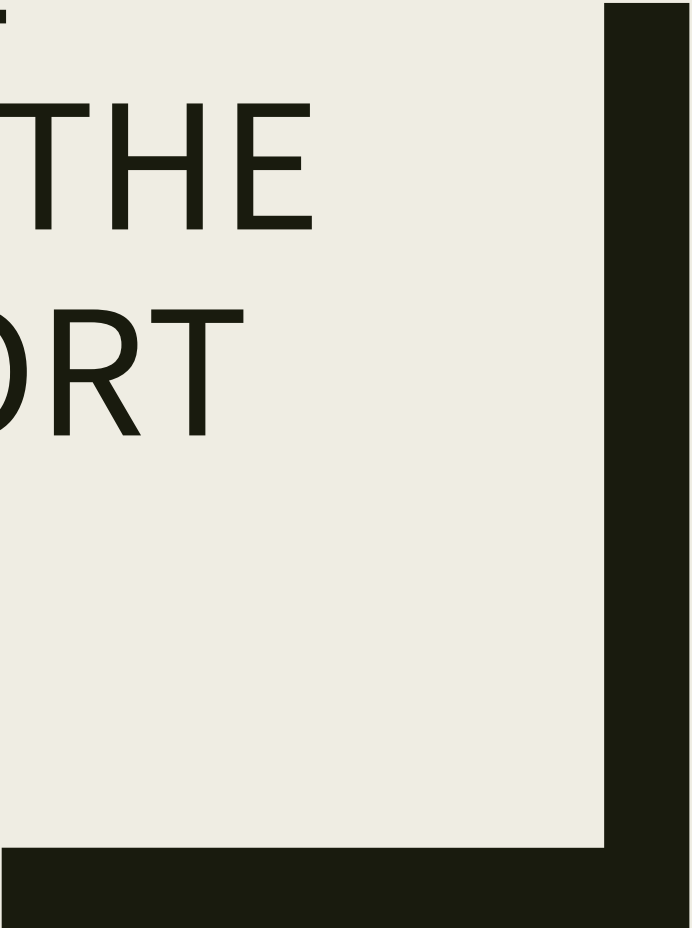# NEONATAL MORTALITY IN THE JA KIDS COHORT

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Background

- The first 28 days (neonatal period)
    - *crucial time in a child's life*
    - *highest risk of dying*

- Every year 3 million neonates die worldwide
    - *50% die in the first 24 hours*
    - *75% by the end of the first week (1)*

WHO, UNICEF. 2014. Every Newborn: an action plan to end preventable deaths: Executive summary. Geneva: World Health Organization.

Background

- Over 80% of the deaths are attributable to three causes
  - *complications of prematurity*
  - *intrapartum related events including asphyxia*
  - *neonatal infections (2)*

- One of the goals of WHO Every New-born Action plan is to end preventable new born deaths and achieve a target of less than 10 neonatal deaths per 1000 births by 2035 (2).

The Millennium Development Goals Report 2015 Available at
http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf

Background

- The Perinatal Morbidity and Mortality Survey of Jamaica 1986-1987
    - *(NMR) of 17.9 per 1000 live births*
    - *ENMR 16.0 per 1000 live births*
    - *LNMR 1.9 per 1000 live births*
    - *56% of deaths occurred within the first 24 hours.*

- The commonest cause of death
    - *immaturity 39% and*
    - *asphyxia related deaths 35% (3).*

Ashley D, McCaw-Binns A, Foster-Williams K. The Perinatal Morbidity and Mortality Survey of Jamaica 1986-1987. Paediatric and Perinatal Epidemiology 1988;2:138-147.

Background

- A review of perinatal mortality in Jamaican hospitals done by the Ministry of Health in 2003
  - *ENMR 13.7 per 1000 live births.*

- McCaw-Binns et al
  - *NMR 16.1 per 1000 live births (2008)*
  - *ENMR 14 per 1000 live births*
  - *LNMR 2.1 per 1000 live births (4)*

McCaw-Binns A, Mullings J, Holder Y. The Quality and Completeness of 2008 Perinatal and Under-five Mortality Data from Vital Registration, Jamaica.West Indian Med J. 2015 Jan;64(1):3-16. doi: 10.7727/wimj.2015.115. Epub 2015 Apr 28.

Rationale

- If Jamaica is to achieve the goal of a neonatal mortality rate of <10 per 1000 live births it will be critical to audit neonatal outcome to determine action points for targeted intervention to decrease neonatal mortality.

- Additionally with the introduction of the Programme for the Reduction of Maternal and Child Mortality (PROMAC) there is the need for baseline data against which the impact of the program can be measured.

Aim

- To determine the neonatal mortality in the 2011 Jamaican birth cohort.

Methods

■ Women who delivered between July 1 and September 30, 2011 (9742) were recruited for the JA Kids Study. Descriptive analyses were performed to determine the crude neonatal mortality rate and factors associated with mortality.
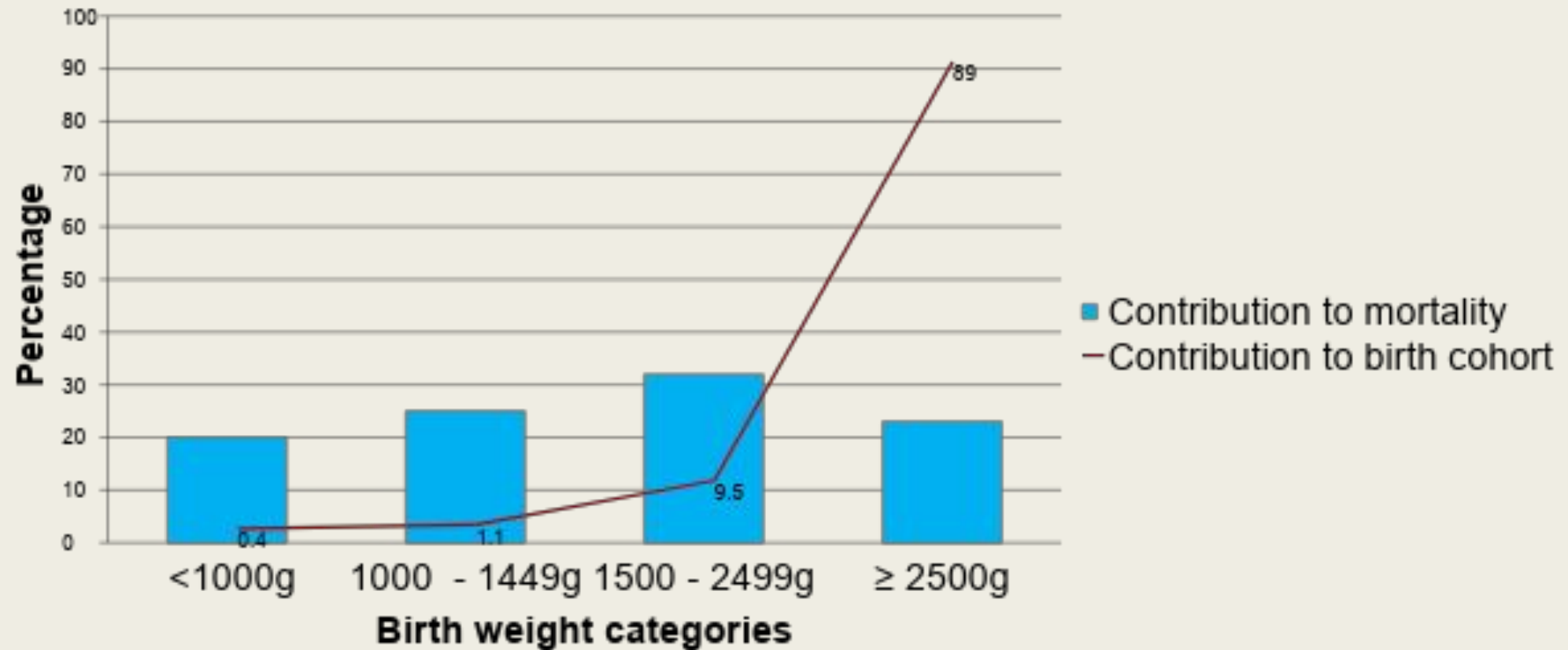
Results

- ■ July 1 – September 30
  - – *9670 total live births*
  - – *158 neonatal deaths*
  - – *NMR* **16.3** *per 1000 life births 95%CI* **13.8 – 18.8**

Outcome by birth weight JA KIDS
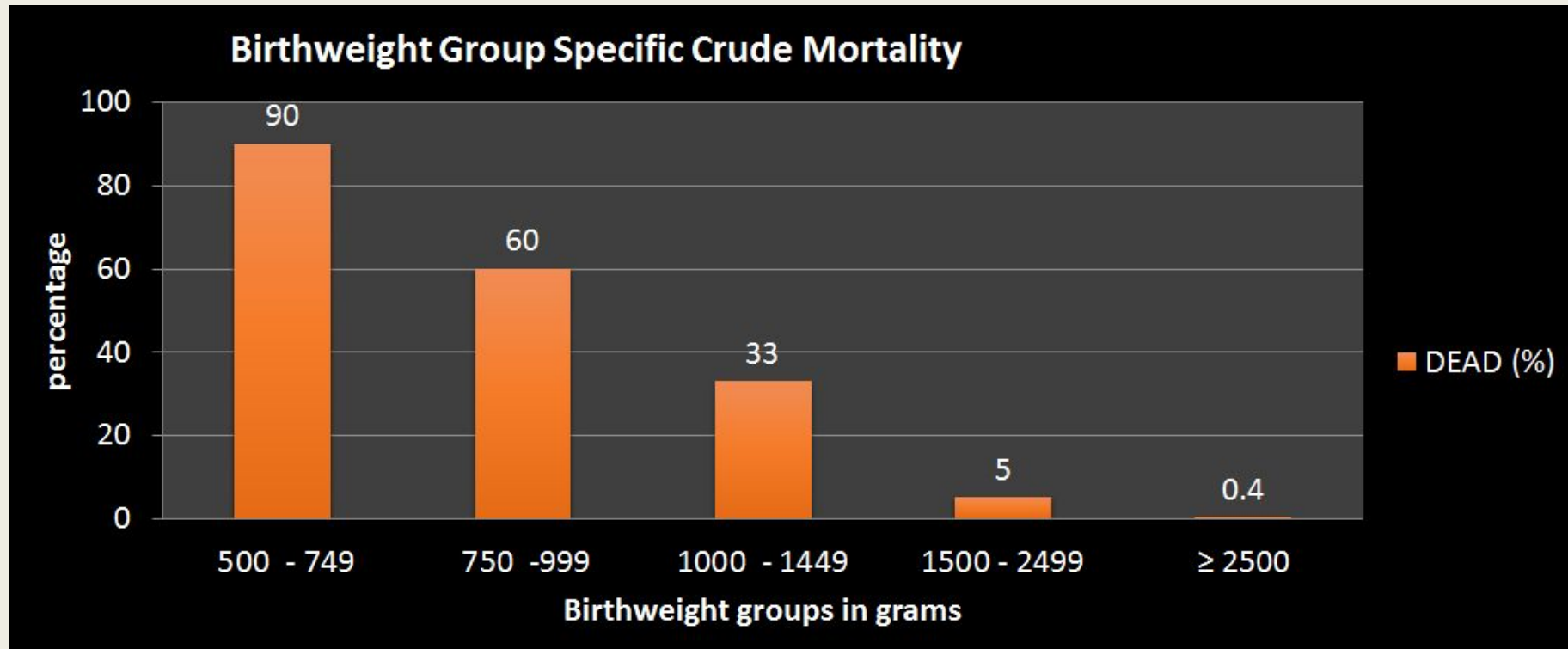
Results

Percentage Contribution of birth weight categories to Cohort and overall Mortality

Outcome by Maturity JA KIDS

GEST AGE	DEAD (%)	ALIVE (%)	TOTAL
Preterm	96 (7)	1366 (93)	1462
Term	25 (0.3)	7809 (99.7)	7834
TOTAL	121 (1)	9175 (99)	9296

(Chi squared p<0.001) OR 21.9;CI 14.1 – 34.2

Outcome by multiple gestation JA KIDS

BIRTH NUMBER	DEAD (%)	ALIVE (%)	TOTAL
Multiple	7(6)	121(94)	128
Singleton	142 (2)	9246 (98)	9388
TOTAL	149 (2)	9367 (98)	9516

(Chi squared p=0.004) OR 3.8;CI 1.7 – 8.2

Outcome by gender JA KIDS

GENDER	DEAD (%)	ALIVE (%)	TOTAL
Male	84 (2)	4656(98)	4740
Female	55 (1)	4536 (99)	4591
TOTAL	139 (2)	9192 (98)	9331

(Chi squared p=0.01) OR 1.5;CI 1.06 – 2.1

Outcome by mode of delivery JA KIDS

MODE OF DELIVERY	DEAD (%)	ALIVE (%)	TOTAL
Emergency C/S	19 (3)	640 (97)	659
Elective C/S	12 (1)	1195 (99)	1207
SVD	106 (1)	7452 (99)	7558
TOTAL	137 (2)	9287 (98)	9424

(Chi squared p=0.009)

Clinical cause of death JA KIDS

Main Causes of Mortality	n(%)
Prematurity/Respiratory Distress Syndrome	55 (53)
Perinatal Asphyxia	10 (9.7)
Sepsis	8 (7.7)
Respiratory Distress Not otherwise Specified	7 (6.7)
Meconium Aspiration Syndrome	4 (3.8)

Discussion

- No significant change in NMR in past 30 years
  - *2011   16.3/1000 (CI 13.8 – 18.8)*
  - *2008   16.1/1000 (CI 15.8 – 16.5)*
  - *1986   17.9/1000 (CI 15.3- 20.46)*

- Excess male mortality similar to that seen in 1986 cohort

- Increased risk of death for twin pregnancies as seen in 1986 cohort
  - *8.6% of death in 1986-87* **(7 fold risk) ***
  - *4.4% of death in 2011* **(3.5 fold Risk)**

- Increased risk of death for premature infants as seen in 1986 cohort

- Commonest cause of mortality Prematurity and HIE remains the same however, proportion secondary to HIE less than 1986 but likely to be an underestimate as clinically diagnosed rather than by autopsy

- ***Samms-Vaughan ME, McCaw-Binns AM, Ashley DC, Foster-Williams K. Neonatal mortality determinants in Jamaica. Journal of tropical pediatrics. 1990;36(4):171-5.***

Discussion

- Decreased mortality with increasing birth weight
- Disproportionate mortality contributed by ELBW (<1000g) and VLBW (<1500g) neonates
- However, neonates ≥ 1000g account for 80% of mortality
- Stepwise approach needed to decrease mortality to <10/1000 live births
  - *First targeted interventions to decrease mortality in neonates ≥ 1000g*
  - *Then targeted interventions to decrease mortality in neonates < 1000g*

Further studies needed to identify preventable causes of mortality in larger babies

Conclusion

■ If Jamaica is to attain the Sustainable Developmental Goal of a neonatal mortality rate of <10/1000 live births there should be a step wise approach

– *initially focus should be placed on measures for decreasing mortality in neonates ≥1000g who contribute to 80% of mortality*

– *then the focus can be shifted to neonates < 1000g who contribute disproportionately to mortality.*

Thank You

Neonatal Mortality by Birthweight categories for the UHWI: 1974 - 2015

	1974-1976	1987	1996	2005-2010	2014	2015
Total deaths	152	32	42	301	28	24
≤ 1000g No. Dead (%)	54(36)	10(31)	13(31)	164(54)	15(54)	14(58)
1001 - 1500g No. Dead (%)	28(18)	3(9)	7(17)	52(17)	6(21)	4(17)
1501 - 2000g No. Dead (%)	19(13)	3(9)	4(10)	20(7)	1(4)	1(4)
2001 – 2500g No. Dead (%)	10(7)	4(13)	2(5)	20(7)	1(4)	1(4)
>2500g No. Dead (%)	43(28)	11(34)	11(26)	36(12)	3(11)	4(17)