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ABSTRACT

The articles presented in this Special Issue on Road Safety Management represent an illustration of the growing interest in policy-related research in the area of road safety. The complex nature of this type of research combined with the observation that scientific journals pay limited attention to this type of research was the background for SWOV Institute for Road Safety Research in the Netherlands to organise a workshop on *Scientific Research on Road Safety Management*. This workshop generated a lot of attention in the road safety research community as well in the policy making community, and it was decided – in addition to the nine articles based on the presentations at the workshop – to include another seven articles which are considered of relevance for the chosen topic of this special issue.

1. Introduction

Road traffic crashes are estimated to cause over 1.27 million deaths per year on the world's roads, and between 20 and 50 million people suffer non-fatal injuries. Road traffic injuries are consistently among the top three causes of death for people aged between 5 and 44 (WHO, 2009). The WHO concludes that in most regions of the world this epidemic of road traffic injuries is still increasing. Over the years, research has increased our knowledge and understanding in the field of road safety: Nowadays we know a lot more about the size, development and background of road safety problems than, say, fifty years ago. However, additional work is required to translate these findings into effective policymaking. For several reasons this type of research is very complicated in nature. It is quite a challenge to assess the safety impacts of policies using standard methodologies which also meet the requirements for sound scientific research.

The design and evaluation of road safety programmes have appeared to be not too popular amongst researchers. A quick literature scan performed in April 2010, searching for 'road safety management' in scientific literature databases SCOPUS and ISIWebofScience, for example, show less than 30 articles published since 1989. The same seems to apply to research which supports policymaking directly, suggesting that also designers of road safety policies make limited or no use of such studies (see for example Bax et al., 2009). This can be illustrated by the fact that in many highly motorised countries significant improvements in road safety have been achieved although most countries have a limited understanding of the explanations for this progress, let alone a comprehensive insight in the impacts of implemented policies.

At the same time, we welcome positive interests from policy makers and designers of road safety programmes in so-called ex-ante and ex-post evaluation. One of the reasons behind the increasing interests is that a growing number of countries are using quantitative targets for policymaking, and as a consequence, have an explicit wish to monitor their progress over time and use these results to improve their performance.

For the workshop we initially invited contributions from Australia, Canada, Czech Republic, France, Great Britain, Hungary, Hong Kong, Netherlands, Norway, Poland, and Switzerland. However, during the preparations of this workshop we encountered a great deal of interest in the research community to make additional contributions. Therefore we decided to invite more researchers coming from Australia, Czech Republic, Germany, Israel, Netherlands, and Sweden to submit contributions. This resulted in 16 articles which found their way towards this Special Issue. We have grouped these papers in five categories: (1) Scientific support to design a road safety strategy in a specific country. (2) Research to support methodologies for 'ex-ante evaluation'. (3) Ex-post evaluations. (4) General research to improve ex-ante and ex-post evaluation. (5) Next steps and new developments. Of course, this is a somewhat arbitrary exercise but we considered this grouping helpful for a global overview of the type of topics covered.

1.1. Scientific support to design a road safety strategy in a specific country

Contributions in this group describe what has been done in three jurisdictions (Western Australia, the Netherlands and Switzerland) to support the design of a safety strategy by modelling road safety developments and making estimates of safety effects of anticipated road safety interventions, taking into account factors such as development of exposure, of changes in the age distribution, etc. We call this research *ex-ante evaluation*. The results of this research are helpful in designing new strategies and to shed light on 'realistic' road safety targets.

In their contribution Corben et al. (2010) describe the early development of the modelling approach in the State of Victoria,

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Australia, which was subsequently refined and adapted to Western Australia. Their article outlines the modelling technique they used along with results. The results of this research played an important role in the community consultation and in the political decision making, which resulted in the official endorsement of the Western Australian Government of the Towards Zero Strategy for 2008–2020 in 2009. Corben et al.'s contribution presents an approach which is based on scientific insights and proven solutions. The 'Towards Zero' strategy is based on the Safe System Approach, which was derived from the best elements of the Swedish Vision Zero and the Dutch Sustainable Safety vision.

The article by Wesemann and Van Norden (2010) discusses the method used for an outlook into the future development of road safety in the Netherlands until 2020. The outlook consists of baseline forecasts for 2010 and 2020, assuming the unchanged continuation of the effect of current road safety policy as a starting point, and the effect of new measures on top of that. They used four different mobility scenarios, derived from a study about the macroeconomic development and its road transport consequences of Dutch society until 2040. The results of this study helped the Dutch Government in defining road safety targets and programmes for the coming decade.

Siegrist (2010) outlines an elaborated method for the ex-ante estimation of the potential of a road safety programme, which takes into account available scientific research, an estimate of the degree of implementation that can be expected at a certain point in time, and the interaction between individual measures. It thoroughly considers the consequences of the effects of overlapping road safety measures, which is a problem in many studies. It also acknowledges the possible 'synergy' effects of different measures. The results of this very systematic approach formed a solid basis for current Swiss road safety policy.

1.2. Scientific research to improve methodologies for 'ex-ante evaluation'

Several examples of ex-ante research are included in this special issue. As road safety policies cannot be assessed until they have been in operation, new programmes need to be evaluated on their potential effects. A clear method to do this still has to be developed. Only some decades ago road safety policies began to be supported in a comprehensive manner and with a scientific approach. This approach turned out to be very complicated because the theoretical basis of the research in this field is not very mature, proven methodologies are still lacking, models cannot always be based on good quality data, etc. From this perspective it was to be expected to receive contributions which address several of the mentioned weaknesses. These contributions have a strong 'work in progress' character and hopefully they will be of support for ex-ante road safety evaluations in the future.

Hauer (2010) describes his – which can be characterised as a data driven – approach on how to choose which method is appropriate for predicting the number of road casualties and fatalities. He describes there are many ways to predict. For the same data different prediction methods produce different results. What targets are set and what estimates of intervention effect are produced will depend on what method of prediction is chosen. Therefore he argues that one has to determine what method tends to predict best. To do so empirically one asks what method would have predicted best had it been applied in the past and then one assumes, inductively, that the same would apply in the future. Hauer then demonstrates this way of doing with an example.

In their contribution Stipdonk et al. (2010) discuss the development of a new forecasting method using many disaggregations. It is conjectured that properly disaggregated forecasts will have smaller prognosis confidence intervals. They calculate a casualty rate from casualty data and mobility (distance travelled) data, which is extrapolated and subsequently multiplied by an expected future distance travelled. After correction for separately assessed effects of additional safety measures, the number of casualties is estimated. The principles of stratified projections are illustrated by three Dutch projections which were carried out between 2006 and 2008.

Broughton and Knowles (2010) describe work on monitoring national casualty trends in Great Britain since 2000, when new casualty reduction targets for 2010 were set. Preparations included forecasting the number of casualties that might be expected in 2010, conditional upon predictions about how the volume of road travel by the various transport modes might change and the type of new road safety measures that the Government might introduce. The forecasts provided the numerical context for the casualty reduction target that the Government announced in March 2000.

1.3. Ex-post evaluation: research support

In ex post policy evaluation one looks at the safety effects after a policy, programme or strategy (authors from different countries use different words for the same concept) has been implemented. One looks backward, and attempts to estimate the safety effects of implemented programmes by comparing the observed road safety situation after implementing certain policies with a (hypothetical) situation if no policies have been implemented.

A number of contributions to this Special Issue discuss the evaluation of research activities. Basically these studies try to document which policies have been implemented and how their implementation was actually realized in practice. As a next step it is tried to identify how so-called safety performance indicators (SPIs) have changed as a result of implemented policies and strategies and how these effects can be isolated from influences of other (confounding factors). As a final step, the changes in SPIs need to be causally related to changes in reported crashes and injuries, in risks etc.

At the workshop two cases were presented (France and a combined contribution with results from the Czech Republic, Hungary and Poland). A third case (from Germany) also fits well in this group.

Hollo et al. (2010) focus on the past development of road safety in three central European countries. They use both counts of road crashes and victims as well as road safety performance indicators to assess the progress being made in road safety. The results of analysing trends in road casualties in these three countries using several well-known road safety performance indicators however suggest that also these indicators cannot provide a full understanding. Their blind use could even lead to serious mistakes in the interpretation of trends in casualties, according the authors.

Chapelon and Lasarre (2010) provide an insight into the old and new organisation of road safety management in France. The focus of the new organisation is on an evidence-based policy. Therefore, an extensive information system was set up and involves structurally collecting road safety data on a variety of topics, covering accidents, risk exposure, but also, for example, speeds driven, and utilisation of mobile phones. These data and different risk models have been integrated in risk management tools to allow for monitoring, benchmarking and it supports policy making.

Also the contribution by Schulze and Kossmann (2010) refers to the need for a scientifically based road safety management. They argue that to ensure that selected road safety strategies, tools and measures are efficient they should be derived from research evidence, and that regularly monitoring the impact of road safety management tools is needed, serving as a "controlling instrument" for the appropriateness of safety management efforts. Their