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**Re. Thyroid Cancer Among Young People in Fukushima**

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ACCEPTED

***To the Editor:***

Tsuda et al.<sup>1</sup> reported the current findings of a large-scale thyroid disease screening program in Fukushima Prefecture, Japan, following the release of radionuclides, in particular iodine-131, from the accident at Fukushima Dai-ichi nuclear power station in March 2011. They suggest that these findings indicate an increase in cases of thyroid cancer that is attributable to the accident. We were members of an International Expert Working Group established by the World Health Organization to perform an initial assessment of the health consequences of the Fukushima Dai-ichi accident<sup>2</sup>, and we have serious concerns over this interpretation of Tsuda et al.<sup>1</sup>.

Thyroid disease screening with ultrasound can have a dramatic effect on the detection of thyroid nodules. A 15-fold increase in the incidence of thyroid cancer occurred in South Korea after the introduction of a national cancer screening program in 1999, with the incidence rate in regions increasing in direct proportion to the proportion of screened people<sup>3</sup>. Consequently, it is inappropriate to compare the data from the Fukushima screening program with cancer registry data from the rest of Japan where there is, in general, no such large-scale screening. The proper comparison is between different screened areas within Fukushima Prefecture, since significant radioactive contamination from the accident was confined to a relatively small part of the prefecture.

There is no statistically discernible difference in thyroid cancer prevalence between the low, intermediate and high contamination areas of Fukushima Prefecture. The prevalence ratio (PR) for the highest to lowest contamination

areas was 1.08 (95% CI: 0.60, 1.96), and the highest prevalence was seen in the area with an intermediate level of contamination (PR= 1.21 (95% CI: 0.80, 1.82)). Further, the measured levels of radioactivity in thyroids in Fukushima Prefecture were far lower<sup>4</sup> than would be needed to elevate cancer rates as much as Tsuda et al.<sup>1</sup> claim.

The situation in areas of the former USSR heavily contaminated following the Chernobyl accident in 1986 is of relevance here: in these areas, many children received high thyroid doses (much higher than those following the Fukushima accident) and there is a clear and large excess of thyroid cancer in this group. The thyroids of 13,127 Ukrainians, 17 years of age or younger at the time of the accident, were screened between 1998 and 2000<sup>5</sup>. Based on this study, 105 (95% CI: 30, 258) background cases of thyroid cancer would be expected from the first screening in Fukushima prefecture<sup>6</sup>. The good agreement between this point estimate and the number of 112 cases that has been detected up to the end of March 2015 in Fukushima Prefecture<sup>1</sup> does not permit the inference that an effect of radiation exposure has been demonstrated. A more plausible conclusion is that the screening program is finding an anticipated increase in thyroid cancer detection across the prefecture.

## REFERENCES

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