Comment on 'Perinatal mortality after the Fukushima accident'

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Sir,

In their Letter to the Editor[1], Körblein and Küchenhoff discussed in some detail our publication[2] on perinatal mortality in Japan before and after the Fukushima nuclear power plant accidents. Employing annual data from 2002 to 2015 and a slightly different stratification of the Japanese prefectures, Körblein and Küchenhoff essentially confirmed our findings of long-term perinatal mortality increases relative to the prevailing stable secular downward trends. Our analyses were originally based on monthly data from 2001 to 2014. By the end of the year 2018, further official monthly perinatal data of the Japanese prefectures for the years 2016 and 2017 became available. Thus, it is now possible to extend our initiating analyses by 3 more years of data, namely from January 2015 through December 2017, which amounts to a considerable enhancement of statistical power and precision. Figures 1 and 2 show the monthly perinatal mortality (2002–2017) in the 6 severely contaminated prefectures Fukushima, Gunma, Ibaraki, Iwate, Miyagi, and Tochigi as well as in the 3 moderately contaminated prefectures Chiba, Saitama, and Tokyo, respectively. The jumps in perinatal mortality in January 2012 presented in Figures 1 and 2 corroborate, firstly, Körblein and Küchenhoff's results and, secondly, our preliminary findings based on the initial 3 years after Fukushima. Importantly, also after the Chernobyl accident long-term relative increases in stillbirths and perinatal mortality were reported along with

exposure-dependent increases in congenital malformations.[3,4] Consistent with these observations after major nuclear accidents, Kaori Murase et al.[5] demonstrate an increasing number of surgeries for severe congenital heart malformations throughout Japan after Fukushima. Murase et al. suggest indirectly that one of the causes of perinatal death includes severe congenital heart diseases. We recommend and hope that responsible scientists and institutions will continue to document and scrutinize the prevalence of perinatal deaths and congenital malformations in Japan more comprehensively over longer periods of time and stratified by exposure.

Sincerely,

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References

1. Körblein A, Küchenhoff H. Perinatal mortality after the Fukushima accident. Journal of Radiological Protection, 2017; 37(3): 800.

2. Scherb H, Mori K, Hayashi K. Increases in perinatal mortality in prefectures contaminated by the Fukushima nuclear power plant accident in Japan. Medicine (Baltimore). 2016; 95(38): e4958.

3. Scherb H, Weigelt E, Brueske-Hohlfeld I. European stillbirth proportions before and after the Chernobyl accident. Int J Epidemiol 1999; 28:932-940.

4. Scherb H, Weigelt E. Congenital Malformation and Stillbirth in Germany and Europe Before and After the Chernobyl Nuclear Power Plant Accident. Environmental Science and Pollution Research 2003; Special Issue 1: 117 – 125

5. Murase K, Murase J, Mishima A. Nationwide Increase in Complex Congenital Heart Diseases After the Fukushima Nuclear Accident. Journal of the American Heart Association. 2019; 8, Issue 6 e009486.

Figure legends

Figure 1. Monthly perinatal mortality (2002–2017) in 6 severely contaminated prefectures Fukushima, Gunma, Ibaraki, Iwate, Miyagi, and Tochigi; logistic regression model (solid line) adjusted for direct earthquake or tsunami effects and allowing for a delayed jump (+10 months) after Fukushima; the broken line indicates the null-effects/null-hypotheses model; jump in January 2012 with jump odds ratio (OR) 1.188 (1.085, 1.301), *P*=0.0002.

Figure 2. Monthly perinatal mortality (2002–2017) in 3 moderately contaminated prefectures Chiba, Saitama, and Tokyo; logistic regression model (solid line) adjusted for direct earthquake or tsunami effects and allowing for a delayed jump (+10 months) after Fukushima; the broken line indicates the null-effects/null-hypotheses model; jump in January 2012 with jump odds ratio (OR) 1.106 (1.035, 1.183), *P*=0.0031.
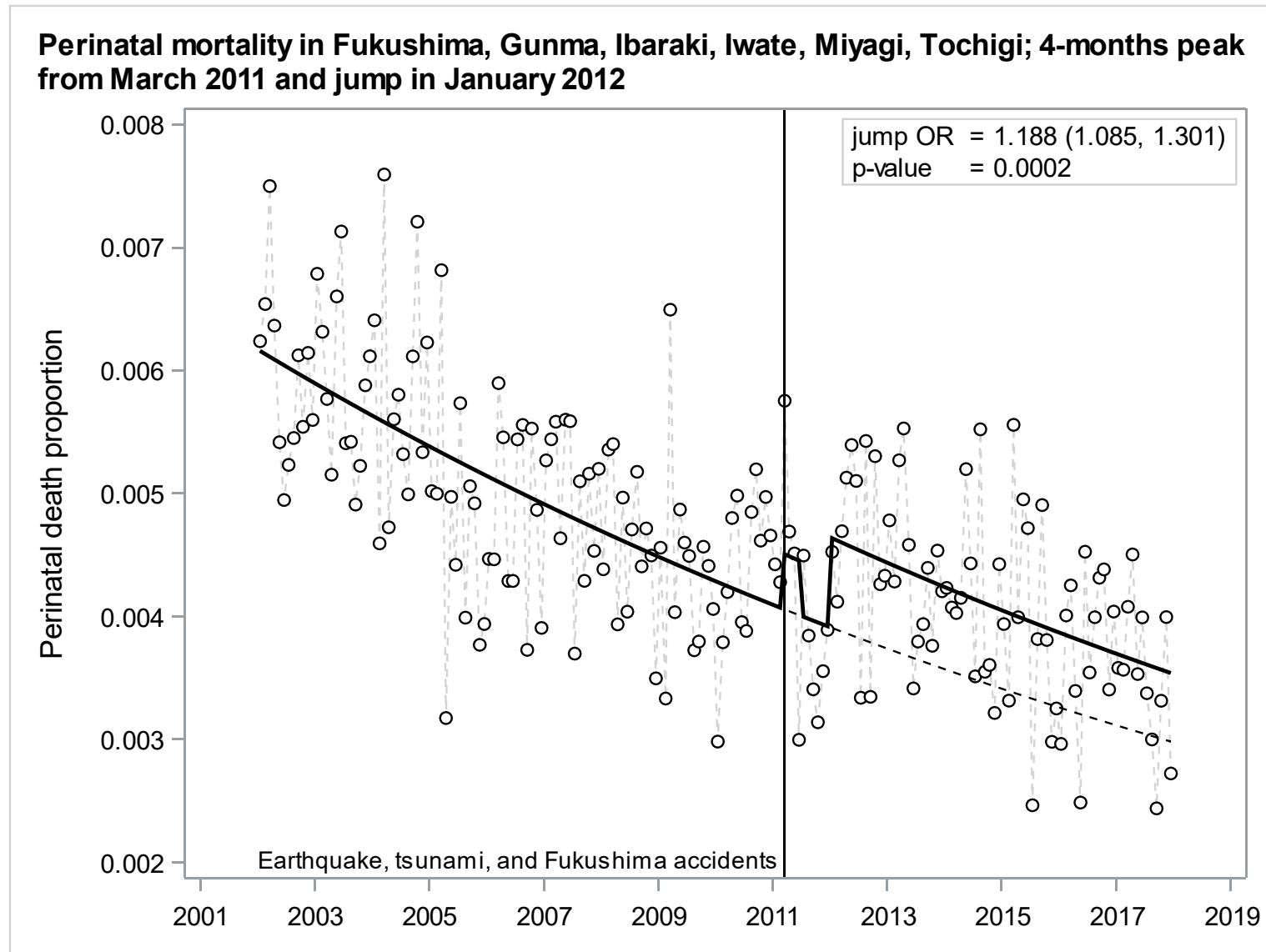
Figure 1

Perinatal mortality in Fukushima, Gunma, Ibaraki, Iwate, Miyagi, Tochigi; 4-months peak from March 2011 and jump in January 2012

Figure 2

Perinatal mortality in Chiba, Saitama, Tokyo; 4-months peak from March 2011 and jump in January 2012