Morbidities associated with childbirth in Victoria

Topic 2: Episiotomy and perineal lacerations

July 2004

The Consultative Council on Obstetric and Paediatric Mortality and Morbidity

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1. Summary

The aim of this study was to provide information about the incidence, risk factors and trends for episiotomy and third/fourth-degree perineal lacerations in Victoria.

Data were extracted from the Victorian Perinatal Data Collection Unit (VPDCU) databases, Department of Human Services. This is a mandatory reporting system of all births in Victoria at or beyond 20 weeks gestation. The period 1999 to 2002 was the focus of this report. The analysis was restricted to term (37 completed weeks gestation and greater) vaginal deliveries (TVD).

Overall rates

In Victoria between 1999 and 2002, 175,276 women had TVD. The perineum was intact[1] in 56% of women and 22% had episiotomies only. A total of 20% had second-degree lacerations without episiotomy. A further 1.2% had an episiotomy and second-degree laceration. Of those who had third/fourth-degree lacerations (1.4%), about half also had an episiotomy.

Episiotomy

Twenty-four per cent of women having TVD had episiotomies (with or without lacerations). Episiotomy rates:

- Were significantly lower in women aged under 25 years, compared to those in other age groups
- Were significantly higher in women from Asia (34%) and Africa (31%), and significantly lower in women from the Middle East (19%), compared to those from Australia/Oceania (23%).
- Were significantly higher in women attending private (33%) or level three public hospitals (30%), compared to those attending metropolitan public hospitals (21%)
- Were significantly higher amongst private patients (33%), compared to public patients (20%).

For first births that were TVD, episiotomy rates:

- Were 41%, compared to 13% in subsequent TVD
- Were higher for private patients (52%), compared to public patients (36%)
- Were significantly higher in women with breech presentations (72%), compared to those with vertex presentations (41%)
- Were significantly higher in women who had epidural analgesia (59%), compared to those who did not (32%)
- Were significantly higher in instrumental deliveries (forceps and vacuum extraction) (77%), compared to spontaneous deliveries (23%)
- Were significantly higher in forceps deliveries (90%) than in vacuum extraction (59%) deliveries.

Third/fourth-degree lacerations

A total of 1.4% of women having TVD sustained third/fourth-degree lacerations (with or without episiotomy) during childbirth. Rates of third/fourth-degree laceration:

- Were significantly higher in younger women, compared to those in older age groups
- Were significantly higher in women born in Asia (2.5%) and Africa (2.0%), and lower in women born in the Middle East (0.8%), compared to those born in Australia/Oceania (1.3%)

[1] Includes first-degree lacerations (both sutured and un-sutured)

- Were significantly higher in women who had babies weighing 4000 grams or greater (2.4%), compared to those who had babies of average birth weight (1.3%)
- Were significantly higher in women attending level three public hospitals (2.0%) and significantly lower in those attending private hospitals (1.0%), compared to those attending metropolitan public hospitals (1.4%)
- Were significantly higher amongst public patients (1.6%), compared to private patients (1.1%)
- Were significantly higher in women who had epidural analgesia (2.1%), compared to those who did not (1.2%).

For first births that were TVD, third/fourth-degree laceration rates:

- Were higher (2.8%), compared to subsequent TVD (0.52%)
- Were higher amongst public patients (3.2%), compared to private patients (1.9%)
- Were significantly higher in women who had prolonged labour (4.4%), compared to those who did not (2.6%)
- Were significantly higher in instrumental deliveries (4.6%), compared to spontaneous deliveries (1.9%)
- Were significantly higher in forceps deliveries (5.5%), than in vacuum extraction (3.4%) deliveries
- In forceps deliveries were higher in public patients (7.9%) compared to private patients (2.8%)
- In vacuum extraction deliveries were higher amongst public patients (4.3%), compared to private patients (1.9%)
- Were significantly higher in women who had episiotomies (3.5%), compared to other women (2.3%).

Trends

From 1999 to 2002 rates of intact perineum, episiotomy only and third/fourth-degree laceration (with or without episiotomy) remained constant. Second-degree laceration rates (with or without episiotomy) increased slightly from 20.1% to 21.5%.

During this period, episiotomy rates appeared to decrease slightly from 24.5% to 23.3%. This decline occurred primarily in the public sector.

Conclusions

A number of the risk factors for episiotomy and third/fourth-degree laceration identified in this study have been reported in other studies. As the main aim of this report was to prepare descriptive data describing recent trends, only univariate analysis was undertaken to explore the factors associated with episiotomy and third/fourth-degree lacerations. Multivariate analysis is required to determine interrelationships between factors and control for any confounding variables.

Rates of episiotomy were comparable to those reported elsewhere, and declined slightly from 1999 to 2002. This decline was not as marked as that reported in other studies. Rates of third/fourth-degree laceration were relatively low compared to other reports, and remained constant from 1999 to 2002.

Of note is the difference in rates between the public and private sectors. Private patients were more likely to have instrumental deliveries and episiotomies, whereas public patients were more likely to have third/fourth-degree lacerations overall, and in deliveries which were instrumental or involved episiotomy.

2. Introduction

As maternal mortality decreases in the developed world, there has been increasing interest in maternal morbidity as an indicator of the quality of obstetric care. Maternal mortality represents 'the tip of the iceberg' with many women suffering serious morbidity for every maternal death that occurs[1]. In an English multi-centre study examining severe pre-eclampsia, haemorrhage, sepsis and uterine rupture, severe obstetric morbidity occurred in 12 out of every 1000 maternities. Maternal death directly attributable to these conditions occurred in 0.10 per 1000 maternities[2].

In Victoria, the Consultative Council on Obstetric and Paediatric Mortality and Morbidity (CCOPMM) routinely collects information on maternal and perinatal mortality and morbidity and has published Annual Reports since 1962. Recent funding from the Programs Branch, Metropolitan Health and Aged Care Services Division, Department of Human Services (DHS), has enabled the employment of a Research Officer for 12 months to investigate and report on selected aspects of maternal morbidity in Victoria.

2.1 Aim of this project

The aim of the overall project is to provide information on selected major morbidities associated with childbirth in Victoria. The resulting reports will be distributed to DHS and maternity service providers. It is anticipated that the information will assist DHS and other relevant agencies to develop appropriate policy interventions and service improvements.

Selected areas of maternal morbidity will be examined. These topics have been selected because they are relatively frequent and severe, and are issues about which clinicians have recently voiced concern. The first topic was obstetric haemorrhage and associated hysterectomy and this report is available at http://www.health.vic.gov.au/maternitycare/major-morbidities1.pdf. The second topic, the subject of this report, is episiotomy and perineal lacerations.

Over the past 20 years there has been increasing evidence[3 4 5 6] (including a Cochrane review[7]) to support the selective (rather than routine) use of episiotomy. During this time, episiotomy rates have fallen substantially in many populations[8 9 10 11 12 13 14 15 6]. An objective of this study was to determine if this was also the case in Victoria.

This report provides an overview of episiotomy and perineal laceration in the population of women giving birth in Victoria. The main focus is on episiotomy and third and fourth-degree lacerations. Incidence, risk factors and trends are given. Finally, the incidence of episiotomy and third/fourth-degree lacerations in Victoria is compared with rates in other populations.

3. Methodology

3.1 Project team

The CCOPMM project team comprised Kerry Haynes, Research Officer; Christine Stone, Consultant Epidemiologist and James King, Chair, CCOPMM.

The project was supported by the Programs Branch, Metropolitan Health and Aged Care Services Division, DHS. The staff in this branch who were involved in the project were Therese Cotter, Gil Dwyer and Trevor Sutherland.

3.2 Clinical reference group

A clinical reference group was established to advise and guide the project. The group is a sub-committee of the Maternity Services Advisory Committee and includes representation from consumers, midwives and obstetricians, as follows:

- Pauline Ahearne, Maternity Coalition
- Mary-Anne Biro, Victoria University of Technology
- Julie Collette, Mercy Hospital for Women
- Euan Wallace, Monash University.

3.3 Data source

The data used for this report were extracted from the Victorian Perinatal Data Collection Unit (VPDCU) databases, DHS. This is a mandatory reporting system of all births in Victoria at or beyond 20 weeks gestation.

VPDCU data from the four years 1999 to 2002 were analysed for this report. This time period was selected because the VPDCU coding system for episiotomy and perineal lacerations was identified as being of better quality and more consistent over these years. Earlier VPDCU data from 1992 to 1998 was, however, also used in the analysis of trends.

From 1992 to 1998 perineal lacerations were collected as 'free text' items on the VPDCU data collection form, and only sutured lacerations were coded. During this period episiotomies were also recorded as 'free text'.

From 1999 to 2002 'tick boxes' were used to report sutured lacerations and episiotomies. Un-sutured lacerations were recorded separately as free text. Rates from 1999 to 2002 shown in this report include both sutured and un-sutured lacerations. It is for these reasons that 1999 to 2002 data are considered more reliable and form the basis of this report.

The analysis was restricted to term (37 completed weeks gestation and greater) vaginal deliveries (TVD) to simplify the analysis by focusing on a homogeneous and more clinically relevant population. More than 90% of vaginal births fall into this category. TVD comprise 71% of total births in Victoria. These criteria need to be considered when making comparisons between this report and data from other sources.

Data are reported to the VPDCU from individual hospitals. It is acknowledged that case ascertainment may vary between hospitals and hospital types. This should be considered when comparing rates between individual hospitals or types of hospitals.

3.3.1 Validity of VPDCU data

The validity of certain VPDCU database variables has been examined (VPDCU, unpublished data). When 1999 data related to perineal status was reviewed, it was found that perineal status was accurately recorded in 92.5% of the 318 forms validated against hospital medical records and /or computer system entries.

Other data items used in compiling this report were also examined in the 1999 validation study (see Appendix 1). The results showed that hospital medical records and VPDCU forms were in agreement more than 90% of the time for a number of data items. However reporting of procedures and operations; and complications of labour, birth or the postnatal period was less reliable.

3.4 Data analysis

Data were analysed using SPSS (version 10). Results are expressed as the percentage of the outcome of interest for the index population (TVD), and for the subgroup of first births which were TVD (first births$_{TVD}$). Odds ratios (OR) with 95% confidence intervals (CI) are reported.

The total population used in the calculations appears at the top of each set of analyses in the tables. There were missing values in some variables, therefore totals may not always be the same for each variable.

The risk factors examined in this report were selected based on a review of the literature complemented by expert clinical advice. The selection was limited to the data that were available on the VPDCU databases.

3.5 Definitions

The VPDCU uses the following classifications to describe the state of the perineum following birth:

- First-degree laceration: A perineal laceration or tear involving one of the following: the fourchette, hymen, labia, skin, vagina or vulva
- Second-degree laceration: a perineal laceration or tear involving the pelvic floor or perineal muscles or vaginal muscles
- Third-degree laceration: a perineal laceration or tear involving the anal sphincter or rectovaginal septum
- Fourth-degree laceration: a third-degree perineal laceration or tear which also involves the anal mucosa or rectal mucosa
- Episiotomy: a surgical incision of the perineum and vagina.

Definitions of other conditions used in this report are provided in Appendix 2.

3.6 Classifications used in this report

First-degree perineal lacerations (both sutured and un-sutured) have been included in the 'intact perineum' category. Second-degree lacerations include some un-sutured lacerations. Third- and fourth-degree lacerations were combined for all analyses.

It is assumed that all episiotomies were mediolateral as this has always been the practice in Victorian maternity hospitals.

The term ‘perineal injury’ has been used when describing both episiotomy and perineal lacerations in this report.

4. Episiotomy and perineal lacerations in Victoria

4.1 Overview

In Victoria between 1999 and 2002, 175,276 women had term vaginal deliveries (TVD). The perineum was intact in 56% of women and 22% had episiotomies only. A total of 20% had second-degree lacerations without episiotomy. Approximately half of the women who had third- or fourth-degree lacerations (1.4%) also had an episiotomy (0.7%). See Table 4.1.

Table 4.1: Frequency of episiotomy and types of perineal laceration in TVD, 1999-2002

Perineal status	Frequency	Percent
Total TVD	*175,276*	*100.0*
Intact perineum	97,634	55.7
Episiotomy only	38,856	22.2
Episiotomy plus second-degree	2,144	1.2
Episiotomy plus third/fourth-degree	1,165	0.7
Second-degree without episiotomy	34,161	19.5
Third/fourth-degree without episiotomy	1,316	0.8

4.2 Overall trends

In order to identify recent changes in rates of episiotomy or perineal laceration in Victoria, data from 1992 to 2002 were examined. As the collection of data on perineal injury was considered to be more reliable from 1999 to 2002, Figures 4.1 and 4.2 show trends for this period. Rates of intact perineum and episiotomy only remained constant. Second-degree laceration rates (with and without episiotomy) increased slightly from 20.1% in 1999 to 21.5% in 2002. Third/fourth-degree laceration rates (with and without episiotomy) averaged 1.4% and did not significantly change over this period.

Fig 4.1: Trends in perineal laceration and episiotomy in TVD, 1999-2002

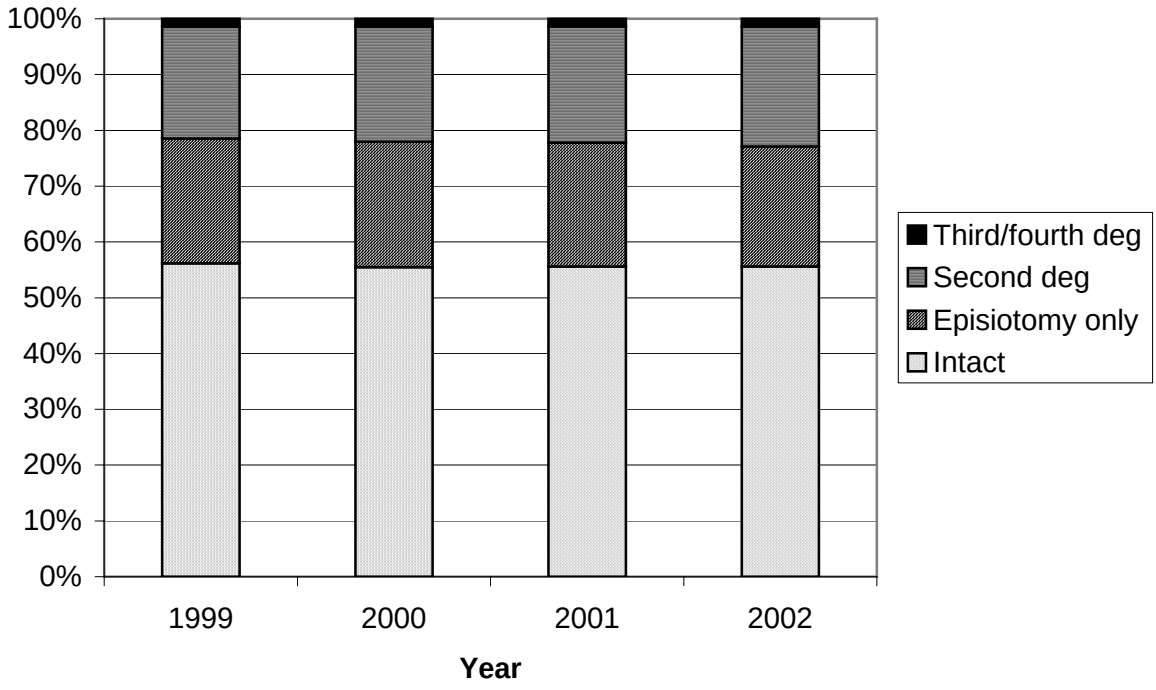


Fig 4.2: Trends in perineal laceration and episiotomy in TVD, 1999-2002

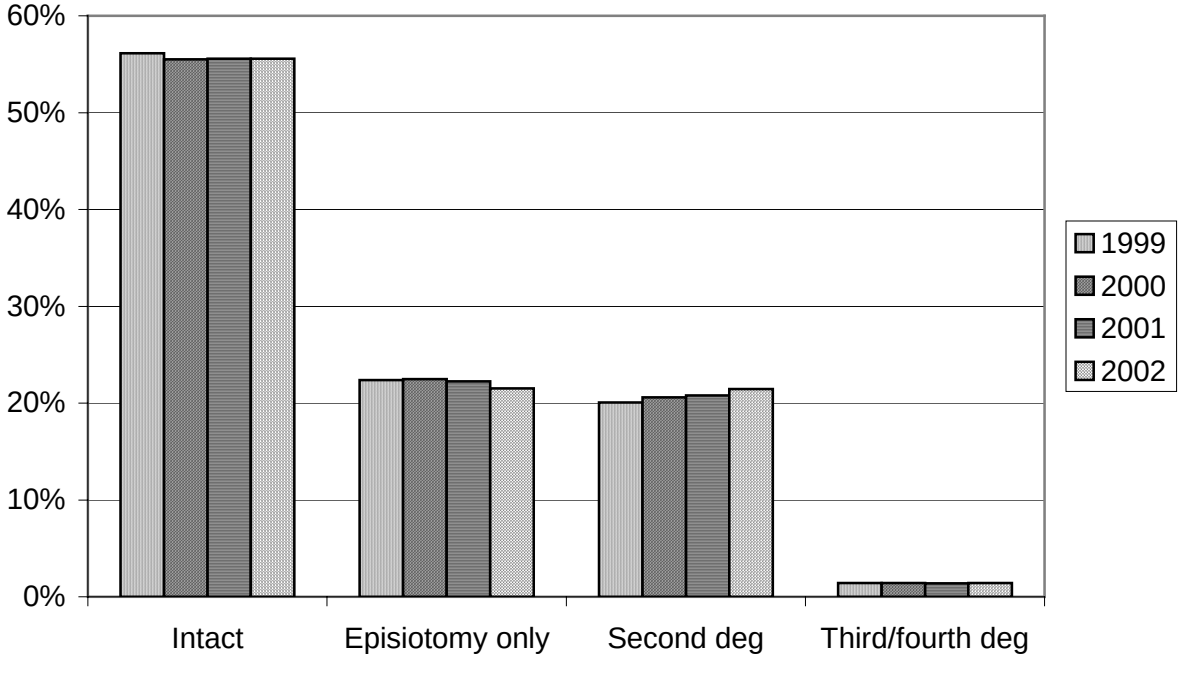


Table 4.2 shows trends in episiotomy with second- or third/fourth-degree lacerations. While rates of second-degree laceration without episiotomy increased slightly from 18.6% to 20.3%, rates of episiotomy with second-degree laceration remained constant (1.2%). Rates of third/fourth-degree laceration without episiotomy (0.8%) and rates of episiotomy with third/fourth-degree laceration also remained constant (0.7%).

Table 4.2: Trends in types of laceration and episiotomy in TVD, 1999-2002

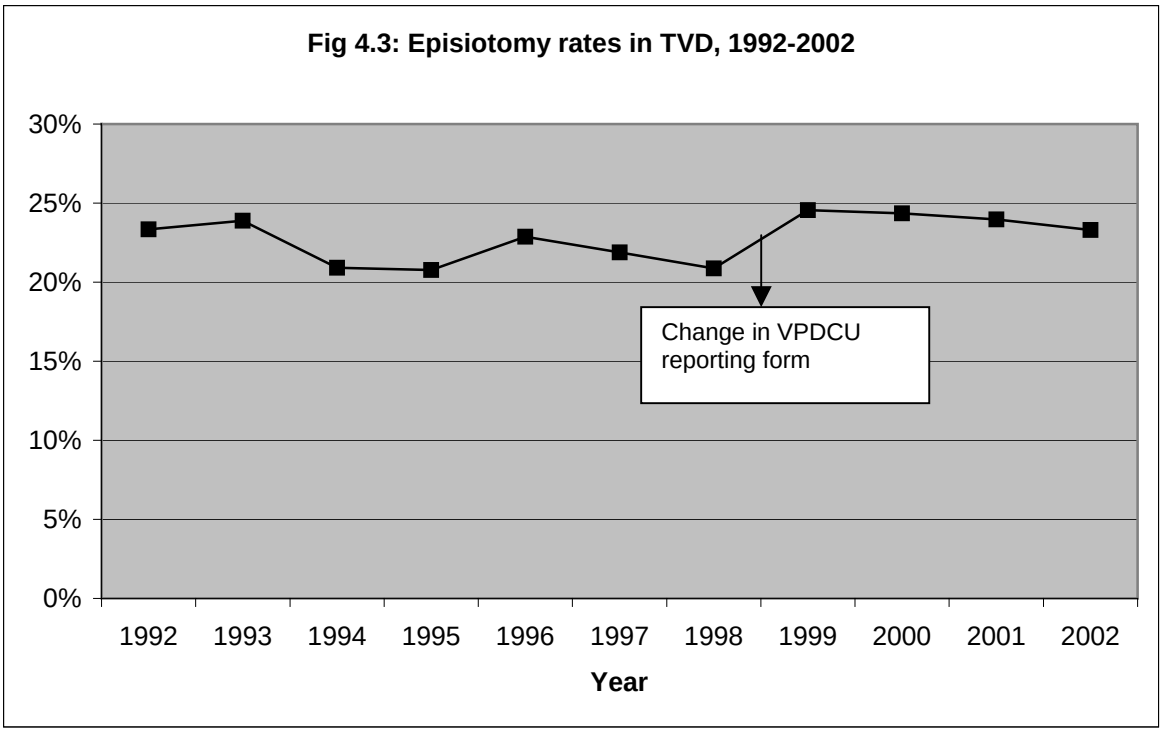
	1999	2000	2001	2002
TVD (n)	*44,945*	*44,584*	*43,207*	*42,540*
	%	*%*	*%*	*%*
Total	100.0	100.0	100.0	100.0
Intact perineum	56.1	55.5	55.6	55.6
Episiotomy only	22.4	22.5	22.2	21.5
Episiotomy plus second degree	1.4	1.2	1.1	1.1
Episiotomy plus third/fourth degree	0.7	0.7	0.7	0.6
Second degree without episiotomy	18.6	19.4	19.7	20.3
Third/fourth degree without episiotomy	0.7	0.8	0.7	0.8

4.2.1 Trends in episiotomy rates

Table 4.3 and Figure 4.3 show episiotomy rates for TVD in Victoria from 1992 to 2002. Episiotomy rates appeared to decrease from 22.9% in 1996 to 20.9% in 1998. The apparent increase in 1999 to 24.5% may be related to improved data collection, due to changes in the VPDCU reporting form. The rates then appeared to slightly decrease again to 23.3% by 2002.

Table 4.3: Episiotomy rates in TVD, 1992-2002

Year	TVD (n)	Episiotomy (n)	Episiotomy rate (%)
1992	50,528	11,796	23.3
1993	49,111	11,735	23.9
1994	48,935	10,233	20.9
1995	47,737	9,917	20.8
1996	47,077	10,769	22.9
1997	46,253	10,123	21.9
1998	45,654	9,532	20.9
1999	44,945	11,033	24.5
2000	44,584	10,858	24.4
2001	43,207	10,359	24.0
2002	42,540	9,915	23.3



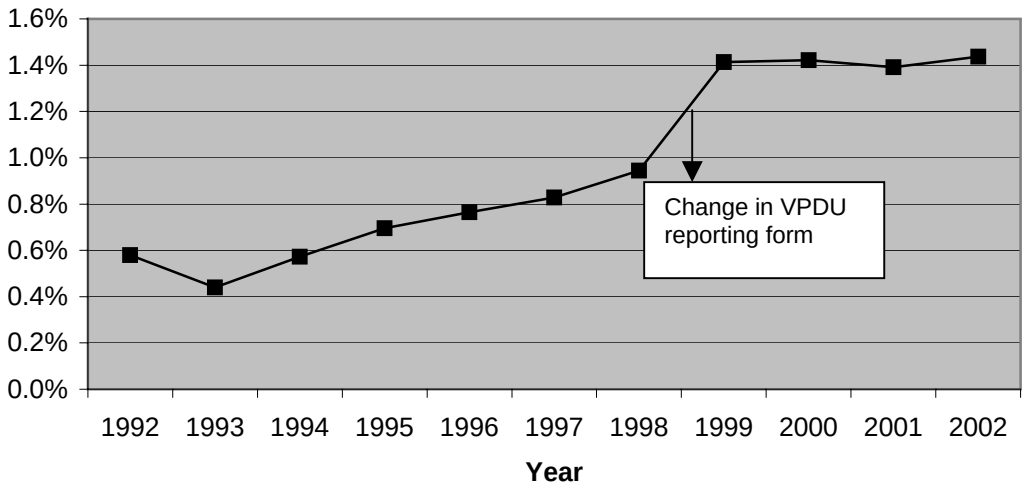
4.2.2 Trends in rates of third/fourth-degree laceration

Table 4.4 and Figure 4.4 show rates of third/fourth-degree laceration from 1992 to 2002 in all TVD. From 1992 until 1998 rates of third/fourth-degree laceration increased steadily, while from 1999 to 2002 rates remained constant. The increase from 1998 to 1999 may be related to changes in VPDCU reporting practices.

Table 4.4: Rates of third/fourth-degree laceration in TVD, 1992-2002

Year	TVD (n)	Third/fourth-deg laceration (n)	Third/fourth-deg laceration rate (%)
1992	50,528	293	0.58
1993	49,111	216	0.44
1994	48,935	280	0.57
1995	47,737	332	0.70
1996	47,077	360	0.76
1997	46,253	383	0.83
1998	45,654	431	0.94
1999	44,945	635	1.41
2000	44,584	634	1.42
2001	43,207	601	1.39
2002	42,540	611	1.44

Fig 4.4: Rates of third/fourth degree-laceration TVD, 1992-2002



The following sections of this report focus on episiotomy and third/fourth-degree lacerations from 1999 to 2002 (as data were more reliable for this period). Section 5 examines the incidence and factors associated with episiotomy (with or without perineal laceration). Section 6 concentrates on the incidence and factors associated with third- and fourth-degree lacerations (with or without episiotomy).

5. Episiotomy

5.1 Incidence of episiotomy in term vaginal deliveries

Between 1999 and 2002 in Victoria, 42,165 women (24%) had episiotomies (with or without lacerations). Episiotomy rates in private hospitals (with 100 or more births per year) ranged from 10-50%, while rates in public hospitals (with 100 or more births per year) ranged from 5-35%.

5.2 Factors associated with episiotomy in TVD

5.2.1 Maternal and child factors

Table 5.1 shows factors associated with episiotomy related to the mother and child in TVD. Information about the incidence of these factors and trends for selected factors from 1999 to 2002 are provided below.

Maternal age

Women aged less than 25 years had significantly lower episiotomy rates (21%), compared to those in other age groups (23% to 25%).

Maternal country of birth

There was some variation in episiotomy rates according to maternal country of birth. Women who were born in Australia/Oceania, the United Kingdom/Europe or North/South America had rates of 23% to 24%. Rates for Asian and African women were significantly higher (34% and 31% respectively) and those for women from the Middle East were significantly lower (19%).

Baby birth weight

A total of 24% of women having babies in the most frequent birth weight range (2500 to 3999 grams) had episiotomies. Slightly higher proportions of women having babies weighing 4000 grams or greater (26%), and smaller proportions of women having babies weighing less than 2500 grams (19%) had episiotomies.

Table 5.1: Maternal and child factors associated with episiotomy 1999-2002 (TVD)

Factor	Episiotomy	Total	% Episiotomy	OR	(95%CI)
Total TVD	42,165	175,276	24%		
Maternal age (yrs)					
Less than 20	1,341	6,257	21	0.81	(0.76 - 0.86)
20-24	5,019	23,880	21	0.79	(0.76 - 0.82)
25-29	13,198	53,866	25	0.96	(0.94 - 0.99)
30-34	15,399	61,065	25	ref	
35-39	6,237	26,030	24	0.93	(0.90 - 0.97)
40 and over	971	4,178	23	0.90	(0.83 - 0.97)
Maternal country of birth					
Australia/Oceania inc NZ	31,660	137,935	23	ref	
UK inc Eire/Europe	2,727	11,496	24	1.04	(1.00 - 1.09)
Middle East	817	4,340	19	0.78	(0.72 - 0.84)
Nth & Sth America	466	1,984	23	1.03	(0.93 - 1.14)
Africa	801	2,611	31	1.49	(1.37 - 1.61)
Asia	5,646	16,706	34	1.71	(1.66 - 1.77)
Baby birth weight (grams)					
Less than 2500	575	2,990	19	0.76	(0.69 - 0.83)
2500 to 3999	35,918	150,196	24	ref	
4000 and greater	5,669	22,077	26	1.10	(1.06 - 1.13)
Hospital category					
Level 3 public	9,940	33,435	30	1.64	(1.59 - 1.69)
Other metro public	10,427	50,787	21	ref	
Private	15,038	45,676	33	1.90	(1.85 - 1.95)
Country base	3,481	21,082	17	0.77	(0.73 - 0.80)
Other country	3,273	23,767	14	0.62	(0.59 - 0.64)
Homebirths	6	529	1	0.04	(0.02 - 0.10)
Accommodation status					
Public	24,491	121,452	20	ref	
Private	17,674	53,824	33	1.94	(1.89 - 1.98)
Parity					
None	28,735	69,630	41	ref	
One	10,380	62,038	17	0.29	(0.28 - 0.29)
Two	2,454	28,535	9	0.13	(0.13 - 0.14)
Three or more	596	15,073	4	0.06	(0.05 - 0.06)

5.2.2 Hospital accommodation

When episiotomy rates according to hospital type were examined, private (33%) or level three public (30%) hospitals had significantly higher rates, compared to metropolitan public hospitals (21%). Country base (17%) and other country hospitals (14%) had significantly lower rates.

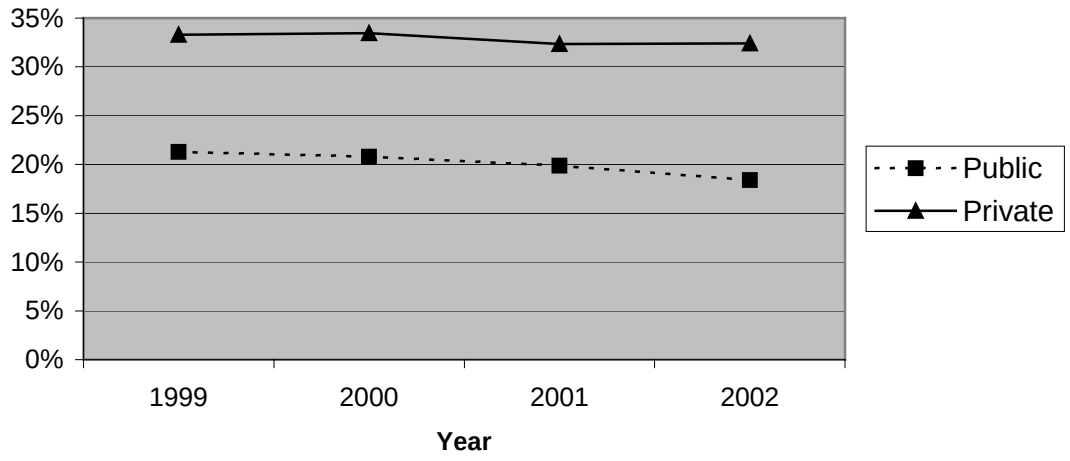
Table 5.2 and Figure 5.1 show episiotomy rates in women who were private patients and those who were public patients from 1999 to 2002. Episiotomy rates were significantly higher in private patients (33%) than in public patients (20%). Rates in

public patients appeared to decline slightly from 21.3% in 1999 to 18.4% in 2002, whereas rates in private patients remained fairly constant.

Table 5.2: Episiotomy rates in TVD according to accommodation status

Year	TVD (n)	Episiotomy rate in TVD (%)		
		All births	*Public*	*Private*
1999	44,945	24.5	21.3	33.3
2000	44,584	24.4	20.8	33.4
2001	43,207	24.0	19.9	32.3
2002	42,540	23.3	18.4	32.4

Fig 5.1: Episiotomy rates according to accommodation status (TVD)



5.2.3 Parity

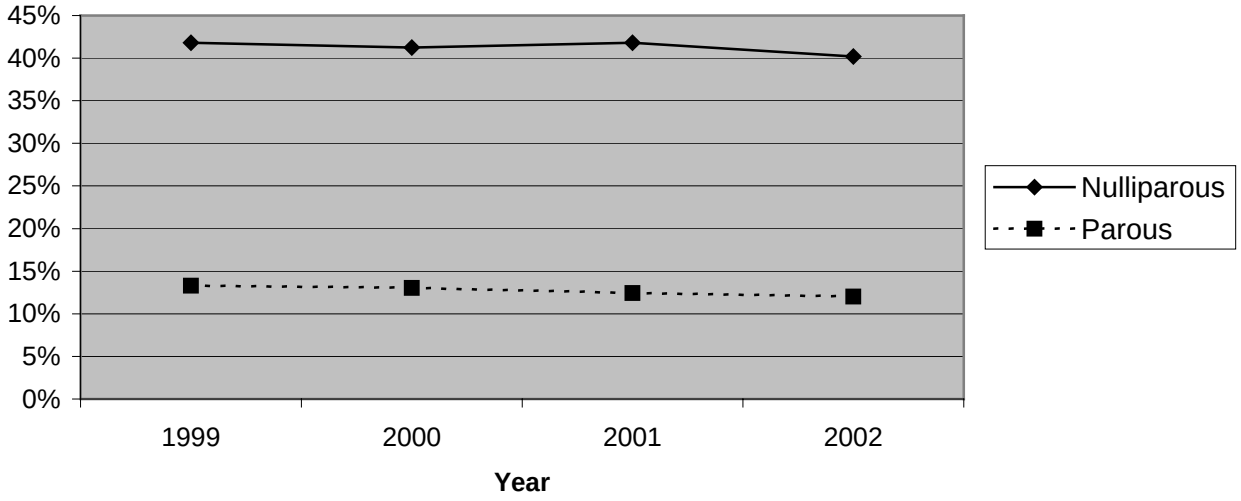
During 1999-2002, 41.3% of women having first births$_{TVD}$ had episiotomies. Significantly smaller proportions of parous women had episiotomies (12.7%).

Table 5.3 and Figure 5.2 show trends in episiotomy rates in first births$_{TVD}$, compared to other TVD. From 1999 to 2002 rates appeared to decrease slightly from 41.8% to 40.2% in nulliparous women and 13.3% to 12.0% in parous women.

Table 5.3: Episiotomy rates in first births$_{TVD}$

Year	TVD (n)	Episiotomy rate in TVD (%)	
		First births	*Other births*
1999	44,945	41.8	13.3
2000	44,584	41.3	13.0
2001	43,207	41.8	12.4
2002	42,540	40.2	12.0

Fig 5.2: Episiotomy rates in nulliparous and parous women (TVD)



5.3 Factors associated with episiotomy in first births$_{TVD}$

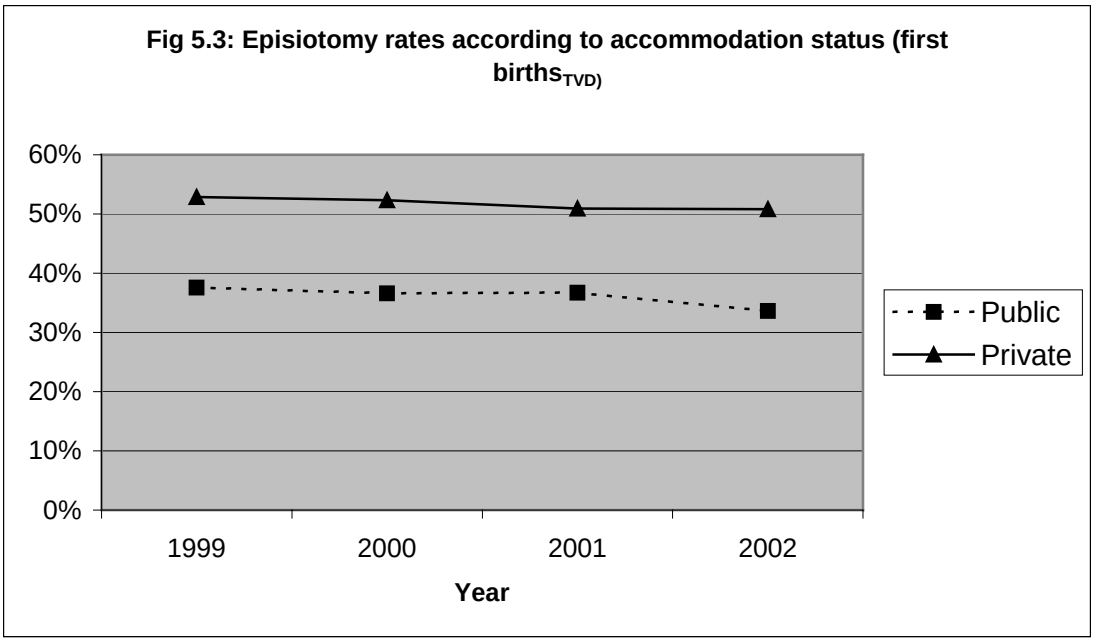
As episiotomy rates were significantly higher in first births, and first births were considered to be a more homogeneous and clinically important population, a separate analysis of selected factors associated with episiotomy using first births$_{TVD}$ as the reference population was undertaken. The results are provided below.

5.3.1 Hospital accommodation

From 1999 to 2002 episiotomy rates for private patients having their first birth$_{TVD}$ were higher (51.6%) than those for public patients (36.2%) (see Table 5.4 and Figure 5.3). Episiotomy rates for first births$_{TVD}$ in both public and private patients appear to have declined slightly from 1999 to 2002.

Table 5.4: Episiotomy rates in first births$_{TVD}$ according to accommodation status

Year	First births$_{TVD}$ (n)	Episiotomy rate in first births$_{TVD}$ (%)		
		All births	*Public*	*Private*
1999	17,740	41.8	37.6	52.9
2000	17,878	41.3	36.6	52.3
2001	16,970	41.8	36.7	50.9
2002	17,042	40.2	33.6	50.8



5.3.2 Labour and delivery

Table 5.5 shows selected factors related to labour and delivery associated with episiotomy in all TVD and first births$_{TVD}$. The odds ratios (OR) were similar for both TVD and first births$_{TVD}$. A discussion of the incidence of these factors and trends for selected factors in first births$_{TVD}$ follows.

Presentation

Significantly higher proportions of women who had breech presentations (72%) had episiotomies, compared to those who had vertex presentations (41%).

Epidural analgesia

Substantially higher proportions of women who had epidural analgesia had episiotomies (59%), compared to other women (32%).

Table 5.5: Factors related to labour and delivery in all TVD and first births$_{TVD}$

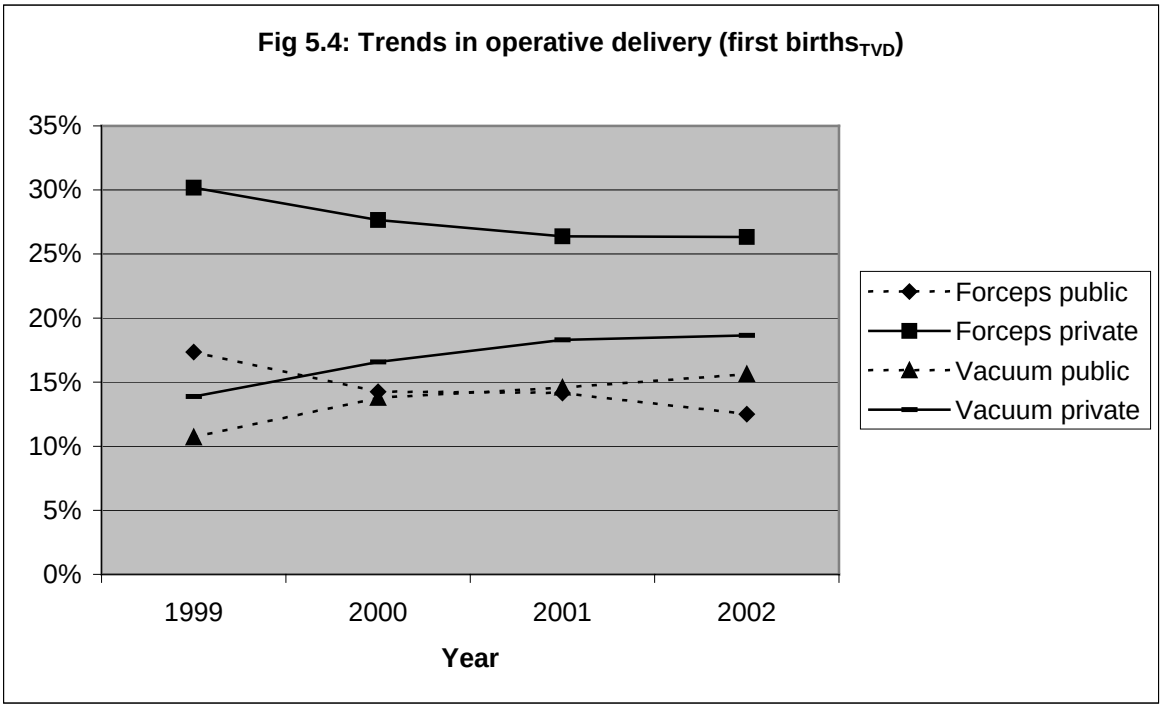
Factor	TVD					First births$_{TVD}$				
	Epis	Total	% Epis	OR	(95% CI)	Epis	Total	% Epis	OR	(95% CI)
Total	42,165	175,276	24			28,735	69,630	41		
Presentation										
Vertex	41,612	173,850	24	ref		28,469	69,144	41	ref	
Breech	349	730	48	2.91	(2.52 - 3.31)	153	213	72	3.64	(2.70 - 4.49)
Other non-vertex	203	680	30	1.35	(1.15 - 1.58)	113	271	42	1.02	(0.80 - 1.27)
Epidural										
No	24,875	139,069	18	ref		15,109	46,597	32	ref	
Yes	17,286	36,181	48	4.20	(4.10 - 4.30)	13,624	23,026	59	3.02	(2.92 - 3.11)
Delivery type										
Spontaneous*	20,764	145,293	14	ref		10,840	46,261	23	ref	
Forceps	14,165	16,249	87	40.8	(38.8 - 41.9)	11,891	13,143	90	31.0	(29.2 - 32.1)
Vacuum	7,236	13,734	53	6.68	(6.44 - 6.90)	6,004	10,226	59	4.65	(4.44 - 4.83)

*Includes breech deliveries (0.4% of TVD and 0.3% of first births$_{TVD}$)

Overall trends in instrumental delivery in Victoria

Figure 5.4 shows overall trends in forceps and vacuum extraction deliveries in first births$_{TVD}$ in Victoria from 1999 to 2002, according to maternal accommodation status. Rates of forceps deliveries steadily declined from 1999 to 2002, while rates of vacuum extraction deliveries increased. In public patients, forceps deliveries decreased from 17.4% in 1999 to 12.5% in 2002 (see Table 5.5). At the same there was a similar decrease in rates in private patients from 30.2% to 26.3%. The increase in vacuum extraction deliveries was similar in public (10.7% to 15.6%) and private patients (13.9% to 18.7%) (see Table 5.7).

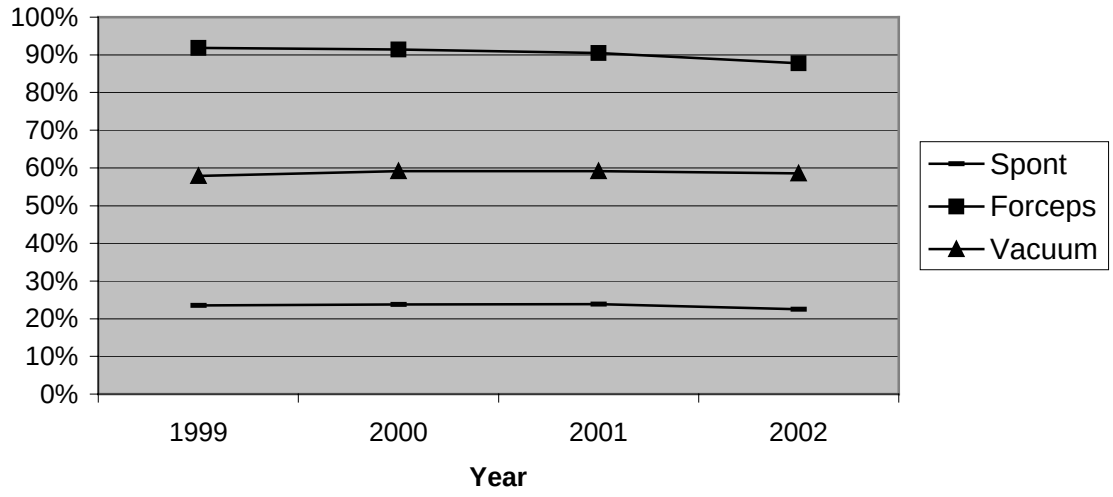
Fig 5.4: Trends in operative delivery (first births$_{TVD}$)



Episiotomy rates according to delivery type

Episiotomy rates were significantly higher in instrumental deliveries (77%), compared to spontaneous deliveries (23%). Rates in forceps deliveries (90%) were significantly greater than those in vacuum extraction deliveries (59%), and remained constant from 1999 to 2002 (see Figure 5.5).

Fig 5.5: Episiotomy rates according to delivery type (first births$_{TVD}$)

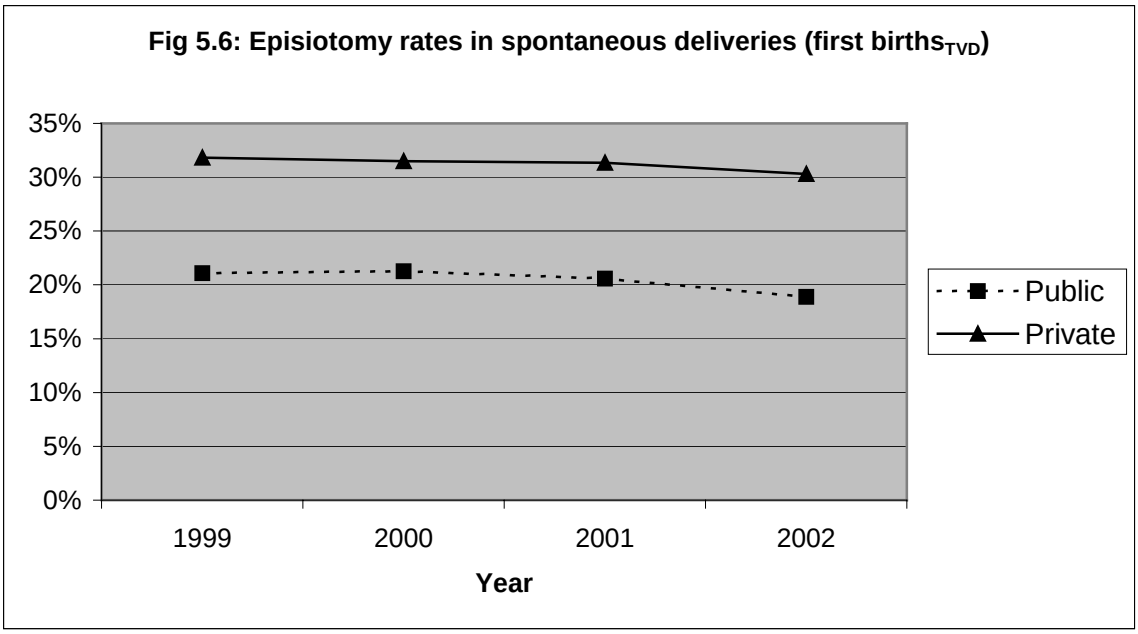


Spontaneous deliveries

The episiotomy rate in spontaneous deliveries (first births$_{TVD}$) was higher amongst private patients (31.2%), compared to public patients (20.5%). Rates for both private and public patients declined slightly in 2002 (see Table 5.6 and Fig 5.6).

Table 5.6: Episiotomy rates in spontaneous deliveries (first births$_{TVD}$)

Year	Spontaneous deliveries in first births$_{TVD}$ (n)	Episiotomy rate in spontaneous deliveries (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	11,977	23.6	21.1	31.8
2000	12,011	23.8	21.3	31.5
2001	11,122	23.8	20.6	31.3
2002	11,151	22.5	18.9	30.3



Forceps deliveries

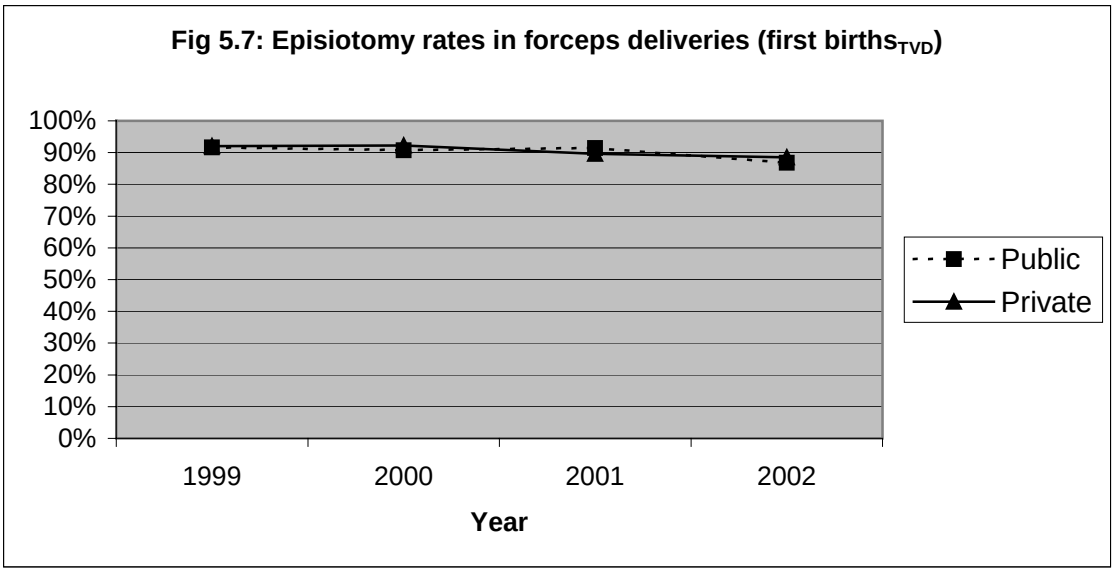
The overall rate of forceps deliveries in first births$_{TVD}$ decreased steadily from 20.9% in 1999 to 17.8% in 2002 (see Table 5.7). During the same period rates of episiotomy in forceps deliveries in first births$_{TVD}$ appeared to decrease slightly from 91.8% in 1999 to 87.8% in 2002 (see Table 5.8). There was little difference between rates for public (90.4%) and private (90.5%) patients (see Figure 5.7).

Table 5.7: Forceps deliveries in first births$_{TVD}$

Year	First births$_{TVD}$ (n)	Forceps deliveries in first births$_{TVD}$ (%)		
		All births	*Public*	*Private*
1999	17,740	20.9	17.4	30.2
2000	17,878	18.2	14.3	27.7
2001	16,970	18.5	14.1	26.4
2002	17,042	17.8	12.5	26.3

Table 5.8: Episiotomy rates in forceps deliveries (first births$_{TVD}$)

Year	Forceps deliveries in first births$_{TVD}$ (n)	Episiotomy rates in forceps deliveries (first births$_{TVD}$) (%)		
	Total	*All births*	*Public*	*Private*
1999	3,710	91.8	91.7	92.1
2000	3,257	91.4	90.7	92.3
2001	3,146	90.5	91.4	89.6
2002	3,030	87.8	86.8	88.5



Vacuum extraction deliveries

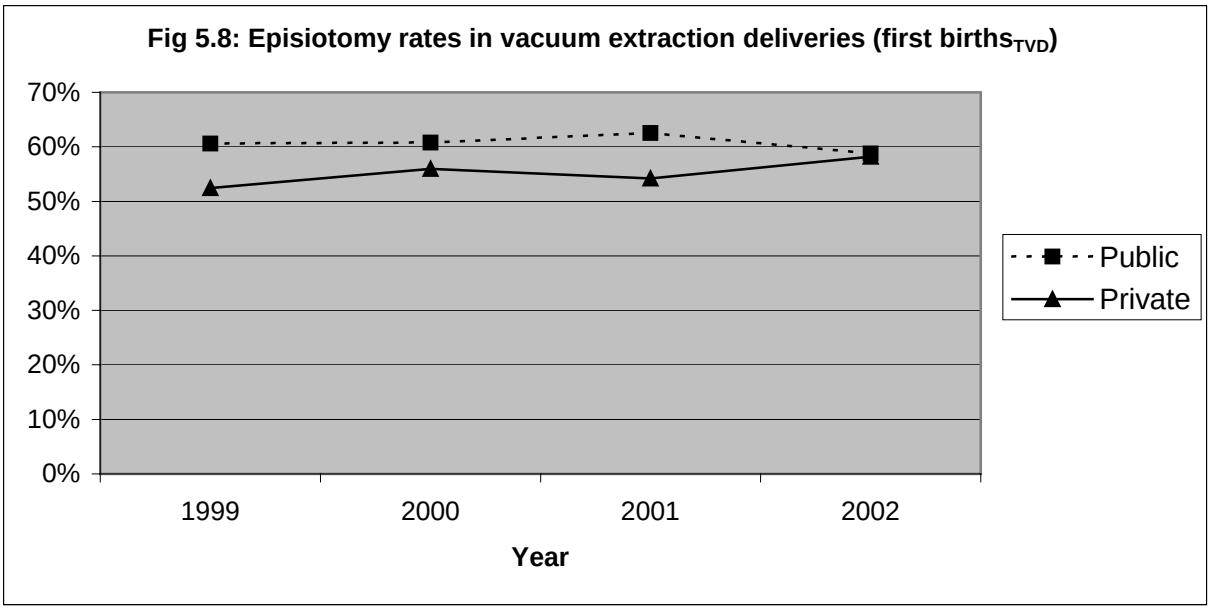
The overall rate of vacuum extraction deliveries in first births$_{TVD}$ increased from 11.6% in 1999 to 16.8% in 2002 (see Table 5.9). During this time, rates of episiotomy in vacuum extraction deliveries in first births$_{TVD}$ remained fairly constant (58.7%) (see Table 5.10). The rate for public patients was 60.7% and 55.5% for private patients. By 2002 episiotomy rates in vacuum extraction deliveries in first births$_{TVD}$ were very similar in both groups: 58.8% in public patients, 58.2% in private patients (see Figure 5.8).

Table 5.9: Vacuum extraction deliveries in first births$_{TVD}$

Year	First births$_{TVD}$ (n)	Vacuum extraction deliveries in first births$_{TVD}$ (%)		
		All births	*Public*	*Private*
1999	17,740	11.6	10.7	13.9
2000	17,878	14.6	13.8	16.6
2001	16,970	15.9	14.6	18.3
2002	17,042	16.8	15.6	18.7

Table 5.10: Episiotomy rates in vacuum extraction deliveries (first births$_{TVD}$)

Year	Vacuum deliveries in first births$_{TVD}$ (n)	Episiotomy rates in vacuum deliveries (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	2,053	57.9	60.6	52.4
2000	2,610	59.2	60.8	55.9
2001	2,702	59.1	62.5	54.2
2002	2,861	58.5	58.8	58.2



5.4 Episiotomy 1999-2002: key points

For all TVD, episiotomy rates:

- Were 24.1%
- Were significantly higher amongst private patients (32.8%), compared to public patients (20.2%)
- Appeared to decrease slightly from 24.5% in 1999 to 23.3% in 2002

For first births$_{TVD}$, episiotomy rates:

- Were 41.3%, compared to 12.7% in parous women
- Were higher for private patients (51.6%), compared to public patients (36.2%)
- Appeared to decrease slightly from 41.8% in 1999 to 40.2% in 2002
- Were significantly higher in instrumental deliveries (77%), compared to spontaneous deliveries (23%)
- Were significantly higher in forceps deliveries (90%) than in vacuum extraction (59%) deliveries.

6. Third- and fourth-degree perineal lacerations

6.1 Incidence of third/fourth-degree lacerations in TVD

Between 1999 and 2002 in Victoria, 2,481 women (1.4%) sustained third or fourth-degree lacerations (with or without episiotomy) during childbirth. Third/fourth-degree laceration rates in public hospitals (with 100 or more births per year) ranged from 0-4.2%, while rates in private hospitals (with 100 or more births per year) ranged from 0-3.9%. Some of these differences may be due to inconsistencies in reporting, but we are unable to explore the extent of this.

6.2 Factors associated with third/fourth-degree lacerations in TVD

6.2.1 Maternal and child factors

Table 6.1 shows factors associated with third/fourth-degree lacerations related to the mother and child in TVD. Information about the incidence of these factors and trends for selected factors from 1999 to 2002 are provided below.

Maternal age

Women aged under 30 years appeared to have slightly increased rates of third/fourth-degree laceration, when compared with those in other age groups.

Maternal country of birth

Rates of third/fourth-degree laceration varied according to maternal country of birth. Women from Australia/Oceania and the UK/Europe had rates of 1.3%. Those from the Middle East had significantly lower rates (0.8%), whereas women from Asia and Africa had significantly higher rates (2.5% and 2.0% respectively).

Baby birth weight

Significantly higher proportions of women who had babies weighing 4000 grams or greater had third/fourth-degree lacerations (2.4%), compared to those who had average birth weight babies (1.3%). Those with low birth weight babies (less than 2500 grams) had lower rates (0.7%).

Table 6.1: Risk factors for third/fourth-degree laceration (TVD)

Factor	3/4 deg lacn	Total	% 3/4 deg lacn	OR	(95%CI)
Total TVD	2,481	175,276	1.4		
Maternal age					
Less than 20	84	6,257	1.3	1.04	(0.83 - 1.31)
20-24	392	23,880	1.6	1.28	(1.13 - 1.44)
25-29	904	53,866	1.7	1.31	(1.19 - 1.44)
30-34	788	61,065	1.3	ref	
35-39	277	26,030	1.1	0.82	(0.72 - 0.94)
40 and over	36	4,178	0.9	0.66	(0.48 - 0.93)
Maternal country of birth					
Australia/Oceania inc NZ	1,805	137,935	1.3	ref	
UK inc Eire/Europe	146	11,496	1.3	0.97	(0.82 - 1.15)
Middle East	36	4,340	0.8	0.63	(0.45 - 0.88)
Nth & Sth America	17	1,984	0.9	0.65	(0.40 - 1.05)
Africa	51	2,611	2.0	1.50	(1.13 - 1.99)
Asia	423	16,706	2.5	1.96	(1.76 - 2.18)
Baby's birth weight (grams)					
Less than 2500	21	2,990	0.7	0.55	(0.35 - 0.84)
2500 to 3999	1,924	150,196	1.3	ref	
4000 and greater	536	22,077	2.4	1.92	(1.74 - 2.11)
Hospital type					
Level 3	653	33,435	2.0	1.42	(1.27 - 1.58)
Metro Public	705	50,787	1.4	ref	
Private	477	45,676	1.0	0.75	(0.67 - 0.84)
Country base	345	21,082	1.6	1.18	(1.04 - 1.35)
Other country	300	23,767	1.3	0.91	(0.79 - 1.04)
Homebirths	1	529	0.2	0.13	(0.02 - 0.96)
Accommodation status					
Public	1915	121,452	1.6	ref	
Private	566	53,824	1.1	0.66	0.60 - 0.73
Parity					
None	1931	69,630	2.8	ref	
One	445	62,038	0.7	0.25	(0.23 - 0.28)
Two	86	28,535	0.3	0.11	(0.09 - 0.13)
Three or more	19	15,073	0.1	0.04	(0.03 - 0.07)

6.2.2 Hospital accommodation

Level three public hospitals had significantly higher rates (2.0%) of third/fourth-degree laceration, whereas private hospitals had significantly lower rates (1.0%), when compared to metropolitan public hospitals (1.4%).

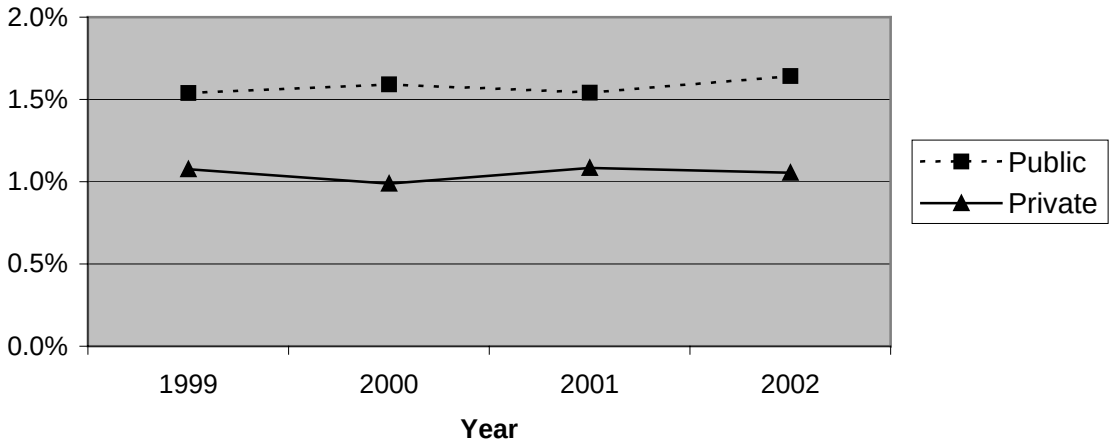
If rates of third/fourth-degree laceration are compared according to accommodation status, public patients had significantly higher rates (1.6%) compared to private patients (1.1%).

From 1999 to 2002, rates of third/fourth-degree laceration overall and amongst public or private patients remained relatively constant (see Table 6.2 and Figure 6.1).

Table 6.2: Third/fourth-degree laceration rates in TVD according to accommodation status

Year	TVD (n)	Rate third/fourth-degree laceration in TVD (%)		
		All births	*Public*	*Private*
1999	44,945	1.41	1.54	1.08
2000	44,584	1.42	1.59	0.99
2001	43,207	1.39	1.54	1.08
2002	42,540	1.44	1.64	1.05

Fig 6.1: Third/fourth-degree laceration rates according to accommodation status (TVD)



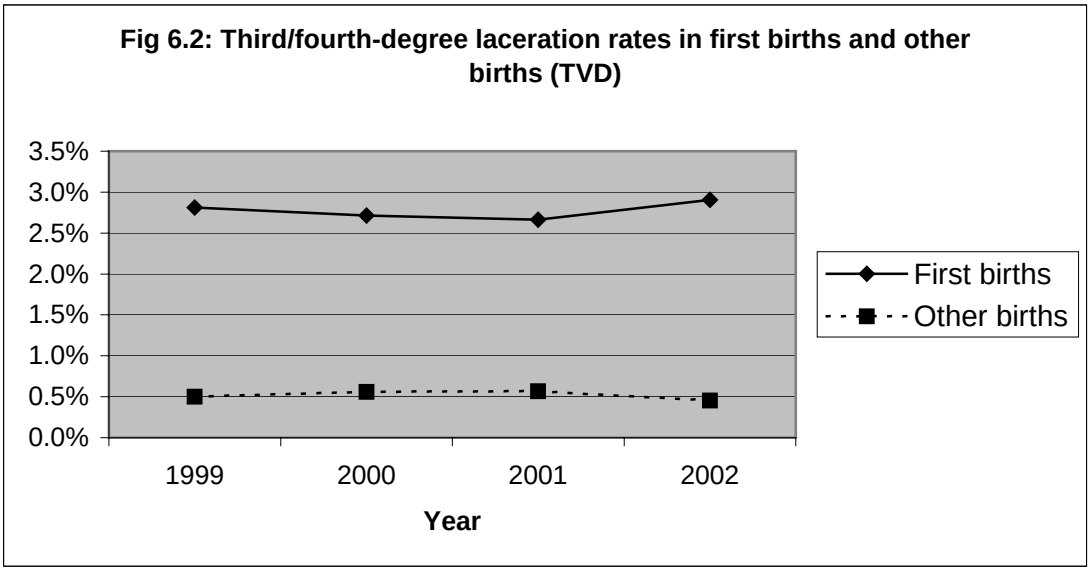
6.2.3 Parity

Nulliparous women had significantly higher rates of third/fourth-degree laceration (2.8%), compared to parous women (0.52%).

Rates of third/fourth-degree laceration for both first births and other TVD were relatively constant from 1999 to 2002 (see Table 6.3 and Figure 6.2).

Table 6.3: Third/fourth-degree laceration rates in first births$_{TVD}$

Year	TVD (n)	Third/fourth-degree laceration rate in TVD (%)	
		First births	*Other births*
1999	44,945	2.81	0.50
2000	44,584	2.71	0.56
2001	43,207	2.66	0.57
2002	42,540	2.90	0.45



6.3 Factors associated with third/fourth-degree lacerations in first births$_{TVD}$

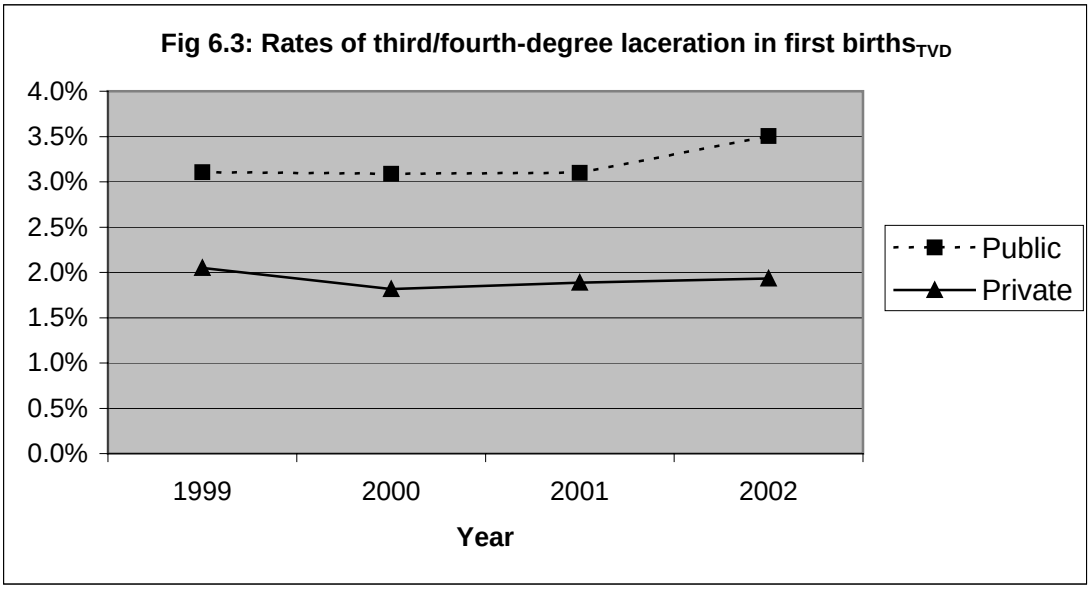
As rates of third/fourth-degree laceration were significantly higher in first births, and first births were considered to be a more homogeneous and clinically important population, a separate analysis of selected factors associated with third/fourth-degree lacerations using first births$_{TVD}$ as the reference population was undertaken. The results are provided below.

6.3.1 Hospital accommodation

As was the case for all TVD, third/fourth-degree laceration rates for first births$_{TVD}$ were higher amongst public patients (3.2%), compared to private patients (1.9%). From 1999 to 2002, rates of third/fourth-degree laceration appeared to be relatively constant for both public and private patients (see Table 6.4 and Figure 6.3).

Table 6.4: Third/fourth-degree laceration rates in first births$_{TVD}$ according to accommodation status

Year	First births$_{TVD}$ (n)	Third/fourth-degree laceration rate in first births$_{TVD}$ (%)		
		All births	*Public*	*Private*
1999	17,740	2.81	3.11	2.05
2000	17,878	2.71	3.09	1.82
2001	16,970	2.66	3.10	1.89
2002	17,042	2.90	3.50	1.93



6.3.2 Labour and delivery

Table 6.5 shows an analysis of the factors related to labour and delivery associated with third/fourth-degree lacerations in all TVD and first births$_{TVD}$. The odds ratios were similar in TVD and first births, with the exception of epidural analgesia. The incidence of these factors and trends for selected factors in first births$_{TVD}$ is described below.

Labour

Slightly higher proportions of women who had inductions (3.0%) had third/fourth-degree lacerations, compared to those who had spontaneous labours (2.7%).

Women who had prolonged labours had significantly higher rates of third/fourth-degree laceration (4.4%) compared to other women (2.6%).

Epidural analgesia

In first births$_{TVD}$, rates of third/fourth-degree laceration were similar in women who had epidural analgesia (2.8%) and those who did not (2.7%). However if all TVD are examined, rates of third/fourth-degree laceration were significantly higher in women who had epidural analgesia (2.1%), compared to those who did not (1.2%).

Table 6.5: Factors related to labour and delivery in TVD and first births$_{TVD}$

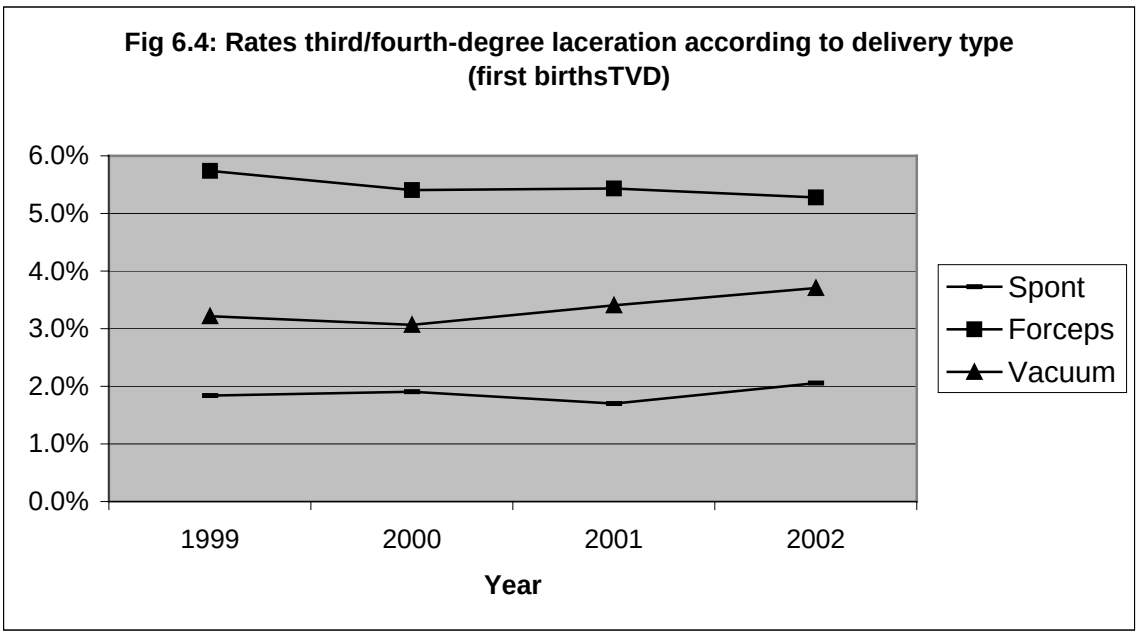
Factor	TVD					First births$_{TVD}$				
	3/4 deg lacn	Total	% 3/4 deg lacn	OR	(95%CI)	3/4 deg lacn	Total	% 3/4 deg lacn	OR	(95%CI)
Total	2,481	175,276	1.4			1,931	69,630	2.8		
Labour										
Spontaneous	1,648	120,983	1.4	ref		1,268	47,474	2.7	ref	
Induced	833	54,291	1.5	1.13	(1.04 - 1.23)	663	22,155	3.0	1.12	(1.02 - 1.24)
Prolonged labour[1]										
No	2,188	167,883	1.3	ref		1,668	63,709	2.6	ref	
Yes	293	7,393	4.0	3.13	(2.76 - 3.54)	263	5,921	4.4	1.73	(1.51 - 1.97)
Epidural										
No	1,738	139,069	1.2	ref		1,278	46,597	2.7	ref	
Yes	743	36,181	2.1	1.66	(1.52 - 1.81)	653	23,026	2.8	1.03	(0.94 - 1.14)
Delivery										
Spontaneous[2]	1,284	145,293	0.9	ref		867	46,261	1.9	ref	
Forceps	802	16,249	4.9	5.82	(5.32 - 6.37)	720	13,143	5.5	3.03	(2.74 - 3.36)
Vacuum	395	13,734	2.9	3.32	(2.96 - 3.72)	344	10,226	3.4	1.82	(1.61 - 2.07)
Episiotomy										
No	1,316	133,111	1.0	ref		928	40,895	2.3	ref	
Yes	1,165	42,165	2.8	2.85	(2.63 - 3.08)	1,003	28,735	3.5	1.56	(1.42 - 1.71)

[1] See Appendix 2 for definition
[2] Includes breech deliveries (0.4% of TVD and 0.3% of first births$_{TVD}$)

Delivery

Women who had instrumental deliveries had significantly greater rates of third/fourth-degree laceration (4.6%), compared to those who had spontaneous deliveries (1.9%). Those who had forceps deliveries had significantly higher rates (5.5%), compared to those who had vacuum extraction deliveries (3.4%). Rates remained relatively constant from 1999 to 2002 (see Figure 6.4).

Fig 6.4: Rates third/fourth-degree laceration according to delivery type (first birthsTVD)



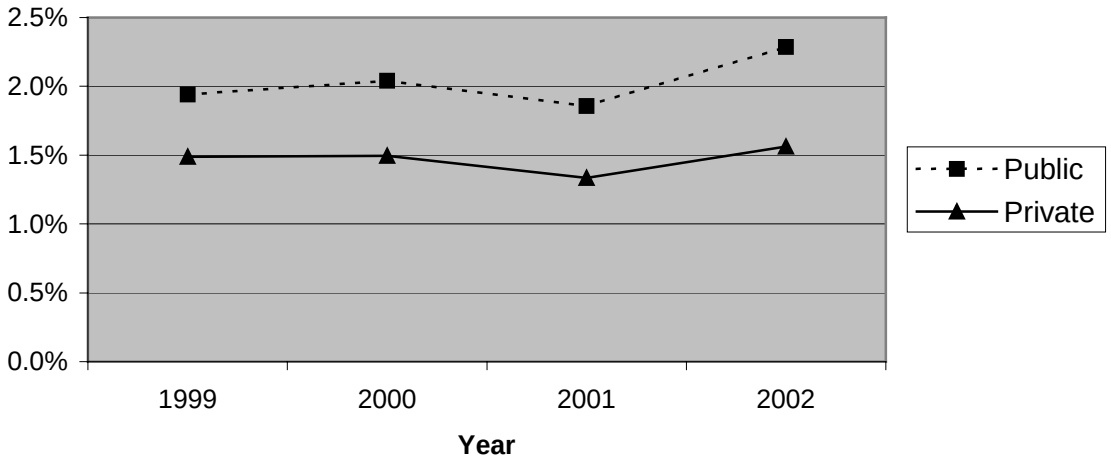
Spontaneous deliveries

Third/fourth-degree laceration rates in spontaneous deliveries (first births$_{TVD}$) were higher amongst public patients (2.0%), compared to private patients (1.5%). Rates for both public and private patients were reasonably constant from 1999 to 2002 (see Table 6.6 and Fig 6.5).

Table 6.6: Third/fourth-degree laceration rates in spontaneous deliveries (first births$_{TVD}$)

Year	Spontaneous deliveries in first births$_{TVD}$ (n)	Rates of third/fourth-degree laceration in spontaneous deliveries (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	11,977	1.8	1.9	1.5
2000	12,011	1.9	2.0	1.5
2001	11,122	1.7	1.9	1.3
2002	11,151	2.1	2.3	1.6

Fig 6.5: Third/fourth-degree laceration rates in spontaneous deliveries (first births$_{TVD}$)



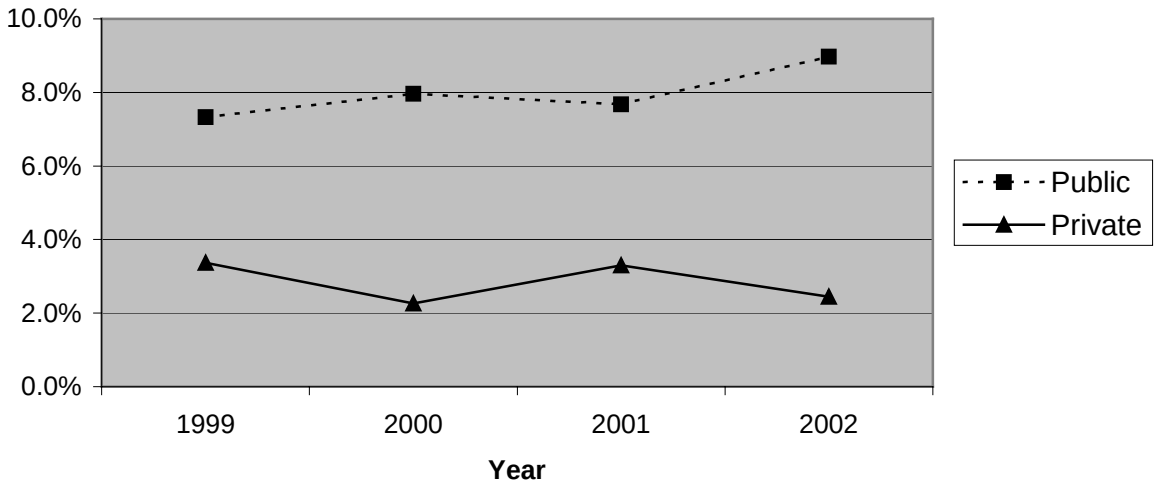
Forceps deliveries

From 1999 to 2002 third/fourth-degree laceration rates in public patients having forceps deliveries (7.9%) were higher than those for private patients (2.8%). Rates were constant overall, and for public or private patients (see Table 6.7 and Figure 6.6).

Table 6.7: Rates of third / fourth-degree laceration in forceps deliveries (first births$_{TVD}$)

Year	Forceps deliveries in first births$_{TVD}$ (n)	Rates of third/fourth-degree laceration in forceps deliveries (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	3,710	5.74	7.33	3.36
2000	3,257	5.40	7.96	2.26
2001	3,146	5.44	7.67	3.30
2002	3,030	5.28	8.97	2.45

Fig 6.6: Rates of third/fourth-degree laceration in forceps deliveries (first births$_{TVD}$)



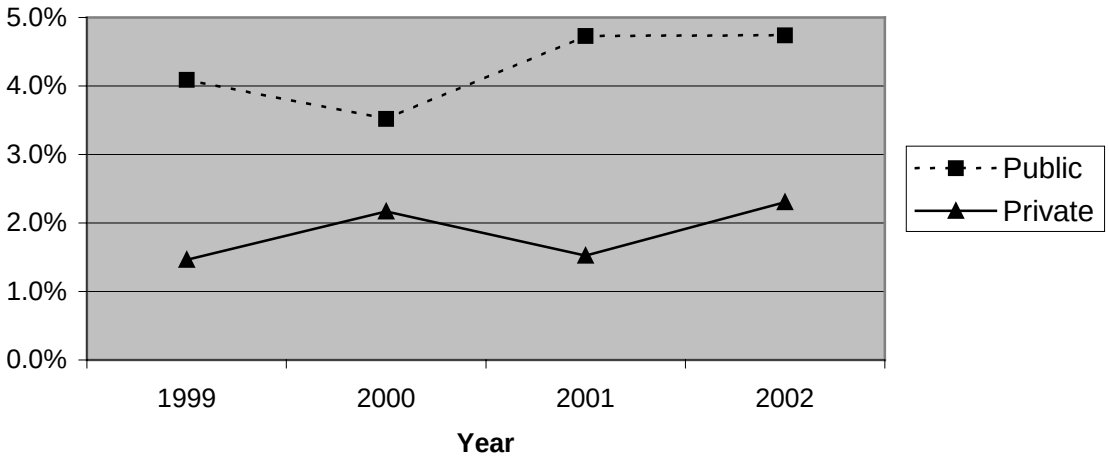
Vacuum extraction deliveries

From 1999 to 2002 rates of third/fourth-degree laceration in vacuum extraction deliveries were higher amongst public patients (4.3%), compared to private patients (1.9%). During this period rates were constant overall and for public or private patients (see Table 6.8 and Figure 6.7).

Table 6.8: Rates of third / fourth-degree laceration in vacuum extraction deliveries (first births$_{TVD}$)

Year	Vacuum deliveries in first births$_{TVD}$ (n)	Rates of third/fourth-degree laceration in vacuum deliveries (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	2,053	3.21	4.09	1.46
2000	2,610	3.07	3.52	2.17
2001	2,702	3.40	4.73	1.52
2002	2,861	3.70	4.74	2.30

Fig 6.7: Rates third/fourth-degree laceration in vacuum deliveries (first births$_{TVD}$)



Episiotomy

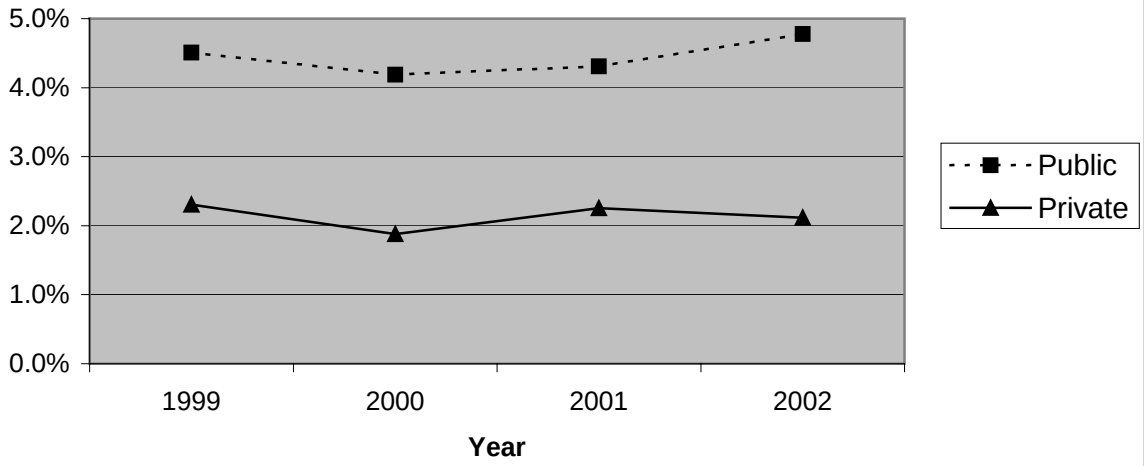
Higher proportions of women who had episiotomies had third/fourth-degree lacerations (3.5%), compared to other women (2.3%).

Rates of third/fourth-degree laceration with episiotomy were higher amongst public patients (4.4%), compared to private patients (2.1%). From 1999 to 2002 rates were constant overall and for public or private patients (see Table 6.9 and Figure 6.7).

Table 6.9: Rates of third/fourth-degree laceration in deliveries with episiotomy (first births$_{TVD}$)

Year	Deliveries with episiotomy in first births$_{TVD}$ (n)	Rates of third/fourth-degree laceration with episiotomy (first births$_{TVD}$) (%)		
		All births	*Public*	*Private*
1999	7,416	3.74	4.51	2.31
2000	7,375	3.32	4.19	1.88
2001	7,095	3.41	4.31	2.26
2002	6,849	3.49	4.78	2.11

Fig 6.7: Rates third/fourth-degree laceration with episiotomies (first births$_{TVD}$)



6.4 Third/fourth-degree laceration 1999-2002: key points

For all TVD, rates of third/fourth-degree laceration:

- Were 1.4%
- Were significantly higher amongst public patients (1.6%), compared to private patients (1.1%)
- Remained constant from 1999 to 2002.

For first births$_{TVD}$, third/fourth-degree laceration rates:

- Were significantly higher (2.8%), compared to subsequent TVD (0.52%)
- Were higher amongst public patients (3.2%), compared to private patients (1.9%)
- Were significantly higher in instrumental deliveries (4.6%), compared to spontaneous deliveries (1.9%)
- Were significantly higher in forceps deliveries (5.5%) than in vacuum extraction deliveries (3.4%)
- In forceps deliveries were higher in public patients (7.9%) compared to private patients (2.8%)
- In vacuum extraction deliveries were higher amongst public patients (4.3%), compared to private patients (1.9%)
- With episiotomy were higher amongst public (4.4%), compared to private (2.1%) patients
- Remained constant from 1999 to 2002.

7. Episiotomy rates in other populations

Published rates of episiotomy in other populations were reviewed. Comparisons should be viewed with caution as there may be differences in definitions and reporting practices may vary.

The episiotomy rate for Australia (excluding Tasmania) in 2000[16] (using total confinements, not TVD, as the denominator) was 12.9% (see Table 7.1). Reported episiotomy rates varied from 2.0% in Queensland to 18.2% in Victoria. This may, in part, be due to deficiencies and inconsistencies in reporting.

Table 7.1 Rates of episiotomy, Australia 2000 (source: Australian Institute of Health and Welfare[16])

State	Total confinements	Episiotomy[a]	
		n	*%*
Vic	61,571	11,222	18.2
NSW	86,460	11,579	13.4
Qld	48,515	957	2.0
WA	24,818	4,143	16.7
SA	17,578	3,027	17.2
ACT	4,684	606	12.9
NT	3,629	261	7.5
Tas[b]	NA	NA	NA
Australia	247,255	31,795	12.9

[a] Episiotomy only, plus combined laceration and episiotomy
[b] Data was not available

The episiotomy rate in the current study was 24.1% in TVD. If this rate is calculated using total vaginal deliveries as the denominator (as was the case in most of the reports discussed below and listed in Table 7.2), the Victorian rate was 22.7%. The reported episiotomy rates in Canada of 23.8% nationally for hospital vaginal deliveries[17] and 18.8% in the province of British Columbia for TVD[18] were similar to the Victorian rate. The episiotomy rate based on United States national hospital survey data[19] was higher at 32.7%, whereas the rate in Denmark[12] was lower at 10.9%. Rates in New Zealand[20] of 14% and England[11] of 17% were also lower.

As found in the current study, episiotomy rates varied considerably from hospital to hospital. A survey of 18 large inner city hospitals in Philadelphia from 1994-1998 found that hospital episiotomy rates ranged from 20-73% in low-risk nulliparous women[21]. Third/fourth-degree laceration rates also varied between hospitals, ranging from 4-13%. There was a positive association between the level of hospital episiotomy use and the estimated relative risk of third/fourth-degree laceration amongst women in each of the hospitals.

Table 7.2: Episiotomy rates in other populations

Location	Data source	Population	Year	Episiotomy rate (%)
Victoria (current study)	*VPDCU*	*Vaginal deliveries >36 wks*	*1999-2002*	*24.1*
Denmark[12]	Danish Patient Register, National Board of Health	Vaginal deliveries	2001	10.9
Canada[9]	Perinatal Surveillance System	Hospital vaginal deliveries	2000-2001	23.8
British Columbia[18]	Perinatal Database Registry	Term vaginal deliveries	2001-2002	18.8
United States[19]	National hospital discharge survey	Vaginal deliveries	2000	32.7
New Zealand[20]	Maternal and Newborn Information System	Vaginal deliveries	2001	14.1*
England[11]	NHS	Vaginal deliveries	2002-2003	Approx 17*

*Derived from data on total hospital deliveries

8. Third- and fourth-degree laceration rates in other populations

Table 8.1 shows rates of third- and fourth-degree laceration without episiotomy amongst Australian states and territories in 2000[16]. The denominator was all confinements, not TVD. Rates ranged from 0.57% in Victoria to 10.3% in Queensland. The Queensland rate requires validation, as it appears to involve a misclassification of third/fourth-degree lacerations.

Table 8.1 Rates of third- and fourth-degree perineal laceration without episiotomy, Australia 2000 (source: Australian Institute of Health and Welfare[16]), all confinements

State	Total confinements	Third/fourth-degree lacerations	
		n	*%*
Vic	61,571	352	0.57
NSW	86,460	927	1.1
Qld	48,515	4,985	10.3
WA	24,818	181	0.73
SA	17,578	126	0.72
ACT	4,684	41	0.88
NT	3,629	45	1.2
Tas[a]	NA	NA	NA
Australia	247,255	6657	2.7

[a] Data was not available

Table 8.2 shows rates of third- and fourth-degree laceration from studies in Australia, the United States, Canada, Europe and Scandinavia. When examining the data, differences in the populations (eg. all hospital deliveries versus vaginal deliveries) as well as when the study was conducted and data sources (tertiary hospital records versus state or national data) should be considered.

Victoria appears to have comparatively low rates of third/fourth-degree laceration of 1.4% for TVD (1.3% if total vaginal deliveries is used as the denominator). Reports from South Australia of total vaginal deliveries[22], The Netherlands of TVD[23] and one American study[24] with broad exclusion criteria identified similar rates. Two[25 12] of the three reports from Scandinavia documented rates of approximately 3%, the other (smaller study) was higher at 6.4%[26]. The Canadian Perinatal Surveillance System reports a rate of 4.7% (for hospital vaginal deliveries)[9], while the rate in Nova Scotia (examining singleton births resulting in a live neonate) was 3.6%[10] and that in British Columbia was similar at 3.9% (for TVD)[18].

Rates of third/fourth-degree laceration in vaginal deliveries derived from hospital records in the United States ranged from 6.4% to 10.2%[27 14 28]. One hospital study of nulliparous women reported rates of 14.1%[29]. A United States national survey of all hospital deliveries[30] reported lower rates of 5.0% which were similar to those reported for the state of California (5.9% for vaginal deliveries)[31].

Table 8.2: Rates of third- and fourth-degree perineal laceration in other populations

Data source and location	Population	Year	Laceration	
			n	*%*
Victoria (current study)	*Vaginal deliveries >36 wks*	*1999-2002*	*2,481*	*1.4*
Hospital records, Adelaide, South Australia[22]	Vaginal deliveries	1991-1996	116	1.2
Hospital records, Miami, Florida[24]	Vaginal deliveries: cases of malpresentation, multiple gestation, history of c/s delivery, shoulder dystocia, babies weighing <500g excluded	1989-1995	1,124	2.2
US national hospital discharge survey[30]	Hospital deliveries	1993-1997	188,803	5.0
Database of the California Office of State Health Planning and Development[31]	Vaginal deliveries (excluding breech, preterm, multiple and stillbirths)	1992-1997	123,009	5.9
Hospital records, Topeka, Kansas[27]	Vaginal deliveries: vertex, singleton, live birth, ≥36 wks (cases with diabetes or severe cardiac disease excluded)	1996-2000	176	6.4
Hospital records, Houston, Texas[28]	Singleton, vertex vaginal deliveries >20 wks	1993-1998	1,905	8.2
Hospital records, Philadelphia, Pennsylvania[14]	Vaginal deliveries	1983-2000	3,487	10.2
Hospital records, Boston, Massachusetts[29]	Non-diabetic nulliparas ≥36 wks, singleton, cephalic presentation	1994-1995	273	14.1
Canada Perinatal Surveillance System[9]	Hospital vaginal deliveries	2000-2001	12,095	4.7
Nova Scotia Atlee Perinatal Database[10]	Singleton vaginal births resulting in a live neonate >500g	1988-1997	3,244	3.6
British Columbia Perinatal Database Registry[18]	Vaginal deliveries >36 wks	2001-2002	1,070	3.9
Hospital records, Amsterdam[23]	Vaginal deliveries >36 wks	1989-1994	120	1.8
Hospital records, Goteborg[25]	Vaginal deliveries	1995-1997	95	3.3
Danish Patient Register, National Board of Health[12]	Vaginal deliveries	2001	1,867	3.5
Hospital records, Stockholm[26]	Vaginal deliveries (Swedish-speaking women)	1995	54	6.4

9. Trends in rates of episiotomy and perineal laceration in other populations

Over the past 20 years a number of studies have reported substantial reductions in episiotomy rates[8 9 10 11 12 13 14 15 6]. Many of these reports[9 12 13] also document increasing rates of second-degree lacerations. In some, third/fourth-degree lacerations remained constant[9 12], while in others, rates of third-degree (but not fourth-degree) laceration increased[10], or rates of both third- and fourth-degree laceration declined[6] (see Table 9.1).

A study of anal sphincter laceration rates in Nova Scotia[10], found an increase from 2.8% in 1988 to 3.6% in 1997. This increase was due to third-degree lacerations only. At the same time, there was a decrease in episiotomy rates, an overall decrease in instrument-assisted deliveries and an increase in the proportion of singleton live births weighing 3000 grams or more. The proportion of women with a second stage longer than two hours also increased while the proportion of women having had no previous vaginal birth did not change. After controlling for changes in all risk factors, a two-fold increase in anal sphincter laceration rates was observed.

In the United States episiotomy rates decreased from 63.9% in 1980 to 39.2% in 1998[13]. Rates decreased across all age, race, region and source of payment categories. However white women had higher episiotomy rates than black women, and those with private insurance continued to have higher rates than those with Medicaid or without insurance.

Table 9.1: Trends in episiotomy and perineal laceration in other populations (amongst vaginal deliveries unless otherwise specified)

Data source and location	Trend in episiotomy rates	Trend in second degree laceration rates	Trend in third/fourth degree-laceration rates
Victoria (current study) *1992-1998* *1999-2002*	 *23.3% to 20.9%* *24.5% to 23.3%*	 *20.1% to 21.5%*	 *0.58% to 0.94%* *Constant (1.4%)*
NSW Perinatal Data Collection[8] 1990-1997 (low-risk women)	Decrease 34.8% to 33.9% nulliparae 13.1% to 9.5% multiparae		Constant (mean 1.8% nulliparae mean 0.31% multiparae)
Canadian Perinatal Surveillance System[9] 1991/92-2000/01	Decrease 49.1% to 23.8%	Increase (first- & second-deg) 33.0% to 49.7%	Constant (mean 4.7%)
Nova Scotia[10] 1988-1997	Decrease 66.7% to 28.0%		Increase 2.8% to 3.6% (increase 3rd deg only)
NHS, England[11] 1991/92-2002/03	Decrease 26% to 17%*		
Danish Patient Register, National Board of Health[12] 1997-2001	Decrease 14.6% to 10.9%	Increase 5.8% to 10.5%	Constant (mean 3.4%)
US National Hospital Discharge Survey[13] 1980-1998	Decrease 63.9% to 39.2%	2.0% in 1980 7.4% in 1990 13.6% in 1998	4.1% in 1980 7.2% in 1990 5.2% in 1998
Hospital records, Philadelphia, Pennsylvania[32] 1983-2000	Decrease 69.6% to 19.4%		
Obstetric record system, obstetric practices based at university health centre and county health dept, Birmingham, Alabama[15] 1995-2000	Decrease 31.6% to 16.7%		Constant (mean 7.5%)
University of California, San Francisco Perinatal Database[6] (spontaneous vaginal deliveries) 1976-1994	Decrease 86.8% to 10.4%		Decrease 9.0% to 4.2%

* Proportion of vaginal deliveries, derived from data on total hospital deliveries

10. Discussion

This study used data routinely collected by the VPDCU to examine the incidence, risk factors and trends for episiotomy and perineal lacerations in the population of women giving birth in Victoria.

10.1 Methodological issues

The VPDCU databases provide a wealth of information on perinatal outcomes and include more than 99% of hospital births, however there are some limitations. The reporting of perineal lacerations and episiotomy was changed from free text to 'tick boxes' on the VPDCU data collection form in 1999. This change may have resulted in improved reporting and contributed to the apparent increase in rates of third/fourth-degree laceration and episiotomy observed in trend data from 1998 to 1999.

When examining the trend data related to third/fourth-degree lacerations, the rates in 1992 appear higher than expected. This may be associated with improved reporting, as a campaign to improve reporting of perineal lacerations was undertaken by VPDCU staff during that year.

Most of the variables examined in this study for the period 1999 to 2002 were 'tick box' items, so are likely to be reliably reported and recorded (as was the case in validation studies when VPDCU data were compared to hospital records). However, some factors which have been previously reported as risk factors for perineal injury (such as duration of the second stage of labour[33 34 10]) were not collected by the VPDCU, so could not be included in this study.

Another factor that may impact on the study is the accuracy of the classification of perineal lacerations. In one report[35], 3% of nulliparous women sustained a third- or fourth-degree laceration during delivery which was identified on clinical examination. Following endosonography, a further 32% were identified as having a third- or fourth-degree laceration. It is unclear if these sphincter defects represent missed lacerations or true 'occult' defects. However it has been shown that the detection and recording of third-degree lacerations can be improved by increased vigilance of labour ward staff[36]. In another study from the United Kingdom[37], 41% of doctors and 16% of midwives classified a torn anal sphincter as a second-degree tear. Therefore, the incidence of third/fourth-degree laceration may be under-estimated in reports to the VPDCU, and reporting may vary between and within maternity units.

When examining some of the factors associated with perineal injury, women having first births$_{TVD}$ were selected as the study population. This meant that the comparison group of parous women included some women who were having their first vaginal delivery after a prior caesarean section. Women who have a first vaginal delivery after a prior caesarean section may be at slightly greater risk of sustaining an anal sphincter laceration, than women who are nulliparous[15]. Inclusion of parous women undergoing their first vaginal delivery may therefore lead to an under-estimation of some of the rates in the current study.

As the main aim of this report was to prepare descriptive data describing recent trends, only univariate analysis was undertaken to identify risk factors for episiotomy and third/fourth-degree lacerations. Multivariate analysis is required to determine interrelationships between the factors and control for any confounding variables.

Another limitation is that there may be systematic differences in reporting practices between (and even within) hospitals.

10.2 Episiotomy

Incidence

A review of the literature to examine the benefits and risks of episiotomy[4], concluded that:

> 'Episiotomies prevent anterior perineal lacerations (which carry minimal morbidity), but fail to accomplish any of the other maternal or fetal benefits traditionally ascribed,…... The incision substantially increases maternal blood loss, the average depth of posterior perineal injury, the risk of anal sphincter damage and its attendant long-term morbidity (at least for midline episiotomy), the risk of improper perineal wound healing, and the amount of pain in the first several postpartum days'.

While there is clear evidence to support restrictive use of episiotomy, the ideal range of episiotomy rate remains to be established. Sultan and Thacker[38] suggest that, based on the literature, the overall ideal episiotomy rate should be between 20% and 30%, however there is no indication of the ideal rate for nulliparae versus multiparae. Others[39] have pointed out that there have been reports of lower episiotomy rates (some less than 10%), with good maternal and neonatal outcomes. Differences in episiotomy rates are not well explained by differences in the patient population and are more likely to be related to differences in clinicians and their beliefs in the benefits of episiotomy[40].

The incidence of episiotomy in Victoria was 24% for TVD. This is comparable with the rate reported by the Canadian Perinatal Surveillance System[9], but higher than rates reported in Danish[12], New Zealand[20] or English[11] studies. These differences are presumed to be due to clinical practices, although there may be disparities in reporting or coding practices.

There were also differences between episiotomy rates amongst Australian states and territories, with Victoria reporting the highest rate. Regional differences in episiotomy rates have been identified elsewhere. In Canada[9], rates ranged from 2.9% to 30.1% in individual provinces and territories. In the United Kingdom, there was marked geographical variation, with episiotomy rates ranging from 26% to 67% in individual regions. In that study, in general, high (or low) rates for episiotomy were balanced by low (or high) rates for perineal lacerations[33]. The authors state that the large geographical variation reflects controversy about whether to perform an episiotomy or to let the perineum tear. They suggest that there is scope to reduce the rates, perhaps through national guidelines.

Episiotomy rates in Victorian hospitals (with greater than 100 births per year) ranged from 5-50%. Differences in reporting practices may contribute to this wide range, however others have reported similar findings. In an American study[21] hospital episiotomy rates ranged from approximately 20-73% in low-risk nulliparous women. The authors speculate that the wide range in rates may be related to the policies, procedures, preferences, or 'practice styles' of individual physicians and hospitals.

Other American studies have found significant differences in episiotomy rates between different types of obstetric providers. In one hospital[34], midwives performed episiotomies in spontaneous vaginal deliveries at a rate of 21%, full-time hospital staff specialists at 33% and private providers at 56%. This

difference could not be explained by clinical or demographic factors of the women giving birth. In another study[41], the strongest predictor of episiotomy use was practitioner type, with women attending private physicians having a seven-fold increased risk of episiotomy.

The various types of obstetric providers in Victoria could not be identified in the VPDCU databases used in the current study. However there were marked differences in episiotomy rates between public (20%) and private (33%) patients and this may, in part, be related to different approaches to episiotomy in the two sectors. There were also significant differences in episiotomy rates between hospital types, with private and level three public hospitals having the highest rates.

As episiotomy is strongly associated with instrumental delivery, one possible reason for the higher rates of episiotomy reported in private hospitals could be as a result of higher rates of instrumental delivery. In NSW, private hospitals had higher rates of instrumental delivery but this did not completely explain the difference in episiotomy rates between the public and private sectors[42]. In addition, variations in intervention rates could not be explained by women being at greater risk of obstetric complications in the private sector[43].

This variation suggests that episiotomy rates could be decreased by changing hospital or physician practices or policies, as has been achieved in other settings through continuous quality improvement programs[44].

Other risk factors for episiotomy

A number of other factors, as well as hospital type and accommodation status, were associated with the risk of episiotomy.

Parity

Nulliparous women were significantly more likely to have an episiotomy than parous women, as has been reported previously[45 46 47]. This may be related to an increased risk of instrumental delivery in nulliparous women[27] or the perceived relative inelasticity of the perineum in nulliparous women[28].

Maternal age

Women aged less than 25 years had significantly lower episiotomy rates, compared to those in older age groups. In contrast, slightly younger women were more likely to have episiotomies in two American studies[39 32] and in others maternal age was not associated with episiotomy[34 45].

Maternal country of birth

An interesting finding was that episiotomy rates varied with maternal country of birth. Women born in Asia and Africa had higher episiotomy rates, compared to Australian-born women, whereas those from the Middle East had lower rates. A NSW study reported similar findings[48]. These investigators also reported higher rates of instrumental delivery in women born in Africa and Asia, and lower rates in women born in the Middle East. Reasons given for this included an increased incidence of dysfunctional labour and cephalopelvic proportion in Asian women, and that Asian women were generally older and more often nulliparous. Another explanation may be increasing rates of macrosomia in Chinese women living in Australia[49], however the univariate analysis undertaken in the current study only found a slightly increased risk of episiotomy in women giving birth to high birth

weight babies. In contrast, others[34 46] have reported high birth weight as a risk factor for episiotomy.

There have been other reports of ethnic differences in episiotomy rates. In an English study, women born in Asia and the Indian sub-continent were more likely to have episiotomies than other women[33]. American studies report an increased risk of episiotomy amongst white women[39 32 46], which may be related to socioeconomic or insurance status[45].

Presentation

As expected, women who had breech or other non-vertex presentations were significantly more likely to have episiotomies. Some studies have excluded breech presentations from their study populations due to a known association with episiotomy[15 39].

Epidural analgesia

Epidural analgesia was a risk factor for episiotomy, as reported elsewhere[50 34 46 47]. This may be related to increased use of epidural analgesia in instrumental delivery or increased willingness to perform the procedure when analgesia had already been provided[46]. In the current study, epidural analgesia was a risk factor for both women having their first birth and all TVD, whereas a NSW study[47] found epidural analgesia increased the risk of episiotomy in parous but not nulliparous women.

Instrumental delivery

Forceps[32 45 47] and vacuum extraction[50 45 47] deliveries are well documented risk factors for episiotomy. In the current study, use of forceps greatly increased the risk of episiotomy, as did vacuum extraction, but to a lesser extent. Episiotomy was performed in 87% of forceps and 53% of vacuum extraction deliveries (TVD). These rates are similar to those reported in England of 75-80% and 60% respectively[11]. Ecker et al[51] provide evidence that the use of episiotomy need not be routine in instrumental deliveries. In that study, episiotomy rates in instrumental delivery declined without a corresponding increase in rates of severe perineal laceration.

10.3 Perineal lacerations

Incidence

Short-term complications of perineal lacerations include pain, infection, and haemorrhage. Long-term effects may include dyspareunia, cosmetic deformity, and incontinence of flatus or faeces[52]. Some of these injuries are occult and only detectable with endoanal sonography[26].

The clinical consequences of anal sphincter trauma may not manifest for some years until there is further deterioration of anal sphincter function, such as that which occurs with aging, effects of menopause and changes in collagen. Long-term follow-up has been suggested to assess the impact of anal sphincter injury on the development of incontinence in later life[53].

The incidence of third/fourth-degree laceration (with and without episiotomy) in Victoria was 1.4% of TVD. This is relatively low compared to rates reported in a number of other studies[31 27 28 14 29 10 9 25 12 26]. In centres practising mediolateral episiotomy rates have been cited as between 0.5% and 2.5%[54]. Differences in

obstetric practices in different populations, such as rates and types of episiotomy and instrumental deliveries, should be considered when making comparisons. In addition, there may be variations in the classification of lacerations and methods of reporting data.

Risk factors

Parity

Nulliparity was identified as a significant risk factor for third/fourth-degree laceration, as reported elsewhere[26 55 24 31]. This is probably related to perceived differences between nulliparous and parous women in terms of the elasticity and strength of connective tissue[56 26].

Instrumental delivery

The risk of third/fourth-degree lacerations is well-documented in both forceps[23 28 55 10 14 24 31] and vacuum extraction deliveries[28 10 14 24 31]. We found that both forceps and vacuum extraction delivery increased the risk of sustaining a third/fourth-degree laceration, however the risk was greater with forceps deliveries. The increased risk with forceps deliveries, compared to vacuum extraction, has been reported previously[28] and the use of vacuum extraction rather than forceps, if instrumental delivery is required is recommended[57]. A possible explanation for the increased risk of third/fourth-degree laceration in instrumental delivery may be the high rates of episiotomy used in forceps and vacuum extraction deliveries.

Episiotomy

In the current study, episiotomy increased the risk of third/fourth-degree laceration. Both midline[26 10 28 24] and mediolateral episiotomy[28 55 10 24] have been associated with increased risk of third/fourth-degree laceration, however the risk was reduced with mediolateral episiotomy[58], which is the procedure performed in Victorian hospitals.

Birth weight

High birth weight was a risk factor for third/fourth-degree lacerations, as has been reported previously[28 26 24 31]. This association is likely to be due to the mechanical stress of delivering a large baby[31]. Ultrasound estimation of fetal weight may be helpful in counselling women about the route of delivery for macrosomic infants[10].

Maternal country of birth

In the current study, women from Asia and Africa had significantly higher rates of third/fourth-degree laceration, while those from the Middle East had lower rates. Others have reported Asian country of birth as a risk factor for third/fourth-degree laceration[31 14 28]. Differences in body type and variations in perineal anatomy[31] or increasing rates of macrosomia in Chinese women living in Australia[49] are possible explanations. Another reason could be higher rates of episiotomy in Asian women found in this and other studies[33].

In America white race is a risk factor for third/fourth-degree laceration, when compared to black race. This may also be due to racial differences in pelvic floor anatomy and function[14]. It should be recognised that in the current study and others, the categories of racial groups were often heterogeneous.

Epidural analgesia

If all TVD were considered, epidural analgesia was a risk factor for third/fourth-degree laceration, however in the sub-group of nulliparous women it was not a risk factor. In one study including both nulliparous and parous women, epidural analgesia was not associated with severe perineal laceration[59]. However, in another study of nulliparous women only, those who had epidural analgesia during labour were almost twice as likely to have third/fourth-degree lacerations, as those who did not[29]. This increased risk with epidural analgesia was attributed to increased rates of instrumental delivery and episiotomy with epidural analgesia, and when this was taken into account, epidural analgesia was no longer an independent predictor of third/fourth-degree lacerations. Others who included both nulliparous and parous women in their study also reported an increased risk of third/fourth-degree laceration with epidural analgesia, which they attributed to an associated threefold increased use of instrumental delivery[27].

Maternal age

Some investigators have found an association between third/fourth-degree lacerations and older maternal age[24], while others did not[55]. We found a slightly increased risk in women under 30 years, when compared to those in older age groups.

Induction of labour

Women who had inductions appeared to be at slightly increased risk for third/fourth-degree lacerations. Induction has been reported as a risk factor[23], however others[55] found that a relationship could not be established after adjustments were made for other associated variables.

Prolonged labour

Some studies have examined the duration of the second stage of labour as a risk factor for third/fourth-degree lacerations[10 55]. Actual duration of labour is not recorded on the VPDCU databases, instead prolonged labour may be reported as a complication of labour and delivery. The current study found that women who had prolonged labour had significantly higher rates of third/fourth-degree laceration. One study found that there was an increase in risk for every hour beyond two hours in the second stage[10]. Others[55] reported similar results to the current study in univariate analysis but the association between duration of the second stage and complete anal sphincter laceration was not present after multivariate analysis. In a review article, Hordnes et al[60] concluded that the duration of the second stage did not seem to affect the risk of severe laceration, and that the risk to the perineum was related to any instrumental intervention 'indicated' by a long second stage.

Hospital accommodation

In the current study, third/fourth-degree laceration rates were related to the type of hospital where the birth took place. Public hospitals, particularly level three hospitals, had the highest rates. A study of hospitals in Philadelphia demonstrated that the relative risk of sustaining a third/fourth-degree laceration was up to five times greater, depending on where the birth occurred, even after adjustment for patient and infant characteristics[21]. This risk was related to the frequency of episiotomy use in the different hospitals.

There is no apparent explanation for the higher third/fourth-degree laceration and episiotomy rates observed in level three hospitals. Validation of data is required to ensure that these differences are not due to variations in reporting practices in the different types of hospitals. Likewise, we are unable to verify the accuracy of reporting practices in the public and private sectors, but taken on face value, the differences invite explanation.

The risk of third/fourth-degree laceration was higher amongst public patients, despite higher rates of instrumental delivery and episiotomy in the private sector. In forceps deliveries in nulliparous women this difference was marked, with 7.9% of public patients sustaining a third/fourth-degree laceration, compared to 2.8% of private patients.

The few American studies that have examined the association between insurance status and third/fourth-degree lacerations are not consistent with the findings of this study. One examined Medicaid status as a predictor of third/fourth-degree lacerations and found no association[14]. Another identified women who were insured with a health maintenance organisation or had private insurance as at greater risk of a third/fourth-degree laceration, compared to those with Medicaid insurance[31].

There have been reports of differences in third/fourth-degree laceration rates according to provider type. The differences in the public and private sector and between hospital types identified in the current study may reflect differences in practices related to the types of clinicians working in the two systems.

McLeod et al[10] found that delivery by an obstetrician, rather than a general practitioner, increased the risk of third/fourth-degree laceration. The authors speculated that this difference could be due to the confounding effect of trainees in the obstetrician group but were unable to confirm this. In contrast, Combs et al[56] found no significant difference in third/fourth-degree lacerations at instrumental delivery, when delivery by residents was compared to delivery by full-time hospital staff specialists.

Inadequate training of clinicians in perineal anatomy has been identified in other settings. In the United Kingdom, Sultan et al[37] found that 91% of doctors who had done at least six months training in obstetrics, and 60% of midwives, indicated inadequate training in perineal anatomy, and 84% and 61% respectively reported inadequate training in identifying third-degree lacerations.

In Victorian metropolitan public hospitals normal births are supervised by midwives, whereas in private hospitals obstetricians attend all births. The higher rates of third/fourth-degree laceration in forceps deliveries in public patients compared to private patients may, in part, be related to differences in the skill and experience of the accoucheur. In metropolitan public hospitals forceps deliveries are often undertaken by trainees with varying degrees of supervision. Lack of specialist supervision at the birth may be an explanation for higher rates of third/fourth-degree laceration observed in the public system. We are unable to confirm this, but it is an important finding of this report, and a topic that public hospitals may wish to address.

The lower rates of episiotomy in public patients could well be explained by a more ‘hands off’ approach to this intervention by midwives, in accordance with the evidence supporting the use of ‘restricted episiotomy’. Private hospitals may wish to address this disparity.

Absence of risk factors

While it is important to understand the risk factors for perineal lacerations, it should be noted that women without any of the reported risk factors may still sustain third/fourth-degree lacerations. In one study, 7% of women who did not have any of the reported risk factors had anal sphincter lacerations[23].

10.4 Trends

Consistent with world trends, episiotomy rates in Victoria have decreased slightly. This trend is not as marked as that reported in other studies. Reports from Canada[9] and England[11] described declines in rates of 25 and seven percentage points respectively over a similar period. It should be noted that the initial episiotomy rate in Canada was considerably higher than the rate in Victoria.

In Victoria the slight decline in episiotomy rates occurred primarily in the public sector. In NSW[42] episiotomy rates declined overall but this was entirely due to a substantial decline in the use of episiotomy in public hospitals (from 17.6% in 1997 to 15.9% in 1999). In private hospitals, the episiotomy rates were consistently between 32% and 33% during this period.

Despite decreasing episiotomy rates in Victoria, there was no corresponding change in rates of women having an intact perineum from 1999 to 2002. This is probably related to increasing rates of second-degree lacerations. More importantly, rates of third/fourth-degree lacerations remained constant. Similar trends (decreasing episiotomy rates, increasing second-degree laceration rates and constant third/fourth-degree laceration rates) have been reported in other populations[9 12]. This is consistent with the view that episiotomy provides considerable protection from first- and second-degree lacerations, but increases the likelihood of third- and fourth-degree lacerations[13].

10.5 Implications for maternity service providers

The key points for maternity services arising from this study are listed below.

- Rates of both episiotomy and third/fourth-degree laceration in Victoria are comparable to those reported in other populations, however disparities between population sub-groups are of concern, for example, differences between public and private sectors, hospital types, and women born in different countries.

- Large variations in episiotomy rates indicate that reductions are possible, particularly in the private sector.

- The higher third/fourth-degree laceration rates (particularly for births involving instrumental delivery and episiotomy) in public patients compared to private patients may indicate the need for improved supervision of trainees in the public sector.

- Knowledge of the risk factors for third/fourth-degree lacerations is required to assist prevention. This involves identification of women at risk so that management of the birth may be modified.

- Hospitals should implement practices to ensure accurate reporting of perineal injury to the VPDCU.

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APPENDIX 1: Summary of the validation study of the Perinatal Morbidity Statistics Form 1999

This study was undertaken to assess the reliability of data reported on the Perinatal Morbidity Statistics Form used by VPDCU.

The validation involved completing blank forms with data obtained from hospital medical records and comparing them with the forms completed by midwives that had been sent to the VPDCU.

Forms recording births in July 1999 were selected. Twenty randomly selected hospitals took part. A total of 676 randomly selected forms were validated. This was equivalent to approximately 1% of births.

Table 1 lists the data items of interest to this study and shows the number (and percent) of forms that did not match for a particular data item. Table 2 shows the accuracy of recording of procedures and operations; and complications of labour, birth or postnatal.

Table1: Discrepancies between the medical record and the form used by VPDCU

Item *(Number items =Number of forms=676 unless otherwise stated)*		**Errors**	**Percentage**
Public/private patient		6	0.8
Mother's country of birth	*(648)*	6	0.9
Hospital		2	0.2
Birth date (mother)		4	0.5
Total previous pregnancies	*(919)*	43	4.6
Labour - induced or augmented	*(417)*	128	30.6
Presentation		2	0.2
Type of birth		6	0.8
Baby's birth weight		4	0.5
Gestation		77	11.3

Table 2: Recording of complications and procedures

Condition	**Recorded on form**	**Missed on form**	**Total validated**	**% Missed**
Procedures and operations[1]	74	24	98	24.4
Complications of labour, birth or postnatal[2]	256	134	390	34.3

[1] Episiotomy was one of the variables coded under this category from 1992-1998
[2] Sutured perineal lacerations (1992-1998), un-sutured perineal lacerations (1999-2002) and prolonged labour were some of the variables coded under this category

APPENDIX 2: Codes and definitions of conditions referred to in this report

Conditions referred to in this report are listed below. The relevant ICD-10-AM codes are listed in brackets next to each condition.

Prolonged labour was defined as:

- Prolonged first stage of labour (O63.0)
- Prolonged second stage of labour (O63.1)
- Delayed delivery of second twin (O63.2), and
- Long labour, unspecified (O63.9)

When labour is actively managed, as it is in hospital, it is termed prolonged if delivery is not imminent after 18 hours of established labour[61].

Epidural analgesia included epidural/spinal/caudal with or without intramuscular narcotics.