The Canadian Neonatal Network™
2023 Annual Report

Le Réseau Néonatal Canadien™
2023 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 2023

Maternal-Infant Care Research Centre, Mount Sinai Hospital, Toronto, Ontario

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Participating CNN Sites and Site Investigators, Year 2023

Alberta Children's Hospital, Calgary, Alberta	Dr. Carlos Fajardo
BC Women's Hospital, Vancouver, British Columbia	Dr. Jonathan Wong
Cape Breton Regional Hospital, Sydney, Nova Scotia	Dr. Andrzej Kajetanowicz
Centre Hospitalier Universitaire de Québec, Sainte Foy, Québec	Dr. Bruno Piedboeuf & Dr. Christine Drolet
Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, Québec	Dr. Valérie Bertelle & Dr. Edith Massé
Children's Hospital of Eastern Ontario, Ottawa, Ontario	Dr. Brigitte Lemyre
Dr. Everett Chalmers Hospital, Fredericton, New Brunswick	Dr. Hala Makary & Dr. Ahmad Aziz
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Hamilton Health Sciences, Hamilton, Ontario	Dr. Amit Mukerji
Health Sciences Centre, Winnipeg, Manitoba	Dr. Mary Seshia & Dr. Deepak Louis
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Hôpital Sainte-Justine, Montréal, Québec	Dr. Keith Barrington, Dr. Anie Lapointe & Mr. Guillaume Ethier
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Janeway Children's Health and Rehabilitation Centre, St. John's, Newfoundland	Dr. Jo-Anna Hudson
Jewish General Hospital, Montréal, Québec	Dr. Victoria Bizgu & Dr. Nina Nouraeyen
Jim Pattison Children's Hospital, Saskatoon, Saskatchewan (Formerly Royal University Hospital)	Dr. Lannae Strueby
Kingston Health Sciences Centre, Kingston, Ontario	Dr. Faiza Khurshid
London Health Sciences Centre, London, Ontario	Dr. Kevin Coughlin
Montreal Children's Hospital – McGill University Health Centre, Montréal, Québec	Dr. Marc Beltempo & Dr. Marco Zeid
Mount Sinai Hospital, Toronto, Ontario	Dr. Prakesh Shah
Regina General Hospital, Regina, Saskatchewan	Dr. Andrei Harabor
Royal Alexandra Hospital, Edmonton, Alberta & University of Alberta Hospital – Stollery Children's, Edmonton, Alberta	Dr. Jennifer Toye & Dr. Joseph Ting
Royal Columbian Hospital, New Westminster, British Columbia	Dr. Miroslav Stavel
St. Boniface General Hospital, Winnipeg, Manitoba	Dr. Ann Yi &

Table of Contents

E.3.8. Site Comparisons – Mortality or Major Morbidity

F. Discharge Disposition & Status

G. Hypoxic Ischemic Encephalopathy

J. Appendices

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 2023. Admissions between January 1, 2023 and December 31, 2023 who were discharged by March 31, 2024 are included. Eight (8) infants who were admitted in 2022 but discharged after March 31, 2023 are also included in the 2023 report. Delivery room deaths, moribund neonates, and readmissions from 2022s were excluded.

Total number of eligible admissions to participating sites (See section D.1 for analyses)	15 660
Total number of eligible individual neonates (See section D.2. for analyses)	14 469
Total number of eligible very preterm (GA <33 weeks) neonates	4 278
Total number of eligible extremely preterm (GA <29 weeks) neonates (See section D.3. for analyses)	1 586
Total number of eligible very low birth weight (BW <1500 g) neonates (See section D.3. for analyses)	2 879

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 2023, eight (8) sites were only able to contribute data from a subset of eligible neonates admitted to their NICUs due to resource limitations. See pages 3-4 for data collection criteria of all participating sites.
c. Characteristics of participating sites are 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 are provided.
e. The denominators for all percentages in this report includes neonates whose data for that particular item were available.
f. This report includes data from neonates who were admitted in to the NICUs, except for Presentations #4, #6a and #6b.
g. Presentations #4, #6a and #6b included delivery room deaths.

Noteworthy findings:

1. This report consists of data from 15 660 admissions (representing 14 469 individual neonates) from 33 participating tertiary NICUs.

    a. Of the above, 4 278 (35.1%) neonates were very preterm <33 weeks' GA, and 1 586 (11%) neonates were extremely preterm <29 weeks' GA.

    b. Of all admissions across CNN, 24.5% were outborn.

2. The proportions of neonates who were provided active resuscitation and survived until discharge were 30%, 57%, and 74% at 22-, 23-, and 24-weeks' GA, respectively.

    a. Palliative care in the delivery room was the primary treatment for 43/89 (48%), 45/161 (28%), and 14/249 (6%) of neonates at 22-, 23-, and 24-weeks' GA, respectively.

    b. Across the CNN, 38, 107, and 235 neonates were admitted to the NICU at 22-, 23-, and 24-weeks' GA, respectively.

3. A complete course (2-doses) of antenatal steroids was administered in 57% of neonates <26-weeks' GA, 59.6% of neonates 26-28 weeks' GA, and 62.6% of neonates 29-32 weeks' GA.

4. Deferred cord clamping ≥60 seconds was administered in 27.8% of neonates <26-weeks' GA, 39.5% of 26-28 weeks' GA, and 52.5% of neonates 29-32 weeks' GA.

5. Among patients who received surfactant, Minimally Invasive Surfactant Therapy (MIST) was used in 8.7% of neonates <26-weeks' GA, 31.1% at 26-28 weeks' GA, 37.7% at 29-30 weeks' GA, and 40.5% at 31-32 weeks' GA.

6. Among neonates <33 weeks' GA with a PDA, 53% were conservatively (no treatment) managed, while 4.6% received either surgical ligation or device closure

7. Incidence of mortality among neonates admitted to the NICU was 275/4 077 (6.7%) for neonates <33-weeks' GA, and 231/1 521 (15.2%) for neonates <29-weeks' GA.

8. Early onset sepsis (EOS) was noted in 41/1 586 (2.6%) of neonates <29 weeks' GA; the most common organism was *E. Coli*. Late onset sepsis (LOS) was noted in 367/1 551 (23.6%) of neonates <29 weeks' GA who survived at least 2 days; the most common organism was *Coagulase-Negative Staphylococcus species (CONS)*.

9. Among neonates <29-weeks' GA, Severe Neurological Injury was noted in 13.7%, Severe ROP in 16.5%, CLD in 59.2%, and NEC stage ≥2 in 8%. The proportion of neonates <29 week's GA with mortality or major morbidity was 72.3%.

10. Among neonates <33 weeks' GA admitted to NICUs, 7.4% died, 52.5% were transferred to a community hospital or another in-patient unit in the same hospital, 2.2% were transferred to another tertiary hospital or transferred out of country. 38.0% were discharged directly home.

11. Across the CNN, 676 neonates were admitted with HIE. Of them, 485 received therapeutic hypothermia, of whom 10% died and 30% had brain injury on MRI.

What's new and updated for the 2023 Annual Report:

1. A new presentation on mortality following sepsis and septic shock in neonates <33 weeks' GA (Presentation #12)

2. A new presentation on the difference in Z-scores for weight at 36 weeks' PMA and birthweight for neonates <29 weeks' GA (Presentation #30)

3. For Presentation #20 and Presentation #21, depicting CLD across CNN, severe CLD has been split into those on invasive mechanical ventilation and non-invasive respiratory support at time of diagnosis.

4. New data points added include: Maternal Hypertension (Presentation #27), and Small for Gestational Age (<10%ile) (Presentation #28).

5. In Presentation #29, reporting the proportion of neonates on IMV at various time points, the 36 weeks' PMA time point has been removed.

6. Severe Brain Injury and PVL incidence by site stratified by GA, part of Presentations 42 and 43 in the 2022 Annual Report, have been removed.

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?
Alberta Children's Hospital, Calgary, AB	All eligible admissions	n	n/a	n/a	y	y	y	y
BC Women's Hospital, Vancouver, BC	All eligible admissions	y	n	y	y	y	y	y
Cape Breton Regional Hospital, Sydney, NS	All eligible admissions	n	n/a	y	n	n	n	n
Centre Hospitalier Universitaire de Quebec, Quebec City, QC	< 33 weeks GA, CDH & gastroschisis, and other selected admissions	y	n	y	y	y	y	y
Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC	< 33 weeks GA, HIE babies who were cooled at any GA	y	n	y	n	n	y	y
Children's Hospital of Eastern Ontario, Ottawa, ON	< 36 weeks GA, HIE babies who were cooled	n	n	n	y	y	y	y
Dr. Everett Chalmers Hospital, Federicton, NB	All eligible admissions	n	n/a	y	n	n	y	y
Foothills Medical Centre, Calgary, AB	All eligible admissions	n	n/a	y	y	y	y	n
Hamilton Health Sciences Centre, Hamilton, ON	All eligible admissions	y	n	y	y	y	y	y
Health Sciences Centre Winnipeg, MB	≤33 weeks GA, DRD, HIE babies who were cooled, CDH & gastroschisis, and other selected admissions	y	y	y	y	y	y	y
Hôpital Maisonneuve-Rosemont, Montréal, QC	< 33 weeks GA	n	n/a	y	n	n	n	n
Hôpital Sainte-Justine, Montreal, QC	All eligible admissions	y	n	y	y	y	y	y
Hospital for Sick Children, Toronto, ON	All eligible admissions	n	n/a	n/a	y	y	y	y
IWK Health Centre, Halifax, NS	< 33 weeks GA, all HIE, all CAPSNet, and transfers to/from other CNN centres	y	y	y	y	y	y	y
Janeway Children's Health & Rehab Centre, Saint John , NL	All eligible admissions	y	y	y	y	y	y	y
Jewish General Hospital, Montreal, QC	All eligible admissions	y	y	y	y	n	n	n
Jim Pattison Children's Hospital, Saskatoon, SK (Formerly Royal University Hospital)	All eligible admissions	n	n/a	n	y	y	y	y
Kingston General Hospital, Kingston, ON	All eligible admissions	y	y	y	y	n	y	y

London Health Sciences Centre, London, ON	All eligible admissions	y	y	y	y	y	y	y
Montreal Children's Hospital – MUHC, Montreal, QC	All eligible admissions	n	n/a	y	y	y	y	y
Mount Sinai Hospital, Toronto, ON	All eligible admissions	y	y	y	n	n	y	n
Regina General Hospital, Regina, SK	All eligible admissions	y	y	y	y	n	y	y
Royal Alexandra Hospital, Edmonton, AB*	< 33 weeks GA, HIE babies who were cooled, DRD	y	y	y	y	n	y	n
Royal Columbian Hospital, New Westminster, BC	All eligible admissions	y	y	y	y	n	y	y
St. Boniface General Hospital, Winnipeg, MB	All eligible admissions	n	n/a	Incomplete	y	y	y	y
Saint John Regional Hospital, Saint John, NB	All eligible admissions	n	n	y	n	n	y	y
Sunnybrook Health Sciences Centre, Toronto, ON	All eligible admissions	n	n/a	y	y	n	y	n
Surrey Memorial Hospital, Surrey, BC	All eligible admissions	y	y	y	y	n	y	n
The Moncton Hospital, Moncton, NB	All eligible admissions	n	n/a	y	y	n	y	n
The Ottawa Hospital, Ottawa, ON	< 33 weeks GA	y	partial	y	y	n	n	n
University of Alberta Hospital - Stollery, Edmonton, AB*	< 33 weeks GA, HIE babies who were cooled, CAPSNet	n	n/a	n/a	n	y	y	y
Victoria General Hospital, Victoria, BC	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
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, 2023 and December 31, 2023, and were discharged by March 31, 2024. 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. Eight (8) infants who were admitted in 2022 but discharged after March 31, 2023 are also included in this 2023 report. Delivery room deaths, moribund neonates, and readmissions from 2022 have been excluded. A total of 14 469 patients accounted for 15 660 admissions as some neonates were admitted on more than one occasion.

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 entered into a 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 at the site or in an alternate secured site used 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 has one or more 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 analyses were 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 the number of eligible admissions to participating sites

These include data from 15 660 eligible admissions (including readmissions) to 33 sites. 25 of these sites submitted complete data (n=14 239) on all admissions and 8 sites submitted data on a selected admission cohort (n=1 421).

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

These include data from 14 469 eligible neonates admitted to 33 sites. 25 of these sites submitted complete data (n=13 256) on all eligible admitted neonates and 8 sites submitted data on selected eligible admitted neonates (n=1 213).

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

These include data from 4 278 eligible very preterm neonates and 2 879 eligible very low birth weight (VLBW) neonates.

Canadian Neonatal Network™ Database: Admissions between January 1, 2023 and December 31, 2023 who were discharged by March 31, 2024. Eight (8) infants who were admitted in 2022 but discharged after March 31, 2023 were also included in the 2023 report. Delivery room deaths, moribund neonates, and readmissions from 2022 were excluded.

Section D.1

Total number of eligible admissions to participating NICUs (33 sites)
15 660

14 239 from 25 sites with complete data
1 421 from 8 sites with restricted data

Readmissions   **457**
Intra-CNN Transfers   **734**

Section D.2

Total number of eligible individual neonates admitted to participating NICUs (33 sites)
14 469

13 256 from 25 sites with complete data
1 213 from 8 sites with restricted data

Discharge destination
Home   7 241
Non-CNN site   3 754
Intra-site   2 640
Tertiary site   334
Death   473
Palliative Care   24
Out of country   1
Missing   2

Missing GA   **0**
Missing BW   **1**

GA < 33 weeks
and
BW < 1500g
2 716

GA < 33 weeks
and
BW ≥ 1500g
1 562

GA ≥ 33 weeks
and
BW < 1500g
163

GA ≥ 33 weeks
and
BW ≥ 1500g
10 027

Total number of eligible very preterm neonates (GA <33 weeks)
4 278

Total number of eligible very low birth weight neonates (BW <1500g)
2 879

Section D.3
Very preterm

Section D.3
VLBW

8

Section D.1

Analyses based on the number of eligible admissions to participating sites

These include data from 15 660 eligible admissions (including readmissions) to 33 sites. 25 of these sites submitted complete data (n=14 239) on all admissions and 8 sites submitted data on a selected admission cohort (n=1 421).

Presentation #1
All admissions: Type of admissions: All Sites

◻ Inborn   ■ Outborn   ◻ Readmission
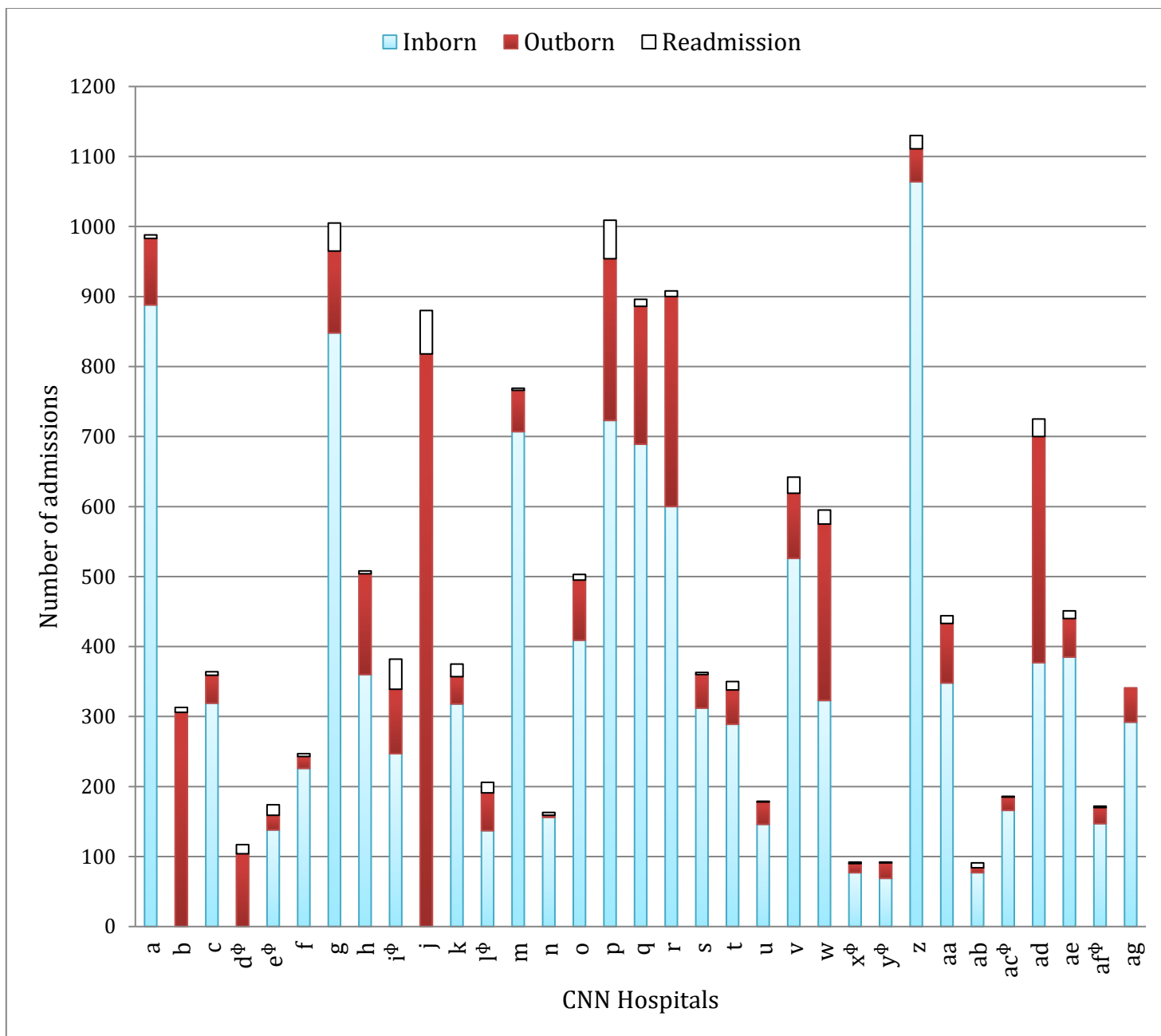
ⱷ Data collected on selected cohort of eligible admissions only.

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

Sites		Admission Status			Total	Sites		Admission status			Total
		Inborn	Outborn	Readmission				Inborn	Outborn	Readmission	
a	Count	888	95	5	988	r	Count	600	300	8	908
	%	89.9	9.6	0.5	(100.0)		%	66.1	33.0	0.9	(100.0)
b	Count	0	306	7	313	s	Count	312	48	3	363
	%	0.0	97.8	2.2	(100.0)		%	86.0	13.2	0.8	(100.0)
c	Count	319	40	5	364	t	Count	289	49	12	350
	%	87.6	11.0	1.4	(100.0)		%	82.6	14.0	3.4	(100.0)
d$^\phi$	Count	0	104	13	117	u	Count	146	32	1	179
	%	0.0	88.9	11.1	(100.0)		%	81.6	17.9	0.6	(100.0)
e$^\phi$	Count	138	21	15	174	v	Count	526	93	23	642
	%	79.3	12.1	8.6	(100.0)		%	81.9	14.5	3.6	(100.0)
f	Count	226	17	4	247	w	Count	323	252	20	595
	%	91.5	6.9	1.6	(100.0)		%	54.3	42.4	3.4	(100.0)
g	Count	848	117	40	1005	x$^\phi$	Count	77	13	2	92
	%	84.4	11.6	4.0	(100.0)		%	83.7	14.1	2.2	(100.0)
h	Count	360	144	4	508	y$^\phi$	Count	69	22	1	92
	%	70.9	28.4	0.8	(100.0)		%	75.0	23.9	1.1	(100.0)
i$^\phi$	Count	247	92	43	382	Z	Count	1064	47	19	1130
	%	64.7	24.1	11.3	(100.0)		%	94.2	4.2	1.7	(100.0)
j	Count	0	818	62	880	aa	Count	348	85	11	444
	%	0.0	93.0	7.1	(100.0)		%	78.4	19.1	2.5	(100.0)
k	Count	318	39	18	375	ab	Count	77	7	7	91
	%	84.8	10.4	4.8	(100.0)		%	84.6	7.7	7.7	(100.0)
l$^\phi$	Count	137	54	15	206	ac$^\phi$	Count	166	19	1	186
	%	66.5	26.2	7.3	(100.0)		%	89.3	10.2	0.5	(100.0)
m	Count	707	59	3	769	ad	Count	377	323	25	725
	%	91.9	7.7	0.4	(100.0)		%	52.0	44.6	3.5	(100.0)
n	Count	156	3	4	163	ae	Count	385	55	11	451
	%	95.7	1.8	2.5	(100.0)		%	85.4	12.2	2.4	(100.0)
o	Count	409	86	8	503	af$^\phi$	Count	147	23	2	172
	%	81.3	17.1	1.6	(100.0)		%	85.5	13.4	1.2	(100.0)
p	Count	723	231	55	1009	ag	Count	292	49	0	341
	%	71.7	22.9	5.5	(100.0)		%	85.6	14.4	0.0	(100.0)
q	Count	689	197	10	896	Total	Count	11363	3840	457	15660
	%	76.9	22.0	1.1	(100.0)		%	72.6	24.5	2.9	(100.0)

COMMENTS: These analyses include 15 660 admissions to participating sites across the CNN during the period of January 1, 2023 to December 31, 2023. After adjusting for readmission, 14 469 neonates are represented. **Twenty-five sites collected data on all eligible admissions whereas eight 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=25 sites, 13 752 admissions, 3 with missing data on SNAP-II scores and 484 not applicable due to death or transfer within 12 hours)
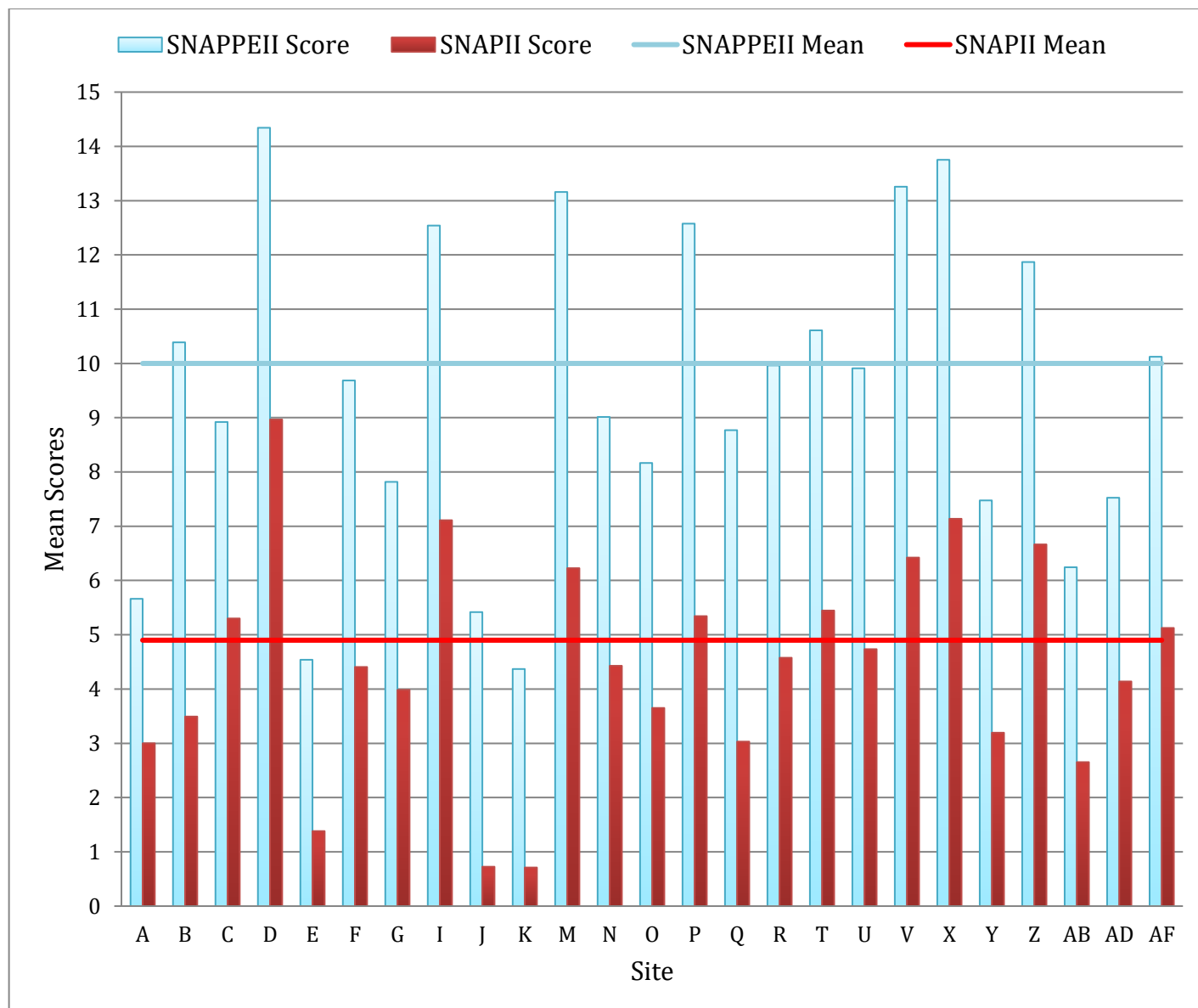
Data collection status	Number of sites	Score	Mean	Std Dev	Q1	Median	Q3
Complete	**25**	**SNAPIIPE**	10.0	0.1	0	0	18
		SNAPII	4.9	0.1	0	0	5
Restricted	**8**	**SNAPIIPE**	17.2	0.5	0	10	28
		SNAPII	7.5	0.3	0	0	9

12

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	5.7	3.0		**Q**	Mean	8.8	3.0
	SEM	0.6	0.4			SEM	0.9	0.4
B	Mean	10.4	3.5		**R**	Mean	10.0	4.6
	SEM	0.5	0.2			SEM	0.5	0.3
C	Mean	8.9	5.3		**S$^\phi$**	Mean	18.4	6.7
	SEM	0.5	0.3			SEM	1.7	1.2
D	Mean	14.3	9.0		**T**	Mean	10.6	5.4
	SEM	1.2	0.8			SEM	0.8	0.4
E	Mean	4.5	1.4		**U**	Mean	9.9	4.7
	SEM	0.5	0.2			SEM	0.8	0.5
F	Mean	9.7	4.4		**V**	Mean	13.3	6.4
	SEM	0.7	0.4			SEM	0.7	0.5
G	Mean	7.8	4.0		**W$^\phi$**	Mean	14.4	6.1
	SEM	0.8	0.5			SEM	1.4	0.9
H$^\phi$	Mean	17.7	7.1		**X**	Mean	13.8	7.1
	SEM	1.5	0.8			SEM	0.7	0.4
I	Mean	12.5	7.1		**Y**	Mean	7.5	3.2
	SEM	0.5	0.3			SEM	0.7	0.4
J	Mean	5.4	0.7		**Z**	Mean	11.9	6.7
	SEM	1.2	0.3			SEM	0.7	0.5
K	Mean	4.4	0.7		**AA$^\phi$**	Mean	18.3	8.1
	SEM	0.5	0.2			SEM	1.4	0.7
L$^\phi$	Mean	16.3	6.7		**AB**	Mean	6.2	2.7
	SEM	1.2	0.6			SEM	0.6	0.3
M	Mean	13.2	6.2		**AC$^\phi$**	Mean	13.8	6.1
	SEM	0.8	0.4			SEM	1.8	1.1
N	Mean	9.0	4.4		**AD**	Mean	7.5	4.1
	SEM	0.7	0.4			SEM	0.4	0.2
O	Mean	8.2	3.7		**AE$^\phi$**	Mean	9.3	4.4
	SEM	0.6	0.4			SEM	1.4	0.7
P	Mean	12.6	5.3		**AF**	Mean	10.1	5.1
	SEM	0.6	0.3			SEM	0.5	0.3
					AG$^\phi$	Mean	20.5	9.9
						SEM	1.1	0.7

COMMENTS: These analyses include 15 159 admissions (out of 15 660 admissions, 10 had missing data on SNAP scores and 491 not applicable due to death or transfer within 15 hours) to participating all sites during the year 2023. Adjusting for readmission, these analyses represent 14 018 neonates. **Twenty-five sites collected data on all eligible admissions whereas eight sites (marked by $^\phi$) collected data on a selected cohort of eligible admissions only.** These eight 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 eight sites and thus, the scores are not comparable with each other or with centers contributing complete data. These eight 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 the number of eligible neonates admitted to participating sites

These include data from 14 469 eligible neonates admitted to 33 sites. 25 of these sites submitted complete data (n=13 256) on all eligible admitted neonates and 8 sites submitted data on a selected cohort of eligible admitted neonates (n=1 213).

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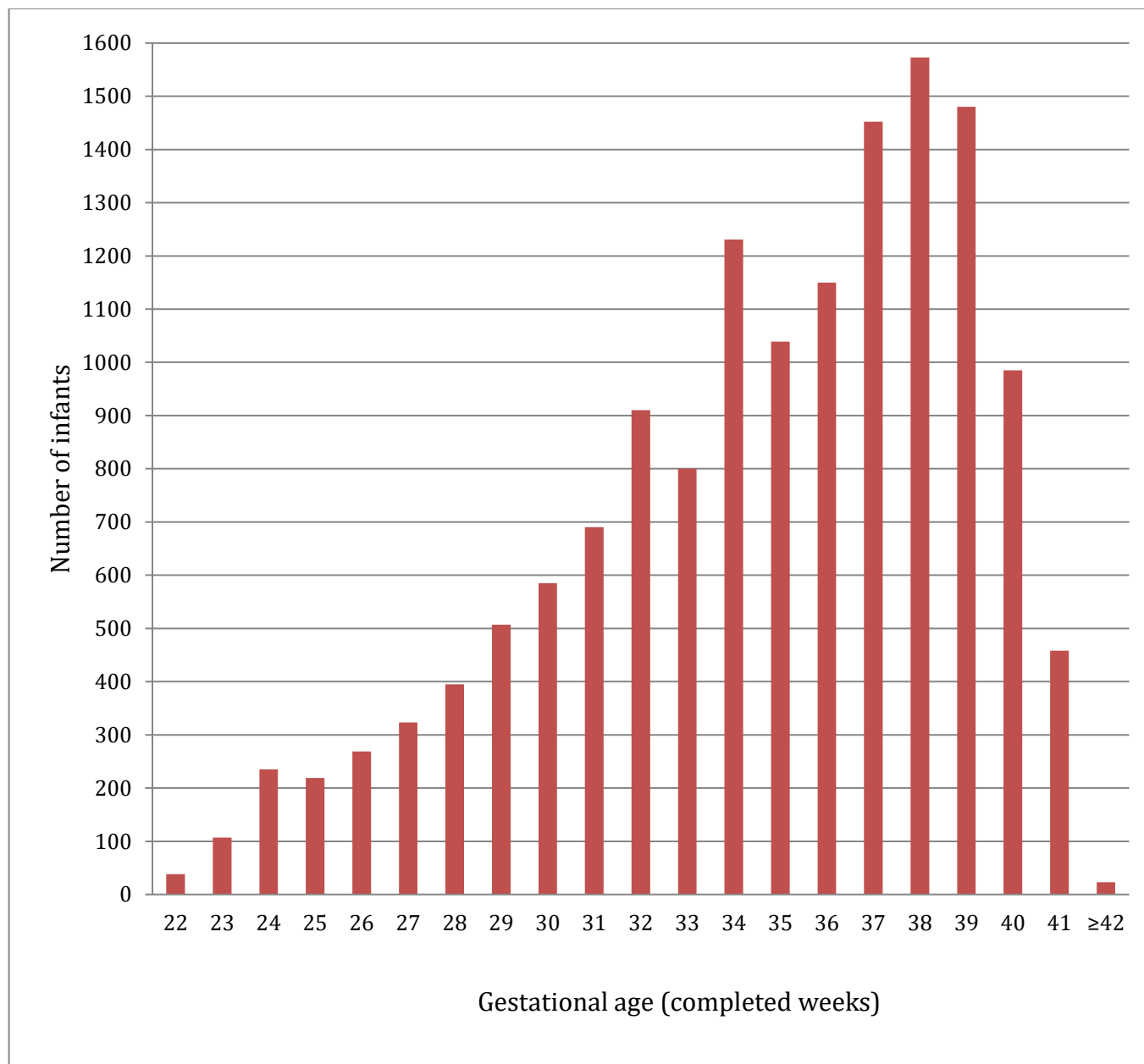
Presentation #3 (continued)
Gestational age distribution: All sites and all admitted neonates

GA in completed weeks at birth	Frequency	Percent	Cumulative percent
22	38	0.3	0.3
23	107	0.7	1.0
24	235	1.6	2.6
25	219	1.5	4.1
26	269	1.9	6.0
27	323	2.2	8.2
28	395	2.7	11.0
29	507	3.5	14.5
30	585	4.0	18.5
31	690	4.8	23.3
32	910	6.3	29.6
33	800	5.5	35.1
34	1 231	8.5	43.6
35	1 039	7.2	50.8
36	1 150	8.0	58.7
37	1 452	10.0	68.8
38	1 573	10.9	79.6
39	1 480	10.2	89.9
40	985	6.8	96.7
41	458	3.2	99.8
≥42	23	0.2	100.0
Total included	14 469	100.0	
Total # of missing GA	0		
Total # of neonates	14 469		

COMMENTS: The GA distribution of neonates is shown here. Early-Term (37-38 weeks) and Term babies (≥39 weeks) represent 41.3% of the total number of neonates. Twenty-five sites collected data on all eligible admissions whereas eight sites collected data on a selected cohort of eligible admissions.

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

Chart: Percentage of Survival (y-axis, 0–100) vs Gestational age (completed weeks) (x-axis, 22 to ≥30). Three series:
- CNN admissions, excluding DR deaths
- All neonates who received active care
- All neonates (CNN admissions + DR deaths)
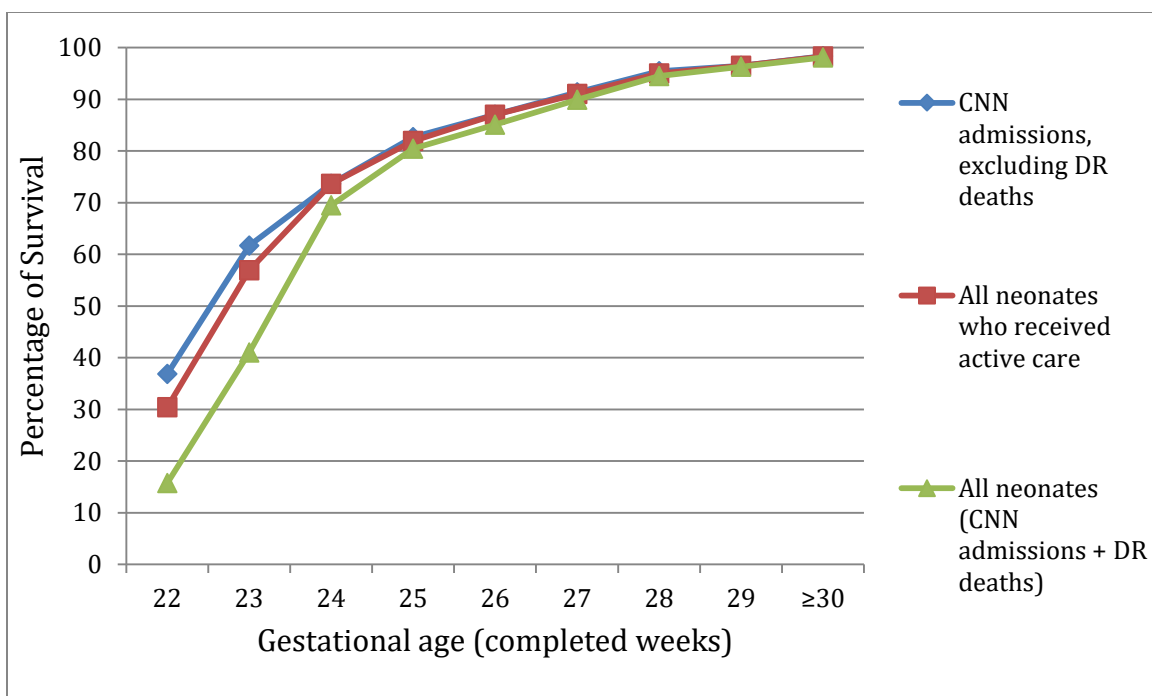
CNN admissions (this excludes delivery room deaths)					Delivery room deaths*		Total CNN admissions + delivery room deaths*				
GA (completed weeks)	#of neonates	#of survivors	Percent survival among CNN admissions, excluding DR deaths	#of neonates who received comfort care	Palliative care	Active care**	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	38	14	37	0	43	8	89	43	46	30	16
23	107	66	62	0	45	9	161	45	116	57	41
24	235	173	74	1	13	1	249	14	235	74	69
25	219	181	83	0	4	2	225	4	221	82	80
26	269	234	87	0	6	0	275	6	269	87	85
27	323	295	91	0	4	1	328	4	324	91	90
28	395	377	95	0	2	2	399	2	397	95	94
29	507	489	96	0	1	0	508	1	507	96	96
≥30	12 376	12 167	98	0	19	8	12 403	19	12 384	98	98
Total included	14 469	13 996	97	1	137	31	14 637	138	14 499	97	96
Missing GA	0				1	0	1	1	0		
Total	14 469			1	138	31	14 638	139	14 499		

*Please note that delivery room deaths are *only included in Presentations #4, #6a, 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.

17

Presentation #5
Birth weight distribution: All sites and all admitted neonates
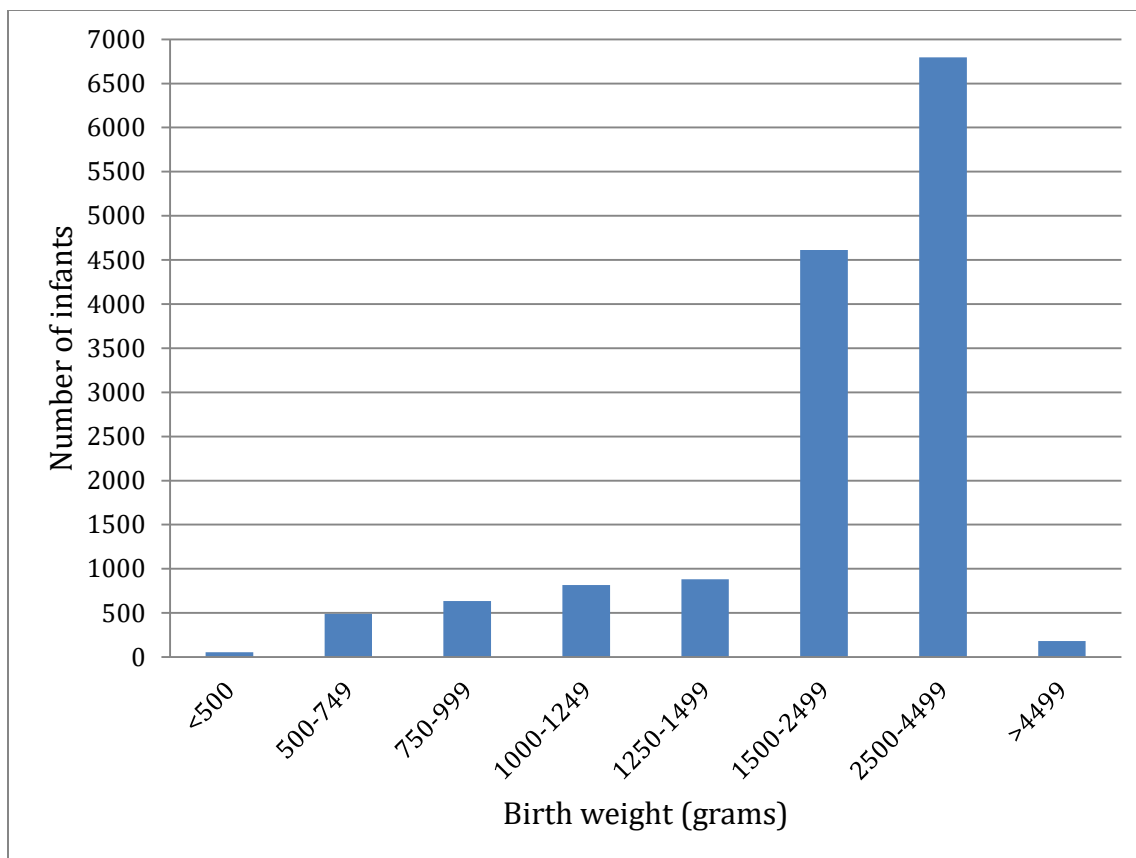
BW (grams)	Frequency	Percent from total number of neonates	Cumulative percent
<500	55	0.4	0.4
500-749	490	3.4	3.8
750-999	635	4.4	8.2
1000-1249	816	5.6	13.8
1250-1499	883	6.1	19.9
1500-2499	4 612	31.9	51.8
2500-4499	6 795	47.0	98.7
>4499	182	1.3	100.0
Total included	14 468	100.0	100.0
Missing BW	1		
Total # of neonates	14 469		

COMMENTS: The BW distribution of neonates admitted to the CNN sites. Eighty percent weighed more than 1 500g at birth and 48.2% weighed more than 2 500g. Twenty-five sites collected data on all admissions whereas eight 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	55	25	45	0	46	6	107	46	61	41	23
500-749	490	367	75	1	56	12	558	57	501	73	66
750-999	635	571	90	0	9	2	646	9	637	90	88
1000-1249	816	775	95	0	4	2	822	4	818	95	94
1250-1499	883	860	97	0	3	0	886	3	883	97	97
1500-2499	4 612	4 527	98	0	14	4	4 630	14	4 616	98	98
2500-4499	6 795	6 689	98	0	4	4	6 803	4	6 799	98	98
>4499	182	181	99	0	0	0	182	0	182	99	99
Total neonates included	14 468	13 995	97	1	136	30	14 634	137	14 497	97	96
Missing BW	1				2	1	4	2	2		
Total # of neonates	14 469				138	31	14 638	139	14 499		

*Please note that delivery room deaths are *only included in Presentations #4, #6a 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. <u>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.</u> 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	6	1	17	0	16	3	25	16	9	11	4
400-499	49	24	49	0	30	3	82	30	52	46	29
500-599	166	117	70	0	33	10	209	33	176	66	56
600-699	203	154	76	1	19	2	224	20	204	75	69
700-799	237	197	83	0	5	1	243	5	238	83	81
800-899	250	222	89	0	6	0	256	6	250	89	87
900-999	269	248	92	0	2	1	272	2	270	92	91
Total included	1 180	963	82	1	111	20	1 311	112	1 199	80	73

*Please note that delivery room deaths are *only included in Presentations #4, #6a 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			**599**	**987**	**2692**	**4220**	**5971**	**14469**
No prenatal care	172	N	11	31	47	91	82	262
		%	1.9	3.2	1.8	2.2	1.4	1.8
Marijuana/cannabis	111	N	42	74	206	307	354	983
		%	7.0	7.5	7.8	7.3	6.0	6.8
Smoking	82	N	70	108	298	472	522	1470
		%	11.7	11.0	11.2	11.3	8.8	10.2
Maternal hypertension	803	N	82	218	695	1083	759	2837
		%	14.0	22.7	26.8	26.8	13.8	20.8
Maternal diabetes	927	N	56	159	505	917	1070	2707
		%	9.9	17.0	19.7	22.9	19.5	20.0
Assisted pregnancy (ART)	0	N	82	105	275	400	264	1126
		%	13.7	10.6	10.2	9.5	4.4	7.8
Multiples	0	N	112	226	835	1164	138	2475
		%	18.7	22.9	31.0	27.6	2.3	18.2
MgSO$_4$ for neuroprotection	853	N	481	832	1970	714	34	4031
		%	82.2	85.8	76.8	17.9	0.6	29.6
Antenatal steroids	None	308	N	59	86	291	2627	5827	8890
			%	10.0	8.9	11.1	64.1	98.9	62.8
	Partial		N	195	305	687	396	7	1590
			%	33.1	31.5	26.3	9.7	0.1	11.2
	Complete		N	336	577	1637	1075	56	3681
			%	57.0	59.6	62.6	26.2	1.0	26.0
Mode of birth	Vaginal	33	N	239	302	853	1656	3334	6384
			%	40.0	30.6	31.8	39.3	56.0	44.2
	C/S		N	358	684	1834	2556	2620	8052
			%	60.0	69.4	68.3	60.7	44.0	55.8
Presentation	Vertex	1477	N	295	560	1701	2943	4725	10224
			%	51.4	59.0	68.2	77.5	91.3	78.7
	Breech		N	240	326	684	733	363	2346
			%	41.8	34.3	27.4	19.3	7.0	18.1
	Other		N	39	64	108	122	89	422
			%	6.8	6.7	4.3	3.2	1.7	3.2
Rupture of membranes	<24 h	1488	N	417	687	1850	3248	4834	11036
			%	74.2	74.8	75.8	85.3	92.0	85.0
	24h to 1wk		N	77	109	286	324	364	1160
			%	13.7	11.9	11.7	8.5	6.9	8.9
	>1 wk		N	68	122	305	236	54	785
			%	12.1	13.3	12.5	6.2	1.0	6.0

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

Characteristics		Missing/ Unknown		GA at birth (completed weeks)					
				<26	26-28	29-32	33-36	≥37	Total
Total				599	987	2692	4220	5971	14469
Chorioamnionitis*		1310	N	240	249	372	254	501	1616
			%	41.5	26.2	14.6	6.5	9.7	12.3
Deferred cord clamping	≤ 29 sec	1916	N	35	53	124	115	166	493
			%	6.1	5.6	5.0	3.0	3.5	3.9
	30-59 sec		N	97	187	388	506	652	1830
			%	16.8	19.7	15.5	13.4	13.8	14.6
	≥60 sec		N	160	376	1313	2296	2536	6681
			%	27.8	39.5	52.5	60.7	53.5	53.2
	Yes, but timing unknown		N	7	4	19	84	187	301
			%	1.2	0.4	0.8	2.2	4.0	2.4
	No		N	277	331	659	784	1197	3248
			%	48.1	34.8	26.3	20.7	25.3	25.9

*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

	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 ****
Inborn	**22-28**	N	68	559	329	15	366
		%	5.0	40.8	24.0	1.1	26.7
	29-32	N	142	815	726	44	518
		%	6.1	35.2	31.4	1.9	22.4
Outborn	**22-28**	N	77	8	<5	<5	106
		%	35.8	3.7	<1%	<1%	49.3
	29-32	N	149	20	24	8	117
		%	39.5	5.3	6.4	2.1	31.0

*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. If multiple courses of steroids received, only the last prior to delivery was used for this table.

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

Singleton

	Weeks		Deferred Cord clamping timing						Any Deferred Cord clamping	Immediate Cord clamping	DCC Unknown
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown			
Inborn	22-28	N	28	154	442	20	10	5	659	399	13
		%	2.6	14.4	41.3	1.9	0.9	0.5	61.5	37.3	1.2
	29-32	N	41	151	894	53	39	14	1192	332	32
		%	2.6	9.7	57.5	3.4	2.5	0.9	76.6	21.3	2.1
Outborn	22-28	N	4	15	40	2	3	3	67	74	36
		%	2.3	8.5	22.6	1.1	1.7	1.7	37.8	41.8	20.3
	29-32	N	2	27	73	0	1	2	105	83	113
		%	0.7	9.0	24.3	0.0	0.3	0.7	34.9	27.6	37.5

First twin

	Weeks		Deferred Cord clamping timing						Any Deferred Cord clamping	Immediate Cord clamping	DCC Unknown
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown			
Inborn	22-28	N	2	16	64	3	2	0	87	50	4
		%	1.4	11.4	45.4	2.1	1.4	0.0	61.7	35.5	2.8
	29-32	N	9	25	176	12	4	1	227	105	7
		%	2.7	7.4	51.9	3.5	1.2	0.3	67.0	31.0	2.1
Outborn	22-28	N	0	0	4	0	0	1	5	14	1
		%	0.0	0.0	20.0	0.0	0.0	5.0	25.0	70.0	5.0
	29-32	N	0	1	11	0	0	0	12	13	11
		%	0.0	2.8	30.6	0.0	0.0	0.0	33.3	36.1	30.6

Second twin

	Weeks		Deferred Cord clamping timing						Any Deferred Cord clamping	Immediate Cord clamping	DCC Unknown
			0-15 seconds	16-30 seconds	31-60 seconds	61-75 seconds	>75 seconds	Duration unknown			
Inborn	22-28	N	4	16	64	4	1	2	91	49	2
		%	2.8	11.3	45.1	2.8	0.7	1.4	64.1	34.5	1.4
	29-32	N	6	47	176	11	2	1	243	90	8
		%	1.8	13.8	51.6	3.2	0.6	0.3	71.3	26.4	2.4
Outborn	22-28	N	0	2	2	0	0	0	4	11	3
		%	0.0	11.1	11.1	0.0	0.0	0.0	22.2	61.1	16.7
	29-32	N	0	2	5	0	0	0	7	14	17
		%	0.0	5.3	13.2	0.0	0.0	0.0	18.4	36.8	44.7

Presentation #8a
Resuscitation details: GA <31 weeks

Action taken			GA at birth (completed weeks)								
			≤23	24	25	26	27	28	29	30	Total
Total			**145**	**235**	**219**	**269**	**323**	**395**	**507**	**585**	**2678**
No resuscitation needed/provided		N	0	0	2	1	0	0	3	13	19
		%	0.0	0.0	0.9	0.4	0.0	0.0	0.6	2.2	0.7
CPAP		N	26	97	120	181	255	325	424	484	1912
		%	17.9	41.3	54.8	67.3	79.2	82.3	83.6	83.0	71.5
PPV via mask		N	141	215	179	207	258	273	310	343	1926
		%	97.2	91.5	81.7	77.0	80.1	69.1	61.1	58.8	72.0
PPV via ETT		N	125	154	109	96	72	69	73	73	771
		%	86.2	65.5	49.8	35.7	22.4	17.5	14.4	12.5	28.8
Chest compression		N	5	10	9	7	5	7	10	15	68
		%	3.5	4.3	4.1	2.6	1.6	1.8	2.0	2.6	2.5
Epinephrine		N	3	5	5	2	2	3	5	9	34
		%	2.1	2.1	2.3	0.7	0.6	0.8	1.0	1.5	1.3
Unknown		N	0	0	1	0	1	1	1	6	10
		%	0.0	0.0	0.5	0.0	0.3	0.3	0.2	1.0	0.4
Any resuscitation provided*		N	145	233	216	268	321	391	500	559	2633
		%	100.0	99.2	98.6	99.6	99.7	99.0	98.6	95.9	98.4
Initial gas	Air	N	30	35	27	25	44	69	148	168	546
		%	20.7	14.9	12.3	9.3	13.6	17.5	29.2	28.7	20.4
	22-40% O_2	N	57	115	117	142	172	200	269	266	1338
		%	39.3	48.9	53.4	52.8	53.3	50.6	53.1	45.5	50.0
	41-70% O_2	N	23	40	42	63	50	68	27	27	340
		%	15.9	17.0	19.2	23.4	15.5	17.2	5.3	4.6	12.7
	71-99% O_2	N	3	2	0	1	4	1	4	3	18
		%	2.1	0.9	0.0	0.4	1.2	0.3	0.8	0.5	0.7
	100% O_2	N	19	28	14	20	20	21	17	22	161
		%	13.1	11.9	6.4	7.4	6.2	5.3	3.4	3.8	6.0
	Unknown/ Missing	N	13	15	19	18	33	36	42	99	275
		%	9.0	6.4	8.7	6.7	10.2	9.1	8.3	16.9	10.3
Maximum O_2 conc. during resus.	21%	N	0	0	1	2	2	2	6	13	26
		%	0.0	0.0	0.5	0.7	0.6	0.5	1.2	2.2	1.0
	22-40%	N	3	8	19	31	57	84	158	180	540
		%	2.1	3.4	8.7	11.5	17.7	21.3	31.2	30.8	20.2
	41-70%	N	15	39	42	72	86	110	128	146	638
		%	10.3	16.6	19.2	26.8	26.6	27.9	25.3	25.0	23.8
	>70%	N	124	182	151	156	169	177	192	185	1336
		%	85.5	77.5	69.0	58.0	52.3	44.8	37.9	31.6	49.9
	Missing	N	3	6	6	8	9	22	23	61	138
		%	2.1	2.6	2.7	3.0	2.8	5.6	4.5	10.4	5.2

* 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			**690**	**910**	**800**	**1231**	**1039**	**1150**	**5971**	**11791**
No resuscitation needed / provided		N	18	71	143	290	289	310	1687	2808
		%	2.6	7.8	17.9	23.6	27.8	27.0	28.3	23.8
CPAP		N	585	664	490	645	483	535	2505	5907
		%	84.9	73.1	61.3	52.4	46.5	46.5	42.0	50.1
PPV via mask		N	359	375	257	330	282	294	1747	3644
		%	52.1	41.3	32.1	26.8	27.1	25.6	29.3	30.9
PPV via ETT		N	68	57	39	49	45	42	400	700
		%	9.9	6.3	4.9	4.0	4.3	3.7	6.7	5.9
Chest compression		N	11	13	6	12	8	11	147	208
		%	1.6	1.4	0.8	1.0	0.8	1.0	2.5	1.8
Epinephrine		N	7	5	3	6	4	5	66	96
		%	1.0	0.6	0.4	0.5	0.4	0.4	1.1	0.8
Unknown		N	0	6	7	11	5	7	57	93
		%	0.0	0.7	0.9	0.9	0.5	0.6	1.0	0.8
Any resuscitation provided*		N	646	724	527	704	543	602	3005	6751
		%	93.8	79.7	65.9	57.2	52.3	52.4	50.3	57.3
Initial gas	Air	N	213	293	191	284	244	290	1448	2963
		%	30.9	32.2	23.9	23.1	23.5	25.2	24.3	25.1
	22-40% O_2	N	293	297	226	275	155	158	623	2027
		%	42.5	32.6	28.3	22.3	14.9	13.7	10.4	17.2
	41-70% O_2	N	36	24	26	39	36	28	134	323
		%	5.2	2.6	3.3	3.2	3.5	2.4	2.2	2.0
	71-99% O_2	N	5	3	2	1	2	6	20	39
		%	0.7	0.3	0.3	0.1	0.2	0.5	0.3	0.3
	100% O_2	N	27	21	28	42	37	53	299	507
		%	3.9	2.3	3.5	3.4	3.6	4.6	5.0	4.3
	Unknown/ Missing	N	116	272	327	590	565	615	3447	5932
		%	16.8	29.9	40.9	47.9	54.4	53.5	57.7	50.3
Maximum O_2 conc. during resus	21%	N	20	37	31	48	38	59	255	488
		%	2.9	4.1	3.9	3.9	3.7	5.1	4.3	4.1
	22-40%	N	249	290	209	261	191	199	843	2242
		%	36.1	31.9	26.1	21.2	18.4	17.3	14.1	19.0
	41-70%	N	149	160	125	162	118	118	476	1308
		%	21.6	17.6	15.6	13.2	11.4	10.3	8.0	11.1
	>70%	N	196	199	123	172	145	173	1047	2055
		%	28.4	21.9	15.4	14.0	14.0	15.0	17.5	17.4
	Missing	N	76	224	312	588	547	601	3350	5698
		%	11.0	24.6	39.0	47.8	52.7	52.3	56.1	48.3

* 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
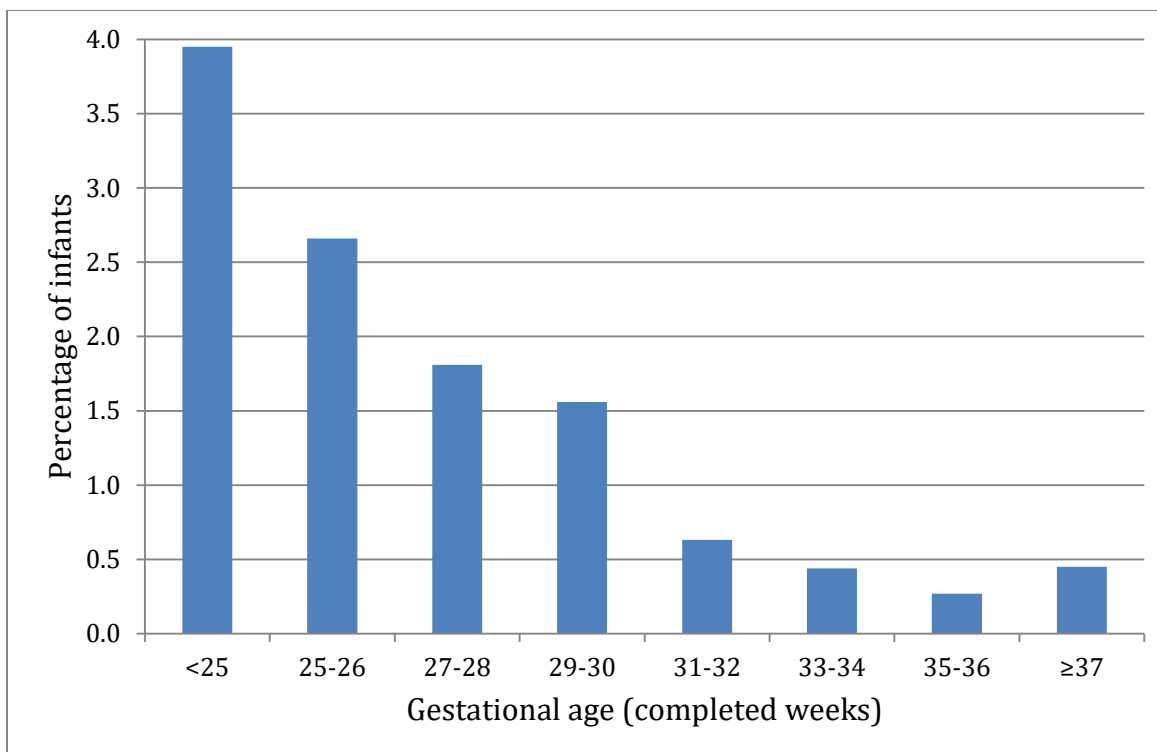
GA at birth (completed weeks)	Total number of neonates	No. of neonates with infection	% of neonates with infection	Total number of organisms	Organism		
					E. Coli	**GBS**	**Others**
<25	380	15	4.0	15	7	1	7
25-26	488	13	2.7	14	3	2	9
27-28	718	13	1.8	14	6	0	8
29-30	1 092	17	1.6	17	9	3	5
31-32	1 600	10	0.6	11	5	1	5
33-34	2 031	9	0.4	9	5	0	4
35-36	2 189	6	0.3	6	2	2	2
≥37	5 971	27	0.5	28	4	9	15
Total neonates included	**14 469**	**110**	**0.8**	**114**	**41**	**18**	**55**
Missing	0						
Total # of neonates	**14 469**						

COMMENTS: Early onset sepsis is defined as positive bacterial, viral or fungal culture in blood and/or cerebrospinal fluid, in the first two calendar days after birth. In other category, top five organisms were: Haemophilus (n=8), Streptococci (n=7), Citrobacter (n=6), Listeria monocytogenes (n=4), Staph aureus (n=4). 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 was not counted as an early onset sepsis in this presentation. No incident of Syphilis was observed in 2023.

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	Viral	Other
<25	380	19	361	160	44	44	233	111	23	22	16	5	56
25-26	488	11	477	126	35	26	173	82	16	27	6	7	35
27-28	718	5	713	81	12	11	98	52	10	13	2	1	20
29-30	1 092	4	1 088	64	8	6	75	33	9	10	0	4	19
31-32	1 600	4	1 596	45	6	3	57	21	9	5	1	4	17
33-34	2 031	7	2 024	23	2	1	26	11	6	3	1	2	3
35-36	2 189	7	2 182	27	3	1	34	17	4	6	0	2	5
≥37	5 971	19	5 952	83	6	1	99	41	12	10	0	14	22
Total included	**14 469**	**76**	**14 393**	**609**	**116**	**4**	795	368	89	96	26	39	177
Missing	0												
Total # of neonates	**14 469**												

COMMENTS: Late onset sepsis is defined as any positive blood and/or cerebrospinal fluid culture for bacteria, viral or fungi after 2 calendar days of age (analysis is neonate-based). The numbers are adjusted for readmission. Among other category, top 5 organisms were: Enterococci (n=38), Klebsiella (n=34), GBS (n=20), Bacillus (n=20) Enterobacter (n=14). Virus category includes Cytomegalovirus (n=18), Enterovirus (n=14), Herpes simplex virus (n=5), Human herpesvirus 6 (n=2).
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	55	7	48	21	9	44	34	13	4	8	0	2	7
500-749	490	16	474	179	50	38	256	124	22	29	18	4	59
750-999	635	5	630	128	25	20	167	86	12	24	6	6	33
1000-1499	1 699	9	1 690	101	11	6	117	54	15	13	0	6	29
1500-1999	2 264	7	2 257	50	11	2	66	26	12	7	2	3	16
2000-2499	2 348	8	2 340	32	3	1	38	17	8	2	0	2	9
≥2500	6 977	24	6 953	98	7	1	117	48	16	13	0	16	24
Total included	**14 468**	**76**	**14 392**	**609**	**116**	**4**	**795**	**368**	**89**	**96**	**26**	**39**	**177**
Missing (BW)	1												
Total # of neonates	**14 469**												

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: Enterococci (n=38), Klebsiella (n=34), GBS (n=20), Bacillus (n=20) Enterobacter (n=14). Virus category includes Cytomegalovirus (n=18), Enterovirus (n=14), Herpes simplex virus (n=5), Human herpesvirus 6 (n=2).
Note: In 2020, the coding for CONS and Staph Aureus were revised which has led to a change in proportion of each.

Presentation #12

Septic Shock and Mortality within 7 days in patients with Sepsis (both EOS & LOS)

	CONS				Non-CONS organisms			
	Total # of sepsis events N	Death within 7 days of sepsis event N (%*)	Septic Shock N (%*)	Death within 7 days of septic shock event N (%†)	Total # of sepsis events N	Death within 7 days of sepsis event N (%*)	Septic Shock N (%*)	Death within 7 days of septic shock event N (%†)
</=25 weeks	153	9 (6%)	25 (16%)	8 (32%)	194	32 (16%)	59 (30%)	30 (51%)
26-28 weeks	92	1 (1%)	5 (5%)	0	111	13 (12%)	32 (29%)	12 (38%)
29-32 weeks	54	0	4 (7%)	0	114	6 (5%)	29 (25%)	6 (21%)

* % of Total # of Sepsis events (e.g., 1 neonate with 2 distinct sepsis episodes = 2 sepsis events)
† % of Total # of Septic shock events

Definitions:
- Septic Shock defined as use of inotropes/pressors within 3 days after onset of sepsis (onset defined as the day the positive blood/CSF culture was sent)

Presentation #13
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				599	987	1092	1600	4220	5971	14469
Prophylactic	Indomethacin	8	N	90	38	3	0	0	1	132
			%	15.0	3.9	0.3	0.0	0.0	0.0	0.9
	Probiotics	8	N	394	681	750	843	598	173	3439
			%	65.8	69.1	68.8	52.8	14.2	2.9	23.8
RDS	Unknown /Uncertain	10	N	0	8	14	32	91	107	252
			%	0.0	0.8	1.3	2.0	2.2	1.8	1.7
	None		N	6	76	207	695	3310	5486	9780
			%	1.0	7.7	19.0	43.5	78.4	91.9	67.6
	Definite		N	593	902	868	870	819	375	4427
			%	99.0	91.5	79.7	54.5	19.4	6.3	30.6
Surfactant in first 30 min			N	123	70	31	19	6	0	249
			%	20.5	7.1	2.8	1.2	0.1	0.0	1.7
Surfactant in first 60 min			N	282	180	99	53	27	3	644
			%	47.1	18.2	9.1	3.3	0.6	0.1	4.5
Surfactant in first 120 min			N	415	312	187	121	68	14	1117
			%	69.3	31.6	17.1	7.6	1.6	0.2	7.7
Surfactant after 120 minutes			N	149	367	320	262	313	190	1601
			%	24.9	37.2	29.3	16.4	7.4	3.2	11.1
Surfactant at any time			N	564	679	507	383	381	204	2718
			%	94.2	68.8	46.4	23.9	9.0	3.4	18.8
Surfactant dose > 1	% out of surfactant at any time		N	293	213	91	50	38	24	709
			%	52.0	31.4	18.0	13.1	10.0	11.8	26.1
Method of surfactant (first dose only among the neonates who received surfactant)*	Endotracheal		N	494	450	298	212	266	163	1883
			%	87.6	66.3	58.8	55.4	69.8	79.9	69.3
	LISA/MIST		N	49	211	191	155	89	20	715
			%	8.7	31.1	37.7	40.5	23.4	9.8	26.3
	Other*		N	21	18	18	16	26	21	120
			%	3.7	2.7	3.6	4.2	6.8	10.3	4.4
Pneumothorax diagnosis		8	N	46	42	47	58	140	404	737
			%	7.7	4.3	4.3	3.6	3.3	6.8	5.1
Pneumothorax treatment**	No intervention		N	3	6	13	11	55	251	339
			%	6.5	14.3	27.7	19.0	39.3	62.1	46.0
	Needle drainage		N	27	20	26	27	49	94	243
			%	58.7	47.6	55.3	46.6	35.0	23.3	33.0
	Chest tube		N	31	31	26	40	50	85	263
			%	67.4	73.8	55.3	69.0	35.7	21.0	35.7
Seizures	Definite /suspected	12	N	25	27	14	29	108	364	567
			%	4.2	2.7	1.3	1.8	2.6	6.1	3.9

* "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 #13 (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				599	987	1092	1600	4220	5971	14469
Operations	Thoracotomy	8	N	10	7	7	13	18	48	103
			%	1.7	0.7	0.6	0.8	0.4	0.8	0.7
	Laparotomy	8	N	49	43	32	25	67	128	344
			%	8.2	4.4	2.9	1.6	1.6	2.1	2.4
	Ostomy		N	2	4	0	4	9	6	25
			%	0.3	0.4	0.0	0.3	0.2	0.1	0.2
	Reservoir/Drain	8	N	11	11	8	3	4	3	40
			%	1.8	1.1	0.7	0.2	0.1	0.1	0.3
	VP shunt	8	N	9	5	10	5	6	6	41
			%	1.5	0.5	0.9	0.3	0.1	0.1	0.3
Gastro-intestinal perforation	Spontaneous	13	N	33	22	12	6	11	15	99
			%	5.5	2.2	1.1	0.4	0.3	0.3	0.7
	NEC related		N	20	8	2	5	6	2	43
			%	3.4	0.8	0.2	0.3	0.1	0.0	0.3
Acquired stricture		8	N	6	5	0	4	4	3	22
			%	1.0	0.5	0.0	0.3	0.1	0.1	0.2
Exchange transfusion		8	N	1	4	1	4	8	3	21
			%	0.2	0.4	0.1	0.3	0.2	0.1	0.1
Congenital anomaly*	None		N	380	700	835	1317	3461	4321	11014
			%	63.4	70.9	76.5	82.3	82.0	72.4	76.1
	Minor		N	205	246	194	209	523	940	2317
			%	34.2	24.9	17.8	13.1	12.4	15.7	16.0
	Major		N	14	41	63	74	236	710	1138
			%	2.3	4.2	5.8	4.6	5.6	11.9	7.9

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

These included data from 4 278 eligible very preterm neonates and 2 879 eligible VLBW neonates.

Presentation #14
Patent ductus arteriosus (PDA) treatments: GA <33 weeks
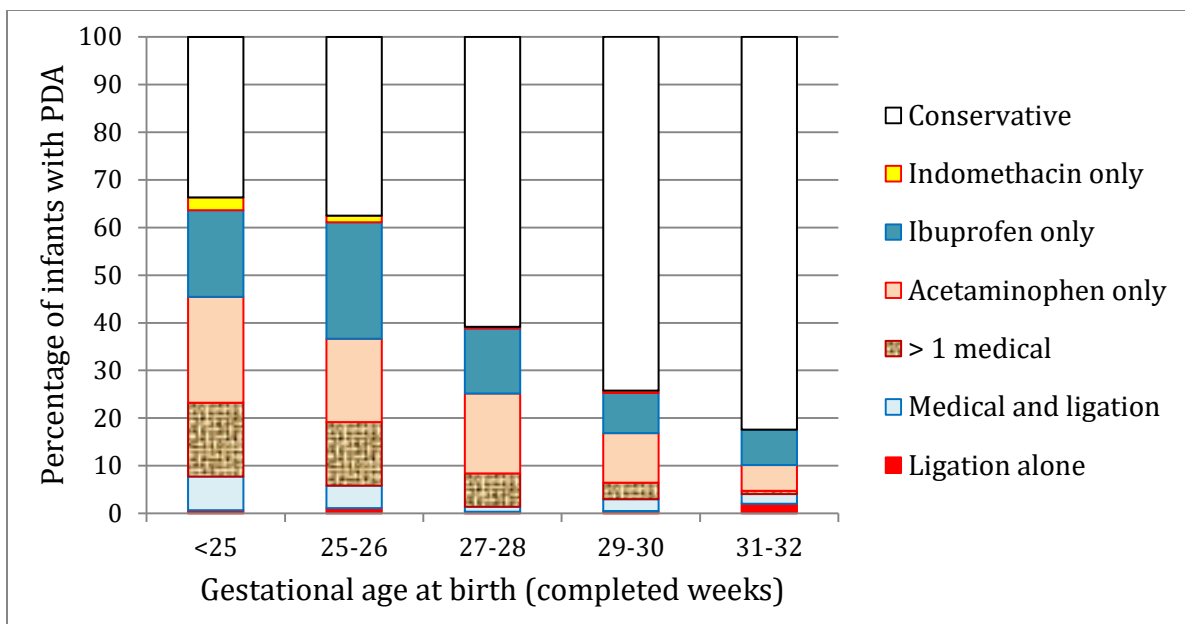
Birth GA (completed weeks)		Total	Missing data on PDA	PDA unknown	No PDA	Neonates with PDA	Treatment†						
							Conservative	Indo	Ibu	Acetaminophen	> 1 medical*	Medical and ligation#	Ligation alone
<25	N	380	0	7	76	297	100	8	54	66	46	21	2
	%						34%	3%	18%	22%	15%	7%	1%
25-26	N	488	0	4	124	360	135	5	88	63	48	17	4
	%						38%	1%	24%	18%	13%	5%	1%
27-28	N	718	1	3	428	286	174	1	39	48	20	3	1
	%						61%	0%	14%	17%	7%	1%	0%
29-30	N	1092	3	13	874	202	150	1	17	21	7	5	1
	%						74%	1%	8%	10%	3%	2%	1%
31-32	N	1600	3	22	1427	148	122	0	11	8	1	3	3
	%						82%	0%	7%	5%	1%	2%	2%
Total neonates included	N	4278	7	49	2929	1293	681	15	209	206	122	49	11
	%						53%	1%	16%	16%	9%	4%	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 49 Medical and ligation = surgical (20), device close (29)
Out of 11 Ligation alone = surgical (8), device closure (3)

COMMENTS: Specific reasons for treatment with indomethacin and frequency of repeat course of medical treatment (when same drug was used) 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 #15
Patent ductus arteriosus (PDA) treatments: BW <1500g
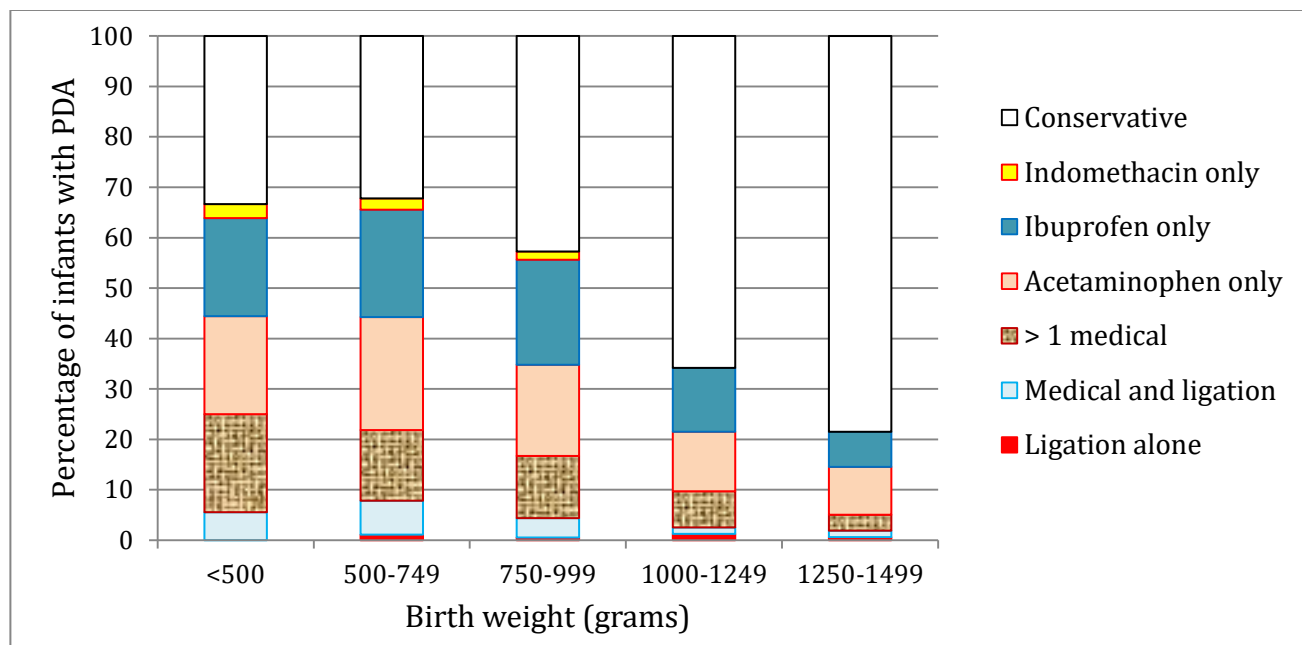
BW (grams)		Total	Missing data on PDA	PDA information unknown	No PDA	Neonates with PDA	Treatment†						
							Conservative	Indo	Ibu	Acetaminophen	> 1 medical*	Medical and ligation#	Ligation alone
<500	**N**	55	0	3	16	36	12	1	7	7	7	2	0
	%						33%	3%	19%	19%	19%	6%	0%
500-749	**N**	490	0	7	126	357	115	8	76	80	50	24	4
	%						32%	2%	21%	22%	14%	7%	1%
750-999	**N**	635	0	3	267	365	156	6	76	66	45	14	2
	%						43%	2%	21%	18%	12%	4%	1%
1000-1249	**N**	816	2	9	568	237	156	0	30	28	17	3	3
	%						66%	0%	13%	12%	7%	1%	1%
1250-1499	**N**	883	0	10	715	158	124	0	11	15	5	2	1
	%						78%	0%	7%	9%	3%	1%	1%
Total neonates included	**N**	2879	2	32	1692	1153	563	15	200	196	124	45	10
	%						49%	1%	17%	17%	11%	4%	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 45 Medical and ligation = surgical (18), device close (27)
Out of 10 Ligation alone = surgical (8), device closure (2)

COMMENTS: Specific reasons for treatment with indomethacin and frequency of a repeat course of medical treatment (when same drug was used) 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 #16
Neuroimaging findings: GA <33 weeks
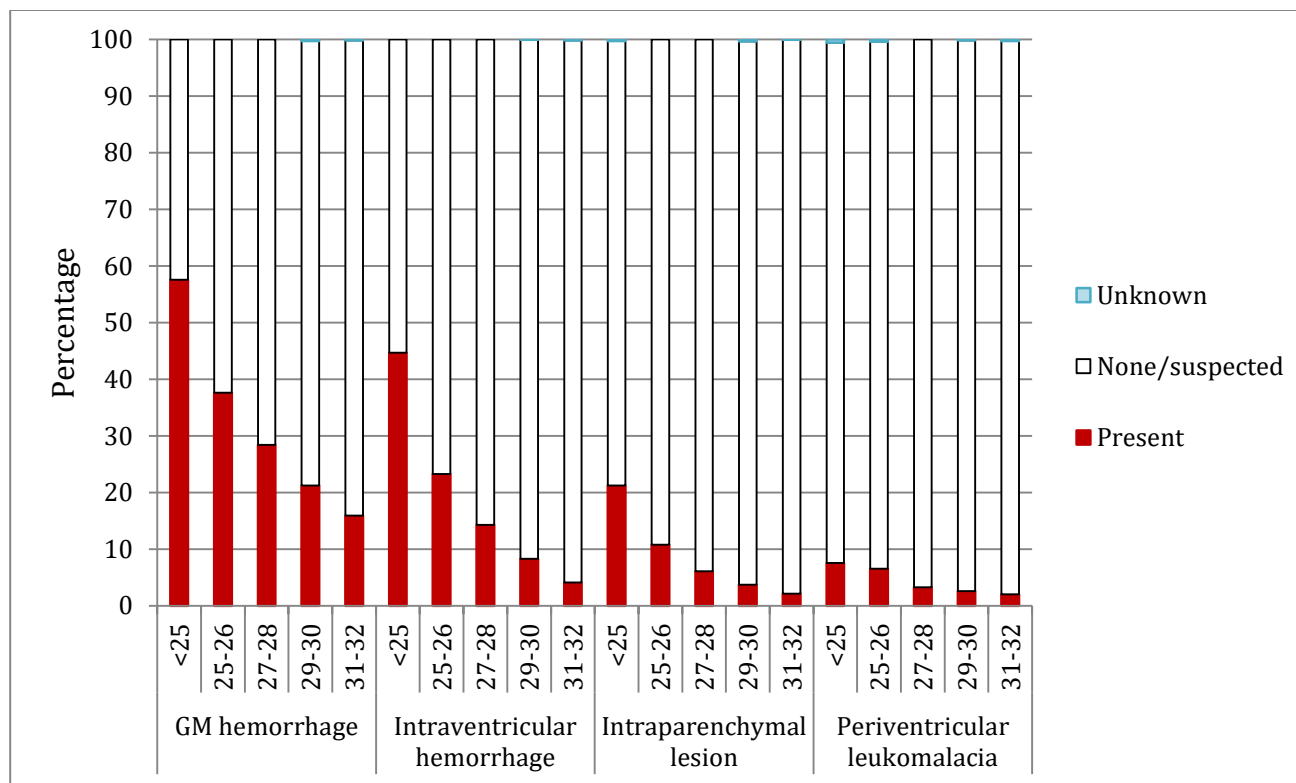
Ventricular enlargement
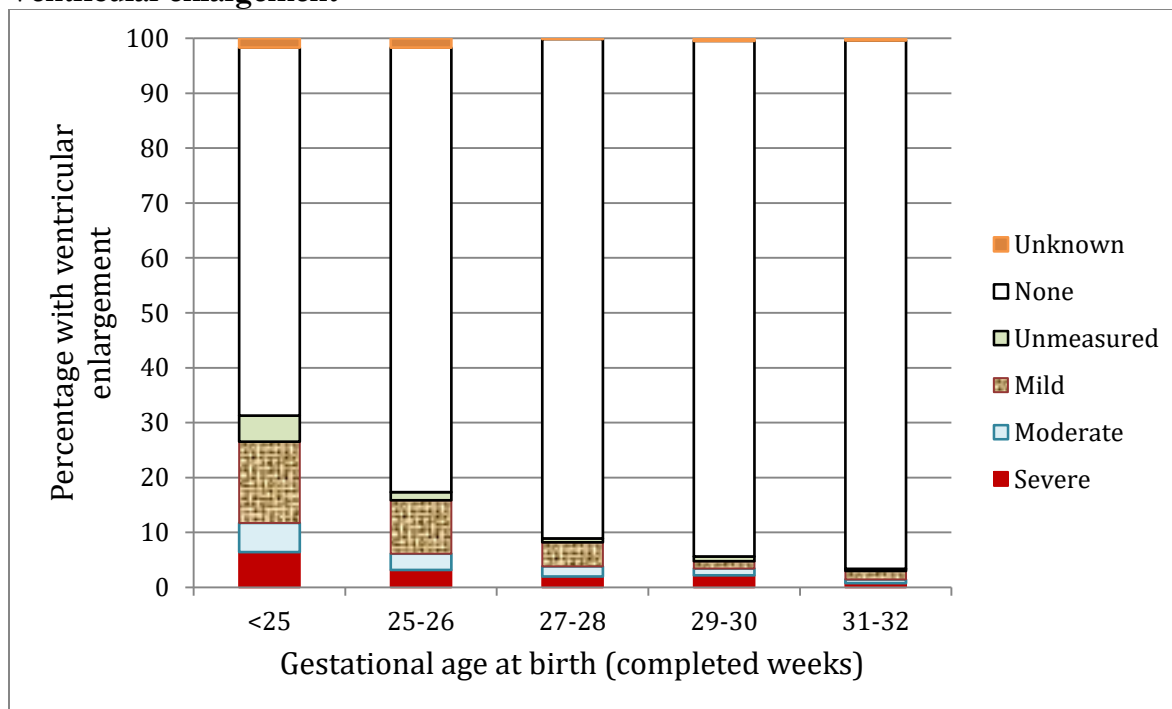
See page 144 for classifications of ventricular enlargement.

Presentation #16 (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	380	358	206	152	0	160	198	0	53	19	23	17	240	6	76	281	1	27	329	2
	%			58%	42%	0%	45%	55%	0%	15%	5%	6%	5%	67%	2%	21%	78%	0%	8%	92%	1%
25-26	N	488	473	178	295	0	110	363	0	46	14	15	7	383	8	51	422	0	31	440	2
	%			38%	62%	0%	23%	77%	0%	10%	3%	3%	1%	81%	2%	11%	89%	0%	7%	93%	0%
27-28	N	718	708	201	507	0	101	607	0	31	13	14	5	644	1	43	665	0	23	685	0
	%			28%	72%	0%	14%	86%	0%	4%	2%	2%	1%	91%	0%	6%	94%	0%	3%	97%	0%
29-30	N	1092	1051	223	825	3	87	963	1	14	13	23	9	987	5	39	1008	4	27	1022	2
	%			21%	79%	0%	8%	92%	0%	1%	1%	2%	1%	94%	0%	4%	96%	0%	3%	97%	0%
31-32	N	1600	1038	165	871	2	43	993	2	16	7	8	4	999	4	22	1015	1	21	1014	3
	%			16%	84%	0%	4%	96%	0%	2%	1%	1%	0%	96%	0%	2%	98%	0%	2%	98%	0%
Total number of neonates	N	4278	3628	973	2650	5	501	3124	3	160	66	83	42	3253	24	231	3391	6	129	3490	9
	%			27%	73%	0%	14%	86%	0%	4%	2%	2%	1%	90%	1%	6%	93%	0%	4%	96%	0%

Note: Neuroimaging findings were not mutually exclusive, i.e. one neonate may have had more than one finding.
See page 144 for classifications of ventricular enlargement.

Presentation #17
Neuroimaging findings: BW <1500g
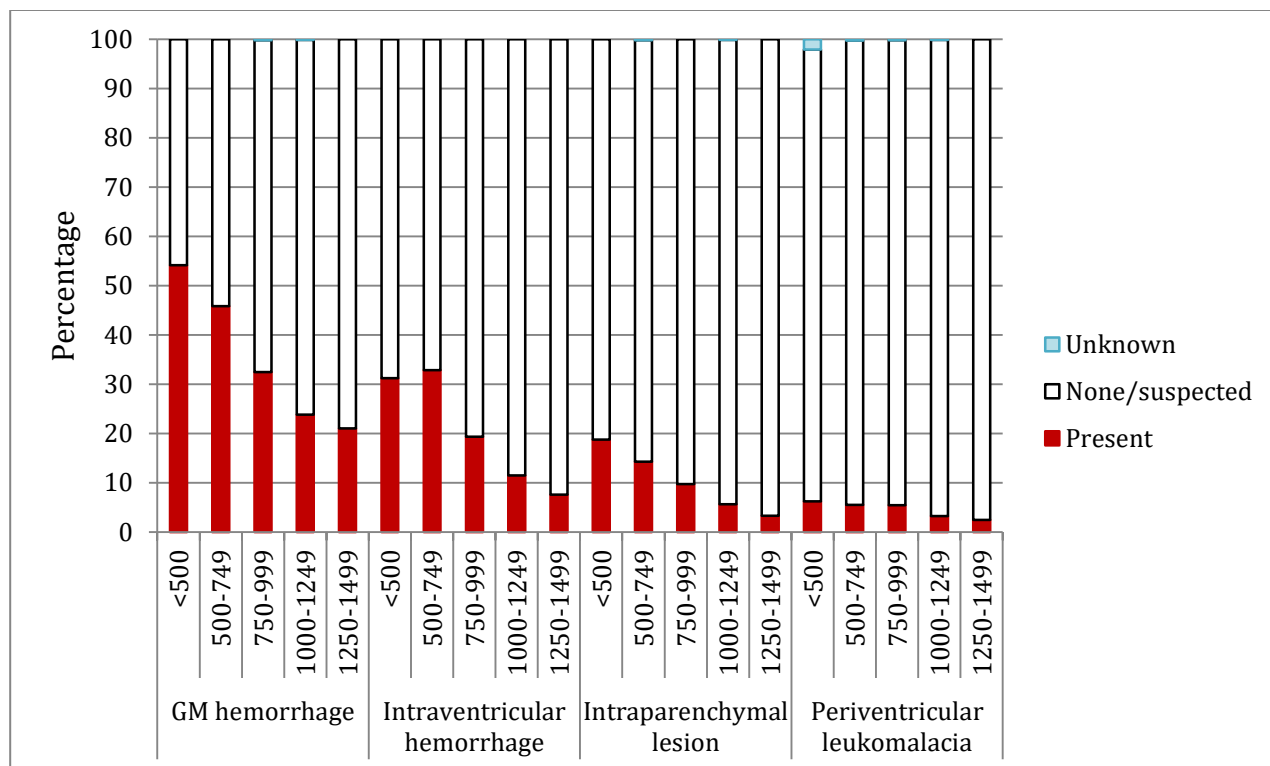
Ventricular enlargement
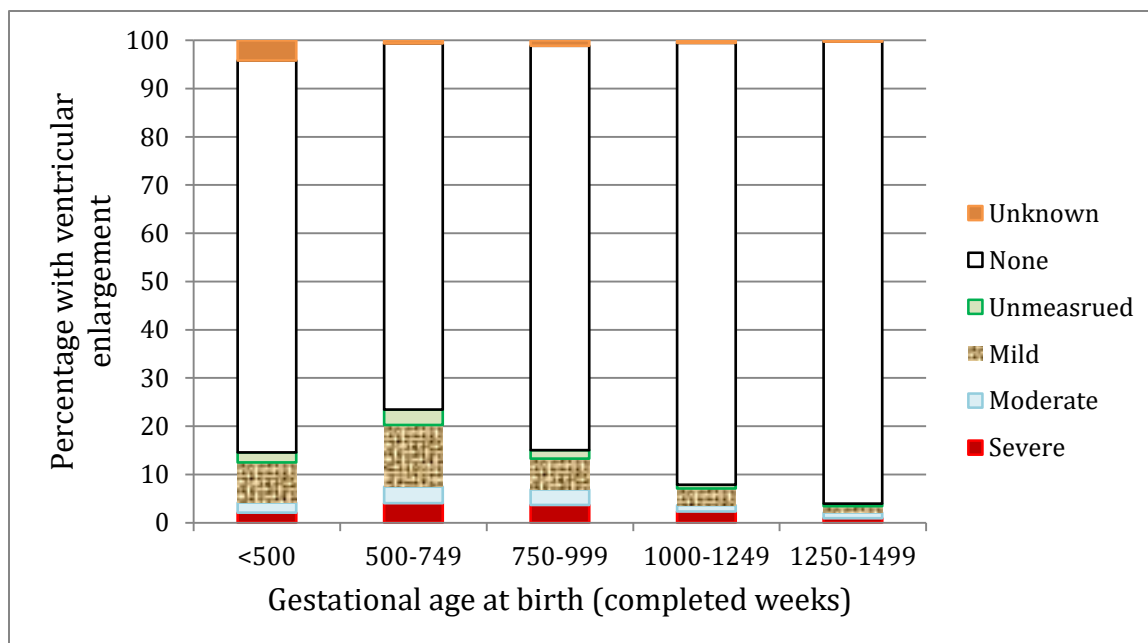
See page 144 for classifications of ventricular enlargement.

Presentation #17 (continued)
Neuroimaging findings: BW <1500g

BW (grams)		Total	Neuro-imaging available	GM hemorrhage Present	None/suspected	Unknown	Intraventricular hemorrhage Present	None/suspected	Unknown	Ventricular enlargement Mild	Moderate	Severe	Unmeasured	None	Unknown	Intraparenchymal lesion Present	None/suspected	Unknown	Periventricular leukomalacia Present	None/suspected	Unknown
<500	N	55	48	26	22	0	15	33	0	4	1	1	1	39	2	9	39	0	3	44	1
	%			54%	46%	0%	31%	69%	0%	8%	2%	2%	2%	81%	4%	19%	81%	0%	6%	92%	2%
500-749	N	490	469	215	254	0	154	315	0	60	16	19	15	356	3	67	401	1	26	442	1
	%			46%	54%	0%	33%	67%	0%	13%	3%	4%	3%	76%	1%	14%	86%	0%	6%	94%	0%
750-999	N	635	625	203	421	1	121	504	0	40	20	23	11	524	7	61	564	0	34	590	1
	%			32%	67%	0%	19%	81%	0%	6%	3%	4%	2%	84%	1%	10%	90%	0%	5%	94%	0%
1000-1249	N	816	775	185	589	1	89	686	0	27	10	18	6	710	4	44	730	1	25	749	1
	%			24%	76%	0%	11%	89%	0%	3%	1%	2%	1%	92%	1%	6%	94%	0%	3%	97%	0%
1250-1499	N	883	760	160	600	0	58	702	0	10	9	7	4	728	2	25	735	0	19	741	0
	%			21%	79%	0%	8%	92%	0%	1%	1%	1%	1%	96%	0%	3%	97%	0%	3%	98%	0%
Total neonates	N	2879	2677	789	1886	2	437	2240	0	141	56	68	37	2357	18	206	2469	2	107	2566	4
	%			29%	70%	0%	16%	84%	0%	5%	2%	3%	1%	88%	1%	8%	92%	0%	4%	96%	0%

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

Presentation #18
Necrotizing enterocolitis (NEC) treatments: GA <33weeks
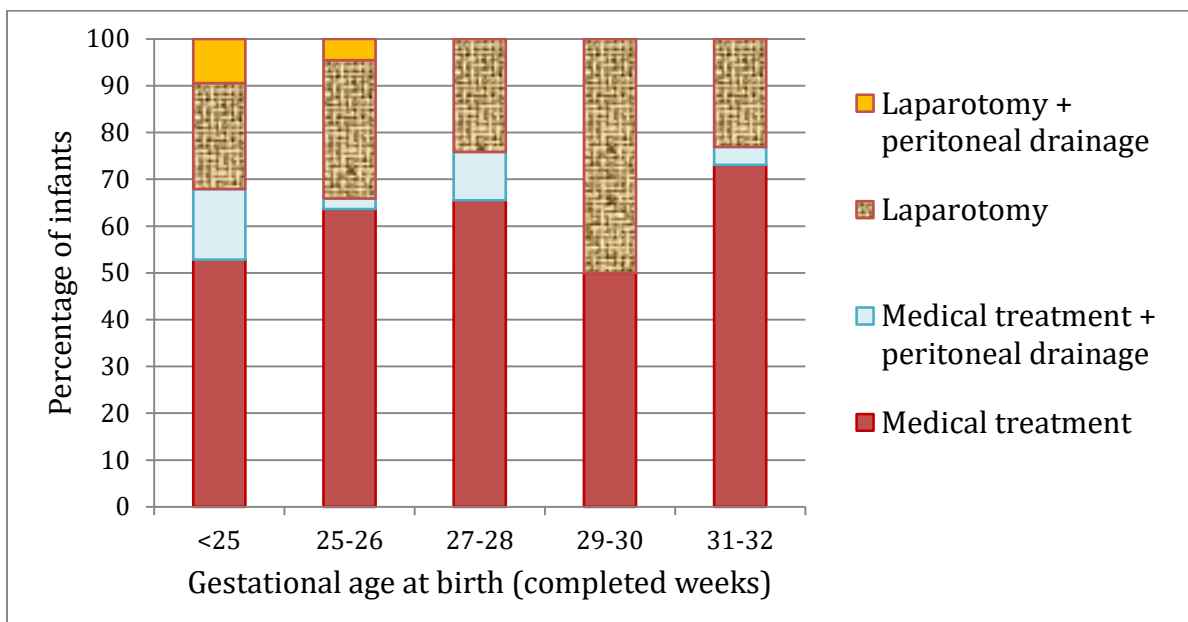
GA at birth (completed weeks)		Total number of neonates	Missing data on NEC	No NEC	NEC*	Neonates with necrotizing enterocolitis**				Death among infants with NEC**
						Medical treatment only	Medical + peritoneal drainage	Laparotomy	Peritoneal drainage + Laparotomy	
<25	N	380	2	325	53	28	8	12	5	18
	%				86%	14%	53%	15%	23%	9%	34%
25-26	N	488	0	444	44	28	1	13	2	11
	%				91%	9%	64%	2%	30%	5%	25%
27-28	N	718	1	688	29	19	3	7	0	4
	%				96%	4%	66%	10%	24%	0%	14%
29-30	N	1092	3	1069	20	10	0	10	0	2
	%				98%	2%	50%	0%	50%	0%	10%
31-32	N	1600	3	1571	26	19	1	6	0	5
	%				98%	2%	73%	4%	23%	0%	19%
Total number of neonates	N	4278	9	4097	172	104	13	48	7	40
	%				96%	4%	60%	8%	28%	4%	23%

*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 GA > 33 weeks:
GA 33 - 36 weeks: 31 neonates (0.7%)
GA ≥ 37 weeks: 22 neonates (0.4%)

Presentation #19
Necrotizing enterocolitis (NEC) treatments: BW <1500 g
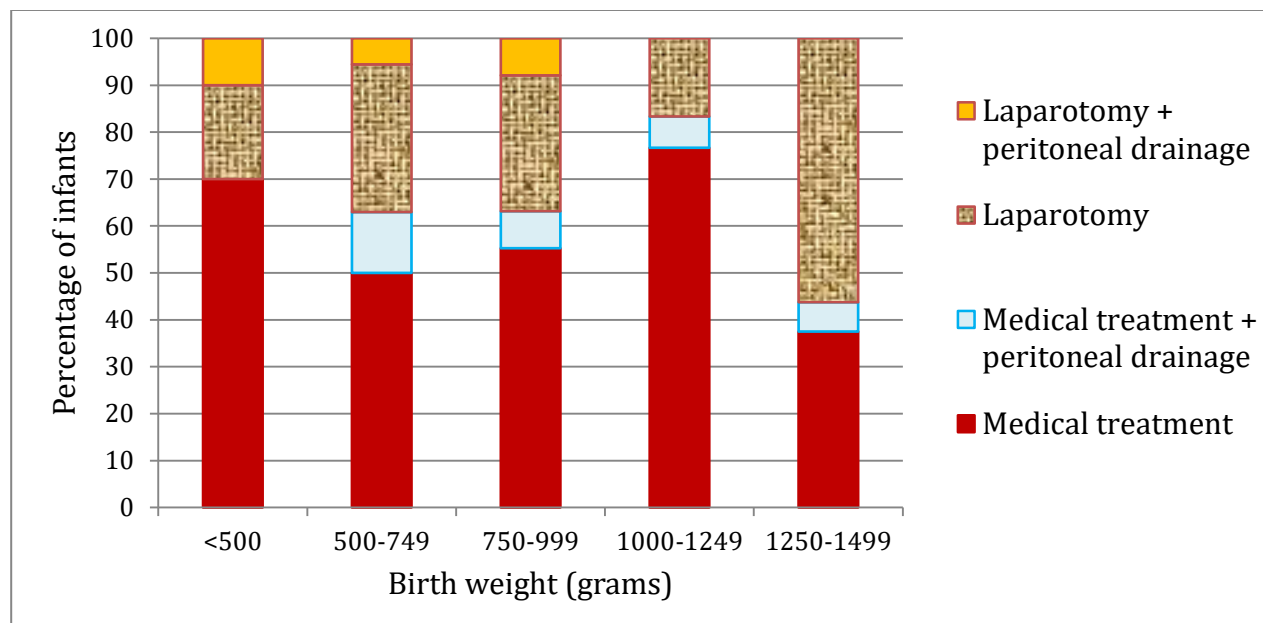
Birth weight (grams)		Total number of neonates	Missing data on NEC	No NEC	NEC*	Medical treatment only	Medical + peritoneal drainage	Laparotomy	Peritoneal drainage + laparotomy	Death among infants with NEC**
						Neonates with necrotizing enterocolitis**				Death among infants with NEC**
<500	N	55	0	45	10	7	0	2	1	6
	%			82%	18%	70%	0%	20%	10%	60%
500-749	N	490	1	435	54	27	7	17	3	14
	%			89%	11%	50%	13%	31%	6%	26%
750-999	N	635	1	596	38	21	3	11	3	9
	%			94%	6%	55%	8%	29%	8%	24%
1000-1249	N	816	2	784	30	23	2	5	0	5
	%			96%	4%	77%	7%	17%	0%	17%
1250-1499	N	883	0	867	16	6	1	9	0	3
	%			98%	2%	38%	6%	56%	0%	19%
Total number of neonates	N	2879	4	2727	148	84	13	44	7	37
	%			95%	5%	57%	9%	30%	5%	25%

*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: 49 neonates (1.1%)
BW ≥ 2500g: 28 neonates (0.4%)

Presentation #20
Chronic lung disease (CLD) at 36 weeks post menstrual age (PMA) or discharge:
GA <33 weeks

GA	Total number of neonates N	Number who died before 36 weeks' PMA N	Surviving neonates whose respiratory support is unknown* N	CLD from†	Neonates with known results N	Neonates with severe CLD on IMV‡, N (%)	Neonates with severe CLD on NRS¥, N (%)	Neonates with moderate CLD, N (%)	Neonates with mild CLD, N (%)	Neonates with unknown severity of CLD, N (%)	Neonates without CLD, N (%)
<25	380	125	0	36w	233	22 (9)	44 (19)	113 (49)	22 (9)	9 (4)	23 (10)
				Disch	22	2 (9)	2 (9)	8 (36)	2 (9)	1 (5)	7 (32)
25-26	488	71	0	36w	302	22 (7)	35 (12)	134 (44)	25 (8)	11 (4)	75 (25)
				Disch	115	1 (1)	1 (1)	38 (33)	11 (10)	2 (2)	62 (54)
27-28	718	42	0	36w	379	16 (4)	18 (5)	132 (35)	37 (10)	3 (1)	173 (46)
				Disch	297	3 (1)	1 (0)	72 (24)	9 (3)	2 (1)	210 (71)
29-30	1 092	28	5	36w	507	16 (3)	11 (2)	120 (24)	55 (11)	2 (0)	303 (60)
				Disch	552	1 (0)	2 (0)	91 (16)	14 (3)	3 (1)	441 (80)
31-32	1 600	23	9	36w	631	25 (4)	8 (1)	80 (13)	50 (8)	7 (1)	461 (73)
				Disch	937	0	0	41 (4)	15 (2)	1 (0)	880 (94)
Total	4 278	289	14	36w	2052	101 (5)	116 (6)	579 (28)	189 (9)	32 (2)	1035 (50)
				Disch	1923	7 (0)	6 (0)	250 (13)	51 (3)	9 (0)	1600 (83)

COMMENTS: See page 145 **for the definition of severity of CLD.**

COMMENTS: See page 145 for the definition of severity of CLD.
*unknown = first admission was after 36 weeks' PMA
** w = weeks' PMA, Disch = Status based on discharge status prior to 36 weeks' PMA
‡IMV = Invasive Mechanical Ventilation
¥NRS = Non-invasive Respiratory Support

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

BW	Total number of neonates N	Number who died before 36 weeks' PMA N	Surviving neonates whose respiratory support is unknown* N	CLD from†	Neonates with known results N	Neonates with severe CLD on IMV‡, N (%)	Neonates with severe CLD on NRS¥, N (%)	Neonates with moderate CLD, N (%)	Neonates with mild CLD, N (%)	Neonates with unknown severity of CLD, N (%)	Neonates without CLD, N (%)
<500	55	29	0	36w	23	4 (17)	6 (26)	7 (30)	1 (4)	2 (9)	3 (13)
				Disch	3	1 (33)	0	1 (33)	0	0	1 (33)
500-749	490	120	0	36w	316	27 (9)	55 (17)	154 (49)	26 (8)	13 (4)	41 (13)
				Disch	54	2 (4)	3 (6)	21 (39)	3 (6)	2 (4)	23 (43)
750-999	635	62	0	36w	379	25 (7)	31 (8)	166 (44)	34 (9)	10 (3)	113 (30)
				Disch	194	2 (1)	1 (1)	54 (28)	11 (6)	3 (2)	123 (63)
1000-1249	816	72	5	36w	389	14 (4)	9 (2)	113 (29)	45 (12)	1 (0)	207 (53)
				Disch	350	1 (0)	0	64 (18)	10 (3)	1 (0)	274 (78)
1250-1499	883	141	1	36w	339	9 (3)	5 (1)	62 (18)	34 (10)	1 (0)	228 (67)
				Disch	402	1 (0)	1 (0)	59 (15)	12 (3)	1 (0)	328 (82)
Total	2 879	424	6	36w	1446	79 (5)	106 (7)	502 (35)	140 (10)	27 (2)	592 (41)
				Disch	1003	7 (1)	5 (1)	199 (20)	36 (4)	7 (1)	749 (75)

COMMENTS: See page 145 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
‡IMV = Invasive Mechanical Ventilation
¥NRS = Non-invasive Respiratory Support

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 #22
Retinopathy of prematurity (ROP) staging: GA <33 weeks

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	380	267	251	6	15	138	92	0
	%				2%	6%	55%	37%	0%
25-26	N	488	422	407	19	111	223	54	0
	%				5%	27%	55%	13%	0%
27-28	N	718	678	576	66	303	192	15	0
	%				11%	53%	33%	3%	0%
29-30	N	1092	1065	620	90	419	105	6	0
	%				15%	68%	17%	1%	0%
31-32	N	1600	1577	188	18	144	24	2	0
	%				10%	77%	13%	1%	0%
Total neonates included	N	4278	4009	2042	199	992	682	169	0
	%				10%	49%	33%	8%	0%

*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.

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) staging: BW< 1500 g

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	55	27	25	0	2	15	8	0
	%				0%	8%	60%	32%	0%
500-749	N	490	381	364	14	52	203	95	0
	%				4%	14%	56%	26%	0%
750-999	N	635	579	509	29	195	230	55	0
	%				6%	38%	45%	11%	0%
1000-1249	N	816	781	549	80	319	143	7	0
	%				15%	58%	26%	1%	0%
1250-1499	N	883	864	376	51	255	67	3	0
	%				14%	68%	18%	1%	0%
Total neonates included	N	2879	2632	1823	174	823	658	168	0
	%				10%	45%	36%	9%	0%

*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.

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 #24
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	380	251	85	3	78	4	0
	%			34%				
25-26	N	488	407	43	8	34	1	0
	%			11%				
27-28	N	718	576	12	1	9	2	0
	%			2%				
29-30	N	1 092	620	4	1	3	0	0
	%			1%				
31-32	N	1 600	188	1	0	1	0	0
	%			1%				
Total neonates included	N	4 278	2 042	145	13	125	7	0
	%			7%				

*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
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	55	25	6	0	6	0	0
	%			24%				
500-749	N	490	364	92	6	81	5	0
	%			25%				
750-999	N	635	509	39	6	32	1	0
	%			8%				
1000-1249	N	816	549	5	0	4	1	0
	%			1%				
1250-1499	N	883	376	2	0	2	0	0
	%			1%				
Total neonates included	N	2879	1823	144	12	125	7	0
	%			8%				

*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 #26
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	144	80 (55)	114 (79)	73 (91)	44 (57)	34 (26)	19 (13)	63 (44)
24	223	165 (74)	189 (85)	145 (87)	64 (40)	45 (21)	31 (14)	92 (41)
25	218	180 (83)	170 (78)	129 (71)	32 (18)	38 (18)	23 (11)	66 (30)
26	254	221 (87)	174 (69)	139 (63)	26 (13)	27 (11)	19 (7)	56 (22)
27	306	281 (92)	163 (53)	131 (46)	11 (5)	26 (9)	15 (5)	40 (13)
28	386	370 (96)	183 (47)	146 (39)	6 (2)	26 (7)	12 (3)	36 (9)
29	478	466 (97)	177 (37)	157 (34)	4 (2)	18 (4)	10 (2)	24 (5)
30	551	543 (99)	169 (31)	127 (23)	2 (1)	29 (5)	8 (1)	30 (5)
31	661	647 (98)	128 (19)	97 (15)	2 (2)	19 (3)	12 (2)	23 (3)
32	865	856 (99)	115 (13)	93 (11)	0	13 (3)	10 (1)	13 (2)
Total neonates	4 086	3 809 (93)	1 582 (39)	1 237 (32)	191 (11)	275 (8)	159 (4)	443 (11)

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 (see below for details)

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 weeks PMA and survived beyond 36 weeks 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 #27
Prenatal characteristics and delivery room care practices: GA<29 weeks:
Site specific crude rates* (inborn only)

Site	Number of neonates	Antenatal MgSO$_4$[a]		Antenatal steroids[b]	Timing of cord clamping			Admission temperature			Apgar <5 at 5 minutes	Maternal hypertension
	N	Yes	No	Completed course within last week prior to birth[a]	<30 sec	30 – 59	≥60	<36.5	36.5-37.2	>37.2		
xxii	≤ 20	83.3	16.7	0.0	50.0	16.7	33.3	60.0	40.0	0.0	16.7	0.0
i		100.0	0.0	50.0	62.5	0.0	37.5	0.0	87.5	12.5	37.5	25.0
iii		81.3	18.8	31.3	25.0	31.3	43.8	12.5	56.3	31.3	6.3	25.0
xxi		100.0	0.0	75.0	37.5	0.0	62.5	50.0	25.0	25.0	25.0	25.0
xxviii		90.9	9.1	45.5	36.4	18.2	45.5	18.2	72.7	9.1	36.4	27.3
xviii		90.9	9.1	18.2	27.3	18.2	54.6	28.6	28.6	42.9	9.1	9.1
xiv		100.0	0.0	33.3	33.3	0.0	33.3	33.3	33.3	33.3	66.7	33.3
xxix		90.9	9.1	36.4	45.5	9.1	45.5	54.6	45.5	0.0	18.2	18.2
xvi	21 – 40	87.5	8.3	41.7	20.8	25.0	54.2	41.7	50.0	8.3	20.8	30.4
xxvii		87.5	12.5	58.3	29.2	25.0	45.8	50.0	41.7	8.3	16.7	20.8
vi		75.0	25.0	25.0	33.3	20.8	45.8	17.4	69.6	13.0	20.8	54.2
iv		76.9	23.1	46.2	34.6	26.9	34.6	30.8	61.5	7.7	23.1	19.2
xvii		84.6	11.5	53.9	19.2	26.9	53.9	32.0	56.0	12.0	11.5	26.9
xx		89.2	10.8	27.0	56.8	21.6	18.9	10.8	59.5	29.7	18.9	32.4
xxiii		92.1	7.9	44.7	57.9	15.8	26.3	52.6	42.1	5.3	21.1	29.7
xxxii		87.2	12.8	33.3	61.5	23.1	15.4	86.8	7.9	5.3	15.4	20.6
xi		80.0	20.0	32.5	47.5	22.5	27.5	32.5	62.5	5.0	20.0	30.0
vii	41 – 70	93.2	4.6	37.2	50.0	27.3	18.2	58.1	27.9	14.0	23.3	25.6
xix		93.2	6.8	59.1	38.6	34.1	27.3	37.2	46.5	16.3	6.8	6.8
v		83.0	14.9	36.2	46.8	8.5	44.7	32.6	60.9	6.5	31.9	17.0
ii		89.6	10.4	41.7	52.1	18.8	29.2	41.7	47.9	10.4	10.4	25.0
xxxiii		90.0	10.0	36.0	74.0	8.0	18.0	67.4	26.1	6.5	20.0	24.0
ix		84.6	15.4	44.2	59.6	5.8	26.9	9.6	67.3	23.1	23.1	26.9
xxv		87.9	12.1	36.2	25.9	51.7	20.7	30.4	53.6	16.1	7.1	18.5
viii		83.1	16.9	55.4	49.2	16.9	24.6	38.1	50.8	11.1	23.1	10.8
x	> 70	92.7	7.3	30.4	34.2	14.6	46.3	25.6	50.0	24.4	8.5	19.5
xv		88.2	11.8	45.2	45.2	16.1	37.6	23.7	59.1	17.2	11.8	16.3
xxx		74.5	25.5	37.7	30.2	13.2	53.8	29.3	56.6	14.2	5.7	19.8
xxiv		91.8	8.2	49.3	37.3	16.4	46.3	35.9	50.4	13.7	9.0	21.1
xxvi		98.0	2.0	37.8	49.3	14.9	35.8	18.2	63.5	18.2	16.2	16.9
Total CNN		88.1	11.6	41.0	43.4	18.7	36.1	33.3	52.1	14.6	15.3	21.1

*Denominators were based on **inborn** neonates <29 weeks' GA admitted without major congenital anomaly.
[a]Antenatal MgSO4 data were missing for 0.3% across CNN.
[b] 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 #28
Postnatal characteristics and care practices: GA <29 weeks:
Site specific crude rates* (inborn only)

Site	Number of neonates	No invasive mechanical ventilation in first 3 days[a]	Never received invasive mechanical ventilation[a]	Fed at any time in first 2 days of admission	Never received antimicrobials[b]	Exclusive mother's own milk feeding at discharge[c]	Exclusive formula feeding at discharge[c]	SGA (<10%)
	N	%	%	%	%	%	%	%
xxii		33.3	33.3	33.3	50.0	33.3	16.7	0.0
i		37.5	37.5	87.5	12.5	37.5	37.5	12.5
iii		56.3	43.8	62.5	25.0	31.3	25.0	12.5
xxi	≤ 20	62.5	25.0	87.5	0.0	25.0	37.5	12.5
xxviii		27.3	18.2	63.6	0.0	36.4	9.1	9.1
xviii		18.2	18.2	63.6	18.2	18.2	45.5	9.1
xiv		100.0	100.0	100.0	100.0	33.3	0.0	33.3
xxix		36.4	36.4	90.9	18.2	9.1	36.4	9.1
xvi		12.5	8.3	95.8	4.2	29.2	25.0	25.0
xxvii		33.3	29.2	75.0	8.3	45.8	41.7	20.8
vi		12.5	12.5	91.7	25.0	33.3	37.5	20.8
iv		53.9	46.2	73.1	15.4	30.8	19.2	12.0
xvii	21 – 40	30.8	26.9	69.2	30.8	53.9	11.5	26.9
xx		24.3	18.9	75.7	16.2	32.4	29.7	21.6
xxiii		42.1	39.5	63.2	10.5	34.2	36.8	15.8
xxxii		10.3	7.7	79.5	2.6	7.7	30.8	10.3
xi		17.5	12.5	92.5	2.5	25.0	52.5	2.5
vii		31.8	27.3	52.3	9.1	50.0	29.6	18.2
xix		34.1	25.0	79.6	4.6	34.1	18.2	15.9
v		34.0	27.7	87.2	8.5	48.9	19.2	4.3
ii	41 – 70	35.4	29.2	77.1	6.3	25.0	54.2	8.3
xxxiii		16.0	14.0	76.0	10.0	42.0	22.0	16.0
ix		28.9	21.2	86.5	23.1	55.8	13.5	9.6
xxv		39.7	29.3	91.4	3.5	29.3	13.8	10.3
viii		33.9	29.2	89.2	3.1	24.6	35.4	10.8
x		28.1	24.4	75.6	4.9	54.9	11.0	15.9
xv		30.1	20.4	91.4	10.8	47.3	25.8	6.5
xxx	> 70	51.9	44.3	85.9	5.7	68.9	4.7	7.6
xxiv		38.8	33.6	93.3	10.5	70.9	9.0	11.9
xxvi		60.1	43.2	86.5	1.4	49.3	10.8	10.8
Total CNN		36.3	29.1	82.7	8.9	44.7	21.4	12.0

*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.

Presentation #29

Proportion of babies on Invasive Mechanical Ventilation (IMV) among babies ALIVE at the specified post-natal ages (INBORN AND OUTBORN included)

- Invasive mechanical ventilation (IMV) includes any of conventional ventilation (IPPV), High Frequency Oscillatory Ventilation (HFOV) and High Frequency Jet Ventilation (HFJV)
- Denominator for each cell is the number of babies in the GA range *who are still alive at the specified post-natal age (and in the NICU)*
- The proportion in each cell represents babies in the GA range who are on IMV on that day *regardless of previous respiratory status* (i.e. this is **not** continuous days of IMV)

GA groups		22-25 weeks' GA (N = 599)				26-28 weeks' GA (N = 987)			
Postnatal age	Number of neonates based on GA 22-25	3 days	7 days	28 days	32 weeks CGA	3 days	7 days	28 days	32 weeks CGA
CNN overall	Number alive	564	530	455	432	966	949	848	826
	Number on MV	481	412	259	84	338	235	99	67
	Proportion	85.3	77.7	56.9	19.4	35.0	24.8	11.7	8.1
Sites									
iii		0.0	0.0	0.0	0.0	25.0	20.0	0.0	5.0
xiii		NA	NA	NA	NA	0.0	0.0	0.0	0.0
xii	1-3	50.0	0.0	50.0	50.0	75.0	33.3	33.3	0.0
i		100.0	100.0	100.0	66.7	16.7	0.0	20.0	20.0
xxi		66.7	66.7	33.3	33.3	42.9	14.3	0.0	0.0
xxii		50.0	0.0	0.0	0.0	0.0	33.3	0.0	0.0
xviii		100.0	100.0	75.0	0.0	62.5	50.0	12.5	0.0
xxviii		100.0	80.0	60.0	0.0	40.0	40.0	0.0	0.0
vi	4-9	100.0	75.0	50.0	0.0	10.5	15.8	10.5	0.0
xxix		100.0	66.7	0.0	0.0	20.0	0.0	0.0	0.0
xvii		100.0	100.0	33.3	0.0	58.3	45.5	15.0	9.5
xvi		100.0	100.0	85.7	50.0	45.5	40.0	27.8	23.5
xxxii		100.0	100.0	100.0	20.0	73.3	56.7	41.4	32.1
xxvii		90.0	77.8	33.3	12.5	20.0	20.0	0.0	0.0
xi		100.0	100.0	70.0	55.6	44.8	24.1	17.9	14.3
iv		83.3	81.8	55.6	12.5	23.8	15.0	10.5	5.3
xxiii	10-25	100.0	100.0	100.0	42.9	35.1	22.2	9.4	9.4
vii		100.0	92.9	58.3	0.0	52.6	48.6	5.4	0.0
xx		78.6	50.0	50.0	22.2	34.8	30.4	20.0	10.0
ix		86.4	86.4	61.9	22.2	44.4	30.6	16.7	8.7
xix		83.3	87.5	71.4	33.3	44.8	31.0	15.4	19.2
xxv		76.0	69.6	57.1	15.0	18.4	15.8	5.7	6.3
ii	26-35	92.0	78.3	42.9	15.0	18.5	14.8	7.4	3.7
v		96.4	88.5	81.8	13.6	37.5	29.0	14.3	0.0
xxxiii		96.4	95.8	18.2	0.0	65.4	38.5	11.5	0.0
viii		96.9	92.9	57.1	21.1	45.5	38.1	10.3	5.0
xv		97.3	86.1	78.1	40.6	37.3	22.7	11.4	14.1
xxx	>35	89.7	86.8	58.1	20.7	25.8	16.9	12.5	5.1
x		97.4	91.7	80.6	35.5	43.6	26.4	20.5	21.9
xxvi		47.8	33.3	35.7	12.7	12.0	11.0	3.8	5.2
xxiv		80.6	74.6	48.3	5.6	31.4	16.7	7.3	3.9

Sites xiv and xxxi did not have any infants in GA 22-25.

NA = No infants in the denominator

Note that grouping of sites per number of neonates was based on the number of neonates in GA 22-25 category; and the number of corresponding neonates was not the same for GA 26-28 group.

Presentation #30

Difference in Weight Z-scores at 36 weeks' PMA vs. Birth: Neonates <29 weeks' GA
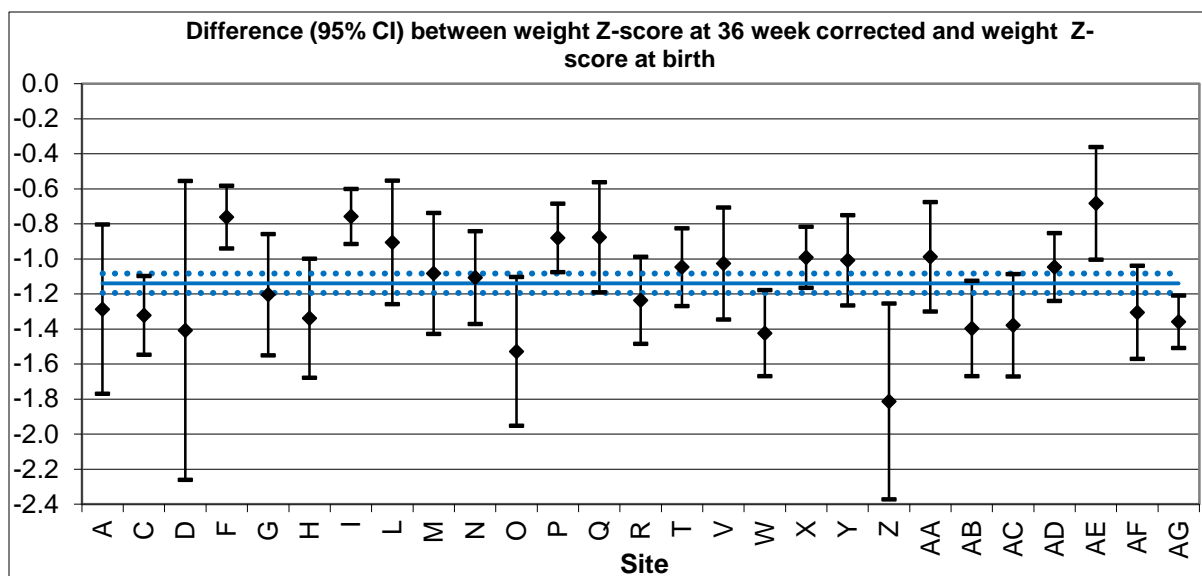
Site	A	C	D	F	G	H	I	L	M	
Mean Diff	-1.29	-1.32	-1.41	-0.76	-1.20	-1.34	-0.76	-0.91	-1.08	
Lower limit	-1.77	-1.55	-2.26	-0.94	-1.55	-1.68	-0.92	-1.26	-1.43	
Upper limit	-0.80	-1.10	-0.56	-0.58	-0.86	-1.00	-0.60	-0.55	-0.74	
Site	**N**	**O**	**P**	**Q**	**R**	**T**	**V**	**W**	**X**	
Mean Diff	-1.11	-1.53	-0.88	-0.88	-1.24	-1.05	-1.03	-1.42	-0.99	
Lower limit	-1.37	-1.95	-1.08	-1.19	-1.48	-1.27	-1.35	-1.67	-1.17	
Upper limit	-0.84	-1.10	-0.69	-0.56	-0.99	-0.82	-0.71	-1.18	-0.82	
Site	**Y**	**Z**	**AA**	**AB**	**AC**	**AD**	**AE**	**AF**	**AG**	**CNN**
Mean Diff	-1.01	-1.81	-0.99	-1.40	-1.38	-1.05	-0.68	-1.31	-1.36	-1.14
Lower limit	-1.27	-2.37	-1.30	-1.67	-1.67	-1.24	-1.00	-1.57	-1.51	-1.19
Upper limit	-0.75	-1.25	-0.68	-1.13	-1.09	-0.85	-0.36	-1.04	-1.21	-1.08

Notes:
- Site J, S, U had no eligible neonates. Sites B, E, K were not included due to small numbers of eligible neonates.
- Only neonates for whom data at 36 weeks' PMA were available were included.

E.2. Site Comparisons –

Survival / Mortality

Presentation #31
Survival rates by site: All GA

Site	Percentage survival for each GA (completed weeks)								Overall survival rate for sites*
	<25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	
A	100.0	50.0	100.0	100.0	100.0	100.0	100.0	99.5	99.4
B	100.0	100.0	66.7	94.1	100.0	98.3	97.6	96.3	96.7
C	69.7	94.9	100.0	97.8	97.5	100.0	99.0	98.8	97.7
D	100.0	0.0	60.0	100.0	100.0	100.0	100.0	100.0	98.3
E	33.3	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4
F	71.4	87.5	91.3	95.8	100.0	100.0	100.0	97.9	97.3
G	NA	100.0	80.0	100.0	100.0	100.0	100.0	100.0	99.6
H$^\phi$	42.9	72.2	88.2	95.5	98.1	100.0	100.0	100.0	92.3
I	78.0	87.0	94.2	94.4	98.2	98.8	98.8	98.8	96.8
J	NA	NA	33.3	NA	100.0	91.7	94.4	100.0	94.8
K	50.0	66.7	100.0	76.9	100.0	98.3	98.8	100.0	97.5
L$^\phi$	76.9	87.5	100.0	97.8	100.0	NA	NA	NA	95.5
M	72.5	90.7	98.8	96.8	100.0	100.0	100.0	98.3	96.4
N	33.3	87.5	100.0	100.0	100.0	98.8	100.0	98.5	98.3
O	50.0	72.7	94.1	100.0	97.9	98.7	98.5	98.8	97.1
P	51.9	80.0	92.3	95.9	98.9	98.7	95.1	97.5	95.5
Q	0.0	100.0	100.0	80.0	100.0	100.0	96.6	100.0	96.2
R	75.0	73.3	95.7	100.0	98.9	100.0	98.7	98.1	97.6
S$^\phi$	0.0	NA	100.0	100.0	100.0	91.7	88.9	90.5	90.5
T	66.7	100.0	95.2	97.5	100.0	98.6	100.0	99.3	97.7
U	NA	NA	NA	100.0	100.0	100.0	95.8	100.0	99.5
V	66.7	85.0	90.3	97.8	92.9	97.6	95.5	97.2	94.9
W$^\phi$	75.0	85.7	95.0	97.3	96.8	100.0	33.3	66.7	93.1
X	53.3	85.0	100.0	92.9	94.1	93.3	98.8	96.6	94.9
Y	40.0	62.5	94.1	96.4	96.9	98.1	100.0	99.3	96.7
Z	44.4	92.3	82.1	100.0	91.4	97.1	97.4	97.0	95.6
AA$^\phi$	75.0	87.5	92.3	98.0	98.7	NA	NA	NA	95.1
AB	50.0	60.0	80.0	93.9	95.8	99.1	98.8	98.9	96.3
AC$^\phi$	80.0	90.0	100.0	100.0	100.0	NA	NA	NA	97.8
AD	50.0	75.0	85.7	100.0	98.6	99.1	99.3	99.5	98.4
AE$^\phi$	NA	100.0	100.0	100.0	97.7	NA	NA	NA	98.9
AF	62.9	72.7	87.0	96.3	96.7	95.9	98.1	99.0	95.5
AG$^\phi$	84.2	89.7	98.2	100.0	96.9	NA	100.0	90.6	95.4
Overall survival rate for GA**	66.6	85.0	93.6	97.1	97.9	98.5	98.5	98.4	96.7

These analyses included 14 469 neonates from 33 sites. **Twenty-five sites collected data on all eligible admissions whereas eight 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 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 #32
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	NA	75.0	100.0	100.0	100.0	98.9	100.0	99.4
B	NA	100.0	100.0	88.9	90.9	96.7	97.0	96.7
C	100.0	78.0	94.6	96.8	100.0	98.3	99.2	97.7
D	0.0	100.0	100.0	75.0	100.0	100.0	100.0	98.3
E	NA	33.3	100.0	100.0	100.0	100.0	100.0	99.4
F	0.0	76.2	85.7	100.0	100.0	100.0	98.3	97.3
G	NA	100.0	100.0	50.0	100.0	100.0	100.0	99.6
H^φ	100.0	60.0	80.0	92.3	100.0	97.4	100.0	92.3
I	57.1	83.3	92.4	94.3	98.8	98.1	98.8	96.8
J	NA	0.0	NA	50.0	100.0	95.8	97.9	94.8
K	NA	66.7	66.7	77.8	92.3	98.6	100.0	97.5
L^φ	NA	85.0	87.5	100.0	100.0	97.8	100.0	95.5
M	70.0	81.5	97.0	97.5	97.2	99.5	98.6	96.4
N	0.0	80.0	100.0	100.0	100.0	97.5	99.5	98.3
O	0.0	75.0	76.9	95.2	94.4	100.0	98.6	97.1
P	100.0	53.6	82.4	97.8	93.2	98.9	96.9	95.5
Q	0.0	0.0	100.0	85.7	100.0	100.0	99.0	96.2
R	100.0	68.2	90.5	96.3	95.7	99.7	98.1	97.6
S^φ	NA	0.0	100.0	100.0	100.0	91.7	90.0	90.5
T	50.0	87.5	89.5	95.8	100.0	98.9	99.4	97.7
U	NA	NA	NA	NA	NA	100.0	99.4	99.5
V	33.3	75.0	87.5	97.2	97.0	92.9	97.6	94.9
W^φ	NA	66.7	94.4	86.4	96.2	98.7	66.7	93.1
X	0.0	73.3	80.8	100.0	100.0	93.1	97.4	94.9
Y	0.0	63.6	100.0	87.5	100.0	99.0	98.9	96.7
Z	33.3	41.7	100.0	97.1	87.5	97.4	96.8	95.6
AA^φ	50.0	85.0	93.8	93.5	100.0	97.5	100.0	95.1
AB	50.0	63.6	57.1	83.3	93.3	98.5	98.7	96.3
AC^φ	NA	100.0	84.6	100.0	100.0	100.0	NA	97.8
AD	NA	66.7	85.0	82.4	100.0	98.7	99.5	98.4
AE^φ	NA	100.0	100.0	100.0	100.0	97.5	NA	98.9
AF	16.7	67.5	81.3	94.5	96.8	96.5	99.2	95.5
AG^φ	80.0	95.5	90.9	96.8	96.2	97.6	94.6	95.4
Overall survival rate for BW**	45.5	74.9	89.9	95.0	97.4	98.2	98.5	96.7

These analyses included 14 468 neonates from 33 sites. **Twenty-five sites collected data on all eligible admissions whereas eight sites (marked by**^φ**) collected data on selected eligible admissions only.** ^φ 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 #33a
**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	102	8	5.1	1.6	0.7	3.1
2	188	11	12.8	0.9	0.4	1.5
3	250	9	15.5	0.6	0.3	1.1
4	321	15	21.4	0.7	0.4	1.2
6	52	0	0.9	0.0	.	4.0
7	9	1	0.4	2.7	0.0	14.9
8	90	1	2.2	0.5	0.0	2.6
9	60	3	3.7	0.8	0.2	2.4
10	108	12	5.6	2.1	1.1	3.7
11	266	27	21.1	1.3	0.8	1.9
13	25	5	2.1	2.4	0.8	5.6
14	89	2	5.2	0.4	0.0	1.4
15	134	9	7.4	1.2	0.6	2.3
16	119	8	10.2	0.8	0.3	1.5
17	174	8	9.6	0.8	0.4	1.6
18	203	20	16.1	1.2	0.8	1.9
19	21	1	1.2	0.8	0.0	4.5
20	113	12	9.0	1.3	0.7	2.3
21	121	9	7.6	1.2	0.5	2.2
22	133	15	11.4	1.3	0.7	2.2
23	38	2	1.5	1.3	0.1	4.7
24	348	23	25.3	0.9	0.6	1.4
25	138	8	12.9	0.6	0.3	1.2
26	147	14	9.7	1.4	0.8	2.4
27	324	18	30.7	0.6	0.3	0.9
28	86	8	4.7	1.7	0.7	3.3
29	58	7	2.1	3.3	1.3	6.9
30	31	3	2.5	1.2	0.2	3.5
31	140	8	7.2	1.1	0.5	2.2
32	149	7	8.7	0.8	0.3	1.7
33	40	1	1.8	0.5	0.0	3.0

Numeric site codes were used in Presentations 31a-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 5 and 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentations #33b
Mortality: GA<33 weeks: Adjusted standardized ratios by site
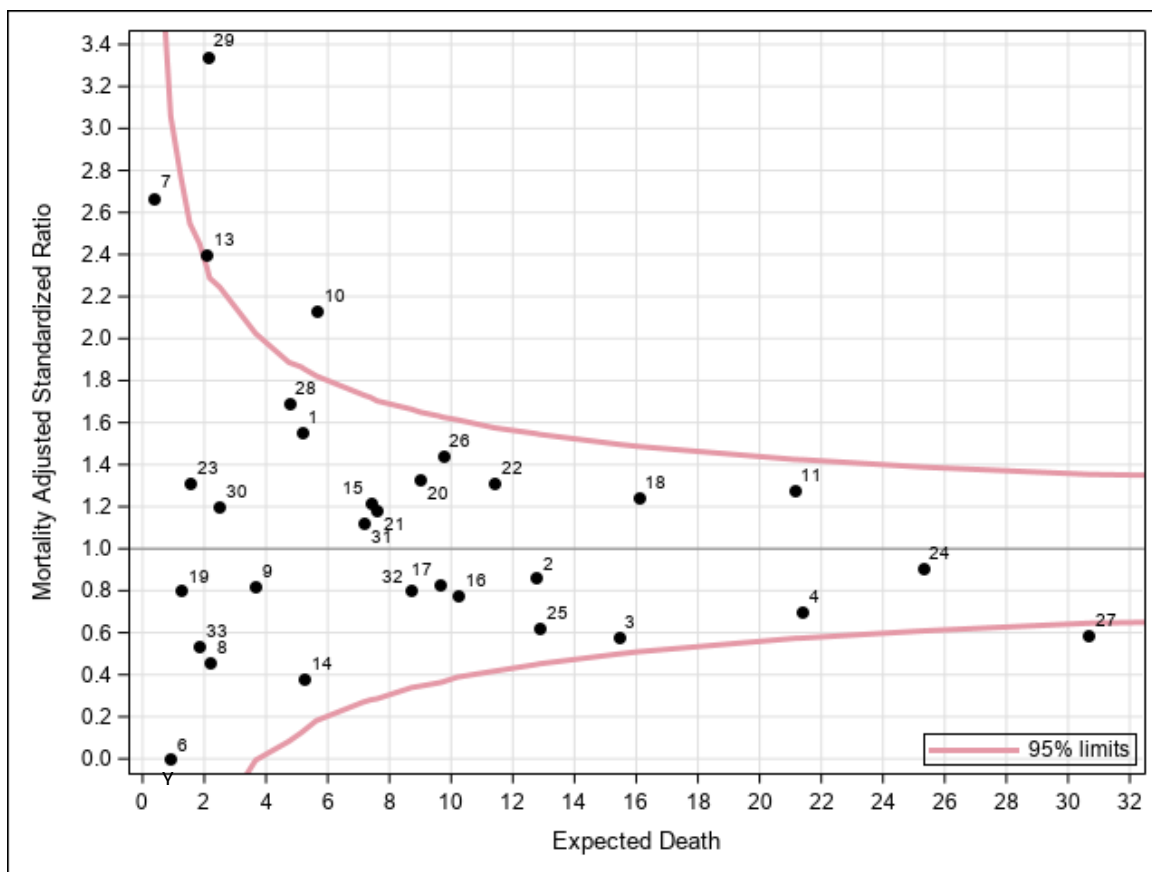
Explanation for Presentation 31a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of neonates with the outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after 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 31b
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 #33c
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	30	7	4.2	1.7	0.7	3.4
2	59	10	10.6	0.9	0.5	1.7
3	105	7	12.8	0.5	0.2	1.1
4	123	12	17.6	0.7	0.4	1.2
8	21	0	1.2	0.0	.	3.1
9	25	3	3.1	1.0	0.2	2.8
10	30	10	4.5	2.2	1.1	4.0
11	102	25	18.5	1.3	0.9	2.0
13	11	4	2.0	2.0	0.5	5.0
14	25	2	4.2	0.5	0.1	1.7
15	42	9	5.5	1.6	0.7	3.1
16	51	8	8.9	0.9	0.4	1.8
17	51	7	7.7	0.9	0.4	1.9
18	76	19	13.9	1.4	0.8	2.1
19	10	1	1.1	0.9	0.0	5.0
20	42	11	7.7	1.4	0.7	2.6
21	42	8	6.6	1.2	0.5	2.4
22	56	10	9.7	1.0	0.5	1.9
23	7	2	1.1	1.8	0.2	6.4
24	159	17	22.0	0.8	0.5	1.2
25	56	7	11.3	0.6	0.2	1.3
26	65	11	8.7	1.3	0.6	2.3
27	171	15	27.0	0.6	0.3	0.9
28	29	7	4.2	1.7	0.7	3.4
29	14	4	1.5	2.7	0.7	6.9
30	11	3	2.1	1.4	0.3	4.2
31	42	5	5.6	0.9	0.3	2.1
32	57	6	7.4	0.8	0.3	1.8
33	9	1	1.3	0.8	0.0	4.2

Numeric site codes were used in Presentations 31a-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 5, 6, 7, 12 were excluded from the analysis due to the small number of eligible neonates.

Presentations #33d
Mortality: GA<29 weeks: Adjusted standardized ratios by site
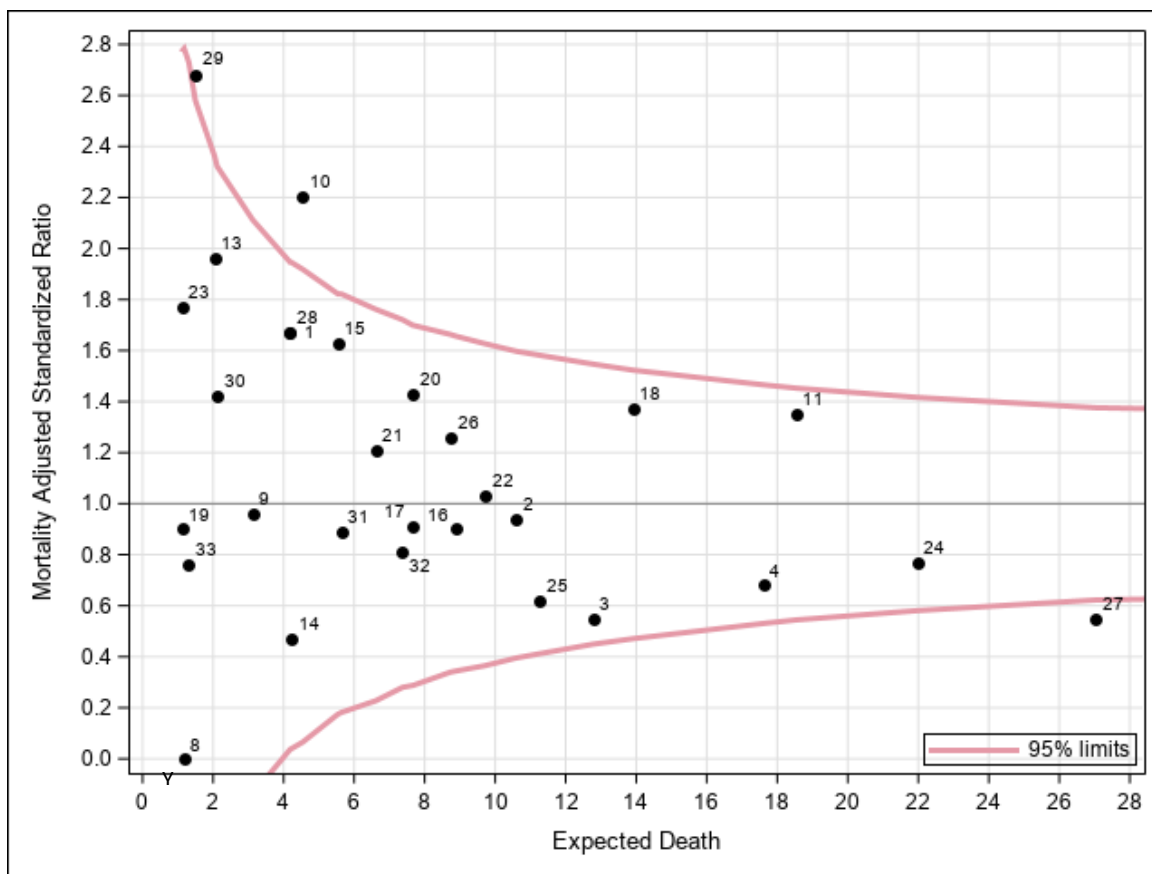
Explanation for Presentation 31c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of neonates with the outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after 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 31d
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 #33e
**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	404	12	7.7	1.6	0.8	2.7
2	795	16	20.2	0.8	0.5	1.3
3	283	11	17.8	0.6	0.3	1.1
4	907	19	28.1	0.7	0.4	1.1
5	76	4	0.8	4.8	1.3	12.3
6	507	15	5.4	2.8	1.6	4.6
7	60	5	1.3	4.0	1.3	9.3
8	90	1	2.5	0.4	0.0	2.2
9	331	4	6.8	0.6	0.2	1.5
10	478	15	9.5	1.6	0.9	2.6
11	892	33	27.4	1.2	0.8	1.7
12	164	1	2.0	0.5	0.0	2.8
13	155	6	2.6	2.3	0.8	5.0
14	89	2	5.7	0.3	0.0	1.3
15	908	11	16.3	0.7	0.3	1.2
16	460	11	14.2	0.8	0.4	1.4
17	174	8	10.5	0.8	0.3	1.5
18	759	29	22.4	1.3	0.9	1.9
19	239	1	3.0	0.3	0.0	1.9
20	159	12	11.2	1.1	0.6	1.9
21	590	16	13.3	1.2	0.7	1.9
22	594	29	18.4	1.6	1.1	2.3
23	328	2	3.7	0.5	0.1	2.0
24	928	26	30.8	0.8	0.6	1.2
25	432	10	16.9	0.6	0.3	1.1
26	452	23	12.9	1.8	1.1	2.7
27	594	20	33.3	0.6	0.4	0.9
28	322	10	6.9	1.4	0.7	2.6
29	356	9	4.4	2.1	0.9	3.9
30	169	3	4.3	0.7	0.1	2.1
31	157	11	8.7	1.3	0.6	2.3
32	149	7	8.1	0.9	0.3	1.8
33	330	1	4.6	0.2	0.0	1.2

Numeric site codes were used in Presentations 31a-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 #33f
Mortality: All neonates: Adjusted standardized ratios by site
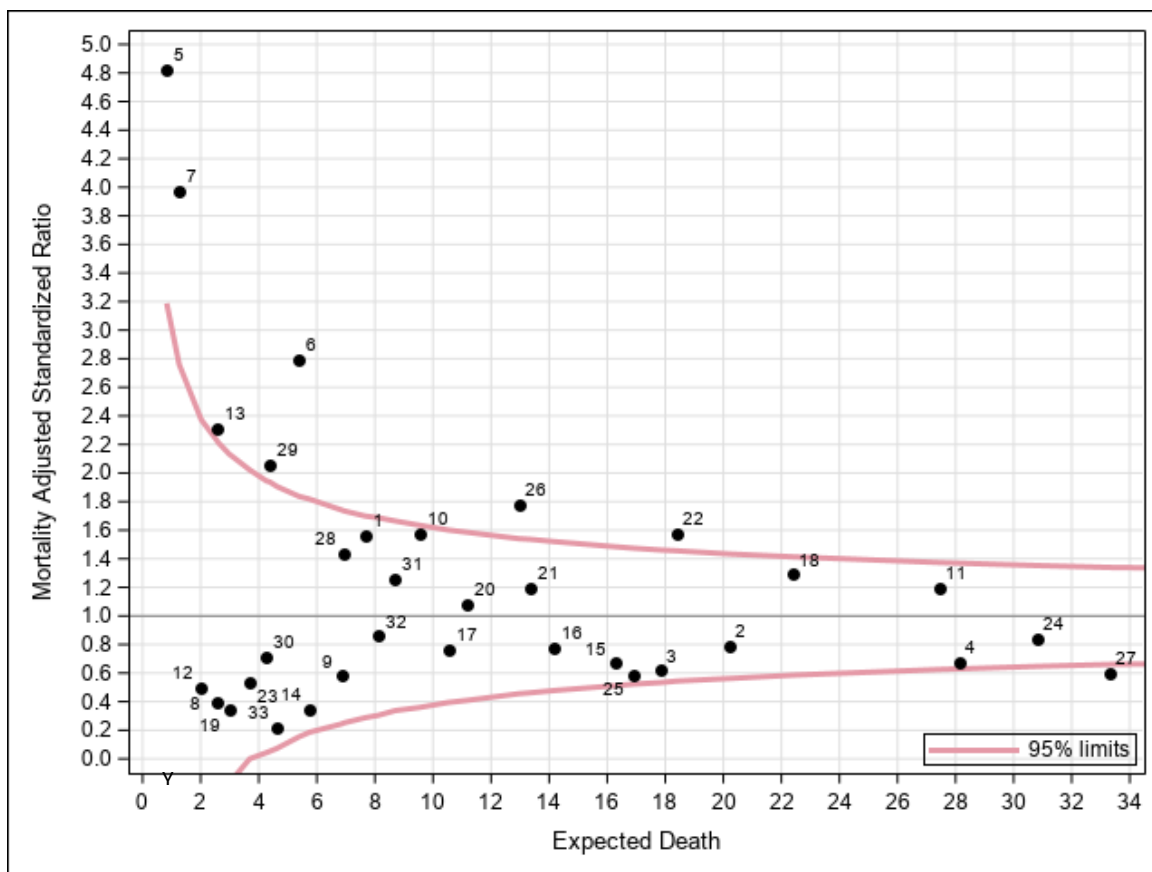
Explanation for Presentation 31e
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with the outcome of interest after adjustment for 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 31f
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 #34
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	%	%	%	%	%	%	%
S		11.1	0.0	0.0	25.0	0.0	0.0	33.3
G		4.8	0.0	13.3	25.0	0.0	23.8	47.6
U	<40	0.0	0.0	NA	0.0	0.0	0.0	0.0
Q		20.0	19.1	7.1	5.0	0.0	8.0	32.0
J		40.0	0.0	NA	0.0	0.0	0.0	40.0
D		9.7	0.0	5.0	28.6	3.2	6.5	38.7
E		5.0	8.8	0.0	23.7	0.0	12.5	40.0
A		2.4	2.9	8.7	15.0	0.0	0.0	19.5
B	40 – 80	3.5	13.6	11.1	49.1	8.6	8.6	62.1
K		12.1	5.7	16.0	21.2	5.2	6.9	34.5
N		4.8	9.8	4.9	39.0	0.0	3.2	46.8
AC		2.2	6.3	10.3	31.8	11.1	11.1	38.9
Y		10.0	6.8	8.3	21.0	2.2	8.9	33.3
AE		1.1	3.5	0.0	28.9	5.5	7.7	38.5
O	81 – 130	7.3	4.6	7.3	15.8	2.8	3.7	24.8
AB		12.5	9.0	14.8	19.2	3.6	8.0	32.1
H		11.0	18.2	18.2	23.6	0.0	11.0	36.4
F		7.4	4.9	34.2	33.0	0.0	18.0	39.3
X		11.1	18.1	6.5	27.3	5.3	17.0	43.7
AD		7.3	8.0	10.0	29.7	0.0	7.3	38.7
T		5.7	7.2	3.3	29.3	1.4	6.4	38.3
W		5.6	9.6	13.0	24.6	5.6	12.7	32.4
Z	131 – 200	10.9	7.6	13.0	83.6	6.8	12.2	87.8
V		9.7	11.0	27.0	31.7	3.3	14.9	44.8
L		4.5	10.1	8.2	27.7	5.2	10.3	37.4
AA		5.0	4.2	10.6	43.9	2.8	5.5	50.6
R		6.1	10.5	13.3	30.3	2.6	13.3	38.3
P		10.5	10.4	17.1	36.1	6.9	13.7	46.6
AG		4.1	13.1	12.6	30.4	4.1	8.9	40.7
AF	> 200	11.3	9.0	16.9	32.5	4.0	19.6	44.0
C		5.1	5.1	10.0	46.6	2.4	8.3	51.5
M		6.0	7.2	6.5	31.4	5.1	10.7	41.1
I		7.4	6.8	7.5	38.3	7.4	14.4	47.1
Total CNN		7.3	8.3	10.7	33.7	4.0	11.1	43.2

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 #35
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	%	%	%	%	%	%	%
S		33.3	0.0	0.0	50.0	0.0	0.0	66.7
B		16.7	33.3	33.3	80.0	16.7	16.7	100.0
E		28.6	16.7	0.0	80.0	0.0	28.6	100.0
A	≤ 10	11.1	12.5	25.0	62.5	0.0	0.0	77.8
J		66.7	0.0	NA	0.0	0.0	0.0	66.7
G		10.0	0.0	22.2	44.4	0.0	40.0	80.0
D		27.3	0.0	12.5	62.5	9.1	9.1	81.8
Q		36.4	30.0	14.3	0.0	0.0	9.1	45.5
K		28.6	15.4	22.2	63.6	14.3	14.3	78.6
AE	11 – 30	0.0	0.0	0.0	38.1	14.3	4.8	52.4
AC		8.0	16.0	23.1	73.9	36.0	28.0	84.0
N		11.5	12.5	8.7	56.5	0.0	7.7	73.1
Y		23.3	13.8	21.1	43.5	3.3	26.7	70.0
AB		32.3	17.2	34.8	57.1	9.7	29.0	77.4
O	31 – 49	20.6	15.2	14.8	40.7	8.8	11.8	61.8
AD		21.4	15.8	21.2	63.6	0.0	14.3	78.6
H		26.2	24.4	30.0	51.6	0.0	21.4	71.4
W		11.9	24.4	21.6	64.9	14.3	33.3	76.2
Z		22.0	14.9	21.4	95.0	10.0	24.0	98.0
F		15.1	9.4	37.1	68.1	0.0	37.7	73.6
AA		13.0	5.7	21.2	78.7	3.8	16.7	87.0
T		12.5	9.3	6.3	59.2	1.8	10.7	67.9
X	50 – 100	17.9	25.9	8.9	50.0	11.1	33.9	73.2
L		10.2	13.8	9.8	54.7	11.9	27.1	71.2
R		17.7	19.7	24.5	69.2	3.2	29.0	77.4
V		16.7	15.6	29.4	50.0	6.1	25.8	65.2
P		25.6	16.9	28.9	72.4	16.7	34.6	82.1
AF		24.3	16.5	22.4	58.8	8.7	38.8	73.8
AG		7.1	19.5	17.7	54.3	6.2	15.9	67.3
C	> 100	9.3	7.0	11.8	81.2	5.4	16.3	83.0
I		12.2	8.0	10.2	51.4	12.8	27.4	63.4
M		9.7	10.3	7.0	43.4	7.4	15.9	58.5
Total CNN		15.5	13.7	16.5	59.2	8.0	23.1	72.3

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

E.3.1. Site Comparisons –

# Late Onset Sepsis and Antimicrobial Use

In presentations #34 and #35, 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 #36 and #37, 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 #36

Late onset sepsis: GA<33 weeks: Site specific crude rates
(n=4 235 neonates, 43 excluded due to death before 3 days of age)
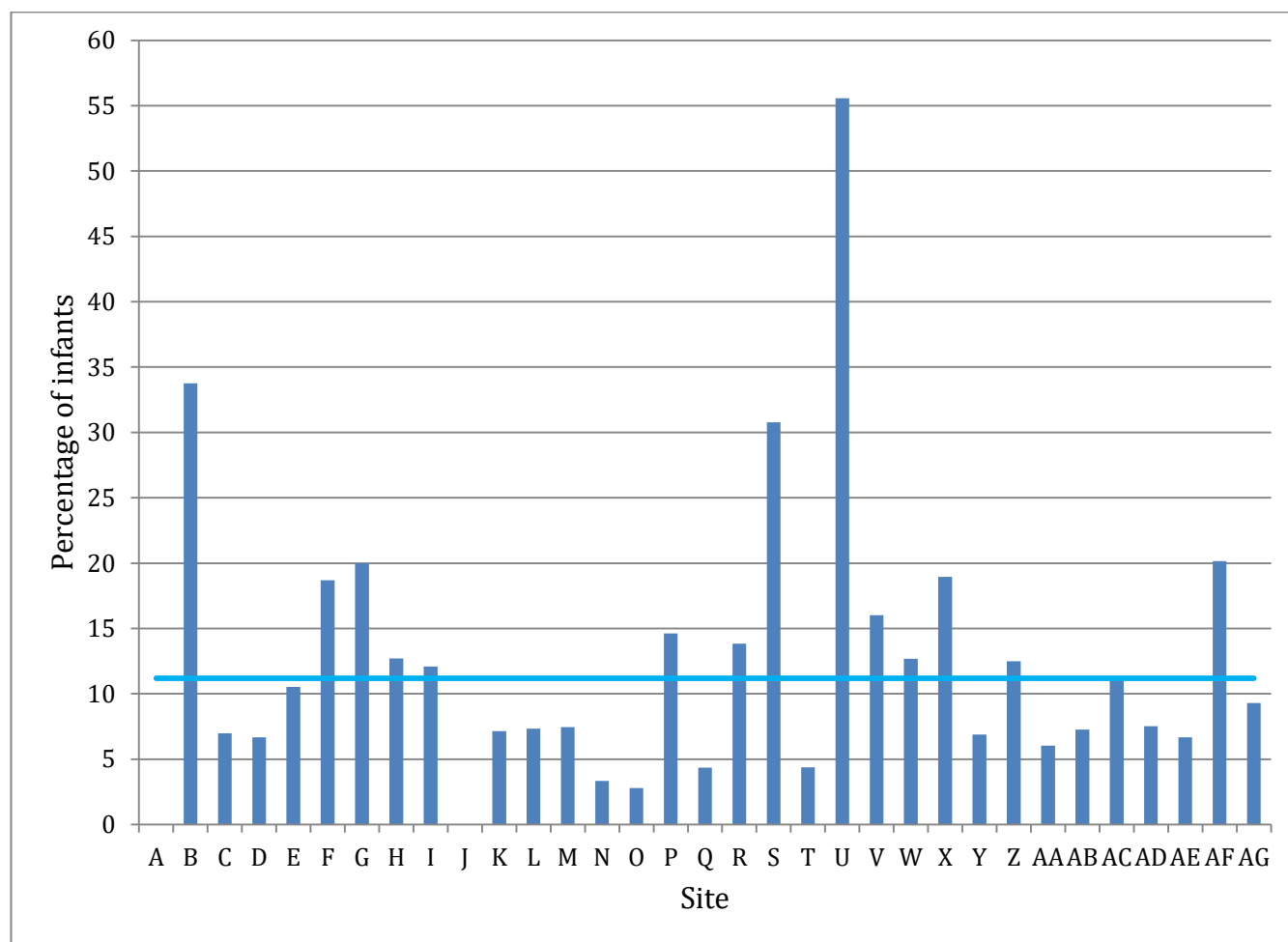
Site	A	B	C	D	E	F	G	H	I	J	K	
%	0.0	33.8	7.0	6.7	10.5	18.7	20.0	12.7	12.1	0.0	7.1	

Site	L	M	N	O	P	Q	R	S	T	U	V	
%	7.3	7.5	3.3	2.8	14.6	4.3	13.8	30.8	4.4	55.6	16.0	

Site	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	CNN
%	12.7	18.9	6.9	12.5	6.0	7.3	11.1	7.5	6.7	20.1	9.3	11.2

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).

In presentations #34 and #35, 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 #37a
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	107	3	10.2	0.3	0.1	0.9
2	195	27	20.7	1.3	0.9	1.9
3	269	25	30.2	0.8	0.5	1.2
4	330	23	37.3	0.6	0.4	0.9
6	80	27	7.9	3.4	2.3	5.0
7	13	4	1.8	2.2	0.6	5.7
8	90	6	5.4	1.1	0.4	2.4
9	60	2	5.9	0.3	0.0	1.2
10	110	8	9.7	0.8	0.4	1.6
11	268	54	32.3	1.7	1.3	2.2
12	9	5	0.9	5.5	1.8	12.7
13	23	1	3.3	0.3	0.0	1.7
14	90	10	8.6	1.2	0.6	2.1
15	133	10	10.8	0.9	0.4	1.7
16	123	23	16.3	1.4	0.9	2.1
17	182	11	17.1	0.6	0.3	1.2
18	219	32	26.2	1.2	0.8	1.7
19	20	4	2.1	1.9	0.5	4.9
20	118	15	13.0	1.1	0.6	1.9
21	144	18	14.7	1.2	0.7	1.9
22	132	25	16.1	1.6	1.0	2.3
23	38	4	2.9	1.4	0.4	3.5
24	356	43	47.9	0.9	0.6	1.2
25	137	6	18.2	0.3	0.1	0.7
26	156	25	19.9	1.3	0.8	1.9
27	322	24	46.2	0.5	0.3	0.8
28	87	6	8.6	0.7	0.3	1.5
29	56	4	4.6	0.9	0.2	2.2
30	30	2	3.2	0.6	0.1	2.2
31	142	18	13.0	1.4	0.8	2.2
32	150	11	17.2	0.6	0.3	1.1
33	41	0	3.3	0.0	.	1.1

Numeric site codes were used in Presentations 35a-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 5was not included in this analysis due to small number of eligible neonates in this category.

Presentation # 37b
Late onset sepsis: GA<33 weeks: Adjusted standardized ratios by site
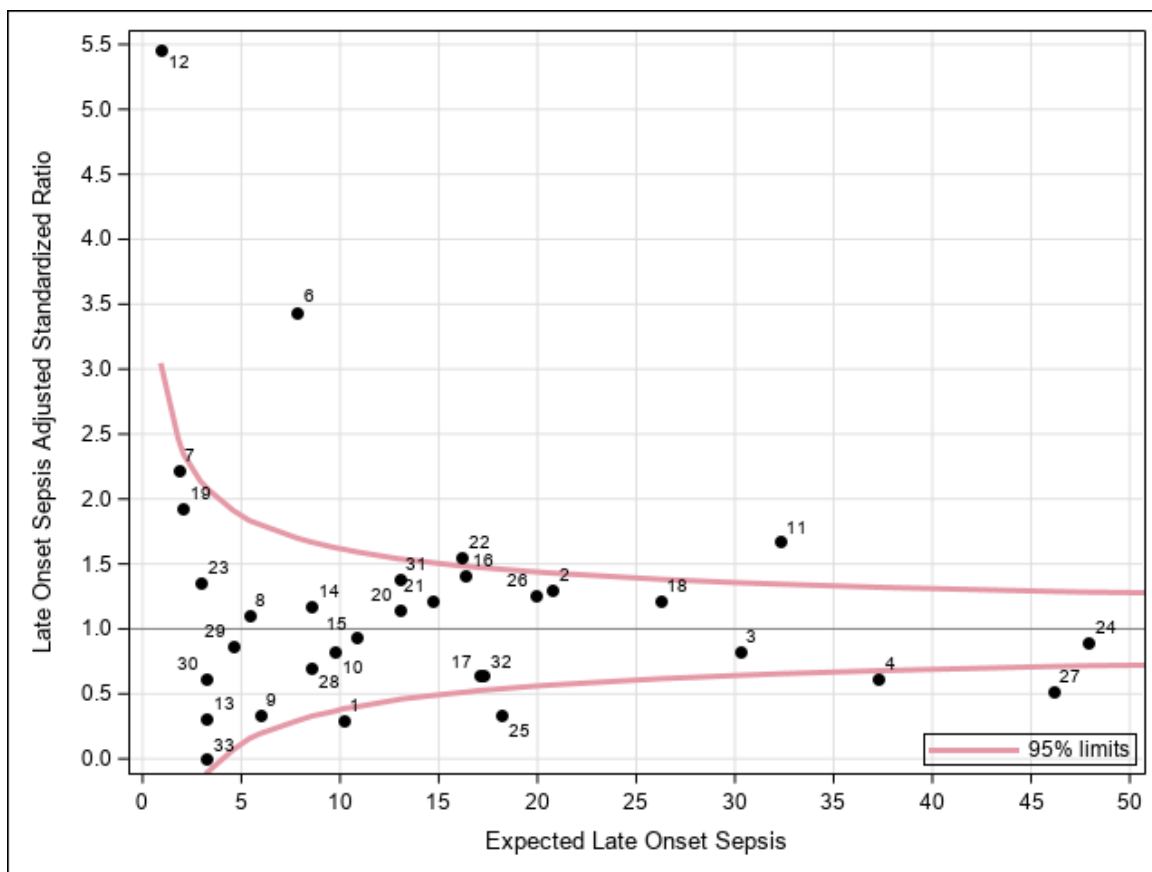
Explanation for Presentation 35a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, 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 35b
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 #37c
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	32	3	7.2	0.4	0.1	1.2
2	60	18	15.7	1.1	0.7	1.8
3	112	18	23.9	0.8	0.4	1.2
4	125	18	28.5	0.6	0.4	1.0
6	20	15	5.7	2.6	1.5	4.4
7	7	4	1.6	2.6	0.7	6.5
8	21	1	2.7	0.4	0.0	2.1
9	24	2	4.3	0.5	0.1	1.7
10	29	8	6.6	1.2	0.5	2.4
11	98	40	25.2	1.6	1.1	2.2
13	10	1	2.9	0.3	0.0	1.9
14	25	7	6.0	1.2	0.5	2.4
15	38	6	7.2	0.8	0.3	1.8
16	53	20	13.4	1.5	0.9	2.3
17	54	10	12.1	0.8	0.4	1.5
18	78	28	20.8	1.3	0.9	1.9
19	9	3	1.7	1.8	0.4	5.2
20	41	10	10.0	1.0	0.5	1.8
21	49	12	11.1	1.1	0.6	1.9
22	54	21	13.0	1.6	1.0	2.5
23	6	2	1.6	1.2	0.1	4.4
24	157	39	39.1	1.0	0.7	1.4
25	52	3	14.5	0.2	0.0	0.6
26	69	20	16.4	1.2	0.7	1.9
27	166	20	38.3	0.5	0.3	0.8
28	27	6	5.9	1.0	0.4	2.2
29	13	2	3.0	0.7	0.1	2.4
30	10	1	2.6	0.4	0.0	2.2
31	43	15	9.5	1.6	0.9	2.6
32	54	11	13.2	0.8	0.4	1.5
33	9	0	2.0	0.0	.	1.8

Numeric site codes were used in Presentations 35a-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 5 and 12 were excluded from the analysis due to the small number of eligible neonates.

Presentation # 37d
Late onset sepsis: GA<29 weeks: Adjusted standardized ratios by site
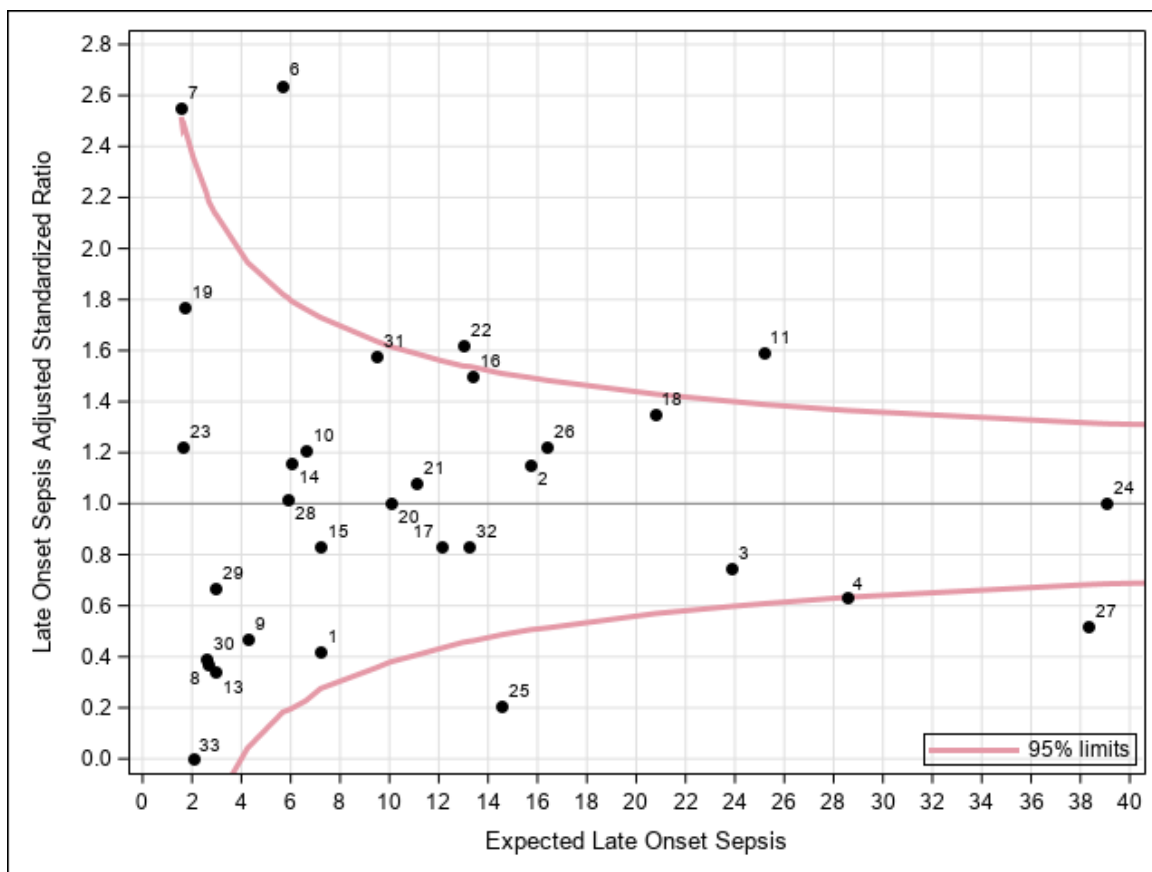
Explanation for Presentation 35c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after adjustment for GA, SGA, 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 35d
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 #38
**Late onset sepsis per 1000 patient days: GA<33 weeks: Site specific crude rates**
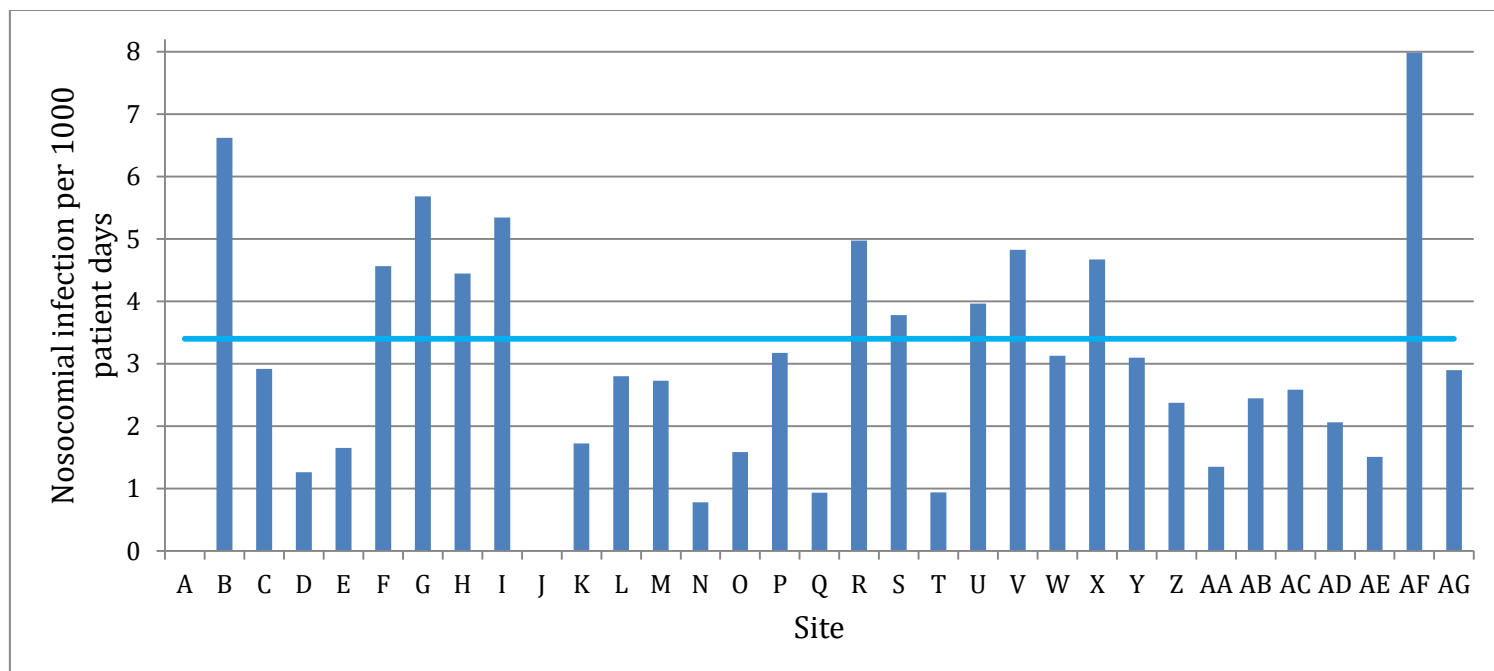
Site	Infections per 1000 patient days	Site	Infections per 1000 patient days	Site	Infections per 1000 patient days
A	0.0	L	2.8	W	3.1
B	6.6	M	2.7	X	4.7
C	2.9	N	0.8	Y	3.1
D	1.3	O	1.6	Z	2.4
E	1.7	P	3.2	AA	1.3
F	4.6	Q	0.9	AB	2.4
G	5.7	R	5.0	AC	2.6
H	4.4	S	3.8	AD	2.1
I	5.3	T	0.9	AE	1.5
J	0.0	U	4.0	AF	8.0
K	1.7	V	4.8	AG	2.9
				CNN	3.4

Total number of neonates = 4 278

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 #36 and #37, the infection was assigned to the hospital where the infection happened and not assigned to the hospital where the first episode of sepsis happened.

Presentation #39a
Central Line-Associated Bloodstream Infections per 1000 central line* days:
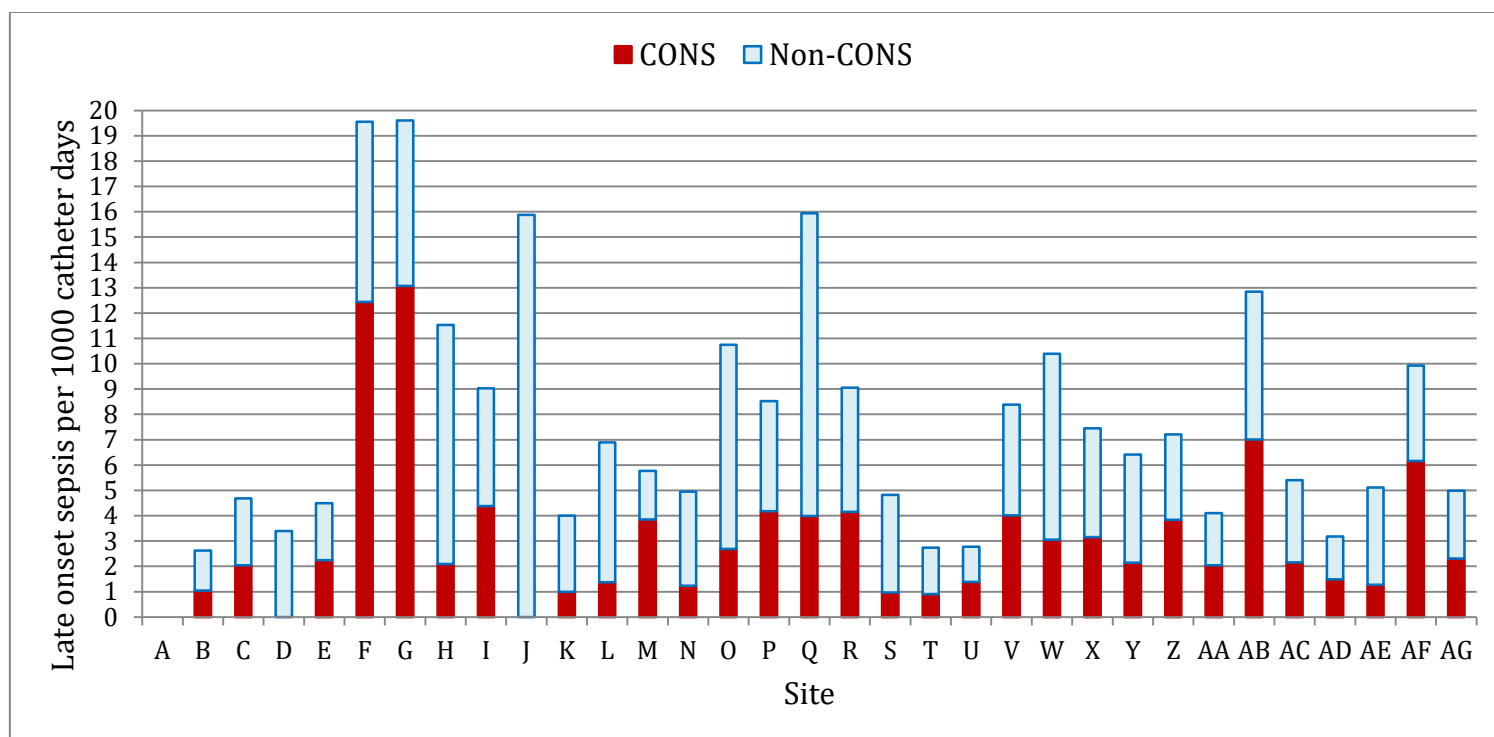**GA < 33 weeks: Site specific crude rates**
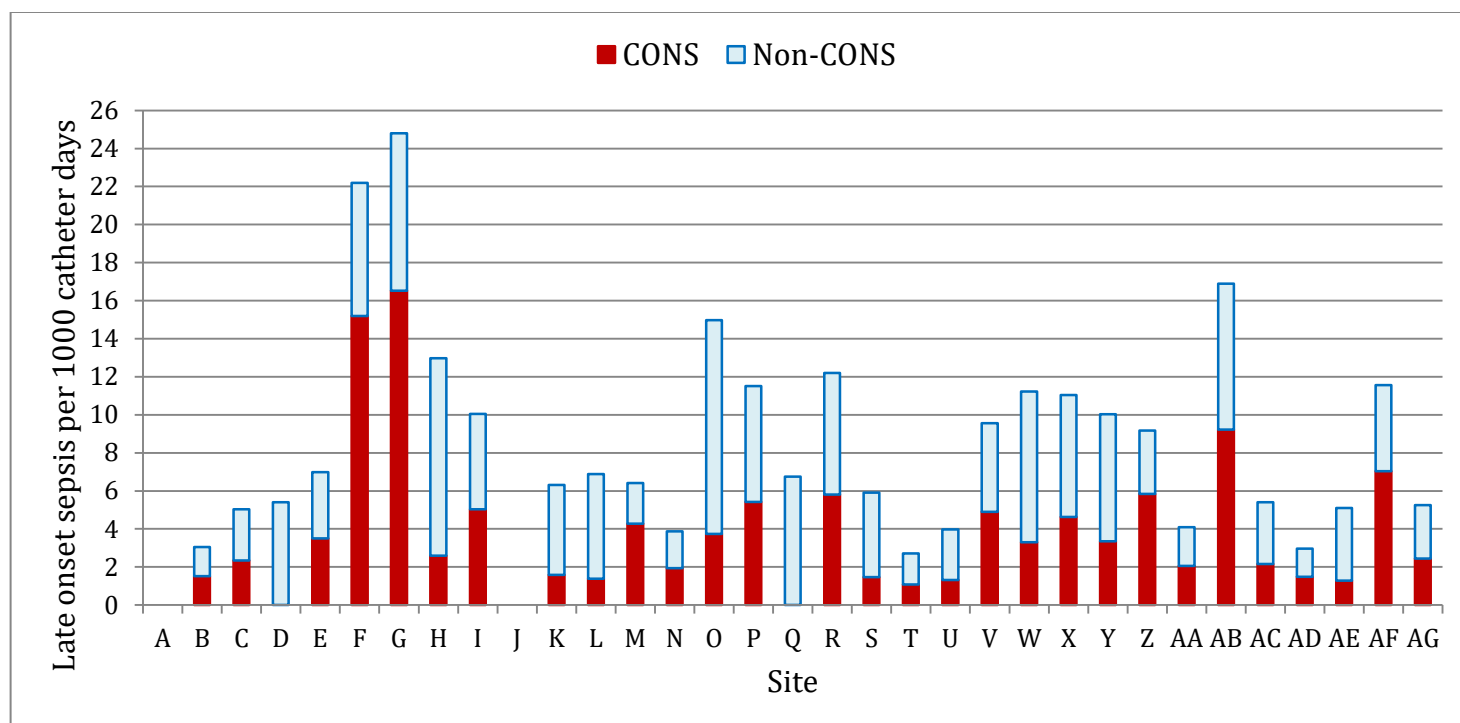
Site	CLABSI**		Central line days	CLABSI per 1000 central line days		Site	CLABSI**		Central line days	CLABSI per 1000 central line days	
	CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS		CONS	Non-CONS
A	0	0	410	0.0	0.0	R	10	11	1722	5.8	6.4
B	7	7	4598	1.5	1.5	S	1	3	678	1.5	4.4
C	7	8	2981	2.3	2.7	T	2	3	1841	1.1	1.6
D	0	1	185	0.0	5.4	U	1	2	756	1.3	2.6
E	1	1	286	3.5	3.5	V	20	19	4082	4.9	4.7
F	13	6	856	15.2	7.0	W	5	12	1515	3.3	7.9
G	2	1	121	16.5	8.3	X	13	18	2807	4.6	6.4
H	4	16	1541	2.6	10.4	Y	2	4	598	3.3	6.7
I	17	17	3383	5.0	5.0	Z	7	4	1199	5.8	3.3
J	0	0	21	0.0	0.0	AA	5	5	2441	2.0	2.0
K	1	3	633	1.6	4.7	AB	6	5	651	9.2	7.7
L	2	8	1451	1.4	5.5	AC	2	3	925	2.2	3.2
M	12	6	2809	4.3	2.1	AD	3	3	2027	1.5	1.5
N	1	1	517	1.9	1.9	AE	1	3	783	1.3	3.8
O	1	3	267	3.7	11.2	AF	28	18	3981	7.0	4.5
P	16	18	2952	5.4	6.1	AG	13	15	5330	2.4	2.8
Q	0	1	148	0.0	6.8	CNN	203	225	54495	3.7	4.1

*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 #39b
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	0	0	730	0.0	0.0	R	11	13	2651	4.1	4.9
B	8	12	7624	1.0	1.6	S	1	4	1036	1.0	3.9
C	7	9	3419	2.0	2.6	T	2	4	2194	0.9	1.8
D	0	1	295	0.0	3.4	U	3	3	2161	1.4	1.4
E	1	1	445	2.2	2.2	V	23	25	5728	4.0	4.4
F	14	8	1125	12.4	7.1	W	5	12	1636	3.1	7.3
G	2	1	153	13.1	6.5	X	14	19	4431	3.2	4.3
H	4	18	1908	2.1	9.4	Y	2	4	935	2.1	4.3
I	17	18	3878	4.4	4.6	Z	8	7	2082	3.8	3.4
J	0	1	63	0.0	15.9	AA	5	5	2441	2.0	2.0
K	1	3	1001	1.0	3.0	AB	6	5	856	7.0	5.8
L	2	8	1451	1.4	5.5	AC	2	3	925	2.2	3.2
M	12	6	3119	3.8	1.9	AD	7	8	4714	1.5	1.7
N	1	3	809	1.2	3.7	AE	1	3	783	1.3	3.8
O	1	3	372	2.7	8.1	AF	36	22	5845	6.2	3.8
P	25	26	5987	4.2	4.3	AG	13	15	5619	2.3	2.7
Q	1	3	251	4.0	12.0	CNN	235	273	76667	3.1	3.6

*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 #40
Days of antimicrobial use per 1000 patient days among neonates who did not
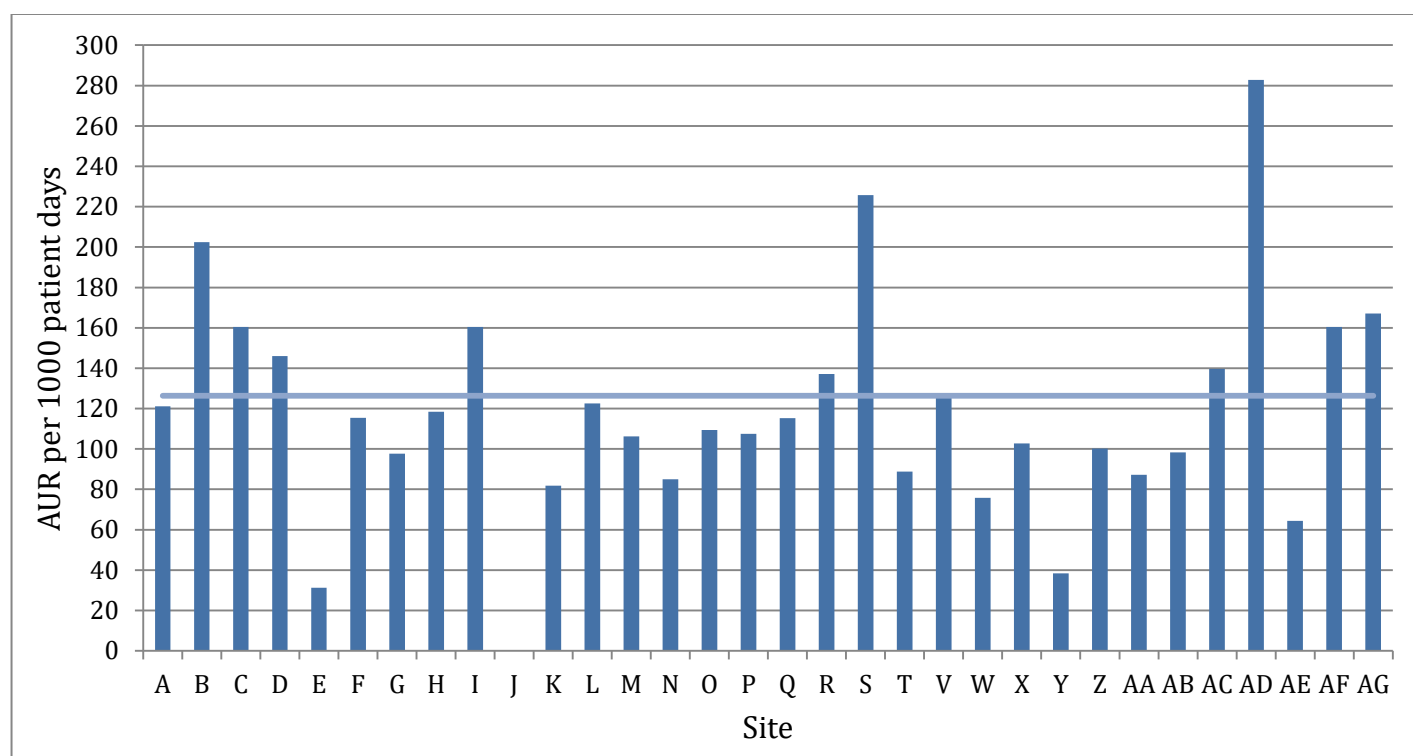**develop NEC, early-onset sepsis or late onset sepsis: <u>GA <33 weeks*</u>**
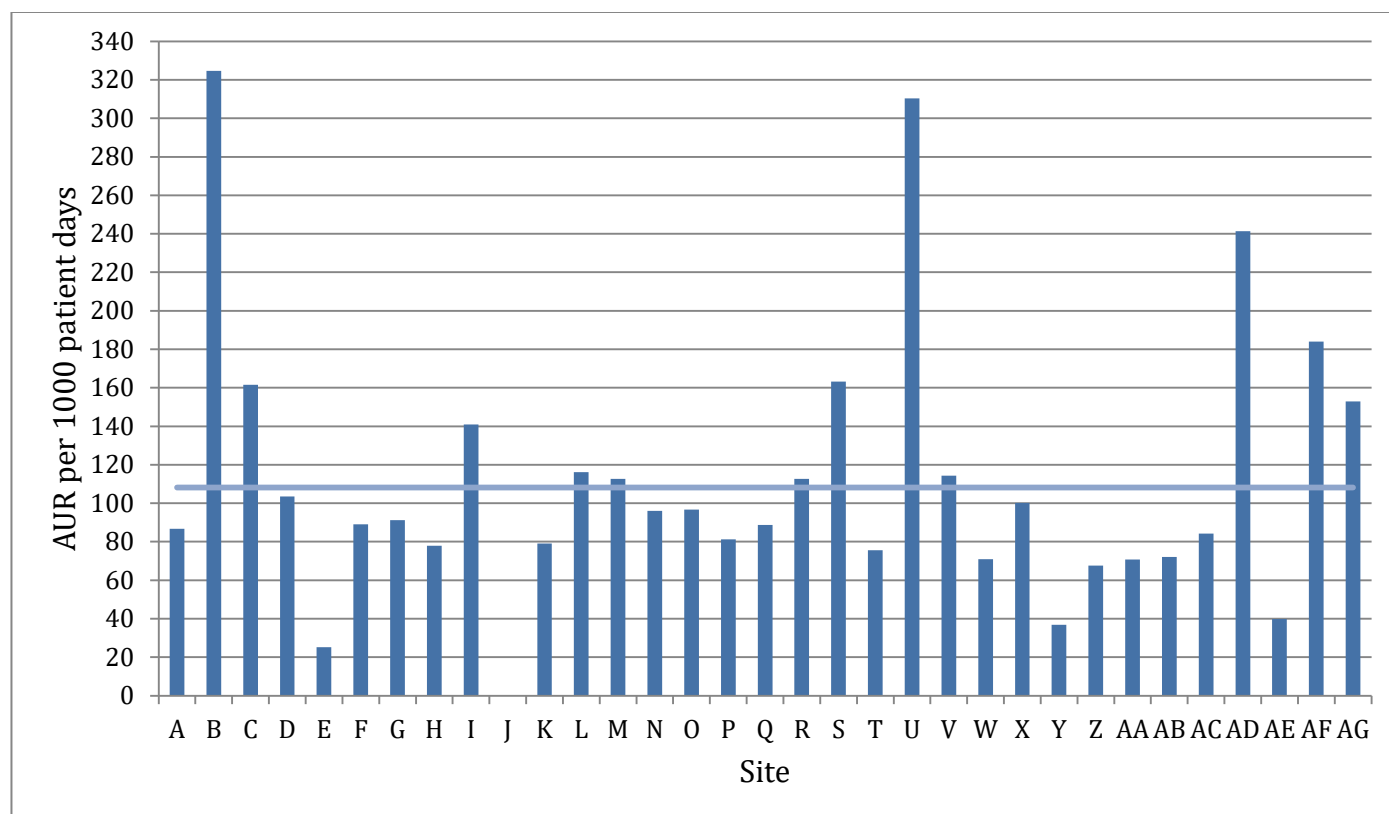
| Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days	Site	Days of antimicrobial use per 1000 patient days
A	86.6	**L**	116.2	**W**	71.0
B	324.6	**M**	112.6	**X**	100.2
C	161.6	**N**	96.1	**Y**	36.9
D	103.5	**O**	96.7	**Z**	67.7
E	25.2	**P**	81.2	**AA**	70.7
F	89.1	**Q**	88.8	**AB**	72.1
G	91.2	**R**	112.6	**AC**	84.3
H	77.9	**S**	163.3	**AD**	241.4
I	140.9	**T**	75.6	**AE**	39.8
J	0.0	**U**	310.3	**AF**	184.0
K	79.0	**V**	114.2	**AG**	152.9
				CNN	108.2

*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.

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

Presentation #41
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	121.2	L	122.6	X	102.7
B	202.4	M	106.1	Y	38.4
C	160.5	N	85.0	Z	100.2
D	146.0	O	109.4	AA	87.2
E	31.3	P	107.4	AB	98.3
F	115.4	Q	115.2	AC	139.7
G	97.6	R	137.1	AD	282.8
H	118.4	S	225.8	AE	64.4
I	160.5	T	88.7	AF	160.4
J	0.0	V	127.5	AG	167.1
K	81.8	W	75.8	CNN	126.3

*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 U does not have any neonates with GA < 29.
*Site H's rate goes over the upper limit of Y-axis. Refer to the table for site H's actual rate.

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

Presentation #42
Rate of treatment# for patent ductus arteriosus (PDA): GA<33 weeks who had PDA*:
Site specific crude rates
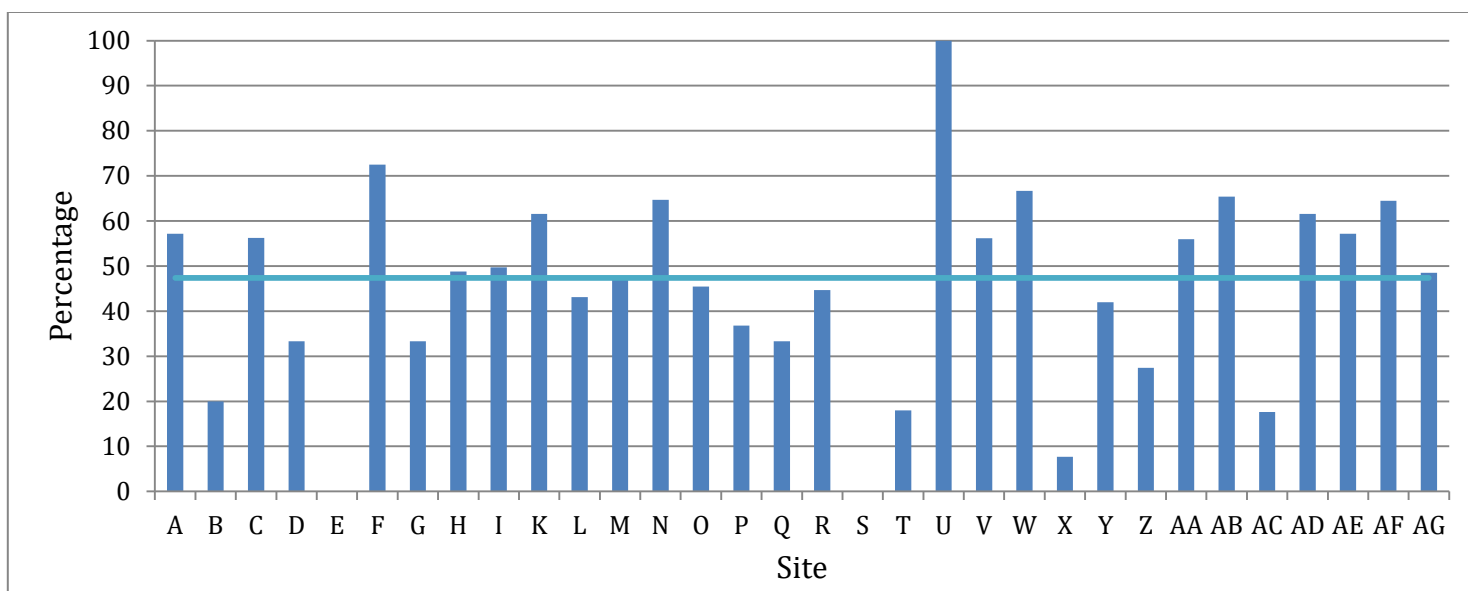
Site	Treatment# for PDA among neonates who had PDA (%)	Site	Treatment# for PDA among neonates who had PDA (%)
A	57.1	S	0.0
B	20.0	T	18.0
C	56.3	U	100.0
D	33.3	V	56.1
E	0.0	W	66.7
F	72.5	X	7.7
G	33.3	Y	41.9
H	48.8	Z	27.5
I	49.7	AA	55.9
K	61.5	AB	65.4
L	43.1	AC	17.7
M	46.9	AD	61.5
N	64.7	AE	57.1
O	45.5	AF	64.5
P	36.8	AG	48.5
Q	33.3		
R	44.7	CNN	47.4

Total number of neonates who had PDA = 1 293
*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.
Note: Site J does not have any neonates with GA < 33 who had PDA.

Presentation #43
Surgical or device patent ductus arteriosus (PDA) closure rate: GA<33 weeks who
had PDA: Site specific crude rates
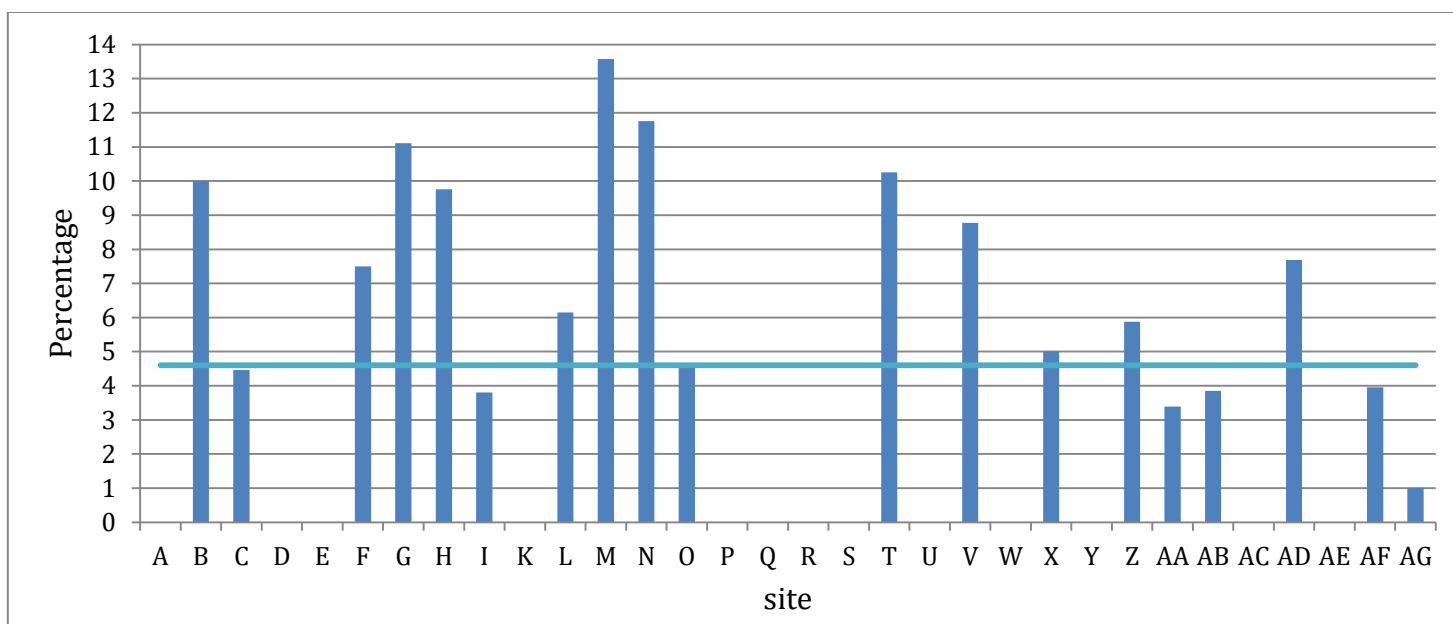
Site	Surgical ligation for PDA among neonates who had PDA (%)	Site	Surgical ligation for PDA among neonates who had PDA (%)
A	0.0	S	0.0
B	10.0	T	10.3
C	4.5	U	0.0
D	0.0	V	8.8
E	0.0	W	0.0
F	7.5	X	5.0
G	11.1	Y	0.0
H	9.8	Z	5.9
I	3.8	AA	3.4
K	0.0	AB	3.9
L	6.2	AC	0.0
M	13.6	AD	7.7
N	11.8	AE	0.0
O	4.6	AF	4.0
P	0.0	AG	1.0
Q	0.0		
R	0.0	CNN	4.6

Total number of neonates who had PDA = 1 293

Note: Site J does not have any neonates with GA < 33 who had PDA.
The percentage of neonates with treated PDA was attributed to the site where the neonate was first admitted.

Presentation #44
Severe brain injury rates: GA<33 weeks: Site specific crude rates
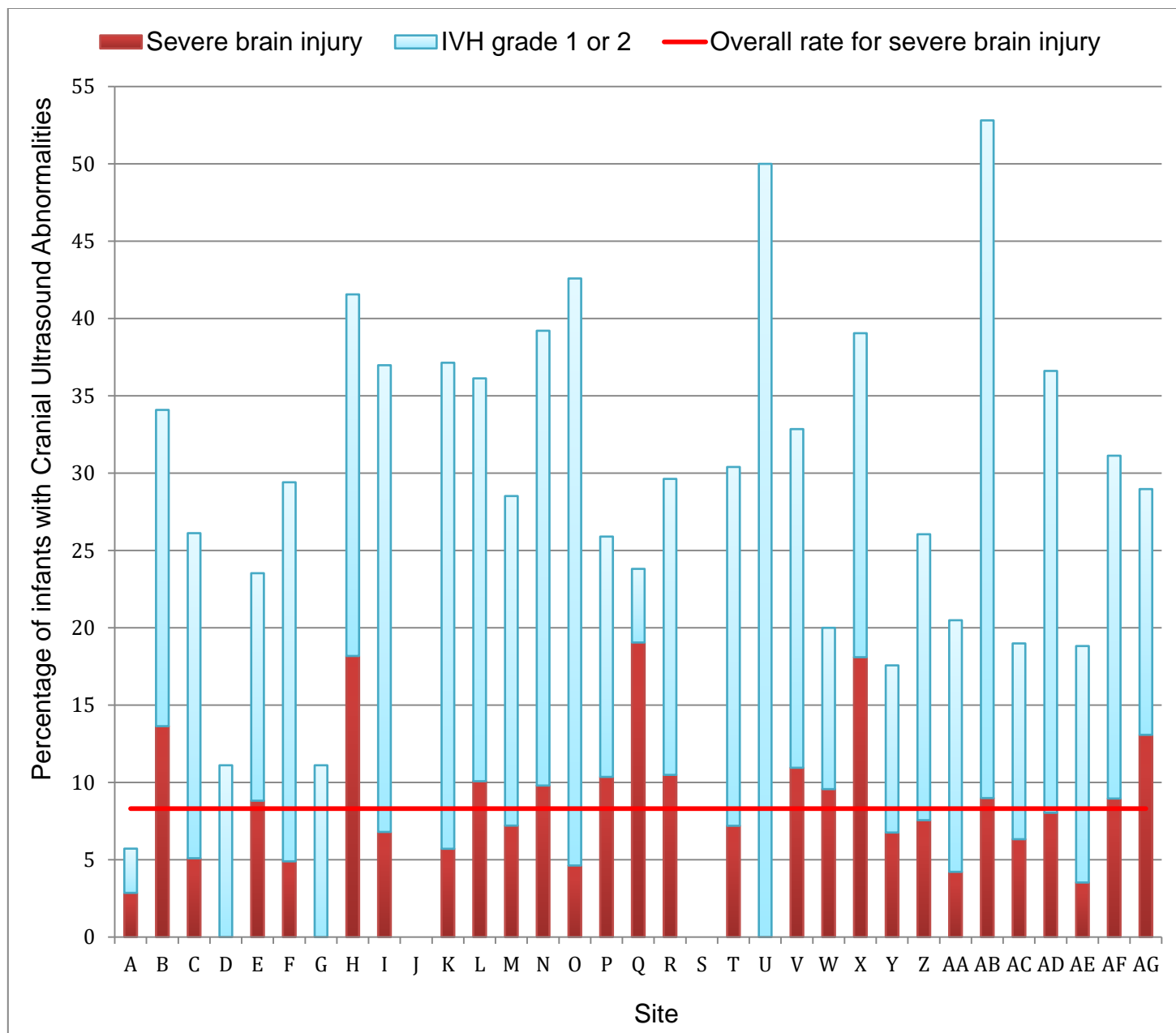
IVH grade 1 or 2 = Germinal matrix hemorrhage or intraventricular hemorrhage **without** ventricular enlargement

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

Presentation #45
Periventricular leukomalacia (PVL) rates: GA<33 weeks: Site specific crude rates
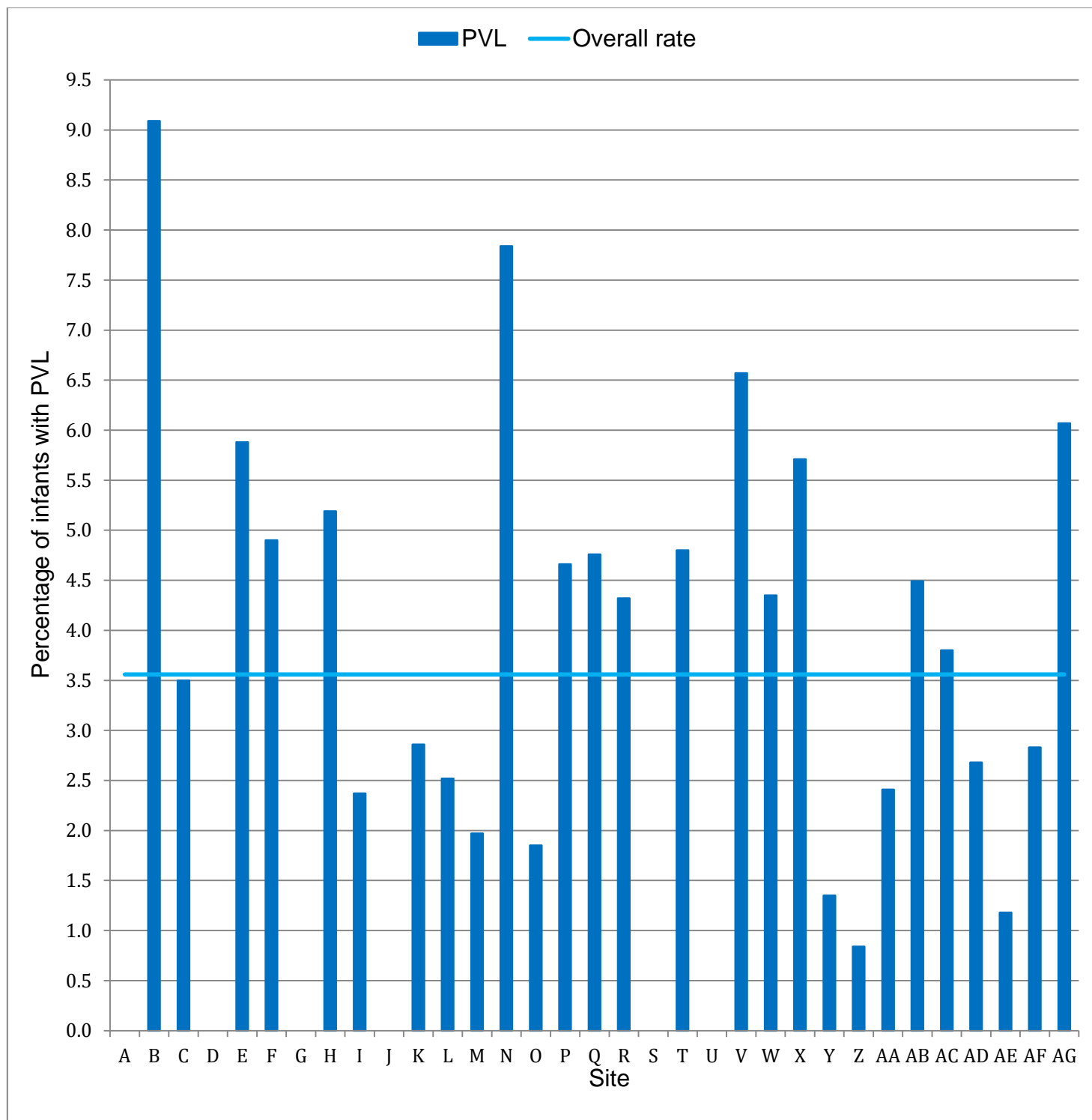
Presentation #46a
IVH grade 3 or 4 or PVL: GA<33 weeks: Adjusted standardized ratios by site

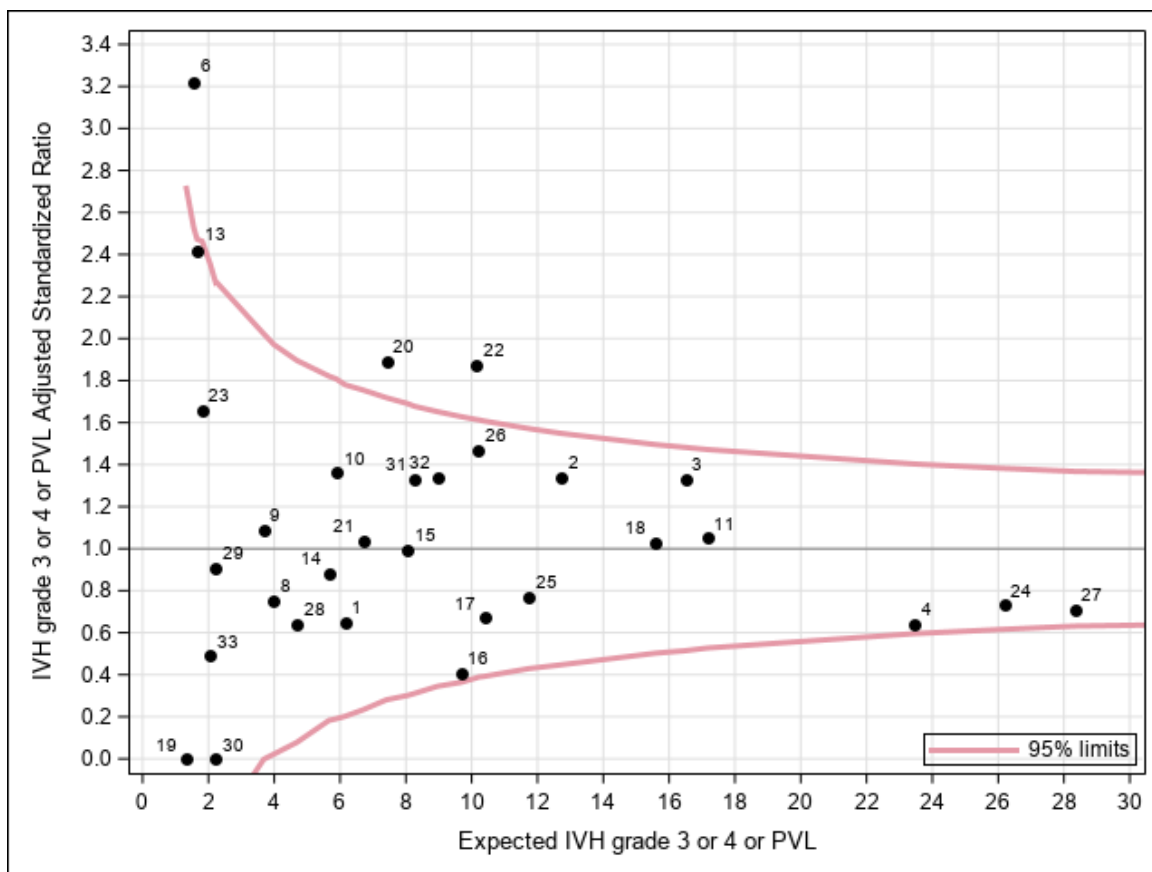| Site	Total number of neonates	Number of neonates with available data	Number of neonates with IVH G3/4 or PVL	Adjusted# expected number of neonates with IVH G3/4 or PVL	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	102	101	4	6.2	0.7	0.2	1.7
2	188	154	17	12.7	1.3	0.8	2.1
3	250	196	22	16.5	1.3	0.8	2.0
4	321	300	15	23.5	0.6	0.4	1.1
6	52	38	5	1.6	3.2	1.0	7.5
8	90	84	3	4.0	0.8	0.2	2.2
9	60	49	4	3.7	1.1	0.3	2.8
10	108	86	8	5.9	1.4	0.6	2.7
11	266	203	18	17.2	1.0	0.6	1.7
13	25	21	4	1.7	2.4	0.7	6.2
14	89	78	5	5.7	0.9	0.3	2.1
15	134	109	8	8.0	1.0	0.4	2.0
16	119	99	4	9.7	0.4	0.1	1.1
17	174	158	7	10.4	0.7	0.3	1.4
18	203	178	16	15.6	1.0	0.6	1.7
19	21	18	0	1.3	0.0	.	2.8
20	113	72	14	7.4	1.9	1.0	3.2
21	121	98	7	6.7	1.0	0.4	2.2
22	133	104	19	10.1	1.9	1.1	2.9
23	38	32	3	1.8	1.7	0.3	4.8
24	348	319	19	26.2	0.7	0.4	1.1
25	138	122	9	11.7	0.8	0.4	1.5
26	147	130	15	10.2	1.5	0.8	2.4
27	324	293	20	28.3	0.7	0.4	1.1
28	86	70	3	4.7	0.6	0.1	1.9
29	58	35	2	2.2	0.9	0.1	3.3
30	31	27	0	2.2	0.0	.	1.7
31	140	113	11	8.3	1.3	0.7	2.4
32	149	114	12	9.0	1.3	0.7	2.3
33	40	34	1	2.1	0.5	0.0	2.7

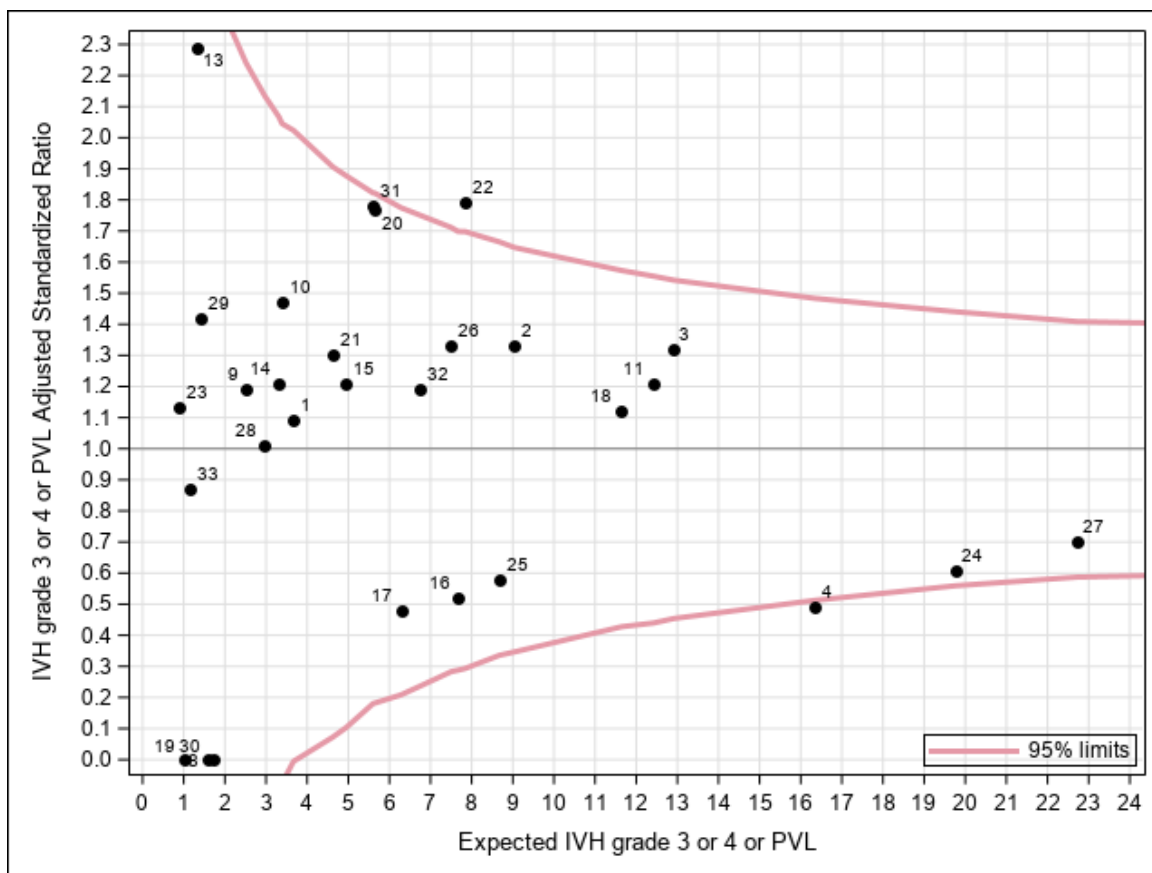**Numeric site codes were used in Presentations 44a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies are excluded.**
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Sites 5, 7 and 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #46b
IVH grade 3 or 4 or PVL: GA<33 weeks: Adjusted standardized ratios by site

Explanation for Presentation 44a
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 44b
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 #46c
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	30	29	4	3.7	1.1	0.3	2.8
2	59	58	12	9.0	1.3	0.7	2.3
3	105	105	17	12.9	1.3	0.8	2.1
4	123	123	8	16.4	0.5	0.2	1.0
8	21	21	0	1.7	0.0	.	2.1
9	25	23	3	2.5	1.2	0.2	3.5
10	30	28	5	3.4	1.5	0.5	3.4
11	102	90	15	12.4	1.2	0.7	2.0
13	11	10	3	1.3	2.3	0.5	6.7
14	25	25	4	3.3	1.2	0.3	3.1
15	42	38	6	5.0	1.2	0.4	2.6
16	51	51	4	7.7	0.5	0.1	1.3
17	51	50	3	6.3	0.5	0.1	1.4
18	76	75	13	11.6	1.1	0.6	1.9
19	10	10	0	1.0	0.0	.	3.7
20	42	41	10	5.7	1.8	0.8	3.3
21	42	39	6	4.6	1.3	0.5	2.8
22	56	54	14	7.8	1.8	1.0	3.0
23	7	6	1	0.9	1.1	0.0	6.3
24	159	158	12	19.8	0.6	0.3	1.1
25	56	54	5	8.7	0.6	0.2	1.3
26	65	63	10	7.5	1.3	0.6	2.5
27	171	169	16	22.7	0.7	0.4	1.1
28	29	28	3	3.0	1.0	0.2	2.9
29	14	13	2	1.4	1.4	0.2	5.1
30	11	10	0	1.6	0.0	.	2.3
31	42	41	10	5.6	1.8	0.9	3.3
32	57	56	8	6.7	1.2	0.5	2.3
33	9	8	1	1.1	0.9	0.0	4.8

Numeric site codes were used in Presentations 44a-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 5, 6, 7, 12 were excluded from the analysis due to the small number of eligible neonates.

Presentation #46d
IVH grade 3 or 4 or PVL: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 44c
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 44d
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 #47
Necrotizing enterocolitis (NEC) treatment rates: GA<33 weeks:
Site specific crude rates
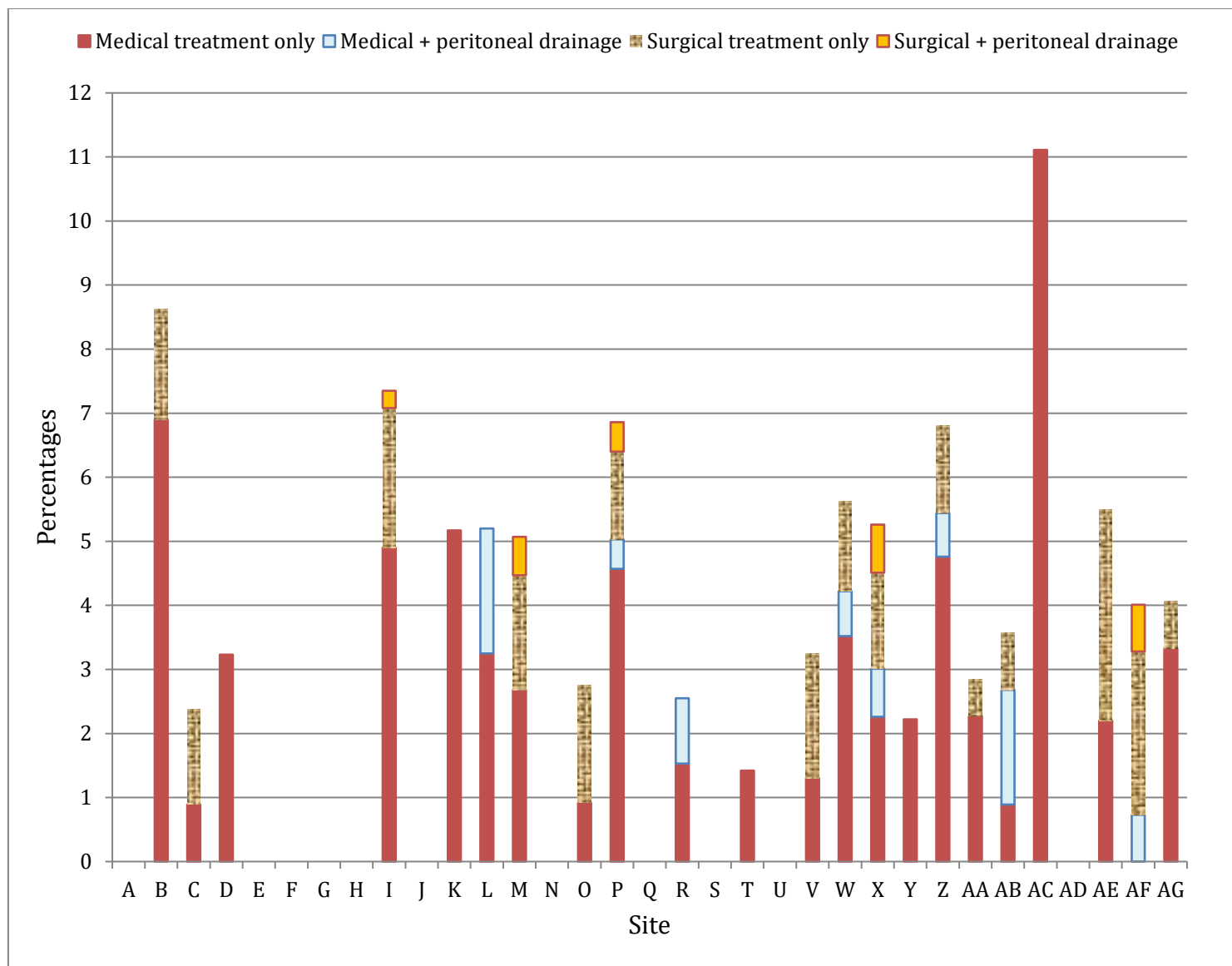
Presentation #47 (continued)
Necrotizing enterocolitis (NEC) treatment rates: GA<33 weeks:
Site specific crude rates

Site	Treatment (%)				
	Medical treatment only	Medical + peritoneal drainage	Laparotomy only	Peritoneal drainage + Laparotomy	Any
A	0.0	0.0	0.0	0.0	0.0
B	6.9	0.0	1.7	0.0	8.6
C	0.9	0.0	1.5	0.0	2.4
D	3.2	0.0	0.0	0.0	3.2
E	0.0	0.0	0.0	0.0	0.0
F	0.0	0.0	0.0	0.0	0.0
G	0.0	0.0	0.0	0.0	0.0
H	0.0	0.0	0.0	0.0	0.0
I	4.9	0.0	2.2	0.3	7.4
J	0.0	0.0	0.0	0.0	0.0
K	5.2	0.0	0.0	0.0	5.2
L	3.3	2.0	0.0	0.0	5.2
M	2.7	0.0	1.8	0.6	5.1
N	0.0	0.0	0.0	0.0	0.0
O	0.9	0.0	1.8	0.0	2.8
P	4.6	0.5	1.4	0.5	6.9
Q	0.0	0.0	0.0	0.0	0.0
R	1.5	1.0	0.0	0.0	2.6
S	0.0	0.0	0.0	0.0	0.0
T	1.4	0.0	0.0	0.0	1.4
U	0.0	0.0	0.0	0.0	0.0
V	1.3	0.0	2.0	0.0	3.3
W	3.5	0.7	1.4	0.0	5.6
X	2.3	0.8	1.5	0.8	5.3
Y	2.2	0.0	0.0	0.0	2.2
Z	4.8	0.7	1.4	0.0	6.8
AA	2.3	0.0	0.6	0.0	2.8
AB	0.9	1.8	0.9	0.0	3.6
AC	11.1	0.0	0.0	0.0	11.1
AD	0.0	0.0	0.0	0.0	0.0
AE	2.2	0.0	3.3	0.0	5.5
AF	0.0	0.7	2.6	0.7	4.0
AG	3.3	0.0	0.7	0.0	4.1
Total	2.4	0.3	1.1	0.2	4.0

COMMENTS: These analyses include 4 269 neonates from 33 sites.

Presentation #48a
Necrotizing enterocolitis (NEC): GA<33 weeks: Adjusted standardized ratios by site

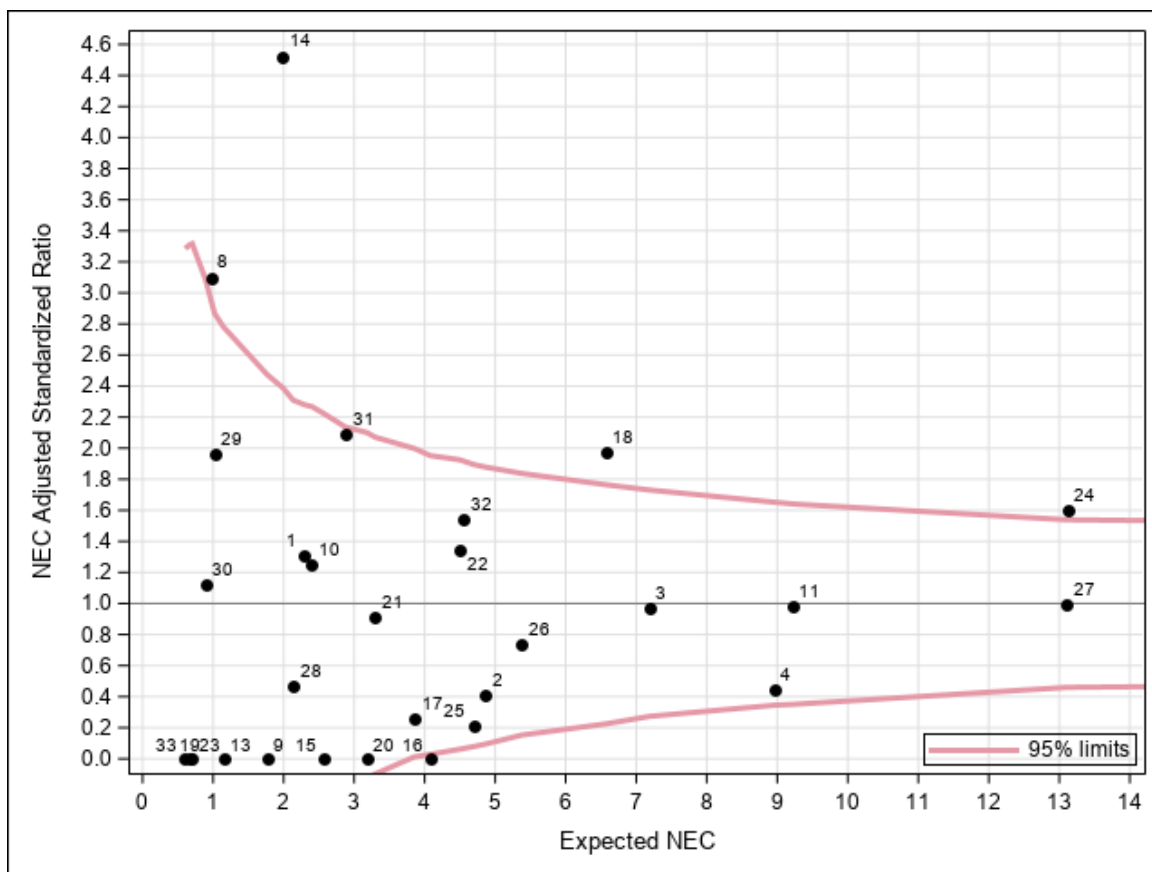| Site	Number of neonates	Number of neonates with NEC	Adjusted# expected number of neonates with NEC	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	102	3	3.4	0.9	0.2	2.6
2	188	5	6.9	0.7	0.2	1.7
3	250	11	9.5	1.2	0.6	2.1
4	321	5	12.3	0.4	0.1	0.9
6	52	4	1.0	4.1	1.1	10.4
7	9	0	0.4	0.0	.	10.2
8	90	5	2.1	2.4	0.8	5.6
9	60	0	2.3	0.0	.	1.6
10	108	4	3.5	1.1	0.3	2.9
11	266	11	11.8	0.9	0.5	1.7
13	25	0	1.3	0.0	.	2.8
14	89	10	3.0	3.4	1.6	6.2
15	134	0	3.9	0.0	.	0.9
16	119	0	5.2	0.0	.	0.7
17	168	4	5.5	0.7	0.2	1.8
18	203	15	8.6	1.8	1.0	2.9
19	21	0	0.8	0.0	.	4.6
20	113	0	4.2	0.0	.	0.9
21	121	6	4.5	1.3	0.5	2.9
22	131	7	5.4	1.3	0.5	2.7
23	38	0	1.2	0.0	.	2.9
24	348	26	16.3	1.6	1.0	2.3
25	138	1	6.1	0.2	0.0	0.9
26	147	4	6.6	0.6	0.2	1.6
27	324	17	15.8	1.1	0.6	1.7
28	86	1	3.0	0.3	0.0	1.9
29	58	3	1.7	1.7	0.3	5.0
30	31	1	1.2	0.9	0.0	4.8
31	140	8	4.4	1.8	0.8	3.6
32	148	8	6.0	1.3	0.6	2.6
33	40	0	1.1	0.0	.	3.4

Numeric site codes were used in Presentations 46a-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: Sites 5 and 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #48b
Necrotizing enterocolitis (NEC): GA<33 weeks: Adjusted standardized ratios by site
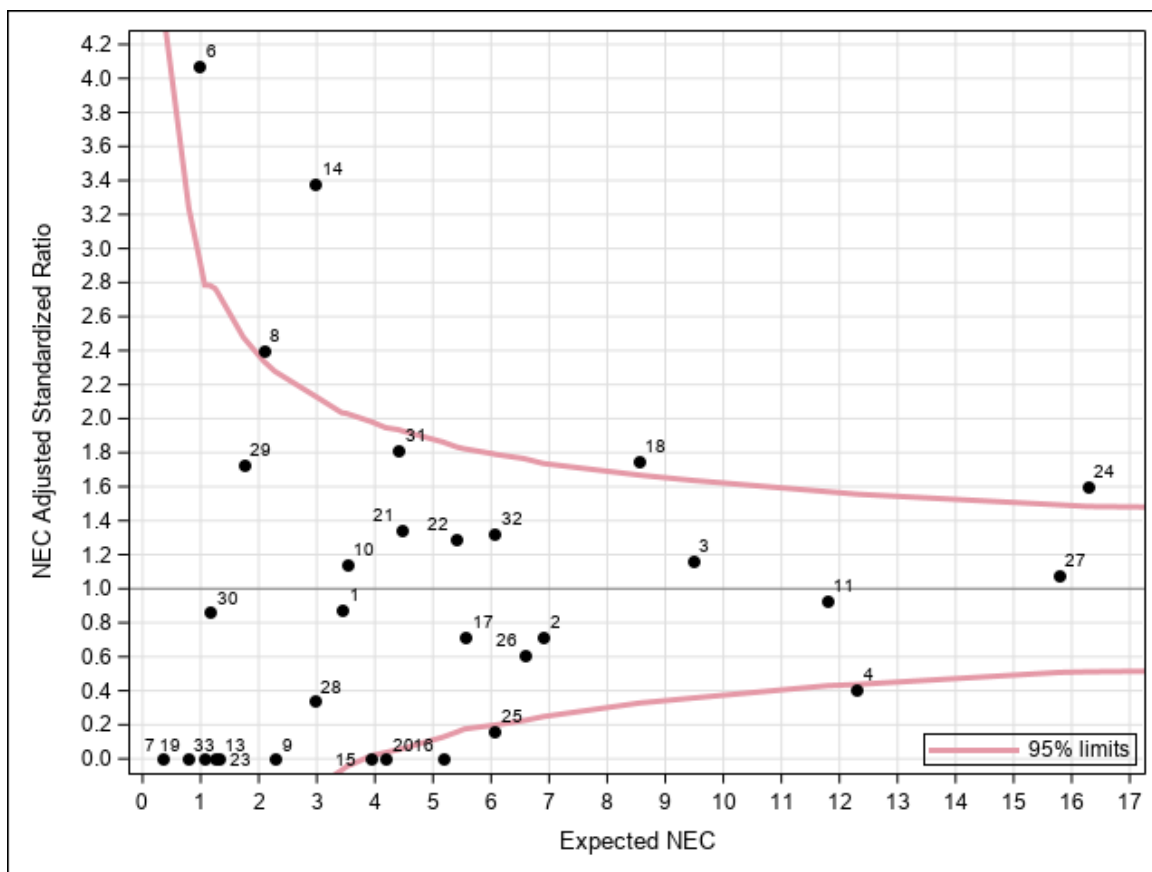
Explanation for Presentation 46a
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after 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 46b
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 #48c
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	30	3	2.3	1.3	0.3	3.8
2	59	2	4.9	0.4	0.0	1.5
3	105	7	7.2	1.0	0.4	2.0
4	123	4	9.0	0.4	0.1	1.1
8	21	3	1.0	3.1	0.6	9.1
9	25	0	1.8	0.0	.	2.1
10	30	3	2.4	1.3	0.3	3.7
11	102	9	9.2	1.0	0.4	1.9
13	11	0	1.1	0.0	.	3.2
14	25	9	2.0	4.5	2.1	8.6
15	42	0	2.6	0.0	.	1.4
16	51	0	4.1	0.0	.	0.9
17	50	1	3.9	0.3	0.0	1.4
18	76	13	6.6	2.0	1.1	3.4
19	10	0	0.7	0.0	.	5.5
20	42	0	3.2	0.0	.	1.2
21	42	3	3.3	0.9	0.2	2.7
22	54	6	4.5	1.3	0.5	2.9
23	7	0	0.7	0.0	.	5.2
24	159	21	13.1	1.6	1.0	2.4
25	56	1	4.7	0.2	0.0	1.2
26	65	4	5.4	0.7	0.2	1.9
27	171	13	13.1	1.0	0.5	1.7
28	29	1	2.1	0.5	0.0	2.6
29	14	2	1.0	2.0	0.2	7.1
30	11	1	0.9	1.1	0.0	6.2
31	42	6	2.9	2.1	0.8	4.5
32	57	7	4.5	1.5	0.6	3.2
33	9	0	0.6	0.0	.	6.1

Numeric site codes were used in Presentations 46a-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 5, 6, 7, 12 were excluded from the analysis due to the small number of eligible neonates.

Presentation #48d
NEC: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 46c
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 46d
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 #49
Chronic lung disease (CLD): GA<33 weeks: Site specific crude rates

	GA at birth					
Site	**<25**	**25-26**	**27-28**	**29-30**	**31-32**	**Overall CLD rate for sites**
A	100.0	100.0	25.0	7.7	0.0	15.0
B	100.0	100.0	50.0	68.8	34.4	43.9
C	100.0	100.0	61.4	39.1	17.2	19.2
D	100.0	NA	0.0	33.3	7.1	31.8
E	100.0	100.0	50.0	38.5	0.0	29.7
F	100.0	71.4	50.0	21.7	2.2	28.9
G	NA	80.0	0.0	0.0	10.0	32.5
H	66.7	69.2	33.3	22.7	7.6	30.4
I	87.1	60.4	27.7	44.8	16.2	49.1
J	NA	NA	0.0	NA	0.0	46.6
K	100.0	85.7	0.0	10.0	9.7	28.6
L	80.0	66.7	31.8	17.8	8.0	23.7
M	62.1	40.8	38.3	29.7	4.6	33.0
N	100.0	57.1	53.3	31.3	25.0	25.0
O	66.7	62.5	25.0	7.1	6.5	23.6
P	92.9	85.0	50.0	34.8	13.3	38.3
Q	NA	0.0	0.0	0.0	11.1	0.0
R	94.7	54.6	54.6	19.2	12.8	21.2
S	NA	NA	50.0	50.0	0.0	27.7
T	75.0	82.4	30.0	15.4	8.9	31.4
U	NA	NA	NA	NA	0.0	39.0
V	80.0	64.7	31.0	26.7	10.5	15.8
W	83.3	66.7	57.9	8.6	9.7	36.1
X	100.0	47.1	33.3	19.2	10.2	5.0
Y	50.0	20.0	50.0	14.8	9.7	30.3
Z	100.0	100.0	91.7	87.2	72.7	25.0
AA	88.9	85.7	70.8	37.5	26.9	29.3
AB	100.0	66.7	41.7	12.9	6.4	0.0
AC	100.0	88.9	50.0	28.0	10.0	31.7
AD	100.0	83.3	54.2	32.0	12.9	24.6
AE	NA	66.7	33.3	38.5	18.6	27.3
AF	100.0	56.3	36.6	25.6	15.4	21.0
AG	93.8	57.1	40.7	22.4	8.5	83.6
Overall CLD rate for GA group	88.2	67.2	43.3	29.8	14.5	33.7

Total number of neonates = 3 975
303 neonates were excluded due to death prior to week 36 or first admission after week 36
NA = Data not available

Presentation #50a
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	102	94	12	25.4	0.5	0.2	0.8
2	188	178	52	52.9	1.0	0.7	1.3
3	250	240	73	82.2	0.9	0.7	1.1
4	321	307	141	101.4	1.4	1.2	1.6
6	52	48	22	9.1	2.4	1.5	3.6
7	9	8	2	2.2	0.9	0.1	3.3
8	90	89	25	21.6	1.2	0.7	1.7
9	60	57	21	19.0	1.1	0.7	1.7
10	108	96	16	24.7	0.6	0.4	1.1
11	266	242	77	79.3	1.0	0.8	1.2
13	25	20	1	5.8	0.2	0.0	1.0
14	89	87	28	25.5	1.1	0.7	1.6
15	134	125	35	33.5	1.0	0.7	1.5
16	119	113	36	41.1	0.9	0.6	1.2
17	174	166	73	47.6	1.5	1.2	1.9
18	203	182	64	57.6	1.1	0.9	1.4
19	21	20	5	7.0	0.7	0.2	1.7
20	113	101	21	31.1	0.7	0.4	1.0
21	121	112	92	32.3	2.8	2.3	3.5
22	133	119	31	40.4	0.8	0.5	1.1
23	38	36	8	9.0	0.9	0.4	1.7
24	348	326	122	126.6	1.0	0.8	1.2
25	138	130	37	47.9	0.8	0.5	1.1
26	147	133	40	47.2	0.8	0.6	1.2
27	324	305	92	126.4	0.7	0.6	0.9
28	86	78	15	21.7	0.7	0.4	1.1
29	58	52	11	13.5	0.8	0.4	1.5
30	31	28	8	8.5	0.9	0.4	1.9
31	140	132	32	36.3	0.9	0.6	1.2
32	149	142	39	49.2	0.8	0.6	1.1
33	40	39	6	10.1	0.6	0.2	1.3

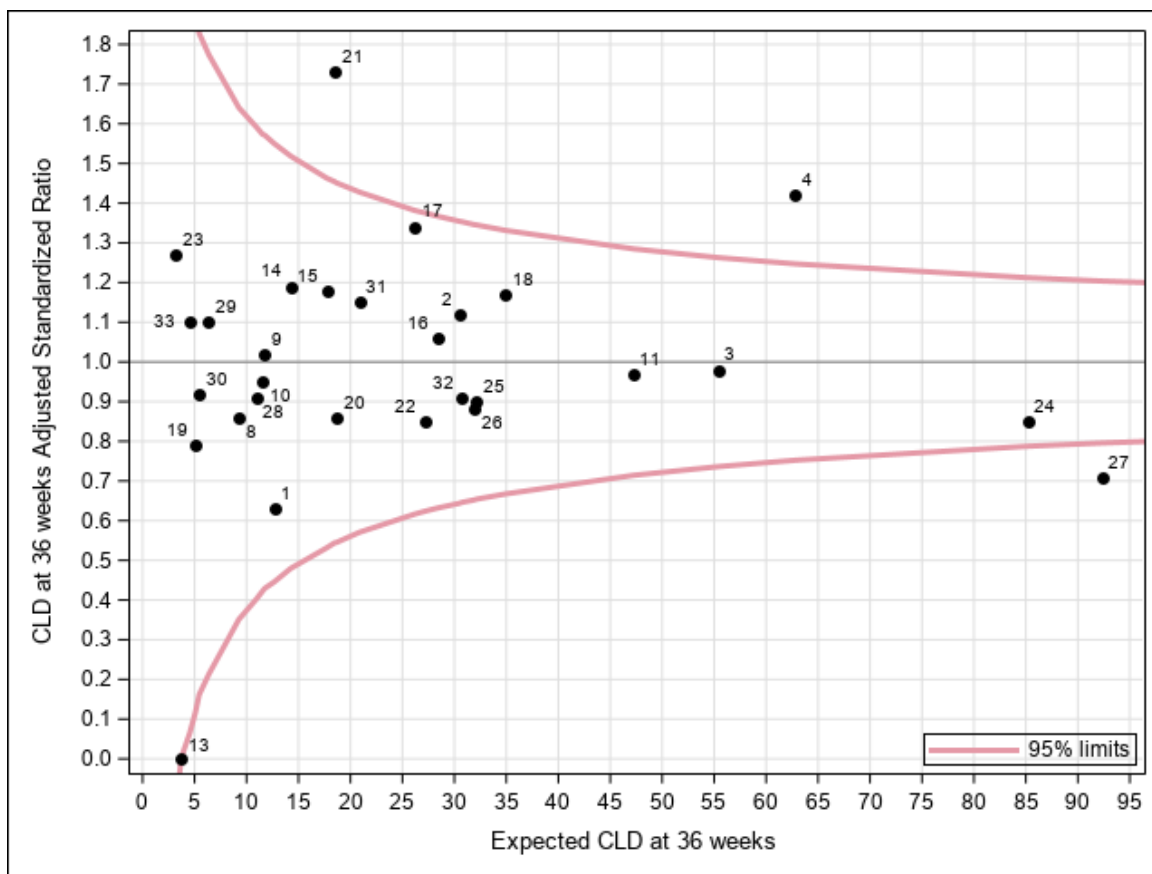**Numeric site codes were used in Presentations 48a-d and they may not correspond to other presentations in this report. Neonates with major congenital anomalies and death before 36 weeks were excluded.** #The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Site 5 and 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #50b
Chronic lung disease (CLD): GA <33 weeks: Adjusted standardized ratios by site
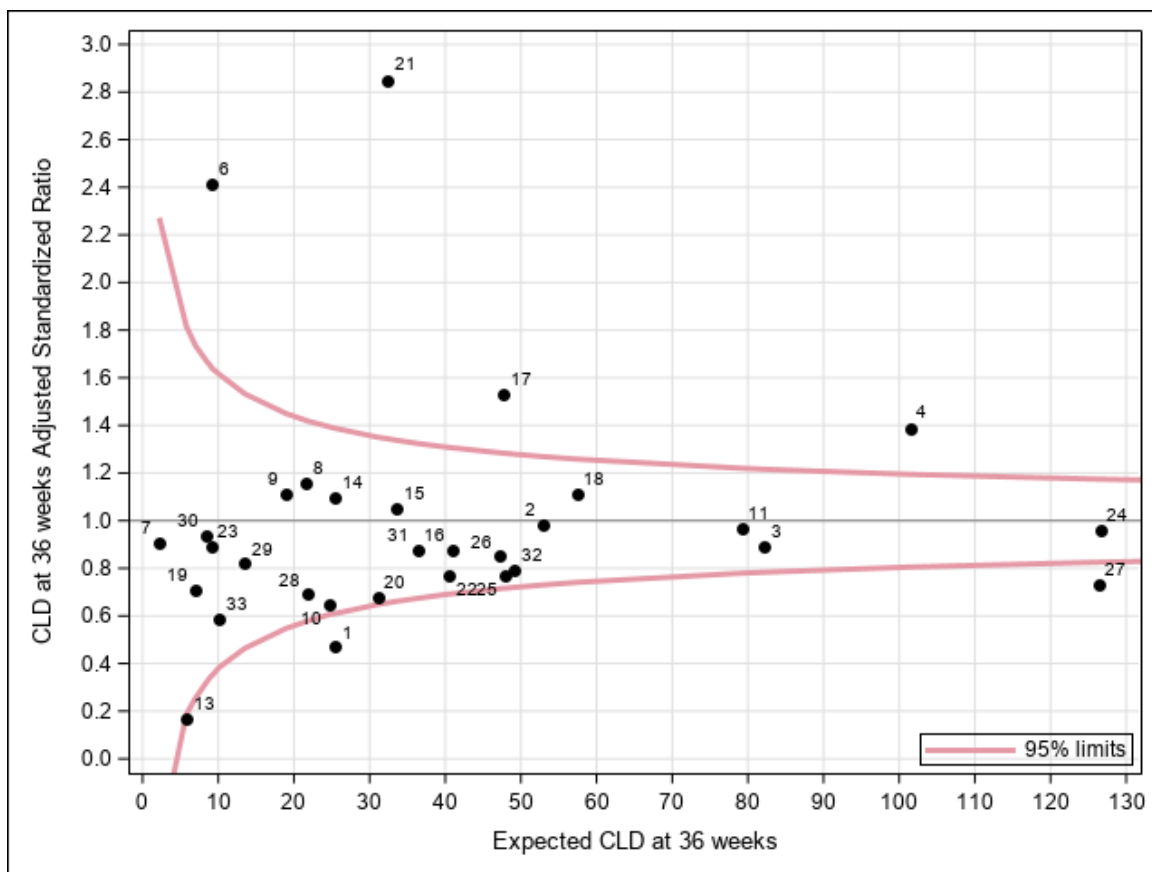
Explanation for Presentation 48a
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<33 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates 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 48b
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 #50c
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	30	23	8	12.7	0.6	0.3	1.2
2	59	50	34	30.5	1.1	0.8	1.6
3	105	98	54	55.4	1.0	0.7	1.3
4	123	111	89	62.8	1.4	1.1	1.7
8	21	21	8	9.3	0.9	0.4	1.7
9	25	22	12	11.7	1.0	0.5	1.8
10	30	20	11	11.5	1.0	0.5	1.7
11	102	79	46	47.2	1.0	0.7	1.3
13	11	7	0	3.7	0.0	.	1.0
14	25	23	17	14.2	1.2	0.7	1.9
15	42	33	21	17.7	1.2	0.7	1.8
16	51	45	30	28.4	1.1	0.7	1.5
17	51	44	35	26.1	1.3	0.9	1.9
18	76	57	41	34.9	1.2	0.8	1.6
19	10	9	4	5.1	0.8	0.2	2.0
20	42	31	16	18.7	0.9	0.5	1.4
21	42	34	32	18.5	1.7	1.2	2.4
22	56	46	23	27.1	0.8	0.5	1.3
23	7	5	4	3.1	1.3	0.3	3.3
24	159	142	72	85.2	0.8	0.7	1.1
25	56	49	29	32.2	0.9	0.6	1.3
26	65	55	28	31.9	0.9	0.6	1.3
27	171	156	66	92.4	0.7	0.6	0.9
28	29	22	10	11.0	0.9	0.4	1.7
29	14	11	7	6.4	1.1	0.4	2.3
30	11	8	5	5.4	0.9	0.3	2.1
31	42	37	24	20.9	1.2	0.7	1.7
32	57	51	28	30.8	0.9	0.6	1.3
33	9	8	5	4.6	1.1	0.4	2.6

Numeric site codes were used in Presentations 48a-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 5, 6, 7, 12 were excluded from the analysis due to the small number of eligible neonates.

Presentation #50d
Chronic lung disease (CLD): GA <29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 48c
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 48d
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 #51a
Postnatal use of steroids for treatment of CLD: GA<29 weeks: Site specific crude rates[†]
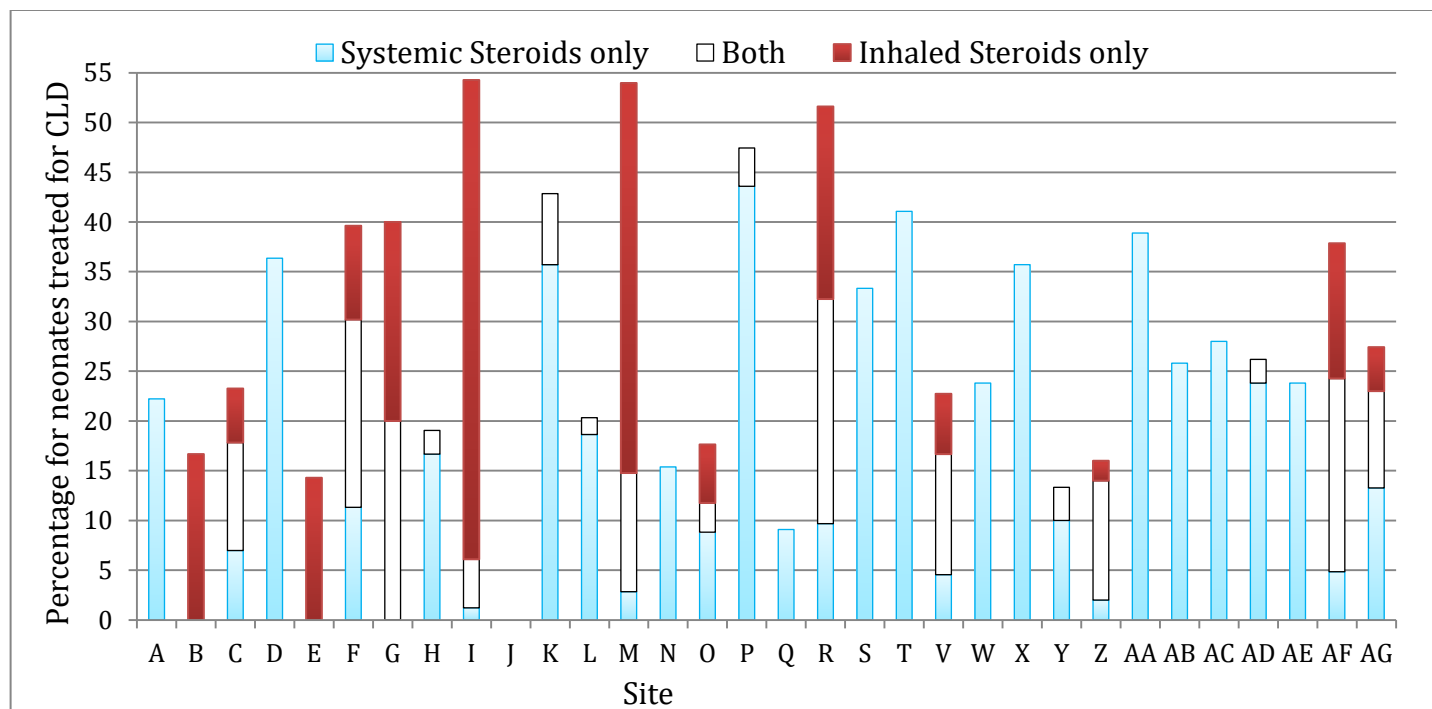
Site	Postnatal steroid use (%) Systemic Steroids only	Both	Inhaled Steroids only
A	22.2	0.0	0.0
B	0.0	0.0	16.7
C	7.0	10.9	5.4
D	36.4	0.0	0.0
E	0.0	0.0	14.3
F	11.3	18.9	9.4
G	0.0	20.0	20.0
H	16.7	2.4	0.0
I	1.2	4.9	48.2
J	0.0	0.0	0.0
K	35.7	7.1	0.0
L	18.6	1.7	0.0
M	2.8	11.9	39.2
N	15.4	0.0	0.0
O	8.8	2.9	5.9
P	43.6	3.9	0.0
Q	9.1	0.0	0.0

Site	Postnatal steroid use (%) Systemic Steroids only	Both	Inhaled Steroids only
R	9.7	22.6	19.4
S	33.3	0.0	0.0
T	41.1	0.0	0.0
U	4.6	12.1	6.1
V	23.8	0.0	0.0
W	35.7	0.0	0.0
X	10.0	3.3	0.0
Y	2.0	12.0	2.0
Z	38.9	0.0	0.0
AA	25.8	0.0	0.0
AB	28.0	0.0	0.0
AC	23.8	2.4	0.0
AD	23.8	0.0	0.0
AE	4.9	19.4	13.6
AG	13.3	9.7	4.4
Total	14.6	7.8	12.7

Total number of neonates = 1 586
[†] Percentage of neonates treated for CLD at each network site; results were attributed to the site of first admission; Site AF did not have any neonates with GA<29.
COMMENTS: Specific criteria for these treatments at each site were not documented here.

Presentation #51b
Systemic steroids for hypotension: GA<33 weeks: Site specific crude rates†
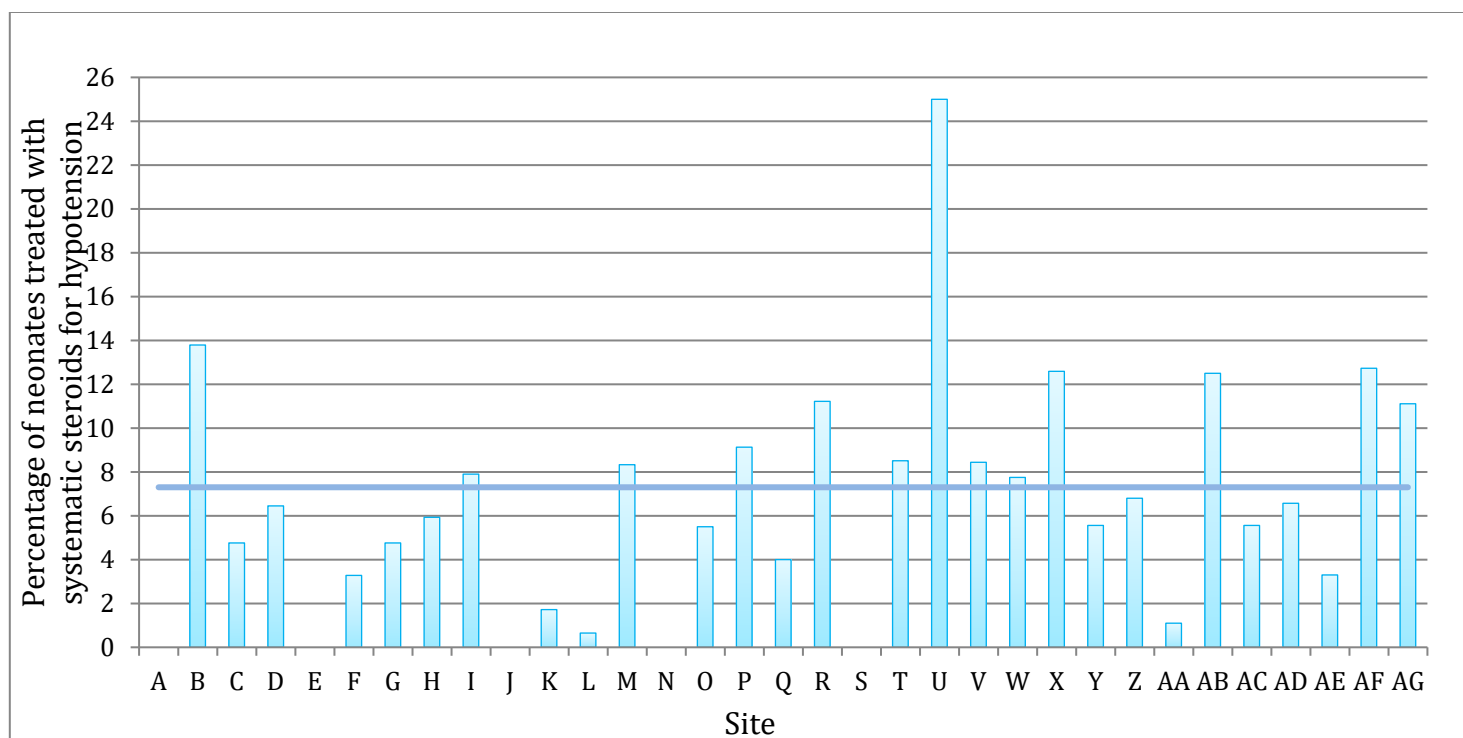
Site	Postnatal systemic steroids use for hypotension (%)	Site	Postnatal systemic steroids use for hypotension (%)
A	0.0	R	11.2
B	13.8	S	0.0
C	4.8	T	8.5
D	6.5	U	25.0
E	0.0	V	8.4
F	3.3	W	7.8
G	4.8	X	12.6
H	5.9	Y	5.6
I	7.9	Z	6.8
J	0.0	AA	1.1
K	1.7	AB	12.5
L	0.7	AC	5.6
M	8.3	AD	6.6
N	0.0	AE	3.3
O	5.5	AF	12.7
P	9.1	AG	11.1
Q	4.0	Total	7.3

Total number of neonates = 4 278

† Percentage of neonates treated with systemic steroids for hypotension at each network site; results were attributed to the site of first admission.

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

Presentation #52a
ROP ≥ Stage 3: GA<33 weeks: Adjusted standardized ratios by site

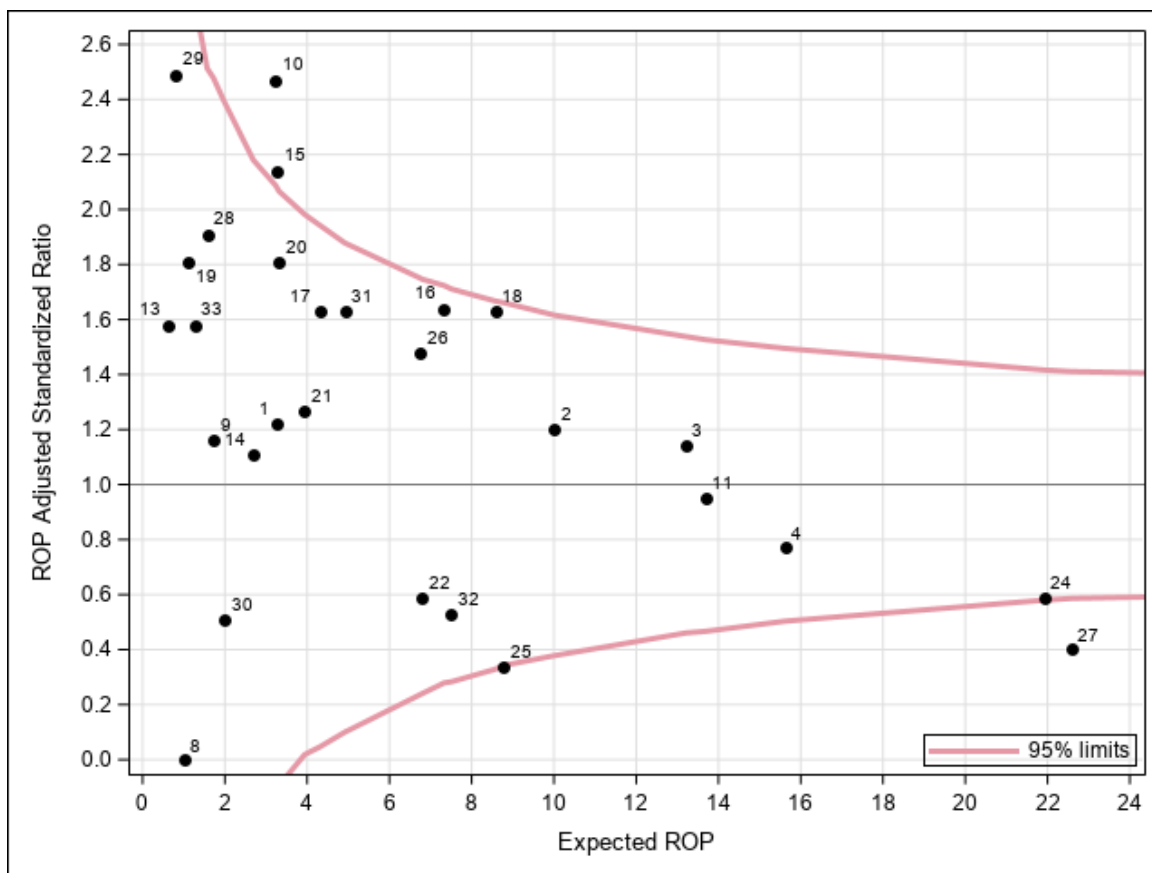| Site	Total number of neonates	Number of neonates with available data	Number of neonates with ROP ≥ Stage 3	Adjusted# expected number of neonates with ROP ≥ Stage 3	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	102	49	4	3.5	1.1	0.3	2.9
2	188	94	13	10.3	1.3	0.7	2.2
3	250	121	15	13.7	1.1	0.6	1.8
4	321	123	13	16.1	0.8	0.4	1.4
6	52	7	1	0.4	2.7	0.0	15.3
8	90	45	0	1.3	0.0	.	2.8
9	60	39	2	2.0	1.0	0.1	3.6
10	108	53	8	3.6	2.2	0.9	4.3
11	266	76	13	13.8	0.9	0.5	1.6
13	25	14	1	0.7	1.4	0.0	8.0
14	89	29	3	3.0	1.0	0.2	3.0
15	134	67	7	3.7	1.9	0.8	3.9
16	119	36	12	7.4	1.6	0.8	2.8
17	174	62	7	4.7	1.5	0.6	3.1
18	203	84	14	9.0	1.6	0.9	2.6
19	21	15	2	1.2	1.7	0.2	6.1
20	113	32	6	3.6	1.7	0.6	3.6
21	121	37	5	4.0	1.2	0.4	2.9
22	133	62	4	7.0	0.6	0.2	1.5
23	38	21	0	0.9	0.0	.	4.0
24	348	179	14	22.5	0.6	0.3	1.0
25	138	90	3	9.2	0.3	0.1	0.9
26	147	35	10	6.8	1.5	0.7	2.7
27	324	149	10	23.3	0.4	0.2	0.8
28	86	45	3	1.9	1.6	0.3	4.7
29	58	25	4	1.0	4.0	1.1	10.2
30	31	20	1	2.0	0.5	0.0	2.8
31	140	76	10	5.2	1.9	0.9	3.5
32	149	47	4	7.7	0.5	0.1	1.3
33	40	23	2	1.4	1.4	0.2	5.2

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 are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.
Note: Sites 5, 7, 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #52b
ROP ≥ Stage 3: GA<33 weeks: Adjusted standardized ratios by site
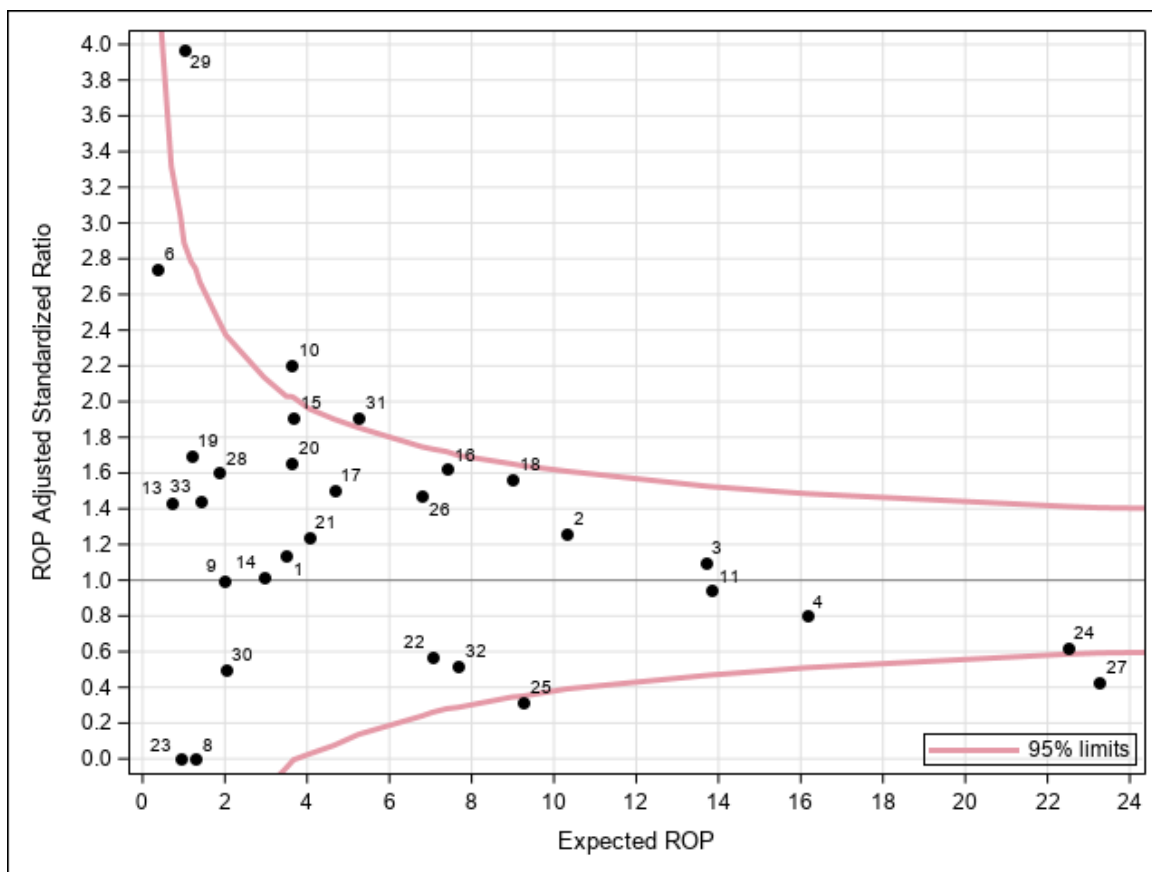
Explanation for Presentation 50a
Column 1: Numeric site codes
Column 2: Total number of neonates at each site (<33 weeks GA and no major anomaly)
Column 3: Number of eligible neonates at each site (<33 weeks GA and no major anomaly) who were actually used to fit the model
Column 4: Number of neonates 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 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 #52c
ROP ≥ Stage 3: GA<29 weeks: Adjusted standardized ratios by site

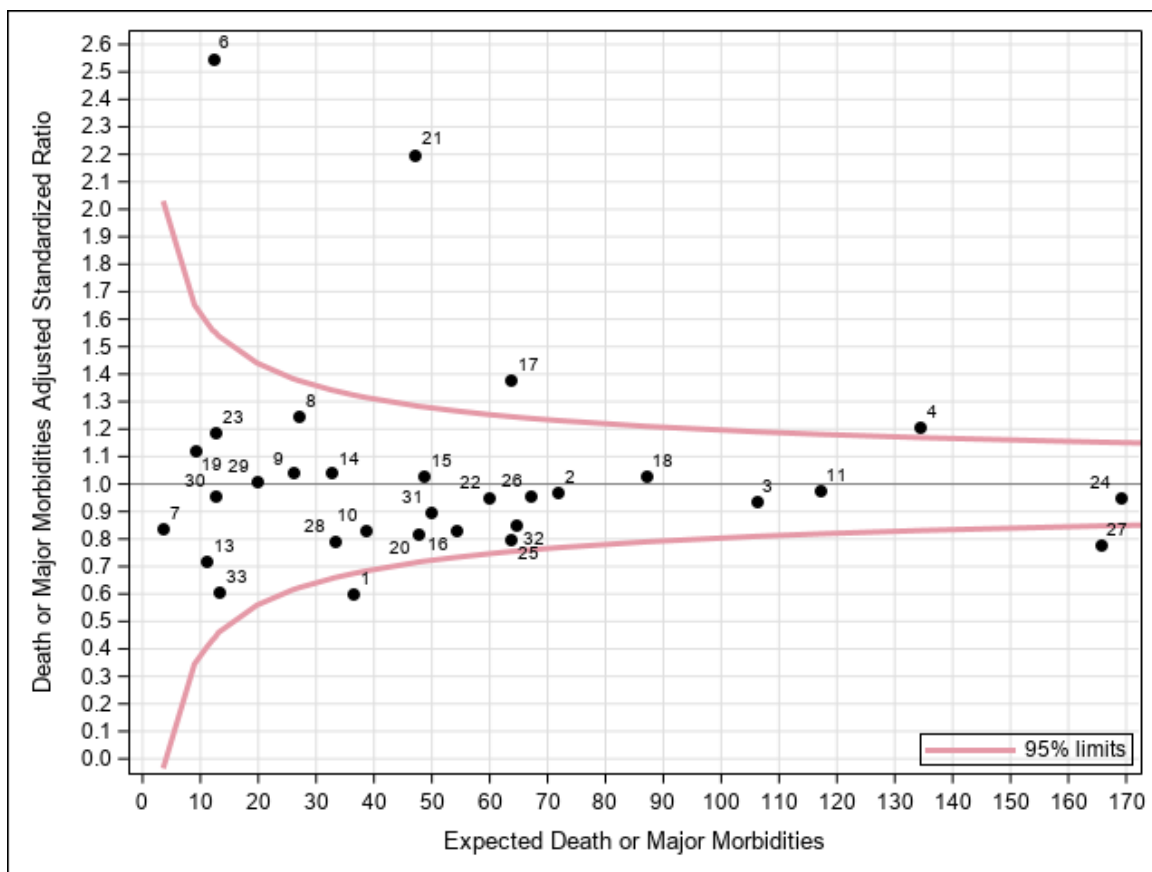| Site	Total number of neonates	Number of neonates with available data	Number of neonates with ROP≥ Stage 3	Adjusted# expected number of neonates with ROP≥ Stage 3	Adjusted# standardized ratio	95% confidence interval for adjusted standardized ratio	
1	30	23	4	3.3	1.2	0.3	3.1
2	59	47	12	10.0	1.2	0.6	2.1
3	105	89	15	13.2	1.1	0.6	1.9
4	123	97	12	15.6	0.8	0.4	1.3
8	21	21	0	1.0	0.0	.	3.7
9	25	22	2	1.7	1.2	0.1	4.2
10	30	22	8	3.2	2.5	1.1	4.9
11	102	57	13	13.7	0.9	0.5	1.6
13	11	7	1	0.6	1.6	0.0	8.8
14	25	13	3	2.7	1.1	0.2	3.3
15	42	33	7	3.3	2.1	0.9	4.4
16	51	33	12	7.3	1.6	0.8	2.9
17	51	30	7	4.3	1.6	0.7	3.4
18	76	51	14	8.6	1.6	0.9	2.7
19	10	9	2	1.1	1.8	0.2	6.5
20	42	20	6	3.3	1.8	0.7	3.9
21	42	23	5	3.9	1.3	0.4	3.0
22	56	45	4	6.8	0.6	0.2	1.5
24	159	127	13	21.9	0.6	0.3	1.0
25	56	48	3	8.8	0.3	0.1	1.0
26	65	33	10	6.8	1.5	0.7	2.7
27	171	126	9	22.6	0.4	0.2	0.8
28	29	18	3	1.6	1.9	0.4	5.6
29	14	9	2	0.8	2.5	0.3	9.0
30	11	8	1	2.0	0.5	0.0	2.8
31	42	37	8	4.9	1.6	0.7	3.2
32	57	39	4	7.5	0.5	0.1	1.4
33	9	8	2	1.3	1.6	0.2	5.7

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 are excluded.
The prediction model was adjusted for GA, SGA, sex, and SNAPII > 20.

Note: Sites 5, 6, 7, 12, 23 were excluded from the analysis due to the small number of eligible neonates.

Presentation #52d
ROP ≥ Stage 3: GA<29 weeks: Adjusted standardized ratios by site

Explanation for Presentation 50c
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 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.

Presentation #53a
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	102	22	36.4	0.6	0.4	0.9
2	188	70	71.8	1.0	0.8	1.2
3	250	100	106.1	0.9	0.8	1.1
4	321	163	134.4	1.2	1.0	1.4
6	52	31	12.2	2.5	1.7	3.6
7	9	3	3.6	0.8	0.2	2.5
8	90	34	27.1	1.3	0.9	1.8
9	60	27	25.9	1.0	0.7	1.5
10	108	32	38.7	0.8	0.6	1.2
11	266	115	117.0	1.0	0.8	1.2
13	25	8	11.1	0.7	0.3	1.4
14	89	34	32.7	1.0	0.7	1.5
15	134	50	48.7	1.0	0.8	1.4
16	119	45	54.1	0.8	0.6	1.1
17	174	88	63.5	1.4	1.1	1.7
18	203	90	87.0	1.0	0.8	1.3
19	21	10	9.0	1.1	0.5	2.1
20	113	39	47.5	0.8	0.6	1.1
21	121	103	46.9	2.2	1.8	2.7
22	133	57	59.8	1.0	0.7	1.2
23	38	15	12.6	1.2	0.7	2.0
24	348	160	169.1	0.9	0.8	1.1
25	138	51	63.7	0.8	0.6	1.1
26	147	64	66.9	1.0	0.7	1.2
27	324	129	165.6	0.8	0.7	0.9
28	86	26	33.1	0.8	0.5	1.2
29	58	20	19.8	1.0	0.6	1.6
30	31	12	12.5	1.0	0.5	1.7
31	140	45	49.7	0.9	0.7	1.2
32	149	55	64.4	0.9	0.6	1.1
33	40	8	13.1	0.6	0.3	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 51a-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 5 and 12 were not included in this analysis due to small number of eligible neonates in this category.

Presentation #53b
Mortality or major morbidity: GA < 33 weeks: Adjusted standardized ratios by site

Explanation for Presentation 51a
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 51b
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
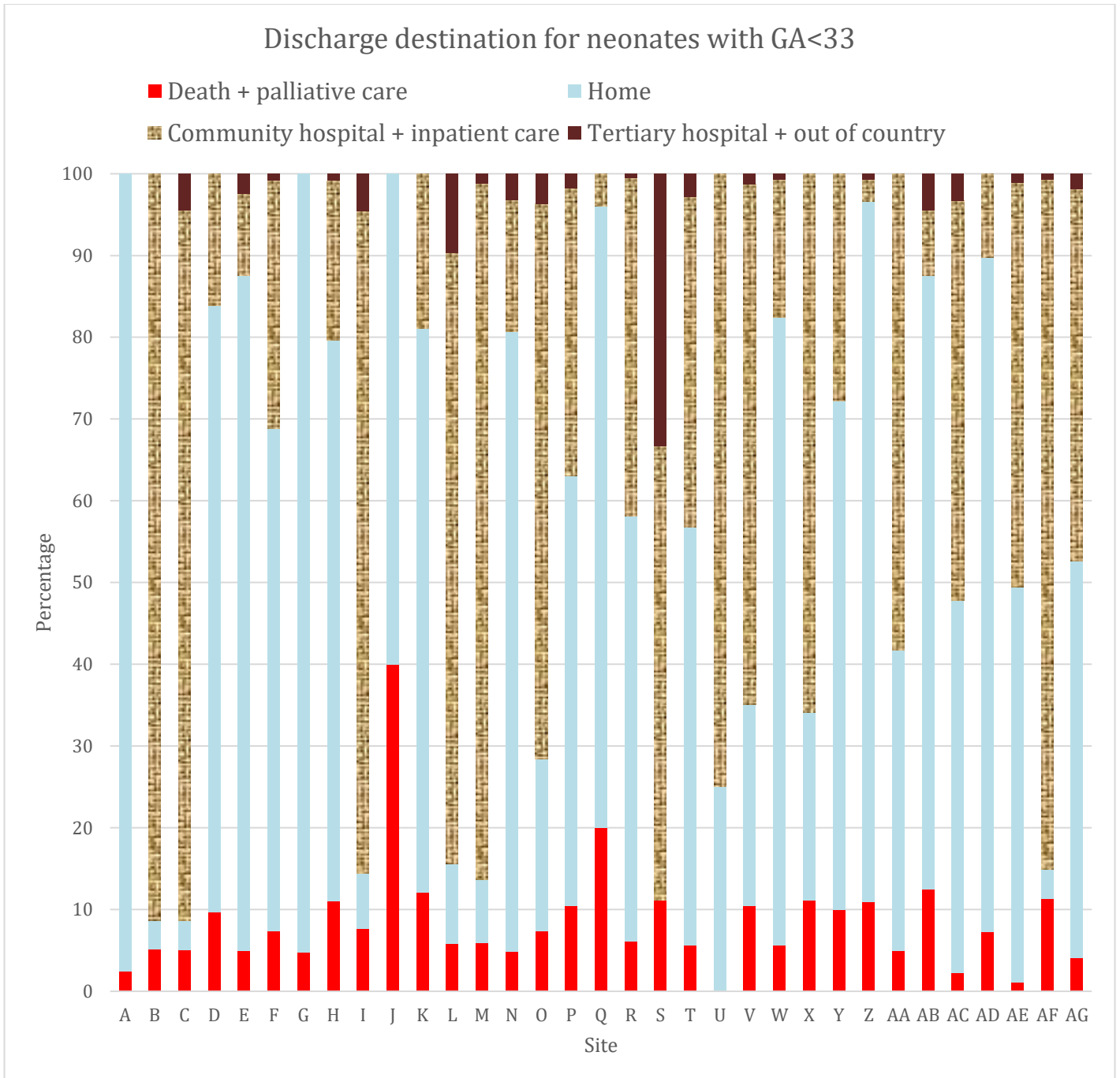Red funnel shaped lines: 95% confidence limits based on entire network information.
Sites outside of red lines represent higher or lower (depending upon position in graph) adjusted standardized ratio. However, for determining whether site is statistically different from others, one should also assess 95% CI and check whether both upper and lower boundaries are also outside of the funnel area or not.

Presentation #53c
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	30	17	20.2	0.8	0.5	1.3
2	59	45	43.2	1.0	0.8	1.4
3	105	70	71.2	1.0	0.8	1.2
4	123	101	84.9	1.2	1.0	1.4
8	21	11	11.3	1.0	0.5	1.7
9	25	18	16.9	1.1	0.6	1.7
10	30	23	21.2	1.1	0.7	1.6
11	102	75	75.4	1.0	0.8	1.2
13	11	5	8.4	0.6	0.2	1.4
14	25	21	18.4	1.1	0.7	1.7
15	42	33	28.1	1.2	0.8	1.6
16	51	37	38.5	1.0	0.7	1.3
17	51	45	36.5	1.2	0.9	1.7
18	76	62	58.4	1.1	0.8	1.4
19	10	8	6.5	1.2	0.5	2.4
20	42	30	31.6	0.9	0.6	1.4
21	42	41	29.2	1.4	1.0	1.9
22	56	41	41.4	1.0	0.7	1.3
23	7	7	5.5	1.3	0.5	2.6
24	159	99	114.6	0.9	0.7	1.1
25	56	38	43.6	0.9	0.6	1.2
26	65	43	45.8	0.9	0.7	1.3
27	171	98	121.7	0.8	0.7	1.0
28	29	20	19.5	1.0	0.6	1.6
29	14	11	10.0	1.1	0.5	2.0
30	11	9	8.5	1.1	0.5	2.0
31	42	32	29.4	1.1	0.7	1.5
32	57	40	40.9	1.0	0.7	1.3
33	9	7	6.3	1.1	0.4	2.3

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 51a-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 5, 6, 7, 12 were excluded from the analysis due to the small number of eligible neonates.

Presentation #53d
Mortality or major morbidity: GA < 29 weeks: Adjusted standardized ratios by site
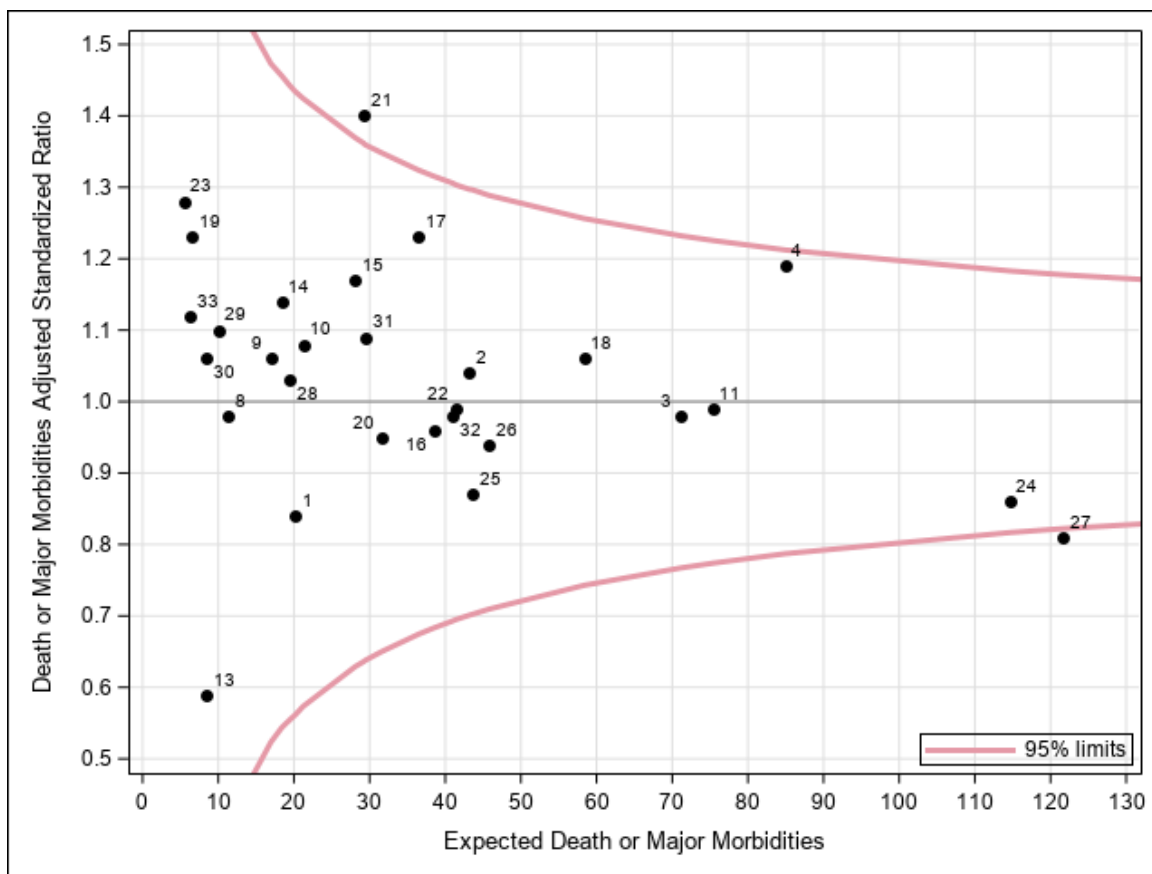
Explanation for Presentation 51c
Column 1: Numeric site codes
Column 2: Number of eligible neonates at each site (<29 weeks GA and no major anomaly)
Column 3: Number of neonates with outcome of interest among those eligible neonates
Column 4: Expected number of neonates with outcome of interest after 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 51d
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 #54a
Final discharge destination: All GA: Crude rates

		GA (completed weeks)								Total
		< 25	25-26	27-28	29-30	31-32	33-34	35-36	≥37	
Home	N	141	192	268	418	605	988	1128	3501	7241
	%	37.1	39.3	37.3	38.3	37.8	48.7	51.5	58.6	
Community hospital	N	50	158	327	559	815	748	508	589	3754
	%	13.2	32.4	45.5	51.2	51.0	36.8	23.2	9.9	
Tertiary hospital	N	20	21	21	14	15	19	31	193	334
	%	5.3	4.3	2.9	1.3	0.9	0.9	1.4	3.2	
Died	N	127	73	46	32	34	30	33	98	473
	%	33.4	15.0	6.4	2.9	2.1	1.5	1.5	1.6	
Palliative care (home/other institute)	N	1	0	0	2	2	2	7	10	24
	%	0.3	0.0	0.0	0.2	0.1	0.1	0.3	0.2	
Another inpatient area in site	N	41	43	56	66	128	244	482	1580	2640
	%	10.8	8.8	7.8	6.1	8.0	12.0	22.0	26.5	
Out of country discharge	N	0	1	0	0	0	0	0	0	1
	%	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total neonates included	N	380	488	718	1091	1599	2031	2189	5971	14467
	%	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									14469

Presentation #54b
Final discharge destination by site: GA<33

Discharge destination for neonates with GA<33

■ Death + palliative care   ■ Home
■ Community hospital + inpatient care   ■ Tertiary hospital + out of country

Presentation #54b (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	2.4	97.6	0.0	0.0
B	5.2	3.5	91.4	0.0
C	5.1	3.6	86.9	4.5
D	9.7	74.2	16.1	0.0
E	5.0	82.5	10.0	2.5
F	7.4	61.5	30.3	0.8
G	4.8	95.2	0.0	0.0
H	11.0	68.6	19.5	0.9
I	7.6	6.8	80.9	4.6
J	40.0	60.0	0.0	0.0
K	12.1	69.0	19.0	0.0
L	5.8	9.7	74.7	9.7
M	6.0	7.7	85.1	1.2
N	4.8	75.8	16.1	3.2
O	7.3	21.1	67.9	3.7
P	10.5	52.5	35.2	1.8
Q	20.0	76.0	4.0	0.0
R	6.1	52.0	41.3	0.5
S	11.1	0.0	55.6	33.3
T	5.7	51.1	40.4	2.8
U	0.0	25.0	75.0	0.0
V	10.4	24.7	63.6	1.3
W	5.6	76.8	16.9	0.7
X	11.1	23.0	65.9	0.0
Y	10.0	62.2	27.8	0.0
Z	10.9	85.7	2.7	0.7
AA	5.0	36.8	58.2	0.0
AB	12.5	75.0	8.0	4.5
AC	2.2	45.6	48.9	3.3
AD	7.3	82.5	10.2	0.0
AE	1.1	48.4	49.5	1.1
AF	11.3	3.6	84.4	0.7
AG	4.1	48.5	45.6	1.9
Total %	**38.0**	**7.4**	**52.5**	**2.2**
Total N	**317**	**1624**	**2243**	**92**

Presentation #55
Resource use (proportion of admissions and of total patient days) per case-mix group within each site among sites with COMPLETE data (n=25)

DEFINITIONS for case mix groups

For each site all admission were included (so same patient may be counted twice since unit of analysis is the admission)

Admissions to were categorized according to 1 diagnostic group – i.e. an admission can only be categorized in one of these groups

	DEFINITION
< 29 weeks	Born <29 weeks GA WITHOUT major congenital anomaly
29-32 weeks	Born 29-32 weeks GA WITHOUT major congenital anomaly
33-36 weeks	Born 33-36 weeks GA WITHOUT major congenital anomaly or HIE

Term resp (MV)	Born ≥37 weeks GA
	- WITHOUT major congenital anomaly
	- Without hypoxic ischemic encephalopathy (with and without cooling)
	- Received ≥1 days of respiratory support defined as any of the following
	   o HFV
	   o IPPV
	   o NI Ventilation
	   o CPAP
	   o High flow

HIE	Infants born ≥35 weeks with hypoxic ischemic encephalopathy (with and without cooling)
Congenital anomaly	Infant with MAJOR congenital anomaly – regardless of GA
Term other	Infants born ≥37 weeks that do not meet any of the diagnostic categories

Presentation #55a
Proportion of <u>admissions</u> per case-mix group within each site among sites with
COMPLETE data (n=25) – Graph format
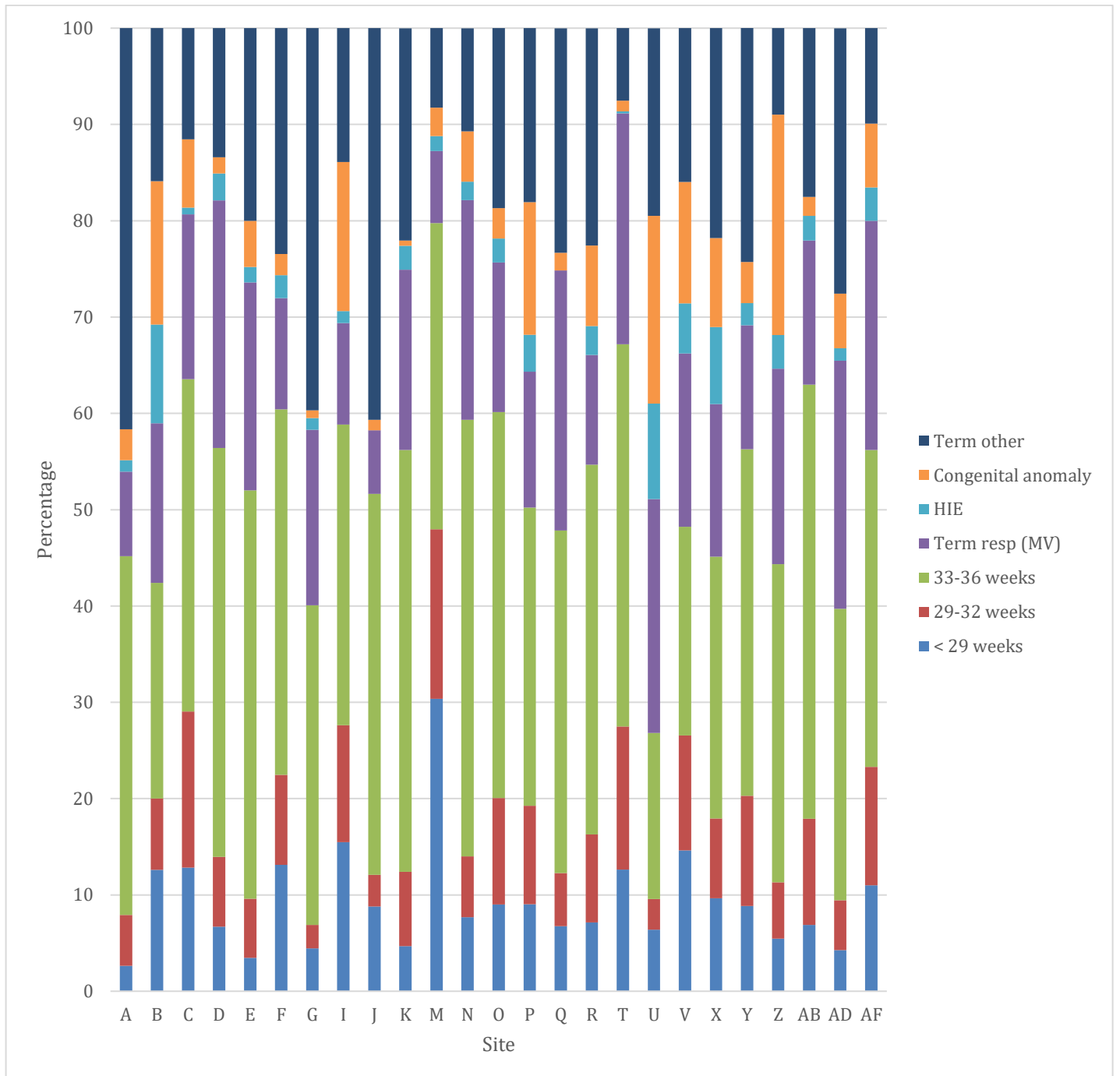
Presentation #55a (continued)
Proportion of <u>admissions</u> per case-mix group within each site among sites with
COMPLETE data (n=25) – Table format

Site	< 29 weeks	29-32 weeks	33-36 weeks	Term resp (MV)	HIE	Congenital anomaly	Term other
A	2.6	5.3	37.2	8.8	1.2	3.2	41.6
B	12.6	7.4	22.4	16.6	10.2	14.9	15.9
C	12.9	16.2	34.5	17.1	0.7	7.1	11.5
D	6.7	7.3	42.5	25.7	2.8	1.7	13.4
E	3.5	6.1	42.4	21.6	1.6	4.8	20.0
F	13.1	9.3	38.0	11.5	2.4	2.2	23.5
G	4.5	2.4	33.2	18.2	1.2	0.8	39.7
I	15.5	12.1	31.2	10.5	1.2	15.5	13.9
J	8.8	3.3	39.6	6.6	0.0	1.1	40.7
K	4.7	7.7	43.8	18.7	2.5	0.6	22.0
M	30.4	17.6	31.8	7.5	1.6	3.0	8.3
N	7.7	6.3	45.3	22.8	1.9	5.2	10.7
O	9.0	11.0	40.1	15.5	2.5	3.2	18.7
P	9.0	10.2	31.0	14.1	3.9	13.8	18.1
Q	6.8	5.5	35.6	27.0	0.0	1.8	23.3
R	7.1	9.2	38.4	11.4	3.0	8.4	22.5
T	12.6	14.9	39.7	24.0	0.2	1.1	7.5
U	6.4	3.2	17.3	24.3	9.9	19.5	19.5
V	14.6	11.9	21.7	18.0	5.2	12.6	16.0
X	9.7	8.3	27.2	15.9	8.0	9.2	21.8
Y	8.9	11.4	36.0	12.9	2.3	4.3	24.3
Z	5.5	5.9	33.0	20.3	3.5	22.9	9.0
AB	6.9	11.0	45.1	15.0	2.6	2.0	17.5
AD	4.3	5.2	30.3	25.8	1.3	5.7	27.6
AF	11.0	12.3	32.9	23.8	3.5	6.6	9.9
Total	10.3	9.8	33.4	17.0	3.2	8.5	17.8

Denominator = total admission in site
*only for sites with complete data

Presentation #55b
Proportion of <u>total patient days</u> per case-mix group within each site among sites with COMPLETE data (n=25) – Graph format
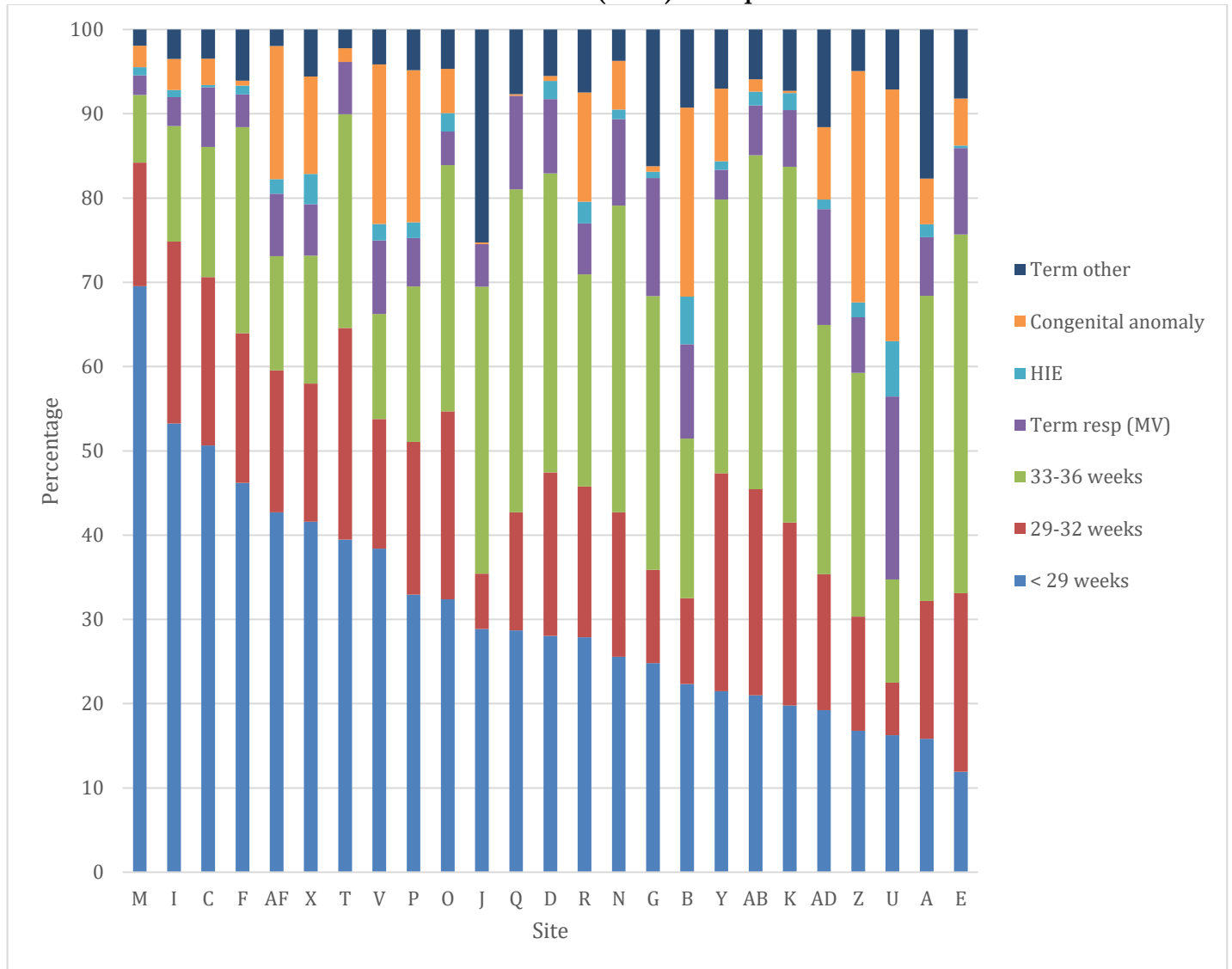
Presentation #55b (continued)
Proportion of <u>total patient days</u> per case-mix group within each site among sites with
COMPLETE data (n=25) – Table format

Site	< 29 weeks	29-32 weeks	33-36 weeks	Term resp (MV)	HIE	Congenital anomaly	Term other
A	15.8	16.4	36.2	7.0	1.5	5.4	17.7
B	22.3	10.2	18.9	11.2	5.6	22.4	9.3
C	50.6	20.0	15.4	7.1	0.2	3.1	3.5
D	28.0	19.4	35.5	8.8	2.1	0.6	5.5
E	11.9	21.2	42.6	10.3	0.3	5.6	8.2
F	46.2	17.8	24.4	3.9	1.0	0.6	6.1
G	24.8	11.1	32.5	14.0	0.7	0.7	16.2
I	53.3	21.6	13.7	3.4	0.9	3.7	3.5
J	28.9	6.5	34.0	5.1	0.0	0.2	25.3
K	19.8	21.7	42.2	6.7	2.0	0.2	7.3
M	69.5	14.7	8.0	2.3	1.0	2.5	1.9
N	25.6	17.2	36.4	10.2	1.2	5.8	3.7
O	32.4	22.3	29.2	4.0	2.2	5.3	4.7
P	32.9	18.1	18.5	5.7	1.9	18.1	4.8
Q	28.7	14.0	38.3	11.1	0.0	0.2	7.7
R	27.9	17.9	25.2	6.1	2.6	12.9	7.5
T	39.5	25.1	25.4	6.2	0.0	1.6	2.2
U	16.2	6.2	12.2	21.7	6.6	29.9	7.1
V	38.4	15.4	12.5	8.7	2.0	18.9	4.1
X	41.6	16.4	15.2	6.1	3.6	11.6	5.6
Y	21.5	25.9	32.5	3.5	1.0	8.6	7.0
Z	16.8	13.6	28.9	6.6	1.8	27.4	4.9
AB	21.0	24.4	39.7	5.9	1.6	1.5	5.9
AD	19.2	16.2	29.6	13.8	1.1	8.6	11.6
AF	42.7	16.8	13.6	7.4	1.7	15.8	2.0
Total	33.9	17.6	22.8	7.2	1.8	10.9	5.8

Proportion of total patient days = (sum of length of stay of all the patients within a category) / (sum of length of stay of each patient admitted in the NICU for the year)

*only for sites with complete data

Presentation #56
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	380	488	718	1092	1600	2031	2189	5971	14469
Number of neonates who survived and were discharged home directly from the NICU	**N**	**141**	**192**	**268**	**418**	**605**	**988**	**1128**	**3501**	**7241**
Oxygen	N	52	43	24	26	25	42	43	111	366
	%	36.9	22.4	9.0	6.2	4.1	4.3	3.8	3.2	5.1
Monitor	N	18	21	16	25	21	50	45	200	396
	%	12.8	10.9	6.0	6.0	3.5	5.1	4.0	5.7	5.5
Enterostomy	N	0	2	0	0	1	2	1	5	11
	%	0.0	1.0	0.0	0.0	0.2	0.2	0.1	0.1	0.2
Gavage	N	22	20	22	22	21	21	15	70	213
	%	15.6	10.4	8.2	5.3	3.5	2.1	1.3	2.0	2.9
Tracheostomy	N	1	2	1	1	0	1	0	3	9
	%	0.7	1.0	0.4	0.2	0.0	0.1	0.0	0.1	0.1
Gastrostomy	N	7	5	3	7	6	1	7	13	49
	%	5.0	2.6	1.1	1.7	1.0	0.1	0.6	0.4	0.7
Ventilation	N	1	2	1	1	0	0	1	6	12
	%	0.7	1.0	0.4	0.2	0.0	0.0	0.1	0.2	0.2
CPAP	N	3	2	0	0	2	1	0	6	14
	%	2.1	1.0	0.0	0.0	0.3	0.1	0.0	0.2	0.2
Feeding status at discharge directly home										
Mother's own milk only	N	49	76	99	155	242	369	350	1128	2468
	%	34.8	39.6	36.9	37.1	40.0	37.4	31.0	32.2	34.1
Formula only	N	53	73	101	131	175	258	287	769	1847
	%	37.6	38.0	37.7	31.3	28.9	26.1	25.4	22.0	25.5
Mother's own milk and formula	N	37	41	67	127	181	344	464	1469	2730
	%	26.2	21.4	25.0	30.4	29.9	34.8	41.1	42.0	37.7

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

G. Hypoxic Ischemic Encephalopathy

Presentation #57
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**	53	296	88	53	485
	No	34	37	33	34	165
	Unknown	3	2	0	3	6
	Total	**90**	**335**	**121**	**90**	**656**

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

Reason	Number
Chromosomal anomalies	1
Major congenital anomalies	3
Weight < 2000g or GA < 35 weeks	40
Extreme condition	15
Head trauma or intracranial hemorrhage	4
Mild HIE	64
Unit policy	11
Health care team preference	4
Delayed transfer	8
Parental request	0
Unknown	36

*One neonate can have more than one reasons.

C. **Time of admission**

Time	Number
<6 hours from birth	440
6 – 12 hours from birth	164
>12 hours from birth	50
Total**	654

**2 neonate were missing either time of birth or time of admission.

Presentation #57 (continued)
Hypoxic Ischemic Encephalopathy

D. Characteristics of neonates who received hypothermia (N=485)

Characteristics	N		Results
Target temperature	485	$< 33^0$C	3 (1%)
		33-34^{0}C	303 (62%)
		33.5-34.5^{0}C	74 (15%)
		34-35^{0}C	2 (0%)
		34.5-35.5^{0}C	0 (0%)
		Unknown	103 (21%)
Seizures at initiation	485		122 (25%)
Seizures at completion	485		0 (0%)
GA < 33 weeks	485		0 (0%)
Birthweight < 2000g	485		7 (1%)
During hypothermia	473	Hypotension	147 (31%)
	464	Thrombocytopenia	79 (17%)
	467	Coagulopathy	144 (31%)
	460	Persistent metabolic acidosis	83 (18%)
Death	485		47 (10%)
Discharge on palliation	485		4 (1%)

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	10	2	1	5	37	55
	Stage 2	56	104	6	23	97	286
	Stage 3	2	17	51	16	5	91
	Unknown	0	1	0	36	16	53
	Total	68	124	58	80	155	485

*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 #57 (continued)

F. Outcomes of infants with hypoxic ischemic encephalopathy that received therapeutic hypothermia stratified per stage of encephalopathy at time of initiation of therapeutic hypothermia and combined

	Stage 1	Stage 2	Stage 3	Stage unknown	Total
Number of infants	55	286	91	53	485
Mortality, %	N/A	4 (1%)	42 (46%)	1 (2%)	47 (10%)
Brain injury[a], %	12 (25%)	68 (26%)	45 (60%)	8 (16%)	133 (30%)
Mortality or brain injury[b], %	12 (25%)	72 (27%)	63 (71%)	9 (18%)	156 (34%)
Length of stay among survivors, days, median (IQR)	8 (6, 11)	9 (7, 13)	15 (10, 25)	9.5 (8, 13.5)	9 (7, 14)
Length of stay among infants who died, days, median (IQR)	N/A	5 (3.5, 8)	6.5 (3, 10)	4 (4, 4)	6 (3, 10)
Gavage feeds at NICU discharge or transfer among survivors, %*	6 (11%)	33 (12%)	17 (19%)	9 (17%)	65 (13%)

Brain injury defined as any of the following abnormalities on neonatal MRI: basal ganglia/thalamic injury and/or watershed/white matter injury, and diffusion changes

[a] Brain injury rate is calculated among infants with magnetic resonance imaging results
[b] Mortality or Brain injury rate is calculated among infants who died and/or had magnetic resonance imaging results

Presentation #57 (continued)
Hypoxic Ischemic Encephalopathy
For neonates* who received hypothermia (N=485)

G. Timing of Hypothermia and Temperature ranges during Hypothermia

Characteristics		N	Mean (h)	SD (h)	Min (h)	1st Q (h)	Median (h)	3rd Q (h)	Max (h)	Outside of recommendation
Timing of hypothermia (in hours)	**Age at Initiation**	476	4.9	3.3	0.2	2.8	4.6	6.1	35.5	After 6 hours 128 (27%)
	Age at re-warming	481	72.8	15.8	2.3	74.7	76.3	78.2	115.3	After 78 hours 134 (28%)
Temperature during hypothermia	**Lowest temp during hypothermia**	379	32.7	0.8	28.5	32.4	32.9	33.2	37.7	Lowest temp < 32.5C 105 (28%)
	Highest temp during hypothermia	379	34.1	0.7	31.0	33.8	33.9	34.2	37.0	Highest temp > 35.5C 16 (4%)

*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 12 years

This section includes trend analyses of specific outcomes from the last 12 years (2012-23) 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	
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
2021	33	32	99	214	254	298	331	448	514	577	761	941	4469
2022	33	30	126	195	254	261	351	432	529	589	642	912	4321
2023	33	38	107	235	219	269	323	395	507	585	690	910	4278

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	
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
2021	33	43	479	673	831	933	2959
2022	33	58	479	649	793	942	2921
2023	33	55	490	635	816	883	2879

1. Neonates in the participating sites: Admission status:

Year	Number of Sites	Total Number of Neonates*	Inborn (%)	Outborn (%)	Number of Neonates* with GA<33	Inborn (%)	Outborn (%)
			All neonates		**Infants with GA<33 weeks**		
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%)
2021	33	14 651	11 419 (77.9%)	3 232 (22.1%)	4 469	3 826 (85.6%)	643 (14.4%)
2022	33	14 494	11 345 (78.3%)	3 149 (21.7%)	4 321	3 722 (86.1%)	599 (13.9%)
2023	33	14 469	11 363 (78.5%)	3 106 (21.5%)	4 278	3 686 (86.2%)	592 (13.8%)

*total number of neonates excluding those who are missing admission status
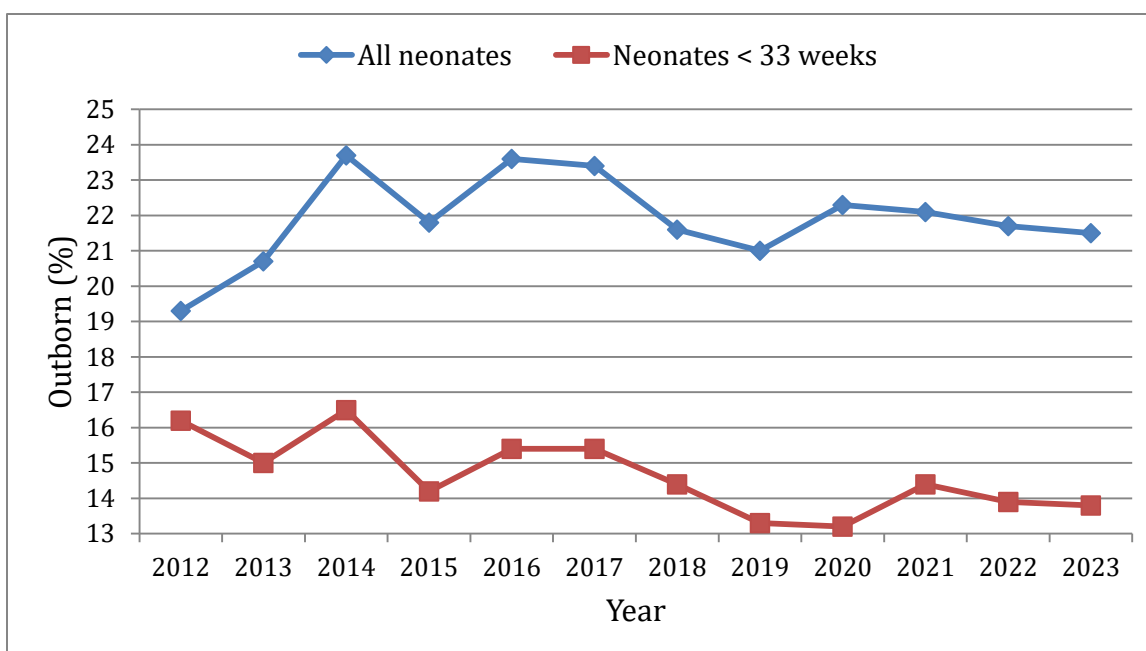
2. Multiple births
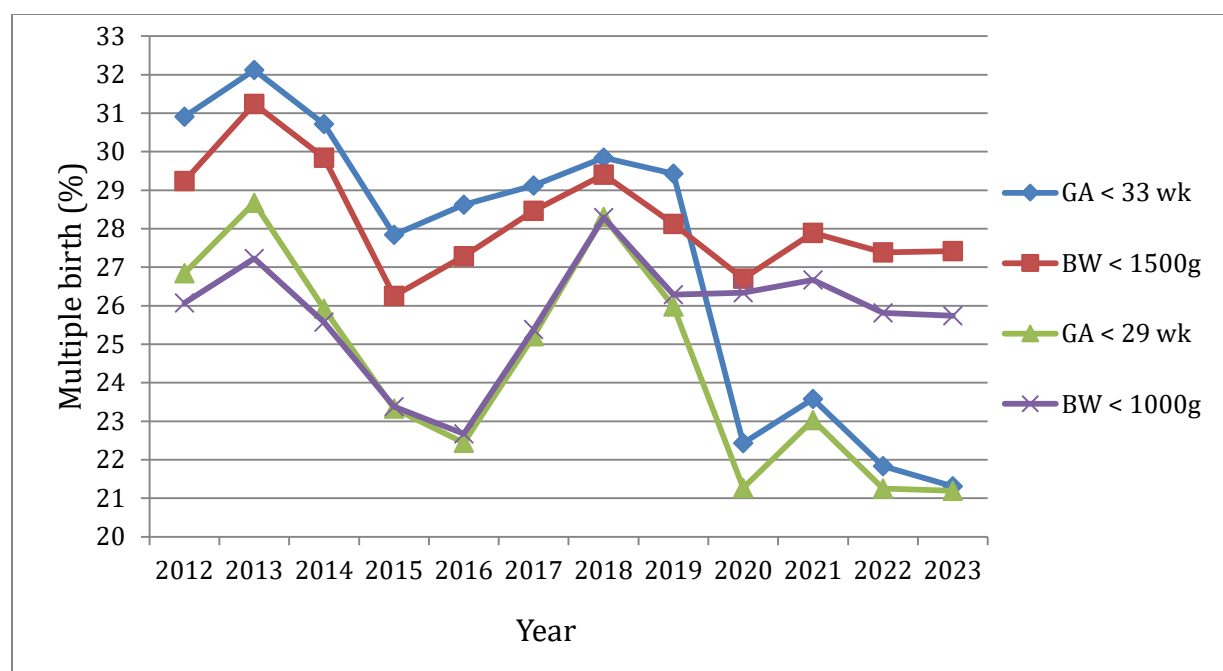
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
GA < 29 weeks	Total	1671	1569	1667	1674	1780	1717	1556	1675	1649	1586
	Multiple	441	366	374	422	504	446	349	395	360	338
		(26%)	(23%)	(22%)	(25%)	(28%)	(26%)	(22%)	(24%)	(22%)	(21%)
	Twin	415	321	345	375	466	415	316	364	336	321
	Higher-Order	26	45	29	47	38	31	33	31	24	17
GA < 33 weeks	Total	4387	4030	4238	4358	4481	4445	4108	4468	4321	4278
	Multiple	1356	1122	1213	1269	1337	1308	1097	1246	1183	1173
		(31%)	(28%)	(29%)	(29%)	(30%)	(29%)	(27%)	(28%)	(27%)	(27%)
	Twin	1229	996	1094	1156	1202	1191	1000	1112	1079	1075
	Higher-Order	127	126	119	113	135	117	97	134	104	98
BW < 1000g	Total	1254	1126	1222	1194	1301	1217	1147	1194	1186	1180
	Multiple	329	264	277	303	368	320	244	275	252	250
		(26%)	(23%)	(23%)	(25%)	(28%)	(26%)	(21%)	(23%)	(21%)	(21%)
	Twin	306	236	260	269	338	295	218	249	232	233
	Higher-Order	23	28	17	34	30	25	26	26	20	17
BW < 1500g	Total	2980	2782	2867	2920	3085	2955	2756	2958	2921	2879
	Multiple	900	731	782	831	907	831	726	789	754	741
		(30%)	(26%)	(27%)	(28%)	(29%)	(28%)	(26%)	(27%)	(26%)	(26%)
	Twin	802	634	703	747	812	757	656	706	687	677
	Higher-Order	98	97	79	84	95	74	70	83	67	64

3a. Proportion of neonates who received active care out of all (including delivery room (DR) deaths)

Note: Refer to presentation #4 for detailed breakdown of neonates by GA in 2022.
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.
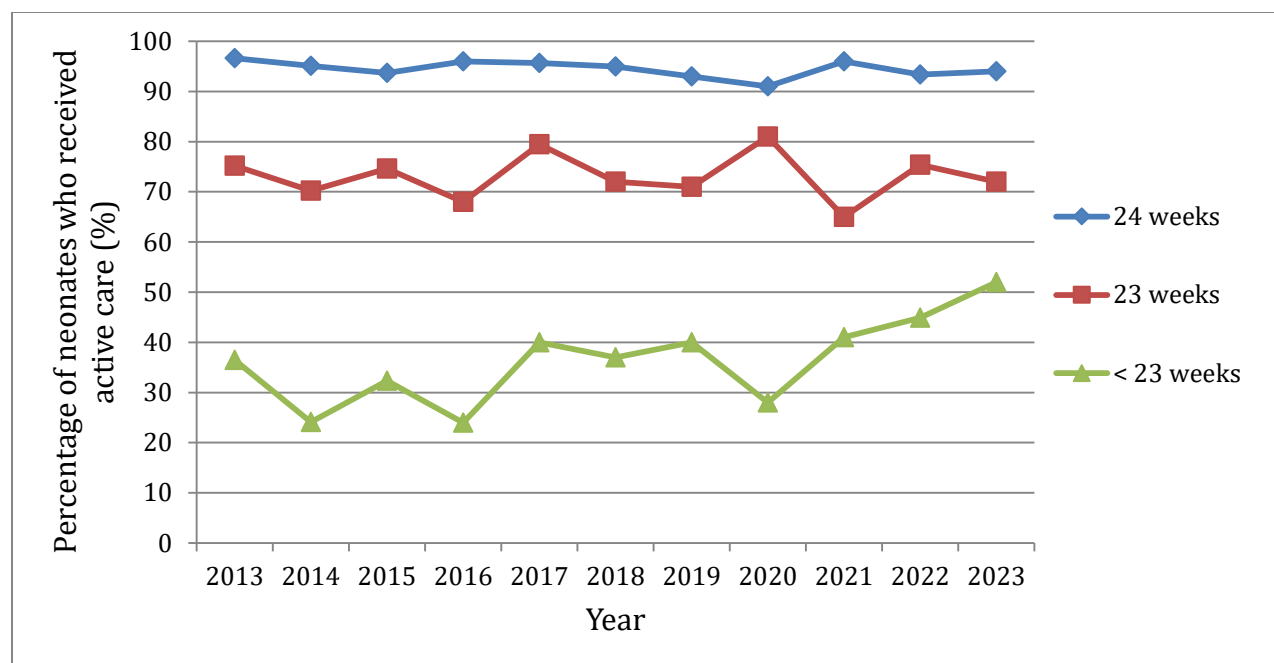
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
<23 weeks	Number of neonates who received active care *(a-c)* +*e*	14	22	16	26	35	35	18	37	35	46
	Total number of neonates including DR deaths *a+d+e*	58	68	67	65	95	88	64	91	78	89
	Percentage of neonates who received active care	24%	32%	24%	40%	37%	40%	28%	41%	45%	52%
23 weeks	Number of neonates who received active care *(a-c)* +*e*	92	106	82	136	133	127	131	101	129	116
	Total number of neonates including DR deaths *a+d+e*	131	142	121	171	185	178	162	155	171	161
	Percentage of neonates who received active care	70%	75%	68%	80%	72%	71%	81%	65%	75%	72%
24 weeks	Number of neonates who received active care *(a-c)* +*e*	233	178	217	221	224	224	199	216	197	235
	Total number of neonates including DR deaths *a+d+e*	245	190	227	231	235	240	218	226	211	249
	Percentage of neonates who received active care	95%	94%	96%	96%	95%	93%	91%	96%	93%	94%

3b. Trends in survival among neonates who received active care (including delivery room deaths)
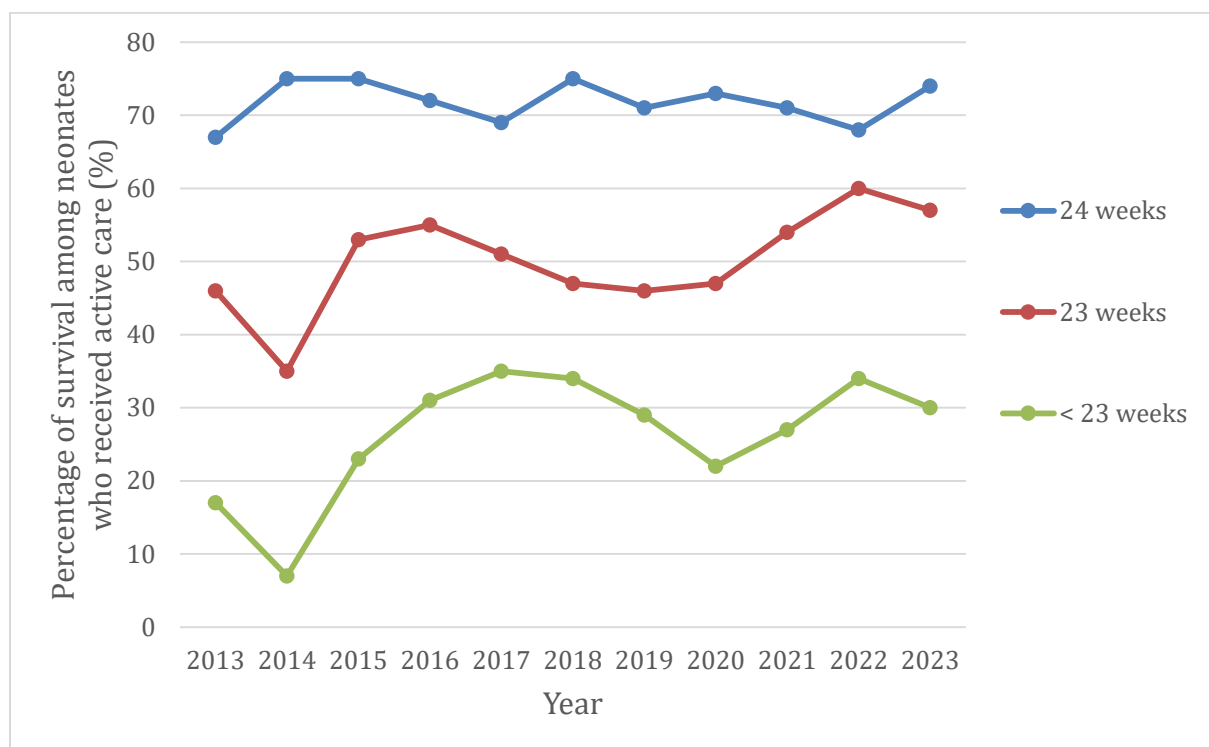
4. Survival rate among those who were admitted to NICU:

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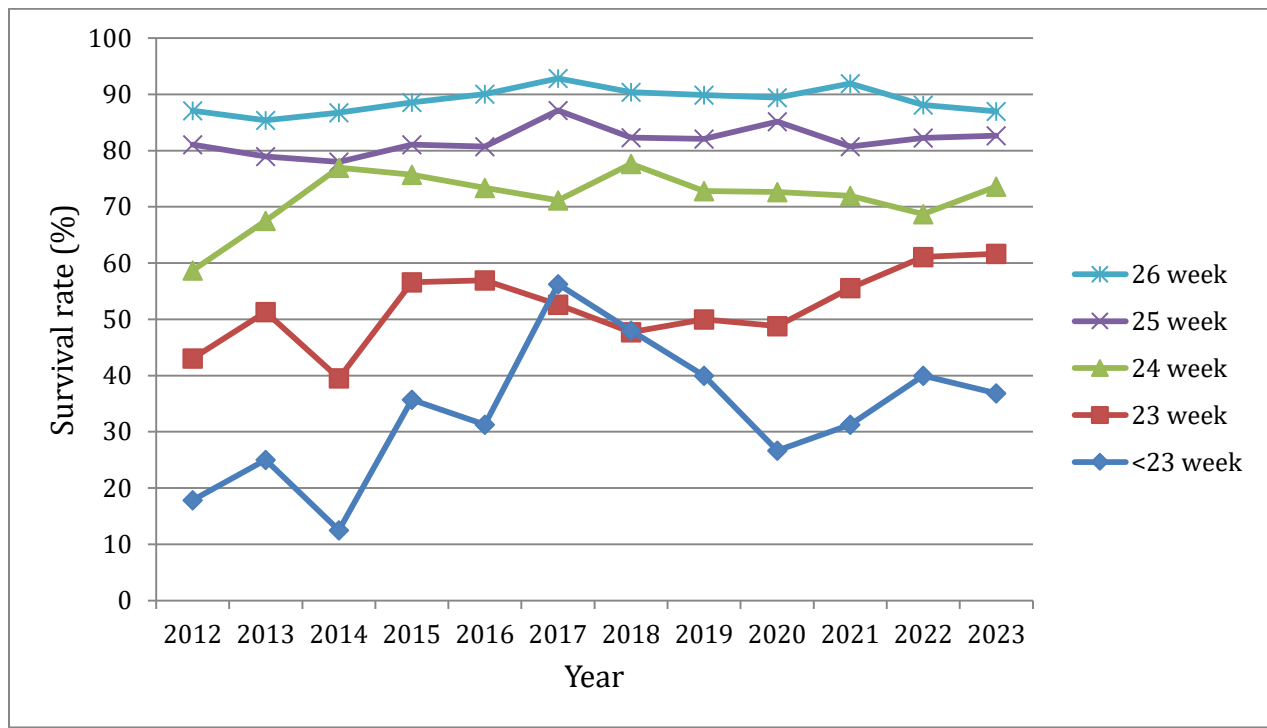
b. 27-32 weeks' GA:
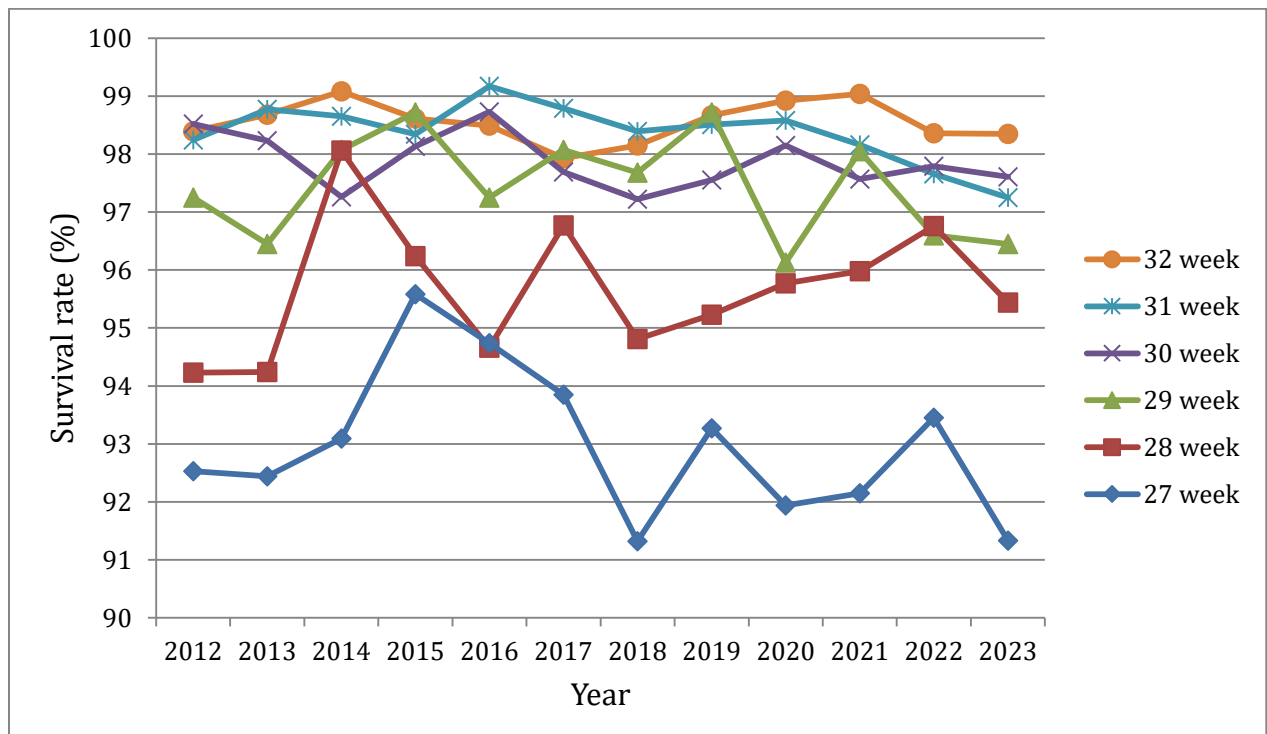
5. Late onset sepsis (with at least one infection) among neonates who survived beyond 2 days post birth

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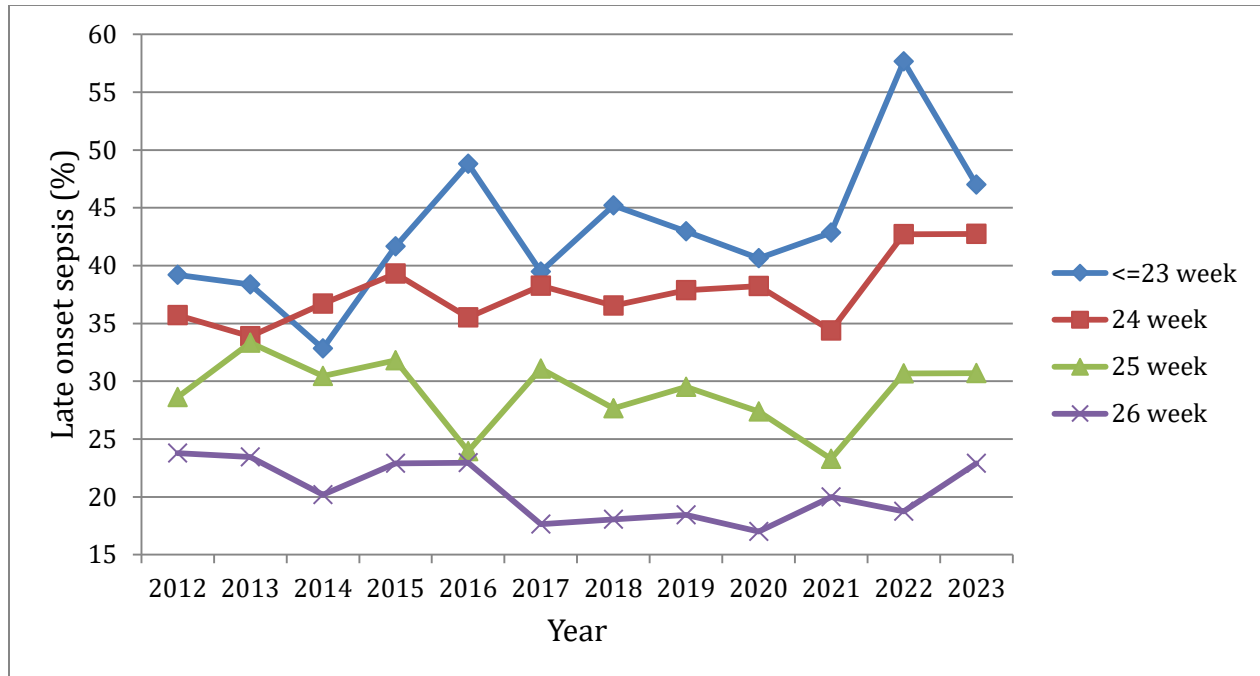
b. 27-32 weeks' GA:
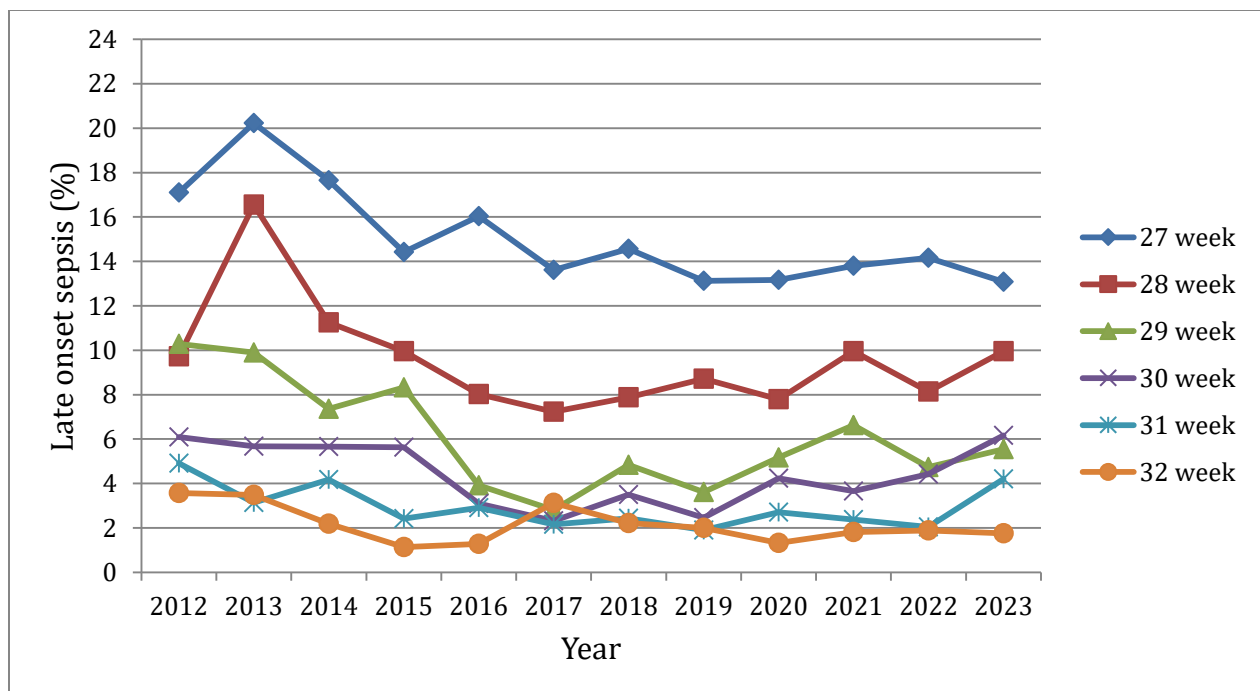
6. Surgical ligation or device closure of PDA among all neonates

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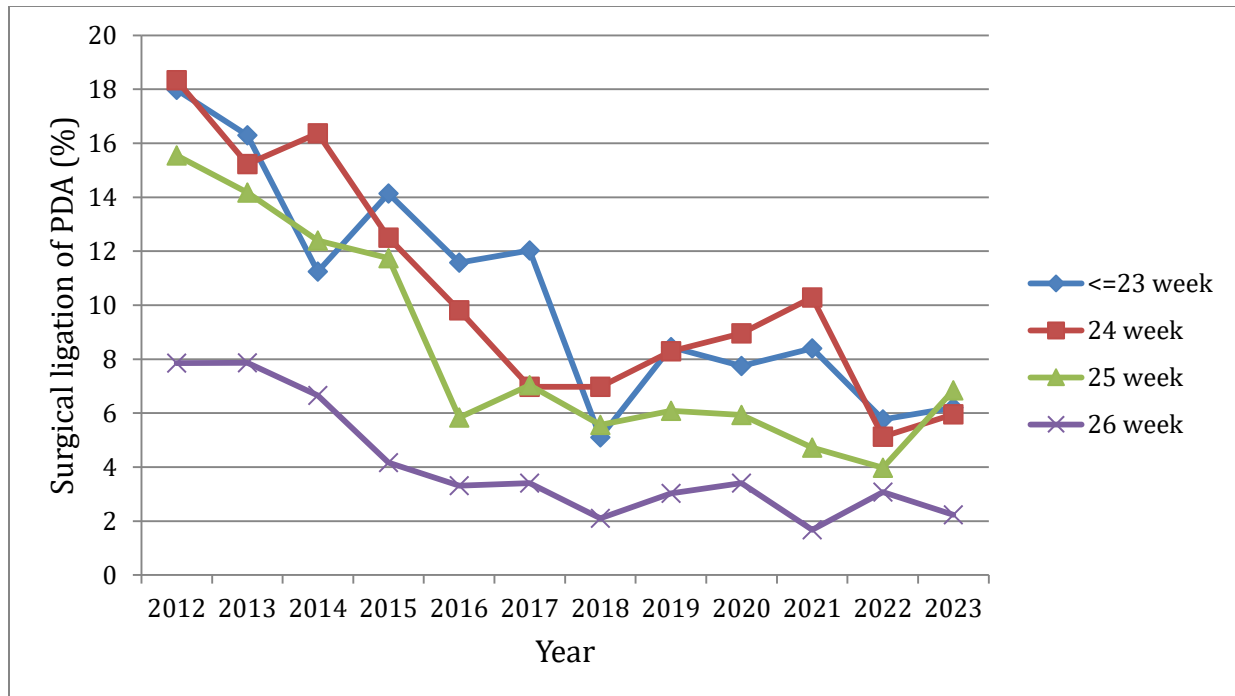
b. 27-32 weeks' GA:
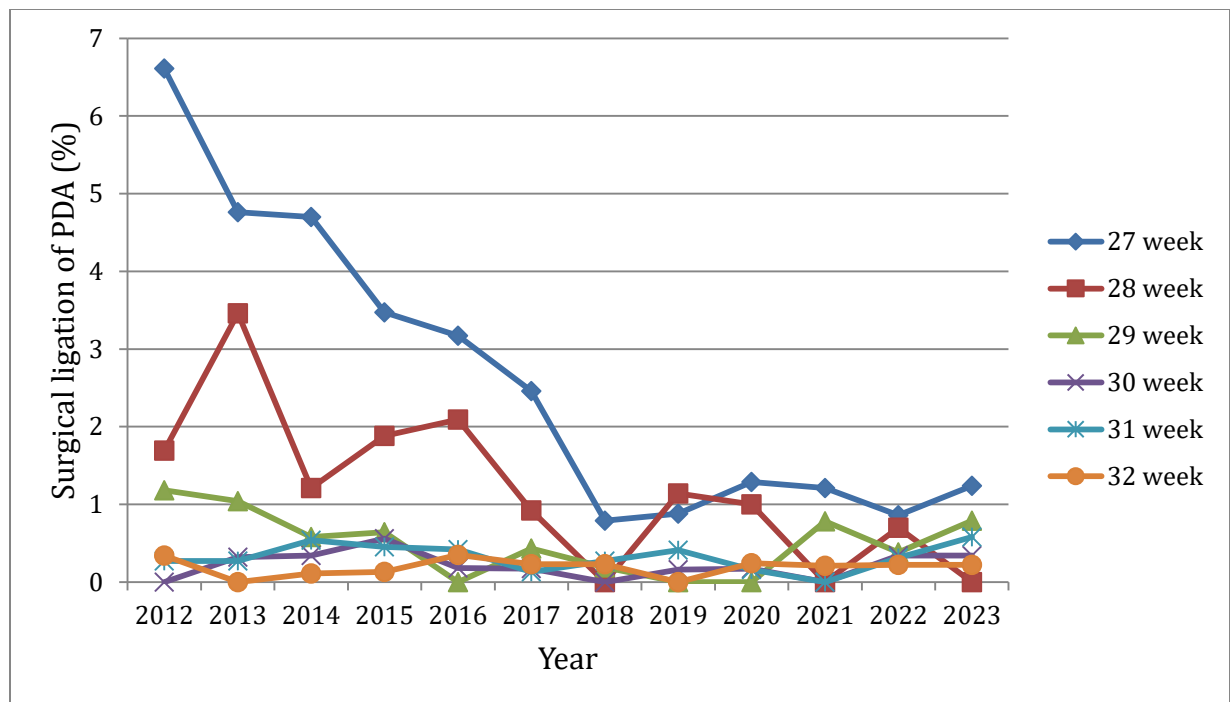
7. Ventricular enlargement (VE): (moderate and severe VE only; among neonates who received ultrasound exams)
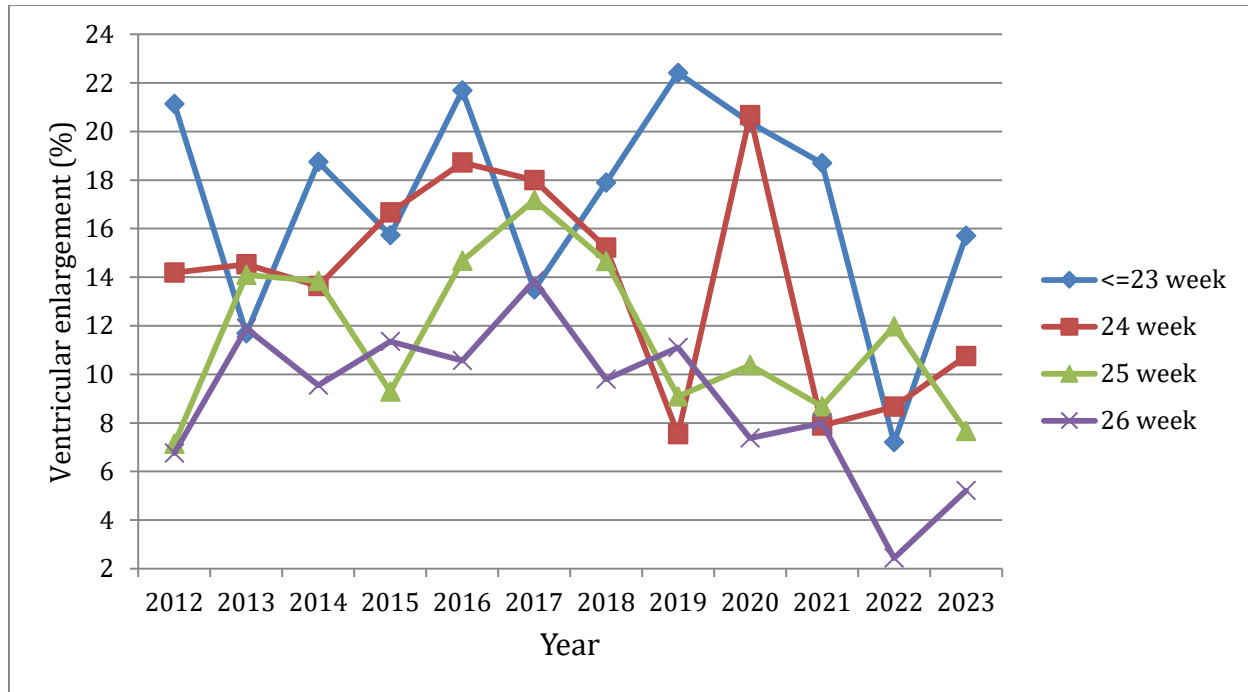
a. 23-26 weeks' GA:
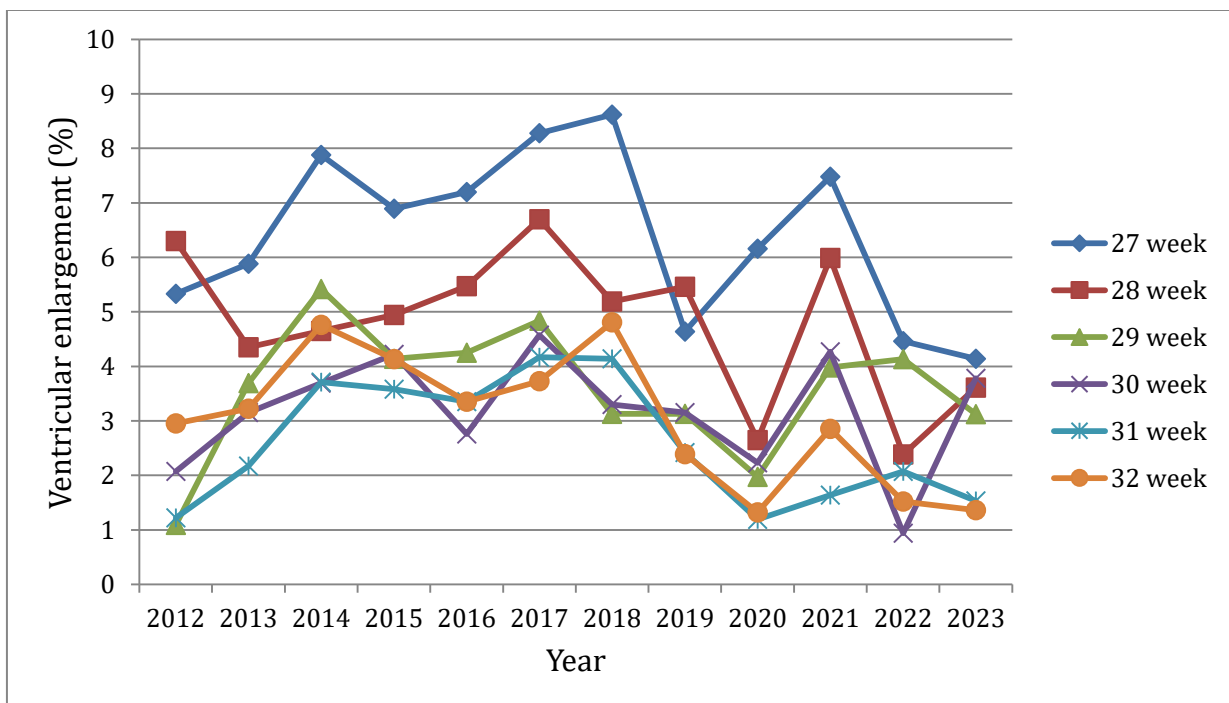
b. 27-32 weeks' GA:

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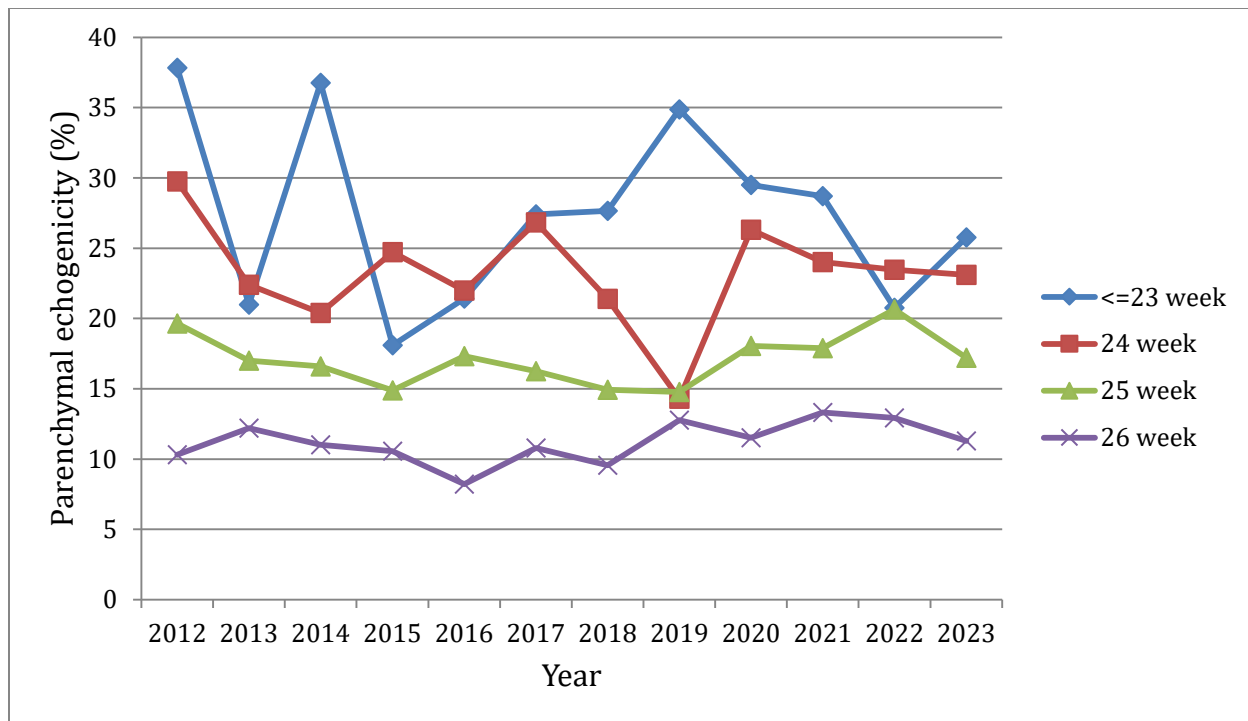
a. 23-26 weeks' GA:
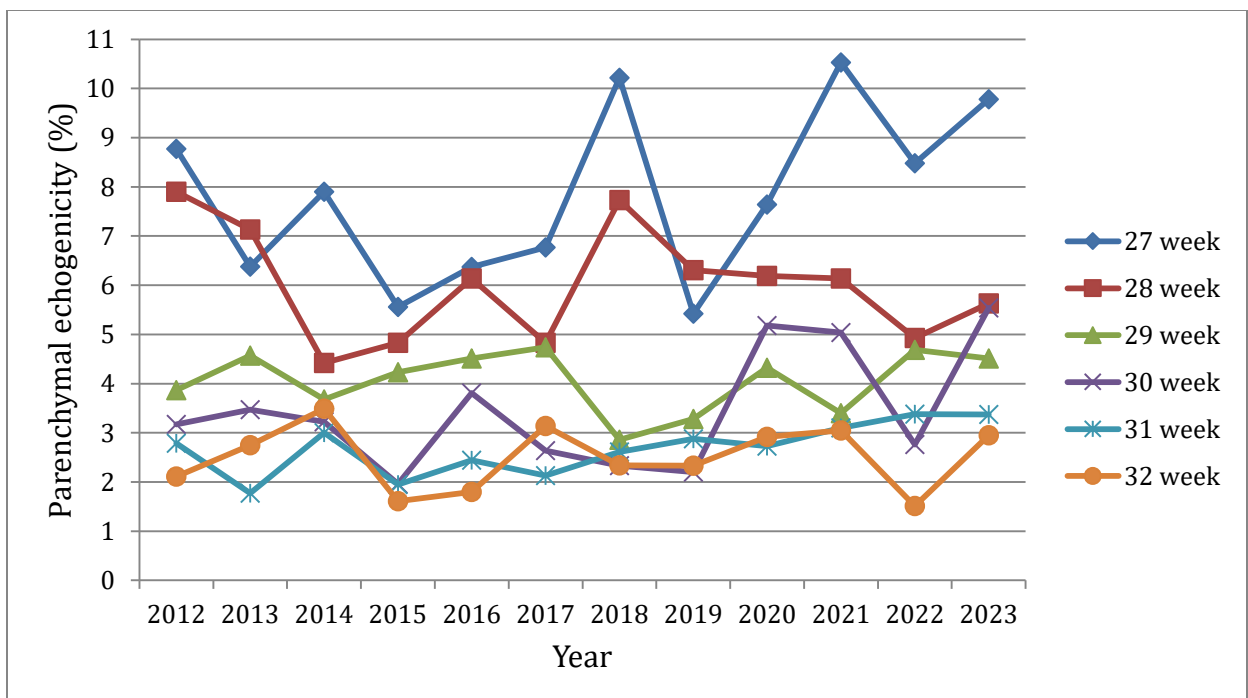
b. 27-32 weeks GA:

9. NEC:

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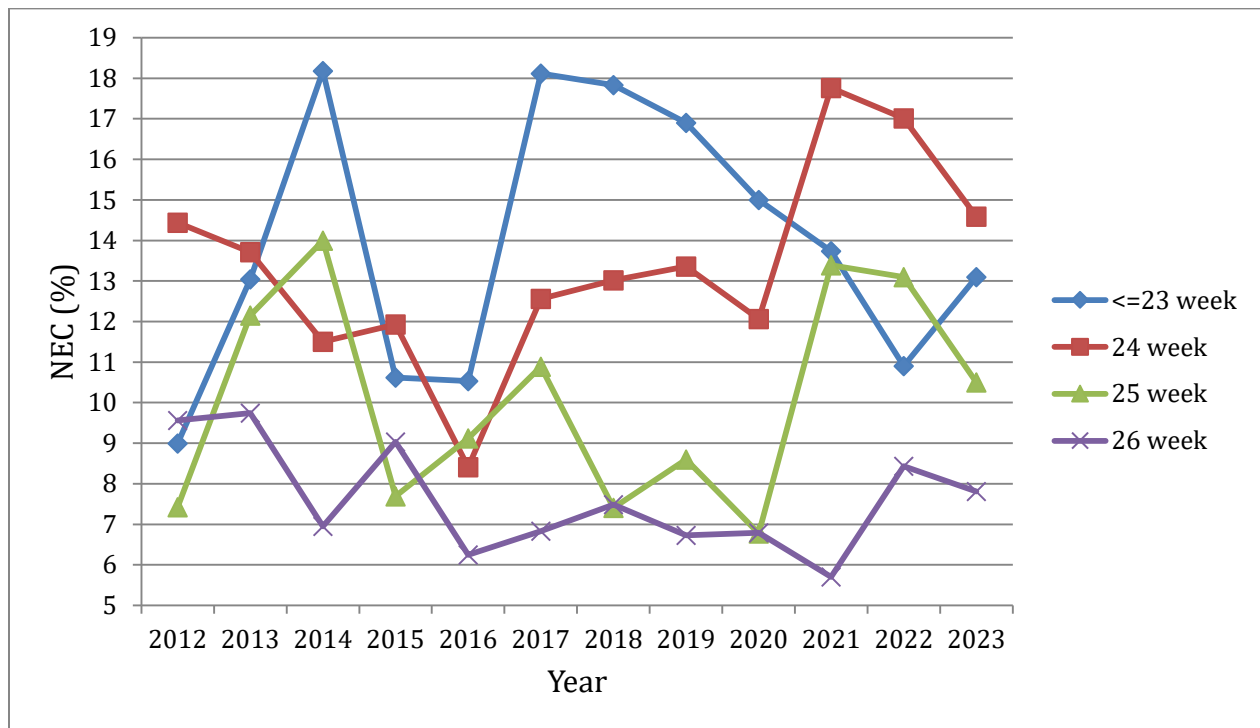
b. 27-32 weeks' GA:
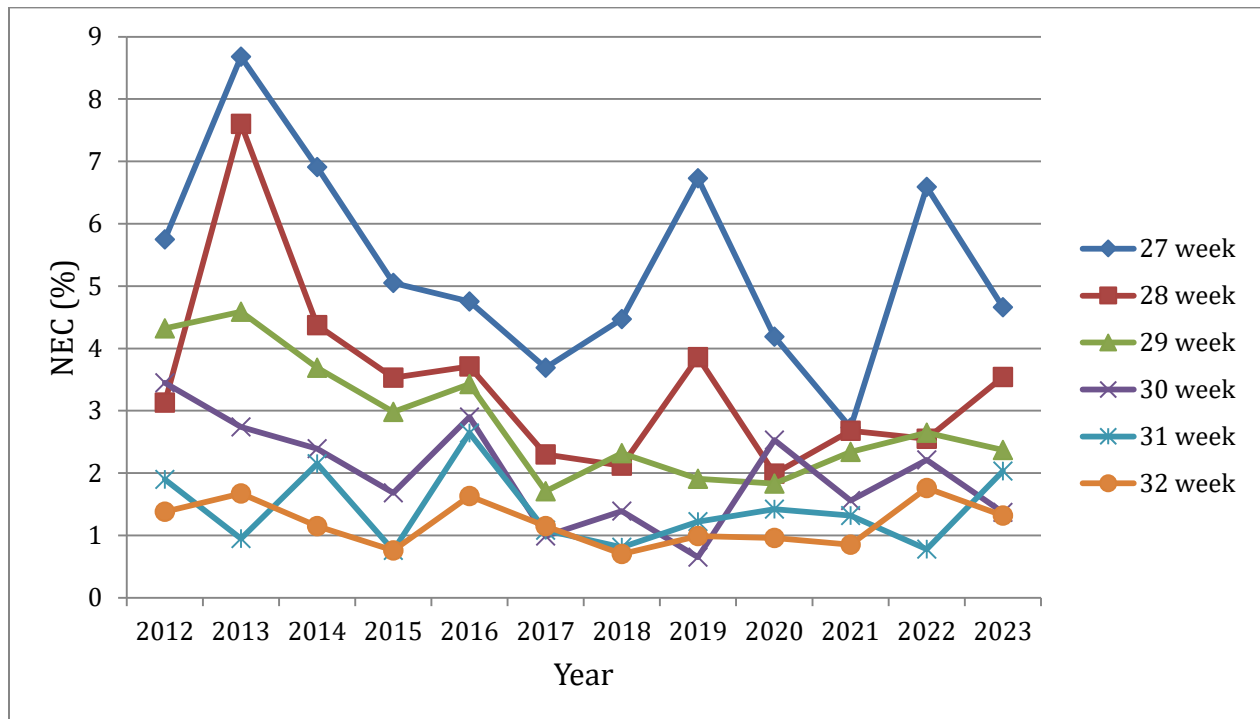
10. Severe ROP (≥ Stage 3 or ROP treatment) among neonates who received eye exams:
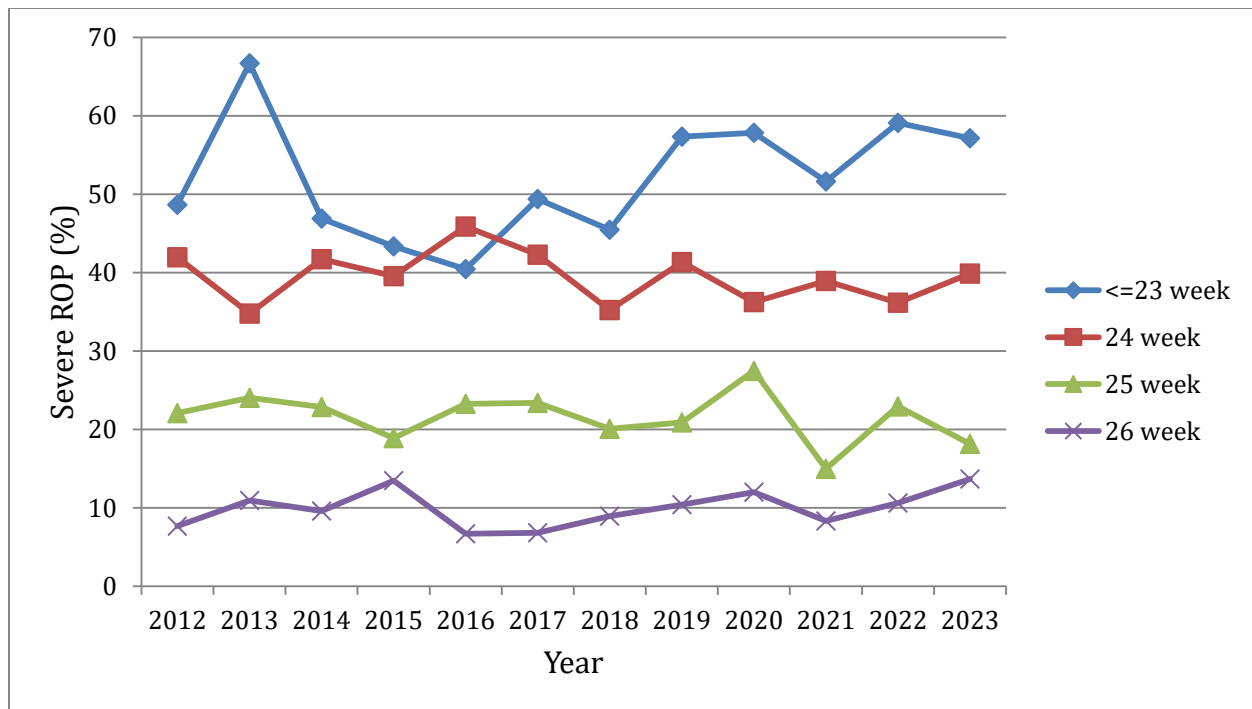
a. 23-26 weeks' GA:
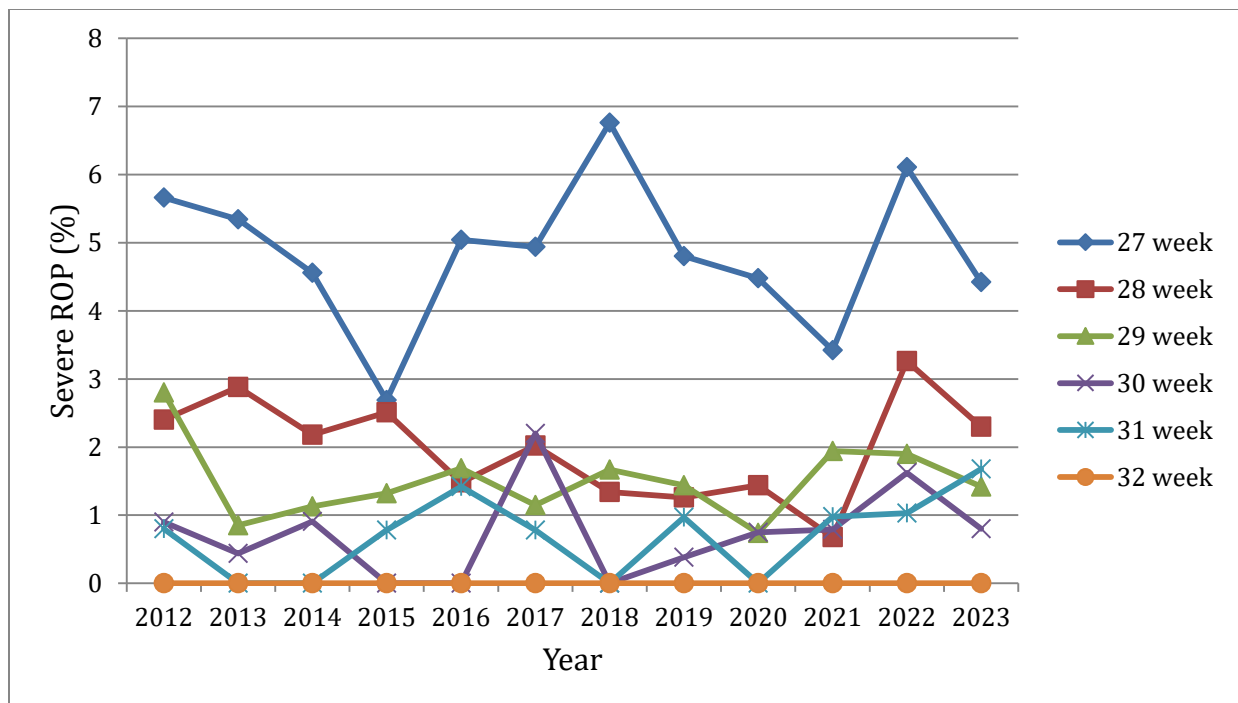
b. 27-32 weeks' GA:

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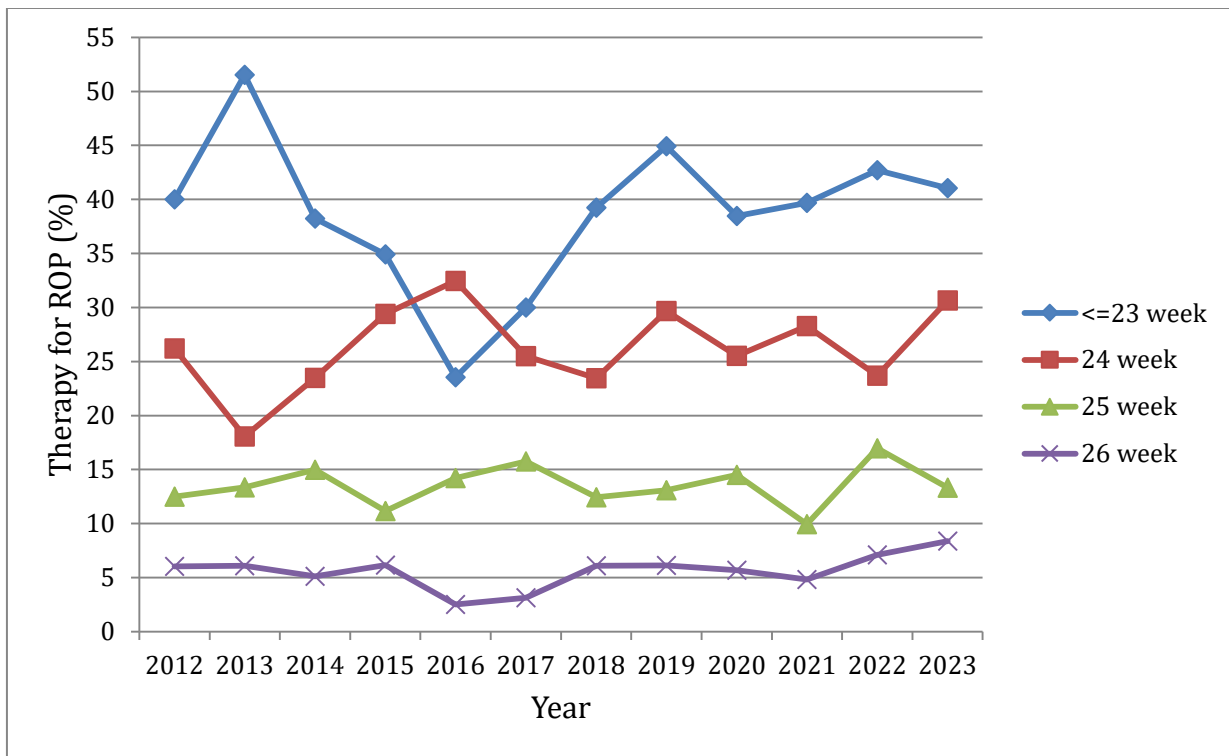
a. 23-26 weeks' GA:
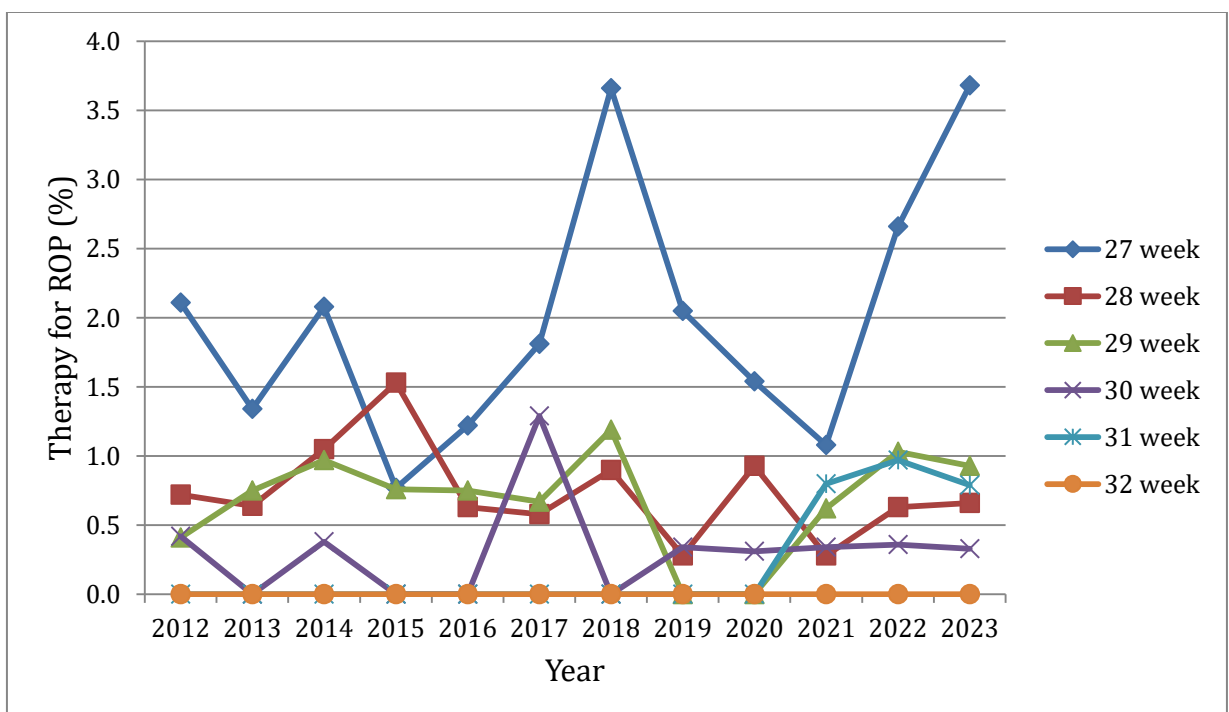
b. 27-32 weeks' GA:

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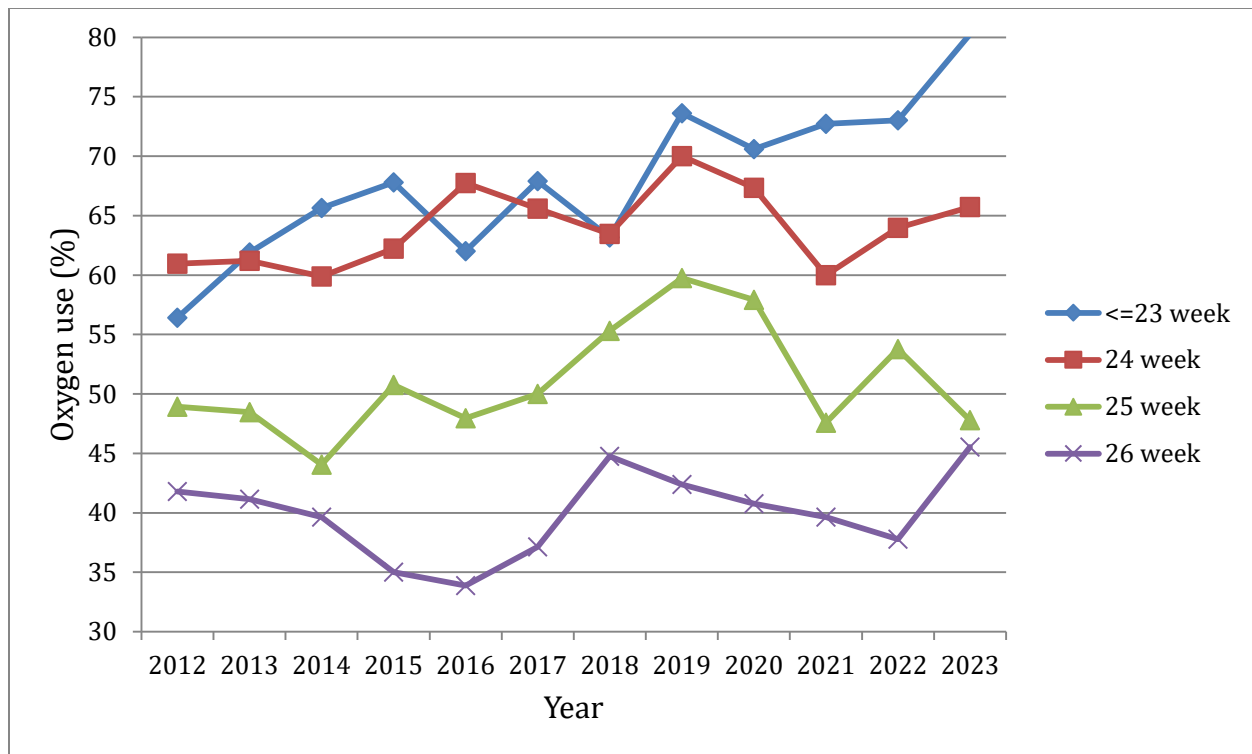
a. 23-26 weeks' GA:
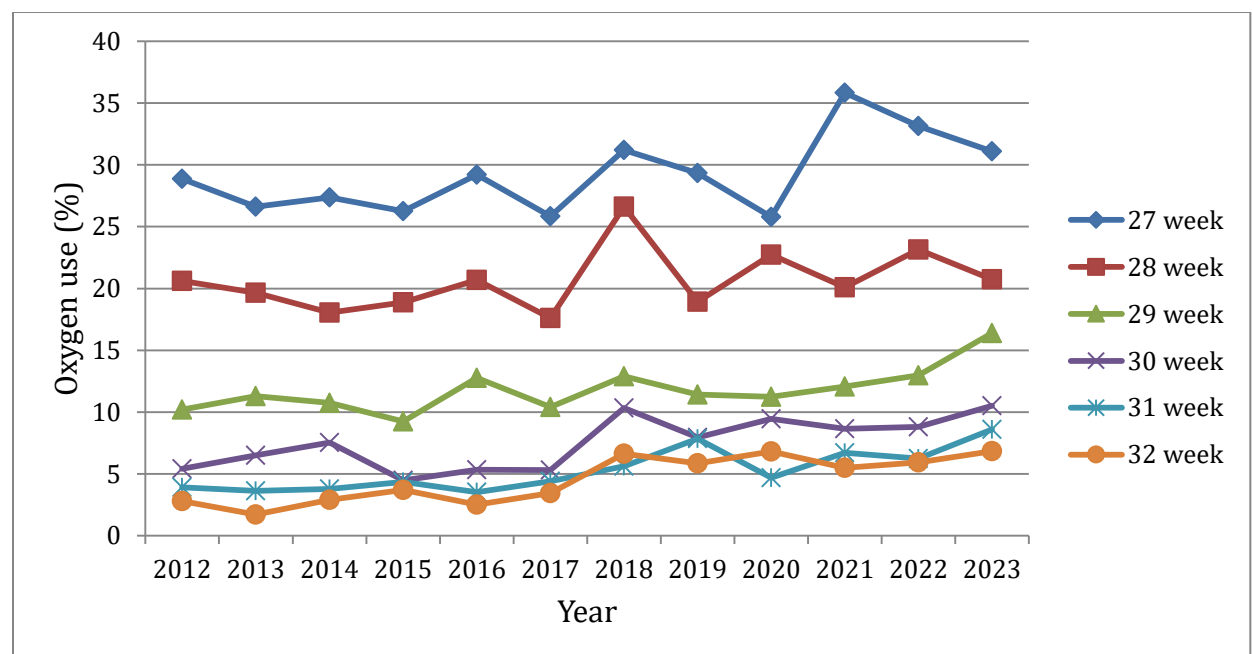
b. 27-32 weeks' GA:

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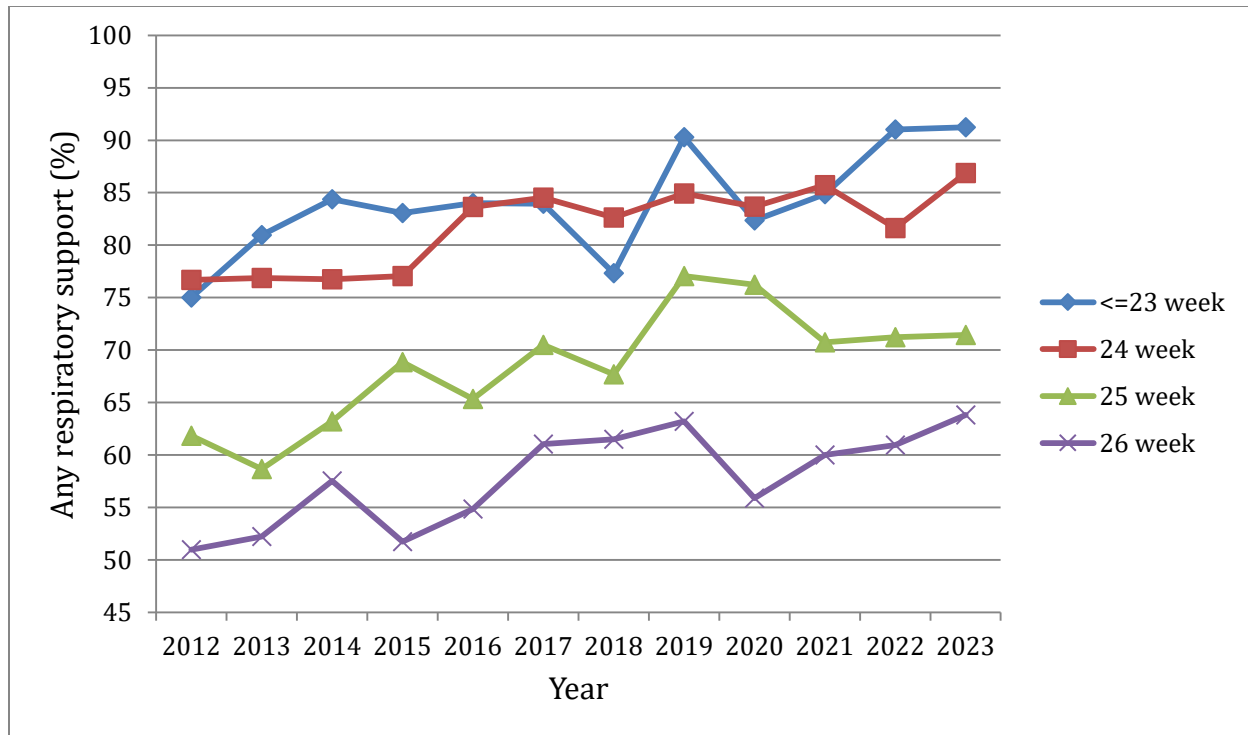
a. 23-26 weeks' GA:
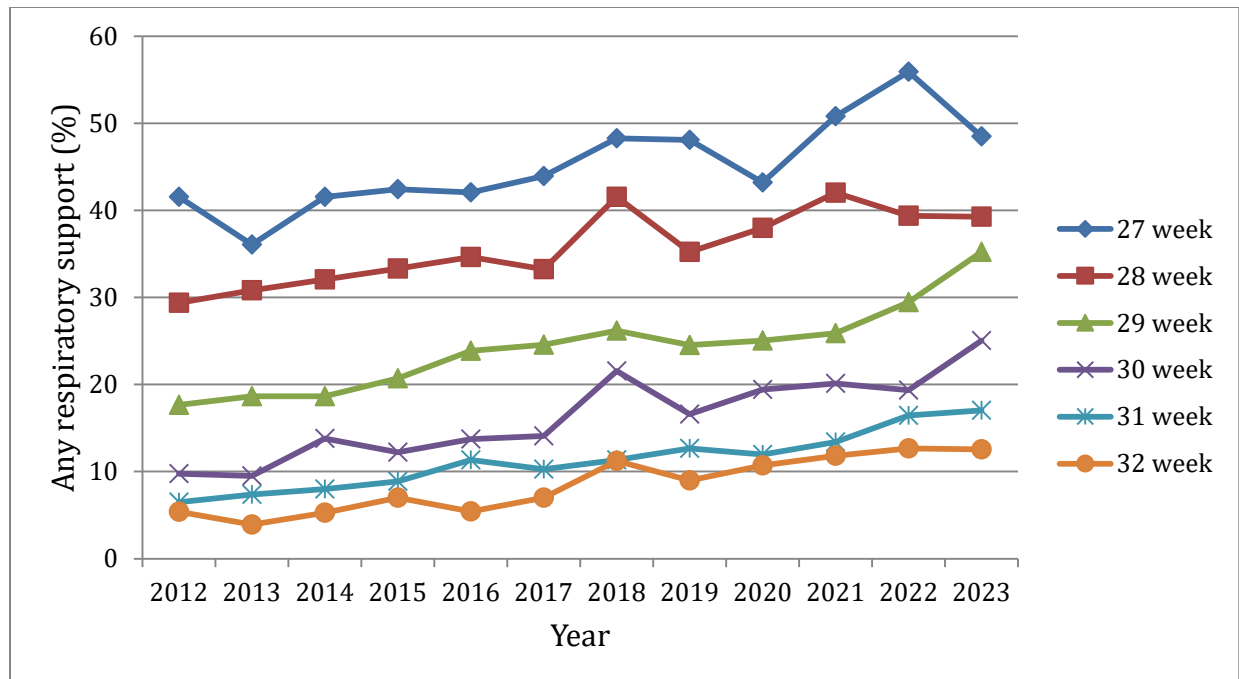
b. 27-32 weeks' GA:

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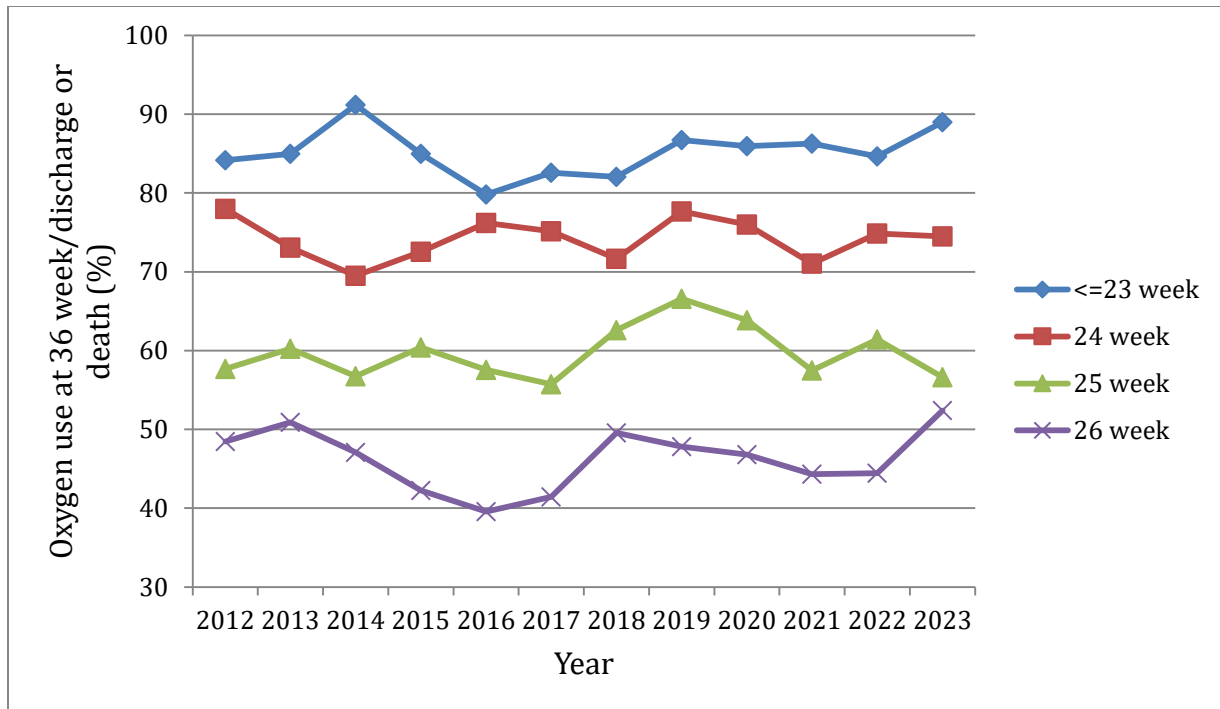
a. 23-26 weeks' GA:
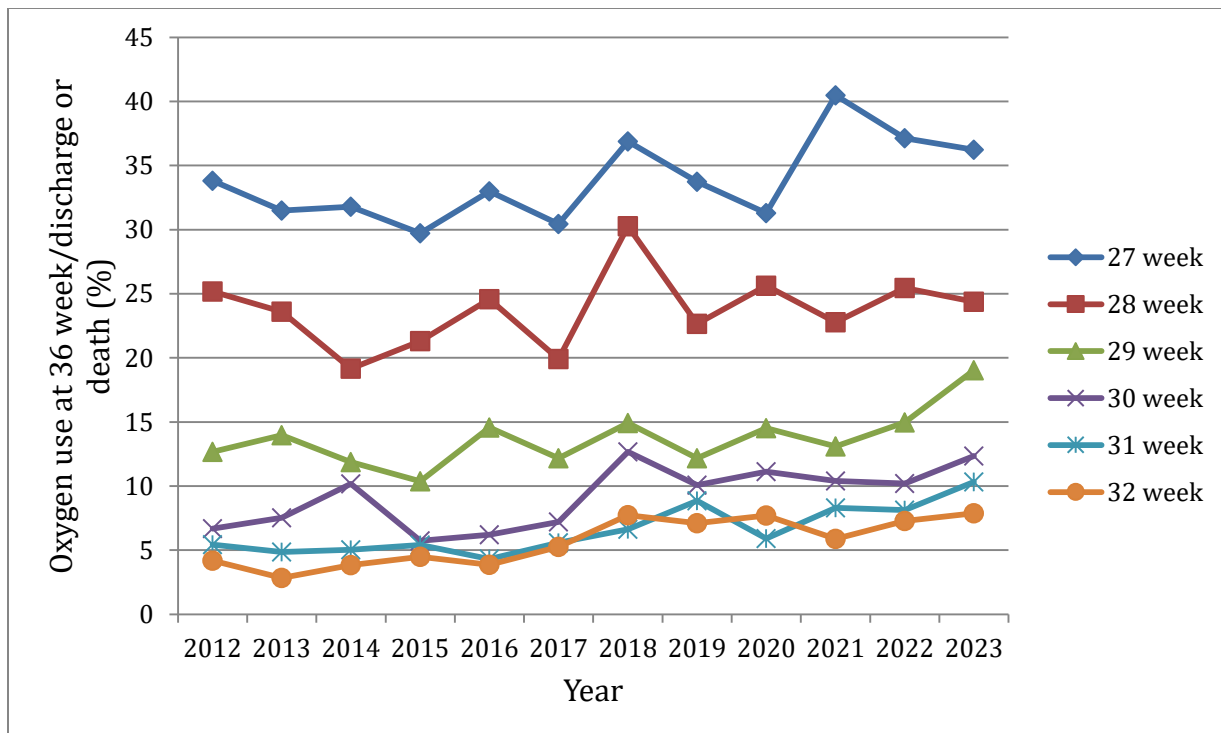
b. 27-32 weeks' GA:

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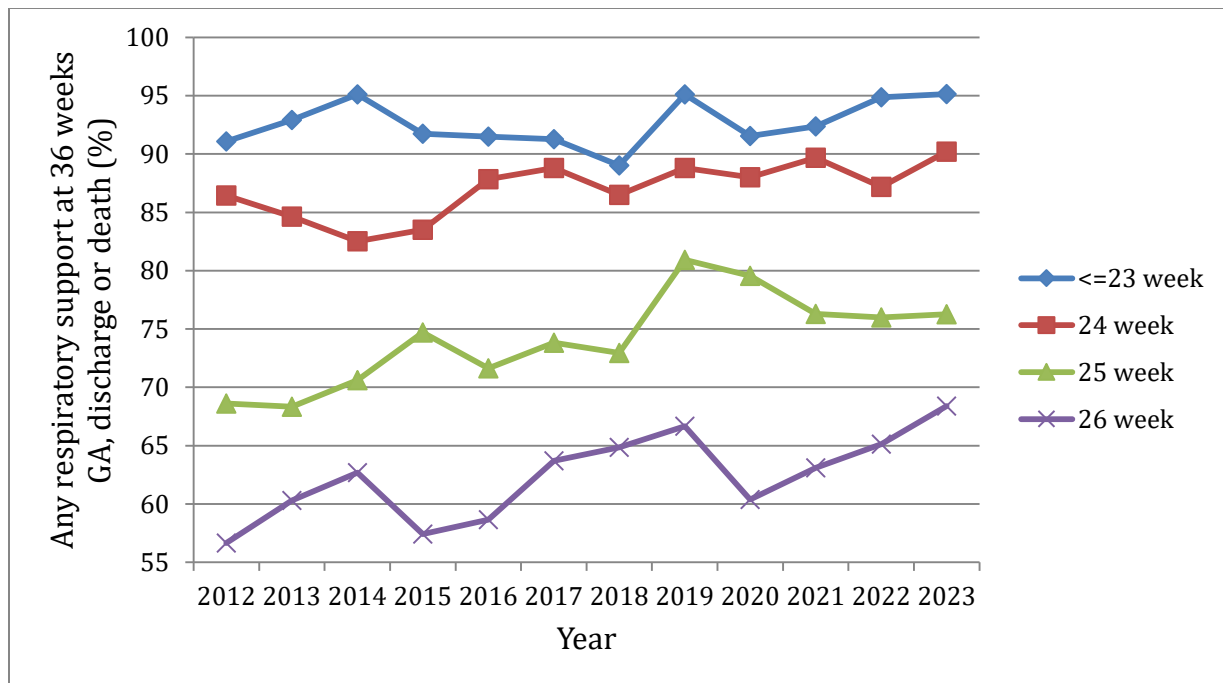
a. 23-26 weeks' GA:
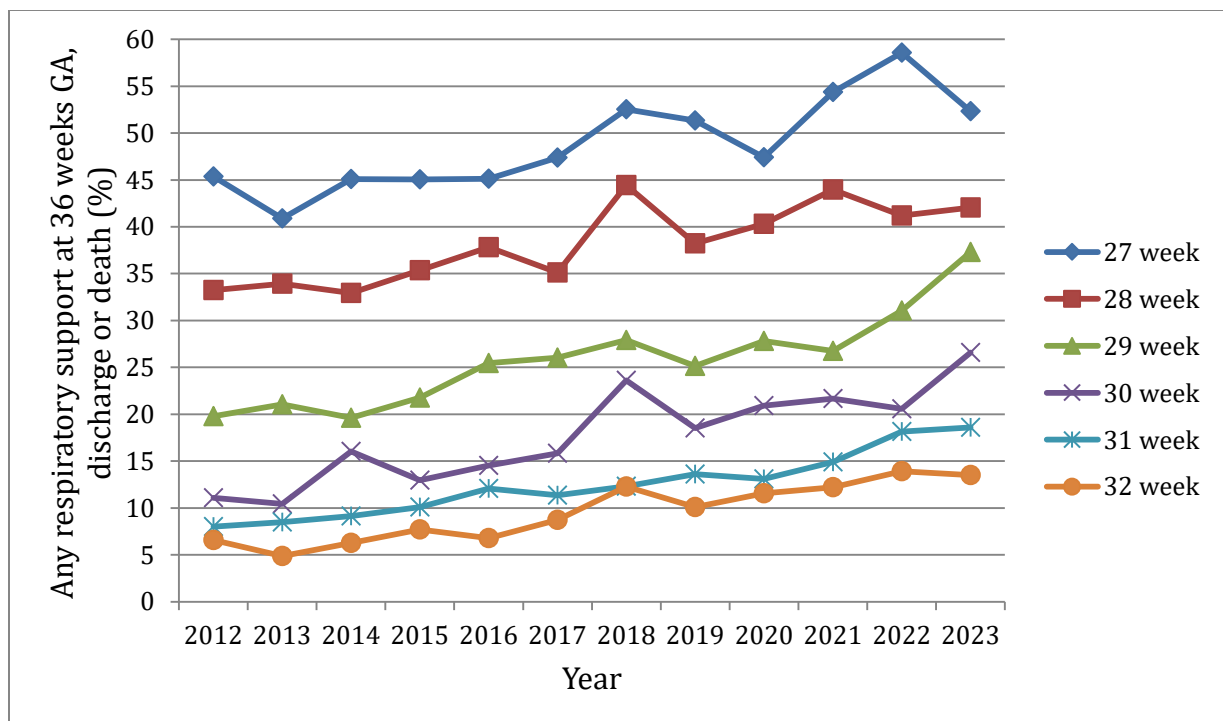
b. 27-32 weeks' GA:

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

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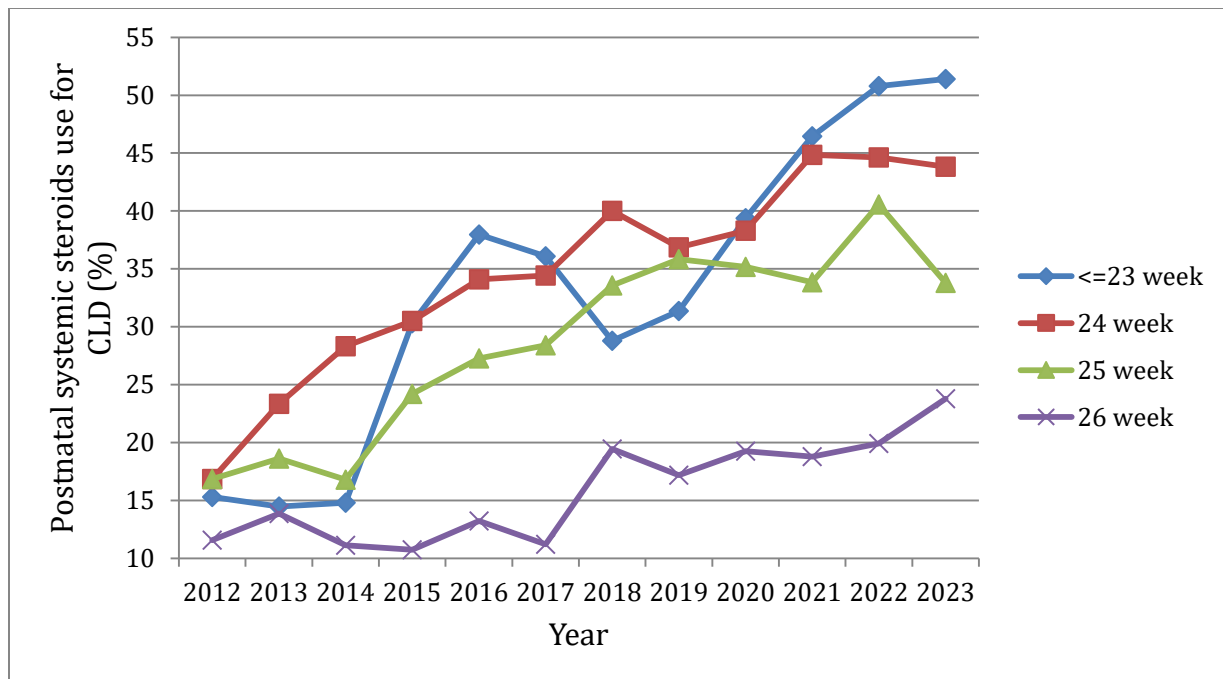
b. 27-32 weeks' GA:
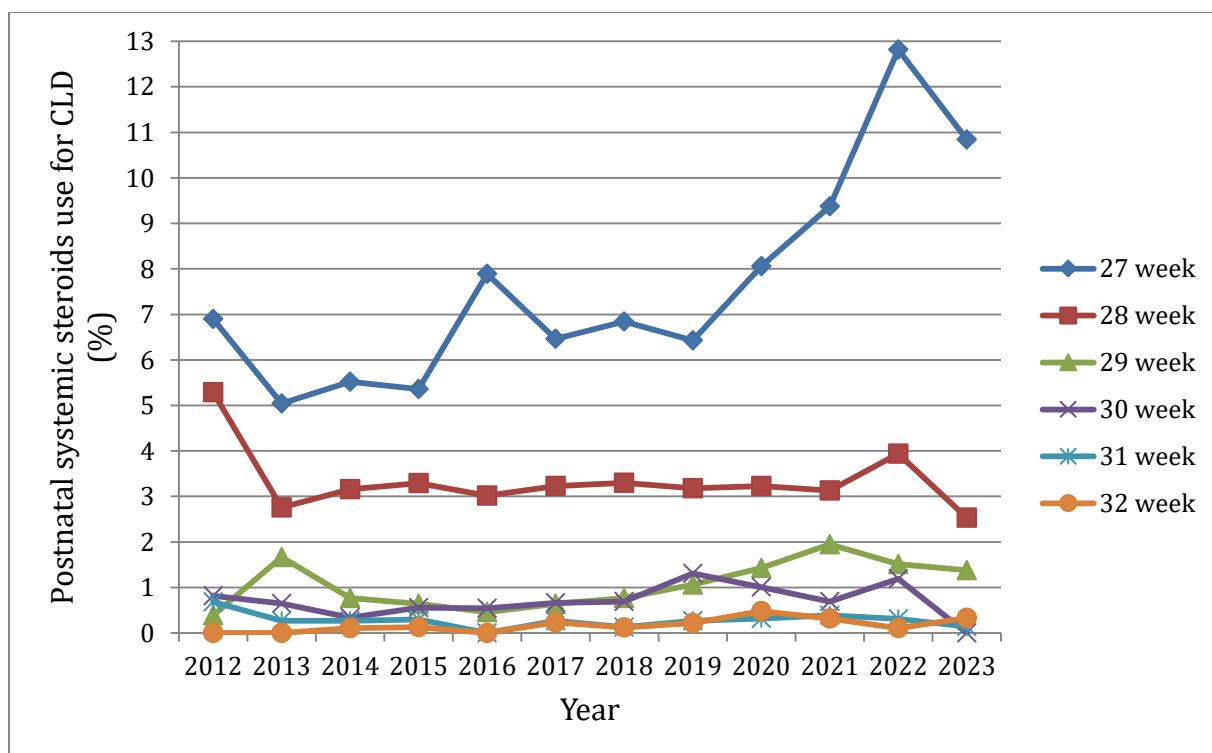
15. Mortality or major morbidity including CLD

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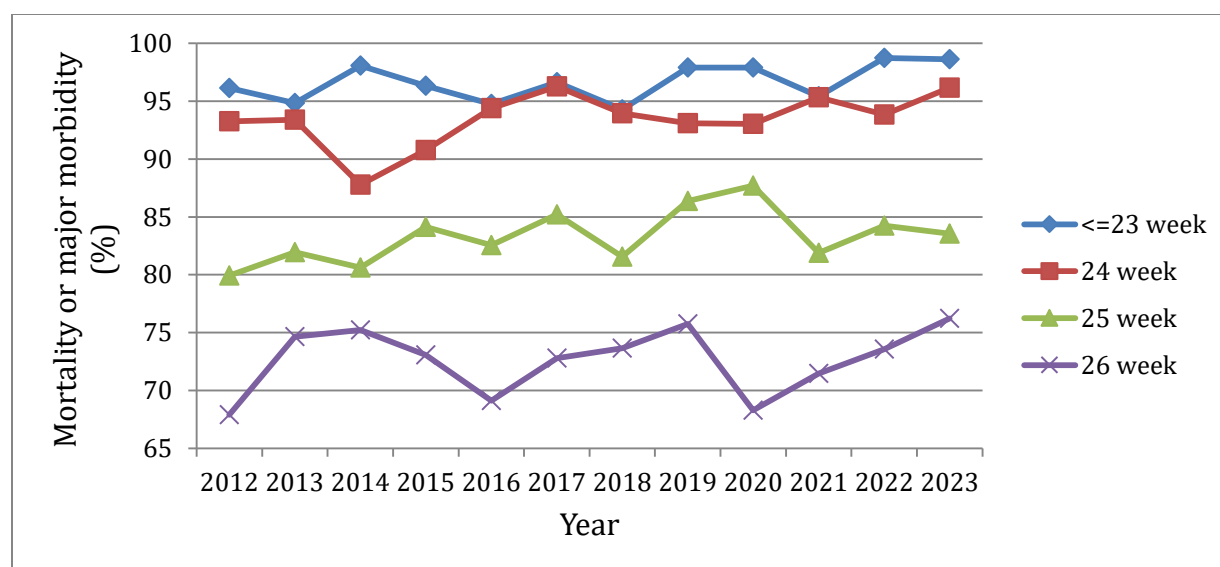
b. 27-32 weeks' GA:
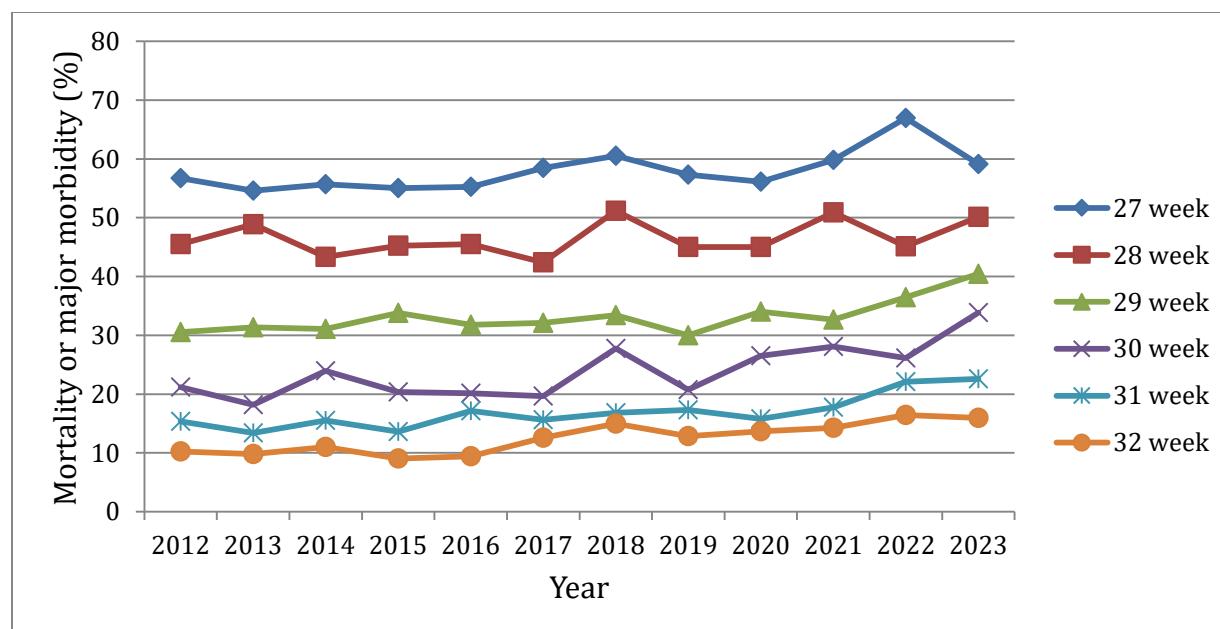
16. Mortality or major morbidity excluding CLD

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:
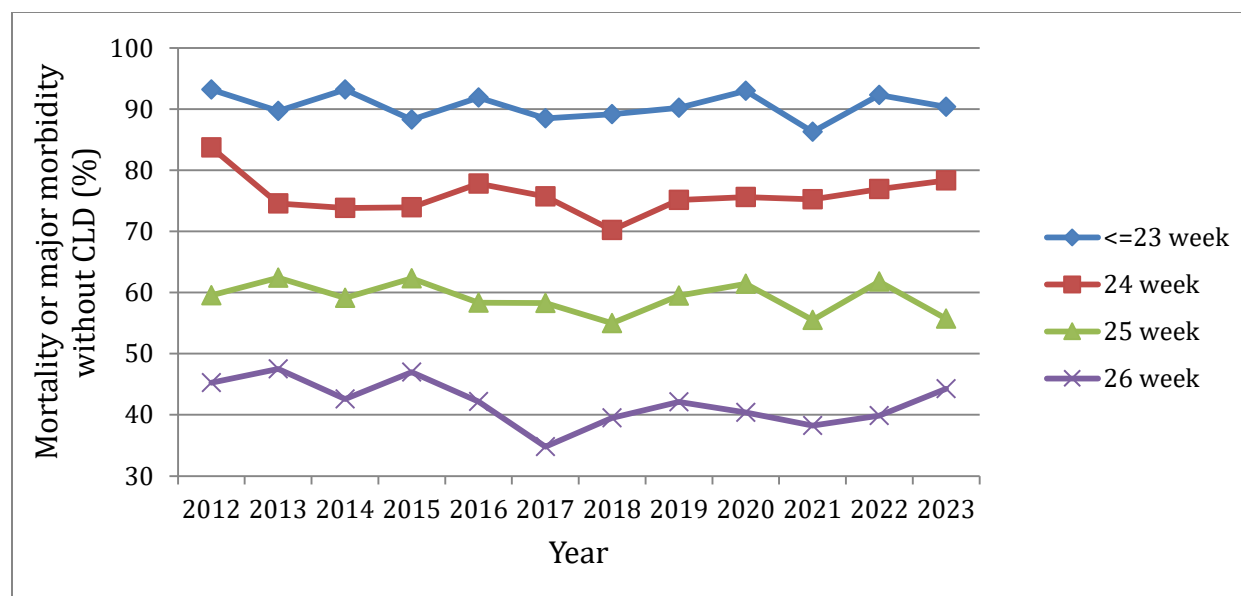
b. 27-32 weeks' GA:
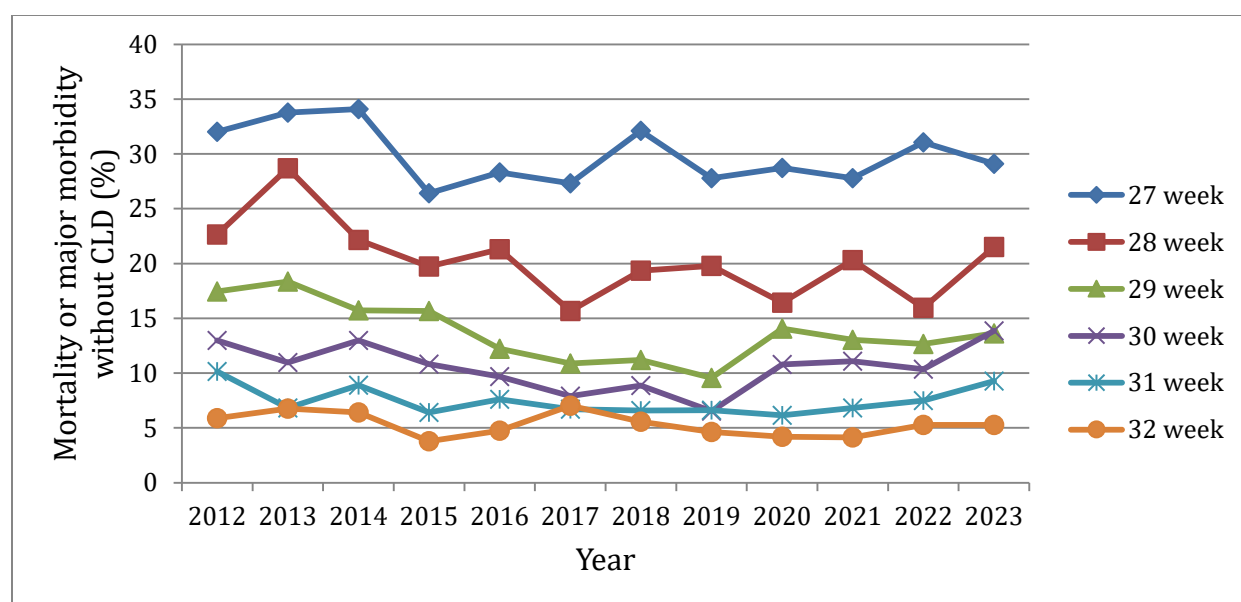
I. 2023 CNN publications

Peer reviewed publications

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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 (Note that some sites collect CLD status at 36 weeks' PMA for infants transferred to level 2 centers):

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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) <u>continued</u>:

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%	≥0.1L/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.

<u>Variables Definitions</u>

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

<u>Major Anomalies</u>

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