

Letter to the Editor: <https://iopscience.iop.org/article/10.1088/1361-6498/ab17fc>

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PREPRINT UPDATE

Comment on 'Perinatal mortality after the Fukushima accident'

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Sir,

In their Letter to the Editor¹, Körblein and Küchenhoff discussed in some detail our publication² 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, 2, and 3 show the monthly perinatal mortality (2001–2017) in the 6 severely contaminated prefectures Fukushima, Gunma, Ibaraki, Iwate, Miyagi, and Tochigi, in the 3 moderately contaminated prefectures Chiba, Saitama, and Tokyo, as well as in Japan without these 9 prefectures, 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. See also Murase et al. 2018⁶. 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

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Figure legends

Figure 1. Monthly perinatal mortality (2001–2017) 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) 1.169 (1.072, 1.274), $P=0.0004$.

Figure 2. Monthly perinatal mortality (2001–2017) 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 3. Monthly perinatal mortality (2001–2017) in Japan excluding the 3 moderately contaminated prefectures Chiba, Saitama, and Tokyo and excluding the 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 May 2014 with jump odds ratio (OR) 1.043 (1.010, 1.078), $P=0.0109$.

Figure 1

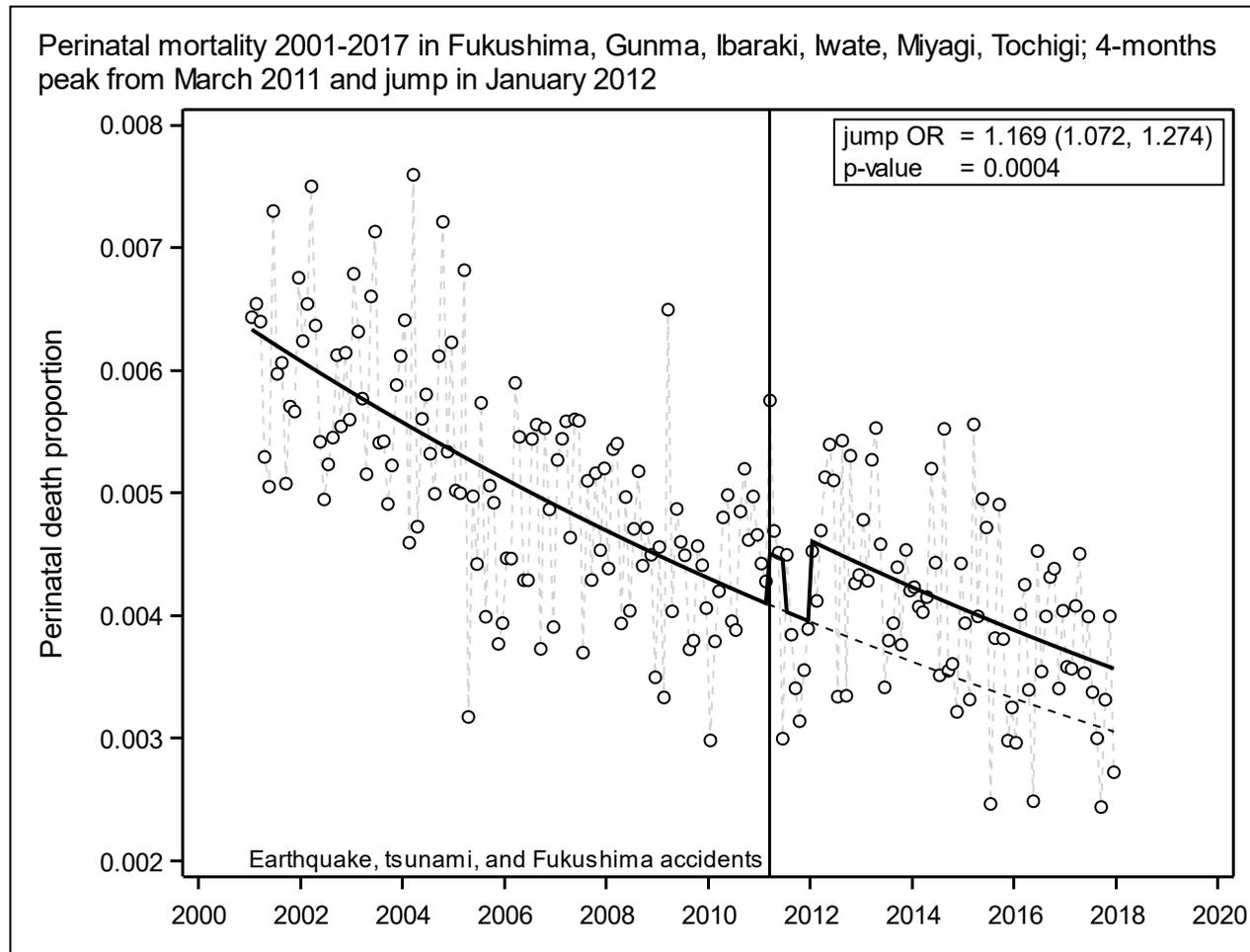


Figure 2

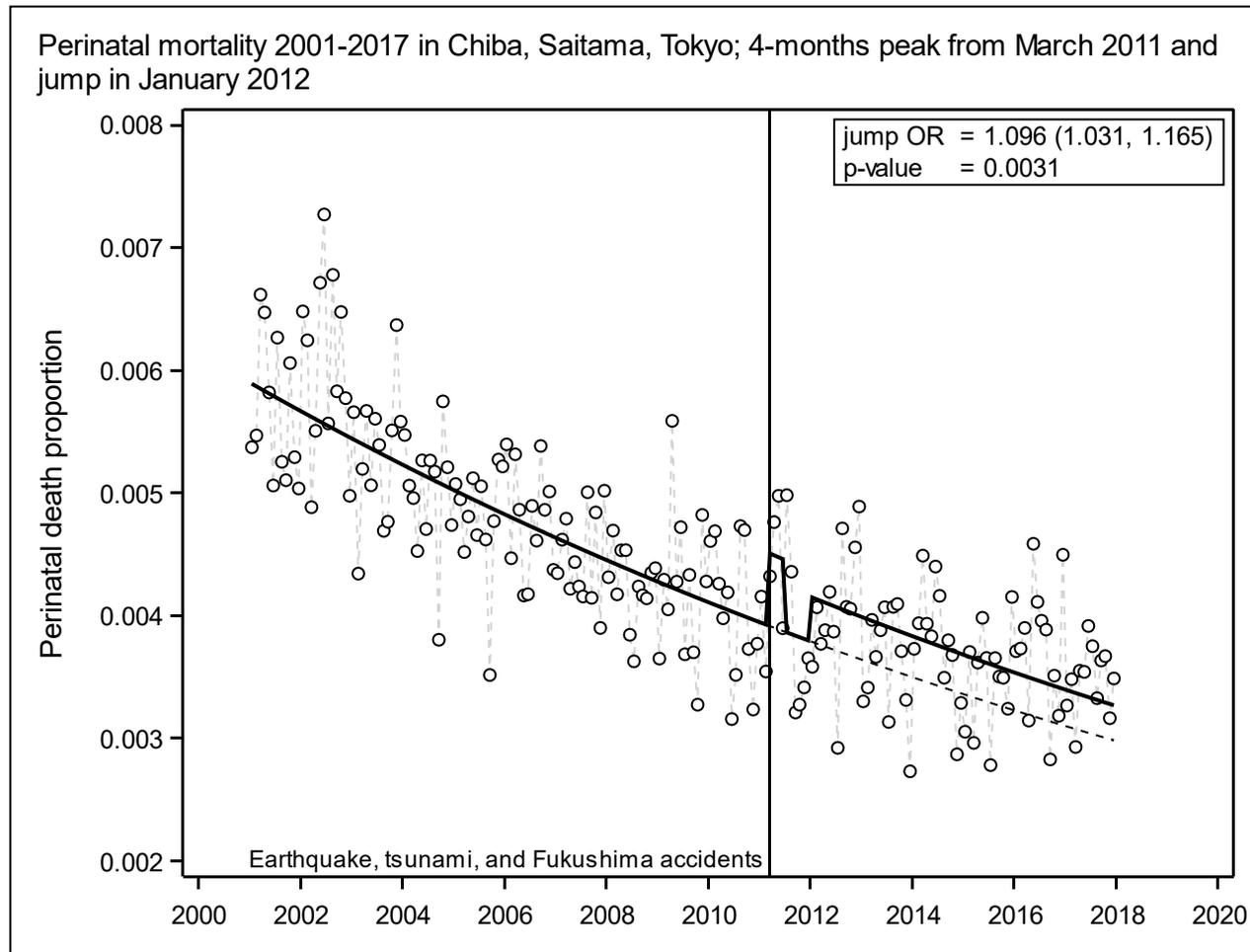


Figure 3

