

Double fortification of salt with iodine and folic acid is a viable and well-timed addition to folate supplementation in Ethiopia!!!

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Neural tube defects (NTDs) are largely preventable birth defects where the fetus is affected by one or more of the three major subgroups namely anencephaly, spina bifida, or encephalocele. Spina bifida and anencephaly are the commonest forms of NTDs that occur by 28 days after conception, a period most women are unaware of their pregnancies [1]. Fetal loss (miscarriage), fetal death (stillbirth), elective termination of pregnancy for fetal impairment or an affected live birth is the outcome of NTD-affected pregnancies. NTDs affect approximately 300,000 babies each year worldwide [2] and have continued to be significant public health problems in Ethiopia. Recently, NTD prevalence of 126 per 10,000 births after 12 weeks of gestation and 138 per 10,000 births were reported from Addis Ababa [3] and Tigray [4, 5], respectively.

Randomized trials have unequivocally demonstrated that folic acid prevents a large proportion of spina bifida and anencephaly in the early 1990s [6]. Thus, the high burdens of NTDs in Ethiopia are believed to be largely due to inadequate dietary intake of folic acid during the pre-conceptional period or early days of pregnancy. Nationally representative study from Ethiopia indicated that 46% and 21.2% of women of reproductive age had severe and marginal folate deficiencies [7]. Similarly, folate deficiency was high (32%) in Ethiopian non pregnant women of reproductive age without significant differences in women from rural (31.4%) and urban (33.1%) communities [8].

Preventing NTDs is a high-value opportunity to improve childhood survival and health in low and middle income countries. Yet, NTD prevention is lagging in Ethiopia despite the high reported incidence as high as 138 per 10,000 births in Tigray [5]. Evidences suggest that termination of pregnancy after the introduction of routine serum alpha-fetoprotein measurements, advances in

ultrasonography resolution for in utero early detection, termination of affected pregnancies, folic acid supplementation and food fortification have contributed to the reduction of NTDs worldwide. For example, the prevalence of NTDs in England and Wales was 38.0 per 10,000 live births in 1965, which steadily declined to 1.4 in 1997, a reduction of 96% [9]. Large scale wheat flour folic acid fortification program resulted in significant improvements in folate status among women of reproductive age from Tanzania [10]. Costa Rica showed a significant reduction in NTD (60 %) and the prevalence of NTDs decreased from 18.6 to 7.3/10 000 births from 1999 to 2007 in Chile [11]. Considering the practical advantages of fortification of centrally processed foods, the fortification of salt with folic acid is a reasonable addition to the current supplementation program while further promoting vitamin supplement use and planned pregnancy.

Thus, double fortification of salt with iodine and folic acid is a viable and effective strategy to address the widespread folic acid preventable NTD burden in Ethiopia because salt is consumed universally and at constant levels irrespective of socioeconomic status. Secondly, the double fortification process of salt could be implemented using the existing salt iodization equipment and infrastructures in the country. Third, doubly fortified salt formulations are reported to retain >80% of the folic acid and >90% of the iodine after 12 months of storage at ambient conditions [12].

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