The geography of traffic accident risk – some policy consequences

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Norway is one of the countries with lowest road traffic accident risk, measured by health risk (per 100 000 population) as well as system risk (per vehicle km travelled). Due to unfavourable physical conditions (topography) for high quality road construction, one could expect that road network per se should indicate a higher accident level compared with neighbour countries (Denmark, Finland). Traditionally, the leading position is traced back to low risk behaviour in the population with a high adherence to regulations (speed limits, use of seat belts, low level of drinking and driving).

Nevertheless, traffic accident risk is regarded as a major health problem. Deaths from traffic accidents are the dominant cause of death for males 15 – 49 years (adjusted for DALYs the burden is even higher because of a long life with disability for victims). Norway has joined in the 'Vision Zero' programme stating a philosophy that eventually no one will be killed or seriously injured within year 2030.

Geographical approaches (maps, GIS) reveal persistent variations in motor vehicle crashes at county and police district level in Norway, adjusted for exposure and population. Analyses of a nation-wide accident data set for 1985 – 2000 shows that the accident pattern is complex, without any broad, overall regional patterns. From a system perspective, a proportion of the variations can be "explained" by structural geographical factors: population distribution, land use, transport routes and rural-urban differences. Climate (temperatures around the freezing point, icy road surface) and daylight represent other differentiating factors in a long stretched county. In terms of road safety policy, these factors can be considered as "natural", difficult to influence by public safety countermeasures. However, differences in road environment and driving behaviour play an important role. By mapping traffic accident composition, area profiles are scrutinised by type of accident, road category, time, weather conditions etc.

Norwegian road safety policy is searching for a multidisciplinary approach with combinations of improving road environment and influencing behaviour. Various strategies are discussed. The need for an aggregated focus seems clear, echoing "the new public health perspective" elaborating social determinants such as collective risk behaviour, reckless driving associated with economic boom periods. Indications are the proportion of accidents which might be associated with risk taking behaviour: suspicion of alcohol, not using seatbelt, single vehicles running off the road, night crashes. The proportion of accidents that might be associated with risk varies remarkably by geography, giving hints of local subcultures and type of road environment, apart from age- and sex composition. Splitting accidents by rural (sparsely populated) and urban (densely populated) areas uncovers the latter as experiencing an increasing share of the fatalities and serious injuries.

A crucial point in decision making is related to the possibilities of behavioural changes induced by improved physical road safety; the effect of risk compensation. To what extent drivers make risk calculations and the potential nullifying effect of enforcement and control, are controversial themes. Police controls as well as informal social attention are weaker in rural (non-built up) areas. "Random" or "unexplainable" vehicle crashes are more frequent in vast areas, rising questions of applying automatic traffic control, intelligent speed limit control system or alcohol-lock in automobiles. The acceptance of such control regimes is a tricky policy and decision issue.

The complexity of accident pattern calls for 'tailor-made' safety policy. Several police districts and communes are now operationalising and launching 'Vision Zero' plans with different targets such as emphasising accident prevention (local safety campaigns) versus reducing consequences of crashes (physical countermeasures). Preliminary efforts seem hitherto to give priority to area schemes and road leg strategies.