

Neonatal Services Review

December 1998

Contents

[Executive Summary](#)

[Findings](#)

[Conclusions and Recommendations](#)

[Background](#)

[Methods](#)

[Findings](#)

[NICUs \(level 3 Nurseries\)](#)

[SCNs \(Level 2 Nurseries\)](#)

[Casemix Funding](#)

[Conclusions and Recommendations](#)

[Capital and Operating Resources](#)

[Collaboration between Nurseries](#)

[Babies at Risk](#)

[Medical and Nursing Workforces](#)

[Prevention of Prematurity](#)

[Evaluation of Outcomes of Neonatal Intensive Care](#)

[Tables and Figures](#)

Table 1. [Metropolitan and country Local Government Areas with largest numbers of births in 1997-98 and proportional changes since 1995/96](#)

Table 2. [Babies of drug dependent mothers delivered in Victorian public hospitals: 1997-98](#)

Table 3. [Number of days per quarter on which combined Victorian NICU occupancy exceeded permanently staffed capacity \(42 cots\)](#)

Table 4. ["Overflow" transfers from Level 3 neonatal units \(NICU\): 1993 -98](#)

Table 5. [Births in public hospitals in 1997-98 and changes since 1995-96](#)

Figure 1. [Proportion of Live Born ELBW Babies Surviving more than 28 Days after Delivery 1989-96](#)

Figure 2. [Post Natal LoS in Victorian Hospitals \(Public & Private\) 1992-96](#)

Figure 3. [Payment Category of Women Delivered in Victorian Hospitals 1994-95/1997-98](#)

Figure [NICU "Overflow" Transfers 1993-98](#)
4.

[Next](#) >

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December 1998

Executive Summary

This report has been prepared following on-site meetings or video conferences with medical, nursing and administrative staff of the four Victorian neonatal intensive care units, the Newborn Emergency Transport Service (NETS) and the eighteen special care nurseries located in suburban and country Victorian public hospitals and discussions with representatives of metropolitan Health Care Networks, the Faculty of Paediatrics of the Royal Australasian College of Physicians, the Australian College of Midwives, the Centre for the Study of Mothers' and Children's Health and officers in the Acute Health, Public Health and Youth & Family Services Divisions and rural regional offices of the Department of Human Services.

It reviews the resources and utilisation of Victoria's neonatal intensive care and public special care nurseries, identifies problems and issues associated with their operation and proposes measures to optimise and improve the services they provide. It does not provide detailed costings of the proposals made.

Findings

- Since the last review of neonatal services seven years ago, the workload of both neonatal intensive care units (NICUs) and special care nurseries (SCNs) has increased steadily. While the introduction of casemix funding in 1994/5 has allowed a more flexible response to increased demands, NICUs are now working consistently beyond their notional, that is, permanently staffed, capacity on an average of one day in three and, on occasions, are forced to transfer babies between NICUs .
- The number of these "overload" transfers of babies between NICUs has increased. To free up cots and avoid such transfers, NICUs have increasingly made use of SCNs, transferring improving babies to nurseries near to their homes. With increased expertise SCNs have been able to provide increasing back-up to NICUs, but on occasions have had to refuse or defer such down-transfers, either because of increases in their intrinsic workloads or because of resource constraints.
- The major reasons for the increase in demand for specialised neonatal care are the increased survival of very tiny babies, brought about by improvements in obstetric and neonatal management; an increase in pre-term births and low birth weights, associated with assisted conception and with smoking among pregnant women and the emergence of chemical dependency complicating pregnancy.
- In areas of rapid population growth, notably the outer suburbs of Melbourne, hospitals are finding it difficult to cope with both the increased numbers of births in their catchments and the increased intensive and special care needs. In some cases this is because allocated funds have not matched the growth in demand (Angliss and Northern Hospitals and Monash Medical Centre); elsewhere, expansion is constrained by limitations of nursery facilities and equipment (Sunshine, Werribee Mercy and Ballarat Base). Dandenong Hospital is limited by of the size of its obstetric unit. If this were upgraded, the hospital would be better able to meet local demand, but its SCN would also require growth funding.
- The major concerns of country hospitals were with their medical and nursing workforce. Because they do not have paediatric registrars, the medical care of sick neonates is the sole responsibility of visiting paediatricians, who may be required to work long periods

without a break. The midwife workforce is ageing, because fewer students are entering training and because career opportunities are better in the metropolitan hospitals.

- The occupancies of some SCNs were inflated by admissions of inborn babies for relatively minor conditions that might safely be treated at the mother's bedside and by readmissions for the establishment of lactation, following discharge home.

Conclusions and Recommendations

- To maximise the use of existing resources, recommendations have been made to effect redistribution of casemix funding to better match demands for neonatal services, and to provide capital funding to improve some nursery facilities.
- It is not expected, however, that these measures will be sufficient to enable nurseries to meet the increased demands being made on them, particularly in the outer Melbourne suburbs. Accordingly, it has been recommended that the Department of Human Services also assess the need for growth funding to meet any shortfall.
- Both levels of nurseries now work increasingly as a unified system, but even closer collaboration should lead to a more efficient system overall, and a more seamless delivery of care. Recommendations have been made to facilitate this, by encouraging the development of professional links between each Level 2 nursery and a Level 3 unit and by establishing a Neonatal Services Advisory Committee to advise the Department on the provision of neonatal care in Victoria.
- Two groups of babies at particular risk have been identified during this review; -babies who, with their mothers, have been discharged from hospital before lactation has been established and babies of mothers with chemical dependency. Recommendations towards ensuring their optimal management have been made.
- To improve medical specialist cover where workloads are increasing, recommendations have been made for the relevant hospitals to review their paediatric registrar training programs and their medical specialist appointments and to consider the establishment of mixed hospital/community based trainee rotations in selected country cities.
- The ageing of the midwife workforce is of particular concern and it has been recommended that this be drawn to the attention of the Ministerial Advisory Committee on Nursing. It has also been recommended that the Ministerial Nurse Practitioner Taskforce be requested to consider the development of a neonatal nurse practitioner model to improve career opportunities for neonatal nurses. The neonatal nurse practitioner could also reduce the level of medical cover required in both intensive and special care nurseries.
- Since the only foreseeable brake on the increasing cost of specialised neonatal care will be a reduction in the incidence of prematurity, and since smoking in pregnancy is known to be associated with an increased likelihood of pre-term birth, it has been recommended that interventions which are effective in cessation of smoking in pregnancy be encouraged and supported.
- Finally, a recommendation has been made for the continued and extended evaluation of babies receiving neonatal intensive care to evaluate their management and long-term outcome.

Recommendations

Two premises have underpinned the recommendations which follow. They are:

- that Victorian babies should receive the highest possible standard of care in the most appropriate facility nearest their home;
- that, to achieve this aim, all Victorian neonatal services should work as a collaborative whole.

To these ends, it is recommended:

1. that the Department of Human Services, in consultation with metropolitan Health Care Networks, effect a redistribution of casemix funding to hospitals with neonatal and special care units, to match better the current and projected demand for neonatal services, including those in outer metropolitan areas with rapid population growth. Urgent attention should be given to the Angliss, Dandenong and Northern Hospitals and the Monash Medical Centre.
2. that planning for the proposed relocation of the Mercy Maternity Hospital take into account the rapid population growth which is occurring in its future catchment.
3. that capital funding be provided towards:
 1. remodelling and re-equipment of Monash Medical Centre and Sunshine Hospital nurseries;
 2. expansion of Dandenong Hospital delivery and post-natal facilities;
 3. expansion of Werribee Mercy and Ballarat Base Hospital nurseries.
4. that the review of neonatal casemix funding to be undertaken for the Acute Health Division of the Department of Human Services address the issues of:-
 1. the increasing complexity of neonatal intensive and special care services; and
 2. the costs incurred by country hospitals in stabilising and transferring neonates to metropolitan Level 3 units.
5. that, in conjunction with the above recommendations, the Department of Human Services assess the additional growth funding that will be required to enable neonatal intensive and special care services to meet fully the increased demands being made on them.
6. that each Special Care Nursery outside the Women's & Children's and Southern Health Care Networks develop professional links with a Level 3 neonatal unit, to exchange information, advice and assistance on educational and clinical management issues which affect the collaborative operation of the two levels of specialised neonatal care in Victoria.
7. that the Department of Human Services' NETS Advisory Committee be replaced by a Neonatal Services Advisory Committee, with representation from Level 3 and Level 2 (suburban and country) nurseries and NETS, to advise and assist the Department in the provision of the best possible standard of neonatal care to Victorian babies, in the most cost-effective way, in the most appropriate facility nearest to their home. The Committee's terms of reference should cover issues of data collection, clinical management, resource allocation, research and evaluation.
8. that the Department of Human Services encourage and facilitate joint initiatives between hospitals with Special Care Nurseries and Maternal and Child Health Services to develop joint domiciliary and community based programs to assist mothers who are having difficulty in establishing and maintaining lactation following discharge from hospital.
9. that hospitals monitor the incidence of chemical dependency among the women presenting to them for antenatal care and, where numbers justify it, consider, in consultation with the Royal Women's Hospital Chemical Dependency Unit, the establishment of an on-site maternal chemical dependency unit. In designing such a unit, special attention should be given to social work requirements and linkages with Child Protection Services.

10. that the needs of mothers having difficulty in establishing lactation following discharge from hospital and of chemically dependent mothers and their babies be given particular attention in the development of the Department of Human Services' Maternity Services Enhancement Strategy.

11. that the Department of Human Services request the Women's & Children's and Southern Health Care Networks to review the rotations in their joint paediatric training program to determine whether:

1. the number of rotations to neonatal intensive care (Level 3) nurseries can be reduced and so provide registrar cover to outer suburban paediatric units with rapidly increasing demands for Level 2 neonatal care;
2. some shift of registrars from suburban hospitals with decreasing neonatal and paediatric workloads to those with increasing workloads is possible.

12. that, in conjunction with the previous recommendation, the Department of Human Services encourage and facilitate joint initiatives from hospital and community health services, in selected country cities, for the establishment of a mixed hospital/community based advanced trainee rotation from the Royal Children's Hospital.

13. that, in conjunction with recommendation 10, the Women's and Children's and Southern Health Care Networks review jointly the requirements for medical specialist cover for their neonatal intensive care units and for the Victorian Newborn Emergency Transport Service.

14. that the Ministerial Nurse Practitioner Task Force be requested to consider including neonatal care settings in both metropolitan and rural locations when developing Nurse Practitioner models.

15. that the attention of the Ministerial Advisory Committee on Nursing be drawn to the nurse workforce issues, particularly the ageing of the midwife workforce, identified in this review, and the Committee be requested to advise on strategies to address them, including the re-establishment of student bursaries.

16. that country hospitals and Level 3 neonatal care units be encouraged to develop, jointly, proposals for special care nurse training courses, to be funded from the Department's Continuing Education Grant. These courses should be arranged at mutually suitable times, and as far as possible, be regionally based. Where appropriate, credit for the course towards a postgraduate diploma or degree should be sought from the relevant universities.

17. that the Department of Human Services encourage hospitals to develop, in collaboration with QUIT, interventions aimed at cessation of smoking among women to whom they are providing antenatal care.

18. that the Royal Women's Hospital, the Royal Children's Hospital, the Mercy Maternity Hospital and the Monash Medical Centre consider jointly:

- i. extending their collaborative follow-up of low birth weight babies who have received neonatal intensive care; and
- ii. including in it neonates who have undergone major surgery.

Neonatal Services Review

December 1998

Background

Since the last review of Victorian neonatal services, seven years ago, a number of changes have occurred in clinical practice, medical technology and the management, funding and geographic distribution of Victorian public hospitals. During this time, medical advances, notably the use of exogenous surfactant and improvements in mechanical ventilation, have resulted in significantly higher survival rates among neonates, especially extremely small and very premature babies. This has thrown additional work on the neonatal intensive care and special care nurseries which care for these babies.

In response, in August 1998 the Department of Human Services (DHS) requested that a review of Victorian neonatal services be carried out, with the following aim:

To assess the ability of existing structures and resources to meet current and future demand for neonatal care of an appropriate standard, and make recommendations for system improvements.

The scope of the review was defined as follows:

To investigate and assess the ability of the current neonatal care system to meet projected future needs for the provision of neonatal care services. This should include investigation of bed and unit numbers and bed availability; investigation of ways to improve statewide coordination, especially the management of "step-down" from level three to level two hospitals; any matters arising from current hospital funding arrangements and administrative practices; and standards, including staff resources and equipment.

Methods

This report has been prepared following on-site consultations or video-conferences with medical and nursing staff of the four metropolitan neonatal intensive care units (NICUs), the Newborn Emergency Transport Service (NETS) and the eighteen special care nurseries (SCNs), approved under the Health Insurance Act 1973, in metropolitan and country public hospitals in Victoria; meetings with representatives of the Women's & Children's and Southern Health Care Networks, DHS Rural Regional Offices, the Faculty of Paediatrics of the Royal Australasian College of Physicians, the Australian College of Midwives and the Centre for the Study of Mothers' and Children's Health; and discussions with DHS officers in the Department's Acute Health, Public Health and Youth & Family Services Divisions.

Information has been sought about the extent and nature of nursery workloads, facilities and equipment, medical and nursing cover, continuing professional education, relationships between individual SCNs and NICUs and funding issues. This has been complemented by data obtained from the consolidated VIMD files held by DHS.

Private hospitals with SCNs were not visited. Detailed analyses of patient data were not requested from individual public hospitals, given that their internal information systems were not always compatible with each other. Several nurseries did, however, provide detailed and

valuable information about their operation.

Findings

Since the last review of neonatal services, in 1991, a number of changes have affected the operation of NICUs and SCNs in Victoria, the most significant of these being:

- a shift of major growth areas with high birth-rates to the outermost metropolitan suburbs ([Table 1](#));
- an increase in the proportion of pre-term births from 6.1% of all births in 1992 to 6.7% in 1996, in part explained by increases in the use of assisted conception and in the frequency of smoking in pregnancy;
- advances in obstetrical and neonatal management, particularly the introduction of exogenous surfactant in 1991-2 and improvements in mechanical ventilation, resulting in increased survival especially of very tiny, very premature babies ([Figure 1](#));
- the emergence of numbers of mothers with chemical dependency, whose babies may require prolonged periods of inpatient detoxification ([Table 2](#));
- introduction of casemix funding, allowing greater flexibility of staffing;
- improvements in staffing and expertise of SCNs, especially in rural hospitals, enabling them to care for smaller, sicker babies;
- earlier discharge of mothers and babies from hospital following delivery ([Figure 2](#));
- decrease in numbers of mothers with private health insurance ([Figure 3](#));
- introduction of College-based nursing;
- increase in parental and community expectations.

The increase in the numbers of premature babies, despite a static overall birth rate and the emergence of numbers of chemically dependent mothers (approximately one in two hundred confinements in 1997/8) have substantially increased the workload of both levels of nursery. However, the introduction of casemix funding has allowed them, initially at least, a more flexible response to these increases.

NICUs and SCNs have always worked in cooperation, aiming to provide as far as possible the most appropriate level of care for sick babies as close as possible to the baby's home. The increased capabilities of SCNs have enabled them both to accept down-transfers of improving babies from NICUs earlier and to care for smaller, more premature inborn babies themselves, instead of referring them on to NICUs. This has, to some extent, relieved the load on NICUs, but at the same time it has made them more closely dependent on the capacities of the SCNs to act as a safety valve in times of acute overload.

While the underlying reasons for the increase in workload are largely common to all nurseries, the issues affecting their ability to respond differ somewhat, between NICUs and SCNs and between suburban and rural SCNs.

NICUs (Level 3 nurseries)

The major increase in the workload of the NICUs is a consequence of the increased survival of very premature babies weighing less than 1000g at birth. Such babies can require upwards of seven weeks of intensive care, followed by a further two months of special care.

The four level 3 neonatal units at the Royal Women's Hospital, the Mercy Hospital for Women, the Monash Medical Centre and the Royal Children's Hospital provide between them a notional

pool of 42 permanently staffed cots for neonates requiring intensive care including cardio-respiratory support. Twelve are located at the Royal Women's Hospital, ten at the Mercy Hospital for Women, eleven at the Monash Medical Centre and nine at the Royal Children's Hospital. The cots at the Royal Children's Hospital are kept primarily for neonates requiring surgery or highly specialised respiratory support, but they also provide back-up support to the three maternity hospital nurseries.

With the increase in demand for intensive care, the number of days on which the notional pool capacity has been exceeded has increased over the past four years, to the extent that more than 42 babies now occupy intensive care cots on at least one day in three ([Table 3](#)).

When an individual nursery's notional cot capacity is exceeded, its ability to respond can vary, because additional nursing staff cannot be found, because they cannot be afforded or because of space and /or equipment constraints: -

Royal Women's Hospital: can encounter difficulties in obtaining additional nursing staff, especially during school holidays and 'flu epidemics.

Mercy Hospital for Women: space is the major limitation; sometimes difficulty in obtaining or financing additional staff;

Monash Medical Centre: major limiting factor is finance, but expansion is also limited by space and equipment constraints.

Royal Children's Hospital: response may be limited by competing demands from other sub-specialties for intensive care.

When an individual maternity hospital nursery's capacity to expand is exceeded for any of the above reasons, a transfer which would otherwise not take place must be arranged. There has been a progressive increase in such "overload" transfers over the past three years, after an initial fall in 1995 following the introduction of casemix funding ([Table 4](#); [Figure 4](#)).

To free up cots and avoid such "overload" transfers, NICUs have increasingly made use of SCNs, transferring down improving babies to nurseries near to their homes. Some SCNs have, however, been obliged to refuse or defer such down-transfers, because of increases in their own intrinsic workloads or because of staffing or funding constraints.

SCNs (Level 2 nurseries)

SCN workloads have increased in amount and intensity over the past five to seven years, for a variety of reasons:

- in some outer suburban hospitals, there have been large increases in numbers of births because of local population growth ([Table 5](#)). The hospitals most affected are the Angliss, Dandenong, Northern and Werribee Mercy Hospitals. In the country, there have been less spectacular increases in numbers of births at the Ballarat Base, Bendigo, Geelong, Goulburn Valley and Wodonga Hospitals;
- numbers of chemically dependent mothers are increasing in many communities. The Royal Women's Hospital operates a specialised unit for mothers with chemical dependence and their babies, but not all mothers living outside the inner metropolitan are often not willing or able travel to this unit. The Frankston and Geelong Hospitals have identified a need to provide a local service for these

women;

- with increasing expertise, SCNs are increasingly able to care for smaller, more premature babies born in their hospitals and to accept return transfers of younger and smaller babies;
- fewer mothers are privately insured and even those who are insured for delivery may not have cover for special care of their babies.

The capacity of individual SCNs to respond, in the face of increased workloads, to requests for down-transfer of improving babies from the NICUs may be limited by one of several factors.

Suburban SCNs

In suburban SCNs the main reasons are funding constraints and limitations of physical space.

The Angliss, Dandenong and Northern Hospital SCNs are limited by the level of operational funding allocated to them. The throughput of the Dandenong Hospital nursery is also limited primarily by the size of the hospital's obstetric unit. Given an increase in midwifery beds, the hospital would be able to meet local demand more effectively, and fewer mothers would need to go outside the area for care. However, an increase in the size of the midwifery unit would require an increase in operational funding to the SCN.

The SCNs at Werribee Mercy and Sunshine Hospitals are unable to expand to meet current or projected demands adequately because of space constraints. Equipment at the Sunshine Hospital also requires upgrading.

Country Hospital SCNs

With one exception, country hospitals SCNs are able to cope with their increases in their workload. The exception, the nursery at Ballarat Base Hospital, is unable to expand because of its physical layout.

The major concerns of country SCNs lie with their medical and nursing workforce. With the exception of Geelong, country hospitals do not have paediatric registrars. Consequently, the medical care of sick neonates is solely the responsibility of the visiting paediatricians, who may be required to work for long stretches without a break, particularly when stabilising and maintaining neonates awaiting transfer to a level 3 hospital.

In general, country hospitals did not have difficulty in retaining nursing staff to work in their SCNs. They were concerned however, about the ageing of their midwife workforce, many of whom can be expected to retire during the next decade. Difficulties in recruiting younger staff to replace them were related partly to the high cost of undergraduate and post-graduate College-based training and partly to the attraction of younger graduates to city hospitals.

Country midwives expressed satisfaction with the NETS continuing education courses, but were critical of the high cost and often inconvenient timing of some city-based courses. The special care nursing course based at the Royal Women's Hospital and held during the summer holidays was unpopular because of the high cost of accommodation and the difficulties of making alternative family arrangements at this time. As well, this course, unlike those offered by the NETS Education courses, does not attract credit towards a post-graduate degree or diploma.

SCN Admission Policies

Analysis of VIMD data revealed wide variations between hospitals in the proportion of inborn babies being admitted to SCNs following delivery. Some of these differences may be related to differences in recording procedures, but they also suggest a lack of conformity between nurseries in admission policies. It was evident that some babies with very minor conditions which could be safely treated at the mother's bedside were nevertheless being admitted to the nursery.

It was also apparent that significant numbers of babies were being re-admitted to hospital for establishment and assessment of lactation and possibly for other conditions that might alternatively be managed at home. Not all these re-admissions were to special care nurseries, some babies were accommodated in paediatric units and some attended special day-care clinics.

Casemix funding

All the nurseries that were visited were generally supportive of casemix funding, but expressed concerns specific to neonatal intensive and special care. It was felt that neonatal practice was continually changing, becoming more, rather than less, intensive and complex. This, combined with the small numbers of patients, and the heterogeneity of conditions with widely divergent lengths of stay, make it difficult to obtain accurate, up-to-date clinical costings.

Transfers were considered to create particular problems for funding for neonatal care. Transfers break otherwise single episodes of care in multiple, shorter episodes, artificially lowering average lengths of stay and costs. This can result in a hospital which provides all necessary care on one site being penalised. In addition, country hospitals were concerned that the high cost of transferring sick neonates to city hospitals were nowhere reflected in the payments they received.

There was concern as well, in hospitals which were experiencing increased demands in a number of areas, that neonatal care was obliged to compete for casemix funding with other specialties. It was pointed out that neonatal care was an obligatory, not a discretionary service, with fluctuations in demand beyond the control of the service.

< [Previous](#) | [Index](#) | [Next](#) >

Neonatal Services Review

December 1998

Conclusions and Recommendations

Two premises should underpin any recommendations made on the provision of neonatal care. They are:

- o that Victorian babies should receive the highest possible standard of care in the most appropriate facility nearest their home;
- o that, to achieve this aim, all Victorian neonatal services should work as a collaborative whole.

Capital and operating resources

Assessment and evaluation of the capacity of the Victorian neonatal services to meet current and future needs were limited by a lack of standardised internal information systems in the nurseries that were visited. Despite this, there is clear evidence of increased workloads, to the extent that nurseries are experiencing difficulties in maintaining their high standards of care, particularly in managing babies as close as possible to their homes, avoiding "overload" transfers and expediting down transfers of improving babies from Level 3 to Level 2 nurseries.

Some improvement in their overall efficiency can be achieved by redistribution of resources to match better the current and projected demands for services, especially those in outer metropolitan areas with rapid population growth. A review of neonatal casemix funding, which is to be undertaken for the Department in the near future, may increase payments for neonatal care, given its increasing complexity and cost.

Allocation of capital funds to overcome limitations of obstetric facilities at Dandenong Hospital, and nursery space and equipment at Monash Medical Centre and Ballarat Base, Sunshine and Werribee Mercy Hospitals will allow better response to demand at these hospitals, but may increase operating requirements.

Despite these measures, some growth in funding is likely to be required to achieve adequate expansion of intensive neonatal care services, particularly at Monash Medical Centre, and special care at the Angliss and Northern Hospitals. As well, in planning for the relocation of the Mercy Hospital to the northern suburbs it will be necessary to take into account the rapid population growth that is occurring in its future catchment.

It is therefore recommended:

1. that the Department of Human Services, in consultation with metropolitan Health Care Networks, effect a redistribution of casemix funding to hospitals with neonatal and special care units, to match better the current and projected demand for neonatal services, including those in outer metropolitan areas with rapid population growth. Urgent attention should be given to the Angliss, Dandenong and Northern Hospitals and the Monash Medical Centre.

2. that planning for the proposed relocation of the Mercy Maternity Hospital take into

account the rapid population growth which is occurring in its future catchment.

3. that capital funding be provided towards:

- 1. remodelling and re-equipment of Monash Medical Centre and Sunshine Hospital nurseries;*
- 2. expansion of Dandenong Hospital delivery and post-natal facilities;*
- 3. expansion of Werribee Mercy and Ballarat Base Hospital nurseries.*

4. that the review of neonatal casemix funding to be undertaken for the Acute Health Division of the Department of Human Services address the issues of:-

i) the increasing complexity of neonatal intensive and special care services; and

ii) the costs incurred by country hospitals in stabilising and transferring neonates to metropolitan Level 3 units.

5. that, in conjunction with the above recommendations, the Department of Human Services assess the additional growth funding that will be required to enable neonatal intensive and special care services to meet fully the increased demands being made on them.

Collaboration between nurseries

Because both levels of nurseries now work increasingly as a unified system, they must be considered together in any review of their operation. Already they are working increasingly in collaboration, with Level 3 units providing mentoring to Level 2 nurseries and Level 2 nurseries increasingly able to accept down transfers of younger and smaller babies.

Further and closer collaboration between the two levels of nurseries should lead to a more efficient system overall and a more seamless delivery of care. With standardisation of clinical management policies, inappropriate admissions to special care nurseries would be minimised and their capacity to care for sicker babies enhanced.

Collaboration would be facilitated by the development of professional links between each SCN and a Level 3 unit, and by the establishment of a Neonatal Services Advisory Committee to advise and assist DHS in the provision and review of neonatal care. The terms of reference of this Committee should cover issues of data collection, clinical management, resource allocation, research and evaluation.

It is therefore recommended:

6. that each Special Care Nursery outside the Women's & Children's and Southern Health Care Networks develop professional links with a Level 3 neonatal unit, to exchange information, advice and assistance on educational and clinical management issues which affect the collaborative operation of the two levels of specialised neonatal care in Victoria.

7. that the Department of Human Services' NETS Advisory Committee be replaced by a Neonatal Services Advisory Committee, with representation from Level 3 and Level 2 (suburban and country) nurseries and NETS, to advise and assist the Department in the provision of the best possible standard of neonatal care to Victorian babies, in the most

cost-effective way, in the most appropriate facility nearest to their home. The Committee's terms of reference should cover issues of data collection, clinical management, resource allocation, research and evaluation.

Babies at Risk

Two groups of babies at particular risk have been identified during this review. They are those babies who, with their mothers, have been discharged from hospital before lactation has been established, and babies of mothers with a chemical dependency.

With the progressive reduction in length of stay in public hospitals, many mothers are now discharged before lactation is established. The numbers of readmissions of neonates with feeding problems indicates that lactation is not always being established successfully at home. Given improved coordination of hospital and community domiciliary resources, these problems might be managed better at home, with less disturbance to both mothers and babies and with reduced demand on SCN resources.

At present, approximately one in two hundred of all women delivered in public hospitals in Victoria have chemical dependence and it is unlikely that this incidence will fall in the immediate future. These babies and their mothers require specialised medical and nursing care and social support, and the Royal Women's Hospital has played a pioneer role in developing services for them. The problem of drug dependence is not confined to the inner city, however, and drug dependent women are likely to be less able than others to travel long distances for antenatal and post-natal care. Thought must be given, therefore, to establishing peripheral units, for the management of women with chemical dependence and their babies, where the need is demonstrated.

It is therefore recommended:

8. that the Department of Human Services encourage and facilitate joint initiatives between hospitals with Special Care Nurseries and Maternal and Child Health Services to develop joint domiciliary and community based programs to assist mothers who are having difficulty in establishing and maintaining lactation following discharge from hospital.

9. that hospitals monitor the incidence of chemical dependency among the women presenting to them for antenatal care and, where numbers justify it, consider, in consultation with the Royal Women's Hospital Chemical Dependency Unit, the establishment of an on-site maternal chemical dependency unit. In designing such a unit, special attention should be given to social work requirements and linkages with Child Protection Services.

10. that the needs of mothers having difficulty in establishing lactation following discharge from hospital and of chemically dependent mothers and their babies be given particular attention in the development of the Department of Human Services' Maternity Services Enhancement Strategy.

Medical and nursing workforces

Some redistribution of the medical specialist and registrar workforce in response to changes in the overall pattern of work will be needed to ensure continuing high standards of neonatal care. This must take account of the increasing demands for neonatal intensive care, including NETS, and the increasing level of care being provided in special care nurseries, as well the

changing requirements and opportunities for paediatric specialist training.

It is therefore recommended:

11. that the Department of Human Services request the Women's & Children's and Southern Health Care Networks to review the rotations in their joint paediatric training program to determine whether:

i) the number of rotations to neonatal intensive care (Level 3) nurseries can be reduced and so provide registrar cover to outer suburban paediatric units with rapidly increasing demands for Level 2 neonatal care;

ii) some shift of registrars from suburban hospitals with decreasing neonatal and paediatric workloads to those with increasing workloads is possible.

12. that, in conjunction with the previous recommendation, the Department of Human Services encourage and facilitate joint initiatives from hospital and community health services, in selected country cities, for the establishment of a mixed hospital/community based advanced trainee rotation from the Royal Children's Hospital.

13. that, in conjunction with recommendation 10, the Women's and Children's and Southern Health Care Networks review jointly the requirements for medical specialist cover for their neonatal intensive care units and for the Victorian Newborn Emergency Transport Service.

The ageing of the midwife workforce, related partly to the cost of College-based training and partly to the lack of good career paths for midwives and nurses who specialise in neonatal care, is of major concern and strategies to avert the expected shortfall in the future are required urgently. Two options which have been proposed in the course of this review are the reintroduction of training bursaries for undergraduates and post-graduates and the development of a neonatal nurse practitioner model to improve career opportunities for neonatal nurses. The neonatal nurse practitioner could also reduce the level of medical cover required in both intensive and special care nurseries.

It is therefore recommended:

14. that the Ministerial Nurse Practitioner Task Force be requested to consider including neonatal care settings in both metropolitan and rural locations when developing Nurse Practitioner models.

15. that the attention of the Ministerial Advisory Committee on Nursing be drawn to the nurse workforce issues, particularly the ageing of the midwife workforce, identified in this review, and the Committee be requested to advise on strategies to address them, including the re-establishment of student bursaries.

A further concern for nurses working in country special care nurseries was the difficulties they experienced in ensuring that their skills were adequately maintained and updated. They were particularly critical of the high cost and sometimes inconvenient timing of city-based continuing education courses. While recognising that certain skills and experience could only be gained in high-volume nurseries, they felt that there was scope for de-centralisation.

It is therefore recommended:

16. that country hospitals and Level 3 neonatal care units be encouraged to develop, jointly, proposals for special care nurse training courses, to be funded from the Department's Continuing Education Grant. These courses should be arranged at mutually suitable times, and as far as possible, be regionally based. Where appropriate, credit for the course towards a postgraduate diploma or degree should be sought from the relevant universities.

Prevention of Prematurity

The only foreseeable brake on the increasing cost of specialised neonatal care will be a reduction in the incidence of prematurity by preventive measures. Smoking in pregnancy is known to be associated with an increased likelihood of prematurity and low birthweight and interventions which are effective in cessation of smoking in pregnancy should be encouraged and supported.

It is therefore recommended:

17. that the Department of Human Services encourage hospitals to develop, in collaboration with QUIT, interventions aimed at cessation of smoking among women to whom they are providing antenatal care.

Evaluation of outcomes of neonatal intensive care

As improvements in the immediate survival of babies requiring neonatal intensive care continue, so do concerns about their long-term future and the very considerable efforts and resources that are required to care for them. The long-term collaborative study into the outcome of extremely low birthweight babies treated in the four Victorian NICUs which commenced in 1979/80 and is continuing, has provided reassuring evidence of the outcome and the value of the care these babies have received. However, this study does not include all babies who have received neonatal intensive care, nor those babies who have undergone major neonatal surgery in the neonatal period. These babies are also worthy of long-term follow-up to evaluate their outcome and the effects of their various treatment regimens.

It is recommended:

18. that the Royal Women's Hospital, the Royal Children's Hospital, the Mercy Maternity Hospital and the Monash Medical Centre consider jointly:

i) extending their collaborative follow-up of low birth weight babies who have received neonatal intensive care; and

ii) including in it neonates who have undergone major surgery.

Neonatal Services Review

December 1998

Table 1. Metropolitan and country Local Government Areas with largest numbers of births in 1997/98 and proportional changes since 1995/96

Local Government Area	All births 97/98	% change since 95/96
Metropolitan		
Brimbank	2071	0
Casey	1802	0
Greater Dandenong	1768	+ 8
Hume	1731	+ 9
Moreland	1520	- 14
Whittlesea	1460	+ 21
Wyndham	1255	- 3
Yarra Ranges	1241	- 7
Darebin	1207	- 20
Frankston	1206	+ 5
Knox	1204	+ 9
Kingston	1128	- 10
Maroondah	965	+ 24
Mornington	963	+ 7
Country		
Greater Geelong	1512	+ 2
La Trobe	926	- 9
Greater Bendigo	887	+ 11
Greater Shepparton	828	+ 4
Ballarat	753	+ 14

Source: VIMD

Table 2. Babies of drug dependent mothers delivered in Victorian public hospitals: 1997/8

Hospital	Babies of drug dependent mothers	
	no. in 1997/8	ALOS
Royal Women's Hospital	115	15.3

Monash Medical Centre	18	18.7
Mercy Hospital for Women	13	21.9
Angliss Health Services	12	11.8
Frankston Hospital	8	22.5
Warrnambool Base Hospital	8	8.4
Western (Sunshine) Hospital	5	17.0
Geelong Hospital	5	13.2
Dandenong Hospital	5	11.8
All Victorian public hospitals	219	15.0

Source: VIMD

Table 3. Number of days per quarter on which combined Victorian NICU occupancy exceeded permanently staffed capacity (42 cots)

Year	Jan-Mar	Apl-June	July-Sept	Oct-Dec	Year total
1995	4	9	22	20	55
1996	11	15	5	6	37
1997	37	14	41	26	118
1998	8	63	26	7*	104*

*Oct -Nov only

Source: NETS

Table 4. "Overflow" transfers from Level 3 neonatal units (NICU): 1993 -1998

"Overflow" Transfers						
Referring NICU	1993	1994	1995	1996	1997	1998*
Royal Women's Hospital	21	11	27	7	10	12
Mercy Hospital for Women	1	6	5	6	5	3
Monash Medical Centre	3	-	2	2	10	15
Royal Children's Hospital	-	-	-	-	-	-
Total	25	17	34	15	25	30

* to end of November 1998

Source: NETS

Table 5. Births in public hospitals in 1997/98 and changes since 1995/96

Hospital	Births in 1997/98	% change since 1995/6
Metropolitan		
Royal Women's Hospital	6158	- 14
Mercy Hospital for Women	4912	- 3
Monash Medical Centre	3728	+ 3
Western (Sunshine) Hospital	2784	- 4
Angliss Health Services	2519	+ 15
Boxhill and St.George's Hospitals	2433	- 6
Dandenong Hospital	2315	+ 23
Frankston Hospital	1546	- 4
Werribee Mercy Hospital	1398	+ 20
Northern Hospital(+ PANCH until Feb1998)	1162*	+ 8
Sandringham Hospital**	1000	+ 35
Country		
Geelong Hospital	1667	+ 4
Bendigo Hospital	1042	+ 4
La Trobe Regional Hospital	996	- 13
Ballarat Base Hospital	996	+ 3
Goulburn Valley Base Hospital	944	+ 6
Wodonga Regional Hospital	858	+ 9
Total	45038	- 2

* 1988 maternity bookings indicate that 1998/99 births will exceed 1600

** functions as annexe of MMC for normal deliveries

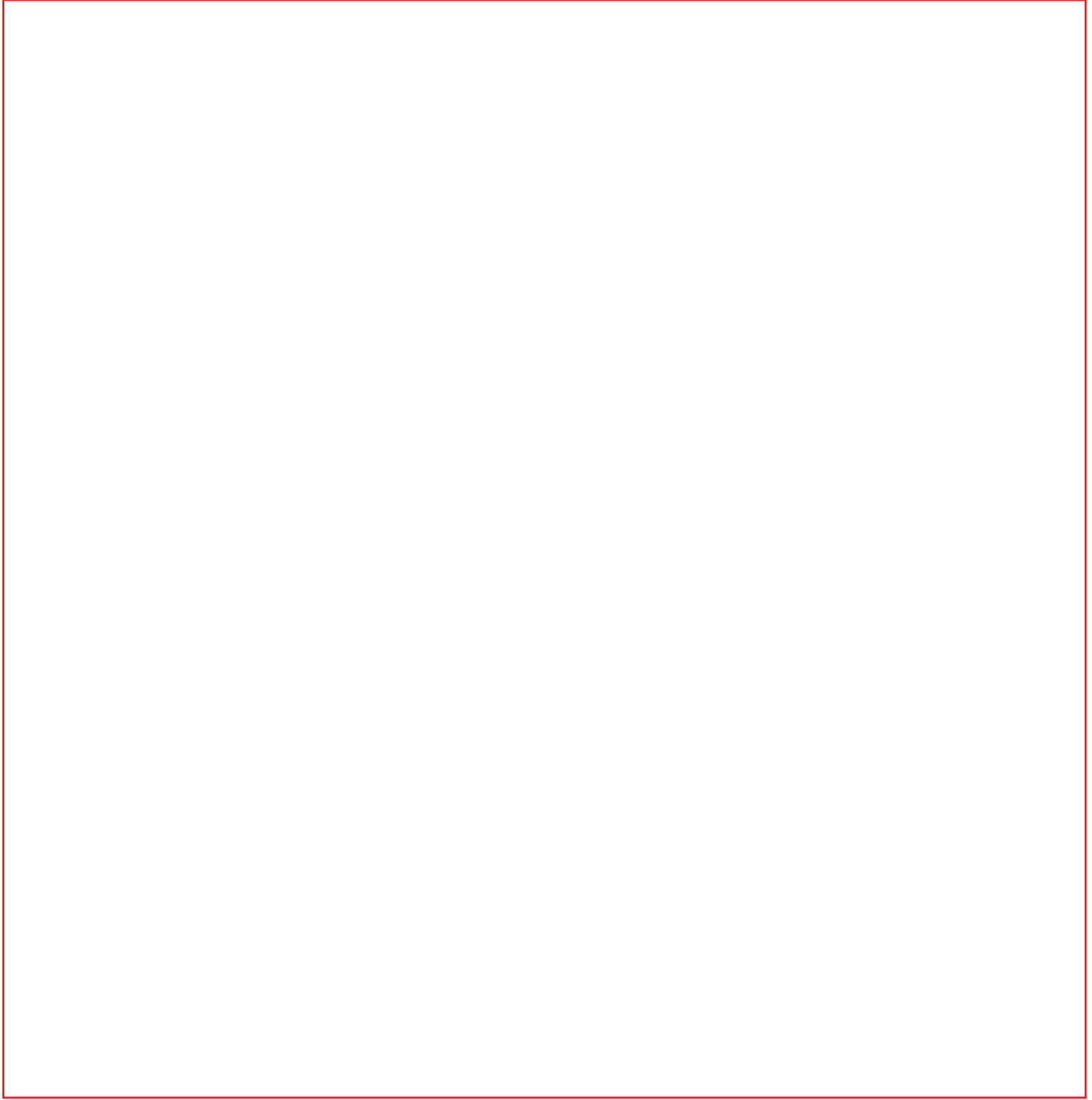
Source: VIMD

[Index](#)

Neonatal Services Review

December 1998

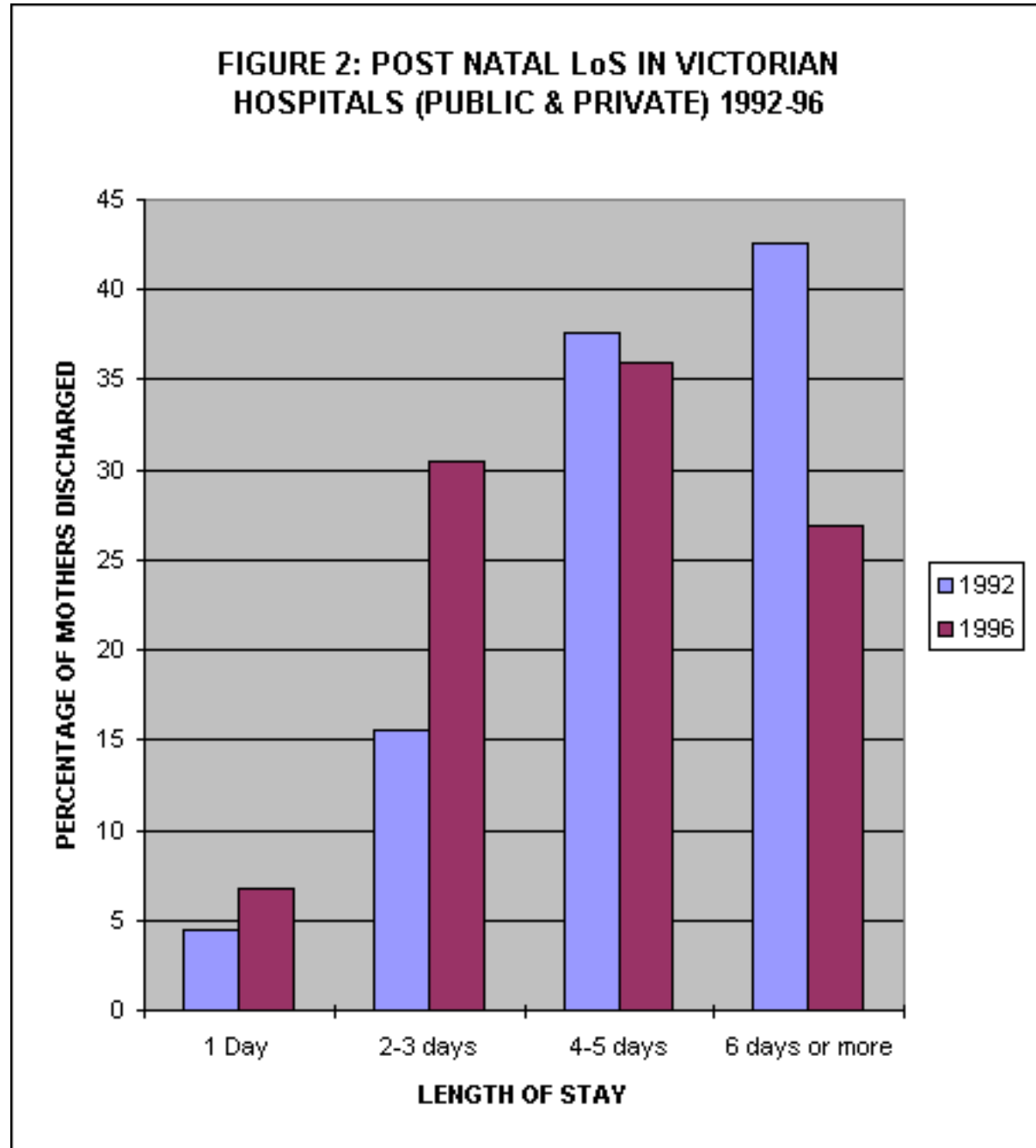
Figure 1



Neonatal Services Review

December 1998

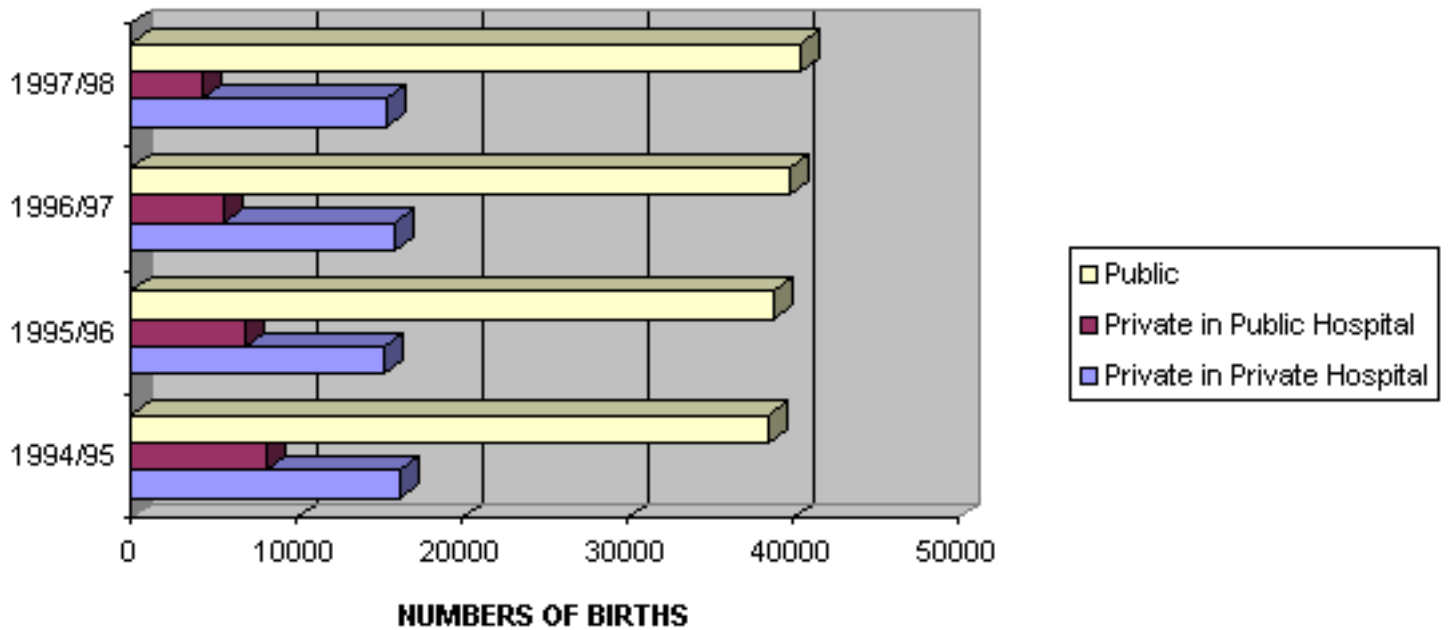
Figure 2



Neonatal Services Review

December 1998

FIGURE 3: PAYMENT CATEGORY OF WOMEN DELIVERED IN VICTORIAN HOSPITALS 1994/95-1997/98



Neonatal Services Review

December 1998

NICU "OVERFLOW" TRANSFERS 1993-1998

