The Canadian Neonatal Network ™

Le Réseau Néonatal Canadien ™

Annual Report 2020 Rapport Annuel

Acknowledgements

Structure of the CNN

The Canadian Neonatal Network™ (CNN) is a group of researchers who collaborate on research issues relating to neonatal care. The CNN was founded in 1995 by Dr. Shoo Lee. The CNN maintains a standardized neonatal database and provides unique opportunities for researchers to participate in collaborative projects on a national and international scale. Health care professionals, health services researchers, and health care administrators participate actively in clinical, epidemiologic, outcomes, health services, health policy and informatics research aimed at improving quality, effectiveness and efficiency of neonatal care. Research results are published in Network reports and in peer-reviewed journals.

Funding

Coordinating Centre of the CNN, Year 2020

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Alberta Children's Hospital, Calgary, Alberta	Dr. Carlos Fajardo
Royal Alexandra Hospital, Edmonton, Alberta & University of Alberta Hospital – Stollery Children's, Edmonton, Alberta	Dr. Khalid Aziz & Dr. Jennifer Toye
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Table of contents

A. Executive Summary

Inclusion summary:

This report from the Canadian Neonatal Network™ (CNN) is based on data from 33 tertiary NICU sites that contributed data in the year 2020. Admissions between January 1, 2020 and December 31, 2020 who were discharged by March 31, 2021 were included.   Five (5) infants who were admitted in 2019 but discharged after March 31, 2020 were also included in the 2020 report. Delivery room deaths, moribund neonates, and readmissions from 2019 were excluded.

Total number of eligible admissions to participating sites (See section D.1 for analyses)	15 227
Total number of eligible individual neonates (See section D.2. for analyses)	14 271
Total number of eligible very preterm (GA <33 weeks) neonates	4 108
Total number of eligible extremely preterm (GA <29 weeks) neonates (See section D.3. for analyses)	1 556
Total number of eligible very low birth weight (BW <1500 g) neonates (See section D.3. for analyses)	2 756

Important information for data interpretations:

a. Neonates who were transferred to a "normal newborn care area" (level I nursery) or discharged home within 24 hours of their admission to the site were excluded.
b. In 2020, nine (9) sites were only able to contribute data from a subset of eligible neonates admitted to their NICUs due to resource limitations or challenges related to the COVID-19 pandemic. See pages 3-4 for data collection criteria of all participating sites.
c. Characteristics of participating sites were highlighted at the outset of the presentations.
d. 'Missing' data on outcome variables varied for each presentation. Caution should be used when interpreting the information. When possible, both the total number of neonates and the number of neonates with available data were provided.
e. The denominators for all percentages in this report included neonates whose data for that particular item were available.
f. This report included data from neonates who were admitted to the NICUs, except for Presentations #4, #6 and #6b.
g. Presentations #4, #6 and #6b included delivery room deaths.
h. Neonates who were not admitted to participating NICUs were not included in this report.

Noteworthy findings:

a. Out of 33 CNN sites, 31 had maternity units in their facilities; and of those, 30 collected data on delivery room deaths in 2020.

b. Among infants born <33 weeks' GA and admitted to Level 3 NICUs, rate of outborn birth continues to decrease from 16.5% in 2010 to 13.2% in 2020.

c. The proportion of infants receiving active care in the delivery room among hospital with a Level 3 NICU remained similar at lower GAs:
   i. At 22 weeks' GA, 28% of all neonates received active care in the delivery room
   ii. At 23 weeks' GA, 81% of all neonates received active care in the delivery room

d. The survival rate has remained similar at lower GAs:
   i. At 22 weeks' GA, 6% of all neonates and 22% of neonates who received intensive care survived.
   ii. At 23 weeks' GA, 38% of all neonates and 47% of neonates who received intensive care survived.

e. The survival rate also remained similar at lower BWs:
   i. At 400-499g, 33% of all neonates and 56% of neonates who received intensive care survived.
   ii. At 500-599g, 49% of all neonates and 60% of neonates who received intensive care survived.

f. Among inborn neonates <29 weeks' GA at birth:
   i. 40% received a complete course of antenatal steroids within the last week prior to birth
   ii. 82% received MgSO4 for neuroprotection.
   iii. 57% received deferred cord clamping ≥30 sec
   iv. 32% were hypothermic (temperature <36.5^{0}C) on admission.
   v. 80% received feeds within the first 2 days of admission
   vi. 31% were never intubated during their stay.
   vii. 40% were exclusively breast milk feeding at discharge

g. Among neonates <33 weeks that received only a single course medical treatment for PDA, rate of acetaminophen use has increased from 20% in 2018 to 35% in 2020

h. NEC rates were 3.4% in neonates <33 weeks' GA

i. Among neonates born >29 weeks' GA and >1250g , none were diagnosed with severe ROP

j. A total of 656 neonates were diagnosed with HIE and of whom 460 received hypothermia (compared to 389 in 2019).

k. Among neonates born <29 weeks' GA, rate of BPD decreased from 58% in 2019 to 55% in 2020

B. CNN Site Characteristics

SITE	CNN data collection criteria	Level II / Step-down nursery	Level II / Step-down data included in CNN	Delivery room deaths included in CNN	ROP treatment service?	PDA surgical service?	Therapeutic hypothermia treatment?	General pediatric surgical Services?
Victoria General Hospital, Victoria, BC	All eligible admissions	y	y	y	y	y	y	y
BC Women's Hospital, Vancouver, BC	All eligible admissions	y	n	y	y	y	y	y
Royal Columbian Hospital, New Westminster, BC	All eligible admissions	y	y	y	y	n	y	y
Surrey Memorial Hospital, Surrey, BC	All eligible admissions	y	y	y	y	n	y	n
Foothills Medical Centre, Calgary, AB	All eligible admissions	n	n/a	y	y	y	y	n
Alberta Children's Hospital, Calgary, AB	All eligible admissions	n	n/a	n/a	y	y	y	y
Royal Alexandra Hospital, Edmonton, AB*	< 33 weeks GA & HIE *Incomplete*	y	y	y	y	n	y	n
University of Alberta Hospital - Stollery, Edmonton, AB*	< 33 weeks GA, HIE, CDH & gastroschisis *Incomplete*	n	n/a	n/a	n	y	y	y
Regina General Hospital, Regina, SK	All eligible admissions	y	y	y	y	n	y	y
Jim Pattison Children's Hospital, Saskatoon, SK (Formerly Royal University Hospital)	All eligible admissions	n	n/a	n	y	y	y	y
Health Sciences Centre Winnipeg, MB	<33 weeks GA, cardiac, HIE, CDH & gastroschisis	y	y	y	y	y	y	y
St. Boniface General Hospital, Winnipeg, MB	All eligible admissions	n	n/a	y	y	y	y	y
Hamilton Health Sciences Centre, Hamilton, ON	All eligible admissions	y	n	y	y	y	y	y
London Health Sciences Centre, London, ON	All eligible admissions	y	y	y	y	y	y	y
Windsor Regional Hospital, Windsor, ON	All eligible admissions	n	n/a	y	y	n	n	n
Hospital for Sick Children, Toronto, ON	All eligible admissions	n	n/a	n/a	y	y	y	y
Mount Sinai Hospital, Toronto, ON	All eligible admissions	y	y	y	n	n	y	n

Site	Eligibility						
Sunnybrook Health Sciences Centre, Toronto, ON	All eligible admissions	n	n/a	y	y	n	y	n
Children's Hospital of Eastern Ontario, Ottawa, ON	< 36 weeks GA and HIE babies who were cooled	n	n	n	y	y	y	y
The Ottawa hospital, Ottawa, ON	< 33 weeks GA	y	partial	y	y	n	n	n
Kingston General Hospital, Kingston, ON	All eligible admissions	y	y	y	y	n	y	y
Jewish General Hospital, Montreal, QC	All eligible admissions	y	y	y	y	n	n	n
Hôpital Sainte-Justine, Montreal, QC	All eligible admissions	y	n	y	y	y	y	y
Centre Hospitalier Universitaire de Quebec, Quebec city, QC	< 33 weeks GA	y	n	y	y	y	y	y
Montreal Children's Hospital – MUHC, Montreal, QC	All eligible admissions	n	n/a	y	y	y	y	y
Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC	< 33 weeks GA, < 1500g at any GA, HIE babies who were cooled	y	n	y	n	n	y	y
Hôpital Maisonneuve-Rosemont, Montreal , QC	< 33 weeks GA	n	n/a	y	n	n	n	n
The Moncton Hospital, Moncton, NB	All eligible admissions	n	n/a	y	y	n	y	n
Dr. Everett Chalmers Hospital, Federicton, NB	< 33 weeks GA	n	n/a	y	n	n	y	y
Saint John Regional Hospital, Saint John, NB	All eligible admissions	n	n	y	n	n	y	y
Janeway Children's Health & Rehab Centre, Saint John , NL	All eligible admissions	y	y	y	y	y	y	y
IWK Health Centre, Halifax, NS	< 34 weeks GA, HIE, CDH & gastroschisis	y	y	y	y	y	y	y
Cape Breton Regional Hospital, Sydney, NS	All eligible admissions	n	n/a	y	n	n	n	n
University of Utah Hospital, Utah, US	All eligible admissions	y	n	y	y	n	y	n
* Royal Alexandra Hospital & University of Alberta Hospital transmit data as one site								

C. Information Systems

Neonates included in this report are those who were admitted to a CNN participating site between January 1, 2020 and December 31, 2020, and were discharged by March 31, 2021. The neonates must have had a length of stay at one of the CNN participating sites for greater than or equal to 24 hours, or died or were transferred to another level 2 or 3 facility within 24 hours. Five (5) infants who were admitted in 2019 but discharged after March 31, 2020 were also included in the 2020 report. Delivery room deaths, moribund neonates, and readmissions from 2019 were excluded. A total of 14 271 patients accounted for 15 227 admissions as some neonates were admitted on more than one occasions.

Patient information was retrospectively abstracted from patient charts by trained personnel using standard definitions and protocols contained in a standard manual of operations. Data were usually entered into a laptop computer using a customized data entry program with built-in error checking and subsequently sent electronically to the Canadian Neonatal Network™ Coordinating Centre located at the Maternal-Infant Care Research Centre (MiCare) in Toronto, Ontario. Patient data at each participating site are available to the respective site investigator and data abstractor only. Patient identifiers were stripped prior to data transfer to the Coordinating Centre. Patient confidentiality was strictly observed. A unique identifier was generated for each entry of neonate into the system and that identifier was followed throughout one or more hospital stays. Individual-level data are used for analyses, but only aggregate data are reported. The results presented in this report will not identify participating sites by name; each site is anonymous using a randomly assigned number. Whenever a small cell size (1 to 4 individuals) was observed in the data output, the data were grouped to maintain anonymity.

At each participating site, data are stored in a secured database in the site or in an alternate secured site used by the site to store patient information (e.g. health records department, computer services department). At the Coordinating Centre, the central database is stored in a secured computer database located on a server and an off-site back up that is maintained and secured by the Mount Sinai Hospital Information Technology Department. At the Coordinating Centre, information was verified for completeness and was reviewed for accuracy by looking for "unusual" and missing values on individual data items and by comparison with other information that might be related (e.g. gestational age [GA] and birth weight [BW]). However, the principal accuracy rests upon the diligence and capabilities of the individual sites. Each site had one or occasionally two dedicated person(s) responsible for data acquisition and transmission.

At the Coordinating Centre, analyses were conducted using univariate, bivariate, and multivariate analyses for the total cohort, and for individual sites. Multivariable regression analysis was used to identify risk factors associated with mortality and major morbidities. Grouped data enabled development of outcome graphs by GA and BW for mortality and selected major morbidities. Similar systems have been used to assist in quality assurance and predict resource utilization.

D. Descriptive Analyses

This section is divided into three sub-sections.

Section D.1.   Analyses based on number of eligible admissions to participating sites

These include data from 15 227 eligible admissions (including readmissions) to 33 sites. 24 of these sites submitted complete data (n=13 837) on all admissions and 9 sites submitted data on a selected admission cohort (n=1 390).

Section D.2.   Analyses based on number of eligible neonates admitted to participating sites

These include data from 14 271 eligible neonates admitted to 33 sites. 24 of these sites submitted complete data (n=13 043) on all eligible admitted neonates and 9 sites submitted data on selected eligible admitted neonates (n=1 228).

Section D.3.   Analyses based on number of eligible very preterm (GA <33 weeks) or very low birth weight (BW <1500g) neonates

These include data from 4 108 eligible very preterm neonates and 2 756 eligible very low birth weight (VLBW) neonates.

Canadian Neonatal Network™ Database: Admissions between January 1, 2020 and December 31, 2020 who were discharged by March 31, 2021. Five (5) infants who were admitted in 2019 but discharged after March 31, 2020 were also included in the 2020 report. Delivery room deaths, moribund neonates, and readmissions from 2019 were excluded.

Section **D.1**

Total number of eligible admissions to participating NICUs (33 sites)
15 227

13 837 from 24 sites with complete data
1 390 from 9 sites with restricted data

Readmissions **351**
Intra-CNN Transfers **605**

Section **D.2**

Total number of eligible individual neonates admitted to participating NICUs (33 sites)
14 271

13 043 from 24 sites with complete data
1 228 from 9 sites with restricted data

Discharge destination
Home   7 375
Non-CNN site   3 677
Intra-site   2 438
Tertiary site   322
Death   426
Palliative Care   25
Out of country   6
Missing   2

Missing GA or BW   **0**

GA < 33 weeks
and
BW < 1500g
2 600

GA < 33 weeks
and
BW ≥ 1500g
1 508

GA ≥ 33 weeks
and
BW < 1500g
156

GA ≥ 33 weeks
and
BW ≥ 1500g
10 007

Total number of eligible very preterm neonates (GA <33 weeks)
4 108

Total number of eligible very low birth weight neonates (BW <1500g)
2 756

Section **D.3**
Very preterm

Section **D.3**
VLBW

Section D.1

Analyses based on number of eligible admissions to participating sites

These include data from 15 227 eligible admissions (including readmissions) to 33 sites. 24 of these sites submitted complete data (n=13 837) on all admissions and 9 sites submitted data on a selected admission cohort (n=1 390).

Presentation #1
All admissions: Type of admissions: All Sites
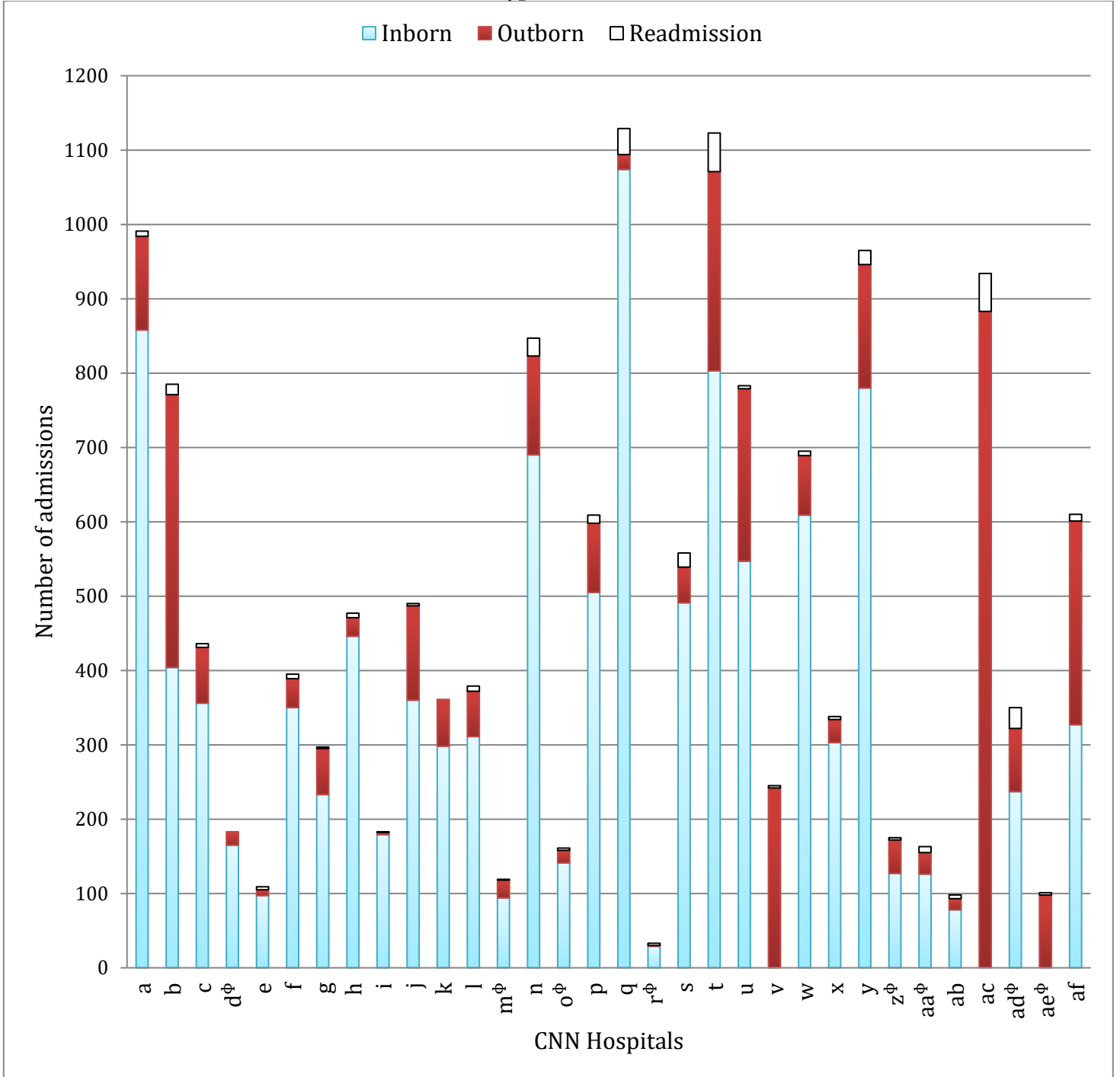
Φ Data collected on selected cohort of eligible admissions only.

Presentation #1 (continued)
All admissions: Type of admissions: All Sites

Sites		Inborn	Outborn	Readmission	Total	Sites		Inborn	Outborn	Readmission	Total
		Admission Status						**Admission status**			
a	Count	858	126	7	991	r$^\phi$	Count	29	1	3	33
	%	86.6	12.7	0.7	(100.0)		%	87.9	3.0	9.1	(100.0)
b	Count	404	367	14	785	s	Count	491	48	19	558
	%	51.5	46.8	1.8	(100.0)		%	88.0	8.6	3.4	(100.0)
c	Count	356	75	5	436	t	Count	803	268	52	1123
	%	81.7	17.2	1.2	(100.0)		%	71.5	23.9	4.6	(100.0)
d$^\phi$	Count	165	18	0	183	u	Count	547	232	4	783
	%	90.2	9.8	0.0	(100.0)		%	69.9	29.6	0.5	(100.0)
e	Count	97	8	4	109	v	Count	0	242	3	245
	%	89.0	7.3	3.7	(100.0)		%	0.0	98.8	1.2	(100.0)
f	Count	350	39	6	395	w	Count	609	80	6	695
	%	88.6	9.9	1.5	(100.0)		%	87.6	11.5	0.9	(100.0)
g	Count	233	62	2	297	x	Count	303	31	4	338
	%	78.5	20.9	0.7	(100.0)		%	89.6	9.2	1.2	(100.0)
h	Count	446	25	6	477	y	Count	780	166	19	965
	%	93.5	5.2	1.3	(100.0)		%	80.8	17.2	2.0	(100.0)
i	Count	179	3	1	183	z$^\phi$	Count	127	45	3	175
	%	97.8	1.6	0.6	(100.0)		%	72.6	25.7	1.7	(100.0)
j	Count	360	127	3	490	aa$^\phi$	Count	126	29	8	163
	%	73.5	25.9	0.6	(100.0)		%	77.3	17.8	4.9	(100.0)
k	Count	298	63	0	361	ab	Count	78	15	5	98
	%	82.6	17.5	0.0	(100.0)		%	79.6	15.3	5.1	(100.0)
l	Count	311	61	7	379	ac	Count	0	883	51	934
	%	82.1	16.1	1.9	(100.0)		%	0.0	94.5	5.5	(100.0)
m$^\phi$	Count	94	24	1	119	ad$^\phi$	Count	237	85	28	350
	%	79.0	20.2	0.8	(100.0)		%	67.7	24.3	8.0	(100.0)
n	Count	690	133	24	847	ae$^\phi$	Count	0	98	3	101
	%	81.5	15.7	2.8	(100.0)		%	0.0	97.0	3.0	(100.0)
o$^\phi$	Count	141	17	3	161	af	Count	327	274	9	610
	%	87.6	10.6	1.9	(100.0)		%	53.6	44.9	1.5	(100.0)
p	Count	505	93	11	609	ag$^\phi$	Count	76	24	5	105
	%	82.9	15.3	1.8	(100.0)		%	72.4	22.9	4.8	(100.0)
q	Count	1074	20	35	1129	Total	Count	11094	3782	351	15227
	%	95.1	1.8	3.1	(100.0)		%	72.9	24.8	2.3	(100.0)

COMMENTS: These analyses include 15 227 admissions to participating sites across the CNN during the period of January 1, 2020 to December 31, 2020. After adjusting for readmission, 14 271 neonates are represented. **Twenty-four sites collected data on all eligible admissions whereas nine sites (marked by $^\phi$) collected data on selected cohort of eligible admissions only.** See pages 3-4 for data collection criteria of all participating sites.

Presentation #2
All admissions: Admission illness severity scores (SNAP-II and SNAP-IIPE):
Sites with complete data
(n=24 sites, 13 837 admissions, 518 missing data on SNAP-II scores)
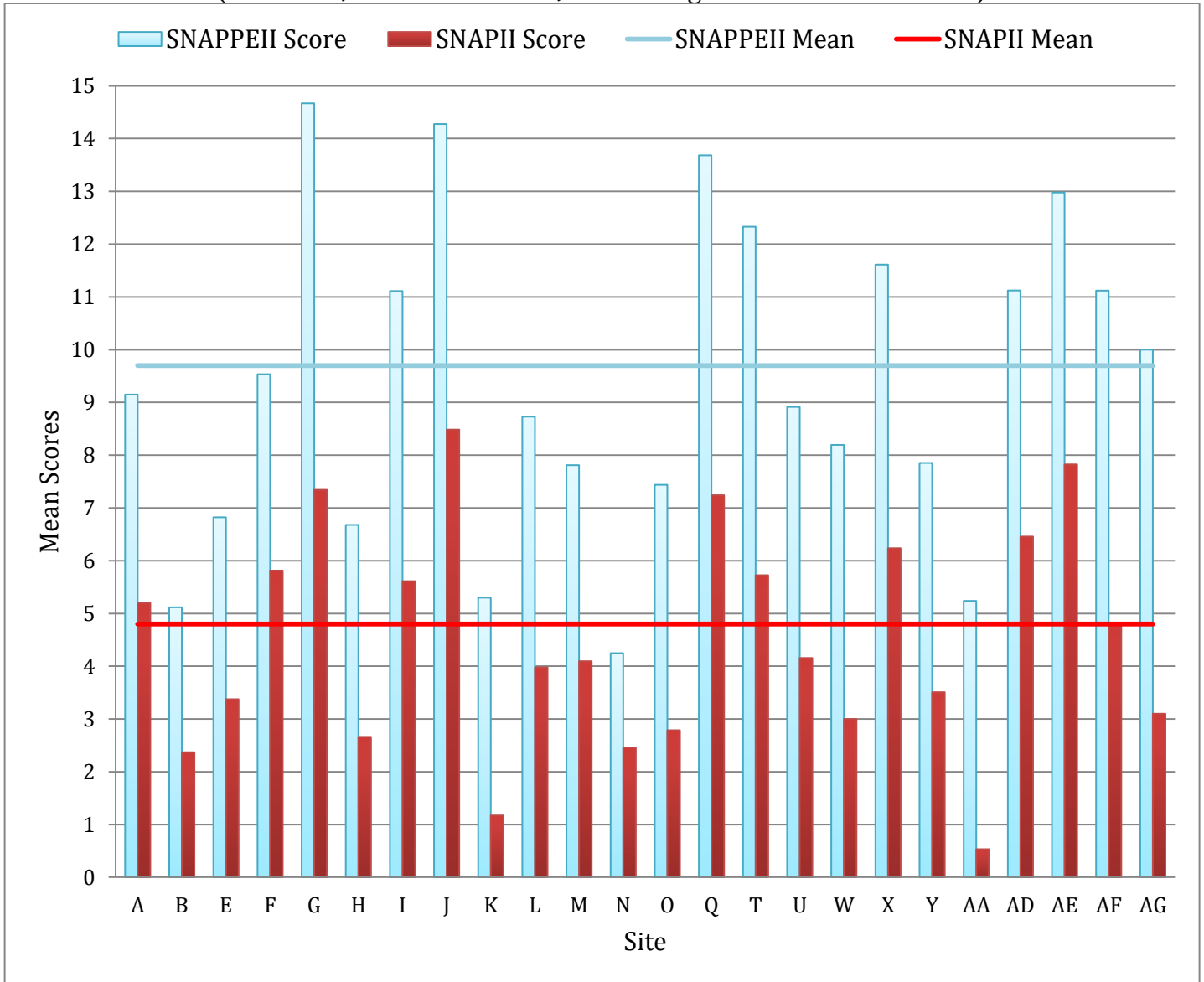
Data collection status	Number of sites	Score	Mean	Std Dev	Q1	Median	Q3
Complete	24	**SNAPIIPE**	9.7	0.1	0	0	18
		SNAPII	4.8	0.1	0	0	5
Restricted	9	**SNAPIIPE**	18.7	0.5	0	15	29
		SNAPII	8.9	0.3	0	5	14

Presentation #2 (continued)
All admissions: Admission illness severity scores (SNAP-II & SNAP-IIPE): All sites

Site		SNAP-IIPE	SNAP-II	Site		SNAP-IIPE	SNAP-II
A	Mean	9.1	5.2	**Q**	Mean	13.7	7.2
	SEM	0.4	0.3		SEM	0.7	0.4
B	Mean	5.1	2.4	**R**$^\phi$	Mean	17.1	8.2
	SEM	0.8	0.5		SEM	1.5	0.8
C$^\phi$	Mean	8.6	4.0	**S**$^\phi$	Mean	16.9	8.1
	SEM	1.2	0.8		SEM	1.5	0.9
D$^\phi$	Mean	14.8	6.2	**T**	Mean	12.3	5.7
	SEM	1.2	0.6		SEM	0.6	0.4
E	Mean	6.8	3.4	**U**	Mean	8.9	4.2
	SEM	0.6	0.4		SEM	0.7	0.4
F	Mean	9.5	5.8	**V**$^\phi$	Mean	17.7	9.6
	SEM	0.5	0.3		SEM	2.0	1.5
G	Mean	14.7	7.3	**W**	Mean	8.2	3.0
	SEM	0.8	0.5		SEM	0.8	0.4
H	Mean	6.7	2.7	**X**	Mean	11.6	6.2
	SEM	0.6	0.3		SEM	1.1	0.8
I	Mean	11.1	5.6	**Y**$^\phi$	Mean	7.9	3.5
	SEM	0.8	0.4		SEM	0.5	0.3
J	Mean	14.3	8.5	**Z**	Mean	20.1	10.1
	SEM	0.5	0.3		SEM	2.1	1.6
K	Mean	5.3	1.2	**AA**	Mean	5.2	0.5
	SEM	0.6	0.2		SEM	0.8	0.3
L	Mean	8.7	4.0	**AB**$^\phi$	Mean	26.3	12.9
	SEM	0.7	0.4		SEM	1.2	0.8
M	Mean	7.8	4.1	**AC**$^\phi$	Mean	14.3	6.0
	SEM	0.8	0.5		SEM	2.9	1.7
N	Mean	4.2	2.5	**AD**	Mean	11.1	6.5
	SEM	0.4	0.2		SEM	0.7	0.4
O	Mean	7.4	2.8	**AE**	Mean	13.0	7.8
	SEM	0.4	0.2		SEM	1.7	1.1
P$^\phi$	Mean	17.9	7.3	**AF**	Mean	11.1	4.8
	SEM	1.6	1.0		SEM	0.6	0.3
				AG	Mean	10.0	3.1
					SEM	0.5	0.2

COMMENTS: These analyses include 15 227 admissions (546 missing data on SNAP scores) to participating all sites during the year 2020. Adjusting for readmission, these analyses represent 14 271 Neonates. **Twenty-four sites collected data on all eligible admissions whereas nine sites (marked by $^\phi$) collected data on a selected cohort of eligible admissions only.** These nine sites were not included in the Presentation #2 bar graph but were included in the Presentation #2 Table. $^\phi$ Please note that the criteria for entering neonates in the CNN dataset are not the same for these nine sites and thus, the scores are not comparable with each other or with centers contributing complete data. These nine sites may have included neonates at lower GAs and/or lower BWs; thus, their severity of illness scores may be different.

Section D.2

Analyses based on number of eligible neonates admitted to participating sites

These include data from 14 271 eligible neonates admitted to 33 sites. 24 of these sites submitted complete data (n=13 043) on all eligible admitted neonates and 9 sites submitted data on a selected cohort of eligible admitted neonates (n=1 228).

Presentation #3
Gestational age distribution: All sites and all admitted neonates
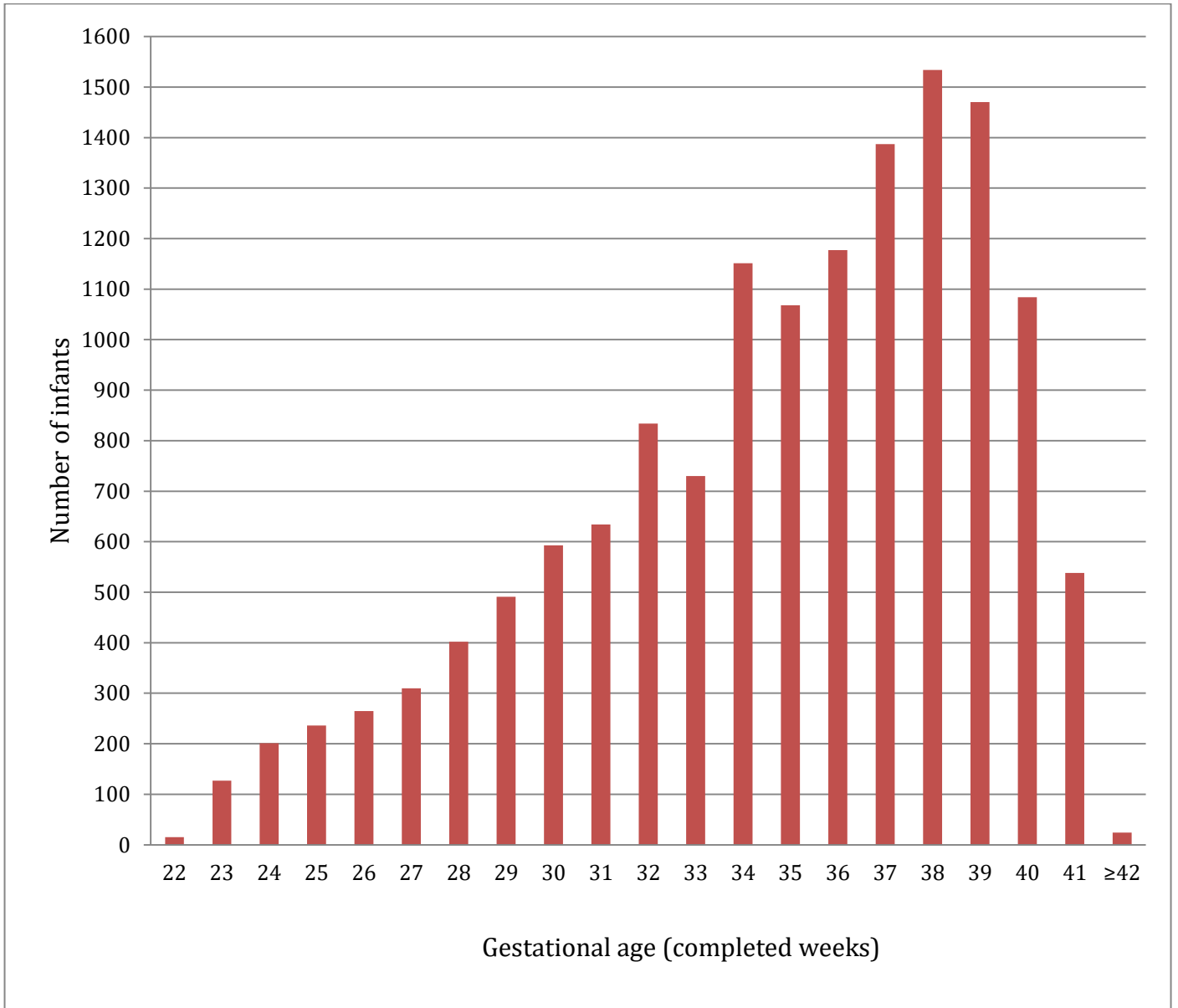
Presentation #3 (continued)
Gestational age distribution: All sites and all admitted neonates

GA in completed weeks at birth	Frequency	Percent	Cumulative percent
22	15	0.1	0.1
23	127	0.9	1.0
24	201	1.4	2.4
25	236	1.7	4.1
26	265	1.9	5.9
27	310	2.2	8.1
28	402	2.8	10.9
29	491	3.4	14.3
30	593	4.2	18.5
31	634	4.4	22.9
32	834	5.8	28.8
33	730	5.1	33.9
34	1 151	8.1	42.0
35	1 068	7.5	49.5
36	1 177	8.3	57.7
37	1 387	9.7	67.4
38	1 534	10.8	78.2
39	1 470	10.3	88.5
40	1 084	7.6	96.1
41	538	3.8	99.8
≥42	24	0.2	100.0
Total included	14 271	100.0	
Total # of missing GA	0		
Total # of neonates	14 271		

COMMENTS: The GA distribution of neonates is shown here. Term babies (≥37 weeks) represent 42.3% of the total number of neonates. Twenty-four sites collected data on all eligible admissions whereas nine sites collected data on a selected cohort of eligible admissions.

Presentation #4
Survival to discharge by GA: All admissions, including delivery room (DR) deaths

CNN admissions, excluding delivery room deaths					Delivery room deaths*		Total CNN admissions including delivery room deaths*				
GA (completed weeks)	#of neonates	#of survivors	**Percent survival among CNN admissions, excluding DR deaths**	#of neonates who received comfort care	Palliative care	Active care**	Total	#of neonates who received comfort care	# of neonates who received active care**	**Percent survival among those who received active care**	**Percent survival among all neonates (CNN admissions + DR deaths)**
	a	b	b/a	c	d	e	a+d+e	c+d	(a-c) +e	b/ (a-c)+e	b/(a+d+e)
22	15	4	27	0	46	3	64	46	18	22	6
23	127	62	49	0	31	4	162	31	131	47	38
24	201	146	73	3	16	1	218	19	199	73	67
25	236	201	85	0	2	1	239	2	237	85	84
26	265	237	89	0	1	1	267	1	266	89	89
27	310	285	92	0	2	1	313	2	311	92	91
28	402	385	96	0	2	1	405	2	403	96	95
29	491	472	96	0	2	1	494	2	492	96	96
≥30	12 224	12 053	99	7	31	7	12 262	38	12 224	99	98
Total included	14 271	13 845	97	10	133	20	14 424	143	14 281	97	96
Missing GA	0				0	1	1	0	1		
Total	14 271				133	21	14 425	143	14 282		

*Please note that delivery room deaths are *only included in Presentations #4, #6, and #6b* in this report. **Active care refers to infants who received cardiopulmonary resuscitation at birth.

Note: The results should be used cautiously for antenatal counseling. The survival rates are based upon the final discharge from the participating neonatal site. Note that these rates include only neonates admitted to the sites or dying in the delivery rooms of participating sites and thus are not reflective of the entire Canadian population. Only one CNN site did not contribute delivery room death data.

Presentation #5
Birth weight distribution: All sites and all admitted neonates
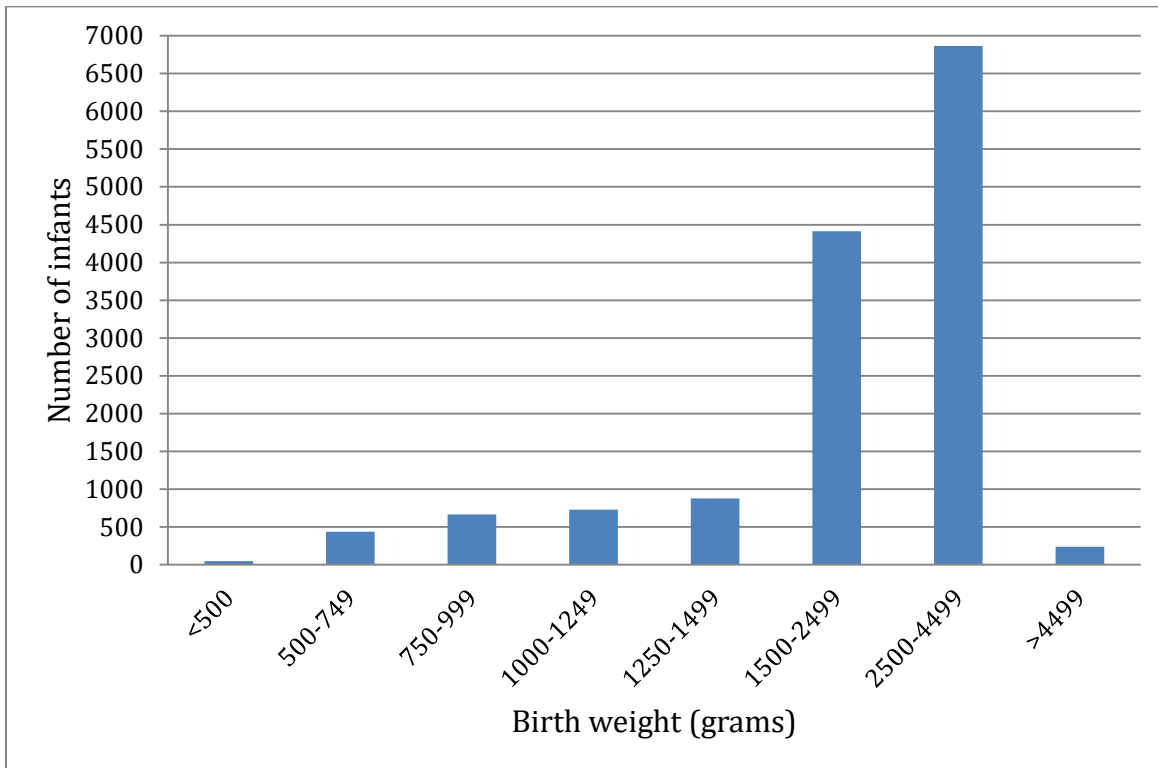
BW (grams)	Frequency	Percent from total number of neonates	Cumulative percent
<500	43	0.3	0.3
500-749	436	3.1	3.4
750-999	668	4.7	8.0
1000-1249	731	5.1	13.2
1250-1499	878	6.2	19.3
1500-2499	4 413	30.9	50.2
2500-4499	6 865	48.1	98.3
>4499	237	1.7	100.0
Total included	14 271	100.0	
Missing BW	0		
Total # of neonates	14 271		

COMMENTS: The BW distribution of neonates admitted to the CNN sites. Eighty-one percent weighed more than 1 500g at birth and 49.8% weighed more than 2 500g. Twenty-four sites collected data on all admissions whereas nine sites collected data on a selected cohort of eligible admissions only.

Presentation #6a

Survival to discharge by BW: All admissions, including delivery room (DR) deaths

CNN Admissions, excluding delivery room deaths					Delivery room deaths*		Total CNN admissions + Delivery room deaths*				
BW (grams)	#of neonates	# of survivors	Percent survival of CNN admissions, excluding DR deaths	# of neonates who received palliative care	Palliative care	Active care **	Total	# of neonates who received palliative care	# of neonates who received active care**	Percent survival of neonates who received active care	Percent survival of all neonates (CNN admissions + DR deaths)
	a	b	b/a	c	d	e	a+d+e	c+d	(a-c) +e	b/ (a-c)+e	b/(a+d+e)
<500	43	24	56	0	36	4	83	36	47	51	29
500-749	436	303	70	3	51	7	494	54	440	69	61
750-999	668	606	91	0	8	1	677	8	669	91	90
1000-1249	731	699	96	0	6	2	739	6	733	95	95
1250-1499	878	863	98	0	4	1	883	4	879	98	98
1500-2499	4 413	4 347	99	3	14	2	4 429	17	4 412	99	98
2500-4499	6 865	6 766	99	4	10	4	6 879	14	6 865	99	98
>4499	237	237	100	0	0	0	237	0	237	100	100
Total neonates included	14 271	13 845	97	10	129	21	14 421	139	14 282	97	96
Missing BW	0				4	0	4	4	0		
Total # of neonates	14 271				133	21	14 425	143	14 282		

*Please note that delivery room deaths are *only included in Presentations #4, #6 and #6b* in this report. **Active care refers to infants who received cardiopulmonary resuscitation at birth.

Note: The results should be used cautiously for antenatal counseling. The survival rates are based upon the final discharge from the participating neonatal site. Note that these rates include only neonates admitted to the sites or dying in the delivery rooms of participating sites and thus are not reflective of the entire Canadian population. Only one CNN site did not contribute delivery room death data.

Presentation #6b
Survival to discharge by BW: BW <1000g including delivery room (DR) deaths

	CNN Admissions, excluding delivery room deaths				Delivery room deaths*		Total CNN admissions + Delivery room deaths*				
BW (grams)	Number of neonates	Number of survivors	Percent survival of CNN admissions, excluding DR deaths	Number of neonates who received palliative care	Pallia tive care	Active care **	Total	Number of neonates who received palliative care	Number of neonates who received active care**	Percent survival of neonates who received active care	Percent survival of all neonates (CNN admissions + DR deaths)
	a	b	b/a	c	d	e	a+d+e	c+d	(a-c) +e	b/ (a-c)+e	b/(a+d+e)
<400	3	1	33	0	7	3	13	7	6	17	8
400-499	40	23	58	0	29	1	70	29	41	56	33
500-599	123	75	61	1	28	3	154	29	125	60	49
600-699	206	147	71	2	19	2	227	21	206	71	65
700-799	248	206	83	0	7	3	258	7	251	82	80
800-899	266	234	88	0	3	0	269	3	266	88	87
900-999	261	247	95	0	2	0	263	2	261	95	94
Total included	1 147	933	81	3	95	12	1 254	98	1 156	81	74

*Please note that delivery room deaths are *only included in Presentations #4, #6 and #6b* in this report. **Active care refers to infants who received cardiopulmonary resuscitation at birth.

Note: The results should be used cautiously for antenatal counseling. The survival rates are based upon the final discharge from the participating neonatal site. Note that these rates include only neonates admitted to the sites or died in delivery room of participating sites and thus are not reflective of the entire Canadian population. Only one CNN site did not contribute delivery room death data.

Presentation #7a
Maternal and peripartum characteristics: All neonates

Characteristics			GA at birth (completed weeks)					
	Missing/ Unknown		<26	26-28	29-32	33 - 36	≥37	Total
Total			**579**	**977**	**2552**	**4126**	**6037**	**14271**
No prenatal care	318	N	17	29	76	90	88	300
		%	3.0	3.0	3.0	2.2	1.5	2.2
Marijuana/cannabis	150	N	45	82	167	298	325	917
		%	7.9	8.5	6.6	7.3	5.4	6.5
Smoking	80	N	68	132	347	536	667	1750
		%	11.8	13.6	13.7	13.1	11.1	12.3
Maternal hypertension	819	N	70	205	656	966	643	2540
		%	12.3	21.6	26.5	24.4	11.7	18.9
Maternal diabetes	911	N	55	156	509	889	1065	2674
		%	10.0	16.8	20.7	22.6	19.4	20.0
Assisted pregnancy (ART)		N	72	101	236	364	250	1023
		%	12.4	10.3	9.3	8.8	4.1	7.2
Multiples		N	128	221	748	1027	146	2270
		%	22.1	22.6	29.3	24.9	2.4	15.9
$MgSO_4$ for neuroprotection	1246	N	444	750	1745	641	36	3616
		%	79.4	79.7	73.5	16.7	0.7	27.8
Antenatal steroids	None	351	N	58	91	230	2380	5802	8561
			%	10.2	9.5	9.3	59.1	98.5	61.5
	Partial		N	190	253	640	444	7	1534
			%	33.3	26.3	25.9	11.0	0.1	11.0
	Complete		N	323	618	1603	1202	79	3825
			%	56.6	64.2	64.8	29.9	1.3	27.5
Mode of birth	Vaginal	16	N	263	337	880	1774	3382	6636
			%	45.5	34.5	34.5	43.1	56.1	46.6
	C/S		N	315	640	1672	2346	2646	7619
			%	54.5	65.5	65.5	56.9	43.9	53.4
Presentation	Vertex	1326	N	320	560	1657	3044	4770	10351
			%	57.7	58.9	68.6	79.6	91.7	80.0
	Breech		N	205	348	654	673	318	2198
			%	36.9	36.6	27.1	17.6	6.1	17.0
	Other		N	30	43	106	105	112	396
			%	5.4	4.5	4.4	2.8	2.2	3.1
Rupture of membranes	<24 h	1409	N	399	690	1825	3180	4881	10975
			%	71.8	75.3	77.0	84.8	92.7	85.3
	24h to 1wk		N	98	103	259	377	332	1169
			%	17.6	11.2	10.9	10.1	6.3	9.1
	>1 wk		N	59	123	287	194	55	718
			%	10.6	13.4	12.1	5.2	1.0	5.6

Presentation #7a (continued)
Maternal and peripartum characteristics: All neonates

Characteristics		Missing/ Unknown		GA at birth (completed weeks)					Total
				<26	26-28	29-32	33 - 36	≥37	Total
Total				579	977	2552	4126	6037	14271
Chorioamnionitis*		1540	N	248	281	425	289	540	1783
			%	44.1	30.3	17.9	7.7	10.6	14.0
Deferred cord clamping	≤ 29 sec	2554	N	40	53	104	107	146	450
			%	7.3	5.8	4.5	3.1	3.3	3.8
	30-59 sec		N	121	173	438	563	607	1902
			%	22.2	18.8	18.8	16.1	13.7	16.2
	≥60 sec		N	148	334	1092	1578	1574	4726
			%	27.2	36.3	47.0	45.1	35.6	40.3
	Yes, but timing unknown		N	6	25	56	195	354	636
			%	1.1	2.7	2.4	5.6	8.0	5.4
	No		N	230	335	636	1058	1744	4003
			%	42.2	36.4	27.3	30.2	39.4	34.2

*Chorioamnionitis is defined as documented histological chorioamnionitis on placenta pathology **or** "suspected or confirmed clinical chorioamnionitis" in chart **or** presence of maternal fever and *either* leukocytosis *or* purulent discharge *or* fetal tachycardia.

Presentation #7b
Maternal and peripartum characteristics:
Timing of single course of Antenatal Corticosteroids (ANCS): GA <33 weeks

			No ANCS	Complete course within last week prior to birth *	Complete course more than 1 week before birth **	Complete course but timing unknown ***	Partial course within last 24 hours ****
	Weeks						
Inborn	**22-28**	N	61	545	374	12	325
		%	4.5	40.4	27.7	0.9	24.1
	29-32	N	128	764	751	30	491
		%	5.8	34.5	33.9	1.4	22.2
Outborn	**22-28**	N	88	6	4	0	84
		%	42.7	2.9	1.9	0.0	40.8
	29-32	N	102	29	26	3	113
		%	30.2	8.6	7.7	0.9	33.4

*Complete course within last week prior to birth – defined as receipt of at least two doses of corticosteroids 24 hours or more but within one week of birth.

**Complete course before 1 week of birth – defined as receipt of at least two doses of corticosteroids initiated more than one week prior to birth.

***Complete course but timing unknown – defined as receipt of at least two doses of corticosteroids or if "complete course" was documented, but the dates of administration were not available.

****Partial course within last 24 hours – defined as any dose given less than 24 hours prior to birth.

Note: Data on "Partial course >24 hours ago" and "Partial course but timing unknown" are collected in the database but they are not reported in this table.

Presentation #7c
Maternal and peripartum characteristics:
Timing of deferred cord clamping: GA <33 weeks

Singleton

			Deferred Cord clamping timing						Immediate Cord clamping	Unknown timing
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown		
	Weeks									
Inborn	22-28	N	30	147	441	14	8	24	343	21
		%	2.9	14.3	42.9	1.4	0.8	2.3	33.4	2.0
	29-32	N	22	174	836	30	32	32	369	41
		%	1.4	11.3	54.4	2.0	2.1	2.1	24.0	2.7
Outborn	22-28	N	1	14	23	0	1	3	80	57
		%	0.6	7.8	12.9	0.0	0.6	1.7	44.7	31.8
	29-32	N	4	23	39	1	5	9	61	126
		%	1.5	8.6	14.6	0.4	1.9	3.4	22.8	47.0

First twin

			Deferred Cord clamping timing						Immediate Cord clamping	Unknown timing
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown		
	Weeks									
Inborn	22-28	N	6	21	60	4	0	3	48	2
		%	4.2	14.6	41.7	2.8	0.0	2.1	33.3	1.4
	29-32	N	5	38	148	4	7	4	83	13
		%	1.7	12.6	49.0	1.3	2.3	1.3	27.5	4.3
Outborn	22-28	N	1	0	1	0	0	0	6	3
		%	9.1	0.0	9.1	0.0	0.0	0.0	54.6	27.3
	29-32	N	0	3	7	0	0	0	9	12
		%	0.0	9.7	22.6	0.0	0.0	0.0	29.0	38.7

Second twin

			Deferred Cord clamping timing						Immediate Cord clamping	Unknown timing
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown		
	Weeks									
Inborn	22-28	N	1	23	58	3	1	1	53	3
		%	0.7	16.1	40.6	2.1	0.7	0.7	37.1	2.1
	29-32	N	5	42	153	5	3	9	88	9
		%	1.6	13.4	48.7	1.6	1.0	2.9	28.0	2.9
Outborn	22-28	N	0	1	1	0	0	0	11	2
		%	0.0	6.7	6.7	0.0	0.0	0.0	73.3	13.3
	29-32	N	0	4	5	0	1	1	5	16
		%	0.0	12.5	15.6	0.0	3.1	3.1	15.6	50.0

Presentation #8a
Resuscitation details: GA < 31 weeks

Action taken			GA at birth (completed weeks)								
			≤23	24	25	26	27	28	29	30	Total
Total			142	201	236	265	310	402	491	593	2640
No resuscitation needed/provided		N	0	0	1	1	0	2	6	20	30
		%	0.0	0.0	0.4	0.4	0.0	0.5	1.2	3.4	1.1
CPAP		N	16	71	124	168	227	311	411	461	1789
		%	11.4	35.5	52.5	63.4	73.2	77.4	83.7	77.7	67.8
PPV via mask		N	122	168	206	205	246	282	313	352	1894
		%	86.5	84.0	87.3	77.4	79.4	70.2	63.8	59.4	71.8
PPV via ETT		N	130	141	113	107	107	101	80	88	867
		%	92.2	70.5	47.9	40.4	34.5	25.1	16.3	14.8	32.9
Chest compression		N	7	12	11	11	12	13	7	15	88
		%	5.0	6.0	4.7	4.2	3.9	3.2	1.4	2.5	3.3
Epinephrine		N	7	8	9	7	7	7	4	5	54
		%	5.0	4.0	3.8	2.6	2.3	1.7	0.8	0.8	2.0
Unknown		N	1	0	1	2	0	3	0	1	8
		%	0.7	0.0	0.4	0.8	0.0	0.8	0.0	0.2	0.3
Any resuscitation provided*		N	138	197	234	262	308	396	479	558	2572
		%	97.9	98.5	99.2	98.9	99.4	98.5	97.6	94.1	97.5
Initial gas	Air	N	17	27	34	43	58	80	143	208	610
		%	12.0	13.4	14.4	16.2	18.7	19.9	29.1	35.1	23.1
	22-40% O_2	N	70	105	128	153	180	215	239	235	1325
		%	49.3	52.2	54.2	57.7	58.1	53.5	48.7	39.6	50.2
	41-70% O_2	N	12	10	19	15	28	37	27	22	170
		%	8.5	5.0	8.1	5.7	9.0	9.2	5.5	3.7	6.4
	71-99% O_2	N	1	2	5	5	7	4	6	9	39
		%	0.7	1.0	2.1	1.9	2.3	1.0	1.2	1.5	1.5
	100% O_2	N	29	33	31	28	18	35	24	37	235
		%	20.4	16.4	13.1	10.6	5.8	8.7	4.9	6.2	8.9
	Unknown/ Missing	N	13	24	19	21	19	31	52	82	261
		%	9.2	11.9	8.1	7.9	6.1	7.7	10.6	13.8	9.9
Maximum O_2 conc. during resus.	21%	N	0	0	0	0	3	4	9	15	31
		%	0.0	0.0	0.0	0.0	1.0	1.0	1.8	2.5	1.2
	22-40%	N	4	10	20	32	64	85	131	174	520
		%	2.8	5.0	8.5	12.1	20.7	21.1	26.7	29.3	19.7
	41-70%	N	9	29	43	56	51	107	109	108	512
		%	6.3	14.4	18.2	21.1	16.5	26.6	22.2	18.2	19.4
	>70%	N	118	135	155	151	165	173	169	172	1238
		%	83.1	67.2	65.7	57.0	53.2	43.0	34.4	29.0	46.9
	Missing	N	11	27	18	26	27	33	73	124	339
		%	7.8	13.4	7.6	9.8	8.7	8.2	14.9	20.9	12.8

* Number of neonates who received any resuscitation includes those who received CPAP, PPV, chest compression or epinephrine
NOTE: Please use caution when interpreting these data. Resuscitation time was defined as the first 30 minutes after birth. Note that delivery room deaths are not included in the denominator.

Presentation #8b
Resuscitation details: GA ≥ 31 weeks

Action taken			GA at birth (completed weeks)							
			31	32	33	34	35	36	≥37	Total
Total			634	834	730	1151	1068	1177	6037	11631
No resuscitation needed / provided		N	48	108	172	393	412	446	2326	3905
		%	7.6	13.0	23.6	34.1	38.6	37.9	38.5	33.6
CPAP		N	489	558	391	494	420	435	2093	4880
		%	77.1	66.9	53.6	42.9	39.3	37.0	34.7	42.0
PPV via mask		N	307	318	198	282	270	291	1694	3360
		%	48.4	38.1	27.1	24.5	25.3	24.7	28.1	28.9
PPV via ETT		N	69	45	30	35	45	34	426	684
		%	10.9	5.4	4.1	3.0	4.2	2.9	7.1	5.9
Chest compression		N	14	8	8	9	18	11	170	238
		%	2.2	1.0	1.1	0.8	1.7	0.9	2.8	2.0
Epinephrine		N	5	3	3	6	10	6	62	95
		%	0.8	0.4	0.4	0.5	0.9	0.5	1.0	0.8
Unknown		N	1	3	5	7	12	14	68	110
		%	0.2	0.4	0.7	0.6	1.1	1.2	1.1	0.9
Any resuscitation provided*		N	550	634	450	565	500	538	2817	6054
		%	86.8	76.0	61.6	49.1	46.8	45.7	46.7	52.1
Initial gas	Air	N	202	301	204	253	237	247	1257	2701
		%	31.9	36.1	28.0	22.0	22.2	21.0	20.8	23.2
	22-40% O₂	N	227	244	144	213	120	126	543	1617
		%	35.8	29.3	19.7	18.5	11.2	10.7	9.0	13.9
	41-70% O₂	N	41	34	24	35	23	31	141	329
		%	6.5	4.1	3.3	3.0	2.2	2.6	2.3	2.8
	71-99% O₂	N	5	4	1	5	2	2	14	33
		%	0.8	0.5	0.1	0.4	0.2	0.2	0.2	0.3
	100% O₂	N	29	36	40	45	55	55	334	594
		%	4.6	4.3	5.5	3.9	5.2	4.7	5.5	5.1
	Unknown/ Missing	N	130	215	317	600	631	716	3748	6357
		%	20.5	25.8	43.4	52.1	59.1	60.8	62.1	54.7
Maximum O₂ conc. during resus	21%	N	26	61	46	59	37	43	225	497
		%	4.1	7.3	6.3	5.1	3.5	3.7	3.7	4.3
	22-40%	N	181	230	157	218	145	165	697	1793
		%	28.6	27.6	21.5	18.9	13.6	14.0	11.6	15.4
	41-70%	N	119	131	70	87	77	87	364	935
		%	18.8	15.7	9.6	7.6	7.2	7.4	6.0	8.0
	>70%	N	146	135	106	128	138	134	863	1650
		%	23.0	16.2	14.5	11.1	12.9	11.4	14.3	14.2
	Missing	N	162	277	351	659	671	748	3888	6756
		%	25.6	33.2	48.1	57.3	62.8	63.6	64.4	58.1

* Number of neonates who received any resuscitation includes those who received CPAP, PPV,
Chest compression or epinephrine
NOTE: Please use caution while interpreting these data. Resuscitation time was defined as the first
30 minutes after birth. Note that delivery room deaths are not included in the denominator.

Presentation #9
Early onset sepsis rates: All GA
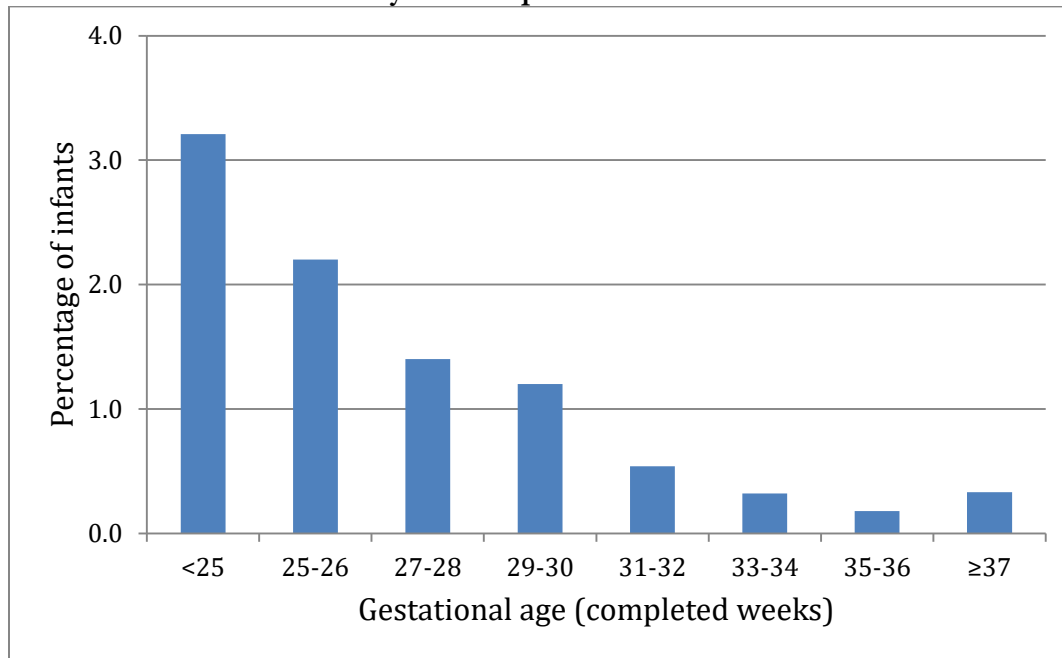
GA at birth (completed weeks)	Total number of neonates	No. of neonates with infection	% of neonates with infection	Total number of organisms	Organism		
					E. Coli	GBS	Others
<25	343	11	3.2	11	5	2	4
25-26	501	11	2.2	11	4	3	4
27-28	712	-9	-1.3	-9	5	0	-4
29-30	1 084	13	1.2	14	6	1	7
31-32	1 468	-7	0.5	-8	2	0	-6
33-34	1 881	6	0.3	6	3	0	3
35-36	2 245	4	0.2	4	1	0	3
≥37	6 037	-19	0.3	-19	4	5	-10
Total neonates included	**14 271**	**-80**	**0.6**	**-82**	**30**	**11**	**-41**
Missing	0						
Total # of neonates	14 271						

COMMENTS: Early onset sepsis is indicated by positive bacterial, viral or fungal culture in blood and/or cerebrospinal fluid, in the first two days after birth. In other category, top six organisms were: Viridans streptococci (n=9), Enterococci (n=5), Bacillus (n=4), Haemophilus (n=3), Paenibacillus (n=3), Streptococci (n=3). In contrast to previous CNN reports, CONS was *not* included as an organism causing early onset sepsis in this report based on consultation with microbiologists.
Syphilis (n=3) was not counted as an early onset sepsis in this presentation.

Presentation #10
Late onset sepsis rates: All GA

GA at birth (completed weeks)	Total number	Number of deaths in the first 2 days after birth	Number of neonates survived beyond day 2 after birth	Number of neonates with at least one infection	Number of neonates with more than one infection	Among neonates who survived day 2, percentage with at least one infection	Total number of organisms	Organisms					
								CONS	E. Coli	Staph aureus	Fungal	Virus	Other
<25	343	24	319	125	30	39	179	80	18	20	12	9	40
25-26	501	12	489	107	25	22	143	70	20	18	2	6	27
27-28	712	10	702	71	7	10	86	45	10	8	0	3	20
29-30	1 084	9	1 075	50	9	5	62	24	11	12	4	1	10
31-32	1 468	7	1 461	28	2	2	30	18	2	5	0	0	5
33-34	1 881	2	1 879	18	2	1	20	10	3	2	0	3	2
35-36	2 245	8	2 237	24	2	1	31	13	4	3	0	0	11
≥37	6 037	17	6 020	64	4	1	72	31	13	9	1	2	16
Total included	14 271	89	14 182	487	81	3	623	291	81	77	19	24	131
Missing	0												
Total # of neonates	14 271												

COMMENTS: Late onset sepsis is defined as any positive blood and/or cerebrospinal fluid culture for bacteria, viral or fungi after 2 days of age (analysis is neonate-based). The numbers are adjusted for readmission. Among other category, top 5 organisms were: GBS (n=28), Enterococci (n=23), Klebsiella (n=19), Enterobacter (n=15), Bacillus (n=12). Virus category includes Cytomegalovirus (n=18), Enterovirus (n=2), Herpes simplex virus (n=3), Human herpesvirus 6 (n=1).
Note: In 2020, the coding for CONS and Staph Aureus were revised which has led to a change in proportion of each.

Presentation #11
Late onset sepsis rates: All BW

BW (grams)	Total number	Number of deaths in the first 2 days after birth	Number of neonates survived beyond day 2 after birth	Number of neonates with at least one infection	Number of neonates with more than one infection	Among neonates who survived day 2, percentage with at least one infection	Total number of organisms	Organisms					
								CONS	E. Coli	Staph aureus	Fungal	Virus	Other
<500	43	5	38	13	2	34	17	11	0	3	0	0	3
500-749	436	28	408	128	28	31	179	82	16	21	13	8	39
750-999	668	8	660	122	25	18	158	73	24	18	1	6	36
1000-1499	1 609	12	1 597	88	18	6	116	55	18	16	0	7	20
1500-1999	2 174	5	2 169	43	2	2	49	22	5	8	4	1	9
2000-2499	2 239	9	2 230	19	0	1	19	7	7	2	0	1	2
≥2500	7 102	22	7 080	74	6	1	85	41	11	9	1	1	22
Total included	**14 271**	**89**	**14 182**	**487**	**81**	**3**	**623**	**291**	**81**	**77**	**19**	**24**	**131**
Missing (BW)	0												
Total # of neonates	**14 271**												

COMMENTS: Late onset sepsis is defined as any positive blood and/or cerebrospinal fluid culture for bacteria, viral or fungi after 2 days of age (analysis is neonate-based). The numbers are adjusted for readmission. Among other category, top 5 organisms were: GBS (n=28), Enterococci (n=23), Klebsiella (n=19), Enterobacter (n=15), Bacillus (n=12). Virus category includes Cytomegalovirus (n=18), Enterovirus (n=2), Herpes simplex virus (n=3), Human herpesvirus 6 (n=1).
Note: In 2020, the coding for CONS and Staph Aureus were revised which has led to a change in proportion of each.

Presentation #12
Other diagnoses / interventions / procedures: All GA

Characteristics		Missing		GA at birth (completed weeks)						
				≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	Total
Total				579	977	1084	1468	4126	6037	14271
Prophylactic	Indomethacin		N	97	71	5	1	0	0	174
			%	16.8	7.3	0.5	0.1	0.0	0.0	1.2
	Probiotics		N	364	695	761	840	396	35	3091
			%	62.9	71.1	70.2	57.2	9.6	0.6	21.7
RDS	Unknown	1	N	5	1	0	0	2	4	12
			%	0.9	0.1	0.0	0.0	0.1	0.1	0.1
	Uncertain		N	2	4	19	19	55	27	126
			%	0.4	0.4	1.8	1.3	1.3	0.5	0.9
	None		N	23	101	288	787	3445	5766	10410
			%	4.0	10.3	26.6	53.7	83.5	95.5	73.0
	Definite		N	549	871	777	661	624	240	3722
			%	94.8	89.2	71.7	45.1	15.1	4.0	26.1
Surfactant in first 30 min			N	108	69	33	11	8	2	231
			%	18.7	7.1	3.0	0.8	0.2	0.0	1.6
Surfactant in first 60 min			N	248	181	70	41	20	8	568
			%	42.8	18.5	6.5	2.8	0.5	0.1	4.0
Surfactant in first 120 min			N	350	322	156	90	46	16	980
			%	60.5	33.0	14.4	6.1	1.1	0.3	6.9
Surfactant after 120 minutes			N	173	316	290	196	273	153	1401
			%	29.9	32.3	26.8	13.4	6.6	2.5	9.8
Surfactant at any time			N	523	638	446	286	319	169	2381
			%	90.3	65.3	41.1	19.5	7.7	2.8	16.7
Method of surfactant (first dose only among the neonates who received surfactant)*	Endotracheal		N	622	606	363	211	225	148	2175
			%	88.6	78.2	73.8	68.7	68.4	82.2	78.1
	LISA		N	21	101	71	46	29	4	272
			%	3.0	13.0	14.4	15.0	8.8	2.2	9.8
	Other*		N	59	68	58	50	75	28	338
			%	8.4	8.8	11.8	16.3	22.8	15.6	12.1
Pneumothorax diagnosis			N	42	41	37	28	132	385	665
			%	7.3	4.2	3.4	1.9	3.2	6.4	4.7
Pneumothorax treatment**	Observation only		N	8	9	8	11	73	285	394
			%	19.1	22.0	21.6	39.3	55.3	74.0	59.2
	Needle drainage		N	25	22	16	11	30	61	165
			%	59.5	53.7	43.2	39.3	22.7	15.8	24.8
	Chest tube		N	26	26	28	19	50	72	221
			%	61.9	63.4	75.7	67.9	37.9	18.7	33.2
Seizures	Definite /suspected	5	N	37	25	14	20	97	428	621
			%	6.4	2.6	1.3	1.4	2.4	7.1	4.4

* "Other" includes other method of surfactant, surfactant method unknown (i.e. "unknown" checked) and method missing (i.e. "method" left blank).

** One neonate can have multiple treatments. Denominators for treatment were based on the number of neonates who had pneumothorax.

Presentation #12 (continued)
Other diagnoses / interventions / procedures: All GA

Characteristics		Missing			≤25	26 - 28	29 - 30	31 - 32	33 - 36	≥37	Total
				GA at birth (completed weeks)							
Total					579	977	1084	1468	4126	6037	14271
Operations	Thoracotomy		N		0	6	5	6	15	29	61
			%		0.0	0.6	0.5	0.4	0.4	0.5	0.4
	Laparotomy		N		40	31	21	17	66	110	285
			%		6.9	3.2	1.9	1.2	1.6	1.8	2.0
	Ostomy		N		3	6	1	2	7	13	32
			%		0.5	0.6	0.1	0.1	0.2	0.2	0.2
	Reservoir/Drain		N		25	11	6	5	6	4	57
			%		4.3	1.1	0.6	0.3	0.2	0.1	0.4
	VP shunt		N		17	6	6	4	6	11	50
			%		2.9	0.6	0.6	0.3	0.2	0.2	0.4
Gastro-intestinal perforation	Spontaneous	98	N		40	16	7	4	11	11	89
			%		7.0	1.7	0.7	0.3	0.3	0.2	0.6
	NEC related		N		16	11	5	1	0	2	35
			%		2.8	1.1	0.5	0.1	0.0	0.0	0.2
Acquired stricture			N		3	7	3	2	2	3	20
			%		0.5	0.7	0.3	0.1	0.1	0.1	0.1
Exchange transfusion			N		0	1	4	4	8	18	35
			%		0.0	0.1	0.4	0.3	0.2	0.3	0.2
Congenital anomaly*	None		N		366	724	865	1246	3386	4460	11047
			%		63.2	74.1	79.8	84.9	82.1	73.9	77.4
	Minor		N		201	228	180	164	472	886	2131
			%		34.7	23.3	16.6	11.2	11.4	14.7	14.9
	Major		N		12	25	39	58	268	691	1093
			%		2.1	2.6	3.6	4.0	6.5	11.5	7.7

*A list of major anomalies can be found in the 2013 annual report, pages 124-127. It is available via the following link:
http://www.canadianneonatalnetwork.org/Portal/LinkClick.aspx?fileticket=lreR0871sjA%3d&tabid=39

Section D.3

Analyses based on number of eligible very preterm (GA <33 weeks) or very low birth weight (BW <1 500g) neonates

These included data from 4 108 eligible very preterm neonates and 2 756 eligible VLBW neonates.

Presentation #13
Patent ductus arteriosus (PDA) treatments: GA <33 weeks
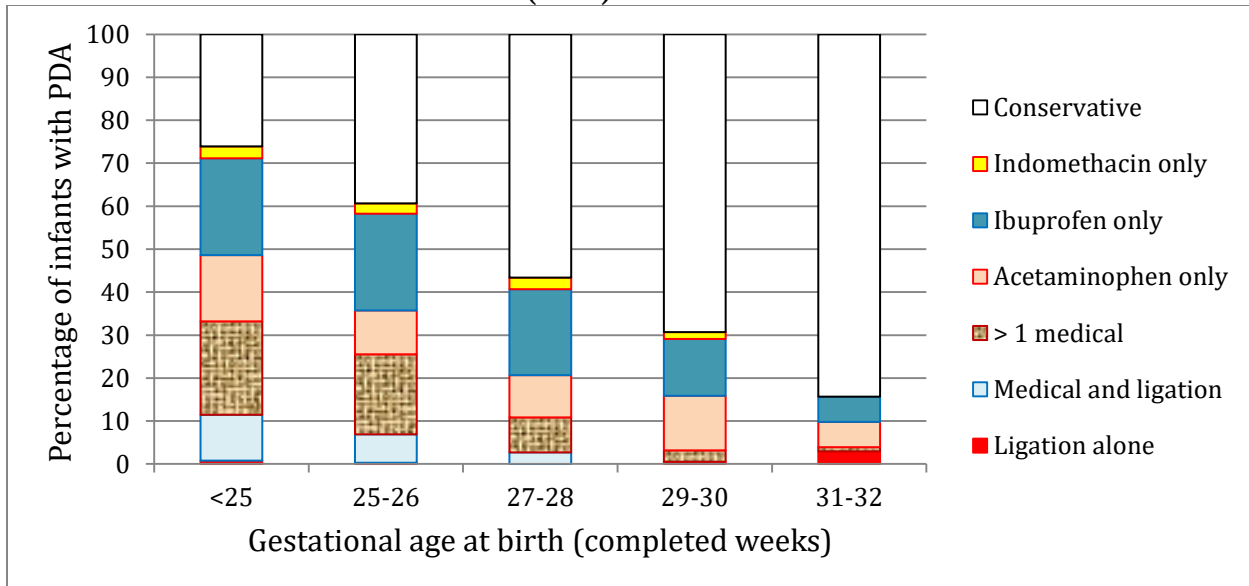
Birth GA (completed weeks)		Total	Missing data on PDA	PDA unknown	No PDA	Neonates with PDA	Treatment†						
							Conservative	Indo	Ibu	Acetaminophen	> 1 medical*	Medical and ligation#	Ligation alone
<25	N	343	0	6	84	253	66	7	57	39	55	27	2
	%						26%	3%	23%	15%	22%	11%	1%
25-26	N	501	0	4	164	333	131	8	75	34	62	22	1
	%						39%	2%	23%	10%	19%	7%	0%
27-28	N	712	0	5	412	295	167	8	59	29	24	8	0
	%						57%	3%	20%	10%	8%	3%	0%
29-30	N	1 084	0	4	891	189	131	3	25	24	5	0	1
	%						69%	2%	13%	13%	3%	0%	1%
31-32	N	1 468	1	3	1 362	102	86	0	6	6	1	0	3
	%						84%	0%	6%	6%	1%	0%	3%
Total neonates included	N	4 108	1	22	2 913	1 172	581	26	222	132	147	57	7
	%						50%	2%	19%	11%	13%	5%	1%

†The percentage of neonates receiving each PDA treatment was calculated using the total number of neonates diagnosed with PDA as the denominator.
*>1 medical = 2 or 3 of (Indomethacin or Ibuprofen or Acetaminophen)
#Medical and ligation = Ligation + at least one of the drugs (Indomethacin or Ibuprofen or Acetaminophen)

Out of 57 Medical and ligation = surgical (26), device close (31)
Out of 7 Ligation alone = surgical (3), device closure (4)

COMMENTS: Specific reasons for treatment with indomethacin and frequency of repeat course of indomethacin were not recorded. Excludes indomethacin prophylaxis started on the first day of age. Neonates were identified as without PDA if there was no clinical suspicion of PDA.

Presentation #14
Patent ductus arteriosus (PDA) treatments: BW <1500g
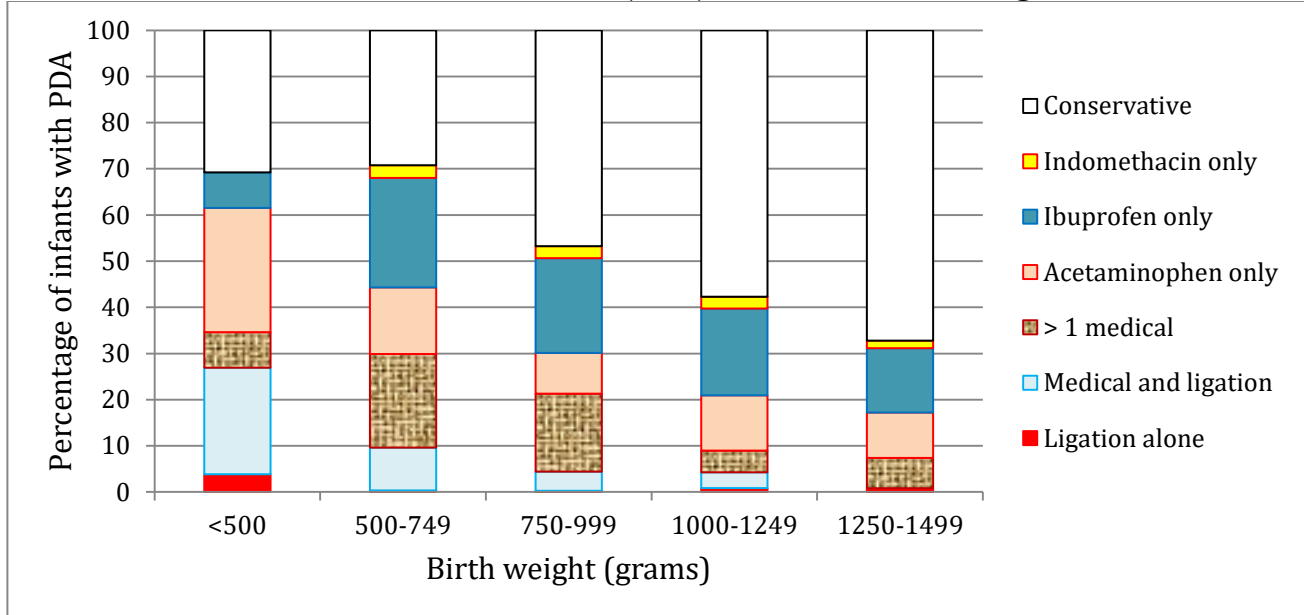
BW (grams)		Total	Missing data on PDA	PDA information unknown	No PDA	Neonates with PDA	Treatment†						
							Conservative	Indo	Ibu	Acetaminophen	> 1 medical*	Medical and ligation#	Ligation alone
<500	N	43	0	1	16	26	8	0	2	7	2	6	1
	%						31%	0%	8%	27%	8%	23%	4%
500-749	N	436	0	10	135	291	85	8	69	42	59	27	1
	%						29%	3%	24%	14%	20%	9%	0%
750-999	N	668	0	1	282	385	180	10	79	34	65	16	1
	%						47%	3%	21%	9%	17%	4%	0%
1000-1249	N	731	0	3	494	234	135	6	44	28	11	8	2
	%						58%	3%	19%	12%	5%	3%	1%
1250-1499	N	878	0	2	754	122	82	2	17	12	8	0	1
	%						67%	2%	14%	10%	7%	0%	1%
Total neonates included	N	2 756	0	17	1 681	1 058	490	26	211	123	145	57	6
	%						46%	2%	20%	12%	14%	5%	1%

† The percentage of neonates receiving each PDA treatment was calculated using the total number of neonates diagnosed with PDA as the denominator.
*>1 medical = 2 or 3 of (Indomethacin or Ibuprofen or Acetaminophen)
#Medical and ligation = Ligation + at least one of the drugs (Indomethacin or Ibuprofen or Acetaminophen)

Out of 57 Medical and ligation = surgical (26), device close (31)
Out of 6 Ligation alone = surgical (3), device closure (3)

COMMENTS: Specific reasons for treatment with indomethacin and frequency of a repeat course of indomethacin were not recorded. Data excludes indomethacin prophylaxis started on the first day of age. Neonates were identified as without PDA if there was no clinical suspicion of PDA.

Presentation #15
Neuroimaging findings: GA <33 weeks
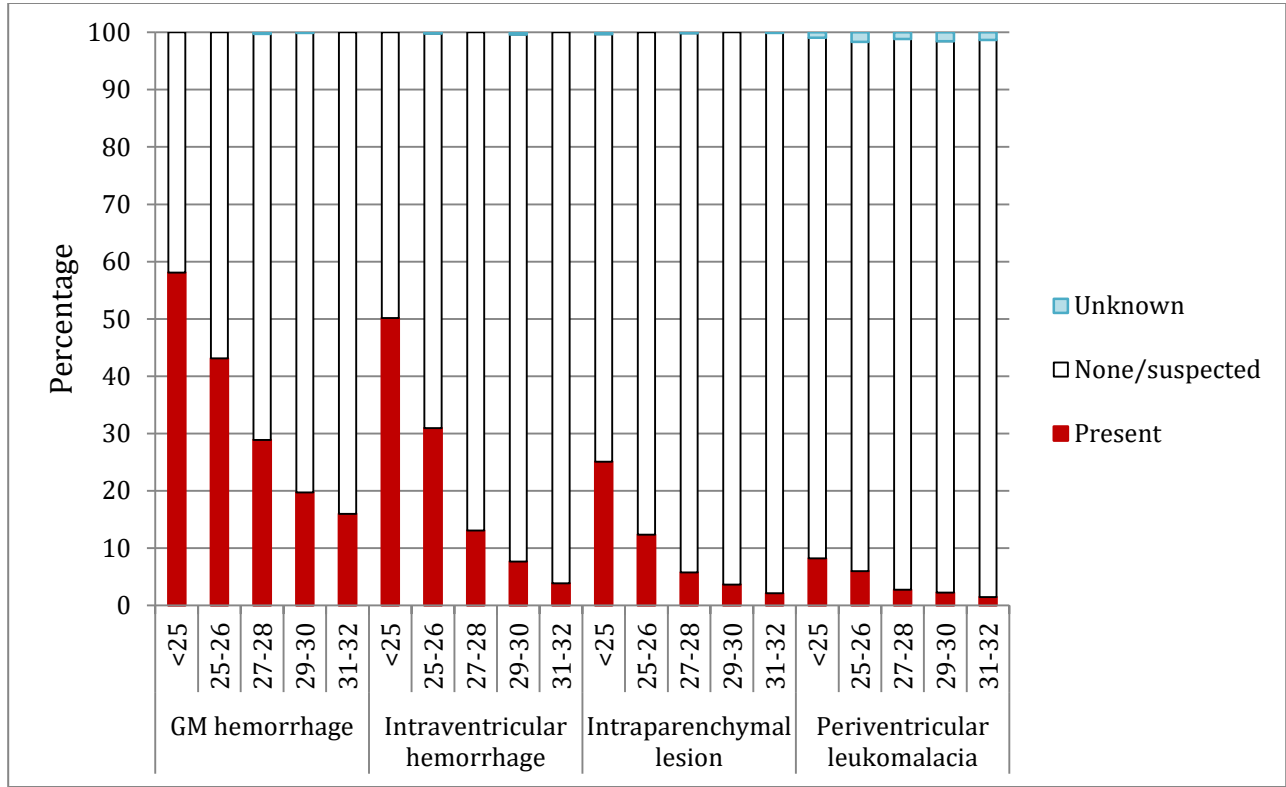
Ventricular enlargement
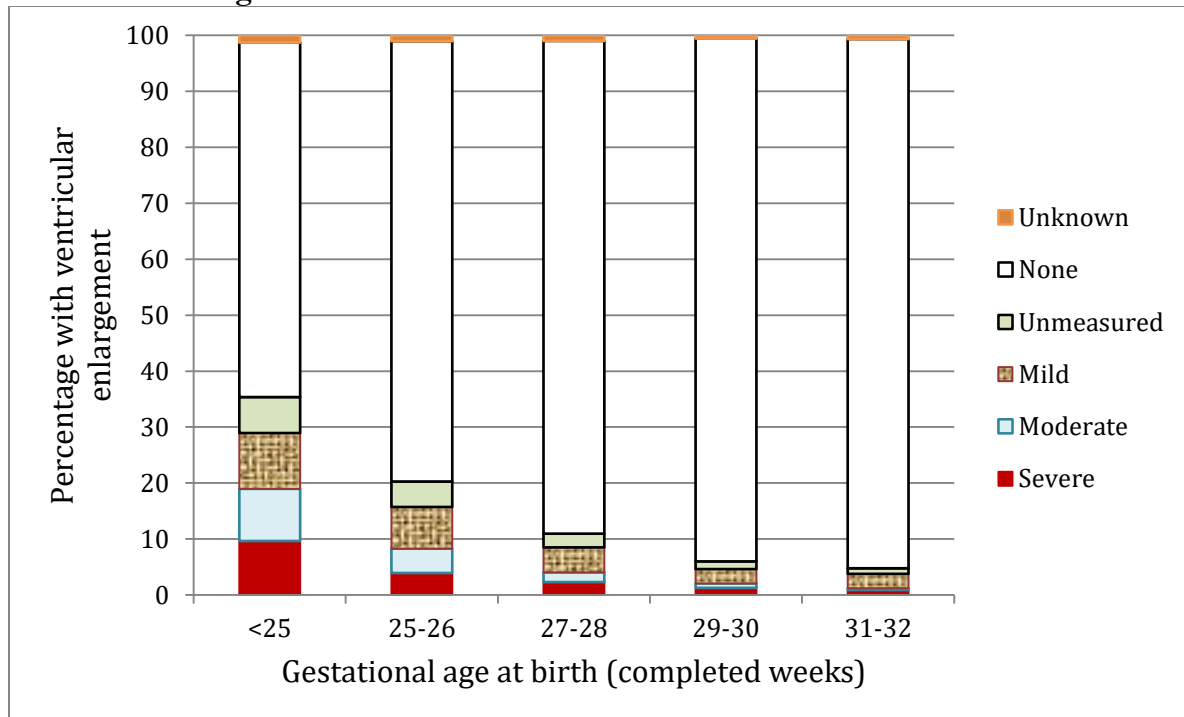
See page 136 for classifications of ventricular enlargement.

Presentation #15 (continued)
Neuroimaging findings: GA <33 weeks

GA at birth (completed weeks)		Total	Neuro-imaging available	GM hemorrhage			Intraventricular hemorrhage			Ventricular enlargement						Intraparenchymal lesion			Periventricular leukomalacia		
				Present	None/suspected	Unknown	Present	None/suspected	Unknown	Mild	Moderate	Severe	Unmeasured	None	Unknown	Present	None/suspected	Unknown	Present	None/suspected	Unknown
<25	N	343	315	183	132	0	158	157	0	31	29	30	20	197	4	79	235	1	26	286	3
	%			58%	42%	0%	50%	50%	0%	10%	9%	10%	6%	63%	1%	25%	75%	0%	8%	91%	1%
25-26	N	501	485	209	276	0	150	334	1	36	21	19	22	380	5	60	425	0	29	448	8
	%			43%	57%	0%	31%	69%	0%	7%	4%	4%	5%	79%	1%	12%	88%	0%	6%	92%	2%
27-28	N	712	696	201	493	2	91	605	0	31	12	16	17	611	7	40	655	1	19	668	8
	%			29%	71%	0%	13%	87%	0%	4%	2%	2%	2%	88%	1%	6%	94%	0%	3%	96%	1%
29-30	N	1084	1019	201	817	1	78	937	4	26	8	13	14	949	6	37	982	0	23	980	16
	%			20%	80%	0%	8%	92%	0%	3%	1%	1%	1%	93%	1%	4%	96%	0%	2%	96%	2%
31-32	N	1468	901	144	757	0	35	866	0	23	3	8	9	850	6	19	881	1	13	876	12
	%			16%	84%	0%	4%	96%	0%	3%	0%	1%	1%	95%	1%	2%	98%	0%	1%	97%	1%
Total number of neonates	N	4108	3416	938	2475	3	512	2899	5	147	73	86	82	2987	28	235	3178	3	110	3258	47
	%			27%	72%	0%	15%	85%	0%	4%	2%	3%	2%	87%	1%	7%	93%	0%	3%	95%	1%

Note: Neuroimaging findings were not mutually exclusive, i.e. one neonate may have had more than one finding.
See for classifications of ventricular enlargement.

Presentation #16
Neuroimaging findings: BW <1500g
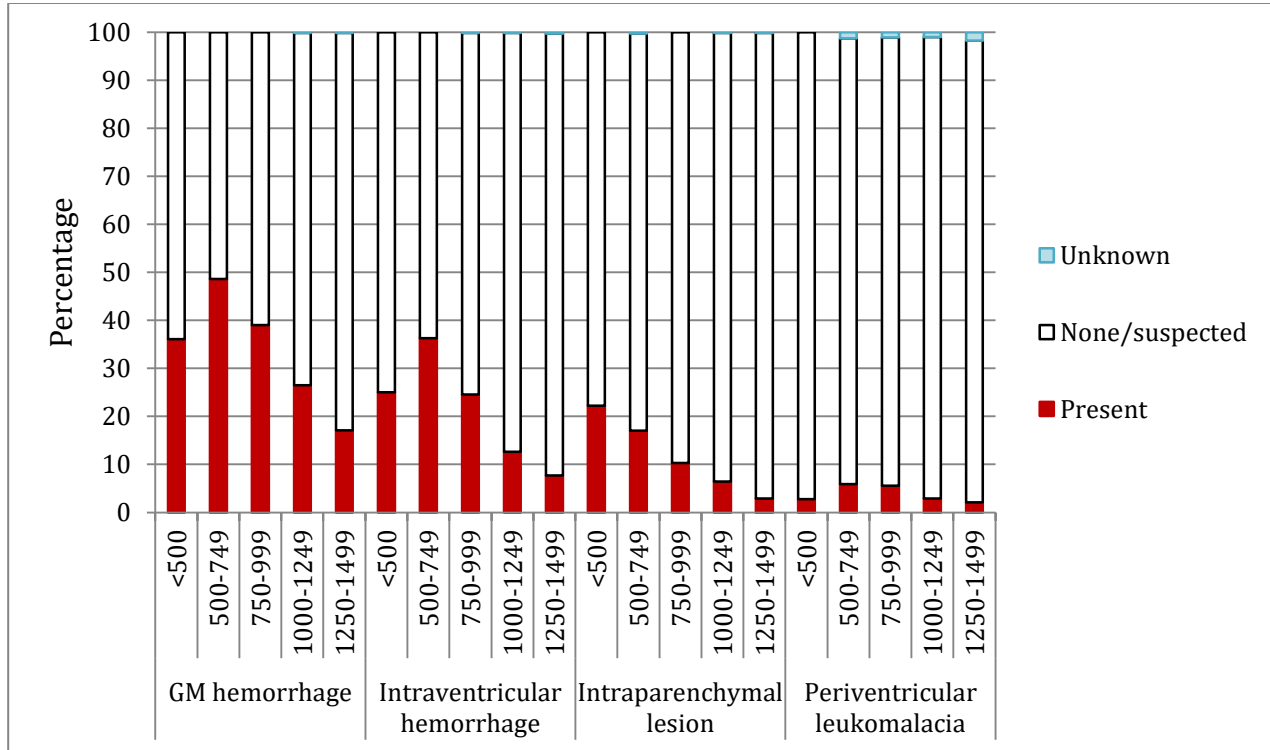
Ventricular enlargement

See page 136 for classifications of ventricular enlargement.

36
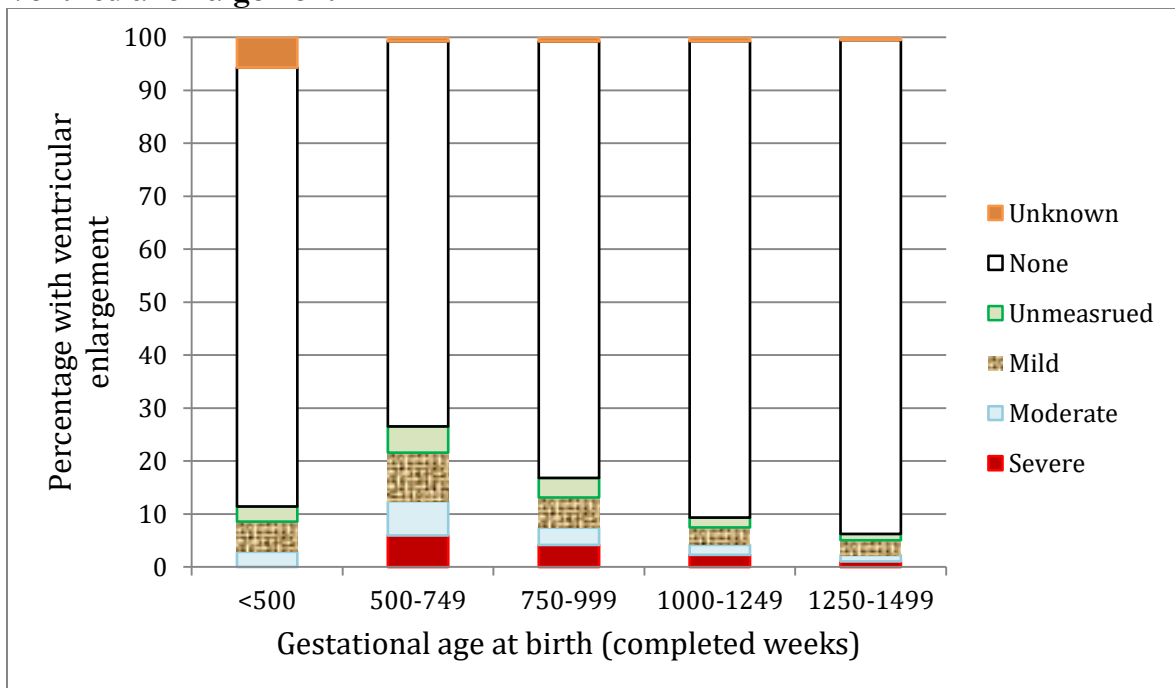
Presentation #16 (continued)
Neuroimaging findings: BW <1500g

BW (grams)		Total	Neuro-imaging available	GM hemorrhage			Intraventricular hemorrhage			Ventricular enlargement						Intraparenchymal lesion			Periventricular leukomalacia		
				Present	None/suspected	Unknown	Present	None/suspected	Unknown	Mild	Moderate	Severe	Unmeasured	None	Unknown	Present	None/suspected	Unknown	Present	None/suspected	Unknown
<500	N	43	36	13	23	0	9	27	0	2	1	0	1	29	2	8	28	0	1	35	0
	%			36%	64%	0%	25%	75%	0%	6%	3%	0%	3%	83%	6%	22%	78%	0%	3%	97%	0%
500-749	N	436	405	197	208	0	147	258	0	37	26	24	20	293	3	69	335	1	24	376	5
	%			49%	51%	0%	36%	64%	0%	9%	6%	6%	5%	73%	1%	17%	83%	0%	6%	93%	1%
750-999	N	668	651	254	397	0	160	490	1	37	21	27	24	534	5	67	584	0	36	607	7
	%			39%	61%	0%	25%	75%	0%	6%	3%	4%	4%	82%	1%	10%	90%	0%	6%	93%	1%
1000-1249	N	731	698	185	512	1	88	609	1	23	13	16	13	626	5	45	652	1	20	671	7
	%			27%	73%	0%	13%	87%	0%	3%	2%	2%	2%	90%	1%	6%	93%	0%	3%	96%	1%
1250-1499	N	878	754	129	624	1	58	694	2	21	9	8	9	701	4	22	731	1	16	725	13
	%			17%	83%	0%	8%	92%	0%	3%	1%	1%	1%	93%	1%	3%	97%	0%	2%	96%	2%
Total neonates	N	2756	2544	778	1764	2	462	2078	4	120	70	75	67	2183	19	211	2330	3	97	2414	32
	%			31%	69%	0%	18%	82%	0%	5%	3%	3%	3%	86%	1%	8%	92%	0%	4%	95%	1%

Note: Neuroimaging findings were not mutually exclusive, i.e. one neonate may have more than one finding.
See page 136 for classifications of ventricular enlargement.

Presentation #17
Necrotizing enterocolitis (NEC) treatments: GA <33weeks

GA at birth (completed weeks)		Total number of neonates	Missing data on NEC	No NEC	NEC*	Neonates with necrotizing enterocolitis**				Death among infants with NEC**
						Medical treatment only	Medical + peritoneal drainage	Laparotomy	Peritoneal drainage + Laparotomy	
<25	N	343	4	294	45	18	4	13	10	22
	%			87%	13%	40%	9%	29%	22%	49%
25-26	N	501	0	467	34	13	4	12	5	10
	%			93%	7%	38%	12%	35%	15%	29%
27-28	N	712	0	691	21	11	1	8	1	8
	%			97%	3%	52%	5%	38%	5%	38%
29-30	N	1084	0	1060	24	18	0	5	1	1
	%			98%	2%	75%	0%	21%	4%	4%
31-32	N	1468	1	1450	17	14	1	2	0	3
	%			99%	1%	82%	6%	12%	0%	18%
Total number of neonates	N	4108	5	3962	141	74	10	40	17	44
	%			97%	3%	52%	7%	28%	12%	31%

*The percentage of neonates with NEC was calculated using the total number of neonates in the same GA category with data available on NEC as the denominator.
**The percentages were calculated using the total number of neonates in the same GA category that had NEC as the denominator.

COMMENTS: NEC is identified according to the following criteria: a) definite pneumatosis (air within the bowel wall) or portal/hepatic gas as diagnosed by x-ray or ultrasound, or b) if there is a surgical or autopsy diagnosis of NEC. Diagnoses of 'suspected NEC' or x-rays showing pneumoperitoneum without pneumatosis are not classified as NEC.

Number (%) of neonates with NEC for GA > 33 weeks:
GA 33 - 36 weeks: 30 neonates (0.7%)
GA ≥ 37 weeks: 20 neonates (0.3%)

Presentation #18
Necrotizing enterocolitis (NEC) treatments: BW <1500 g
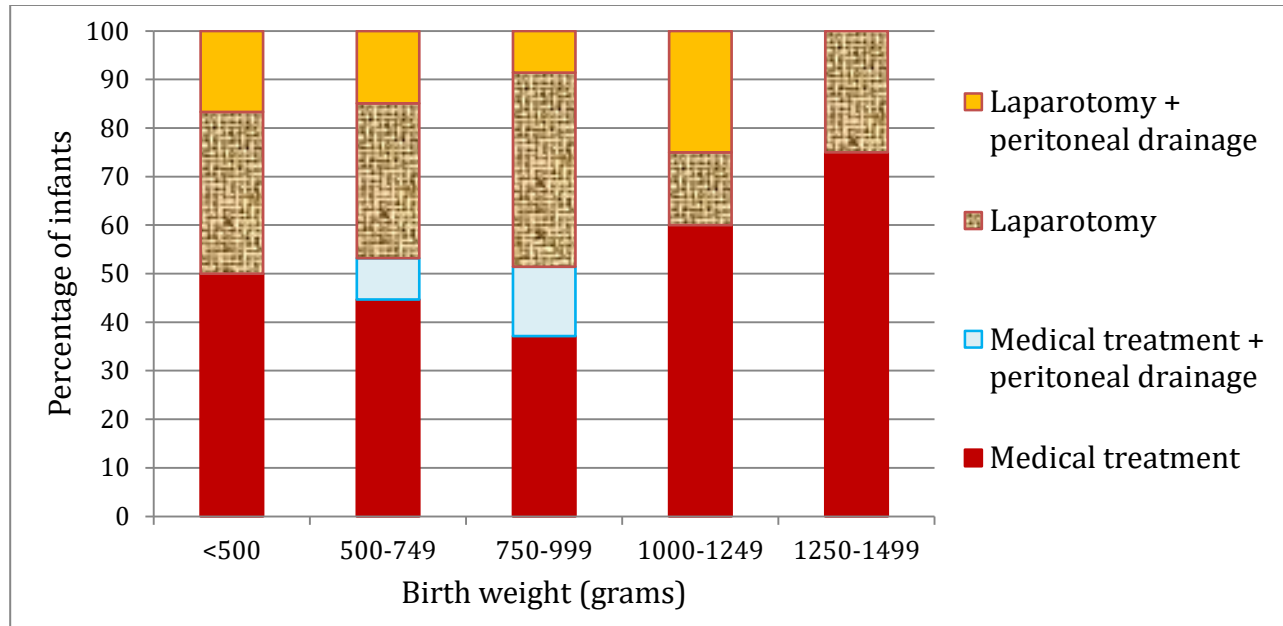
Birth weight (grams)		Total number of neonates	Missing data on NEC	No NEC	NEC*	Neonates with necrotizing enterocolitis**				Death among infants with NEC**
						Medical treatment only	Medical + peritoneal drainage	Laparotomy	Peritoneal drainage + laparatomy	
<500	N	43	2	35	6	3	0	2	1	1
	%			85%	15%	50%	0%	33%	17%	17%
500-749	N	436	2	387	47	21	4	15	7	23
	%			89%	11%	45%	9%	32%	15%	49%
750-999	N	668	0	633	35	13	5	14	3	10
	%			95%	5%	37%	14%	40%	9%	29%
1000-1249	N	731	0	711	20	12	0	3	5	5
	%			97%	3%	60%	0%	15%	25%	25%
1250-1499	N	878	0	866	12	9	0	3	0	3
	%			99%	1%	75%	0%	25%	0%	25%
Total number of neonates	N	2756	4	2632	120	58	9	37	16	42
	%			96%	4%	48%	8%	31%	13%	35%

*The percentage of neonates with NEC was calculated using the total number of neonates in the same GA category with data available on NEC as the denominator.
** The percentages were calculated using the total number of neonates in the same GA category that had NEC as the denominator.

COMMENTS: NEC is identified according to the following criteria: a) definite pneumatosis (air within the bowel wall) or portal/hepatic gas as diagnosed by x-ray or ultrasound, or b) if there is a surgical or autopsy diagnosis of NEC. Diagnoses of 'suspected NEC' or x-rays showing pneumoperitoneum without pneumatosis are not classified as NEC.

Number (%) of neonates with NEC and BW > 1500g:
BW 1500 - 2499g: 44 neonates (1.0%)
BW ≥ 2500g: 27 neonates (0.4%)

Presentation #19
Chronic lung disease (CLD) at 36 weeks post menstrual age (PMA) or discharge:
GA <33 weeks

GA	Total number of neonates	Number of neonates who died before 36 weeks PMA	Number of surviving neonates whose respiratory support is unknown*	CLD from**	Number of neonates with known results	Number of neonates with severe CLD, N (%)	Number of neonates with moderate CLD, N (%)	Number of neonates with mild CLD, N (%)	Number of neonates with CLD but severity unknown, N (%)	Number of neonates without CLD, N(%)
<25	343	127	1	36w	190	45 (24)	91 (48)	13 (7)	12 (6)	29 (15)
				Disch	25	6 (24)	6 (24)	4 (16)	2 (8)	7 (28)
25-26	501	60	1	36w	334	58 (17)	144 (43)	27 (8)	16 (5)	89 (27)
				Disch	106	7 (7)	18 (17)	12 (11)	5 (5)	64 (60)
27-28	712	38	0	36w	385	39 (10)	106 (28)	35 (9)	14 (4)	191 (50)
				Disch	289	5 (2)	55 (19)	16 (6)	1 (0)	212 (73)
29-30	1 084	29	2	36w	481	17 (4)	94 (20)	32 (7)	11 (2)	327 (68)
				Disch	572	6 (1)	53 (9)	10 (2)	8 (1)	495 (87)
31-32	1 468	20	8	36w	542	14 (3)	53 (10)	43 (8)	7 (1)	425 (78)
				Disch	898	7 (1)	26 (3)	7 (1)	5 (1)	853 (95)
Total	4 108	274	12	36w	1 932	173 (9)	488 (25)	150 (8)	60 (3)	1 061 (55)
				Disch	1 890	31 (2)	158 (8)	49 (3)	21 (1)	1 631 (86)

COMMENTS: See pages 136-137 for the definition of severity of CLD.
*unknown = first admission was after 36 weeks' PMA
** w = weeks' PMA, Disch = Discharge prior to 36 weeks' PMA

Note: Percentages of neonates with CLD were calculated based on the total number of neonates in the same GA category with known CLD results.

Presentation #20
Chronic lung disease (CLD) at 36 weeks post menstrual age (PMA) or discharge:
BW < 1500g

BW	Total number of neonates	Number of neonates who died before 36 weeks' PMA	Number of surviving neonates whose respiratory support is unknown*	CLD from**	Number of neonates with known results	Number of neonates with severe CLD, N (%)	Number of neonates with moderate CLD, N (%)	Number of neonates with mild CLD, N (%)	Number of neonates with CLD but severity unknown, N (%)	Number of neonates without CLD, N (%)
<500	43	17	0	36w	24	12 (50)	7 (29)	0 (0)	2 (8)	3 (13)
				Disch	2	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)
500-749	436	131	0	36w	257	56 (22)	130 (51)	14 (5)	10 (4)	47 (18)
				Disch	48	6 (13)	8 (17)	5 (10)	4 (8)	25 (52)
750-999	668	61	2	36w	438	53 (12)	177 (40)	45 (10)	22 (5)	141 (32)
				Disch	167	8 (5)	33 (20)	18 (11)	4 (2)	104 (62)
1000-1249	731	66	3	36w	356	29 (8)	80 (22)	30 (8)	12 (3)	205 (58)
				Disch	306	2 (1)	49 (16)	11 (4)	4 (1)	240 (78)
1250-1499	878	128	0	36w	326	6 (2)	46 (14)	20 (6)	8 (2)	246 (75)
				Disch	424	4 (1)	33 (8)	8 (2)	3 (1)	376 (89)
Total	2 756	403	5	36w	1 401	156 (11)	440 (31)	109 (8)	54 (4)	642 (46)
				Disch	947	22 (2)	123 (13)	42 (4)	15 (2)	745 (79)

COMMENTS: See pages 136-137 for the definition of severity of CLD.
*unknown = first admission was after 36 weeks' PMA
** w = weeks' PMA, Disch = Discharge prior to 36 weeks' PMA

Note: Percentages of neonates with CLD were calculated based on the total number of neonates in the same GA category with known CLD results.

Presentation #21

Retinopathy of prematurity (ROP) staging: GA <33 weeks

The percentage of neonates diagnosed with each stage of ROP was calculated using the total number of neonates in the same GA category with known eye examination results as the denominator.

GA (completed weeks)		Total number of neonates	Number of neonates alive at 6 weeks of age	Number of neonates with known eye examination results	Retinopathy of prematurity*				
					Immature	None	Stages 1 & 2	Stage 3	Stages 4 & 5
<25	N	343	228	206	4	12	111	78	1
	%				2%	6%	54%	38%	0%
25-26	N	501	449	429	39	120	198	70	2
	%				9%	28%	46%	16%	0%
27-28	N	712	677	581	81	329	159	11	1
	%				14%	57%	27%	2%	0%
29-30	N	1 084	1 056	643	107	446	86	4	0
	%				17%	69%	13%	1%	0%
31-32	N	1 468	1 451	160	14	135	11	0	0
	%				9%	84%	7%	0%	0%
Total neonates included	N	4 108	3 861	2 019	245	1042	565	163	4
	%				12%	52%	28%	8%	0%

COMMENTS: ROP is defined according to the International Classification of Retinopathy of Prematurity (ICROP) and includes the highest level of ROP in either eye. More advanced stages may have been detected in neonates transferred from network sites to level II sites or units. **Caution should be used when interpreting these data.**

Presentation #22
Retinopathy of prematurity (ROP) staging: BW< 1500 g

*The percentage of neonates diagnosed with each stage of ROP was calculated using the total number of neonates in the same GA category with known eye examination results as the denominator.

BW (grams)		Total number of neonates	Number of neonates alive at 6 weeks of age	Number of neonates with known eye examination results	Retinopathy of prematurity*				
					Immature	None	Stages 1 & 2	Stage 3	Stages 4 & 5
<500	N	43	27	23	2	0	6	15	0
	%				9%	0%	26%	65%	0%
500-749	N	436	322	301	16	48	156	79	2
	%				5%	16%	52%	26%	1%
750-999	N	668	614	566	63	221	223	57	2
	%				11%	39%	39%	10%	0%
1000-1249	N	731	703	517	68	325	115	9	0
	%				13%	63%	22%	2%	0%
1250-1499	N	878	864	408	60	300	45	3	0
	%				15%	74%	11%	1%	0%
Total neonates included	N	2 756	2 530	1 815	209	894	545	163	4
	%				12%	49%	30%	9%	0%

COMMENTS: ROP is defined according to the International Classification of Retinopathy of Prematurity (ICROP) and includes the highest level of ROP in either eye. More advanced stages may have been detected in neonates transferred from network sites to level II sites or units. **Caution should be used when interpreting these data.**

Presentation #23

Retinopathy of prematurity (ROP) treatments: GA <33 weeks

Birth GA (completed weeks)		Total number of neonates	Number of neonates with known eye examination results	Therapy for retinopathy of prematurity (ROP)*	Therapy for ROP			
					Laser	Anti-VEGF	Both Laser and Anti-VEGF	Other surgery**
<25	N	343	206	61	14	44	4	0
	%			30%				
25-26	N	501	429	42	12	28	2	0
	%			10%				
27-28	N	712	581	7	2	3	2	0
	%			1%				
29-30	N	1 084	643	1	0	1	0	0
	%			0%				
31-32	N	1 468	160	0	0	0	0	0
	%			0%				
Total neonates included	N	4 108	2 019	111	28	76	8	0
	%			6%				

*The percentage of neonates who received ROP therapy was calculated using the total number of neonates in the same GA category with known eye examination results as the denominator.
**Infants who had other surgery may have one or both of Laser and Anti-VEGF treatments.

COMMENTS: ROP is defined according to the International Classification of Retinopathy of Prematurity (ICROP) and includes the highest level of ROP in either eye. More advanced stages may have been detected in neonates transferred from network sites to level II sites or units. **Caution should be used when interpreting these data as some neonates did not have eye examination data.**

Presentation #24
Retinopathy of prematurity (ROP) treatments: BW <1500 g

BW (grams)		Total number of neonates	Number of neonates with known eye examination results	Therapy for retinopathy of prematurity (ROP)*	Therapy for ROP			
					Laser	Anti-VEGF	Both Laser and Anti-VEGF	Other surgery
<500	N	43	23	10	1	8	1	0
	%			44%				
500-749	N	436	301	54	13	39	3	0
	%			18%				
750-999	N	668	566	41	12	25	4	0
	%			7%				
1000-1249	N	731	517	5	1	4	0	0
	%			1%				
1250-1499	N	878	408	1	1	0	0	0
	%			0%				
Total neonates included	N	2 756	1 815	111	28	76	8	0
	%			6%				

*The percentage of neonates who received ROP therapy was calculated using the total number of neonates in the same GA category with known eye examination results as the denominator.
**Infants who had other surgery may have one or both of Laser and Anti-VEGF treatments.

COMMENTS: ROP is defined according to the International Classification of Retinopathy of Prematurity (ICROP) and includes the highest level of ROP in either eye. More advanced stages may have been detected in neonates transferred from network sites to level II sites or units. **Caution should be used when interpreting these data as some neonates did not have eye examination data.**

Presentation #25
Select major morbidity: GA <33 weeks

GA	Number of neonates	Number survived until discharge / transfer (%)	Major morbidity[a] (%)	CLD[b] (%)	Severe ROP[c] (%)	Severe neurological injury[d] (%)	NEC[e] (%)	Late onset sepsis [f]
<24	140	65 (46)	101 (72)	55 (82)	36 (58)	37 (30)	21 (15)	50 (36)
24	198	144 (73)	169 (85)	121 (83)	49 (36)	49 (26)	24 (12)	72 (36)
25	229	194 (85)	184 (80)	148 (76)	45 (26)	38 (17)	15 (7)	59 (26)
26	260	233 (90)	165 (63)	131 (56)	25 (12)	26 (10)	18 (7)	43 (17)
27	297	273 (92)	155 (52)	115 (42)	10 (5)	25 (9)	13 (4)	36 (12)
28	395	380 (96)	170 (43)	142 (37)	4 (1)	22 (6)	8 (2)	30 (8)
29	472	462 (98)	145 (31)	111 (24)	2 (1)	24 (5)	9 (2)	23 (5)
30	573	565 (99)	138 (24)	105 (19)	1 (0)	22 (4)	15 (3)	22 (4)
31	610	607 (100)	87 (14)	70 (12)	0	10 (2)	8 (1)	17 (3)
32	800	792 (99)	91 (11)	73 (9)	0	10 (3)	7 (1)	10 (1)
Total neonates	3974	3715 (93)	1405 (35)	1071 (29)	172 (10)	263 (8)	138 (3)	362 (9)

Inclusion criteria for these analyses:
1. Neonate born at <33 weeks GA without major congenital anomaly
2. Denominators were based on the number of neonates with available data and those without major congenital anomaly

Definitions:
[a] Major morbidity was counted as any one of the following
  1. CLD (any grade)
  2. Severe ROP
  3. Severe neurological injury (IVH ≥ grade 3 and/or PVL)
  4. Stage 2 or 3 NEC
  5. Late onset sepsis
[b] Chronic lung disease was defined as per presentation #19 of any grade
[c] Severe ROP was defined as ROP stage 3,4,5 and/or those with ROP treatment (laser or intraocular injection).
[d] Severe neurological injury was defined as IVH ≥ grade 3 and/or PVL
[e] NEC defined as stage 2 or 3
[f] Late onset sepsis was defined as any positive blood and/or cerebrospinal fluid culture after 2 days of age. Analysis was neonate-based.

Denominator used in percentage calculation for each morbidity
  Survivor until discharge: All neonates
  Major morbidities: All neonates
  CLD: First admission before 36 week PMA and survived beyond 36 week PMA
  ROP: Eye exam done and results available
  NEC: All neonates
  Late onset sepsis: All neonates

E. Site Comparisons

E.1. Site Comparisons –

Care Practices

Presentation #26
Prenatal and delivery room care practices: GA<29 weeks:
Site specific crude rates* (inborn only)

Site	Number of neonates	Antenatal MgSO$_4$			Antenatal steroids[a]	Timing of cord clamping			Admission temperature			Apgar <5 at 5 minutes
	N	Yes	No	Missing	Completed course within last week prior to birth[a]	≥ 30 sec	< 30 sec or none	Missing	<36.5	36.5-37.2	>37.2	
xxxiii	< 20	80.0	20.0	0.0	20.0	20.0	80.0	0.0	75.0	25.0	0.0	40.0
xxviii		100.0	0.0	0.0	33.3	66.7	33.3	0.0	66.7	33.3	0.0	0.0
xxx		85.7	14.3	0.0	14.3	85.7	14.3	0.0	14.3	0.0	85.7	42.9
xiv		100.0	0.0	0.0	100.0	50.0	0.0	50.0	0.0	100.0	0.0	50.0
xv		44.4	44.4	11.1	33.3	33.3	66.7	0.0	55.6	33.3	11.1	22.2
x		80.0	20.0	0.0	30.0	30.0	70.0	0.0	0.0	90.0	10.0	40.0
xix		83.3	16.7	0.0	50.0	50.0	33.3	16.7	0.0	91.7	8.3	8.3
xiii		88.2	11.8	0.0	58.8	58.8	41.2	0.0	23.5	70.6	5.9	17.7
vi	20-39	85.0	15.0	0.0	45.0	40.0	55.0	5.0	38.9	38.9	22.2	10.5
viii		89.2	10.8	0.0	40.5	37.8	56.8	5.4	55.6	22.2	22.2	11.1
ix		100.0	0.0	0.0	40.0	80.0	20.0	0.0	10.0	80.0	10.0	15.0
xxix		57.1	42.9	0.0	38.1	33.3	57.1	9.5	20.0	70.0	10.0	4.8
xvii		96.7	3.3	0.0	40.0	83.3	16.7	0.0	13.3	66.7	20.0	20.0
i		60.0	40.0	0.0	45.0	75.0	25.0	0.0	47.4	36.8	15.8	20.0
xxiv		82.9	17.1	0.0	34.3	62.9	37.1	0.0	8.6	71.4	20.0	28.6
xxiii		89.7	7.7	2.6	59.0	7.7	92.3	0.0	56.4	38.5	5.1	15.4
xxvii	40-59	90.0	10.0	0.0	45.0	57.5	42.5	0.0	25.0	55.0	20.0	17.5
xxv		92.7	7.3	0.0	41.8	45.5	50.9	3.6	67.3	29.1	3.6	20.0
xviii		73.3	26.7	0.0	24.4	31.1	66.7	2.2	74.4	25.6	0.0	4.6
ii		87.0	10.9	2.2	26.1	41.3	47.8	10.9	35.7	59.5	4.8	19.1
xx		85.4	14.6	0.0	37.5	31.3	66.7	2.1	29.8	48.9	21.3	10.4
iv		60.4	29.2	10.4	34.0	72.9	25.0	2.1	36.2	57.5	6.4	25.5
xi		94.0	2.0	4.0	46.0	70.0	24.0	6.0	35.4	52.1	12.5	14.0
v		92.7	7.3	0.0	36.6	65.9	34.2	0.0	37.5	47.5	15.0	4.9
xxxii		54.9	31.4	13.7	41.2	74.5	25.5	0.0	33.3	58.8	7.8	29.4
xxi	> 60	69.5	20.0	10.5	34.0	69.5	28.4	2.1	28.7	62.1	9.2	19.0
iii		59.6	40.4	0.0	50.0	68.8	31.2	0.0	20.2	59.6	20.2	9.2
xxxi		88.1	9.5	2.4	39.3	65.5	32.1	2.4	14.6	48.8	36.6	11.9
vii		93.1	6.9	0.0	41.7	64.6	33.3	2.1	44.4	42.3	13.4	9.7
xxvi		96.5	3.5	0.0	42.2	49.7	50.3	0.0	24.4	51.7	23.8	16.9
Total CNN		82.7	15.1	2.2	40.4	56.9	41.0	2.1	32.9	51.1	15.9	15.4

*Denominators were based on **inborn** neonates <29 weeks' GA admitted without major congenital anomaly.
[a] Completed course of antenatal steroids within the last week prior to birth = received at least two doses of corticosteroids for a period of 24 hours or more, but within one week of birth
These are unadjusted rates.

Presentation #27
Postnatal care practices: GA <29 weeks:
Site specific crude rates* (inborn only)

Site	Number of neonates	No mechanical ventilation at any time in first 3 days[a]	Never received mechanical ventilation[a]	Fed at any time in first 2 days of admission	Never received antimicrobials[b]	Exclusive breast milk feeding at discharge[c]	Exclusive formula feeding at discharge[c]
	N	%	%	%	%	%	%
xxxiii		100.0	60.0	80.0	20.0	0.0	60.0
xxviii		66.7	33.3	83.3	0.0	16.7	16.7
xxx		14.3	14.3	85.7	28.6	28.6	14.3
xiv	< 20	50.0	50.0	100.0	50.0	0.0	100.0
xv		44.4	33.3	77.8	11.1	77.8	0.0
x		10.0	10.0	70.0	0.0	30.0	30.0
xix		25.0	25.0	100.0	50.0	41.7	33.3
xiii		41.2	23.5	76.5	17.7	11.8	29.4
vi		55.0	50.0	70.0	35.0	50.0	15.0
viii		8.1	8.1	48.7	5.4	2.7	40.5
ix		45.0	30.0	55.0	20.0	45.0	20.0
xxix	20-39	19.1	9.5	85.7	14.3	0.0	28.6
xvii		23.3	20.0	46.7	3.3	43.3	20.0
i		30.0	25.0	100.0	10.0	30.0	30.0
xxiv		22.9	14.3	74.3	2.9	28.6	31.4
xxiii		20.5	18.0	38.5	15.4	20.5	38.5
xxvii		25.0	20.0	50.0	5.0	45.0	20.0
xxv		20.0	14.6	94.6	9.1	29.1	30.9
xviii		13.3	11.1	86.7	6.7	28.9	20.0
ii		23.9	19.6	50.0	13.0	45.7	34.8
xx	40-59	43.8	37.5	93.8	22.9	54.2	16.7
iv		25.0	18.8	95.8	12.5	20.8	45.8
xi		48.0	38.0	90.0	4.0	20.0	50.0
v		34.2	26.8	85.4	4.9	41.5	22.0
xxxii		23.5	21.6	86.3	2.0	25.5	21.6
xxi		25.3	22.1	87.4	4.2	17.9	21.1
iii		32.1	27.5	80.7	2.8	70.6	3.7
xxxi	> 60	10.7	10.7	92.9	3.6	59.5	11.9
vii		40.3	34.7	91.7	16.0	54.2	10.4
xxvi		52.6	38.7	80.9	6.9	52.0	12.1
Total CNN		31.8	25.6	80.5	9.3	40.4	21.2

*Denominators were based on **inborn** neonates <29 weeks' GA admitted without major congenital anomaly.

[a] Neonates either received high frequency ventilation or intermittent positive pressure ventilation.

[b] Neonates never received any antimicrobials. Prophylactic administration of trimethoprim or amoxicillin for the prevention of urinary tract infections with a suspected renal anomaly was not included as antimicrobials.

[c] Information obtained from *Discharge* screen/table of CNN database, includes discharge and transfer.

These are unadjusted rates.

E.2. Site Comparisons –

Survival / Mortality

Presentation #28
Survival rates by site: All GA

Site	Percentage survival for each GA (completed weeks)								
	<25	**25-26**	**27-28**	**29-30**	**31-32**	**33-34**	**35-36**	**≥37**	**Overall survival rate for sites***
A	35.7	91.7	95.3	100.0	100.0	98.3	99.4	98.9	97.1
B	100.0	100.0	75.0	100.0	100.0	100.0	100.0	98.0	98.4
Cᶲ	0.0	75.0	100.0	100.0	100.0	NA	NA	NA	97.5
Dᶲ	60.0	95.7	88.9	100.0	100.0	NA	NA	NA	95.4
E	25.0	85.0	100.0	97.8	100.0	100.0	97.7	99.2	97.6
F	81.0	92.5	96.7	92.2	97.9	99.2	100.0	99.5	98.1
G	70.8	92.7	97.3	97.1	98.3	98.6	100.0	100.0	95.5
H	50.0	58.3	73.3	91.2	97.9	100.0	99.0	99.0	96.5
I	86.7	93.3	95.2	97.1	97.7	98.6	98.4	100.0	97.8
J	62.5	96.8	92.5	96.8	96.4	100.0	99.4	99.5	96.7
K	0.0	38.5	87.5	100.0	100.0	100.0	100.0	100.0	96.6
L	100.0	100.0	92.9	100.0	100.0	100.0	100.0	97.5	98.7
M	0.0	80.0	100.0	94.7	100.0	100.0	100.0	99.3	97.6
N	100.0	100.0	88.9	100.0	92.3	100.0	100.0	100.0	99.6
O	57.1	76.2	91.3	100.0	98.4	100.0	98.0	99.5	97.9
Pᶲ	50.0	84.6	100.0	96.9	100.0	100.0	100.0	77.8	92.3
Q	44.4	91.3	92.3	100.0	100.0	100.0	97.1	97.1	96.7
Rᶲ	46.2	93.3	100.0	97.6	100.0	100.0	NA	NA	94.2
Sᶲ	66.7	93.3	88.9	94.3	97.1	NA	75.0	100.0	93.1
T	77.8	88.2	100.0	100.0	97.7	98.6	96.2	98.0	97.2
U	76.9	62.5	100.0	100.0	100.0	98.8	100.0	98.9	97.9
Vᶲ	50.0	83.3	100.0	100.0	100.0	100.0	100.0	82.4	95.0
W	0.0	100.0	76.9	100.0	100.0	100.0	98.8	98.3	97.6
X	NA	NA	NA	0.0	100.0	100.0	96.0	94.3	94.4
Y	45.5	90.0	100.0	92.3	97.6	100.0	95.9	99.4	97.7
Zᶲ	NA	NA	50.0	100.0	87.5	85.7	85.0	85.7	85.1
AA	NA	NA	100.0	100.0	100.0	100.0	100.0	100.0	100.0
ABᶲ	83.3	75.0	98.0	97.3	98.7	NA	100.0	100.0	93.6
ACᶲ	NA	75.0	100.0	100.0	100.0	100.0	NA	87.5	93.1
AD	81.8	92.9	93.8	91.4	100.0	99.3	97.8	99.1	98.1
AE	NA	100.0	80.0	100.0	100.0	100.0	100.0	94.4	97.8
AF	53.3	88.9	93.5	93.9	98.6	98.0	98.4	97.3	96.4
AG	50.0	100.0	83.3	100.0	100.0	88.9	93.5	97.4	96.3
Overall survival rate for GA**	61.8	87.4	94.1	97.2	98.8	99.0	98.3	98.6	97.0

These analyses included 14 271 neonates from 33 sites. **Twenty-four sites collected data on all eligible admissions whereas nine sites (marked by**ᶲ**) collected data on selected eligible admissions only.** ᶲ Please note the data collection criteria were not the same for these eight sites, and thus their rates may not be comparable with other sites.
Overall* = (number of neonates who survived per site / total number of neonates for that site)*100
Overall** = (number of neonates who survived for each GA category / total number of neonates in each GA category)*100
NA = no data available, 0 = no neonates survived, Delivery room deaths were not included

Presentation #29
Survival rates by site: All BW

Site	Percentage survival for each BW (g) category							
	<500	**500-749**	**750-999**	**1000-1249**	**1250-1499**	**1500-2499**	**≥2500**	**Overall survival rate for sites***
A	25.0	48.3	95.1	97.5	98.1	99.0	99.0	97.1
B	NA	100.0	100.0	87.5	100.0	98.1	99.1	98.4
C$^\phi$	NA	0.0	91.7	100.0	100.0	100.0	NA	97.5
D$^\phi$	NA	64.3	96.8	96.0	100.0	100.0	100.0	95.4
E	0.0	66.7	90.9	95.8	97.0	100.0	98.7	97.6
F	100.0	81.3	93.8	96.2	95.0	99.0	99.6	98.1
G	50.0	78.7	94.1	98.4	98.4	98.9	100.0	95.5
H	0.0	0.0	80.0	70.0	96.2	99.4	98.8	96.5
I	NA	86.7	89.3	100.0	100.0	98.0	100.0	97.8
J	57.1	78.8	92.3	95.4	100.0	99.1	98.9	96.7
K	NA	12.5	66.7	87.5	100.0	100.0	100.0	96.6
L	NA	100.0	90.0	100.0	100.0	100.0	98.1	98.7
M	NA	20.0	83.3	100.0	93.8	100.0	99.4	97.6
N	0.0	100.0	100.0	100.0	100.0	99.2	100.0	99.6
O	100.0	70.6	73.9	100.0	97.0	98.7	99.2	97.9
P$^\phi$	0.0	76.9	83.3	96.0	100.0	100.0	87.5	92.3
Q	100.0	61.5	89.7	96.8	100.0	98.8	97.4	96.7
R$^\phi$	100.0	58.8	92.9	96.2	100.0	100.0	100.0	94.2
S$^\phi$	NA	50.0	100.0	96.0	92.6	95.9	100.0	93.1
T	100.0	71.4	100.0	100.0	100.0	96.1	98.4	97.2
U	NA	75.0	84.6	93.3	100.0	99.2	99.1	97.9
V$^\phi$	NA	50.0	85.7	100.0	100.0	100.0	83.3	95.0
W	100.0	33.3	81.8	100.0	95.5	98.1	99.4	97.6
X	NA	NA	NA	NA	100.0	88.9	95.7	94.4
Y	33.3	54.5	100.0	95.0	100.0	97.2	99.1	97.7
Z$^\phi$	NA	NA	NA	50.0	75.0	82.8	89.7	85.1
AA	NA	NA	NA	100.0	100.0	100.0	100.0	100.0
AB$^\phi$	75.0	83.3	89.3	90.6	100.0	97.3	100.0	93.6
AC$^\phi$	NA	0.0	100.0	100.0	100.0	100.0	87.5	93.1
AD	100.0	78.6	90.0	100.0	95.8	99.6	98.4	98.1
AE	NA	100.0	100.0	66.7	100.0	100.0	96.6	97.8
AF	NA	58.8	85.2	96.9	98.0	98.0	97.5	96.4
AG	NA	50.0	83.3	100.0	100.0	94.2	96.9	96.3
Overall survival rate for BW**	55.8	69.5	90.7	95.6	98.3	98.5	98.6	97.0

These analyses included 14 271 neonates from 33 sites. **Twenty-four sites collected data on all eligible admissions whereas nine sites (marked by $^\phi$) collected data on selected eligible admissions only.** $^\phi$ Please note the data collection criteria were not the same for these eight sites, and thus their rates may not be comparable with other sites.
Overall* = (number of neonates who survived per site / total number of neonates for site)*100
Overall** = (number of neonates who survived for each BW category / total number of neonates in each BW category)*100
NA = no data available, 0 = no neonates survived, Delivery room deaths were not included

Presentation #30a
Mortality: GA<33 weeks: Adjusted standardized ratios by site

Site	Number of neonates	Number of deaths	Adjusted[#] expected number of deaths	Adjusted[#] standardized ratio	95% confidence interval (CI) for adjusted standardized ratio	
1	127	6	8.2	0.7	0.3	1.6
2	80	2	2.4	0.8	0.1	3.0
3	32	1	1.1	0.9	0.0	4.9
4	110	9	7.6	1.2	0.5	2.3
5	170	8	9.2	0.9	0.4	1.7
6	110	14	4.0	3.5	1.9	5.8
7	72	1	2.6	0.4	0.0	2.2
8	78	4	2.9	1.4	0.4	3.5
9	153	9	7.6	1.2	0.5	2.2
10	8	0	0.1	0.0	.	25.8
11	23	1	0.8	1.2	0.0	6.9
12	379	28	32.2	0.9	0.6	1.3
13	302	22	32.3	0.7	0.4	1.0
14	161	14	10.4	1.4	0.7	2.3
15	148	6	6.8	0.9	0.3	1.9
16	267	13	18.1	0.7	0.4	1.2
17	123	4	8.7	0.5	0.1	1.2
18	19	1	0.8	1.2	0.0	6.6
19	245	22	19.2	1.1	0.7	1.7
20	79	6	6.7	0.9	0.3	2.0
21	163	13	9.5	1.4	0.7	2.3
22	64	12	3.1	3.9	2.0	6.8
23	65	6	2.9	2.1	0.8	4.5
24	59	2	1.3	1.5	0.2	5.4
25	36	2	1.5	1.4	0.2	4.9
26	250	15	20.5	0.7	0.4	1.2
27	12	2	0.2	12.6	1.4	45.3
28	129	9	7.7	1.2	0.5	2.2
29	117	3	2.6	1.1	0.2	3.3
31	107	8	7.4	1.1	0.5	2.1
32	148	8	9.4	0.9	0.4	1.7
33	135	7	11.2	0.6	0.2	1.3

Numeric site codes were used in Presentations 30a-f and they may not correspond to other presentations in this report. Neonates with major congenital anomalies were excluded. [#] The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20. Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentations #30b
Mortality: GA<33 weeks: Adjusted standardized ratios by site
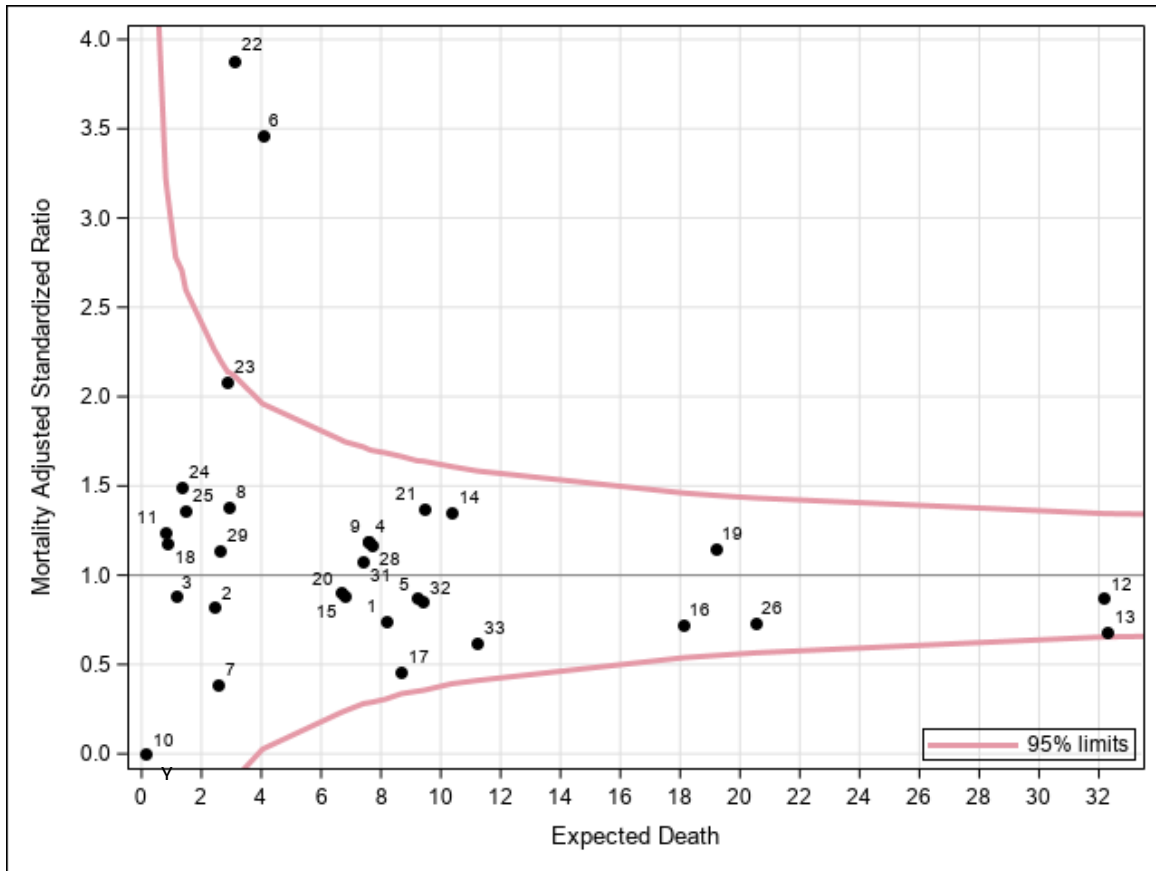
Explanation for Presentation 30a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of neonates with the outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed deaths/expected deaths
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 30b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Note: Site 27 is not shown in the plot. Refer to the table in the previous page for the site's adjusted standardized ratio.

Presentation #30c
Mortality: GA<29 weeks: Adjusted standardized ratios by site

| Site	Number of neonates	Number of deaths	Adjusted[#] expected number of deaths	Adjusted[#] standardized ratio	95% confidence interval (CI) for adjusted standardized ratio	
1	40	4	7.3	0.6	0.1	1.4
2	12	2	1.7	1.1	0.1	4.1
3	7	1	0.8	1.2	0.0	6.8
4	36	8	6.8	1.2	0.5	2.3
5	56	8	7.7	1.0	0.4	2.0
6	29	10	3.3	3.1	1.5	5.7
7	19	1	1.9	0.5	0.0	2.9
8	22	4	2.2	1.8	0.5	4.6
9	51	7	6.6	1.1	0.4	2.2
11	6	1	0.6	1.7	0.0	9.4
12	186	25	29.7	0.8	0.5	1.2
13	176	20	30.4	0.7	0.4	1.0
14	63	11	9.2	1.2	0.6	2.1
15	63	6	5.9	1.0	0.4	2.2
16	121	9	16.3	0.6	0.3	1.0
17	50	4	7.8	0.5	0.1	1.3
18	6	1	0.7	1.4	0.0	7.9
19	92	22	17.3	1.3	0.8	1.9
20	30	6	6.1	1.0	0.4	2.1
21	57	13	8.6	1.5	0.8	2.6
22	24	12	2.8	4.3	2.2	7.4
23	16	5	2.3	2.1	0.7	5.0
24	9	2	0.8	2.4	0.3	8.5
25	14	1	1.2	0.8	0.0	4.6
26	107	14	17.8	0.8	0.4	1.3
28	44	8	6.7	1.2	0.5	2.3
29	23	3	1.7	1.8	0.4	5.2
31	41	7	6.7	1.1	0.4	2.2
32	53	8	8.7	0.9	0.4	1.8
33	62	6	10.3	0.6	0.2	1.3

Numeric site codes were used in Presentations 30a-f and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies were excluded.
[#] The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentations #30d
Mortality: GA<29 weeks: Adjusted standardized ratios by site
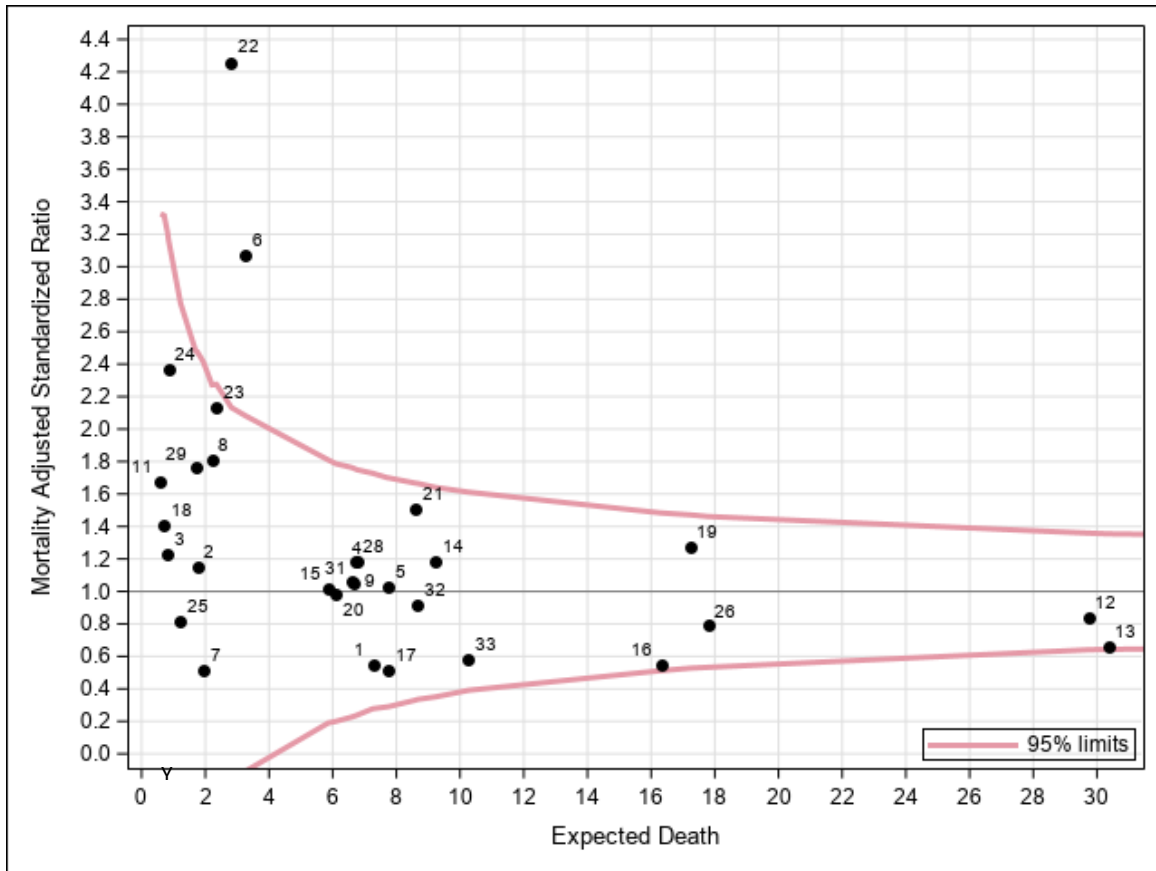
Explanation for Presentation 30c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of neonates with the outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed deaths/expected deaths
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 30d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #30e
**Mortality: All neonates: Adjusted standardized ratios by site**

Site	Number of neonates	Number of deaths	Adjusted# expected number of deaths	Adjusted# standardized ratio	95% confidence interval (CI) for adjusted standardized ratio	
1	545	10	12.4	0.8	0.4	1.5
2	99	5	3.3	1.5	0.5	3.6
3	89	2	2.2	0.9	0.1	3.3
4	142	11	8.1	1.4	0.7	2.4
5	476	14	14.4	1.0	0.5	1.6
6	481	17	7.8	2.2	1.3	3.5
7	366	4	5.9	0.7	0.2	1.7
8	320	5	5.6	0.9	0.3	2.1
9	170	9	9.3	1.0	0.4	1.8
10	94	0	0.7	0.0	.	5.0
11	175	1	2.1	0.5	0.0	2.7
12	921	30	39.0	0.8	0.5	1.1
13	531	23	33.4	0.7	0.4	1.0
14	656	18	15.3	1.2	0.7	1.9
15	148	6	6.8	0.9	0.3	1.9
16	923	15	24.3	0.6	0.3	1.0
17	364	6	12.0	0.5	0.2	1.1
18	27	2	1.1	1.8	0.2	6.4
19	991	28	25.7	1.1	0.7	1.6
20	406	8	9.6	0.8	0.4	1.6
21	885	17	14.8	1.1	0.7	1.8
22	355	12	4.8	2.5	1.3	4.4
23	285	7	5.5	1.3	0.5	2.6
24	571	23	5.2	4.4	2.8	6.7
25	455	2	4.5	0.4	0.0	1.6
26	266	15	26.4	0.6	0.3	0.9
27	62	5	1.2	4.3	1.4	10.0
28	568	13	11.7	1.1	0.6	1.9
29	117	3	3.9	0.8	0.2	2.2
30	124	6	1.2	5.1	1.9	11.1
31	765	14	12.7	1.1	0.6	1.9
32	149	8	10.1	0.8	0.3	1.6
33	652	17	15.0	1.1	0.7	1.8

Numeric site codes were used in Presentations 30a-f and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies were excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Presentations #30f
Mortality: All neonates: Adjusted standardized ratios by site
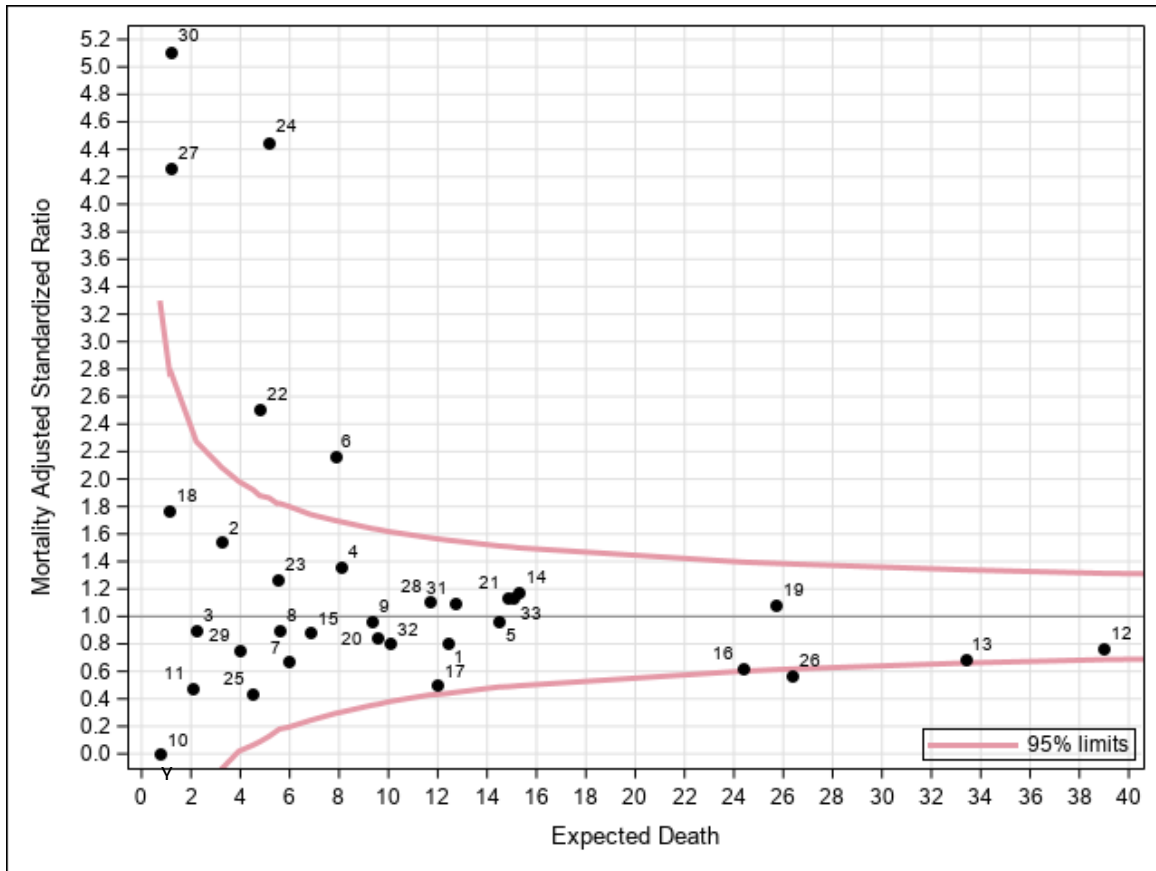
Explanation for Presentation 30e
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with the outcome of interest after adjustment for GA,
SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed deaths/expected deaths
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 30f
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted
standardized ratio. However, for determining whether site is statistically different from others, one
should also assess 95% CI and check whether both upper and lower boundaries are also outside of
the funnel area or not.

E.3. Site Comparisons –

Mortality / Morbidities

Presentation #31
Mortality/morbidities: GA<33 weeks: Site specific crude rates

Site	Number of neonates	Mortality	Severe neurological injury	Severe ROP	CLD at 36 weeks PMA or discharge*	NEC stage 2 or 3	Late onset sepsis	Mortality or severe morbidity
	N	%	%	%	%	%	%	%
AA		0.0	33.3	33.3	12.5	0.0	0.0	37.5
N		5.6	2.9	0.0	8.8	2.8	5.6	19.4
Z		16.7	20.0	0.0	10.0	8.3	0.0	33.3
AC	< 50	5.0	10.5	0.0	21.1	0.0	10.0	30.0
X		33.3	33.3	NA	50.0	0.0	0.0	66.7
B		4.4	4.8	5.6	18.2	0.0	8.7	26.1
AE		3.0	3.9	11.1	6.3	0.0	0.0	12.1
AG		3.1	5.4	16.7	43.9	6.3	4.7	51.6
K		18.8	7.8	6.9	22.6	9.4	4.7	40.6
M		9.1	5.7	6.1	6.7	4.6	4.6	18.2
W	50 – 100	6.3	3.3	7.5	10.7	1.3	8.9	19.0
L		1.2	5.4	0.0	15.0	0.0	2.5	18.5
V		2.5	11.9	2.6	21.5	1.2	4.9	33.3
U		7.3	9.9	6.5	18.4	1.2	8.5	25.6
P		8.2	9.1	20.5	16.8	0.9	7.3	28.2
H		12.6	14.1	7.7	16.3	5.4	6.3	30.6
AD		5.0	11.3	9.5	79.0	3.6	5.0	80.7
Y	101 – 150	9.0	9.8	8.2	31.7	1.8	7.2	42.3
C		2.5	2.0	1.8	13.5	1.7	5.9	19.5
I		4.7	8.0	3.5	22.1	7.8	13.3	35.9
E		7.6	3.5	26.3	24.0	0.8	15.3	36.6
T		5.1	13.3	7.1	26.4	2.3	13.9	39.4
D		4.6	1.6	8.8	20.7	2.0	8.6	30.9
Q		5.1	13.7	16.7	35.3	3.9	10.7	46.1
R		5.8	2.8	5.1	43.2	2.6	5.8	50.3
S	151 – 200	7.1	5.1	4.6	21.5	1.3	7.7	31.6
AF		8.4	3.9	10.8	33.6	4.2	15.1	40.4
O		8.4	11.3	12.5	29.6	3.6	8.4	38.0
A		8.7	10.0	8.9	32.3	4.4	15.0	41.9
AB		6.8	19.9	22.2	31.9	2.6	9.0	43.6
F	> 200	5.7	7.1	14.9	43.0	3.2	5.7	48.9
G		7.5	5.5	18.9	31.6	5.9	10.2	41.6
J		8.4	7.9	11.2	30.3	4.8	13.2	40.1
Total CNN		6.9	8.3	10.2	29.6	3.4	9.3	39.1

Mortality or severe morbidity = Mortality prior to discharge or any of the five morbidities
*PMA: Post-menstrual age
NA = no data available
These are unadjusted rates.

Presentation #32
Mortality/morbidities: GA<29 weeks: Site specific crude rates

Site	Number of neonates	Mortality	Severe neurological injury	Severe ROP	CLD at 36 weeks PMA or discharge*	NEC stage 2 or 3	Late onset sepsis	Mortality or severe morbidity
	N	%	%	%	%	%	%	%
Z		50.0	50.0	0.0	0.0	0.0	0.0	50.0
AG		22.2	11.1	50.0	14.3	22.2	11.1	55.6
B	< 10	16.7	0.0	20.0	40.0	0.0	16.7	50.0
AC		14.3	28.6	0.0	50.0	0.0	28.6	71.4
AA		0.0	50.0	50.0	50.0	0.0	0.0	100.0
AE		14.3	14.3	20.0	16.7	0.0	0.0	42.9
V		15.4	8.3	9.1	54.6	0.0	7.7	69.2
N		7.1	7.7	0.0	15.4	7.1	14.3	35.7
M		31.3	20.0	16.7	18.2	18.8	12.5	56.3
C	10 – 25	13.0	4.8	0.0	45.0	0.0	13.0	52.2
L		4.4	17.4	0.0	40.9	0.0	8.7	52.2
W		21.7	4.4	16.7	36.8	4.4	26.1	56.5
K		50.0	20.0	18.2	69.2	12.5	12.5	87.5
H		34.5	30.8	20.0	50.0	10.3	10.3	72.4
U		18.8	21.9	12.0	46.2	3.1	21.9	56.3
P	26 – 50	22.2	11.4	29.2	50.0	0.0	19.4	66.7
AD		9.8	21.1	13.8	97.3	4.9	9.8	97.6
Y		16.3	12.8	14.3	61.1	2.3	14.0	72.1
E		20.0	7.1	35.7	61.1	0.0	31.1	77.8
I		7.8	13.7	6.5	42.6	13.7	25.5	62.8
S		13.7	6.3	9.1	52.3	0.0	21.6	62.8
R		15.1	6.4	11.1	64.4	5.7	11.3	71.7
O		22.4	21.4	21.7	67.4	8.6	22.4	77.6
Q	51 – 90	15.5	24.6	21.1	68.0	3.5	25.9	86.2
T		9.7	15.3	9.6	45.5	3.5	25.8	59.7
AF		17.2	7.8	21.2	71.7	7.8	31.3	78.1
D		10.9	3.3	10.0	42.1	3.1	17.2	59.4
A		23.2	16.7	12.7	58.7	10.5	29.5	71.6
AB		13.0	28.3	30.7	55.9	6.1	15.7	73.0
F	> 90	7.4	8.4	18.3	72.6	4.9	9.8	77.1
G		11.3	8.6	20.9	48.4	8.5	15.8	61.0
J		13.6	13.4	14.4	51.8	10.0	25.1	64.9
Total CNN		15.2	13.9	16.1	55.5	6.4	19.5	68.7

Mortality or severe morbidity = Mortality prior to discharge or any of the five morbidities
*PMA: Post-menstrual age
Note: Site X had no neonates with GA<29.
These are unadjusted rates.

E.3.1. Site Comparisons –

Late Onset Sepsis and Antimicrobial Use

In presentations #33 and #34, late onset sepsis was attributed to the hospital where the first episode of sepsis was acquired. Each neonate was counted only once even if there were multiple episodes of infections.

In presentations #35 and #36, assignment of infection was based on location where the infection happened and not assigned to the hospital where the first episode of sepsis was acquired. Each episode of infection was counted (the total number of episodes exceeds the total number of neonates).

In all other presentations of this report, all morbidities including late onset sepsis were attributed to the hospital where the neonate was first admitted.

Presentation #33

Late onset sepsis: GA<33 weeks: Site specific crude rates
(n=4 046 neonates, 62 excluded due to death before 3 days of age)
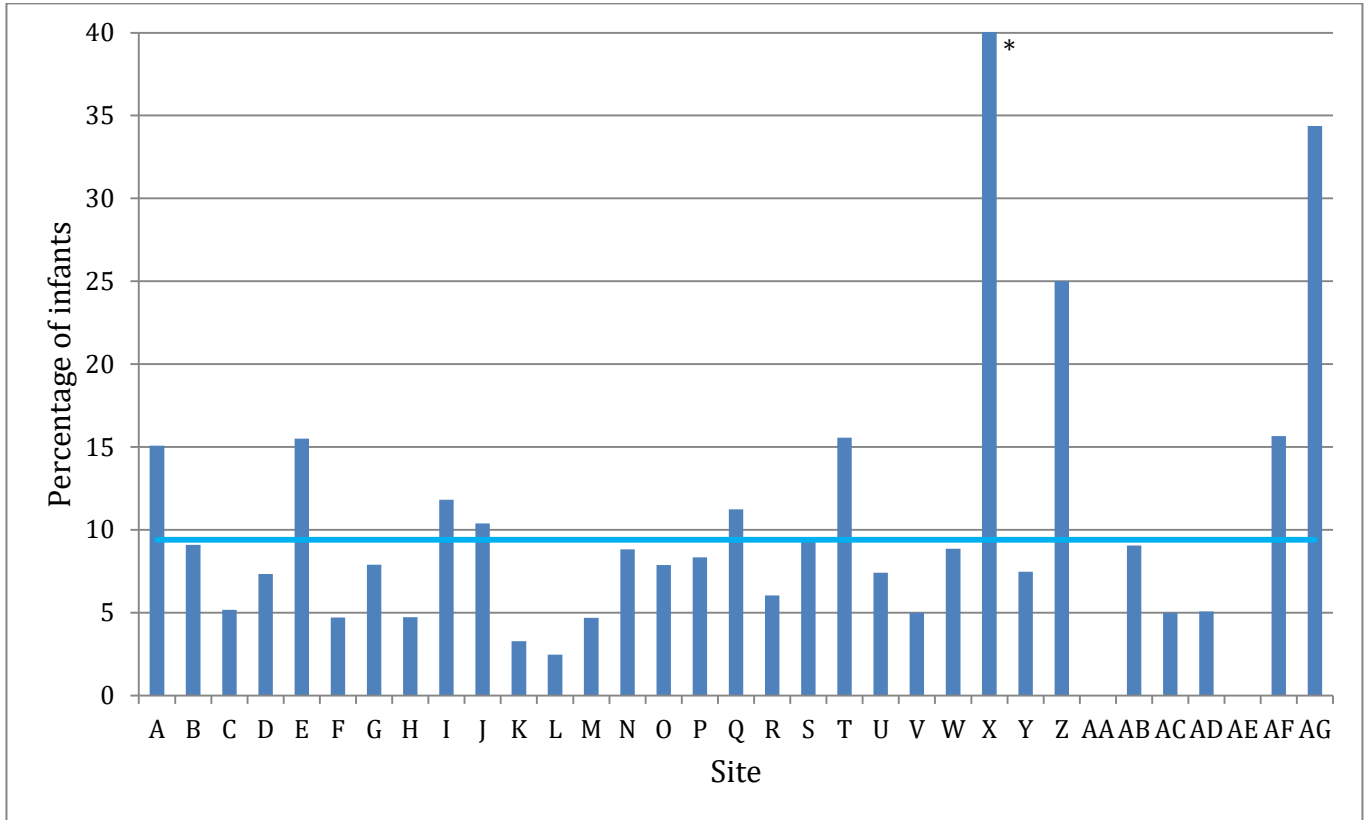
Site	A	B	C	D	E	F	G	H	I	J	K	
%	15.1	9.1	5.2	7.3	15.5	4.7	7.9	4.7	11.8	10.4	3.3	

Site	L	M	N	O	P	Q	R	S	T	U	V	
%	2.5	4.7	8.8	7.9	8.3	11.2	6.0	9.5	15.6	7.4	5.0	

Site	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	CNN
%	8.9	100.0	7.5	25.0	0.0	9.1	5.0	5.1	0.0	15.7	34.4	9.4

COMMENTS: Late onset sepsis is defined as any positive blood and/or cerebrospinal fluid culture after 2 days of age (analysis is neonate-based and deaths before 3 days of age are excluded).
 *Site X's rate goes over the range of Y-axis in the plot. Refer to the table for the actual rate for site X.

In presentations #33 and #34, late onset sepsis was attributed to the hospital where the first episode of sepsis was acquired. Each neonate was counted only once even if there were multiple episodes of infections.

Presentation #34a
**Late onset sepsis: GA<33 weeks: Adjusted standardized ratios by site**

Site	Number of neonates	Number of NI	Adjusted# expected number of NI	Adjusted# standardized ratio	95% confidence interval (CI) for adjusted standardized ratio	
1	138	7	11.6	0.6	0.2	1.2
2	80	4	3.9	1.0	0.3	2.6
3	33	0	2.1	0.0	.	1.7
4	109	9	10.6	0.9	0.4	1.6
5	179	20	14.9	1.3	0.8	2.1
6	104	5	6.5	0.8	0.2	1.8
7	81	2	5.4	0.4	0.0	1.3
8	79	7	5.3	1.3	0.5	2.7
9	150	14	11.0	1.3	0.7	2.1
10	8	0	0.4	0.0	.	10.0
11	22	2	1.5	1.4	0.2	4.9
12	373	40	43.5	0.9	0.7	1.3
13	297	24	40.7	0.6	0.4	0.9
14	167	26	16.0	1.6	1.1	2.4
15	148	11	12.4	0.9	0.4	1.6
16	273	13	27.0	0.5	0.3	0.8
17	125	15	12.3	1.2	0.7	2.0
18	19	1	1.4	0.7	0.0	4.0
19	252	38	26.5	1.4	1.0	2.0
20	80	6	8.6	0.7	0.3	1.5
21	164	13	15.3	0.8	0.5	1.4
22	60	2	4.7	0.4	0.0	1.5
23	64	3	4.2	0.7	0.1	2.1
24	83	22	8.7	2.5	1.6	3.8
25	35	3	2.8	1.1	0.2	3.2
26	265	24	28.2	0.9	0.5	1.3
27	15	3	0.9	3.3	0.7	9.6
28	129	20	11.4	1.7	1.1	2.7
29	115	6	5.0	1.2	0.4	2.6
31	107	8	9.1	0.9	0.4	1.7
32	149	9	11.9	0.8	0.3	1.4
33	137	21	15.6	1.3	0.8	2.1

Numeric site codes were used in Presentations 34a-d and they may not correspond to other presentations in this report. *Late onset sepsis was attributed to the hospital where the first episode of sepsis was acquired. *Neonates who died before 3 days of age were excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentation # 34b
Late onset sepsis: GA<33 weeks: Adjusted standardized ratios by site
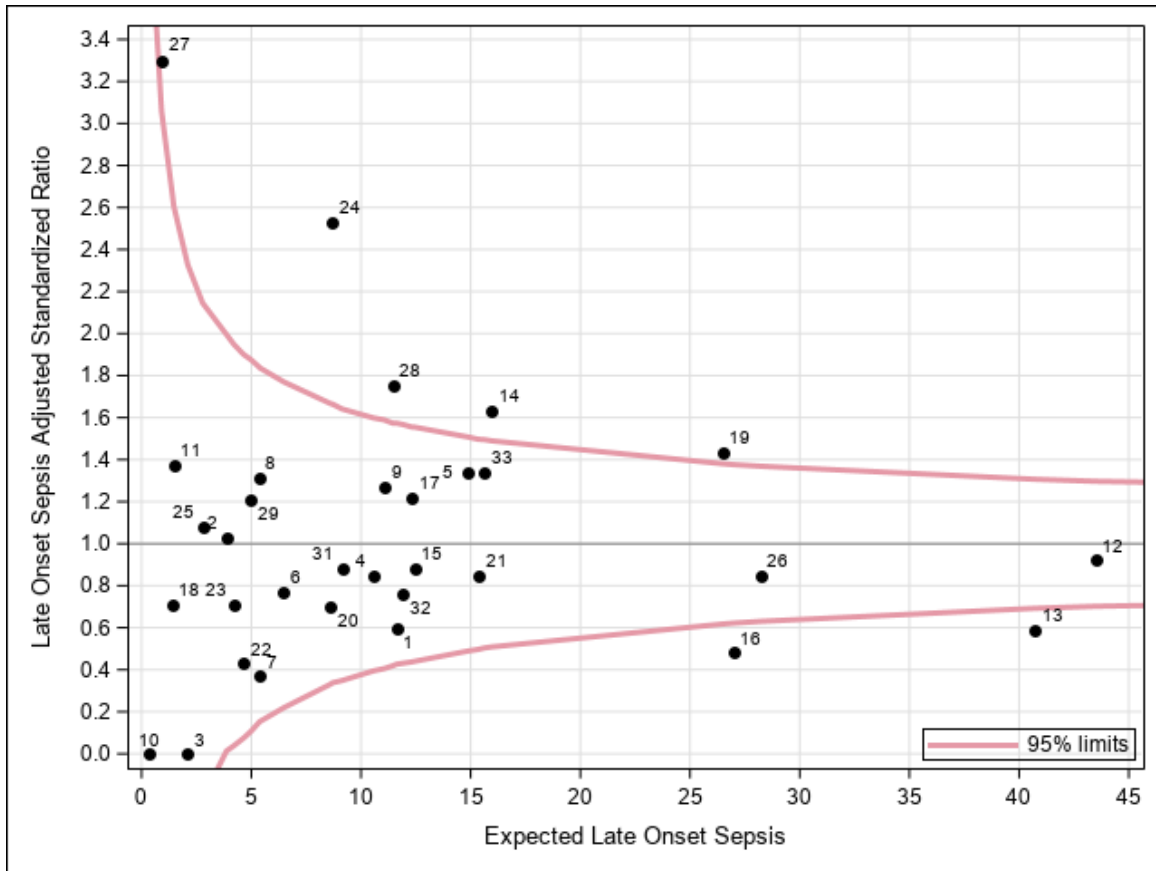
Explanation for Presentation 34a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed late onset sepsis/expected late onset sepsis
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 34b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #34c
Late onset sepsis: GA<29 weeks: Adjusted standardized ratios by site

Site	Number of neonates	Number of NI	Adjusted# expected number of NI	Adjusted# standardized ratio	95% confidence interval (CI) for adjusted standardized ratio	
1	40	4	9.0	0.4	0.1	1.1
2	12	1	2.0	0.5	0.0	2.8
3	7	0	1.3	0.0	.	2.9
4	35	8	8.1	1.0	0.4	1.9
5	59	16	11.4	1.4	0.8	2.3
6	24	2	4.2	0.5	0.1	1.7
7	23	2	3.6	0.5	0.1	2.0
8	23	6	3.7	1.6	0.6	3.6
9	47	12	8.3	1.4	0.7	2.5
11	5	1	0.9	1.1	0.0	6.3
12	176	38	36.9	1.0	0.7	1.4
13	169	21	36.3	0.6	0.4	0.9
14	65	21	13.1	1.6	1.0	2.4
15	61	10	9.7	1.0	0.5	1.9
16	119	11	22.3	0.5	0.2	0.9
17	49	11	10.0	1.1	0.5	2.0
18	6	1	1.1	0.9	0.0	5.1
19	94	28	21.3	1.3	0.9	1.9
20	30	6	7.2	0.8	0.3	1.8
21	57	12	12.2	1.0	0.5	1.7
22	20	2	3.5	0.6	0.1	2.1
23	15	2	2.8	0.7	0.1	2.6
24	26	18	6.9	2.6	1.5	4.1
25	14	3	2.2	1.4	0.3	4.1
26	114	18	23.3	0.8	0.5	1.2
28	44	14	8.7	1.6	0.9	2.7
29	20	2	2.3	0.9	0.1	3.1
31	40	6	7.2	0.8	0.3	1.8
32	47	6	9.0	0.7	0.2	1.5
33	62	18	13.3	1.4	0.8	2.1

Numeric site codes were used in Presentations 34a-d and they may not correspond to other presentations in this report.
*Late onset sepsis was attributed to the hospital where the first episode of sepsis was acquired.
*Neonates who died before 3 days of age are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation # 34d
**Late onset sepsis: GA<29 weeks: Adjusted standardized ratios by site**
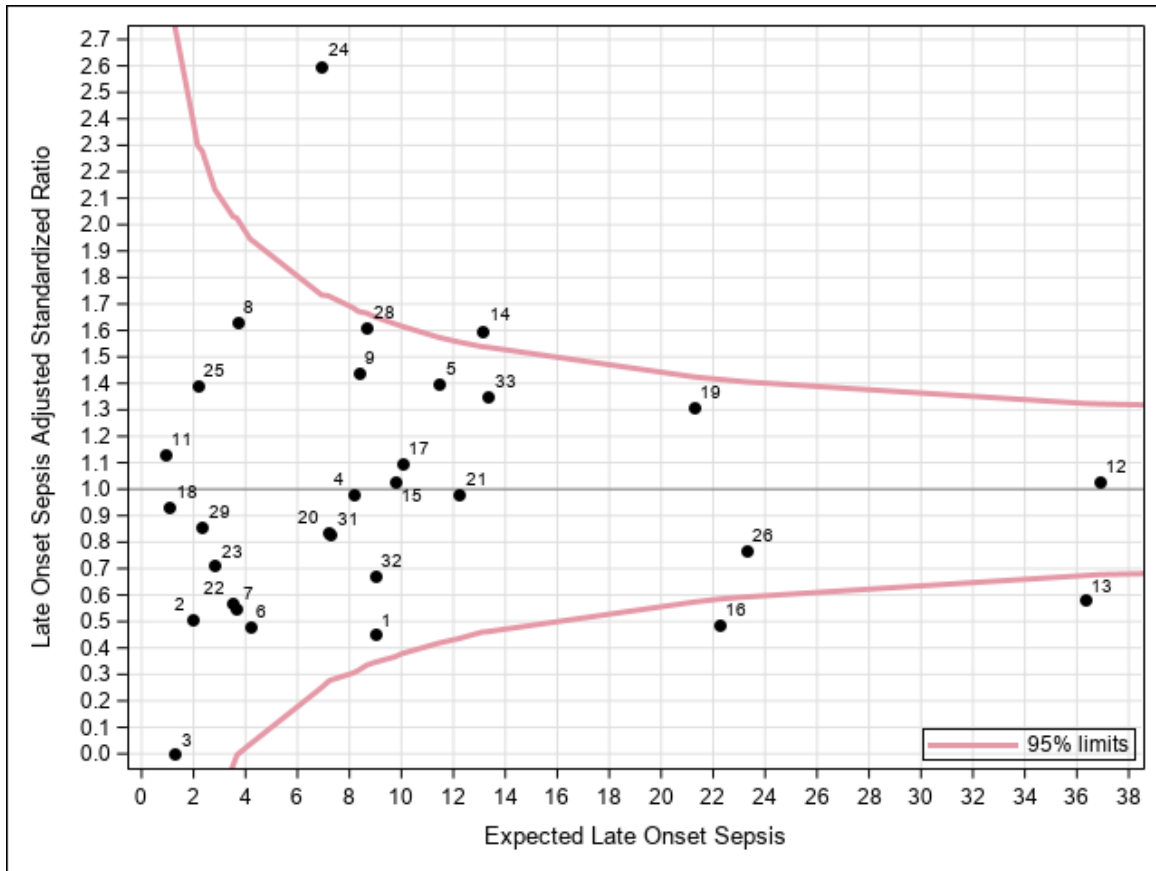
Explanation for Presentation 34c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed late onset sepsis/expected late onset sepsis
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 34d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #35
Late onset sepsis per 1000 patient days: GA<33 weeks: Site specific crude rates
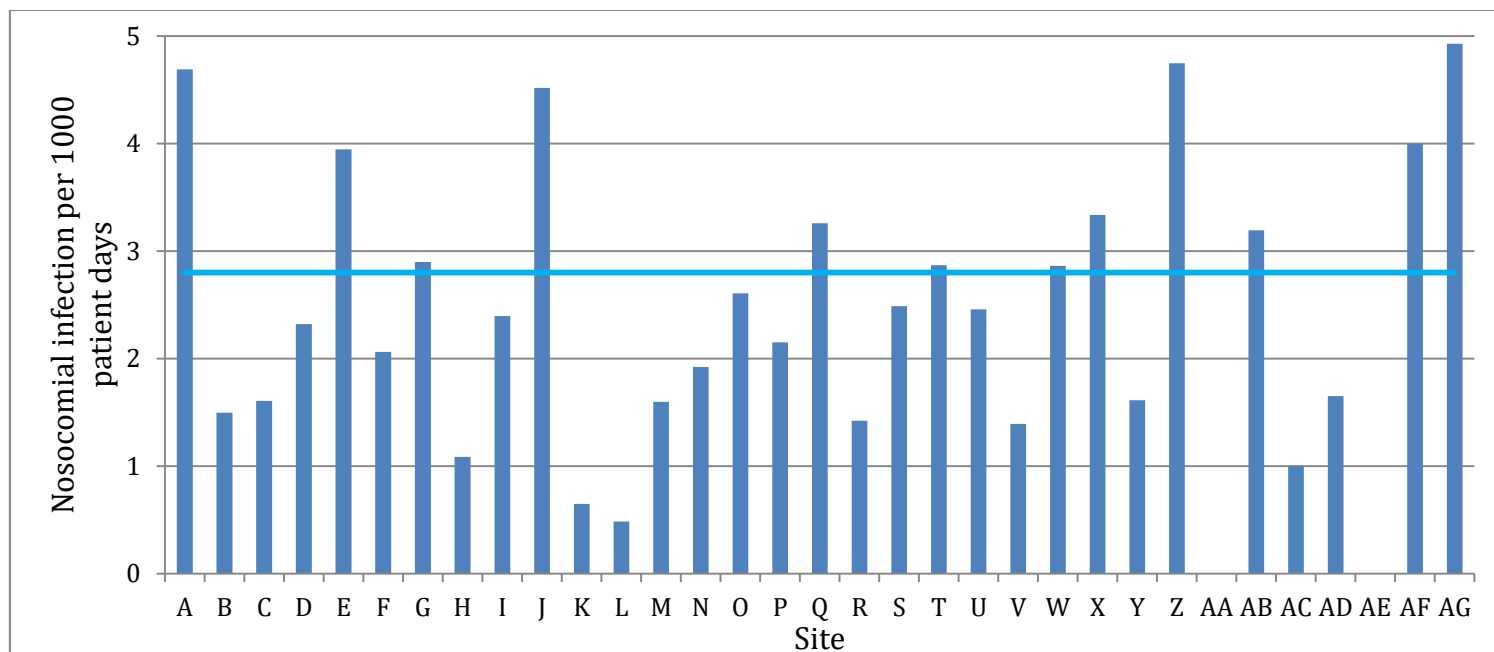

Site	Infections per 1000 patient days	Site	Infections per 1000 patient days	Site	Infections per 1000 patient days
A	4.7	L	0.5	W	2.9
B	1.5	M	1.6	X	3.3
C	1.6	N	1.9	Y	1.6
D	2.3	O	2.6	Z	4.7
E	3.9	P	2.2	AA	0.0
F	2.1	Q	3.3	AB	3.2
G	2.9	R	1.4	AC	1.0
H	1.1	S	2.5	AD	1.7
I	2.4	T	2.9	AE	0.0
J	4.5	U	2.5	AF	4.0
K	0.6	V	1.4	AG	4.9
				CNN	2.8

Total number of neonates = 4 108

COMMENTS: Late onset sepsis is defined as positive blood and/or cerebrospinal fluid culture after 2 days of age (includes all admissions). Considerable variation exists when late onset sepsis is analyzed as infections per 1000 patient days. Note that it is possible that certain sites with high retro transfer rates may report a high incidence per 1000 patient days since neonates who are transferred out are those with lower acuity. If a neonate had >1 distinct episodes of infection, each episode will be counted as separate infections in the numerator.

In presentations #35 and #36, the infection was assigned to the hospital where the infection happened and not assigned to the hospital where the first episode of sepsis happened.

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Presentation #36a
Central Line-Associated Bloodstream Infections per 1000 central line* days:
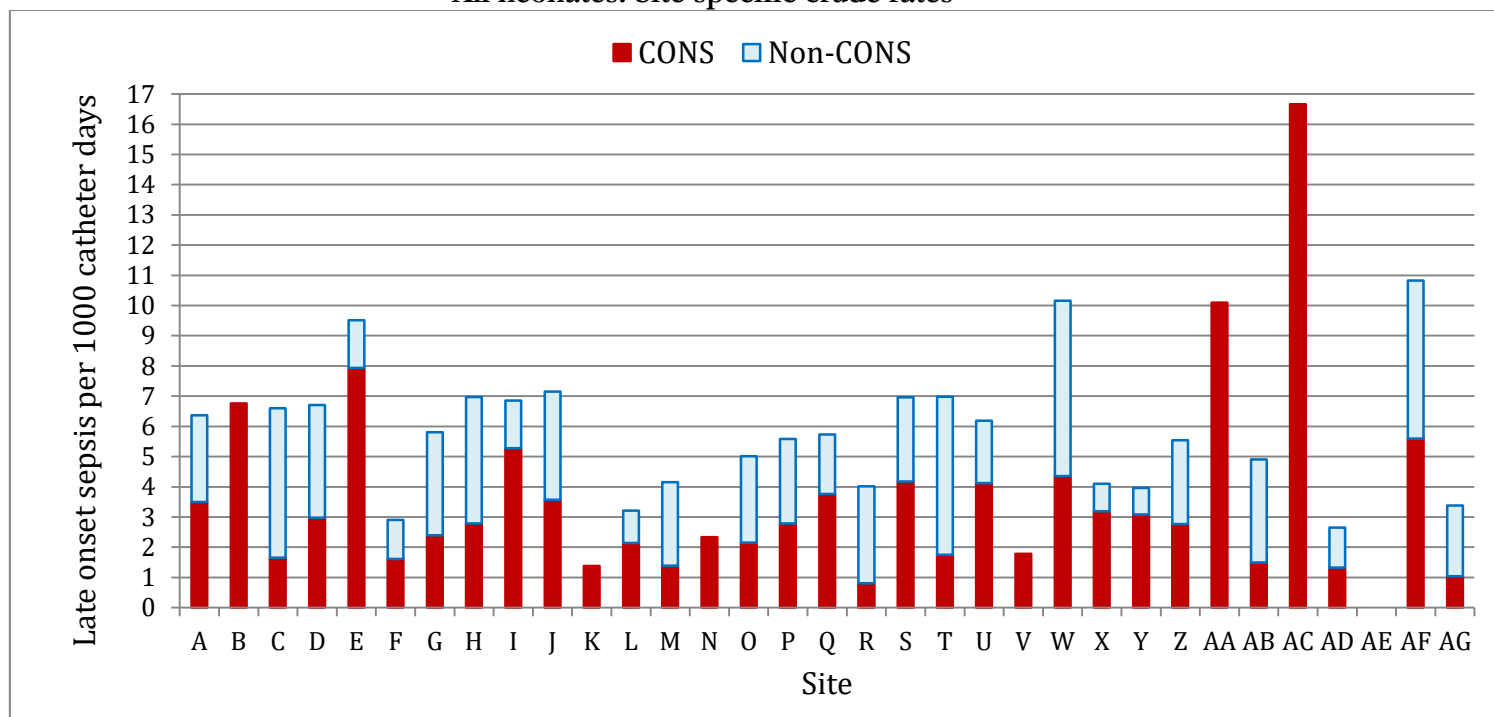**GA < 33 weeks: Site specific crude rates**
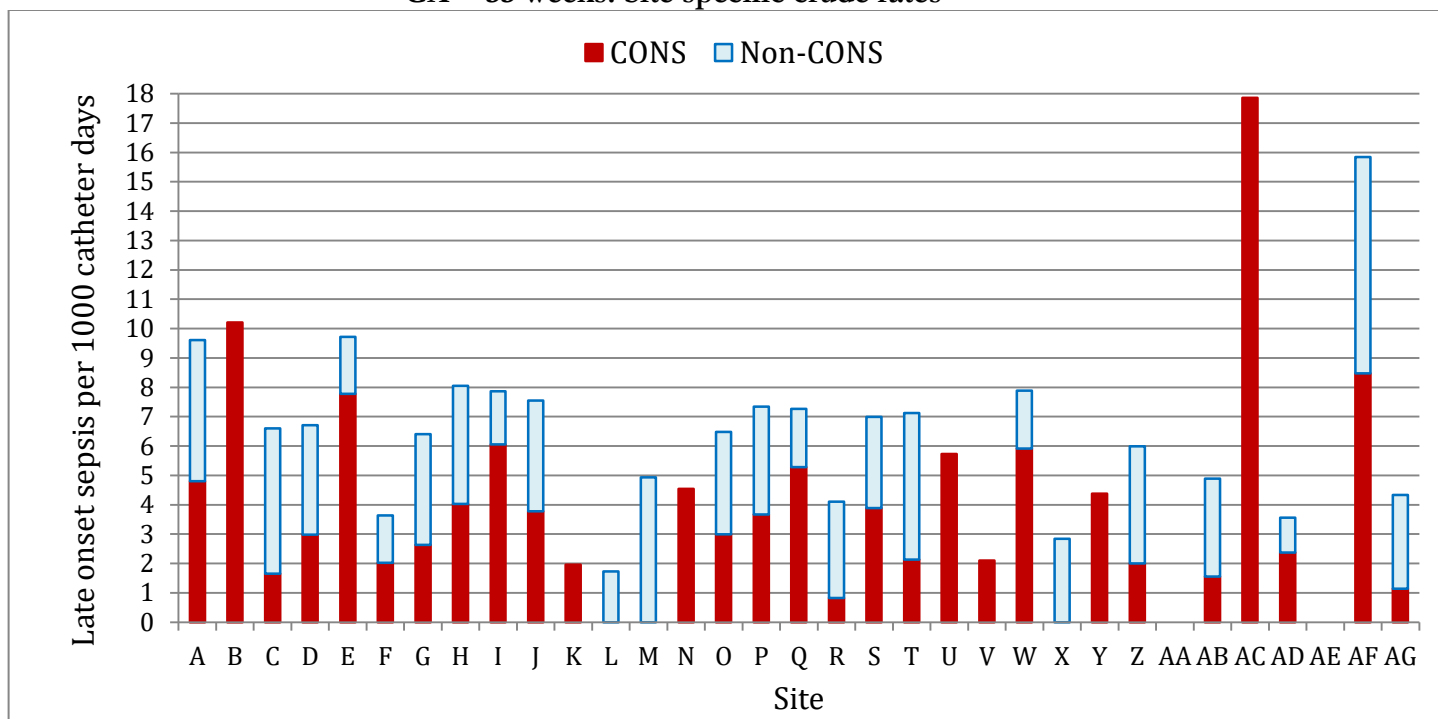
Site	CLABSI**		Central line days	CLABSI per 1000 central line days		Site	CLABSI**		Central line days	CLABSI per 1000 central line days	
	CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS
A	11	11	2289	4.8	4.8	R	2	8	2437	0.8	3.3
B	1	0	98	10.2	0.0	S	5	4	1287	3.9	3.1
C	1	3	606	1.7	5.0	T	6	14	2808	2.1	5.0
D	4	5	1342	3.0	3.7	U	2	0	349	5.7	0.0
E	8	2	1029	7.8	1.9	V	1	0	476	2.1	0.0
F	5	4	2472	2.0	1.6	W	3	1	507	5.9	2.0
G	7	10	2655	2.6	3.8	X	0	2	703	0.0	2.8
H	2	2	497	4.0	4.0	Y	5	0	1141	4.4	0.0
I	10	3	1652	6.1	1.8	Z	1	2	501	2.0	4.0
J	16	16	4241	3.8	3.8	AA	0	0	31	0.0	0.0
K	1	0	510	2.0	0.0	AB	7	15	4503	1.6	3.3
L	0	1	580	0.0	1.7	AC	1	0	56	17.9	0.0
M	0	2	405	0.0	4.9	AD	2	1	842	2.4	1.2
N	1	0	220	4.5	0.0	AE	0	0	84	0.0	0.0
O	6	7	2007	3.0	3.5	AF	23	20	2714	8.5	7.4
P	5	5	1362	3.7	3.7	AG	5	14	4386	1.1	3.2
Q	16	6	3028	5.3	2.0	CNN	157	158	47818	3.3	3.3

*Central line = Any of UV, surgical CVL, or PICC
** CLABSI was defined as a primary bloodstream infection in a neonate who developed
infection while a central line was in situ or within 2 days of removal of the central line.

Presentation #36b
Central Line-Associated Bloodstream Infections per 1000 central line* days:
**All neonates: Site specific crude rates**

Site	CLABSI**		Central line days	CLABSI per 1000 central line days		Site	CLABSI**		Central line days	CLABSI per 1000 central line days	
	CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS
A	17	14	4868	3.5	2.9	R	2	8	2493	0.8	3.2
B	1	0	148	6.8	0.0	S	6	4	1436	4.2	2.8
C	1	3	606	1.7	5.0	T	9	27	5153	1.7	5.2
D	4	5	1342	3.0	3.7	U	2	1	485	4.1	2.1
E	10	2	1261	7.9	1.6	V	1	0	560	1.8	0.0
F	5	4	3097	1.6	1.3	W	3	4	689	4.4	5.8
G	7	10	2928	2.4	3.4	X	7	2	2192	3.2	0.9
H	2	3	717	2.8	4.2	Y	7	2	2271	3.1	0.9
I	10	3	1895	5.3	1.6	Z	3	3	1083	2.8	2.8
J	17	17	4756	3.6	3.6	AA	1	0	99	10.1	0.0
K	1	0	723	1.4	0.0	AB	7	16	4690	1.5	3.4
L	2	1	934	2.1	1.1	AC	1	0	60	16.7	0.0
M	1	2	722	1.4	2.8	AD	2	2	1508	1.3	1.3
N	1	0	429	2.3	0.0	AE	0	0	103	0.0	0.0
O	6	8	2795	2.1	2.9	AF	31	29	5539	5.6	5.2
P	5	5	1792	2.8	2.8	AG	8	18	7701	1.0	2.3
Q	19	10	5055	3.8	2.0	CNN	199	203	70130	2.8	2.9

*Central line = Any of UV, surgical CVL, or PICC
** CLABSI was defined as a primary bloodstream infection in a neonate who developed infection while a central line was in situ or within 2 days of removal of the central line.

Presentation #37
**Days of antimicrobial use per 1000 patient days among neonates who did not
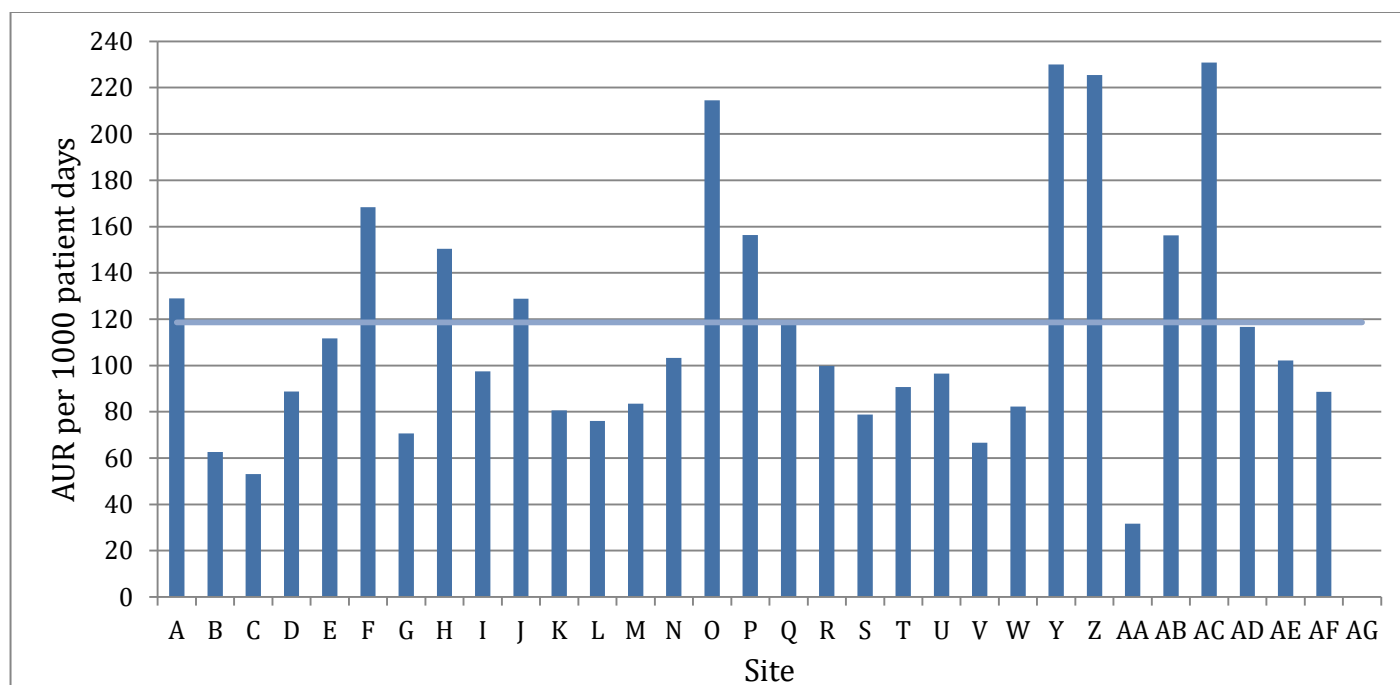develop NEC, early-onset sepsis or late onset sepsis: <u>GA <33 weeks</u>***
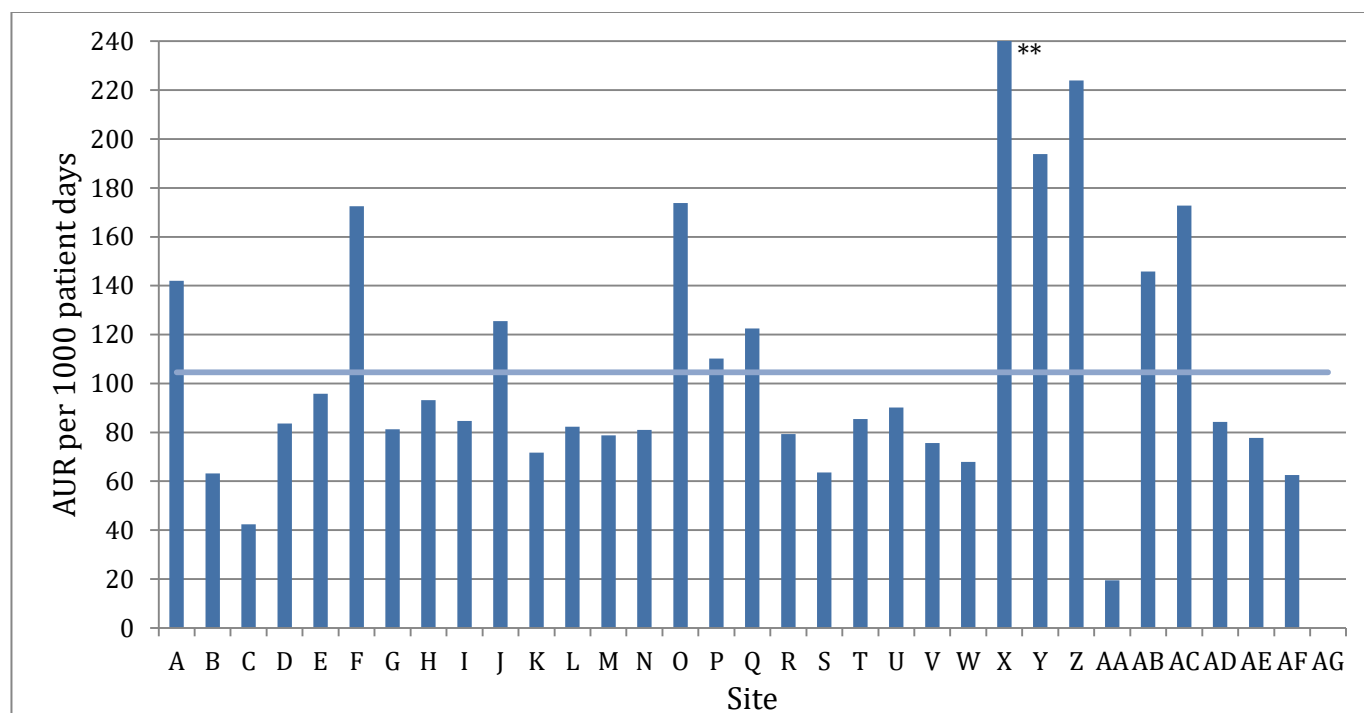
Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days
A	142.0	L	82.3	W	68.0
B	63.2	M	78.7	X	600.0
C	42.4	N	81.0	Y	193.8
D	83.7	O	173.8	Z	223.9
E	95.8	P	110.1	AA	19.5
F	172.5	Q	122.5	AB	145.9
G	81.3	R	79.3	AC	172.8
H	93.2	S	63.6	AD	84.3
I	84.7	T	85.5	AE	77.8
J	125.6	U	90.1	AF	62.5
K	71.7	V	75.6	AG	0.0
				CNN	104.5

*Denominators were based on neonates born < 33 weeks' GA without major congenital
anomaly who did not develop early-onset sepsis, late-onset sepsis or necrotising enterocolitis.
**Site X's AUR goes over the range of Y-axis. Refer to the table for the actual AUR for site X.

Note: Prophylactic administration of trimethoprim or amoxicillin for the prevention of
urinary tract infections with a suspected renal anomaly was not included.

Presentation #38
Days of antimicrobial use per 1000 patient days among neonates who did not
**develop NEC, early-onset sepsis or late onset sepsis: <u>GA <29 weeks</u>***

Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days
A	129.0	L	76.1	W	82.3
B	62.7	M	83.5	Y	230.0
C	53.0	N	103.3	Z	225.5
D	88.8	O	214.5	AA	31.6
E	111.7	P	156.3	AB	156.2
F	168.4	Q	119.0	AC	230.8
G	70.7	R	99.8	AD	116.7
H	150.4	S	78.8	AE	102.1
I	97.5	T	90.7	AF	88.6
J	128.8	U	96.5	AG	0.0
K	80.6	V	66.6	CNN	118.6

*Denominators were based on neonates born < 29 weeks' GA without major congenital anomaly who did not develop early-onset sepsis, late-onset sepsis or necrotising enterocolitis.

Note: Site X does not have any neonates with GA < 29.

Note: Prophylactic administration of trimethoprim or amoxicillin for the prevention of urinary tract infections with a suspected renal anomaly was not included.

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Presentation #39
Rate of treatment# for patent ductus arteriosus (PDA): GA<33 weeks who had PDA*:
Site specific crude rates
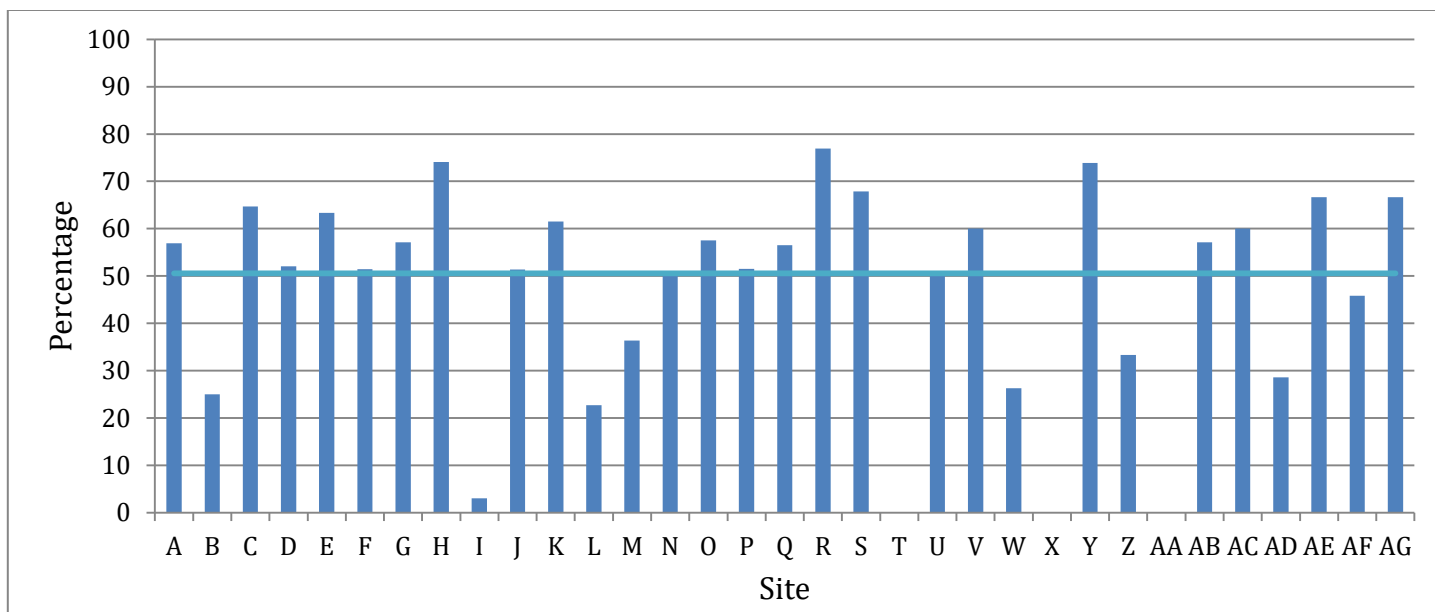
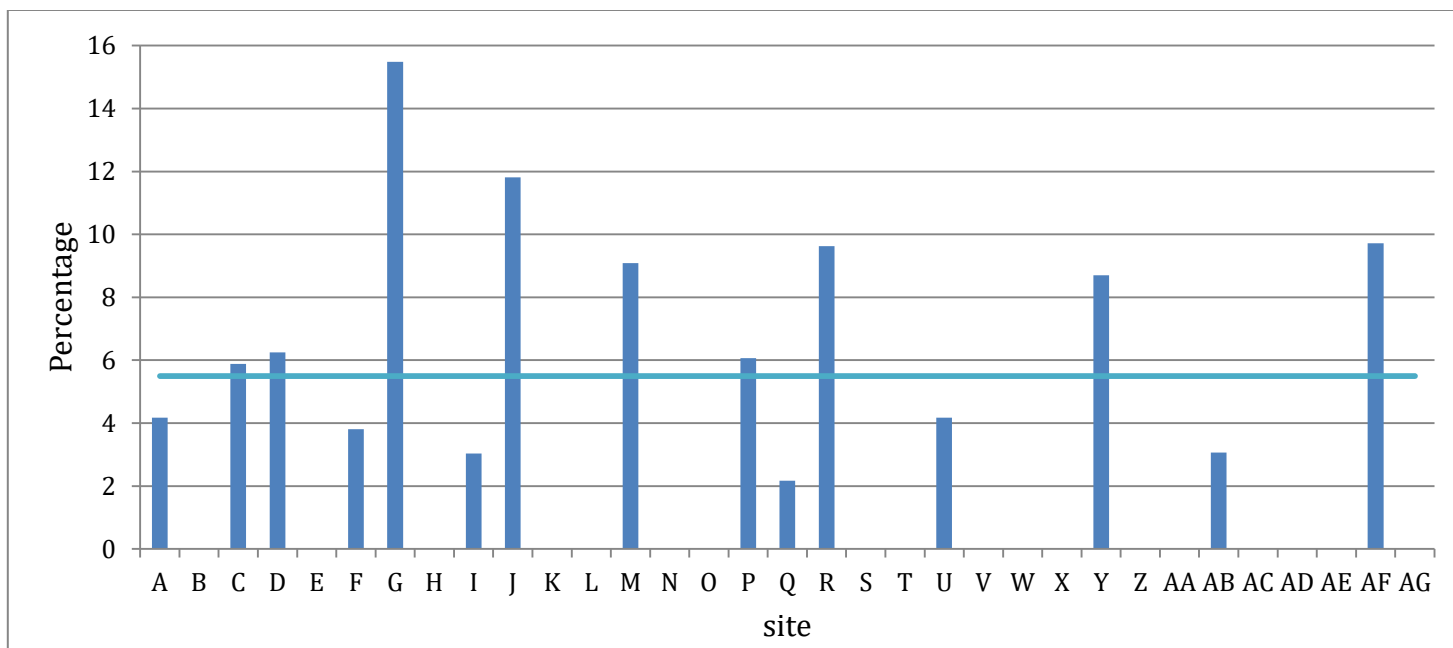| Site	Treatment# for PDA among neonates who had PDA (%)	Site	Treatment# for PDA among neonates who had PDA (%)
A	56.9	R	76.9
B	25.0	S	67.9
C	64.7	T	0.0
D	52.1	U	50.0
E	63.3	V	60.0
F	51.4	W	26.3
G	57.1	X	0.0
H	74.1	Y	73.9
I	3.0	Z	33.3
J	51.4	AA	0.0
K	61.5	AB	57.1
L	22.7	AC	60.0
M	36.4	AD	28.6
N	50.0	AE	66.7
O	57.5	AF	45.8
P	51.5	AG	66.7
Q	56.5	CNN	50.6

Total number of neonates who had PDA = 1 172
*PDA diagnosis is based on clinical suspicion and/or echocardiography findings.
#Treatment of PDA includes any of indomethacin, ibuprofen, acetaminophen, or ligation.
The percentage of neonates with treated PDA was attributed to the site where the neonate was first admitted.

Presentation #40
Surgical patent ductus arteriosus (PDA) closure rate: GA<33 weeks who had PDA:
**Site specific crude rates**

Site	Surgical ligation for PDA among neonates who had PDA (%)	Site	Surgical ligation for PDA among neonates who had PDA (%)
A	4.2	R	9.6
B	0.0	S	0.0
C	5.9	T	0.0
D	6.3	U	4.2
E	0.0	V	0.0
F	3.8	W	0.0
G	15.5	X	0.0
H	0.0	Y	8.7
I	3.0	Z	0.0
J	11.8	AA	0.0
K	0.0	AB	3.1
L	0.0	AC	0.0
M	9.1	AD	0.0
N	0.0	AE	0.0
O	0.0	AF	9.7
P	6.1	AG	0.0
Q	2.2	CNN	5.5

Total number of neonates who had PDA = 1 172

The percentage of neonates with treated PDA was attributed to the site where the neonate was first admitted.

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Presentation #41
Severe brain injury rates: GA<33 weeks: Site specific crude rates
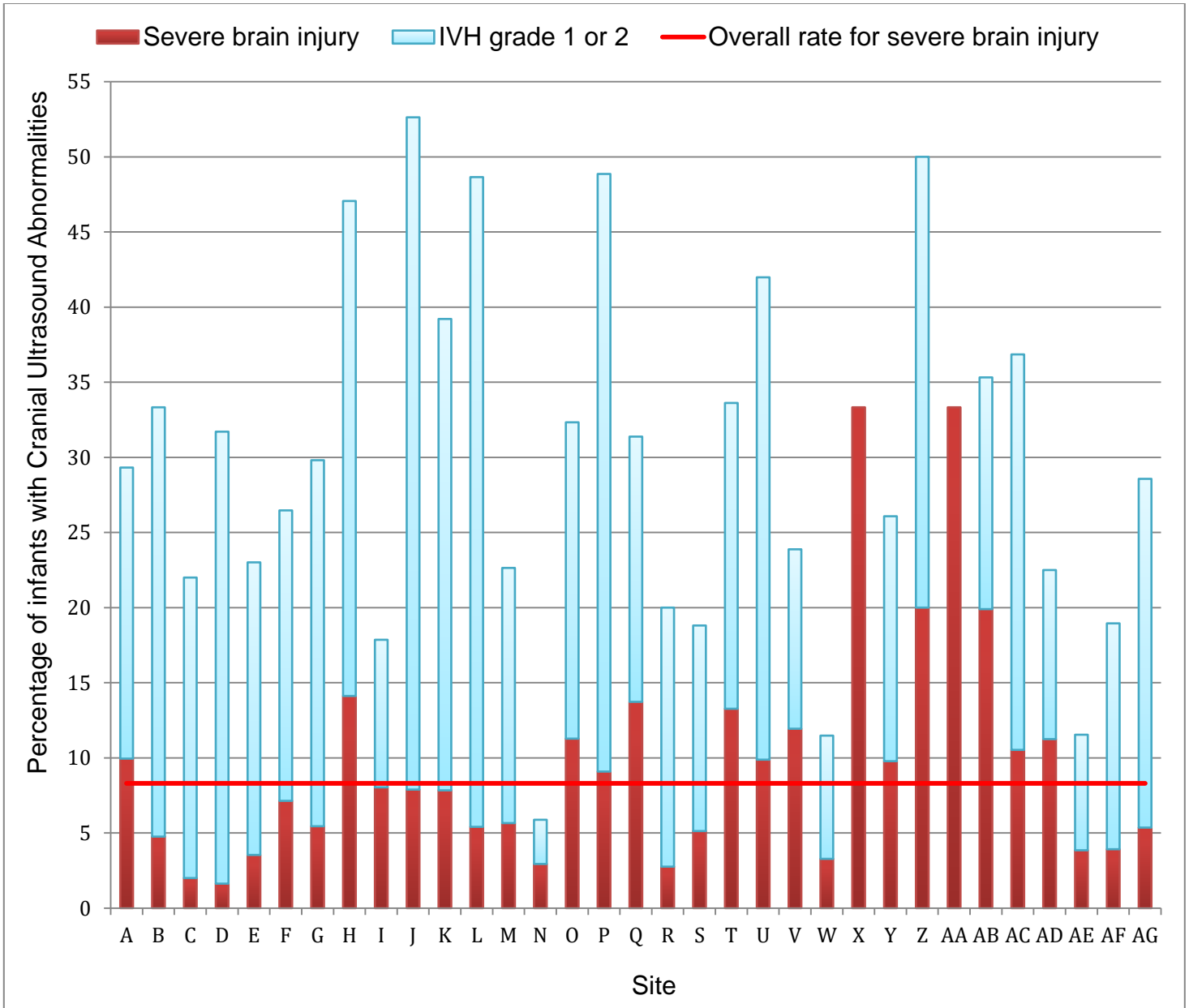
IVH grade 1 or 2 = Germinal matrix hemorrhage or intraventricular hemorrhage **without** ventricular enlargement

IVH grade 3 or 4 or PVL (severe brain injury) = Intraventricular hemorrhage **with** ventricular enlargement or persistent parenchymal echogenicity or periventricular leukomalacia

Presentation #41 (continued)
Severe brain injury rate: GA<33 weeks: Site specific crude rates

Site	<25	25-26	27-28	29-30	31-32	Overall rate* per site %
A	41.7	8.3	7.1	5.7	0.0	10.0
B	0.0	0.0	0.0	11.1	0.0	4.8
C	100.0	0.0	0.0	2.7	0.0	2.0
D	0.0	4.6	2.9	0.0	0.0	1.6
E	16.7	5.3	5.9	2.2	0.0	3.5
F	10.5	10.3	6.6	6.6	5.2	7.1
G	17.4	5.6	5.4	0.0	0.0	5.5
H	50.0	20.0	35.7	3.2	10.7	14.1
I	26.7	13.3	4.8	2.9	3.7	8.0
J	29.8	11.3	5.2	2.3	0.0	7.9
K	66.7	22.2	0.0	0.0	0.0	7.8
L	0.0	14.3	21.4	0.0	0.0	5.4
M	66.7	20.0	0.0	0.0	0.0	5.7
N	0.0	25.0	0.0	0.0	0.0	2.9
O	35.7	25.0	9.1	4.4	3.2	11.3
P	27.3	7.7	0.0	9.4	4.8	9.1
Q	50.0	17.4	23.1	9.5	5.6	13.7
R	12.5	14.3	0.0	2.4	0.0	2.8
S	12.5	7.1	3.9	6.1	2.8	5.1
T	40.0	11.8	3.7	6.9	16.0	13.3
U	30.8	37.5	0.0	4.2	0.0	9.9
V	0.0	16.7	0.0	20.7	3.9	11.9
W	0.0	0.0	7.7	4.2	0.0	3.3
X	NA	NA	NA	100.0	0.0	33.3
Y	37.5	0.0	9.5	12.0	3.6	9.8
Z	NA	NA	50.0	0.0	16.7	20.0
AA	NA	NA	50.0	50.0	0.0	33.3
AB	45.8	32.5	16.3	8.9	9.4	19.9
AC	NA	50.0	0.0	0.0	0.0	10.5
AD	18.2	38.5	7.1	4.0	0.0	11.3
AE	NA	0.0	20.0	0.0	0.0	3.9
AF	26.7	5.6	0.0	3.0	0.0	3.9
AG	50.0	0.0	0.0	4.8	3.9	5.4
Overall rate** per GA group %	28.6	13.8	7.3	4.9	2.7	8.3

Total number of neonates = 3 416
Severe brain injury includes Grade 3 or 4 IVH or PVL
Note that the proportion of neonates with neuroimaging data available varies by GA.
692 neonates were excluded due to neuroimaging data not available.
*Overall % = (number of neonates with cranial ultrasound abnormalities for site / total number of neonates for site with neuroimaging data available) *100
**Overall % = (number of neonates with cranial ultrasound abnormalities for GA category / total number of neonates in GA category with neuroimaging data available) *100
NA = no data available

Presentation #42
Periventricular leukomalacia (PVL) rates: GA<33 weeks: Site specific crude rates
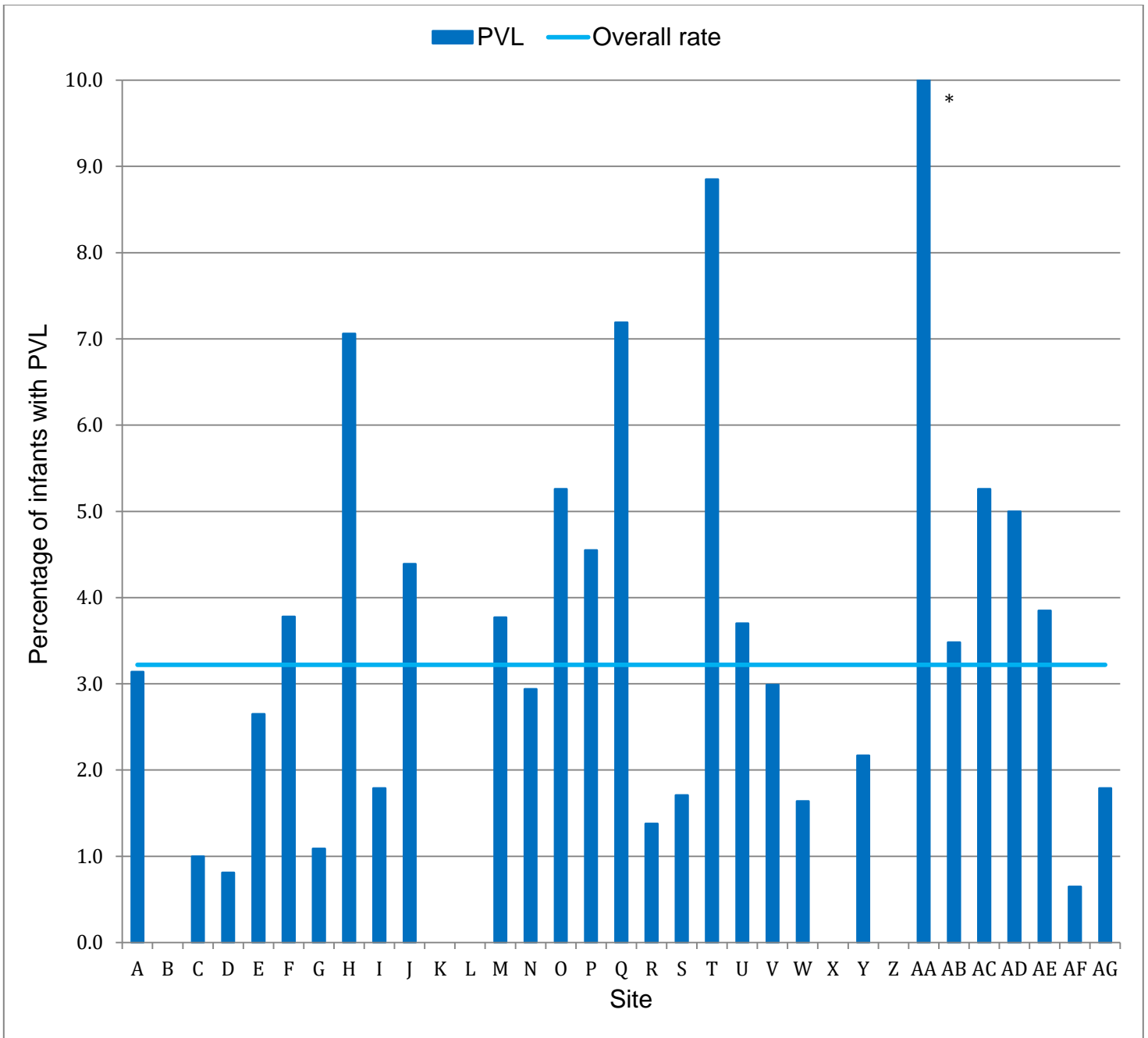
*Site AA's rate goes over the range of Y-axis in the plot. Refer to the table on the next page for the actual rate of site AA.

Presentation #42 (continued)
Periventricular leukomalacia (PVL) rate: GA<33 weeks: Site specific crude rates

Site	<25	25-26	27-28	29-30	31-32	Overall rate* per site %
A	8.3	4.2	4.8	1.4	0.0	3.1
B	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	2.7	0.0	1.0
D	0.0	4.6	0.0	0.0	0.0	0.8
E	16.7	5.3	0.0	2.2	0.0	2.7
F	5.3	7.7	1.6	3.3	3.5	3.8
G	2.2	1.9	1.4	0.0	0.0	1.1
H	50.0	0.0	28.6	0.0	3.6	7.1
I	0.0	0.0	0.0	2.9	3.7	1.8
J	14.9	9.7	1.3	1.1	0.0	4.4
K	0.0	0.0	0.0	0.0	0.0	0.0
L	0.0	0.0	0.0	0.0	0.0	0.0
M	33.3	20.0	0.0	0.0	0.0	3.8
N	0.0	25.0	0.0	0.0	0.0	2.9
O	14.3	10.0	0.0	4.4	3.2	5.3
P	9.1	7.7	0.0	6.3	0.0	4.6
Q	25.0	4.4	11.5	7.1	3.7	7.2
R	0.0	14.3	0.0	0.0	0.0	1.4
S	0.0	0.0	3.9	0.0	2.8	1.7
T	20.0	5.9	3.7	6.9	12.0	8.9
U	15.4	0.0	0.0	4.2	0.0	3.7
V	0.0	0.0	0.0	6.9	0.0	3.0
W	0.0	0.0	0.0	4.2	0.0	1.6
X	NA	NA	NA	0.0	0.0	0.0
Y	12.5	0.0	0.0	0.0	3.6	2.2
Z	NA	NA	0.0	0.0	0.0	0.0
AA	NA	NA	50.0	50.0	0.0	33.3
AB	4.2	5.0	4.1	1.8	3.1	3.5
AC	NA	25.0	0.0	0.0	0.0	5.3
AD	0.0	23.1	7.1	0.0	0.0	5.0
AE	NA	0.0	20.0	0.0	0.0	3.9
AF	0.0	5.6	0.0	0.0	0.0	0.7
AG	0.0	0.0	0.0	4.8	0.0	1.8
Overall rate** per GA group %	8.3	6.0	2.7	2.3	1.4	3.2

Total number of neonates = 3 415
Note that the proportion of neonates with neuroimaging data available varies by GA.
693 neonates were excluded due to neuroimaging data not available.
*Overall % = (number of neonates with PVL for site / total number of neonates for site) *100
**Overall % = (number of neonates with PVL for GA category / total number of neonates in GA category) *100
NA = no data available

Presentation #43a
IVH grade 3 or 4 or PVL: GA<33 weeks: Adjusted standardized ratios by site

Site	Total number of neonates	Number of neonates with available data	Number of neonates with IVH G3/4 or PVL	Adjusted# expected number of neonates with IVH G3/4 or PVL	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	127	80	9	7.3	1.2	0.6	2.3
2	80	66	8	3.0	2.6	1.1	5.2
3	32	25	1	1.4	0.7	0.0	3.9
4	110	88	8	7.1	1.1	0.5	2.2
5	170	145	19	10.5	1.8	1.1	2.8
6	110	85	12	4.7	2.6	1.3	4.5
7	72	65	3	3.4	0.9	0.2	2.6
8	78	60	2	3.8	0.5	0.1	1.9
9	153	117	6	8.4	0.7	0.3	1.6
10	8	6	2	0.3	7.5	0.8	26.9
11	23	21	1	1.0	1.0	0.0	5.3
12	379	332	24	31.0	0.8	0.5	1.2
13	302	272	14	29.1	0.5	0.3	0.8
14	161	149	6	11.1	0.5	0.2	1.2
15	148	119	2	7.5	0.3	0.0	1.0
16	267	227	16	18.5	0.9	0.5	1.4
17	123	108	9	9.5	1.0	0.4	1.8
18	19	18	2	1.2	1.7	0.2	6.1
19	245	184	18	18.0	1.0	0.6	1.6
20	79	78	6	7.0	0.9	0.3	1.9
21	163	130	15	9.5	1.6	0.9	2.6
22	64	51	4	2.9	1.4	0.4	3.5
23	65	52	3	3.2	0.9	0.2	2.7
24	59	51	3	2.1	1.4	0.3	4.2
25	36	34	1	2.0	0.5	0.0	2.8
26	250	186	35	21.6	1.6	1.1	2.3
27	12	10	2	0.4	5.1	0.6	18.6
28	129	111	3	7.4	0.4	0.1	1.2
29	117	99	2	4.1	0.5	0.1	1.8
31	107	89	8	6.5	1.2	0.5	2.4
32	148	138	4	9.0	0.4	0.1	1.1
33	135	111	14	10.4	1.3	0.7	2.3

Numeric site codes were used in Presentations 43a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies are excluded. # The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentation #43b
IVH grade 3 or 4 or PVL: GA<33 weeks: Adjusted standardized ratios by site
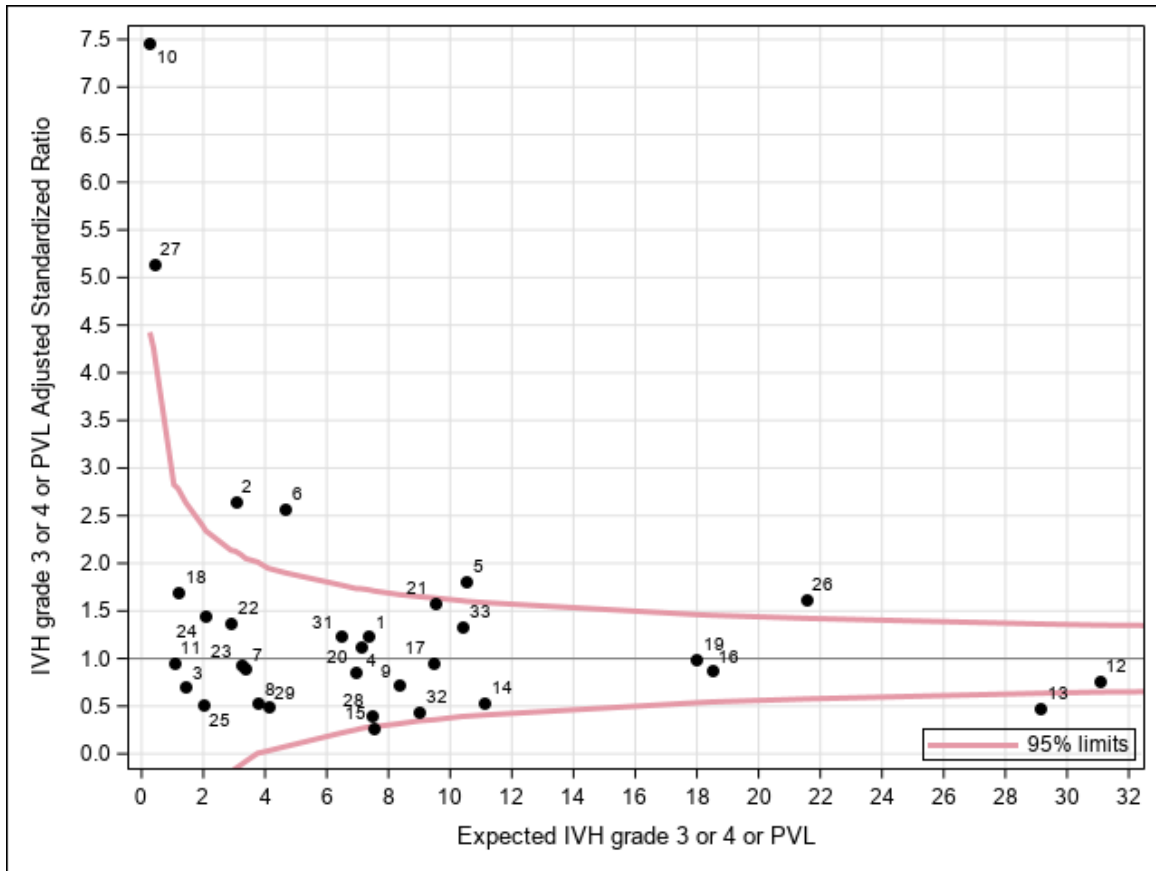
Explanation for Presentation 43a
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<33 weeks GA and no major anomaly) who
were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA,
sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed IVH or PVL/expected IVH or PVL
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 43b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted
standardized ratio. However, for determining whether site is statistically different from others, one
should also assess 95% CI and check whether both upper and lower boundaries are also outside of
the funnel area or not.

Presentation# 43c
IVH grade 3 or 4 or PVL: GA<29 weeks: Adjusted standardized ratios by site

Site	Total number of neonates	Number of neonates with available data	Number of neonates with IVH G3/4 or PVL	Adjusted# expected number of neonates with IVH G3/4 or PVL	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	40	38	8	5.7	1.4	0.6	2.8
2	12	11	1	1.4	0.7	0.0	4.0
3	7	7	1	0.7	1.4	0.0	7.6
4	36	35	4	5.2	0.8	0.2	2.0
5	56	55	14	7.4	1.9	1.0	3.2
6	29	26	8	2.8	2.9	1.2	5.6
7	19	19	3	1.7	1.7	0.3	5.1
8	22	22	1	2.3	0.4	0.0	2.4
9	51	48	3	6.1	0.5	0.1	1.4
11	6	5	0	0.5	0.0	.	6.9
12	186	181	23	25.3	0.9	0.6	1.4
13	176	173	14	25.3	0.6	0.3	0.9
14	63	63	5	8.4	0.6	0.2	1.4
15	63	60	2	5.4	0.4	0.0	1.3
16	121	118	10	14.5	0.7	0.3	1.3
17	50	50	7	7.3	1.0	0.4	2.0
18	6	6	2	0.8	2.5	0.3	8.9
19	92	87	14	14.2	1.0	0.5	1.7
20	30	30	5	5.6	0.9	0.3	2.1
21	57	55	12	6.9	1.7	0.9	3.0
22	24	20	4	2.1	1.9	0.5	4.9
23	16	15	3	2.0	1.5	0.3	4.4
24	9	9	1	0.8	1.3	0.0	7.1
25	14	13	1	1.2	0.8	0.0	4.5
26	107	105	28	17.4	1.6	1.1	2.3
28	44	41	3	5.0	0.6	0.1	1.8
29	23	21	1	1.7	0.6	0.0	3.2
31	41	37	5	4.5	1.1	0.4	2.6
32	53	47	3	6.1	0.5	0.1	1.4
33	62	59	9	8.2	1.1	0.5	2.1

Numeric site codes were used in Presentations 43a-d and they may not correspond to other presentations in this report.
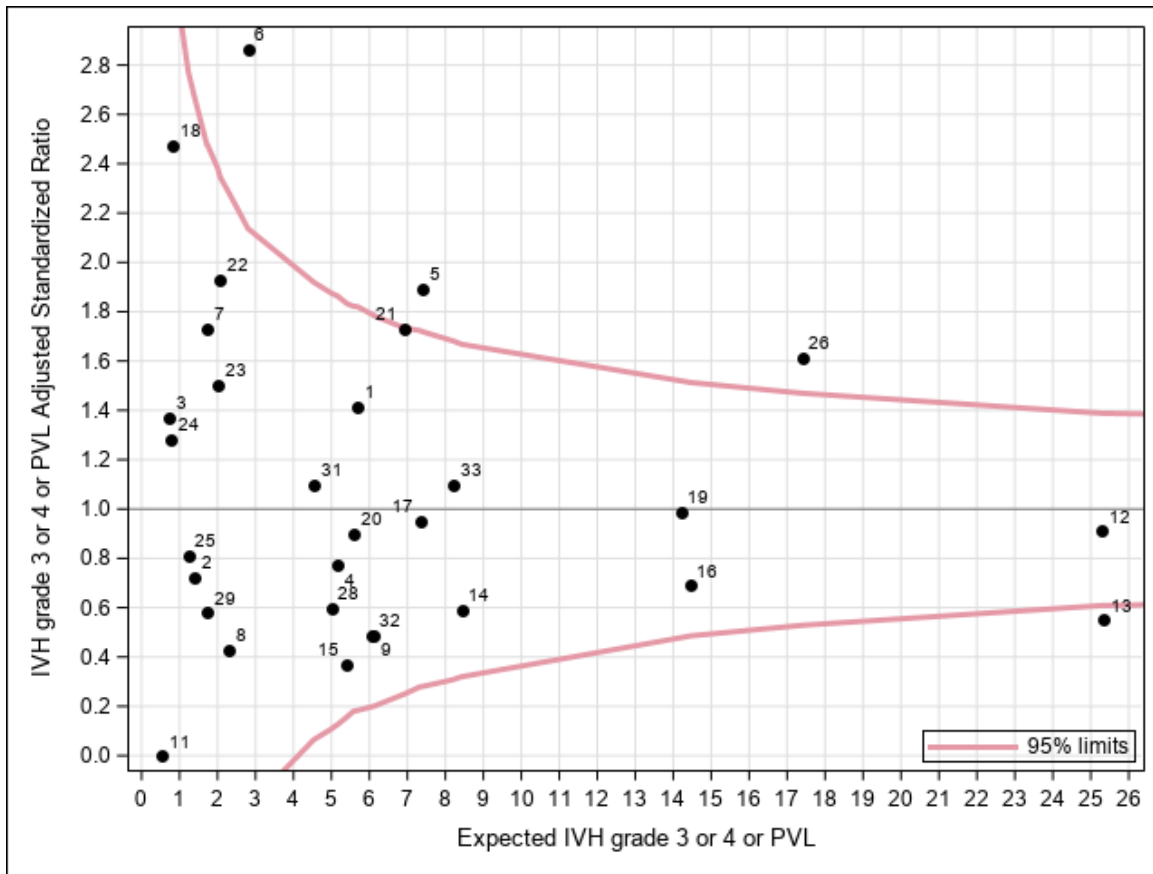**Neonates with major congenital anomalies are excluded.**
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation #43d
IVH grade 3 or 4 or PVL: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 43c
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<29 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed IVH or PVL/expected IVH or PVL
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 43d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #44
Necrotizing enterocolitis (NEC) treatment rates: GA<33 weeks:
Site specific crude rates
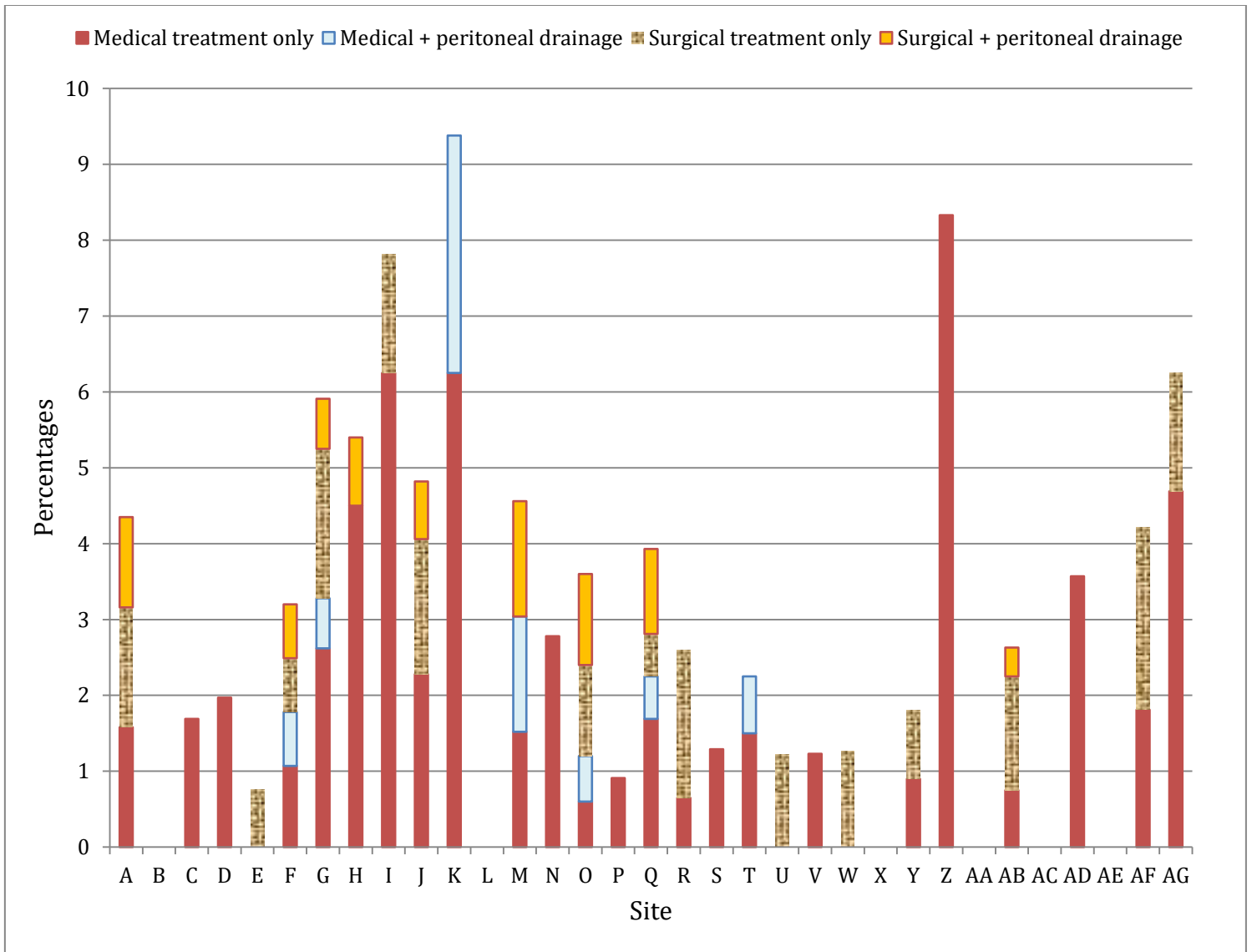
Presentation #44 (continued)
Necrotizing enterocolitis (NEC) treatment rates: GA<33 weeks:
Site specific crude rates

Site	Treatment (%)				
	Medical treatment only	Medical + peritoneal drainage	Laparotomy only	Peritoneal drainage + Laparotomy	Any
A	1.6	0.0	1.6	1.2	4.4
B	0.0	0.0	0.0	0.0	0.0
C	1.7	0.0	0.0	0.0	1.7
D	2.0	0.0	0.0	0.0	2.0
E	0.0	0.0	0.8	0.0	0.8
F	1.1	0.7	0.7	0.7	3.2
G	2.6	0.7	2.0	0.7	5.9
H	4.5	0.0	0.0	0.9	5.4
I	6.3	0.0	1.6	0.0	7.8
J	2.3	0.0	1.8	0.8	4.8
K	6.3	3.1	0.0	0.0	9.4
L	0.0	0.0	0.0	0.0	0.0
M	1.5	1.5	0.0	1.5	4.6
N	2.8	0.0	0.0	0.0	2.8
O	0.6	0.6	1.2	1.2	3.6
P	0.9	0.0	0.0	0.0	0.9
Q	1.7	0.6	0.6	1.1	3.9
R	0.7	0.0	2.0	0.0	2.6
S	1.3	0.0	0.0	0.0	1.3
T	1.5	0.8	0.0	0.0	2.3
U	0.0	0.0	1.2	0.0	1.2
V	1.2	0.0	0.0	0.0	1.2
W	0.0	0.0	1.3	0.0	1.3
X	0.0	0.0	0.0	0.0	0.0
Y	0.9	0.0	0.9	0.0	1.8
Z	8.3	0.0	0.0	0.0	8.3
AA	0.0	0.0	0.0	0.0	0.0
AB	0.8	0.0	1.5	0.4	2.6
AC	0.0	0.0	0.0	0.0	0.0
AD	3.6	0.0	0.0	0.0	3.6
AE	0.0	0.0	0.0	0.0	0.0
AF	1.8	0.0	2.4	0.0	4.2
AG	4.7	0.0	1.6	0.0	6.3
Total	1.8	0.2	1.0	0.4	3.4

COMMENTS: These analyses include 4 103 neonates from 33 sites.

Presentation #45a
Necrotizing enterocolitis (NEC): GA<33 weeks: Adjusted standardized ratios by site

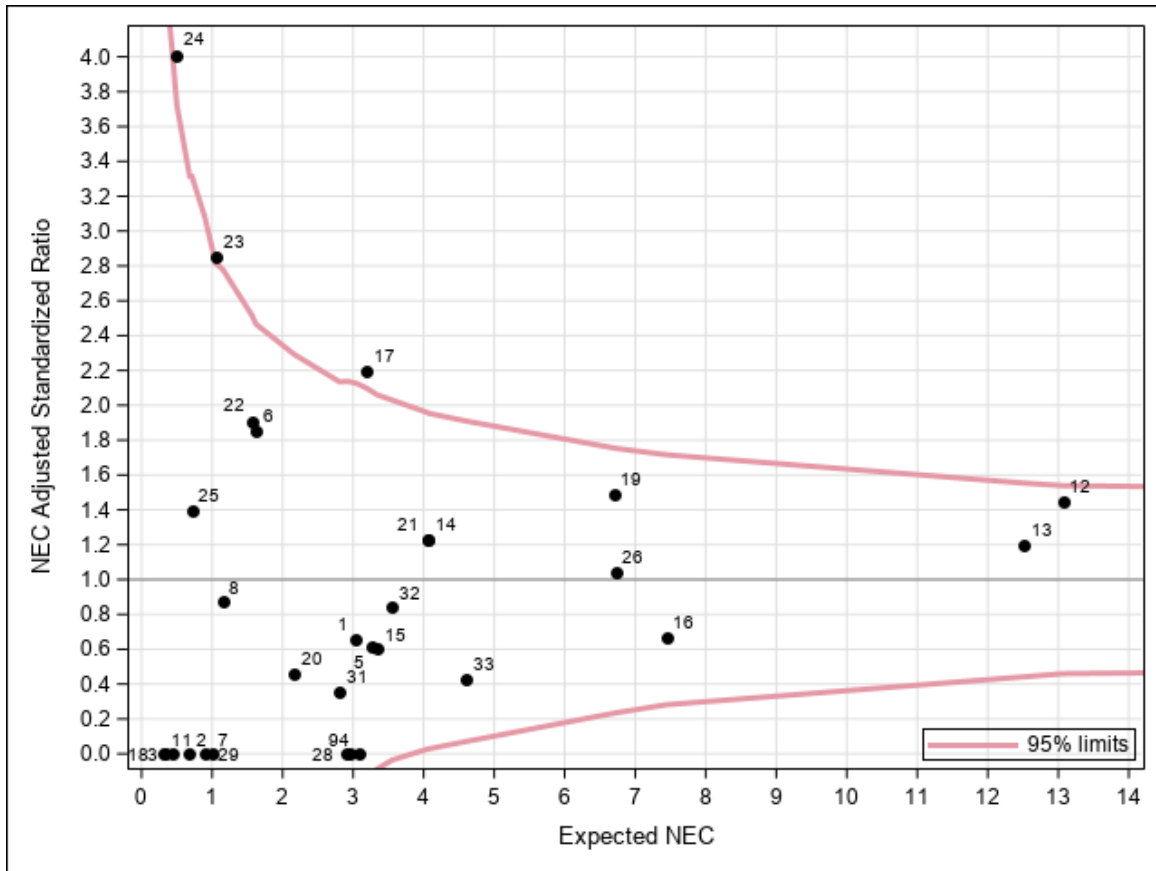| Site	Number of neonates	Number of neonates with NEC	Adjusted[#] expected number of neonates with NEC	Adjusted[#] standardized ratio	95% confidence interval for adjusted standardized ratio	
1	127	5	4.2	1.2	0.4	2.8
2	80	1	1.7	0.6	0.0	3.3
3	32	0	0.8	0.0	.	4.5
4	110	1	4.0	0.2	0.0	1.4
5	170	6	5.1	1.2	0.4	2.6
6	110	6	2.9	2.1	0.8	4.5
7	72	0	1.8	0.0	.	2.0
8	78	1	2.0	0.5	0.0	2.7
9	153	2	4.4	0.5	0.1	1.6
10	8	0	0.2	0.0	.	23.2
11	23	0	0.6	0.0	.	5.9
12	379	19	16.3	1.2	0.7	1.8
13	302	17	14.8	1.2	0.7	1.8
14	161	7	5.5	1.3	0.5	2.6
15	148	3	4.8	0.6	0.1	1.8
16	267	8	9.9	0.8	0.3	1.6
17	123	10	4.4	2.3	1.1	4.2
18	19	0	0.5	0.0	.	7.0
19	245	11	9.3	1.2	0.6	2.1
20	79	1	3.0	0.3	0.0	1.9
21	163	6	5.6	1.1	0.4	2.3
22	64	6	2.2	2.8	1.0	6.0
23	65	3	1.8	1.7	0.3	5.0
24	59	4	1.3	3.1	0.8	8.0
25	36	1	1.1	0.9	0.0	5.1
26	250	7	9.2	0.8	0.3	1.6
27	12	1	0.2	5.4	0.1	30.3
28	129	1	4.3	0.2	0.0	1.3
29	117	2	2.3	0.9	0.1	3.1
31	107	2	3.7	0.5	0.1	1.9
32	147	4	5.0	0.8	0.2	2.1
33	131	3	4.9	0.6	0.1	1.8

Numeric site codes were used in Presentations 45a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies are excluded. [#] Variables adjusted for in the prediction model: GA, SGA, sex, and SNAPII > 20
Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentation #45b
Necrotizing enterocolitis (NEC): GA<33 weeks: Adjusted standardized ratios by site
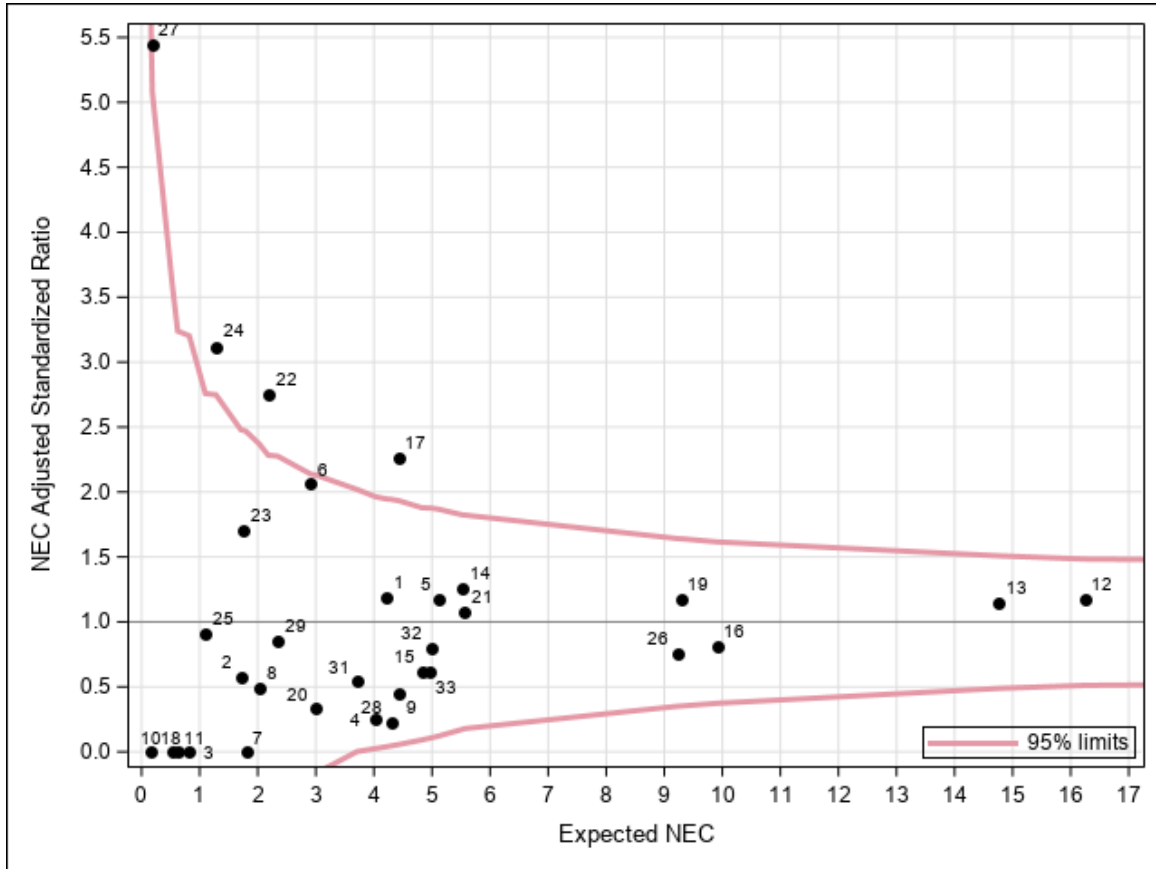
Explanation for Presentation 45a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed NEC/expected NEC
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 45b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #45c
NEC: GA<29 weeks: Adjusted standardized ratios by site

Site	Number of neonates	Number of neonates with NEC	Adjusted# expected number of neonates with NEC	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	40	2	3.0	0.7	0.1	2.4
2	12	0	0.7	0.0	.	5.4
3	7	0	0.4	0.0	.	8.4
4	36	0	3.1	0.0	.	1.2
5	56	2	3.3	0.6	0.1	2.2
6	29	3	1.6	1.9	0.4	5.4
7	19	0	1.0	0.0	.	3.7
8	22	1	1.1	0.9	0.0	4.8
9	51	0	2.9	0.0	.	1.3
11	6	0	0.3	0.0	.	11.2
12	186	19	13.1	1.5	0.9	2.3
13	176	15	12.5	1.2	0.7	2.0
14	63	5	4.1	1.2	0.4	2.9
15	63	2	3.3	0.6	0.1	2.2
16	121	5	7.4	0.7	0.2	1.6
17	50	7	3.2	2.2	0.9	4.5
18	6	0	0.3	0.0	.	11.7
19	92	10	6.7	1.5	0.7	2.7
20	30	1	2.2	0.5	0.0	2.6
21	57	5	4.0	1.2	0.4	2.9
22	24	3	1.6	1.9	0.4	5.6
23	16	3	1.1	2.8	0.6	8.3
24	9	2	0.5	4.0	0.5	14.5
25	14	1	0.7	1.4	0.0	7.8
26	107	7	6.7	1.0	0.4	2.1
28	44	0	2.9	0.0	.	1.2
29	23	0	0.9	0.0	.	4.1
31	41	1	2.8	0.4	0.0	2.0
32	53	3	3.6	0.8	0.2	2.5
33	58	2	4.6	0.4	0.0	1.6

Numeric site codes were used in Presentations 45a-d and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation #45d
NEC: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 45c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed NEC/expected NEC
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 45d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #46
Chronic lung disease (CLD): GA<33 weeks: Site specific crude rates

Site	<25	25-26	27-28	29-30	31-32	Overall CLD rate for sites
			GA at birth			
A	66.7	77.3	46.3	32.4	8.4	32.3
B	100.0	0.0	33.3	11.1	12.5	18.2
C	NA	66.7	41.2	10.8	3.7	13.5
D	66.7	59.1	28.1	8.1	5.9	20.7
E	100.0	82.4	35.3	8.9	7.5	24.0
F	100.0	89.2	54.2	28.8	16.1	43.0
G	67.7	51.0	37.5	18.2	1.7	31.6
H	100.0	87.5	18.2	3.2	10.6	16.3
I	76.9	50.0	15.0	15.2	4.8	22.1
J	96.8	54.1	31.1	16.5	8.5	30.3
K	NA	60.0	75.0	18.8	0.0	22.6
L	100.0	28.6	38.5	12.5	0.0	15.0
M	NA	50.0	0.0	0.0	6.5	6.7
N	0.0	25.0	12.5	11.1	0.0	8.8
O	88.9	81.3	47.6	26.1	3.3	29.6
P	100.0	54.6	18.2	9.7	0.0	16.8
Q	100.0	71.4	60.0	33.3	14.7	35.3
R	83.3	85.7	48.0	43.9	26.7	43.2
S	50.0	69.2	44.0	18.2	3.0	21.5
T	84.6	33.3	33.3	18.8	7.1	26.4
U	90.0	40.0	9.1	4.2	3.9	18.4
V	100.0	60.0	40.0	20.7	12.8	21.5
W	NA	50.0	27.3	4.2	0.0	10.7
X	NA	NA	NA	NA	50.0	50.0
Y	60.0	88.9	50.0	20.8	12.2	31.7
Z	NA	NA	0.0	0.0	14.3	10.0
AA	NA	NA	50.0	0.0	0.0	12.5
AB	80.0	65.6	40.0	22.2	8.1	31.9
AC	NA	66.7	33.3	20.0	0.0	21.1
AD	100.0	100.0	93.3	78.1	68.8	79.0
AE	NA	50.0	0.0	10.0	0.0	6.3
AF	100.0	81.3	58.6	25.8	7.4	33.6
AG	0.0	0.0	20.0	66.7	34.5	43.9
Overall CLD rate for GA group	83.3	65.2	40.2	21.9	11.3	29.6

Total number of neonates = 3 822

286 neonates were excluded due to death prior to week 36 or first admission after week 36

NA = Data not available

Presentation #47a
Chronic lung disease (CLD): GA <33 weeks: Adjusted standardized ratios by site

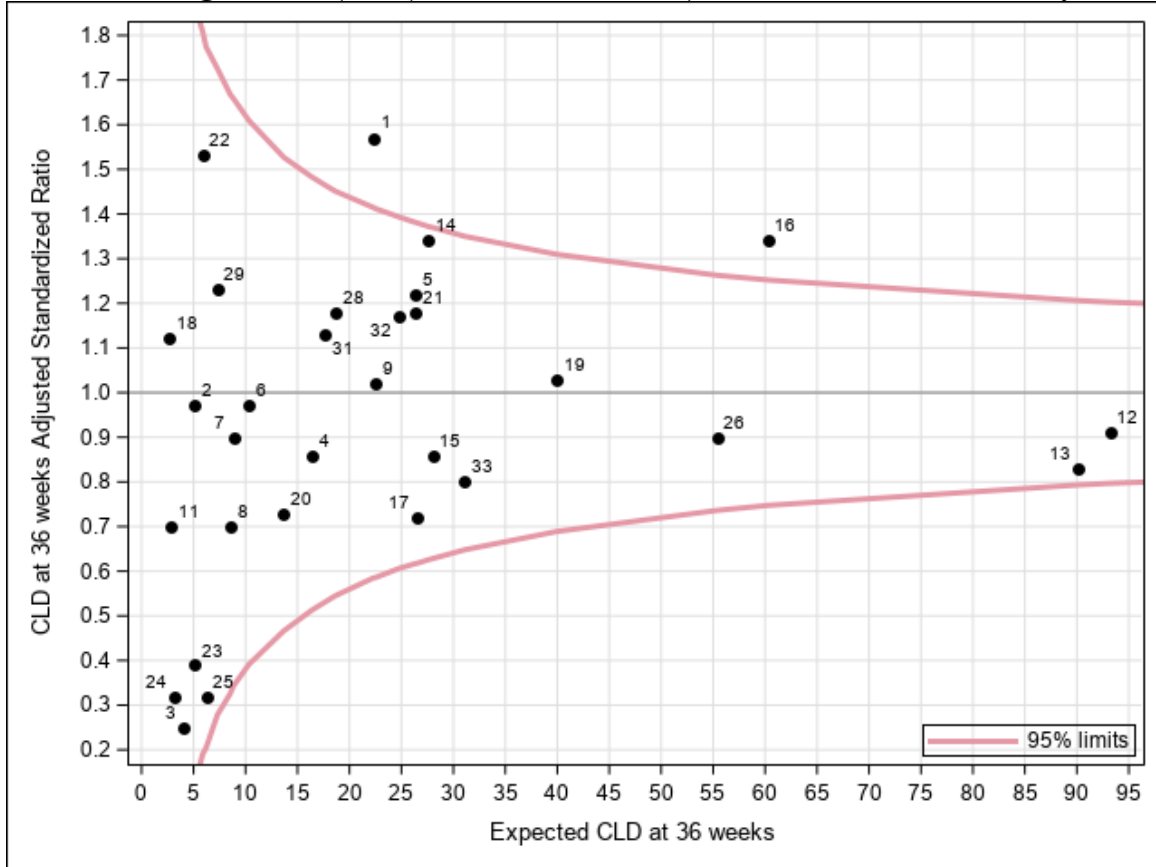| Site	Total number of neonates	Number of neonates with available data	Number of neonates with CLD at 36w or discharge	Adjusted[#] expected number of CLD at 36w or discharge	Adjusted[#] standardized ratio	95% confidence interval for adjusted standardized ratio	
1	127	121	94	33.4	2.8	2.3	3.4
2	80	78	16	14.6	1.1	0.6	1.8
3	32	31	2	7.7	0.3	0.0	0.9
4	110	101	17	27.5	0.6	0.4	1.0
5	170	162	57	43.0	1.3	1.0	1.7
6	110	97	16	21.2	0.8	0.4	1.2
7	72	71	11	16.5	0.7	0.3	1.2
8	78	74	7	16.8	0.4	0.2	0.9
9	153	144	31	35.6	0.9	0.6	1.2
10	8	8	1	1.5	0.7	0.0	3.7
11	23	22	4	5.7	0.7	0.2	1.8
12	379	352	107	125.2	0.9	0.7	1.0
13	302	280	88	110.4	0.8	0.6	1.0
14	161	147	49	40.7	1.2	0.9	1.6
15	148	142	29	40.6	0.7	0.5	1.0
16	267	255	107	81.4	1.3	1.1	1.6
17	123	119	25	37.4	0.7	0.4	1.0
18	19	18	4	4.2	0.9	0.3	2.4
19	245	225	69	64.9	1.1	0.8	1.3
20	79	73	12	21.2	0.6	0.3	1.0
21	163	150	44	40.1	1.1	0.8	1.5
22	64	53	12	11.5	1.0	0.5	1.8
23	65	59	4	12.0	0.3	0.1	0.9
24	59	52	23	10.1	2.3	1.5	3.4
25	36	34	3	9.4	0.3	0.1	0.9
26	250	236	70	79.6	0.9	0.7	1.1
27	12	10	1	1.2	0.8	0.0	4.7
28	129	120	29	31.6	0.9	0.6	1.3
29	117	110	15	19.2	0.8	0.4	1.3
31	107	99	30	26.2	1.1	0.8	1.6
32	148	140	59	37.6	1.6	1.2	2.0
33	135	**127**	34	42.0	0.8	0.6	1.1

Numeric site codes were used in Presentations 47a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies and death before 36 weeks were excluded. [#] The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20. Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentation #47b
Chronic lung disease (CLD): GA <33 weeks: Adjusted standardized ratios by site
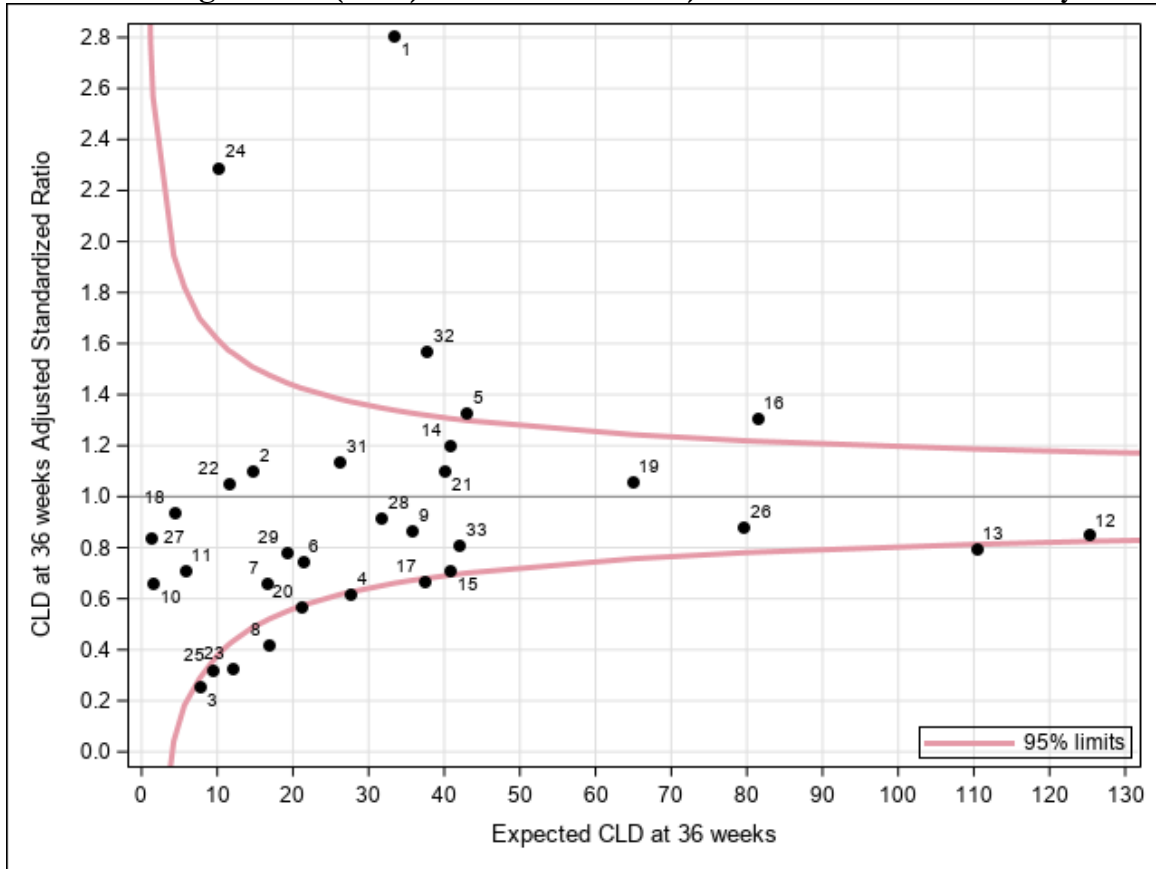
Explanation for Presentation 47a
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<33 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed CLD/expected CLD
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 47b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Note: Deaths before 36 weeks were excluded in the denominator.

Presentation #47c
Chronic lung disease (CLD): GA <29 weeks: Adjusted standardized ratios by site

Site	Total number of neonates	Number of neonates with available data	Number of neonates with CLD at 36w or discharge	Adjusted# expected number of neonates with CLD at 36w or discharge	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	40	36	35	22.3	1.6	1.1	2.2
2	12	10	5	5.1	1.0	0.3	2.3
3	7	6	1	4.0	0.2	0.0	1.4
4	36	28	14	16.4	0.9	0.5	1.4
5	56	48	32	26.3	1.2	0.8	1.7
6	29	20	10	10.3	1.0	0.5	1.8
7	19	18	8	8.8	0.9	0.4	1.8
8	22	18	6	8.5	0.7	0.3	1.5
9	51	44	23	22.5	1.0	0.6	1.5
11	6	5	2	2.9	0.7	0.1	2.5
12	186	162	85	93.2	0.9	0.7	1.1
13	176	156	75	90.2	0.8	0.7	1.0
14	63	52	37	27.6	1.3	0.9	1.8
15	63	57	24	28.0	0.9	0.5	1.3
16	121	112	81	60.3	1.3	1.1	1.7
17	50	46	19	26.5	0.7	0.4	1.1
18	6	5	3	2.7	1.1	0.2	3.3
19	92	72	41	39.9	1.0	0.7	1.4
20	30	24	10	13.7	0.7	0.3	1.3
21	57	45	31	26.3	1.2	0.8	1.7
22	24	13	9	5.9	1.5	0.7	2.9
23	16	11	2	5.1	0.4	0.0	1.4
24	9	7	1	3.1	0.3	0.0	1.8
25	14	13	2	6.2	0.3	0.0	1.2
26	107	95	50	55.4	0.9	0.7	1.2
28	44	36	22	18.6	1.2	0.7	1.8
29	23	20	9	7.3	1.2	0.6	2.3
31	41	34	20	17.7	1.1	0.7	1.8
32	53	45	29	24.8	1.2	0.8	1.7
33	62	55	25	31.1	0.8	0.5	1.2

Numeric site codes were used in Presentations 47a-d and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies and death before 36 weeks were excluded.
#The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation #47d
Chronic lung disease (CLD): GA <29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 47c
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<29 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed CLD/expected CLD
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 47d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Note: Deaths before 36 weeks were excluded in the denominator.

Presentation #48a
Postnatal use of steroids for treatment of CLD: GA<29 weeks: Site specific crude rates†
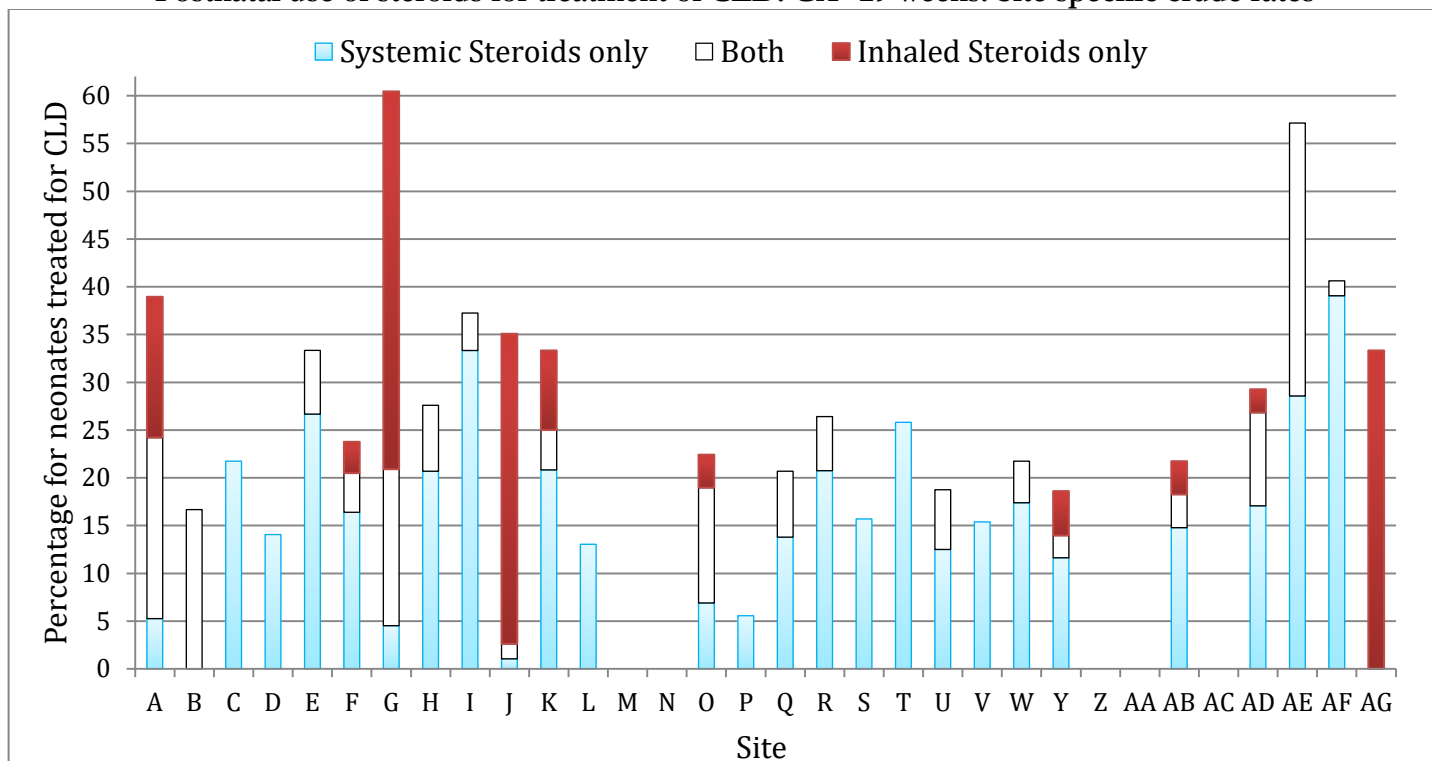
Site	Systemic Steroids only	Both	Inhaled Steroids only
A	5.3	19.0	14.7
B	0.0	16.7	0.0
C	21.7	0.0	0.0
D	14.1	0.0	0.0
E	26.7	6.7	0.0
F	16.4	4.1	3.3
G	4.5	16.4	39.6
H	20.7	6.9	0.0
I	33.3	3.9	0.0
J	1.1	1.6	32.5
K	20.8	4.2	8.3
L	13.0	0.0	0.0
M	0.0	0.0	0.0
N	0.0	0.0	0.0
O	6.9	12.1	3.5
P	5.6	0.0	0.0

Site	Systemic Steroids only	Both	Inhaled Steroids only
Q	13.8	6.9	0.0
R	20.8	5.7	0.0
S	15.7	0.0	0.0
T	25.8	0.0	0.0
U	12.5	6.3	0.0
V	15.4	0.0	0.0
W	17.4	4.4	0.0
Y	11.6	2.3	4.7
Z	0.0	0.0	0.0
AA	0.0	0.0	0.0
AB	14.8	3.5	3.5
AC	0.0	0.0	0.0
AD	17.1	9.8	2.4
AE	28.6	28.6	0.0
AF	39.1	1.6	0.0
AG	0.0	0.0	33.3
Total	13.3	6.0	10.5

Total number of neonates = 1 556

† Percentage of neonates treated for CLD at each network site; results were attributed to the site of first admission; Site X had no neonates with GA<29.

COMMENTS: Specific criteria for these treatments at each site were not documented here.

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Presentation #48b
Systemic steroids for hypotension: GA<33 weeks: Site specific crude rates†
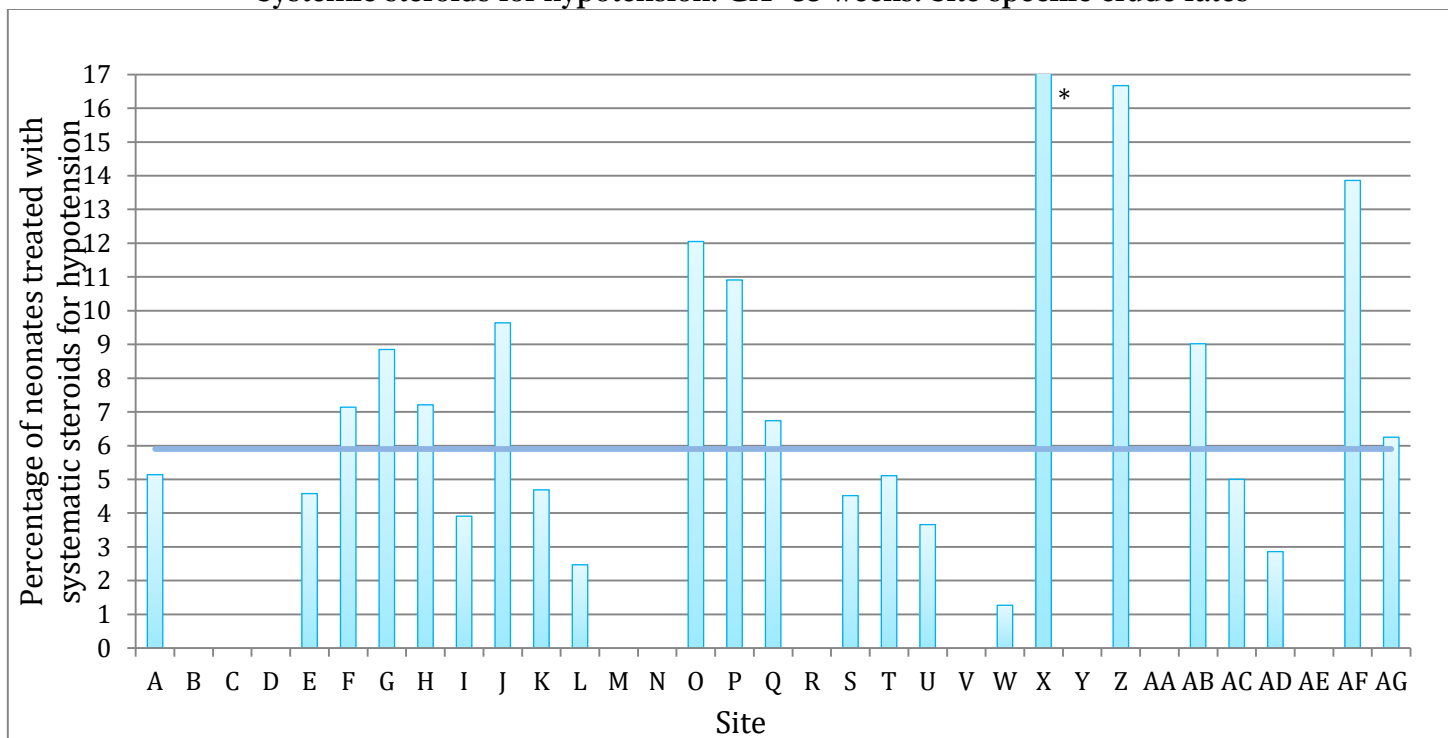
Site	Postnatal systemic steroids use for hypotension (%)	Site	Postnatal systemic steroids use for hypotension (%)
A	5.1	**R**	0.0
B	0.0	**S**	4.5
C	0.0	**T**	5.1
D	0.0	**U**	3.7
E	4.6	**V**	0.0
F	7.1	**W**	1.3
G	8.9	**X**	33.3
H	7.2	**Y**	0.0
I	3.9	**Z**	16.7
J	9.6	**AA**	0.0
K	4.7	**AB**	9.0
L	2.5	**AC**	5.0
M	0.0	**AD**	2.9
N	0.0	**AE**	0.0
O	12.1	**AF**	13.9
P	10.9	**AG**	6.3
Q	6.7	**Total**	5.9

Total number of neonates = 4 108

† Percentage of neonates treated with systemic steroids for hypotension at each network site; results were attributed to the site of first admission. *Site X's rate goes over the range of Y-axis in the plot. Refer to the table for the actual rate of site X.

COMMENTS: Specific criteria for these treatments at each site were not documented here.

Presentation #49a
ROP ≥ Stage 3: GA<33 weeks: Adjusted standardized ratios by site

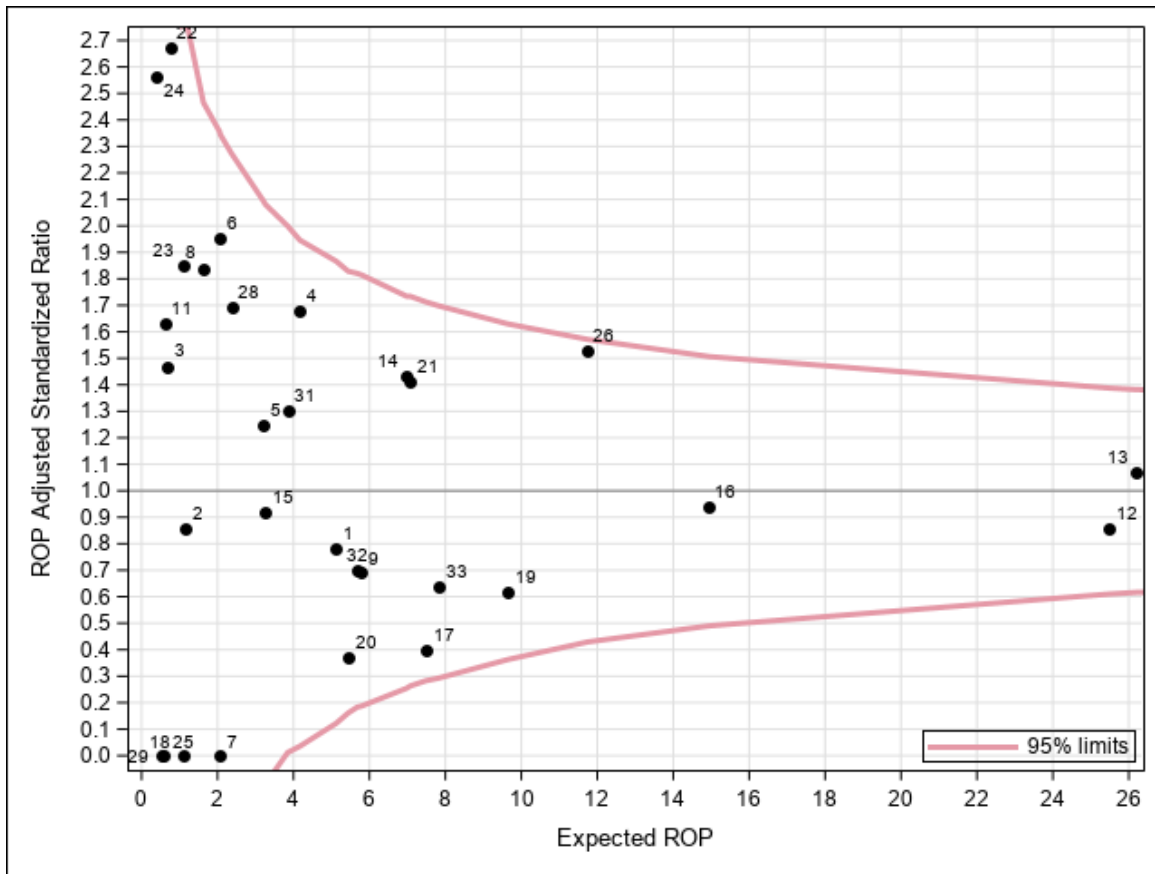| Site	Total number of neonates	Number of neonates with available data	Number of neonates with ROP ≥ Stage 3	Adjusted# expected number of neonates with ROP ≥ Stage 3	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	127	41	4	5.2	0.8	0.2	2.0
2	80	37	1	1.3	0.8	0.0	4.3
3	32	9	1	0.7	1.4	0.0	8.0
4	110	39	8	4.3	1.9	0.8	3.7
5	170	23	4	3.2	1.3	0.3	3.2
6	110	52	4	2.2	1.9	0.5	4.7
7	72	39	0	2.2	0.0	.	1.7
8	78	39	3	1.7	1.7	0.4	5.1
9	153	87	4	6.0	0.7	0.2	1.7
11	23	18	1	0.7	1.5	0.0	8.4
12	379	193	22	25.7	0.9	0.5	1.3
13	302	147	28	26.3	1.1	0.7	1.5
14	161	100	10	7.2	1.4	0.7	2.6
15	148	34	3	3.2	0.9	0.2	2.7
16	267	96	14	15.0	0.9	0.5	1.6
17	123	84	3	7.7	0.4	0.1	1.1
18	19	14	0	0.5	0.0	.	7.0
19	245	85	6	9.9	0.6	0.2	1.3
20	79	44	2	5.6	0.4	0.0	1.3
21	163	86	10	7.2	1.4	0.7	2.5
22	64	29	2	0.8	2.4	0.3	8.7
23	65	33	2	1.2	1.7	0.2	6.1
24	59	6	1	0.4	2.5	0.0	13.8
25	36	24	0	1.2	0.0	.	3.2
26	250	87	19	11.9	1.6	1.0	2.5
28	129	17	4	2.4	1.7	0.5	4.3
29	117	54	1	0.7	1.4	0.0	7.6
31	107	59	5	3.9	1.3	0.4	3.0
32	148	78	4	5.8	0.7	0.2	1.8
33	135	69	5	7.9	0.6	0.2	1.5

Numeric site codes were used in Presentations 49a-d and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Site 10, 27, 30 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #49b
ROP ≥ Stage 3: GA<33 weeks: Adjusted standardized ratios by site
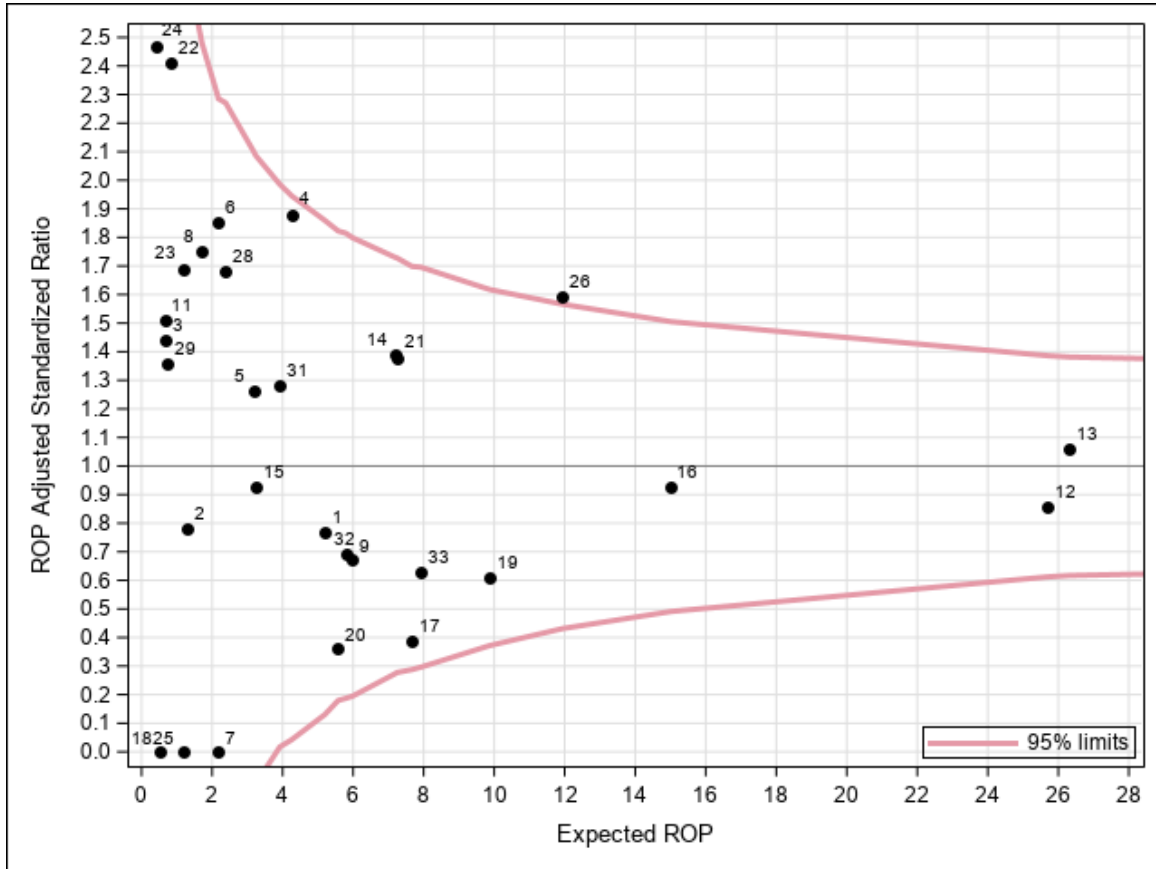
Explanation for Presentation 49a
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<33 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed ROP/expected ROP
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 49b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation# 49c
ROP ≥ Stage 3: GA<29 weeks: Adjusted standardized ratios by site

Site	Total number of neonates	Number of neonates with available data	Number of neonates with ROP≥ Stage 3	Adjusted# expected number of neonates with ROP≥ Stage 3	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	40	29	4	5.1	0.8	0.2	2.0
2	12	10	1	1.2	0.9	0.0	4.8
3	7	5	1	0.7	1.5	0.0	8.2
4	36	24	7	4.2	1.7	0.7	3.5
5	56	18	4	3.2	1.3	0.3	3.2
6	29	20	4	2.1	2.0	0.5	5.0
7	19	18	0	2.1	0.0	.	1.8
8	22	17	3	1.6	1.8	0.4	5.4
9	51	44	4	5.8	0.7	0.2	1.8
11	6	5	1	0.6	1.6	0.0	9.1
12	186	149	22	25.5	0.9	0.5	1.3
13	176	133	28	26.2	1.1	0.7	1.5
14	63	51	10	7.0	1.4	0.7	2.6
15	63	30	3	3.3	0.9	0.2	2.7
16	121	81	14	15.0	0.9	0.5	1.6
17	50	45	3	7.5	0.4	0.1	1.2
18	6	5	0	0.5	0.0	.	7.2
19	92	60	6	9.6	0.6	0.2	1.4
20	30	23	2	5.4	0.4	0.0	1.3
21	57	45	10	7.1	1.4	0.7	2.6
22	24	11	2	0.7	2.7	0.3	9.6
23	16	12	2	1.1	1.8	0.2	6.7
24	9	2	1	0.4	2.6	0.0	14.3
25	14	12	0	1.1	0.0	.	3.3
26	107	61	18	11.7	1.5	0.9	2.4
28	44	13	4	2.4	1.7	0.5	4.3
29	23	19	0	0.6	0.0	.	6.2
31	41	33	5	3.8	1.3	0.4	3.0
32	53	36	4	5.7	0.7	0.2	1.8
32	62	52	5	7.8	0.6	0.2	1.5

Numeric site codes were used in Presentations 49a-d and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation #49d
ROP ≥ Stage 3: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 49c
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<29 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates with outcome of interest among those eligible neonates
Column 5: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 6: Adjusted standardized ratio calculated based on observed ROP/expected ROP
Columns 7 and 8: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 49d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #50a
Mortality or major morbidity: GA < 33 weeks: Adjusted standardized ratios by site

Site	Number of neonates	Number of neonates with mortality or major morbidities	Adjusted# expected number of neonates with mortality or major morbidities	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	127	101	44.3	2.3	1.9	2.8
2	80	26	19.8	1.3	0.9	1.9
3	32	4	10.1	0.4	0.1	1.0
4	110	31	41.4	0.7	0.5	1.1
5	170	77	60.3	1.3	1.0	1.6
6	110	34	34.0	1.0	0.7	1.4
7	72	13	21.1	0.6	0.3	1.1
8	78	14	24.0	0.6	0.3	1.0
9	153	47	50.4	0.9	0.7	1.2
10	8	3	1.9	1.5	0.3	4.5
11	23	6	7.4	0.8	0.3	1.8
12	379	149	174.3	0.9	0.7	1.0
13	302	125	151.8	0.8	0.7	1.0
14	161	64	60.2	1.1	0.8	1.4
15	148	45	55.1	0.8	0.6	1.1
16	267	127	108.6	1.2	1.0	1.4
17	123	42	48.8	0.9	0.6	1.2
18	19	6	6.1	1.0	0.4	2.1
19	245	100	97.9	1.0	0.8	1.2
20	79	19	30.9	0.6	0.4	1.0
21	163	60	58.2	1.0	0.8	1.3
22	64	26	23.2	1.1	0.7	1.6
23	65	12	20.0	0.6	0.3	1.0
24	59	31	15.0	2.1	1.4	2.9
25	36	7	12.8	0.5	0.2	1.1
26	250	103	108.5	0.9	0.8	1.2
27	12	4	2.3	1.8	0.5	4.5
28	129	46	46.8	1.0	0.7	1.3
29	117	23	28.0	0.8	0.5	1.2
31	107	43	39.3	1.1	0.8	1.5
32	148	73	53.1	1.4	1.1	1.7
33	135	52	57.7	0.9	0.7	1.2

Major morbidity = IVH 3 or 4 or PVL or BPD or ROP >stage 2 or NEC or nosocomial sepsis
**Numeric site codes were used in Presentations 50a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies were excluded.** # The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Site 30 was not included in this analysis due to small number of eligible neonates in this category.

Presentation #50b
Mortality or major morbidity: GA < 33 weeks: Adjusted standardized ratios by site
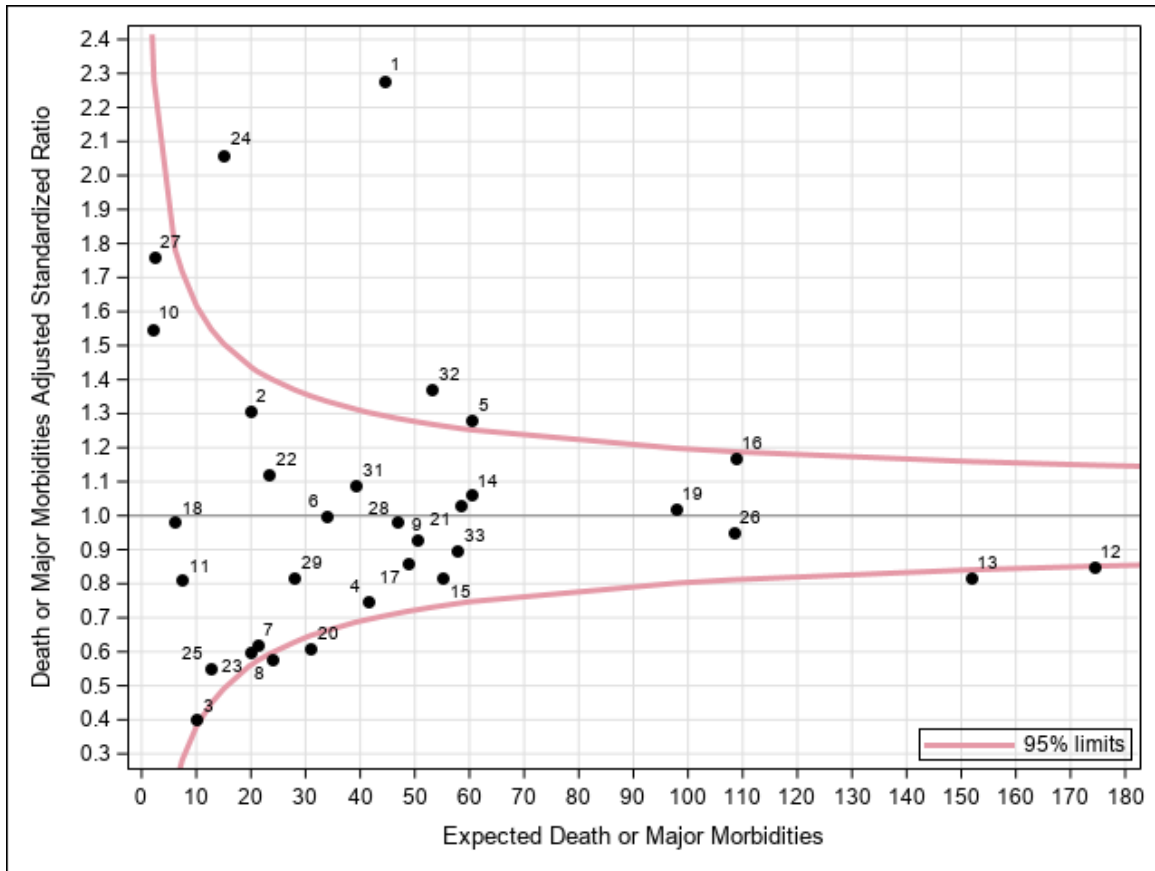
Explanation for Presentation 50a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, small for gestational age, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed death or morbidities/expected deaths or morbidities
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 50b
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #50c
**Mortality or major morbidity: GA < 29 weeks: Adjusted standardized ratios by site**

Site	Number of neonates	Number of neonates with mortality or major morbidities	Adjusted# expected number of neonates with mortality or major morbidities	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	40	39	29.3	1.3	0.9	1.8
2	12	8	7.9	1.0	0.4	2.0
3	7	3	5.4	0.6	0.1	1.6
4	36	24	26.8	0.9	0.6	1.3
5	56	48	38.9	1.2	0.9	1.6
6	29	21	19.3	1.1	0.7	1.7
7	19	10	10.9	0.9	0.4	1.7
8	22	12	13.3	0.9	0.5	1.6
9	51	32	32.7	1.0	0.7	1.4
11	6	3	3.9	0.8	0.2	2.3
12	186	121	131.3	0.9	0.8	1.1
13	176	107	124.1	0.9	0.7	1.0
14	63	49	42.2	1.2	0.9	1.5
15	63	37	38.3	1.0	0.7	1.3
16	121	93	79.2	1.2	0.9	1.4
17	50	31	34.6	0.9	0.6	1.3
18	6	5	4.1	1.2	0.4	2.8
19	92	65	65.5	1.0	0.8	1.3
20	30	16	21.2	0.8	0.4	1.2
21	57	44	40.4	1.1	0.8	1.5
22	24	21	16.5	1.3	0.8	2.0
23	16	9	10.8	0.8	0.4	1.6
24	9	5	5.4	0.9	0.3	2.1
25	14	5	8.4	0.6	0.2	1.4
26	107	76	75.5	1.0	0.8	1.3
28	44	34	29.7	1.1	0.8	1.6
29	23	12	11.5	1.0	0.5	1.8
31	41	29	27.6	1.1	0.7	1.5
32	53	38	36.7	1.0	0.7	1.4
33	62	37	43.4	0.9	0.6	1.2

Major morbidity = IVH 3 or 4 or PVL or BPD or ROP >stage 2 or NEC or nosocomial sepsis
Numeric site codes were used in Presentations 50a-d and they may not correspond to other presentations in this report.
Neonates with major congenital anomalies were excluded.
#The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Sites 10, 27, 30 were excluded from the analysis due to the small number of eligible neonates.

Presentation #50d
Mortality or major morbidity: GA < 29 weeks: Adjusted standardized ratios by site
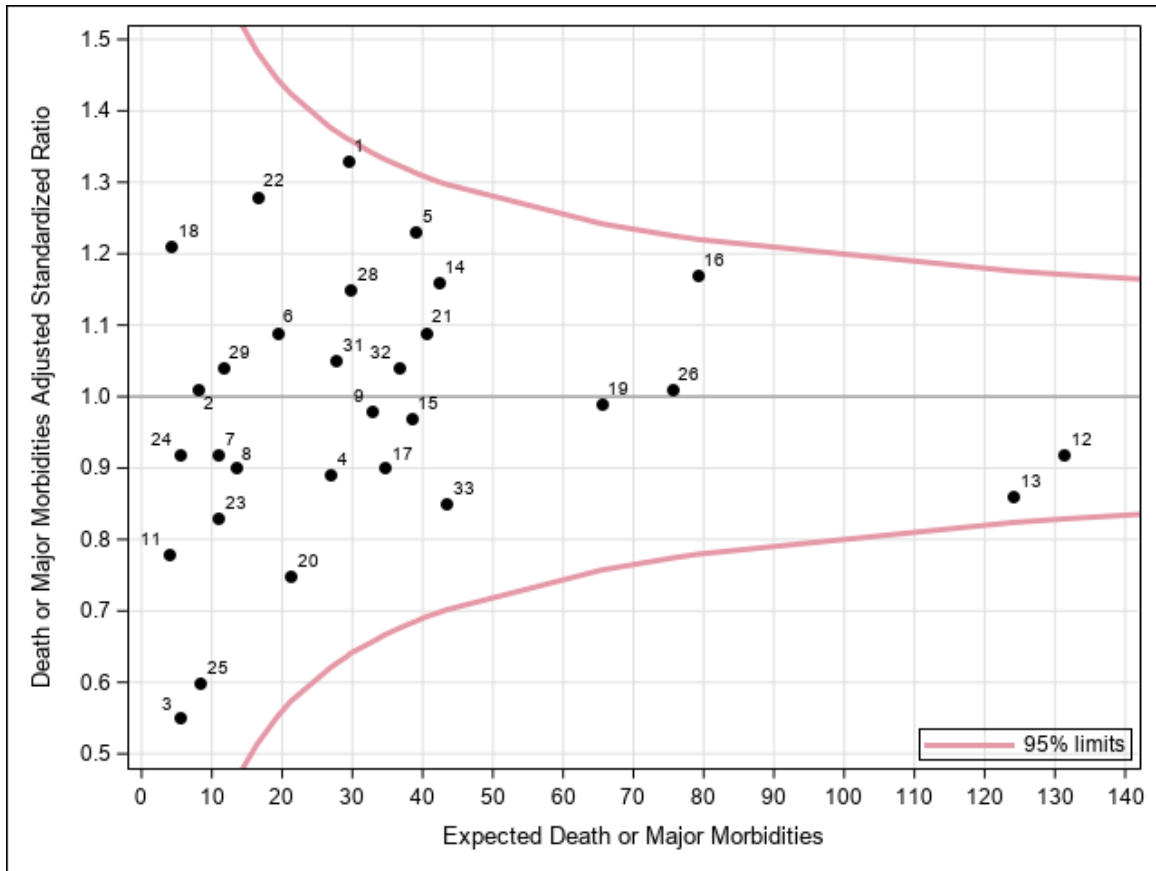
Explanation for Presentation 50c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, sex, and SNAPII > 20
Column 5: Adjusted standardized ratio calculated based on observed death or morbidities/expected deaths or morbidities
Columns 6 and 7: 95% CI around the adjusted standardized ratio for the outcome

Explanation for Presentation 50d
X-axis: Expected number of neonates with outcome (value from Column 4 of previous presentation)
Y-axis: Adjusted standardized ratio (value from Column 5 of previous presentation)
Dark points with numerical notation: Site and its location matching x and y axis values
Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

F. Discharge Disposition and Status

Presentation #51a

Final discharge destination: All GA: Crude rates

		GA (completed weeks)								
		< 25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	Total
Home	N	109	219	300	455	599	924	1245	3524	7375
	%	32.0	43.7	42.1	42.0	40.8	49.1	55.5	58.4	51.7
Community hospital	N	43	163	314	525	753	673	506	700	3677
	%	12.6	32.5	44.1	48.4	51.3	35.8	22.5	11.6	25.8
Tertiary hospital	N	25	13	12	10	5	24	36	197	322
	%	7.3	2.6	1.7	0.9	0.3	1.3	1.6	3.3	2.3
Died	N	131	63	42	30	18	19	38	85	426
	%	38.4	12.6	5.9	2.8	1.2	1.0	1.7	1.4	3.0
Palliative care (home/other institute)	N	0	1	1	1	2	0	2	18	25
	%	0.0	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.2
Another inpatient area in site	N	33	41	42	63	91	239	418	1511	2438
	%	9.7	8.2	5.9	5.8	6.2	12.7	18.6	25.0	17.1
Out of country discharge	N	0	1	1	0	0	2	0	2	6
	%	0.0	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Total neonates included	N	341	501	712	1084	1468	1881	2245	6037	14269
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Discharge destination missing	N									2
GA missing	N									0
Total number of neonates	N									14271

Presentation #51b

Final discharge destination by site: GA<33

Discharge destination for neonates with GA<33
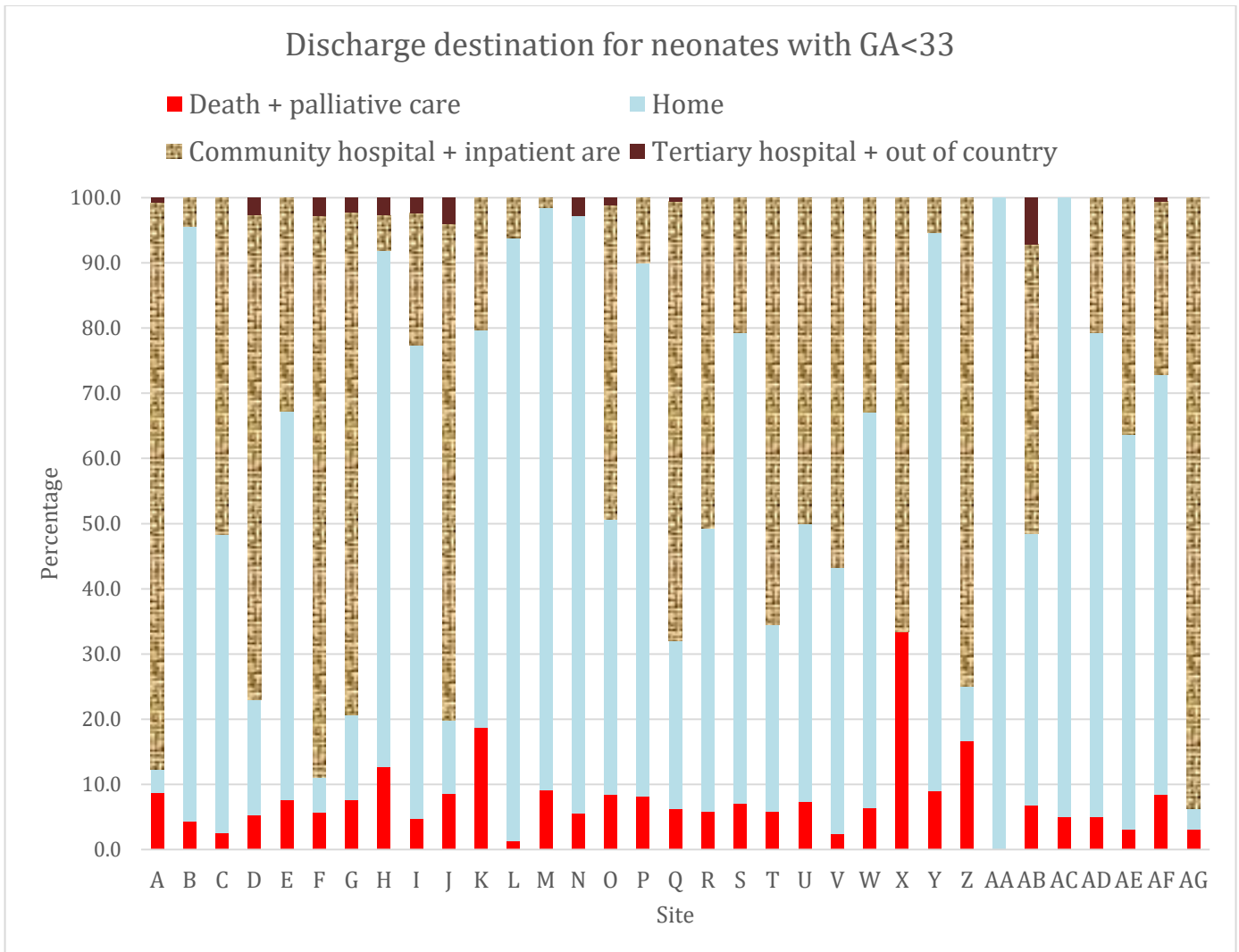
Presentation #51b (continued)

Final discharge destination by site: GA<33

Site	Discharge destination			
	Death + Palliative care	Home	Community hospital + inpatient area	Tertiary hospital + Out of country
A	8.7	3.6	87.0	0.8
B	4.4	91.3	4.4	0.0
C	2.5	45.8	51.7	0.0
D	5.3	17.8	74.3	2.6
E	7.6	59.5	32.8	0.0
F	5.7	5.4	86.1	2.9
G	7.5	13.1	77.1	2.3
H	12.6	79.3	5.4	2.7
I	4.7	72.7	20.3	2.3
J	8.6	11.2	76.1	4.1
K	18.8	60.9	20.3	0.0
L	1.2	92.6	6.2	0.0
M	9.1	89.4	1.5	0.0
N	5.6	91.7	0.0	2.8
O	8.4	42.2	48.2	1.2
P	8.2	81.8	10.0	0.0
Q	6.2	25.8	67.4	0.6
R	5.8	43.5	50.7	0.0
S	7.1	72.3	20.7	0.0
T	5.9	28.7	65.4	0.0
U	7.3	42.7	50.0	0.0
V	2.5	40.7	56.8	0.0
W	6.3	60.8	32.9	0.0
X	33.3	0.0	66.7	0.0
Y	9.0	85.6	5.4	0.0
Z	16.7	8.3	75.0	0.0
AA	0.0	100.0	0.0	0.0
AB	6.8	41.7	44.4	7.1
AC	5.0	95.0	0.0	0.0
AD	5.0	74.3	20.7	0.0
AE	3.0	60.6	36.4	0.0
AF	8.4	64.5	26.5	0.6
AG	3.1	3.1	93.8	0.0
Total %	**7.0**	**41.0**	**50.4**	**1.6**
Total N	**289**	**1682**	**2068**	**289**

Presentation #52

Support at discharge: Neonates who were discharged directly home: Crude rates

		GA (completed weeks)								
		< 25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	Total
Total available	N	343	501	712	1084	1468	1881	2245	60371	14271
Number of neonates who survived and were discharged home directly from the NICU	**N**	**109**	**219**	**300**	**455**	**599**	**924**	**1245**	**3524**	**7375**
Oxygen	N	36	50	43	20	21	28	34	101	333
	%	33.0	22.8	14.3	4.4	3.5	3.0	2.7	2.9	4.5
Monitor	N	11	20	16	23	16	31	43	174	334
	%	10.1	9.1	5.3	5.1	2.7	3.4	3.5	4.9	4.5
Enterostomy	N	0	0	2	1	1	1	2	7	14
	%	0.0	0.0	0.7	0.2	0.2	0.1	0.2	0.2	0.2
Gavage	N	12	25	15	13	9	13	11	57	155
	%	11.0	11.4	5.0	2.9	1.5	1.4	0.9	1.6	2.1
Tracheostomy	N	1	0	0	0	0	1	0	1	3
	%	0.9	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Gastrostomy	N	6	4	5	4	3	11	7	14	54
	%	5.5	1.8	1.7	0.9	0.5	1.2	0.6	0.4	0.7
Ventilation	N	0	0	2	0	0	1	0	1	4
	%	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0	0.1
CPAP	N	3	1	1	1	1	0	0	2	9
	%	2.8	0.5	0.3	0.2	0.2	0.0	0.0	0.1	0.1
Feeding status at discharge directly home										
Breast milk only	N	27	69	106	171	188	343	399	1078	2381
	%	24.8	31.5	35.3	37.6	31.4	37.1	32.1	30.6	32.3
Formula only	N	48	83	101	156	183	229	323	686	1809
	%	44.0	37.9	33.7	34.3	30.6	24.8	25.9	19.5	24.5
Both breast milk and formula	N	31	67	90	122	220	344	517	1740	3131
	%	28.4	30.6	30.0	26.8	36.7	37.2	41.5	49.4	42.5

Note: In this presentation, denominators were based on the number of neonates who survived and were discharged directly home.

G. Hypoxic Ischemic Encephalopathy

Presentation #53

Hypoxic Ischemic Encephalopathy

A. **Sarnat staging at the time of admission and receipt of hypothermia**

		Sarnat's staging of HIE on admission				
		Stage 1	Stage 2	Stage 3	Unknown stage	Total
Hypothermia treatment	**Yes**	80	266	81	33	460
	No	87	34	16	49	186
	Unknown	4	5	0	1	10
	Total	**171**	**305**	**97**	**83**	**656**

B. **Reason for not receiving hypothermia treatment***

Reason	Number
Chromosomal anomalies	4
Major congenital anomalies	3
Weight < 2000g or GA < 35 weeks	30
Extreme condition	10
Head trauma or intracranial hemorrhage	0
Mild HIE	94
Unit policy	20
Health care team preference	3
Delayed transfer	22
Parental request	0
Unknown	25

*One neonate can have more than one reasons.

C. **Time of admission**

Time	Number
<6 hours from birth	412
6 – 12 hours from birth	158
>12 hours from birth	84
Total**	654

**2 neonates are missing either time of birth or time of admission.

Presentation #53 (continued)

Hypoxic Ischemic Encephalopathy
D. Characteristics of neonates who received hypothermia (N=460)

Characteristics	N		Results
Method	460	Selective head	0 (0%)
		Whole body cooling	460 (100%)
Target temperature	460	< 33^{0}C	1 (0%)
		33-34^{0}C	296 (64%)
		33.5-34.5^{0}C	73 (16%)
		34-35^{0}C	2 (0%)
		34.5-35.5^{0}C	1 (0%)
		Unknown	87 (19%)
Seizures at initiation	460		99 (22%)
Seizures at completion	460		0 (0%)
GA < 33 weeks	460		0 (0%)
Birthweight < 2000g	460		3 (1%)
During hypothermia	439	Hypotension	139 (32%)
	431	Thrombocytopenia	82 (19%)
	437	Coagulopathy	129 (30%)
	419	Persistent metabolic acidosis	57 (14%)
Death	460		45 (10%)
Discharge on palliation	460		9 (2%)

E. Encephalopathy stage in relation to hypothermia treatment

Encephalopathy stage*		At the end of hypothermia					
		Stage 1	**Stage 2**	**Stage 3**	**Unknown**	**Normal**	**Total**
At the start of hypothermia	**Stage 1**	23	3	1	15	43	85
	Stage 2	53	71	7	58	74	263
	Stage 3	4	6	45	15	6	76
	Unknown	2	2	2	14	16	36
	Total	82	82	55	102	139	460

*The numbers may be different from table A because table E presents encephalopathy staging at the start and end of hypothermia, whereas table A presents encephalopathy staging at the first assessment.

Presentation #53 (continued)
Hypoxic Ischemic Encephalopathy
For neonates* who received hypothermia (N=460)

Characteristics		N	Mean (h)	SD (h)	Min (h)	1st Q (h)	Median (h)	3rd Q (h)	Max (h)	Outside of recommendation	Time taken to achieve target
Timing of hypothermia (in hours)	**Initiation**	455	5.1	4.2	0.0	2.8	4.6	6.4	40.2	After 6 hours 135 (30%)	
	Age at re-warming	457	72.5	18.4	4.4	74.5	76.6	78.4	127.2	After 78 hours 133 (29%)	Re-warming started >72 hours after initiation 133 (29%)
Temperature during hypothermia	**Lowest temp during hypothermia**	367	32.8	0.7	27.6	32.6	33.0	33.2	35.9	Lowest temp < 32.5C 160 (44%)	
	Highest temp during hypothermia	366	34.1	0.7	32.4	33.7	33.9	34.1	37.2	Highest temp > 35.5C 20 (5%)	

*Neonates with time of initiation > 72 hours were excluded.

**All timings were calculated from time of birth in hours of age.

H. Trend Analyses over last 11 years

This section includes trend analyses of specific outcomes from the last 11 years (2010-20) for neonates <33 weeks' GA in CNN sites. The following table describes the number of neonates in the respective GA categories that were included in these trend analyses. Delivery room deaths were excluded.

Number of neonates by admission year and GA

Year	Number of Sites	GA											Total
		<23	23	24	25	26	27	28	29	30	31	32	
2010	27	9	73	172	270	333	388	371	480	611	678	788	4173
2011	30	15	86	166	242	318	332	391	467	553	643	828	4041
2012	30	28	85	184	285	294	348	416	510	610	738	872	4370
2013	29	16	76	197	247	267	357	434	479	620	733	836	4262
2014	31	8	81	226	250	332	362	412	517	585	743	871	4387
2015	30	14	99	177	248	289	317	425	470	536	662	793	4030
2016	30	16	79	214	275	272	380	431	437	551	722	861	4238
2017	31	16	133	215	257	294	325	434	467	606	743	868	4358
2018	32	25	132	215	271	334	380	424	518	576	744	863	4482
2019	32	25	118	217	279	297	342	440	470	613	740	905	4446
2020	33	15	127	201	236	265	310	402	491	593	634	834	4108

Number of neonates by admission year and birth weight

Year	Number of Sites	Birth weight					Total
		< 500	500 - 749	750 - 999	1000 – 1249	1250 – 1499	
2010	27	32	436	792	819	879	2958
2011	30	31	383	660	680	794	2548
2012	30	48	441	696	815	922	2922
2013	29	36	428	651	842	919	2876
2014	31	36	458	760	804	922	2980
2015	30	40	406	680	792	864	2782
2016	30	40	472	710	744	901	2867
2017	31	38	478	678	806	920	2920
2018	32	55	508	739	807	977	3086
2019	32	50	482	685	802	937	2956
2020	33	43	436	668	731	878	2756

1. Neonates in the participating sites: Admission status:

Year	Number of Sites	All neonates			Infants with GA<33 weeks		
		Total Number of Neonates*	Inborn (%)	Outborn (%)	Number of Neonates* with GA<33	Inborn (%)	Outborn (%)
2010	27	13 147	10 662 (81.1%)	2 485 (18.9%)	3 383	2 824 (83.5%)	559 (16.5%)
2011	30	13 548	10 972 (81.0%)	2 576 (19.0%)	4 040	3 460 (85.6%)	580 (14.4%)
2012	30	14 222	11 475 (80.7%)	2 747 (19.3%)	4 370	3 663 (83.8%)	707 (16.2%)
2013	29	14 489	11 487 (79.2%)	3 002 (20.7%)	4 262	3 624 (85.0%)	638 (15.0%)
2014	31	14 038	11 473 (76.3%)	3 565 (23.7%)	4 383	3658 (83.5%)	725 (16.5%)
2015	30	14 814	11 583 (78.2%)	3 231 (21.8%)	4 030	3 459 (85.8%)	571 (14.2%)
2016	30	14 905	11 388 (76.4%)	3 517 (23.6%)	4 238	3 585 (84.6%)	653 (15.4%)
2017	31	14 773	11 320 (76.6%)	3 453 (23.4%)	4 358	3 685 (84.6%)	673 (15.4%)
2018	32	15 479	12 134 (78.4%)	3 345 (21.6%)	4 481	3 836 (85.6%)	645 (14.4%)
2019	32	14 868	11 750 (79.0%)	3 118 (21.0%)	4 446	3 856 (86.7%)	590 (13.3%)
2020	33	14 271	11 091 (77.7%)	3 180 (22.3%)	4 108	3 564 (86.8%)	544 (13.2%)

*total number of neonates excluding those who are missing admission status
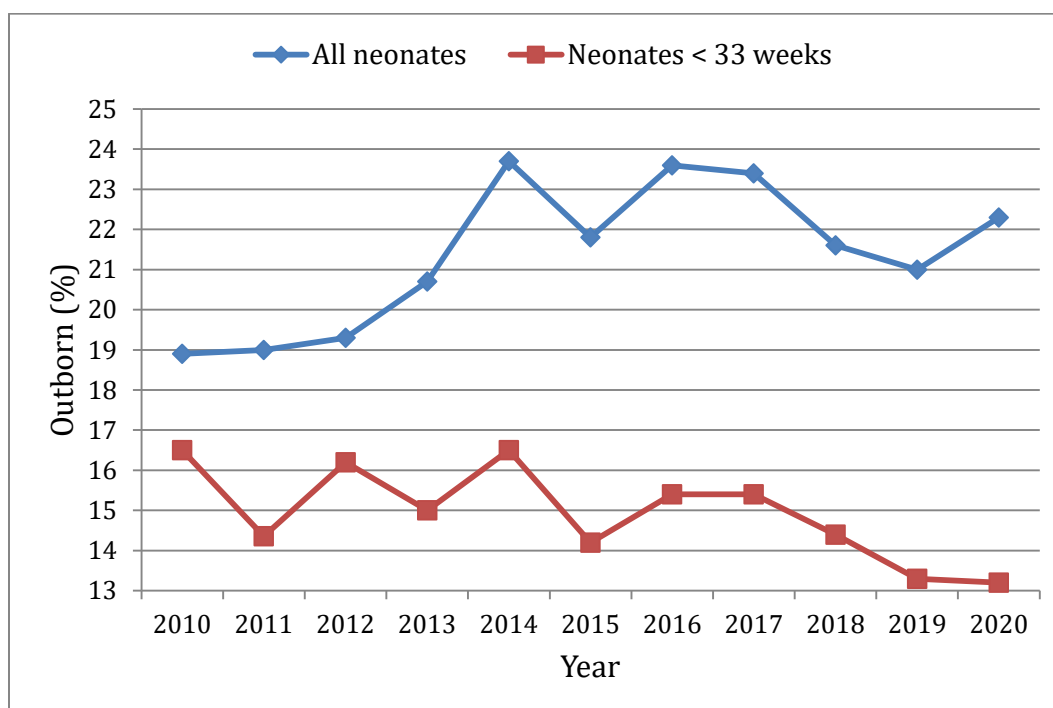
2. Multiple births
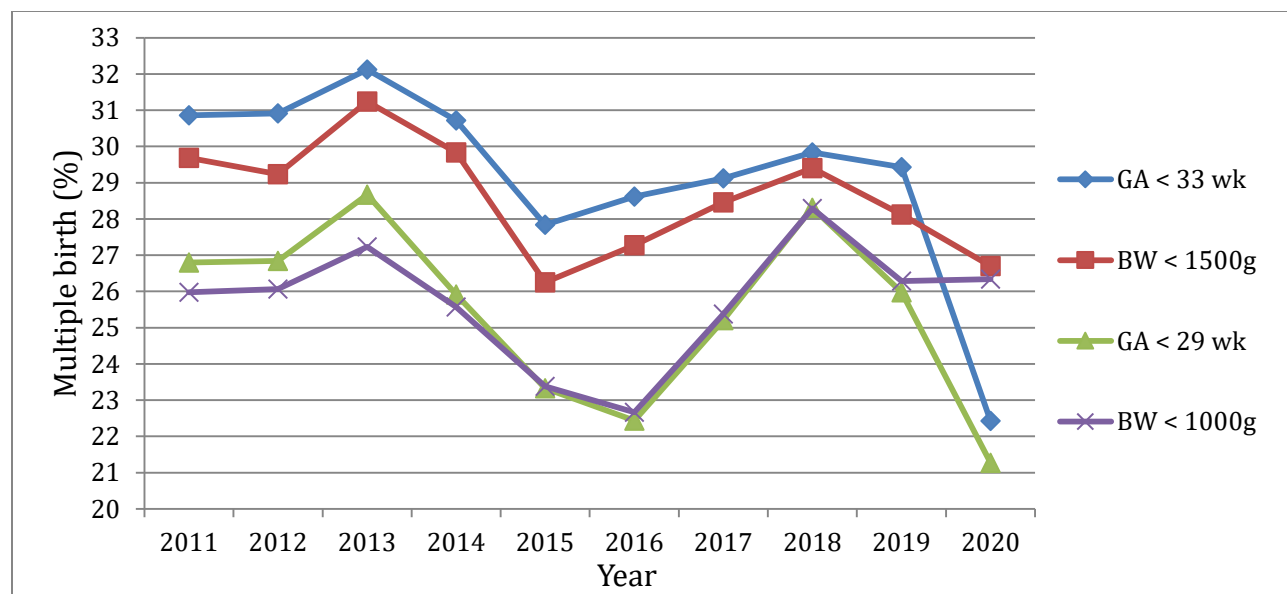
		2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
GA < 29 weeks	Total	1639	1594	1671	1569	1667	1674	1780	1717	1556
	Multiple	437 (27%)	460 (29%)	441 (26%)	366 (23%)	374 (22%)	422 (25%)	504 (28%)	446 (26%)	349 (22%)
	Twin	397	398	415	321	345	375	466	415	316
	Higher-Order	40	62	26	45	29	47	38	31	33
GA < 33 weeks	Total	4369	4262	4387	4030	4238	4358	4481	4445	4108
	Multiple	1352 (31%)	1380 (32%)	1356 (31%)	1122 (28%)	1213 (29%)	1269 (29%)	1337 (30%)	1308 (29%)	1097 (27%)
	Twin	1175	1193	1229	996	1094	1156	1202	1191	1000
	Higher-Order	177	187	127	126	119	113	135	117	97
BW < 1000g	Total	1184	1115	1254	1126	1222	1194	1301	1217	1147
	Multiple	305 (26%)	306 (27%)	329 (26%)	264 (23%)	277 (23%)	303 (25%)	368 (28%)	320 (26%)	244 (21%)
	Twin	273	259	306	236	260	269	338	295	218
	Higher-Order	32	47	23	28	17	34	30	25	26
BW < 1500g	Total	2921	2876	2980	2782	2867	2920	3085	2955	2756
	Multiple	851 (29%)	905 (31%)	900 (30%)	731 (26%)	782 (27%)	831 (28%)	907 (29%)	831 (28%)	726 (26%)
	Twin	736	769	802	634	703	747	812	757	656
	Higher-Order	115	136	98	97	79	84	95	74	70

3. Proportion of neonates who received active care out of all (including delivery room (DR) deaths)
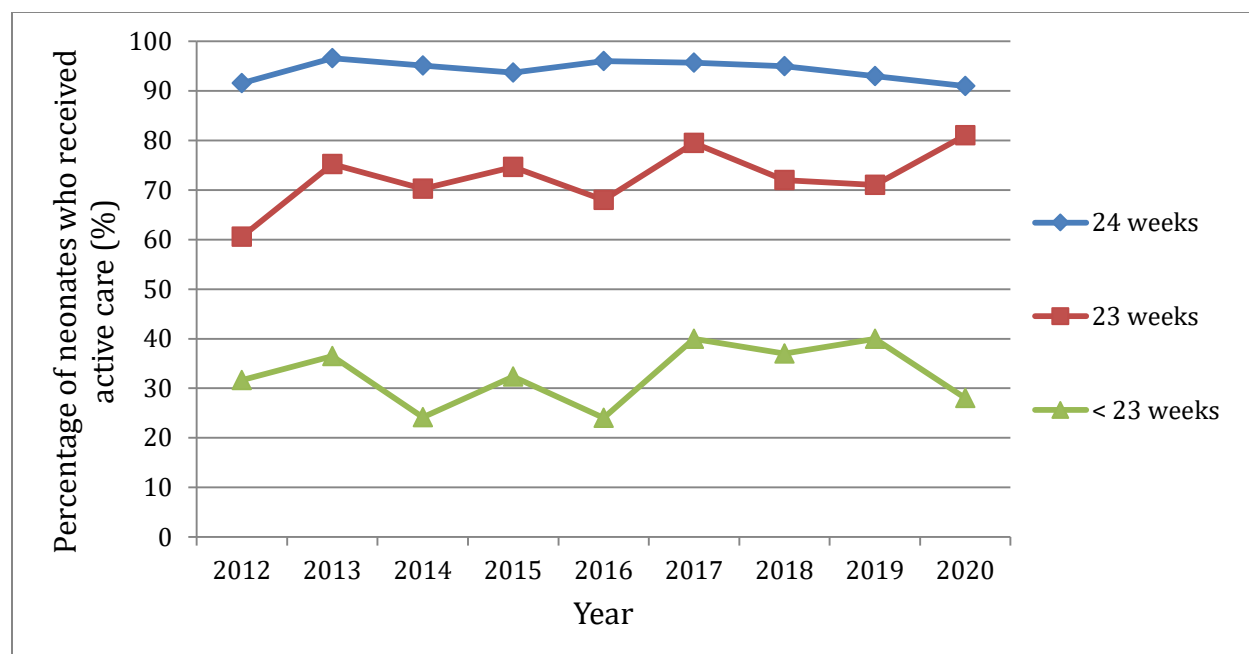
		2012	2013	2014	2015	2016	2017	2018	2019	2020
<23 weeks	Number of neonates who received active care *(a-c)* +*e*	25	23	14	22	16	26	35	35	18
	Total number of neonates including DR deaths *a+d+e*	79	63	58	68	67	65	95	88	64
	Percentage of neonates who received active care	32%	37%	24%	32%	24%	40%	37%	40%	28%
23 weeks	Number of neonates who received active care *(a-c)* +*e*	83	85	92	106	82	136	133	127	131
	Total number of neonates including DR deaths *a+d+e*	137	113	131	142	121	171	185	178	162
	Percentage of neonates who received active care	61%	75%	70%	75%	68%	80%	72%	71%	81%
24 weeks	Number of neonates who received active care *(a-c)* +*e*	185	200	233	178	217	221	224	224	199
	Total number of neonates including DR deaths *a+d+e*	202	207	245	190	227	231	235	240	218
	Percentage of neonates who received active care	92%	97%	95%	94%	96%	96%	95%	93%	91%

Note: Refer to presentation #4 for detailed breakdown of neonates by GA in 2020.
The alphabet notations used in the table above are carried from presentation #4.
Information should be interpreted with caution as not all sites provided data on delivery room deaths. Active care refers to infants who received cardiopulmonary resuscitation at birth.

4. Survival rate among those who were admitted to NICU:

a. 22-26 weeks' GA:
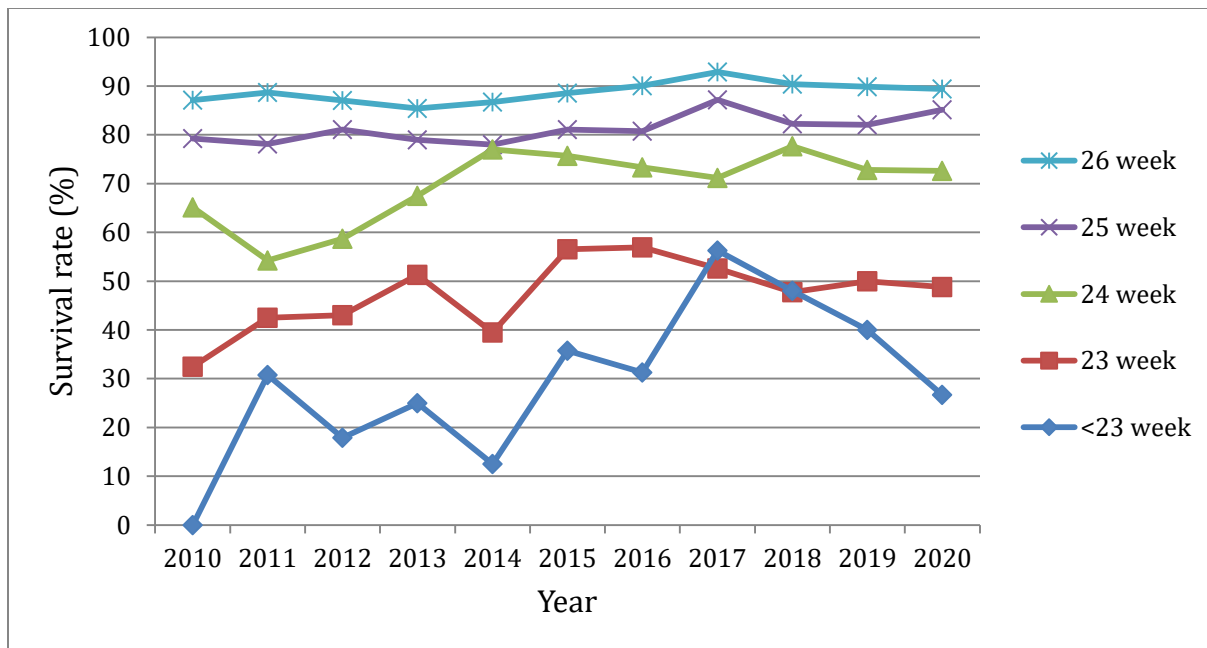
b. 27-32 weeks' GA:
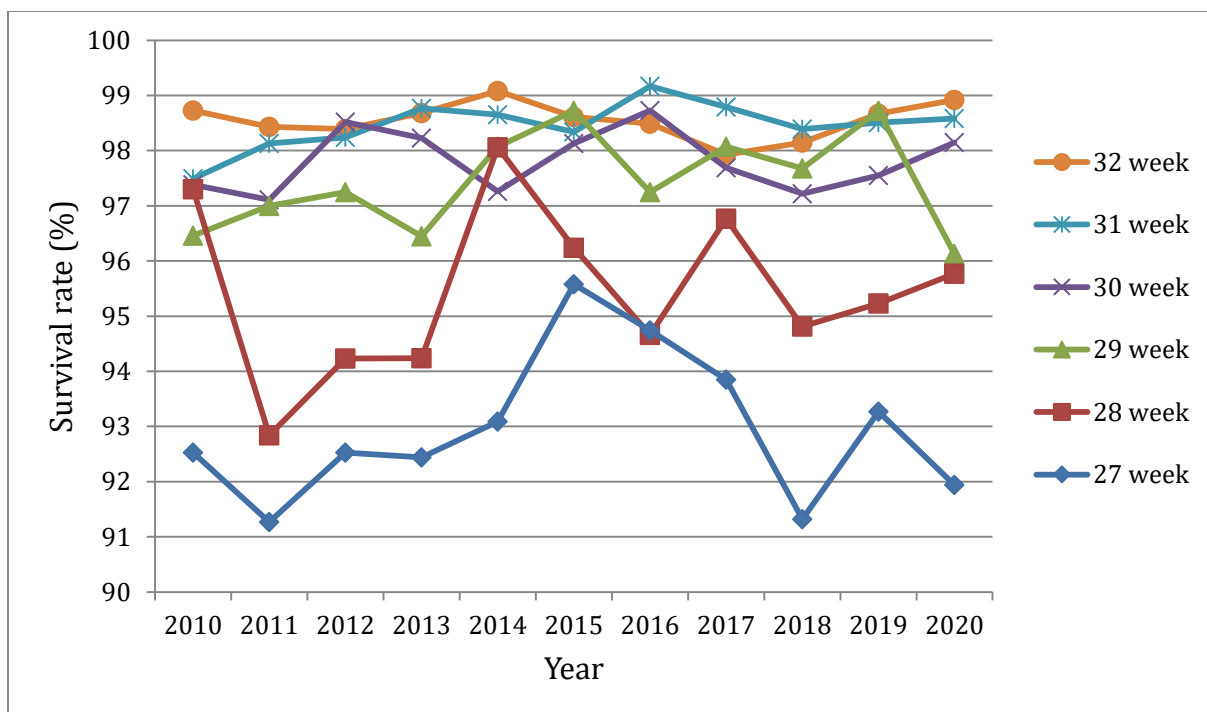
5. Late onset sepsis (with at least one infection) among neonates who survived beyond 2 days post birth

a. 23-26 weeks' GA:
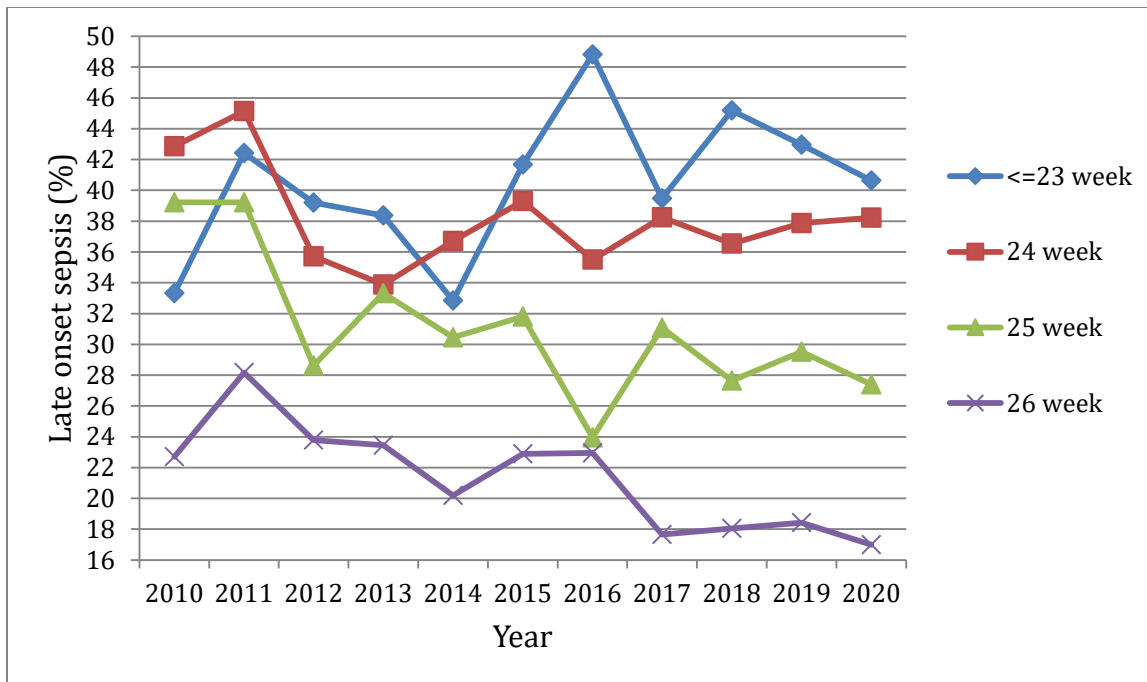
b. 27-32 weeks' GA:
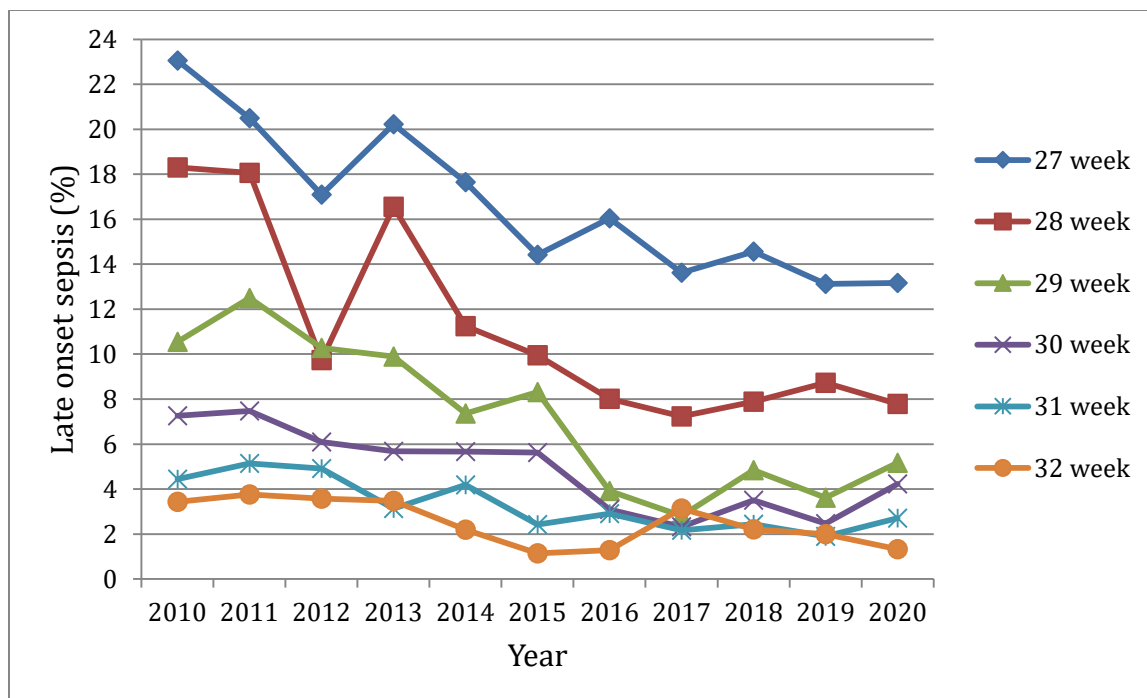
6. Surgical ligation of PDA among all neonates

a. 23-26 weeks' GA:
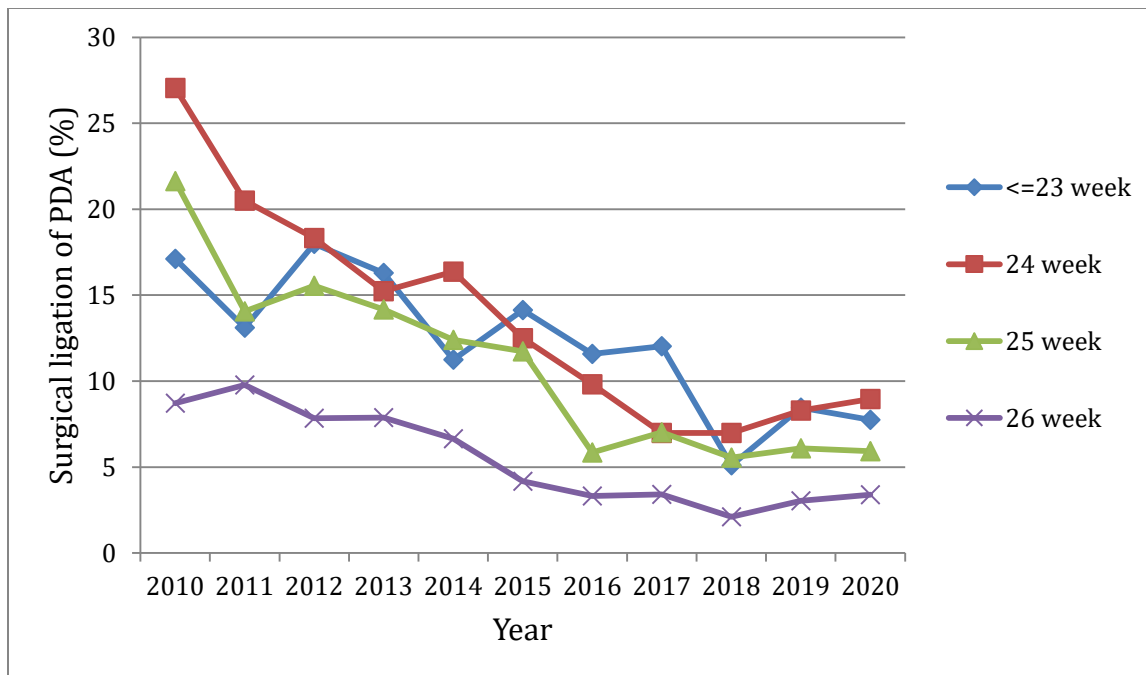
b. 27-32 weeks' GA:
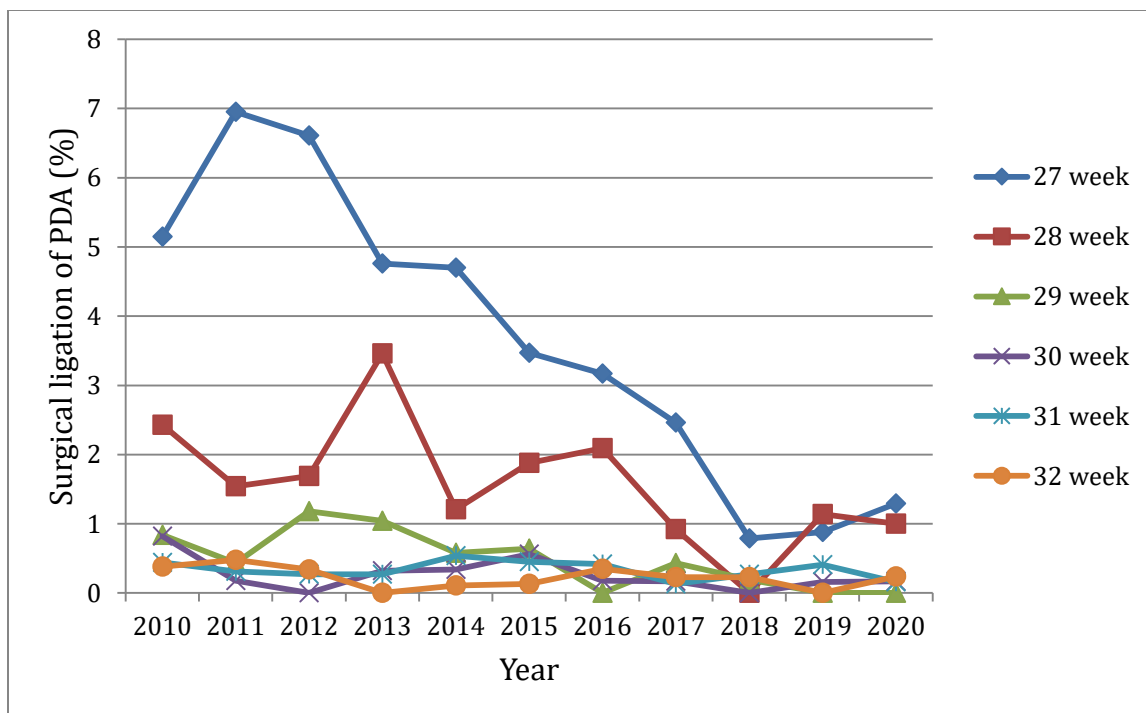
7. Ventricular enlargement (VE): (moderate and severe VE only; among neonates who received ultrasound exams)
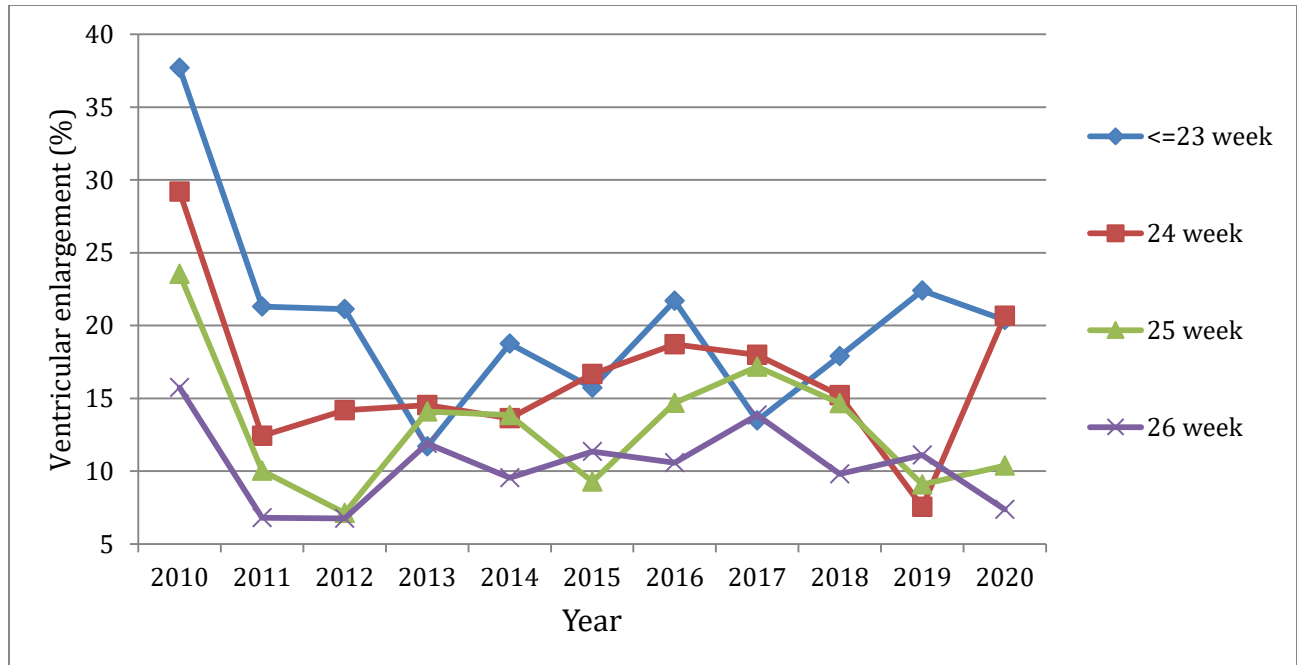
a. 23-26 weeks' GA:
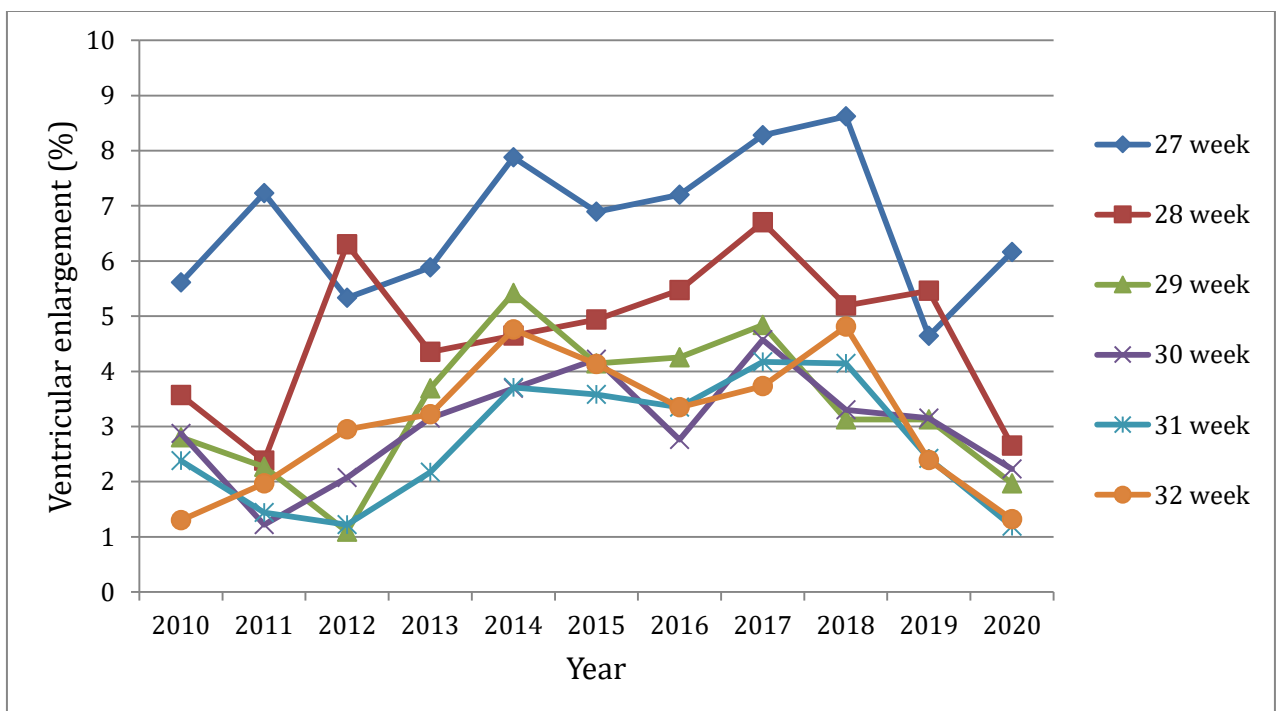
b. 27-32 weeks' GA:

8. Parenchymal echogenicity (among neonates who received ultrasound exams)
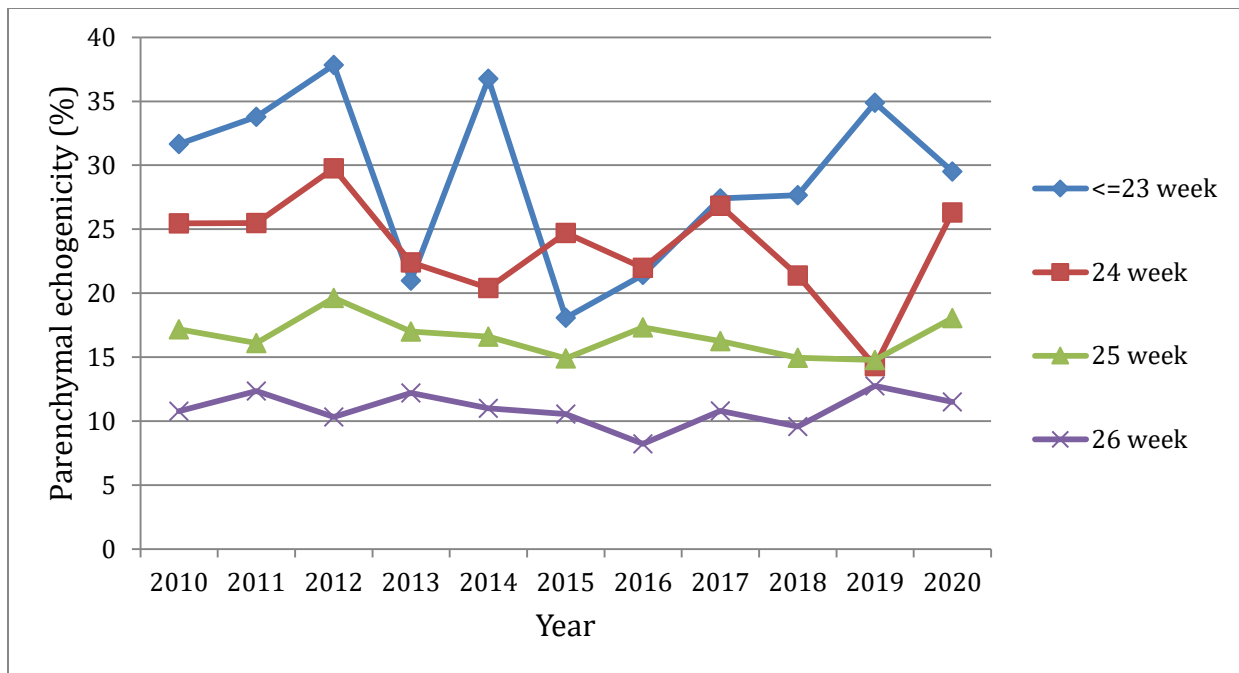
a. 23-26 weeks' GA:
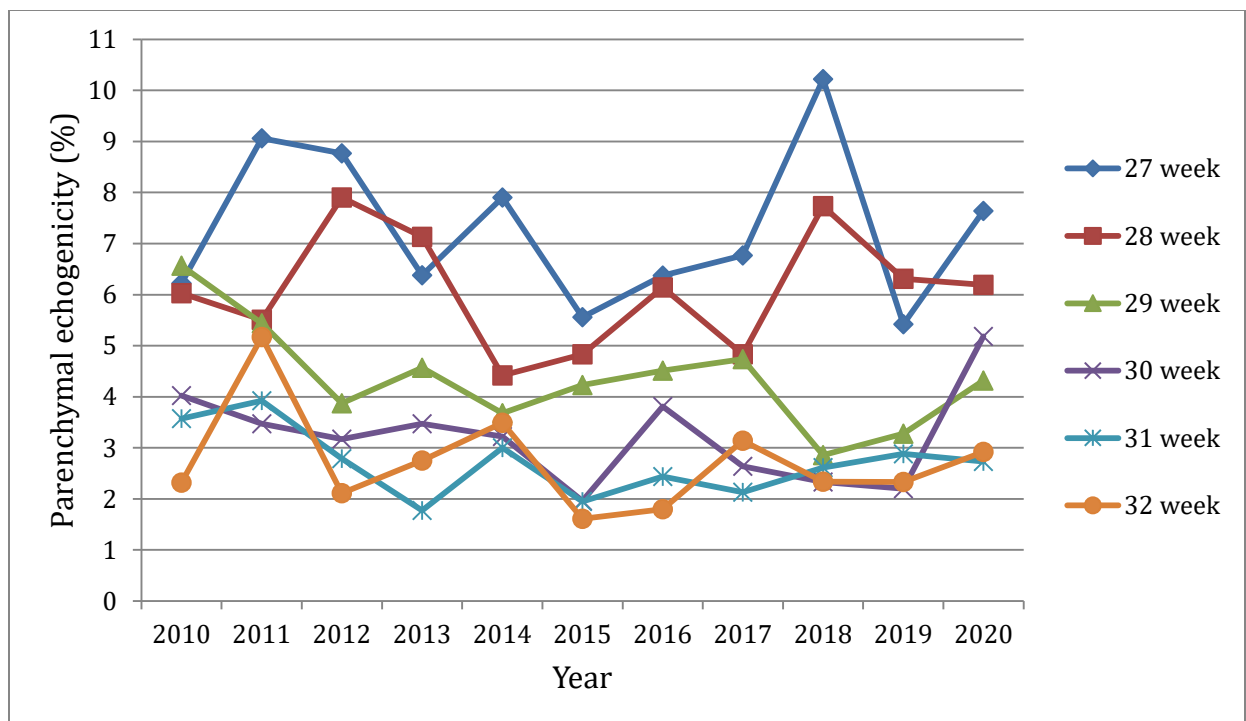
b. 27-32 weeks GA:

9. NEC:

a. 23-26 weeks' GA:
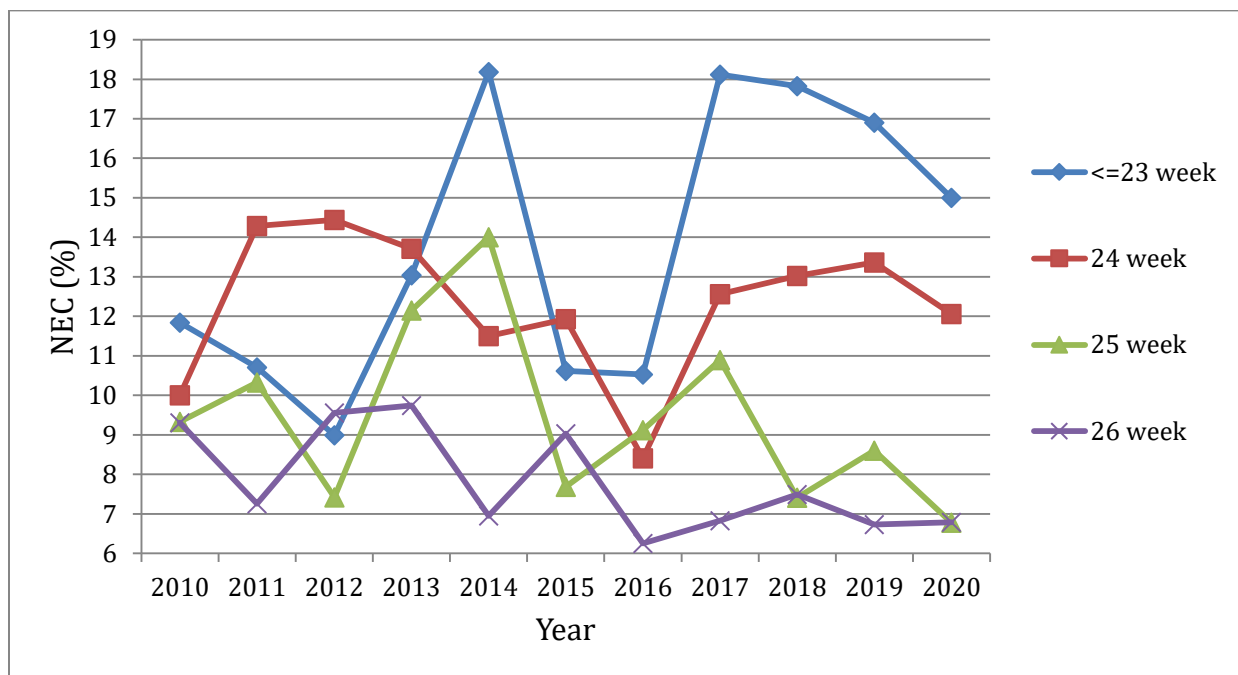
b. 27-32 weeks' GA:
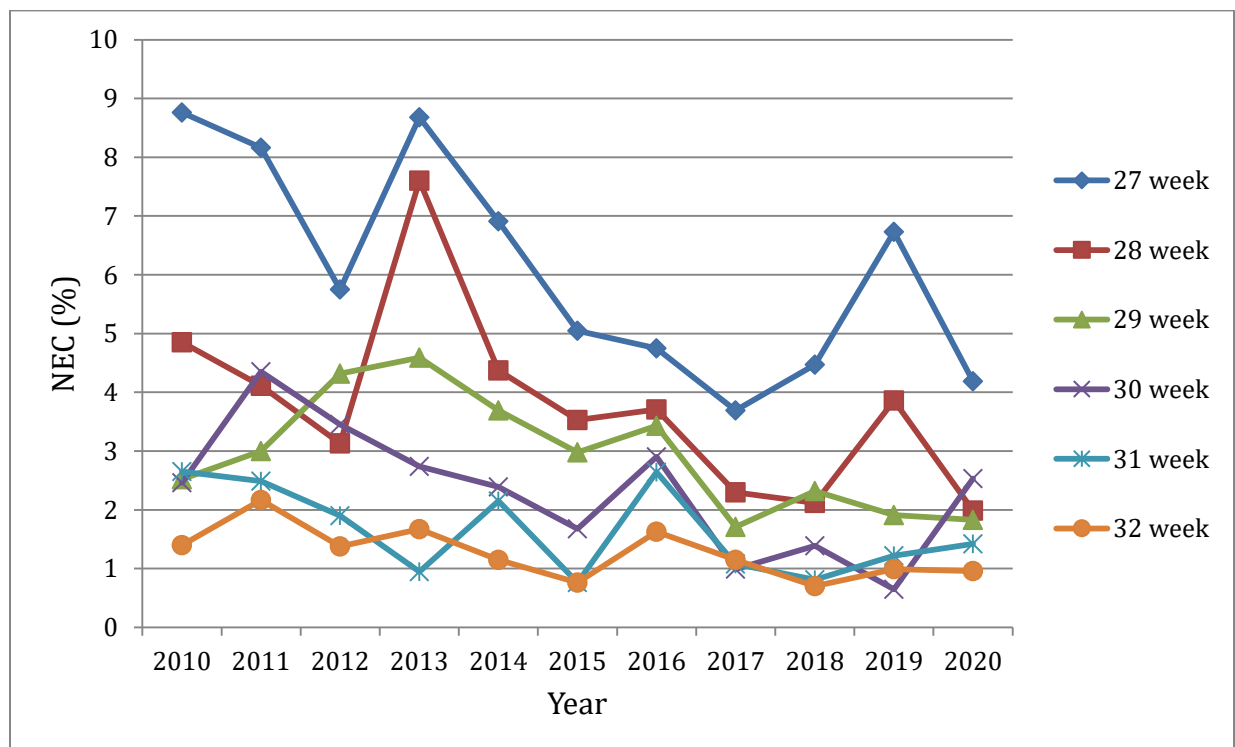
10. Severe ROP (≥ Stage 3 or ROP treatment) among neonates who received eye exams:
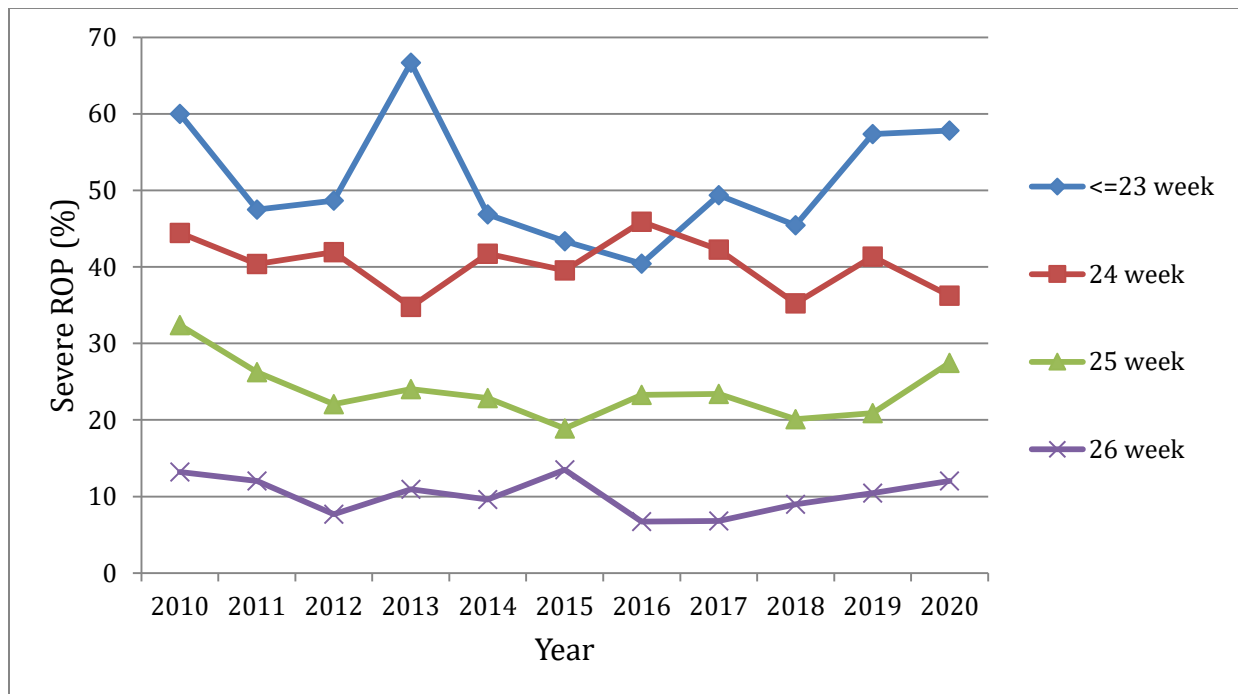
a. 23-26 weeks' GA:
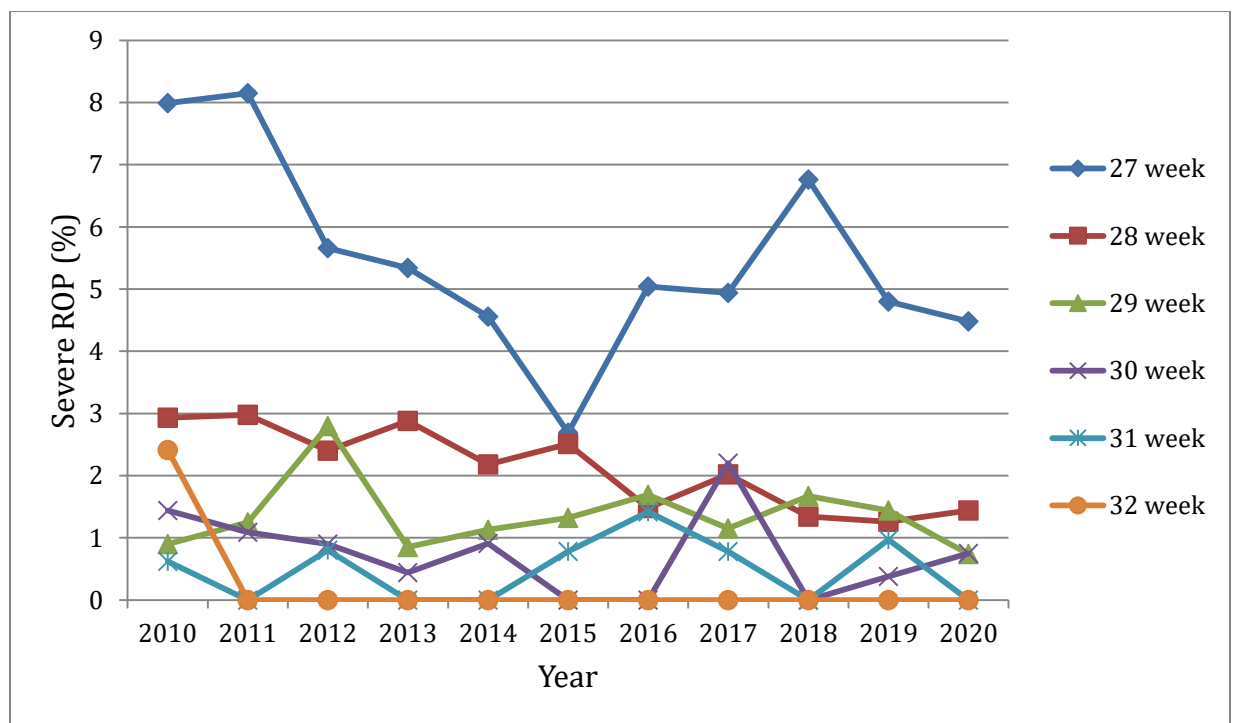
b. 27-32 weeks' GA:

11. Therapy for ROP (among neonates who received eye exams)
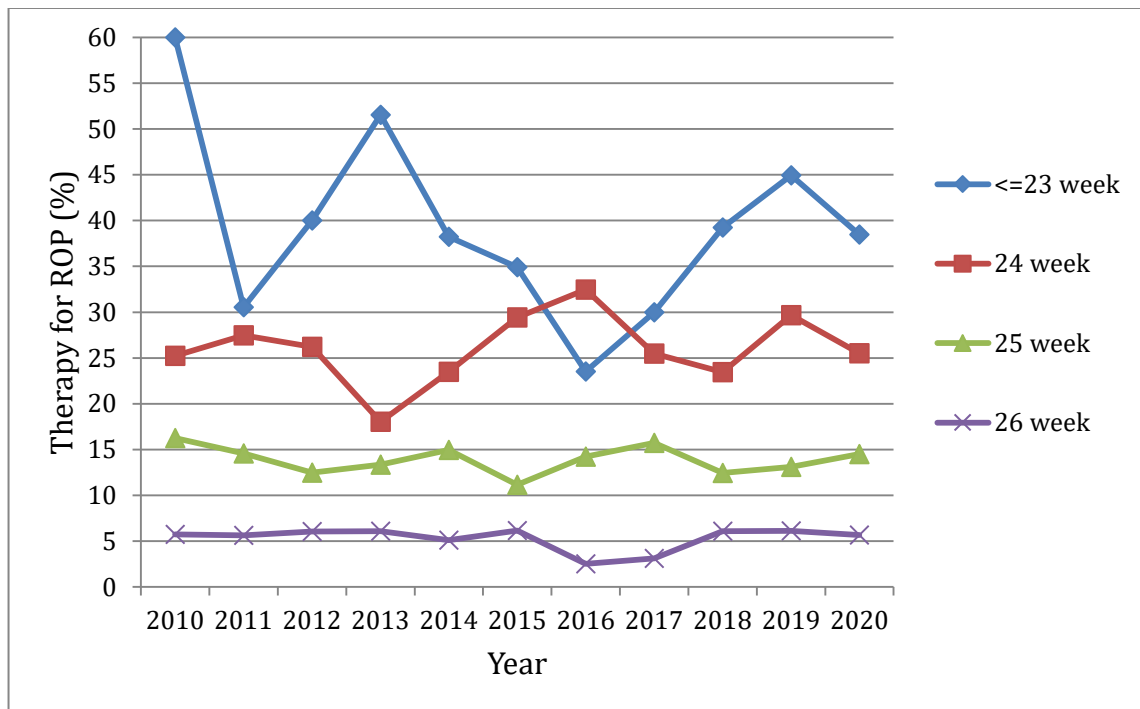
a. 23-26 weeks' GA :
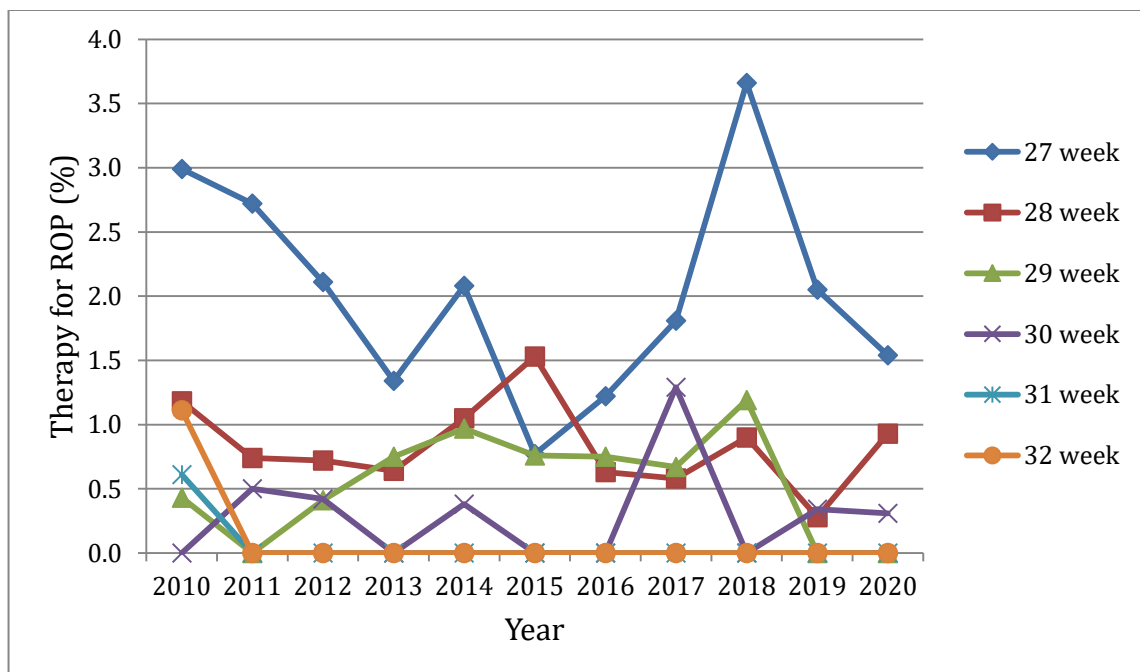
b. 27-32 weeks' GA:

12a. Oxygen use at 36 weeks or at discharge:
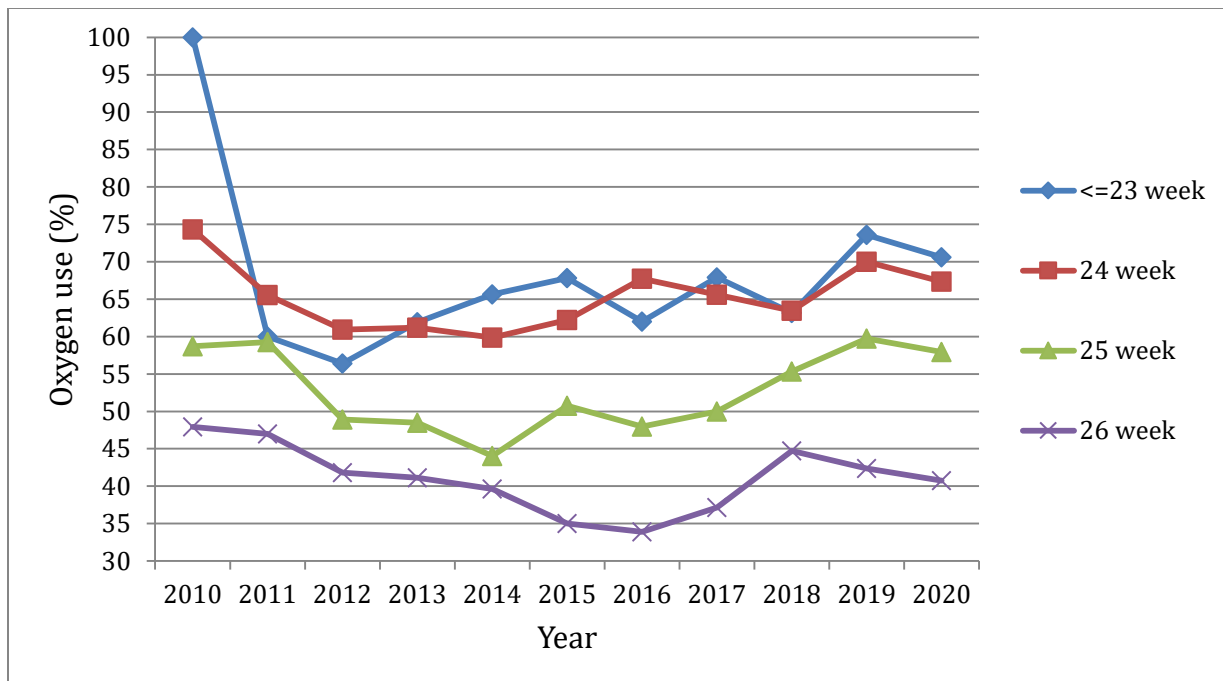
a. 23-26 weeks' GA:
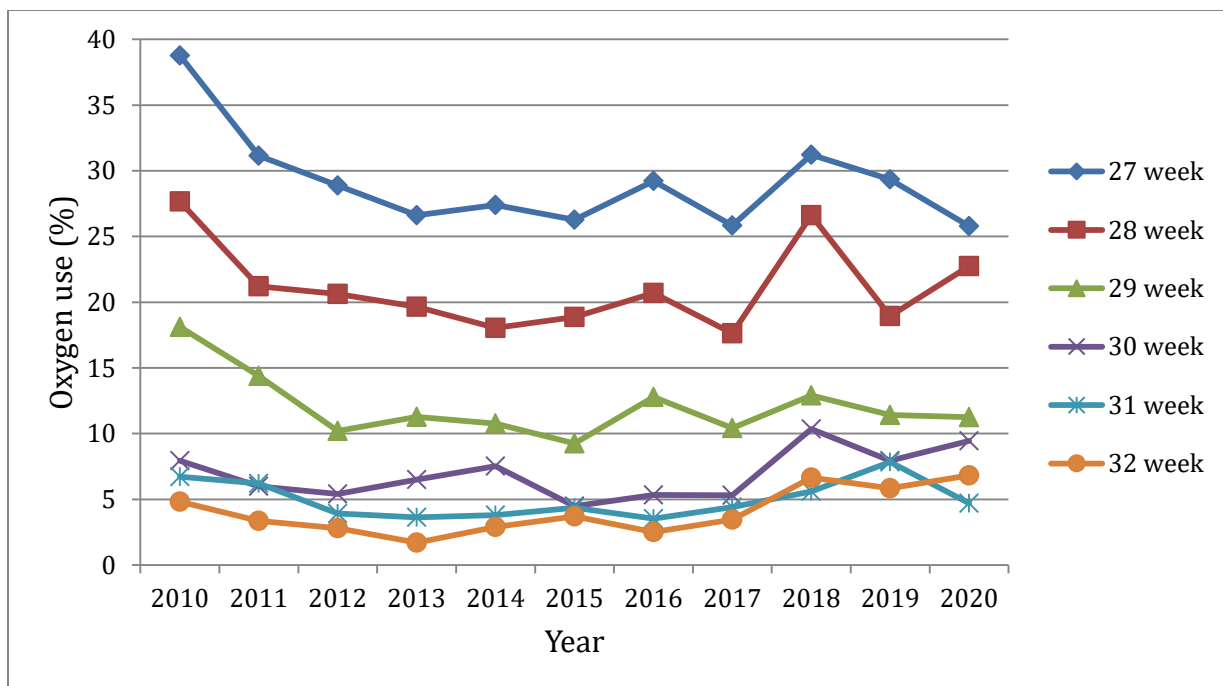
b. 27-32 weeks' GA:

12b. Any respiratory support at 36 weeks or at discharge:
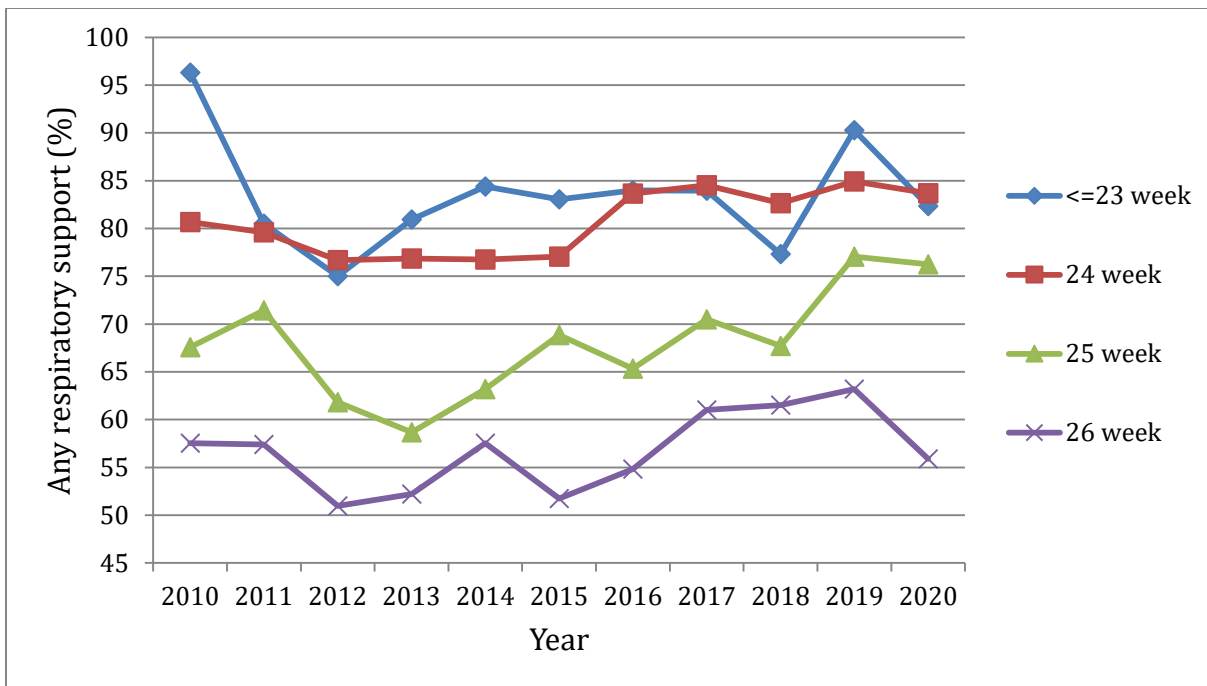
a. 23-26 weeks' GA:
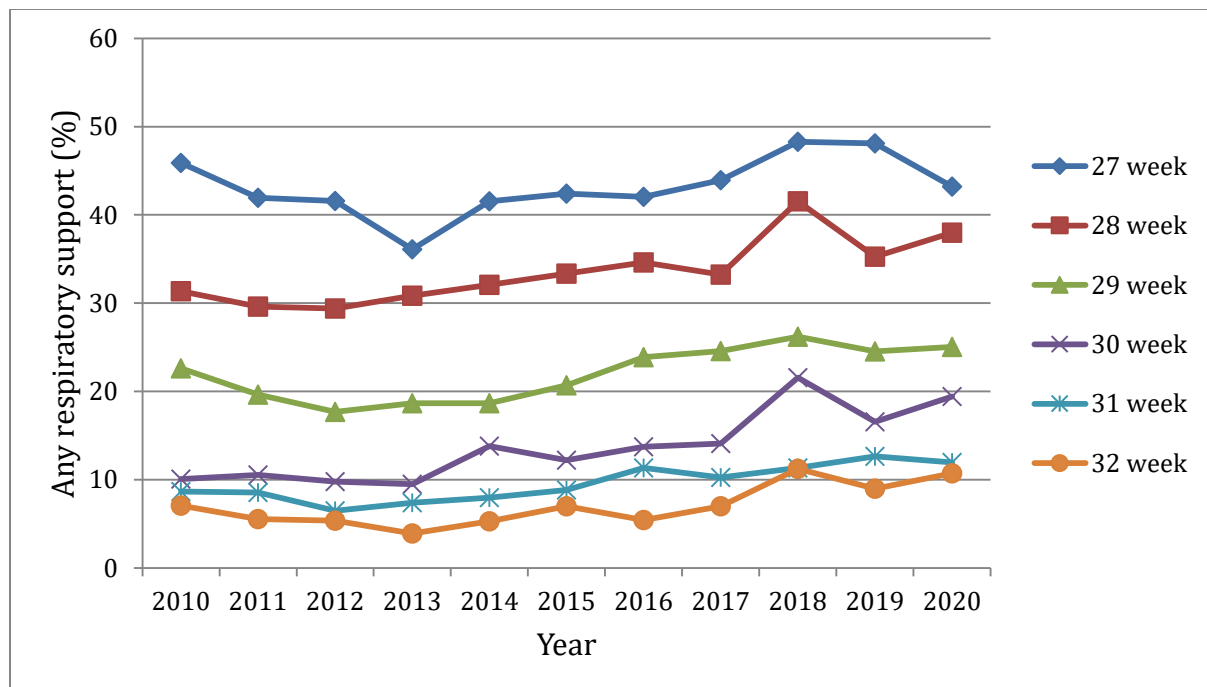
b. 27-32 weeks' GA:

13a. Oxygen use at 36 weeks/discharge or death:
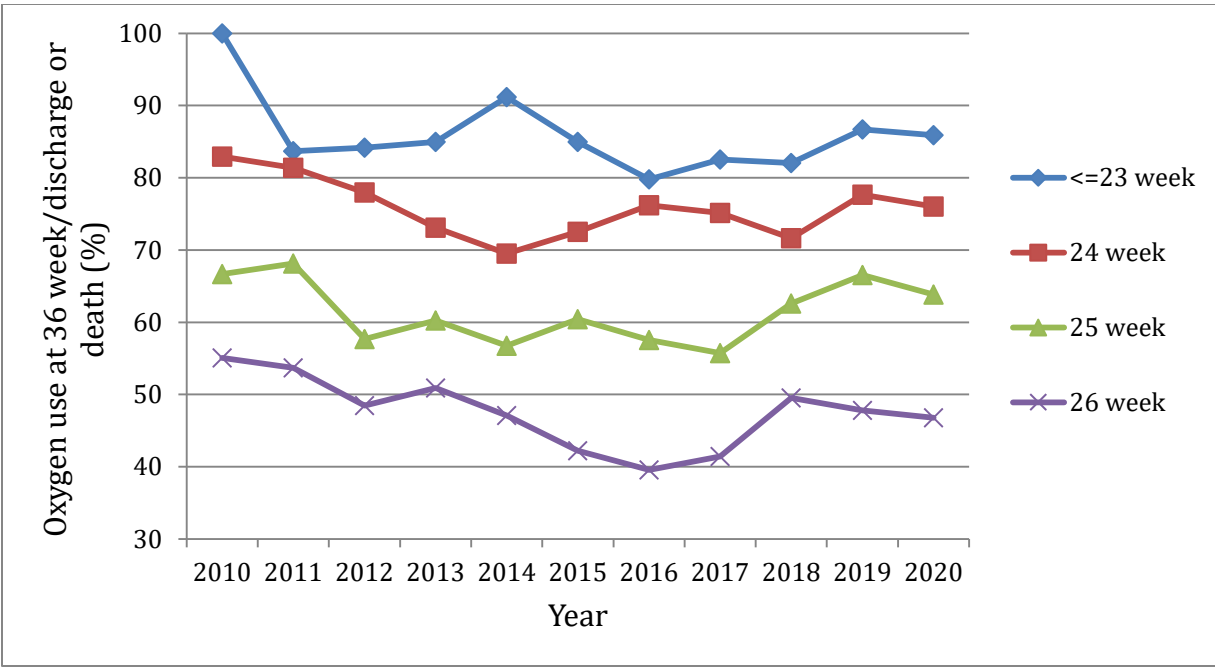
a. 23-26 weeks' GA:
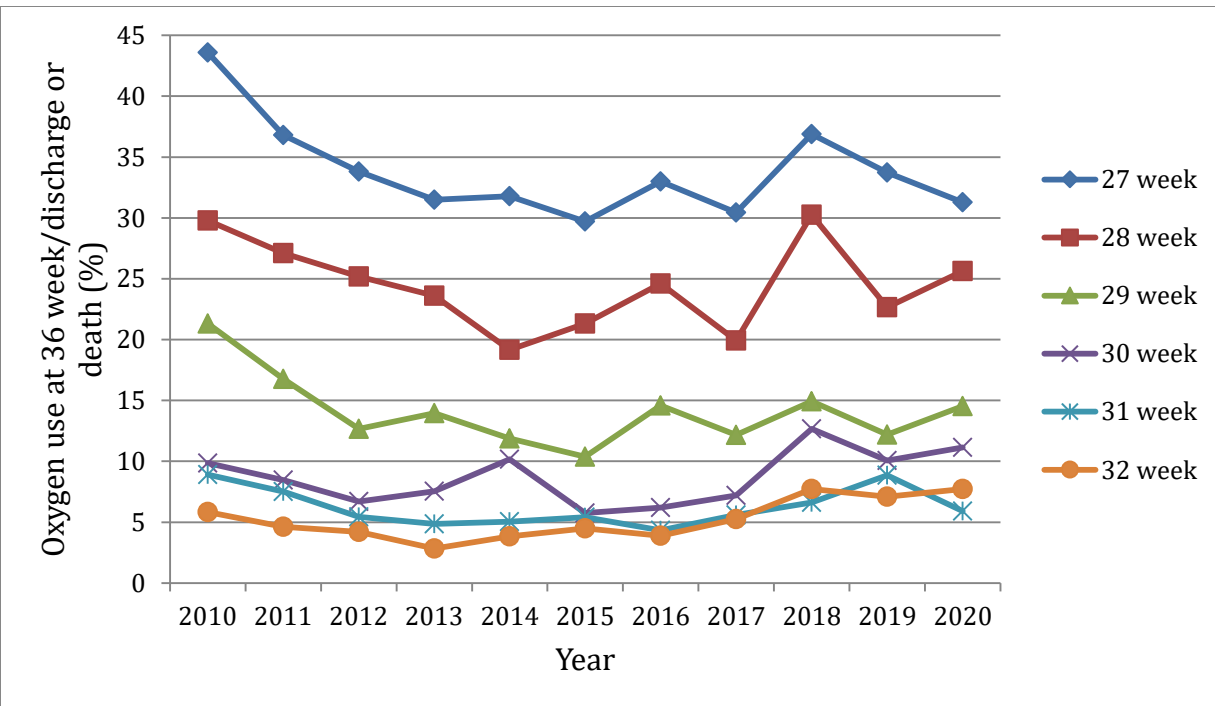
b. 27-32 weeks' GA:

13b. Any respiratory support at 36 weeks/discharge or death:
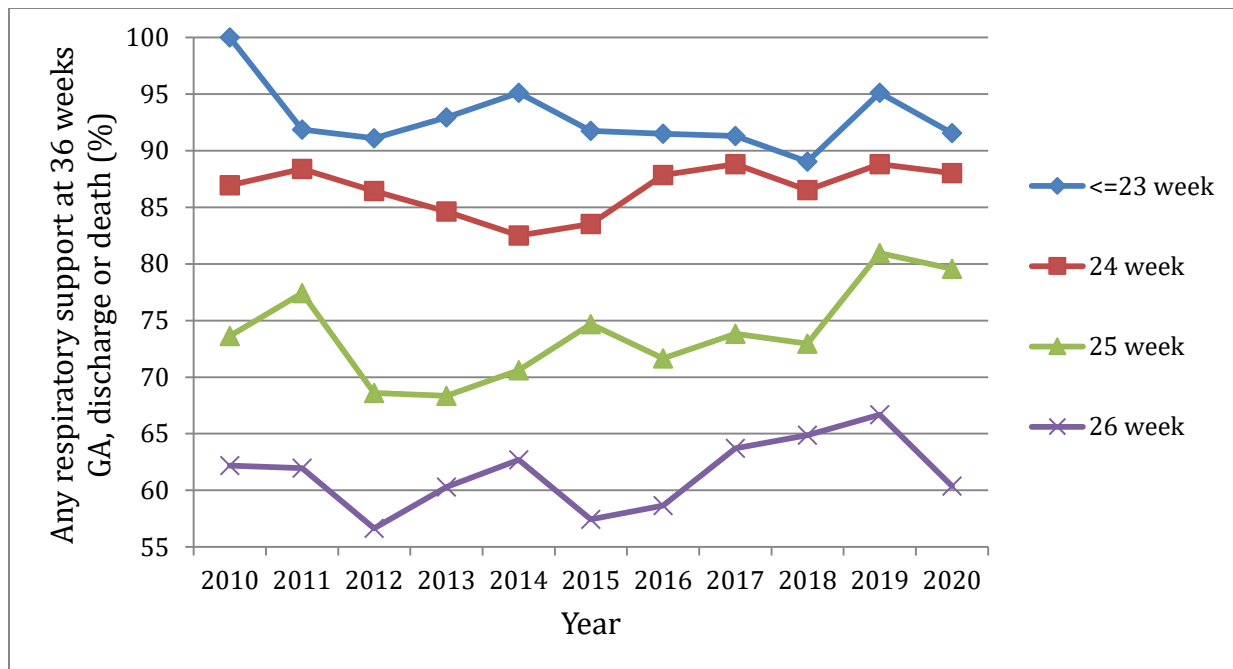
a. 23-26 weeks' GA:
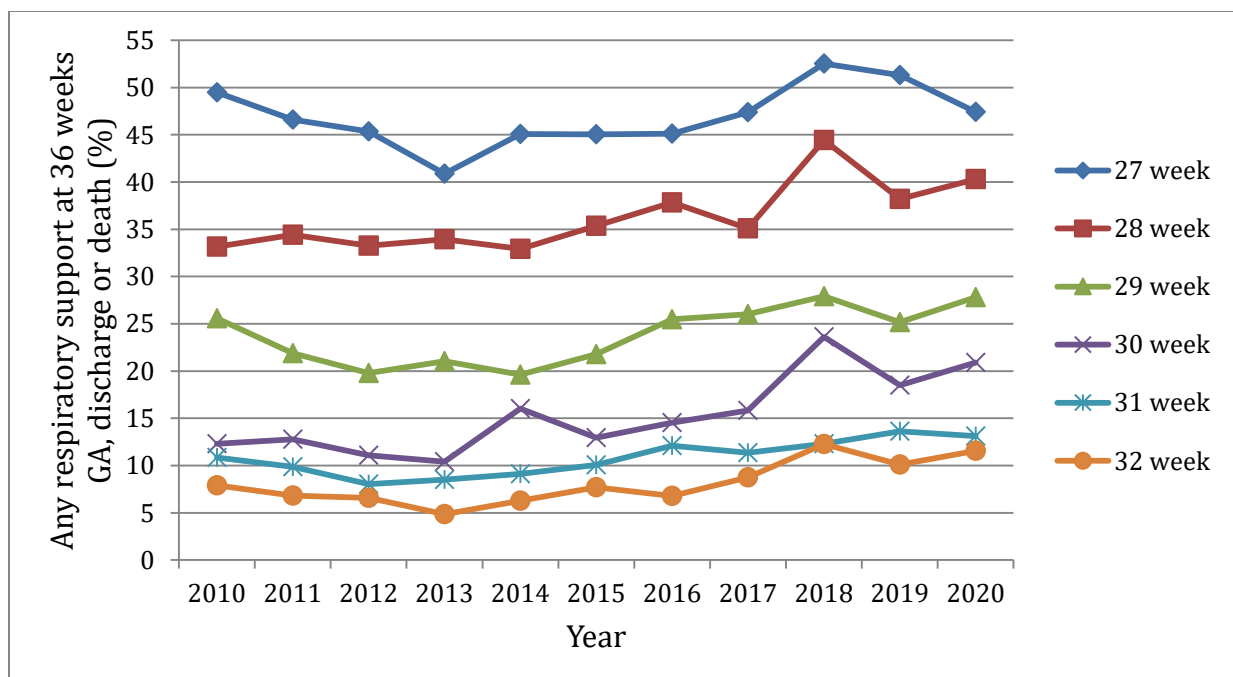
b. 27-32 weeks' GA:

14. Postnatal systemic steroids use for chronic lung disease (CLD)

a. 23-26 weeks' GA:
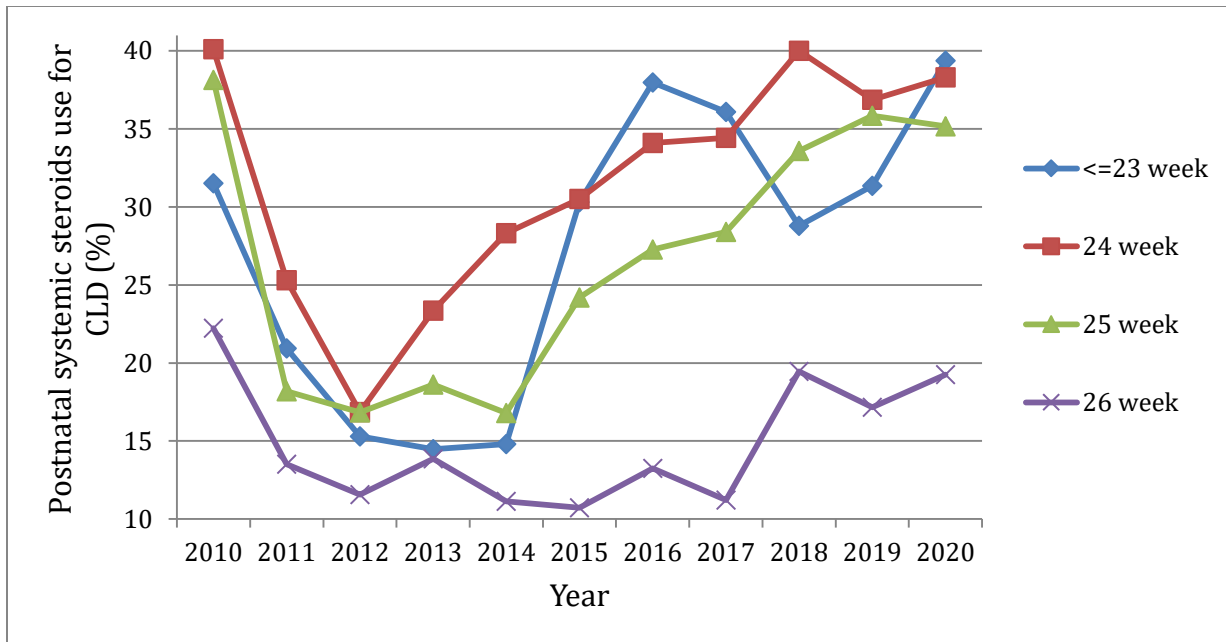
b. 27-32 weeks' GA:
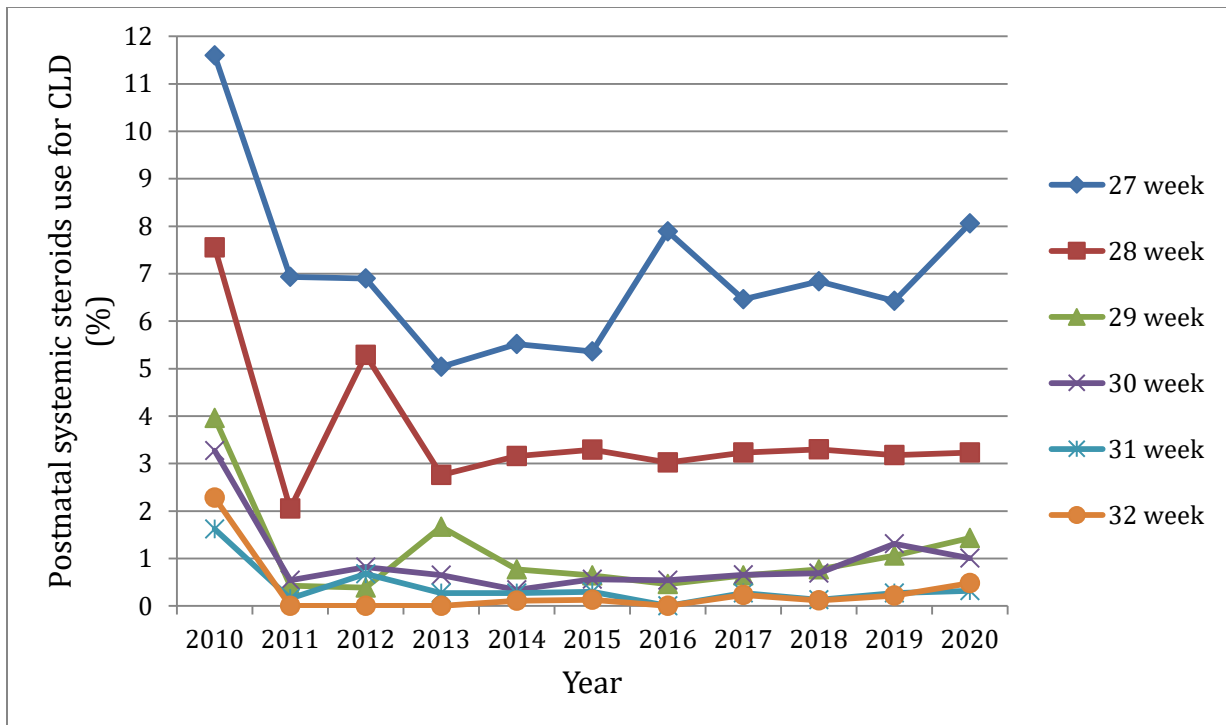
15. Mortality or major morbidity including CLD

Major morbidity was counted as any one of the following:
1. CLD (any grade)
2. Severe ROP (stage 3,4,5 and/or those with ROP treatment)
3. Severe neurological injury (IVH grade 3 or grade 4 or PVL)
4. NEC (stage 2 or 3)
5. Late onset sepsis (any positive blood and/or cerebrospinal fluid culture after 2 days of age)

a. 23-26 weeks' GA:
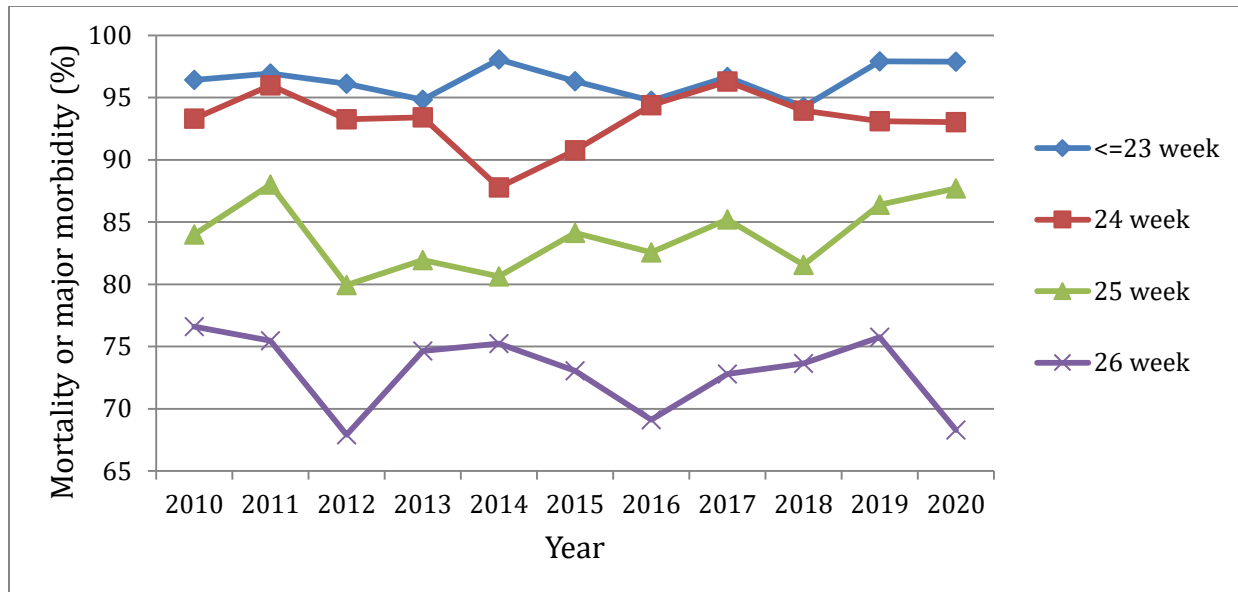
b. 27-32 weeks' GA:
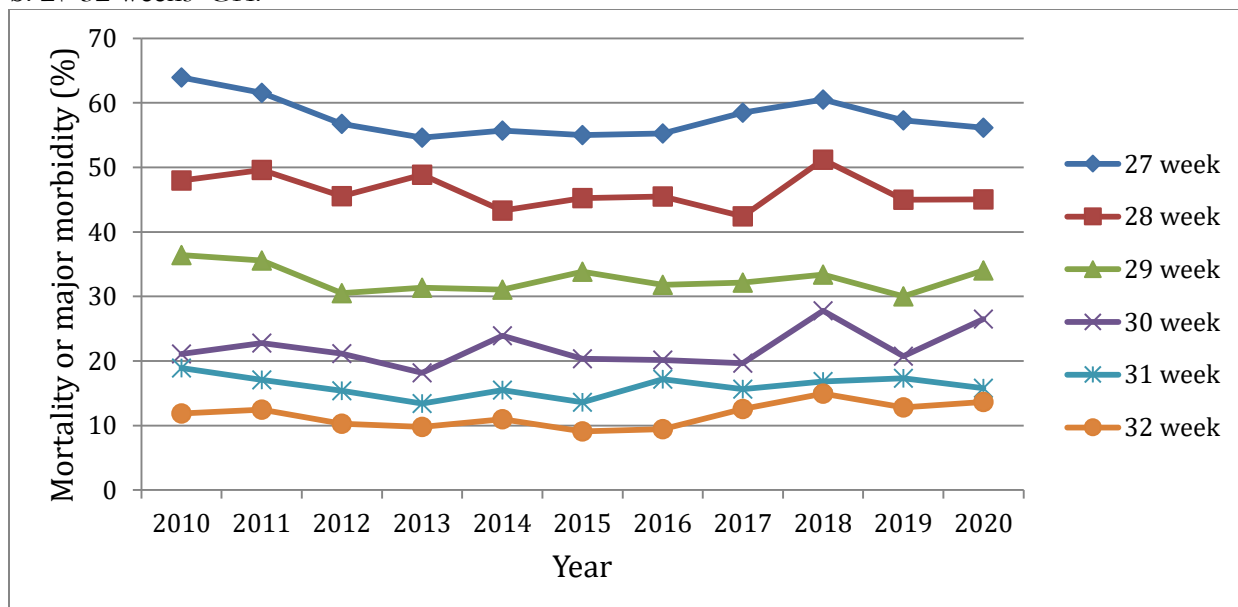
16. Mortality or major morbidity excluding CLD

Major morbidity was counted as any one of the following:

1. Severe ROP (stage 3,4,5 and/or those with ROP treatment)
2. Severe neurological injury (IVH grade 3 or grade 4 or PVL)
3. NEC (stage 2 or 3)
4. Late onset sepsis (any positive blood and/or cerebrospinal fluid culture after 2 days of age)

a. 23-26 weeks' GA:
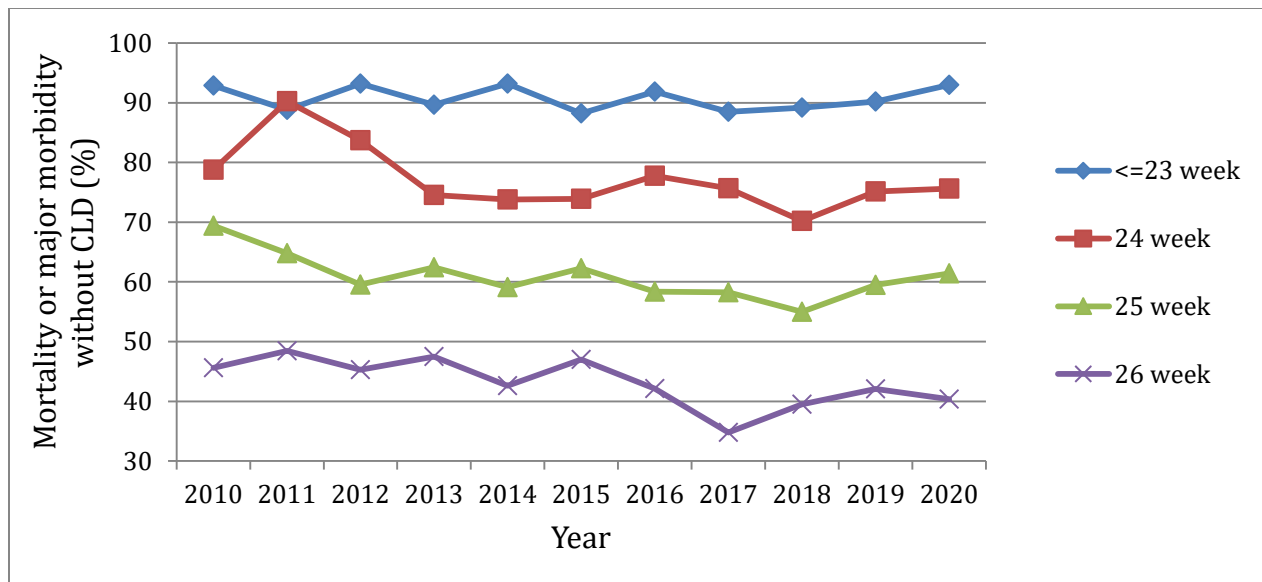
b. 27-32 weeks' GA:
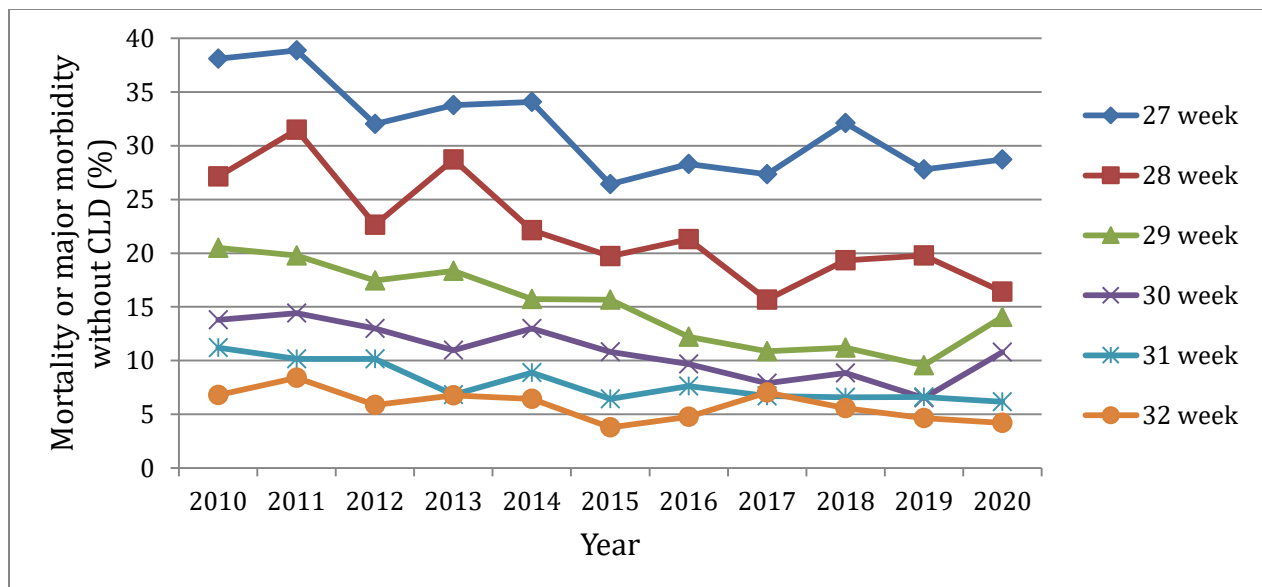
I. 2020 CNN publications

Peer reviewed publications

1) Ting JY, Roberts A, Tilley P, Robinson JL, Dunn MS, Paquette V, Lee KS, Shah V, Yoon E, Richter LL, Lodha A, Shivananda S, Thampi N, Autmizguine J, Shah PS for the Canadian Neonatal Network Investigators. Development of National Neonatal Intensive Care Unit-Specific Antimicrobial Stewardship Program in Canada: protocol for a cohort study. BMJ Open; 2020 Dec 10;10(12):e043403.
2) DiLabio J, Zwicker J, Sherlock R, Daspal S, Shah PS, Shah V and Canadian Neonatal Network Investigators. Maternal age and long-term neurodevelopmental outcomes of preterm infants <29 weeks gestational age. J Perinatol. 2020 Jul 21;41(6):1304-1312.
3) Lehtonen L, Lee SK, Kusuda S, Lui K, Norman M, Bassler D, Håkansson S, Vento M, Darlow BA, Adams M, Puglia M, Isayama T, Noguchi A, Morisaki N, Helenius K, Reichman B, Shah PS; International Network for Evaluating Outcomes of Neonates (iNeo). Family Rooms in NICUs and Neonatal Outcomes: An International Survey and Linked Cohort Study. J Pediatr. 2020 Jun 7;226:112-117.e4.
4) El-Naggar W, Afifi J, Dorling J, Bodani J, Cieslak Z, Canning R, Ye XY, Lee S, Shah PS on behalf of the Canadian Neonatal Network Investigators. A comparison of strategies for managing the umbilical cord at birth in preterm infants. J Pediatr. 2020 Oct;225:58-64.e4.
5) Shah PS, Rau S, Yoon EW, Alvaro R, da Silva O, Makary H, Claveau M, Lee SK; Canadian Neonatal Network (CNN) Investigators. Actuarial Survival Based on Gestational Age in Days at Birth for Infants Born at <26 Weeks of Gestation. J Pediatr. 2020 Oct;225:97-102.e3.
6) El-Naggar W, Yoon E, McMillan D, Afifi J, Mitra S, Singh B, da Silva O, Lee S, Shah PS on behalf of the Canadian Neonatal Network Investigators. Epidemiology of thrombosis in Canadian neonatal intensive care units. Journal of Perinatology. 2020 Jul;40(7):1083-1090.
7) Nielsen CC, Amrhein CG, Shah PS, Stieb DM, Osornio-Vargas A. Space-time hot spots of critically ill small for gestational age newborns and industrial air pollutants in major metropolitan areas of Canada. Environmental Research. 2020 Jul;186:109472.
8) Xu EH, Claveau M, Yoon EW, Barrington KJ, Mohammad K, Shah PS, Wintermark P, on behalf of the Canadian Neonatal Network. D Neonates with hypoxic-ischemic encephalopathy treated with hypothermia: Observations in a large Canadian population and determinants of death and/or brain injury. Journal of Neonatal Perinatal Medicine. 2020;13(4):449-458.
9) Isayama T, Kusuda S, Reichman B, Lee SK, Lehtonen L, Norman M, Adams M, Bassler D, Helenius K, Hakansson S, Yang J, Jain A, Shah PS on behalf of the International Network for Evaluating Outcomes of Neonates (iNeo) Investigators* Neonatal Intensive Care Unit-Level Patent Ductus Arteriosus Treatment Rates and Outcomes in Infants Born Extremely Preterm. J Pediatr. 2020 May;220:34-39.e5.
10) Norman M, Hakansson S, Kusuda S, Vento M, Lehtonen L, Reichman B, Darlow BA, Adams M, Bassler D, Isayama T, Rusconi F, Lee S, Lui K, Yang J, Shah PS on behalf of the International Network for Evaluation of Outcomes in Neonates (iNeo) Investigators. Neonatal Outcomes in Very Preterm Infants with Severe Congenital Heart Defects: an International Cohort Study. J Am Heart Assoc. 2020 Mar 3;9(5):e015369.

11) Lee SK, Beltempo M, McMillan D, Seshia MMK, Singhal N, Dow K, Aziz K, Piedbouef B, Shah PS. Outcomes and care practices for preterm infants <33 weeks' gestation: a quality improvement study. CMAJ. 2020 Jan 27;192(4):E81-E91.

12) Shukla V, Elkhateeb O, Shah PS, Yang J, Lee KS and Canadian Neonatal Network Investigators. Outcomes of neonates born at <26 weeks gestational age who receive extensive cardiopulmonary resuscitation compared with airway and breathing support. J Perinatol. 2020 Mar;40(3):481-487.

13) Goswami I, Whyte H, Wintermark P, Mohammad K, Shivananda S, Louis D, Yoon E, Shah PS and Canadian Neonatal Network Investigators. Characteristics and short-term outcomes of neonates with mild hypoxic-ischemic encephalopathy treated with hypothermia. J Perinatol. 2020 Feb;40(2):275-283.

14) Rizzolo A, Shah PS, Boucoiran I, Lemyre B, Bertelle V, Pelausa E, St-Hilaire M, Dahlgren L, Beltempo M on behalf of the Canadian Neonatal Network and Canadian Preterm Birth Network Investigators. Cumulative effect of evidence-based practices on outcomes of preterm infants born at <29 weeks gestational age. Am J Obstet Gynecol 2020 Feb;222(2):181.e1-181.

15) Sgro M, Campbell DM, Mellor KL, Hollamby K, Bodani J, Shah PS for Candian Neonatal Network Investigators. Early-onset neonatal sepsis: Organism patterns between 2009 and 2014. Paediatr Child Health. 2020 Nov;25(7):425-431.

16) Shafey A, Bashir RA, Shah PS, Synnes A, Yang J, Kelly E, Canadian Neonatal Network and Canadian Neonatal Follow-Up Network Investigators. Outcomes and resource usage of infants born at ≤ 25 weeks gestation in Canada. Paediatr Child Health. 2020 Jun;25(4):207-215.

17) Leibel SL, Ye XY, Shah P, Shah V, Canadian Neonatal Network. Chronic lung disease in preterm infants receiving various modes of noninvasive ventilation at ≤30 weeks' postmenstrual age. J Matern Fetal Neonatal Med. 2020;33(9):1466-1472.

18) Helenius K, Morisaki N, Kusuda S, Shah PS, Norman M, Lehtonen L, Reichman B, Darlow BA, Noguchi A, Adams M, Bassler D, Håkansson S, Isayama T, Berti E, Lee SK, Vento M, Lui K; International Network for Evaluation of Outcomes of neonates (iNeo). Survey shows marked variations in approaches to redirection of care for critically ill very preterm infants in 11 countries. Acta Paediatr. 2020 Jul;109(7):1338-1345.

19) Redpath S, Shah PS, Moore GP, Yang J, Toye J, Perreault T, Lee KS; Canadian Neonatal Transport Network and Canadian Neonatal Network Investigators. Do transport factors increase the risk of severe brain injury in outborn infants <33 weeks gestational age? J Perinatol. 2020 Mar;40(3):385-393.

20) Garfinkle J, Yoon EW, Alvaro R, Nwaesei C, Claveau M, Lee SK, Shah PS; Canadian Neonatal Network Investigators. Trends in sex-specific differences in outcomes in extreme preterms: progress or natural barriers? Arch Dis Child Fetal Neonatal Ed. 2020 Mar;105(2):158-163.

21) Xu JH, Coo H, Fucile S, Ng E, Ting JY, Shah PS, Dow K, Canadian Neonatal Network Investigators. A national survey of the enteral feeding practices in Canadian neonatal intensive care units. Paediatrics & Child Health. 2020 Dec; 25(8): 529-533.

Abstracts

1) Lodha A, Shah PS, Synnes A, Creighton D, McDonald S, Soraisham A, E-Naggar W. Association of deferred cord clamping and neurodevelopmental outcomes of preterm neonates of <29 weeks' gestation. E-PAS 2020: 1449.832.

2) McRae LP, Kieran E, Shivananda S, Synnes A. The Impact of Home Respiratory Support on Developmental Outcomes in Very Preterm Infants. E-PAS 2020: 1447.795.

3) Ting J, Roberts A, Chan NH, Mohamed A, Farjado C, St.Hilaire M, Shah PS. Impact of duration of Initial Empirical Antibiotic Therapy on Neurodevelopmental Outcomes among Extremely Low Gestational Age Neonates. E-PAS 2020: 3945.795.

4) Dharel D, Singhal N, Major C, Shah PS, Ye XY, Alshaikh B. Rate and determinants of breast milk feeding at discharge among very preterm neonates in Canadian Neonatal Units. E-PAS 2020: 1436.618.

5) Yurkiw K, Alshaikh B, Hasan S, Louis D, Emberely J, Claveau M, Beltempo M, Yusuf K. Neonatal outcomes of twins less than 33 weeks gestation born to mothers with hypertensive disorders of pregnancy and normotensive pregnancies. E-PAS 2020: 1441.695.

6) Rustogi D, Synnes A, Alshaikh B, Drolet C, Masse E, Murthy P, Shah PS, Yusuf K. Neurodevelopmental outcomes of singleton large for gestational age infants < 29 weeks gestation. E-PAS 2020: 1446.764.

7) Lan M, Qi Z, Ting JY, Xe XY, Lee SK. Meningitis and bloodstream sepsis in very preterm infants have different incidence trends and risk factors. E-PAS 2020: 4119.354.

8) Ouellet EF, Beltempo M, Lapointe A, Pelausa E, Cieslak Z, Shah PS. Cumulative Effect of Prevention Intervention on Outcomes of Preterm Infants <29 Weeks of Gestational Age. E-Pas 2020: 3935.635.

9) Beltempo M, Rizzolo A, Piedboeuf B, Bertelle V, Makary H, Shah PS. Association of hour of admission with mortality among preterm infants born in Canada. E-PAS 2020: 2839.639.

10) Shah PS, Coshal H, Mukerji A, Lemyre B, Ng E. Alvaro R, Ethier G, Yoon E, Beltempo M. Characteristics and outcomes of preterm neonates according to doses of surfactant received. E-PAS 2020: 4140.724.

11) Kandraju H, Dorling J, Kanungo J, Lee KS, Daspal S, Adie M, Lee SK, Shah PS. Association of Prophylactic Indomethacin and Antenatal Steroids with Spontaneous Intestinal Perforation. E-PAS 2020 platform presentation: 1165.1.

12) Shah PS, Yang J, Synnes A, Kelly E, DaSilva O, Monterrosa L, Beltempo M. The Association of Residential Area-Level Dependency as Marker of Marginalization and Neurodevelopmental Outcomes of Preterm Infants of < 29 Weeks' Gestation. E-PAS 2020: 4118.341.

13) Shah PS, Yang J, Synnes A, Kelly E, Sherlock R, Lodha A, Lee SK, Beltempo M. The Association of Area-level Material Factor Score and Neonatal and Infant / Childhood Outcome of Preterm Infants of < 29 Weeks' Gestation in Canada. E-PAS 2020: 4118.337.

14) Lui K, Yang J, Vento M, Lee SK, Hakansson S, Modi N, Bassler D, Rusconi F, Darlow BA, Helenius K, Reichman B, Lehtonen L, Kusuda S, Adams M, Isayama T, Norman M, Shah PS. Intra-country Trends in Variation of Mortality and Morbidity of Extremely Preterm Neonates - A evaluation among 11 countries. E-PAS 2020 platform presentation: 1175.8.

15) Seaton SE, Draper ES, Adams M, Kusuda S, Hakansson S, Helenius K, Reichman B, Lehtonen L, Bassler D, Lee SK, Vento M, Darlow BA, Rusconi F, Beltempo M, Isayama T, Lui K, Norman M, Manktelow BN, Yang J, Shah PS, Modi N. Variations in length of stay for infants born at 24-31 weeks' gestation: an international comparison study. E-PAS 2020: 2270.7.

J. Appendices

Outcomes Definitions

Mortality: Death prior to discharge from the NICU.

Severe neurological injury: Intraventricular hemorrhage (IVH), ventricular enlargement or parenchymal echogenicity or periventricular leukomalacia (PVL): Defined as grade 3 IVH (intraventricular hemorrhage with ventricular enlargement) or grade 4 IVH (intraventricular hemorrhage and persistent parenchymal echogenicity) or persistent parenchymal echogenicity.

Ventricular enlargement
-   *None:* Measurement of ventricles was <7 mm at any level section of lateral ventricle.
-   *Mild:* Measurement was 7 to 10 mm at any level of the larger lateral ventricle. Classify as "mild" if there was no mention of "ventricular enlargement", "ventriculomegaly" or "hydrocephalus", or if the most severe report was of "mild ventriculomegaly" or "mild ventricular enlargement", or if described as "suspected"
-   *Moderate:* Measurement was 11 to 15 mm at any level of the larger lateral ventricle on sagittal scan. Classify as "moderate" if the terms "grade III IVH", "ventricular enlargement", "ventriculomegaly" or "hydrocephalus" were used with "moderate", or without descriptors.
-   *Severe:* Measurement was >15 mm at any level of the larger lateral ventricle on a sagittal scan, or ventricular drainage/shunting was required. If no measurement was made, classify as "severe" if the terms "severe" or "significant" were used to describe "grade III IVH", "ventricular enlargement", "ventriculomegaly" or "hydrocephalus".
-   *Not measured*
-   *Unknown*

Severe retinopathy of prematurity (ROP): Stage 3, 4 or 5 ROP as defined by the International Classification of Retinopathy of Prematurity[1] and/or those infants requiring treatment (laser or intraocular injection). ROP was scored as the highest stage in either eye identified at any time.

Necrotizing enterocolitis (NEC): Stage 2 or 3 NEC according to Bell's classification[2], diagnosed by clinical and imaging findings.

Sepsis: Isolation of bacterial, fungal or viral organism from blood or cerebrospinal fluid in a symptomatic infant.

Chronic lung disease (CLD): Defined as respiratory support given at 36 weeks' post menstrual age or at discharge (if earlier than 36 weeks' PMA) to level 2 centers and was classified in different degrees of severity described as follows:

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[1] An International Committee for the Classification of Retinopathy of Prematurity. **The International Classificaiton of Retinopathy of Prematurity Revisited.** Arch Ophthalmol 2005;123:991-999

[2] Bell MJ, Ternberg JL, Feigin RD, et al. **Neonatal necrotizing enterocolitis. Therapeutic decisions based upon clinical staging.** Ann Surg 1978;187:1–7

Chronic lung disease (CLD) continued:

Severity	Respiratory support at time of classification (at 36 weeks' PMA or at discharge if baby was discharged prior to 36 weeks' PMA)	Oxygen	Flow rate
No CLD	None	21%	None
Mild CLD	Headbox or incubator	>21%	Any amount
	Nasal cannula	100%	<0.1L/min
	Nasal cannula blended air/oxygen	21-99%	<1.5L/min
Moderate CLD	Nasal cannula	100%	≥100cc/min
	Nasal cannula blended air/oxygen	21-29%	≥1.5L/min
	CPAP, SIPAP, NIPPV, NIHFV	21-29%	
Severe CLD	Nasal cannula blended oxygen	≥30%	≥1.5L/min
	CPAP, SIPAP, NIPPV, NIHFV	≥30%	
	Mechanical ventilation (intubated)	21-100%	

Survival without major morbidities: Defined as survival at discharge from the NICU without having any of CLD, NEC stage 2 or 3, IVH grade 3 or 4 or PVL, sepsis, or ROP stage 3, 4, 5, or ROP treatment.

Variables Definitions

Definitions of CNN variables can be found in the CNN abstractors' manual. The manual can be accessed on the CNN website (www.canadianneonatalnetwork.org/portal) via the following link:
http://www.canadianneonatalnetwork.org/portal/Portals/0/CNN%20Manuals/CNN%20Manual_20210225.pdf

Major Anomalies

A list of major anomalies can be found in the 2013 annual report, pages 124-127.
It is available via the following link:
http://www.canadianneonatalnetwork.org/Portal/LinkClick.aspx?fileticket=lreR0871sjA%3d&tabid=39

Abbreviations

ANCS	Antenatal Corticosteroids
BW	Birth Weight
BPD	Bronchopulmonary dysplasia
CONS	Coagulase-Negative Staphylococcus
CPAP	Continuous Positive Airway Pressure
CLABSI	Central Line-Associated Bloodstream Infection
CLD	Chronic Lung Disease
CVL	Central Venous Line
DR	Delivery Room
EPIQ	Evidence-based Practice for Improving Quality
ETT	Endotracheal Tube
GA	Gestational Age
GBS	Group B Streptococcus
GM	Germinal Matrix
HFV	High Frequency Ventilation
HIE	Hypoxic Ischemic Encephalopathy
ICROP	International Classification of Retinopathy of Prematurity
IPPV	Intermittent Positive Pressure Ventilation
IVH	Intra-Ventricular Hemorrhage
NEC	Necrotizing Enterocolitis
NI	Nosocomial Infection
NICE	Neonatal-Perinatal Interdisciplinary Capacity Enhancement
NICU	Neonatal Intensive Care Units
NTISS	Neonatal Therapeutic Intervention Scoring System
PDA	Patent Ductus Arteriosus
PEC	Parenchymal Echogenicity
PICC	Peripherally Inserted Central Catheters
PIV	Peripheral Intravenous
PMA	Postmenstrual Age
PPV	Positive Pressure Ventilation

PVL	Periventricular Leukomalacia
RDS	Respiratory Distress Syndrome
ROP	Retinopathy of Prematurity
SD	Standard Deviation
SEM	Standard Error of Mean
SGA	Small for Gestational Age
SNAP	Score for Acute Neonatal Physiology
SNAP-IIPE	Score for Acute Neonatal Physiology Version II, Perinatal Extension
SR	Standardized Ratio
TPN	Total Parenteral Nutrition
TRIPS	Transport Risk Index of Physiologic Stability
UV	Umbilical Vein
VE	Ventricular Enlargement
VEGF	Vascular Endothelial Growth Factor
VLBW	Very Low Birth Weight
VP	Ventriculoperitoneal