

Injured cyclists with focus on single-bicycle crashes

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Background: In Sweden, a total of 288 cyclists were killed between 2007 and 2018. During the same period, the number of injured cyclists were 23,528 based on police reported accidents, which also represents the official statistics. The majority, 78%, were injured in collisions with motor vehicles, usually cars. However, the police reported accidents comprise a large underreporting, especially for single-bicycle crashes. From the health care perspective, another picture arises, with a major part being single-bicycle crashes. In 2007-2018, more than 105,000 cyclists were so badly injured (at least MAIS 1+) that they were admitted to A&E departments. In contrast to the police reported data, this hospital data shows that in fact 78% are single-bicycle crashes. It should be emphasized that the number of injured cyclists as stated here must be considered as a minimum, because not all hospitals and health care centres are included in this reporting.

Aim: Study the single-bicycle crashes in more detail to identify appropriate actions.

Method: The results are based on injured cyclists seeking medical care in hospital A&E (accident and emergency) departments, as registered in the Swedish Traffic Accident Data Acquisition (STRADA). The paper will include analyses of data from 2007 to 2019 regarding single-bicycle crashes. Statistical analysis of gender, age and type of accident will be presented as well as differences between single-bicycle crashes with or without electric powered bicycles. From the data between 2007 and 2011, 4,000 single-bicycle accident descriptions were randomly selected and categorised. These descriptions are based on the victims' recollection of their accident. The cause of the accident was categorized due to a "main cause" and could be somewhere in the chain-of-events but have an obvious addressee (e.g. municipality). To get a deeper understanding of the single-bicycle crashes occurring, 32 seriously injured cyclists were also interviewed about the accident in which they had been involved.

Results: The results for the whole data set from 2007 to 2019 are not yet complete. Results from the in-depth analysis of the data from 2007-2011 show that nearly 80% of all cyclists were injured in a single-bicycle crash. The distribution of "main" causes due to a single-bicycle crash were as follows: the most common cause was deficiencies in road maintenance (44%) followed by bicycle-cyclist interaction (16%), road design (15%), cyclist behaviour (14%), and interaction with other road users (10%). Accounting for all the causes mentioned in the accident descriptions, without assessing the "main cause", the five most common causes resulting in a single-bicycle crash are: Ice/snow (20%), kerbstones/edgings (11%), grit – mainly from winter maintenance (10%), evasive actions/lack of interaction (9%), and making a turn/taking a curve (9%). Note that a person can recall several contributing events that caused the crash (on average there were 1,5 causes mentioned per injured cyclist).

Conclusions: In Sweden, eight out of ten injured cyclists have been injured in a single-bicycle crash. Improved road maintenance and road design are important factors to reduce these crashes. In the full paper we will discuss on possible accident trends that can be seen from the data analysed and draw further conclusions regarding appropriate actions needed to reduce the number of injured cyclists.