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**Title:** THE VULNERABLE PEDESTRIAN: A MULTI DIMENSIONAL PROBLEM BASED ON THE ISRAELI EXPERIENCE

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**Abstract:**

Economically Israel is considered a developed country. Yet its crash statistics are not consistently similar to those of other developed countries. Its pedestrian fatalities - at approximately 35% of all traffic fatalities - are abnormally high for its level of motorization. Analysis of pedestrian fatalities by age and gender shows high percentages of the very young and the very old relative to other age groups. At nearly all age groups males constitute a higher percentage than women. This is typical of most countries: over-involvement of the very young and the very old, with greater proportions of males than females. However, this pattern is not identical for different cultures within Israel, where approximately 80% are Jews and 20% are non-Jews (mostly Arabs). Analyses of fatality and injury rates indicate very different patterns for these two groups. Of the injured elderly (65+ years old) most are Jews, whereas of the injured young children (under 5 years old) most are Arabs.

We conducted in-depth analyses to compare the two groups in terms of their involvement in rural versus urban crashes, daytime versus nighttime crashes, time of day and behavior of the pedestrian immediately prior to the crash. The analyses look at the absolute numbers, the percentages within the age group the religious affiliation, and the rate relative to the size of the specific sub-populations in Israel. The results reveal that differences in crash involvement are due to both exposure variables (numbers in the population) as well as to demographic differences (level of urbanization and living conditions) and behavioral/cultural differences related to different social norms in the two groups. These differences require different countermeasures that include both infrastructure and behavior modification. Some of the countermeasures that have been employed are discussed. Because the Arabs have a much higher birth rate their relative proportion in the overall population is much greater in the very young than in the very old. In addition Arabs tend to live in more rural areas in detached homes with a large yard, where they typically park their vehicles and where their children tend to play without supervision even when they are less than one year old. Thus the prevalence of very young Arab pedestrian fatalities is due both to their prevalence in the general population as well as to their actual exposure to vehicular traffic. In contrast, most Jews live in apartment buildings that have fenced playgrounds nearby, and most Jewish mothers do not let their young children play unattended – thus reducing their exposure to vehicular traffic.

When analyzing the distribution of urban pedestrian fatalities by crossing location in the years 2002-2009 we note that there is a stark contrast between Arab and Jewish fatalities: 42% of Arab children fatalities occurred while they were not crossing the street at all (i.e. walking on or playing in the roadway). The majority of the time, they were actually in the unfenced yard of their home. In comparison only 22% of Jewish children fatalities occurred when they did not cross. Analyzing elderly fatalities show a similar outcome: 47% of all Arab elderly fatalities occurred when they did not cross the road while the Jewish elderly comparable fatality rate is only 13%. The abnormally high difference can be explained by both different cultures, and the surrounding architecture of the towns.

To combat this problem beginning in 2007 the National Road Safety Authority initiated different programs to educate pedestrians of both the Arab and Jewish sectors, with specific targeting by

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age group. These programs were varied to meet the challenges from the different "at-risk" groups. For example, a special program was designed for the Arab and Bedouin populations, targeting parents to better educate and protect their children around their home. The projects for the Jewish groups were specifically tailored towards the elderly, with advertisements and instructions in clubs and health clinics. For example, one project aimed solely at the children of the orthodox community. In addition to these special projects, there were presentations made at schools throughout the country. In this paper we will also analyze the differences of these "at-risk" groups before and after the inception of the new programs.