Can 20mph (30km/h) speed limit interventions influence liveability? A natural experiment using the Microscale Audit of Pedestrian Streetscapes Liveability (MAPS-Liveability) and Google Street View.

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Background

Liveability is a multi-faceted concept, which informs the work of a variety of fields (e.g., public health, urban planning, infrastructure and transport). Current investigations working to disentangle the complexities of liveability are timely, considering the potential impact of the environment (both built and social) on health and well-being. When considering the challenges of liveability and its improvement over time, it is plausible to hypothesize that by aiming to positively influence a single construct of liveability (e.g., traffic/transport), there is the potential that this will have a ripple effect and beneficially influence liveability as a whole. Consequently, if successful, 'improved liveability' may also have the capacity to act as a mechanism in numerous other public health pathways resulting in beneficial physical and mental health outcomes, and thereby to reducing the burden of health and social and environmental inequalities. Examples of such pathways were proposed by Turner et al., (2018) through their work on 20mph speed limit interventions.

20mph speed limits have become increasingly popular due to the minimal implementation resources that are required, but the potential for far reaching population level public health outcomes. However, work in this field is limited with a recent meta-narrative review investigating 20mph speed limits on public health outcomes identifying limited research exploring their impact on liveability.

Study aim

The aim of this study was to determine whether 20mph speed limit interventions can contribute to improved liveability as assessed using MAPS-Liveability via Google Street View (GSV).

The objectives were to assess liveability both pre- and post-implementation of the Belfast (City Centre) and Edinburgh (Citywide) 20mph speed limit interventions.

Methods

20mph Speed limit interventions

Belfast city centre (2016), 76 streets and £9935 invested (signage, awareness and educational campaign, Traffic limit order and enforcement). Edinburgh city wide (2016-2018), 80% of Edinburgh now 20mph, £2.2 millions invested.

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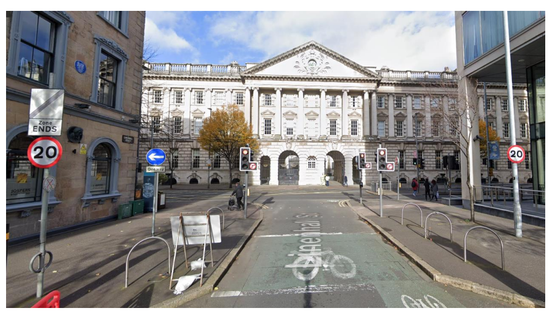
https://www.edinburghlive.co.uk/news/edinburgh-news/new-20mph-speed-limit-edinburgh-17048226



BELFAST

https://www.phpc.cam.ac.uk/pcu/20mph-zones-are-effective-in-reducing-road-casualties-say-researchers/

MAPS-Liveability

MAPS-Liveability provides a reliable (Cleland et al., 2021) quantitative assessment of liveability and its constructs (i.e., safety, health, sustainability, inclusivity, places, education, traffic/transport, roads and pavements) at the micro-level (i.e., street) using GSV. Pre- and post-implementation data collected for Belfast (n=68 streets) and Edinburgh (n=76 streets) by two independent raters, with scores calculated for total liveability and nine liveability constructs.

Statistical analysis

Wilcoxon signed-rank tests (changes pre- to post-implementation), cluster analysis (identification of discrete street clusters) and analysis of variance (differences between clusters) were undertaken. Clusters were then mapped, street type identified and clusters named by determining the predominant street type.

Results

In Belfast and Edinburgh, there were significant increases post-intervention for total liveability, with 57.4% (n=39) of streets in Belfast and 75% (n=57) in Edinburgh recording positive changes. Significant increases in the constructs of traffic/transport (e.g., speed signage) and places (e.g., presence of shops) were observed in both cities. In Edinburgh a significant increase post-intervention for pavements (e.g., quality) was also observed.

Cluster analysis identified three clusters: 1) *Mixed land use*; 2) *Central business district;* and 3) *Residential*. Results showed total liveability was significantly higher in the *Central Business District* and on *Mixed land use streets* in comparison to *Residential* streets. Changes pre- to post-intervention showed total liveability and the traffic/transport construct significantly increased over time for all three clusters.

Conclusion

20mph speed limit interventions can positively contribute to total liveability and liveability constructs (i.e., traffic/travel), particularly when implemented on streets with dense mixed land use.

Implications for practice and policy

Policy makers and practitioners should consider the implementation of 20mph speed limit interventions not only in relation to the direct benefits (e.g., collisions, casualties, pollution) of 20mph speed limits on public health outcomes but also in relation to the improvement of liveability and active living. For the greatest impact, 20mph speed limit interventions should focus on streets that have dense mixed land use. When implementing 20mph speed limits on streets with limited land use (i.e., residential) they could be linked with other environmental and traffic/transport interventions, potentially increasing the magnitude of effect on a range of public health outcomes through direct and indirect mechanistic pathways. Finally, 20mph speed limits offer a potentially cost-effective population level public health intervention as they only rely on signage, awareness raising and enforcement.

Funding: The 'Is 20 plenty for health?' project is funded by a National Institute for Health Research (NIHR) Public Health Research (PHR) grant 15/82/12. This paper presents independent research funded by the NIHR. The views expressed are those of the authors and not necessarily those of the National Health Service, the NIHR or the Department of Health and Social Care.'

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