Commentary: Health policies in the US: can they increase or decrease the gap between subgroups of the population? The case of folic acid

Luisa N Borrell

Effective on January 1, 1998, the Food and Drug Administration (FDA) amended the standards to identify several enriched grain products, bromated flour, vegetable macaroni and vegetable noodle products by requiring folic acid fortification. Specifically, the FDA required that these products be fortified with folic acid levels ranging from 0.43 to 1.4 mg/pound or 95 to 309 μg/100 g of product. Although this requirement affects the entire population, the purpose of this amendment was to ensure that women of childbearing age consume the US Public Health Service recommended daily allowance of at least 0.4 mg (400 μg) of folic acid daily to reduce their risk of having a child with spina bifida or other neural tube defects (NTDs). Spina bifida and anencephaly affect approximately 4000 children in the US prior to the folic acid fortification amendment. However, approximately 1000 of these cases have been prevented with folic acid fortification.

As with most conditions in the US, estimates for NTDs vary by race and ethnicity, with Hispanics exhibiting the highest estimates and blacks and Asians the lowest. Moreover, NTDs varies by socioeconomic status defined using income and education with the least educated and those with low income exhibiting the highest estimates.

Low folic acid levels not only affect children in utero, but also evidence suggests that low folic acid levels are associated with increased prevalence of cancer, cardiovascular disease, physical and mental functioning. Thus, despite the fact that the fortification was targeted to women of childbearing age, the FDA amendment could be a preventive paradox for population health by benefiting everyone. The latter could have implications for health disparities across subgroups of the population if differences exist across the outcomes benefiting from the fortification.

Findings from existing studies on folic acid pre- and post-fortification suggest that there are disparities between groups. For instance, Ford and Bowman showed differences in red blood cell (RBC) folate concentrations between non-Hispanic blacks and non-Hispanic whites with the highest differences among those with greater than a high school diploma regardless of gender. Conversely, differences between Mexican Americans and non-Hispanic whites were significant for men with at least 9 years of education and for women at the educational attainment extreme (<9 years of education and more than a high school diploma). Ganji and Kafai showed a decrease in prevalence of low RBC folate between 1988–94 and 1999–2002 across all racial/ethnic and poverty-income ratio groups. However, non-Hispanic blacks continue to exhibit a higher prevalence of low RBC folate through this period.

Unlike previous studies examining trends between the pre- and post-fortification period, Dowd and Aiello focused on investigating the magnitude of the racial/ethnic and socioeconomic status (defined using poverty to income ratio) disparities assessed as absolute and relative differences. Using data from the National Health and Nutrition Examination Surveys (NHANES), Dowd and Aiello examined racial/ethnic and income disparities in folate status in US adults aged 25 years or older before (1991–1994) and after (1999–2002) enactment of the folic acid fortification. They found an increase in relative, but a decrease, in absolute difference before and after the fortification. Non-Hispanic blacks had 1.6 (95% CI: 1.4–1.9) greater odds of having low RBC folate (<362.6 nmol) levels compared with non-Hispanic whites in the pre-fortification period. This estimate was 3.7 (95% CI: 2.8–5.0) in the post-fortification period. In the pre-fortification period, individuals in the bottom income quartile had a 1.3 (95% CI: 1.1–1.4) greater odds of having low RBC compared with those in the highest income quartile. Finally, in the post-fortification period, this estimate was 2.1 (95% CI: 1.6–2.7). The corresponding absolute differences were 233 (pre-) and 121 (post-fortification).
for non-Hispanic blacks and 124 (pre-) and 41 (post-fortification) for those in the bottom income quartile. These measures are not perfect, and Dowd and Aiello elegantly discuss the advantages and disadvantages of using absolute and relative differences for documenting health disparities.

Dowd and Aiello’s study together with existing evidence call attention to the complexity of health disparities among groups of the US population and the implications of health policies to reduce health disparities. For example, the FDA folic acid fortification amendment was implemented as a population-level intervention to target a specific group, childbearing women, to reduce the risk of NTDs. The post-fortification evidence suggests that there has been a reduction in NTDs, but gaps still exist. Further, NTDs are more common among Hispanic women. To monitor trends in the prevalence of NTD in the US, the NTD Ascertainment Project, a population-based birth defects surveillance system, was established by the National Birth Defects Prevention Network’s Neural Tube Defect Surveillance/Folic Acid Education Committee in partnership with the Centers for Disease Control and Prevention. The data obtained from the NTDs Ascertainment Project aggregate all Hispanic subgroups under the Hispanic category. However, the available data used in the studies documenting and monitoring progress, including Dowd and Aiello’s study, only include Mexican Americans, the largest Hispanic subgroup, but the one with better health outcomes regardless of their lower educational attainment, income and health insurance coverage. Thus, the estimates for Mexican Americans may not apply to the entire Hispanic population. The latter represent an example of Type III error, or the right answer to the wrong problem. To determine whether the fortification is reducing the prevalence of NTDs among Hispanics, better data are needed to reflect the heterogeneity of the Hispanic population and identify, which subgroup is carrying the load of NTDs. Moreover, the disparities between non-Hispanic blacks and whites is worrisome because despite the population-level nature of folic acid fortification, non-Hispanic blacks are either benefiting the least from these health policies or are lagging so far behind that we would need a spring board to bring them up to the level of other racial/ethnic groups in the US. Yet, another example of type III error: non-Hispanic blacks together with Asians have the lowest prevalence of NTDs in the US. Thus, we have no idea where minority groups are relative to non-Hispanic whites, the standard comparisons for health status statistics. Now and in the near future, we will never know whether population-level health policies will decrease or increase health disparities among groups (or subgroups) of the US population until better data systems are available to monitor and document health disparities in a continuous and growing diverse US population.

References


