

## Letter in response to Pfinder et al on the efficacy of the WHO Guidelines on Iodine Prophylaxis

Dear Editor,

As an instigator of and a participant in, the preparation of the WHO *Guidelines for Iodine Prophylaxis Following Nuclear Accidents: Update 1999* (WHO 1999) I was very interested to see the systematic review by Pfinder, et al. (2016), ostensibly on the efficacy of iodine prophylaxis in reducing thyroid disease in populations exposed to radio-iodine fallout. The authors are to be applauded for their rigorous “sieving” of the pertinent literature that would endorse or otherwise the advocacy of the Guidelines: the author’s systematic literature search identified only four relevant studies out of more than 2000. Unfortunately, the study objective failed to draw a distinction between two uses of the term “iodine prophylaxis”, namely as an ongoing preventive public health measure in iodine deficient areas to prevent goitre and, as an emergency measure anticipating, or in response to, an exposure to radio-active iodine where substantially larger amounts of stable iodine are administered for a short time. The WHO Guidelines (WHO 1999) refer exclusively to the latter. Any effect on thyroid cancer of the former is attributable to the effects of iodine on the prevalence of goitre and not on blocking radioactive iodine uptake.

As to the best of my knowledge emergency stable iodine prophylaxis after the Chernobyl accident was only undertaken, on any systematic scale, in Poland and only exceptionally after the Fukushima Daiichi accident, only the evidence from Bandurska-Stankiewicz et al. (2010) and Zarzycki et al (1994) is likely to shed light on the reliability of the WHO Guidelines.

Zarzycki et al (1994) are concerned with the safety of dispensing relatively large quantities of stable iodine to children as a public health measure and so do not assess the impact of the procedure on thyroid disease incidence. They conclude that there were no major side-effects from the distribution, even though a significant proportion of the adult population were also treated.

So the only information possibly relevant to the Guidelines is that provided by Bandurska-Stankiewicz et al. (2010). The WHO Guidelines (WHO 1999) stipulate that stable iodine prophylaxis should only be provided to children, specifically because it is children that are at risk: the adult thyroid is much less sensitive to radiation and the risks of giving relatively high levels of stable iodine were judged to be higher than for children. Examination of tables II and IV in Bandurska-Stankiewicz et al. (2010), shows that over the study period in the Olsztyn Province there were a total of 7 thyroid cancers in children under 18 years of age and only 12 such children in the control group. This is clearly an inadequate evidence base upon which to draw conclusions.

Bandurska-Stankiewicz et al. (2010), report that Olsztyn Province has a stable population of ~770,000. In their study thyroid cancer registrations were collected from 1994 to 2003, i.e., over a 10 year period. I estimate that there were in that population about 200,000 individuals 0 to 18 years of age. Assuming that the spontaneous rate of thyroid cancer under the age of 18 is in the range 2 to 5 per

million per year, I estimate that there would be between 4 and 10 spontaneous cancers collected by the survey. There were 7, which leaves very little margin for any radiation induced cancer. I also estimate that the period 1994 to 2003 would capture around 60 percent of cancers in those less than 18 years of age induced in 1986 due to radioactive iodine exposure. As there clearly was exposure to radio-iodine in that region, the distribution to children of stable iodine would appear to have been effective, albeit that it was administered after the exposure had commenced.

I don't think there is any doubt that appropriately administered stable iodine prophylaxis will reduce the incidence of radio-iodine induced thyroid cancer. Following the publication of the Update (WHO 1999) some WHO Member States opposed the Guidelines on the grounds of cost. However, there is a price to pay when iodine prophylaxis is not made available: in Fukushima Prefecture a large scale ultrasound screening programme of those 18 years of age or younger at the time of the Fukushima Daiichi accident is ongoing. In the first round of screening (2011-2013) the baseline prevalence was measured. In the second round (2014/15) still to be completed, newly diagnosed cases have been reported, that is, appear to have been initiated since the first round, but the predominance of very young ages at exposure as observed from 1989 onwards after the Chernobyl accident is not seen. Over the two rounds combined 184 cases had been diagnosed by the end of last year. These costly results are causing considerable concern in the population, arguably fuelling a potentially damaging psychosocial effect.

That just leaves the question of the value of time and resource consuming systematic reviews, such as that reported by Pfenders et al (2016). One lesson from this exercise would appear to be that in spite of the ready availability of automated literature search engines it is still helpful if review authors read the studies they capture.

Yours faithfully,

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## References.

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