

6th Transport Research Arena April 18-21, 2016



## An analysis on health care costs due to accidents involving powered two wheelers to increase road safety

Maria Vittoria Corazza <sup>a,\*</sup>, Antonio Musso <sup>a</sup>, Kostas Finikopoulos <sup>a</sup>, Veronica Sgarra <sup>a</sup>

<sup>a</sup>Department of Civil and Environmental Engineering – DICEA, Sapienza University of Rome, Via Eudossiana 18, Rome 00184, Italy

---

### Abstract

Powered Two Wheelers (PTWs) provide a convenient mode for a large portion of population in many cities. At the same time PTWs present serious system problems, the most important being poorer safety if compared to other motorized modes. But even when lower safety levels are acknowledged, problems behind are far from being solved. Rome is an example: although PTWs accidents rates are not negligible, the need for a specific safety policy is still unmet. Therefore the local Mobility Agency appointed the authors of this paper for a study of PTWs accidents occurring in the urban area. An assessment of the associated health care costs was also required. The objective of the paper is to report the main outcomes of this study highlighting recurring features of PTWs accidents, the high health care costs and how to quantify the economic resources to improve safety. The methodology was based on three steps: i) an analysis of the causes of PTWs accidents, which resulted into the location of black spots and assessment of the severity of the events; ii) the estimation of health care costs after a scientific literature review; iii) the association of health care costs to black spots and accidents severity to rank interventions to improve PTWs safety. This led to a final list of roads where PTWs accidents of the highest severity occurred and the required economic resources to improve their safety level. This stressed, for the first time, the unaffordable expenditures due to PTWs accidents. In conclusion, the issue whether the awareness of such costs can be used as leverage for more mindful behaviors among the riders is addressed.

© 2016 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Road and Bridge Research Institute (IBDiM)

**Keywords:** road safety; Powered Two Wheelers; health care costs; safety potential index

---

\* Corresponding author. Tel.: +39-06-44585736; fax:+39-06-44585146.  
E-mail address: [mariavittoria.corazza@uniroma1.it](mailto:mariavittoria.corazza@uniroma1.it)

## 1. Introduction

The magnitude of the overall road safety crisis is largely acknowledged worldwide: according to the World Health Organization (WHO) “the economic consequences of motor vehicle crashes have been estimated between 1% and 3% of the respective GNP of the world countries, reaching a total over \$500 billion” (WHO 2010).

Still, decision-makers seem to underestimate the relevance of public health care costs to recover and rehabilitate those involved in road accidents. For what strictly concerns PTWs, there are many contributing factors. At national level, emphasis is obviously placed on prevention, thus enforcing stricter and stricter regulations to mandate comprehensive sets of safety measures (for example compulsory helmets; restrictions for novices; vehicle improvements such as enhanced brake systems or anti-tampering measures, etc.). Not the same can be said in terms of efforts to promote and enforce effective and consolidated post-crashes response procedures. According to the WHO (2013), if considering the Countries with >1,000,000 inhabitants and with riders accounting for about  $\geq 1/3$  the deceased (table 1), it is clear that the quality of post-crashes care response procedures is far from being adequate (also in some high income countries).

At local level, reasons of underestimation rely on the general approach to mobility problems, as policies with respect to the use of two-wheelers and whether special facilities should be provided are typically non-existent. The involvement of Powered Two-Wheelers (PTWs) in mobility plans is quite rare, being this mode considered by decision-makers as either not a priority (when PTWs are not among the dominant modes) or too sensitive to reach consensus (in areas where they are dominant, as observed in Musso et al. 2010).

Table 1. Countries with PTWs highest fatality rates.

| Country              | PTWs as dominant mode (Yes/No) | Helmet wearing rate (%) |           | Deceased drivers/passengers of PTWs (% of all reported road traffic deceased) | Post-crashes care response procedures          |                                      |        |
|----------------------|--------------------------------|-------------------------|-----------|---|--|--------------------------------------|--------|
|                      |                                | Driv.                   | Pass.     |   | Seriously injured transported by ambulance (%) | Emergency medicine training (Yes/No) |        |
|                      |                                |                         |           |   |  | doctors                              | nurses |
| Laos**               | Yes                            | 75                      | n.a       | 74.5  | $\leq 10$                                      | Yes                                  | No     |
| Thailand**           | Yes                            | 53                      | 19        | 73.5  | 50–74  | Yes                                  | No     |
| Cambodia*            | Yes                            | 65                      | 9         | 66.6  | 11–49  | Yes                                  | Yes    |
| Malaysia**           | Yes                            | 76 (all riders)         |           | 58.7  | $\geq 75$                                      | Yes                                  | Yes    |
| Dominican Republic** | Yes                            | n.a                     | n.a       | 57.8  | n.a  | Yes                                  | No     |
| Benin***             | No                             | n.a                     | n.a       | 50.2  | -  | Yes                                  | Yes    |
| Singapore*           | No                             | n.a                     | n.a       | 46.1  | $\geq 75$                                      | Yes                                  | Yes    |
| Paraguay**           | No                             | 45                      | 20        | 41.4  | 50–74  | Yes                                  | No     |
| Colombia**           | Yes                            | 99                      | 40        | 39.1  | 11–49  | Yes                                  | Yes    |
| Pakistan**           | Yes                            | 10 (all riders)         |           | 38.6  | 11–49  | Yes                                  | No     |
| Indonesia**          | Yes                            | 80                      | 52        | 35.7  | $\leq 10$                                      | Yes                                  | Yes    |
| Cyprus*              | No                             | 75                      | 68        | 35.0  | $\geq 75$                                      | No                                   | No     |
| China**              | n.a.                           | n.a                     | n.a       | 34.5  | $\geq 75$                                      | Yes                                  | Yes    |
| India**              | Yes                            | 50                      | $\leq 10$ | 32.4  | 11–49  | Yes                                  | Yes    |
| Greece*              | No                             | 74                      | 34        | 30.6  | n.a  | No                                   | No     |
| Italy*               | No                             | 92 (all riders)         |           | 30.3  |  | Yes                                  | Yes    |
| Guatemala**          | No                             | 40 (all riders)         |           | 30.0  | $\geq 75$                                      | Yes                                  | No     |

Income: \*high, \*\*middle, \*\*\*low

Download English Version:

<https://daneshyari.com/en/article/1106217>

Download Persian Version:

<https://daneshyari.com/article/1106217>

[Daneshyari.com](https://daneshyari.com)