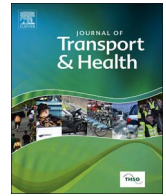




Contents lists available at ScienceDirect

Journal of Transport & Health

journal homepage: www.elsevier.com/locate/jth

The health impacts of traffic-related exposures in urban areas: Understanding real effects, underlying driving forces and co-producing future directions

Haneen Khreis^{a,*}, Karyn M. Warsow^b, Ersilia Verlinghieri^a, Alvaro Guzman^a, Luc Pellecuer^{a,c}, Antonio Ferreira Ian Jones^a, Eva Heinen^a, David Rojas-Rueda^{d,e,f}, Natalie Mueller^{d,e,f}, Paul Schepers^g, Karen Lucas^a, Mark Nieuwenhuijsen^{d,e,f}

^a Institute for Transport Studies, University of Leeds, 34-40 University Road, Leeds LS2 9JT, United Kingdom

^b Johns Hopkins Bloomberg School of Public Health, Department of Health Policy Management, 615 N. Wolfe Street, Room 408, Baltimore, MD 21205, USA

^c École de Technologie Supérieure, 1100 Notre-Dame Ouest, Montréal, Canada H3C 1K3

^d Centre for Research in Environmental Epidemiology (CREAL), C/ Dr. Aiguader 88, 08003 Barcelona, Spain

^e Universitat Pompeu Fabra (UPF), C/ Dr. Aiguader 88, 08003 Barcelona, Spain

^f CIBER Epidemiología y Salud Pública (CIBERESP), C/ Monforte de Lemos 3-5, 28029 Madrid, Spain

^g Human Geography and Spatial Planning, Utrecht University, Domplein 29, 3512 JE Utrecht, Netherlands

ARTICLE INFO

Article history:

Received 24 March 2016

Received in revised form

6 July 2016

Accepted 6 July 2016

Keywords:

Urban transport

Health

Transport policy

Car-mobility

Collaboration

Appraisal

ABSTRACT

The world is currently witnessing its largest surge of urban growth in human history; a trend that draws attention to the need to understand and address health impacts of urban living. Whilst transport is instrumental in this urbanisation wave, it also has significant positive and negative impacts on population health, which are disproportionately distributed.

In this paper, we bring together expertise in transport engineering, transport and urban planning, research and strategic management, epidemiology and health impact assessment in an exercise to scope and discuss the health impacts of transport in urban areas. Adopting a cross-disciplinary, co-production approach, we explore the key driving forces behind the current state of urban mobility and outline recommendations for practices that could facilitate positioning health at the core of transport design, planning and policy.

Current knowledge on the health-related impacts of urban transport shows that motor vehicle traffic is causing significant premature mortality and morbidity through motor vehicle crashes, physical inactivity and traffic-related environmental exposures including increases in air pollution, noise and temperature levels, as well as reductions in green space. Trends of rapid and car-centred urbanisation, mass motorisation and a tendency of policy to favour car mobility and undervalue health in the transport and development agenda has both led to, and exacerbated the negative health impacts of the transport systems. Simultaneously, we also argue that the benefits of new transport schemes on the economy are emphasised whilst the range and severity of identified health impacts associated with transport are often downplayed. We conclude the paper by outlining stakeholders' recommendations for the adoption of a cross-disciplinary co-production approach that takes a health-aware perspective and has the potential to promote a paradigm shift in transport practices.

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* Corresponding author.

E-mail address: ts12hrk@leeds.ac.uk (H. Khreis).<http://dx.doi.org/10.1016/j.jth.2016.07.002>

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1. Introduction

Today, the city is regarded as the primary settlement form, accommodating half the world's population; a trend expected to continue (United Nations, 2014; Vallance and Perkins, 2010). It is estimated that 75% of the European population live in urban areas (European Environment Agency, 2015), which have been and are being shaped, amongst other things, by step changes in transport connectivity and related land-use practices (Eddington, 2006). This is the largest wave of urban growth in human history (United Nations Population Fund, 2015) and a trend which draws attention to the need to understand and address the health impacts of urban living.

Transport is instrumental in this urbanisation wave and is often envisioned as a driver for urban development and a key contributor to economic returns. By way of supporting labour markets, allowing businesses to harvest the benefits of larger catchment areas, and providing “the right connections in the right places” (Eddington, 2006), urban transport networks facilitate the economic growth, competitiveness and social progress of cities (Eddington, 2006; Hall et al., 2014). Yet, the transport sector also has negative impacts on the health of a population, some of which are exacerbated in urban areas. These impacts, as shown in this paper, are particularly connected to the prevalence and use of private motorised transport. In developed countries, there is a cultural and economic dependence on motor vehicles as the primary mode of transport that dominates urban transport design and planning (Gakenheimer, 1999; Jeekel, 2013). Although mass motorisation started much later in developing countries, it is growing rapidly, causing similar problems in many developing cities (Dargay et al., 2007).

When considered at a global level, the adverse health impacts of motor vehicle traffic are striking. Each year, over 1.3 million deaths and 78 million injuries warranting medical care are a result of motor vehicle crashes (MVC) (Bhalla et al., 2014). Traffic-related exposures including increases in air pollution, greenhouse gases, noise and local temperatures and dwindling green spaces have resulted in stressors on the environment and in turn, on the population's health (Nieuwenhuijsen, 2016; Health Effects Institute, 2010). Mass motorisation, low motoring costs, convenience and the associated lack of active travel provision have resulted in reduced opportunities for physical activity and increased sedentary behaviours (Audrey et al., 2014; Mackett and Brown, 2011; Lucas and Pangbourne, 2014; Wanner et al., 2012). Current land-use planning and policy patterns are furthermore reinforcing the excessive use of motorised transport for short distance trips (Cervero and Duncan, 2003; Giles-Corti and Donovan, 2002), further contributing to increased traffic-related environmental exposures and reduced opportunities for physical activity. These trends are all associated with a significant burden of chronic disease and increased premature mortality. For example, air pollution and decreases in physical activity, both to a significant extent, caused by motorised traffic, are associated with annual estimates of 7 million and 2.1 million global deaths, respectively (Forouzanfar et al., 2015). These impacts are disproportionately distributed, contributing further to well-established gross inequalities in health (Marmot, 2005).

Although current trends are not encouraging, there is emerging evidence that health promoting and sustainable transport infrastructure and modes such as cycling, walking and transit access can be effective in promoting active travel (Heinen et al., 2015; Panter et al., 2016; Heath et al., 2006) and can potentially reduce traffic-related environmental exposures (Woodcock et al., 2009; Grabow et al., 2012). These same policies can reduce health inequalities through modifying some of the pathways by which low socioeconomic position can lead to diseases (Lindsay et al., 2011; Maas et al., 2006; Mitchell and Popham, 2008).

The adverse health impacts associated with urban transport and the potential solutions that a change in transport design and planning could offer reinforce the need to develop and implement effective policies that delineate and address health consequences. To this end, a clear scoping of traffic-related health impacts is needed as part of a systematic and systemic transport design and planning approach. In this paper, we conduct a cross-disciplinary literature review to summarise the health effects and impacts of traffic-related exposures and practices considering that motor vehicles are the primary mode of transport in most urban areas. Subsequently, adopting a cross-disciplinary co-production approach (Jasanoff, 2004), we explore and outline the underlying driving forces behind the accepted status-quo and make recommendations for practices that could facilitate a paradigm shift placing health at the core of transport design, planning and policy making.

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