

# Cost-Effectiveness Of Interventions To Prevent Road Traffic Injuries In Low- And Middle-Income Countries: A Systematic Review

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## Abstract

In Low- and Middle-Income Countries (LMICs), cost-effective road safety interventions can save not only lives of vulnerable road users but also save costs to society. The objective of this systematic review was to identify, critically appraise, summarise and synthesise cost-effectiveness evidence of road traffic interventions in LMICs by age group and road users targeted. Thirteen databases were searched between May 2002 and August 2015. The cost-effectiveness of interventions ranged from US\$4.14 per DALYs averted for building speed bumps to US\$3,403 per DALYs averted for legislation and enforcement of motorcycle helmet use in the sub-Saharan Africa region.

## Background

In Low- and Middle-Income Countries (LMICs), an important step in Road Traffic Injuries (RTIs) prevention is to develop and evaluate interventions that work best regarding cost and benefits because cost-effective interventions can save not only lives from RTIs but save costs to society as well (Peden et al., 2004). Considering the huge burden of RTIs in LMICs (WHO, 2015), growth in the implementation of effective interventions (Brown, 2007; de Andrade, Soares, Matsuo, Barrancos Liberatti, & Hiromi Iwakura, 2008; Law, Umar, Zulkaurnain, & Kulanthayan, 2005; Soori, Royanian, Zali, & Movahedinejad, 2009; WHO 2015), evidence of translating effective interventions from high-income countries to LMICs (Esperato, Bishai, & Hyder, 2012; Stevenson et al., 2008), and the absence of evidence on the cost-effectiveness of studies in LMICs as stated by Waters, Hyder, & Phillips (2004) there is a need to review the literature in order to identify the evidence on the cost-effectiveness of interventions to prevent RTIs in the context of LMICs.

## Method

MEDLINE, EMBASE, CINAHL Plus, PsycINFO, the Cochrane Central Register of Controlled Trials, the Cochrane Injuries Group's Specialised Register, EconLit, Index Medicus for the South-East Asia Region, World Health Organisation Library Information System, OpenGrey, African Index Medicus, and Index Medicus for the Eastern Mediterranean Region were searched between May 2002 and August 2015 using specifically designed search filters. An English language restriction was applied. Additional studies were identified by contacting authors, searching reference lists of included studies, and grey literature by using Google Scholar. The terms that state the overall strength of the evidence regarding quality, quantity and consistency (i.e. no evidence, weak evidence, moderate evidence, strong evidence, and inconsistent evidence) were adapted from the recent National Institute for Health and Care Excellence (NICE) public health guidance (NICE, 2012).

## Results

Out of 1,504 studies, five studies were included in the final review that reported nine interventions. Only two out of nine interventions (drink-drive legislation with enforcement via breath testing campaign, and combined interventions for reducing RTIs) showed a moderate evidence of being cost-effective while the evidence regarding other interventions was weak. Similarly, only two

interventions (bicycle and motorcycle helmet use legislation and enforcement) were explicitly targeted to children, young people and vulnerable road users. The cost-effectiveness of interventions ranged from US\$4.14 per DALYs averted for building speed bumps at junctions that causes 10% of junction deaths to US\$3,403 per DALYs averted for legislation and enforcement of helmet use by motorcyclists in the WHO sub-Saharan Africa region.

## Conclusions

There are currently few studies reporting the cost effectiveness of interventions in LMICs to prevent RTIs, particularly for children, young people and vulnerable road users. Further research to build upon this emerging evidence base should include robust methods, with outcomes that measure the impact on children, young people and vulnerable road users. The ability to demonstrate effectiveness and cost-effectiveness would be facilitated by the development of systems to routinely record road traffic incidents and injuries in these countries.

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