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## Periconception folic acid supplement use in Northern Ireland: A longitudinal analysis of maternity healthcare data 2015–2020

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Folic acid supplement use is involved in the prevention of neural tube defects, the most common major malformations of the central nervous system<sup>(1)</sup>. Women with childbearing potential are advised to take supplements containing 400mcg/day of folic acid in the period preceding pregnancy until the 12<sup>th</sup> week of pregnancy, while some women (e.g., women with obesity) require a higher dose of 5mg/day<sup>(2)</sup>. Despite these public health recommendations, there is limited translation to folic acid supplement use behaviours<sup>(3)</sup>. In Northern Ireland, data on women's self-reported periconception folic acid supplement use can be accessed via the Northern Ireland MATernity System. Using this dataset, the current study reports trends of periconception folic acid supplement use (2015–2020), exploring differences based on women's age, deprivation, pregnancy planning, gravida, and body mass index (BMI) at their antenatal booking appointment.

R, accessed via the UK Secure eResearch Platform, was used to calculate yearly proportions of self-reported periconception folic acid supplement use. To comply with disclosure controls, only complete cases were retained for analyses. When necessary, years were combined (e.g., instead of yearly prevalences, data on BMI was analysed in 2015–2016, 2017–2018, and 2019–2020) and numerical restrictions were applied (e.g., BMI was restricted to values between 14–70kg/m<sup>2</sup>). Patient and Public Involvement and Engagement strategies were adopted throughout the study.

Analyses included 132,205 pregnancies. Under a third of pregnancies were primigravida (30.90%), and less than half of pregnancies were conceived by women with a BMI within the healthy range (44.75%). In most cases (58.96%), folic acid supplement use was initiated after, rather than before, conception. Preconception supplement use of 400mcg of folic acid declined between 2015 and 2020 (34.40%–30.03%) and was especially low in young women (i.e., <25 years old), women living in the most deprived areas, and women who did not report planning their pregnancy. Although postconception supplement use of 400mcg also declined, trends exhibited a slight increase in the last year (2019: 51.38%; 2020: 53.94%). Preconception and postconception use of supplements containing 5mg of folic acid increased throughout the study period (3.57%–4.98% and 4.02%–7.67%, respectively). The most notable increase was observed among women with obesity, especially those with BMI ≥ 40kg/m<sup>2</sup> (preconception: 8.31%–15.70%; postconception: 23.05%–37.97%).

Overall, these analyses of routinely collected maternity data indicate that folic acid supplement use before pregnancy remains suboptimal in Northern Ireland. The use of higher-dose supplements (5mg/day) is increasing for specific population groups, but it remains at a concerning low level particularly in the preconception period. Although based on women's self-reported folic acid supplement use, these findings can provide valuable insights for policymakers and healthcare professionals, informing the development of future interventions and campaigns. These may include long-term awareness-raising initiatives and preconception support for all women, especially at-risk groups.

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