The impact of a road safety policy implementation within an international organization

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Abstract

Aim This study was performed within an international organization (IO), headquartered in Washington, D.C. The employees are facing great risks during their missions abroad, where developing countries are the most common travel destination. The IO conducted a staff road safety survey in 2008 and based a road safety policy on the results of this survey. In 2017, a follow-up survey investigated the impact of the policy implementation. The aim of this study was to investigate the effect of that policy.

Subjects and methods This study is based on two cross-sectional road safety surveys conducted by the IO's Staff Road Safety Task Force. The study population consisted of both regular employees and consultants based at country offices (CO) worldwide. The number of reported road traffic crashes and near-crashes (nearly had a crash), as well as road safety behavior, was compared between these two surveys. The analysis was performed from a gender perspective. High-risk countries were identified based on the number of reported road traffic crashes and near-crashes.

Results Over a period of nine years, the incidence rates had dropped from 1.6 to 0.7 road traffic crashes per 1000 travel days and from 14 to 8.9 near-crashes per 1000 travel days. Seat belt usage had increased from 70% to 80%. There were no major differences between male and female respondents. Developing countries had the highest travel adjusted event rates.

Conclusion The findings of this study suggest that the policy had a positive impact on road safety among CO staff within the IO.

Keywords Road traffic crashes · Policy · Epidemiology

Introduction

A global issue

According to the World Health Organization (WHO), there are approximately 3400 deaths caused by road traffic crashes every day. Ninety percent of all traffic-related deaths take place in developing countries (WHO 2015). An estimated 50 million people each year suffer injuries of various levels of severity. Road traffic crashes are, thereby, one of the most common causes of mortality and morbidity worldwide (WHO 2015; Goldoni Laestadius et al. 2011; Ameratunga et al. 2006).

Gender differences

It has been observed that men are more likely than women to die in road traffic-related crashes (Pulido et al. 2016). The gender distribution is consistent worldwide, regardless of the country's economic situation (WHO 2015). This is mainly due to a more risky and aggressive driving attitude among men. Speeding, drunk driving, and disobeying the traffic rules are some of the factors contributing to an increased risk of traffic-related deaths among men (WHO 2015; Shinar and Compton 2004; Taubman-Ben-Ari and Skvirsky 2016; Penmetsa and Pulugurtha 2017; Sun et al. 2014).

Vision Zero

Several countries have embraced the nowadays well-known Vision Zero, a road safety policy originally established in Sweden in 1997. The main purpose of the Vision Zero approach is to eliminate all road traffic-related fatalities and severe injuries, by improving road design and vehicle safety standards (WHO 2004; Belin et al. 2012; Johansson 2009; Tingvall and Haworth 1999). The policy also contains guidelines for seat belt use and

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speed limits. Another important part is drunk driving prevention (WHO 2004).

Road safety within an international organization

This study was performed within a global international organization (IO), headquartered in Washington, D.C. The organization has about 30,000 employees, who are located in offices all over the world. Business traveling is an occupational characteristic for a majority (70%) of the employees. The employees are facing great risks during their missions abroad, especially since developing countries, with insufficient road safety infrastructure and regulations, are the most common destinations (Goldoni Laestadius et al. 2011). In 2008, the IO conducted a survey among the employees. The purpose of the study was to gather information about the employees' experiences of road traffic crashes and near-crashes while traveling on mission. The employees were also asked to provide ideas on how to increase road safety within the organization. The conclusion of the 2008 staff survey resulted in developing a road safety policy within the IO (Goldoni Laestadius et al. 2011).

Aims

The main purpose of this study is to investigate if the road safety policy implementation has had any impact regarding road traffic crashes and near-crashes, as well as seat belt usage among employees. The aim is also to analyze the employees' suggestions on how to improve road safety within the IO, as well as if there is any relationship between gross national income per capita and the relative number of road traffic crashes and near-crashes among business road travelers. Relevant issues are analyzed from a gender perspective. The focus is set on collected data from IO staff at offices located outside of the United States.

Materials and methods

Survey design

This study is based on two cross-sectional surveys conducted by the IO Staff Road Safety Task Force. The baseline survey was conducted in March 2008. Nine years later, a follow-up survey was launched. The questionnaires included questions about staff's general characteristics, number of travel days in a typical year, use of seat belts, and number of road crashes and near-crashes in the past three years.

Study population

The study population consisted of both regular employees and consultants based at more than 150 country offices (CO)

worldwide. This study only includes respondents who had reported at least one travel day in a typical year.

Risk ratio

Questions about the number of travel days in a typical year and the number of reported road traffic crashes and near-crashes were used in order to calculate the total number of road traffic crashes and near-crashes per 1000 travel days.

$$\frac{\text{Number of crashes and near-crashes during the past 3 years}}{\text{Number of travel days in a typical year} \times 3 \text{ years}} \times 1000$$

High-risk countries

The employees were asked to provide detailed information (e.g., location and circumstances of the road traffic crash) about their three most recent crashes and near-crashes. Based on this information, the countries with the highest number of events (i.e., road traffic crashes and near-crashes combined) were compiled. According to previous studies, there is a positive correlation between the number of crashes and near-crashes, which supports this combined analysis (Goldoni Laestadius et al. 2011). Information about the number of staff at each CO was provided from the human resources department. This information was used to calculate the total number of road traffic crashes and near-crashes per 100 staff at each CO, hereafter referred to as the travel adjusted event rate. The number of staff at each CO was used to estimate the amount of mission travel to the respective office. This reasoning suggests that more trips are made to CO with many employees and vice versa. Countries with less than 1 reported road traffic crash and 5 near-crashes during the past three years were excluded in order to present the most accurate results possible. Otherwise, countries with few staff would be more likely to be incorrectly ranked as a high-risk country. In an internal document from 2016, the United Nations Department of Safety and Security used the size of the CO (i.e., number of staff) as an approximation for UN missions to the respective country. Since this was considered a proven method, the same formula (i.e., incidents per 100 staff at each CO) was used in this study to calculate a risk measure for each country.

Income group

Countries were divided into income groups by using results from the Global status report on road safety 2009 (WHO 2009) (used for the baseline survey) and Global status report on road safety 2015 (WHO 2015) (used for the follow-up survey). Individual road traffic crash rates were then calculated.

Seat belt usage

A comparison of seat belt usage among the respondents in both surveys was made.

Comments from respondents

The comments were divided into five main categories and several subgroups. The selection of the categories was based on the repetitive content of the comments, combined with essential targets of the road safety policy. This so-called editing analysis style is constructed by analyzing and identifying the main content of the comments in order to divide them into appropriate categories (Malterud 2001).

Statistical methods

Poisson regression in SPSS was performed to investigate whether there were any differences in incidence rate between the surveys.

Fig. 1 Description of the study population selection in the baseline survey as well as in the follow-up survey. The final sample size consisted of employees working for the international organization (IO), based at country offices (CO)

A Chi-square test in SPSS was performed to investigate if there were any significant differences in seat belt use between the surveys. A double-sided p -value of < 0.05 was used for significance.

Results

Study population

Figure 1 shows the selection of the study population in both surveys. The overall response rate in the baseline survey was 24%. The corresponding number in the follow-up survey was 23%. The number of respondents was significantly higher in the follow-up survey. Respondents in the follow-up survey were somewhat older than in the baseline survey, with a higher proportion of men. Table 1 shows the general characteristics for all employees based at CO before exclusion of non-travelers (defined as respondents with less than one travel day annually).

Table 1 Demographic information of respondents* in both road safety surveys

	Baseline survey		Follow-up survey	
	No.	%	No.	%
Age (years)				
29 or younger	214	14	276	8
30–39	628	39	947	27
40–49	500	31	1149	33
50–59	236	15	778	22
60 or older	41	3	389	11
Total	1619	100	3539	100
Gender				
Male	805	50	2048	58
Female	807	50	1472	42
Total	1612	100	3520	100
Contract type				
Staff	1427	88	2002	58
Consultant	180	11	1398	41
Vendor/contractor	9	1	17	1
Other	0	0	34	1
Total	1616	100	3451	100
Number of travel days in a typical year among business travelers**				
1–30	965	70	1593	72
31–60	194	14	322	15
61–90	95	7	125	6
91–120	79	6	104	5
121–150	20	1	39	2
151–180	7	1	8	0
181–210	10	1	8	0
211–240	4	0	1	0
241–270	0	0	1	0
271–300	3	0	3	0
Total	1377	100	2204	100

*Including both travelers and non-travelers (defined as respondents with < 1 travel day)

**Only travelers included

Demographic information of the respondents is available in Table 1.

Number of road traffic crashes and near-crashes

In the baseline survey, a total of 174 road traffic crashes and 1680 near-crashes were reported, of which 108 crashes (62%) and 966 near-crashes (58%) were described. A total of 106 road traffic crashes and 1427 near-crashes were reported in the follow-up survey, of which 53 crashes (50%) and 504 near-crashes (35%) were described. The number of reported road traffic crashes had decreased from 121 to 74 among men and from 53 to 29 among women. The compilation of the number of near-crashes showed that the number had decreased between both males (from 1045 to 867) and females (from 632 to 511).

Risk ratio

The overall road traffic crash rate had dropped from 1.6 to 0.7 crashes per 1000 travel days ($p < 0.01$), whereas the near-crash rate had dropped from 14 to 8.9 near-crashes per 1000 travel days ($p < 0.01$). Regarding the gender analysis, the road traffic crash rate had decreased from 1.7 to 0.7 crashes per 1000 travel days among men ($p = 0.003$) and from 1.3 to 0.5 crashes per 1000 travel days among women ($p < 0.001$). The incidence rate had decreased from 14 to 8.6 near-crashes per 1000 travel days among men ($p < 0.01$) and from 14 to 9.0 near-crashes among women ($p < 0.01$). There were no significant differences between male and female respondents.

Income group

As shown in Table 2, developing countries have a higher travel adjusted event rate than high-income countries. This trend applies to both surveys. However, the rates for low- and middle-income countries have dropped since the baseline survey.

Seat belt usage

In the baseline survey, 69% of female respondents and 71% of male respondents reported that they always use a seat belt when available and functional. There was no significant difference between the genders ($p = 0.606$). In the follow-up survey, 77% of female and 82% of male respondents reported that they always use a seat belt ($p = 0.003$). The overall picture showed an

Table 2 Travel adjusted event rates, sorted by the countries' gross national income

Income group	Baseline survey				Follow-up survey			
	Countries (n)	Crashes and near-crashes in the past 3 years (n)	Staff (n)	Travel adjusted event rate	Countries (n)	Crashes and near-crashes in the past 3 years (n)	Staff (n)	Travel adjusted event rate
High	17	7	13,680	0.1	24	20	18,932	0.1
Middle	57	429	3869	11	81	366	8187	4
Low	44	481	3334	14	29	155	2609	6

increase from 70% to 80% ($p < 0.01$). There was a significant increase among both men ($p < 0.01$) and women ($p = 0.005$).

Comments from respondents

Figure 2 shows a comparison of all comments in both surveys. The percentage of respondents that asked for more driver training and information about road safety had increased. It is noteworthy that the proportion that stated that they had no suggestions for improvement had increased. The most common categories among both males and females were “More information about road safety”, “More driver training”, “Lists of reliable taxi companies”, and “No suggestions for improvements”.

Discussion

Main findings

The absolute number, as well as the relative number, of reported road traffic crashes and near-crashes had decreased in both male and female staff. There were no significant differences between men and women. However, CO employees on mission often use professional drivers, which could affect the gender analysis, since the gender of the drivers is unknown. According to the findings of this study, there was an expected correlation between gross national income and the number of incidents in a country. Low- and middle-income countries had a higher road traffic crash rate than high-income countries.

The travel adjusted event rate had dropped in both low- and middle-income countries. This could indicate increased road safety awareness among the staff due to the road safety policy implementation. Contrary to this, during 2008–2013, while people and the number of vehicles have increased in developing countries, the number of road traffic-related deaths have leveled out, but not decreased. In 2013, with road travel crash rate per 100,000 population in high-income countries of 9.2, it was double that rate in middle-income and almost tripled in low-income countries (WHO 2018).

The IO's efforts to increase seat belt use among the employees seem to have been effective. It is noteworthy that the increase in seat belt use was slightly greater among men (from 71% to 82%) than among women (from 69% to 77%). However, since this study was based on self-reported data, these numbers are just an approximation.

The proportion of respondents that had no suggestions for improvements had increased. This could indicate that the employees experienced improvements since the road safety policy implementation. However, the proportion of respondents that wanted more information about road safety had increased, which indicates that further improvements are possible. No major difference between male and female respondents was detected. It is noteworthy that only 37% of the respondents in the follow-up survey reported that they were aware of the road safety policy within the IO. This could explain the increased need for information, which indicates that much work remains to be done before this road safety policy reaches its full potential.

Fig. 2 Percentage of comments divided into 17 categories. A total of 587 comments were collected in the baseline survey and 1374 comments were collected in the follow-up survey

Study limitations and strengths

The overall response rate was 24% in the baseline survey and 23% in the follow-up survey. Thus, a great number of employees did not complete the survey and it was, therefore, difficult to determine whether these results were representative of all employees. Despite a relatively low response rate, these surveys included a large study population, which increased the power of the study. To enable comparison between the surveys, it is preferable to use identical questions in both surveys. That was, unfortunately, not the case for all questions in this study, which limited the interpretation of some of the results. Since information about the number of travel days in each country was not available, we had to use the number of staff at each CO to estimate the amount of mission travel to the respective office. This was just an approximation and might not fully reflect the actual situation.

Conclusions

The findings of this study suggest that the road safety policy implementation contributed to improved road safety within the international organization (IO).

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Compliance with ethical standards

The authors declare that they have no conflict of interest.

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The Health and Safety Working Group, which also serves as the Ethical committee, and the Road Safety Committee at the IO approved the surveys before they were launched. Participation was voluntary and the surveys were anonymous. All data are presented at a group level.

Dr. Goldoni Laestadius is employed by the World Bank, where this study has been performed as part of her occupational health position. No separate funding has been necessary.

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Dr. Dandebo was, for this work, associated with the Sahlgrenska Academy, University of Gothenburg, where this article was part of her student scientific assignment curriculum.

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