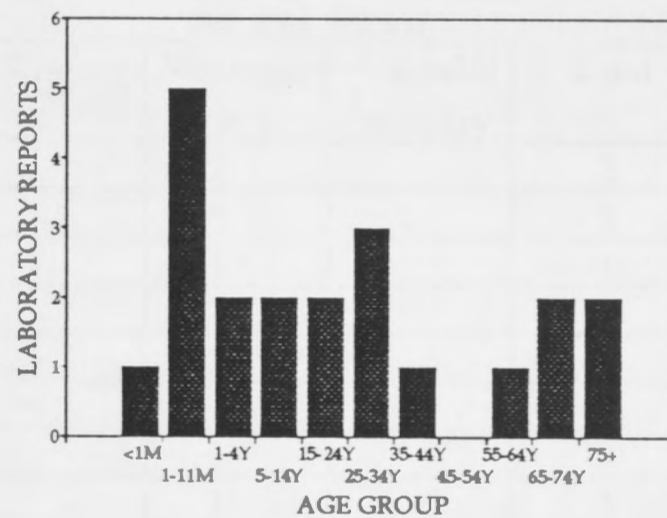


Table 2. *Haemophilus influenzae* meningitistis reports, 1992, by serogroup and age group

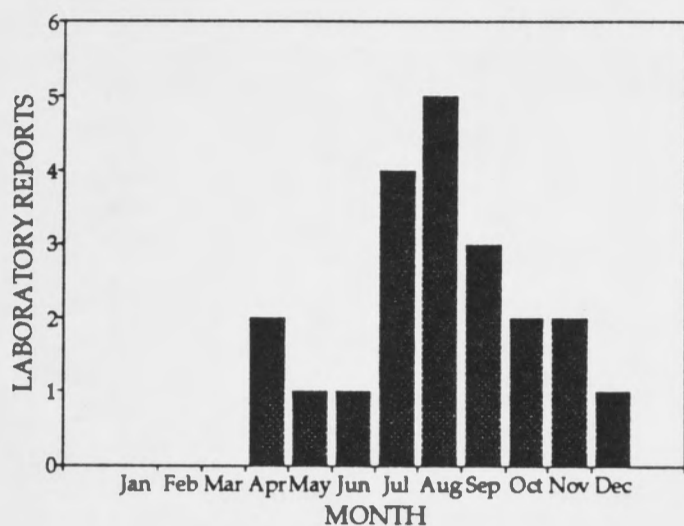
	Age					
	Months	Years				Total
	1-11	1-4	25-34	55-64	Unknown	
Serogroup b	4	14	2	0	4	24
No group	2	4	1	1	4	12
Total	6	18	3	1	8	36

Table 3. *Neisseria meningitidis* meningitis reports, 1992, by serogroup and age group

	Age					
	Months		Years			Total
	<1	1-11	15-24	25-34	Unknown	
Serogroup B	1	1	4	0	0	6
Serogroup C	0	2	0	1	0	3
Polyvalent ACYW135	0	0	1	0	0	1
Not Provided	4	7	3	0	2	16
Total	5	10	8	1	2	26



**Figure 8. *Streptococcus pneumoniae* meningitis reports, 1992, by month of specimen collection**



children under 5 years of age. Serogroup information was provided for 10 reports (Table 3). The seasonal trend of meningococcal meningitis occurring in winter and spring is evident even with the few cases reported in 1992 (Figure 6).

Twenty-one cases of pneumococcal meningitis were reported in 1992. The cases were equally distributed between the sexes (10 females, 10 males and 1 unknown), and occurred in all age groups (Figure 7). Usually the cases occur in the elderly, the young and those with a predisposing risk factor. In the 1992 LabDOSS reports, pneumococcal meningitis occurred predominantly in the winter months (Figure 8).

Immunodeficiency was reported for 15 of the 16 cases of cryptococcal meningitis reported;

**Table 4. Meningitis reports with a risk factor of surgery reported, 1992, by organism and surgery type**

Organism	Risk Factor			Total
	Surgery	Neurosurgery	Vascular surgery	
<i>Acinetobacter</i> species		2		2
<i>Corynebacterium</i> species		3		3
<i>Escherichia coli</i>		1		1
<i>Haemophilus parainfluenzae</i>		1		1
<i>Klebsiella oxytoca</i>		1		1
<i>Klebsiella pneumoniae</i>		1		1
<i>Morganella</i> species		1		1
<i>Propionibacterium acnes</i>		1		1
<i>Staphylococcus aureus</i>		3		3
<i>Staphylococcus epidermidis</i>		13	1	14
<i>Streptococcus "milleri"</i>	1			1
<i>Streptococcus sanguis</i>		2		2
<i>Streptococcus "viridans"</i>		3		3
<i>Xanthomonas maltophilia</i>		1		1
<b>Total</b>	<b>1</b>	<b>33</b>	<b>1</b>	<b>35</b>

**Table 5. Meningitis reports with a risk factor of immunodeficiency reported, 1992, by organism**

Organism	Risk Factor						Total
	HIV Infection	Neutropenia	Diabetes	Renal Failure	Other	Malignancy	
<i>Cryptococcus neoformans</i>	12	2			1		15
<i>Haemophilus influenzae</i>					1		1
<i>Listeria monocytogenes</i>						1	1
<i>Neisseria meningitidis</i>					1		1
<i>Pseudomonas aeruginosa</i>			1				1
<i>Staphylococcus coagulase negative</i>				1			1

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 6 - 22 March 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 8 laboratories. CDI welcomes The Institute of Medical and Veterinary Science, Adelaide, to the LabDOSS scheme. Royal Brisbane Hospital also provided 96 records which will be added to the 1992 database.

A total of 241 reports have been included in this issue (96 IMVS Adelaide, 47 Royal Prince Alfred Hospital, 29 Concord Hospital, 32 Royal North Shore Hospital, 14 Northern Tasmania Pathology Service, 10 New England Pathology Tamworth, 8 Nambour Hospital, 5 TB Lynch Pathologists - Rockhampton).

Organisms reported 5 or more times from blood are detailed in Table 2.

Other blood isolates not included in Table 2 were:

#### Gram positive:

1 *Bacillus cereus*, 2 *Streptococcus* Group A, 2 *Streptococcus mitis*, 1 *Streptococcus* Group B, 2 *Streptococcus* Group G, 3 *Streptococcus milleri*, 3 *Streptococcus pneumoniae*, 1 *Streptococcus sanguis*, 3 *Streptococcus "viridans"*, 3 *Streptococcus* species, 1 *Corynebacterium JK*.

**Gram negative:** 4 *Acinetobacter sp*, 2 *Aeromonas sp* (1 *hydrophila*), 5 *Serratia* species (3 *marcescens*), 1 *Cardiobacterium hominis*, 1 *Citrobacter freundii*, 1 *Pasteurella sp*, 1 *Pseudomonas* species, 1 *Pseudomonas fluorescens*, 1 *Haemophilus influenzae*, 1 *Neisseria meningitidis*, 1 *Salmonella typhi* (F 33), 1 *Salmonella sp*, 1 *Morganella morgani*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 1 *Bacteroides fragilis*, 1 *Bacteroides species*, 1 *Bacteroides loeschii*.

**Fungi:** 2 *Candida* species (1 *parapsilopsis*, 1 *kruseii*).

#### CSF Isolates and Meningitis Reports

2 *Haemophilus influenzae* (M 3 type b, F 41), 3 *Neisseria meningitidis* (F 27 group B, M 1, M 12), 2 *Cryptococcus neoformans*, 1 *Candida albicans*, 1 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*, 1 *Klebsiella pneumoniae*.

#### Isolates from Sites other than Blood or CSF

**Peritoneal Dialysate:** 2 *Staphylococcus aureus*, 2 *Staphylococcus epidermidis*, 1 *Klebsiella pneumoniae*.

**Joint fluid:** 1 *Escherichia coli*, 1 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*, 1 *Streptococcus* group G.

**Other:** 1 *Nocardia sp*, 2 *Staphylococcus aureus*, 1 *Escherichia coli*.

Table 2. LabDOSS reports of blood isolates for the reporting period 4 March to 17 March 1993

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	39	3	1		1		10	3	10	16		
<i>Staphylococcus epidermidis</i>	16			1	2		3		7	4		
<i>Staphylococcus coagulase negative</i>	14				1		2		1	6		
<i>Enterococcus sp</i>	6 <sup>2</sup>				3				2			
<i>Escherichia coli</i>	50							3	16			
<i>Klebsiella sp</i>	14 <sup>3</sup>				2							
<i>Proteus mirabilis</i>	5				1							
<i>Pseudomonas aeruginosa</i>	11				3			1	6			
<i>Enterobacter sp</i>	10 <sup>4</sup>								4			

1. Only organisms with 5 or more reports are included in this table.
2. 3 *Enterococcus faecalis*
3. 11 *Klebsiella pneumoniae*, 1 *Klebsiella cytac*
4. 2 *Enterobacter aerogenes*, 3 *Enterobacter cloacae*



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 7 - 5 April 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 4 laboratories. A total of 264 reports have been included for this report (169 ICPMR Westmead, 54 Liverpool Hospital, 29 Concord Hospital, 12 Toowoomba General Hospital).

Organisms reported 5 or more times from blood are detailed in Table 2.

Other blood isolates not included in Table 2 were:

**Gram positive:** 1 *Streptococcus* Group A, 4 *Streptococcus* Group B (3 neonates, 1 aged 5 weeks) 1 *Streptococcus* Group G, 3 *Streptococcus milleri*, 2 *Streptococcus sanguis*, 2 *Streptococcus "viridans"*, 3 *Streptococcus pneumoniae* 1 *Streptococcus uberis*, 4 *Streptococcus mitis*, 1 *Streptococcus bovis*, 2 *Streptococcus sp*, 1 *Corynebacterium* Group A-4 (immunocompromised), 1 *Listeria monocytogenes* (neonate).

**Gram negative:** 2 *Alcaligenes sp*, 3 *Serratia marcescens*, 2 *Citrobacter sp* (1 *freundii*), 3 *Pseudomonas* (2 *paucimobilis*), 1 *Haemophilus influenzae type b*, 1 *Yersinia enterocolitica*, 4 *Proteus mirabilis*, 3 *Xanthomonas maltophilia*, 2 *Aeromonas sp*

**Anaerobes:** 3 *Bacteroides sp* (1 *fragilis*, 1 *vulgatus*), 1 *Clostridium ramosum*, 2 *Fusobacterium sp* (1 *nucleatum*),

**Fungi:** 2 *Rhodotorula sp*, 2 *Cryptococcus neoformans var neoformans* (Both HIV)

### CSF Isolates and Meningitis Reports

1 *Haemophilus influenzae type b* (3 M), 1 Group B *Streptococcus* (M neonate) 1 *Bacillus sp*, 1 *Enterobacter aerogenes* (neonate) 2 Coagulase negative *Staphylococci*, 1 *Serratia Marcescens*, 2 *Cryptococcus neoformans* (both HIV).

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Acinetobacter sp*, 1 *Escherichia coli*, 2 *Staphylococcus aureus*, 3 *Staphylococcus epidermidis*, 1 Coagulase negative staphylococcus

**Joint fluid:** 1 *Escherichia coli* 2 *Staphylococcus aureus*

**Pleural fluid:** 1 *Comomonas sp*, 1 *Rhodotorula sp*, 1 *Acinetobacter sp*, 1 *Enterococcus sp*, 1 *Escherichia coli*, 4 *Staphylococcus aureus* (1 MRSA), 6 Coagulase negative staphylococci, 1 *Streptococcus sanguis*

**Other:** 1 *Alcaligenes sp*, 1 *Eikenella corrodens*, 2 *Enterococcus sp* (1 *faecium*, 1 *faecalis*), 6 *Staphylococcus aureus* (1 MRSA), 1 *Staphylococcus epidermidis*, 2 *Streptococcus milleri*, 1 group A *Streptococcus*

Table 2. LabDOSS reports of blood isolates for the reporting period 11 to 24 March 1993

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	39 <sup>2</sup>	4	2	2			3	5	4	5		1
<i>Staphylococcus coagulase negative</i>	33				1		3	4	2	14		1
<i>Enterococcus sp</i>	10 <sup>3</sup>			2	4	2	2	1	3	3		
<i>Escherichia coli</i>	38		4		6	16		2	5	4	2	1
<i>Klebsiella sp</i>	12 <sup>4</sup>		1		2	2			1	3		1
<i>Enterobacter sp</i>	10 <sup>5</sup>				1	1	1	1	1	2		
<i>Pseudomonas aeruginosa</i>	7		1		1	1	1		1	3		
<i>Candida albicans</i>	6							1	1	3	1	

1. Only organisms with 5 or more reports are included in this table.
2. 7 MRSA
3. 4 *Enterococcus faecalis*
4. 4 *Klebsiella oxytoca*, 5 *Klebsiella pneumoniae*
5. 2 *Enterobacter aerogenes*, 6 *Enterobacter cloacae*



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 8 - 19 April 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 5 laboratories. A total of 131 reports has been included: 32, ICPMR Westmead; 79, Liverpool Hospital; 13, Northern Tasmanian Pathology Service; 5, Nambour Hospital; 2, Central Queensland Pathology Service.

Organisms reported 5 or more times from blood are detailed in Table 4. Other blood isolates not included in Table 4 were:

**Gram positive:** 1 *Streptococcus* Group B, 1 *Streptococcus* Group G, 1 *Streptococcus milleri*, 2 *Streptococcus sanguis* 1 *Streptococcus mitis*, 1 *Streptococcus intermedius*, 2 *Corynebacterium* species, 3 *Enterococcus* species (2 *E. faecalis*), 2 *Bacillus* species.

**Gram negative:** 4 *Acinetobacter* species (1 *A. baumannii*), 2 *Enterobacter cloacae*, 1 *Serratia marcescens*, 1 *Pseudomonas putida*, 3 *Haemophilus influenzae* (all aged 1 to 11 months, 2 type b), 1 *Salmonella* Bredeney, 2 *Morganella morgani*,

2 *Proteus mirabilis*, 1 *Chromobacterium violaceum*.

**Anaerobes:** 1 *Eubacterium* species, 4 *Bacteroides* species, (1 *B. fragilis*, 1 *B. thetaotomicron*), 1 *Clostridium perfringens*, 2 *Peptostreptococcus* species.

### CSF Isolates and Meningitis Reports

2 *Haemophilus influenzae* type b (female aged 11 months and a male aged 2 years), *Pseudomonas aeruginosa* and *E. coli* in a female aged 3 months.

### Isolates from Sites other than Blood or CSF

**Peritoneal dialysate:** 1 *Pseudomonas aeruginosa*, 1 *Staphylococcus aureus*.

**Peritoneal fluid:** 1 *Salmonella* Typhimurium.

**Joint fluid:** 1 *Streptococcus* Group A (female aged 2 months), 1 *Staphylococcus aureus*.

Table 4. LabDOSS reports of blood isolates

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	17 <sup>2</sup>	1		1			3	1	3			
<i>Staphylococcus coagulase negative</i>	8 <sup>3</sup>						1	1	1	4		
<i>Streptococcus pneumoniae</i>	6		6									
<i>Escherichia coli</i>	29				4	14		2	3	1		
<i>Klebsiella</i> species	7 <sup>4</sup>					2			3	2		
<i>Pseudomonas aeruginosa</i>	16				4		1	1	2	7		

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 5.
3. *Staphylococcus epidermidis* 1.
4. *Klebsiella oxytoca* 3, *K. pneumoniae* 4.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 9 - 3 May 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 7 laboratories. A total of 136 reports have been included: IMVS Adelaide 50, Gosford Hospital 10, Royal North Shore Hospital 42, Northern Tasmanian Pathology Service 23, Nambour Hospital 5, TB Lynch Rockhampton 3, Central Queensland Pathology Service 3.

Gosford Hospital also provided 36 reports for December 1992 and 84 reports for January and February 1993. These records have been merged with the total LabDOSS files for the respective years.

Organisms reported 5 or more times from blood are detailed in Table 4. Other blood isolates not included in Table 4 were:

**Gram positive:** 2 *Streptococcus sanguis*, 1 *Streptococcus "viridans"*, 1 *Streptococcus bovis* (endocarditis), 4 *Streptococcus pneumoniae*, 1 *Corynebacterium jeikeium*, 4 *Enterococcus faecalis*, 1 *Enterococcus faecium*, 1 *Enterococcus* species.

**Gram negative:** 2 *Aeromonas* species (1 *A. hydrophila*, 1 *A. sobria*), 3 *Acinetobacter* species, 2 *Klebsiella oxytoca*, 3 *Serratia marcescens*, 1 *Pseudomonas* species, 1 *Haemophilus influenzae* (lower respiratory tract infection in a 29 year

old patient), 1 *Salmonella* Typhi (from a New South Wales laboratory, history of overseas travel), 2 *Morganella morganii*, 1 *Proteus mirabilis*, 1 *Proteus vulgaris*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 1 *Bacteroides fragilis*, 2 *Clostridium perfringens*, 1 *Peptostreptococcus* species.

**Fungi:** 1 *Cryptococcus neoformans* (HIV positive patient).

#### CSF isolates and meningitis reports

1 *Haemophilus influenzae* type b (6 month old female), 1 *Neisseria meningitidis* group B (Tasmanian laboratory, 3 month old female), 1 *Enterobacter aerogenes* (surgery).

#### Isolates from sites other than blood or CSF

**Peritoneal dialysate:** 1 *Escherichia coli*, 2 *Staphylococcus aureus*, 1 *Pseudomonas aeruginosa*, 2 *Staphylococcus epidermidis*.

**Joint fluid:** 2 *Staphylococcus aureus*, 1 *Proteus mirabilis*, 1 Group G *Streptococcus* (joint replacement).

**Other:** 1 *Escherichia coli*, 1 *Proteus mirabilis*, 1 *Citrobacter freundii*.

Table 4. LabDOSS reports of blood isolates

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	23 <sup>2</sup>		3	1		1	6	3	7	2		
<i>Staphylococcus coagulase negative</i>	8				1	1	1		1			
<i>Escherichia coli</i>	29				11	9		1	7			
<i>Klebsiella pneumoniae</i>	8		1		3		1		5			1
<i>Enterobacter</i> species	8 <sup>3</sup>				1	1		1				
<i>Pseudomonas aeruginosa</i>	6				2	1	1	1	2			

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.
3. *Enterobacter cloacae* 4.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 10 - 17 May 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 5 laboratories. A total of 43 reports have been included: Northern Tasmanian Pathology Service 9, Nambour General Hospital 7, TB Lynch Pathologists, Rockhampton 4, Toowoomba General Hospital 10, New England Pathology Tamworth 13.

Organisms reported 5 or more times from blood are detailed in Table 4. Other blood isolates not included in Table 4 were:

**Gram positive:** 1 *Streptococcus* Group A, 2 *Streptococcus* Group B (1 male neonate), 1 *Streptococcus* Group G, 1 *Streptococcus pneumoniae* (1 year old female), 2 *Staphylococcus epidermidis*, 1 *Staphylococcus hominis*.

**Gram negative:** 1 *Acinetobacter baumannii*, 4 *Klebsiella pneumoniae*, 1 *Serratia marcescens*, 1 *Haemophilus influenzae* type b (8 month old

male), 2 *Pseudomonas aeruginosa*, 1 *Pseudomonas* species.

**Anaerobes:** 1 *Peptostreptococcus* species, 1 *Propionibacterium* species.

**Fungi:** 1 *Candida tropicalis*.

### CSF Isolates and meningitis reports

1 *Haemophilus influenzae* type b (2 year old male), 1 *Neisseria meningitidis* (group pending, 6 year old female).

### Isolates from sites other than blood or CSF

**Joint fluid:** 2 *Staphylococcus aureus*, 1 *Streptococcus* Group A.

**Other:** 1 *Klebsiella oxytoca*.

Table 4. LabDOSS reports of blood isolates

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	8 <sup>2</sup>	1								1		
<i>Escherichia coli</i>	8					2						

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 11 - 31 May 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 8 laboratories. A total of 245 reports have been included: ICPMR Westmead 75, Liverpool Hospital 79, Tamworth Pathology 13, Royal North Shore Hospital 36, Nambour Hospital 3, Central Queensland Pathology Service 4, Northern Tasmanian Pathology Service 9, Royal Hobart Hospital 26.

Organisms reported 5 or more times from blood are detailed in Table 6. Other blood isolates not included in Table 6 were:

**Gram positive:** 3 *Streptococcus* Group A, 2 *Streptococcus* Group B, 2 *Streptococcus* Group G, 2 *Streptococcus pneumoniae*, 1 *Streptococcus mitis*, 1 *Streptococcus sanguis*, 1 *Streptococcus viridans*, 2 *Streptococcus* species, 2 *Corynebacterium* species, 1 *Corynebacterium xerosis*, 3 *Enterococcus faecalis*, 1 *Enterococcus* species.

**Gram negative:** 4 *Proteus mirabilis*, 1 *Serratia* species, 1 *Citrobacter diversus*, 1 *Citrobacter freundii*, 1 *Citrobacter* species, 1 *Pseudomonas paucimobilis*, 2 *Pseudomonas* species, 2 *Haemophilus influenzae* type b (an 8 month old male and a 61 year old female), 1 *Morganella morganii*, 1 *Campylobacter jejuni*, 1 *Aeromonas hydrophila*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 3 *Propionibacterium* species (1 *P. acnes*), 1 *Prevotella* species.

**Mycobacteria:** 1 *Mycobacterium avium-intracellulare* complex, 1 *Mycobacterium* species.

### CSF isolates and meningitis reports

Eleven reports of meningitis were received (Table 7). Four cases of meningococcal group C meningitis were reported by the South West Area Pathology Service, Liverpool. All cases were investigated by the South West Sydney Public Health Unit. There was no link between the patients, and all recovered from the illness.

Table 7. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	36	2	1	1	1		8		8	10		1
MRSA	9							1		2		
<i>Staphylococcus epidermidis</i>	6 <sup>2</sup>											
<i>Staphylococcus coagulase negative</i>	23						1		5	13		1
<i>Escherichia coli</i>	52		1		6	27	2	1	10	2		1
<i>Klebsiella</i> species <sup>3</sup>	10				1	1			1	2		
<i>Acinetobacter</i> species <sup>4</sup>	8				2				2	1		
<i>Enterobacter</i> species <sup>5</sup>	13				3		1			2		
<i>Pseudomonas aeruginosa</i>	8		1					1	1	2		1
<i>Candida</i> species <sup>6</sup>	9				2			1				

1. Only organisms with 5 or more reports are included in this table.

2. *Staphylococcus hominis* 1.

3. *Klebsiella pneumoniae* 5, *K. oxytoca* 1.

4. *Acinetobacter calcoaceticus* 7 (var *l. woffii* 2, var *anitratus* 1).

5. *Enterobacter cloacae* 7, *E. aerogenes* 2, *E. agglomerans* 2.

6. *Candida albicans* 5, *C. tropicalis* 1, *C. parapsilosis* 1, *C. krusei* 1.

Isolates from sites other than blood or CSF

**Peritoneal dialysate:** 1 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.

**Joint fluid:** 5 *Staphylococcus aureus*, 1 *Enterobacter* species.

**Other:** 1 *Haemophilus influenzae* group b (55 year old female), 1 *Klebsiella oxytoca*, 1 *Pseudomonas aeruginosa*, 2 coagulase negative *Staphylococcus*, 1 *Streptococcus* group A, 1 *Streptococcus 'milleri'*, 1 *Mycobacterium tuberculosis*.

Table 8. LabDOSS reports of meningitis, by organism and age group

Organism	< 1 month	1-4 years	5-14 years	15-24 years	25-34 years	75 + years	Total
<i>Neisseria meningitidis</i> group C	1		2	1			4
<i>Neisseria meningitidis</i> group B				1			1
<i>Cryptococcus neoformans</i>					1	1	2
<i>Haemophilus influenzae</i> type b		2					2
<i>Streptococcus</i> group B	1						1
<i>Streptococcus pneumoniae</i>		1					1
<b>Total</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>11</b>

Table 9. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Total	Clinical Information		Total
		Septicemia	Other	
<i>Staphylococcus aureus</i>	12	10	2	12
<i>Staphylococcus epidermidis</i>	8	7	1	8
<i>Streptococcus pneumoniae</i>	7	6	1	7
<i>Streptococcus</i> group B	2	2	0	2
<i>Streptococcus</i> group A	1	1	0	1
<i>Streptococcus</i> group D	1	1	0	1
<i>Streptococcus</i> group G	1	1	0	1
<i>Streptococcus</i> group O	1	1	0	1
<i>Streptococcus</i> group L	1	1	0	1
<i>Streptococcus</i> group M	1	1	0	1
<i>Streptococcus</i> group N	1	1	0	1
<i>Streptococcus</i> group P	1	1	0	1
<i>Streptococcus</i> group Q	1	1	0	1
<i>Streptococcus</i> group R	1	1	0	1
<i>Streptococcus</i> group S	1	1	0	1
<i>Streptococcus</i> group T	1	1	0	1
<i>Streptococcus</i> group U	1	1	0	1
<i>Streptococcus</i> group V	1	1	0	1
<i>Streptococcus</i> group W	1	1	0	1
<i>Streptococcus</i> group X	1	1	0	1
<i>Streptococcus</i> group Y	1	1	0	1
<i>Streptococcus</i> group Z	1	1	0	1
<i>Streptococcus</i> group AA	1	1	0	1
<i>Streptococcus</i> group AB	1	1	0	1
<i>Streptococcus</i> group AC	1	1	0	1
<i>Streptococcus</i> group AD	1	1	0	1
<i>Streptococcus</i> group AE	1	1	0	1
<i>Streptococcus</i> group AF	1	1	0	1
<i>Streptococcus</i> group AG	1	1	0	1
<i>Streptococcus</i> group AH	1	1	0	1
<i>Streptococcus</i> group AI	1	1	0	1
<i>Streptococcus</i> group AJ	1	1	0	1
<i>Streptococcus</i> group AK	1	1	0	1
<i>Streptococcus</i> group AL	1	1	0	1
<i>Streptococcus</i> group AM	1	1	0	1
<i>Streptococcus</i> group AN	1	1	0	1
<i>Streptococcus</i> group AO	1	1	0	1
<i>Streptococcus</i> group AP	1	1	0	1
<i>Streptococcus</i> group AQ	1	1	0	1
<i>Streptococcus</i> group AR	1	1	0	1
<i>Streptococcus</i> group AS	1	1	0	1
<i>Streptococcus</i> group AT	1	1	0	1
<i>Streptococcus</i> group AU	1	1	0	1
<i>Streptococcus</i> group AV	1	1	0	1
<i>Streptococcus</i> group AW	1	1	0	1
<i>Streptococcus</i> group AX	1	1	0	1
<i>Streptococcus</i> group AY	1	1	0	1
<i>Streptococcus</i> group AZ	1	1	0	1
<i>Streptococcus</i> group BA	1	1	0	1
<i>Streptococcus</i> group BB	1	1	0	1
<i>Streptococcus</i> group BC	1	1	0	1
<i>Streptococcus</i> group BD	1	1	0	1
<i>Streptococcus</i> group BE	1	1	0	1
<i>Streptococcus</i> group BF	1	1	0	1
<i>Streptococcus</i> group BG	1	1	0	1
<i>Streptococcus</i> group BH	1	1	0	1
<i>Streptococcus</i> group BI	1	1	0	1
<i>Streptococcus</i> group BJ	1	1	0	1
<i>Streptococcus</i> group BK	1	1	0	1
<i>Streptococcus</i> group BL	1	1	0	1
<i>Streptococcus</i> group BM	1	1	0	1
<i>Streptococcus</i> group BN	1	1	0	1
<i>Streptococcus</i> group BO	1	1	0	1
<i>Streptococcus</i> group BP	1	1	0	1
<i>Streptococcus</i> group BQ	1	1	0	1
<i>Streptococcus</i> group BR	1	1	0	1
<i>Streptococcus</i> group BS	1	1	0	1
<i>Streptococcus</i> group BT	1	1	0	1
<i>Streptococcus</i> group BU	1	1	0	1
<i>Streptococcus</i> group BV	1	1	0	1
<i>Streptococcus</i> group BW	1	1	0	1
<i>Streptococcus</i> group BX	1	1	0	1
<i>Streptococcus</i> group BY	1	1	0	1
<i>Streptococcus</i> group BZ	1	1	0	1
<i>Streptococcus</i> group CA	1	1	0	1
<i>Streptococcus</i> group CB	1	1	0	1
<i>Streptococcus</i> group CC	1	1	0	1
<i>Streptococcus</i> group CD	1	1	0	1
<i>Streptococcus</i> group CE	1	1	0	1
<i>Streptococcus</i> group CF	1	1	0	1
<i>Streptococcus</i> group CG	1	1	0	1
<i>Streptococcus</i> group CH	1	1	0	1
<i>Streptococcus</i> group CI	1	1	0	1
<i>Streptococcus</i> group CJ	1	1	0	1
<i>Streptococcus</i> group CK	1	1	0	1
<i>Streptococcus</i> group CL	1	1	0	1
<i>Streptococcus</i> group CM	1	1	0	1
<i>Streptococcus</i> group CN	1	1	0	1
<i>Streptococcus</i> group CO	1	1	0	1
<i>Streptococcus</i> group CP	1	1	0	1
<i>Streptococcus</i> group CQ	1	1	0	1
<i>Streptococcus</i> group CR	1	1	0	1
<i>Streptococcus</i> group CS	1	1	0	1
<i>Streptococcus</i> group CT	1	1	0	1
<i>Streptococcus</i> group CU	1	1	0	1
<i>Streptococcus</i> group CV	1	1	0	1
<i>Streptococcus</i> group CW	1	1	0	1
<i>Streptococcus</i> group CX	1	1	0	1
<i>Streptococcus</i> group CY	1	1	0	1
<i>Streptococcus</i> group CZ	1	1	0	1
<i>Streptococcus</i> group DA	1	1	0	1
<i>Streptococcus</i> group DB	1	1	0	1
<i>Streptococcus</i> group DC	1	1	0	1
<i>Streptococcus</i> group DD	1	1	0	1
<i>Streptococcus</i> group DE	1	1	0	1
<i>Streptococcus</i> group DF	1	1	0	1
<i>Streptococcus</i> group DG	1	1	0	1
<i>Streptococcus</i> group DH	1	1	0	1
<i>Streptococcus</i> group DI	1	1	0	1
<i>Streptococcus</i> group DJ	1	1	0	1
<i>Streptococcus</i> group DK	1	1	0	1
<i>Streptococcus</i> group DL	1	1	0	1
<i>Streptococcus</i> group DM	1	1	0	1
<i>Streptococcus</i> group DN	1	1	0	1
<i>Streptococcus</i> group DO	1	1	0	1
<i>Streptococcus</i> group DP	1	1	0	1
<i>Streptococcus</i> group DQ	1	1	0	1
<i>Streptococcus</i> group DR	1	1	0	1
<i>Streptococcus</i> group DS	1	1	0	1
<i>Streptococcus</i> group DT	1	1	0	1
<i>Streptococcus</i> group DU	1	1	0	1
<i>Streptococcus</i> group DV	1	1	0	1
<i>Streptococcus</i> group DW	1	1	0	1
<i>Streptococcus</i> group DX	1	1	0	1
<i>Streptococcus</i> group DY	1	1	0	1
<i>Streptococcus</i> group DZ	1	1	0	1
<i>Streptococcus</i> group EA	1	1	0	1
<i>Streptococcus</i> group EB	1	1	0	1
<i>Streptococcus</i> group EC	1	1	0	1
<i>Streptococcus</i> group ED	1	1	0	1
<i>Streptococcus</i> group EE	1	1	0	1
<i>Streptococcus</i> group EF	1	1	0	1
<i>Streptococcus</i> group EG	1	1	0	1
<i>Streptococcus</i> group EH	1	1	0	1
<i>Streptococcus</i> group EI	1	1	0	1
<i>Streptococcus</i> group EJ	1	1	0	1
<i>Streptococcus</i> group EK	1	1	0	1
<i>Streptococcus</i> group EL	1	1	0	1
<i>Streptococcus</i> group EM	1	1	0	1
<i>Streptococcus</i> group EN	1	1	0	1
<i>Streptococcus</i> group EO	1	1	0	1
<i>Streptococcus</i> group EP	1	1	0	1
<i>Streptococcus</i> group EQ	1	1	0	1
<i>Streptococcus</i> group ER	1	1	0	1
<i>Streptococcus</i> group ES	1	1	0	1
<i>Streptococcus</i> group ET	1	1	0	1
<i>Streptococcus</i> group EU	1	1	0	1
<i>Streptococcus</i> group EV	1	1	0	1
<i>Streptococcus</i> group EW	1	1	0	1
<i>Streptococcus</i> group EX	1	1	0	1
<i>Streptococcus</i> group EY	1	1	0	1
<i>Streptococcus</i> group EZ	1	1	0	1
<i>Streptococcus</i> group FA	1	1	0	1
<i>Streptococcus</i> group FB	1	1	0	1
<i>Streptococcus</i> group FC	1	1	0	1
<i>Streptococcus</i> group FD	1	1	0	1
<i>Streptococcus</i> group FE	1	1	0	1
<i>Streptococcus</i> group FF	1	1	0	1
<i>Streptococcus</i> group FG	1	1	0	1
<i>Streptococcus</i> group FH	1	1	0	1
<i>Streptococcus</i> group FI	1	1	0	1
<i>Streptococcus</i> group FJ	1	1	0	1
<i>Streptococcus</i> group FK	1	1	0	1
<i>Streptococcus</i> group FL	1	1	0	1
<i>Streptococcus</i> group FM	1	1	0	1
<i>Streptococcus</i> group FN	1	1	0	1
<i>Streptococcus</i> group FO	1	1	0	1
<i>Streptococcus</i> group FP	1	1	0	1
<i>Streptococcus</i> group FQ	1	1	0	1
<i>Streptococcus</i> group FR	1	1	0	1
<i>Streptococcus</i> group FS	1	1	0	1
<i>Streptococcus</i> group FT	1	1	0	1
<i>Streptococcus</i> group FU	1	1	0	1
<i>Streptococcus</i> group FV	1	1	0	1
<i>Streptococcus</i> group FW	1	1	0	1
<i>Streptococcus</i> group FX	1	1	0	1
<i>Streptococcus</i> group FY	1	1	0	1
<i>Streptococcus</i> group FZ	1	1	0	1
<i>Streptococcus</i> group GA	1	1	0	1
<i>Streptococcus</i> group GB	1	1	0	1
<i>Streptococcus</i> group GC	1	1	0	1
<i>Streptococcus</i> group GD	1	1	0	1
<i>Streptococcus</i> group GE	1	1	0	1
<i>Streptococcus</i> group GF	1	1	0	1
<i>Streptococcus</i> group GG	1	1	0	1
<i>Streptococcus</i> group GH	1	1	0	1
<i>Streptococcus</i> group GI	1	1	0	1
<i>Streptococcus</i> group GJ	1	1	0	1
<i>Streptococcus</i> group GK	1	1	0	1
<i>Streptococcus</i> group GL	1	1	0	1
<i>Streptococcus</i> group GM	1	1	0	1
<i>Streptococcus</i> group GN	1	1	0	1
<i>Streptococcus</i> group GO	1	1	0	1
<i>Streptococcus</i> group GP	1	1	0	1
<i>Streptococcus</i> group GQ	1	1	0	1
<i>Streptococcus</i> group GR	1	1	0	1
<i>Streptococcus</i> group GS	1	1	0	1
<i>Streptococcus</i> group GT	1	1	0	1
<i>Streptococcus</i> group GU	1	1	0	1
<i>Streptococcus</i> group GV	1	1	0	1
<i>Streptococcus</i> group GW	1	1	0	1
<i>Streptococcus</i> group GX	1	1	0	1
<i>Streptococcus</i> group GY	1	1	0	1
<i>Streptococcus</i> group GZ	1	1	0	1
<i>Streptococcus</i> group HA	1	1	0	1
<i>Streptococcus</i> group HB	1	1	0	1
<i>Streptococcus</i> group HC	1	1	0	1
<i>Streptococcus</i> group HD	1	1	0	1
<i>Streptococcus</i> group HE	1	1	0	1
<i>Streptococcus</i> group HF	1	1	0	1
<i>Streptococcus</i> group HG	1	1	0	1
<i>Streptococcus</i> group HH	1	1	0	1
<i>Streptococcus</i> group HI	1	1	0	1
<i>Streptococcus</i> group HJ	1	1	0	

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 12 - 14 June 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 4 laboratories. The CDI welcomes Sullivan Nicolaides Pathologists, Queensland to the laboratory surveillance schemes. A total of 124 reports have been included: Sullivan Nicolaides Queensland 91, Royal Hobart Hospital 28, Northern Tasmanian Pathology Service 3, TB Lynch Pathologists, Rockhampton 2.

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates not included in Table 3 were:

**Gram positive:** 1 *Streptococcus* Group B, 2 *Streptococcus 'milleri'* /group F, 2 *Streptococcus sanguis*, 2 *Streptococcus 'viridans'*, 2 *Streptococcus mitis*, 1 *Streptococcus hominis*, 1 *Streptococcus pneumoniae*, 2 *Corynebacterium* species, 3 *Enterococcus faecalis*, 1 *Bacillus* species, 1 *Arcanobacterium haemolyticum*, 1 *Micrococcus* species.

**Gram negative:** 1 *Salmonella* Typhi (Queensland report, 13 year old male, recent travel to

Indonesia), 1 *Enterobacter aerogenes*, 1 *Serratia marcescens*, 1 *Pseudomonas aeruginosa*, 1 *Haemophilus influenzae* type b (10 month old male), 1 *Vibrio* species, 2 *Proteus mirabilis*.

*Yersinia enterocolitica*, *Branhamella* species and *Acinetobacter* species were all isolated from a 42 year old male with endocarditis and HIV.

**Anaerobes:** 3 *Bacteroides fragilis*, 1 *Clostridium* species, 2 *Fusobacterium* species, 1 *Peptostreptococcus* species.

**Fungi:** 1 *Candida albicans*, 1 *Candida* species.

**Isolates from Sites other than Blood or CSF**

**Peritoneal dialysate:** 1 *Staphylococcus epidermidis*.

**Joint fluid:** 2 *Staphylococcus aureus*.

**Other:** 2 *Staphylococcus aureus*, 1 *Staphylococcus epidermidis*.

Reports of meningitis/CSF isolates are summarised in Table 4. Also provided was a report of isolation of *Bordetella pertussis* from a nasopharyngeal aspirate in a female 2 months of age (Tasmania).

Table 3. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Total <sup>1</sup>	Clinical Information						Risk Factors				
		Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal
<i>Staphylococcus aureus</i>	20 <sup>2</sup>						2	1	1	1	2	
<i>Staphylococcus epidermidis</i>	9	1	1	1				1	2			
<i>Staphylococcus coagulase negative</i>	12 <sup>3</sup>	2		1				1		1		
<i>Escherichia coli</i>	20				1				2			
<i>Acinobacter</i> species	6			3					2			
<i>Klebsiella</i> species	8 <sup>4</sup>				2					1		1

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.
3. *Staphylococcus haemolyticus* 1, *S. warneri* 1.
4. *Klebsiella pneumoniae* 5, *K. oxytoca* 3.





# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 13 - 28 June 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 9 laboratories. A total of 243 reports has been included (146 males, 96 females); ICPMR, Westmead 57, Royal Prince Alfred Sydney 67, Sullivan Nicolaides, Queensland 13, IMVS, Adelaide 50, Royal North Shore Hospital, Sydney 35, Northern Tasmanian Pathology Service 8, Nambour Hospital, Queensland 5, Toowoomba Pathology 6, Central Queensland Pathology Service 2.

Only reports of isolates collected after the first day of the previous month are included in the fortnightly CDI report. Additional data prior to this period have been included in the 1993 total LabDOSS file (Royal Prince Alfred 112 reports, IMVS 39 reports).

Organisms reported 5 or more times from blood are detailed in Table 5. Other blood isolates were:

**Gram positive:** 3 *Streptococcus* Group A, 4 *Streptococcus* Group B (ages 2 months, 34 years, 40 years, 66 years, 84 years), 1 *Streptococcus* Group G, 4 *Streptococcus* 'milleri', 2 *Streptococcus sanguis*, 3 *Streptococcus mitis*, 1

*Streptococcus salivarius*, 1 *Streptococcus* 'viridans', 1 *Streptococcus* species, 1 *Arcanobacterium* species, 1 *Micrococcus* species.

**Gram negative:** 3 *Acinetobacter* sp, 1 *Citrobacter diversus*, 2 *Pseudomonas cepacia*, 1 *Pseudomonas pseudomallei* (56 year old diabetic male), 4 *Haemophilus influenzae* (3 type b; 5 month old female with periorbital cellulitis, 13 month old female with epiglottitis, 71 year old female), 1 *Neisseria meningitidis* group B (patient aged less than 1 year), 1 *Morganella morganii*, 3 *Proteus mirabilis*, 1 *Flavobacterium* species, 2 *Xanthomonas maltophilia*, 1 *Providencia alcalifaciens*, 1 *Cardiobacterium hominis* (endocarditis, 22 year old).

**Anaerobes:** 2 *Bacteroides fragilis* species, 1 *Peptostreptococcus* species.

**Fungi:** 4 *Candida* species (1 *C. albicans*, 1 *C. krusei*).

Most of the blood isolates of bacteria were from patients aged 55 and over (Figure 2).

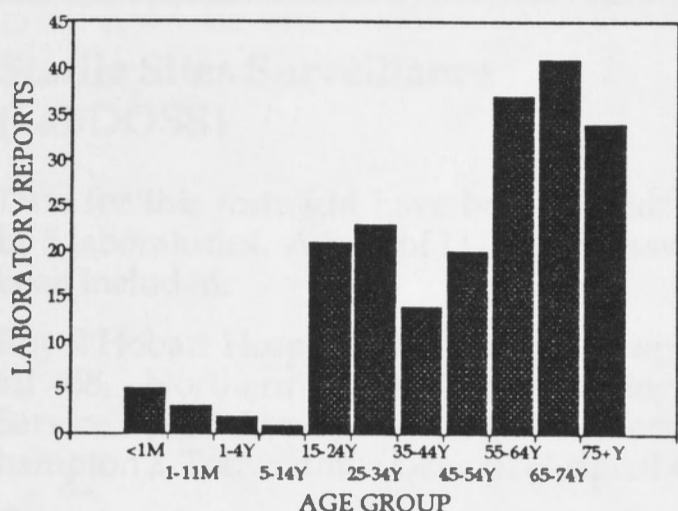
#### CSF isolates and meningitis reports

There were 7 reports of CSF isolates and/or meningitis (Table 6).

Table 6. LabDOSS meningitis reports, by organism and age group

	1-11 months	1-4 years	35-44 years	55-64 years	75 + years	Total	Total reported this year
<i>Haemophilus influenzae</i> type b	1	2				3	20
<i>Streptococcus pneumoniae</i>				1	1	2	9

**Figure 2. LabDOSS reports of blood isolates of bacteria, by age group**



**Isolates from Sites other than Blood or CSF**

**Peritoneal dialysate:** 1 *Enterobacter cloacae*, 2 *Staphylococcus aureus*, 7 *Staphylococcus epidermidis*, 2 *Staphylococcus coagulase negative*, 1 *Streptococcus* species, 1 *Streptococcus* group D (non enterococcal).

**Joint fluid:** 4 *Staphylococcus aureus*, 1 *Staphylococcus coagulase negative*, 1 *Streptococcus* Group G.

**Other:** 1 *Aspergillus* species, 1 *Bacillus* species, 1 *Corynebacterium* species, 1 *Enterococcus*

species, 2 *Escherichia coli*, 1 *Kingella kingae*, 1 *Serratia marcescens*, 1 *Staphylococcus aureus*, 1 *Candida* species.

**Hospital acquired infections**

Accurate case definitions of hospital acquired infection are complex. The LabDOSS scheme arbitrarily accepts 'hospital acquired' as a risk factor if the infection was acquired greater than 48 hours after admission. This risk factor was reported for 42 of the 206 reports of bacteraemia. IV lines were listed as a risk factor in 22, 10 patients were immunocompromised and 7 had undergone surgery.

The organisms implicated were: 1 *Acinetobacter* species, 2 *Enterobacter cloacae*, 2 *Enterococcus faecalis*, 8 *Escherichia coli*, 2 *Klebsiella oxytoca*, 3 *Klebsiella pneumoniae*, 1 *Proteus mirabilis*, 2 *Pseudomonas aeruginosa*, 2 *Serratia marcescens*, 8 *Staphylococcus aureus*, 1 *Staphylococcus coagulase negative*, 7 *Staphylococcus epidermidis*, 1 *Streptococcus* group B, 1 *Streptococcus 'milleri'*, 1 *Xanthomonas maltophilia*.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 14 - 12 July 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 5 laboratories. A total of 111 reports have been included:

Royal Hobart Hospital 30, Liverpool Hospital 68, Northern Tasmanian Pathology Service 7, TB Lynch Pathologists - Rockhampton 2, Toowoomba General Hospital 4.

Organisms reported 5 or more times from blood are detailed in Table 5. Other blood isolates not included in Table 5 were:

**Gram positive:** 2 *Streptococcus* Group B (1 neonate), 1 *Streptococcus* Group G, 1 *Streptococcus* Group F, 1 *Streptococcus milleri*, 1 *Streptococcus sanguis*, 1 *Corynebacterium jeikeium* (HIV), 1 *Enterococcus faecalis*, 1 *Enterococcus faecium*, *Lactobacillus leichmannii*.

**Gram negative:** 1 *Flavimonas oryzihabitans* (4 year old male), 3 *Acinetobacter* species, 3 *Klebsiella* species, 1 *Klebsiella oxytoca*, 1 *Enterobacter cloacae*, 1 *Enterobacter* species, 1 *Serratia liquefaciens*, 3 *Pseudomonas aeruginosa* 1 *Pseudomonas paucimobilis*, 1 *Neisseria meningitidis* (group Y in a 53 year old male), 1 *Salmonella Typhimurium* species, 1 *Xanthomonas maltophilia*, 1 *Providencia* species, 1 *Pasteurella multocida*.

**Anaerobes:** 1 *Bacteroides fragilis*, 1 *Clostridium tertium*, 2 *Fusobacterium* species, 1 *Peptostreptococcus* species.

**Fungi 1:** *Candida parapsilosis*.

Ages of patients with bacterial blood isoaltes ranged from less than one month to over 75 years (Table 6).

**Peritoneal dialysate:** 1 *Fusarium* species, 2 *Staphylococcus epidermidis*.

**Joint fluid:** 1 *Staphylococcus epidermidis*, 1 *Streptococcus* Group G.

**Other:** 1 *Staphylococcus aureus*, 1 *Escherichia coli*.

Figure 5. LabDOSS reports of blood isolates, by age group

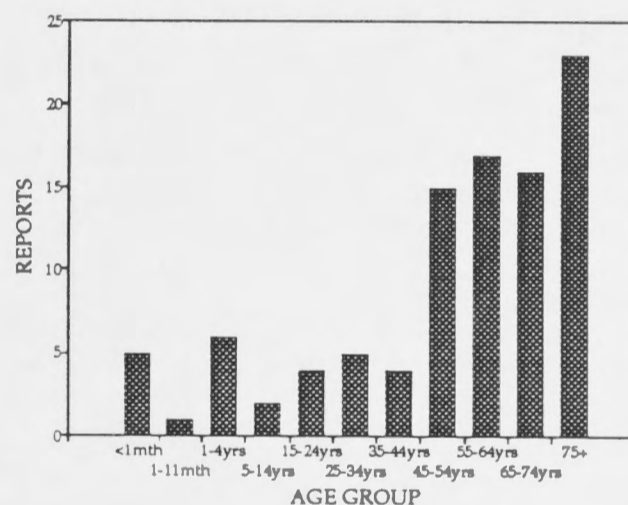


Table 5. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup> this fortnight	Total reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal	Neonatal		
<i>Staphylococcus aureus</i> <sup>2</sup>		1	1			2	1		6			15	336
<i>Staphylococcus epidermidis</i>												5	101
<i>Staphylococcus coagulase negative</i> <sup>3</sup>		1						1	1			8	142
<i>Streptococcus pneumoniae</i>		4										7	66
<i>Escherichia coli</i>				5	11			3				22	425
<i>Haemophilus influenzae</i> <sup>4</sup>		3				1						5	34

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.
3. *S. warneri* 1, *S. hominis* 1.
4. Type b 3 (18 months, 4 years, 26 years).





# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 15 - 26 July 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 11 laboratories. CDI welcomes Woden Valley Hospital, ACT to the LabDOSS scheme.

A total of 272 reports have been included: Liverpool Hospital 27, Royal North Shore Hospital 27, Northern Tasmanian Pathology Service 8, Nambour Hospital 9, Gosford Central Coast Hospital Services 28, Toowoomba General Hospital 16, Westmead 60, Woden Valley Hospital 22, Tamworth Laboratory, New England Pathology 8, Sullivan and Nicolaidis Partners, Brisbane 18, Institute of Medical and Veterinary Science, Adelaide 49.

The LabDOSS scheme received 3 reports of *Listeria monocytogenes* this fortnight from 3 laboratories (2 NSW, 1 ACT). Risk factors were identified in two patients. One was a 70 year old male with meningitis and a history of renal failure and the second was a 22 year old male with a history of injecting drug use. The third case was a 65 year old female with meningitis. The three isolates have been forwarded to the Microbiological Diagnostic Unit, University of Melbourne, for typing.

Organisms reported 5 or more times from

lood are detailed in Table 2. Other blood isolates were:

**Gram positive:** 3 *Streptococcus* Group B (1 neonate, 73 year old female, 71 year old male), 1 *Streptococcus* Group F, 2 *Streptococcus* Group G, 3 *Streptococcus 'milleri'*, 4 *Streptococcus sanguis*, 1 *Streptococcus mitis*, 3 *Streptococcus* species, 3 *Corynebacterium* species, 2 *Corynebacterium jeikeium* (immunocompromised females, 28 years and 31 years), 3 *Enterococcus* species, 3 *Enterococcus faecalis*, 2 *Enterococcus faecium*, 1 *Listeria monocytogenes*, 1 *Bacillus* species.

**Gram negative:** 1 *Acinetobacter* species, 3 *Klebsiella* species, 1 *Klebsiella oxytoca*, 1 *Enterobacter aerogenes*, 4 *Enterobacter cloacae*, 2 *Serratia marcescens*, 1 *Citrobacter* species, 4 *Haemophilus influenzae* type b (2 years, 3 years, 6 years, 59 years), 1 *Haemophilus parainfluenzae*, 1 *Proteus mirabilis*, 1 *Flavobacterium* species, 1 *Aeromonas* species, 2 *Xanthomonas maltophilia*, 1 *Eikenella corrodens*.

**Anaerobes:** 1 *Bacteroides* species, 1 *Bacteroides thetaiotaomicron*, 1 *Bacteroides ovatus*, 2 *Clostridium* species, 1 *Peptostreptococcus* species, 1 *Propionibacterium* species, 1 *Propionibacterium acnes*.

**Fungi:** 1 *Candida* species, 2 *Candida albicans*.

Table 2. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i> <sup>2</sup>		1	3	1	2	10	5	6	6	5		47	355
<i>Staphylococcus epidermidis</i>								2				9	112
<i>Staphylococcus coagulase negative</i>								3	9	8	2	30	157
<i>Streptococcus</i> Group A								1	1			7	20
<i>Streptococcus pneumoniae</i>									1			14	72
<i>Escherichia coli</i>					1	1	1	8			1	35	440
<i>Proteus mirabilis</i>							1		1			5	38
<i>Klebsiella pneumoniae</i>							2	1	1			7	76
<i>Bacteroides fragilis</i>							1					6	22
<i>Pseudomonas aeruginosa</i>								2	3			10	96

<sup>1</sup> Only organisms with 5 or more reports are included in this table.  
<sup>2</sup> MRSA 5



Most isolates were from patients aged over 15 years (Figure 1).

Figure 1. LabDOSS reports of isolates from blood, by age group

**CSF isolates and meningitis reports**

Eighteen reports of CSF isolates and/or meningitis were received this fortnight (Table 3).

**Isolates from sites other than blood or CSF**

**Peritoneal dialysate:** 1 *Candida* species, 1 *Acinetobacter* species, 1 *Klebsiella oxytoca*, 1 *Escherichia coli*, 1 *Streptococcus 'viridans'*, 1 *Staphylococcus aureus*, 1 *Bacteroides fragilis*.

**Pleural fluid:** 1 *Corynebacterium* species, 1 *Enterococcus* species, 1 *Peptostreptococcus* species.

**Other:** 1 *Leuconostoc* species, 1 *Branhamella catarrhalis*, 1 *Cryptococcus neoformans*, 1 *Enterococcus faecalis*, 1 *Escherichia coli*, 1 *Staphylococcus aureus*.

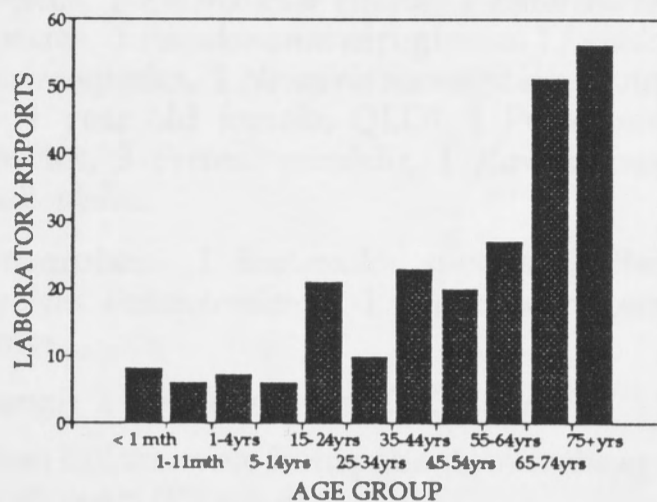


Table 3. LabDOSS meningitis reports, by organism and age group

	<1 month	1-11 months	1-4 years	5-14 years	25-34 years	35-44 years	65-74 years	Total	Total reported this year
<i>Listeria monocytogenes</i>							2	2	3
<i>Haemophilus influenzae</i>		2 (type b)	1					3	22
<i>Streptococcus pneumoniae</i>				2				2	10
<i>Cryptococcus neoformans</i>						1		1	
var <i>neoformans</i>						1		1	19
var <i>gatti</i>					1			1	
<i>Enterococcus faecalis</i>					1			1	1
<i>Serratia marcescens</i>	1							1	2
<i>Staphylococcus aureus</i>			1					1	4
<i>Streptococcus 'viridans'</i>		1						1	1
<i>Neisseria meningitidis</i> group B		2						2	
group Z		1						1	16
ungrouped				1				1	

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 16 - 9 August 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 8 laboratories. CDI welcomes Sir Charles Gairdner Hospital, Western Australia to the LabDOSS scheme.

A total of 108 reports have been included: Sir Charles Gairdner WA 30, Liverpool Hospital NSW 16, Woden Valley Hospital ACT 31, Sullivan Nicolaides Qld 8, Northern Tasmanian Pathology Service 8, Nambour Hospital Qld 6, TB Lynch Pathologists, Rockhampton QLD 7, Central Queensland Pathology Service 2. Woden Valley Hospital supplied additional data for the period April to June 1993. These data have been merged into the total 1993 file.

Organisms reported 5 or more times from blood are detailed in Table 5.

Other blood isolates not included in Table 5 were:

**Gram positive:** 1 *Streptococcus* Group B, 1 *Streptococcus sanguis*, 3 *Streptococcus 'viridans'*, 1 *Streptococcus* species, 1 *Corynebacterium JK* species, 1 *Lactococcus cremoris*

**Gram negative:** 1 *Salmonella* species (age 2 years, failure to thrive), 1 *Acinetobacter* species, 3 *Klebsiella pneumoniae*, 1 *Klebsiella*

*oxytoca*, 1 *Enterobacter cloacae*, 1 *Enterobacter* species, 1 *Pseudomonas aeruginosa*, 1 *Pseudomonas* species, 1 *Neisseria meningitidis* group B (1 year old female, QLD), 1 *Providencia* species, 3 *Proteus mirabilis*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 1 *Bacteroides* species, 1 *Bacteroides thetaotomicron*, 1 *Propionobacterium acnes*.

**Fungi:** 3 *Candida* species (2 *C. albicans*).

Most isolates were from patients over the age of 45 years (Figure 4).

Figure 4. LabDOSS reports of isolates from blood, by age group

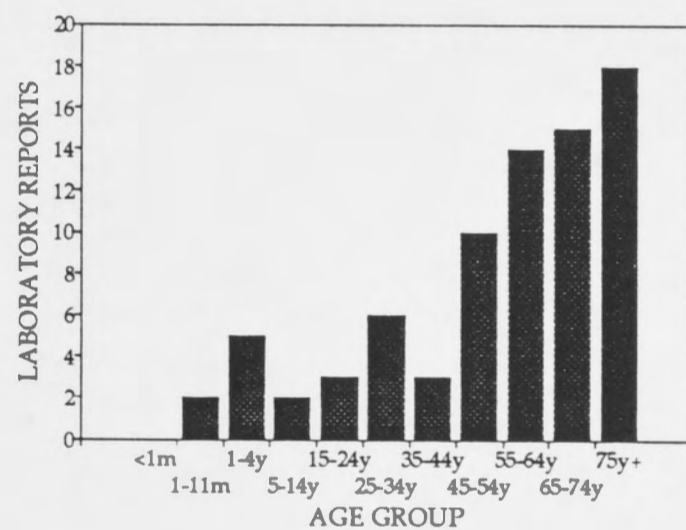


Table 5. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information					Risk Factors					Total <sup>1</sup>	Total Reported this year	
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Perinatal			Neonatal
<i>Staphylococcus aureus</i> <sup>2</sup>	4					1	2		1			10	343
<i>Staphylococcus epidermidis</i>								1				8	108
<i>Staphylococcus coagulase negative</i> <sup>3</sup>	1											6	160
<i>Enterococcus</i> species <sup>4</sup>												5	71
<i>Streptococcus pneumoniae</i>		2										5	73
<i>Escherichia coli</i>					2		1	1				16	434

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 1.
3. *Staphylococcus capitis* 2, *S. haemolyticus* 1, *S. hominis* 1, *S. saprophyticus* 1.
4. *Enterococcus faecalis* 3, *E. faecium* 1.

Table 6. LabDOSS meningitis reports, by organism and age group

	1-4 years	5-14 years	25-34 years	35-44 years	55-64 years	Total	Total reported this year
<i>Haemophilus influenzae</i> type b	1			1		2	24
<i>Haemophilus parainfluenzae</i>	1					1	1
<i>Klebsiella pneumoniae</i>					1	1	2
<i>Neisseria meningitidis</i> group B			1			1	8
<i>Streptococcus pneumoniae</i>		1				1	11

**CSF Isolates and meningitis reports**

There were 46 reports of CSF isolates and/or meningitis (Table 6).

**Isolates from sites other than blood or CSF**

**Peritoneal dialysate:** 1 *Staphylococcus aureus*, 1 *Streptococcus 'milleri'*, 1 coagulase negative *Staphylococcus*.

**Joint fluid:** 3 *Staphylococcus aureus*, 1 Group G *Streptococcus*.

**Other:** 3 *Escherichia coli*, 4 *Corynebacterium* species, 1 *Enterococcus faecalis*, 1 *Haemophilus influenzae* (no type provided), 2 *Pseudomonas aeruginosa*, 1 *Serratia marcescens*, 1 *Staphylococcus aureus*, 1 coagulase negative *Staphylococcus*, 1 *Staphylococcus epidermidis*.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 17 - 23 August 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 6 laboratories. A total of 119 reports have been included: IMVS Adelaide 57, Woden Valley Hospital ACT 16, Northern Tasmanian Pathology Service 24, Royal Hobart Hospital 7, Central Queensland Pathology Service Mackay 4, Sullivan Nicolaides Queensland 11.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** 2 *Streptococcus sanguis*, 2 *Streptococcus viridans*, 2 Group B *Streptococcus*, 2 Group A *Streptococcus* (1 year old female and 55 year old female), 1 *Streptococcus* species, 1 coagulase negative *Staphylococcus*, 3 *Enterococcus faecalis*, 1 *Enterococcus* species.

**Gram negative:** 2 *Haemophilus influenzae* type b (both epiglottitis, 4 year old female and 5 year old male), 1 *Haemophilus influenzae* (no type, 22 year old male), 1 *Acinetobacter* species, 1 *Serratia marcescens*, 1 *Proteus mirabilis*, 1 *Enterobacter* species, 2 *Enterobacter aerogenes*, 1 *Enterobacter cloacae*.

**Anaerobes:** 1 *Fusobacterium* species, 1 *Bacteroides thetaiotomicron*, 1 *Clostridium perfringens*.

**Fungi:** 1 *Candida albicans*, 2 *Candida* species.

Most isolates were from patients over the age of 55 years (Figure 4).

### CSF isolates and meningitis reports

One report of meningitis was received, *Cryptococcus neoformans* var *neoformans* in a 40 year old male with HIV.

### Isolates from sites other than blood or CSF

**Peritoneal dialysate:** 1 *Flavimonas oryzihabitans*, 1 *Staphylococcus epidermidis*, 1 coagulase negative *Staphylococcus*, 1 *Pseudomonas aeruginosa*.

**Joint fluid:** 1 *Haemophilus influenzae* type b, 6 *Staphylococcus aureus*, 1 *Escherichia coli*.

**Other:** 1 *Candida albicans*, 1 *Enterobacter cloacae*, 1 *Escherichia coli*, 1 *Klebsiella oxytoca*, 3 *Staphylococcus aureus*.

Figure 4. LabDOSS reports of blood isolates by age group

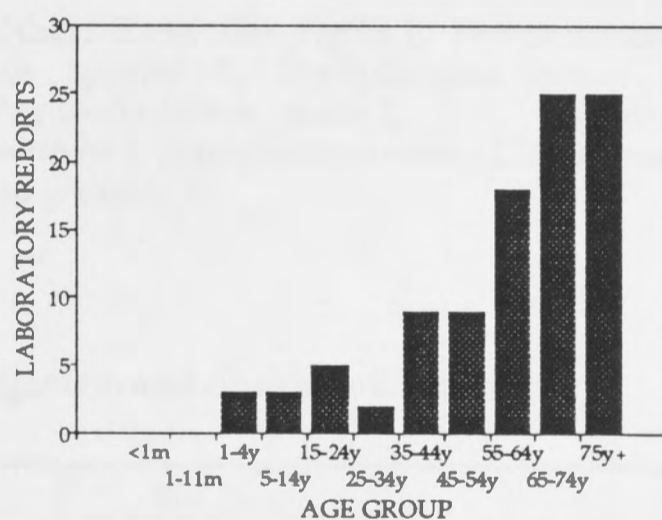


Table 2. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information					Risk Factors					Total <sup>1</sup>	Total reported this year	
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired			Neonatal
<i>Staphylococcus aureus</i>	3	1	1			1	3	3		7		23 <sup>2</sup>	365
<i>Staphylococcus epidermidis</i>								2	1	2		8	116
<i>Streptococcus pneumoniae</i>		4										5	78
<i>Escherichia coli</i>		1		6	5		1	5		1		20	454
<i>Klebsiella</i> species		1		3	1			1		1		7 <sup>3</sup>	130
<i>Pseudomonas aeruginosa</i>				1	1			3	1	1		6	98

1. Only organisms with 5 or more reports are included in this table.

2. MRSA 1.

3. *Klebsiella pneumoniae* 5, *K. oxytoca* 1.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 18 - 6 September 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 8 laboratories. A total of 235 reports have been included: Gosford Central Coast Hospital Services 25, Liverpool Hospital 62, Nambour Hospital 5, Royal Hobart Hospital 14, Royal North Shore Hospital 30, Royal Prince Alfred Hospital 58, Sullivan and Nicolaides Partners, Brisbane 13, Woden Valley Hospital, ACT 28.

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates not included in Table 3 were:

**Gram positive:** *Bacillus* species 1, *Corynebacterium* species 1, *Enterococcus faecalis* 3, *Enterococcus faecium* 1, *Streptococcus bovis* 1, *Streptococcus* group A 3, *Streptococcus* group B 4 (2 neonates), *Streptococcus* group G 1, *Streptococcus sanguis* 3, *Streptococcus viridans* 3, *Streptococcus salivarius* 1, *Streptococcus mitis* 2, *Streptococcus* species 3, *Lactococcus lactis* 1, *Micrococcus* species 1.

**Gram negative:** *Acinetobacter* species 2, *Acinetobacter calcoaceticus* var *lwoffii* 1, *Branhamella catarrhalis* 1, *Citrobacter freundii* 1, *Citrobacter* species 1, *Enterobacter aerogenes* 1, *Enterobacter* species 1, *Flavobacterium multivorum* 1, *Haemophilus influenzae* 3 (one type b epiglottitis age 2, 2 no type ages 5 and 36),

*Klebsiella* species 2, *Morganella morganii* 1, *Proteus mirabilis* 1, *Providencia* species 1, *Pseudomonas fluorescens* 1, *Pseudomonas paucimobilis* 2, *Pseudomonas stutzeri* 1, *Pseudomonas pseudomallei* 1 (diabetic recent travel to Borneo), *Pseudomonas* species 1, *Salmonella Typhi* 1, *Serratia marcescens* 1.

**Anaerobes:** *Bacteroides fragilis* 3, *Clostridium perfringens* 2, *Clostridium* species 2, *Fusobacterium* species 1, *Propionibacterium acnes* 1.

**Fungi:** *Candida albicans* 2.

Most patients were over the age of 55 years (Figure 4).

#### CSF isolates and meningitis reports

There were 9 reports of CSF isolates and/or meningitis (Table 4).

#### Isolates from sites other than blood or CSF

**Joint fluid:** *Escherichia coli* 2, *Staphylococcus aureus* 1.

**Peritoneal dialysate:** *Enterococcus faecalis* 1, *Pseudomonas fluorescens* 1, *Staphylococcus epidermidis* 1.

**Other:** *Bacteroides fragilis* 1, *Peptostreptococcus* species 1, *Staphylococcus aureus* 1, *Propionibacterium acnes* 1, *Proteus mirabilis* 1, *Staphylococcus aureus* 1, *Streptococcus* group A 1.

Table 3. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i>	5			1		7	5	7	10			49 <sup>2</sup>	4593
<i>Staphylococcus epidermidis</i>							1	1	3			7	135
<i>Staphylococcus coagulase negative</i>			1				1	1	2	1		9	171
<i>Streptococcus pneumoniae</i>	1	9		2				2				17	100
<i>Escherichia coli</i>				5	10	2	4	9	1		1	36	518
<i>Enterobacter cloacae</i>				1			1	2	1			5	53
<i>Klebsiella oxytoca</i>					1		1	1				5	31
<i>Klebsiella pneumoniae</i>					3			4				8	92
<i>Pseudomonas aeruginosa</i>		1		2		1	2	7				12	118

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 5.
3. MRSA 24.

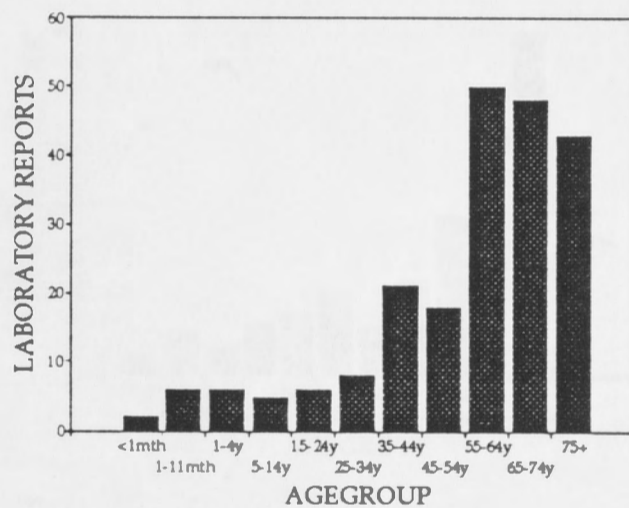


Table 4. LabDOSS meningitis reports, by organism and age group

	1-4 years	5-14 years	15-24 years	25-34 years	35-44 years	75+ years	Total	Total reported this year
<i>Neisseria meningitidis</i> group B	1		1				2	20*
<i>Staphylococcus aureus</i>						1	1	5
<i>Staphylococcus epidermidis</i>			1				1	2
<i>Streptococcus</i> group A			1				1	3
<i>Haemophilus influenzae</i> type b	2						2	26
<i>Cryptococcus neoformans</i> var <i>neoformans</i>				1 HIV	1 HIV		2	22

\* includes all *Neisseria meningitidis* serogroups.

Figure 4. LabDOSS reports of blood isolates by age group





# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 19 - 20 September 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight has been provided by 9 laboratories. CDI welcomes Ipswich Hospital, Queensland to the LabDOSS Scheme. Their 87 records have been merged into the total 1993 file.

A total of 249 reports have been included: ICPMR, Westmead 25, Institute of Medical and Veterinary Science, Adelaide 76, Northern Tasmanian Pathology Service 21, Royal North Shore Hospital, Sydney 41, Sir Charles Gairdner Hospital, Western Australia 24, Sullivan and Nicolaidis Partners, Queensland 10, Tamworth Laboratory 3, Toowoomba Pathology Laboratory 8, Woden Valley Hospital, ACT 41.

Organisms reported 5 or more times from blood are detailed in Table 5. Other blood isolates not included in Table 5 were:

**Gram positive:** *Corynebacterium jeikeium* 2 (associated with IV lines), *Enterococcus faecalis* 4, *Enterococcus faecium* 1, *Enterococcus* species 2, *Streptococcus* group A 4, *Streptococcus* group B 2 (74 year old female, 23 year old male), *Streptococcus* group D non-enterococci 1, *Streptococcus* group G 2, *Streptococcus 'milleri'* 1, *Streptococcus sanguis* 2, *Streptococ-*

*cus viridans* 1, *Streptococcus* species 2, *Nocardia asteroides* 1.

**Gram negative:** *Acinetobacter* species 1, *Enterobacter aerogenes* 2, *Enterobacter cloacae* 2, *Enterobacter* species 1, *Klebsiella oxytoca* 4, *Klebsiella* species 4, *Neisseria meningitidis* Group C 1 (14 year old female), *Pseudomonas* species 1, *Serratia* species 2.

Figure 6. LabDOSS reports of blood isolates, by age group

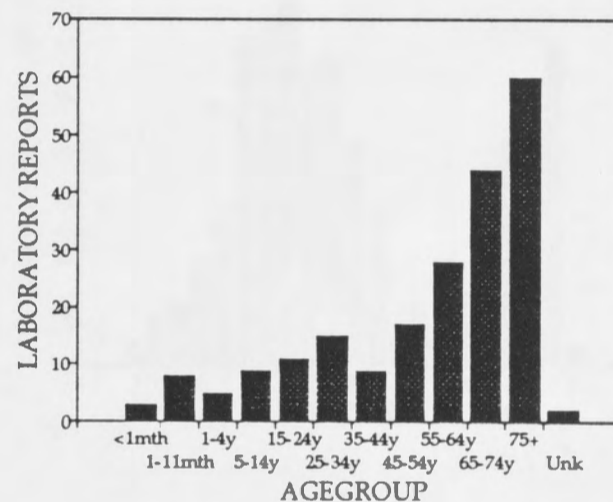


Table 5. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i>	1	4		3	1	11	8	9	5	5	1	50 <sup>2</sup>	536 <sup>3</sup>
<i>Staphylococcus epidermidis</i>						2	4	2	5			15	160
<i>Staphylococcus coagulase negative</i>		1				1	1		3		1	10	183
<i>Streptococcus pneumoniae</i>		11				2						15	118
<i>Escherichia coli</i>					13		1	9	2	1		34	557
<i>Haemophilus influenzae</i>		1				2						5 <sup>4</sup>	45
<i>Klebsiella pneumoniae</i>					2		1	2	1			9	102
<i>Proteus mirabilis</i>					4			2	1			5	49
<i>Pseudomonas aeruginosa</i>		3		1	1		2	6	3			12	134

1. Only organisms with 5 or more reports are included in this table.

2. MRSA 6.

3. MRSA 51.

4. 2 type b.

Table 6. LabDOSS meningitis reports, by organism and age group

	1-4 years	5-14 years	15-24 years	25-34 years	55-64 years	75+ years	Total	Total reported this year
<i>Neisseria meningitidis</i> group B			1				1	23 <sup>1</sup>
<i>Neisseria meningitidis</i> group C					1		1	
<i>Streptococcus pneumoniae</i>	1				1		2	13

1. All *Neisseria meningitidis* serogroups.

**Anaerobes:** *Bacteroides fragilis* 3, *Bacteroides* species 1, *Bacteroides thetaiotaomicron* 1, *Clostridium septicum* 1, *Propionibacterium acnes* 2.

**Fungi:** *Candida* species 2, *Candida albicans* 2.

Most patients were over the age of 55 years (Figure 6).

**CSF isolates and meningitis reports**

There were 4 reports of CSF isolates and/or meningitis (Table 6).

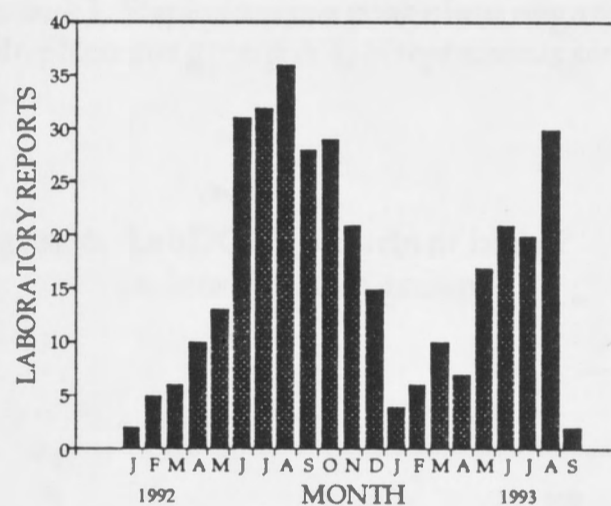
**Isolates from sites other than blood or CSF**

**Joint fluid:** *Enterobacter* species 1, *Pseudomonas aeruginosa* 1, *Staphylococcus aureus* 6, *Streptococcus* Group B 1, *Streptococcus pneumoniae* 1, *Streptococcus* species 1.

**Peritoneal dialysate:** *Staphylococcus aureus* 3, *Staphylococcus epidermidis* 4, *Streptococcus sanguis* 2.

**Other:** *Clostridium perfringens* 1, *Corynebacterium xerosis* 1, *Enterobacter cloacae* 1, *Enterococcus* species 1, *Escherichia coli* 4, *Staphylococcus aureus* 3, *Staphylococcus epidermidis* 3, *Pseudomonas aeruginosa* 1.

Figure 7. LabDOSS *Streptococcus pneumoniae* isolates 1992 to 1993



The winter seasonal trend of *Streptococcus pneumoniae* reports is shown in Figure 7.

# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 20 - 4 October 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight has been provided by 5 laboratories.

A total of 51 reports have been included: Central Queensland Pathology Laboratory, Mackay 4, Nambour General Hospital 10, Northern Tasmanian Pathology Service 8, Sullivan and Nicolaidis Partners, Queensland 11 and Woden Valley Hospital, ACT 18.

Organisms reported 5 or more times from blood are detailed in Table 2. Other blood isolates not included in Table 2 were:

**Gram positive:** *Staphylococcus epidermidis* 1, *Streptococcus* group A 1, *Streptococcus* group G 1, *Streptococcus pneumoniae* 3, *Streptococcus viridans* 1.

**Gram negative:** *Campylobacter jejuni* 1, *Haemophilus influenzae* type b 1 (61 year old female with acute epiglottitis), *Klebsiella oxytoca* 1, *Klebsiella pneumoniae* 3, *Neisseria meningitidis* group B 1 (11 month old female), *Pseudomonas aeruginosa* 2.

**Anaerobes:** *Bacteroides fragilis* 1, *Fusobacterium* species 1.

**Fungi:** *Torulopsis glabrata* 1, *Candida albicans* 1.

Most patients were over the age of 55 years (Figure 4).

### CSF isolates and meningitis reports

One report of meningitis was received, *Haemophilus influenzae* type b in an 11 month old female.

### Isolates from sites other than blood or CSF

**Joint fluid:** *Pseudomonas aeruginosa* 1, *Staphylococcus aureus* 3.

**Peritoneal dialysate:** *Staphylococcus epidermidis* 1, *Streptococcus viridans* 1.

**Other:** *Enterococcus* species 1, *Enterobacter* species 1, *Escherichia coli* 1, *Staphylococcus aureus* 1, *Staphylococcus coagulase negative* 1, *Streptococcus* group A 1, *Streptococcus sanguis* 1.

Figure 4. LabDOSS reports of blood isolates, by age group

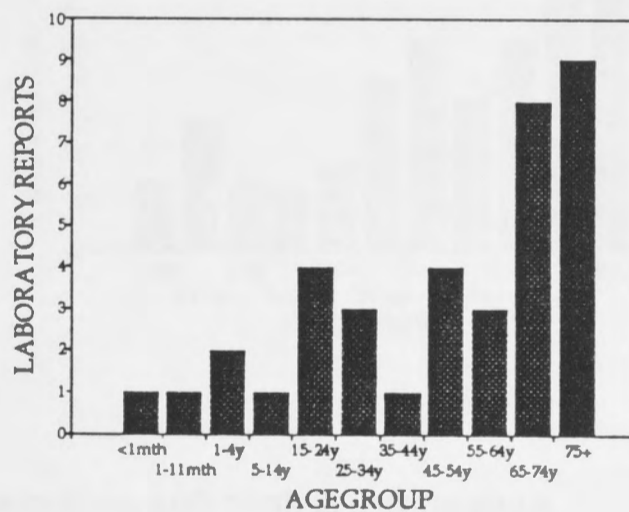


Table 2. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information					Risk Factors					Total <sup>1</sup>	Total reported this year	
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired			Neonatal
<i>Staphylococcus aureus</i>							1		1	1		6	564 <sup>2</sup>
<i>Staphylococcus coagulase negative</i>									2			5	198
<i>Escherichia coli</i>					3		1					6	590

1. Only organisms with 5 or more reports are included in this table.  
2. MRSA 65.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 21 - 18 October 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 6 laboratories. A total of 233 reports have been included - ICPMR, Westmead 143, Nambour General Hospital 3, Royal Hobart Hospital 18, Royal North Shore Hospital 39, Sullivan and Nicolaides Partners, Queensland 14, Woden Valley Hospital, ACT 16.

Organisms reported 5 or more times from blood are detailed in Table 4.

Uncommon isolates reported this fortnight were: coryneform (CDC group A5 1, Group F2 1, Oerskovia-like organism 1), *Rothia dentocariosa* 1, *Brevibacterium* species 1, CDC EO-3 group gram negative rod 1.

Other blood isolates not included in Table 4 were:

**Gram positive:** *Bacillus* species 1, *Corynebacterium jeikeium* 1, *Corynebacterium xerosis* 1, *Enterococcus faecalis* 4, *Staphylococcus epidermidis* 4, *Streptococcus* group A 1, *Streptococcus* group B 1 (term neonate), *Streptococcus* group G 1, *Streptococcus 'milleri'* 2, *Streptococcus sanguis* 1, *Streptococcus salivarius* 1, *Lactobacillus casei* 1.

**Gram negative:** *Acinetobacter johnsonii* 1, *Acinetobacter* species 1, *Aeromonas hydrophila* 1, *Enterobacter cloacae* 3, *Enterobacter agglomerans* 1, *Enterobacter* species 1, *Flavobacterium indologenes* 1, *Flavobacterium oryzihabitans* 1),

*Gemella haemolysans* 1, *Haemophilus influenzae* type b 3 (epiglottitis in a 6 year old female, pneumonia in a 75 year old male), *Kingella kingae* 1, *Klebsiella oxytoca* 1, *Moraxella osloensis* 1, *Proteus mirabilis* 2, *Proteus vulgaris* 1, *Pseudomonas* species 1, *Serratia marcescens* 4, *Xanthomonas maltophilia* 1.

**Anaerobes:** *Actinomyces israelii* 1, *Bacteroides fragilis* 3, *Bacteroides* species 1, *Bacteroides thetaomicron* 1, *Clostridium tertium* 1, *Clostridium septicum* 1, *Clostridium* species 1), *Peptostreptococcus* species 1, *Prevotella buccalis* 1.

Figure 7. LabDOSS blood isolates, by age group

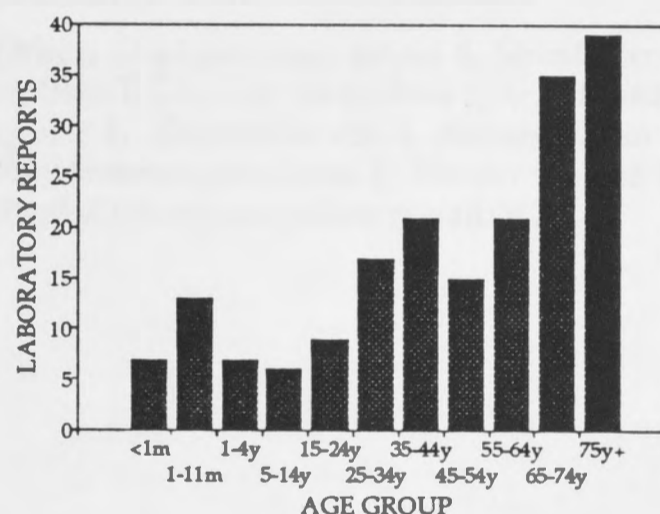


Table 4. LabDOSS reports of blood isolates, by organism and clinical information

	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/ Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i>	3	3	3	1		8	5	7	6			372	6013
<i>Staphylococcus coagulase negative</i>	2	2		5			1	3	29	1	1	42	240
<i>Streptococcus pneumoniae</i>		4						1				6	135
<i>Escherichia coli</i>		3			10	1	2	6	3			26	616
<i>Klebsiella pneumonia</i>				2	2	1	2	3			2	9	98
<i>Pseudomonas aeruginosa</i>		1		1			3	2	3			8	146

1. Only organisms with 5 or more reports are included in this table.
2. 10 MRSA.
3. 75 MRSA.

Table 5. LabDOSS meningitis reports, by organism and age group

	Age group							Total	Total reported this year
	1-11 months	1-4 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years		
<i>Enterobacter aerogenes</i>						1		1	3
<i>Escherichia coli</i>				1				1	1
<i>Neisseria meningitidis</i>		3 <sup>1</sup>						3	26 <sup>3</sup>
<i>Propionibacterium acnes</i>					1			1	1
<i>Haemophilus influenzae</i> type b	1							1	28
<i>Cryptococcus neoformans</i> <i>var neoformans</i>			1 <sup>2</sup>					1	14
<i>Staphylococcus aureus</i>	1						1	2	7
<i>Staphylococcus coagulase negative</i>		1						1	4

1. Group C 2.
2. HIV positive.
3. Group C 8.

**Fungi:** *Candida parapsilosis* 1, *Candida albicans* 4.

**Mycobacteria:** *Mycobacterium avium* 1, *Mycobacterium intracellulare* 1.

There were 20 blood isolates from patients aged less than one year and 74 from patients aged over 65 years (Figure 7).

**CSF isolates and meningitis reports**

There were 11 reports of CSF isolates and/or meningitis this fortnight (Table 5).

**Isolates from sites other than blood or CSF**

**Peritoneal dialysate:** *Moraxella species* 1, *Staphylococcus epidermidis* 1, *Bacillus species* 1, *Staphylococcus coagulase negative* 3, *Streptococcus viridans* 2, MRSA 1.

**Joint fluid:** *Staphylococcus aureus* 4.

**Other:** *Staphylococcus aureus* 4, *Streptococcus viridans* 1, *Candida parapsilosis* 1, *Acinetobacter species* 1, *Escherichia coli* 1, *Neisseria sicca* 1, *Pseudomonas aeruginosa* 1, *Serratia species* 1, *Staphylococcus coagulase negative* 2.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 22 - 1 November 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 6 laboratories. A total of 124 reports have been included for this report: Institute of Medical and Veterinary Science, Adelaide 53, Nambour General Hospital 5, Northern Tasmanian Pathology Service 7, Sir Charles Gairdner Hospital, Western Australia 30, Sullivan and Nicolaides Partners, Queensland 9, Woden Valley Hospital, ACT 20.

Organisms reported 5 or more times from blood are detailed in Table 3. Other blood isolates not included in Table 3 were:

**Gram positive:** *Enterococcus faecalis* 3, *Enterococcus* species 1, *Staphylococcus coagulase negative* 4, *Streptococcus* Group A 1, *Streptococcus 'milleri'* 2, *Streptococcus sanguis* 1, *Streptococcus 'viridans'* 3.

**Gram negative:** *Enterobacter* species 1, *Flavobacterium* species 1, *Haemophilus influenzae* type b 1 (4 year old male), *Klebsiella oxytoca* 2, *Serratia marcescens* 3.

**Anaerobes:** *Bacteroides fragilis* 2, *Bacteroides thetaiotaomicron* 1, *Clostridium* species 1, *Clostridium perfringens* 1.

**Fungi:** *Candida* species 3, *Candida albicans* 1.

Most reports were for patients over the age of 44 years (Figure 9).

### CSF isolates and meningitis reports

*Neisseria meningitidis* untypeable 1 (14 year old male), *Staphylococcus aureus* 1 (51 year old female).

### Isolates from sites other than blood or CSF

**Peritoneal dialysate:** *Staphylococcus epidermidis* 2, *Streptococcus* species 1.

**Joint fluid:** *Staphylococcus aureus* 1, *Escherichia coli* 1.

**Pleural fluid:** *Staphylococcus aureus* 2.

Figure 9. LabDOSS reports by blood isolates, by age group

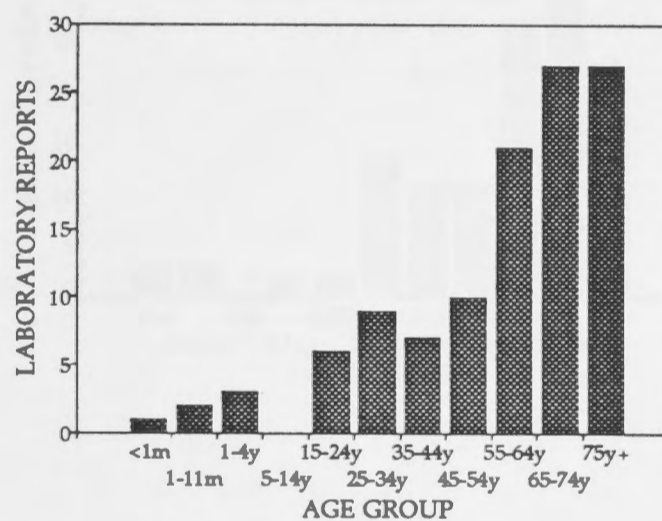


Table 3. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information					Risk Factors					Total <sup>1</sup>	Total reported this year	
	Bone / joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired			Neonatal
<i>Staphylococcus aureus</i>	3	1		1		6	4	8	2	11		24	625 <sup>2</sup>
<i>Staphylococcus epidermidis</i>				1		1	1	2	6	10		15	185
<i>Streptococcus pneumoniae</i>		6					1	1				8	143
<i>Escherichia coli</i>				4	5		1	3		3		19	635
<i>Klebsiella pneumoniae</i>					2		1	4	2	3		11	130
<i>Pseudomonas aeruginosa</i>		1				1		2	1	2		5	151

1. Only organisms with 5 or more reports are included in this table.  
2. 75 MRSA.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 23 - 15 November 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by seven laboratories.

A total of 157 reports have been included: Royal Hobart Hospital 17, Liverpool Hospital 25, Royal North Shore Hospital 41, Northern Tasmania Pathology Service 4, Sullivan and Nicolaidis Partners, Queensland 16, Toowoomba Pathology Laboratory 25, Woden Valley Hospital ACT 29.

A further 65 reports were received from Liverpool Hospital with onset date of illness prior to the 1st of October. These records have been merged with 1993 data.

Organisms reported 5 or more times from blood are detailed in Table 3.

Other blood isolates not included in Table 3 were:

**Gram positive:** 1 *Listeria monocytogenes* (lymphoma), 2 *Streptococcus* Group A, 2 *Streptococcus* Group B (1 post partum), 2 *Streptococcus* Group G, 1 *Streptococcus* 'milleri', 1 *Streptococcus sanguis*, 2 *Streptococcus mitis*, 1 *Streptococcus* species, 2 *Corynebacterium* species, 2 *Enterococcus faecalis*, 1 *Enterococcus durans*, 2 coagulase negative staphylococci, 1 *Staphylococcus auricularis*, 1 *Staphylococcus lugdunensis* (endocarditis).

**Gram negative:** 1 *Salmonella* Typhi (from Indonesia), 2 *Acinetobacter* species (1 calcoaceticus), 1 *Serratia marcescens*, 4 *Pseudomonas aeruginosa*, 1 *Pseudomonas paucimobilis*, 2 *Haemophilus influenzae* (1 type b age 56, 1 not type b), 1 *Aeromonas hydrophila*, 1 *Campylobacter jejuni*, 1 *Pasteurella multocida*, 2 *Proteus mirabilis*, 1 *Xanthomonas maltophilia*.

**Anaerobes:** 1 *Bacteroides fragilis*, 1 *Clostridium perfringens* (neonate), 1 *Fusobacterium mortiferum*.

Figure 1. LabDOSS reports of blood isolates, by age group

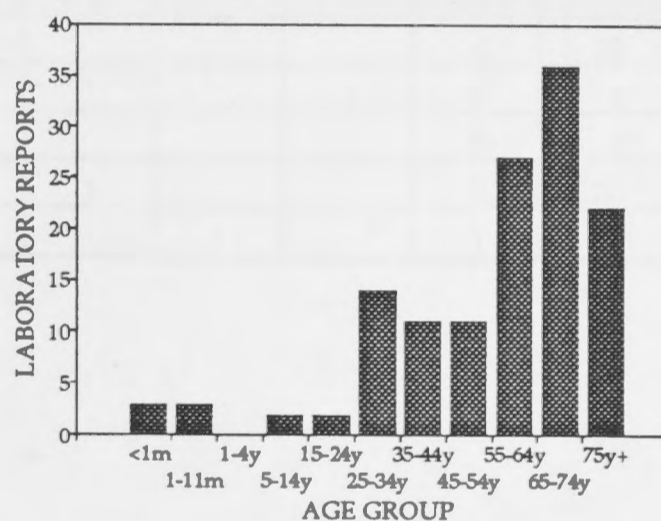


Table 3. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/ Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i>	1		2	1	2	5	5	3	7			25 <sup>2</sup>	662 <sup>5</sup>
<i>Staphylococcus epidermidis</i>			1	2				1				7	192
<i>Streptococcus pneumoniae</i>		4										5	156
<i>Escherichia coli</i>		1		6			4	7				32	683
<i>Enterobacter</i> species					1			2				5 <sup>3</sup>	114
<i>Klebsiella</i> species		1			1	2		3	1	1		9 <sup>4</sup>	217

1. Only organisms with 5 or more reports are included in this table.
2. MRSA 2.
3. *Enterobacter aerogenes* 1, cloacae 3, agglomerens 1.
4. *Klebsiella pneumoniae* 4, oxytoca 2.
5. MRSA 75.

**Fungi:** *Candida albicans* 4.

Most reports were for patients over the age of 24 years (Figure 1).

**CSF isolates and meningitis reports**

Three cases of *Neisseria meningitidis* serogroup C were reported in children in Sydney. The children were from the same family and developed illness on 15 October (Table 4). All three children survived. Chemoprophylaxis was administered to close contacts. The remaining two family members were *Neisseria meningitidis* group C nasopharyngeal carriers. No other carriers were identified in close contacts. No further cases occurred.

(Liverpool Hospital and South West Area Pathology Service, NSW).

**Isolates from sites other than blood or CSF**

**Joint fluid:** 1 *Enterococcus faecalis*, 5 *Staphylococcus aureus*, 1 *Streptococcus* group B.

**Peritoneal dialysate:** 2 *Escherichia coli*, 1 *Bacteroides fragilis*, 1 *Staphylococcus aureus*, 4 coagulase negative staphylococci.

**Other:** 1 *Enterococcus faecalis*, 1 coagulase negative *Staphylococcus*, 1 *Staphylococcus aureus*, 1 *Streptococcus* group A.

**Table 4. LabDOSS meningitis reports, by organism and age group**

	1-11 months	1-4 years	5-14 years	35-44 years	65-74 years	75+ years	Total	Total reported this year
<i>Neisseria meningitidis</i>	1	2 <sup>1</sup>	1 <sup>2</sup>				4	32
<i>Streptococcus</i> Group A						1	1	4
<i>Enterobacter cloacae</i>	1 <sup>4</sup>						1	1
<i>Haemophilus influenzae</i>	1 <sup>3</sup>			1			2	30
<i>Streptococcus pneumoniae</i>					1		1	15

1. *Neisseria meningitidis* group A.
2. *Neisseria meningitidis* group C.
3. *Haemophilus influenzae* type b.
4. Preterm neonate.



# COMMUNICABLE DISEASES INTELLIGENCE

## Volume 17, Number 24 - 29 November 1993

### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 7 laboratories. A total of 138 reports was received this fortnight: Sir Charles Gairdner Hospital, Western Australia 40, Liverpool Hospital, New South Wales 9, Sullivan Nicolaides, Queensland 9, IMVS Adelaide 46, Central Queensland Pathology Laboratory, Mackay 7, Nambour General Hospital 9, Northern Tasmanian Pathology Service 18.

Organisms reported 5 or more times from blood are detailed in Table 4. Other blood isolates not included in Table 4 were:

**Gram positive:** 1 *Bacillus* species, 1 *Corynebacterium jeikeium*, 1 *Corynebacterium* species, 2 *Enterococcus* species (1 *E. faecalis*), 4 *Streptococcus* group B (3 adult females, 2 of whom died, 1 male aged 2 months), 1 *Streptococcus* group A, 1 *Streptococcus* group G, 1 *Streptococcus* group D nonenterococci, 1 *Streptococcus equinus*, 3 *Streptococcus sanguis*, 1 *Streptococcus 'milleri'*, 2 *Streptococcus pneumoniae*, 1 *Streptococcus salivarius*, 2 *Streptococcus mitis*, 2 *Streptococcus 'viridans'*, 2 *Streptococcus* species.

**Gram negative:** 1 *Neisseria meningitidis* (19 year old male, Tasmania, awaiting serogroup identification), 3 *Acinetobacter* species, 3 *Klebsiella pneumoniae*, 2 *Klebsiella oxytoca*, 3 *Pseudomonas aeruginosa*, 1 *Proteus mirabilis*, 1 *Xanthomonas maltophilia*, 2 *Serratia marcescens*, 1 *Serratia* species, 1 *Citrobacter freundii*.

**Anaerobes:** 3 *Bacteroides fragilis*, 2 *Clostridium perfringens*, 1 *Peptostreptococcus* species, 1 *Propionibacterium* species.

**Fungi:** 6 *Candida* species (3 *C. albicans*, 1 *C. glabrata*).

Most patients were over the age of 55 years (Figure 10).

#### CSF isolates and meningitis reports

There were two reports of meningitis, *Haemophilus influenzae* type b in a 2 year old male, and *Staphylococcus aureus* in a 74 year old male.

#### Isolates from sites other than blood or CSF

**Peritoneal dialysate:** 1 *Bacillus* species, 1 *Pseudomonas aeruginosa*, 1 *Enterobacter cloacae*, 1 *Enterococcus faecalis*.

**Joint fluid:** 4 *Staphylococcus aureus*, 1 *Klebsiella* species.

**Other:** 1 *Escherichia coli*, 1 *Streptomyces griseus*.

Figure 10. LabDOSS blood isolates, by age group

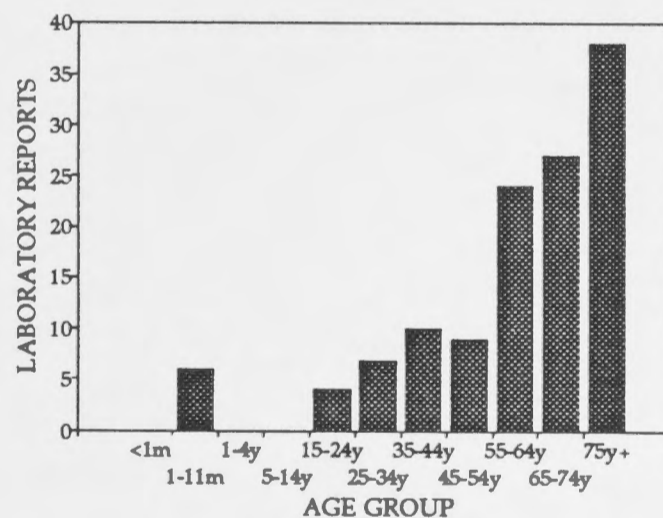


Table 4. LabDOSS reports of blood isolates, by organism and clinical information

Organism	Clinical Information						Risk Factors					Total <sup>1</sup>	Total reported this year
	Bone/Joint	Lower respiratory	Endocarditis	Gastrointestinal	Urinary Tract	Skin	Surgery	Immunosuppressed	IV line	Hospital acquired	Neonatal		
<i>Staphylococcus aureus</i>	3	3	1		2	2	4	3	2	1		23 <sup>2</sup>	785 <sup>3</sup>
<i>Staphylococcus epidermidis</i>		1				1						15	206
<i>Staphylococcus coagulase negative</i>							1	2	1			6	256
<i>Escherichia coli</i>				2	11		1	5		1		24	707

1. Only organisms with 5 or more reports are included in this table.
2. 2 MRSA.
3. 175 MRSA.



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## COMMUNICABLE DISEASES INTELLIGENCE

### Volume 17, Number 25 - 13 December 1993

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#### Sterile Sites Surveillance (LabDOSS)

Data for this fortnight have been provided by 3 laboratories. A total of 27 reports has been included: Sir Charles Gairdner Hospital, Western Australia 13, Sullivan Nicolaides Partners, Queensland 9, Woden Valley Hospital, ACT 5.

Other blood isolates not included in Table 3 were:

**Gram positive:** 3 *Staphylococcus aureus*, 1 *Staphylococcus haemolyticus*, 2 *Staphylococcus epidermidis*, 2 coagulase negative *Staphylococci*, 2 *Streptococcus* group G, 1 *Streptococcus 'milleri'*, 1 *Streptococcus pneumoniae* 1, *Streptococcus mitis* (endocarditis), 1 *Streptococcus mutans* (endocarditis), 1 *Streptococcus* species (endocarditis), 1 *Enterococcus*

*faecalis* (endocarditis), 1 *Listeria monocytogenes* (neutropaenic 75 year old female).

**Gram negative:** 3 *Pseudomonas aeruginosa*.

**Anaerobes:** *Bacteroides fragilis*.

#### CSF isolates and meningitis reports

1 *Haemophilus influenzae* type b (2 year old male), 1 *Neisseria meningitidis* group B (32 year old male).

#### Isolates from sites other than blood or CSF

**Joint fluid:** 1 *Staphylococcus aureus*.

**Other:** 1 *Serratia marcescens*, 1 group F *Streptococcus*, 1 *Enterococcus* species.

## **1.2 The LabDOSS Scheme : Analysis of data from January 1992 to September 1993**

A condensed form of the following article is to be submitted for publication in a refereed journal. I have prepared the article to a stage for comment by co-authors Dr Robert Hall and Dr Mahomed Patel.

### **1.2.1 Introduction**

### **1.2.2 Methods**

### **1.2.3 Results**

- Overview of Reports, Patterns of Contributing Laboratories, Age and Sex Distribution
- Common Organisms, Proportion of Sepsis by Age Group and Sex Distribution
- Cases of Sepsis by Clinical Category; Endocarditis, Meningitis, Osteomyelitis and Septic Arthritis, Recent Surgery, Immunocompromised

### **1.2.4 Discussion**

### 1.2.1 Introduction

A new laboratory based surveillance scheme for sepsis from invasive organisms was established in 1992. The purpose of the routine surveillance of organisms isolated in normally sterile sites was to :

- Improve our understanding of epidemiology of disease caused by invasive organisms in Australia,
- Monitor trends of disease caused by invasive organisms over time, e.g. seasonal or annual,
- Identify emerging pathogens causing invasive disease,
- Identify outbreaks,
- Monitor geographic distribution of diseases across Australia,
- Identify risk groups for disease e.g. sex, age, underlying disease,
- Guide direction for further research and
- To use the knowledge gained from surveillance to develop and evaluate public health policy e.g. vaccination for *Haemophilus influenzae* type b disease.

(Refer Section 1 A New Surveillance Scheme Part 1 Development of LabDOSS)

The scheme is operated by the Commonwealth Department of Human Services and Health and results are published in the *Communicable Diseases Intelligence (CDI)*. The surveillance system is titled LabDOSS, an acronym for **L**aboratory **D**atabase of **O**rganisms from **S**terile **S**ites. LabDOSS is a passive surveillance scheme with voluntary contributions from microbiology laboratories across Australia. Contributing laboratories provide reports of organisms isolated from normally sterile sites.

My role in establishing the scheme is outlined in Section 1.1 A New Surveillance Scheme, Development of LabDOSS. The vast majority of collation of laboratory reports, processing , sorting , screening for errors and duplicates and analysis of data for this report is my own work.



### 1.2.2 Methods

The definition of a normally sterile site is a site in the body that does not under normal healthy conditions contain any micro-organisms. Examples of samples of normally sterile sites are blood, cerebrospinal fluid, joint fluid, tissue samples such as spleen, liver, muscle. To be sterile the site must not have any connection out of the body. Access to a normally sterile site must be via an invasive instrument, needle or surgical implement.

LabDOSS software for personal computers is provided to laboratories by the Commonwealth Department of Human Services and Health. The system is written in EpiInfo. Laboratories transfer data to the *CDI* by floppy disc, or telephone modem, on a fortnightly basis. Details of development of the scheme are outlined in the Section 1; A New Surveillance Scheme, Part 1 Development of LabDOSS. Data from the commencement of the scheme, 1st January 1992 through to the end of September 1993 have been analysed. Reports of *Haemophilus influenzae* have been considered separately and analysed from January 1992 to December 1993 (refer section 1.3). Analysis of LabDOSS data has been performed using EpiInfo and Excel. There has been a progressive increase in the number of contributing laboratories over the 21 month period. Proportions of reports per ten "contributing laboratory months" have been quoted to compare periods with a varying number of participating laboratories. One "contributing laboratory month" is defined as one laboratory providing reports for a period of one month.

### 1.2.3 Results

#### Total Number of Reports and Patterns of Contributing Laboratories

There were 7,033 reports of organisms from normally sterile sites from January 1992 to September 1993. Nineteen laboratories contributed to the scheme. The mean number of contributing laboratories per month was 13. Laboratories from 5 states and the ACT contributed; 73 percent of laboratories were from NSW and Queensland (Figure 1). Reports from contributing laboratories have increased slowly over time (Figure 2). There is little difference between the total numbers of reports for the periods of January to September 1992 (  $n = 2901$ ) and 1993 (  $n = 3003$ ). However, the number of contributing laboratories has changed over this period. The mean number of reports per contributing laboratory month was 30.9 for Jan to Sep 1992 and 18.7 for the same period in 1993. This difference in the mean number of reports per contributing laboratory month in 1992 and 1993 is restricted to the months January to March (Figure 3). The distribution of laboratories contributing in this early phase of the scheme was skewed as 3 of the 4 contributing laboratories were servicing metropolitan teaching hospitals. Metropolitan hospital laboratories provide more reports of sepsis from sterile sites than country hospital or private laboratories (Figure 4). There was little difference in the number of reports per contributing laboratory month and a more even proportion of type of laboratory over the subsequent period April 1992 to September 1993 (Figures 3 and 5). One large teaching hospital laboratory provided data in 1992 but has not provided reports in 1993.



Figure 1: State Location of Contributing Laboratories, LabDOSS January 1992 to September 1993

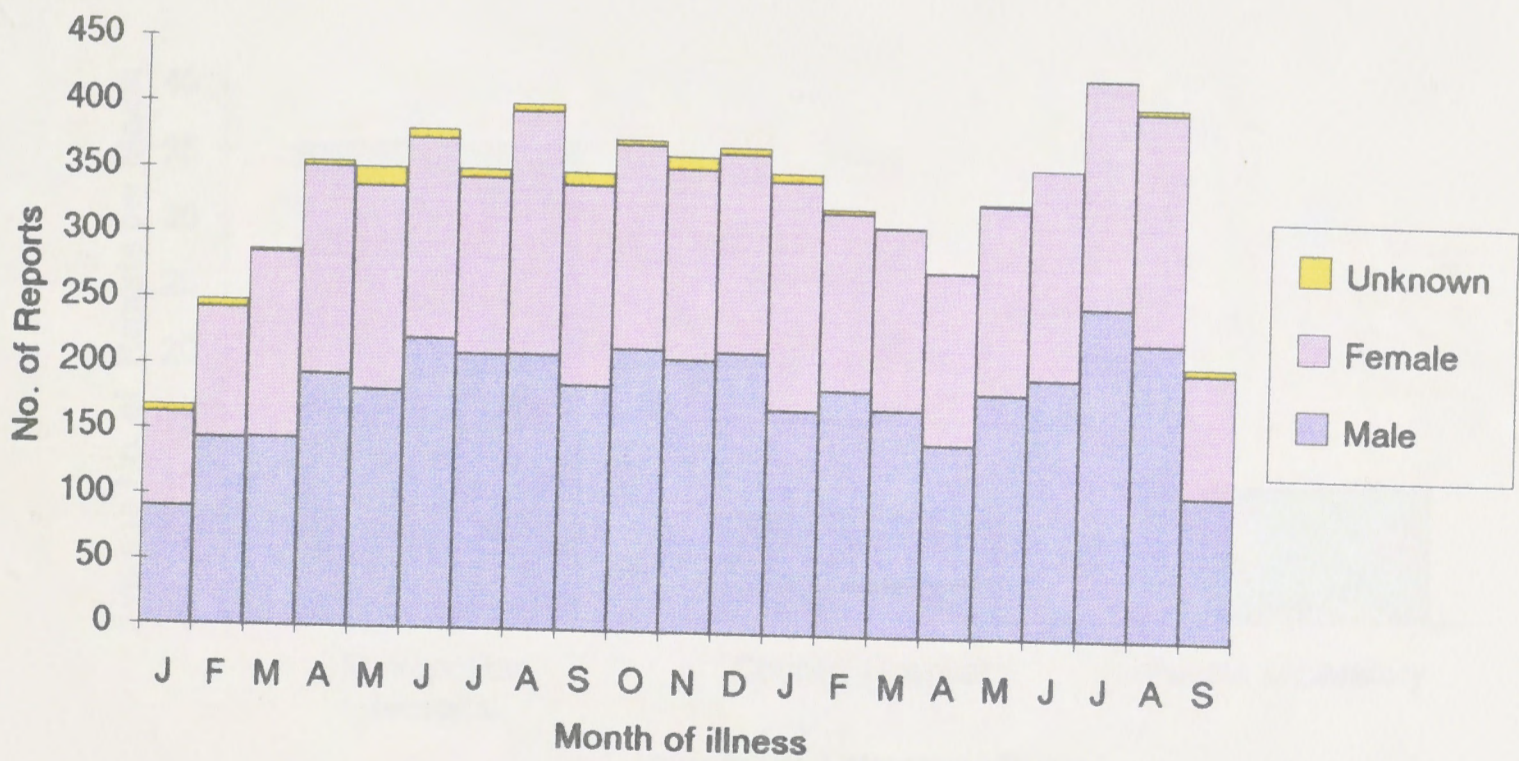
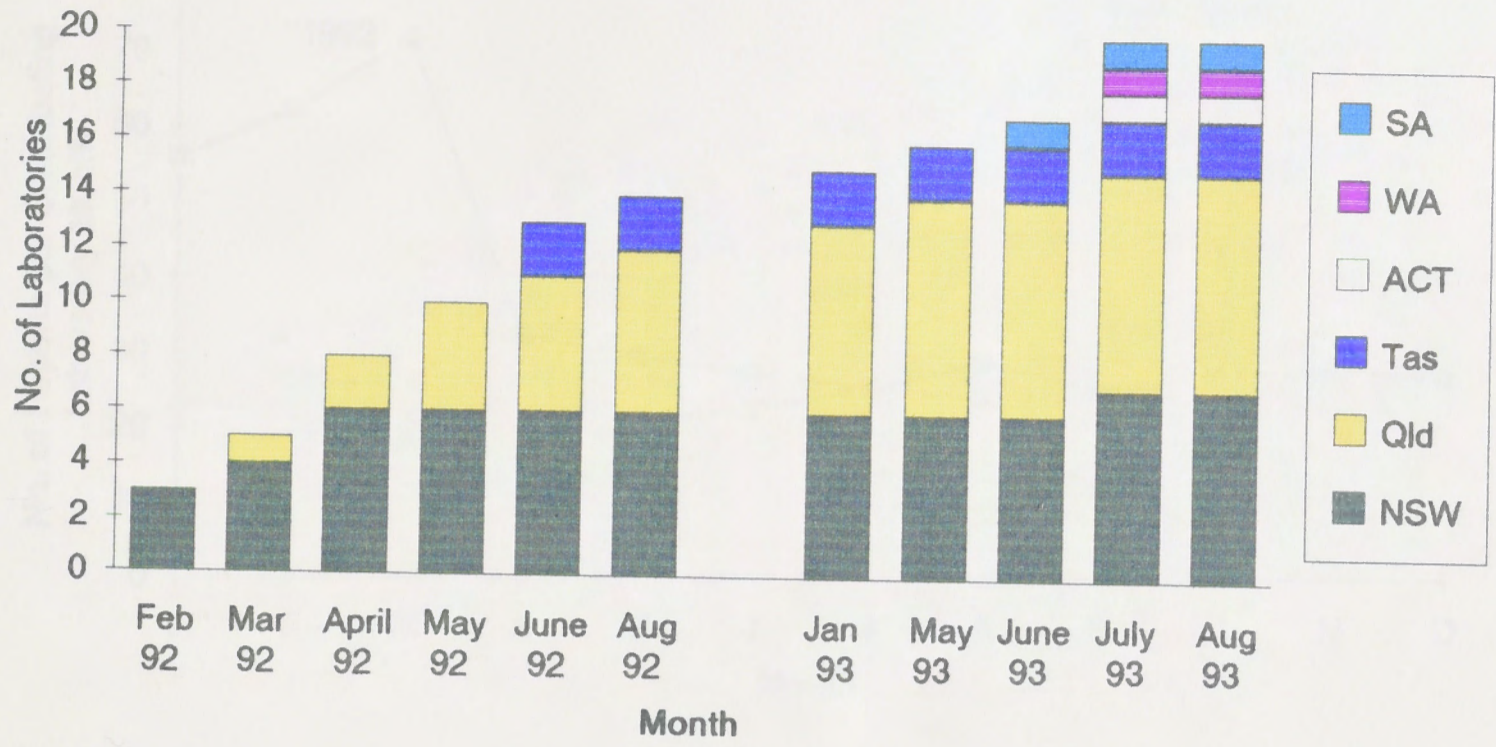


Figure 2: Number of Reports in Each Sex per Month, LabDOSS January 1992 to September 1993



Figure 3: Number of Reports per Contributing Laboratory Month , LabDOSS January 1992 to September 1993

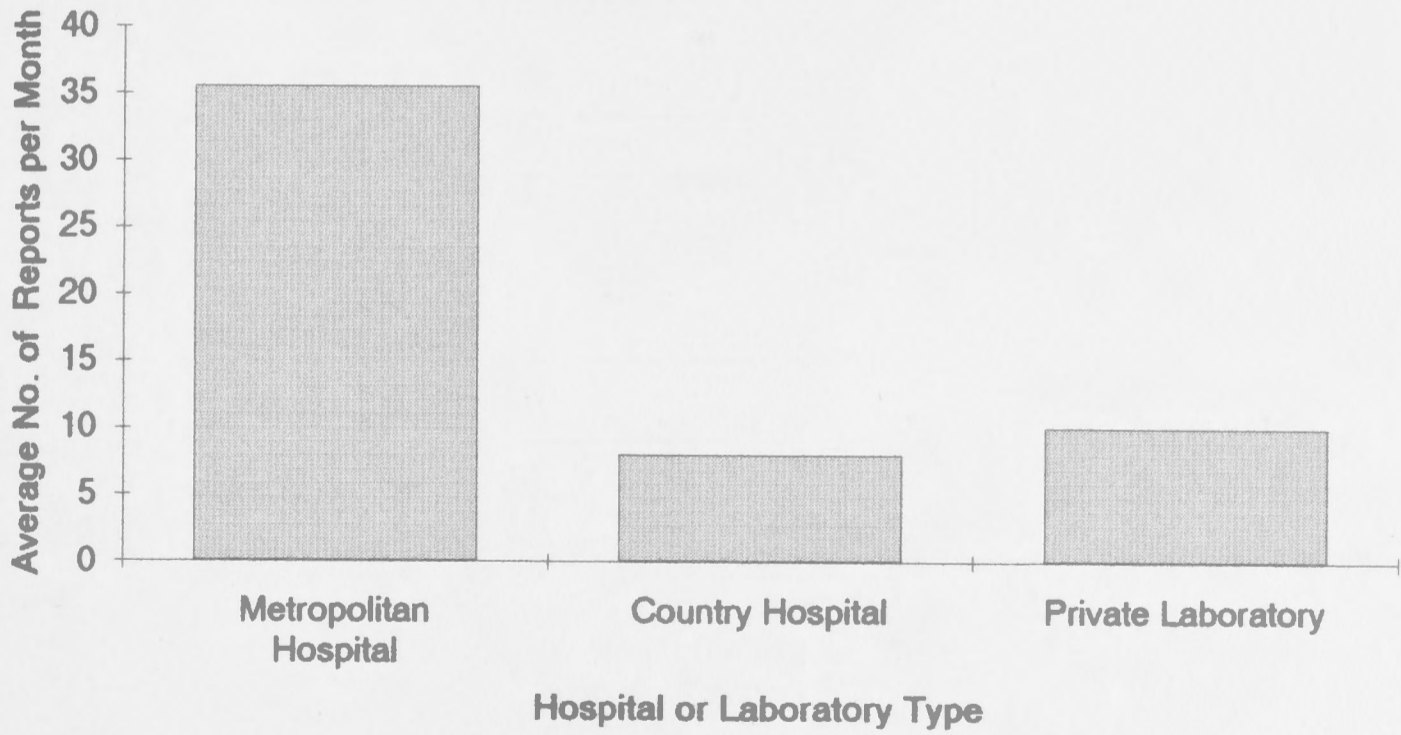
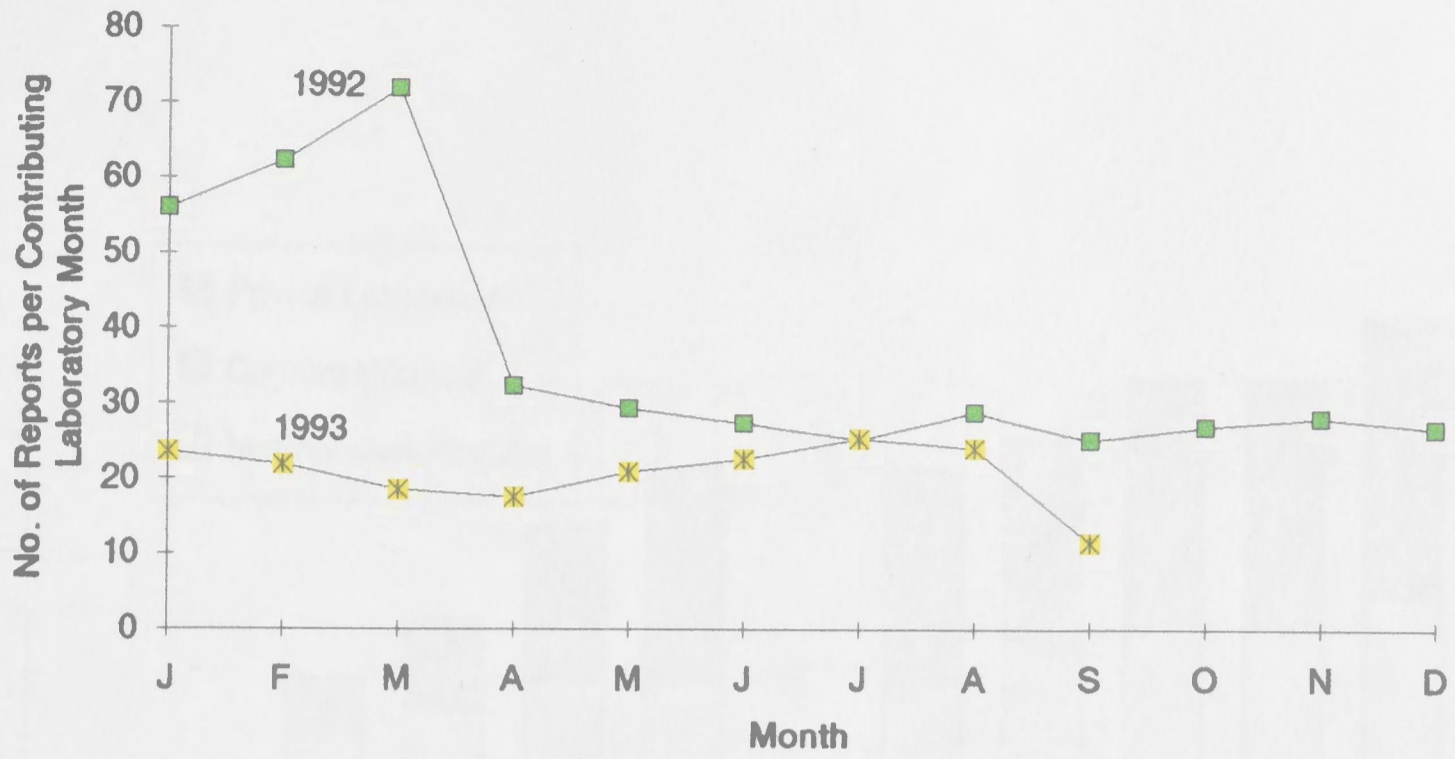
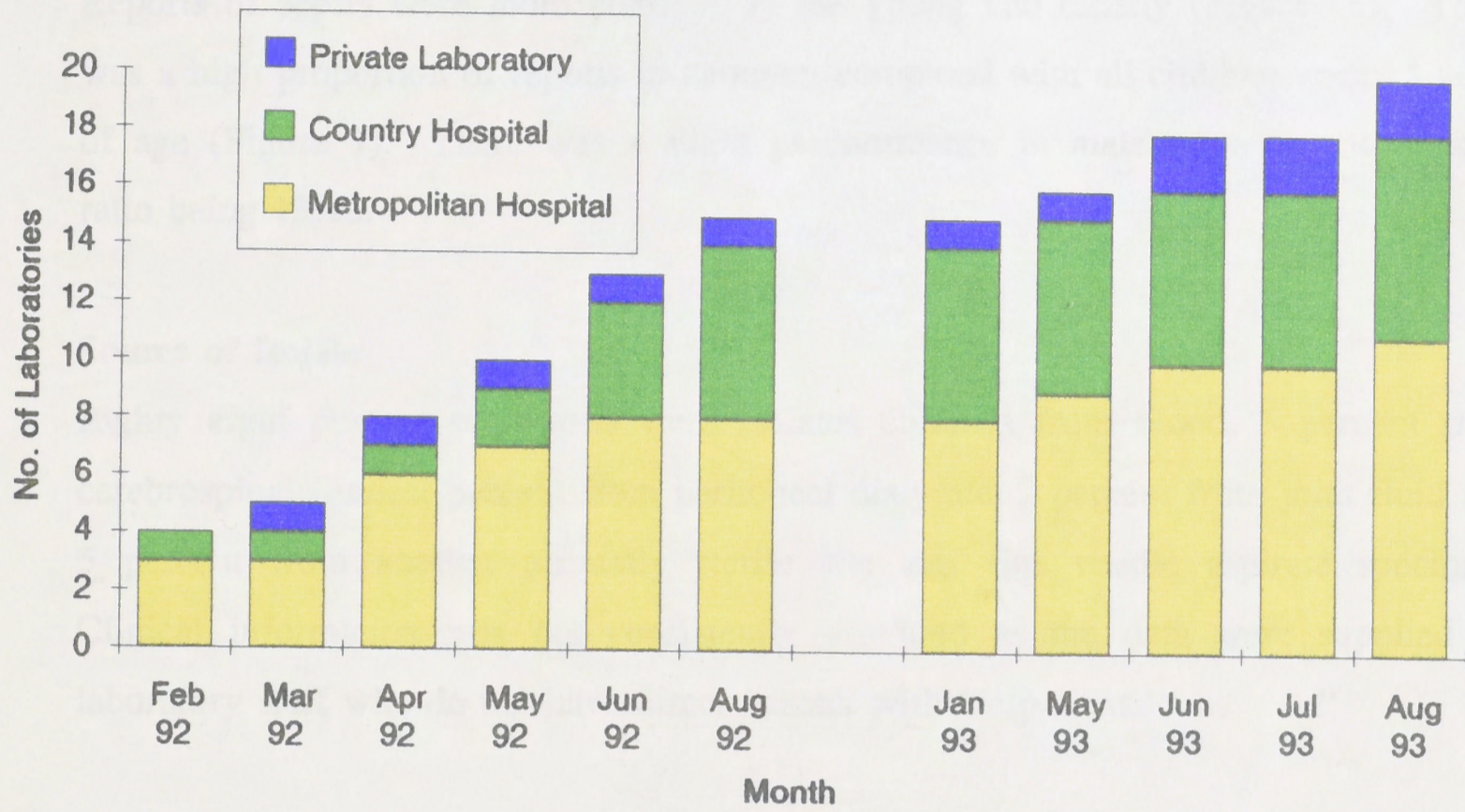


Figure 4 : Average Number of Reports per Month by Hospital or Laboratory Type



Figure 5: Contributing Laboratoires by Month of Commencement and Hospital or Laboratory Type, LabDOSS  
January 1992 to September 1993





### 1.2.3 Results

#### Age and Sex Distribution

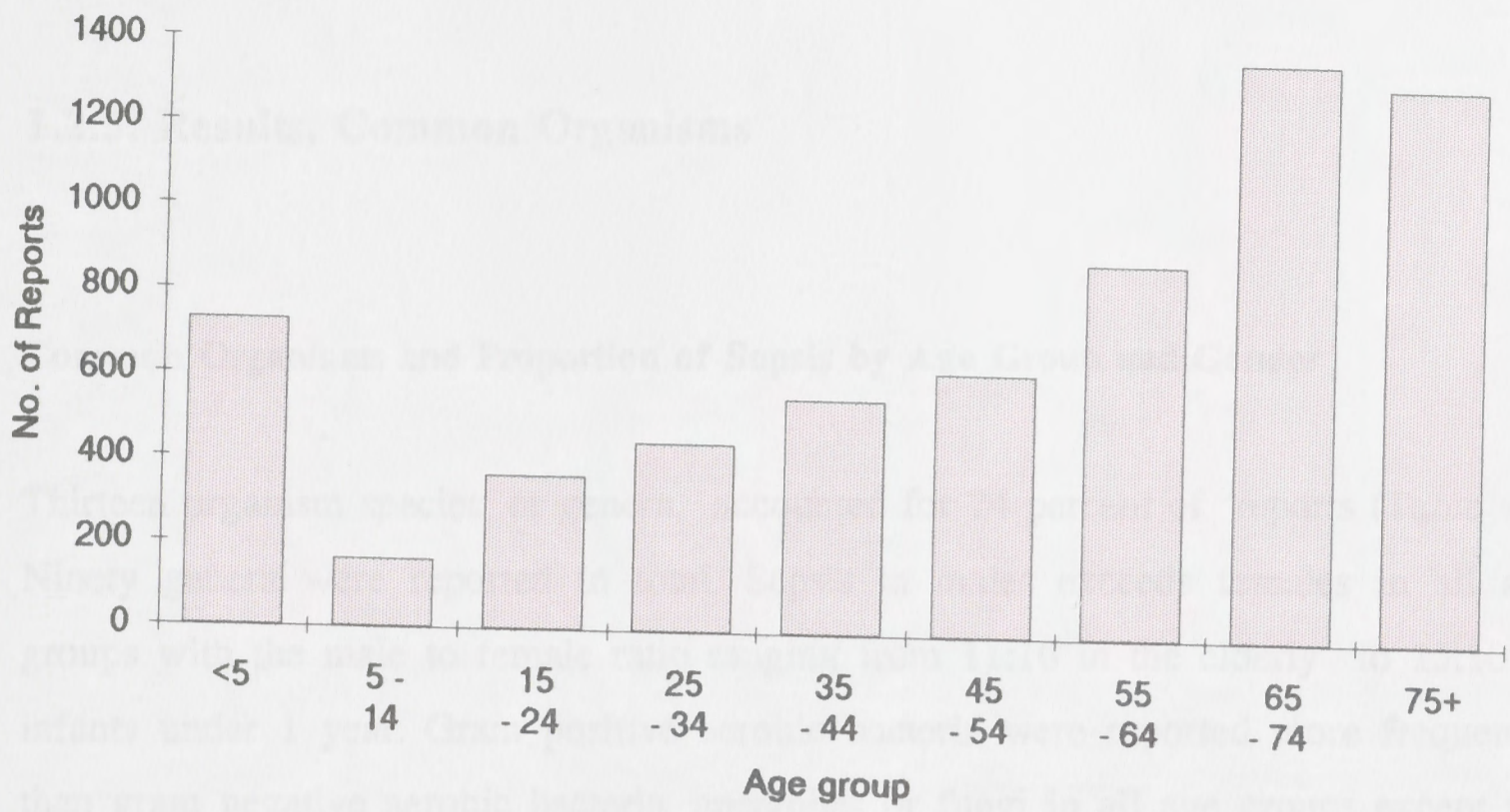
Reports of sepsis were more common in the young and elderly (Figure 6). There was a high proportion of reports in neonates compared with all children under 5 years of age (Figure 7). There was a slight predominance in males, the male to female ratio being 13:10.

#### Source of Isolate

Eighty eight percent of reports were isolates cultured from blood, 3 percent from cerebrospinal fluid, 2 percent from peritoneal dialysate, 2 percent from joint fluid and 5 percent from another normally sterile site e.g. fine needle aspirate specimen. Clinical information was not consistently provided as the data were supplied by laboratory staff who do not have direct contact with the patient.



Figure 6: Number of Reports by Age Group, LabDOSS January 1992 to September 1993



*Staphylococcus* species

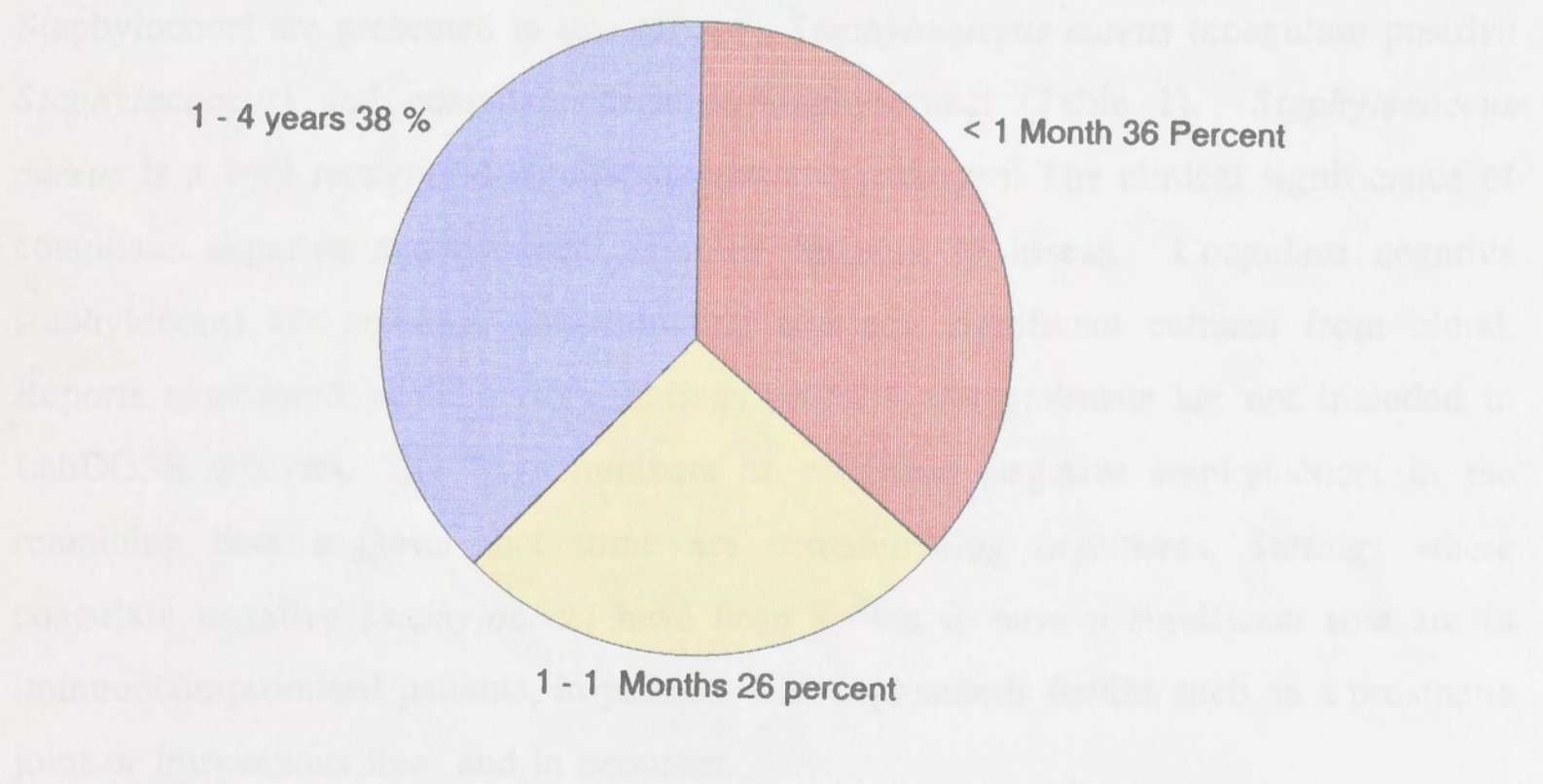


Figure 7 : Proportion of Reports by Age Group in Children under 5 Years of Age, LabDOSS January 1992 to September 1993



### 1.2.3. Results, Common Organisms

#### Common Organisms and Proportion of Sepsis by Age Group and Gender

Thirteen organism species, or genera, accounted for 74 percent of reports (Table 1). Ninety genera were reported in total. Sepsis in males exceeds females in all age groups with the male to female ratio ranging from 11:10 in the elderly to 15:10 in infants under 1 year. Gram positive aerobic bacteria were reported more frequently than gram negative aerobic bacteria, anaerobes or fungi in all age groups except the elderly. The ratio of gram positive to gram negative organisms was highest in neonates and young adults aged 15 to 24 years; staphylococci, coagulase positive and negative, accounted mainly for this trend in these age groups.

#### *Staphylococcus* species

Staphylococci are presented in two groups, *Staphylococcus aureus* (coagulase positive *Staphylococcus*) and coagulase negative staphylococci (Table 1). *Staphylococcus aureus* is a well recognised significant invasive pathogen. The clinical significance of coagulase negative staphylococci is often difficult to assess. Coagulase negative staphylococci are common contaminating and non significant cultures from blood. Reports considered by laboratory staff as probable contaminants are not included in LabDOSS analysis. The large numbers of coagulase negative staphylococci in the remaining data suggests that some are contaminating organisms. Settings where coagulase negative *Staphylococci* have been shown to have a significant role are in immunocompromised patients, in patients with a prosthetic device such as a prosthetic joint or intravenous line and in neonates.

**Table 1: Percentage of Reports for Common Organisms Stratified by Age Group with Ratio of Males to Females for Each Isolate**

	< 1mth		1 - 11mth		1 - 4 yr		5 - 14		15 - 24		25 - 34		35 - 44		45 - 54		55 - 64		65 - 74		75 +		Total
	M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		M : 10F		
<b>Total Number of Reports</b>	266	15	189	15	274	12	160	15	365	15	447	12	557	13	625	14	893	13	1381	13	1325	11	6630 <sup>1</sup>
<b>Organisms</b>																							
<b>Gram Positive</b>																							
<i>Staphylococcus aureus</i>	12%	13	6%	18	4%	10	31%	20	18%	17	20%	12	18%	14	15%	20	20%	18	18%	17	19%	12	18% <sup>2</sup>
Coagulase negative Staphylococci	29%	15	21%	18	14%	12	10%	13	16%	13	13%	14	17%	11	13%	15	15%	15	12%	12	9%	11	13%
<i>Streptococcus pneumoniae</i>	3%	10	14%	7	23%	15	8%	10	3%	6	4%	7	3%	43	2%	25	3%	7	4%	23	6%	7	5%
Group B Streptococcus	10%	9	3%	10	<1%	-	<1%	-	<1%	-	2%	3	1%	10	<1%	-	<1%	-	1%	12	1%	10	1%
<i>Enterococcus sp</i>	4%	3	<1%	-	1%	5	<1%	-	3%	23	3%	20	2%	10	3%	10	4%	15	4%	12	3%	26	3%
Group A Streptococcus	<1%	-	2%	10	<1%	-	4%	3	2%	30	1%	30	<1%	-	<1%	-	<1%	-	<1%	-	<1%	-	1%
<b>Gram Negative</b>																							
<i>Escherichia coli</i>	14%	22	8%	20	4%	15	5%	10	10%	4	11%	5	9%	7	16%	10	15%	8	21%	7	25%	6	16%
<i>Haemophilus influenzae</i>	1%	10	16%	15	26%	15	13%	15	<1%	-	2%	13	<1%	-	<1%	-	1%	5	<1%	18	<1%	3	3%
<i>Pseudomonas aeruginosa</i>	4%	5	4%	13	1%	5	3%	3	4%	20	3%	40	3%	13	4%	13	5%	12	5%	18	4%	17	4%
<i>Enterobacter sp</i>	5%	6	<1%	-	1%	3	2%	5	2%	70	4%	12	5%	10	4%	7	4%	12	4%	22	2%	11	3%
<i>Klebsiella pneumoniae</i>	1%	3 Males	2%	20	<1%	-	4%	6	<1%	-	1%	40	3%	5	5%	9	4%	13	4%	16	4%	12	4%
<i>Proteus mirabilis</i>	<1%	-	<1%	-	<1%	-	<1%	-	<1%	-	1%	3	<1%	-	2%	4	1%	35	2%	18	4%	33	2%
<i>Neisseria meningitidis</i>	<1%	-	6%	7	8%	20	6%	7	4%	6	<1%	-	<1%	-	<1%	-	<1%	-	<1%	-	<1%	-	1%
<b>Other</b>	17%		16%		18%		15%		35%		36%		37%		34%		26%		24%		21%		26%
<b>Total Percentage</b>	100%		100%		100%		100%		100%		100%		100%		100%		100%		100%		100%		100%
<b>Ratio G P to N Aerobic Bacteria</b>	1.9		1.1		1.1		1.4		1.7		1.4		1.4		1.0		1.3		1.0		0.9		1.1 <sup>3</sup>

1. Age Unknown for 551 reports

2. MRSA 1 %

3. Ratio of Gram Positive Aerobic Bacteria to Gram Negative Aerobic Bacteria



### 1.2.3 Results, Common Organisms

#### *Staphylococcus aureus*

Between 6 and 29 percent of reports in each age group were *Staphylococcus aureus* (Table 1). Sepsis in males exceeded females in all age groups except 1 to 4 years. The male to female ratio ranged from 11:10 ( 1 to 4 year age group) to 20:10 ( 45 to 64 year age group). Reports of *Staphylococcus aureus* were the highest proportion of all reported organisms in all agegroups over 5 years of age. The proportion of bacteraemia attributable to *Staphylococcus aureus* was highest in the age group 5 to 14 years.

Clinical information was provided for 58 percent (29/50) of the reports of *Staphylococcus aureus* sepsis in children aged 5 - 14. Septic arthritis was reported in 30 percent of cases and osteomyelitis in 18 percent of cases. Cases of septic arthritis were more common in males, the male to female ratio being 24:10. In contrast, osteomyelitis was more common in females, the male to female ratio being 6:10 .

Initial analysis of reports by month of illness suggests a Winter peak (Figure 8). When adjusted by contributing laboratory month this Winter peak is less dramatic (Figure 9).

#### Coagulase negative *Staphylococci*

Coagulase negative *Staphylococci* ranged between 9 and 28 percent of all reports of invasive disease (Table 1). The proportion was highest in neonates, being 28 percent of all reports. There was a predominance of males in all age groups. The male to female ratio ranged from 11:10 (age groups 35 - 44 and 75+) to 28:10 (agegroup 1 to 11 months ). There was no seasonal pattern in the reports.



Figure 8: Numbers of Staphylococcus aureus Reports by Month of Illness, LabDOSS January 1992 to September 1993

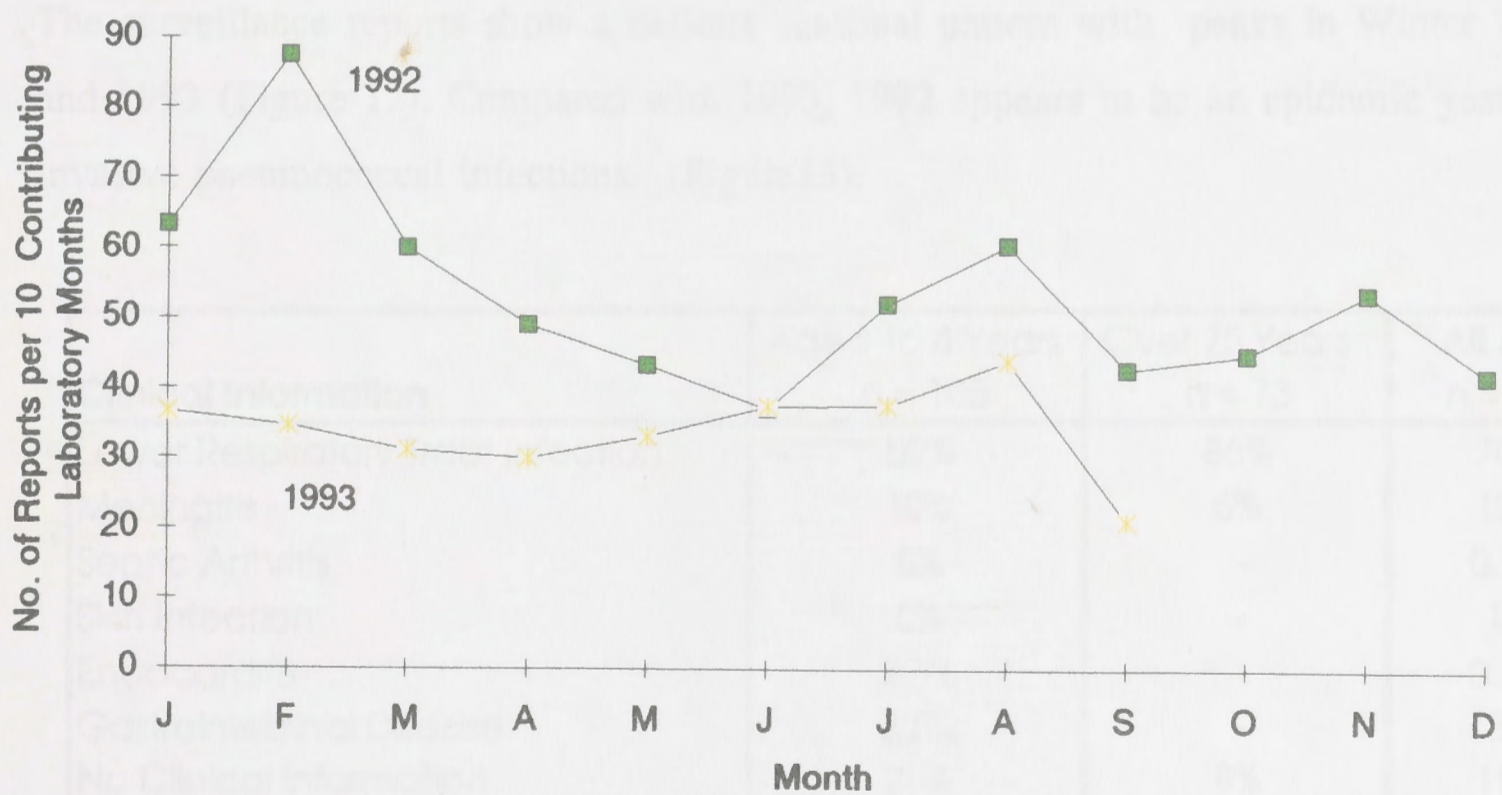
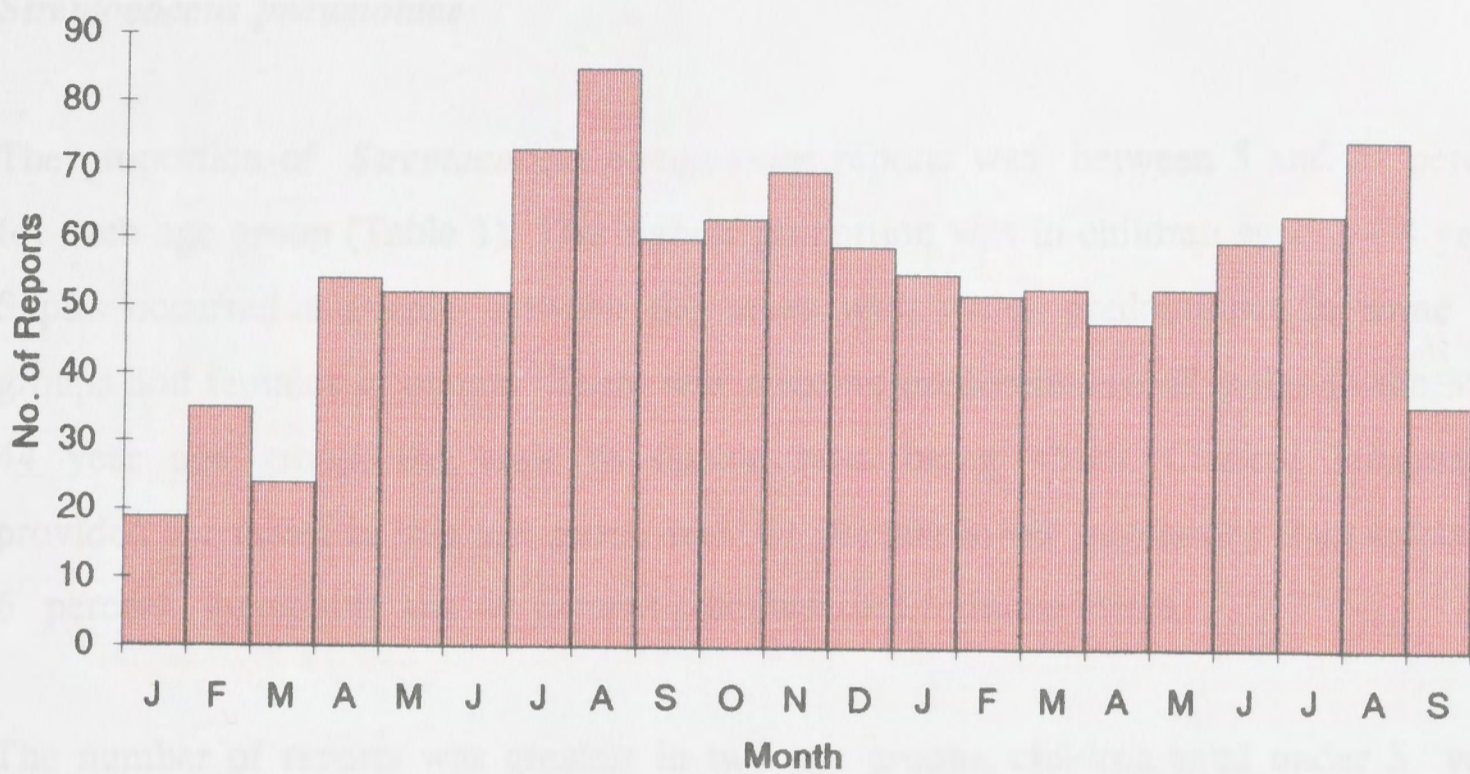


Figure 9: Numbers of Staphylococcus aureus Reports per 10 Contributing Laboratory Months by Month of Onset of Illness, LabDOSS January 1992 to September 1993



### 1.2.3 Results

#### *Streptococcus pneumoniae*

The proportion of *Streptococcus pneumoniae* reports was between 3 and 21 percent for each age group (Table 1). The highest proportion was in children aged 1 - 4 years. Sepsis occurred unevenly between the sexes with males predominant in some age groups and females in others. There was a strong predominance of males in the 35 to 44 year age group, the male to female ratio being 43:10. Clinical information provided for males in this age group was: 61 percent lower respiratory tract infection, 6 percent meningitis and 46 percent compromised immune status.

The number of reports was greatest in two age groups, children aged under 5 years of age and adults over 75 years (Figure 10). Sixty four percent of cases in children under 5 were between 1 and 4 years of age (Figure 11). Lower respiratory tract infection was reported more frequently in the elderly than in children (Table 2).

The surveillance reports show a definite seasonal pattern with peaks in Winter 1992 and 1993 (Figure 12). Compared with 1993, 1992 appears to be an epidemic year for invasive pneumococcal infections. (Figure 13).

Clinical Information	Age 1 to 4 Years n = 105	Over 75 Years n = 73	All Ages n = 337
Lower Respiratory Tract Infection	50%	86%	70%
Meningitis	10%	6%	10%
Septic Arthritis	5%	-	0.7%
Skin Infection	5%	-	1%
Endocarditis	2.5%	-	0.3%
Gastrointestinal Disease	2.5%	-	3%
No Clinical Information	25%	8%	15%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table 2:** Clinical Diagnosis in Cases of *Streptococcus pneumoniae* Sepsis, Comparison between Selected Age Groups, LabDOSS January 1992 to September 1993



Figure 10 : Numbers of Streptococcus pneumoniae Reports by Age Group, LabDOSS January 1992 to September 1993

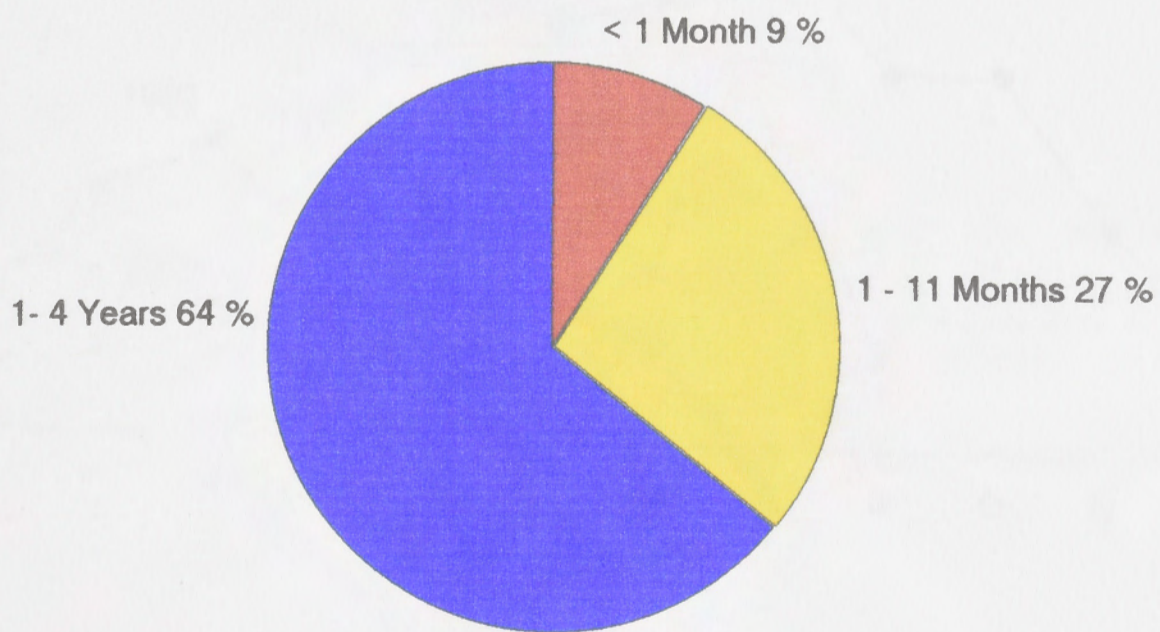
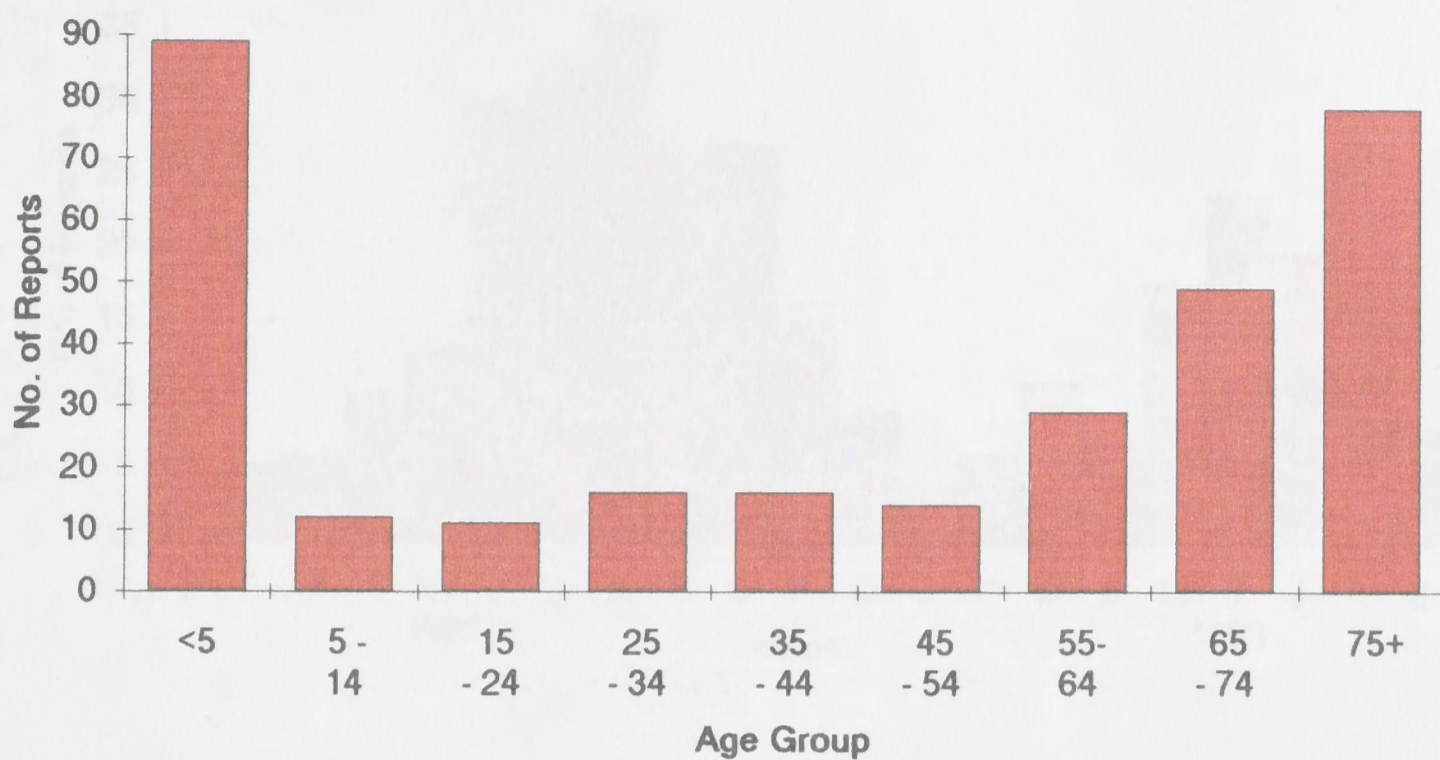


Figure 11: Proportion of Streptococcus pneumoniae Reports by Age Group in Children under 5 Years of Age



Figure 12: Numbers of Streptococcus pneumoniae Reports by Month of Illness, LabDOSS  
January 1992 to September 1993.

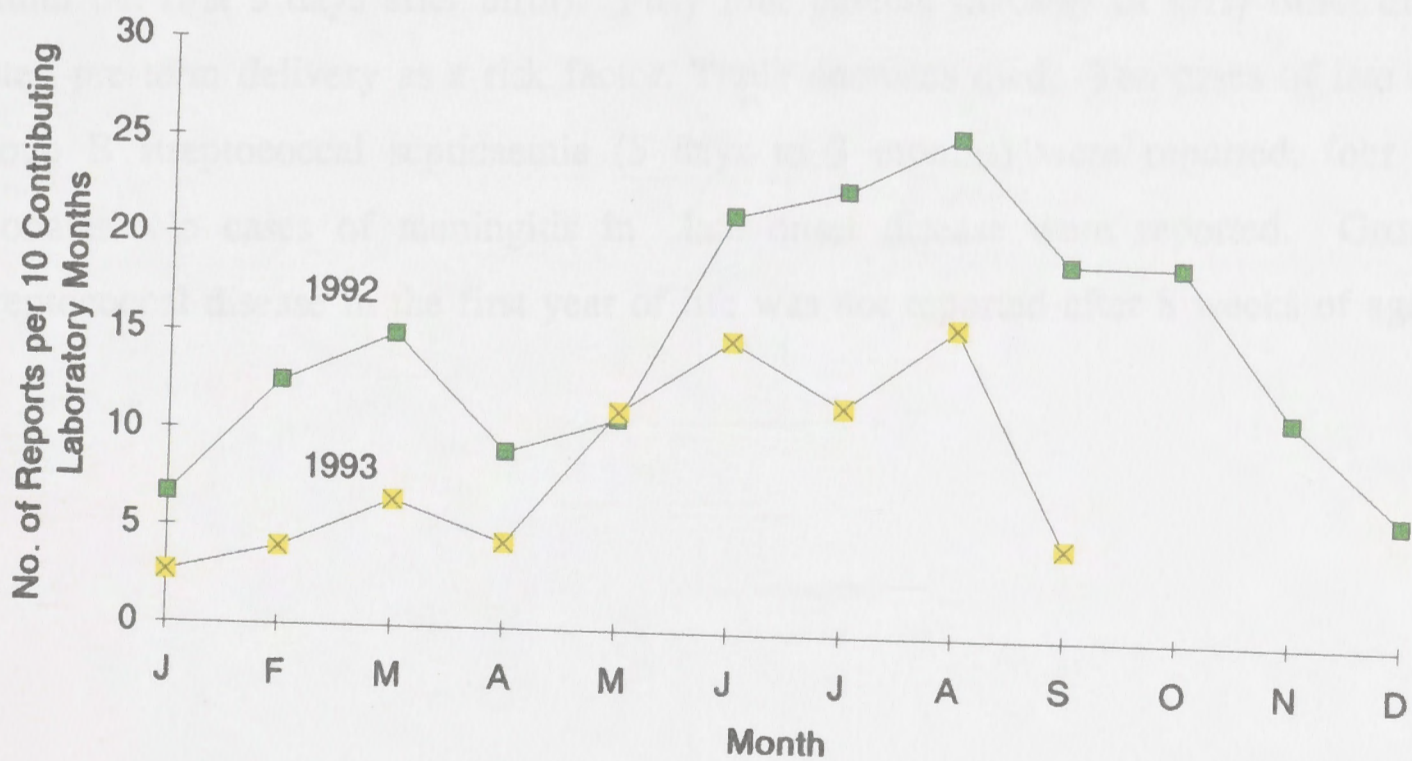
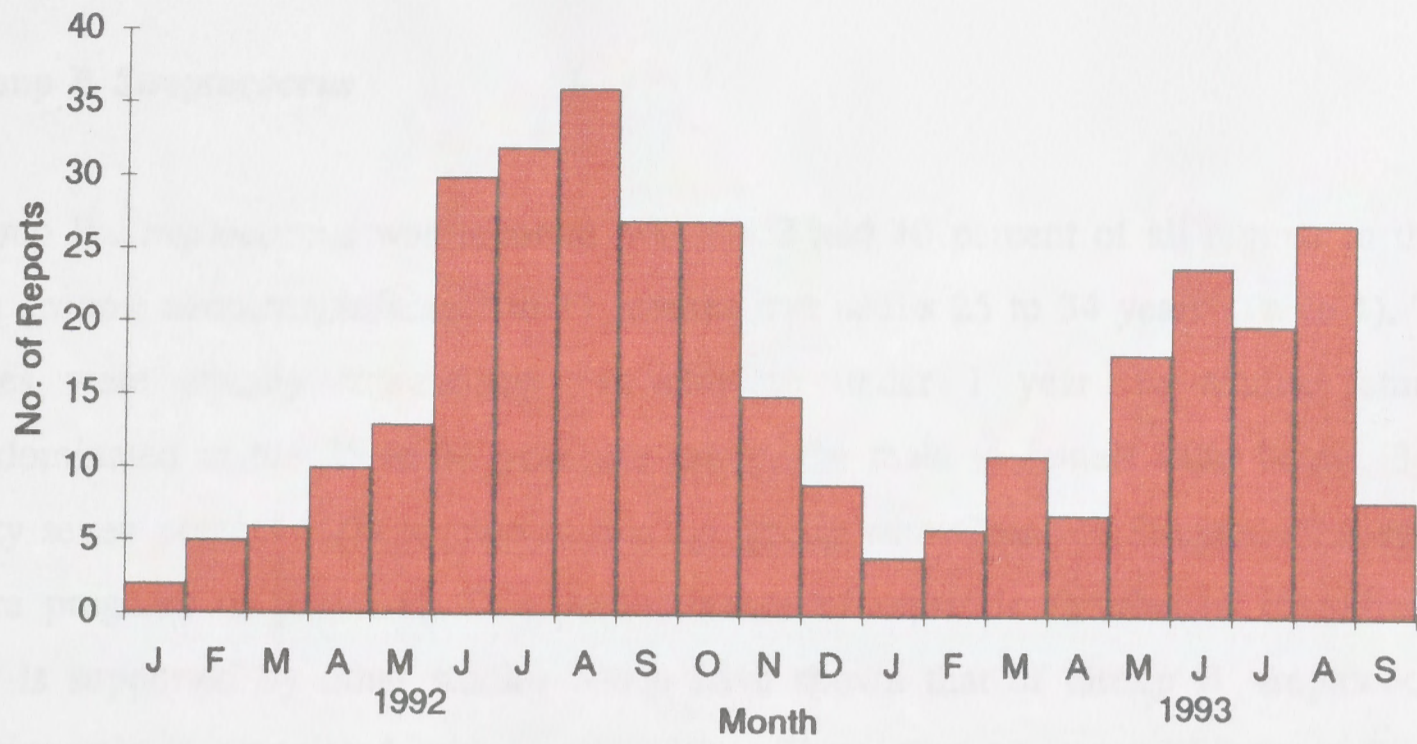


Figure 13 : Numbers of Streptococcus pneumoniae reports by Months of Illness, per 10 Contributing Laboratory Months , LabDOSS January 1992 to September 1993



### 1.2.3 Results, Common Organisms

#### *Group B Streptococcus*

Group B *Streptococcus* was reported between 2 and 10 percent of all reports in three age groups: neonates, infants 1 to 11 months and adults 25 to 34 years (Table 1). The sexes were equally represented in children under 1 year. In adults, females predominated in the 25 to 34 year age group, the male to female ratio being 3:10. Fifty seven percent (4/7) women in this age group with Group B Streptococcal sepsis were pregnant or postnatal. This predominance of sepsis in females of reproductive age is supported by other studies which have shown that of Group B streptococcus septicaemia is associated with pregnancy. There was no seasonal pattern in the reports.

Twenty six cases of neonatal group B streptococcal disease were reported, two cases had meningitis. Eighty four percent of reports were of early onset disease (onset within the first 5 days after birth). Fifty four percent of cases of early onset disease listed pre-term delivery as a risk factor. Three neonates died. Ten cases of late onset group B streptococcal septicaemia (5 days to 3 months) were reported, four were neonates. No cases of meningitis in late onset disease were reported. Group B streptococcal disease in the first year of life was not reported after 8 weeks of age.



### 1.2.3 Results, Common Organisms

#### *Enterococcus* species

Enterococci featured in neonates and adults over 15 years, accounting for an increasing proportion of sepsis with age (Table 1). Neonatal disease was predominant in females, while disease in the elderly was predominant in males. There was no seasonal trend in the reports.

#### Group A *Streptococcus*

The proportion of Group A *Streptococcus* was 2 to 3 percent of reports in three age groups : infants 1 to 11 months, children 5 to 14 and young adults 15 to 24 (Table 1). There appears to be a predominance in females in the 5 to 14 year age group and males aged 15 to 24. However, the number of reports are low in these groups. There was no seasonal trend. There were more reports in 1993 than in 1992 for the periods January to September (Figure 14). However, when adjusted for the number of contributing laboratories, there was no difference between the two years (Figure 15).



Figure 14: Number of Reports of Group A Streptococcus by Month of Illness, LabDOSS January 1992 to September 1993

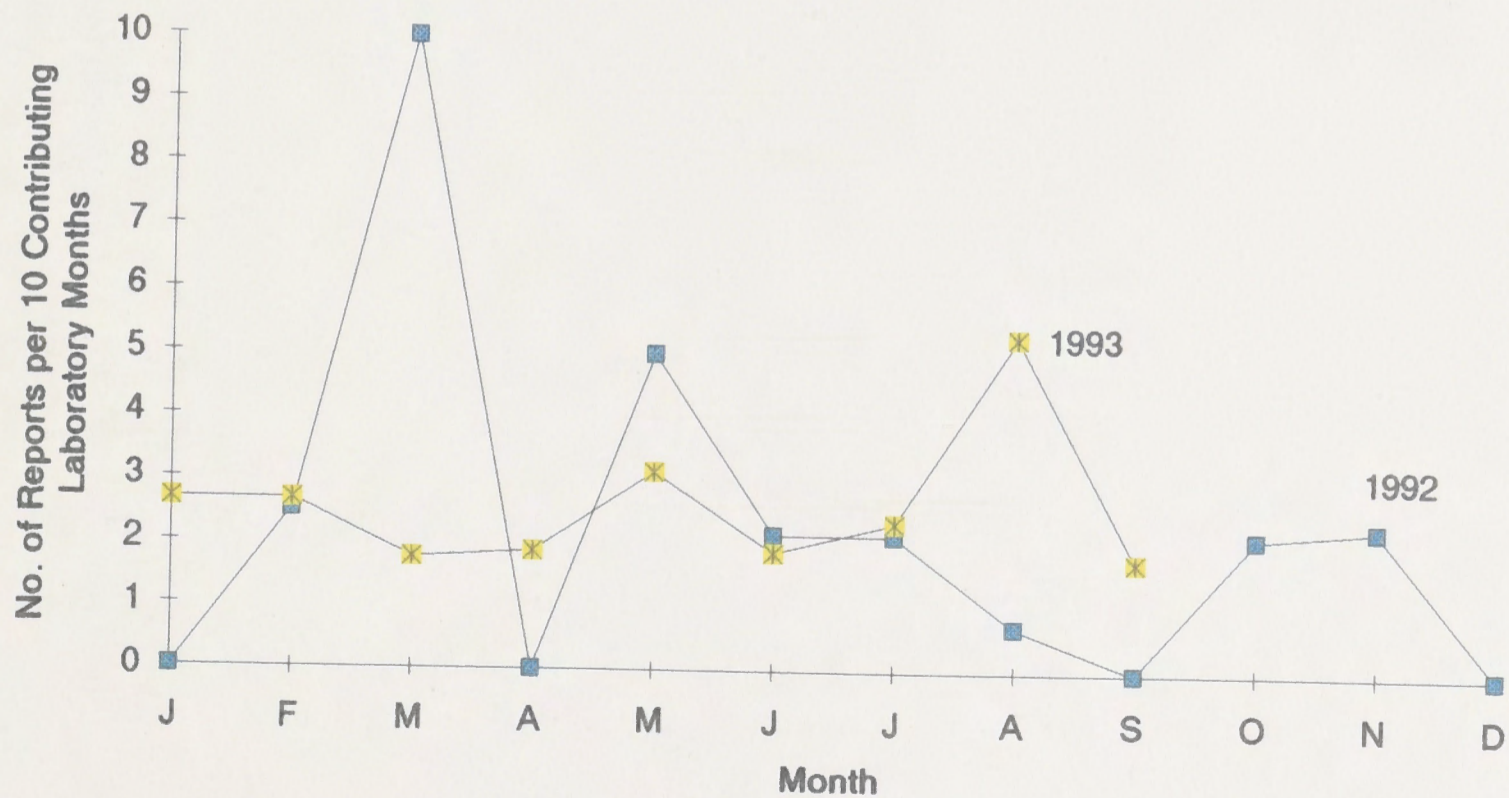
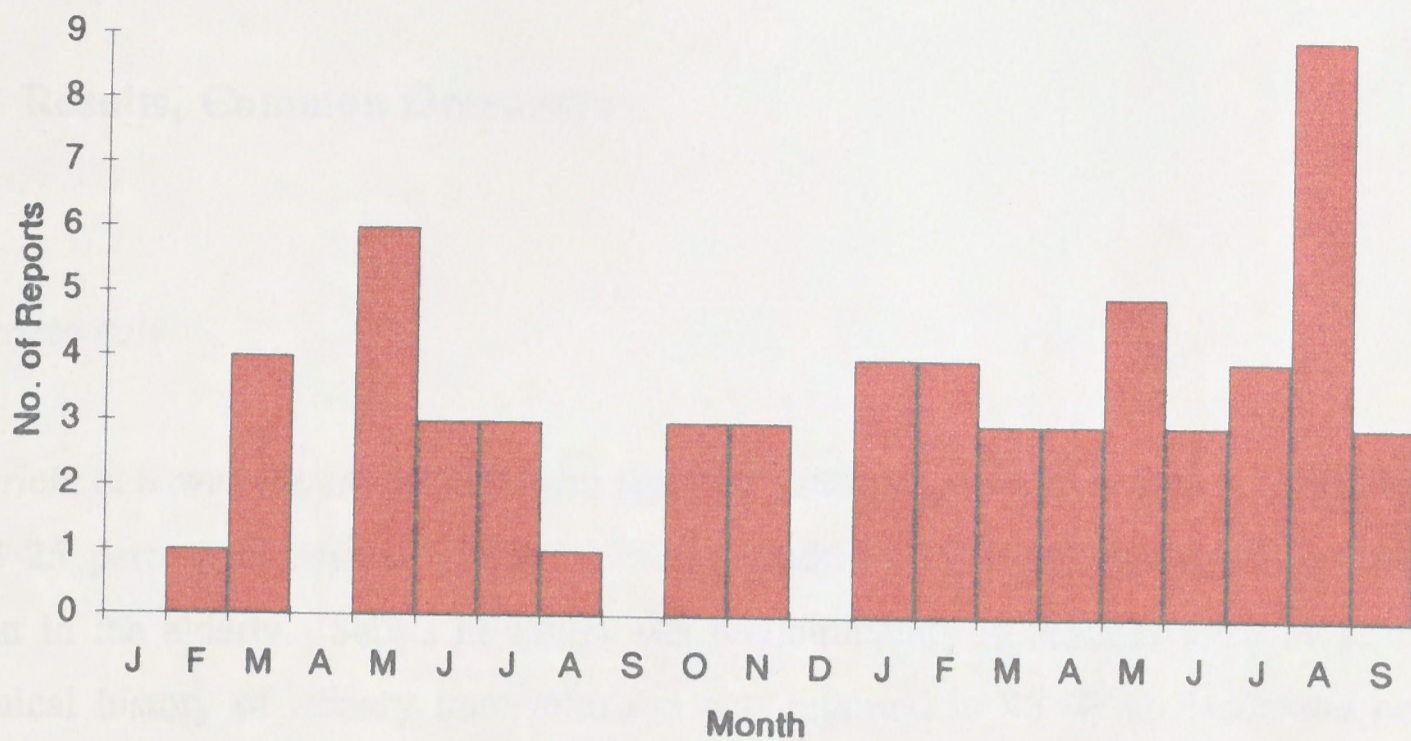


Figure 15: Numbers of Reports of Group A Streptococcus per 10 Contributing Laboratory Months, LabDOSS January 1992 to September 1993



### 1.2.3 Results, Common Organisms

#### 1.2.3 Results, Common Organisms

##### *Streptococcus pneumoniae*

##### *Escherichia coli*

*Escherichia coli* was the most frequently reported gram negative organism. i.e. between 7 and 25 percent of reports (Table 1). The proportion of sepsis due to *E coli* was highest in the elderly. Sepsis in adults was predominantly in females over 14 years. A clinical history of urinary tract infection was reported in 45 % of *Escherichia coli* sepsis in women over 14 years. There was a predominance of males in children under 5 years. There was no seasonal trend .

##### *Pseudomonas aeruginosa*

*Pseudomonas aeruginosa* comprised between 1 and 3 percent of reports in all age groups (Table 1). There was a predominance of males in adult and infant (1 to 14 month) age groups. In contrast, females were predominant in neonates and children 1 to 14 years. There was no seasonal distribution. Twenty seven percent of all *Pseudomonas aeruginosa* reports noted iatrogenic risk factor: tracheal intubation, intravenous line or recent surgery.

##### *Enterobacter species*

*Enterobacter* species accounted for 2 to 3 percent of reports in neonates and children over 5 years (Table 1). The number of cases in each age group are too small to include a meaningful interpretation of male to female ratio. There was no seasonal trend.

### 1.2.3 Results, Common Organisms

#### *Haemophilus influenzae*

*Haemophilus influenzae* accounted for between 12 and 27 percent of reports in children between 1 month and 5 years (Table 1). The proportion was highest in 1 to 4 year olds where *Haemophilus influenzae* comprised 27 percent of reports. There was a predominance of males, the male to female ratio being 15:10

*Haemophilus influenzae* data have been analysed separately for an extended period to December 1993 (Section 1.3).

#### *Pseudomonas aeruginosa*

*Pseudomonas aeruginosa* comprised between 1 and 5 percent of reports in all age groups (Table 1). There was a predominance of males in adult and infant (1 to 11 month) age groups. In contrast, females were predominant in neonates and children 1 to 14 years. There was no seasonal distribution. Twenty seven percent of all *Pseudomonas aeruginosa* reports listed iatrogenic risk factors: hospital acquired, intravenous line or recent surgery.

#### *Enterobacter species*

*Enterobacter species* accounted for 2 to 5 percent of reports in neonates and all ages over 5 years (Table 1). The number of cases in each age group are too small to include a meaningful interpretation of male to female ratio. There was no seasonal trend.



### 1.2.3 Results, Common Organisms

#### *Klebsiella pneumoniae*

*Klebsiella pneumoniae* accounted for 3 to 5 percent of all reports of sepsis in adults aged over 35 years and in children 5 to 14 years (Table 1). There was a strong predominance of males in these children, however the total number of reports is small. There was a predominance of females in the ages 35 to 44. There was little difference between the sexes in the ages 55 to 64. Males were predominant in cases aged over 55. There was no seasonal trend.

#### *Proteus mirabilis*

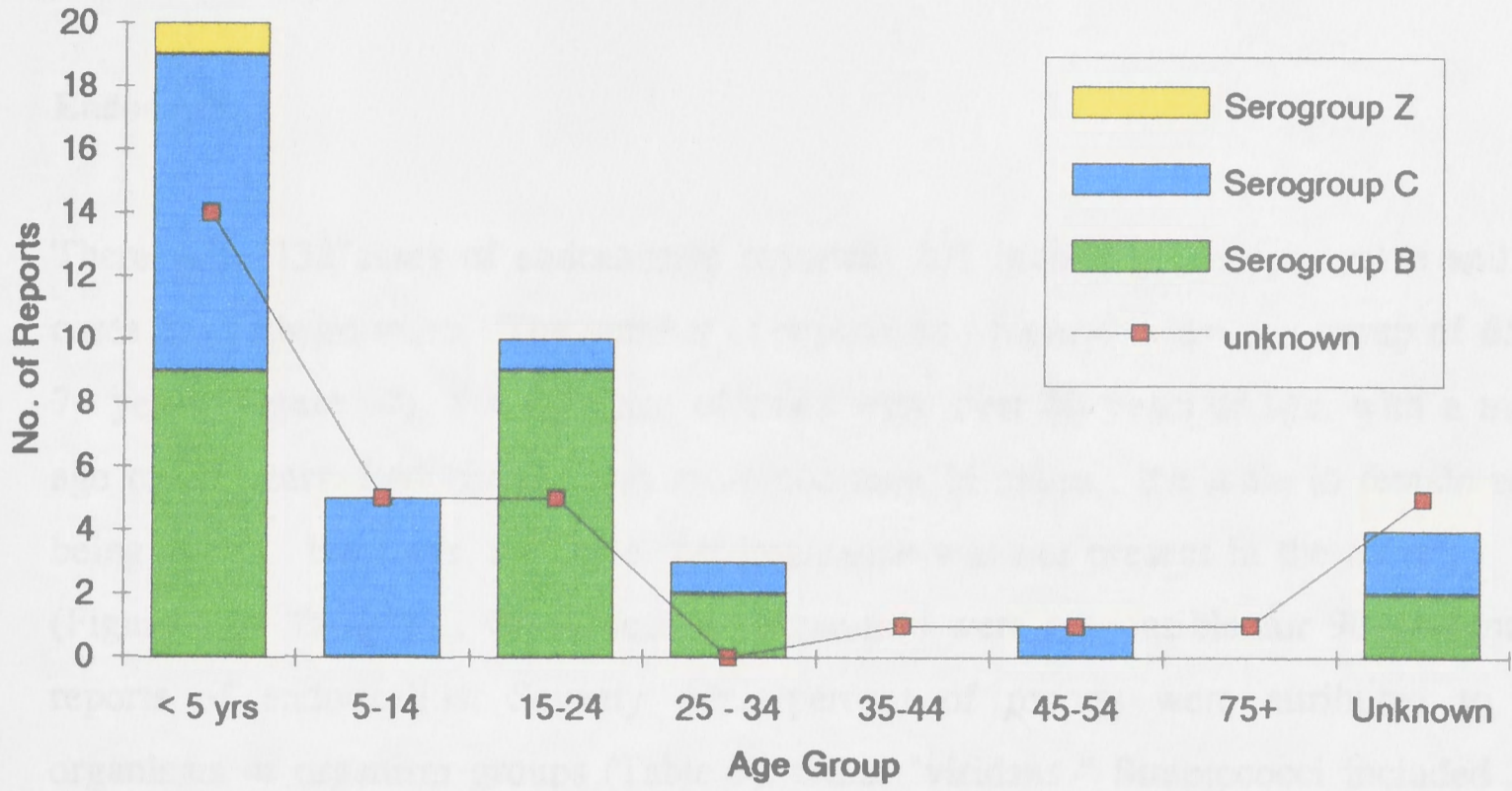
*Proteus mirabilis* sepsis was more common in the elderly (Table 1) . There was a predominance of males over 55 years. In contrast, there was a predominance of females in the age group 45 to 54 years.

#### *Neisseria meningitidis*

There were 75 reports of sepsis with *Neisseria meningitidis*. Meningococcal disease reports were between 4 and 8 percent of all reports in ages 1 month to 24 years (Table 1). Seventy six percent of cases were under 24 years of age, 43 percent under 5 years of age. There was a predominance of males in the 1 to 4 year age group. All other age groups depict a predominance of infection in females. There was no seasonal trend

Serogroup information was provided for 58 percent of reports: 30 percent serogroup B, 27 percent serogroup C, 1 percent serogroup Z. Serogroup B reports peaked in the agegroup 15 to 24 years, serogroup C reports were more frequent in the 1 to 14 year agegroups (Figure 16). Serogroup preferences by agegroup must be interpreted with caution as 42 percent of reports did not include serogroup data.

Figure 16: Numbers of *Neisseria meningitidis* Reports by Serogroup and Agegroup, LabDOSS January 1992 to September 1993



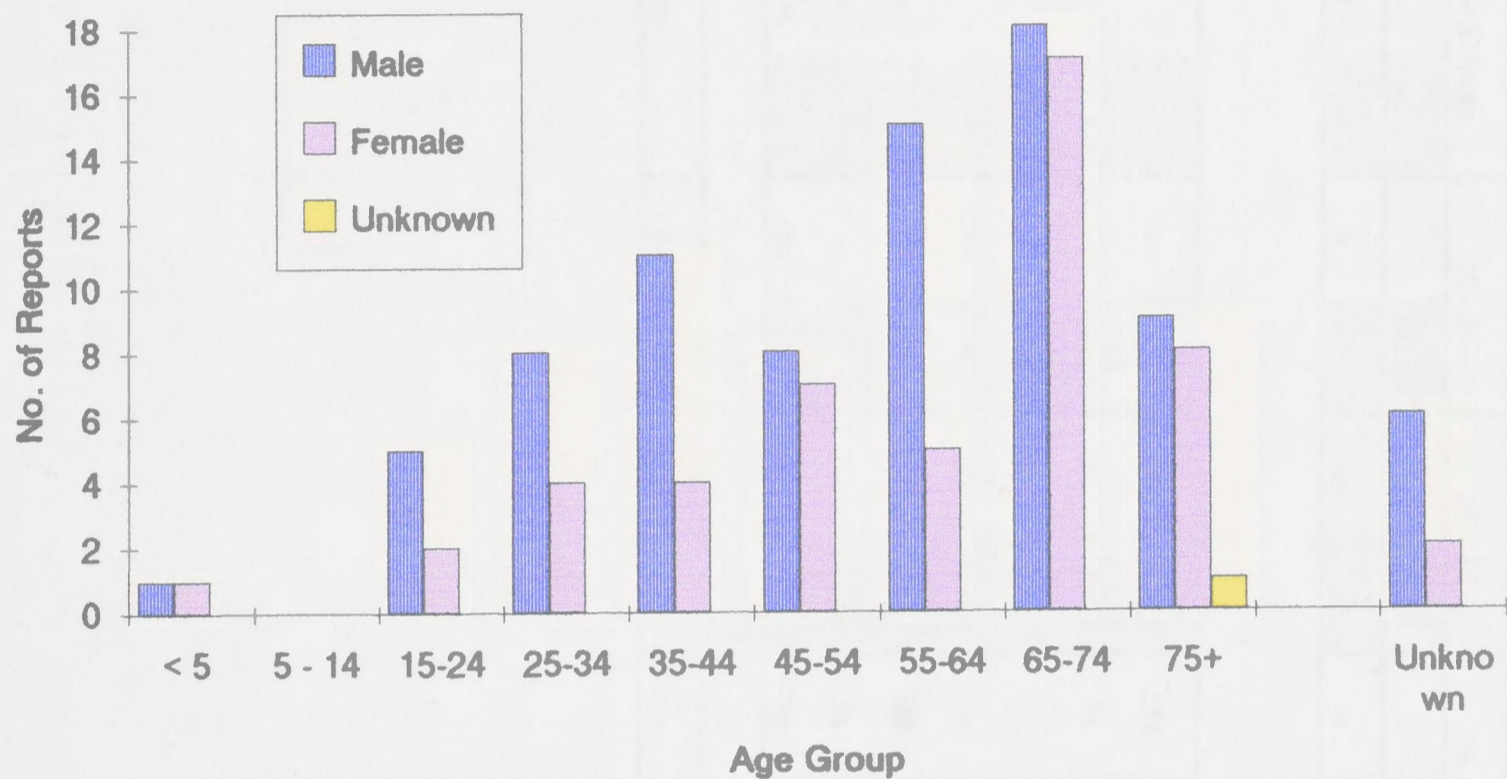


### 1.2.3 Results, Clinical Category

#### Endocarditis

There were 132 cases of endocarditis reported, 101 involving a native valve and 30 cases a prosthetic valve. The number of reports was highest in the age group of 65 to 74 years (Figure 17). Sixty percent of cases were over 50 years of age, with a mean age of 55 years. Endocarditis was more common in males, the male to female ratio being 16:10. However, the male predominance was not present in the elderly (Figure 17, Table 3). Gram positive organisms were responsible for 90 percent of reports of endocarditis. Seventy three percent of reports were attributed to 5 organisms or organism groups (Table 3). Other "viridans" Streptococci included 2 *S mitis*, 2 *S mutans*, 1 *S mitior*. Enterococcal endocarditis was not reported under the age of 55 years, the mean age for enterococcal endocarditis was 69 years. Prosthetic valve endocarditis was more frequently reported due to coagulase negative Staphylococci, and Enterococci than native valve infection ( Table 4 ).

Figure 17: Number of Reports of Endocarditis by Age Group and Sex, LabDOSS January 1992 to September 1993





**Table 3:** Endocarditis; Percentage of reports for Common Organisms Stratified by Age Group with Ratio of Males to Females for Each Isolate

	< 5 Years		15 - 24		25 - 34		35 - 44		45 - 54		55 - 64		65 - 74		75 +		Total
	M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		
<b>Total Number of Reports</b>	2	10	7	25	12	20	15	28	15	11	20	30	35	10	18	8	266
<b>Organisms</b>																	
<i>Staphylococcus aureus</i>	-	-	43%	20	25%	5	33%	6	7%	1 Male	20%	30	20%	25	11%	10	20%
Coagulase negative Staphylococci	-	-	-	-	8%	1 Male	7%	1 Male	20%	5	30%	50	31%	8	22%	10	20%
<i>Enterococcus sp</i>	-	-	-	-	-	-	-	-	-	-	10%	10	17%	50	17%	2 Female	8%
<i>Streptococcus sanguis</i>	-	-	29%	2 Males	8%	1 Male	13%	2 Males	33%	6	10%	2 Males	11%	15	6%	1 Male	13%
Other Streptococcus "viridans"	-	-	14%	1 Male	25%	5	33%	40	20%	3 Males	15%	20	6%	1 Female	6%	1 Male	9%
Streptococcus "milleri"	-	-	-	-	8%	1 Male	7%	1 Male	-	-	-	-	-	-	6%	1 Male	3%
Other	100%	-	14%	-	25%	-	7%	-	20%	-	15%	-	14%	-	33%	-	27%
<b>Total Percentage</b>	100%		100%		100%		100%		100%		100%		100%		100%		100%

1. Age Unknown for 8 cases

**Table 4:** Percentage of Common Organisms reported in Cases of Prosthetic Valve and Native Valve Endocarditis

2.3 Results, Clinical Category	Native Valve n = 102	Prosthetic Valve n = 30	Total n = 132
<b>Organisms</b>			
<i>Staphylococcus aureus</i>	22%	10%	20%
Coagulase negative Staphylococci	18%	30%	20%
<i>Enterococcus sp</i>	5%	20%	8%
<i>Streptococcus sanguis</i>	13%	10%	13%
Other "viridans" Streptococci	11%	7%	9%
<i>Streptococcus "milleri"</i>	2%	7%	3%
Other	29%	16%	27%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>



### 1.2.3 Results, Clinical Category

#### Meningitis

There were 280 reports of meningitis. A slight predominance in males was present, the male to female ratio being 13:10. There was a predominance of females in the elderly, the male to female ratio being 2:10 (Table 5). Six organisms, or organism groups were responsible for 75 percent of meningitis reports (Table 5).

The greatest number of cases was in the 1 to 4 year old agegroup (Figure 18). Forty three percent of these cases were *Haemophilus influenzae*, 30 percent *Neisseria meningitidis* (Table 5).

*Staphylococcus aureus* was responsible for 23 percent of cases of meningitis in the agegroup 65 to 74 years. There was a predominance of females in this age group, the male to female ratio being 5:10.

Coagulase negative *Staphylococci* were not reported in cases of meningitis in the very young and the very elderly. These organisms were responsible for 21 percent of cases of meningitis in young adults aged 15 to 24 years. Clinical risk factors for sepsis were provided in all cases: 57 percent recent neurological surgery, 14 percent recent vascular surgery, 14 percent recent surgery type unstated and 14 percent with a prosthetic device type unstated.

*Streptococcus pneumoniae* was responsible for 36 percent of reports of meningitis in the elderly. There was a female predominance in this age group.

*Neisseria meningitidis* was responsible for between 27 and 40 percent of cases of meningitis in the ages 1 month to 24 years.





### 1.2.3 Results, Clinical Category

#### Meningitis

*Cryptococcus neoformans* was not seen under the age of 15 years. Sixty six percent of cases of *Cryptococcus neoformans* meningitis were patients with AIDS. Variant *neoformans* was responsible for the greatest proportion of cases.

There were less reports of meningitis from all bacterial and fungal causes in 1993 for the period January to September than for the same period in 1992: 107 in 1993 and 124 in 1992 (Figure 19).



Figure 18 : Numbers of Reports of Meningitis by Age Group, LabDOSS January 1992 to September 1993

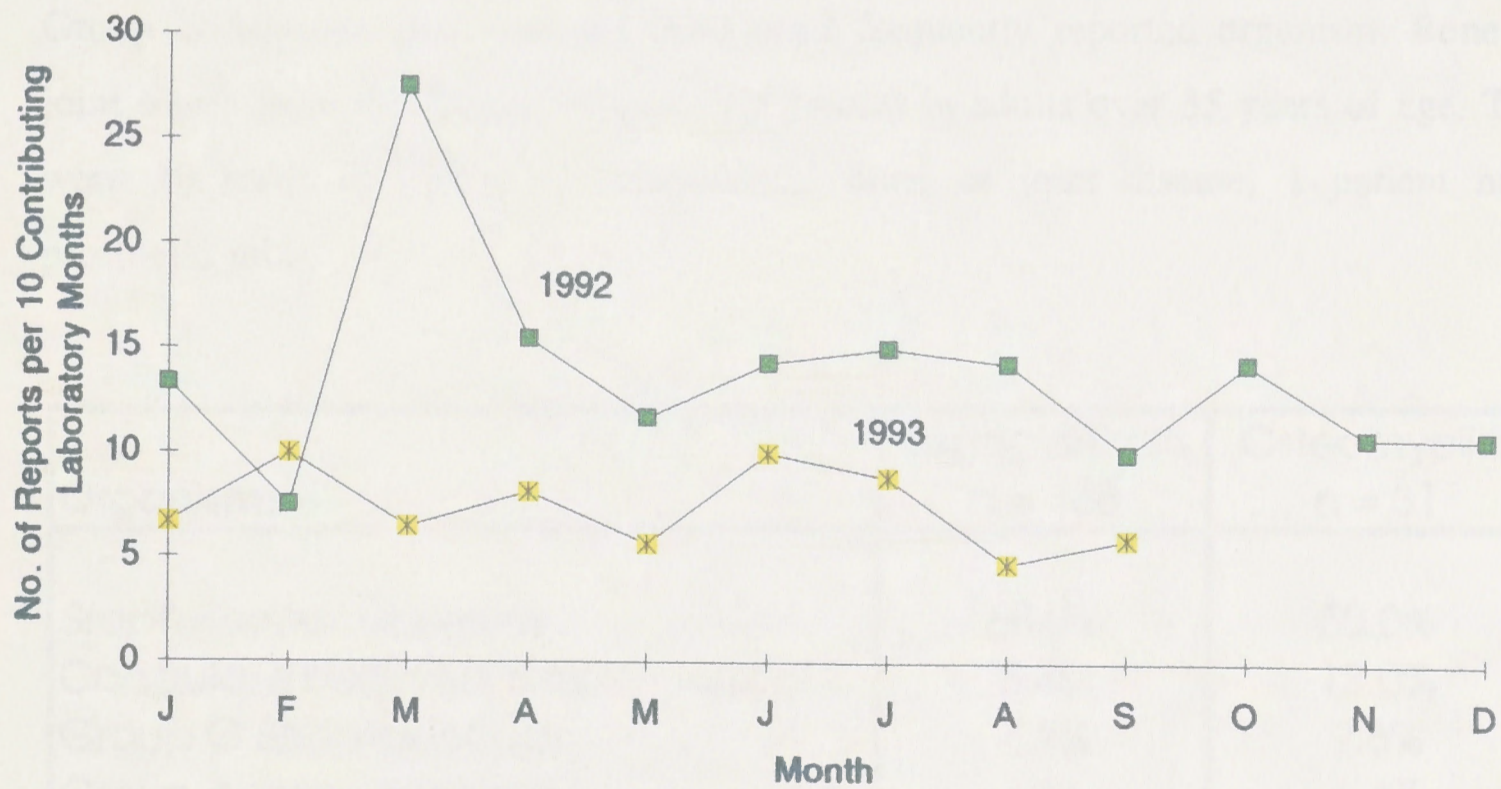
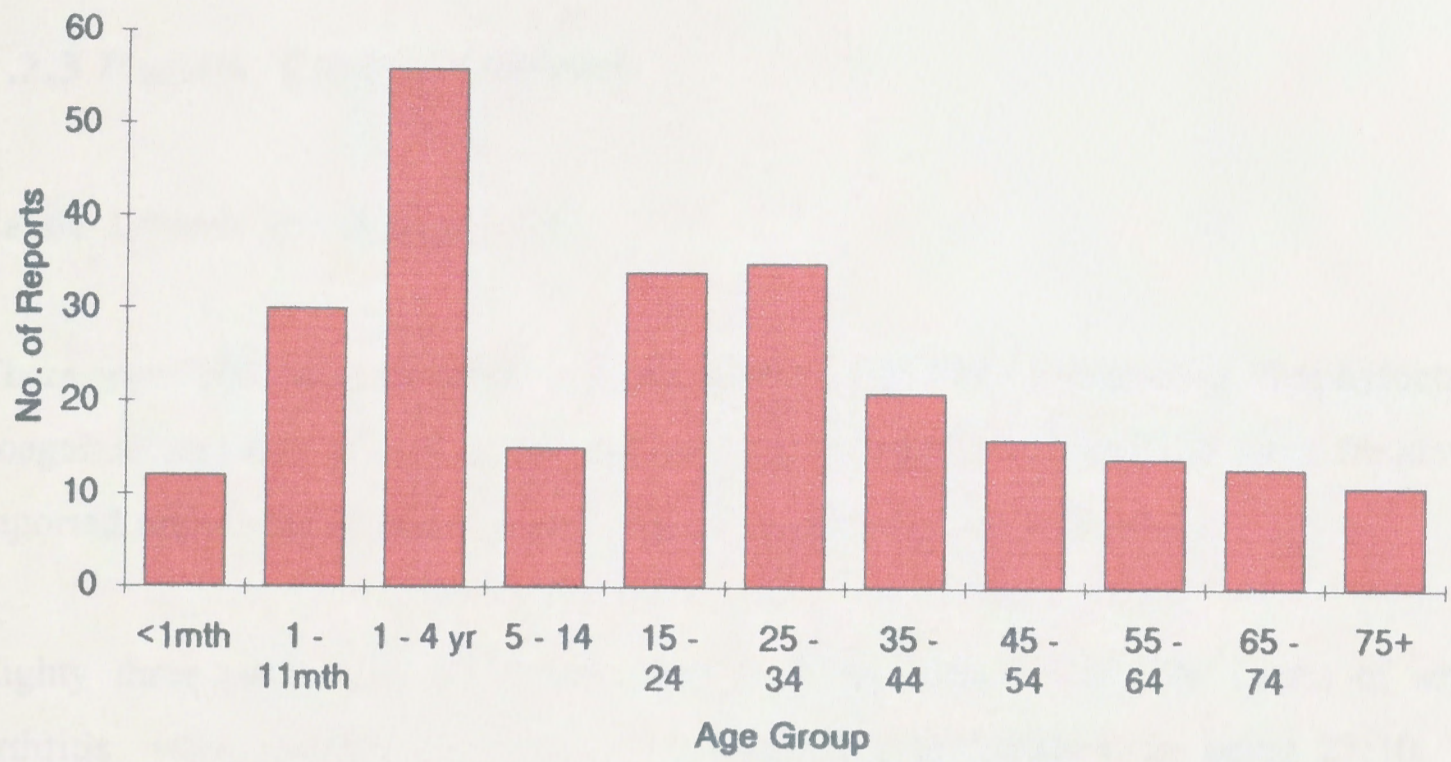


Figure 19: Numbers of Reports of Meningitis per 10 Contributing Laboratory Months, LabDOSS January 1992 to September 1993



### 1.2.3 Results, Clinical Category

#### Septic Arthritis and Osteomyelitis

There were 165 cases of septic arthritis and 31 cases of osteomyelitis. Staphylococci, coagulase negative and positive, and group G Streptococci were the most frequently reported organisms in both osteomyelitis and septic arthritis (Table 6).

Eighty three percent of cases were due to 7 organisms (Table 7). Cases of septic arthritis were predominant in males, the male to female ratio being 23:10. The male to female ratio for osteomyelitis was 12:10.

Staphylococci were responsible for most cases of infection of bone and joints. *Staphylococcus aureus* was the most common organism in all age groups except age 1 to 11 months. *Haemophilus influenzae* was the most common organism reported in infants between 1 and 11 months.

Group G *Streptococcus* was the third most frequently reported organism. Bone and joint sepsis from this organism was only present in adults over 35 years of age. There were 10 cases of Group G streptococcal bone or joint disease, 1 patient had a prosthetic joint.

Organisms	Septic Arthritis n = 165	Osteomyelitis n = 31
<i>Staphylococcus aureus</i>	68.0%	50.0%
Coagulase negative Staphylococci	5.4%	13.0%
Group G Streptococcus	4.2%	9.6%
Group A Streptococcus	3.6%	1.4%
<i>Haemophilus influenzae</i>	1.2%	2.8%
<i>Eschericia coli</i>	3.0%	-
<i>Pseudomonas aeruginosa</i>	1.8%	1.4%

**Table 6:** Septic Arthritis and Osteomyelitis; Percentage of Reports for Common Organisms, LabDOSS January 1992 to September 1993

**Table 7:** Septic Arthritis and Osteomyelitis; Percentage of Reports for Common Organisms Stratified by Age Group with Ratios of Males to Females for Each Isolate

	1-11mth		1-4 yr		5-14		15-24		25-34		35-44		45-54		55-64		65-74		75+		Total
	M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		M:10F		
<b>Total Number of Reports</b>	4	10	10	23	26	12	17	32	20	56	19	85	15	20	27	15	33	15	52	11	237
<b>Organisms</b>																					
<b>Gram Positive</b>																					
<i>Staphylococcus aureus</i>	-	-	20%	2 Males	85%	14	59%	90	55%	11 Males	63%	5	73%	18	78%	16	58%	17	62%	11	63%
Coagulase negative Staphylococci	-	-	30%	10	4%	1 Female	18%	5	15%	3 Males	5%	1 Male	7%	1 Male	7%	10	6%	10	4%	10	8%
Group G Streptococcus	-	-	-	-	-	-	-	-	-	-	5%	1 Male	7%	1 Male	-	-	12%	30	6%	5	4%
Group A Streptococcus	25%	1 Male	-	-	8%	10	6%	1 Male	-	-	5%	1 Male	-	-	-	-	3%	1 Male	-	-	3%
<b>Gram Negative</b>																					
<i>Haemophilus Influenzae</i>	75%	5	10%	1 Male	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2%
<i>Escherichia coli</i>	-	-	-	-	-	-	-	-	-	-	-	-	7%	1 Male	4%	1 Male	3%	1 Female	2%	1 Male	2%
<i>Pseudomonas aeruginosa</i>	-	-	-	-	-	-	-	-	5%	1 Male	5%	1 Male	-	-	-	-	-	-	2%	1 Male	2%
<b>Other</b>	-		40%		4%		18%		25%		17%		7%		11%		18%		25%		17%
<b>Total Percentage</b>	100%		100%		100%		100%		100%		101%		100%		100%		100%		100%		100%



### 1.2.3 Results, Clinical Category

#### Surgery

There were 736 reports of organisms from sterile sites in patients with a risk factor of recent surgery. This represents 10.2 percent of all reports. Abdominal surgery was most frequently reported, being 4.1 percent of all reports, followed by Thoracic (1.2 percent), Neurological (1.2 percent), Orthopaedic (0.9 percent), Urinary Tract and Vascular surgery (0.8 percent each). Surgery type unspecified represented 1.2 percent. Nine organisms, or organism groups were responsible for 73 percent of reports of sepsis (Table 8).

Total Number of Reports	All Surgery	Abdominal	Thoracic	Neurological	Orthopaedic	Urinary Tract	Vascular	Total
	738	292	88	83	70	59	56	1386
<b>Organisms</b>								
<b>Gram Positive</b>								
<i>Staphylococcus aureus</i>	22%	14%	49%	16%	36%	2%	23%	21%
Coagulase negative Staphylococci	10%	7%	7%	30%	17%	-	11%	10%
<i>Enterococcus sp</i>	6%	8%	7%	2%	1%	8%	5%	6%
<b>Gram Negative</b>								
<i>Escherichia coli</i>	13%	15%	-	4%	9%	42%	5%	13%
<i>Enterobacter sp</i>	7%	11%	13%	1%	4%	-	9%	8%
<i>Pseudomonas aeruginosa</i>	6%	8%	2%	4%	4%	10%	9%	6%
<i>Klebsiella pneumoniae</i>	4%	5%	1%	5%	1%	7%	4%	4%
<b>Anaerobe</b>								
<i>Bacteroides sp</i>	3%	5%	1%	1%	4%	3%	-	3%
<b>Fungi</b>								
<i>Candida albicans</i>	2%	3%	1%	-	1%	3%	2%	2%
<b>Other Organisms</b>	27%	25%	19%	37%	21%	24%	32%	27%
Total Percentage	100%	100%	100%	100%	100%	100%	100%	100%

1. MRSA 2.2%

Table 8: Recent Surgery; Percentage of Reports for Common Organisms by Class of Surgery

### 1.2.3 Results, Clinical Category

#### Compromised Immune Status

Twenty four percent (n = 1670) of all reports listed immunocompromised status as a risk factor for sepsis. Reports increased with age up to 74 years. The sexes were equally represented. Further details of immune susceptibility were 32 percent malignancy, 23 percent renal failure, 16 percent neutropaenia, 7 percent diabetes, 6 percent transplant, 5 percent HIV/AIDS and 2 percent intravenous drug user. Nine organisms were responsible for sixty seven percent of the reports (Table 9).



**Table 9:** Compromised Immune Status; Percentage of Reports for Common Organisms Stratified by Description of Immunosuppression ,  
LabDOSS January 1992 to September 1993

	HIV /AIDS	Neutropaenia	Diabetes	IDU	Renal Failure	Transplant	Malignancy	Other	Total
<b>Total Number of Reports</b>	85	267	122	25	379	94	154	544	1670
<b>Organisms</b>									
<b>Gram Positive</b>									
<i>Staphylococcus aureus</i>	11%	8%	16%	56%	22%	15%	12%	16%	16%
Coagulase negative Staphylococci	11%	12%	7%	4%	10%	7%	11%	10%	14%
<i>Enterococcus sp</i>	-	1%	1%	-	4%	6%	4%	2%	3%
<i>Streptococcus pneumoniae</i>	6%	1%	2%	-	-	2%	3%	7%	2%
<b>Gram Negative</b>									
<i>Eschericia coli</i>	4%	19%	32%	4%	9%	12%	18%	17%	16%
<i>Pseudomonas aeruginosa</i>	6%	13%	4%	-	3%	5%	6%	6%	6%
<i>Klebsiella pneumoniae</i>	1%	6%	2%	4%	2%	4%	6%	3%	4%
<i>Enterobacter species</i>	-	4%	2%	-	2%	10%	5%	4%	4%
<b>Fungi</b>									
<i>Candida sp</i>	-	1%	-	-	1%	3%	1%	1%	2%
<b>Other</b>	62%	33%	34%	32%	46%	35%	34%	34%	33%
<b>Total percentage</b>	100%	100%	100%	100%	100%	100%	100%	100%	100%

1. Intravenous Drug User

## 1.2.4 Discussion

- Valid Data
- Trends over Time
- An Emerging Pathogen
- Limitations of the LabDOSS Scheme
- Value of LabDOSS

### Valid Data

### Known Pathogens

### Known pathogens

number of cases of septicaemia from invasive organisms are in the young and the elderly. Gram negative organisms play a larger role with increasing age. *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Neisseria meningitidis* are well known as the three common causative organisms of meningitis. Reproduction of these and other known kinds of infection is an encouraging feature of a new surveillance system.

### Clinical Information

The reliability of clinical information from contributing laboratories is controversial. The clinical data are provided by laboratory staff who have no direct contact with patient. Laboratory staff suggest that the completeness of ascertainment of cases will differ with the condition. The ascertainment rate of cases of meningitis, endocarditis, or patients with recent surgery is likely to be high whilst the ascertainment of patients with diabetes will be low.

The LabDOSS data for endocarditis are validated by overseas studies. It has been shown that males are more commonly affected with the mean male to female ratio of 1.7:1 with a range of 1.2 to 3.0:1 in 17 large series. The male to female ratio in the LabDOSS data was 1.6:1. Other studies show over 50 percent of cases are over 50 years, 60 percent of patients were over 50 years in LabDOSS data with a mean age 55 years. The mean age of patients with endocarditis has been shown to be higher than other organisms, with a range of 61 to 57 years in other studies. The mean age for endocarditis in LabDOSS was 59 years. Thus the clinical data are reliable with the rate of ascertainment of all cases is high.



## 1.2.4 Discussion

### Valid Data

#### Known Patterns of Sepsis

Known patterns of infectious diseases are echoed in the LabDOSS data. The greatest number of cases of sepsis from invasive organisms are in the young and the elderly. Gram negative organisms play a larger role with increasing age. *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Neisseria meningitidis* are well known as the three common causative organisms of meningitis. Reproduction of these and other known trends of infection is an encouraging feature of a new surveillance system.

#### Clinical Information

The reliability of clinical information from contributing laboratories is controversial. The clinical data are provided by laboratory staff who have no direct contact with patient. Laboratory staff suggest that the completeness of ascertainment of cases will differ with the condition. The ascertainment rate of cases of meningitis, endocarditis, or patients with recent surgery is likely to be high whilst the ascertainment of all patients with diabetes will be low.

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## 1.2.4 Discussion

### Trends over Time

#### Seasonal Trend and an Epidemic

LabDOSS surveillance showed pneumococcal sepsis in Australians to be more common in Winter. The Winter increases in pneumococcal disease are also found in overseas studies. In the first year of operation, LabDOSS surveillance detected an epidemic of pneumococcal disease in comparison with the subsequent year. Pneumococcal data in future years may show patterns of disease that may be useful for developing and monitoring effects of public health policy for use of pneumococcal vaccine .

#### Trends Resulting From Other Diseases or Public Health Intervention

*Cryptococcus neoformans* is the fourth most frequently reported organism causing meningitis, an effect of AIDS.

There is a decrease in reports of *Haemophilus influenzae* disease following introduction of Hib vaccine. Ongoing *Haemophilus influenzae* disease, type b and other serotypes, will be monitored through LabDOSS

#### An Emerging Pathogen

Group G *Streptococcus* may be an emerging pathogen in bone and joint disease. The patterns of known common organisms in cases of bone and joint sepsis are present in the LabDOSS data. Group G *Streptococcus* has not previously been described as a frequent agent in bone and joint disease. All *Streptococci* accounted for 10 percent of bone or joint sepsis in LabDOSS data, 4.2 percent of this being group G *Streptococci*. The role of group G *Streptococci* in bone and joint sepsis will be further investigated. Emerging pathogens may be detected through the LabDOSS scheme.



## 1.2.4 Discussion

### Limitations of the LabDOSS Scheme

#### Small Sentinel Scheme

LabDOSS surveillance is a scheme in its infancy. It consists of a small number of contributing laboratories with a geographical bias. Growth of the scheme has been limited by the resources of the section producing the *CDI* rather than lack of offers to provide contributions.

#### The Need for a Semi-Active Scheme

Incomplete serogroup information highlights the need for LabDOSS to be a semiactive scheme. Considering *Neisseria meningitidis*, there is a suggestion of a difference of serogroup reports for differing agegroups, serogroup B being more common in the 15 to 24 year age group. However, the incomplete serogroup information restricts a confident conclusion. A semiactive scheme would allow telephone follow up to complete missing data.

#### Appropriate or Inappropriate Denominator Data

Appropriate denominators for current LabDOSS data are difficult to define. Admission data, or numbers of currently occupied beds, may be used as denominators for numbers of reports of sepsis. However, comparison between hospital laboratories encompasses a referral pattern bias. Sepsis reported by one hospital may only be a reflection of the type of patient managed. For example, hospitals with oncology or burns facilities will generate a different spectrum of blood culture results than hospitals without these units. Similarly, use of the total number of blood cultures processed by any laboratory is affected by likelihood of admission of a patient with sepsis and the hospital policy of numbers of blood samples referred for culture. Appropriate denominators with growth of the scheme may be total population for States or other geographical areas

#### **1.2.4 Discussion**

##### **Value of LabDOSS**

The LabDOSS surveillance system provides valuable information on cases of diseases from invasive organisms. The scheme has detected an epidemic of pneumococcal disease, monitored a seasonal trend and disease prevention by vaccination. Unusual reports are able to be accepted as worthy of further investigation because of the strong reproduction of known trends in infectious diseases. Seasonal patterns, outbreaks, emerging pathogens hitherto not identified will become apparent with subsequent years of reporting. Prevention of disease may be enabled by intervention arising from improved understanding.

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### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

I have prepared the following section with the assistance of Dr Robert Hall and Dr Mahomed Patel.

### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

National notifications and microbiological surveillance of invasive *Haemophilus influenzae* type b (Hib) disease before and immediately after the introduction of conjugated Hib vaccines in Australian children.

#### Introduction

Invasive *Haemophilus influenzae* type b (Hib) disease is estimated to have affected between 550 and 700 Australian children under 5 years of age per year (1). The incidence in this age group varies from 20 to 30 per 100,000 in non Aboriginal children to 500 per 100,000 in Aboriginal children (2,3,4).

The first available conjugate *Haemophilus influenzae* type b vaccine in Australia was PRP - D (ProHIBit Pasteur Merieux) licensed in February 1992. This vaccine was recommended for use in children over 18 months of age. Vaccines suitable for infants were licensed from September 1992 and marketed from February 1993. All Hib vaccines were government funded from April 1993 by reimbursement of vaccine cost to parents. HbOC vaccine (HibTITER Lederle) for non Aboriginal children and PRP-OMP (Pevax HIB, Merck Sharp & Dohme CSL) for Aboriginal children, were included in the immunisation schedule from July 1992. This enabled vaccination of babies aged 8 weeks of age at no outlaying cost to the parent.

Surveillance of Hib disease is required to assess the impact of the vaccination program.



### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

#### Methods

We analysed reports of *Haemophilus influenzae* from two routine, autonomous, surveillance systems. Hib disease was included as a notifiable disease in state and territories from 1991. In 1992 a new sentinel laboratory based surveillance scheme commenced; Laboratory Database of Organisms from Sterile Sites (LabDOSS). LabDOSS is operated by the Commonwealth Department of Human Services and Health and data are published in the Communicable Diseases Intelligence (CDI). The two schemes differ in rates of ascertainment of cases and coverage of the population.

Statutory notifications of Hib cases are made to each state or territory health department who forward data to the Commonwealth Department of Health, Housing Local Government and Community Services. The definition of a case of Hib infection is;

- a) An invasive clinically compatible illness  
(meningitis, epiglottitis, cellulitis, septic arthritis, osteomyelitis, pneumonia, pericarditis or septicæmia).

AND either:

the isolation of *Haemophilus influenzae* type b ( Hib) from  
blood

or

detection of *Haemophilus influenzae* type b antigen  
( in a clinical case)

or

detection of gram negative bacteria where the organism fails to  
grow in a clinical case

OR

- b) A confident diagnosis of epiglottitis by direct vision, laryngoscope or X -  
ray

### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

Notification of Hib disease commenced in 1991. The source of notification differs between states and territories. Notifications are made by physicians, microbiology laboratory staff or a combination of both sources. The proportion of cases notified is not known. Case ascertainment is not considered complete, however data are provided from across the entire country. Cases are identified as Aboriginal or non Aboriginal.

LabDOSS is a voluntary sentinel surveillance system receiving reports from microbiology laboratories. The scheme commenced operation in 1992 with 4 participating laboratories increasing to 17 participating laboratories at the end of 1993. Reporting of meningitis and septicaemia by each contributing laboratory is considered complete, however the ascertainment can be expected to be low for cases of epiglottitis. All reports of *Haemophilus influenzae* in children under 5 were analysed. The data in LabDOSS are currently from mainly two geographic areas; NSW and Queensland. Ethnicity data are not collected. To allow for comparison of numbers of reports per month in an expanding surveillance scheme, the mean number of *Haemophilus influenzae* reports per 10 contributing laboratories for one month has been used.



### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

#### Results

##### National Notifiable Diseases Surveillance System

Nationwide there were 1,186 cases of Hib disease in children under 5 years of age notified to State and Territory Health departments from January 1991 to December 1993. Thirty nine percent of reports were from NSW, 24 percent from Victoria.. There were 16 cases of Hib disease in aboriginal children ( 1.4 percent) , however aboriginality was not reported in 72 percent of cases. There was a male predominance, the male to female ratio being 1.3 : 1. Seventy nine percent of cases were under 3 years of age . The highest rates of Hib disease per 100,000 children under 5 years of age were in children under 1 year of age in spring of 1991 .

##### LabDOSS Reports

All reports of *Haemophilus influenzae* in children under 5 were analysed; 92 percent were serotype b, serotype data were not provided in 8 percent. There were 129 reports of invasive Hib disease in children under 5 years of age to LabDOSS scheme between January 1992 and December 1993. Eighty five percent of cases were under 3 years of age . There was a predominance of males, the male to female ratio being 1.4 : 1. Forty three percent of reports were from NSW/ACT , 48 percent from Queensland and 8 percent from Tasmania.

1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

Children Less Than 1 year of age

**Notifiable Disease**

After reporting began in 1991 a peak of Hib disease was present in spring of 1991 (Figure 1). A similar but less dramatic increase in spring was also evident the following year. The rate of Hib disease in children under 1 year of age in spring 1993 are lower than the previous two years. Rates for 1993 fall below those of previous years from June 1993 onward.

**LabDOSS**

A peak in reports of disease was present in spring 1992 (Figure 2). The 1993 reports, adjusted for number of contributing laboratories, fall below levels for 1992 after August 1993.

Children Aged 1 to 4 years

**Notifiable Diseases**

The rate of Hib disease in children aged 1 to 4 years has decreased since 1991. A peak of reports occurred in winter 1992 (Figure 3). In contrast a slow decline occurred in reports in winter 1993.

**LabDOSS**

There were fewer reports of *Haemophilus influenzae* in 1993 than in 1992. The comparative decrease is seen beginning September 1993 (Figure 4 ).



Figure 1: Two Month Moving Average of Notification Rate of Hib Disease in Children Under 1 Year per 100,000 Children Under 1 Year of Age, 1991 to 1993

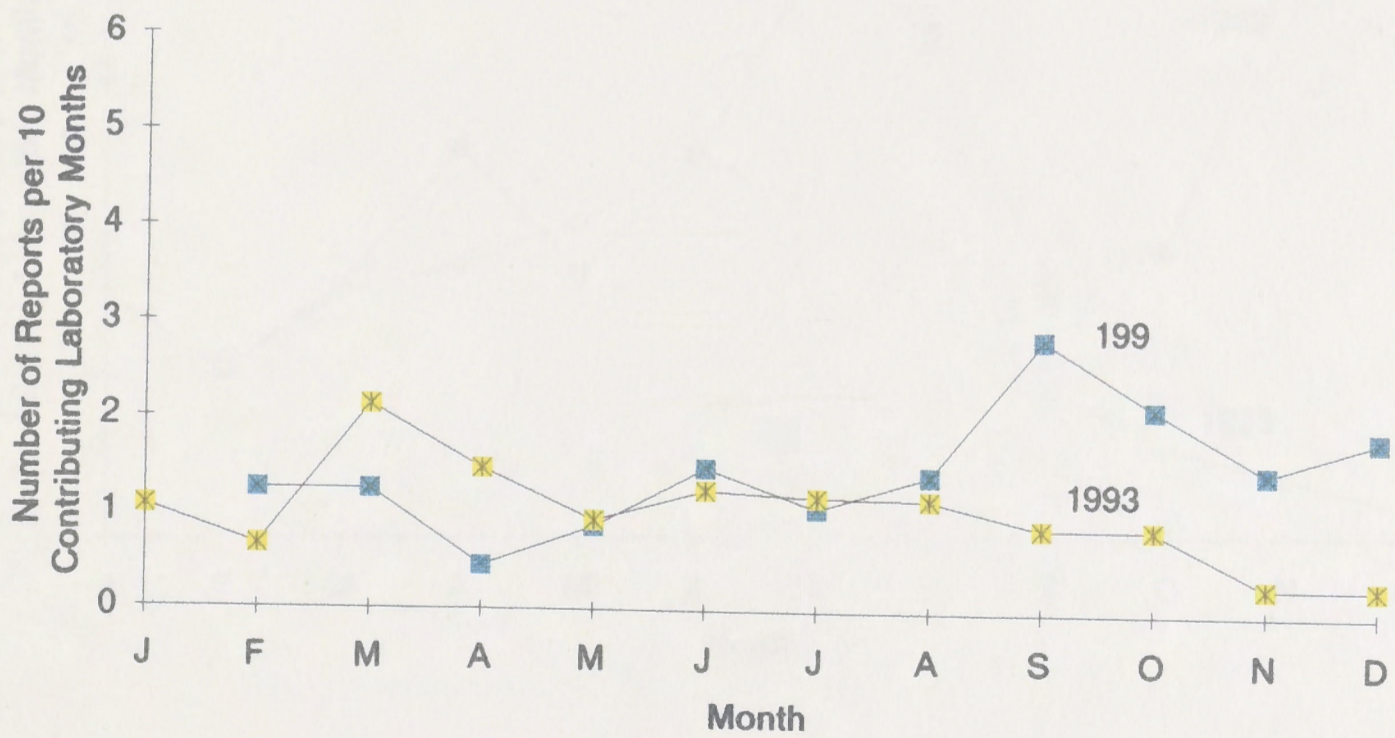
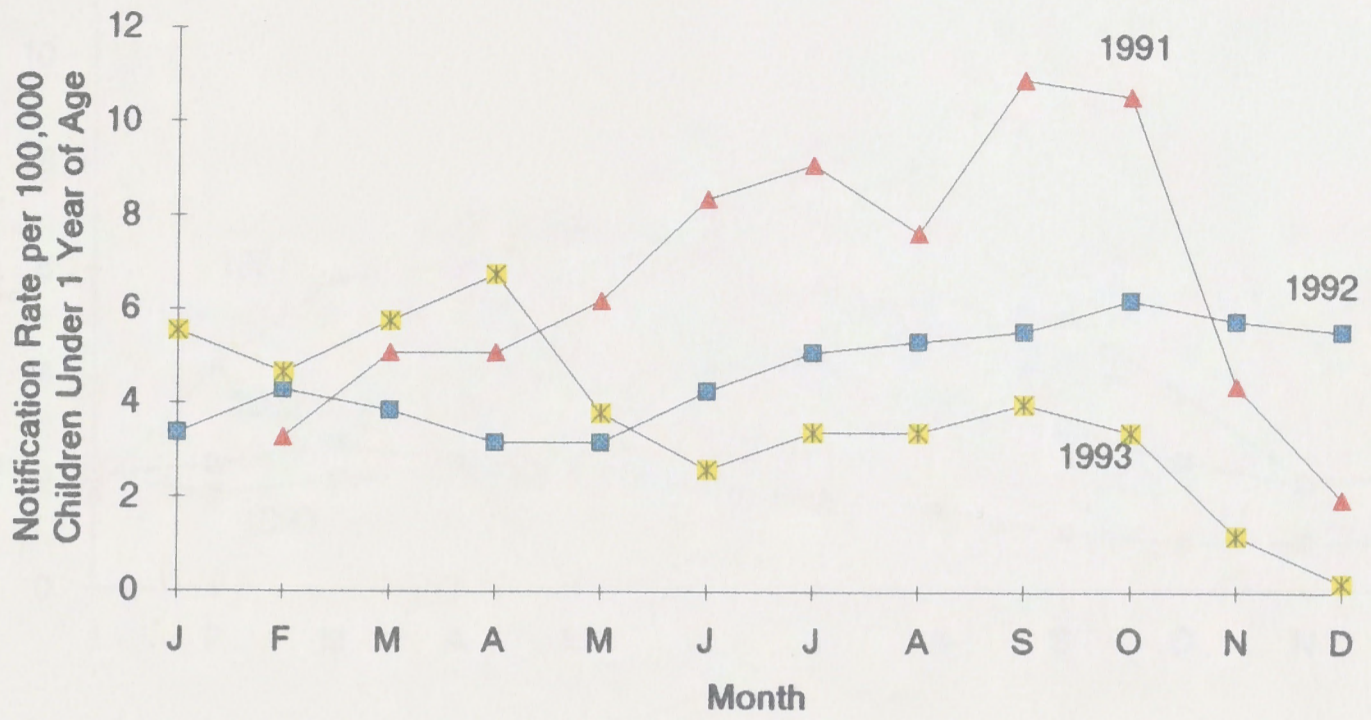


Figure 2: Two Month Moving Average of Number of Reports of Invasive Haemophilus influenzae Disease in Children Under 1 Year of Age, LabDOSS 1992 and 1993



Figure 3: Two Month Moving Average of Notification rates of Hib Disease in Children Aged 1 to 4 years per 100,000 children aged 1 to 4 years , 1991 to 1993

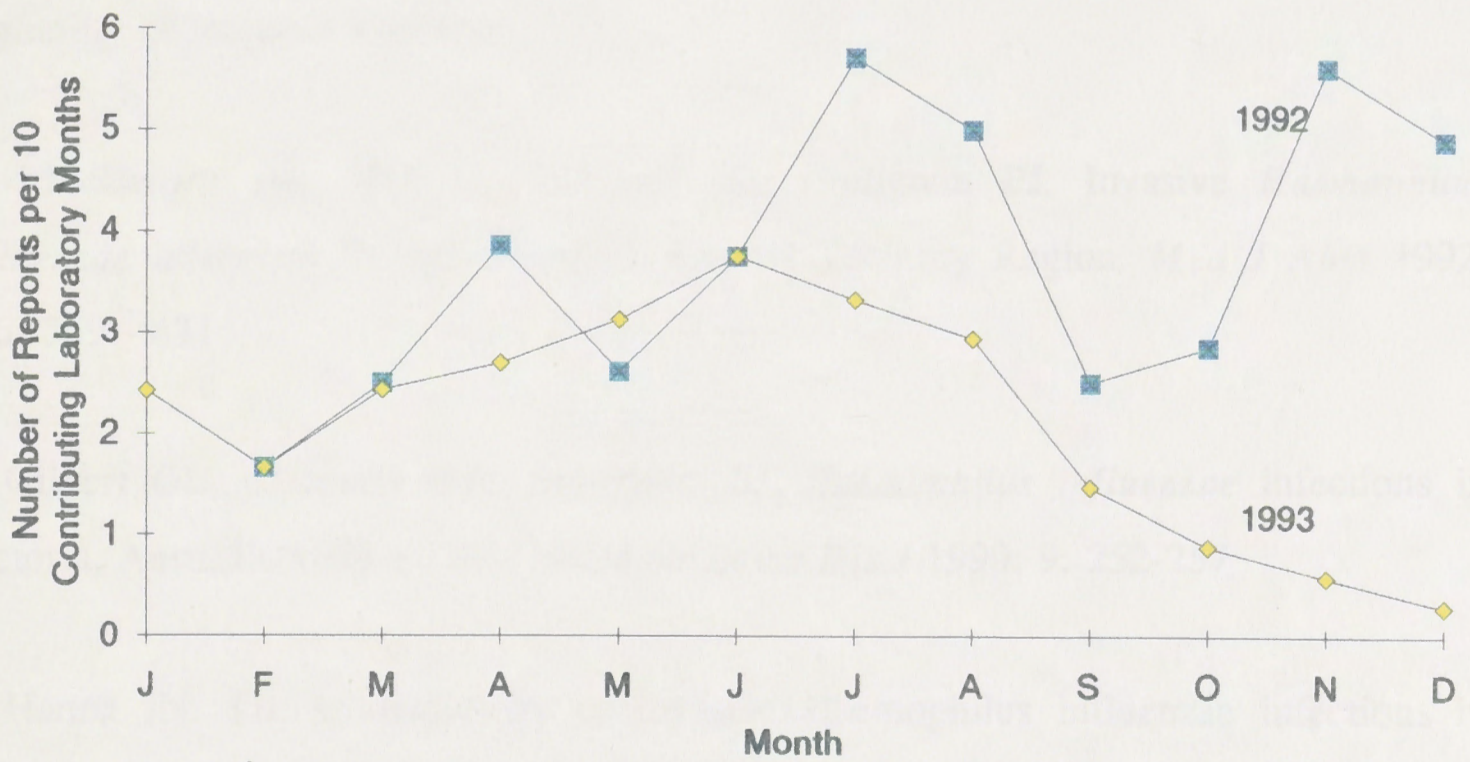
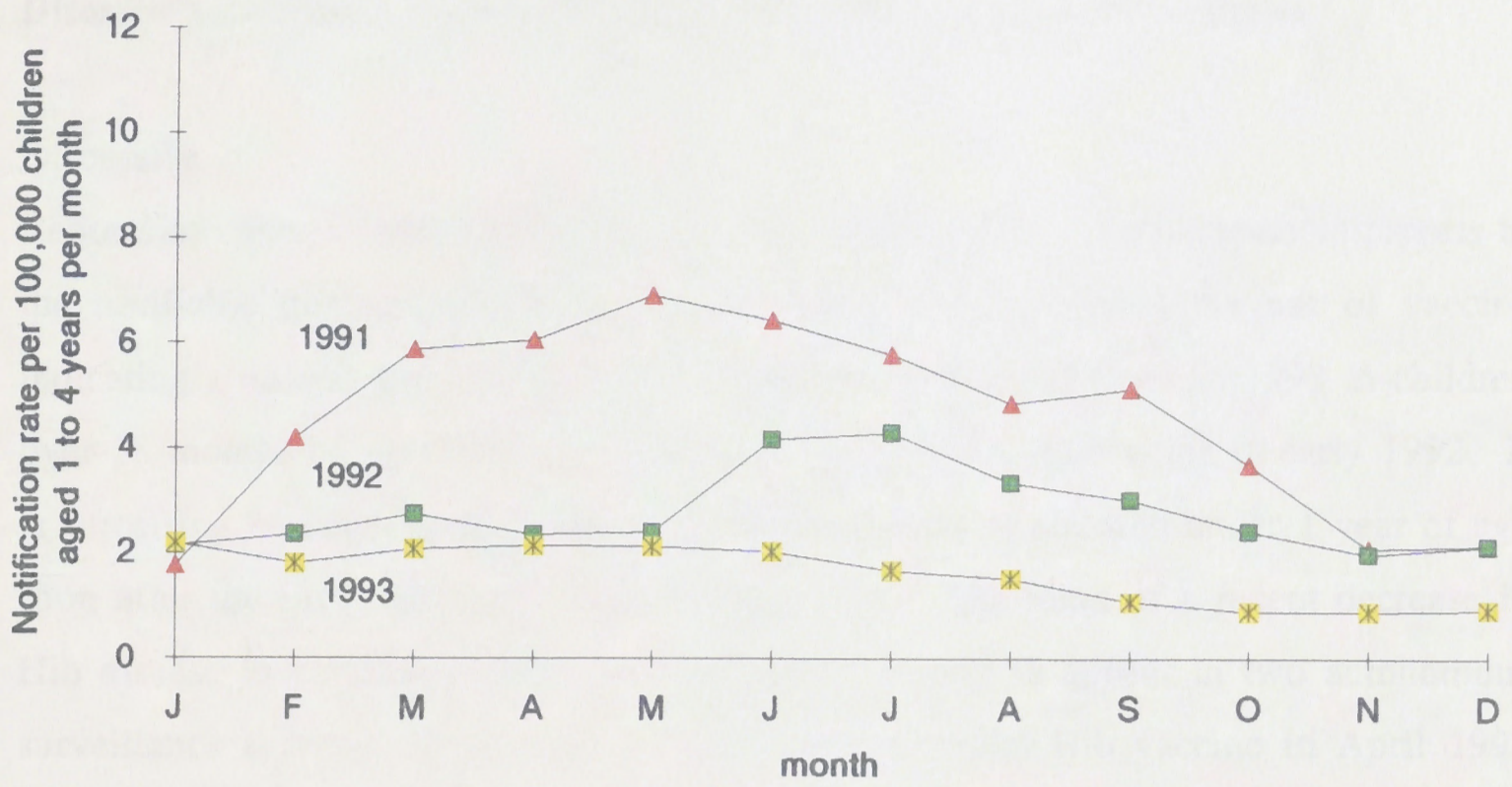


Figure 4: Two Month Moving Average of Number of reports of Invasive Haemophilus Influenzae Disease in Children Aged 1 to 4 Years, per 10 Contributing Laboratory Months , LabDOSS 1992 and 1993



### 1.3 *Haemophilus influenzae*, LabDOSS 1992 and 1993 and National Notifiable Diseases Surveillance System, Communicable Diseases Network Australia

#### Discussion

Reports of cases of Hib disease have decreased since 1991. The decrease in reports to the notifiable diseases scheme in from 1991 to 1992 preceded the use of vaccine indicating a natural decrease occurred. We anticipated fewer cases in 1993 in children over 18 months of age because of the availability of PRP-D vaccine in early 1992. It is surprising however to see a decrease in Hib disease in children under 1 year of age soon after the introduction of infant Hib vaccines. The trend of a recent decrease in Hib disease in children under 1 year of age is starting to appear in two autonomous surveillance systems. Introduction of government funded Hib vaccine in April 1993 appears to have successfully prevented cases of Hib in children under the age of 5 years in 1993. Ongoing surveillance is needed to continue to assess effect of vaccination in future years.

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#### **1.4 Evaluation of LabDOSS**

My evaluation of the system is provided and acknowledges the shortcomings of any evaluation that is conducted by the person who developed the project. I have used the CDC Guidelines for Evaluating Surveillance Systems <sup>1</sup> to improve objectivity.

##### **Public Health Importance of the Health Event**

LabDOSS receives reports of significant invasive organisms. Septicaemia, meningitis and sepsis in other normally sterile sites represent significant morbidity, mortality, health care costs. The total number of cases, incidence and prevalence of septicaemia and meningitis in Australia is unknown. Some reports in LabDOSS may have a high case fatality ratio, for example cases of meningococcal septicaemia. In contrast the case fatality ratio for sepsis from other organisms reported may be low, for example cases of septicaemia with coagulase negative *Staphylococci*. The morbidity of septicaemia and meningitis is high. Nosocomial septicaemia results in extended hospitalisation. The preventability of sepsis varies widely and includes factors of general health of the population, public health policy toward vaccine, development of immunosuppression by therapy for other disease, awareness and prevention of nosocomial infection.

##### **Description of the System**

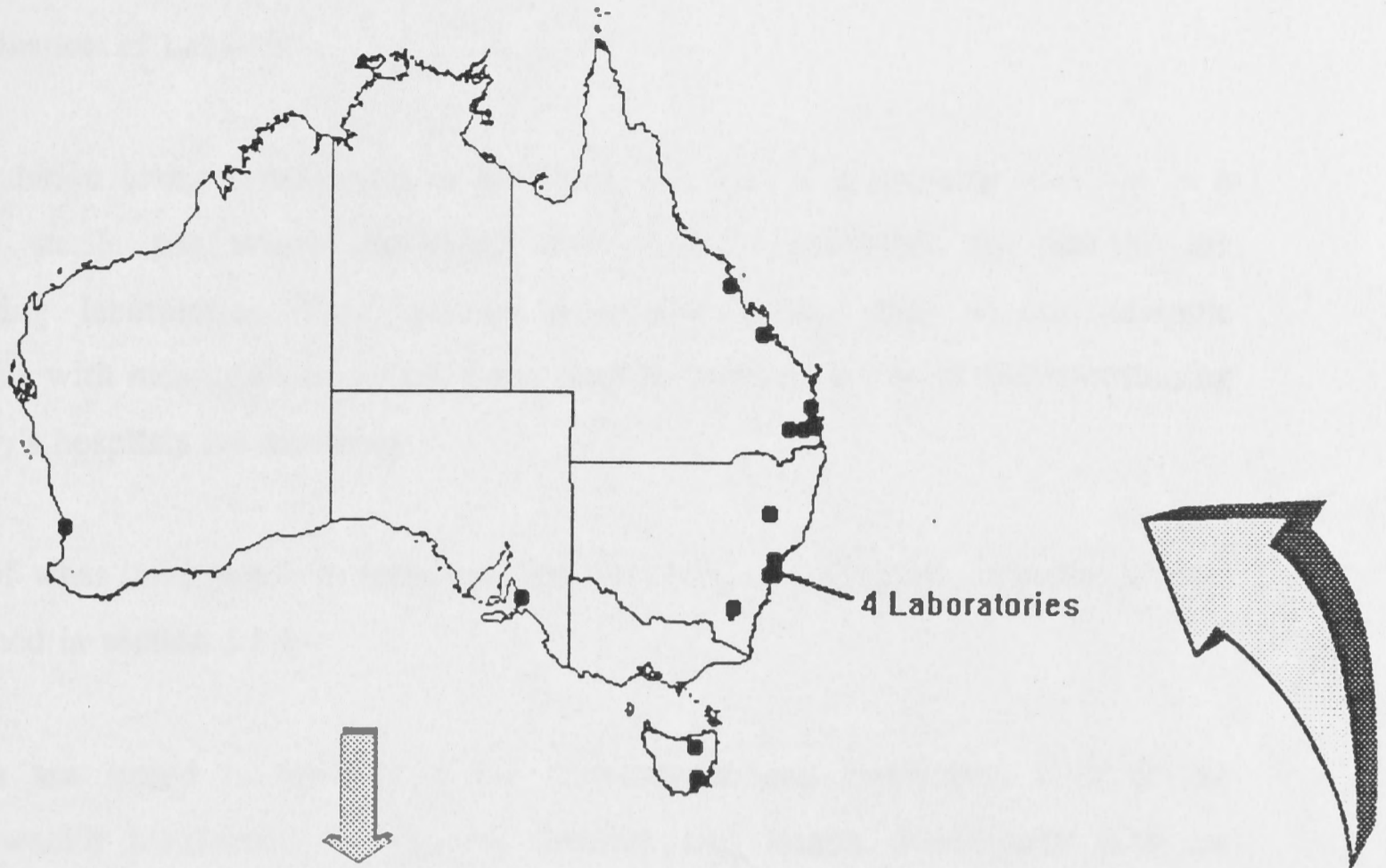
The objectives of the LabDOSS system are outlined in section 1.1.1. The case definition for reports in the scheme is the isolation of a bacterial or fungal organism from a site that is normally sterile. Organisms that are considered as probably contaminating the specimen may be reported to the scheme however, are analysed separately from reports of significant organisms.

Data generated from sentinel, voluntary microbiology laboratories are forwarded to the CDI ( Figure 1 ).

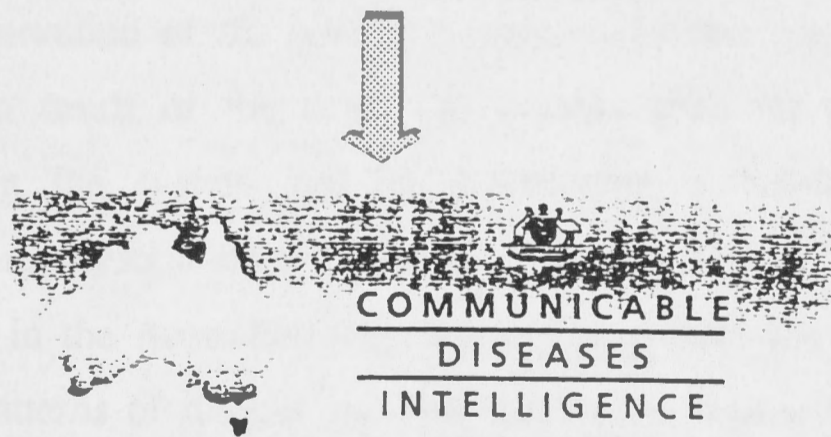


**1.4 Evaluation of LabDOSS**

**Figure 1** Flow Chart of the LabDOSS Surveillance Scheme, Contributing Laboratories from 1992 to September 1993.



Commonwealth Department of Human Services and Health



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#### 1.4 Evaluation of LabDOSS

The population under surveillance is; the group at risk of developing infection in a normally sterile site whose pathology tests will be performed by one of the contributing laboratories. This includes a referral pattern bias as for example individuals with meningitis or severe burns may be referred to one of the contributing laboratory's hospitals for treatment .

Details of what information is collected, the frequency of collection , transfer of data are outlined in section 1.1.2

The data are stored in EpiInfo in the Surveillance and Evaluation Unit of the Commonwealth Department of Human Services and Health. Fortnightly data are analysed and printed in the *CDI*, distributed free of charge to approximately 5,000 Australian and International Readers.

#### Usefulness

Initial observation of the scheme suggests limited use as there has been no action taken as a result of the data. The priority thus far has been for the process of establishing the system and in determining a baseline for future comparisons. However, the system does improve understanding of the epidemiology of invasive organisms in the Australian population. The system has detected seasonal trends, age and sex patterns of disease and risk factors for sepsis. It is able to detect epidemics and has shown periods of increased reports of pneumococci and decreasing reports of *Haemophilus influenzae*. Evaluation of vaccination for Hib disease is able to be preformed.

( Refer Section 1.2 Analysis of Data January 1992 to September 1993 and Section 1.3 *Haemophilus influenzae* LabDOSS 1992 and 1993)



## 1.4 Evaluation of LabDOSS

### Usefulness , Stimulation of Epidemiological Research

As knowledge about the system grows it is likely to stimulate epidemiological research to control or prevent illness. For example, there are few reports of early onset neonatal group B streptococcus infection in the 1992 and 1993 LabDOSS data. However, some centres in Australia actively screen all women for vaginal carriage of the organisms and use intrapartum chemoprophylaxis to prevent neonatal disease. The incidence of this diseases has been shown to vary geographically within countries<sup>2</sup>. The incidence of the disease in neonates across Australia is unknown. One Melbourne study showed the incidence one area to be 2.0 per 1,000 live births<sup>3</sup>. Screening for any disease should only occur if there is effective intervention. Controversy persists about chemoprophylaxis to prevent disease and work continues on development of group B streptococcal vaccine. Expansion of LabDOSS scheme may allow a more representative determination of the incidence of this disease. LabDOSS may enable evaluation of current screening programs and any future programs of intrapartum chemoprophylaxis or vaccination.

### Usefulness, Prevention of Nosocomial Sepsis

The constituents of the surveillance system each use Labdoss for their own purposes. One of these purposes may be improvement of nosocomial infection surveillance. The system currently collects data on intravenous line risk factors and hospital acquired (defined as infection acquired greater than 48 hours after admission) origin of sepsis. With improved hospital access to data on sepsis, treatment of infections and prevention of nosocomial sepsis may be improved .

## 1.4 Evaluation of LabDOSS

### Attributes

Simplicity The system has been designed to be easy for the laboratory to provide and send data. The means of providing data can be tailored to each laboratory's needs. This has been a major factor in the slow development of the scheme as considerable time is spent to individualise each system. However, it will be a significant factor in ensuring the scheme will continue.

Flexibility LabDOSS flexibility has been shown with copying of the scheme to create LabVISE. Fifty percent of the virus reports are now provided on floppy disc. Any organism may be included, data may be requested from other sites, for example genital specimens, wound swabs.

Acceptability The acceptance of LabDOSS has been shown by the request of laboratories to join the scheme and the support displayed at the Australian Society for Microbiology Meetings.

Sensitivity The sensitivity of the scheme is high if the condition is detected by culture of an organism from sterile sites. An example of lack of sensitivity is cases of Hib epiglottitis which are unlikely to be detected.

Positive Predictive Value The positive predictive value of a report of an isolate from sterile sites is high for known pathogens and may be low for less aggressive organisms such as coagulase negative staphylococci. False positive case reports have been minimised by including the option of coding the organisms as "probable contaminant". At times it will be difficult for the laboratory scientist to assess the significance and therefore the positive predictive value of an isolate.



## 1.4 Evaluation of LabDOSS

### Attributes

Representativeness The scheme appears to be representative, as initial analysis of early data support known trends in infectious diseases. Where the scheme lacks accuracy is in incomplete data provided such as serogroup information. This is a considerable shortcoming of the scheme for surveillance of meningococcal sepsis. This highlights the need for the scheme to be semiactive, allowing for telephone call back to correct or correct and complete reports.

Timeliness The data are reported in a timely manner to CDI and reports are printed no later than one month after onset of illness. On occasions, data are provided retrospectively by laboratories, this occurs when their staffing levels are low or the computer entry person is on leave. On such occasions the data are acknowledged in the CDI and merged into the main file for the year. All data printed in the CDI are of recent isolates.

#### 1.4 Evaluation of LabDOSS

##### The Resources for the System

The direct costs in establishing the scheme have been high, largely the cost of staff time. Costs of the LabDOSS scheme to the Department of Human Services and Health are outlined below. Cost of production and distribution of CDI and attendance at conferences are not included. The individual laboratory cost is approximately 1 hour of data entry per fortnight, estimated between \$ 260 and \$ 780 per year depending on staff qualification.

##### 1991

70% of Medical Officer grade 1	\$ 35,000
20 % Computer Systems Officer	\$ 10,000
Telephone, stationary,travel	\$ 1,000
<b>Total</b>	<b>\$ 46,000</b>

##### 1992

30 % Medical officer grade 1	\$ 15,000
20 % Senior Professional Officer	\$ 9,000
30 % Computer systems officer	\$ 15,000
Kits for 14 laboratories	\$ 280
Travel	\$ 2,000
<b>Total</b>	<b>\$ 41,280</b>

##### 1993

10 % Medical Officer grade 1	\$ 5,000
20 % Computer systems Officer	\$ 10,000
20 % Clerical Officer	\$ 6,000
Kits for 5 Laboratories	\$ 100
<b>Total</b>	<b>\$ 21,100</b>

##### Projected for 1994 Including Scheme Expansion

40 % Computer systems Officer	\$ 20,000
10 % Medical office	\$ 5,000
70 % Clerical Officer	\$ 21,000
Kits for 20 Laboratories	\$ 400
Travel	\$ 2,000
Annual Report Medical Officer	\$ 5,000

**1994 Projected Total** **\$53,400**



**Ongoing Maintenance**

10 % Systems operator	\$ 5,000
70% Clerical Officer Analysis	\$21,000
Fortnightly 20 % Medical /Science Officer	\$10,000
Annual report Medical /Science Officer	\$ 5,000
<b>Annual Total</b>	<b>\$ 41,000</b>

1. Guidelines for Evaluating Surveillance Systems, Centers for Disease Control

MORBID May 6 1983, Vol 37, No 5-5

2. King K. Early onset neonatal infection sub-group F. Journal of Clinical Microbiology

Aug 1983, 1542-47

3. Quinn GL, DeLard S. Neonatal group I streptococcal infections. Med J Aust

1983, 1: 545-54

## 1.4 Evaluation of LabDOSS

### Conclusions and Recommendations

The LabDOSS system is meeting its objectives. The understanding of the epidemiology of disease caused by invasive organisms in Australia such as *Streptococcus pneumoniae* has been improved. Trends of disease caused by invasive organisms over time have been monitored. Emerging pathogens causing invasive disease may be identified. Outbreaks are able to be identified. The knowledge gained from LabDOSS surveillance is able to be used to develop public health policy.

The LabDOSS system is in an early stage of development. Fully meeting the objective and providing full value of the scheme will only be attained if expansion is enabled to occur.

### References

1. Guidelines for Evaluating Surveillance Systems , Centers for Disease Control , MMWR May 6 1988 ,Vol37, No S-5
2. King K: Early Onset neonatal infection with group B streptococci. [Editorial] Med J Aust 1983;1:542-543
3. Gilbert GL, Garland S. Perinatal group B streptococcal infections. Med J Aust 1983; 1: 566 -571





**MANUAL  
FOR  
LABORATORY DATABASE OF ORGANISMS FROM STERILE SITES  
LABDOSS2**

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Help can be obtained by contacting Dr Leslee Roberts 06 2897217 or Mr David Evans 06 2897155

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**Word Processor:** MicroSoft Word5

**Graphics:** Scangal Plus 5.0 with HP Scanjet Plus

The authors express their appreciation for comments by CDI staff.



## 1. THE LABDOSS SYSTEM

### 1.1 Overview of the LabDOSS System

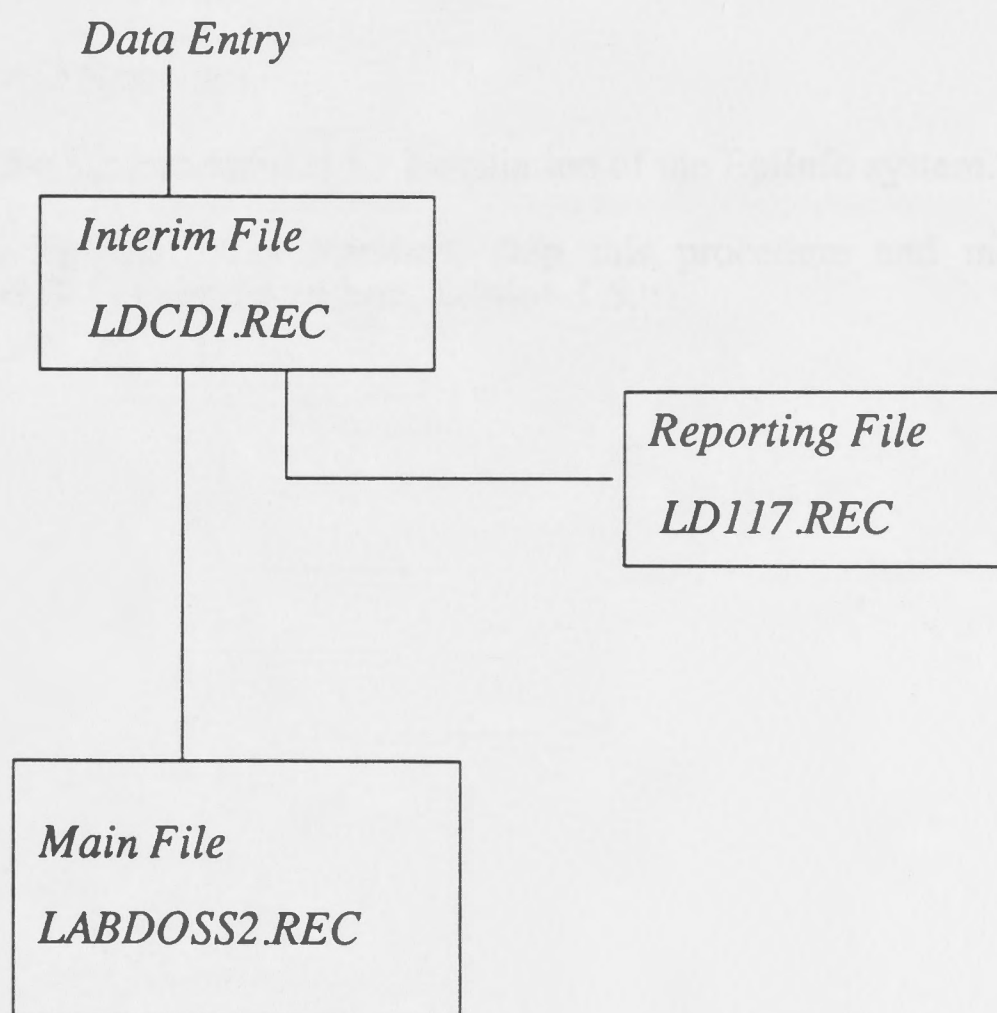
LabDOSS is a national scheme for surveillance of significant isolates from normally sterile sites.

The computerised LabDOSS surveillance system presented here has been produced in EpiInfo 5.01a, a text editor (word processing), database and statistics system for epidemiology on microcomputers. This program is public domain software from the Centers for Disease Control (CDC) in Atlanta, Georgia, USA. An EpiInfo manual is provided with these instructions for use in more general operations.

For LabDOSS, a series of EpiInfo and DOS programs have been produced to allow for DATA ENTRY, STORAGE, ANALYSIS, and REPORTING TO CDI.

The LabDOSS system is two tiered, as follows:-

- i) An interim file (LDCDI.REC) is created for entry of data and for reporting via a file (LD###.REC) on diskette to the Communicable Diseases Intelligence bulletin (CDI). (The ### refers to the laboratory number.)
- ii) A main file (LABDOSS2.REC) is created for your own laboratory, in which you may do your own analysis, by incorporating the interim file into it.



**Note:** *LDCDI.REC* is used for entering all records.  
*LABDOSS2.REC* is the main file that is used to analyse data.  
*LD###.REC* is copied to diskette for CDI.

## 1.2 *Data in LabDOSS*

Data related to each isolate and entered in LabDOSS are divided into 3 types:

- i) Clerical data
- ii) Clinical data
- iii) Microbiological data.

Details on the data for each type are provided in Section 2 of this manual.

## 1.3 *Tailoring LabDOSS for your Laboratory*

LabDOSS can be tailored for your own needs, adding extra fields (e.g. patient outcome, antimicrobial susceptibility) where appropriate. The data sent to CDI are only the core data that have been included in the files mentioned above.

*If you would like your database to store additional information it is important that you contact the personnel indicated on the front page. Adding additional fields may cause unintended consequences to the LabDOSS files. For example, the look-up tables (or pop-up screens) may not function properly, thereby seriously affecting your data entry.*

*Alterations may be readily arranged by contacting the CDI personnel.*

## 1.4 *Installation of EpiInfo System.*

Refer to chapter 4 of the EpiInfo manual for installation of the EpiInfo system.

If you already have EpiInfo 5.01a installed, skip this procedure and move to the "*Installation of LabDOSS System*" procedure, Section 1.5.



### 1.5 Installation of LabDOSS System.

Insert LabDOSS2 installation diskette into drive A: (or B:)

At the DOS prompt (i.e. C:\> or A:\> or B:\>)

Type A:INSTALL (or B:INSTALL B:) & press <Enter>

A series of instructions will lead you through the installation process, as follows:-

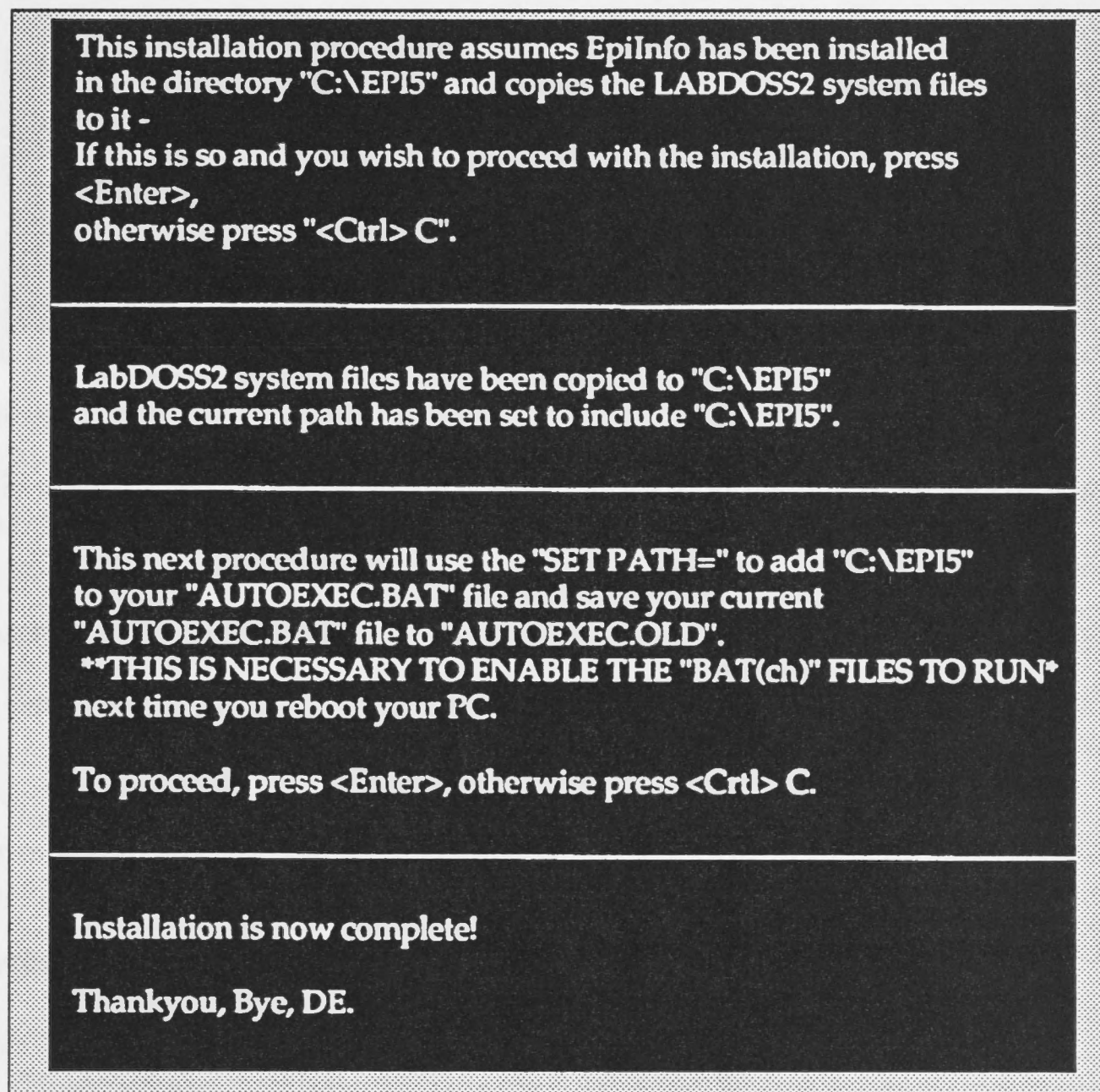


FIGURE 1. INSTALLATION PROCEDURES FOR LABDOSS.

**NOTE:** If the message "Invalid directory" appears on the screen during installation, you will need to install the EPIINFO system to the C:\EPI5 directory before proceeding with the installation of LabDOSS2.

At the end of the installation of LabDOSS2 a menu (shown next page) will appear.

## 1.6 LabDOSS2 Menu

To bring up the LabDOSS2 Menu, type `LDMENU` at the DOS prompt (`C:\>` or `A:\>`)

```

WELCOME TO THE LABDOSS2 SYSTEM
-----
LabDOSS2 data files include:
  1. interim file LDCDI.rec into which data is entered;
  2. main file LABDOSS2.rec into which all data is stored and analysed.

Select the appropriate options by typing against the C:\> prompt:-

LDENTER  to enter data into the interim file LDCDI.rec.
LDSORT   to sort records in the interim file LDCDI.rec.
LDDEL    to delete records in the interim file LDCDI.rec.
LDPOST   to run the program which writes LDCDI.rec data to the A: drive
         diskette (for posting to CDI) and to LABDOSS2.rec on hard disk.
LDAN     to analyse the LABDOSS2.rec file under ANALYSIS option of EpiInfo.
LDBK     to run the Backup/Restore Menu.
LDMENU   to run this menu again.

C:\>

```

FIGURE 2. ENTER DATA, POST (OR SEND) DATA and SORT RECORDS.

This menu is not required to run the following options but is provided as a reminder of the options available.

## 1.7 Entering Data

To enter data into the interim file `LDCDI.REC`:

Type `LDENTER` at the DOS prompt (i.e. at `C:\>` or `A:\>`).

For more details on entering data, refer to "*Instructions for Entering Data...*" - Section 2.

## 1.8 Sorting & Deleting Data

To sort records (in `LDCDI.REC`) to check for duplicates:

(The records will be sorted by *Organism* and *Surname*)

Type `LDSORT` at the DOS prompt (i.e. at `C:\>` or `A:\>`).

Press `<F5>`, then `<up arrow>` twice, then `<Enter>` to print out the data for checking of duplicates OR scan the records on the screen to enable checking of duplicates.

To delete records (in `LDCDI.REC`):

(The `UPDATE` procedure will be invoked under `ANALYSIS` - refer to page 359 "`UPDATE`" command of EpiInfo manual for more detail.)

Type `LDDEL` at the DOS prompt (i.e. at `C:\>` or `A:\>`).

Position cursor on the duplicate record.

Press `<F6>` to mark records for deletion.

Press `<F10>` twice to quit `ANALYSIS` and EpiInfo.



### 1.9 Posting (or Sending) data to CDI

To send data to the CDI (as file LD###.REC):

Type LDPOST at the DOS prompt (i.e. at C:\> or A:\>).

- . A programme will run that will ask you to insert a formatted diskette into the A: drive.
- . The data from LDCDI.REC - excluding the patients whole name and any extra fields included in your tailored system - is copied onto the diskette as file LD###.REC.
- . All of the data in LDCDI.REC is merged into the main file LABDOSS2.REC, and LDCDI.REC is emptied ready for you to start over again.
- . Mail the diskette to CDI/LABDOSS, Communicable Diseases Section, Department of HH&CS, GPO Box 9848, Canberra, ACT 2601.

### 1.10 Analysing your Laboratory Data

Analysing your data may be performed using the EpiInfo ANALYSIS option, and can be accessed from the LabDOSS2 menu, as follows:

Type LDAN at the DOS prompt (i.e. at C:\> or A:\>).

(This is equivalent to typing CD\EPI5 at the DOS prompt, then EPI to activate the program, then selecting ANALYSIS.)

You should now be in the browse mode looking at the LABDOSS2.REC file.

To look at options for ANALYSIS, escape from the BROWSE screen by pressing <Escape> or <F10>, then press <F2>, and for field names, press <F3>.

If at any time you need to look at another file, type READ <path><filename>, then press <F4> to browse.

Refer to the ANALYSIS section of the EpiInfo Manual for further details.

For examples of LabDOSS2 data analysis refer to "Analysis Report Examples" in Section 6.

### 1.11 Backing up and Restoring Data

To bring up the Backup/Restore Menu:

Type LDBK at the DOS prompt (i.e. at C:\> or A:\>).

For more details on backing up and restoring files, refer to "BACKUP and RESTORE Procedures" - Section 3.

## 2. INSTRUCTIONS FOR ENTERING DATA INTO THE LABDOSS SYSTEM

From "LabDOSS2 System" menu (see figure 2), to enter data:

Type LDENTER at the DOS prompt (i.e. C:\> or A:\>).

(This can also be accessed from the EpiInfo menu by selecting ENTER then at the data file prompt, type LDCDI and press <Enter>)

To enter data into each field (or entry location) type the appropriate data and the cursor will jump to the next field, or press <Enter> if the cursor remains. The following sets out the procedures and requirements for each field.

### CLERICAL DATA - SCREEN 1

```

Communicable Diseases Intelligence LabDOSS

Laboratory Database of Organisms from Sterile Sites
Phone enquiries Dr Leslee Roberts 06 2897217
*****
CLERICAL

Laboratory Code ###      Specimen Labnumber

Specimen Collection Date

PATIENT IDENTIFICATION

Surname                   Firstname
Sex                       DOB                If No DOB .. Age
Post Code of patient

Press Return to Continue....
LABCODE: All entries allowed
<Ctrl-N>-New <Ctrl-F>-Find F5-Print F6-Delete F9-Choices F10-Done Rec=

```

FIGURE 3.

*Laboratory Code:* Automatically entered

*Specimen Number:* Either numbers or characters up to 8 in length, e.g. B000231.

*Date of Collection of Specimen:* Format is dd/mm/yy. If this is not available enter the date the specimen was received by the laboratory. Compulsory field - if nothing is entered you cannot move to the next field.

*Surname:* Enter the whole name - when the LDPOST program is executed, only the first 2 letters of the name will be sent to CDI.

*Firstname:* Enter the whole name, only the first 2 letters will be sent to CDI

*Sex:* M = male F = female U = unknown

*DOB:* Format is dd/mm/yy. The patient's age will automatically be calculated (as "Collection date" - "DOB") and presented in years. If the DOB is not entered the cursor will move to the age field where the age can be manually entered. The age field may be left blank.



**Postcode of Residence****of Patient:**

If this is not available please leave blank. If the specimen has been referred from interstate, but full postcode is unknown, please place first digit of state followed by 999, e.g. NSW is 2999.

**Press Return to Continue:** Press <Enter> and cursor will move to the next screen

**CLINICAL INFORMATION - SCREEN 2**

```

*****
                                     CLINICAL
Clinical Diagnosis 1

Clinical Diagnosis 2

Risk Factor

Press return to continue...

*****
DIAG1: Valid values: 95, 02, 07, 20, 21, 03, 89, 88, 31, 30, 16, 99, A2, 09
<Ctrl-N>-New <Ctrl-F>-Find F5-Print F6-Delete F9-Choices F10-Done Rec=

```

FIGURE 4.

**Diagnosis 1:** Press the <F9> Key . This will bring up all the options for this field. The appropriate number can be entered *by typing it directly OR by highlighting it* (using the <arrow> keys) *and pressing the <Enter> key*. Your choice will appear in words on the screen. If you want to leave the screen without making a selection use the <Escape> key.

**Diagnosis 2:** Press the <F9> Key - contains the same options as diagnosis 1.

**Risk Factor:** Press the <F9> Key . This will bring up all options for this field. Either enter in the number or highlighted choice. Other clinical information may be entered in the comments field.

**Press Return to Continue:** Press <Enter> and cursor will move to the next screen

**Note:** To move to previous screen use <up arrow>.

## MICROBIOLOGY - SCREEN 3

**MICROBIOLOGY**

Source Tissue 1                      Optional Source Tissue 2

Isolated by Culture?

If Antigen Detection ..... Method

Organism Code

serogroup

Further Identification of organism

Comments

SOURCE1: Valid values: BL, CS, PF, PD, JF, OT You must enter data  
 <Ctrl-N>-New <Ctrl-F>-Find F5-Print F6-Delete F9-Choices F10-Done Rec=

FIGURE 5.

*Source Tissue 1:* Is compulsory. The <F9> Key will bring up the options. Enter the code or press <Enter> on the highlighted choice.

*Source Tissue 2:* May be used when two sources are present e.g. Blood and CSF. Press <F9> Key for options.

*Isolated by culture:* Defaults to YES. To change to NO, press "N".

*Antigen detection:* Press <F9> Key for options.

*Organism:* Press <F9> Key for a list of organisms in alphabetical order. To quickly arrive at a group of organisms, press the first letter, e.g. Y for *Yersinia*, OR use the <Page down> or <down arrow> key to work through this field. The appropriate organism code can be entered *by typing it directly*, e.g. ESO1 for *Ecoli* OR *by pressing <Enter>* when the organism is highlighted. The name of the organism will appear on the screen. If there is no code for the organism, type the correct name in full in the *Further Identification of Organism* field. If you have chosen the wrong organism use the <up arrow> key to return to the field, press <F9> Key and select again.

*Serogroup:* If applicable, e.g. enter B for *Neisseria meningitidis* type B, organism code NE02.

*Further Identification of Organism:* Use this for organisms that are not included in the code list (e.g. *Staphylococcus warnerii*) or where the identification is insufficient (e.g. *Acinetobacter calcoaceticus* var *lwoffii*).

*Comments:* If applicable, e.g. resistance pattern, patient history, travel, occupation.

To complete the record, the message "Write data to disk? Y/N" will appear. Type "Y" to complete or, if there is an error in any field, type "N" to return to the beginning of that record. (The <F10> Key will also enable "Write data to disk" but will end the "ENTER" session if pressed while the cursor is on the last field).



### 3. BACKUP & RESTORE PROCEDURES

Data backup is a most important part of any successful system. You can use either your existing backup procedures or the backup facility provided with the LabDOSS system as shown in the menu below:

```

      THIS IS THE LABDOSS2 SYSTEM BACKUP/RESTORE MENU
      -----
      BACKUP is a most important part of any successful system. The following
      options provide for backup or restore of all LABDOSS2.* & LDCDI.* files
      from the \EPI5 directory on your C: drive.

      Select the appropriate options by typing against the C: prompt:-

      LDBACKA  to backup LABDOSS2.* & LDCDI.* files to A: drive.
      LDBACKB  to backup LABDOSS2.* & LDCDI.* files to B: drive.
      LDRESTA  to restore LABDOSS2.* & LDCDI.* files from A: drive.
      LDRESTB  to restore LABDOSS2.* & LDCDI.* files from B: drive.
      LDBK     to run this Menu again.
      LDMENU   to run the main LABDOSS2 Menu.

      C:\>
  
```

FIGURE 6. BACKUP & RESTORE PROCEDURES FOR A: & B: DRIVES.

To access this menu:

Type LDBK at the DOS prompt (i.e. at C:\> or A:\>).

- i) The LabDOSS *Backup* facility uses the DOS BACKUP command. If it is necessary to *Restore* the data to your system, refer to the procedure in ii) below.

To backup the LabDOSS data to the A: drive:

Type LDBACKA at the DOS prompt (i.e. at C:\> or A:\>).

- . The DOS BACKUP procedure will run and ask you to insert a diskette into the A: drive. (NOTE: It will then ask you to "Insert the last backup diskette ..." to enable backup of further files. If you have used only one diskette re-insert that diskette, or if you used more than one, insert the last diskette used.)
- . Ensure each backup diskette is numbered in order and labelled.
- . The diskette can either be formatted or unformatted - if unformatted, ensure the diskette is compatible with the default size of the drive (e.g. do not use a double density (or 360Kb) diskette in a 1.2Mb drive because the FORMAT command uses the default size of 1.2Mb).
- . If the diskette is formatted, any size that can be operated in the diskette drive is acceptable.
- . Files that are backed up using this procedure are LABDOSS2.\* and LDCDI.\*, where "\*" means all extensions of those files.

To backup the LabDOSS data to the B: drive:

Type LDBACKB at the DOS prompt (i.e. at C:\> or A:\>).

- . The DOS BACKUP procedure will run and ask you to insert a diskette into the B: drive.

#### Frequency of backup.

*It is important that the backup be performed at the end of each day, Monday to Friday, and that diskettes are set aside for this purpose, OR, if only a small amount of data is entered, then at less frequent intervals (however, BACKUP should occur not less than weekly).*

---

Where you operate a daily backup procedure, the earliest backup diskette/s can be used on the first day of the following week. For example, use the Monday diskette/s on Monday of the following week, and the Tuesday diskette/s on Tuesday of the following week, etc.

Where you operate a less-than-daily backup procedure, keep at least three backups at any one time. The earliest backup diskette/s can be used for the current backup.

ii) The LabDOSS *Restore* facility uses the DOS RESTORE command using files that were backed up on your system from the BACKUP command.

- . Ensure that the same version of DOS (e.g. 3.3) is used as was used in the BACKUP - this should not normally be a concern, however, because you would normally RESTORE to the same computer as you backed up from.)

To restore the LabDOSS files to the A: drive:

Type LDRESTA at the DOS prompt (i.e. at C:\> or A:\>).

- . The DOS RESTORE procedure will run and ask you to insert a diskette into the A: drive.

To restore the LabDOSS files to the B: drive:

Type LDRESTB at the DOS prompt (i.e. at C:\> or A:\>).

- . The DOS RESTORE procedure will run and ask you to insert a diskette into the B: drive.

iii) LabDOSS files can also be backed up using the DOS COPY command by typing the following at the DOS prompt:

COPY C:\EPI5\*filename* A: (where *filename* is e.g. LABDOSS2.REC for one file or LABDOSS2.\* for all files with the name LABDOSS2)

- . In the COPY procedure, the number of files that can be copied to disk is restricted to the size of one disk, whereas with BACKUP the whole disk and subsequent disks are used to store files.
- . A BACKUP file is different from a COPY file in that a backup file can only be accessed using the RESTORE command, whereas a copy file can be accessed directly.

(Note: BACKUP and RESTORE in versions of DOS earlier than 3.3 are not compatible with version 3.3 or later.)



4. LABORATORY WORKSHEET

A Laboratory Worksheet (see following page), if required, is provided for data entry purposes. The worksheet provides a paper copy of the LabDOSS data and may be useful in the laboratory work flow. For example, clinical diagnosis and risk factor options may be selected prior to entering the data.

A Laboratory "LabDOSS2 Worksheet" document file (LDWORK.DOC) has been included on your LabDOSS diskette and may be modified using EPED, the EpiInfo text editor.

For editing in EPED refer to the EPIINFO Manual provided.

01 Laboratory  
 02 Microbiology  
 03 Post-exposure prophylaxis  
 04 Septic Arthritis  
 05 Other, please write in comments

Risk Factor (may select One)

<input type="checkbox"/> 70 Abdominal <input type="checkbox"/> 71 Thoracic <input type="checkbox"/> 72 Other surgery	<input type="checkbox"/> 73 Orthopedic <input type="checkbox"/> 74 Vascular <input type="checkbox"/> 75 Neurological <input type="checkbox"/> 76 Other Intracranial	<input type="checkbox"/> 77 Other <input type="checkbox"/> 78 Other <input type="checkbox"/> 79 Other <input type="checkbox"/> 80 Other <input type="checkbox"/> 81 Other <input type="checkbox"/> 82 Other <input type="checkbox"/> 83 Other <input type="checkbox"/> 84 Other <input type="checkbox"/> 85 Other <input type="checkbox"/> 86 Other <input type="checkbox"/> 87 Other <input type="checkbox"/> 88 Other <input type="checkbox"/> 89 Other <input type="checkbox"/> 90 Other <input type="checkbox"/> 91 Other <input type="checkbox"/> 92 Other <input type="checkbox"/> 93 Other <input type="checkbox"/> 94 Other <input type="checkbox"/> 95 Other <input type="checkbox"/> 96 Other <input type="checkbox"/> 97 Other <input type="checkbox"/> 98 Other <input type="checkbox"/> 99 Other
--	--	---

Microbiology

01 Bacteriology  
 02 Fungal  
 03 Parasitology  
 04 Serology  
 05 Other

Isolated by Culture? Y/N

01 Culture  
 02 Other  
 03 Other  
 04 Other  
 05 Other  
 06 Other  
 07 Other  
 08 Other  
 09 Other  
 10 Other

Comments

---

*CDI LabDOSS2 Worksheet*

---

Specimen Labnumber \_\_\_\_\_ Collection Date / /  
 Surname \_\_\_\_\_ Firstname \_\_\_\_\_ Sex \_\_\_\_  
 DOB / / If no DOB, Age \_\_\_\_ Postcode of patients residence \_\_\_\_\_

---

*Diagnosis Attributable to Pathogen* (May Select One or Two)

95 Probable Contaminant	99 No Diagnosis Provided
02 Lower Resp Tract Infection (Pneumonia)	07 Gastrointestinal disease
20 Endocarditis Native Valve	21 Endocarditis Prosthetic
03 Meningitis	89 UTI
88 UTI Post catheterisation/instrumentation	31 Osteomyelitis
30 Septic Arthritis	16 Skin Cellulitis Wound
	A2 Died

09 Other, please write in comments

---

*Risk factor* (May Select One)

Surgery	70 Abdominal	71 Orthopaedic	72 Urinary Tract
	73 Thoracic	74 Vascular	75 Neurological
	79 Other surgery		
Immunosuppression	50 HIV	51 Neutropaenia	52 Diabetes
	53 IV Drug use	54 Renal Failure	55 Transplant
	58 Malignancy	57 Other Immunocompromised	
IV Line	81 IV Peripheral	82 IV Central	
	84 Other Vascular Prosthesis		
Miscellaneous	61 Pregnant	62 Postnatal	
	68 Preterm Neonate	15 Trauma	
	96 Hospital Acquired (greater than 48hrs after admission)		

---

*Microbiology*

Source Tissues (May Select One or Two)

BL = Blood CS = CSF PF = Pleural Fluid JF = Joint Fluid OT = Other

Isolated by Culture? Y/N

If antigen detection....Method:

LX = Latex Agglutination IF = Immunofluorescence OT = Other

Organism \_\_\_\_\_ Serogroup \_\_\_\_\_  
 (if applicable)

Further Identification of organism \_\_\_\_\_

Comments \_\_\_\_\_



## 5. LIST OF ORGANISM CODES USED IN LABDOSS2

AA00	"ACINETOBACTER SPECIES"	GE00	"GEMELLA SP"
AE00	"AEROMONAS SPECIES"	HM02	"HAEMOPHILUS INFLUENZAE"
AE01	"AEROMONAS HYDROPHILA"	HM03	"HAEMOPHILUS PARAINFLAE"
AS00	"ASPERGILLUS SPECIES"	HP01	"HISTOPLASMA CAPSULATUM"
AT01	"ACTINOMYCES ISRAELII"	KI01	"KINGELLA KINGAE"
BA01	"BACILLUS CEREUS"	KL01	"KLEBSIELLA PNEUMONIAE"
BA02	"BACILLUS SUBTILIS"	KL02	"KLEBSIELLA OXYTOCA"
BA00	"BACILLUS SPECIES"	KL00	"KLEBSIELLA SP"
BT00	"BACTEROIDES SPECIES"	LI01	"LISTERIA MONOCYTOGENES"
BT01	"BACTEROIDES CORPORIS"	MR01	"MORGANELLA MORGANII"
BT02	"BACTEROIDES FRAGILIS"	NE02	"NEISSERIA MENINGITIDIS"
BT03	"BACTEROIDES LOESCHII"	NE01	"NEISSERIA GONORRHOEA"
BT04	"BACTEROIDES MELANINOGENICUS"	PA00	"PASTEURELLA SP"
BT05	"BACTEROIDES ORALIS"	PD00	"PROVIDENCIA SP"
BT06	"BACTEROIDES OVATUS"	PE00	"PEPTOSTREPTOCOCCUS SP"
BT07	"BACTEROIDES THETAOTOMICRON"	PI00	"PLESIOMONAS SP"
BT08	"BACTEROIDES BIVIUS"	PP01	"PROPIONIBACTERIUM ACNES"
BT09	"BACTEROIDES DISIENS"	PP00	"PROPIONIBACTERIUM SP"
BR00	"BRUCELLA SPECIES"	PR02	"PROTEUS VULGARIS"
BR01	"BRUCELLA ABORTUS"	PR01	"PROTEUS MIRABILIS"
BR02	"BRUCELLA MELITENSIS"	PR00	"PROTEUS SP"
BR03	"BRUCELLA SUIS"	PS01	"PSEUD AERUGINOSA"
BR04	"BRUCELLA CANIS"	PS02	"PSEUD CEPACIA"
BH01	"BRANHAMELLA CATARRHALIS"	PS03	"PSEUD FLUORESCENS"
BH00	"BRANHAMELLA SPECIES"	PS04	"XANTHOMONAS MALTOPHILIA"
CA00	"CANDIDA SPECIES"	PS05	"PSEUD PAUCIMOBILIS"
CA01	"CANDIDA ALBICANS"	PS06	"PSEUD PICKETTII"
CB02	"CORYNEBACTERIUM JK"	PS00	"PSEUD SP"
CB03	"CORYNEBACTERIUM XEROSIS"	SL01	"SALMONELLA TYPHI"
CB00	"CORYNEBACTERIUM SP"	SL02	"SALMONELLA PARATYPHI"
CI01	"CITROBACTER DIVERSUS"	SL00	"SALMONELLA SP"
CI02	"CITROBACTER FREUNDII"	SS01	"SERRATIA LIQUEFACIENS"
CI00	"CITROBACTER SPECIES"	SS02	"SERRATIA MARCESCENS"
CL02	"CLOSTRIDIUM PERFRINGENS"	SS00	"SERRATIA SP"
CL00	"CLOSTRIDIUM SPECIES"	SH00	"SHIGELLA SP"
CM00	"CAMPYLOBACTER SPECIES"	SA01	"STAPH AUREUS"
CM01	"CAMPYLOBACTER JEJUNI"	SA02	"STAPH EPIDERMIDIS"
CM02	"CAMPYLOBACTER COLI"	SA03	"STAPH SAPROPHYTICUS"
CM03	"CAMPYLOBACTER FETUS "	SAN0	"STAPH COAG NEG"
CR01	"CRYPTOCOCCUS NEOFORMANS"	SE01	"STREP PNEUMONIAE"
CR02	"C NEOFORMANS-GATTII"	SE02	"STREP A"
CR03	"C NEOFORMANS-NEOFORMANS"	SE04	"STREP B"
EN01	"ENTEROBACTER AEROGENES"	SE05	"STREP C"
EN02	"ENTEROBACTER CLOACAE"	SE06	"STREP D NONENTERO"
EN00	"ENTEROBACTER SPECIES"	SE07	"STREP F"
ER01	"ENTEROCOCCUS FAECALIS"	SE08	"STREP G"
ER02	"ENTEROCOCCUS FAECIUM"	SE09	"STREP SANGUIS"
ER00	"ENTEROCOCCUS SPECIES"	SE11	"STREP VIRIDANS"
ES01	"ESCHERICHIA COLI"	SE12	"STREP MILLERI "
FL00	"FLAVOBACTERIUM SP"	SE00	"STREP SP"
FU00	"FUSOBACTERIUM SP"	VI00	"VIBRIO SP"
GA01	"GARDNERELLA VAGINALIS"	YE01	"YERSINIA ENTEROCOLITA"
GE01	"GEMELLA MORBILLORUM"		

*If no code exists for an organism enter the whole name in the "Further Identification of Organism" field.*

If you would like further codes included in the Labdoss lookup table please phone or send a note with your CDI diskette report.

---

## 6. ANALYSIS REPORT EXAMPLES

*Analysis Reports of LabDOSS data in EpiInfo are provided in the following examples.*

To produce each report:

Type LDAN at the DOS prompt (i.e. at C:\> or A:\>)

(or select the ANALYSIS option from the EpiInfo menu)

then use the *commands* listed in each section.

### Notes:

- . The codes used in the database fields {ORGANISM, DIAG1, DIAG2, RISK} have been decoded for the purpose of each report.
- . Assistance with decoding may be obtained from the authors.
- . The *select* command alone cancels the selection.
- . The reports are provided only as examples of the steps involved in analysing your own data. The data shown here has been modified for purposes of illustration.



### A. *Staphylococcus Aureus* Reports

i)

#### Commands

```
Read LABDOSS2.REC
Select ORGANISM = "SA01"
List AGE SEX DIAG1 RISK
Select
```

Current selection: ORGANISM = "SA01"

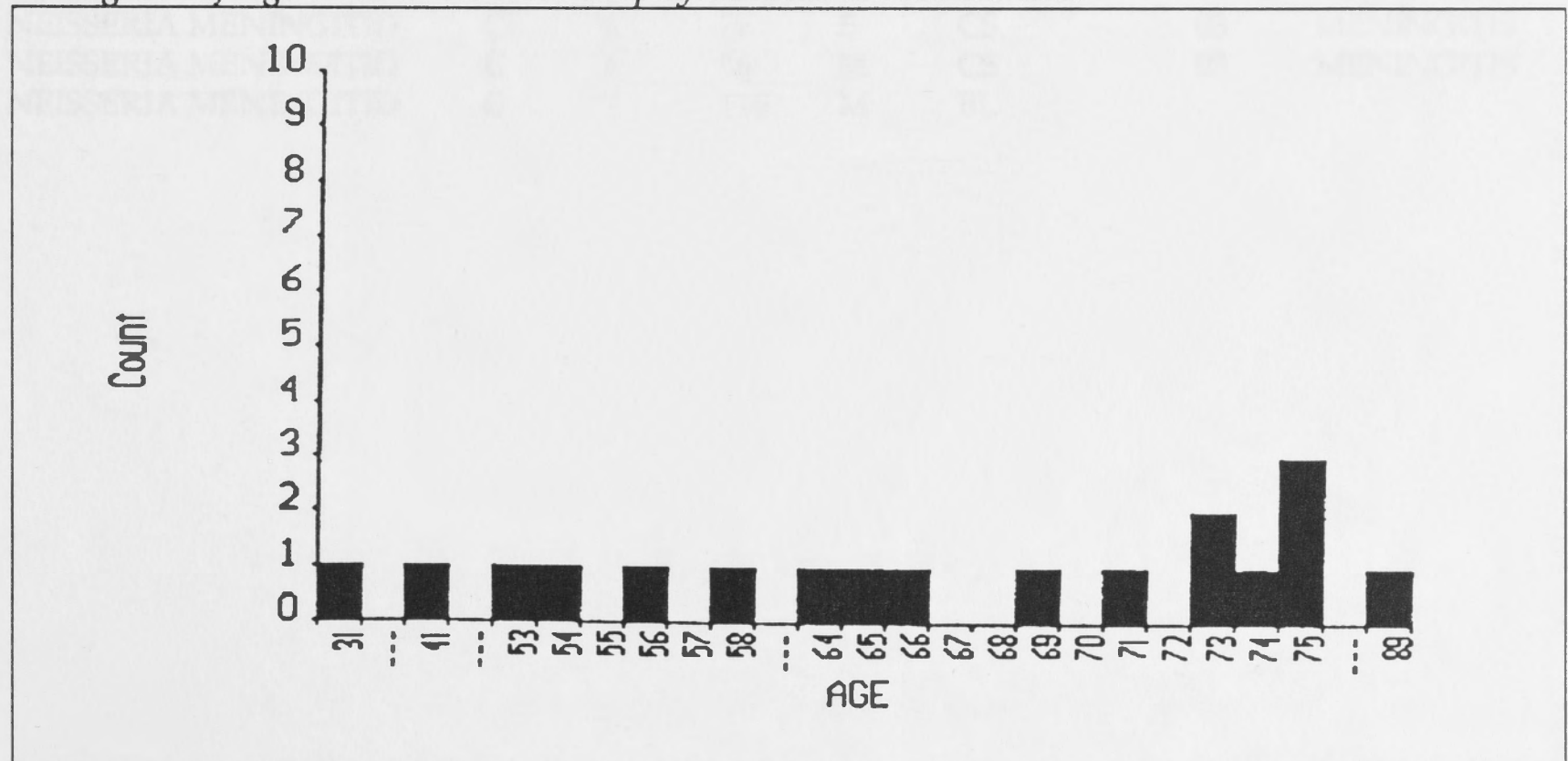
AGE	SEX	DIAG1	RISK
75	M	.	.
75	M	.	.
66	F	.	81 IV PERIPHERAL
71	M	.	52 DIABETES
31	M	16 SKIN CELLULITIS WOUND	81 IV PERIPHERAL
54	M	.	52 DIABETES
41	M	20 ENDOCARDITIS NATIVE	53 IV DRUG
53	U	.	.
65	M	.	.
58	M	.	.
56	M	.	.
64	M	.	.
75	.	16 SKIN CELLULITIS WOUND	.
69	M	.	58 MALIGNANCY
74	M	89 UTI	.
73	M	.	.
73	M	.	.
89	.	.	.

ii)

#### Commands

```
Read LABDOSS2.REC
Select ORGANISM = "SA01"
Histogram AGE
Select
```

*Histogram of Age in Patients with Staphylococcus aureus isolates*



### B. *Infective Endocarditis involving Native Valves*

i)

**Commands**

```
Read LABDOSS2.REC
Select (DIAG1 = "20") or (DIAG2 = "20")
List AGE SEX ORGANISM FURTHERID1
Select
```

AGE	SEX	ORGANISM	FURTHERID1
33	M	.	MORAXELLA
28	F	CB00	CORYNEBACTERIUM SP C.DIPHThERIAE
41	M	SA01	STAPH AUREUS

### C. *Neisseria meningitidis Bacteraemia*

i)

**Commands**

```
Read LABDOSS2.REC
Select ORGANISM = "NE02"
Define MTHS ###
Set EUROPEAN = ON
Let MTHS = (COLLECTDAT - DOB)/31
List SERO AGE MTHS SEX SOURCE1 DIAG1
Select
```

Current selection: ORGANISM = "NE02"

	SERO	AGE	MTHS	SEX	SOURCE1	DIAG1	
NEISSERIA MENINGITID	C	2	29	F	CS	03	MENINGITIS
NEISSERIA MENINGITID	C	14	166	.	CS	03	MENINGITIS
NEISSERIA MENINGITID	C	0	5	M	BL	03	MENINGITIS
NEISSERIA MENINGITID	U	3	42	M	BL	03	MENINGITIS
NEISSERIA MENINGITID	C	6	76	F	CS	03	MENINGITIS
NEISSERIA MENINGITID	C	4	58	M	CS	03	MENINGITIS
NEISSERIA MENINGITID	C	9	116	M	BL	.	



### D. Patients with Hospital Acquired Infections

i)

**Commands**

```

Read LABDOSS2.REC
Select RISK = "96"
List AGE SEX ORGANISM FURTHERID1
Select

```

AGE	SEX	ORGANISM	FURTHERID1
0	M.	.	ENTEROCOCCUS FAECALIS
54	M	.	KLEBSIELLA, CITROBACTER, MRSA
29	M	.	BACTEROIDES FRAGILIS, S.AUREUS
46	F	CB00	CORYNEBACTERIUM SP
63	M	EN00	ENTEROBACTER SPECIES
24	F	ES01	ESCHERICHIA COLI
78	F	ES01	ESCHERICHIA COLI
83	M	ES01	ESCHERICHIA COLI
22	M	FU00	FUSOBACTERIUM SP
53	M	PS01	PSEUD AERUGINOSA
78	M	PS01	PSEUD AERUGINOSA
74	M	PS01	PSEUD AERUGINOSA
.	M	PS02	PSEUD CEPACIA
66	F	SA01	STAPH AUREUS
54	M	SA01	STAPH AUREUS
18	M	SAN0	STAPH COAG NEG
53	M	SAN0	STAPH COAG NEG
53	M	SAN0	STAPH COAG NEG
62	M	SAN0	STAPH COAG NEG
0	M	SAN0	STAPH COAG NEG
30	F	SAN0	STAPH COAG NEG
0	M	SE01	STREP PNEUMONIAE

### D. Patients with Hospital Acquired Infections - cont'd

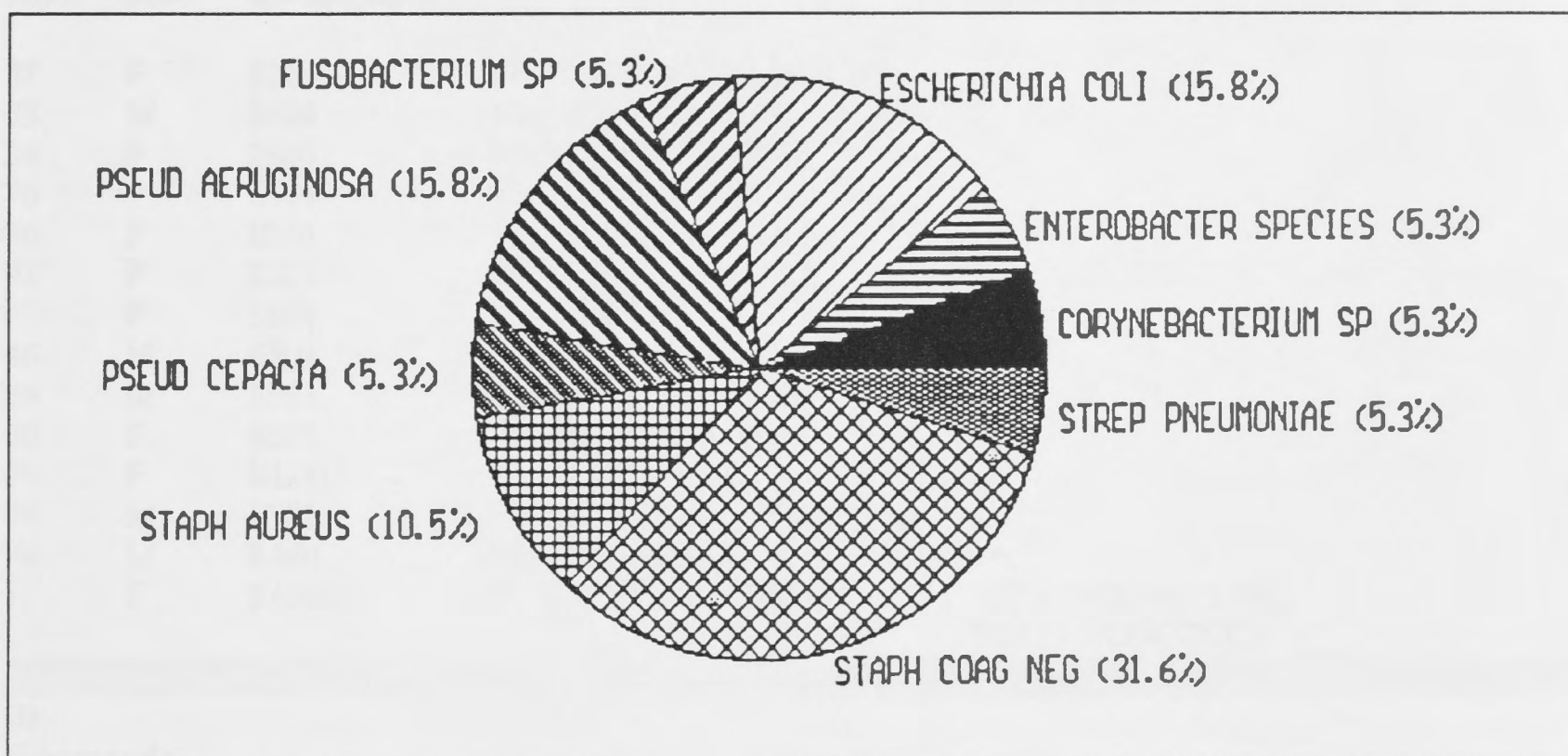
ii)

**Commands**

```

Read LABDOSS2.REC
Select RISK = "96"
Pie ORGANISM
Select

```



**Note:** The organisms have been decoded for the purpose of demonstration.  
The command *Pie ORGANISM* will produce the same graph, however the organism names will be in code.

iii)

**Commands**

```

Read LABDOSS2.REC
Select RISK = "96"
Freq ORGANISM
Select

```

ORGANISM	! Freq	Percent	Cum.
CORYNEBACTERIUM SP	! 1	5.3%	5.3%
ENTEROBACTER SPECIES	! 1	5.3%	10.5%
ESCHERICHIA COLI	! 3	15.8%	26.3%
FUSOBACTERIUM SP	! 1	5.3%	31.6%
PSEUD AERUGINOSA	! 3	15.8%	47.4%
PSEUD CEPACIA	! 1	5.3%	52.6%
STAPH AUREUS	! 2	10.5%	63.2%
STAPH COAG NEG	! 6	31.6%	94.7%
STREP PNEUMONIAE	! 1	5.3%	100.0%
Total	! 19	100.0%	



### E. Reports of Bacteraemia with Diagnosis of Urinary Tract Infection

i)

**Commands**

Read LABDOSS2.REC  
 Select (DIAG1 = "89") OR DIAG2 = "89")  
 List AGE SEX ORGANISM FURTHERID1  
 Select

AGE	SEX	ORGANISM	FURTHERID1
57	F	EN00	ENTEROBACTER SPECIES .
55	M	ES01	ESCHERICHIA COLI .
84	F	ES01	ESCHERICHIA COLI .
70	F	ES01	ESCHERICHIA COLI .
76	F	ES01	ESCHERICHIA COLI .
91	F	ES01	ESCHERICHIA COLI .
.	F	ES01	ESCHERICHIA COLI .
46	M	ES01	ESCHERICHIA COLI .
39	M	ES01	ESCHERICHIA COLI .
80	F	ES01	ESCHERICHIA COLI .
79	F	KL00	KLEBSIELLA SP .
78	M	PS01	PSEUD AERUGINOSA .
74	M	SA01	STAPH AUREUS .
.	F	SAN0	STAPH COAG NEG MIXED COAG. NEG STAPHYLOCOCCI

ii)

**Commands**

Read LABDOSS2.REC  
 Select (DIAG1 = "89") or (DIAG2 = "89")  
 Tables ORGANISM SEX  
 Select

ORGANISM	SEX		Total
	! F	M !	
ENTEROBACTER SPECIES	! 1	0 !	1
ESCHERICHIA COLI	! 6	3 !	9
KLEBSIELLA SP	! 1	0 !	1
PSEUD AERUGINOSA	! 0	1 !	1
STAPH AUREUS	! 0	1 !	1
STAPH COAG NEG	! 1	0 !	1
Total	! 9	5 !	14

iii)

**Commands**

Read LABDOSS2.REC  
 Select (DIAG1 = "89") or (DIAG2 = "89")  
 Freq SEX  
 Select

SEX	! Freq	Percent	Cum.
F	! 9	64.3%	64.3%
M	! 5	35.7%	100.0%
Total	! 14	100.0%	

---

**F. *Haemophilus influenzae* Bacteraemia**


---

i)

**Commands**

```

Read LABDOSS2.REC
Select ORGANISM = "HM02"
Define MTHS ###
Set EUROPEAN = ON
Let MTHS = (COLLECTDAT - DOB)/31
Sort MTHS
List ORGANISM SERO AGE MTHS SEX SOURCE1 DIAG1
Select

```

ORGANISM	SERO	AGE	MTHS	SEX	SOURCE1	DIAG1
HM02	B	0	5	M	BL 16	SKIN CELLULITIS WOUND
HM02	B	0	7	M	BL 02	LRTI - PNEUMONIA
HM02	B	0	8	M	BL 16	SKIN CELLULITIS WOUND
HM02	.	0	8	.	BL 16	SKIN CELLULITIS WOUND
HM02	B	0	8	F	BL 16	SKIN CELLULITIS WOUND
HM02	B	1	13	M	BL 03	MENINGITIS
HM02	B	1	15	M	CS 03	MENINGITIS
HM02	B	1	14	.	BL 03	MENINGITIS
HM02	B	1	14	.	BL	.
HM02	B	4	52	M	BL 02	LRTI - PNEUMONIA

ii)

**Commands**

```

Read LABDOSS2.REC
Select ORGANISM = "HM02"
Define MTHS ###
Set EUROPEAN = ON
Let MTHS = (COLLECTDAT - DOB)/31
Freq DIAG1
Select

```

DIAG1	! Freq	Percent	Cum.
LRTI - PNEUMONIA	! 2	22.2%	22.2%
MENINGITIS	! 3	33.3%	55.6%
SKIN CELLULITIS WOUND	! 4	44.4%	100.0%
Total	! 9	100.0%	

---



Section 1 Appendix B CDI Reporting Forms

# Communicable Diseases Intelligence Pathogen Report

	1.	2.	3.	4.
Laboratory	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3
Pathogen	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7
Patient	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 8 11 12 13 14	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 8 11 12 13 14	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 8 11 12 13 14	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 8 11 12 13 14
Collection date	Yr/Mth <input type="text"/> <input type="text"/> 15 16 17 18	Yr/Mth <input type="text"/> <input type="text"/> 15 16 17 18	Yr/Mth <input type="text"/> <input type="text"/> 15 16 17 18	Yr/Mth <input type="text"/> <input type="text"/> 15 16 17 18
Age	< 1 Mth = 1 1-12 Mths = 2 1-4 yrs = 3 5-14 yrs = 4 15-24 yrs = 5 25-44 yrs = 6 45-64 yrs = 7 65-74 yrs = 8 > 75 yrs = 9 <input type="text"/> 19	< 1 Mth = 1 1-12 Mths = 2 1-4 yrs = 3 5-14 yrs = 4 15-24 yrs = 5 25-44 yrs = 6 45-64 yrs = 7 65-74 yrs = 8 > 75 yrs = 9 <input type="text"/> 19	< 1 Mth = 1 1-12 Mths = 2 1-4 yrs = 3 5-14 yrs = 4 15-24 yrs = 5 25-44 yrs = 6 45-64 yrs = 7 65-74 yrs = 8 > 75 yrs = 9 <input type="text"/> 19	< 1 Mth = 1 1-12 Mths = 2 1-4 yrs = 3 5-14 yrs = 4 15-24 yrs = 5 25-44 yrs = 6 45-64 yrs = 7 65-74 yrs = 8 > 75 yrs = 9 <input type="text"/> 19
Sex	M or F <input type="text"/> 20	M or F <input type="text"/> 20	M or F <input type="text"/> 20	M or F <input type="text"/> 20
Category of infection	Patient = 1 Survey = 2 Colonisation = 3 Nosocomial = 4 <input type="text"/> 21	Patient = 1 Survey = 2 Colonisation = 3 Nosocomial = 4 <input type="text"/> 21	Patient = 1 Survey = 2 Colonisation = 3 Nosocomial = 4 <input type="text"/> 21	Patient = 1 Survey = 2 Colonisation = 3 Nosocomial = 4 <input type="text"/> 21
Host condition	Living = L Dead = D <input type="text"/> 22	Living = L Dead = D <input type="text"/> 22	Living = L Dead = D <input type="text"/> 22	Living = L Dead = D <input type="text"/> 22
Clinical information	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 23 24 25 26 27 28	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 23 24 25 26 27 28	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 23 24 25 26 27 28	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 23 24 25 26 27 28
Source tissues	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 29 30 31 32 33 34	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 29 30 31 32 33 34	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 29 30 31 32 33 34	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 29 30 31 32 33 34
Method of isolation	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35 36 37 38 39 40	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35 36 37 38 39 40	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35 36 37 38 39 40	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 35 36 37 38 39 40
Method of identification	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 41 42 43 44 45 46	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 41 42 43 44 45 46	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 41 42 43 44 45 46	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 41 42 43 44 45 46
Serology	technique diag. technique diag. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 47 48 49 50 51 52	technique diag. technique diag. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 47 48 49 50 51 52	technique diag. technique diag. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 47 48 49 50 51 52	technique diag. technique diag. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 47 48 49 50 51 52
Antibiotic sensitivity (if applicable)	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 53 54 55 56 57 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 60 61 62 63 64	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 53 54 55 56 57 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 60 61 62 63 64	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 53 54 55 56 57 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 60 61 62 63 64	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 53 54 55 56 57 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 60 61 62 63 64
Virus typing	Complete = 1 Pending = 2 Untypable = 3 <input type="text"/> 65	Complete = 1 Pending = 2 Untypable = 3 <input type="text"/> 65	Complete = 1 Pending = 2 Untypable = 3 <input type="text"/> 65	Complete = 1 Pending = 2 Untypable = 3 <input type="text"/> 65
Central office use only	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 66 72 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 73 79 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 80 86 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 87 93	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 66 72 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 73 79 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 80 86 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 87 93	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 66 72 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 73 79 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 80 86 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 87 93	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 66 72 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 73 79 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 80 86 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 87 93
Comments				





# Communicable Diseases Intelligence - Virus Report

	1	2	3	4
<b>Laboratory</b>	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3	<input type="text"/> <input type="text"/> <input type="text"/> 1 3
<b>Patient</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7 8 9 10	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7 8 9 10	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7 8 9 10	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 4 7 8 9 10
<b>Sex</b>	<input type="text"/> 11	<input type="text"/> 11	<input type="text"/> 11	<input type="text"/> 11
<b>Age</b>	If < 1 year, enter months. <input type="text"/> <input type="text"/> 12 13 If > 1 year, enter years. <input type="text"/> <input type="text"/> 14 15	If < 1 year, enter months. <input type="text"/> <input type="text"/> 12 13 If > 1 year, enter years. <input type="text"/> <input type="text"/> 14 15	If < 1 year, enter months. <input type="text"/> <input type="text"/> 12 13 If > 1 year, enter years. <input type="text"/> <input type="text"/> 14 15	If < 1 year, enter months. <input type="text"/> <input type="text"/> 12 13 If > 1 year, enter years. <input type="text"/> <input type="text"/> 14 15
<b>Patient (1) Survey (2)</b>	<input type="text"/> 16	<input type="text"/> 16	<input type="text"/> 16	<input type="text"/> 16
<b>Syndrome</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 17 18 19 20	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 17 18 19 20	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 17 18 19 20	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 17 18 19 20
<b>Collection date</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 21 26	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 21 26	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 21 26	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 21 26
<b>Life (1) PM (2)</b>	<input type="text"/> 27	<input type="text"/> 27	<input type="text"/> 27	<input type="text"/> 27
<b>Source tissues</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 28 29 30 31 32 33	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 28 29 30 31 32 33	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 28 29 30 31 32 33	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 28 29 30 31 32 33
<b>Isolation method</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 34 35 36 37 38 39	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 34 35 36 37 38 39	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 34 35 36 37 38 39	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 34 35 36 37 38 39
<b>Direct Ident. method</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 40 41 42 43 44 45	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 40 41 42 43 44 45	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 40 41 42 43 44 45	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 40 41 42 43 44 45
<b>Serology</b>	technique <input type="text"/> <input type="text"/> diagnosis <input type="text"/> 46 47 48	technique <input type="text"/> <input type="text"/> diagnosis <input type="text"/> 46 47 48	technique <input type="text"/> <input type="text"/> diagnosis <input type="text"/> 46 47 48	technique <input type="text"/> <input type="text"/> diagnosis <input type="text"/> 46 47 48
<b>Virus</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 49 52	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 49 52	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 49 52	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 49 52
<b>Typing</b>	<input type="text"/> 53	<input type="text"/> 53	<input type="text"/> 53	<input type="text"/> 53
<b>Central Office Use Only</b>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 54 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 63 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 64 68	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 54 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 63 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 64 68	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 54 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 63 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 64 68	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 54 58 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 59 63 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> 64 68
<b>Comments</b>				



# Communicable Diseases Intelligence - Laboratory Report

	1	2	3
Laboratory	<input type="text"/>	<input type="text"/>	<input type="text"/>

## ► Clerical

Lab Patient ID	<input type="text"/>	<input type="text"/>	<input type="text"/>
Collection date	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y
Initials	SN <input type="text"/> FN <input type="text"/>	SN <input type="text"/> FN <input type="text"/>	SN <input type="text"/> FN <input type="text"/>
Sex	M or F <input type="checkbox"/>	M or F <input type="checkbox"/>	M or F <input type="checkbox"/>
Date of birth	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y	<input type="text"/> <input type="text"/> <input type="text"/> d d m m y y
<i>if no DOB then</i> Age	<input type="text"/> years	<input type="text"/> years	<input type="text"/> years
Postcode	<input type="text"/>	<input type="text"/>	<input type="text"/>

## ► Clinical

Clinical diagnosis	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Risk factor and outcome	Risk factor <input type="text"/> Outcome <input type="checkbox"/> D Died S Survived U Unknown	Risk factor <input type="text"/> Outcome <input type="checkbox"/> D Died S Survived U Unknown	Risk factor <input type="text"/> Outcome <input type="checkbox"/> D Died S Survived U Unknown

## ► Microbiology

Source tissues	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>
Method of detection	Isolation <input type="checkbox"/> (Y/N) Antigen <input type="text"/> <input type="text"/> Antibody <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Isolation <input type="checkbox"/> (Y/N) Antigen <input type="text"/> <input type="text"/> Antibody <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	Isolation <input type="checkbox"/> (Y/N) Antigen <input type="text"/> <input type="text"/> Antibody <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Organism	<input type="text"/>	<input type="text"/>	<input type="text"/>
Serogroup <i>if applicable</i>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Further identification of organism			
Comments <i>eg outbreak occupation</i>			
CDI Office use only	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>



Section 1 Appendix C

LabDOSS Analysis Programs

\*\*\*\*\*

- \* PROGRAM NAME: LABDOSS - LabDOSS Preliminary Program
- \* This program produces reports on the lab for each organism, comments, drug, test and result.
- \* This allows for updating of the record and file with more accurate codes prior to running the report program.
- \* The files are written to a file file called "report.doc" and the report are written to a file called "report.txt".
- \* Write it to the report file as the result of the

Section1 Appendix C LabDOSS Analysis Programs

\*\*\*\*\*

```
SET NOBCD = ON
SET STATISTICS = OFF
SET LISTREC = OFF

SET NDCON = ON

ABSA Type of field as required for report
* Before Entering data, the organism codes have been checked for organism
* Identification.

ROUTE 7 type of data the report is generated for

set ignore = 0
```

## Section 1 Appendix C

### LabDOSS Analysis Programs

\*\*\*\*\*

\* PROGRAM NAME: LDANPRE9.PGM Preliminary Program

\* This program produces two tables: org and furtherid; organism, comments,

\* diag1, risk1 and risk2.

\* This allows for updating of the merged data file with more complete

\* codes prior to running the analysis program.

\*

\* The tables are written to a .doc file called vvnnpred.doc and the

\* records are written to a .rec file called vvnnpred.rec.

\* where vv is the volume and nn is the number of the

\* CDI issue in which the data will be published.

\*

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\*\*\*\*\*

\*\*

SET NOECHO = ON

SET STATISTICS = OFF

SET LISTREC = OFF

SET NOECHO=ON

READ ?type in name of merged file to read ?

\* Before Processing ensure that adequate codes have been entered for organism

\* Identification.

ROUTE ? type in text file name eg vvnnpred.doc ?

set ignore = off



## Section 1 Appendix C

### LabDOSS Analysis Programs: LDANPRE9.PGM

```
*****
*   Decoding data and grouping into extra fields
*
*
***The recordings listed below are not literal decodes . These are
***grouped for the purpose of CDI
***Accurate decodes can be found in decode.prg
*****

define agegroup <A      >
define mths ###
let mths = (collectdat - dob) /31
recode mths to agegroup 0 = " <1mth" 1-11 = " 1-11mth"\
12 = "1-4"

recode age to agegroup 1-4=" 1-4" 5-14=" 5-14" 15-24="15-24"\
25-34="25-34" 35-44="35-44" 45-54="45-54" 55-64="55-64" \
65-74="65-74" 75-110="75+"
** Spaces in recodes gives correct order for Agegroup

if age = . then agegroup = "u"
*if risk = "68" then agegroup = " <1mth"
if mths = . and age = 0 then agegroup = " 1-11mth"
if mths = . and age = 0 and risk1 = "68" then agegroup = " <1mth"
if agegroup = . then agegroup = mths
**** This allows records with no agegroup classification to be listed in
**** the table under individual months and the record can than be manually
**** placed in the correct agegroup.

define clinical _____
recode diag1 to clinical \
    02=LRT 07=Gas 20=End \
    21=End 03=Men 89=UTI 88= UTI \
    recode diag1 to clinical 31="B/J" 30="B/J" 16=Skn \
*not needed in table 99="nil"
* not needed in table A2="Die"
```

## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
define diagnosis _____
recode diag2 to diagnosis\
  02=LRT 07=Gas 20=End \
  21=End 03=Men 89=UTI 88= UTI \
  recode diag2 to diagnosis 31="B/J" 30="B/J" 16=Skn \
* not needed in table 99="nil" A2="Die"
```

```
define risks _____
  recode risk1 to risks 70=Surge 71=Surge 72=Surge \
  73=Surge 74=Surge 75=Surge 79=Surge \
  recode risk1 to risks\
  58=Immun/com 50=Immun 51=Immun \
  52=Immun 53=Immuno
  recode risk1 to risks\
  54=Immun 55=Immun 57=Immun
  recode risk1 to risks\
  81="IV Ln" 82="IV Ln" 84="IV Ln" 61="P/P.n"\
  62="P/P.n" 68= Neona 96="HospAc"
* not needed in table 15 = trauma
```

```
define risks2 _____
  recode risk2 to risks2 70=Surge 71=Surge 72=Surge \
  73=Surge 74=Surge 75=Surge 79=Surge \
  recode risk2 to risks2\
  58=Immun/com 50=Immun 51=Immun \
  52=Immun 53=Immuno
  recode risk2 to risks2\
  54=Immun 55=Immun 57=Immun
  recode risk2 to risks2\
  81="IV Ln" 82="IV Ln" 84="IV Ln" 61="P/P.n"\
  62="P/P.n" 68= Neona 96="HospAc"
```

```
if risk1 = "96" then HospAcq = "y"
if risk2 = "96" then HospAcq = "y"
if comments = "risk=96" then HospAcq = "y"
sort organism
*****Classification or organisms into gram pos neg
***** anaerobes and fungi for CDI report
```



## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
define class <A>
recode organism to class AA00 = "N" AA03 = "N" AE00 = "N" AE01 = "N" AS00 =
"F" \
AT01 = "A" BA01 = "P" BA02 = "P" BA00 = "P" BT00 = "A" BT01 = "A" BT02 =
"A" BT03 = "A" \
BT04 = "A" BT05 = "A" BT06 = "A" BT07 = "A" BT08 = "A"

recode organism to class BT09 = "A" BR00 = "N" BR01 = "N" BR02 = "N" \
BR03 = "N" BR04 = "N" BH01 = "N" BH00 = "N" CA00 = "F" CA01 = "F" CB02
="P" \
CB03 = "P" CB00 = "P" CI01 = "N" CI02 = "N" CI00 = "N" CL02 = "A" CL05 = "A"

recode organism to class CL00 = "A" CM00 = "N" CM01 = "N" CM02 = "N" \
CM03 = "N" CR01 = "F" CR02 = "F" CR03 = "F" EN01 = "N" EN02 = "N" EN00 =
"N" \
ER01 = "P" ER02 = "P" ER00 = "P" ES01 = "N" FL00 = "N" FU00 = "A"

recode organism to class GA01 = "N" GE01 = "N" GE00 = "N" HM02 = "N" \
HM03 = "N" HP01 = "F" KI01 = "N" KL01 = "N" KL02 = "N" KL00 = "N" LI01
="P" \
MR01 = "N" MX00 = "N" NE02 = "N" NE01 = "N" NE00 = "N" PA00 = "N" PD00
= "N" PE00 = "A"

recode organism to class PI00 = "N" PP01 = "A" PP00 = "A" PR02 = "N" \
PR01 = "N" PR00 = "N" PS01 = "N" PS02 = "N" PS03 = "N" PS04 = "N" PS05 =
"N" \
PS06 = "N" PS00 = "N" SA01 = "P" SA02 = "P" SA03 = "P" SAN0 = "P" SAMR = "P"

recode organism to class SE01 = "P" SE02 = "P" SE04 = "P" SE05 = "P" SE06 = "P" \
SE07 = "P" SE08 = "P" SE09 = "P" SE11 = "P" SE12 = "P" SE00 = "P" SH00 = "N" \
SL01 = "N" SL02 = "N" SL00 = "N" SS01 = "N" SS02 = "N" SS00 = "N" VI00 =
"N" YE01 = "N"
```

## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
define org _____
  recode organism to org AA00="Acinetobacter species" AA03="Acinetobacter calc
var lwoffii" \
  AE00="Aeromonas species" AI00 = "Alcaligenes sp" AE01="Aeromonas
hydrophila" \
  AS00="Aspergillus species" AT01="Actinomyces israelii" BA01="Bacillus cereus"

  recode organism to org BA02="Bacillus subtilis" BA00="Bacillus species"
  recode organism to org BT00="Bacteroides species" BT01="Bacteroides corporis"
  \
  BT02="Bacteroides fragilis" BT03="Bacteroides loeschii" BT04="Bacteroides
melaninogenicus"\
  BT05="Bacteroides oralis" BT06="Bacteroides ovatus" BT07="Bacteroides
thetaitaomicron"

  recode organism to org BT08="Bacteroides bivius" BT09="Bacteroides disiens" \
  BR00="Brucella species" BR01="Brucella abortus" BR02="Brucella melitensis" \
  BR03="Brucella suis"

  recode organism to org BR04="Brucella canis" BH01="Branhamella catarrhalis"\
  BH00="Branhamella species" CA00="Candida species" CA01="Candida
albicans"\
  CA02 = "Candida parapsilosis" CB02="Corynebacterium jeikeium"
CB03="Corynebacterium xerosis"

  recode organism to org CB00= "Corynebacterium species" CI01="Citrobacter
diversus"\
  CL05 = "Clostridium septicum"

  recode organism to org CI02="Citrobacter freundii" CI00="Citrobacter species"
CL02="Clostridium perfringens"\
  CL00="Clostridium species" CM00="Campylobacter species"
CM01="Campylobacter jejuni"

  recode organism to org CM02="Campylobacter coli" CM03="Campylobacter fetus
" CR01="Cryptococcus neoformans"\
  CR02="Cryptococcus neoformans var gattii" CR03="Cryptococcus neoformans var
neoformans"
```



## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
recode organism to org EI01="Eikenella corrodens" EN01="Enterobacter
aerogenes"\
EN02="Enterobacter cloacae" EN00="Enterobacter species" ER01="Enterococcus
faecalis"\
ER02="Enterococcus faecium" ER00="Enterococcus species" ES01="Escherichia
coli"

recode organism to org FL00="Flavobacterium sp" FU00="Fusobacterium sp"\
GA01="Gardnerella vaginalis" GE01="Gemella morbillorum" GE00="gemella sp"\
HM02="Haemophilus influenzae" HM03="Haemophilus parainfluenzae"
HP01="Histoplasma capsulatum"

RECODE ORGANISM TO ORG ki01="Kingella kingae" kl01="Klebsiella
pneumoniae" kl02="Klebsiella oxytoca"\
kl00="Klebsiella sp" li01="Listeria monocytogenes" mr01="Morganella morganii"\
mc00="Micrococcus species" NE02="Neisseria meningitidis" Ne01="Neisseria
gonorrhoeae"

RECODE ORGANISM TO ORG MX00="Moraxella species" NE00 = "Neisseria
species" MY00 = "Mycobacterium species"

RECODE ORGANISM TO ORG pa00="Pasteurella sp" pd00="Providencia sp"
pe00="Peptostreptococcus sp"\
pi00="Plesiomonas sp" pp01="Propionibacterium acnes" pp00="Propionibacterium
sp"\
pr02="Proteus vulgaris" pr01="Proteus mirabilis" pr00="Proteus sp"

RECODE ORGANISM TO ORG ps01="Pseudomonas aeruginosa"\
ps02="Pseud cepacia" ps03="Pseud fluorescens" ps04="Xanthomonas maltophilia"\
ps05="Pseud paucimobilis" ps06="Pseud pickettii" ps00="Pseudomonas sp"

RECODE ORGANISM TO ORG sa01="Staph aureus" sa02="Staph
epidermidis"\
sa03="Staph saprophyticus" san0="Staph coagneg" sano = "staph\
coag neg" se01="Strep pneumoniae" SAMR = "MRSA"

RECODE ORGANISM TO ORG se02="Strep group A" se04="Strep group B"\
se05="Strep group C" se06="Strep group D nonenterococci"

RECODE ORGANISM TO ORG se07="Strep group F" se08="Strep group G"
se09="Strep sanguis"\
se11="Strep viridans" se12="Strep milleri" se00="Streptococcus sp"
sh00="Shigella sp"\
sl01="Salmonella typhi" sl02="Salmonella paratyphi" sl00="Salmonella sp"
```

## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
RECODE ORGANISM TO ORG ss01="Serratia liquefaciens" ss02="Serratia  
marcescens"\  
ss00="Serratia sp" vi00="Vibrio sp" ye01="Yersinia enterocolitica"
```

```
IF ORGANISM= . THEN ORG=FURTHERID
```

```
if org= . then org=organism
```

```
***** note only upper case may be achieved when decoding the
```

```
***** data - recode automatically converts to upper case
```

```
***** Using if statments ie.e if diag1 = then clinical =
```

```
***** converts to upper case also
```

```
define menin <y>
```

```
if source1 = "cs" then menin = "y"
```

```
if source2 = "cs" then menin = "y"
```

```
if diag1 = "03" then menin = "y"
```

```
if diag2 = "03" then menin = "y"
```

```
define other <y>
```

```
if source1 = "pd" then other = "y"
```

```
if source1 = "pf" then other = "y"
```

```
if source1 = "jf" then other = "y"
```

```
if source1 = "ot" then other = "y"
```

```
if source2 = "pd" then other = "y"
```

```
if source2 = "pf" then other = "y"
```

```
if source2 = "jf" then other = "y"
```

```
if source2 = "ot" then other = "y"
```



## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

```
define labname _____
recode labcode to labname 116 ="Woden Valley Hospital, ACT" 112
="ICPMR,Westmead"\
  213 ="Prince of Wales, Sydney" 214 ="Royal Alexandra Hospital for Children"\
  117 ="Liverpool Hospital" 220 ="Royal Prince Alfred Hospital"

recode labcode to labname 230 = "Concord Hospital" 270 ="Tamworth Laboratory"\
  275 ="Royal North Shore Hospital" 280 ="Gosford Central Coast Hospital Service"\
  290 ="Lismore Area Pathology Service"

recode labcode to labname 400 ="T B Lynch Pathologists, Rockhampton"\
  410 ="Royal Brisbane Hospital" 411 ="Princess Alexandra Hospital, Queens"\
  416 ="Prince Charles Hospital, Queens" 418 ="Sullivan and Nicolaides Partners,\
  Queensland"

recode labcode to labname 420 = "Nambour General Hospital" 425 ="Central
Queensland Pathology\
  Laboratory, Mackay" 430 ="Toowoomba Pathology Laboratory" 435 ="Ipswich
General Hospital"\
  426 ="Mackay Base Hospital"

recode labcode to labname 510 ="Institute of Medical and Veterinary Science,\
  Adelaide" 511 ="Flinders Medical Centre, SA" 512 ="Gribbles Pathology"

recode labcode to labname 664 ="Western Diagnostic Pathology, WA" 666
="Princess\
  Margaret Hospital for Children, WA" 667 ="Royal Perth Hospital" 668 ="Sir
Charles\
  Gairdner Hospital, WA" 669 ="Fremantle Hospital"

recode labcode to labname RHH = "Royal Hobart Hospital" 710 = "Hobart
Pathology"\
  711 ="Royal Hobart Hospital" 730 ="Northern Tasmanian Pathology Service"

if labname = . then labname = labcode
```

## Section 1 Appendix C

### LabDOSS Analysis Programs LDANPRE9.PGM

.....  
Title 1 \cComplete/further Organism identification - ALL SITES

select furtherid <> .

sort source1

list org source1 furtherid

select

select comments <> .

Title 1 \cCOMMENTS FOR ALL SITES

sort source1

list organism source1 comments diag1 risk1 risk2

select

.....  
route ? type in data file name eg vvnnpref.rec ?

\*\*\*\*\* This file contains significant and contaminant records.

write recfile

route screen

set noecho = off

type "\77"

quit



Section 1 Appendix C

LabDOSS Analysis Programs LDANFIN9.PGM

\*\*\*\*\*

\* PROGRAM NAME LDANFIN9.PGM

\* This program analyses data sent from labs to prepare  
\* tables for CDI bulletins.

\* The programme prints a table of probable contaminants from the pooled  
\* data stored in the merged file.

\* It then selects significant isolates for further processing by excluding  
\* those labelled as probable contaminants and then writing the resulting  
\* file to ldvvn.rec where vv is the volume and nn is the number of the  
\* CDI issue in which the data will be published.

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\*\*\*\*\*

\*\*

READ ? type in file name of screened data eg vvnprel.rec ?

ROUTE ? type in text file name eg LDvvn.doc ?

SET NOECHO = ON

SET STATISTICS = OFF

SET LISTREC = OFF

\*\*\*\*\*

\*\*\*\*\* Preparing reports for CDI

set ignore missing = off

\* Browsing contaminants for unusual organisms

SELECT DIAG1 = "95" OR DIAG2 = "95"

TITLE 1 \cCONTAMINANTS BY LABORATORY

freq org

FREQ LABNAME

SELECT

\* CODE 95 IS PROBABLE CONTAMINANT. EXCLUDE FROM REGULAR  
ANALYSIS

SELECT DIAG1 <> "95" AND DIAG2 <> "95"

Title 1 \cLABORATORY CONTRIBUTIONS

FREQ LABNAME

## Section 1 Appendix C

### LabDOSS Analysis Programs LDANFIN9.PGM

```
* Report below is covered in the pre program
**Title 1 \cComplete/further Organism identification - ALL SITES
*select furtherid <> .
*list org furtherid
*select
*select comments <> .
*Title 1 \cCOMMENTS FOR ALL SITES
*sort source1
*list organism comments diag1 risk1 risk2
*select

***** Blood culture reports
SELECT DIAG1 <> "95" AND DIAG2 <> "95"
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")
Title 1 \cFrequency blood culture organisms
Freq org
Title 1 \cBlood Culture Organisms by Agegroup
Title 2 0.01... - 0.1...= 0mth  0.1...- 0.9...= 1mth  1.1....- 11.9...= x mths
freq agegroup

**** Blood Culture Organisms by Class
select class = "P"
Title 1 \c Blood Culture Gram Positives
Title 2
Freq org

Select

SELECT DIAG1 <> "95" AND DIAG2 <> "95"
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")
select class = "N"
Title 1 \c Blood Culture Gram Negatives
Freq org

Select
```



Section 1 Appendix C

LabDOSS Analysis Programs LDANFIN9.PGM

```
SELECT DIAG1 <> "95" AND DIAG2 <> "95"  
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")  
select class = "A"  
Title 1 \c Blood Culture Anaerobes  
Freq org
```

Select

```
SELECT DIAG1 <> "95" AND DIAG2 <> "95"  
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")  
select class = "F"  
Title 1 \c Blood Culture Fungi  
freq org
```

select

\*\*\*\* Blood Culture Organisms by No Class

```
SELECT DIAG1 <> "95" AND DIAG2 <> "95"  
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")  
select class = .  
Title 1 \c Blood Culture No Class  
list organism org furtherid
```

Select

\*Title 1 \c Blood Culture ORGANISMS REPORTED

\*FREQ ORG

\*title 1 \c Blood culture organisms reported by code

\*freq organism

Section 1 Appendix C

LabDOSS Analysis Programs LDANFIN9.PGM

SELECT DIAG1 <> "95" AND DIAG2 <> "95"  
SELECT MENIN <> "Y" AND ( SOURCE1="BL" OR SOURCE2="BL")  
Title 1 \cDIAGNOSIS & ORGANISMS REPORTED FOR THIS MONTH - BLOOD  
CULTURE

TABLES ORG CLINICAL

tables org diagnosis

Title 1 \cRISKS & ORGANISMS REPORTED FOR THIS MONTH - BLOOD  
CULTURE

TABLES ORG RISKS

TABLES ORG RISKS2

TABLES ORG HOSPACQ

SELECT

SELECT DIAG1 <> "95" AND DIAG2 <> "95"

SELECT MENIN="Y"

Title 1 \cMENINGITIS

FREQ ORG

Title 1 \cMeningitis by age group

Title 2 0.01... - 0.1...= 0mth 0.1...- 0.9...= 1mth 1.1...- 11.9...= x mths

tables org agegroup

Title 1 \cMENINGITIS ORGANISM DATA

Title 2

sort org

LIST ORG sero AGE SEX RISKS RISKS2 COMMENTS FURTHERID

SELECT

SELECT DIAG1 <> "95" AND DIAG2 <> "95"

SELECT SOURCE1 <> "BL" AND SOURCE2 <> "BL" AND OTHER="Y"

select menin <> "Y"

SORT SOURCE1 ORG

Title 1 \cORGANISMS FROM OTHER STERILE SITES

FREQ ORG



Section 1 Appendix C

LabDOSS Analysis Programs LDANFIN9.PGM

Title 1 \cSOURCE OF ORGANISMS REPORTED FOR THIS MONTH - OTHER  
SITES

LIST SOURCE1 ORG AGE SEX DIAG1 COMMENTS

select

select source1 =.

Title 1 \c Organisms reported with no source

list org source1 source2 labcode

select

route ? name of CDI expanded file, eg LDvvn.rec ?

\*\*\*\*\* This file contains significant and contaminant records.

write recfile

ROUTE SCREEN

SET NOECHO = OFF

TYPE "\7 \7"

QUIT

## Section 1 Appendix C

### LabDOSS Analysis Programs LD2to3.PGM

```
*****
*LD2to3.pgm
* Converts data received in LD2 format into LD 3 structure
*****
read ? type in name of file to be modified to LD3 format?
Define Risk1 <A >
Define Furtherid <A > >
Define Comments <A > >
define risk2 <A >
define outcome <A>
define hospacq <A>
let risk1 = risk
let furtherid = furtherid1
let comments = comments1
route ? type in name of new file in ld3 format?

write recfile labcode:3 labnumber:9 collectdat:8 surname:2 firstname:2 sex:1 \
dob:8 age:2 pcode:4 diag1:2 diag2:2 hospacq:1 risk1:2 risk2 outcome \
source1:2 source2:2 cult:1 ant:2 organism:4 sero:2 furtherid:51 comments:51
```



Section 1 Appendix C

LabDOSS Analysis Programs LDYDTAB.PGM

\*\*\*\*\*

\* Program Name YDTAB.PGM  
\* New program to create YTD tables for Blood Culture, Meningitis and  
\* other Sites.

\* Sheila Beaton 27/9/93

\*\*\*\*\*

\* YTD totals for LabDOSS significant blood and meningitis  
read ? type in name of ytd file ?  
route ? file to store eg ytdsvvnn.doc ?  
select menin <> "y" and (source1="bl" or source2="bl")  
set ignore missing = off  
Title 1 \cFrequency of Organisms in Blood Cultures 93 to date  
freq org  
select  
title 1 \cFrequency of Organisms in Meningitis 93 to date  
select menin = "y"  
freq org  
select  
select other = "y"  
title 1 \cFrequency of organisms in Other Sterile Sites 93 to date  
freq org

## **Section 2 Outbreak Investigation**

### **2.1 Introduction Winter Rubella Outbreak in the ACT: Investigation of One Primary School**

In 1991 I investigated an outbreak of Rubella in the Australian Capital Territory ACT. The outbreak was reported in the *CDI*, article attached. At the time, the policy of the *CDI* editor was that staff who routinely worked on the *CDI* did not have their name heading an article. Because of my work with the pathogen scheme and LabDOSS, my name was not included on the article. The work performed in this outbreak was entirely my own. The outbreak report was reprinted by the Weekly Epidemiological Record, one of the first *CDI* articles to be reproduced.

#### **How I became aware of the outbreak**

In May 1991, I was notified of a case of measles in a three year old child who attended child care. The diagnosis of measles was not confirmed by pathology testing. A school aged sibling of the child had been unwell two weeks previously with symptoms of fever and rash. The three year old child attended a family day care home. The family day care mother had taken the child to a play group meeting of 20 children on the two days preceding the onset of her rash. I reviewed the immunisation records of all children who had attended the play group and contacted by telephone parents of children who had not received MMR vaccine. All parents were informed of their child's contact with a case of presumed measles by letter.



## **2.1 Introduction Winter Rubella Outbreak in the ACT: Investigation of One Primary School**

### **Cases at the local school**

The co-ordinator of the family day care scheme and a parent of the index case told me of numerous cases of "measles both sorts" at the local primary school. I contacted the school and found more than 40 children had been absent in the previous month because of illnesses thought to be either measles or rubella. To make a diagnosis, I contacted parents of children who were away with the illness. I obtained clinical histories and arranged serological testing of some of the cases. I contacted general practitioners in the surrounding suburbs, informing them of the outbreak and requesting any new cases be tested for antibodies to rubella and measles. The first serological test confirming rubella was provided by a general practitioner.

### **Public Health Action**

When the rubella outbreak was identified, I reviewed possible action with the ACT Medical Officer of Health and ACT Child Health Doctors. The greatest concern was the risk of rubella to susceptible pregnant women in the ACT. We issued media warnings about the outbreak and provided advice for susceptible women. Community newspapers, delivered free to each household, The Canberra Times and local radio stations all presented news of the Rubella outbreak. Immunisation of all children at the index school against rubella was not considered manageable. The time of the outbreak was nearing commencement of a two week school holiday period and this was considered as a fortuitous and probable conclusion of outbreak.

## 2.1 Introduction Winter Rubella Outbreak in the ACT: Investigation of One Primary School

### Communication between the Department of Education and the Department of Health

The fortnightly school newsletter had contained a paragraph on the illness for the previous two editions. Despite this awareness of large numbers of cases and the reported diagnosis of some cases of measles, the school principal had not informed the Department of Health of the outbreak. Similarly, the regional co-ordinator for schools was unaware of the absenteeism. I discussed with all regional co-ordinators the possible role they may play in being aware of absenteeism and alerting the Department of Health of suspected outbreaks of disease. Because schools may play an important part in surveillance of absenteeism, improved communication between the departments of Education and Health in the ACT is desirable.

I formulated to further areas for potential investigation from this outbreak:

- A possible hypothesis that open plan classes containing between 50 and 90 students promote greater mixing between children and may promote widespread outbreaks of disease. I did not pursue any further investigation of school design/function and spread of communicable diseases.
  
- How could we determine serosusceptibility rates of women in the ACT?

I am undertaking a case control study to determine the reasons for rubella serosusceptibility in women in the ACT. I obtained results of all rubella tests performed at the central health laboratory ACT in 1992. From this data I established that 6.3 % (64/1008) of women routinely tested for rubella serostatus were seronegative.. I have obtained ethics committee approval to contact seronegative and positive women in writing to determine possible reasons for sero susceptibility, e.g. overseas born, not schooled in Australia. The study is at the stage of forwarding letters to 64 cases and 192 controls.



## Section 2.2 CDI article 1991: Winter Rubella Outbreak in the ACT: Investigation of One Primary School

### WINTER RUBELLA OUTBREAK IN THE ACT: INVESTIGATION OF ONE PRIMARY SCHOOL

#### Introduction

An outbreak of rubella in a Canberra primary school occurred from September to November 1991. Rubella virus was isolated from 19 year old children. This outbreak was investigated. Two classes in the school attended the primary school which had been absent with measles and rubella. The school was investigated for rubella virus activity. At least 100 rubella cases from the primary school. The school health officer health issued a statement to the parents to warn of the risk to their children of rubella.

#### Methods

Questionnaires distributed to parents of children attending the school. Rubella virus was isolated from 19 year old children. Cases were defined as those who had the rubella virus isolated from the Canberra Community Health Centre. Rubella virus was isolated from 19 year old children with other rubella virus isolates. The rubella virus was isolated from 19 year old children with other rubella virus isolates. The rubella virus was isolated from 19 year old children with other rubella virus isolates.

considered to have had a good chance of being infected by the virus. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children.

#### Results

Eighty nine cases of rubella were identified in the school outbreak. Eleven cases were confirmed by rubella antibodies. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children.

The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children.

The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children. The rubella virus was isolated from 19 year old children.

Figure 1. Day of onset of rubella virus infection in the school, Canberra, May 1991.



## COMMUNICABLE DISEASES INTELLIGENCE

### Volume 15, Number 19 - 23 September 1993

#### WINTER RUBELLA OUTBREAK IN THE ACT: INVESTIGATION OF ONE PRIMARY SCHOOL

##### Introduction

An outbreak of rubella in a Canberra primary school occurred from 31 May 1991 to 4 September 1991. Notification of measles in a three year old vaccinated child led to the investigation. Two siblings of this child attended the primary school where students had been absent with assumed rubella and measles. The school outbreak occurred during widespread rubella activity in the ACT, with at least 168 rubella cases from other primary schools. The Medical Officer of Health issued a statement to the community to warn of the risk to susceptible pregnant women.

##### Methods

Questionnaires distributed to families of children attending the primary school and a neighbouring preschool identified the cases of rubella. Cases were defined according to the Canadian Communicable Disease Surveillance System case definitions<sup>1</sup>. A confirmed case included a child or adult with either rubella virus isolation, a 4-fold rise in titre of rubella antibodies, or rubella-specific IgM in the serum. A person was

considered to have had clinical rubella if they had an illness comprised of fever and rash, with one or more of arthritis/arthralgia, lymphadenopathy, or conjunctivitis and they were epidemiologically linked to a confirmed case.

##### Results

Eighty-nine cases of rubella were identified in this school outbreak. Eleven cases were tested for rubella antibodies; eight were confirmed rubella. One serologically tested case had no detectable antibodies, however the serum had been collected on the day of onset of the rash. Two cases had IgG but not IgM antibodies, but the sera had been collected from these two children 44 days after the onset of rash.

Seventy-seven of these 89 cases of rubella occurred in children attending the school or preschool. The overall attack rate was 77/468 or 16% of the student population. Sixty percent of cases were female. The outbreak is continuing.

The epidemic curve (Figure 1) is difficult to interpret until separated into class groups. Eighty-seven cases are presented; parents could not recall the date of onset of illness for two school children. The almost flat curve shows this outbreak is of long duration, with sporadic low level incidence. The largest

Figure 1. Day of onset of 87 cases of rubella associated with a school, Canberra, May through September 1991.

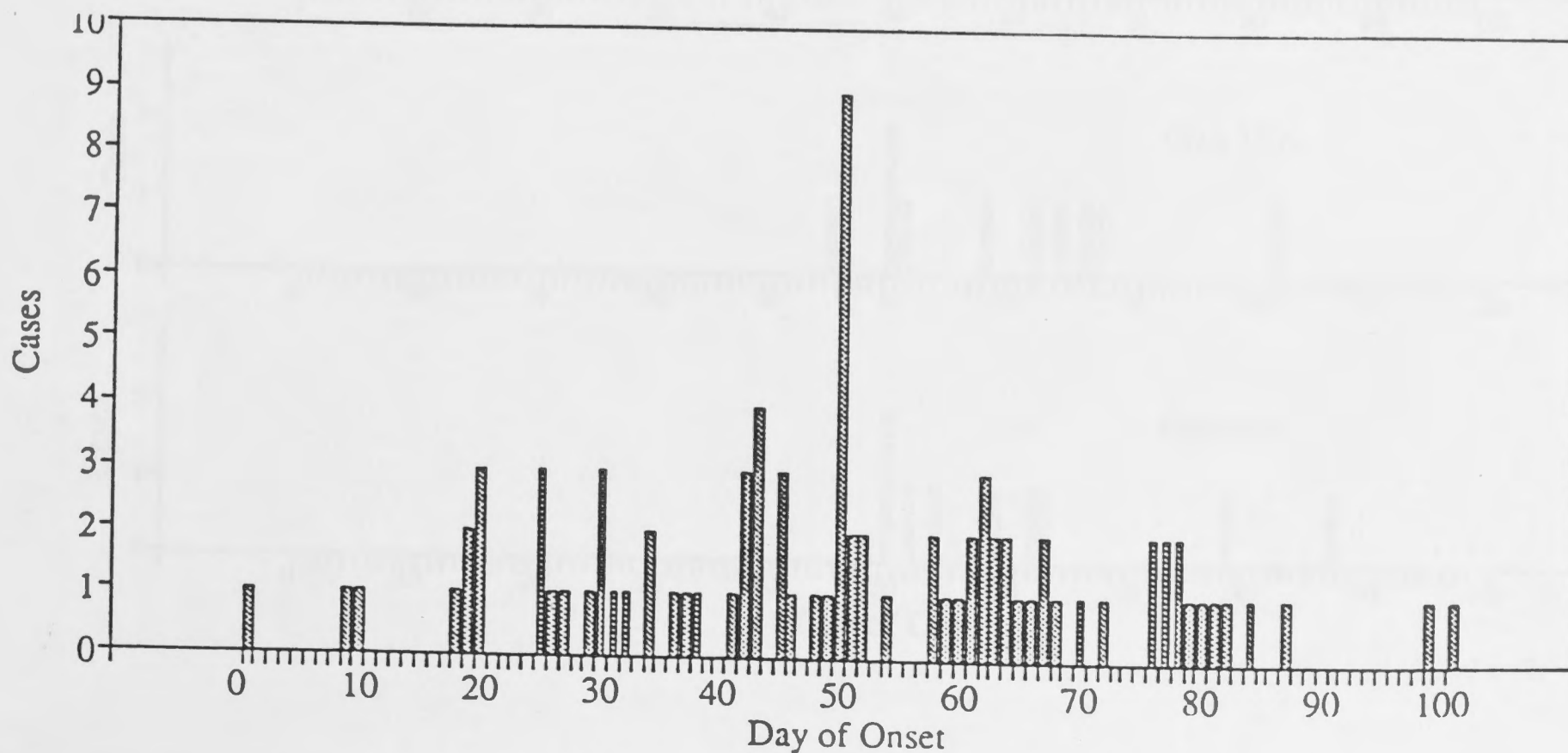
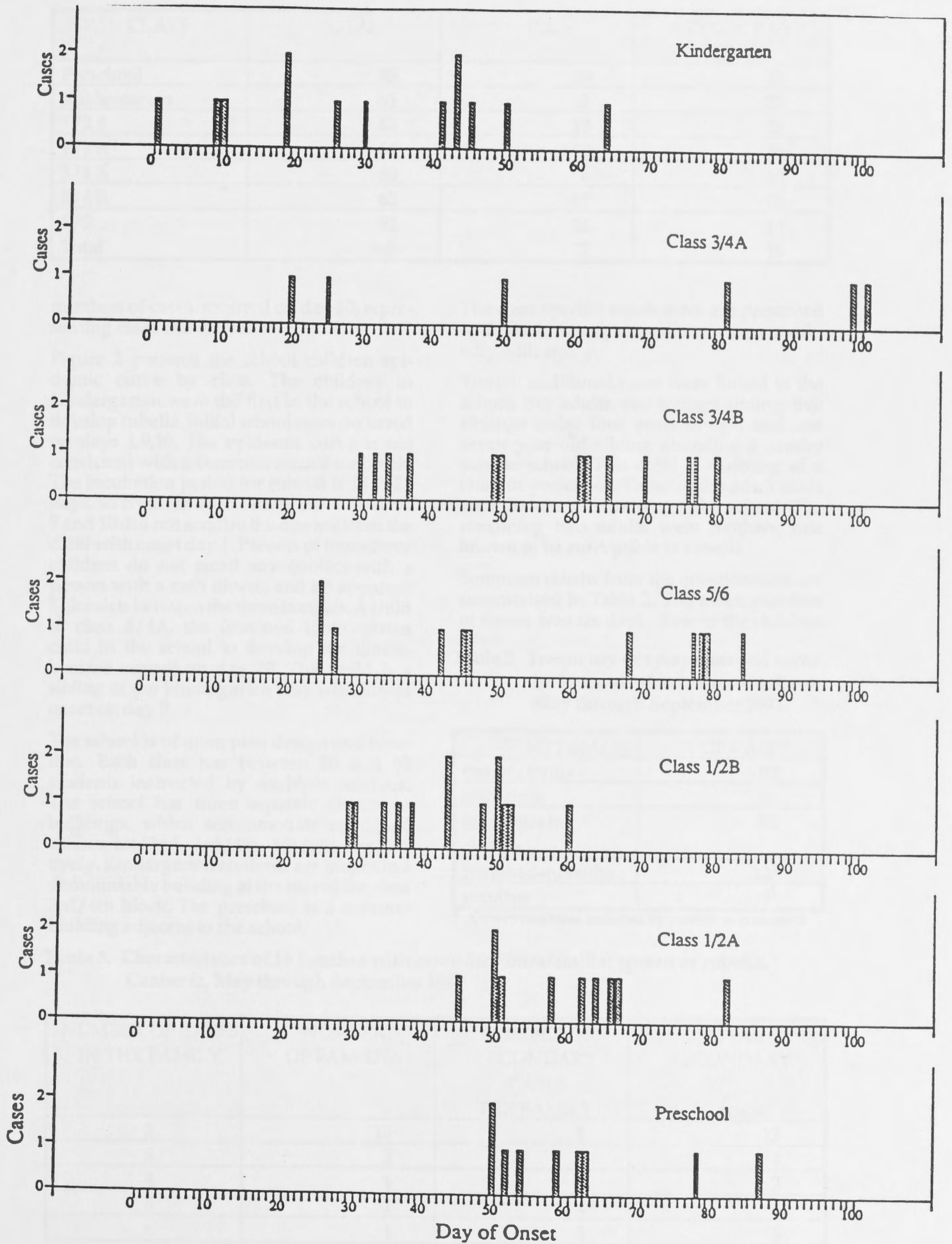




Figure 2. Day of onset of 75 cases of Rubella separated by class, in a school in Canberra, May through September, 1991



**Table 1. Attack rates by classroom in 77 children with rubella in a Canberra school and preschool with 468 students May through September 1991.**

CLASS	TOTAL	ILL	ATTACK RATE PER 100
Preschool	75	10	13
Kindergarten	51	13	25
1/2 B	64	13	20
1/2 A	64	10	16
3/4 A	60	6	10
3/4 B	62	13	21
5/6	92	12	13
Total	468	77	16

numbers of cases occurred on day 50, representing cases in 6 classes.

Figure 2 presents the school children epidemic curve by class. The children in Kindergarten were the first in the school to develop rubella. Initial school cases occurred on days 1,9,10. The epidemic curve is not consistent with a common source outbreak. The incubation period for rubella is 14 to 23 days, so children with illness onset on days 9 and 10 did not acquire the disease from the child with onset day 1. Parents of these three children do not recall any contact with a person with a rash illness, and no apparent link exists between the three families. A child in class 3/4A, the first non kindergarten child in the school to develop the illness, became unwell on day 20. This child is a sibling of the kindergarten case with illness onset on day 9.

The school is of open plan design and function. Each class has between 50 and 92 students instructed by multiple teachers. The school has three separate classroom buildings, which accommodate combined classes 1st/2nd, 3rd/4th, 5th/6th respectively. Kindergarten students are taught in a demountable building at the rear of the class 3rd/4th block. The preschool is a separate building adjacent to the school.

**Table 3. Characteristics of 18 families with secondary intrafamilial spread of rubella, Canberra, May through September 1991.**

NUMBER OF CASES IN THE FAMILY	NUMBER OF FAMILIES	NUMBER OF SECONDARY CASES PER FAMILY	TOTAL SECONDARY CASES
2	13	1	13
3	2	2	4
4	1	3	3
5	1	4	4
6	1	5	5

The class specific attack rates are presented in Table 1. Attack rates did not vary markedly with age.

Twelve additional cases were linked to the school; five adults, one teenage sibling, five siblings under four years of age, and one seven year old sibling attending a nearby private school. This child is a sibling of a child in preschool. Three of the adult cases were fathers of children in the school. The remaining two adults were mothers, one known to be susceptible to rubella.

Symptom results from the questionnaire are summarised in Table 2. The mean duration of illness was six days. Few of the children

**Table 2. Frequency of symptoms and signs in 89 cases of rubella, Canberra, May through September 1991.**

SYMPTOM	% OF CASES
conjunctivitis	82
arthralgia	56
arthralgia in children	52
lymphadenopathy	22 <sup>1</sup>
pruritus	9 <sup>1</sup>

1. Other symptoms included by parents as comments



had prodromal symptoms; 71% of parents gave the same date for onset of illness and onset of rash. Sixty-seven percent of the children consulted their general practitioner. Ninety-two per cent of the cases reported past vaccination for measles and mumps.

**Family clusters**

Twenty-five families had more than one case in their household. The incubation periods were consistent with transmission from one family member to another in eighteen families. Table 3 summarises these data. The total number of subsequent / secondary infections was 29, from 18 cases. The index to contact ratio equals 1 : 1.61.

**Discussion**

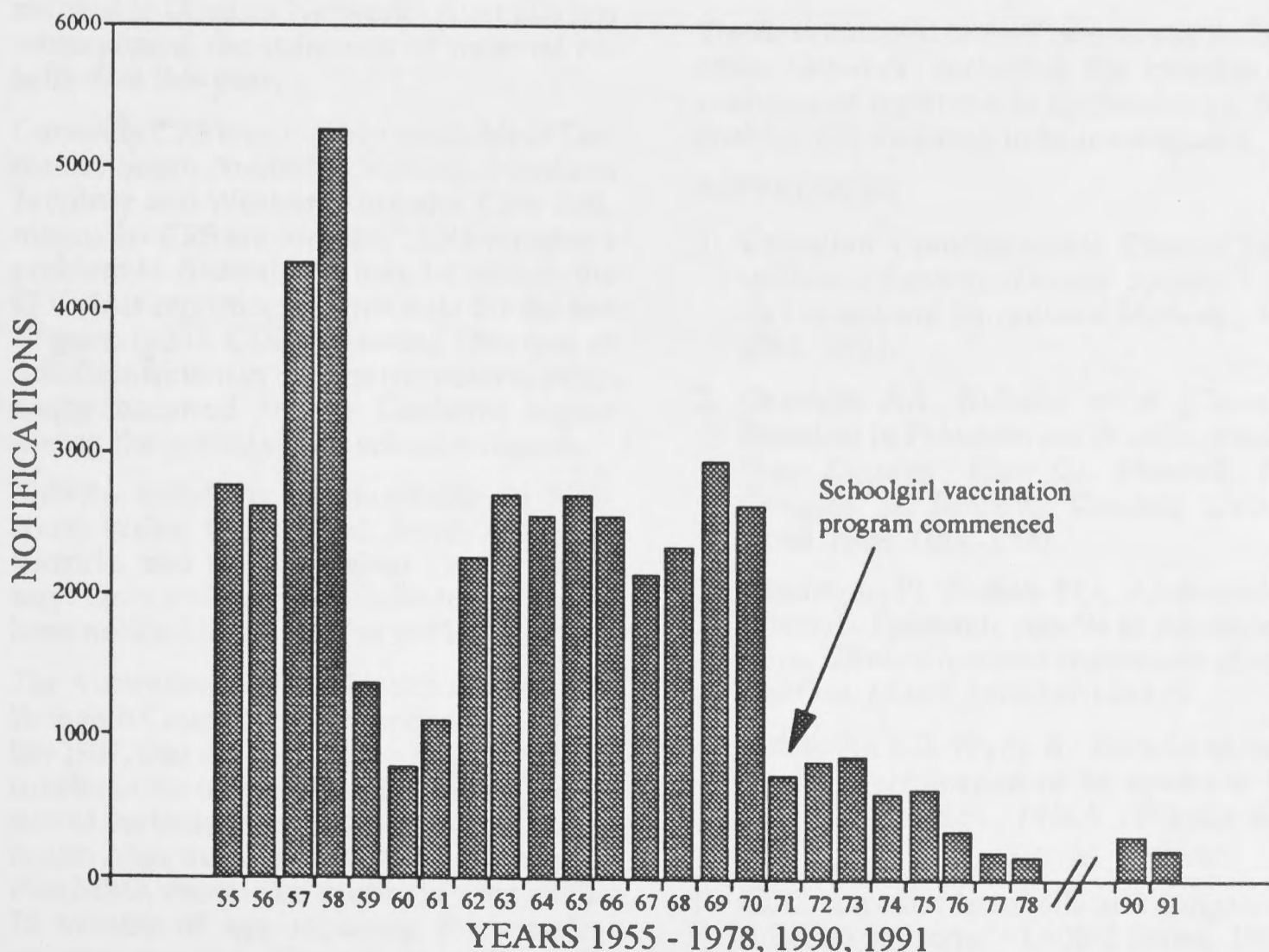
The data suggest this rubella outbreak is continuing at high endemic level. Sixteen percent of the school population have acquired clinical disease over 101 days.

The morbidity associated with this outbreak is striking. Sixty-seven percent of children consulted their general practitioner, suggesting this was not mild disease. Fifty-two

percent of the children, suffered from arthralgia. This is a surprisingly high frequency of arthralgia in children. All five adults with rubella reported joint pain. Classically, arthritis / arthralgia is reported in up to one third of adult women with rubella, but is less frequently reported in men and children<sup>2,3,4</sup>. Pruritus, which is occasionally reported in rubella infections<sup>4</sup>, occurred in 9% of cases.

The control of rubella varies widely between countries. In the USA rubella vaccine was licensed in 1969, and a policy of universal immunisation of children was adopted. This strategy aims to control rubella infection in young children, reducing circulating virus, and thereby decreasing the risk of exposure to pregnant women. In the year of licensure in the USA the incidence of rubella cases notified was 28 per 100,000 population. In the prevaccine era rubella was predominantly a disease of school age children, with the highest rate in children aged 5 to 9 years. There was a dramatic decrease in numbers of cases of rubella and Congenital Rubella Syndrome (CRS) in the following 19 years. A rise in reported rubella and CRS occurred

Figure 3. Incidence of rubella, National Notifiable Diseases Data 1955 - 1978, 1990, 1991, Communicable Diseases Network Australia\*



\* New South Wales not included until 1991; Western Australia not included between 1964 and 1990; Tasmania not included between 1970 and 1990; CRS only in 1990-91 in Northern Territory, Tasmania and Western Australia.

from 1988 to 1990. The incidence rate for rubella infection in the USA in 1990 was 0.4 per 100,000. USA outbreaks suggest that the recent rubella increase is from failure to vaccinate rather than vaccine failure. In February 1991 a *Morbidity Mortality Weekly Report* suggested several strategies may be required to improve rubella prevention and control, including initiating prompt and aggressive control measures whenever outbreaks are reported<sup>5</sup>.

The approach to rubella control in the United Kingdom differed from the USA. Selective vaccination of schoolgirls was commenced in the UK in 1970. In 1988 this programme was augmented by mass vaccination of both sexes using measles-mumps-rubella vaccine (MMR) targeted at 1-2 year old children and 4-5 year old children.

Australia has also used a selective program of school girl vaccination which commenced in 1971. The Australian National Notifiable Disease data from 1955 to 1978, (Figure 3) show a decrease in rubella following vaccine introduction. The rapid fall of rubella cases in 1971 may have been in part an effect of vaccination as well as a natural decrease in cases. A continued decrease in rubella followed during the next seven years. Rubella was removed from the National Health and Medical Research Council recommended list of notifiable diseases in 1978 but the Communicable Diseases Network - Australia has reintroduced the collection of national rubella data this year.

Currently CRS is separately notifiable in Tasmania, South Australia, Victoria, Northern Territory and Western Australia. Case definitions for CRS are complex<sup>6</sup>. CRS remains a problem in Australia as may be seen in the CDI virus reporting scheme data for the last 10 years (p333, *CDI*, this issue). One case of rubella infection in the first trimester of pregnancy occurred in the Canberra region during the period of this school outbreak.

Rubella infections are notifiable in New South Wales, Queensland, South Australia, Victoria, and the Australian Capital Territory. Only one case of rubella infection has been notified in the ACT in 1991.

The Australian National Health and Medical Research Council recommended in November 1987, that the elimination or reduction of rubella in the community and further reduction of the incidence of CRS should be public health objectives. In 1987, it recommended that MMR vaccine be routinely used at 12 - 15 months of age, replacing the measles-mumps vaccine. The school girl rubella program is to be maintained indefinitely.

This is in contrast to the UK where MMR is currently targeted at two age groups of young children. A National Health and Medical Research Council committee is currently considering the introduction of a two dose MMR strategy.

The incidence rate during this outbreak was at least 90 per 100,000 population, which means considerable risk existed for susceptible pregnant women. This study suggests that intervention in community outbreaks may be needed to lower the risk to these women.

The MMR vaccine for 12 month old children replaced the measles mumps vaccine in July 1989 in the ACT. There is now a cohort of 2 year old children who have received vaccination for rubella. There remains a risk of school outbreaks over at least eight years until this cohort completes primary education. Prior to vaccination, rubella outbreaks in the USA occurred on a 6 - 9 year cycle<sup>2</sup>. In the UK an epidemic pattern of a 4 year cycle is described<sup>7</sup>. In the next eight years in Australia there may be outbreaks in school age children. In view of Australia's rubella public health policy, the role of intervention in outbreaks is worthy of debate. The Communicable Diseases Network provides the forum for national co-ordinated consideration of Australia's approach to rubella control.

The development of the Communicable Diseases Network, including the creation of positions of registrars in epidemiology, has enabled this outbreak to be investigated.

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# RELEVÉ EPIDEMIOLOGIQUE HEBDOMADAIRE

26 JUNE 1992 • 67th YEAR

67<sup>e</sup> ANNÉE • 26 JUIN 1992

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**Rubella**

## Winter outbreak in the Australian Capital Territory (ACT)

**Australia.** An outbreak of rubella occurred from 31 May 1991 to 4 September 1991 in a Canberra primary school. Notification of measles in a 3-year old immunized child led to the investigation. Two siblings of this child attended the primary school where students had been absent with assumed rubella and measles. The school outbreak occurred during widespread rubella activity in the ACT, with at least 168 rubella cases from other primary schools. The Medical Officer of Health issued a statement to the community to warn of the risk for susceptible pregnant women.

**Methods**

Questionnaires distributed to families of children attending the primary school and a neighbouring preschool identified the cases of rubella. A person was considered to have had clinical rubella if he/she had had an illness comprised of fever and rash, with one or more of the following symptoms: arthritis/arthralgia, lymphadenopathy, or conjunctivitis and was epidemiologically linked to a confirmed case. A confirmed case included a child or adult with rubella virus isolation, a 4-fold rise in titre of rubella antibodies, or rubella-specific IgM in the serum.

**Results**

Eighty-nine cases of clinical rubella were identified in this school outbreak. Eleven cases were tested for rubella antibodies; 8 were confirmed rubella. One serologically tested case had no detectable antibodies; however, the serum had been collected on the day of onset of the rash. Two cases had IgG but not IgM antibodies, but the sera had been collected from these 2 children 44 days after the onset of rash.

Seventy-seven of these 89 clinical cases of rubella occurred in children attending the school or preschool. The overall attack rate was 77 out of 468, or 16% of the student population. Sixty per cent of cases were female.

Twelve additional clinical cases were linked to the school: 5 adults, 1 teenage sibling, 5 siblings under 4 years of age, and a 7-year old sibling attending a nearby private school. This child was a sibling of a child in preschool. Three of the adult cases were fathers of children in the school. The remaining 2 adults were mothers, one known to be susceptible to rubella.

Symptom results from the questionnaire are summarized in Table 1. The mean duration of illness was 6 days. Few of the children had prodromal symptoms; 71% of parents gave the same date for onset of illness and onset of rash. Sixty-seven per cent of the children consulted their general practitioner and 92% of the cases reported past immunization for measles and mumps.

Table 1 Frequency of symptoms and signs in 89 clinical cases of rubella, Canberra, Australia, May-September 1991

Symptom - Symptôme	Percentage of cases - Pourcentage des cas
Conjunctivitis - Conjonctivite .....	82
Arthralgia - Arthralgie .....	56
Arthralgia in children - Arthralgie chez l'enfant .....	52
Lymphadenopathy - Adénopathie .....	22
Pruritus - Prurit .....	9

**Rubéole**

## Poussée hivernale en Australie (Territoire fédéral de la capitale)

**Australie.** Une poussée de rubéole s'est produite du 31 mai 1991 au 4 septembre 1991 dans une école primaire de Canberra. La notification d'une rougeole chez un enfant vacciné âgé de 3 ans a entraîné une enquête. Deux enfants de la même famille fréquentaient l'école primaire, où les élèves avaient été absents en raison d'une rubéole et d'une rougeole présumées. La poussée en question est survenue au cours d'une période de grande activité rubéoleuse dans le Territoire de la capitale où 168 cas au moins de rubéole ont été déclarés par les autres écoles primaires. Le chef des services de santé du Territoire a prévenu la population du risque encouru par les femmes enceintes réceptives.

**Méthodes**

Les cas de rubéole ont pu être identifiés grâce à des questionnaires distribués aux familles des enfants fréquentant l'école primaire, ainsi qu'une école maternelle voisine. Une rubéole clinique était diagnostiquée dans tous les cas de maladie éruptive et fébrile accompagnée d'un ou plusieurs symptômes tels qu'arthrite/arthralgie, adénopathie ou conjonctivite, et si le sujet était épidémiologiquement lié à un cas confirmé. Était considéré comme un cas confirmé l'enfant ou l'adulte chez qui l'on avait isolé le virus de la rubéole, qui présentait un quadruplement du titre d'anticorps antirubéoleux ou des IgM sériques spécifiques de la rubéole.

**Résultats**

On a recensé 89 cas cliniques de rubéole au cours de cette poussée scolaire. Sur les 11 cas chez lesquels on a recherché des anticorps, 8 avaient une rubéole confirmée. Chez un des cas, la sérologie n'a pas permis de déceler d'anticorps mais le sérum avait été prélevé le jour de l'apparition de l'éruption. Deux cas présentaient des IgG et pas d'IgM, mais il s'agissait de 2 enfants chez qui les sérums n'avaient été prélevés que 44 jours après l'apparition de l'éruption.

Sur ces 89 cas cliniques de rubéole, 77 étaient des élèves de l'école primaire ou de l'école maternelle. Le taux d'attaque global a été de 77 cas sur 468, soit 16% de la population scolaire. Les filles représentaient 60% des cas.

Douze autres cas cliniques avaient des liens familiaux avec les cas scolaires: 5 adultes, 1 adolescent, 5 enfants de moins de 4 ans et 1 enfant de 7 ans qui fréquentait une école privée voisine et appartenait à la même fratrie qu'un enfant de l'école maternelle. Parmi les adultes, 3 étaient des pères d'enfants fréquentant l'école. Les 2 autres étaient des mères, dont une que l'on savait réceptive à la rubéole.

Les résultats du questionnaire sur les symptômes figurent au Tableau 1. La durée moyenne de la maladie a été de 6 jours. Les prodromes ont été rares chez les enfants; 71% de parents ont donné la même date pour le début de la maladie et l'apparition de l'éruption; 67% des enfants ont été vus par leur généraliste et 92% des cas avaient été vaccinés contre la rougeole et les oreillons.

Tableau 1 Fréquence des symptômes et des signes dans 89 cas cliniques de rubéole, Canberra, Australie, mai-septembre 1991

Symptom - Symptôme	Percentage of cases - Pourcentage des cas
Conjunctivitis - Conjonctivite .....	82
Arthralgia - Arthralgie .....	56
Arthralgia in children - Arthralgie chez l'enfant .....	52
Lymphadenopathy - Adénopathie .....	22
Pruritus - Prurit .....	9



**Family clusters**

Twenty-five families had more than 1 case in their household. The incubation periods were consistent with transmission from one family member to another in 18 families. The total number of subsequent/secondary infections was 29, from 18 cases. The index to contact ratio thus equals 1:1.61.

**Discussion**

The data suggest this rubella outbreak proceeded at a high endemic level. Sixteen per cent of the school population acquired clinical disease over 101 days.

The morbidity associated with this outbreak is striking. Sixty-seven per cent of children consulted their general practitioner, suggesting this was not mild disease. Fifty-two per cent of the children suffered from arthralgia. This is a surprisingly high frequency of arthralgia in children. All 5 adults with rubella reported joint pain. Classically, arthritis/arthralgia is reported in up to one-third of adult women with rubella, but is less frequently reported in men and children. Pruritus, which is occasionally reported in rubella infections, occurred in 9% of the cases.

The control of rubella varies widely between countries. In the United States of America, rubella vaccine was licensed in 1969, and a policy of universal immunization of children was adopted. This strategy aims to control rubella infection in young children, reducing circulating viruses, and thereby decreasing the risk of exposure for pregnant women. In 1969 in the United States, the incidence of rubella cases notified was 28 per 100 000 population. In the prevaccine era, rubella was predominantly a disease of school-age children, with the highest rate in children aged 5 to 9 years. There was a dramatic decrease in numbers of cases of rubella and congenital rubella syndrome (CRS) in the following 19 years. A rise in reported rubella and CRS occurred from 1988 to 1990. In 1990, the incidence rate for rubella infection in the United States was 0.4 per 100 000. Outbreaks in that country suggest that the recent rubella increase is due to failure to vaccinate rather than vaccine failure. In February 1991, it was suggested that several strategies may be required to improve rubella prevention and control, including initiating prompt and aggressive control measures whenever outbreaks are reported.<sup>1</sup>

The approach to rubella control in the United Kingdom differed from the United States. Selective immunization of schoolgirls and susceptible adult women was introduced in 1970. In 1988, this programme was expanded by the mass vaccination of both sexes using measles-mumps-rubella (MMR) vaccine targeted at 1-2-year old children and 4-5-year old children.<sup>2</sup>

Australia has also used a selective programme of school-girl vaccination which started in 1971. The Australian National Notifiable Disease data from 1955 to 1978 (Fig. 1) show a decrease in rubella following vaccine introduction. The rapid fall of rubella cases in 1971 may have been in part an effect of vaccination as well as a natural decrease in cases. A continued decrease in rubella followed during the next 7 years. Rubella was removed from the recommended list of notifiable diseases in 1978 but the Communicable Diseases Network-Australia reintroduced the collection of national rubella data in 1991.

The Australian National Health and Medical Research Council recommended in November 1987 that the elimination or reduction of rubella in the community and further reduction of the incidence of CRS should be public health objectives. In 1987, it recommended that MMR vaccine be routinely used at 12-15 months of age, replacing the measles-mumps vaccine. The schoolgirl rubella immunization programme is to be maintained indefinitely. A committee is currently considering the introduction of a 2-dose MMR strategy.

<sup>1</sup> See No. 18, 1991, pp. 128-131.

<sup>2</sup> See No. 30, 1991, pp. 217-220.

**Série de cas familiaux**

Il y a eu plus d'un cas dans 25 familles. La durée de l'incubation concordait avec une transmission intrafamiliale dans 18 familles. Le nombre total d'infections consécutives/secondaires a été de 29, à partir de 18 cas. Le rapport entre cas initiaux et cas contacts est donc de 1:1,61.

**Discussion**

Les données laissent à penser que cette poussée de rubéole s'est maintenue à un niveau d'endémicité élevé. En 101 jours, 16% de la population scolaire a contracté la maladie clinique.

La morbidité associée à cette poussée est frappante. Soixante-sept pour cent des enfants ont été vus par leur généraliste, ce qui indique que la maladie n'était pas bénigne, et 52% souffraient d'arthralgie, chiffre étonnamment élevé chez l'enfant. Les 5 adultes ayant contracté la maladie se sont plaints de douleurs articulaires. Ordinairement, c'est au maximum un tiers des femmes adultes atteintes de rubéole qui souffrent d'arthrite/arthralgie, la proportion étant moins élevée chez les hommes et les enfants. Le prurit, qui est signalé occasionnellement dans les infections rubéoleuses, s'est produit dans 9% des cas.

La lutte contre la rubéole varie largement suivant les pays. Aux Etats-Unis d'Amérique, un vaccin contre la rubéole a reçu l'autorisation de mise sur le marché en 1969, et l'on a adopté une politique de vaccination universelle des enfants. Cette stratégie vise à prévenir l'infection rubéoleuse chez le jeune enfant, et à réduire ainsi le nombre de virus circulants, et, partant, le risque d'exposition pour les femmes enceintes. En 1969, l'incidence des cas notifiés de rubéole était, aux Etats-Unis, de 28 pour 100 000 habitants. Avant l'introduction de la vaccination, la rubéole touchait essentiellement les enfants d'âge scolaire, et le taux le plus élevé se situait dans la tranche d'âge de 5 à 9 ans. Il y a eu une chute marquée du nombre de cas de rubéole et de syndrome rubéoleux congénital (SRC) dans les 19 années qui ont suivi. Une augmentation des cas notifiés de rubéole et de SRC s'est produite entre 1988 et 1990. En 1990, le taux d'incidence de l'infection rubéoleuse aux Etats-Unis était de 0,4 pour 100 000 habitants. Les poussées qui se sont produites dans ce pays donnent à penser que la récente augmentation des cas est due au fait de ne pas vacciner plutôt qu'à un échec vaccinal. En février 1991, il a été indiqué que plusieurs stratégies pourraient être nécessaires pour mieux prévenir et combattre la rubéole, notamment l'adoption rapide de mesures de lutte énergiques chaque fois que des poussées sont signalées.<sup>1</sup>

Au Royaume-Uni, l'approche adoptée diffère de celle des Etats-Unis. La vaccination sélective des écolières et des femmes adultes réceptives a été introduite en 1970. En 1988, on a élargi ce programme en administrant systématiquement le vaccin triple rougeole-oreillons-rubéole (ROR) aux enfants des deux sexes de 1-2 ans et de 4-5 ans.<sup>2</sup>

L'Australie a également lancé un programme sélectif de vaccination des écolières en 1971. Les données nationales sur les maladies à déclaration obligatoire entre 1955 et 1978 (Fig. 1) montrent une diminution de la rubéole après l'introduction de la vaccination. La chute rapide du nombre de cas de rubéole en 1971 peut être attribuée en partie à la vaccination mais aussi à une diminution naturelle de l'incidence. Pendant les 7 années suivantes, cette baisse s'est poursuivie. La rubéole a été supprimée en 1978 de la liste recommandée des maladies à déclaration obligatoire, mais le *Communicable Diseases Network-Australia* a réintroduit en 1991 la collecte nationale de données sur la rubéole.

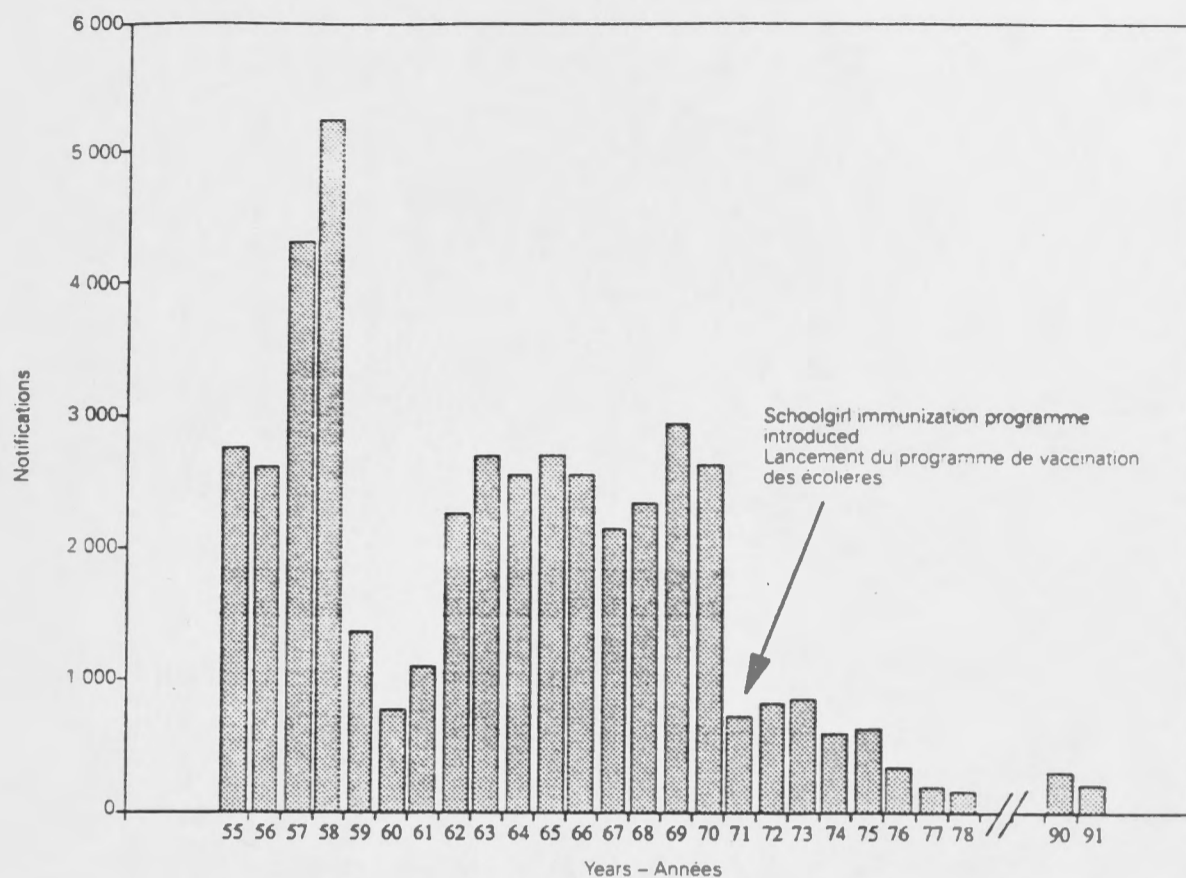
En novembre 1987, l'*Australian National Health and Medical Research Council* avait recommandé comme objectifs de santé publique l'élimination ou la réduction des cas de rubéole dans la population et une réduction plus poussée de l'incidence du SRC. En 1987, il a recommandé d'utiliser systématiquement le vaccin ROR à 12-15 mois, en remplacement du vaccin rougeole-oreillons. Le programme de vaccination des écolières contre la rubéole devrait être maintenu en permanence. Une commission étudie actuellement l'introduction d'une vaccination ROR en 2 doses.

<sup>1</sup> Voir N° 18, 1991, pp. 128-131.

<sup>2</sup> Voir N° 30, 1991, pp. 217-220.

Fig. 1 Incidence of rubella, National Notifiable Diseases data, Communicable Diseases Network, Australia,<sup>1</sup> 1955-1978, 1990, 1991

Fig. 1 Incidence de la rubéole, données nationales sur les maladies à déclaration obligatoire, *Communicable Diseases Network, Australie*,<sup>1</sup> 1955-1978, 1990, 1991



<sup>1</sup> New South Wales not included until 1991; Western Australia not included between 1964 and 1990; Tasmania not included between 1970 and 1990; congenital rubella syndrome included only in 1990-1991 in Northern Territory, Tasmania and Western Australia - À l'exclusion de la Nouvelle-Galles du Sud jusqu'en 1991, de l'Australie-Occidentale entre 1964 et 1990 et de la Tasmanie entre 1970 et 1990, le syndrome rubéolux congénital n'est inclus qu'en 1990-1991 pour le Territoire du Nord, la Tasmanie et l'Australie-Occidentale

The rubella incidence rate during this outbreak was at least 90 per 100 000 population, which means considerable risk existed for susceptible pregnant women. This report suggests that intervention in community outbreaks may be needed to lower the risk for these women.

The MMR vaccine for 12-month-old children replaced the measles-mumps vaccine in July 1989 in the ACT. There is now a cohort of 2-year-old children who have received vaccination against rubella. There remains a risk of school outbreaks over at least 8 years until this cohort completes primary education. Prior to vaccination, rubella outbreaks in the United States occurred on a 6-9 year cycle. In the United Kingdom, an epidemic pattern of a 4-year cycle is described.<sup>1</sup>

(Based on: *Communicable Diseases Intelligence*, Vol. 15, No. 19, Sept. 1991; Department of Health, Housing and Community Services.)

See No. 30, 1991, pp. 217-220.

Le taux d'incidence de la rubéole pendant la poussée susmentionnée a été d'au moins 90 cas pour 100 000 habitants, d'où un risque considérable pour les femmes enceintes réceptives. Le présent rapport permet de penser qu'en cas de poussée épidémique dans une communauté, une intervention pourrait être nécessaire pour réduire le risque auquel ces femmes sont exposées.

Dans le Territoire fédéral de la capitale, le vaccin ROR administré aux enfants de 12 mois a remplacé le vaccin rougeole-oreillons en juillet 1989. Il existe maintenant une cohorte d'enfants de 2 ans qui ont été vaccinés contre la rubéole. Jusqu'à ce que cette cohorte ait atteint la fin de l'enseignement primaire, soit pendant 8 ans au moins, un risque de poussée scolaire subsistera. Avant la vaccination, les poussées de rubéole aux États-Unis se produisaient suivant un cycle de 6 à 9 ans. Au Royaume-Uni, c'est un cycle épidémique de 4 ans qui est décrit.<sup>1</sup>

(D'après: *Communicable Diseases Intelligence*, Vol. 15, N° 19, Sept. 1991; Department of Health, Housing and Community Services.)

Voir N° 30, 1991, pp. 217-220.

### Yellow-fever vaccinating centres for international travel

Amendments to 1991 publication

#### AUSTRIA/AUTRICHE

Insert - Insérer:

##### Wien

- Univ. Doz. Dr. Herwig Kollaritsch, Facharzt für Spezifische Prophylaxe und Tropenmedizin, Alberggasse 1 A/10
- Betriebsärztlicher Dienst der Austrian Airlines, Fontanastrasse 1

#### CANADA

Insert - Insérer:

##### Québec

- Dr A. Pepin, Clinique Sante-Voyages, Hull
- Dr L. Laberge, Clinique medicale, Hull

### Centres de vaccination contre la fièvre jaune pour les voyages internationaux

Amendments à la publication de 1991

#### NORWAY/NORVÈGE

Insert - Insérer:

##### Tvedestrand

Medical Officer, Tvedestrand Municipality Health Centre

#### SPAIN/ESPAGNE

Insert - Insérer:

Dirección provincial de sanidad y consumo:

##### Murcia



## **Section 3 Infectious Diseases In Child Care Settings**

### **3.1 Staying Healthy in Child Care**

A working group for Infectious Diseases in Child Care, the Communicable Diseases Standing Committee (CDSC) of the National Health and Medical Research Council (NHMRC) was formed in 1992. The term of reference for the group was to develop guidelines for prevention of communicable disease in child care settings. The group had no funding and work was performed by mail and facsimile forwarded documents and telephone comments. My role was secretary to the group since its inception. I also undertook much of the work of reviewing literature, drafting and editing the document. The document, "Staying Healthy in Child Care", is based and expands upon the South Australian Government book "Infectious Diseases in Early Childhood Settings". "Staying Healthy in Child Care" aims to provide nationally consistent guidelines for prevention and management of communicable diseases in child care settings. Staying Healthy in Child Care was endorsed by the NHMRC council in November 1993.

#### **Funding for Production**

As a result of my work for the CDSC working group, the director for the new Commonwealth sick care program approached me to develop a suitable sick care "definition of illness" that would be acceptable to NHMRC (refer section 3.2). The director offered funds for development of the definition. Because there was no money allocated by NHMRC or our Unit to enable design, production and printing of "Staying Healthy in Child Care", I offered to develop draft guidelines for sick care in exchange for assistance with the production costs for Staying Healthy in Child Care. The Children's Services Program of the Department of Human Services and Health has allocated \$50,000 towards production of "Staying Healthy in Child Care". This money has enabled procurement of illustrations, graphic design, posters and spiral binding to allow repeated photocopying. The book/kit will be available April 1994.

### 3.2 The Sick Care program

The Australian Labor Party included as an election promise in 1990, the development of a program to meet the needs of parents with mildly ill children when they also have out of home, work commitments. Funds for this program were allocated in the Federal Budget 1993. The Department of Industrial Relations is pursuing the arrangement of approved parental leave to care for unwell children. The Department of Human Services and Health is developing a program to enable mildly ill children to be cared for in a situation that allows the parent to remain at work.

There is considerable community debate about whether non parental care of mildly ill children is desirable. The value of nurturing of children in our community has been raised as a factor to ensure parents are available for care of their ill child. Despite the community concerns, the sick care program is considered likely to continue.

A pilot program of care of sick children operated from November 1992 to May 1993. This program had no organised health community input for admission criteria or protection of health of children or carer's. Pilot program services were encouraged to enlist the support of local health professionals in running the program.

I became involved in the sick care program in April 1993. Because of my work for "Staying Healthy in Child Care", the Director of the sick care program approached me for assistance. It was clear that the program needed health guidelines for protection of children and workers in a sick care room. I was hopeful at this stage that the guidelines could form a new chapter of "Staying Healthy in Child Care". I reviewed the literature of sick care programs overseas. I developed the guidelines, with input from Dr Mark Ferson and Dr Jeff Hanna (working group members), to present to CDSC for comment. (Appendix A "Chapter 11 Sick Care Programs").



The need for and role of a sick care program were debated at the subsequent CDSC meeting. Because of considerable concern over the health and social aspects of the sick care program, it was decided to remove the sick care chapter from Staying Healthy in Child Care to enable further debate, comment and consideration.

My involvement in the Sick Care program has been challenging. Development of a "definition of illness " for children suitable for sick care is clearly a difficult task. This type of care depends upon many factors including;

- the health and safety of the child;
- the type of illness;
- the child's immunisation status;
- the child's well being and emotional needs;
- the situation of the child's care,( e.g. group or individual);
- whether the carer and the care place are familiar to the child;
- the carer's familiarity with the illness;
- the carer's familiarity with the child;
- the carer's ability to meet the child's emotional needs;
- the carer's immunisation status and
- the carer's familiarity with prevention of spread of communicable diseases.

### **Who, How and Where?**

The Who, How and Where of sick care highlight the complexity of the issues;

- **who** is eligible for care and **who** is an eligible carer ?
- **How** are eligibility decisions made ?
- **Where** will sick care occur e.g. child's home, centre, another home in a single or group setting ?

### 3.2 The Sick Care program

Because of the many difficulties with care of sick children in a group setting, I suggested another model to the children's services team;

- a sick care agency program. This allows for care of a child in the child's own home by a familiar carer, a worker attached to their normal child care setting.

Although initially rejected, this proposal has gained popularity as the preferred model for sick care. This would allay many concerns about cross infection, familiarity of a carer and setting for the child and eligibility criteria for children. Safety issues in the home may be assessed by registration safety checks.

The sick care program is still in a period of transition and evolution. Consideration is being given to the cost implications of the agency model. This is complicated by the need for award wages, which are considerably higher than current wages paid to other home based carers. The agency model limits the spread of communicable disease and enables care to occur in a familiar setting for the child. Consideration needs to be given to who determines a child and carer are eligible. Particular health issues of carer's, particularly pregnant women still need to be addressed.

A new working group for sick care was suggested at the last CDSC meeting. When the model program is decided by the Children's Services team, I will arrange for the working group to meet and develop recommendations.

My involvement with sick care program has been an interesting learning experience. The implementation of new controversial policy that affects many areas such as health, child care and industrial relations is difficult. A new policy that questions social issues of parenting and work responsibilities generates heated debate. Although I was unable to provide significant input to developing earlier options, I would view my input to the sick care program as most rewarding if the agency model of care evolves.



#### 4.2 Australian Government Involvement in *Eschericia coli* 0157:H7 outbreak in USA, January 1993

Over 500 laboratory confirmed cases of infection with E coli 0157:H7 occurred in the USA from November 1992 to February 1993. Report of a cluster of children with haemolytic uraemic syndrome to a state health department led to investigations identifying the outbreak. The source of the outbreak was identified as incompletely cooked hamburgers from a large chain of restaurants. The contaminated meat patties were from one meat processing plant. The processing plant records detailing origin of the meat used for the patties were poor; 9 sources of meat were potentially implicated, including 2 Australian abattoirs. Australia's potential role in providing contaminated meat was investigated by:

- Inspection of the two implicated abattoirs; and
- Evidence of *E Coli* 0157:H7 disease in humans in Australia.

The Commonwealth Department of Primary Industries and Energy, Australian Quarantine Inspection Service (AQIS) arranged for immediate inspection of the two abattoirs. The inspection team was made up of two Commonwealth AQIS officers, a CSIRO representative who has been working on an E Coli 0157:H7 project, and an officer from the Commonwealth Department of Human Services and Health. The inspection team report was provided to the USA Food Safety Inspection Service (FSIS). I attended inspection of one of the Abattoirs.

## **SECTION 3 APPENDIX A**

### **DRAFT CHAPTER 11 SICK CARE PROGRAMS; Guidelines for care of children who are mildly ill within child care settings.**

#### **Introduction**

#### **The Get Well Room's Physical Requirements**

#### **Protocols within the Get Well Room**

#### **Staff to work in the Get Well Room**

#### **Children's daily program**

#### **Selecting children for the Get Well Room.**

#### **Managing Fever**

#### **Administering Medicines**

#### **Introduction**

Mild illness in children poses a difficulty for working parents and child care workers alike. A child with mild illness needs a flexible program that can be modified throughout the day. The child may not be well enough to cope with the rigors of a normal child care setting, yet may not require the individual attention provided by a parent home from work. Such a child may be able to be cared for in a Get Well facility within the centre.

Such a facility may be a small get well centre at a workplace, a separate get well room in a centre or get well program provided in a carers home supported by a co-ordination unit.

These guidelines are suitable for use by all sick care services, but for ease of explanation centre based care has been used as an example. Guidelines for care of mildly unwell children can only be interpreted as GUIDELINES. This background information will never replace the need for sound common sense and personal judgement in the management of sick care programs.



A major concern for parents and staff in the care of children in sick care programs is the risk of spread of infection. Especially as children and adults may carry the germs that spread disease irrespective of whether they show signs of illness. It is for this reason that daily procedures that prevent spread of infection are important in the child care setting. **INFECTION CONTROL PROTOCOLS IN THE GET WELL ROOM ARE THE SAME AS THE REST OF THE SERVICE.**

Handwashing is the most important factor in preventing spread of disease and is essential before leaving the Get Well Room. This is important in preventing potential spread of infection to other areas of the centre.

Children in Get Well Room programs may need medication, ensure the Get Well Room staff are familiar with the guidelines for administering medicines.

Children cared for in sick care programs in home day care settings should be assessed for eligibility of care in the same manner as children in centre based care. Infection control protocols are equally applicable in home settings.

## The Get Well Room's Physical Requirements

Mildly unwell children must be able to be cared for in an area away from the main child care setting. This requires a separate play room with its own facilities. The size of the play room needs to conform with the required floor space for the expected maximum size of the group and must have areas for some children to rest on mats or cots whilst others are playing. Child care licensing authorities in each state can provide advice on the relevant requirements for space and staff.

The room requires

1. Its own bathroom area with a toilet, handbasin and nappy change table
2. A telephone
3. A handbasin near the door leading into the centre
4. Kitchen sink and fridge (optional but desirable)
5. Bathroom Scales for weighing children.



## Protocols within the Get Well Room

### HANDWASHING

HANDWASHING is the main method of preventing spread of illness. The handwashing protocols used in the rest of the centre must also be adhered to in the Get Well Room, even if there is only one child in the room. Refer Chapter 1 How Infections Spread and Handwashing

### WASH YOUR HANDS

- EVERY TIME YOU LEAVE THE ROOM. This prevents organisms from being carried out of the room, for example into tearooms or kitchens by staff
- When you arrive at the centre/facility, preventing introduction of germs
- Before preparing or serving food.
- After changing a nappy.
- After wiping a nose - a child's or your own.
- After cleaning up messes (faeces or vomit).
- After you've been to the bathroom - either with a child or by yourself.
- Before you eat.
- Before you leave the centre at the end of your day, to prevent taking germs home.

## WASH CHILDREN'S HANDS

- EVERY TIME the child LEAVES the ROOM
- When they arrive at the centre/facility, preventing introduction of germs.
- Before eating.
- After having their nappy changed. Their hands will become contaminated with germs whilst they are on the change mat.
- After using the toilet.
- After playing outside.
- After touching nose secretions.
- Before they leave the centre at the end of their day, preventing taking germs home.

Toys in the Get Well Room may be provided by other play rooms. However, before toys from the Get Well Room are returned to other rooms they must be washed. This is especially important for mouthed toys. Toys that are difficult to wash, e.g. books should be left in the Get Well Room. (Refer Chapter 3)

Laundry from the Get Well Room should be washed separately from the centres laundry. Washing should be done in hot water.

Garbage should be sealed within the area in plastic bags and then taken to the centre's garbage area.



### **Staff to work in the Get Well Room**

Staff need to be chosen carefully , both for their ability to provide for the special needs of the mildly unwell child and for their awareness of infectious diseases and commitment to preventing spread of infectious diseases. A registered nurse is not required for care of mildly ill children. However, a nurse should be available within the centre and able to give advice to the staff about which children should be in such a room. Staff in the room must have ready access to medical advice, (nurse within the centre, community nurse, general practitioner, public health unit). When establishing a Get Well Room the centre should seek a medical professional who is prepared to offer telephone advice.

Review the records of the staff members' immunisation ( refer Immunisation chapter 4) Relief staff should be asked to provide a copy of their immunisation records. It would be unwise to allow pregnant staff members, or women planning pregnancy to work in the Get Well Room.

Relief staff members need to be familiar with the permission notes the parents have signed on enrolment of the child. These permission notes may allow for administration of paracetamol, first aid , and calling for ambulance or other medical support if required.

To minimise the spread of infection it is wise for the staff member working in the rest and play room to only care for children enrolled in the program on that day . They should not care for other children in the centre on the same day . Nor should these staff be responsible for preparing meals for any other children in the centre.

**Staff Ratios for the care of mildly unwell children .**

The pilot sick care study of the Commonwealth Department of Health, Housing, Local Government and Community Services established staff to child ratios for centre base programs; 1 staff to 2 children .

### Children's daily program

The children's daily program needs to be flexible to provide for each unwell child's needs.

Meals and Snacks should be consumed within the room. Food may be provided from home or the kitchen area of the centre. However, any food prepared within the Get Well Room should not be given to children in other rooms. Similarly food, for example cut fruit, that is not eaten in the Get Well Room must not be taken out to children in the other areas of the centre. Food should not be shared between children.

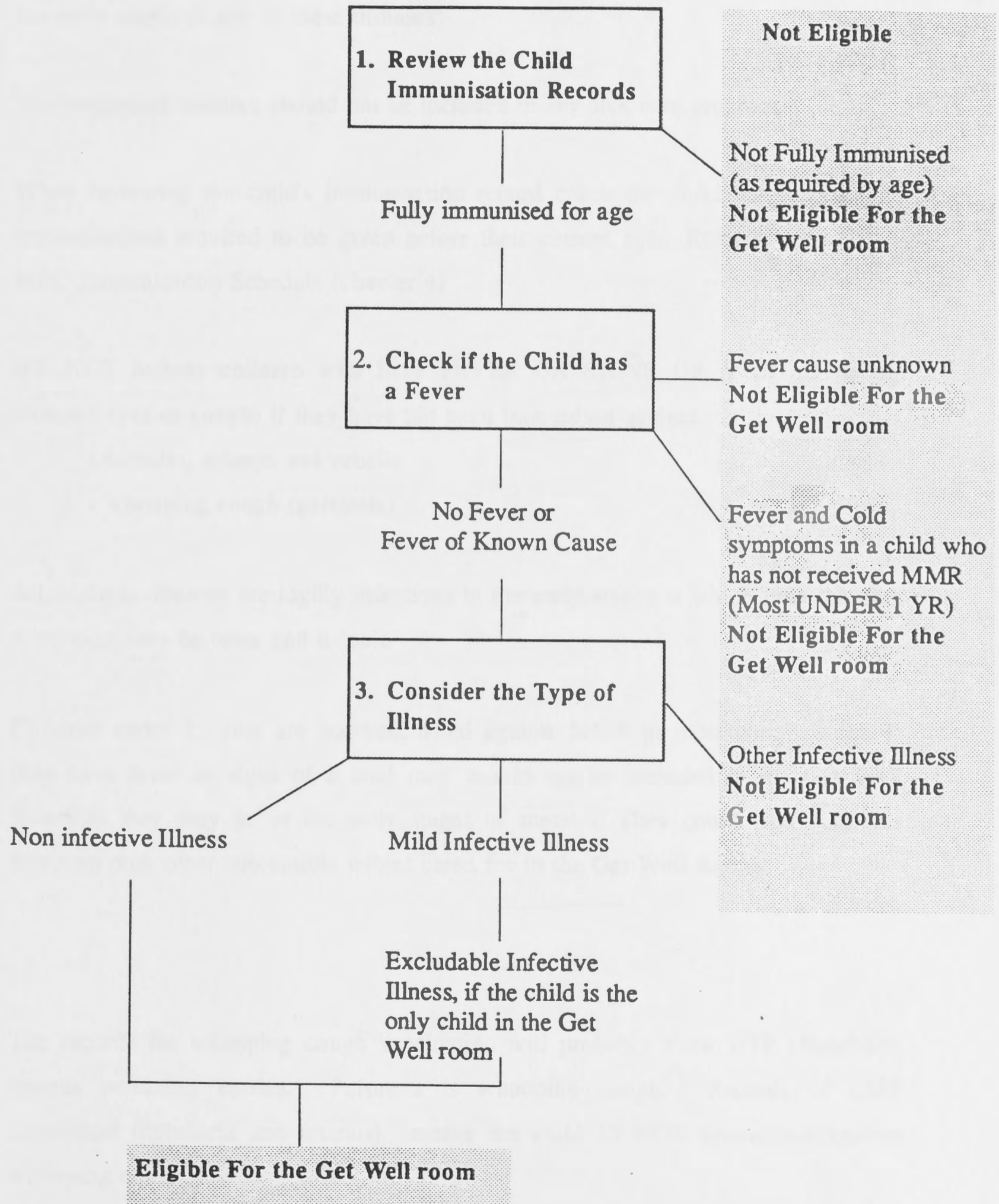
Sleep times, rest sessions in the Get Well Room may need to be more frequent than in the other rooms. Beds must be used and stored in the Get Well Room. Sheets and pillow cases must be washed daily in hot water. Vinyl mattresses must be cleaned, with soap and water, between use from one child to another.

### Outside play times

Children should only play outside in an area set aside for the Get Well Room children.



## Selecting children for the Get Well room



### **1. Review the Child Immunisation Records**

Many severe childhood diseases are prevented by vaccination. Unimmunised children who are mildly unwell, with little or no definite signs of illness may be in the early stages of one of these diseases .

**Unimmunised children should not be included in any sick care program.**

When reviewing the child's immunisation record check the child has received all immunisations required to be given before their current age. Refer to the NH & MRC Immunisation Schedule (chapter 4)

**DO NOT include children who have FEVER OR SIGNS OF A COLD (runny nose, red eyes or cough) if they have not been immunised against**

- measles, mumps and rubella
- whooping cough (pertussis)

All of these diseases are highly infectious in the early stages at which time the only symptoms may be fever and a "cold".

Children under 1 year are not vaccinated against MMR in most communities. If they have fever or signs of a cold they should not be included in the Get Well Room as they may be in the early stages of measles. They could then pass this infection onto other susceptible babies cared for in the Get Well Room.

The records for whooping cough vaccination will probably show DTP (diphtheria tetanus pertussis) entries. Pertussis is whooping cough. Records of CDT (combined diphtheria and tetanus) means the child IS NOT immunised against whooping cough.



## **2. Check if the Child has a Fever (temperature over 37 degrees celsius) .**

It is not possible to state a temperature level to exclude a child from the program. Sometimes even a child with a low grade fever may not be suitable for the Get Well Room ( e.g. if the cause for the fever is not known).

**IF THE CHILD HAS A FEVER, IS THERE AN OBVIOUS CAUSE FOR THE FEVER?**

A child with a fever may be enrolled in the Get Well Room if there is a known or obvious cause for the fever; for example a middle ear infection. If fever is the only sign , and there is no obvious cause for the fever then this child is not eligible for the Get Well Room. Fever is often the first sign of many communicable diseases. The fever "of unknown origin" may represent the start of a highly contagious illness such as measles and the child could infect others at this time.

For more information on Fever refer to Management of Fever at the end of this chapter.

### 3. Consider the Type of Illness

**Non Infective Illnesses where the child may be enrolled in the Get Well Room.**

A. Physical injury where the child may not be able to join the larger groups of children,

B. Recovering from surgery

C. Chronic non infective illness , with acute periods . These may make the child unable to cope with the normal child care setting e.g. mild asthma, teething, dermatitis



**Infective Illness where the child may be enrolled in the Get Well Room.**

**A. Excludable Conditions where the child will be the only child in the room**

**B. Mild infective Illness**

**A. Excludable Conditions where the child will be the only child in the room**

Children with the following diseases that require exclusion ( according to NHMRC recommendations) from mainstream care may be enrolled in the Get Well Room **IF THEY ARE THE ONLY CHILD IN THE ROOM**. Further details on these specific diseases may be found in the second section of this book.

*Vomiting and Diarrhoea, including Campylobacter*

*Conjunctivitis*

*Chicken Pox*

*Impetigo*

*Mumps*

IF MORE THAN ONE CHILD IN THE CENTRE HAS A SIMILAR ILLNESS the children may be grouped together in the Get Well Room. **THIS SHOULD ONLY BE DONE WITH THE ASSISTANCE OF LOCAL PUBLIC HEALTH WORKERS**

It may be appropriate for children with mild **CONTAINABLE** diarrhoea or conjunctivitis to be cared for together (cohorted).

Diarrhoea may be better contained in disposable nappies. Children whose faeces will leak out of nappies or who cannot manage to keep faeces in the toilet should not be admitted to a Get Well Room.



**B. Mild infective illness.** Further detail on each illness may be found in the second section of this book.

### **Respiratory Diseases**

#### *Common Cold*

Teach the child to cover his/her mouth when sneezing or coughing. Dispose of tissues soiled with nose and throat discharges. **WASH HANDS** after contact with soiled tissues and articles and after contact with nose and throat discharges.

#### *Sore throats*

If a child has a severe sore throat (symptoms of strep throat), the child should be sent to a doctor for assessment. Good personal hygiene practices should be followed. Cover the nose and mouth when coughing or sneezing. Dispose of soiled tissues after wiping a runny nose. Always follow with proper handwashing. Do not share eating utensils, food or drinking cups. Disinfect toys that infants and toddlers put in their mouths.

#### *Ear Infections ( inner and outer ear )*

The child will probably oral antibiotics or ear drops and paracetamol.  
Any discharge from an ear should be treated as infectious, wash hands thoroughly.

### **Gastrointestinal Diseases (see notes on diarrhoea outbreaks above)**

*Worm infections* Be sure that **GOOD HANDWASHING** and **CLEANING** procedures are being carried out .

### **Skin Diseases**

**All children with rash and fever should be referred to a doctor.** For general information on rashes refer page X

### *Erythema Infectiosum*

(Parvovirus b 19, Slapped Cheek Syndrome, Fifth Disease)

A mild viral illness with fever, red cheeks and an itchy, lace like rash on the body and limbs. Parvovirus B 19 is transmitted by droplets, or secretions from the nose and throat. Complications are rare. Parvovirus causes miscarriage or still births in a SMALL percentage of women infected during pregnancy. Malformations DO NOT appear to occur in babies who survive this infection in the mother.

### *Hand, Foot and Mouth disease, dried lesions only*

A viral illness with blisters often seen in the mouth and on the hands and feet. It is not a serious illness. The child is infectious as long as there is fluid in the blisters. The child should be excluded from all child care whilst these blisters are wet. However a child with dried lesions may be readmitted to both the normal child care setting and the rest and play setting. The faeces can remain infectious for several weeks, this is not a reason for continued exclusion. Good hand washing techniques and cleaning procedures need to be followed.

### *Head Lice*

Children should be allowed to return to the normal child care setting after their first treatment. Nits (dead eggs) may still be present but the child is no longer infested and nits need not be removed.

### *Pet Bites and Scratches*

Some animal bites and scratches may be visibly infected within a day, while others may take up to ten days before infection is obvious. Ensure the sore is covered. Tetanus may occur after an animal bite so check that the child has received vaccination against tetanus (DT or DTP at 2, 4, 6, 18mths and prior to school entry)



*Ringworm/Tinea , After Treatment has been Started*

Ringworm is not actually a worm, but a spreading area of fungal dermatitis. It is passed on by direct skin contact or indirectly by touching contaminated articles, clothing and floors. Ringworm of the skin appears as a flat, spreading ring-shaped lesion. The edge is usually reddish often containing fluid or pus but may also be dry and scaly or moist and crusted. The centre of the patch may appear to be healing.

*Scabies and other mites causing skin disease ( One day after treatment)*

Scabies is an infectious disease of the skin caused by a mite. Scabies is not an indication of poor hygiene. Scabies and other mites usually cause intense itching. Treatment involves application of insecticidal cream, lotion or solution as prescribed by a doctor. If spread has occurred within the centre/facility, all staff and children will need to be treated at the same time.

*School Sores (Impetigo) only after treatment is started and if the sore is well covered.*

Impetigo is a bacterial skin infection caused by the "staph" or "strep" organism (or both). This infection can easily spread to other parts of the infected person's body or to other people by direct contact with sores or contaminated clothes. Sores on exposed surfaces should be covered with a dressing. The incubation period for impetigo is 1 - 3 days.

*Thrush*

Exclusion of babies and children with thrush from the normal child care setting is NOT necessary. Thrush commonly occurs in very young babies and young infants and often presents inside the mouth as white spots or flakes that cannot be removed by cleaning the mouth. Spread takes place by contact with excretions of mouth, skin, vagina and faeces. Be sure good hand washing techniques and cleaning procedures are being practised

## *Warts*

Warts are caused by a papova virus infection of the skin. After treatment the warts are not contagious. The wart virus may enter via moist skin surface, abrasions, cuts, and so it is important to get children to:

1. Dry hands well after washing.
2. Cover abrasion and cuts with band-aids or clean dressings.
3. Wear shoes to protect feet.

Be sure good handwashing techniques and cleaning procedures are being practised.

## **Other Diseases**

### *HIV/AIDS*

Human Immunodeficiency Virus infection (HIV, AIDS virus)

There is no evidence of spread from child to child in schools or child care centres through normal social contact. A child with HIV infection may be more likely than others to pick up infection from other children in a sick care program. For the protection of the child with HIV the parents should discuss the sick care program with the child's doctor. (See HIV page X)

### *Cytomegalovirus (CMV) infection*

Shedding of CMV in urine and saliva is common in children under the age of five. Exclusion of these children from the service is NOT necessary. Most CMV infections cause either no symptoms or only mild symptoms. The virus is spread person-to-person by close contact with infectious body secretions (saliva, urine, breast milk, tears, blood, cervical secretions, and semen) which enter through mucous membranes and cuts in the skin. Most women (50-60%) have been infected with CMV in the past and cannot be infected with the virus again. However, women who are infected with CMV for the first time while PREGNANT may infect their unborn baby. GOOD HANDWASHING must be undertaken after contact with body secretions, and especially after changing nappies or assisting in toilet care. Avoid kissing infants on the mouth (hugging is acceptable).



### *HEPATITIS B*

Exclusion of a child with Hepatitis B from the normal child care setting is NOT necessary. Hepatitis B is an infection of the liver caused by the hepatitis B virus.

Frequently, this virus is carried without symptoms. Symptoms, if present, may include abdominal discomfort, loss of appetite, nausea, fever, tiredness, joint pain, dark urine, and yellow skin or eyes (jaundice). Hepatitis B is infectious for about one month before jaundice occurs, to about one to three months after jaundice occurs. Some people may carry the virus for life. A strong emphasis needs to be placed upon good handwashing technique and cleaning and disinfecting practices. Prevent scratching, biting or violent/aggressive behaviour. Cover any open sores, cuts and abrasions that are weeping or moist.

### *Toxoplasmosis*

Person to person spread does not occur, apart from transmission of infection from pregnant mothers to their unborn children. Toxoplasmosis in pregnant women can result in effects on unborn children ranging from no symptoms, to rashes and damage to the nervous system, liver and other organs. Toxoplasmosis acquired after birth usually results in either no symptoms or mild illness. When mild illness occurs, it commonly involves enlarged lymph nodes, muscle pain, intermittent fever and generally feeling ill.

**Other Infective Illnesses that are Not Appropriate for the Get Well Room**

Children with diseases *marked \*\** may be considered for Get Well Room if they are the only child in the room.

**Respiratory complaints**

Bronchiolitis (RSV), Bronchitis, Croup, Influenza, Tuberculosis (TB)

Whooping Cough ( Pertussis)

**Gastrointestinal complaints, Vomiting and Diarrhoea**

*Gastroenteritis \*\**, *Campylobacter\*\**, *Cryptosporidiosis\*\**, *Giardiasis\*\**, *Rotavirus\*\**, Salmonella, Shigella

**Skin Complaints** (all children with rash and fever should see a doctor)

*Chickenpox\*\**, Hand Foot and Mouth disease with wet blisters, Measles, Roseola, Rubella ( German measles), Scarlet Fever, School sores if the sore cannot be covered ( Impetigo),

**OTHER complaints**

*Conjunctivitis\*\**, Haemophilus influenzae b infections , Hepatitis A, Meningitis, Meningococcal Infections, *Mumps\*\**, Polio, Diphtheria



## Management of Fever

The normal body temperature is 37 degrees celsius. Most fevers in children are caused by minor infections like the common cold, a raised temperature is not usually a cause for alarm. A child with a high temperature needs extra fluids to drink. The times to worry about a child with a fever are the following

- when the temperature is over 39 degrees celsius
- when the temperature stays high for more than six hours at a time
- when the fever keeps recurring over one or two days
- when the fever does not respond to paracetamol (15mg per kg of body weight)
- when it is associated with other significant symptoms such as vomiting , diarrhoea, drowsiness, severe headache, fitting.

Try to lower a child's fever by

1. Giving the child paracetamol at an appropriate dose. This is 15mg per kg of body weight. See the table below
2. Removing extra clothing , tepid sponging or bathing the child, fanning the child.

The recommended paracetamol dose for reducing fever in children is 15mg per kg, Table X. This will often be a larger volume than is printed on the paracetamol bottle. Check the child's weight before administering the paracetamol Also check the paracetamol elixir is 120mg of paracetamol /5ml ( Paracetamol preparations are available in higher concentrations for children over 4).

Children with a high fever sometimes have convulsions. this is quite frightening at first but normally causes no harm. Lie the child on the side so saliva runs out of the mouth. Take the child to a hospital or nearest doctor.

Table X Paracetamol Doses for Children, four hourly doses of liquid paracetamol \*

Weight Kg	Elixir* 120mg/5ml	Infant Drops 60mg/0.6ml
4	2.5ml	0.6ml
5	3.0ml	0.6ml
6-7	4.0ml	0.9ml
8-9	5.0ml	1.2ml
10-11	6.0ml	1.5ml
12-13	7.0ml	1.8ml
14-15	8.0ml	2.1ml
16-17	10.0ml	2.4ml
18-19	11.0ml	-
20-21	12.0ml	-
22-23	13.0ml	-
24-27	15.0ml	-

\* Only use these measures for paracetamol that is 120mg/5ml. Check the concentration of paracetamol elixir as a higher concentration is also available in a preparation for over 4 year olds.



## Administering Medicines In Child Care Centres

Medication provided must be in its original container.

Parents need to complete an authorisation form , and example is on the next page.

The dose authorised by the parent should be checked with the instructions on the container. If the instructions given by the parent differ from those on the container this needs to be checked again with the parent. The parent should write down the desired dose and reason for the different dose.

The medication should be prepared by a qualified child care worker and checked by another staff member. Both these staff need to complete the administration record.

All authorisation details

Child's name

Date

Medication Name

The dose prepared by the trained staff member.

Following administaion of medication , the child should be observed for any reactions. These should be noted on the form and reported to parents.

**Approval for administration of medicines, to be completed by the parent.**

Date ...../...../.....

Child's name.....

Parent's name.....

Name of Medication .....

Dose to be given.....volume/number tablets

at ..... time

and at ..... time

Special instructions for giving medicine ;

.....  
.....

**Administering Medication Record , to be completed by staff**

Date ...../...../.....

Child's Name Checked by	Medication	Dose	Time Given	Staff Administering
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Any reactions that may be attributed to the medication

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### Further Reading

Triage Decisions in Child Care for Sick Children Desguin BW and Murray DL,  
AJDC Vol 144 February 1990 pg 190

Management of Illness and Temporary Disability in Children Enrolled in Day Care  
Centers , Chang A, et al AJDC Vol 142 June 1988

Care of the Ill Child in Day Care Settings Giebink GS, Paediatrics Vol 91 No1  
Janueary 1993

Child Care Options for Ill Children Suzanne Landis,Chang A Pediatrics Vol 88 No4  
October 1991

## Section 4.1 Child Care Centre Investigations and Advice

Early in my placement I expressed my interest, and willingness to assist with episodes of infectious diseases in day care settings. I have worked primarily with the Children's Day Care Services Child Care Advisers of the Family Services Branch of the ACT Housing and Community Services Bureau. In 1991, I helped to develop ACT guidelines for exclusion of sick children from child care settings. I have acted as a resource person, providing telephone support to advisers and co-ordinators of child care services. I receive telephone enquires approximately once each week. Some examples of the enquiries are;

- how to manage a child with impetigo on the face;
- staff concerns about Hepatitis B;
- appropriate disinfectants to use in the centres;
- how to minimise risk of transmission of hand foot and mouth disease and
- the risk a child with middle ear infection draining pus from the ear may pose to other children.

On three occasions, I visited child care centres because of the numbers of cases involved or concern about the risk to other children in the centre. Two of these episodes were outbreaks of diarrhoea. In both gastroenteritis outbreaks, the child care adviser was notified near the end of the epidemic. The third investigation was of a case of pertussis. The work performed in the investigation was my own, I discussed each step with Dr Cathy Mead ACT Medical Officer of Health. The work is prepared ready for comment by Dr Mead with whom I hope to submit the article to the *CDI* (refer section 4.1.1 A case of pertussis in an ACT Child Care Centre).



#### 4.1 Child Care Centre Investigations and Advice

##### Outbreaks of Vomiting and Diarrhoea

The first outbreak was at a child care centre within the Australian National University. Cases of diarrhoea were predominantly in babies in the nursery and adults of close contact. By the time of my visit, children had been refused admission to the nursery whilst it underwent thorough cleaning. I reviewed the infection control protocols, daily practices of nappy changing and hand washing and food preparation and serving. The staff sought my advice on some aspects of hand washing and nappy changing. I arranged for testing of faeces from 5 babies and two adults in the centre. The cause of the diarrhoea was not identified. No new cases occurred after the investigation.

The second outbreak was cases of diarrhoea at a child care centre in Woden ACT. Forty five cases of vomiting and diarrhoea in children and close adults were identified. I reviewed the policies and practices of infection control . The centre was due to have a fund raising carnival two days after my visit. Plans had been made to serve food at the carnival, some prepared at the time of the carnival and other food donated by parents. I advised food should not be sold if it had been prepared in homes of children or staff from the centre and that all food handlers on the day of the carnival protected the food by wearing gloves. No subsequent cases of vomiting and diarrhoea were linked to the carnival. I arranged for testing of faeces from 6 babies and 4 adults connected with the centre. Rotavirus was implicated as the cause of the outbreak, identified in 6 stool samples.

#### 4.1.1 A Case of Pertussis in an ACT Child Care Centre.

In August 1993, the ACT Department of Health received notification that an 18 month old boy in an ACT Child Care centre had developed pertussis ( whooping cough ) . The child attended a community child care centre and had been cared for in the centre's nursery room at the onset of symptoms.

##### **Background**

The child care centre, established in 1993, is licensed to care for 55 children in three groups: 15 children under 18 months of age , 18 children aged 18 months to 3 years of age and 22 preschool children aged 3 - 5 years. The nursery children mix with children from other groups for short periods in the morning and afternoon.

The centre has a written health policy that is given to all parents at the time of enrolment. The policy lists exclusion requirements for specific diseases, fever and antibiotic administration. The health policy does not mention infection control protocols or immunisation records. Immunisation in Long Day Care centres is compulsory in the ACT, unless a written statement is provided from a doctor stating the child cannot be immunised<sup>1</sup>. Original records of immunisation are requested to be presented to the co-ordinator who completes an immunisation record for the centre.



#### 4.1.1 A Case of Pertussis in an ACT Child Care Centre.

##### Methods

We identified close contacts of the child with pertussis; 17 babies and 6 staff members. Sixteen of the babies had received 3 doses of Diphtheria, Tetanus, Pertussis (DTP) vaccine, one had received one dose of DTP vaccine. We reviewed the centre held immunisation records for all children attending the centre. To assess side effects of erythromycin we distributed a questionnaire 23 staff and parents two weeks after the investigation.

##### Action

The index case had not mixed with children other than those in the nursery in the preceding three weeks. We recommended erythromycin chemoprophylaxis for 17 babies and 6 staff. The index case and older sibling also received erythromycin. The older sibling had continued to attend the centre after diagnosis and before Health Department notification. We advised the sibling be excluded from the centre until erythromycin had been administered for 5 days.

##### Results

No further cases of pertussis occurred.

Post treatment questionnaires were returned by 91 percent of parents and staff. The duration of medication completed ranged from 5 to 31 days, median 14, mean 13 days. Side effects were reported in 60 % of children and 1 % of adults ( Table 1 ). Mild gastrointestinal disturbance was responsible for 38 % of side effects. One child developed a rash, vomiting and diarrhoea 24 hours after commencing the antibiotic. Rotavirus antigen was present in her faeces and she was hospitalised because of dehydration.

#### 4.1.1 A Case of Pertussis in an ACT Child Care Centre.

Table 1 Side effects reported from erythromycin chemoprophylaxis, 15 children and 6 adults, an ACT child care centre, August 1993.

Side Effects	% of children	% of total
No side effects	40 %	52 %
Diarrhoea	33 %	24 %
Other gastrointestinal disturbance	20 %	19 %
Rash , Vomiting and Diarrhoea	7 %	5 %

#### Immunisation Records

Immunisation records, appropriate for the child's age, were incomplete for 34 percent of children. The proportion of completed records varied with age. Immunisation records were incomplete for 47 percent of babies in the nursery, 38 percent of toddlers and 19 percent of preschool aged children. There was no record of any immunisation for three children , recent immigrants.

We reviewed completed records for the age each vaccine was given to determine whether immunisations were given at ages recommended by the National Health and Medical research Council (NHMRC). Less than 1 percent of DTP vaccinations were given 1 month after the due date. Forty children were over 12 months of age and had received Measles, Mumps, Rubella vaccine (MMR). Eleven of these (28 percent) received MMR later than 12 months of age , mean 14.3. These children would be classified as receiving immunisation late according to current NHMRC recommendations of MMR at 12 months of age. However, at the time these immunisations were given, the NHMRC recommendation was to administer MMR at 12 to 15 months of age.



#### 4.1.1 A Case of Pertussis in an ACT Child Care Centre.

##### Discussion

Pertussis was not transmitted from the index case to other children in the child care centre. This successful outcome may have been due to a number of factors, a natural occurrence, partial immunity in the children who had received one to three doses of DTP or the success of chemoprophylaxis.

Side effects were commonly reported in children who received erythromycin. It is difficult to be certain that some of the reported side effects were not effects of concomitant rotavirus infection.

The immunisation records of children in the centre were poorly maintained. Legislation ensuring immunisation for all children attending child care is insufficient. The difficulties in maintaining an immunisation register in a setting with many children of varying immunisable age need to be addressed. We are looking at methods to assist child care workers to maintain age appropriate records.

##### Reference

1. ACT Long Day Care License Condition Clause 24(d)

## 4.2 Australian Government Involvement in *Eschericia coli* 0157:H7 outbreak in USA, January 1993

### Abattoir Inspection

I became familiar with the Hazard Analysis Critical Control Point (HACCP) strategy used by the food industry to minimise the risk of contamination of food. Each food is assessed for its potential hazard using six hazard categories. For example one category is products that are not treated by a terminal heating process after packaging or when cooked at home. The critical control points are potential risk points in food production. These high risk steps are managed and observed to minimise contamination. For example, soon after slaughter, cattle are eviscerated. The contamination risk at this stage is two fold; stomach contents may regurgitate and bowel contents may leak from the rectum. Sealing the alimentary canal to prevent leakage is a crucial step to prevent contamination. During the inspection we looked for presence of contamination, existence of opportunities for contamination and opportunities for microbiological growth. Microbiological samples were collected for testing for presence of *E coli* 0157:H7.

There was no evidence of faecal or ingesta contamination, nor presence of contamination. Delays of up to 20 minutes in the requirement for freezing of chilled packed beef were detected, the meat remained at -4 to 2 degrees celsius during this time. The variation from requirements was not likely to result in any increase in *E coli*.



#### 4.2 Australian Government Involvement in *Escherichia coli* 0157:H7 outbreak in USA, January 1993

##### Evidence of *E coli* 0157:H7 disease in humans in Australia.

There is no routine surveillance of *E coli* 0157:H7 in Australia. Detection of the organism in faeces would not occur with normal processing methods for faecal pathogens, specific culture media is required to enable detection. This media is unlikely to be used unless specific reference is made to a history of Haemolytic Uraemic Syndrome or a special study is being undertaken. One such study was performed at the Camperdown Children's Hospital in 1991. Of 1,843 stools from cases of acute diarrhoea, only 2 were *E coli* 0157 and neither of these possessed the flagella antigen H7. Three unpublished cases of *E coli* 0157:H7 have occurred in Australia in 1986, 1989 and 1992. It appeared unlikely that *E coli* 0157:H7 was a significant cause of morbidity in the Australian population.

## 4.2 Australian Government Involvement in *Escherichia coli* 0157:H7 outbreak in USA, January 1993

### Australian *E coli* 0157:H7 and other enteropathogens meeting July 1993

I attended a meeting of veterinary and medical scientists, representatives from Australian Quarantine Inspection Service (AQIS) and Meat Research Corporation (MRC). The objectives of the meeting were to develop a program which meets the projected requirements of the United States Department of Agriculture (USDA) for the surveillance, monitoring, control and reporting of enteropathogens of importance (particularly *E coli* 0157:H7) to the Australian export and domestic meat industries. The USDA were expected to introduce new standards of zero tolerance of faecal, ingesta or hair contamination of meat. It was possible that microbiological testing of all imported meat for *E coli* 0157:H7 would be required. The recommendations of the meeting included:

- Improved abattoir microbiological survey information is required (MRC baseline study);
- Education of the community on the prevention of food poisoning through improved handling in the retail chain and at home is required ( National Food Authority);
- On farm survey information of *E coli* 0157:H7 is the second veterinary priority after abattoir baseline studies;
- National Enteric Pathogen Surveillance Scheme (National Salmonella Surveillance Scheme NSSS) information needs to be fed into the National Animal Health Information Systems ( NSSS and Bureau of Resource Sciences)
- Entero-haemorrhagic *E coli* should be monitored through human health surveillance (Communicable Diseases Network and Australian Paediatric Surveillance Unit );
- All isolates of verocytotoxigenic *E coli* should be reported to the NEPSS/ NSSS.



#### **4.2 Australian Government Involvement in *Eschericia coli* 0157:H7 outbreak in USA, January 1993**

##### **Experience Gained**

Through this involvement I gained a better understanding of the influence of industry and export trade on food production. I made valuable contacts with animal and food government and non government bodies in Australia. As a result of these contacts the Surveillance and Evaluation unit now receives notification of all food recall actions by the National Food Authority. In the field I experienced one food production process, explored the HACCP principles and the difficulties in protecting food from contamination. The abattoir inspection gave me invaluable experience and a greater appreciation of occupational health and safety risks.

The result of the outbreak in the US has been a significant change in requirements of production of Australian meat for export. The US approach is a "farm to table " approach and includes an education campaign to ensure adequate cooking of food. In addition to "zero tolerance" of contamination , all raw meat and poultry products in the USA are required to be labelled with safe handling instructions. Exported Australian meat to the US must now be labelled;

##### **Safe Handling Instructions**

**This Product was inspected for your safety. Some animal products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection follow these safe handling instructions.**

**Keep refrigerated or frozen. Thaw in refrigerator or microwave.**

**Keep raw [meats or poultry] separate from other foods. Wash working surface including cutting boards, utensils, and hands after touching [ meat or poultry].**

**Cook thoroughly.**

**Refrigerate leftovers within 2 hours.**

#### 4.2 Australian Government Involvement in *Eschericia coli* 0157:H7 outbreak in USA, January 1993

Meat that is intended for overseas export but remains in Australia may remain labelled with safe handling instructions. Inconsistent labelling may lead to confusion in the Australian market. Whilst accepting the pressures of overseas trade and the right of importing countries to apply standards to food, I find it incongruous that different standards apply to the domestic product.



### Section 4.3 Blue Green Algae

In late 1991, a large bloom of Blue Green algae, *Cyanobacteria*, occurred in New South Wales rivers. Concomitantly, Blue Green algae were detected in lakes in Victoria and South Australia. Human health risks, investigation and management alternatives were reviewed in a meeting on 16 December 1991 between representatives from the Health Departments of affected States (i.e. NSW, Vic and SA), the Commonwealth Health Department and scientific researchers. I attended the meeting as the Commonwealth representative.

My initial role in the water outbreak of Blue Green Algae was to provide advice and recommendations to the Commonwealth Department of Human Resources and Health. One Australian report of blue green algal disease was in November 1989 when gastroenteritis and hepatitis was investigated in 139 children and 10 adults in Palm Island Community Qld. A variety of lakes and rivers across Australia have been reported to have episodes of algal blooms. I reviewed the published literature and reviewed papers on the effects on people and water management policies.

Blue Green algae include many species. The most commonly reported are *Anabaena*, *Microcystis*, *Nodularia* and *Oscillatoria*. *Anabaena* may produce a neurotoxin that has not been reported to have affected humans to date. *Microcystis*, *Nodularia* and *Oscillatoria* may produce hepatotoxins and enterotoxins.

The occurrence of Blue Green algal blooms follows a complex combination of :

- nutrients enabling growth , nutrient enriched or eutrophic water;
- water flow, depth of water , stratification of the water column and
- warm temperatures.

### 4.3 Blue Green Algae

Management of a bloom may include the use of algicides, a short term treatment that has been used is copper sulphate. However, this treatment of the algal bloom will not remove toxin presence. On the contrary, if the algal cells have commenced production of toxin, rupture of the cells by copper sulphate will increase the toxin release. Chlorination will have a similar effect on rupture of the blue green algae cells. Granular activated carbon has been shown to remove algal toxins and may be useful for drinking water supplies. The toxins are heat stable and will not be removed from water by boiling. Ongoing surveillance of algal counts and Health warnings to the community to avoid water exposure and ingestion are the probably the most effective current management practices.

One of the difficulties in investigation of human effects of blue green algae is the variety of symptoms that may be associated with ingestion or superficial exposure. Case reports of human effects of blue- green algae include symptoms of;

- skin irritation,
- hay fever like response,
- conjunctivitis,
- mucosal blisters,
- asthma,
- vomiting, diarrhoea, abdominal pain,
- headache,
- arthralgia and
- respiratory distress.

Many of the reports of presumed cyanobacterial poisoning of humans have been criticised because they lacked case definitions and analytical epidemiology.



### 4.3 Blue Green Algae

Following the December meeting, I believed a consistent case definition would be useful for investigation of human effects of algal bloom in Australia. I aimed for a case definition that was high in sensitivity and lacking in specificity. When the disease was better understood, specificity of the case definition could be improved. I developed a draft case definition and forwarded the definition to all States and Territory Health Departments for comment in January 1992. Minor wording recommendations were made by 5 State/Territory Health Departments, one agreed a case definition was desirable but should not be developed until current studies on the health effects were complete and two states did not reply. Following is the proposed definition of Blue Green algae associated illness as at 11 March 1992 incorporating the recommended changes:

### 4.3 Blue Green Algae

A case of Blue Green Algae associated illness is defined as;

A.) a person with the onset of any of the following after contact with water known to contain toxin producing Blue Green algae

1. Eye irritation or conjunctivitis
2. Mouth or lip vesicles/blisters
3. Sneezing, rhinorrhoea conjunctival and pharyngeal itching, obstruction of nasal passages, lacrimation ( hay fever), not experienced in previous seasons.

or

B.) a person with the onset of any of the following after ingestion\* of water from water supplies known to contain toxin producing Blue Green algae.

1. Vomiting or diarrhoea
2. Myalgia
3. Fever, cough and pleuritic chest pain and/or clinical or radiological signs of lower respiratory tract infection.
4. Right upper quadrant abdominal pain, and/or hepatomegally and /or jaundice and/or elevated liver enzymes.

\* The water may be ingested by drinking or accidental ingestion e.g. in recreational pursuits.



### 4.3 Blue Green Algae

I believed further development of the case definition was premature because of the complexity of the definition and the opportunity to await results of ongoing studies.

I have pursued my interest in Blue Green algae with the Australian Society for Microbiology. A well attended symposia was held in Perth 1993 meeting. A large number of water and algal experts presented Australian data on algal outbreaks and management. Unfortunately, the session was attended by few workers in human health.

## Section 4.4 Laboratory reports of Toxoplasmosis, CDI Laboratory "Pathogen Surveillance Scheme" 1986 to 1991

### 4.4.1 Results

During the six year period of surveillance by the CDI Pathogen Scheme, there were 414 reports of positive *Toxoplasma gondii* serologic tests. Ninety one percent of the reports were provided by three laboratories: Fairfield Hospital, Melbourne (22%); Institute of Clinical Pathology and Medical Research (ICPMR) Westmead, Sydney (34%); and State Health Laboratory, Brisbane (34%). Postcode information was not included in this surveillance scheme, therefore further analysis by area is not possible.

An increase in laboratory reports occurred in 1989 (Figure 1). The increase was predominantly reports from ICPMR, Westmead. The reason for this increase cannot be readily ascertained, over half of these reports had no diagnosis coded and eighteen percent mentioned reticuloendothelial disease. Only one report included HIV infection in clinical information.

There was no seasonal trend.

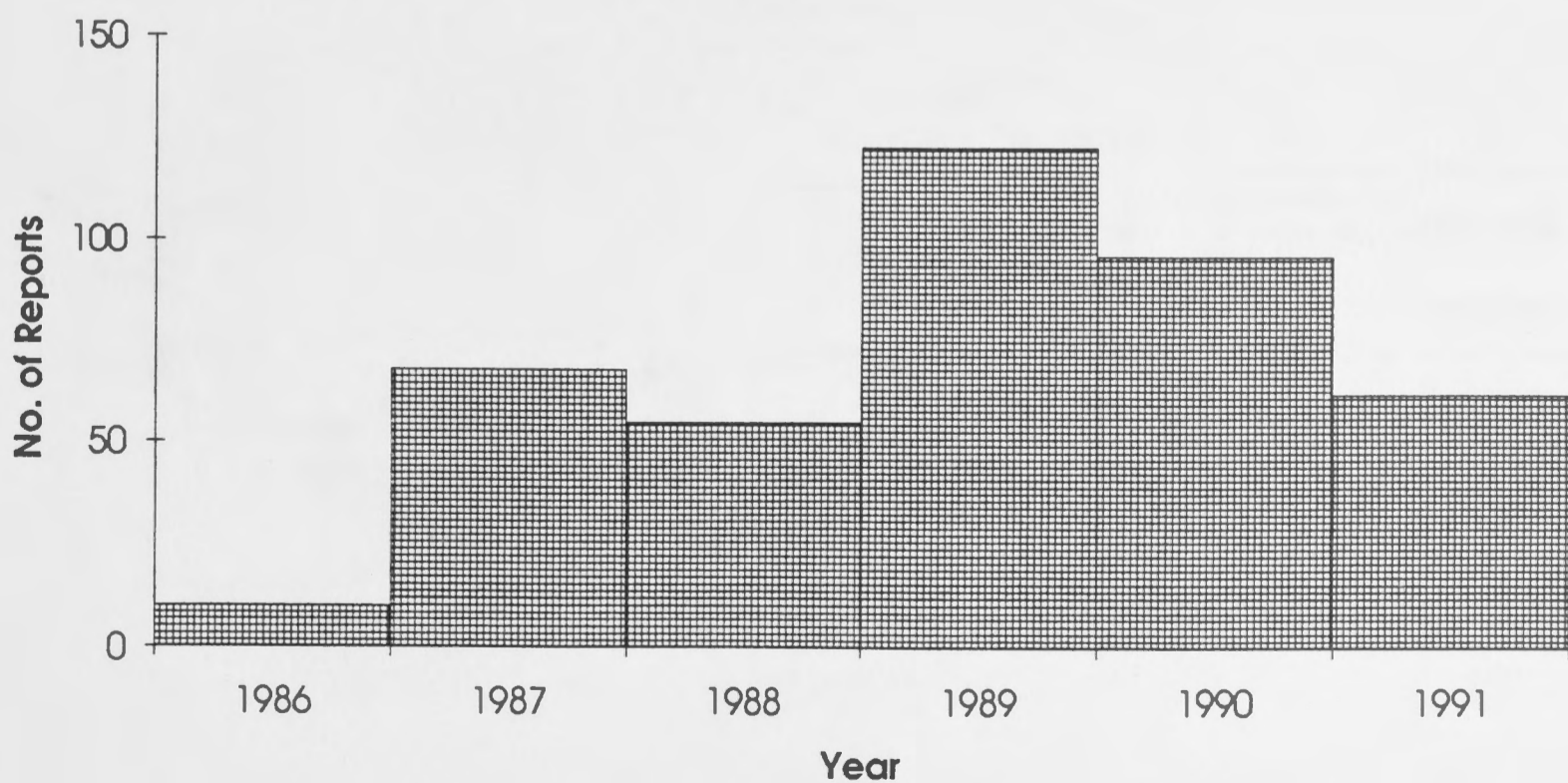


Figure 1: Number of Reports of Serologic evidence of infection with *Toxoplasma gondii*, CDI Laboratory Pathogen Scheme 1986 to 1991



Figure 2: Reports of Serological Evidence of Infection with *Toxoplasma gondii* by Age Group and Sex, CDI Laboratory pathogen Scheme 1986 to 1991

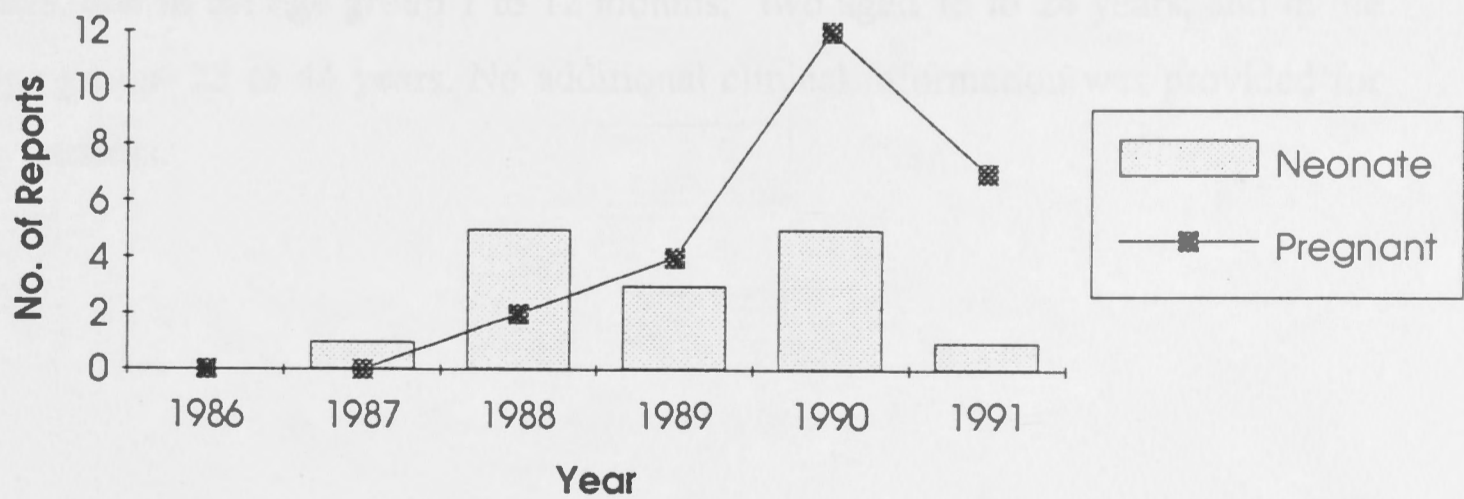
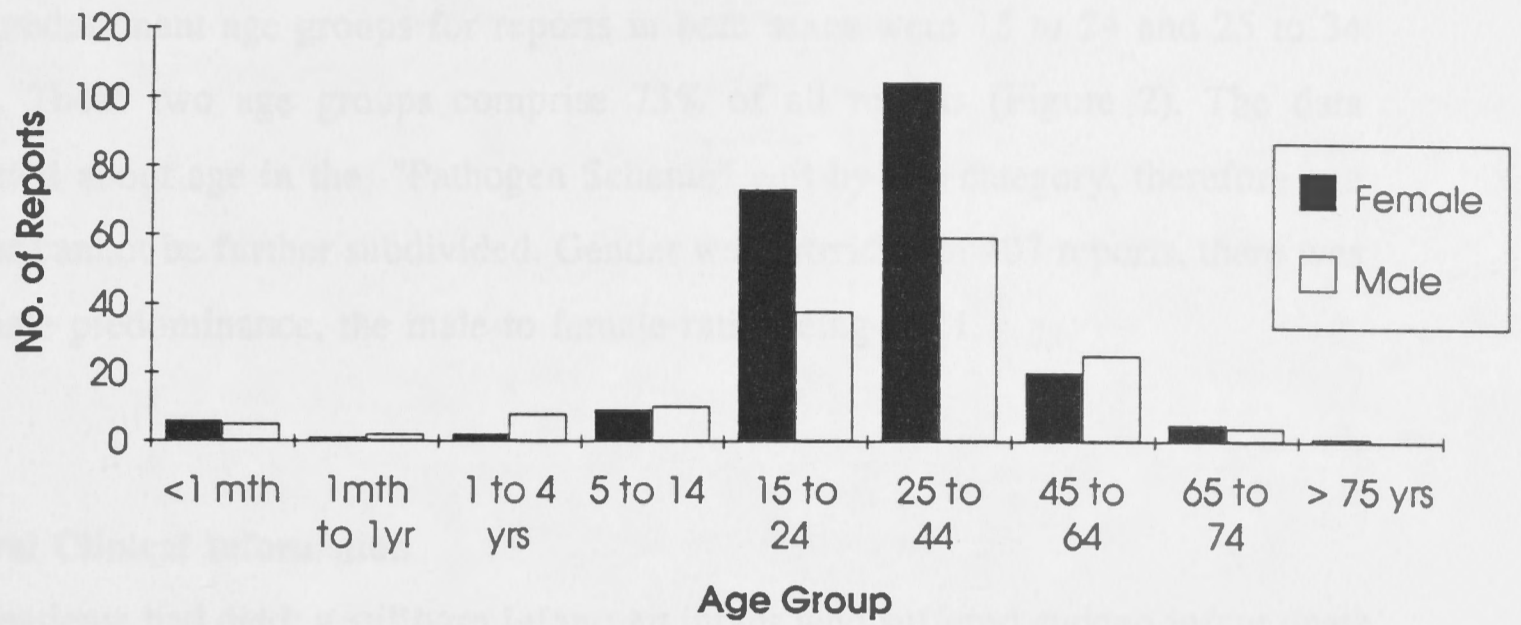


Figure 3: Serologic Evidence of Infection with *Toxoplasma gondii* in 25 Pregnant Women and 15 Neonates, by Year, CDI Laboratory Pathogen Scheme 1986 to 1991

#### 4.4.1 Results

##### Age and Sex

The predominant age groups for reports in both sexes were 15 to 24 and 25 to 34 years. These two age groups comprise 73% of all reports (Figure 2). The data collected about age in the "Pathogen Scheme" was by age category, therefore age groups cannot be further subdivided. Gender was provided in 407 reports, there was a female predominance, the male to female ratio being 0.7:1.

##### General Clinical Information

Four patients had died: a stillborn infant; an infant who suffered sudden infant death (age unknown); a neonate and an 63 year old adult with central nervous system toxoplasmosis. Although codes for clinical diagnosis were included for all reports, 30 percent recorded no diagnosis. In 20 percent reticuloendothelial disease was the clinical diagnosis, 7.5 percent were apparently healthy and 6 percent had only malaise.

##### Congenital Disease

Congenital disease was stated as the clinical diagnosis in seven reports: three neonates, one in the age group 1 to 12 months; two aged 15 to 24 years; and in the one age group 25 to 44 years. No additional clinical information was provided for these patients.



#### 4.4.1 Results

##### **Toxoplasmosis Infection in Pregnant Women**

Analysis of the Pathogen Scheme dataset for pregnancy is difficult, because coding for pregnancy was not provided to the laboratories.

There were 25 reports of infection in pregnancy, identified through comments provided with reports (Figure 3). Other reports of Toxoplasmosis in pregnancy may exist within this data but cannot be identified.

The method of detection was provided in 24 of the reports in pregnant women; in 23 cases the diagnosis was made by IgM Elisa technique , and one diagnosis made by a single high titre by immuno fluorescence.

The clinical information provided for pregnant patients included 5 asymptomatic and one patient with reticuloendothelial disease. Clinical outcome was provided for 5 of the reported infections in pregnancy: 2 stillborn, 1 fetal death in utero, 1 termination for hydrocephalus and 1 neonatal death ( reported also as a neonate). The period of gestation at which Toxoplasmosis was diagnosed was provided for four cases: gestation of 8 , 9, 22 and 25 weeks .

The age group for pregnant women with acute toxoplasmosis was provided for 22 cases: 4 within the age group 15 - 24 years and 18 within the age group 25-44 years.

The ratio of reports by age group of Toxoplasmosis in pregnancy is therefore

1 ( 15 to 24 years ) : 4.5 ( 25 to 44 years).

#### 4.4.1 Results

##### Toxoplasmosis Infection Detected in Neonates

There were 15 reports of serologic evidence of infection in neonates. (Figure 3). Three neonates had a clinical history of congenital disease and three of the reports of Toxoplasmosis in neonates were from overseas patients.

Excluding mild fever, there are 8 reports of affected neonates (Table 1). One reported infection in a neonate was included as an outcome of a reported infection in pregnancy.

The method of detection was provided 14 reports about neonates; IgM Elisa 10 , IgM immuno fluorescence 3, direct antigen detection in CSF by immuno fluorescence one and one unspecified.

Table 1. Clinical Information in 15 Neonates with Serologic Evidence of Infection with *Toxoplasma gondii*., CDI Laboratory Pathogen Scheme, 1986 to 1991

Congenital Disease	3
Central Nervous System Disease	2
Hepatic Disease	1
Gastrointestinal Disease	1
Death *	1
Mild Fever	1
No Clinical Information	6
Total reports	15

\* Report received for infection in pregnancy and neonatal outcome



#### 4.4.1 Results

##### Episodes of Toxoplasmosis Infection during Gestation

There was a total of 39 episodes of infection during pregnancy in the six years; 25 pregnancies and 15 neonates, one duplicate neonate and mother. The morbidity and mortality reported in these 39 episodes were 8 affected neonates and 4 unsuccessful pregnancies.

##### Incidence of Toxoplasmosis

The *CDI* Pathogen scheme data are not national figures. However 91% of reports have been provided by large reference laboratories in the three eastern states.

If the total number of confinements in 1991 for Queensland, NSW and Victoria<sup>1</sup> are used as the denominator, the incidence of infection with Toxoplasmosis during pregnancy in 1991 was 3.6 per 100,000 pregnancies.

The *CDI* Pathogen scheme reports of neonatal Toxoplasmosis in NSW, QLD and VIC in 1990 and 1991 yield an incidence of 1.28 per 100,000 births in the three eastern states.

#### 4.4.2 Discussion

##### **Limitations of Pathogen Scheme Data for Infection during Gestation**

These data do not document the outcome of Toxoplasmosis infections in pregnancy. The ratio of reported affected neonates to reported infections in pregnancy (12:39) cannot be construed as the outcome of Toxoplasmosis in pregnancy. The infections in pregnancy have not been followed to provide outcome reports. Toxoplasmosis infections in neonates may be more likely to have been reported than positive tests in pregnant women.

There are little available Australian data on Toxoplasmosis. Laboratory based data provide limited reliable clinical information. Such data are also restricted to reports of patients on whom serological testing has been performed. The data presented in this article rely on a sentinel laboratory scheme and therefore are not comprehensive national figures of incidence for toxoplasmosis. The ability to draw conclusions from the figure of incidence of 3.6 per 100,000 pregnancies is clearly limited because the reports of Toxoplasmosis infection in pregnancy are incomplete. In addition it is further restricted by estimating numbers of pregnancies from confinements alone, and by the assumption that all pregnant women in the 3 states would have diagnostic specimens sent to the 3 laboratories.

An incidence of neonatal Toxoplasmosis of 1.28 per 100,000 births is a gross underestimate of the incidence, since congenital disease may not be evident in the first month of life and surveillance of the disease is limited. Overseas reports identify an incidence for Congenital Toxoplasmosis to be between 130 to 650 per 100,000 live births<sup>2,3</sup>



#### 4.4.2 Discussion

##### Reports in Older Women

The age specific occurrence of reports of Toxoplasmosis in pregnancy in the *CDI* data are surprising, with a ratio of 1 ( 15 to 24 years ) : 4.5 ( 25 to 44 years). The ratio of confinements in Australian women in these age groups is 1( 24 and under ) : 2.85 (25 to 40 and over )<sup>1</sup> . Older women may be more likely to be tested for Toxoplasmosis; be more likely to present for antenatal care ; be more aware of Toxoplasmosis. Similarly, the medical profession may monitor older pregnant women more actively.

##### Prevention

Acquisition of Toxoplasmosis is by ingestion of matured oocysts and tissue cysts. Only primary infection in a seronegative women is dangerous for the fetus. Prevention may be achieved by:

- education of women at risk,
- allowing natural infection in girls during childhood,
- vaccination of cats, the definitive host and/or
- screening for acute Toxoplasmosis in pregnancy.

Education of women includes advice of precautionary measures during pregnancy: washing hands before eating , care in areas where cats may defecate, and avoidance of eating poorly cooked meat . Primary prevention, by education, has been shown to decrease the seroconversion to *Toxoplasma gondii* in pregnancy by 63 %.<sup>4</sup>

Prevention may be achieved by ensuring women are immune to Toxoplasmosis before entering child bearing years. There is a protective role of primary infection in young girls. One simple way is to allow potential exposure of children (not pregnant women) to oocysts is in gardening and sandpit play.

Vaccination of all cats, to interrupt maturation of oocysts would be difficult to implement and costly .

#### 4.4.2 Discussion

The requirements for a screening program include the availability of; a sensitive test to identify women at risk, specific tests to confirm toxoplasmosis infection in pregnancy and effective treatment. These criteria are met for Congenital Toxoplasmosis, and screening is widespread in some European countries.

However, screening pregnant women in Australia needs to be considered carefully. It is difficult to justify screening for Toxoplasmosis in pregnancy given limited knowledge of the Australian incidence of congenital disease. Screening in pregnancy needs to be performed at frequent intervals because there may be few clinical symptoms. The costs of screening and treating pregnant women falls dramatically when a large proportion of the population are already immune to the disease. When women are immune, or seropositive, no further testing is necessary during the pregnancy. Seropositivity in pregnant women varies between areas, and has been found to be 47 % in Austria, 53% in Belgium, 22% in England and 84 % in France<sup>2</sup>. The high level of immunity in France has been attributed to a dietary preference for eating undercooked meat. Screening programs in Austria have decreased the incidence of prenatal toxoplasmosis from 50 - 70 per 10,000 births in 1975 to 1 per 10,000 births in 1992.

Before screening is instituted in Australia we need more information on the background serological status in Australian women and the incidence of congenital disease. Serological surveys in microbiology laboratories can provide serological status of women of reproductive age. However, laboratory data are inadequate to determine the incidence of congenital disease.



#### 4.4.2 Discussion

##### References

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2. Joynson D H M. Epidemiology of Toxoplasmosis in the U.K., Scand J of Infect Dis - Suppl 84: 65 -69, 1992
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## Section 5 Summary of Practical Epidemiological Experience Gained

### LabDOSS

Establishing a new surveillance system was invaluable experience. I learnt

- how to approach a new scheme,
- the practical issues in development,
- the sensitivities of data ownership,
- how invaluable is the enthusiasm of scientific laboratory staff ,
- how to program a detailed, user friendly data entry system in EpiInfo,
- how to develop a method for easy data extraction,
- how to tailor a system to meet the needs of those providing the data and
- how important this is for a system to work,
- how to analyse surveillance results,
- how to develop analysis programs in EpiInfo,
- methods of presentation of results,
- the limitations of surveillance data and
- how surveillance data may be used to develop and monitor public health interventions.

I developed an appreciation of other surveillance systems: the role of Notifiable Diseases and the difficulties in collection of this data; the National Salmonella Surveillance Scheme; Malaria surveillance; Gonococcal Surveillance; the Australian Paediatric Surveillance Unit and the new National Meningococcal Network..



## 5. Summary of Practical Epidemiological Experience Gained

### Rubella Outbreak

I learnt through this investigation:

- alternative ways to approach a community outbreak,
- how valuable if the information provided by local practitioners,
- the value of a case definition,
- how to collect and analyse data in the field,
- how to appropriately use laboratory tests to establish a diagnosis,
- the value of school based surveillance of absenteeism,
- the resources required to perform an investigation and
- how to arrange public health intervention; use of the media and direct contact with parents of babies considered exposed to measles.

### Child Care

My role with the child care program has been challenging. I have participated in the development of new policy towards a fulfilling program. I have understood the complex nature of the new policy and helped to resolve difficulties in implementation and concerns by a variety of groups including child care workers, health care workers and parents. I have learnt the need for ongoing consultation and development of programs addressing sensitive issues.

### Child Care Centre Investigations and Advice

I believe my practical role with child care in the ACT has been helpful in my understanding of the issues facing the child care program and awareness of "Staying Healthy in Child Care". Many of the questions raised in my work with child care workers were able to be addressed in "Staying Healthy in Child Care".

## **5. Summary of Practical Epidemiological Experience Gained**

### **Child Care**

Through my work in Child Care I gained awareness of the role of the Communicable Diseases Standing Committee (CDSC) and Public Health Committee (PHC) of the NHMRC. I experienced being the secretary, and worker, for a CDSC working group which was to produce a document to improve the health of children in child care settings.

Development of "Staying Healthy in Child Care" required review of literature, development of guidelines, consultation with workers in child care, the general public and health communities. Endorsement of the document by NHMRC council in November was rewarding. I am continuing to learn intricacies of progressing a document from final draft, through professional editing, graphic design, illustrations, printing requirements, marketing, media strategy, and a launch by the Commonwealth Minister/s of Health and/or Family and Children's Services.

### **Sick Care**

My role with the sick care program has been challenging. I have experienced the development of new policy towards a functioning program. I have understood the controversial nature of the new policy and helped to resolve difficulties in implementation and concerns by a variety of groups including union representatives, child care workers, health care workers and parents. I have learnt the need for extensive consultation and slow development of programs addressing sensitive issues.

### **Child Care Centre Investigations and Advice**

I believe my practical role with child care in the ACT has been helpful in my understanding of the issues facing the sick care program and usefulness of "Staying Healthy in Child Care". Many of the questions raised in my work with child care advisers were able to be addressed in "Staying Healthy in Child Care."



## **5. Summary of Practical Epidemiological Experience Gained**

### **E coli 0157:H7**

I attained a better understanding of food borne disease, difficulties in surveillance of food borne illness and the public health opportunities of prevention of food borne disease.

My appreciation of the effects of trade issues on development of policy for Australian exports has also been heightened. I experienced the working conditions in an abattoir and developed a network of contacts with the National Food Authority and Australian Quarantine Inspection Service.

### **Blue Green Algae**

Through my involvement with Blue Green Algae I became aware of the difficulties in establishing surveillance of an illness that is not well understood. I learnt of land and water management policies that may affect development of algal blooms. I learnt of the extensive work performed in Australia on the water conditions enabling growth, documentation of algal blooms, testing of toxins from the blooms. I developed a draft National case definition with input from the States and Territories.

## 5. Summary of Practical Epidemiological Experience Gained

### Management Experience

In March 1993, the AIDS and Communicable Diseases Branch was restructured to four units: Prevention and Care, Strategy and Co-ordination, Education and Surveillance and Evaluation. For a period of 4 months, I acted as Director of the Surveillance and Evaluation Unit. I gained management skills and useful experience by undertaking the following;

- preparing briefs for the Commonwealth Minister of Health,
- preparing responses to ministerial enquiries,
- expanding the Unit to incorporate the AIDS evaluation and developed strategies for ongoing evaluation of AIDS and other programs,
- planning expansion of surveillance functions of the Unit,
- supervising 11 staff,
- undertaking recruitment action to ensure the Unit's functions were progressed effectively;
- managing Unit finances and
- attending training programs for new managers.



## 5. Summary of Practical Epidemiological Experience Gained

### Other Experience

I presented the following papers at scientific meetings;

- **Proposal of a New Surveillance Scheme** , PHA Melbourne, ASM  
Gold Coast 1991;
- **LabDOSS 1992 data** ASM Perth, September 1993;
- **Staying Healthy in Child Care and the Sick Care Program**  
PHA Sydney, October 1993

I played an ongoing role in the production of the *CDI* ; preparation of surveillance reports, review of articles submitted for publication and provided written editorial comments.

Overseas travel advice for communicable diseases was provided on a roster basis by the medical officers in the Communicable Diseases Section in 1991 and 1992.. For the first 18 months of my placement I gave overseas travel advice over the telephone for half a day every week.

I regularly attended meetings of the ACT Consultative Committee of Communicable Diseases as the Commonwealth Department of Health representative.

I am grateful for the experience of a Masters of Applied Epidemiology placement in the Commonwealth Department of Human Resources and Health. I enjoyed working as part of the sections multidisciplinary team and valued being part of a wider public health network.