

EXPOSURE MEASUREMENT ERROR DUE TO RESIDENTIAL MOBILITY DURING PREGNANCY

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Background and Aims: Pregnant women are a highly mobile group, yet recent studies suggest exposure error due to migration in pregnancy is minimal. However, the spatial and temporal variability of the exposure of interest, and the scale at which it is measured, are likely to influence the extent of error introduced. We aimed to investigate the impact of maternal residential moves on measurement error for exposures differing in their spatial and temporal variability.

Methods: Deliveries recorded by the Northern Congenital Abnormality Survey (NorCAS) during 2000-2008 were linked to the UK's National Strategic Tracing Service (NSTS) to provide address at conception. Data on continuous and discontinuous urban fabric were obtained at 100m resolution, and the proportion of each land class within a 500m buffer assigned to each postcode (conception and delivery). Total road length within each buffer was also calculated. We contrasted exposure to these variables based on conception versus delivery address.

Results: NorCAS registered 7428 deliveries during 2000-2008. Of these, 7227 (97.3%) were linked to the NSTS data, and postcode at conception and delivery geocoded for 6970 (93.8%). 1609/6970 women (23%) moved during pregnancy with a median moving distance of 1.7km. Amongst movers, 84% and 38% were 'exposed' to the same proportion (+/- 0-10%) of continuous and discontinuous urban fabric respectively, and 36% were exposed to the same length of road (+/- 0-250m) at conception and delivery.

Conclusions: Exposure does not differ between conception and delivery when assessed overall; increases in exposure in some are offset by decreases in others. Nonetheless, for exposures that show substantial spatial variation, a high proportion of pregnancies would have included measurement error if exposure was assigned at delivery rather than conception. For exposures with both spatial and temporal variability, such as air pollution, the probability of exposure error is likely to be higher.