Cyclist-reported habits of helmet usage in Europe and differences in riding positions by using helmets

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Cooperation work of different countries (partners) within the COAST TU1101 WG 1 action "better cycling"

Abstract

Within the COST Action TU1101 the working group WG 1 is dealing with acceptance criteria and problems in helmet use while bicycling concerning conspicuity, thermal stress, ventilation deficits and other potential confounding.
To analyze the helmet usage practice of bicyclists in Europe a questionnaire and a measuring of helmet position on the head of driving cyclists was developed to collect relevant information by means of a field study.
The questionnaire consists of some 66 questions cover the fields of personal data of the cyclist, riding und helmet usage habits, information concerning the helmet model and the sensation of the helmet, as well as information on previous bicycle accidents. A second complementary study is conducted to analyze if the use of a bicycle helmet influences the seating geometry and the posture of cyclists when riding a bicycle and if the if the helmet vertically limits the vision. For this purpose cyclists with and without helmets were photographed in real world situations and relevant geometrical values such as the decline of the torso, the head posture of the upper vertical vision limit due to the helmet were established from the photos.
The interim results of the field studies conducted in Germany by the Hannover Medical School are presented for this abstract as preliminary results. For the final paper the both parts of study carried out in Greece, Italy and Portugal are summarized for I total number of more than 1000 bicyclists involved.
Preliminary results for Germany: From the riders interviewed with the questionnaire only 11% of the city bike riders and 12% of the mountain bike riders always used the helmet, while 38% of the racing bike riders and 88% of the e-bike-riders always used the helmet. The helmet use seems not to change the sensation of safety of cycling compared to the use of a car. The arguments for not wearing a helmet are mostly stated to be the short distance of a trip, high temperatures or carelessness and waste of time. The reasons for using a helmet are stated to be the feeling of safety and being used to using a helmet. Being a role model for others was also stated to be a reason for helmet use. Concerning the sensation of the helmet 9% of the riders reported problems with the field of vision when using a helmet, 57% saw the problem of sweating too much, and 10% reported headaches or other unpleasant symptoms like pressure on the forehead when using the helmet. The analysis of the

seating posture from the pictures taken of cyclists revealed that older cyclists generally have a riding position where the handle bar is higher than the seat (0° to 10° incline from seat to handlebar), while younger riders had a higher variance (between -10° decline and 20° incline). Further, elderly riders and riders with helmets seem to have a more upright position of the upper body when cycling. The vertical vision limit due to the helmet is determined by the front rim of the helmet (mostly the sun shade). Typical values here range from 0° (horizontal line from the eye to the sun shade) to 75° upwards, in which elderly riders tend to have a slightly higher vertical vision limit possibly due to the helmet being worn more towards the face.