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The health and economic benefits of active transport policies in Barcelona

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ABSTRACT

Promoting active travel and public transport has both health and environmental benefits due to increased physical activity, reduced air and noise pollution, and decreased greenhouse gas emissions. Barcelona promoted during the last decade cycling, public transportation, and traffic calming. In this study we i) used the Health Economic Assessment Tool (HEAT) to estimate the health and economic benefits of policies promoting walking and cycling in Barcelona, and ii) assessed trends in road traffic injuries.

We conducted a pre-post evaluation study. First, we compared the number of walking and cycling trips in 2009 to those in 2013. As measurable outcomes, we estimated the number of deaths prevented per year due to changes in the amount of walking and cycling, as well as the economic benefit resulting from these prevented deaths. Second, we analysed trends in the number of road traffic injuries from 2009 to 2013 according to transportation mode.

The number of walking and cycling trips registered on working days in Barcelona increased by 26.7% and 72.5%, respectively. A total of 86 and 8.5 deaths were prevented per year due to the increase in walking and cycling levels, respectively. This resulted in an average annual economic benefit of €47, 3 m due to walking and of €4, 7 m due to cycling (averaged over 5 years), assuming that future benefits are reduced by 5% per year. While the number of walking and cycling trips in the city increased between 2009 and 2013, pedestrian and cyclist injury rates decreased by 26.7% and 1.4% respectively.

In conclusion, changes in transport policies in Barcelona aimed at promoting active transportation created clear health benefits related to physical activity, but increased neither the number of pedestrian nor cyclist traffic injuries. Thus, under the framework of the Health in All Policies, the benefits of active travel support the need for better integration and coordination between transport and health policies.

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1. Background

Insufficient physical activity is one of the leading risk factors linked with morbidity and mortality. The World Health Organization (WHO) European Region estimates that nearly 1 million deaths per year are attributable to lack of physical activity (World Health Organization, 2011). The current transport model, which is still dominated by motor vehicles, is one of the underlying causes of physical inactivity. Transport is an essential aspect of all communities, as it enables the movement of people, goods and services, and contributes to economic and human development (WHO, 2011). However, the increasing number of private motor vehicles is leading to lower investment in public and non-motorized transport, as well as to inefficiency in the transport system. This affects people's health due to increased noise and air pollution, greenhouse emissions, traffic injuries, social isolation, and physical inactivity (de Nazelle et al., 2011).

Transportation is a structural determinant of both health and health inequalities (Borrell et al., 2013), such that transport policies have a high potential for intervention according to the framework of Health in All Policies. The Health in All Policies is defined as “an approach to public policies across sectors that systematically takes into account the health implications of decisions, seeks synergies and avoids harmful health impacts in order to improve population health and health equity” (World Health Organisation, n.d.). This approach has emerged from an understanding that health interventions are more effective and efficient when promoted from outside the health sector (Bauman et al., 2014; Kahlmeier et al., 2010; Kickbusch, 2013; WHO, 2010). This requires collaborative work between sectors to identify win-win interventions that benefit the population's overall health (Kahlmeier et al., 2010).

Promoting active travel and public transport has health and environmental benefits through increased physical activity, reduced pollution and congestion, and even job creation (Unlocking new opportunities. Jobs in green and healthy transport, 2014). Active travel refers to any mode of transport that incorporates physical activity. This can include walking and/or cycling as part of a greater public transport journey, and can be for any purpose, whether to reach work, school or shopping facilities, or to take a social or leisure trip. Active travel increases an individual's level of daily exercise and can help fulfil health requirements for physical activity (Cohen et al., 2014; Transport and Health Study Group, 2011). The health benefits of physical activity outweigh the adverse consequences that arise from mobility, such as the exposure to air pollution and road traffic injuries (de Hartog et al., 2010; de Nazelle et al., 2011; Mueller et al., 2015; Rojas-Rueda et al., 2011a). The availability of walking and cycling alternatives along with the promotion of safer road behaviours can improve equity in terms of both access to transport systems and health outcomes. The implementation of suitable inter-sector policies by health and transport experts could lead to better environments for non-motorized transport users and those belonging to disadvantaged groups. Currently, there is a strong need for urban re-organization in order to integrate the necessary infrastructure. This includes groundwork such as the implementation of continuous pedestrian and cycling networks, along with the construction of bicycle parking facilities. In turn, this type of development would promote walking, cycling and public transport use, as well as their integration into the everyday life of city residents for more than just recreational purposes.

As reported by Bauman et al., to date there has been “little attention to an integrated long-term approach to the measurement and evaluation of Health in All Policies as a concept, or as a set of concrete actions. Thus far, the focus of Health in All Policies evaluation has been on examining the processes of policy formulation and introduction, rather than on the health-related impact or outcomes of these policies” (Bauman et al., 2014). Since this would likely be insufficient to convince decision makers to adopt cross-government public policy approaches (Bauman et al., 2014), the WHO developed the Health Economic Assessment Tool (HEAT) (Kahlmeier et al., 2014) with the aim of creating economic arguments to advocate investment in transport policies. HEAT enables economic assessment of the health benefits of walking or cycling by estimating a value for the reduced mortality that results from specified amounts of walking or cycling at the population level. The tool can be used when planning new cycling or walking infrastructures to calculate an economic value of the reduced mortality when compared to past and/or current levels of cycling and walking. Furthermore, it can aid in developing more comprehensive economic appraisals and provides input for assessing the health impact of these new infrastructures.

With the aim of reducing the number of private vehicles and improving active transportation, various mobility plans have been developed for Barcelona city since the year 2000. The first was the Road Safety Plan (2000) was followed by several other interventions, and the current mobility plan (2013–2018) is structured around four axes: safety, sustainability, equity and efficiency. Some of the interventions developed during the last decade aimed to increase pedestrian priority areas, develop safe school routes, reduce car use through resident-only parking, increase public transport, and implement 30 km/hr speed limit zones, crosswalk audits, bike lanes, and public bicycle-sharing programs. From 2003 to 2014 the number of bicycle lanes was increased by 72%, from a total of 60.9 km of paths to 104.9 km. Traffic calming areas, with maximum speeds of 30 km/h, were implemented in 2007, and reached a total of 442 km in 2014. Moreover, pedestrian zones have increased by 66.2% since 2004, from 61.7 ha to 103.8 ha (“*Mobilitat i Ajuntament de Barcelona*,”).

Have these interventions increased the levels of walking and cycling in the city? Have they had any impact on the population's health? Is it possible to estimate the impact in economic terms? Have the number of pedestrian and cyclist road injuries increased in parallel? While previous studies have assessed some aspects of promoting walking (Olabarria et al., 2014, 2013a, 2013b), public transport, and cycling (Rojas-Rueda et al., 2013, 2012, 2011), in Barcelona, none have assessed the health and economic impacts of changes in the levels of walking and cycling as modes of transport. The HEAT tool provides an opportunity to study these questions within a well-established and standardized framework.

Thus, the aims of this study were i) to estimate the health and economic benefits of policies promoting walking and cycling between 2009 and 2013, and ii) to assess trends in road traffic injuries related to walking and cycling.

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