605 **NON EMERGENCY CALLS AT AN EMERGENCY SETTING: MASS AWARENESS NEEDED**

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Background Timely provision of emergency care reduces losses associated with trauma, fire or disaster. Rescue 1122 is an integrated emergency service offering emergency services and safer community programs in 37 major cities of Province Punjab, Pakistan. It operates through a toll free number, 1122. This study analyses the burden of Non-Emergency Calls (NECs) received on 1122.

Methods Retrospective analysis of all received calls on 1122 during 2004-September 2015 was conducted. Data were collected from 37 major cities of Punjab.

Results Rescue 1122 received over 79 million calls during study period; with only over three million (4%) emergency calls and 76 million (96%) NECs. There were 66 million (87%) Prank, 8 million (10.5%) Information Seeking and 1.8 million (2.5%) Wrong calls. Additionally, about 0.17 million (0.2%) Fake calls were also received, on which 3,964 false dispatches were made. Maximum NECs (around 14 million) were attended by Lahore Rescue 1122; while similar patterns of NECs were also experienced across Punjab. Rescue 1122 adopted various NECs counter-strategies that include: usage of questionnaire-based minimalist communication between anonymous caller and 1122 staff; software-based blacklisting and auto-blocking for habitual callers and calling back for deterrence.

Conclusions Data analysis shows that NECs pose a massive burden on Rescue 1122. Excessive misuse of an emergency number suggests public's lack of awareness and apathetic attitude that could result in death or serious outcome of an emergency. False dispatches made could have resulted in deprivation of emergency care to real emergencies and economic losses as well. Though, Rescue 1122 has adopted some counter-strategies, however that cannot lessen the burden of NECs. Therefore, a mass awareness campaign is needed to sensitise the public regarding the sensitivity of the issue.

606 **PREVENTION OF ACCIDENTS BY ENHANCING REPORTING CULTURE IN THE FINNISH DEFENCE FORCES**

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Background One of the most common obstacles in preventing accidents is the unwillingness of personnel to report near miss incidents. The enhancement of a common reporting culture is essential for a safety process to work.

Methods The number of employees in the Finnish Defence Forces (FDF) is around 12,000 and FDF trains around 25 000 conscripts every year. However the number of official safety near miss reports was 223 in the year 2014. The aim of this process is to lower the threshold of incident reporting by making it simple and worthwhile with a software.

Results A safety management software (SMS) incorporates a common methodology for incident and risk management. Incident management includes reporting and managing near misses and injuries as well as performing safety investigations. FDF personnel and conscripts can report incidents via internet or intranet and on the simplest level they have to fill a form with only a few fields. Three obligatory fields (material, activity and location) link the incidents to the risk management tool and can be used as an easy database when performing risk assessments. The reporter can follow the management of incident report and corrective and preventive actions and will always get a feedback. One of the reasons for high threshold of reporting incidents is the fear of penalty. This matter is of great importance especially in military environment and the safety investigations and the investigations to allocate legal liability must be strictly separated. The safety investigation tool and a related norm are one of the methods to tackle this problem.

Conclusions The safety management software with anonymous and mobile reporting possibility is striving towards a proactive safety reporting. But the software itself is not a shortcut to success. To play its part, it needs communication, procedures, training and above all systematic safety work at all levels and good safety culture starting from the top of the organisation.

Environmental Safety

Post Mon 1.20

607 **EXTERNAL COSTS OF TRAFFIC CONGESTION IN IRAN URBAN FREEWAYS**

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With the rapid growth of urbanisation in recent decades, urban transportation has become one of the major issues, and urban traffic congestion is the concern of mismatch cars with the development facilities of urban transportation. Density is created due to the competition between users of the limited capacity of the transportation system. This social phenomenon is accompanied with problems such as wasting time, wasting opportunities to live, and air pollution, and noise, waste of national resources such as fuel, mental health problems, and neurological disorders. Therefore, the identification and estimation of external costs caused by traffic congestion is important to attract the attention of researchers and policy-makers.

In this paper, overviews of studies on all the parameters that affect the congestion cost have been conducted. These parameters include the cost of traffic congestion, including vehicle operating costs, pollution, travel time and accidents. The different methods used to calculate any of these costs have been introduced and the method of calculating each parameter vector is presented. The principal developed relations for such calculation in this research are as following:

$$C^E_{Con} = \propto_S \left(C^E_{Acc} + C^E_{Delay}\right) + C^E_{AP} + VOC_{Total}$$

C^E_{Con}: External cost of congestion

α_S: Factor related to increasing costs due to neurological disorders

C^E_{Acc}: External costs of congestion due to traffic accidents

C^E_{Delay}: External costs of congestion due to wasted times and delays

C^E_{AP} : External costs of congestion due to air pollution

VOC_{Total}: Additional external operational costs of vehicles

All costs are in Rial/Km. Vehicular operational costs are calculated based on the following relation:

$$\mathbf{VOC}_{\text{Total}} = VOC_F + VOC_M + VOC_S$$

The elements of operational costs are fuel consumption, periodical services, and repairs. The relation for calculation of costs due to delays is as following:

$$C^E_{Delay} = \frac{VOT_T \times T_{CS} \times (T_{CS} \times \beta_P \times V_{CS})}{L_{CS}}$$

VOT $_{\text{Total}}$: The value of time for all trips in Rial/hour

T_{CS} = delay in comparison with the average speed in freeway (70 km/h)

β_P = factor related to vehicle occupation (person/veh)

V_{CS} = average of traffic volume (veh/h)

L_{CS} = total length of the freeway in this study (km)

The additional cost of pollution due to congestion is calculated as following:

$$C^E_{AP} = 10^{-9} * \left(C^{LOS\,E,F}_{AP} - C^{LOS\,D}_{AP}\right) * P * U^I_P$$

C^E_{Ap}: Additional external cost of pollution

P: Factor of pollution dissipation in passenger cars

U^1_p: The cost of one metric ton of dissipated pollution in Iran

The additional cost of congestion due to traffic accidents, has been based on a comprehensive study of accident cost performed earlier in Iran.

Applying the abovementioned research method, and assuming 6 hours of congestion in Hemmat freeway in Tehran in a working day, the average total cost of congestion for such working day, has been computed for six different average speeds of 10 to 60 km/h. The cost related to average speed of 60 km/h is equal to 3 396 681 162 Rial per one kilometre, which is equal to 91802 US Dollar per kilometre.

Calculating the external costs of density with these number of elements that influence on it, and the data used relative to freeways in Tehran (Iran capital) are the specific features and innovations of this paper. The result of this paper is to provide a comprehensive and practical method for calculating the external costs of highway congestion, that with using this information, it is possible to provide the appropriate solutions to invest properly in order to solve this problem.

608 ENVIRONMENTAL CHANGE TO REDUCE CHILD INJURY IN LOW AND MIDDLE INCOME COUNTRIES: A SYSTEMATIC REVIEW

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Background Injuries sustained in the home are a significant contributor to the burden of death and disabilities among young children especially those living in Low and Middle Income Countries (LMICs). The objective of this review was to identify and evaluate the effectiveness of environmental change interventions to reduce child injuries and injury hazards in the home in LMICs.

Methods Seven electronic databases were searched for randomised controlled trials (RCTs) and controlled before and after (CBA) studies of environmental change interventions designed to reduce child injuries and home hazards and published up to 1 April 2014. Where possible, meta-analysis was conducted using RevMan 5.

Results In total four studies were included in the review. Only one study (CBA) reported child injury and three studies (RCTs) home hazards. In the CBA study, child resistant containers were found effective to reduce the incidence of paraffin ingestion by 47% during the intervention period and by 50% after the intervention. Data from two RCTs pooled in a meta-analysis found that a multifactorial intervention (home inspection, safety education and safety device) significantly reduced the post intervention mean scores in the intervention group for poisoning hazards (Mean Difference (MD) −0.77; 95% CI: −1.36, −0.19) and burn related unsafe practices (MD −0.37; 95% CI: −0.66, −0.09) but not for fall, electrical and paraffin burn hazards. The intervention (home inspection and safety education, not safety device) used in a single RCT significantly reduced the post-intervention mean scores in the intervention group for fall hazards (MD −0.5; 95% CI −0.66, −0.33) but not for ingestion hazards.

Conclusions There is limited evidence to determine if environmental change interventions reduce child injuries but some evidence suggested that they may reduce home hazards. More evidence is needed to determine if altering the physical home environment by removing potential hazards reduces injuries.

609 ESCALATOR-RELATED INJURIES AGAINST PRESCHOOLERS: AN IN-DEPTH INVESTIGATION IN GUANGDONG PROVINCE, CHINA

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Background Escalator appears more and more in urban public areas like tube, mall, and some sorts of entertainment venue in recent years accompanied by the modernization of Guangdong Province, China. We benefit facilities but suffer injuries simultaneously from it. Preschoolers are more vulnerable to injuries since they have poor recognition capability of danger. How do escalator-related injuries against preschoolers go like?

Methods From all 56 escalator-related injury accidents happened in Guangdong province at the fewest with one child victim aged 12 or below from the year of 2011 to 2014 by having recourse to the local Media who ever reported them, we succeeded in capturing 43 eligible so as to investigate in depth subsequently. Data inputting and analyses were based on the social statistic software SPSS 20.0 to describe the characteristics epidemiologically of escalator-related injury accidents.

Results There were 47 preschoolers in 43 escalator-related injury accidents totally. Victims went to different outcomes like death 2, finger loss 18, scalp or skin elsewhere laceration 33, soft tissue contusion 25, bone fracture 4, functional deformity 28, and post-traumatic stress disorder 12. Mal-dressing was the main direct cause (53.12%) to escalator-related injuries among all victims including slippers, any dress or backpack with cord. Other causes