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## Preconception health inequalities in Northern Ireland: a focus on obesity and folic acid supplement use from 255,117 pregnancies

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Obesity prevalence is rising globally. Living with obesity can lead to increased reproductive challenges and compromise preconception health, defined as the overall health of non-pregnant individuals of childbearing age (15–49 years)<sup>(1)</sup>. Folic acid supplement use, considered a key *preconception* health behaviour, is pivotal for the prevention of neural tube defects in offspring<sup>(2)</sup>. Guidelines suggest women with obesity take a higher dose (5mg/day) to reduce the risk of fetal complications<sup>(3)</sup>. This research explored trends in Body Mass Index (BMI) in the preconception and early pregnancy period in Northern Ireland (NI) and the prevalence of folic acid supplement use across BMI categories, exploring differences based on deprivation.

Anonymised national data collected in the Northern Ireland MATernity System (NIMATS) were accessed via the UK Secure eResearch Platform Data, provided by the HSC Honest Broker Service. The NI Multiple Deprivation Measure (NIMDM) (2017) aggregates the rankings of seven specific domains into a single ranking, used to categorise deprivation into quintiles for comparison (Q1 highest deprivation vs Q5 least deprivation). Healthy weight, overweight, and obesity were classified as BMI 18.5–24.99kg/m<sup>2</sup>, 25.00–29.99kg/m<sup>2</sup> and ≥30kg/m<sup>2</sup>, respectively. Folic acid supplement use was self-reported. Multiple linear regressions explored trends in BMI between 2011 and 2021 and  $\chi^2$  tests explored associations between BMI categories and folic acid supplement use from 2014–2021. The 'Healthy Reproductive Years' Patient and Public Involvement and Engagement (PPIE) advisory panel (aged 18–45 years), were involved throughout the study.

The analyses included a total of 255,117 pregnancies, with missing data addressed per variable.

The percentage of women entering pregnancy with a healthy BMI decreased between 2011 and 2021 (48.65%, n = 12,144, and 39.55%, n = 4,316, respectively), while the percentage of women with obesity increased over the same period (18.11%, n = 4,520, and 27.36%, n = 2,986, respectively). Regression models suggested an average increase of ~1 unit of BMI per calendar year in women entering pregnancy (p<0.001). There were higher proportions of pregnancies conceived by women with overweight or obesity in the highest deprivation quintile (Q1, 53.57%) compared to the least deprivation (Q5, 46.37%). Folic acid supplement use was mostly initiated after conception (59.03%) rather than before (37.54%), as recommended. Among women living with obesity, preconception supplement use of 5mg of folic acid was low (8.74%, n = 2,990). Lower proportions were observed for preconception supplement use of 400mcg among women in the quintile of greatest deprivation (Q1, 21.41%) versus least deprivation (Q5, 44.06%).

Analyses demonstrated an increased number of women entering pregnancy with an elevated BMI and suboptimal preconception folic acid supplement use, particularly for women with obesity. It highlights significant health inequalities according to NIMDM regarding obesity and folic acid supplement use. There is a need to address modifiable preconception health risks, particularly for those from lower socioeconomic groups.

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### References

1. Poston L, Caleyachetty R *et al.* (2016) *Lancet Diabetes Endocrinol* 4(12) 1025–1036.
2. Food Safety Authority Ireland (FSAI) Update report on folic acid and the prevention of birth defects in Ireland (2016) [Available at: <https://www.fsai.ie/getmedia/2b1deb65-0bc9-416a-b0db-7cf46355db2f/folic-acid-report-2016.pdf?ext=.pdf>].
3. National Institute for Health and Care Excellence (NICE) Pre-conception-advice and management (2023) [Available at: <https://cks.nice.org.uk/topics/pre-conception-advicemanagement/>].