

- Similar presentations also delivered to the Japanese Teratology Society (July 6, 2012), at the International Clearinghouse for Birth Defects Surveillance and Research and World Health Organization joint meeting (September 28, 2011), to the International Radiation Protection Agency (May 13, 2012 and September 23, 2011)



**Title: Congenital Malformation Studies in Chernobyl Impacted Regions of Ukraine: Lessons Learned**

**Abstract No.** 0061

**Abstract**

**Introduction:** The 1986 Chernobyl disaster triggered public concerns that persist today including teratogenic risks posed by ionizing radiation (IR). We present the process of creating population monitoring systems of congenital malformations (CM) in Ukraine and the results of descriptive population observations. We believe our findings are compelling and call for prospective investigations by international research partnerships (IRP) to investigate the nature of concurrent and synergistic teratogenic impacts causing unprecedented high rates of CM in the Polissia region of the Rivne province of Ukraine.

**Method:** establishing population registries of neonates linked to CM monitoring relying on EUROCAT and ICBDSR methods (European and International CM monitoring consortia). Define population rates of CM from an analysis of 145,437 pregnancy outcomes.

**Results:** elevated rates of NTD (neural tube defects) were noted in north-western Ukraine (2000-2003 Volyn and Rivne provinces data); elevated rates of NTD, microcephaly, microphthalmia, teratomas, and conjoined twins were noted in Rivne province (2000-2005 data); persisting and highest rates of these CM were noted in the Polissia region of Rivne (2000-2009 data). The Polissia is the sole region of Rivne officially designated as Chernobyl impacted where concurrently the transfer index of <sup>137</sup>Cs from soil to plants is the highest in Ukraine. Polissia is mostly inhabited by a well characterized population isolate (Polishchuks). Polishchuk pregnant women have the highest whole body counts of IR and their alcohol consumption during pregnancy is lower than in the rest of the Rivne province.

**Discussion:** population rates of NTD, microcephaly, and microphthalmia in Polissia are among the highest in Europe. We view our observations as sufficiently compelling to justify prospective investigation of DNA damage with consideration of  $\alpha$ ,  $\beta$ , and  $\gamma$  emissions, antioxidants, micronutrients, alcohol, and other factors impacting DNA damage-repair. Our accrued data and experience can facilitate the creation of study cohorts and integration of molecular with population investigations at regional, village and household levels with consideration of endogamy patterns and clinical and sub-clinical observations such as microcephaly or head size, cognition, proximity to operating nuclear power plants, and other confounders.

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