

## TRANSPORT AND HEALTH: A MARRIAGE OF CONVENIENCE OR AN ABSOLUTE NECESSITY

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## Text

The recent diesel scandal has again highlighted the impact that the transport sector can have on public health. Introduced in the 1990s in Europe as a technology to reduce transport CO<sub>2</sub> emissions and mitigate the transport sector's contribution to climate change - whilst improving fuel economy - diesel is now recognized as causing a considerable immediate health burden. This is due to diesel emissions of oxides of nitrogen (NO<sub>x</sub>) and particulate matter, including ultrafine particulate matter, which are much larger than other technologies such as petrol, hybrid or electric engines (Cames & Helmers 2013). The lax regulation and inadequate testing did not help the situation (Schiermeier 2015).

The recent scandal around Volkswagen has thus brought important issues to the attention of the general public: urgent policy measures and action are needed to reduce the large health burden caused by this technology. At the same time, the scandal should bring to light the limitations in the current narrow framing of issues in transport planning and policy: despite the elaborate discourse around the sustainability agenda since the 1970s (Hall et al. 2014), the focus was effectively reduced to CO<sub>2</sub> reduction and engine design, without concretely considering and addressing the larger impacts of transport planning choices. A more systemic approach to transport is thus needed, including a more central role for public health in the planning and policy agenda.

The role of transport in our cities' economic and social development is understood as fundamental. Transport provides opportunities to interact with others and participate in the society; and moves people and goods in an efficient manner supporting a vibrant economy. Shortening travel times and making transportation affordable are some of transport planning key declared goals. There however seems to be less emphasis on the role of transport in public health despite the mounting evidence of the negative environmental, social and associated economic impacts of current transport planning practices including road accidents, toxic air pollution, noise, local environment disturbance, land take and congestion (Gudmundsson et al 2015). These impacts seem to be furthermore unequally distributed amongst the population (Lucas 2004).

The main public health indicators that are generally touched on by transport planners and engineers are accidents, air pollution and to a lesser extent noise exposures. More than 1.24 million deaths (Bhalla et al 2014, WHO 2015), and some 78 million injuries (Bhalla et al 2014)

are due to traffic around the world. Road traffic injuries are the eighth leading cause of death, and as such, are an important global public health problem. They are the number one cause of death among those aged 15-29 years, with again unequal distribution of impacts as middle-income countries have the highest burden and highest road traffic death rates (WHO 2015).

In addition there are the health impacts of traffic-related air pollution. Bhalla et al (2014) estimated that pollution from vehicles is the cause of 184,000 deaths globally, including 91,000 deaths from ischemic heart disease, 59,000 deaths from stroke, and 34,000 deaths from lower respiratory infections, chronic obstructive pulmonary disease, and lung cancer. Lelieveld et al (2015) using more sophisticated source models, estimated that land traffic emissions are responsible for about one-fifth of mortality by ambient PM<sub>2.5</sub> and O<sub>3</sub> in Germany, the UK and the USA, while globally they account for about 5% of the annual 3.3 million premature deaths due to outdoor air pollution. Adding the (less certain) health impacts of NO<sub>x</sub>, as was recently done in London, doubles these numbers (Walton et al 2015). Of course, deaths are only the top of the pyramid and there is a wide spectrum of other health effects of air pollution including well known effects on cardiovascular and respiratory morbidity and cancer (Heroux et al 2015) and emerging evidence for effects on cognitive function, diabetes, obesity and birth weight (Sunyer et al 2015, Eze et al 2015, Jerrett et al 2014, Pedersen et al 2013).

Furthermore, the health effects of noise are increasingly being recognized and can contribute to a large burden of disease that may be comparable to that of air pollution (Basner et al 2014, Hanninen et al 2014). Also, the road network is taking up space, particularly in cities, which reduce space available for green space and thereby potentially causing, amongst others, all cause and cardiovascular mortality and poorer mental health (Gascon et al 2015, Gascon et al 2016).

Finally, current transport planning choices also impact on the lifestyles of the public, directly causing a lack of physical activity. Insufficient physical activity is the 4th leading risk factor for mortality (WHO 2012). Approximately 2.1 million deaths each year are attributable to insufficient physical activity (Forouzanfar et al 2015). People who are insufficiently physically active have a 20% to 30% increased risk of all-cause mortality compared to those who engage in at least 30 minutes of moderate intensity physical activity most days of the week (Woodcock et al 2011). In different regions around the world 20% to 50% of the population do not meet the WHO physical activity guidelines (WHO 2012).

The role of transportation in this must be understood as crucial, as lack of time has been repeatedly listed as a detriment of physical activity (Wilcox et al 2000, Brownson et al 2001) and active transport could provide means to build physical activity patterns into daily routines. This would enable people to both get sufficient physical activity and subsequently improve their health (Hamer and Shida 2008, Bauman et al 2012, Reiner et al 2013) and if done at a sufficient scale; reduce their carbon impact and local air pollution contribution (Poudenx 2008, Woodcock et al. 2009, Pratt et al 2012). Almost half of car journeys are less than 5 km (Xia et al 2013), and these could be feasibly substituted by active transport modes. Recent health impact assessments have shown great potential health benefits of active and public transportation through increased physical activity opposed to minor risks through air pollution and accidents (Mueller et al 2015).

Our cities, however, are too car dominated and transport planning and policy seem to cater too much for the vehicle and too little for the public and transport modes that could really benefit them. Large infrastructures for vehicles are in place and are still underway with little work done for cyclists and pedestrians across most regions. There is an urgent need to rebalance and provide better and safer infrastructures and policy support for transport, and particularly, active transport modes, building a new culture for it.

Active transport can indeed reduce the detrimental impacts of transportation including accidents, air pollution, noise, increased sedentary behavior, and congestion, becoming a tool of health promotion and well-being during daily routines such as commuting to work and school. However, active transport to key destinations will only be possible when cities are made more compact and where urban infrastructure supports cyclists and pedestrians. This highlights the fact that transport systems cannot be made sustainable in their own right, without considering actions of the other complementing sectors (Hall et al. 2014).

Modelling potential future scenarios, taking into account different policy measures and estimating the impact on health is now possible and should become routine for when planning new urban and transport policies (Mueller et al 2015, Perez et al 2015). This could provide better insights into the various aspects being considered and provide policy makers with better data to guide their decision making process.

Healthy and environmentally friendly journeys should now become the core goal of transport planning practices, making public health its priority. To enable this it is important that we have

a more systemic approach to our cities, bringing together urban and transport planners, with environmentalist and the public health professionals (Nieuwenhuijsen 2015). We cannot wait for a new technological transition in car engines and fuels to by themselves resolve the societal and environmental problems of urban mobility. A parallel transition in transport and urban planning is needed to improve, in a global and structural way, the relations between urban mobility and health.

Hamburg has recently announced that it will be private car free by 2034 (Nuwer 2014), and Oslo wants a car free centre by 2019 (Reuters 2015) and perhaps this is a vision that can be followed quickly by many other cities.

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