

Implementing a revised standard for wheat flour fortification in Indonesia

A BENEFIT-COST ANALYSIS

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BACKGROUND

In 2002, mandatory wheat flour fortification legislation was introduced in Indonesia as one of the measures to address the widespread burden of micronutrient deficiencies. In 2018, the government revised the legislation and the Indonesia National Standard (SNI 3751:2018) to specify more effective bioavailable iron compounds, in line with the World Health Organization's recommendations. This standard was made mandatory in 2021.

An economic analysis of wheat flour fortification (WFF) was conducted to understand the potential impact of the revised standards and to generate up to date estimates of the possible health effects of the population and economic benefits for the country.





SCOPE

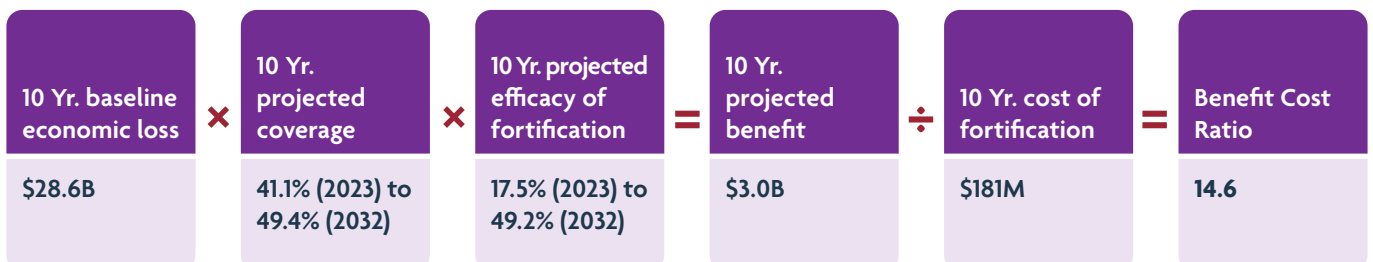
The analysis quantified the economic consequences of not addressing the current high prevalence of iron deficiency anaemia, folate and zinc deficiency in Indonesia over the next 10 years (from 2023–32). A benefit- cost ratio was developed that estimates the health and productivity benefits of WFF in reducing the current levels of three micronutrient deficiencies mentioned above.

Based on the most recent scientific literature, the assessment measured economic damage via four pathways listed to the right.

- 1 Net present value (NPV) of mortality associated with iron deficiency anemia, zinc deficiency and folate deficiency in children
- 2 NPV of lost productivity due to anaemia-associated cognitive deficit in children and folate deficiency-associated birth defects and disability
- 3 Current value of depressed productivity of adults with iron deficiency anaemia working in jobs that require manual labour and physical strength
- 4 Current value of excess healthcare and welfare services required to address the added burden of folate deficiency related birth defects, as well as to address cases of diarrhoea and acute respiratory infections associated with zinc deficiency.

SUMMARY OF THE BENEFIT-COST ANALYSIS (BCA)

10-year overview of the BCA analytical approach (At 5% discount rate)





KEY RESULTS

- For the year 2023, the economic cost of inaction in addressing the burden of iron deficiency anaemia, zinc deficiency, and folate deficiency is an estimated US \$2.79B, which is approximately 0.2% of the national Gross domestic Product (GDP). The projected losses over 10 years are an estimated US \$28.6B.
- Iron deficiency anaemia represents Indonesia's most acute economic burden constituting 87% of total economic consequences, which emphasizes the importance of revising national fortification standards to include a more effective iron fortification compound.
- The current prevalence of micronutrient deficiencies is associated with the deaths of nearly 20,000 children annually. As the consumption of wheat flour products continues to expand, fortification is expected to benefit approximately half of the population by 2032.
- Wheat flour fortification is projected to decrease the national prevalence of iron deficiency anaemia by 7.2–9.9% and zinc deficiency by 15.6–21.6% annually in children and adults between 2023–32. Over the next decade, a total of 45M cases of iron deficiency anaemia and zinc deficiency could be prevented in Indonesia through WFF. Additionally, national rates of folate associated birth defects are predicted to decrease by approximately 25%.
- Of the US \$28.6B economic losses over the course of 10 years, WFF may prevent US \$3.0B in the form of net present value of reduced mortality and improved future productivity
- The increased cost to mills for fortification is projected at US \$2.05 per MT flour. For consumers, this suggests an invisible daily cost of approximately US \$0.10 per person, per year.
- As national consumption continues to increase, annual fortification costs are projected to rise from US \$14.7M in 2023 to US \$21.9M in 2032.
- An estimated 10-year investment of US \$181M in fortifying wheat flour for a benefit of US \$3.0B indicates that every \$1 invested in WFF will bring a return of US \$14.6 in increased economic activity over the next 10 years (2023–32).

CONCLUSION

There is a clear health and economic argument for continued investment to implement and improve wheat flour fortification in Indonesia.





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