

# Response to Letters to the Editor

In this issue of the *International Journal of Risk and Safety in Medicine* two Letters to the Editor are published concerning a paper by Victor Grech: Births and male: female birth ratio in Scandinavia and the United Kingdom after the Windscale fire of October 1957, which was published in the first issue of 2014 of this journal [1].

This study specifically attempted to identify changes in the male: female ratio at birth in countries potentially exposed to fallout after the Windscale reactor fire of 1957. Countries chosen for analysis were based on two facts:

1. The fallout may have affected the countries in closest proximity, namely the United Kingdom.
2. A Norwegian Defence Research Establishment report clearly showed that the fallout extended over North-East Scandinavia [2].

I understand Alfred Koerblein's contention that a Bonferroni correction be applied when performing multiple tests [3]. However, there was no way to know for certain *a priori* which countries would be most affected as this depends entirely on wind patterns and rainfall. In more recent accidents, there are better ways to identify the location of fallout, which is tracked intensively using isotopes such as  $^{137}\text{Cs}$  as was done following the Chernobyl disaster [4]. This allows better identification of affected countries, thereby allowing researchers to focus their attention [5].

Applying a Bonferroni in the Windscale context may be an application of statistical rectitude but may well result in a type 2 error.

However, in any case, Hagen Scherb has recalculated using a different statistical technique that obviates a Bonferroni correction and has confirmed the original findings of an increase in the male: female ratio at birth following Windscale in downwind countries.

Victor Grech  
*Department of Paediatrics*  
*Mater Dei Hospital*  
*Malta*  
*Tel.: +356 99495813*  
*E-mail: victor.e.grech@gov.mt*

## References

- [1] Grech V. Births and male:Female birth ratio in Scandinavia and the United Kingdom after the Windscale fire of October 1957. *International Journal of Risk & Safety in Medicine*. 2014;26:45-53.
- [2] Storebø PB. Advection of radioactive dust over Norway after the Windscale accident in England October 1957. Kjeller: Norwegian Defence Research Establishment. 1958.

- [3] Dunn OJ. Multiple Comparisons Among Means. *J Am Statistical Assoc.* 1961;56:52-64.
- [4] Chernobyl Forum Expert Group. Environmental Consequences of the Chernobyl Accident and their Remediation: Twenty Years of Experience. Vienna: International Atomic Energy Agency; 2006.
- [5] Grech V. The Chernobyl accident, the male to female ratio at birth and birth rates. *Acta Medica (Hradec Kralove)* – in press.