Association between prenatal mercury exposure with birth outcome in Indonesia

P3-P9

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The relationship between low level of Hg exposure during pregnancy and birth outcomes of children is debatable. We examined the association between hair Hg level of pregnant women and birth outcomes in Indonesia, a fish consuming country. Despite high fish intake, *hair Hg concentrations in Indonesian women were relatively low* and were *not associated with birth outcomes*.

BACKGROUND

- Methylmercury (MeHg) is a well-known neurotoxin that can **cross both the blood-brain and blood-placental barriers**. The relationship between **low level of Hg exposure during pregnancy and birth outcomes of children is debatable**. Since the main source of Hg is marine species, the government of some countries including the US and Japan provide a guideline of fish intake for pregnant women.
- Although the consumption of marine fish in Indonesia has been increased in the last decades, studies in the association between maternal Hg exposure and birth outcomes of their children are quite limited.

METHODS

- Study design & Time: a **cohort study** in 2018-2019
- Study participants: **304 pregnant women** with a singleton pregnancy and their children
- Area & Time: Semarang and Jepara, Indonesia
- Sampling material: Hair samples from women during the second trimesters
- Collected information: age, height, weight, lifestyles, socioeconomic status, fish consumption, history of previous delivery and medical history
- Hg measurement: Cold vapor atomic absorption method
- Outcomes: Gestational age, and body weight and length of babies at birth

Table 1. Characteristics of participated mothers, 2018-2019

	Total (N=304)	Semarang (N=118)	Jepara (N=186)	P value
Age (median)	28	29.5	27	0.117
	(27-29)	(27-31)	(26-29)	
BMI (median)	22.7	22.8	22.6	0.909
	(22.2-23.3)	(22-24)	(22.1-23.4)	
Education				
Primary/Secondary	147 (48%)	38 (32%)	109 (59%)	<0.001
High school	132 (43%)	70 (59%)	62 (33%)	
University	25 (8%)	10 (8%)	15 (8%)	
Income*				
< 1,000,000	47 (15%)	3 (3%)	44 (24%)	<0.001
1,000,000 ～	99 (33%)	23 (19%)	76 (41%)	
2,000,000 ～	143 (47%)	83 (70%)	60 (32%)	
5,000,000 ～	15 (5%)	9 (8%)	6 (3%)	

* Indonesian Rupee

COI: The authors have no COI to disclose.

A part of this presentation was published in **International Journal of Environmental Research and Public Health, 2022**

RESULTS

- The median (range) of the maternal hair Hg level was 0.510 (0.055-8.169) μg/g, and **most of them were lower the upper limit for pregnant women by USEPA (1.1 μg/g)** (Fig 1).
- Fish intake was not positively related to hair Hg level (Fig 2).
- **Maternal hair Hg level was related to neither birth weight nor birth length** (Fig 3, Table 2).

Fig 1. Hair Hg distribution

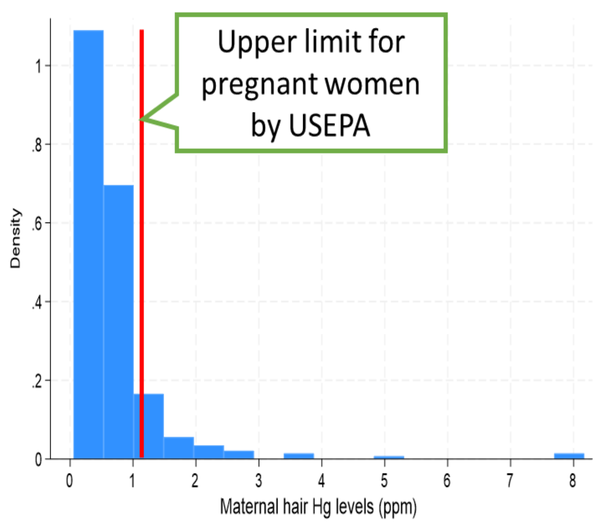

Fig2. Fish intake and Hg level

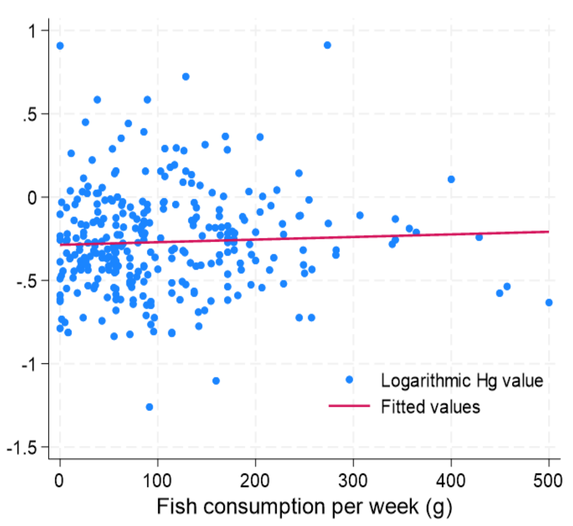

Fig 3. Associations between hair Hg and body length at birth

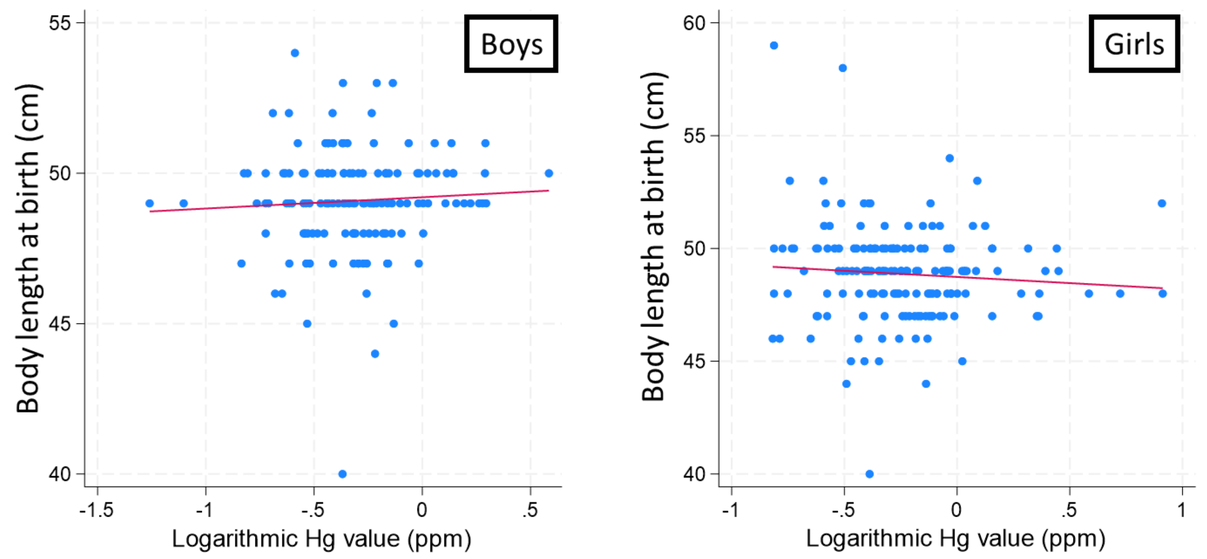

Table 2. Results of multiple regression analysis* on child growth

Outcomes	Regression Coefficient	Standard Error	P value
Birth weight (g)	15.96	25.61	0.534
Birth length (cm)	0.014	0.129	0.913

* Mothers' age, height, BMI, income, and region, gestational age at birth, and sex were included in the model.

CONCLUSIONS

- Despite high fish intake, hair Hg concentrations in Indonesian women were relatively low and were not associated with child growth. This is due to the fact that the fish consumed mainly in this country are mostly small fish species and have low Hg levels.
- At this point, it is not necessary to alert the local population, but as a country with remarkable economic development, future environmental monitoring should be continued.

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