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Factors associated with changes into public or private maternity care for a second pregnancy

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Abstract

Objective. The aim of this study was to determine whether outcomes in a first pregnancy were associated with changes into and out of public maternity care.

Methods. The study population included 155,492 women with 1st and 2nd sequential singleton births, 2000-2009 in NSW. Analyses were stratified by whether obstetric care for the first birth involved private or public maternity care. Interventions, infant and maternal outcomes were assessed as predictors of a change in care. Adjusted odds ratios (aOR) for changing care were obtained from logistic regression using backwards elimination.

Results. Similar proportions of women changed from private to public care between first and second births, (9.6% compared to 9.4% public to private, P=0.10). While interventions (operative delivery, epidural) and outcomes (low Apgar, preterm birth, perinatal death, postpartum haemorrhage, perineal tear and severe maternal morbidity) were all associated with changes from public to private care, only poor infant condition (aOR 1.39, 1.15-1.68) was associated with a change from private to public care.

Conclusions. The majority of women had consistent care type for both births. This may indicate women are generally satisfied with care, they rationalize that their first birth care was optimal or they value continuity of carer across pregnancies.

What is known about the topic?

There is some evidence to suggest that interventions and outcomes of one pregnancy are associated with changes in type of delivery, timing of delivery and outcomes of subsequent births.

What does this paper add?

Obstetric interventions and adverse maternal and infant outcomes were associated with changing maternity care provider and influenced whether or not women remained with the same care provider.

What are the implications for practitioners?

Continuity of carer may be important to women in choosing subsequent pregnancy maternity care provider. Most women do not change provider, but first birth experiences appear to influence those who do change.

Introduction

In Australia, approximately one-third of women receive private obstetric care for pregnancy and childbirth and overall 30% of births occur in private hospitals.[1] Private care usually involves antenatal, birth and postpartum care by a single carer, an obstetrician, while public maternity care often includes a range of carers including residents, registrars, midwives, and staff specialists and may occur through a range of models of care including team care and shared care.[2] Although there have been numerous federal incentives to take up private care including the private health insurance rebate (introduced 1999; means tested from 2012), lifetime health cover (introduced 2000), and the Medicare levy surcharge (introduced 1997), since 2004 the proportion of women giving birth as private patients has not changed.[1,3]. However, there have been changes in where the private care is provided with an increase in the proportion of births in private hospitals (22.9% to 24.5%) consistent with a small increase in the availability of private hospital beds.[4,5] Following the introduction of the baby bonus in 2004 and the associated birth boom, private hospital births did not increase as quickly as public hospital births probably because maternity beds in private hospitals are capped.[6]

For women who have previously given birth, choice of public or private care in a subsequent pregnancy and birth is likely to be affected by numerous factors including satisfaction with previous care,[7,8] continuity of previous care,[7] proximity to services, and personal circumstances related to income, partner and childcare. There is evidence to suggest that interventions and outcomes of one pregnancy are associated with changes in type of delivery,[9] timing of delivery[9] and outcomes of subsequent births.[10] Extending this previous research, we hypothesised that obstetric interventions and adverse outcomes in a first birth might influence a change in the type of maternity care. Given the increase in births over the proposed study period and the capping of private hospital births during this time, we focussed our primary analyses on changes in private care, rather than type of birth hospital. The aim of this study was to determine whether outcomes in a first pregnancy were associated with a change into and out of public maternity care in NSW between July 2000 and December 2009.

Methods

Study population

The study population included women with 1st and 2nd sequential singleton birth between July 2000 and December 2009 in NSW. Multifetal pregnancies (twins and higher order multiples) were excluded as they carry different risks and outcomes compared to singleton pregnancies.

Data sources

This is a population-based record linkage study utilising data from the New South Wales (NSW) Perinatal Data Collection (PDC) and the NSW Admitted Patient Data Collection (APDC). The PDC is a statutory, population-based surveillance system including births of at least 400 grams birth weight or 20 weeks gestation, and includes information on maternal characteristics, pregnancy, labour and delivery factors and infant outcomes. Hospital birth admission data were obtained from the APDC, which covers demographic and hospitalisation related information for every inpatient that is admitted to public and private hospitals in NSW. Record linkage of these two data collections was undertaken by the Centre for Health Record Linkage (CHeReL) using methods described previously[11] and only de-identified information was provided to the researchers. For this project, the CheReL reported the linkage quality as < 1/1,000 missed links and < 2/1,000 false positive links. Approval for record linkage and use of the data was obtained from the NSW Population and Health Services Research Ethics Committee.

The primary outcome of interest was whether the mother changed from public (public patients) to private obstetric care (private patients) from the first to second pregnancy (or vice versa). The potential explanatory factors included obstetric interventions (Caesarean section, instrumental birth, epidural), adverse infant outcomes (5 minute Apgar score of <7, preterm birth, perinatal death), and adverse maternal outcomes (postpartum haemorrhage, perineal tear and severe maternal morbidity).[12] Potential confounders included maternal age, year of first birth, inter-birth interval (women with

complicated pregnancies tend to have longer inter-birth intervals), Australian born, social disadvantage, maternal hypertension or diabetes, metropolitan or rural locality, and for women receiving private care hospital type (public or private).

For potential explanatory and confounding factors, the rate of missing information was typically less than 0.1%. However, for severe maternal morbidity and postpartum haemorrhage, which rely only on APDC records, the rate of missing information was equal to the proportion of unlinked PDC records (1.2%). Where public/ private patient status was unknown records were excluded, including 1183 (0.7%) first births and 1564 (1.0%) second births, representing 2666 (1.7%) mothers.

Data Analysis

Descriptive statistics and analyses were stratified by whether obstetric care for the first birth was private or public. We compared women who changed their maternity care provider with those who did not. The overall rates of change from first to second birth were calculated. Differences in first birth characteristics were assessed using Chi-square tests. Adjusted odds ratios (aOR) were obtained from logistic regression using backwards elimination. Covariates were retained if they were significant at $P<0.05$ or if they were confounders (change in adjusted odds ratio of 10% or more), and all eliminated variables were re-tested for entry back into the final adjusted model.

Results

From July 2000 to December 2009 there were 155,492 women who had two sequential singleton births in New South Wales and known public/ private patient status at each birth (Table 1). Of these 95,229 (61.2%) were public patients for their first birth and 92,097 (59.2%) for their second births.

Among first births, public patients were younger (40.4% <25 vs 8.0% private patients) and more likely to be born outside Australia (21.1% vs 16.5%) and to come from a disadvantaged socioeconomic area (27.1% vs 10.7%) or rural area (22.4% vs 8.8%) (Table 1). The median time to second births among both public and private patients was 27 months. Birth interventions including regional labour

analgesia, instrumental and caesarean births were more common among private than public patients. Hypertension, diabetes and preterm birth was slightly more prevalent among public patients as were neonatal complications (low Apgar, perinatal death) and maternal complications such as postpartum haemorrhage and overall maternal morbidity (Table 1).

Similar proportions of women changed from private to public care between first and second births, with 5815 (9.6%) private patients changing to public provider compared to 8947 (9.4%) of public patients at first birth changing to private care at a second birth (P=0.10) (Table 2). The factors associated with changing maternity care provider were similar (public to private or private to public), however the impacts were not. Use of obstetric interventions, adverse infant outcomes and adverse maternal outcomes were all positively associated with changing from public to a private maternity care provider for the 2nd birth (Table 3). In contrast, among women who received private care in their first birth those who had obstetric interventions (operative delivery and/or regional analgesia) were less likely to change to public care than women who did not have these interventions. Having a baby with a low Apgar score in the 1st birth was the only adverse outcome significantly associated with changing from private to public care for the 2nd birth (Table 3). However, the latter association was limited to women whose 1st birth was in a private hospital (aOR 1.79, 95% CI 1.39-2.31) and not observed among those receiving private care in a public hospital (aOR 1.02 95% CI 0.77-1.35). The reduced likelihoods of changing from private to public care associated with obstetric interventions were similar regardless of whether the 1st birth was in a private or public hospital.

Discussion

A higher proportion of NSW women (around 40%) received private maternity care than has been reported nationally. Overall, just under 10% of women changed maternity care provider between first and second births. The magnitude of the change was similar for public to private care and from private

to public care. Factors (obstetric interventions and adverse outcomes) associated with changing maternity care provider were as hypothesised, although the direction of effect was not.

Among women receiving private care for their first birth, obstetric interventions such as operative delivery and/or regional analgesia were strongly associated with continuing in private care. In contrast, these factors were associated with change out of public care. Obstetric interventions are higher for women receiving private care[13] and the perceived availability of interventions such as regional analgesia may be drivers in women choosing this maternity care. Other research indicates that women are more satisfied when they have continuity of maternity care provider (midwife or obstetrician) providing antenatal, intrapartum and postpartum care[14,15] and this may have influenced choice of subsequent care. Having a single care provider throughout pregnancy, childbirth and the postpartum period is a key feature of private care. Previous research has shown that women having an emergency CS, pain relief or obstetric interventions have been shown to be more likely to be dissatisfied with care compared to women who did not experience these birth events.[8,16] However another study has identified that women favour or approve of interventions they previously experienced (eg. epidural) when making choices about subsequent births.[17] These conflicting findings may be related to when women are asked about their satisfaction, with the longer time frame associated with subsequent births allowing women to think differently about their satisfaction with prior care. Interestingly, the proportion of women in our sample that changed care providers (10%) is consistent with the rates of dissatisfaction with maternity care reported in both UK (12%) and Australian surveys (8%).[16,18] Poor infant condition at birth was associated with change from private to public care and vice-versa. In addition, other factors including preterm birth and perinatal death were associated with change from public to private care. Irrespective of the form of maternity care when there are poor infant outcomes, families may perceive that a different form of care may have altered the first birth outcome.

Adverse maternal outcomes (severe perineal trauma, bleeding, severe morbidity) were only associated with changing from public to private care. This may reflect either a perception of poor care in the

public setting or a desire for subsequent care under a single private obstetric provider who is familiar with pregnancy history. It is also possible that when adverse maternal outcomes (eg third/ fourth degree tear) occur in the context of private care that postpartum followup by a single care provider focuses on the prevention of further complications, whereas in the public setting subsequent debriefing does not necessarily involve those providing intrapartum care. Trials and other studies have reported mixed evidence on the effectiveness of midwife or obstetrician-led debriefing after birth on mental distress.[19-21], although the effect of debriefing (and choice of 'debriefer') on subsequent birth options does not appear to have been studied. Importantly, the higher rates of adverse outcomes at first birth in public patients are likely related to the higher risk population treated in public care settings. Women seeking private care have been shown to be older and first –time mothers, less likely to have medical or obstetrical complications, non-cephalic presenting infants and twin pregnancies than women seeking public care.[13]

It is possible that there are different motivations for changing from public to private care that may also be related to facilities. Three quarters of private care is provided in private hospital settings that may be perceived to be aesthetically more pleasing than public facilities. There also remains the possibility that changes in choice of maternity care provider may be related to changed proximity to services, financial or family circumstances. Overall, a similar proportion of women changed from private to public care and for the most part these changes were not related to interventions or outcomes, suggesting other potential drivers for changing care provider. With cross-sectional data it is only possible to demonstrate association with known birth information. Capping of hospital beds in private hospitals means some private patients may have been unable to birth in private hospitals because of lack of bed availability. Hence we did not focus on change by hospital type.

Strengths of this paper include the use of population-based longitudinally linked data on women's sequential pregnancies to follow patterns of obstetric care. Limitations include the possibility that there is some misclassification of public care for women who may have changed their care type during

pregnancy since type of care was as reported at birth. Information on the model of care experienced within the public system was not available over the study period.

Conclusion

We found that obstetric interventions and outcomes at first birth were associated with changes in subsequent maternity care and affected change from public to private care more than the reverse. However, the majority of women (around 90%) had consistent care type for first and second births. This may reflect that women are generally satisfied with care, they rationalize that the care they had for a first birth was optimal or they value continuity of carer across pregnancies.

Table 1 First birth characteristics by type of maternity care provider ‡

Variable	Public Patients N = 95229 *n* (col %)	Private Patients N = 60263 *n* (col %)	P-value
Exposures			
Age (years)			< 0.01
<25	38505 (40.4)	4822 (8.0)	
25-34	51372 (54.0)	47382 (78.7)	
35+	5343 (5.6)	8037 (13.3)	
Australian born			< 0.01
No	20082 (21.1)	9944 (16.5)	
Yes	68727 (72.2)	47973 (79.6)	
Unknown	6420 (6.7)	2346 (3.9)	
Disadvantage (SEIFA)‡			< 0.01
Least disadvantaged (1st Quintile)	12760 (13.5)	22505 (37.4)	
2nd-4th Quintile	56049 (58.9)	31215(51.8)	
Most disadvantaged (5th Quintile)	25527 (27.1)	6444 (10.7)	
Rural	21365 (22.4)	5272 (8.8)	< 0.01
Private hospital birth	0 (0.0)	45528 (75.6)	-
Diabetes	4224 (4.4)	2607 (4.3)	0.304
Hypertension	10235 (10.8)	6236 (10.4)	0.013
Regional labour analgesia†	10512(12.1)	17538 (31.8)	< 0.01
Delivery mode			< 0.01
Vaginal	58124 (61.0)	24980 (41.3)	
Instrumental	15899 (16.7)	15386 (25.5)	
Caesarean	21182 (22.2)	19838 (32.9)	
Outcomes			
Apgar5 < 7	2536 (2.7)	1050 (1.7)	< 0.01
Preterm birth	5932 (6.2)	3280(5.4)	< 0.01
Perinatal death	1158 (1.2)	402 (0.7)	< 0.01
Postpartum haemorrhage	7908 (8.3)	3143 (5.2)	< 0.01
3rd or 4th degree tear*	3584 (4.8)	1608 (4.0)	< 0.01
Severe maternal morbidity	1388 (1.5)	577 (1.0)	< 0.01

‡ Percentages may not sum to 100 due to missing data
†among women who laboured
*among vaginal births

Table 2 Changes in maternity care provider from first to second birth

First Birth†	**Second Birth**	
	Public patients N = 92097 *n* (row %)	**Private patients N = 63395 *n* (row %)**
Public patients N = 95229	86282 (90.6)	8947 (9.4)
Private patients N = 60263	5815 (9.6)	54448 (90.4)

Table 3 Factors associated with changing maternity care provider from first to second birth

Variable	Public to Private		Private to Public	
	aOR	95% CI	aOR	95% CI
Delivery mode (Reference = Vaginal)				
Instrumental	1.44	(1.35,1.52)	0.76	(0.71,0.82)
Caesarean	1.57	(1.49,1.65)	0.66	(0.62,0.71)
Regional analgesia†	1.40	(1.32,1.50)	0.68	(0.63,0.74)
Apgar5 < 7	1.66	(1.48,1.87)	1.39	(1.15,1.68)
Preterm birth	1.32	(1.21,1.44)	0.95	(0.84,1.07)
Perinatal death	2.62	(2.24,3.06)	1.12	(0.81,1.55)
Postpartum haemorrhage	1.21	(1.12,1.30)	1.05	(0.93,1.18)
3rd or 4th degree tear or repair*	1.44	(1.30,1.60)	0.99	(0.84,1.17)
Severe maternal morbidity	1.48	(1.26,1.74)	0.92	(0.69,1.23)

aOR = adjusted Odds Ratio, compared with not having the outcome. Each reported aOR is adjusted for exposures in Table 1 including maternal age, Australian born, disadvantage (SEIFA), diabetes, hypertension, rural and interbirth interval as well as year of first birth.
CI = Confidence Interval
*among vaginal births
† among women who laboured

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