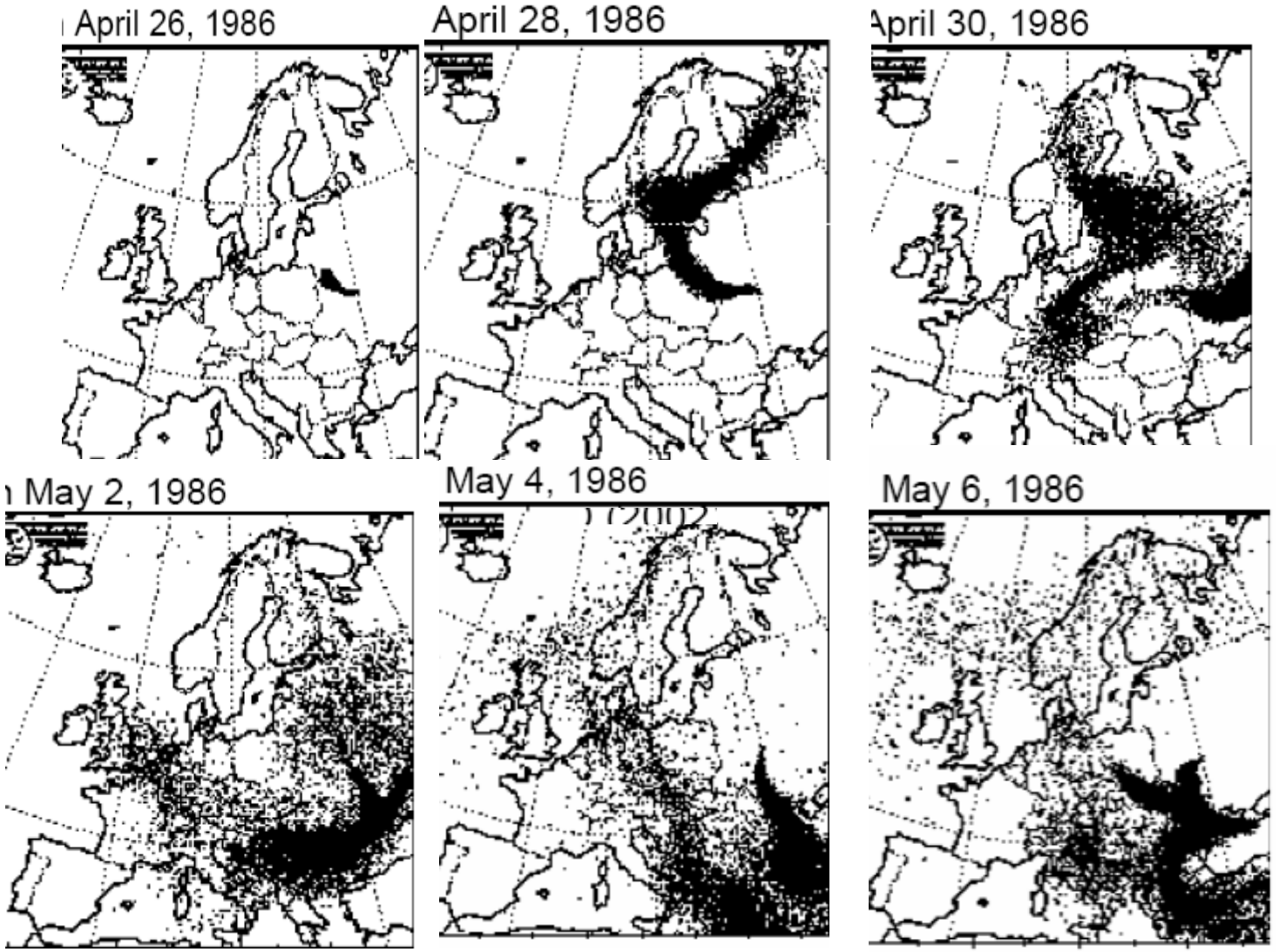
Bastophaties - Conjoined Twins - NTD Complex
Rivne – Polissia Region

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

A work in Progress

CHORNOBYL WINDS

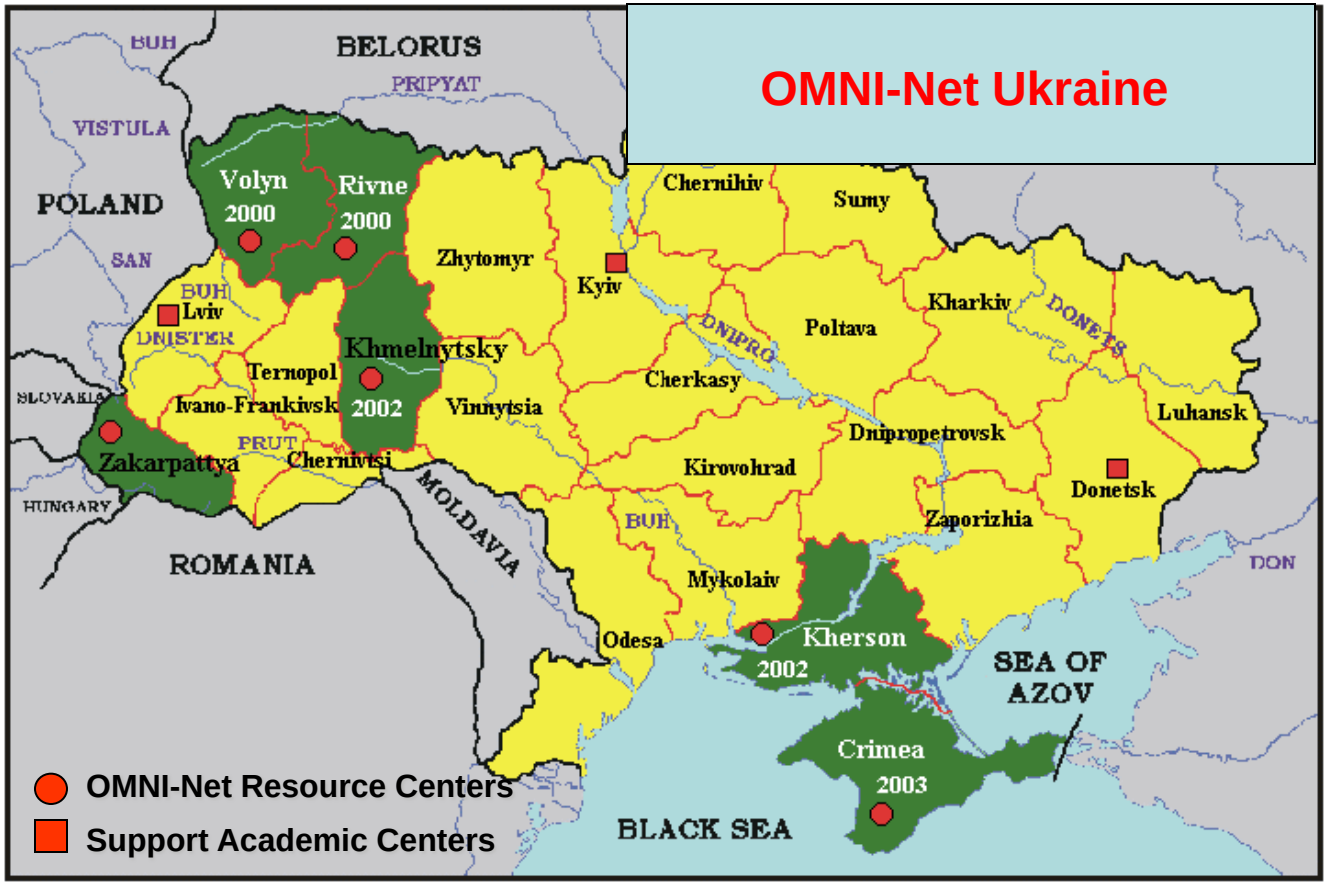


From ARAC, Lawrence Livermore Research Laboratory reproduced per OECD 2002

BIRTH DEFECTS <> CHORNOBYL
CHORNOBYL <> BIRTH DEFETCS

1986 … 1992 … 1996

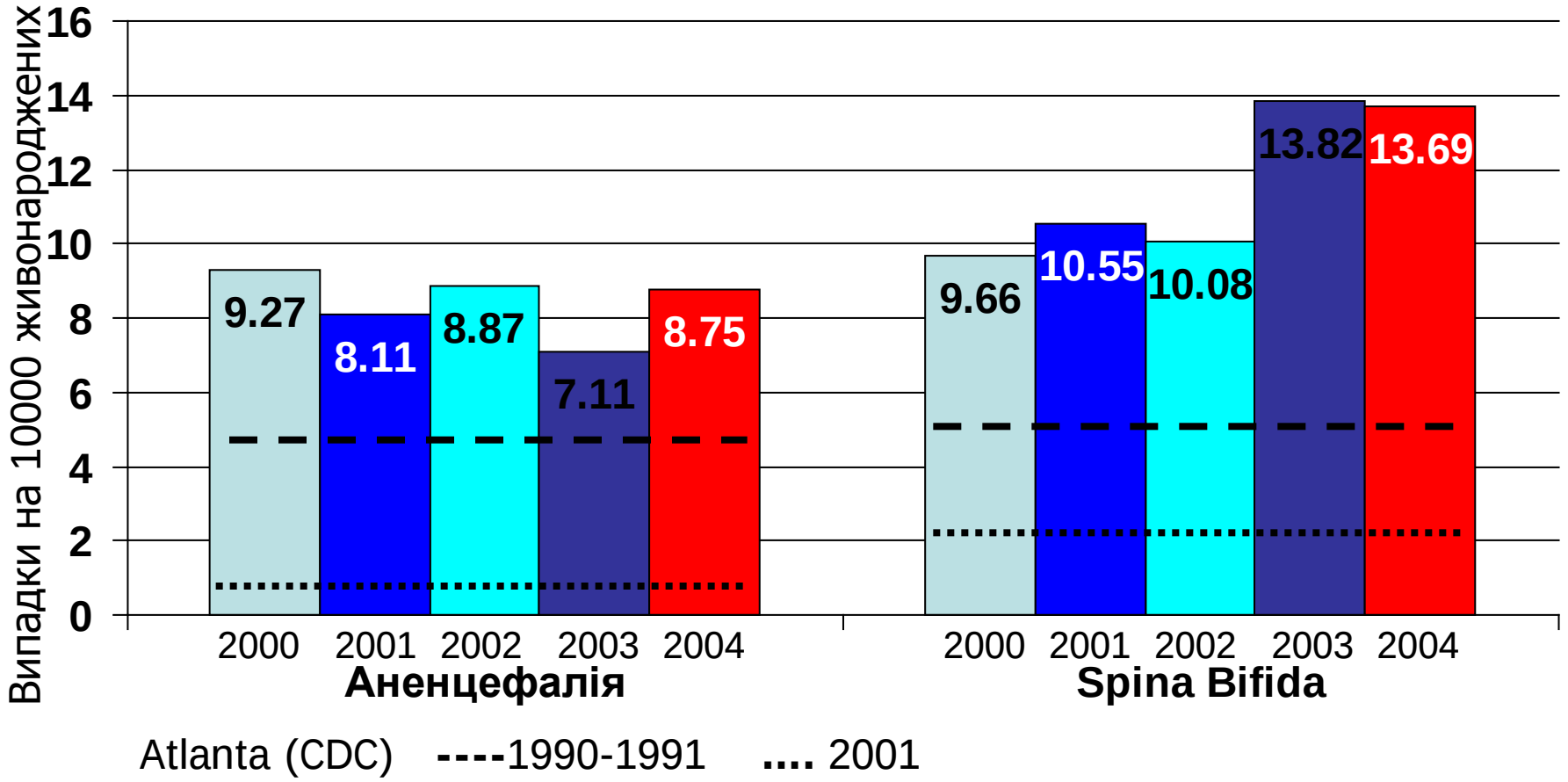
Population Monitoring Data



1998 Planning
1999 Training
2000 BD and Neonatal Population Registires 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



Atlanta (CDC) ----1990-1991 2001

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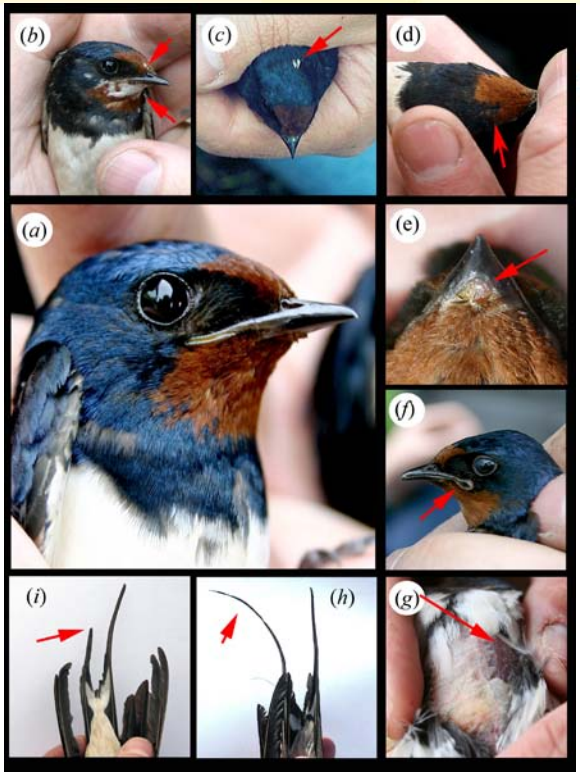
Chernobyl Birds' Defects Link Radiation, Not Stress, to Human Ailments

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



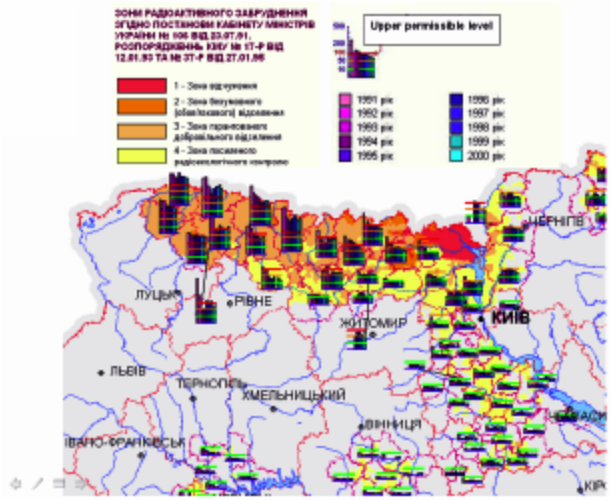
2006

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

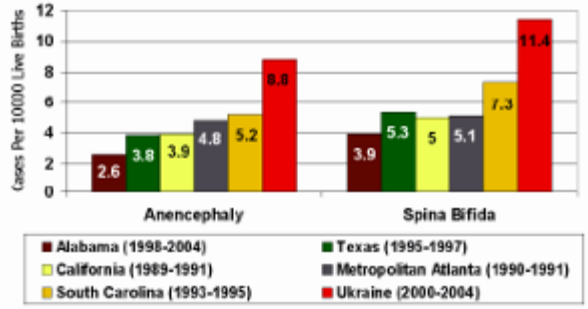
Dr. W. Wertelecki, M.D. [a]

Based on a presentation during the
HUMANITARIAN FORUM
COMMEMORATING THE 20TH ANNIVERSARY OF
THE CHORNOBYL DISASTER
April 25, 2006
Kyiv, Ukraine

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



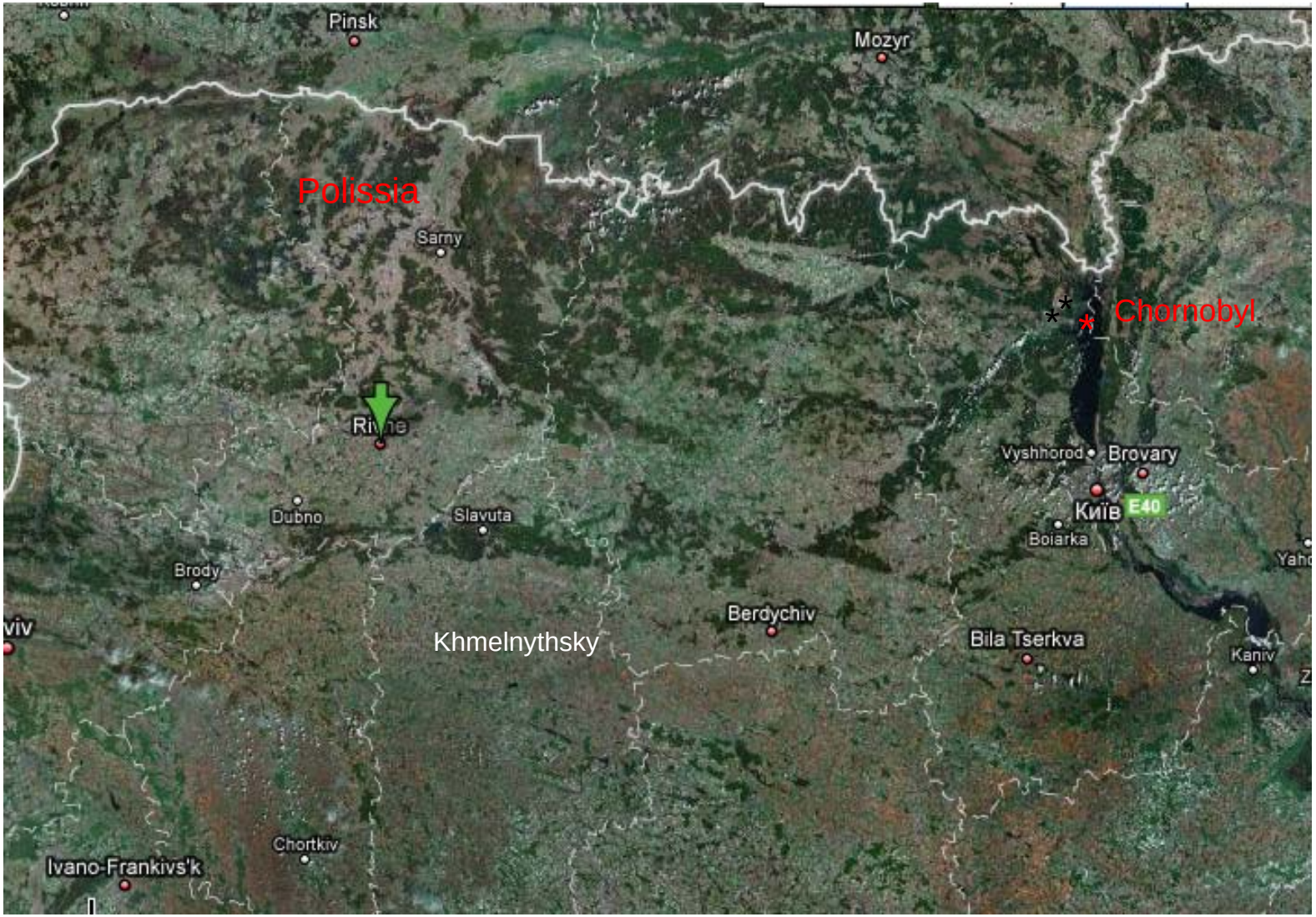
In 2002, we noted elevated rates of spina bifida, anencephaly and encephaloceles, collectively referred to as neural tube defects (NTD). In 2004, we reported a prevalence of NTD in Northwest Ukraine of 21 per 10 000 live births, nearly 4 times what it would have been were the population consuming enough folic acid. [6]



Year	Rivne[a]	Volyn	Khmelnitskyj	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

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


Pinsk
Mozyr
Polissia
Sarny
Chornobyl
Rivne
Vyshhorod
Brovary
Dubno
Slavuta
Київ
E40
Boiarka
Brody
Berdychiv
Khmelnythsky
Bila Tserkva
Kaniv
Chortkiv
Ivano-Frankivs'k

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 Antenatal

1:300000 Neonatal

North-West Ukraine

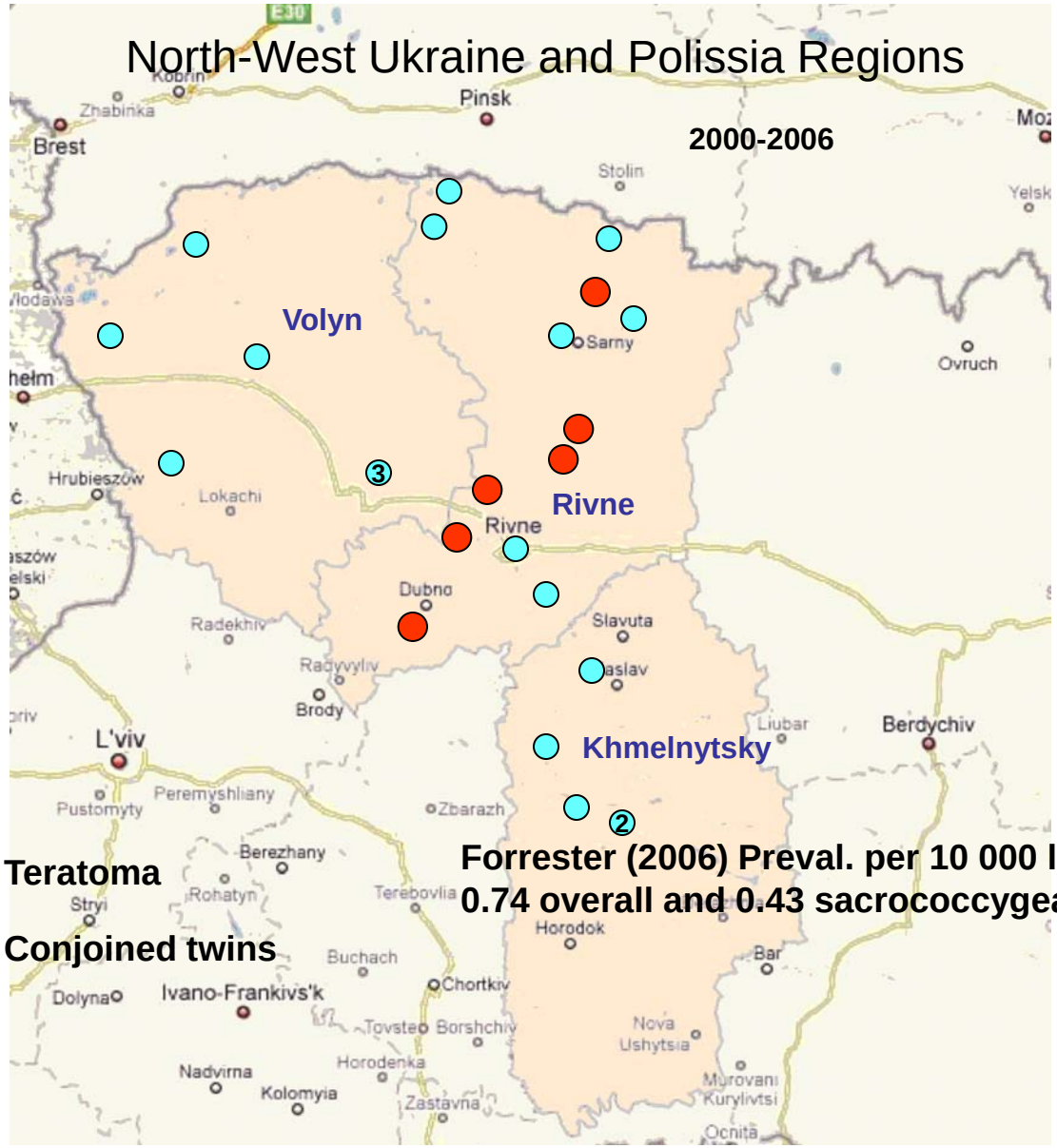
	2000-2006 Rivne Polissia	2000-2006 Rivne Not Pol.	2005-2006 Khmelnytsky
NTD x 10000	27.1	19.5	19.3
CONJ. TWINS	3	3	0
Prevalence	0.69	0.56	0
Continental Eur.	0.09-0.37 (Eurocat)		
Uk/Ireland	0.27-0.39 (Eurocat)		

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



- **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-rachschisis	**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**

2008 08 16b

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)
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END