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Is the impact of transport modes on health an individual determinant of transport mode choice?

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Introduction

→ Modal choice generates individual and public health issues.
→ Modal shift to active and less polluting modes is a valid strategy to reduce:
  • Individual health risk related to (a lack of) physical activity (Tainio et al., 2016).
  • Public health risk related to air pollution (Bouscasse et al., 2022).

Objectives

• Assess the way introducing these two health dimensions in the individual choice process could influence modal shift intentions.
• Account for the perception of health risks in the study of mobility behavior.

Results

• Individual risk reduction: More significant effect in encouraging modal shift compared to public risk when there is a relatively small share of the population (50%) already using alternatives.
• Public risk reduction: Has a larger impact on the mobility preferences than the individual risk reduction with larger shares of the population (75% or 90%).
• Both types of information: the risk reduction is generally under-estimated by the participants.

Method

• Original data: Online Discrete Choice Experiment (June to September 2019). 792 residents of Grenoble Metropolitan Area (France).
• 3 modes of transport: car, public transport and bicycle.
• 4 Attributes: Travel time, Cost, Individual (through physical activity) and Public (Through air pollution) health risk with framing (50%, 75%, 90% shares of the population).

• Illustrating the health risk of developing a cardiovascular disease
  → Use of smileys (Green = health gain risk).

• Discrete Choice Modelling accounting for the perception of risk reduction probabilities using a power transformation (Bouscasse and de Lapparent, 2020; Vuari, 1987).

Conclusion

• Our findings confirm that information on health risks related to air pollution or lack of physical activity both have a significant effect on the preferences of the participants in regards to modal choice.
• Today, in Grenoble, the modal share of people using an alternative mode to the car is rather around 50% or lower, our results indicate that decision makers could play on both the individual and public health impact of modal choices to incent citizens to reduce car usage.

References

Bouscasse, H., Haber, S., Bennaoum, G., Provençal, A., Théba, C., Sarrès, N. B., ... & Sarrès, F. (2021). Designing local air pollution policies focusing on mobility and housing to avoid a targeted number of pollution-related deaths: Forward and backward approaches combining air pollution modeling, health impact assessment and cost-benefit analysis. Environment international, 159, 107034.