

Abstract:

The Contribution of Wheat Flour Fortification to Reducing Anemia in Indonesia

Objective

Mandatory wheat flour fortification with iron, zinc, thiamine, riboflavin, and folic acid became effective in Indonesia in 2002. There are no evaluations of its effectiveness on reducing anemia. This study estimated the contribution of fortified wheat flour to changes in hemoglobin concentration and anemia prevalence from the period before to after the introduction of mandatory fortification.

Methods

The Indonesian Family Life Survey is a longitudinal study that followed over 30,000 Indonesians. Data from 6,488 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. Households were categorized by their food purchases. Logistic regression was used to predict the effect of covariates on anemia status, while linear regression was used for hemoglobin concentration.

Results

Mean hemoglobin significantly increased ($p < 0.0001$) and anemia prevalence significantly decreased ($p < 0.0001$) from the pre-fortification period during 1997-2000 (12.35 g/dL & 34.0%) to the post-fortification period in 2007 (12.67 g/dL & 25.1%). The proportion of weekly household food expenditures spent on foods containing heme iron and flour remained constant from 1997 to 2007. The percentage of household-purchased foods containing heme iron and flour, only heme iron, only flour, or neither in the past week was not significantly associated with 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.

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