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TRANSPORT AND HEALTH

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Abstract. Transport is an essential factor for economic development. Unfortunately actual trends, indicating an unsustainable way of development, are leading to large detrimental health and environmental impacts. Consequently, the results of analyses of evidences for the type, magnitude and costs of transport-related health and environmental effects, international, integrated action on transport, environment and health were developed. They provide a valuable framework for the development of national and local action to address the transport related health effects, which falls under the responsibility and mission of the national public health authorities
Key words: environmental health, public health authorities, transport

Rezumat. Transportul este un factor esenţial pentru dezvoltarea economică. Din nefericire dinamica prezentă indică faptul că dezvoltarea transporturilor nu este susţinută, ceea ce induce efecte negative importante atât asupra mediului cât şi sănătăţii. În consecinţă, pe baza analizei dovezilor privind tipul, magnitudinea şi costul efectelor transportului asupra sănătăţii, la nivel internaţional au fost dezvoltate acţiuni integrate pentru ameliorarea relaţiei transport-sănătate – mediu. Acestea asigură un cadru valoros de dezvoltare de acţiuni la nivel naţional şi local, ce se adresează efectelor asupra sănătăţii generate de transport, acţiuni care constituie responsabilitatea autorităţilor de sănătate publică.
Cuvinte cheie: sănătatea mediului, autoritate de sănătate publică, transport

INTRODUCTION

Efficient transport systems are essential for modern economies. Transport facilitates access to jobs, education, markets, leisure and other services, social relations, and has a key role for the economic development. Due to those important roles the transport development scenarios impose a further rise of motorized road transport, both for passengers and freight, more intense for the Eastern European regions. However, the current trends seriously challenge sustainable development resulting in significant negative health and environmental impacts, that cause a considerable burden on public health with a disproportionate burden for the most vulnerable groups and particularly children, that makes the transport related issues a priority for public health authorities (1, 2). In this context the Charter for Transport Environment and Health and the Pan –European Action plan for transport represents the main strategic framework for integrated action at both international and national level (1).

Transport related health impacts

Transport affects the health of the whole population both directly and through pollution of the environment.

Transport emissions are also one of the major contributors to climate change. In addition, private motor vehicle travel reduces opportunities for daily physical activity, and major roads can reduce community coherence and lead to social isolation. Main figures on health effects associated to transport are as following (3):

Transport accidents and injuries

Road accidents account for the most significant share of all transport accidents, in terms of the number of deaths and of death rates per kilometre travelled. The main figures shows:

- traffic accidents is the leading cause of death among children and young people aged 5–29 years, which represents approximately one third of all deaths due to road traffic crashes. The numbers are significant: about 127 000 people are estimated to die every year; approximately 6,500 deaths/year are reported among children aged 0-14 years and more than 2.4 million are injured as a result of road traffic collisions;
- the Annual Statistical report of the CARE database for the year 2004 reports a slightly decreasing trend of the number of injuries since 1999. In 15 EU countries (EU-15), 72% of all the accidents occur in urban areas. The directly measurable cost of road accidents was of the order of EUR 45 billion in 2001. The indirect costs (including physical and psychological damage suffered by the victims and their families) are three to four times higher, the annual figure being about 180 billion, equivalent to 2 % of the EU's GNP (EU-15);
- as a linear relationship between the number of cars in circulation and the injury rate could be observed it is foreseen that the Eastern European countries will face increasing road traffic accidents in near future;
- the majority of road traffic crashes occurs in urban areas, and pedestrians and cyclists account for one third of all deaths, consequently traffic accidents remains a relevant public health problem that urges for intervention.

Air pollution related health effects

In most urban areas, despite the decreasing of the overall pollution, registered due to technological measures, road transport remains the most important source of ambient air concentrations for the following pollutants: nitrogen oxides, carbon monoxide, benzene, black smoke and ultra fine particles (those whose aerodynamic diameter is smaller than 1.0 μm – PM1.0) (4, 5). The main figures reveal:

- in urban agglomerations, tailpipe emissions of primary particles by road transport contribute up to 30% of PM2.5, and non-tailpipe pollutants (such as resuspended road dust) are the most important source of the breath fraction (those whose aerodynamic diameter is 2.5–10 μm – PM2.5–10);

- forecasts by 2010 are estimating for increasing levels of traffic - related pollutants in urban areas, for annual nitrogen dioxide, 24-hour and also annual PM10. Consequently, percents of 20%, 70% and 50% respectively, of urban populations will live in areas where limit values are exceeded;
- air pollution associated effects reveals that the number of people who are estimated to die prematurely as a result of their exposure to air pollutants in the European Region is about of 100,000 per year. Tens of thousand of those are associated with transport related air pollution, reducing significantly life expectancy of the chronically exposed populations. Health risks imposed by transport-related air pollution include also increased cardiopulmonary morbidity and mortality, and increased risk of development of non-allergic respiratory symptoms as well as exacerbation of allergic reactions and recently proven, cancers;
- even that the enforcement of the current, stringent policies for engine emissions should result a reduction in traffic emissions, still additional measures as public transportation development, traffic restriction, improved technology for engines and educational measures, should be further adopted and implemented (6).

Noise exposure and health effects

Transport (road, rail and air traffic) is the most important source of community noise and road traffic and the major cause of human exposure to noise in the European Region. Noise is one of the most persuasive and underestimated ambient stressor, and the only environmental factor for which complaints have increased over the past decades. The main facts and figures are:

- noise levels in the last few decades, despite the legislative measures adopted and technological improvements, have steadily increased, as a result of the growing numbers of road trips and kilometres driven in motor vehicles, higher speeds in motor vehicles and the increased frequency of flying;
- the proportion of people exposed to noise levels greater than 65 dB LAeq over 24 hours, has risen from 15% in the 1980s to 26% in the 1990s (7). About 65% of the European population (450 million people) is exposed to sound levels (55–65 dB LAeq over 24 hours) that cause serious annoyance, speech interference, sleep disturbance, and has effects on children's learning. It is also suspected to contribute to the development of other adverse health outcomes, such as cardio-vascular diseases;
- reducing the overall amount of traffic or at least its growth is almost certainly necessary to control the health effects of noise emissions from traffic. This will be

particularly important in populated areas located near zones of heavy traffic (8).

Climate change

Over the past decade, the fact that the world's climate is changing has become visible. The global average surface temperature has increased, the sea level has risen, the heat content of the oceans has increased and the extent of snow cover and ice has decreased. The greenhouse effect that facilitated the balance between incoming solar radiation and outgoing terrestrial radiation was affected by the numerous human activities generating gases into the atmosphere, and enhancing the natural greenhouse effect. Consequently it is expected that extreme weather and climate events are becoming more frequent and intense in Europe main facts and figures are:

- transport in Europe is the second largest energy consumer, consequently emissions forecasts announce further increasing in the CO2 emissions, due to the growth in passenger and freight transport;
- over the period from 1990 to 2000, transport greenhouse gas emissions in the EU-15 increased by 19 %, whereas emissions from Central and Eastern Europe (CEE) had a smaller increase of 4 %;
- the health effects of climate change are quite complex. The Burden of Disease assessment of the WHO estimated, that, in the year 2000 there were an excess of 160,000 deaths due to climate change. Only the heat-wave in 2003 caused approximately 25,000 excess deaths in the aging population;
- evidence is also proving increased child hospital admissions during hot periods. Floods in recent decades have caused some rare disease outbreaks or increased incidences of respiratory or diarrhoeal diseases and an increase of symptoms of posttraumatic stress disorders. The elderly, disabled, children, women, ethnic minorities may be at greater risk of exposure.

If in addition we consider the climate change features that they are global, affecting future generations even more than current ones, they are unevenly distributed and they can be worsened according the current trends, a need of convergent action is obvious.

Effects on mental health and wellbeing

The neurotoxic effects of lead from petrol, on the cognitive development of children from transport have been proven by the scientific evidences. Recent studies suggest that lead affects several specific brain functions, particularly attention, motor coordination, visuospatial function and language, cognitive dysfunction that last long time affecting functional abilities and academic progress of children.

In addition, recent prospective studies have related deficits in neuro-behavioral function in children to lower blood lead concentrations, about 0.5 μmol/ litre.

Posttraumatic stress from accidents is commonly experienced by survivors of motor vehicle accidents, even when they have minimal or no physical injury. Studies have found that 14% of survivors have posttraumatic stress disorder, 25% have psychiatric problems one year after an accident, and one third has clinically significant symptoms at follow-up 18 months after an accident.

Exposure to traffic congestion increases blood pressure and frustration tolerance, influencing psychological performance and overall satisfaction with life, inducing increased aggression and nervousness.

Effects on social life

Excessive care use has affected people's social lives, the car that enabled them to move away from cities but in same time it acts as a mean for social isolation. In addition, the growth in the use of the car has affected social contact through the so-called "community severance effect", the divisive effects of a road on those in the locality.

Also the neighbourhood perception is profoundly influenced by the traffic volumes and speed, the decline of environmental and isolation being more frequent on heavily traffic streets;

Children's development is influenced by high traffic density, fewer children are allowed to walk or cycle, due to accidents spectrum. Children have become more dependent and less physically active parents, more stressed and worried, the mental health and social development of both groups, being obviously affected.

Effects on physical activity

The evidence shows that a total of 30 minutes of walking or cycling a day, on most days, even if carried out in ten to fifteen-minute episodes, reduces the risk of developing cardiovascular diseases, diabetes, hypertension, some cancers and helps to control blood lipids and body weight (9). The benefits of physical activity increase especially for sedentary people. But, due to car transport development, in many countries both the number of foot or cycling trips dropped seriously. Actual trends in transports lead to a severe reduction in physical activity, with main consequences: mortality attributed to physical inactivity is estimated to range between 5 and 10% of the total mortality in different European countries, i.e. an estimated 600 000 deaths per year.

These effects are unequally distributed geographically and also among groups. For instance people in urban areas, especially pedestrians are experiencing more of the health impact from road transport, especially those related to injuries and pollution. In rural areas traffic fatalities are greater, probably associated to the higher speed on vehicles. Children are at greater risk in all the environments and for most of the effects.

Key messages and policy directions

In the above briefly described context, as response of the stringent need for action, at international level political commitment for addressing the

transport related impacts were taken through the adoption of European Charter on transport and Health (London, 1999) and the Pan European action plan for Transport-Environment and Health, adopted in 2002. They represent the policy framework for integrating environmental and health aspects into transport policies and to take action on the priority areas.

The international policy developments provide a valuable framework for the development of national and local action to address the transport related health effects. For instance, stronger integration of health considerations into transport policies, by carrying out health impact assessments for major transport projects, promoting walking and cycling, legal restriction enforcement for level of emissions, speed limits, seat belts, development of local transport services, are just few examples of interventions for the public health leadership.

CONCLUSION

Transport represents one of the key areas of intervention for public health, where the expertise, experience and collaboration must act together for healthier people in healthy communities.

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