

## Letter to the Editor

Dear Editor,

With great interest we took note of the article “*Births and male: female birth ratio in Scandinavia and the United Kingdom after the Windscale fire of October 1957*” [1] by Victor Grech in “The International Journal of Risk and Safety in Medicine”. The article by Victor Grech presents a number of historically important observations. From a scientific perspective, this article is a valuable contribution to the issue “radiation and the sex ratio in man” [2].

Measurement of  $^{137}\text{Cs}$  on archive filter materials in Norway and more recent analysis of meteorological trajectories after the Windscale nuclear accident suggest that fallout from the accident extended farther across northern and eastern Europe than originally considered [3]. Therefore, it is self-evident to synoptically compare the sex ratio (or technically sex odds) in appropriately chosen upwind and downwind countries as for example the USA and France (upwind) versus the United Kingdom and Scandinavia (downwind).

Using data provided by the “The Human Mortality Database (<http://www.mortality.org/>)” and applying our spatiotemporal trend analysis methodology [4, 5] we can show that in the affected and downwind countries United Kingdom (UK), Denmark, Finland, Norway, and Sweden combined the sex odds jumps significantly in 1958, i.e. in the year after the Windscale nuclear accident. The jump sex odds ratio SOR is 1.0036, 95%-CL (1.0016, 1.0057),  $p$ -value 0.0004, see Fig. 1 upper curve. No such similar jump in the human secondary sex odds is visible in the upwind countries France and USA combined, see Fig. 1 lower curve. Therefore, our synoptic trend analysis of upwind vs. downwind countries strengthens the evidence provided by Victor Grech of a significant health impact of the Windscale fire in large parts of Europe. As exposure and effect are lagged by the pregnancy length and perhaps partially by the period of spermatogenesis, a somewhat less conservative result obtains when the jump is assumed in 1959 instead of 1958. The jump sex odds ratio SOR is then 1.0040, 95%-CL (1.0019, 1.0061),  $p$ -value 0.0002.

As Victor Grech presented an intriguing new example of a spatiotemporal association between the release of radioactivity and a subsequent sex odds increase in affected countries, he supports our findings of increased sex odds in the USA and in Europe after the atmospheric atomic bomb tests and of increased sex odds across Europa after Chernobyl [6].

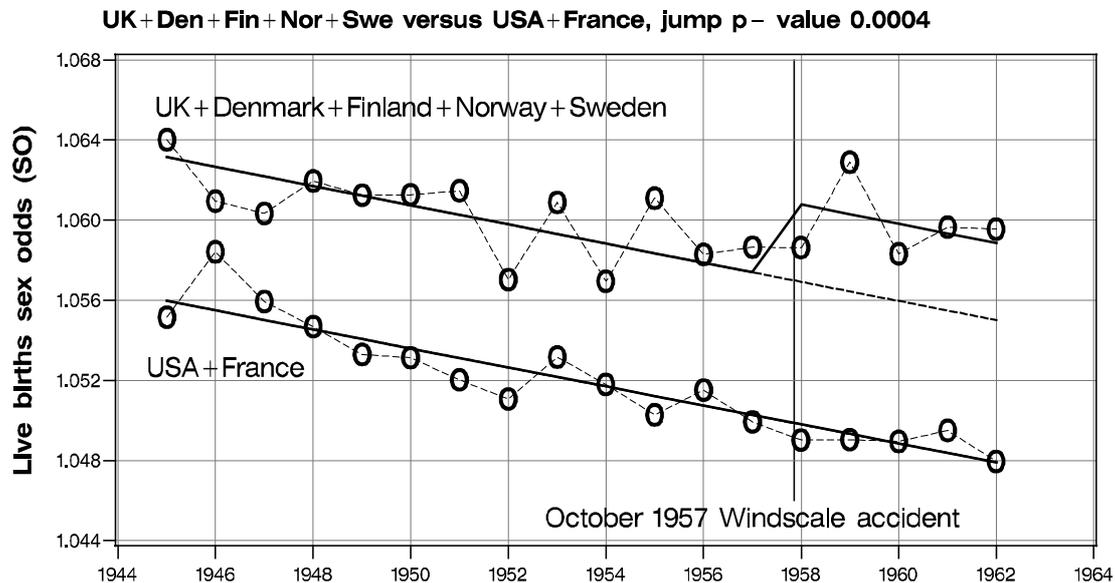


Fig. 1. Synoptic trend analysis of the human secondary sex ratio (or sex odds in technical terms) in the United Kingdom (UK), Denmark (Den), Finland (Fin), Norway (Nor), and Sweden (Swe) combined versus USA and France combined. Estimated jump in 1958, jump sex odds ratio SOR 1.0036, 95%-CL (1.0016, 1.0057),  $p$ -value 0.0004.

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## References

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