



# Survival and morbidity of Very Low Birth Weight Infants in Ireland: 2014-2019

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## Background

- Although in the last decades advances in neonatal care have led to a reduction of neonatal mortality and morbidity of Very Low Birth Weight (VLBW) infants, further data and enhanced care are needed to improve the outcomes of these highly vulnerable infants.
- The Vermont Oxford Network (VON) is a non-profit international voluntary collaboration of health care professionals dedicated to improving the quality and safety of medical care for newborn infants and their families.
- The National Perinatal Epidemiology Centre (NPEC) facilitates membership of the VON on behalf of all 19 neonatal units in Ireland, making it possible to have composite national data on all very low birthweight (VLBW) infants born in Ireland.
- The VON Network is today comprised of over 1400 Neonatal Intensive Care Units around the world. The database provides unique, reliable and confidential data to participating units for use in quality management, process improvement, internal audit and peer review.

## Methods

- Clinical data on the care and outcomes of all liveborn infants born between 401g and 1500g and/or between 22 and 29 weeks gestation were gathered.
- Data were collected on VLBW infants who were born and/or admitted to the maternity hospital or neonatal centre within 28 days of birth.
- All 19 ROI maternity units (their affiliated neonatal intensive care units (NICUs)) and one paediatric hospital participated in data collection which was carried out as described in figure 1

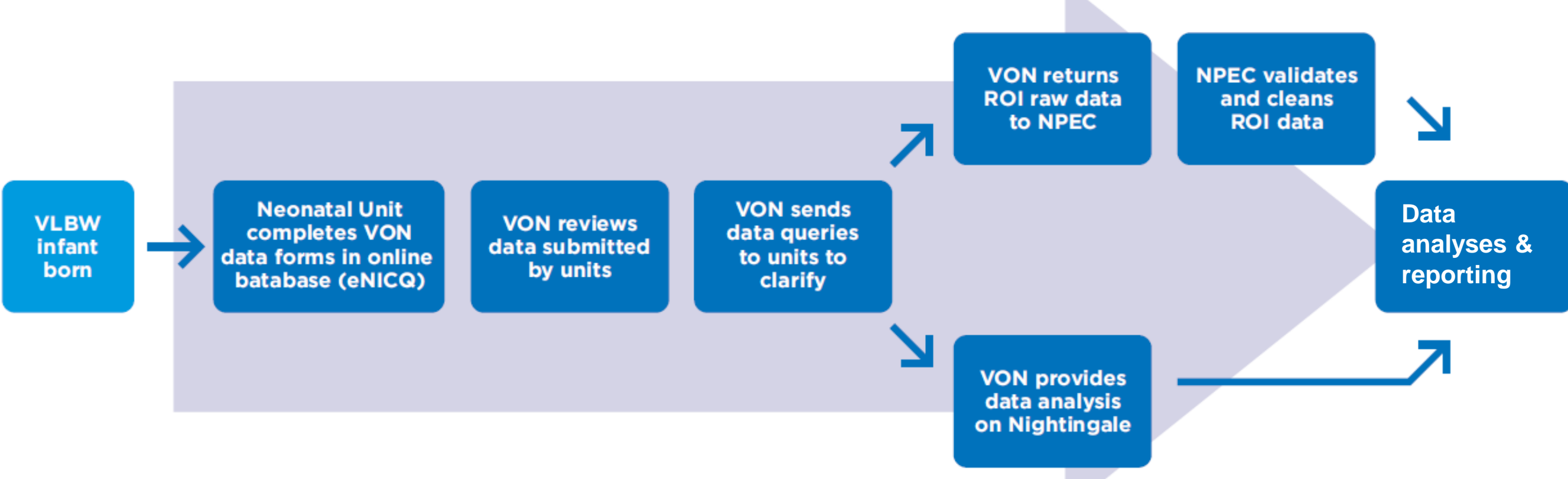


Figure 1: Data collection process for the Very Low Birth Weight infant national data

## Findings

### 6 Years of data: 3466 infants

Table 1: Number of VLBW infants in ROI 2014 – 2019 according to gestational age (weeks), n

Gestation	2014	2015	2016	2017	2018	2019
<24 wks	41	48	48	38	44	44
24-26 wks	114	114	134	125	138	104
27-29 wks	235	235	217	240	198	202
30-32 wks	159	170	152	172	126	118
>32 wks	48	55	42	37	31	37
Total	597	622	593	612	537	505

Table 2: Number of VLBW infants in ROI in 2014 – 2018 according to birth weight (g), n

Birth weight (g)	2014	2015	2016	2017	2018	2019
<501	26	23	21	23	24	26
501 – 750	85	100	104	93	97	89
751 – 1000	115	98	125	122	118	97
1001 – 1250	154	155	152	157	132	122
>1250	216	246	191	217	166	171
Total	596	622	593	612	537	505

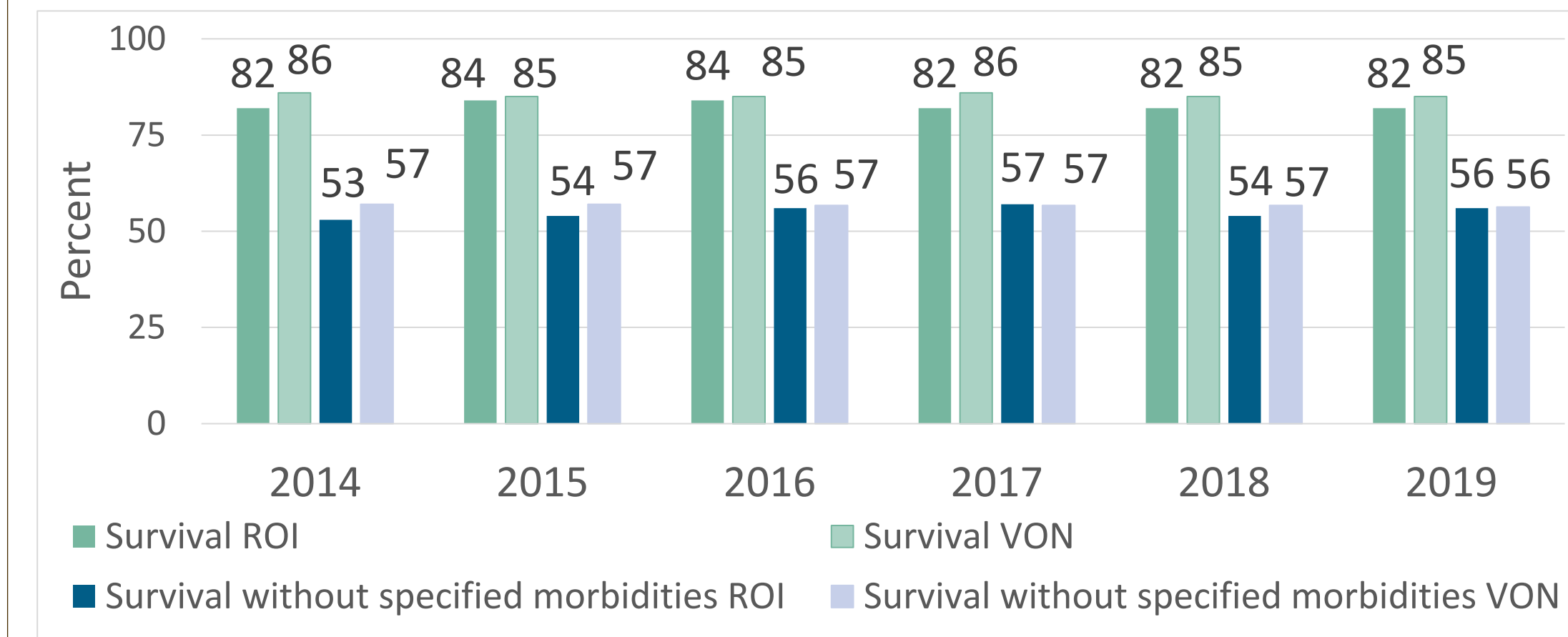


Figure 3: Survival of ROI and VON infants 2014-19

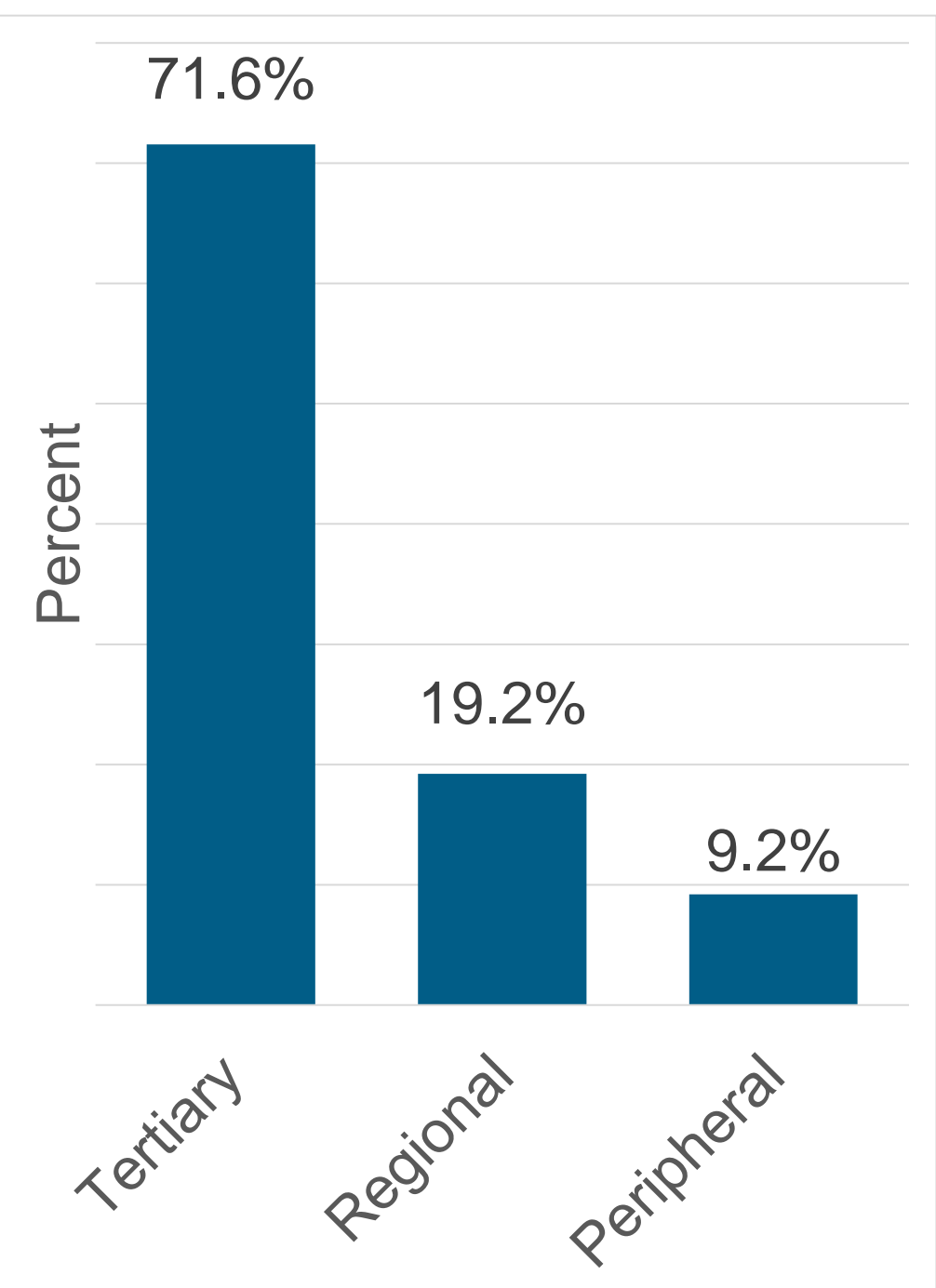


Figure 2: Type of neonatal centre where infants were born

Table 3: Survival of ROI and VON infants in infants born and ≤22 and at 23 weeks gestation, 2014 - 2019

	2014	2015	2016	2017	2018	2019
≤22 weeks gest.	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Liveborn infants	20	18	21	22	17	15
Resuscitation in DR	1 (5%)	0	1 (5%)	2 (9%)	1 (6%)	1 (7%)
Admitted to NICU/SCBU	0	0	1 (5%)	2 (9%)	1 (6%)	0
Survived to discharge	0	0	0	0	0	0
23 weeks gest.						
Liveborn infants	21	30	27	15	27	29
Resuscitation in DR	9 (42%)	22 (73%)	20 (74%)	13 (87%)	24 (89%)	24 (83%)
Admitted to NICU/SCBU	5 (24%)	10 (33%)	20 (74%)	13 (87%)	22 (81%)	23 (79%)
Survived to discharge	4 (19%)	9 (30%)	10 (37%)	7 (47%)	9 (33%)	10 (42%)

DR – Delivery Room; NICU – Neonatal Intensive care Unit; SCBU – Special Care Baby Unit

Table 4: Standardised Mortality/Morbidity Ratios for Key Performance Indicators (KPIs), 2014-2019.

KPIs	2014	2015	2016	2017	2018	2019
	SMR (95% CI)	SMR (95% CI)	SMR (95% CI)	SMR (95% CI)	SMR (95% CI)	SMR (95% CI)
Mortality	1.27 (1.03, 1.51)	1.15 (0.91, 1.39)	1.10 (0.87, 1.34)	1.19 (0.96, 1.42)	1.11 (0.87, 1.36)	1.56 (1.13, 1.98)
Death or Morb.	1.14 (1.01, 1.27)	1.16 (1.03, 1.29)	1.02 (0.89, 1.15)	1.01 (0.89, 1.14)	1.01 (0.88, 1.15)	1.04 (0.90, 1.19)
CLD	1.08 (0.88, 1.28)	1.07 (0.87, 1.27)	0.95 (0.75, 1.15)	1.12 (0.93, 1.31)	0.97 (0.77, 1.17)	0.99 (0.77, 1.21)
Pnmthrx	1.67 (1.25, 2.10)	1.80 (1.37, 2.24)	1.40 (0.98, 1.82)	1.69 (1.29, 2.1)	1.56 (1.13, 1.98)	1.97 (1.51, 2.44)
Any Late Infect.	1.26 (1.00, 1.52)	1.44 (1.18, 1.7)	1.13 (0.88, 1.39)	1.03 (0.78, 1.27)	0.96 (0.70, 1.22)	1.02 (0.74, 1.31)
SIH	1.22 (0.85, 1.58)	1.15 (0.80, 1.51)	1.32(0.98, 1.67)	0.90 (0.59, 1.22)	0.90 (0.57, 1.23)	0.86 (0.50, 1.21)
CPL	0.32 (0.0, 0.87)	1.26 (0.71, 1.82)	0.56 (0.0, 1.11)	0.66 (0.15, 1.16)	0.88 (0.32, 1.43)	0.45 (0.0, 1.04)
NEC	1.21 (0.84, 1.59)	1.47 (1.08, 1.86)	1.39 (1.01, 1.78)	1.22 (0.86, 1.59)	1.22 (0.83, 1.61)	1.05 (0.63, 1.47)

Pnmthrx – Pneumothorax; CLD - Chronic Lung Disease; SIH - Severe Intraventricular Haemorrhage; CPL - Cystic Periventricular Leukomalacia; NEC - Necrotising Enterocolitis

## Summary

- Continuous monitoring of the outcomes and characteristics of VLBW infants is essential to ensure establishment and implementation of best practices and high-quality care.
- The highest proportion of VLBW babies in ROI was born with a gestation between 27-29 weeks and birthweight between 751-1250g.
- ROI Infants continue to show a statistically higher rate of pneumothorax compared to VON, a consistent finding since 2014.
- The mortality risk has been higher than expected after adjusting for the risk profile of the ROI infants: 14% in 2014 (SMR 1.27 CI 1.03, 1.51) and 56% in 2019 (SMR=1.56 CI 1.13, 1.98).
- Since 2014, there has been a steady increase in the number of infants born at 23 weeks who are resuscitated in the delivery room. This had been associated with an increase in the number of these infants who survive to discharge.