

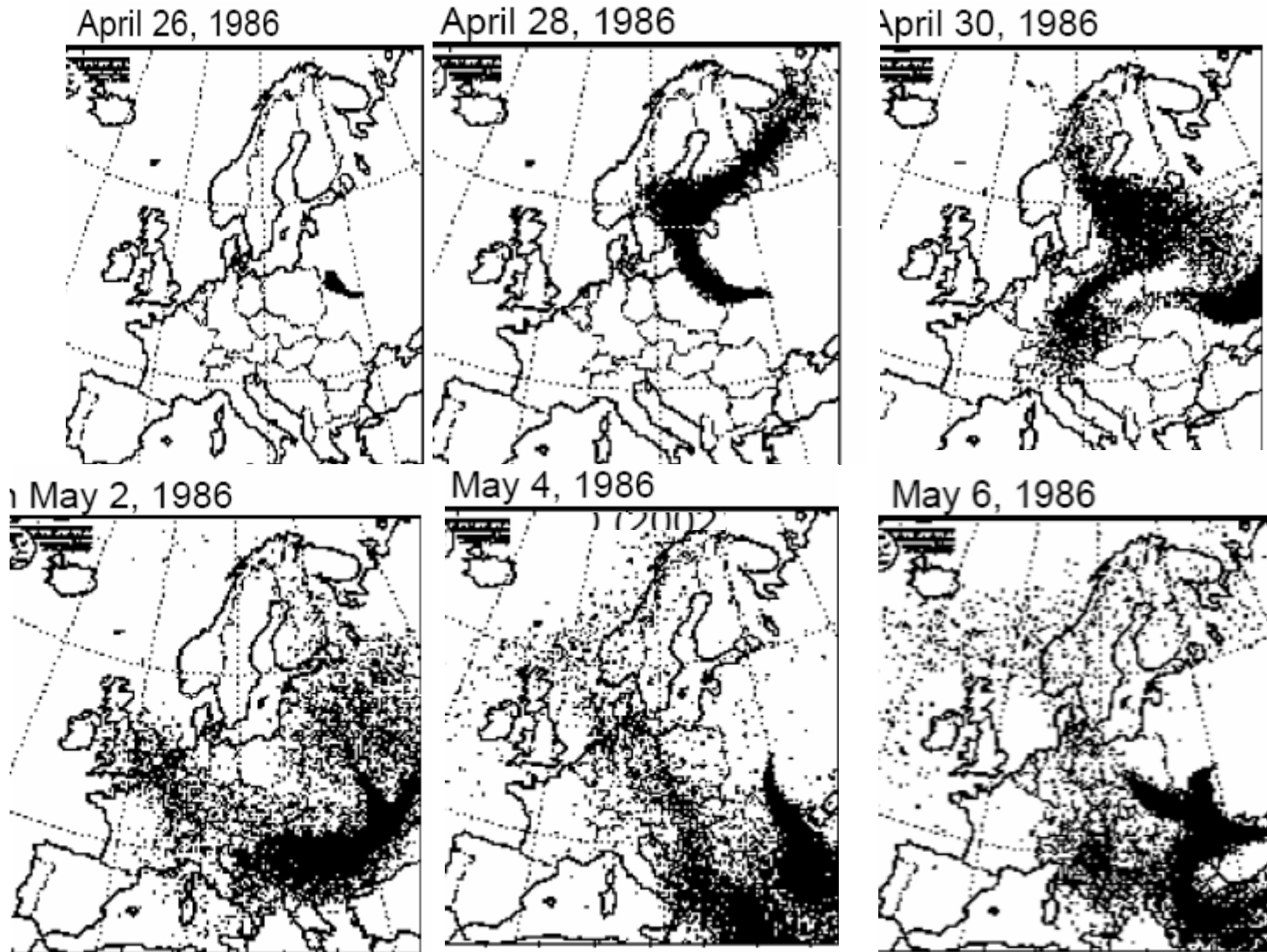
Bastopathies - Conjoined Twins - NTD Complex Rivne – Polissia Region

L. Yevtushok, M.D., W. Wertelecki, M.D.

A work in Progress



CHORNOBYL WINDS



From ARAC, Lawrence Livermore Research Laboratory reproduced per OECD 2002



**BIRTH DEFECTS <> CHORNOBYL
CHORNOBYL <> BIRTH DEFECTS**

1986 ... 1992 ... 1996



Population Monitoring Data

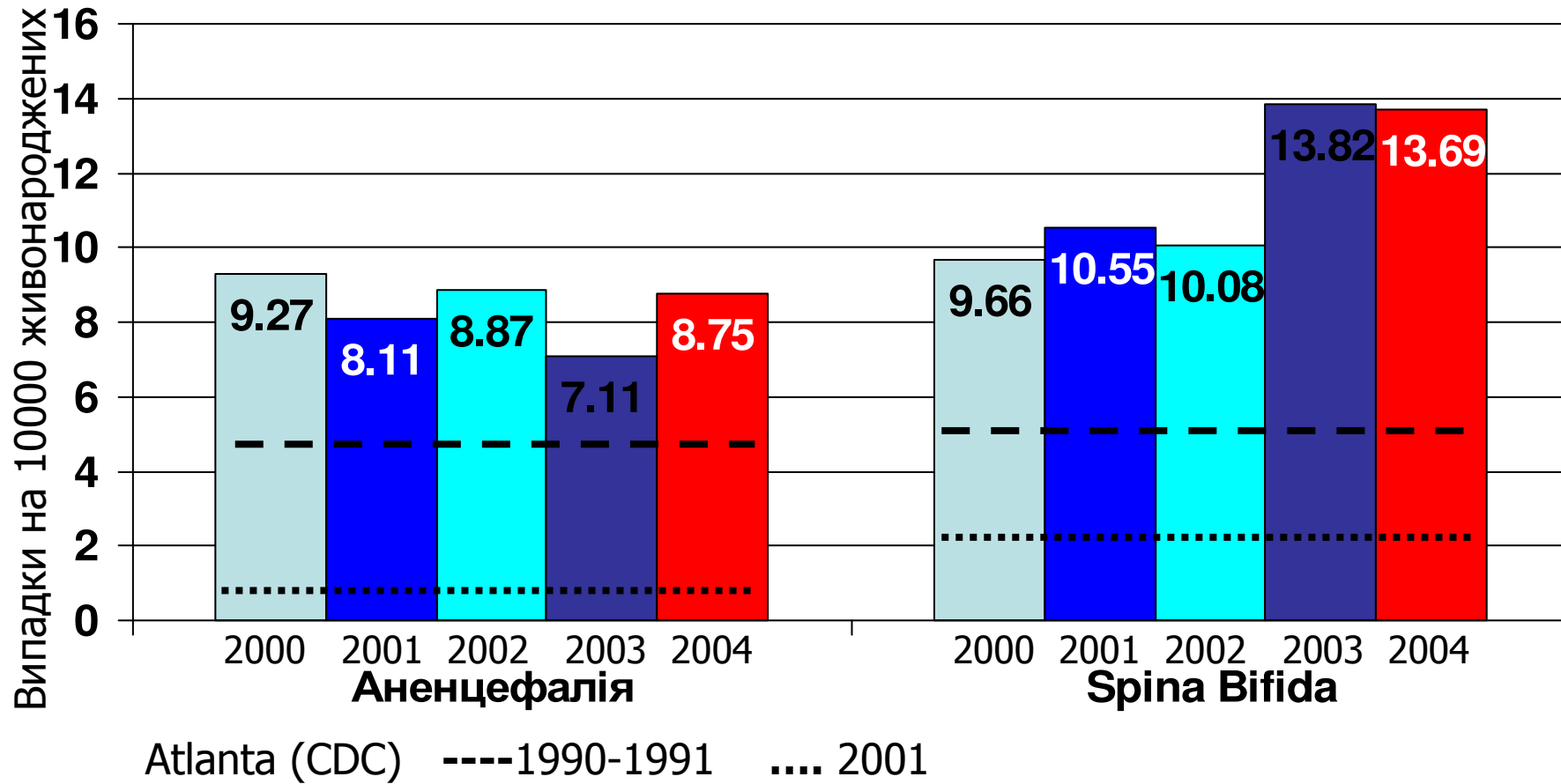




- 1998 Planning
- 1999 Training
- 2000 BD and Neonatal Population Registries initiated
- 2002 Volyn+Rivne > **NTD ~ 20 per 10000 livebirths** (Yuskiv et al. 2004)
- 2003 **3rd set of conjoined twins solely in the Rivne region**
- 2006 Higher NTD rates in **Rivne-Polissia**
6th set of Conjoined twins noted in Rivne
- 2007 Focus on NTD – Twins – Omphalocele - Body Stalk ... complex

Випадки аненцефалії та spina bifida за даними реєстру Українсько-Американської Програми запобігання вродженим вадам розвитку

2004



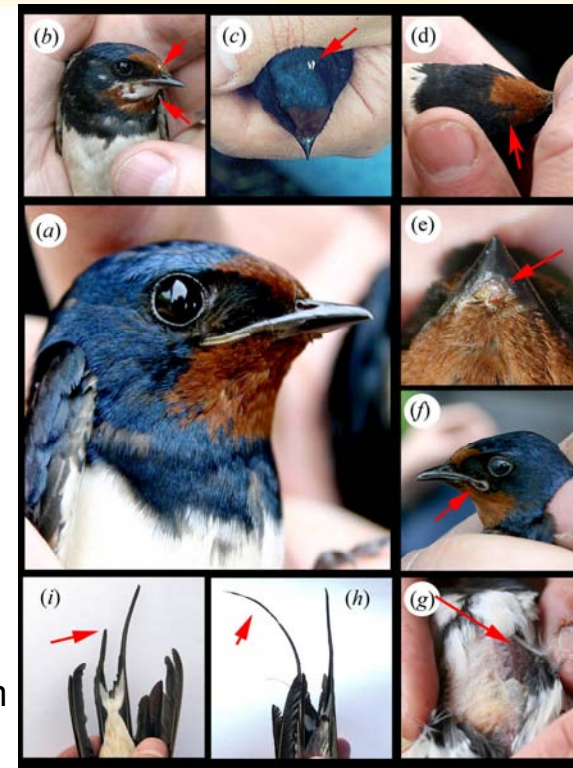
Chernobyl Birds' Defects Link Radiation, Not Stress, to Human Ailments

Moller, A. P., Surai, P., and T. A. Mousseau. 2004. **Antioxidants, radiation and mutations in barn swallows from Chernobyl.** [Proceedings of the Royal Society, London, 272:247-252](#)

A.P. Moller, T.A. Mousseau, F. de Lope, and N. Saino. 2007. **Elevated frequency of abnormalities in barn swallows from Chernobyl.** [Biology Letters of the Royal Society](#)

<http://cricket.biol.sc.edu/Chernobyl.htm>

<http://cricket.biol.sc.edu/chernobyl/photos-chernobyl.htm>



Rates of Neural Tube Defects in Ukraine Highest in Chernobyl Impacted Regions

Dr. W. Wertschleki, M.D. ⁽⁴⁾

Based on a presentation during the
HUMANITARIAN FORUM

COMMEMORATING THE 20TH ANNIVERSARY OF
THE CHORNOBYL DISASTER

April 25, 2006
Kyiv, Ukraine



Figure 2. OBNI-Net BD surveillance centers were established in 2000 (in blue) and in 2002-2003 (in green). In the upper left corner are shown the regions (counties) of Rivne and Volyn oblasts, nine of which have been designated as contaminated by Chernobyl ionizing radiation, a region called Polissya (shaded in gray).

In 2002, we noted elevated rates of spina bifida, anencephaly and encephalocoeles, collectively referred to as neural tube defects (NTD). In 2004, we reported a prevalence of NTD in Northwest Ukraine of 21 per 10 000 live births, nearly 4 times what it would have been were the population consuming enough folic acid. ⁽⁵⁾

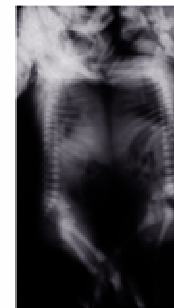
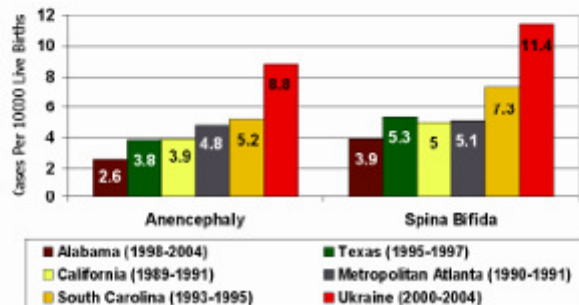
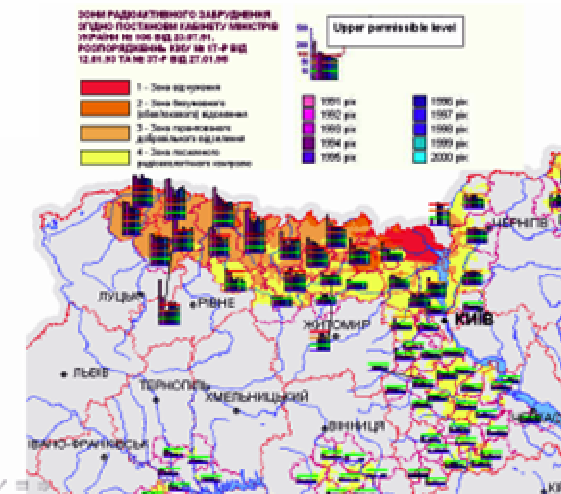
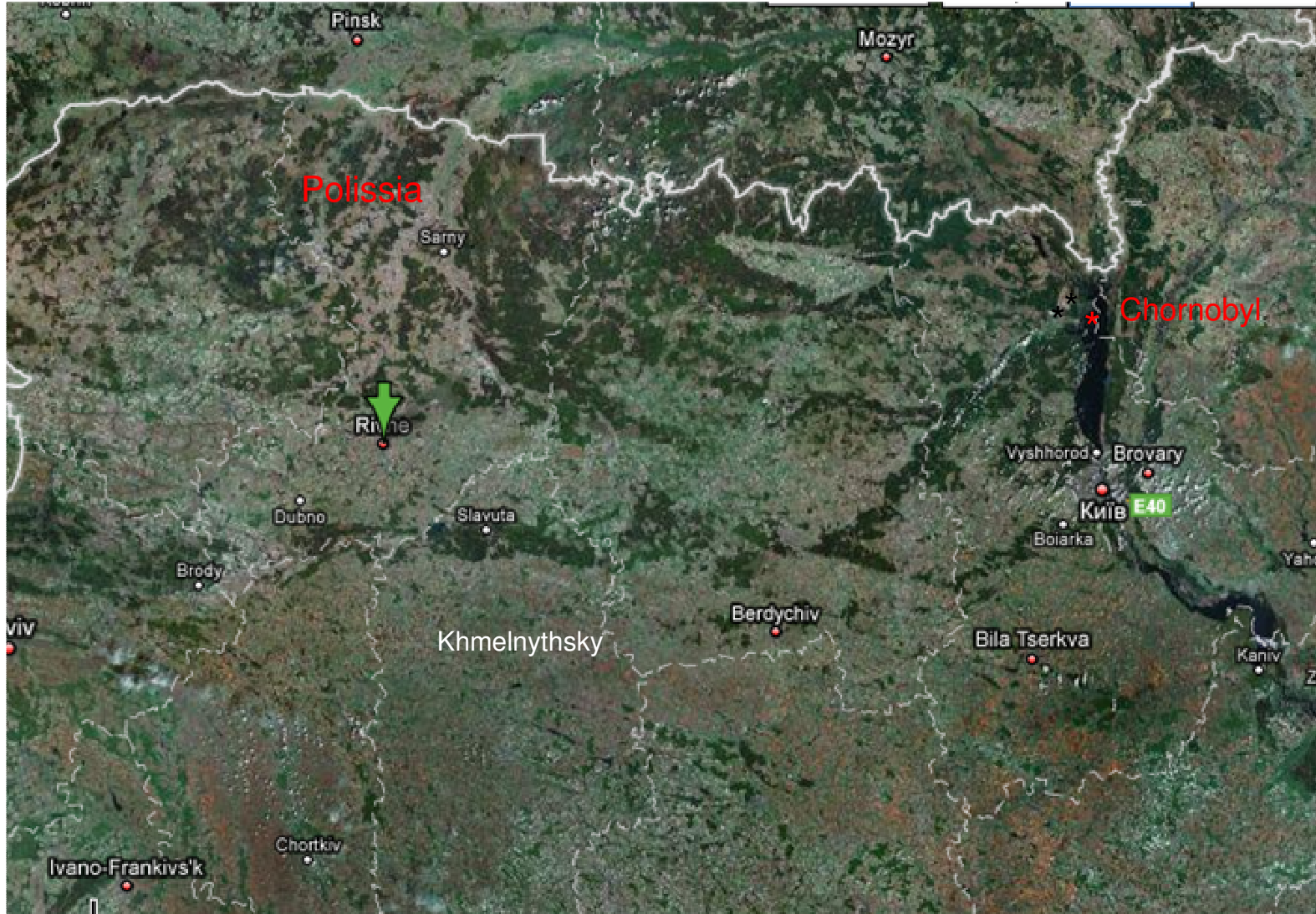


Figure 7. The prevalence rate of conjoined twins, a very rare malformation, is not established.



Year	Rivne ^(a)	Volyn	Khmelnytskyj	Kherson ^(b)	Crimea
2000	2	0	-	-	-
2001	0	0	-	-	-
2002	1	0	0	-	-
2003	1 ^(c)	0	0	0	0
2004	1	0	0	0	0
2005	0	0	0	1	0

(a) 81 909 live births (2000-2005)
(b) 46 883 live births (2003-2005)
(c) One twin in this series had a spina bifida



2006



Chornobyl



NTD

Omphalocele

TWINS CONJOINED TWINS TERATOMA
BODY STALK SHORT CORD SCHISIS
BODY WALL COMPLEX CAUDAL "REGRESSION"

SIRENOMELIA "REDUCTION" LIMBS AMONIOTIC BANDS ...

1.31 per 10 000 at 10-14 wks (Daskalakis, 97)

0.32 per 10 000 lb; Hawaii BD Register (Forrester, 99)

1:7500

1:300000

Antenatal

Neonatal



North-West Ukraine

	2000-2006 Rivne Polissia Not Pol.		2005-2006 Khmelnytsky
NTD x 10000	27.1	19.5	19.3
CONJ. TWINS	3	3	0
Prevalence	0.69	0.56	0
Continental Eur.	0.09-0.37	(Eurocat)	
Uk/Ireland	0.27-0.39	(Eurocat)	

CONJOINED TWINS in RIVNE OBLAST (Province) *

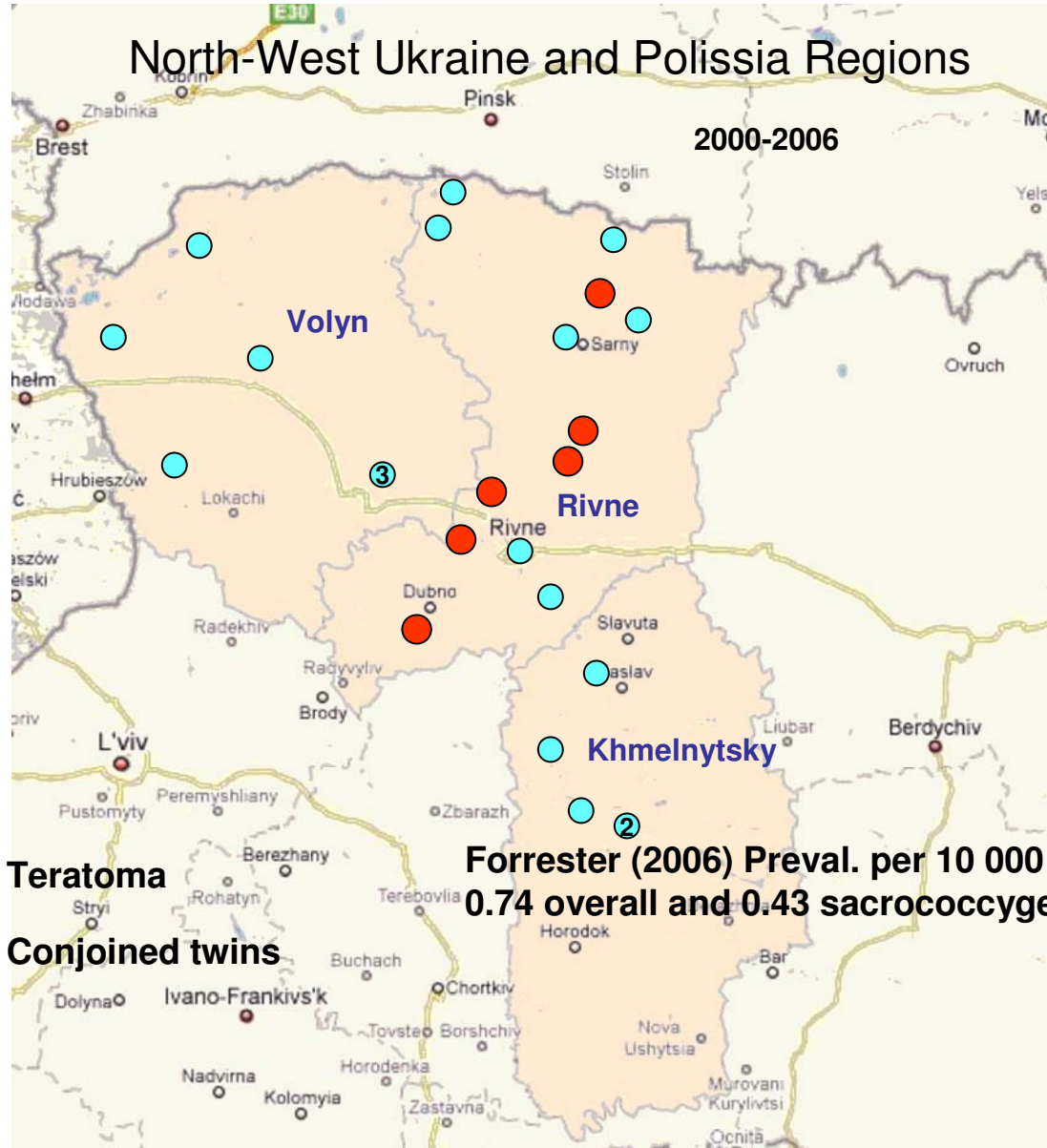
	Village	Births (502)*	Polissia	Sex;	Comments: pagus ...
2000	A	35	Yes	Female ;	thoracopagus
2000	B	212	No	Female ;	cranio-thoraco-omphalopagus
2002	C	136	No	Female ;	thoraco-omphalopagus and bilocular heart; PF had twin daughters by previous marriage; PMD had DZ twins ; PMF had twin brothers; unrelated female bilateral cleft lip and a male with lumbar spina bifida were born in the village in 2004 and 2006
2003	D	54	Yes	Female ;	cranio-thoracopagus and thoraco-lumbar thoraco-lumbar spina bifida and omphalocele ; PMF had twin sister; PMM had twin sisters
2004	E	56	Yes	Unknown ;	omphalopagus
2006	F	9	No	Female ;	thoracopagus; unrelated female infant with cranio-rachis-chisis and multicystic kidney born in village in 2002.

* 2000-2006



North-West Ukraine and Polissia Regions

2000-2006



- Teratoma
- Conjoined twins

Forrester (2006) Preval. per 10 000 lb in Hawaii –
0.74 overall and 0.43 sacrococcygeal – 58% females

RIVNE OBLAST 2000-2006

	Polissia	Non-Polissia
ISOLATED		
Anencephaly	23	25
Cranio-rachischisis	8	8
Enceph-rachsichsis	1	0
Iniencephaly	1	1
Encephalocele	7	9
Enceph-SpinBifid	1	0
Spina bifida	56 *	41
Sub-total NTD	97 [22.35]	84 [15.84] (P:<0.05)
NTD and Omphalocele	7	2

RIVNE OBLAST 2000-2006

	Polissia	Non-Polissia
Omphalocele		
Isolated	4	11
Not Isol.	12	6
and NTD	7	2
Gastroschisis		
Isolated	12	17
Not Isol.		1
and NTD		1

Prevalence (x 10 000) NTD - Omphalocele

	UK/I *	Cont. * Eur.	Ukr.	Rivne Not Polissia	Polissia
Omph Total	3.23	2.20	3.42	3.2	3.69
Omph/NTD	0.71	0.07	0.93	0.38	1.61
NTD Total	32.25	12.01	22.5	18.66	27.19

* Calzolari 1997



BLASTOPATHY
Conjoined twins. – **Teratoma*** -
Placenta – Body Stalk – Cord -
Schisis - Ectopia Viscera -
“Regression” – Bands – Limb
“Reductions”

*... **blastoma** ... **Nephroblastoma**



What next?

- Expand antenatal data (retro and **prospective**)
- Focus on Placenta - Twins – Cord – Body Stalk – Schisis – Limbs ...
- Expand analysis – adjoining Olbasts – other regions
- Focus on selected villages - micro-nutrients – radiation ...
- Implement a “**Polissia Initiative**” - co-investigators, review panels, develop open data sources ...

Our thanks to:

- Rivne Oblasts Leaders (Ms. S. Bohatyrchuk-Kryvko)
- Rivne Diagnostic Center Leaders (Dr. I. Shumlyanskyj)
- Rivne Children's Hospital Leaders (Dr. V. Boyko)
- Omni-Net Partners
- CDC BD Center Colleagues
- Drs. G. Oakley, L. Edmons, R. Garruto, L. Sever
- Drs. I. Baryliak, N. Zymak-Zakutnia, S. Kalynka, S. Lapchenko ...

END