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Background: Since it is often not possible to make sufficient air pollution exposure measurements for epidemiological and health impact assessments, many studies rely on air pollution modeling such as land use regression (LUR) or atmospheric dispersion (AD) modeling. Generally, these models are only validated using one validation dataset. Further, their estimates at select receptor points are sometimes generalized to larger areas. This may lead to unsatisfactory validation and/or inaccurate insights about the models' performance and suitability for application in larger epidemiological and health impact assessments.
Methods: The primary objective of this paper was to explore the effect of different validation datasets on the validation results of two commonly used air quality models. The secondary objective of this paper was to explore the effect of the model estimates' spatial resolution on the models' validity at different locations. Two air pollution exposure datasets of annual NOx and NO2 were generated using an existing LUR model and a newly developed AD model. These estimates were validated against four different measurement datasets, once when estimates were made at the exact locations of the validation points and once when estimates were made at the centroid of the 100×100m grid in which the validation point fell.
Results: The estimates from the LUR and AD models were weakly correlated ($R2 = 25\%$). The validation results varied substantially based on which model and validation dataset was used. The R2 of the LUR models ranged between 21% to 58%, based on the choice of the validation dataset. The R2 of the AD models ranged between 13% to 56% based on the choice of the validation dataset and the use of constant or varying background NOx levels. With one of the validation datasets (diffusion tubes), the performance of both models was similar. Overall, the validation results based on model estimates at the exact validation site locations were much better than with those based on a grid of 100×100m.
Conclusions: This paper demonstrated the value of validating modeled air quality data against various datasets to obtain a better understanding of the performance of models. The work suggested that the spatial resolution of the models' estimates has a significant influence on the validity at the application point. These results have implications for epidemiological and health impact assessments.

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An Examination of Children's School Travel and Parents' Non-Motorized Travel Decisions: A Focus on Active Travel

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Background: Active travel can provide solutions to both public health and transportation sustainability issues. Switching from vehicle trips to active modes can bring traffic and safety gains, easing congestion and creating a safer, more walkable environment. Furthermore, active travel can contribute to reaching medically recommended levels of physical activity. Walking and biking to school can help school-age children achieve recommended daily physical activity levels. Similarly, parents who are physically active, whether through non-motorized utilitarian trips or trips for physical and recreational purposes, can improve their own health while influencing the decisions of their children.
Methods: This study analyzed the topic of children's school travel decisions and parents' non-motorized travel frequency in order to understand the determinants of these two household-level decisions that affect the overall physical activity levels of household members. The 2009 National Household Travel Survey with the add-on sample for Texas was used for the model estimation. A multinomial logit model was estimated for the children's school mode choice, and a Poisson count regression model was estimated for the parents' non-motorized travel frequency (weekly).

Results: Overall, an opportunity appears to be present for increased active school travel among children in Texas. Rates of walking and biking to school were lower in Texas than the national average. Additionally, the lower rate of walking in the morning indicates that there are children able and willing to walk to school who do so only in one direction. Findings from this research highlight the importance of parental attitudes and characteristics on the school mode choice decision, with notable differences between mothers and fathers. For example, results strongly suggested that mothers' concerns regarding traffic conditions in the neighborhood can discourage children's active mode use. In contrast, fathers' work flexibility seemed to facilitate more non-motorized school travel. Similarly, many factors were important in determining non-motorized trip frequency. A flexible work environment, particularly for the mothers, was observed to increase the overall trip frequency of parents.
Conclusions: Concerns regarding health and physical activity levels have prompted a growing interest in understanding the mode choice decisions. The results from this study corroborate the findings from several earlier studies while also indicating new factors not previously identified. The work done in this study can be extended in several directions. One particularly interesting avenue of future research is to model the two decisions in a joint model to identify the causal direction while accounting for unobserved factors.

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The Health Impact of Rural Transport Deprivation and Social Exclusion in the Older Population: A Systematic Literature Review

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Background: This paper examines the literature on rural transport and social exclusion in regard to the potential health impact in the older population (defined as those aged 60 and over).A lack of access to affordable transport and rurality have been identified as contributing significantly to social exclusion. People are living longer, predictions indicate that by 2024 more than one in four UK residents will be over 60. The ageing process has implications for mobility, this is particularly associated with wellbeing for older people. While previous literature reviews have examined transport related social exclusion, none have addressed it's associated health impact. By acknowledging that social exclusion is a multi-disciplinary concept this review extends existing research to include the health impact of transport related social exclusion
Methods: Database searches identified 751 studies. Of these 32 were identified as pertinent. Search criteria comprised of transport related social exclusion, older populations and rural communities in developed countries. Qualitative and quantitative articles from peer reviewed journals between 2000 to 2017 were reviewed. Findings were analysed using themes of social exclusion, wellbeing, rurality, older age, accessibility and public transport.
Results: Results of the literature review found that older people in general, make fewer, shorter journeys than other age groups. In rural areas, where public transport is unavailable and for those older people who do not have a car, there appears to be a tendency to utilise car-pooling and social networks to access essential services such as doctor's surgeries, hospitals and shopping. Additionally, results highlighted the unmet needs of older people in rural communities. Difficulty accessing public transport presents a barrier for older people's independence and freedom to make leisure trips such as visiting friends and relatives. This presents a physical and mental health disadvantage, particularly for those older people who live alone.
Conclusions: In conclusion, the prevalence of older people relying on social networks and car-pooling for their essential transport needs appears to indicate a disconnect with public transport providers and healthcare services. There are obvious synergies here presenting opportunities to forge links and overcome