Sustainable Urban Mobility Plans

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What is already known

Priority of the problem
The World Health Organization highlights risks associated with sedentary behaviour and recommends a minimum level of daily physical activity (PA) for health.[2] A shift towards transport modes enhancing physical activity (TMEPA) could contribute to meeting these recommendations. Similarly, the European Commission has long supported the implementation of Sustainable Urban Mobility Plans (SUMPs) [3] as an approach to strategic and sustainable mobility planning.

Benefits and harms
Public transport (PT) users may gain an additional 8 - 33 minutes of walking attributable to each trip.[4] Walking and cycling, however, are often confined to neighbourhoods, might take more time and effort and cause inconvenience.

Outcome importance
Soft interventions can be very effective and lead to a 7% reduction in car modal split share.[5] Yet the general impact of transport-related policies and interventions on PA levels is poorly understood. The strength of the evidence varied from very low to moderate.

Source: [2], www.eltis.org/mobility-plans/sump-concept, epomm.eu

Fig. 1. Support measures for SUMPs at European level

What our studies add

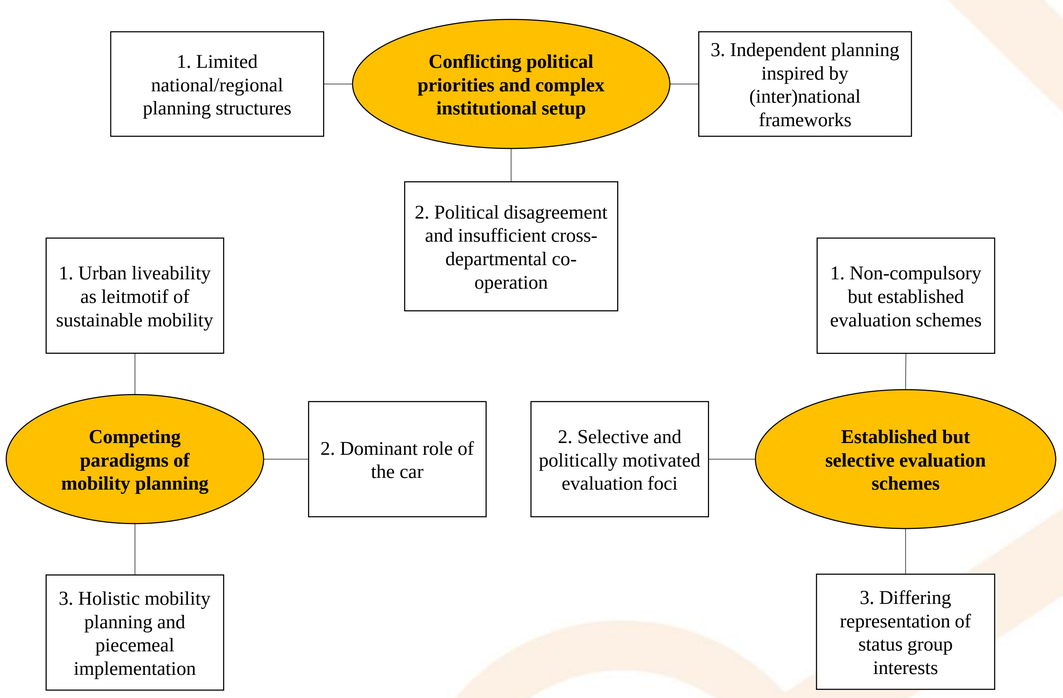

Fig. 2. Thematic map for interviews on SUMP implementation in Copenhagen

Certainty of the evidence
We identified three main transport policy areas contributing to higher PA levels: (i) convenient transport infrastructure development, (ii) TMEPA promotion and (iii) shift of transport mode.[6] Results of a meta-analysis indicate that TMEPA-related interventions significantly reduce car use (Hedges' g=-0,121, 95% CI [-0.22,-0.02]).[7] An evaluation of the effect of SUMP implementation on PA-levels was restricted by data availability. Limited data availability and a variety of indicators impede a cross-city comparative evaluation of the effectiveness of SUMPs.[8]

Feasibility of SUMPs
Complex institutional structures, the dominant role of motorised traffic as well as complex regional and local policy integration hamper SUMP implementation. [8]

Acceptability
In cities advanced in SUMP implementation, mobility strategies are aligned with broader sustainability themes. Cities less experienced in active mobility could utilise a similar strategy. However, car-oriented planning is grounded in culture, nurtured by economic dependencies and perpetuated by hesitant policymakers.[8]

Study limitations
Costs and equity of policy interventions were not assessed.

Policy recommendations

PA goals and measures
1. Most promising are policy interventions aimed at infrastructure development but also educational programmes and any indirect interventions with potential to achieve substantial shifts towards TMEPA.
2. Motorisation rate, modal split, and public-transport use rates were identified as common and suitable indicators for monitoring changes in transport-related PA levels.

SUMP implementation
Sufficient financial resources, horizontal and vertical co-operation between agencies as well as a fundamental emphasis on sustainable transitions are crucial for successful SUMP implementation.

SUMP evaluation
1. Local idiosyncrasies need to be accounted for when assessing the implementation of SUMPs.
2. Consistent indicators and data transparency are essential for comparing the effectiveness of SUMPs.
3. Motorisation rate, modal split, and public transport use rates can be utilised to assess the impact of SUMPs on PA.

Fig. 3. Investments & Education

Literature references
[1] J. Lakerveld et al. https://doi.org/10.1016/j.foodpol.2020.101873; [2] WHO. Global rommendations on physical activity for health. 2010; [3] Rupprecht Consult. Guidelines for developing and implementing a sustainable urban mobility plan, second edition, 2019; [4] C. Rissel et al. doi: 10.3390/ijerph9072454; [5] A. Semenescu et al. https://doi.org/10.1016/J.TRD.2020.102397; [6] J. Żukowska et al. Which transport policies influence physical activity of the whole of society? A systematic review, Journal of Transport & Health (under review); [7] R.Okraszewska et al. The effect of transport-related interventions on increasing physical activity in general adult populations: a systematic review and meta-analysis (in progres); [8] R.Okraszewska et al. Sustainable Urban Mobility Plans in European cities: barriers and facilitators of implementation and potential influence on physical activity, European Journal of Public Health (under review);

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WP6.2 Fact sheet – Additional Text on “What our Studies add”

1. *We found three main **transport policy areas** that contribute to **higher PA** levels: convenient transport infrastructure development, TMEPA (transport modes enhancing physical activity) promotion, and shift of transport mode.*

This statement is based on the manuscript: "Which transport policies influence physical activity of the whole of society? A systematic review"

Current status: Submitted to *Journal of Transport & Health*; under review

Abstract:

Purpose: There is strong evidence of a link between car dependency and physical inactivity. Globally, 7-8% of all-cause and cardiovascular disease deaths are attributable to physical inactivity1. Research consistently shows that, unlike passive transport, active transport is associated with higher total daily physical activity (PA). While there are public policies that support PA in transport and thus, PA levels overall, the specific quantitative effects of such policies on PA behaviour have not been sufficiently studied. This systematic review aims to determine the level and type of evidence for policies in the active transport area that contribute to higher PA levels in society.

Methods: Six databases (MEDLINE (Ebsco), SportDiscus, Cinahl, Cochrane library, Web of Science, and Scopus) were searched for key concepts of policy, transport, evaluation, and PA. Methodological quality was assessed using standardised tools. The strength of the evidence of the impact of the policy was described using four predefined categories: positive, negative, or inconclusive impact: as well as untested.

Results: 17 of 2,549 studies were included in the data synthesis. The authors identified three main transport policy areas with 51 individual policy actions that directly or indirectly affected PA. These were: convenient transport infrastructure development, active travel promotion, and transport mode shift. More than half of the policy actions identified had a positive effect on PA. Study quality ratings were moderate to good.

Conclusions: PA levels can be increased by implementing policies that provide convenient, safe, and connected walking and cycling infrastructures, promote active travel, and support to public transport. There is also strong evidence that active travel policies work best when implemented comprehensively and coherently. This may include infrastructure and facility improvements as well as educational programmes to achieve substantial shifts towards active modes of travel.

2. *Results of a meta-analysis indicate that **TMEPA**-(transport modes enhancing physical activity) **related interventions significantly reduce car use** (Hedges' g= -0,121, 95% CI [-0.22, -0.02]).*

This statement is based on the manuscript: "The effect of transport-related interventions on increasing physical activity in general adult populations: A systematic review and meta-analysis."

Current status: in development

Abstract:

Background: Despite the well-established health benefits of physical activity (PA), most adults do not meet PA guidelines. Transport-related policies and interventions that promote sustainable travel may be promising, but their impact on PA levels is poorly understood. This review synthesises literature investigating the effectiveness of interventions designed to stimulate a shift from car use to active transportation and explores the key factors that may influence the respective (in)effectiveness. The paper systematically updates the earlier study by Sheeper et al. (2014)2.

Methods: A systematic search of PubMed and Web of Science Core Collection bibliographic databases for papers published from January 2014 to June 2020 was conducted in October 2019 and repeated in June 2020. We selected peer-reviewed quasi-experimental or longitudinal observational studies that evaluated transport-related interventions targeted at the general adult population and reported car usage reduction quantitatively. A total of k=27 original studies met all inclusion criteria. We used random-effects meta-analyses for further investigation. Moderator analysis was conducted to identify critical factors that may influence car usage reduction.

Results: A total of 21 studies were included in the meta-analysis. The pooled estimates of the effects of transport-related interventions showed a significant reduction in car use (Hedges' g=-0,121, 95% CI [-0.22, -0.02]). Funnel plot inspection and Egger's test results suggest publication bias, affecting the validity and generalisation of inferences.

Conclusion: Across the 21 analysed studies, TMEPA-related interventions were effective in reducing car use. A shift from car to TMEPA may favour additional daily PA of individuals. However, due to the identified publication bias, the implications of the results are limited and need to be further verified.

Pre-registration: PROSPERO, #CRD42020156636

References

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WP6.2 Fact sheet – Additional Text on “What our Studies add”

3. *Data availability restricts an evaluation of the effect of SUMP (Sustainable Urban Mobility Plan) implementation on PA-levels . Limited data availability and a variety of indicators impede a cross-city comparative* ***evaluation of the effectiveness of SUMPs.***

   Complex institutional structures, the dominant role of motorised transport, and complex regional and local policy integration ***hamper the implementation of SUMPs.***

   In cities advanced in SUMP implementation, mobility strategies are aligned with broader sustainability themes. Cities less experienced in active mobility could utilise a similar strategy. However, car-oriented planning is grounded in culture, nurtured by economic dependencies, and perpetuated by hesitant policymakers.

These statements are based on the manuscript: "Sustainable Urban Mobility Plans in European cities: barriers and facilitators of implementation and their potential influence on transport-related physical activity."

Current status: submitted to European Journal of Public Health (PEN Special Issue), under review

Abstract:

Background: Active mobility and public transport increase physical activity (PA) levels. European cities implement Sustainable Urban Mobility Plans (SUMPs) with varying intensity and effectiveness to spur transport-related PA. The paper examines drivers and barriers to SUMP implementation and assesses their influence on PA across European cities.

Methods: We screened policy reports to gain insights into SUMP implementation in one Danish, two German, and two Polish cities. Further, we conducted semi-structured interviews with SUMP stakeholders in these cities to explore their experiences with SUMP implementation. Thematic analysis of interview transcripts was applied to identify similarities and differences across cities. Finally, to assess the effect of SUMP implementation on PA, we searched for data on indicators of transport-related PA.

Results: All investigated cities are committed to sustainable mobility. Nonetheless, existing institutional structures, the dominant role of motorised traffic as well as complex regional and local policy integration hamper SUMP implementation. Danish, German, and Polish cities face different contexts in terms of financing, national guidelines, and the prominence of sustainability as a policy objective. Each city adopts unique indicators for monitoring the effects of SUMPs on transport-related PA. The variety of indicators and limited data availability impede a comparative evaluation across cities. Constrained by this restriction, we identified motorisation rate, modal split, and public-transport ridership as suitable indicators.

Conclusions: Local idiosyncrasies need to be accounted for when assessing the implementation of SUMPs. Nonetheless, consistent indicators and data transparency are essential for evaluating and comparing the effectiveness of SUMPs and their impact on PA.

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