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Analysis of Single-Bicycle Accidents

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1 INTRODUCTION

While trying to increase the use of bicycles as an environmental friendly and healthy mode of transport cycling safety is a major concern. Accidents between motorized vehicles and bicycles have been analysed in several studies however there is a lack of detailed knowledge of single bicycle accidents. This is partly caused by underreporting of such accidents andto the police. For example in the US accidents need to involve a motorised vehicle to be included in the national accident statistics. In Germany single bicycle accidents when happening in public accessible roads are applicable for the national accident statistics in case they involve normal risks in traffic. However, it appears to be more likely that a bicyclist will not call the police after having a singlebicycle accident.

The accident data base of the German In-Depth Accident Study (GIDAS) includes in-depth information of approx. 1,000 single vehicle bicycle accidents. GIDAS is the largest and most comprehensive in-depth road accident study in Germany. Since mid-1999, the GIDAS project has investigated about 2,000 accidents per year in the areas of Hannover and Dresden and records up to 3,000 variables per crash.

In addition to the in-depth data statistical accident data from the regional accident statistics of Lower Saxony is used for analysis in this study

2 INITIAL ANALYSIS

The GIDAS data base as of December 2016 includes accidents with 65,000 participants. 10,708 participants are cyclists, of which 1,069 are cyclists involved in a single-bicycle accident. This corresponds to 10% of all registered bicycle accidents.

Comparable to all other bicycle accidents the majority of cyclists in single- accidents sustain only minor injuries (MAIS 1 and MAIS 2), see **Error! Reference source not found.**.

Table 1: Injury severity of cyclists in single- bicycle accidents.

Injury severity	Percentage
MAIS 0	3.0
MAIS 1	61,2
MAIS 2	23.5

MAIS 3+	8.1
Unknown	4.2

The majority (46%) of single-bicycle accidents are loss of control accidents at a straight stretch while approx. 16% involve any kind of curve (including turning manoeuvres in crossings). In 10% of the single bicycle accidents the loss of control is caused by an uneven road surface. Approx. 7% of the included accidents involve other participants for the conflict leading to the accident without having an impact (e.g., the cyclist falls following a braking manoeuvre to avoid a collision with another traffic participant). Health issues are responsible for approx. 4% of the single bicycle accidents and sudden failure of the bicycle causes another 4% of the single bicycle accidents.

For the proposed paper the accidents will be analysed more in detail and the in-depth data will be compared to the regional statistical accident data of Lower Saxony.

Currently research is ongoing to better quantify the issue of underreporting based on treated cyclists after an accident in the MHH hospital emergency department. If initial results are available before the paper deadline these will be incorporated into this study.

3 CONCLUSIONS

The GIDAS data base contains a sufficient number of single bicycle accidents for detailed analysis of accident causation and consequences of these accidents.