Summary:

Effects of road safety measures: a summary for use in impact assessment

This report contains a condensed presentation of the best current estimates of the effects of most of the road safety measures that are included in The Handbook of Road Safety Measures. The tables providing information on the effects of road safety measures are intended for use in road safety impact assessment, i.e. to estimate expected safety benefits when planning the measures. A simple scale for rating study quality has been applied. When planning the measures, safety should be estimated by means of the empirical Bayes method.

Estimating the number of accidents that are influenced by a road safety measure

The first stage of a road safety impact assessment is to select locations where road safety measures are to be implemented and to estimate the number of accidents each measure is expected to influence. The report recommends using the empirical Bayes method to estimate the long-term number of accidents that can be influenced by a road safety measure. The coefficients and dispersion parameters of negative binomial regression models that have been developed for junctions and road sections are presented, and a numerical example is provided.

The report also presents two methods that can be used to estimate the combined effects of several road safety measures that influence the same target accidents.

Effects of road safety measures

A detailed set of tables are provided, presenting the best current knowledge regarding the effects on accidents and injured road users of most of the road safety measures that are included in The Handbook of Road Safety Measures. This book now includes a total of 134 road safety measures. These measures cover all elements of the traffic system.

Effects are in most cases stated in terms of the percentage change in the number of target accidents expected when a road safety measure is introduced. Target accidents are the accidents a measure will influence, for example accidents in darkness (road lighting), accidents in junctions (converting junctions to roundabouts), or accident when using a mobile phone (enforcement of the ban on using hand held mobile phones while driving).

It is recognised that the effects of road safety measures are likely to vary systematically, depending on characteristics of the measure and the context into which it is introduced. It is therefore increasingly relevant to summarise the effects of road safety measures in terms of accident modification functions, rather than single point estimates of effect. Accident modification functions have been developed for some of the road safety measures included in this report, but in the majority of cases, such functions are not available.

Whenever possible, effects are differentiated according to injury severity. Several road safety measures have a greater effect on fatal and serious injuries than on slight injuries.

Study quality scoring

A simple scale has been developed for rating studies by their quality. The rating is based on how well studies control for potentially confounding factors when estimating the effect of a road safety measure. Knowledge is rated as good when the studies underlying the summary estimate of safety effects have controlled for all important potentially confounding factors, such as regression-to-the-mean, long-term trends, or changes in traffic volume. Knowledge is rated as average when studies have controlled for some, but not all important confounding factors. Knowledge is rated as poor when studies have controlled for few or none of the potentially confounding factors in road safety evaluation studies.

The presentation and rating of knowledge in this report is very similar to the Highway Safety Manual, published in 2010 in the United States.