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Risk factors and costs of hospital admissions in first year of life: a population based study.

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Short title: Hospitalizations and severe neonatal morbidity

Abbreviations: A$ - Australian dollars, aOR – adjusted odds ratio, APDC - Admitted Patient Data Collection, AR-DRG - Australian Refined Diagnoses Related Groups, CI – confidence interval, NSW – New South Wales, PDC - Perinatal Data Collection

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Contributor's Statement Page

Ms. Samantha Lain participated in the study design, took primary responsibility of the data analysis, drafted the initial manuscript and approved the final manuscript as submitted.

Dr. Natasha Nassar participated in the study design, data analysis and interpretation, reviewed and revised manuscript, and approved the final manuscript as submitted.

Dr. Jennifer Bowen participated in interpretation of the data, revision of manuscript for important clinical content and approved the final manuscript as submitted.

Associated Professor Christine Roberts participated in the study design, data analysis and interpretation, reviewed and revised manuscript, and approved the final manuscript as submitted.

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Abstract

Objective: Identify health care utilization and associated costs of infants with and without severe neonatal morbidity in the first year of life.

Methods: Data from the Perinatal Data Collection for all 601,455 live born infants born in NSW, Australia, 2001-2007 were linked to hospital admission data. Logistic regression models were used to investigate the association between severe neonatal morbidity and readmission to hospital once, and more than once in the first year; and average costs were calculated for infants with and without serious neonatal morbidity up to one year. Neonatal morbidity was assessed using a validated composite outcome indicator.

Results:

Four per cent of infants suffered neonatal morbidity, 14.6% were readmitted to hospital once and 4.6% were had multiple readmissions. Gestational age (GA) was the strongest predictor of infants readmitted to hospital once while severe neonatal morbidity was the strongest predictor of multiple admissions (aOR 2.49; 95% CI 2.36-2.62). Infants with severe neonatal morbidity cost, on average $30,238 in the first year compared to $3,307, the cost per year of infants without neonatal morbidity. The mean annual cost decreased on average 10% and 25% each increasing week of GA for infants with and without neonatal morbidity respectively. This cost decrease continued until 39 weeks where average costs plateaued.

Conclusions:

Infants born with severe neonatal morbidity have increased hospitalizations and costs in the first year of life; and hospitalizations increased with decreasing GA, even for infants born at 37-38 weeks.

Introduction

Admission to hospital in the first year of life places an economic burden on both the infant's family and the health system. Over a quarter of pediatric hospital admissions (up to 18 years) occur in the first year[1] with many admissions relating to conditions originating in the perinatal period. A review of literature on economic costs of preterm birth performed by Petrou *et al*[2] highlighted that an inverse relationship between gestational age at birth and infant readmissions and an increase in associated hospital costs was a common theme among studies.

Although preterm and low birthweight infants have a high incidence of morbidity, severe neonatal morbidity in term infants also has potentially large economic consequences on the health system. The proportion of term infants with neonatal morbidity ranges from almost 3%[3, 4] to around 10%[5, 6] depending upon how morbidity is defined. As term infants make up between 88% and 94% of births in the developed world,[7, 8] term infants with severe neonatal morbidity comprise a large absolute number of severely ill newborns.

The utilization and cost of health services by infants of all gestations has been examined in a number of studies, however few studies have assessed the complete burden on the health system of all infant admissions during the first year of life.[9-18] While most studies used population data some focused on admissions four to six weeks after discharge,[12, 15, 18] used inaccurate measures of gestational age[10, 11, 14, 18] or had a large proportion of missing data.[9-11, 14, 16] We aimed to identify health care

utilization and associated costs of infants with and without severe neonatal morbidity in the first year of life.

Methods:

(i) Study Population

All livebirths to women residing in New South Wales (NSW), Australia from January 2001 through December 2007 were included in the study population. NSW is the most populous state in Australia, with around 95,000 births per year, comprising 34% of all Australian births.[19, 20] Infants born in this period were followed up to one year of age.

(ii) Data Sources

Data were obtained from the NSW Perinatal Data Collection (PDC) and the Admitted Patient Data Collection (APDC). The PDC is a legislated population-based surveillance system of all births in NSW, including home births, of $\geq$ 20 weeks gestation or a baby $\geq$ 400 gram birth weight. The data are collected by the attending midwife or doctor and includes maternal and infant health information relating to pregnancy, labor and birth. The APDC is an administrative database of all hospital admissions in NSW and is based on information from hospital discharge summaries. Relevant diagnoses and procedures pertaining to the admission are coded from the medical records according to the 10th revision of the International Classification of Diseases and Related Health Problems, Australian Modification and Australian Classification of Health Interventions respectively. From diagnosis and procedure information, each admission is coded using the Australian Refined Diagnoses Related Groups (AR-DRG) classification system. The average cost per AR-DRG for public and private hospitals for 2007/2008, published by the Commonwealth Department of Health and Ageing,[21, 22] were applied to each admission. The average cost per AR-

DRG takes into account the average length of stay, direct and overhead costs, including medical, nursing and non-clinical salaries, pathology, pharmaceuticals, operating rooms, supplies and depreciation.[22]

The two databases, PDC and APDC, were linked by the Centre for Health Record Linkage using probabilistic linkage. This process enables each infant's PDC birth data to be linked cross-sectionally to their and their mother's hospital birth admission, and then longitudinally linked to subsequent hospital admissions in the corresponding first year of life. Over 98% of birth records linked to both a mother and infant hospital record. The proportion of missing data was small; maternal age 0.02%, gestational age 0.04% and marital status 0.06%.

(iii) Definition of severe neonatal morbidity

The Neonatal Adverse Outcome Indicator was used to identify infants born with severe neonatal morbidity.[3] This tool uses reliably reported information from the PDC and diagnosis and procedure codes from the APDC to identify infants who have a severe adverse birth outcome in the first 28 days of life. The adverse outcome indicator comprises a range of conditions (for example, birthweight less than 1500 grams, a diagnosis of respiratory distress syndrome, sepsis or intraventricular hemorrhage) and procedures (for example infants who have received ventilatory support, cardiopulmonary resuscitation, a central line, or a transfusion).[3] A composite outcome overcomes the under-ascertainment associated with using individual diagnoses and procedures in population health databases[23] and increases the chance of capturing all sick infants as severely ill infants are more likely to have more than one condition or procedure.

(iv) Explanatory factors

The main explanatory variable in the study was neonatal morbidity. Co-variates available for analysis included gestational age, birth order, maternal age, delivery with or without labor, public or private hospital care, maternal smoking, and residential postcode which were all obtained from the PDC; maternal marital status was obtained from the APDC. Socioeconomic status was derived based on scores from the Index of Relative Disadvantage from the Socio-Economic Indexes for Areas (SEIFA)[24] produced by the Australian Bureau of Statistics. An Index of Relative Disadvantage was assigned to each postcode and the scores divided into five quintiles of socioeconomic disadvantage with approximately 20% of the population in each quintile. Urban/rural status was derived from the Accessibility/ Remoteness Index of Australia (ARIA+),[25] whereby a mean ARIA+ score was attributed to each postcode and then dichotomized. Planned births were defined as births where the onset of labor was not spontaneous (labor induction or pre-labor caesarean section). Only factors that were well and accurately reported were included in the analysis.[23]

(v) Analysis

The two primary outcomes of the study were whether infants had been admitted to hospital once after discharge home from the birth admission or more than once in the first year of life. The admission in which the birth took place and subsequent hospitalizations after initial discharge were identified for each infant. Inter-hospital transfers prior to first discharge home were included as part of the birth admission. All infants were followed up to their first birthday and infants identified with and without serious neonatal morbidity were compared. To examine the association

between infants suffering severe neonatal morbidity and readmission to hospital, univariate analysis was performed on all explanatory variables that are known to be associated with both neonatal morbidity and hospital readmission. All variables associated ($p<0.05$) with infant readmission to hospital were included in the multivariable logistic regression models. The final model fit was tested using the Hosmer-Lemeshow test. Because the risks and outcomes are different for singleton versus multiple births (twins and triplets), the analyses was stratified by plurality.

The frequency and average number of readmissions, average length of stay and average cost of the birth admission and subsequent readmissions for infants with and without severe neonatal morbidity were calculated. Day only stays are included as admissions in the hospital data so the average number of readmissions excluding day only stays was also calculated. Total average costs per year were calculated for infants with and without severe morbidity, including costs for the birth admission and for all subsequent readmissions. Although costs are displayed in Australian dollars (A$), the relative difference in cost between groups rather than the absolute cost is more important. However for comparison in 2007 the purchasing power parities index (for gross domestic product) for US dollars to A$ dollars was 1.43.[26] The ten most frequent reasons for hospitalization were also determined based on principal diagnosis codes in the hospital data.

Results

From 2001 to 2007 there were 601,455 live births in NSW with a birth record that linked to an infant and maternal hospital record. Table 1 shows the distribution of infant and maternal characteristics and hospital readmission in the study population.

Of all the infants born in the study period, 24,486 (4.0%) suffered severe neonatal morbidity, 89,605 (14.6%) were readmitted to hospital just once in the first year, and 27,790 (4.6%) were readmitted more than once. Almost a fifth (18.6%) of term infants were admitted to hospital at least once in the first year compared to 31.3% of preterm infants. This readmission rate reduced to 13.7% of term infants and 25% of preterm infants when day only stays were omitted. Compared to those infants not readmitted, the proportion of infants readmitted to hospital in the first year was greater for those born at a lower gestational age, were multiples and born to mothers with the following characteristics; age less than 20 years, smokers, unmarried or were living in rural areas (Table 1). The highest proportion of infants readmitted were those suffering severe neonatal morbidity; of all infants with neonatal morbidity, 5,133 (20.3%) were readmitted once and 3,297 (13.3%) were readmitted more than once.

In the univariate analysis for singleton and multiple infants, neonatal morbidity and gestational age were most strongly associated with readmission once and more than once. These associations remained in the multivariate models. Although neonatal morbidity was the predictive variable we planned to examine *a priori,* gestational age had the strongest association with being readmitted to hospital once when all significant co-variates were adjusted for, including neonatal morbidity (Table 2). Readmission rates increased for neonates with decreasing gestational age; however, even late preterm (34-36 weeks) and early term (37-38 weeks) births had an increased risk of readmission compared with neonates born at 39 weeks or later (Table 2). For *multiple births* neonatal morbidity was not associated with admission to hospital once

(aOR 1.09, 95% CI 0.97-1.23), but gestational age and being the mother's first pregnancy were significant co-variates in the adjusted model.

For *singletons,* infants born with severe neonatal morbidity had the strongest association with being admitted to hospital more than once (aOR 2.49, 95% CI 2.36-2.62) (Table 2). Gestational age less than 39 weeks, or maternal age less than 20 years were also independent risk factors for admission to hospital more than once in the regression model. For *multiple births*, neonatal morbidity was also the factor that was most strongly associated with readmission more than once (aOR 1.87, 95% CI 1.60-2.18) after adjustment for other significant variables, gestational age and smoking.

On average, infants who experienced severe neonatal morbidity were readmitted to hospital 2.3 times in the first year, stayed in hospital 23.4 (95% CI 23.1-23.8) days in the birth admission and 10.0 (95%CI 9.4-10.6) days per year after discharge. This compared to infants without neonatal morbidity who were admitted, on average, 1.3 times in the first year, stayed 3.8 (95% CI 3.7-3.8) days in the birth admission and 3.7 (95% CI 3.7-3.8) days in the first year after discharge.

The total cost of all infant admissions was, on average, A$380.5 million per year as outlined in Table 3, with birth admissions making up the majority of this figure. Infants born with severe neonatal morbidity comprise 4.0% of the population; however, contribute to 31% (A$90 million) of the cost of birth admissions and 16% (A$14 million) of the cost of readmissions in the first year. The average annual cost of hospital admissions per infant with and without severe neonatal morbidity was

A$30,238 and A$3,307, respectively. The average annual cost per infant decreased with increasing gestational age for both infants with and without severe neonatal morbidity (see Figure 1). The mean annual cost decreased on average 25% with each increasing week of gestational age for infants without neonatal morbidity and an average decrease of 10% per week for infants with neonatal morbidity until 39 weeks where average costs per infant plateaued.

There were over 2900 principal diagnosis codes used to classify infant hospital readmissions, however over 66% of readmissions were included in the top 10 ranking principal diagnosis groups (Table 4). The most common reason for readmission to hospital was acute lower respiratory infections, particularly acute bronchiolitis which comprised over 15% of all readmissions. Differences in principal diagnoses between infants with and without severe neonatal morbidity included 5.0% of infants with morbidity were readmitted with inguinal hernia compared to 1.7% of infants without morbidity (rank 16).

Discussion

Infants born with severe neonatal morbidity, of all gestational ages, were most likely to be readmitted more than once in the first year indicating an ongoing burden on the health system. Although this group is a small proportion of the total infant population (4%), it contributes almost a third of the total hospital costs in the first year. However regardless of neonatal morbidity the risk of readmission to hospital, and incurring associated costs, decreases with each additional week of gestational age at birth. Although we, and others,[2] have shown that preterm infants utilize substantially more hospital resources and have a greater economic burden on the health system compared to term infants, this analysis reveals that infants born at 37-38 weeks gestation (early

term) are also more likely to be readmitted to hospital in the first year of life and have a greater average annual cost than infants born at 39 weeks or greater. Infants born to teenage mothers, mothers that smoke, are unmarried or live in a rural area also have an increased risk of being admitted to hospital before age one.

To date, studies that have examined the complete burden on the health system of all infant admissions in the first year of life have large amounts of unlinked or missing data,[9-11, 14] or unreliable estimates of gestational age.[10, 11, 14] Although these studies had limitations, they also found that the initial birth admission incurred most of the costs in the first year and that preterm infants generated vastly more costs in the first year compared to term infants. Bird *et al*, using data from Arkansas, found 11.8% of term infants were admitted to hospital in the first year,[9] while McLaurin *et al* using an insurance database found 7.9% of term infants were readmitted to hospital.[14] The lower readmission rates reported in these studies compared to ours (13.7% of term infants admitted for more than a day stay) may be due to a 'healthier' study population; one study excluded infants with identifiable medical conditions[9] while the other study population were insured and had access to quality healthcare. Both studies found that infants born 33/34-36 weeks generated about 25-30% more hospital costs during their first year compared to term infants, similar to the results in this study.[9, 14]

An important finding of this paper is the decrease in average annual cost per infant with increasing gestational age for both infants with and without neonatal morbidity up to 39 weeks gestation. Costs related to morbidity in infants born at 37 and 38 weeks gestation have not been investigated.[27] There has been a gradual increase in

the rate of infants born late preterm and early term in a number developed countries[28-30] and this is partly due to planned births with an apparent lowering of the threshold for early intervention.[8] The clinical decision to perform a planned birth involves weighing up the risks of continuing the pregnancy for both the mother and/or baby against the risks of delivery before full term.[31] There are times when birth at this gestation is the optimal outcome,[31] however the American College of Obstetricians and Gynecologists recommends that planned birth should occur at 39 weeks gestation or greater to reduce neonatal respiratory morbidity.[32] We found infants born at 38 weeks gestation or less have more long term morbidity than infants born 39 to 41 weeks, as they were more likely to be readmitted more than once in the first year of life. There is also a possible two-fold economic benefit with birth at each later week of gestation. Not only do infants with neonatal morbidity incur less costs at each increasing gestation, there is also less chance of having severe neonatal morbidity with each additional week, 18.3% of infants 34-36 weeks gestation have neonatal morbidity compared to 2.4% of term infants.[3] Our findings reveal that the biggest impact on reducing costs may be preventing neonatal morbidity.

Although infants with neonatal morbidity comprise a large proportion of total infant hospitalizations, given their low prevalence, the majority of the total economic burden on the health system is produced by infants without severe neonatal morbidity. To reduce this burden, modifiable risk factors and/or possible avoidable admissions could be targeted. We found that infants of young mothers, unmarried mothers and mothers who smoke are all more likely to be readmitted to hospital in the first year. Supportive postnatal community programs may lead to decreased readmission rates for targeted groups such as adolescent mothers,[33] while programs aimed at maternal

smoking cessation may decrease neonatal morbidity associated with antenatal smoking[3] and infant respiratory admissions associated with living in a household with a smoker.[34] Postnatal community care following discharge from hospital may also reduce hospital readmissions for jaundice and feeding difficulties.[35] These conditions may only become apparent after discharge and may be preventable with a timely home visit from a health worker.

The strength of this study is the large, longitudinally linked population dataset with very little missing data. With over 600,000 infants, it has over ten times the number of infants included in the previous studies.[9, 14] The population dataset has been validated against medical records and includes an accurate measure of gestational age.[36] However information is limited to hospital data and we do not have information regarding postnatal contact with the health system other than hospital admissions. Consequently any out-of-hospital health costs have not been included in the cost estimates.

Conclusions

Infants born with severe neonatal morbidity have increased hospitalizations in the first year of life. We also found that hospitalizations increased with decreasing gestational age, even for infants born at 37 to 38 weeks. This ongoing morbidity and hospital utilization in the first year of life is reflected in higher healthcare costs for these infants. Future research should focus on potential for reducing costs and investigate strategies for reducing the burden on the health system.

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Table 1: Infant and maternal characteristics of study population and proportion of infants readmitted once, more than once and not at all in the first year

	Not readmitted n (%)	Readmitted once n (%)	Readmitted more than once n (%)
Infant characteristics	N = 484,060	N = 89,605	N = 27,790
Neonatal morbidity			
Infants with severe neonatal morbidity	16,056 (3.3)	5,133 (5.7)	3,297 (11.8)
Gestational age			
≤33 weeks	7,150 (1.5)	2,655 (3.0)	1,723 (6.2)
34-36 weeks	20,750 (4.3)	5,937 (6.6)	2,477 (8.9)
37-38 weeks	102,262 (21.1)	21,425 (23.9)	7,115 (25.6)
39-41 weeks	344,071 (71.1)	58,052 (64.8)	16,062 (57.8)
≥41 weeks	9,827 (2.0)	1,536 (1.7)	413 (1.5)
Plurality			
Singleton	470,934 (97.3)	85,579 (95.5)	26,177 (94.2)
Multiple	13,126 (2.7)	4,026 (4.5)	1,613 (5.8)
Birth order			
First born	201,795 (41.7)	37,737 (42.1)	11,166 (40.2)
Second born or higher	282,265 (58.3)	51,868 (57.9)	16,624 (59.8)
Maternal characteristics			
Age group			
<20 years	17,518 (3.6)	4,296 (4.8)	1,744 (6.2)
20-34 years	365,649 (75.5)	68,432 (76.4)	21,193 (76.3)
≥ 35 years	100,893 (20.8)	16,877 (18.8)	4,853 (17.5)
Labor			
Spontaneous	290,384 (60.0)	51,563 (57.5)	15,247 (54.9)
Planned	193,676 (40.0)	38,042 (42.5)	12,543 (45.1)
Hospital type			
Public hospital patient	367,551 (75.9)	67,848 (75.7)	21,999 (79.2)
Private hospital patient	116,509 (24.1)	21,757 (24.3)	5,791 (20.8)
Smoking status			
Non-smoker	416,921 (86.1)	74,561 (83.2)	22,069 (79.4)
Smoker	67,139 (13.9)	15,044 (16.8)	5,721 (20.6)
Socioeconomic status			
Lowest SES quintile	103,747 (21.4)	19,204 (21.4)	6,360 (22.9)
Mid 3 SES quintiles	285,963 (59.1)	53,914 (60.2)	16,554 (59.6)
Upper SES quintile	94,350 (19.5)	16,487 (18.4)	4,876 (17.5)
Remoteness			
Urban	279,228 (57.7)	48,554 (54.1)	15,064 (54.2)
Rural	204,832 (42.3)	41,051 (45.8)	12.726 (45.8)
Marital status			
Married/de facto	388,016 (80.2)	69,216 (77.3)	20,220 (72.8)
Not married/unknown	96,044 (19.8)	20,389 (22.7)	7,570 (27.2)

Table 2 Crude and adjusted odds ratios for singleton infants readmitted to hospital once and more than once in the first year

	Crude OR (95% CI) for readmission once	Adj OR (95% CI) for readmission once	Crude OR (95% CI) for readmission more than once	Adj OR (95% CI) for readmission more than once
Infant characteristics				
Infants with severe neonatal morbidity	1.53 (1.47-1.58)	1.40 (1.34-1.46)	3.54 (3.39-3.67)	2.49 (2.36-2.62)
Gestational age				
≤33 weeks	1.82 (1.72-1.91)	1.64 (1.54-1.77)	4.64 (4.364-4.94)	2.09 (1.94-2.26)
34-36 weeks	1.52 (1.47-1.58)	1.52 (1.47-1.58)	2.29 (2.18-2.40)	1.87 (1.77-1.96)
37-38 weeks	1.19 (1.17-1.21)	1.20 (1.18-1.22)	1.42 (1.37-1.46)	1.36 (1.32-1.40)
39-41 weeks	ref	ref	ref	ref
≥41 weeks	0.93 (0.88-0.98)	0.90 (0.85-0.95)	0.91 (0.82-1.00)	0.85 (0.77-0.94)
Birth order				
First born	ref	ns	ref	ref
Second born or higher	0.99 (0.97-1.00)	ns	1.08 (1.06-1.11)	1.13 (1.10-1.16)
Maternal characteristics				
Age group	1.28 (1.23-1.32)	1.21 (1.17-1.25)	1.68 (1.59-1.76)	1.45 (1.37-1.53)
<20 years	ref	ref	ref	ref
20-34 years	0.89 (0.87-0.91)	0.88 (0.87-0.89)	0.82 (0.79-0.85)	0.80 (0.77-0.83)
≥ 35 years				
Labor				
Spontaneous	ref	ref	ref	ref
Planned	1.08 (1.07-1.10)	1.10 (1.08-1.12)	1.21 (1.18-1.25)	1.22 (1.19-1.26)
Hospital type				
Public hospital	ref	ns	ref	ns
Private hospital	1.01 (0.99-1.03)	ns	0.83 (0.81-0.86)	ns
Smoking status				

Non-smoker	ref	ref	ref	ref
Smoker	1.23 (1.20-1.25)	1.15 (1.12-1.17)	1.57 (1.52-1.62)	1.29 (1.25-1.34)
Socioeconomic status				
Lowest SES quintile	0.98 (0.97-1.00)	ns	1.07 (1.04-1.11)	ns
Mid 3 SES quintiles	ref	ns	Ref	ns
Upper SES quintile	0.92 (0.90-0.94)	ns	0.89 (0.86-0.92)	ns
Remoteness				
Urban	ref	ref	ref	ref
Rural	1.15 (1.13-1.16)	1.12 (1.10-1.13)	1.14 (1.11-1.17)	1.04 (1.01-1.06)
Marital status				
Married/de facto	ref	Ref	ref	ref
Not married/unknown	1.17 (1.15-1.19)	1.10 (1.08-1.12)	1.49 (1.45-1.53)	1.27 (1.24-1.31)

ref = reference, ns = not significant

Table 3. Average cost per year (in thousands A$) and average cost per infant of hospital admissions (in A$) in first year of life for all infants, and infants with and without neonatal morbidity

	All Infants		Neonatal Adverse Outcomes Indicator			
			Infants with neonatal morbidity		Infants without neonatal morbidity	
	$000's		$$000's	% of row	$$000's	% of row
Average cost per year (in thousands $)						
Birth admissions	293,375		89,835	31%	202,697	69%
Readmission in first year after discharge	87,162		14,077	16%	73,085	84%
All admissions in first year	380,537		103,912	27%	275,782	72%
	$	95% CI	$	95% CI	$	95% CI
Average cost per infant						
Birth admissions	3,375	3,350 – 3,400	26,143	25,590 – 26,695	2,430	2,424 -2,436
Readmission in first year after discharge	1,004	990 –1,017	4,096	3,905-4,286	876	865 –888
All admissions in first year	4,374	4,343– 4,404	30,238	29,620-30,857	3,307	3,294 – 3,321

Figure 1. Average annual cost per infant born with and without severe neonatal morbidity, for infants born 33 weeks or greater

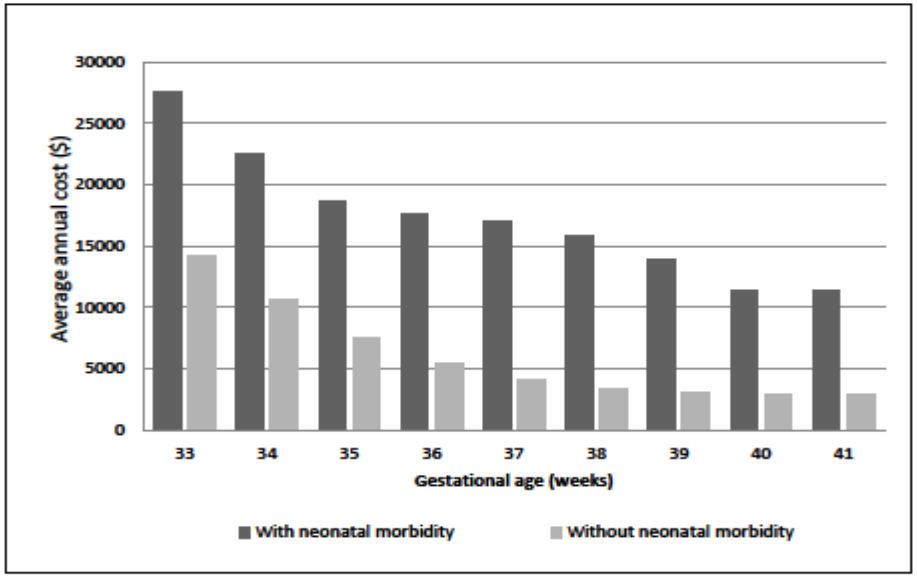

Table 4: Top ten principle diagnoses for all readmissions in the first year of life for all infants, and infants with and without severe neonatal morbidity

	All Infants		Neonatal Adverse Outcomes Indicator			
			Infants with neonatal morbidity		Infants without neonatal morbidity	
	Rank	%	Rank	%	Rank	%
Acute lower respiratory infections	1	16.8	1	18.5	1	16.1
Nonspecific symptoms peculiar to infancy*	2	7.7	4	4.9	2	8.5
Congenital abnormality	3	6.3	2	9.7	5	6.1
Inguinal hernia	-	-	3	5.0	-	-
Intestinal infectious diseases	4	6.3	5	4.4	3	6.6
Circumcision	5	5.5	10	2.4	4	6.3
Acute upper respiratory infections	6	5.4	6	4.3	6	5.6
Viral infection, unspecified	7	3.9	9	2.8	7	4.1
Convulsions or fever	8	3.2	8	2.8	8	3.3
Feeding problem	9	2.7	7	3.8	10	2.7
Neonatal Jaundice	9	2.7	12	0.6	9	3.0
Urinary tract infection	10	2.6	11	1.7	10	2.7

*Classified in ICD10-AM as excessive crying or irritable infant