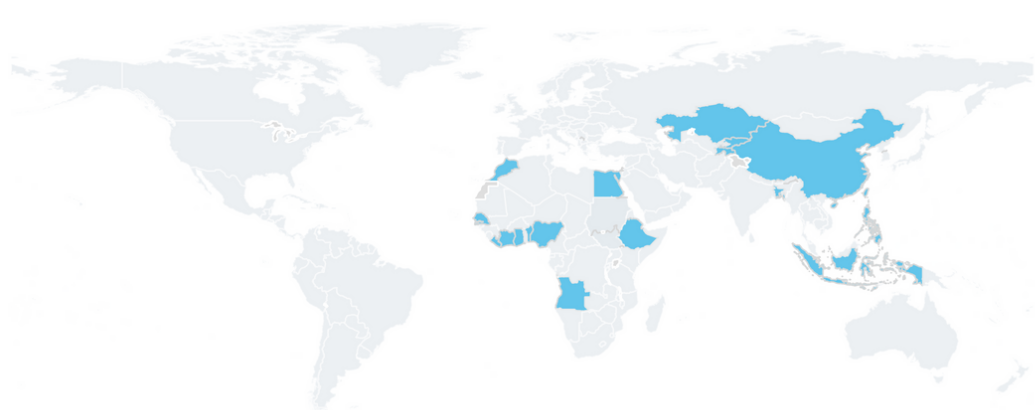


Preventing Anemia and Neural Tube Defects (NTDs) in Low- and Middle-Income Countries through Food Fortification with Iron and Folic Acid

Food fortification can help reduce the staggering number of preventable birth defects and anemia, moving the world closer to achieving child mortality reduction and health equity by 2030 for the United Nations Sustainable Development Goals.



The 18 high-priority countries identified in this study to have the greatest potential for economic and health improvements if wheat flour and / or rice were fortified are colored in blue

This recently published study*, which used a multi-disciplinary approach led by the Food Fortification Initiative, Emory University's Center for Spina Bifida Prevention, and Nutrition International, identified **18 low- and middle-income countries** with greatest potential for economic and health improvements related to NTDs and anemia through large-scale wheat flour and/or rice fortification with iron and folic acid.

Potential benefits of effectively implemented fortification programs in the 18 priority countries:

Avert 72.1 million cases of anemia among non-pregnant women of reproductive age; **51,636 live births** associated with folic acid-preventable NTDs; and **46,378 child deaths** associated with NTDs annually



34% reduction in number of anemia cases and **38% reduction in NTDs**

5.4 million DALYs (disability-adjusted life years) prevented annually



\$31.8 billion USD of economic value generated for women and children beneficiaries annually

Estimated annual health and economic benefits of fortification at scale in countries of interest:

Country	Number of People Reached (Millions)	Cases of Anemia in WRA Averted	Cases of NTDs Averted	Child Deaths Averted	DALYs Averted	Economic Value of DALYs Averted (in Millions of USD)
Angola	9.0	365,698	816	769	57,522	383
Bangladesh	144.6	3,194,605	4154	3857	369,392	594
Benin	10.3	503,202	375	354	38,998	64
China	1284.8	28,831,810	14,037	11,681	1,701,396	20,298
Côte d'Ivoire	12.3	559,521	142	134	26,294	93
Egypt	88.6	1,896,955	2077	1783	161,352	699
Ethiopia	84.5	1,695,531	1397	1315	140,088	141
Ghana	20.0	722,468	531	499	54,008	147
India (17 states)	553.1	24,950,107	22,006	20,410	2,198,103	5532
Indonesia	24.5	540,840	312	274	35,071	196
Kazakhstan	16.5	429,785	62	53	16,768	370
Kyrgyzstan	5.7	169,646	36	29	7666	17
Liberia	2.8	105,235	92	87	8555	6
Morocco	32.4	1,016,226	547	454	66,193	310
Nigeria	109.4	5,374,530	3731	3519	362,564	2364
Philippines	80.7	809,657	1089	954	102,517	537
Senegal	14.2	653,907	171	161	32,183	64
Tajikistan	7.8	273,501	61	47	11,371	29
Total	2.5 B	72.1 M	51,636	46,378	5.4 M	31.84 B

DALYs: disability adjusted life years; NTDs: neural tube defects; USD: United States dollar; WRA: women of reproductive age; B: billion; M: million



Call to Action

There is a tremendous opportunity in the identified 18 priority countries for fortification to have a positive impact on health and national economies. Although the 18 countries identified are those that were found to have the most immediate impact on prevention of anemia among women and NTDs, this does not mean that additional countries, including those that are high-income or political instability would not benefit from fortification. Stronger support among government leaders and key stakeholders as well as increased regional technical support is needed to make lasting, large-scale change for a smarter, stronger, and healthier future.

*Kancherla, V., Chadha, M., Rowe, L., Thompson, A., Jain, S., Walters, D., Martinez, H., (2021). "Reducing the Burden of Anemia and Neural Tube Defects in Low- and Middle-Income Countries: An Analysis to Identify Countries with an Immediate Potential to Benefit from Large-Scale Mandatory Fortification of Wheat Flour and Rice." *Nutrients* 13(1): 244. <https://doi.org/10.3390/nu13010244>