Analysis of the Family Life Surveys in Indonesia: The Contribution of Wheat Flour Fortification to Improving Anemia

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2012

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Global Epidemiology
2014

Abstract

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Objective
Mandatory wheat flour fortification with electrolytic iron, zinc, thiamine, riboflavin, and folic acid became effective in Indonesia in 2002. There have been no evaluations of the effectiveness of wheat flour fortification on improving hemoglobin concentrations. This study estimated the contribution of wheat flour fortification to the change in hemoglobin concentration and anemia prevalence from the period before to after the introduction of mandatory fortification.

Methods
The Indonesia Family Life Survey is a longitudinal study that followed over 30,000 Indonesians from 1993 to 2008. Data from 5,828 non-pregnant women of child-bearing age with hemoglobin measurements in 1997, 2000, and 2007 were analyzed. Anemia prevalence was calculated, adjusting for smoking status and altitude. Logistic regression was used to predict the effect of confounders on anemia status, while linear regression was used for hemoglobin concentration.

Results
Anemia prevalence significantly decreased ($p<0.0001$) from the pre-fortification period during 1997-2000 (34.0%) to the post-fortification period in 2007 (25.2%). The main variable of interest, whether a household purchased foods containing heme iron and flour, only heme iron, only flour, or neither in the past week was not significantly associated with either hemoglobin concentration or anemia status.

Conclusion
Wheat flour fortification does not appear to have significantly contributed to the reduction in anemia prevalence among women of child-bearing age in Indonesia. It is recommended that the fortification iron source be changed from electrolytic iron to a more bioavailable form.

Acknowledgements

I'd like to thank my advisor, Helena Pachón, for all of her guidance and help making this project possible, and my advisor, Harland Austin, for his epidemiologic advice. I'd also like to thank Karen Codling and Annoek van den Wijngaart from the Flour Fortification Initiative (FFI), Siti Muslimatun, Helda Khusun, Otte Santika, and Linda Oey from the Southeast Asian Ministers of Education Organization—Regional Center for Food and Nutrition (SEAMEO-RECFON), Bondan Sikoki from SurveyMETER, Harriet Torlesse and Ninik Sukotjo from UNICEF, and Pak Soekirman and Pak Sunawang from the Indonesian Nutrition Foundation for Food Fortification. Finally, I'd like to thank FFI, the Micronutrient Initiative, the Rollins School of Public Health Global Field Experience Fund, and SEAMEO-RECFON for funding this project.

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