

Infant Mortality – Ukraine vs. Alabama

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- **Background** The OMNI-Net established a neonatal registry concurrently with a birth defects surveillance system, both relying on international standards.
- **Objectives** To assess infant mortality and its causes and conduct Ukraine - Alabama comparisons.

Methods

- Compare Alabama 2005 (40895 white infants) with Ukrainian 2006 data (41826 live births) regarding infant mortality
- Examine causes of infant deaths in Ukrainian region: newborns' register, case histories review



Births and infant deaths dependently of birthweight in Ukrainian region and Alabama

Birth weight, g	Ukrainian region			Alabama		
	Births	% of all birhs	Infant deaths	Births	% of all birhs	Infant deaths
total	41826		407	40895	100.00	293
< 1000	78	0.19	15	297	0.73	126
1000-1499	135	0.32	35	303	0.74	15
1500-1999	366	0.88	49	711	1.74	29
2000-2499	1148	2.74	51	2216	5.42	31
2500-2999	5590	13,37	68	7556	18,48	31
3000-3499	15911	38,04	117	15934	38,96	36
3500-3999	13658	32,66	62	10839	26,50	15
4000-4499	4297	10,27	12	2586	6,32	2
≥ 4500	643	1.54	3	391	0.96	1
unknown	0	0.00	0	62	0.15	7

Infant mortality dependently of birthweight in Ukrainian region and Alabama

Birth weight, g	Infngant mortality, ‰		% of all infant deaths	
	Ukraine	Alabama	Ukraine	Alabama
total	9.73	9.04	100.00	100.00
<1000	192.31	424.24	3.69	43.01
1000-1499	259.26	49.50	8.60	5.12
1500-1999	133.88	40.78	12.04	9.90
2000-2499	44.43	13.90	12.53	10.58
2500-2999	12.16	4.10	16.71	10.58
3000-3499	7.35	2.26	28.75	12.29
3500-3999	4.54	1.38	15.23	5.12
4000-4499	2.79	0.77	2.95	0.68
≥ 4500	4.67	2.56	0.74	0.34

Infant mortality dependently of gestational age in Ukrainian region and Alabama

GA, weeks	Infant mortality, ‰		% of all infant deaths	
	Ukraine	Alabama	Ukraine	Alabama
< 34	158.18	120.2	21.38	54.60
34-36	42.69	8,47	11.55	10.58
37-41	6.83	2.75	65.36	33.45
≥ 42	4.86	0.00	1.47	0.00

Infant mortality vs maternal age in Ukrainian region and Alabama

Maternal age, years	Infant mortality, ‰	
	Ukraine	Alabama
< 15	0.00	00.00
15-19	11.60	9.34
20-24	8.91	7.25
25-29	8.19	7.05
30-34	12.43	6.24
35-39	9.66	6.57
≥ 40	25.09	7.37

Parity and infant mortality

Parity	Infant mortality, ‰	
	Ukraine	Alabama
1	9.54	7.04
2	9.33	6.51
3	7.89	7.32
4	12.26	11.75
5	14.22	8.77
6	22.87	4.65
≥ 7	14.88	0.00

Infant mortality by postnatal age

The age of death, days	Infant mortality, ‰		% of all infant deaths	
	Ukraine	Alabama	Ukraine	Alabama
< 1	1.48	2.30	15.23	32.08
1-6	1.58	1.15	16.22	16.04
<i>0-6</i>	<i>3.06</i>	<i>3.45</i>	<i>31.45</i>	<i>48.12</i>
7-27	2.13	1.17	21.87	16.38
<i>0-27</i>	<i>5.19</i>	<i>4.62</i>	<i>53.32</i>	<i>64.50</i>
≥ 28	4.54	2.54	46.68	35.49

Infant mortality by plurality of births

Plurality of births	% of all births		Infant mortality, ‰	
	Ukraine	Alabama	Ukraine	Alabama
Single	99.25	96.56	9.27	5.88
Twins	0.75	3.18	80.91	34.64
Triplets or higher	0.00	0.26	500.00 (1 of 2)	148.15

Percentage by method of delivery

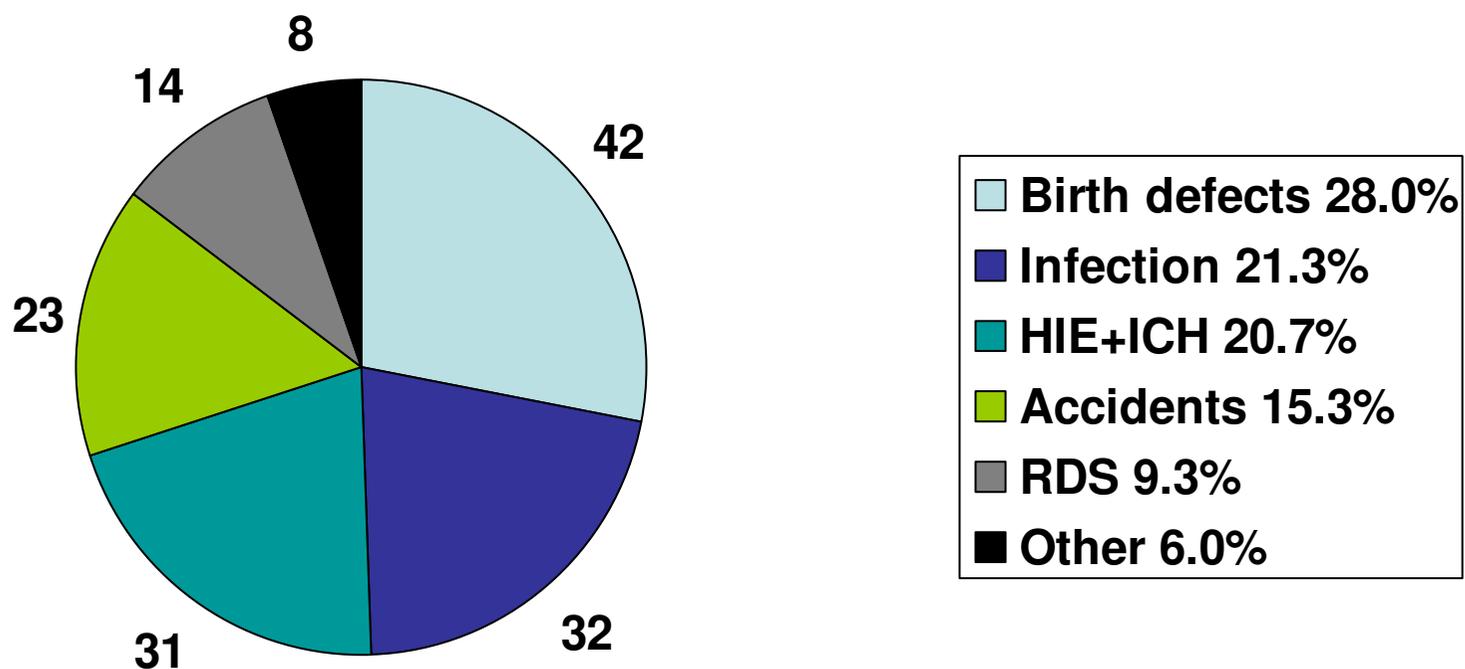
Route of delivery	% of all births	
	Ukraine	Alabama
Vaginal	86.87	67.44
Cesarean	13.13	32.56

Main contrasts Ukraine - Alabama

- Higher infant mortality in Ukraine in birth weight groups above 1000 g – notably twice as high in the 2500-4499 g (62.4% of all infant deaths)
- Lower first day mortality and higher late neonatal and postnatal mortality in Ukraine
- More than 2.5 times as high mortality in twins
- The highest mortality in Ukraine was observed in maternal age group ≥ 40 years, while in Alabama – in maternal age group 15-19 years

Review of 150 death records in Rivne oblast showed that the leading causes of infant mortality were birth defects, mainly cardiac malformations, followed by infections, asphyxia, intracranial hemorrhage and accidents.

Infant Deaths in Rivne (2006)



Some birth defects as causes of death (Rivne, 2006)

Birth defect	Number of cases
Congenital heart malformations	26
Gastroschisis	2
Biliary atresia	2
CNS malformation	2
NTD	2
Esophageal atresia	2
Diaphragmatic hernia	1
Multiple malformations	4

Points of Concern

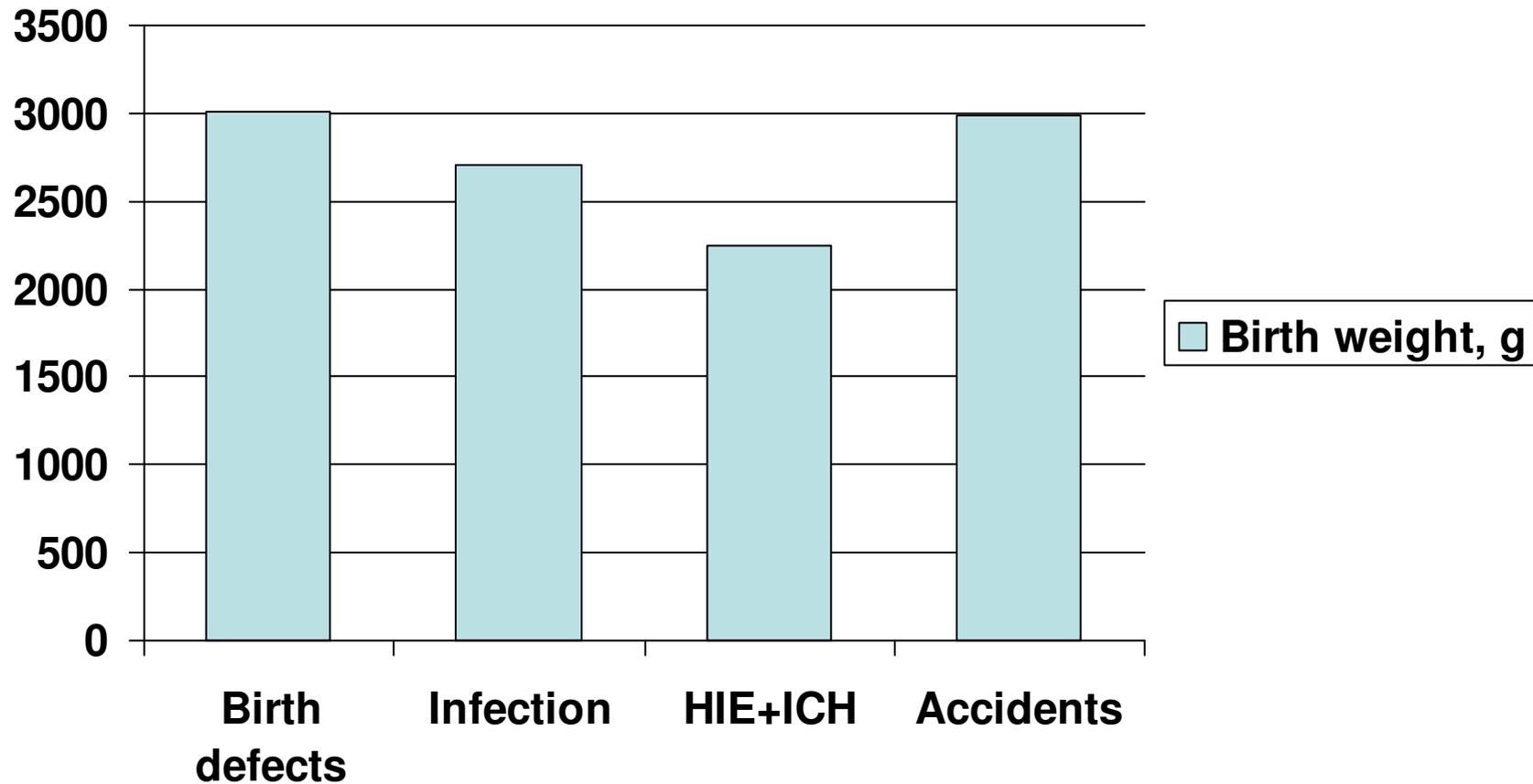
- High mortality among term and near-term infants as well as twins
- Relatively high postneonatal mortality
- Focus on quality of medical records
- Focus on quality of obstetric care
- Focus on social care (high rate of accidental deaths)

Conclusions

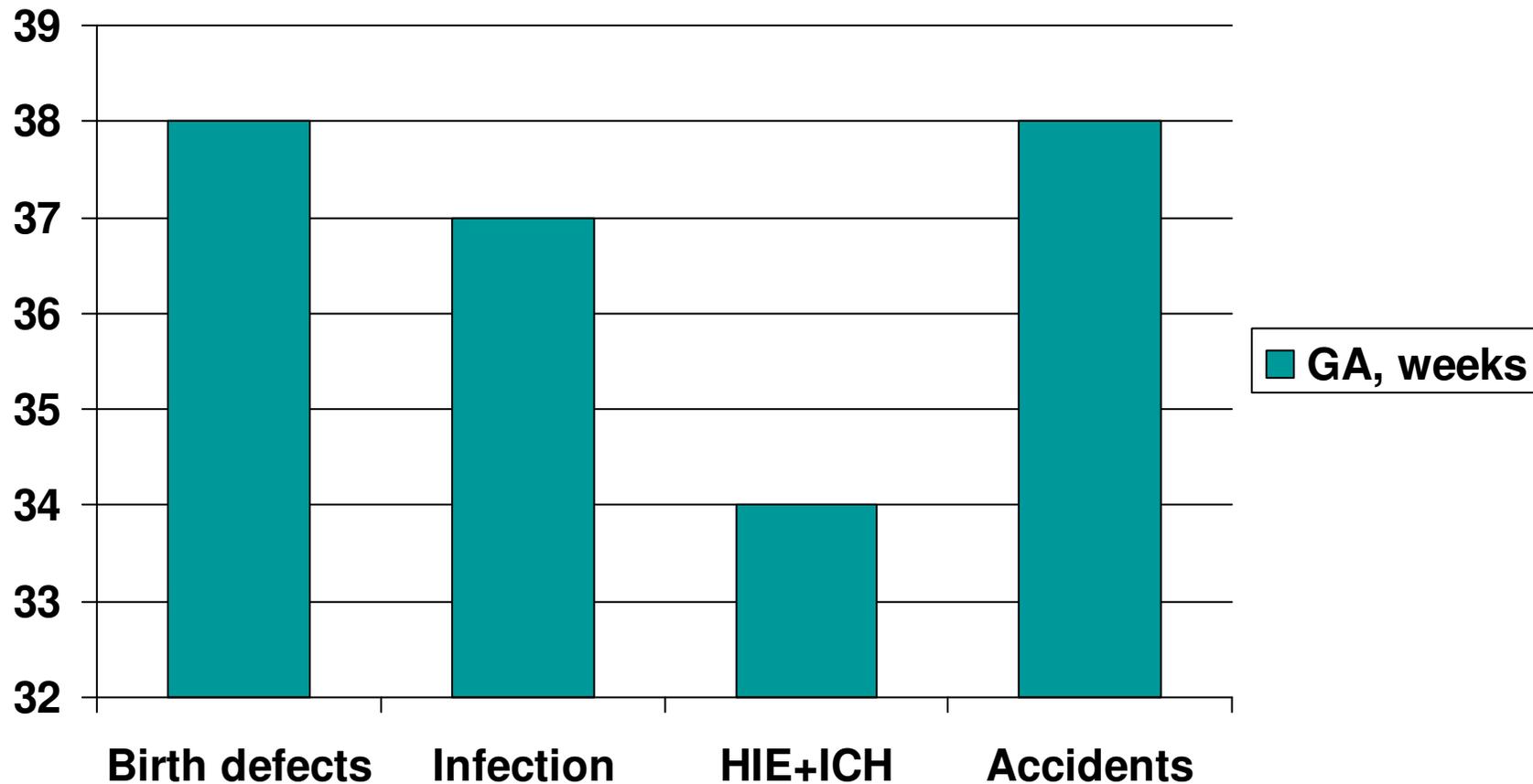
- The review team will expand the study of death records in other OMNI-Net regions
- Diagnosis and treatment of neonatal and infant infections should be improved
- Investigation aimed to assess the quality of obstetric and neonatal care is needed to determine the ways of its improvement (attention payed to hypoxic injury, cesarean section, multiple births, perinatal infections esp. GBS)
- Conclusions and recommendations will be forwarded to city, regional and national authorities to reduce mortality and morbidity particularly that of infants with near-normal gestational ages and near-normal birth weights (the most numerous category)

Thank you

Mean birth weight of infants that died from 4 major causes in Rivne in 2006



Mean gestational age of infants that died from 4 major causes in Rivne in 2006



Proportion of SGA and LGA infants

	% in general population of Rivne and Volyn regions <i>(W.Wertelecki, Y.Korzhytsky et al., 2006)</i>	% among cases of death in Rivne region, 2006
SGA	8.5%	16.7% (p < 0.05)
LGA	9.0%	4.0% (p < 0.05)