

# **Helmets for Preventing Injury in Motorcycle Riders**

## **Abstract**

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### **BACKGROUND:**

Motorcycle crash victims form a high proportion of those killed or injured in road traffic accidents. Injuries to the head, following motorcycle crashes, are a common cause of severe morbidity and mortality. It seems intuitive that helmets should protect against head injuries but it has been argued that motorcycle helmet use decreases rider vision and increases neck injuries. This review will collate the current available evidence on helmets and their impact on mortality, and head, face and neck injuries following motorcycle crashes.

### **OBJECTIVES:**

To quantify the effectiveness of wearing a motorcycle helmet in reducing mortality and head and neck injury following motorcycle crashes.

### **SEARCH STRATEGY:**

Databases including the Cochrane Injuries Group Specialised Register, Cochrane Central Register of Controlled Trials (The Cochrane Library issue 1, 2003), MEDLINE (January 1966 to February 2003), EMBASE (January 1985 to February 2003), CINAHL (January 1982 to February 2003), IRRD (International Road Research Documentation), TRANSDOC, TRIS (Transport Research Information Service), ATRI (Australian Transport Index) (1976 to Feb 2003), Science Citation Index were searched for relevant articles. Web sites of traffic and road accident research bodies including government agencies were also searched. Reference lists from topic reviews, identified studies and bibliographies were examined for relevant articles.

### **SELECTION CRITERIA:**

We considered for inclusion studies that investigated a population of motorcycle riders who had crashed, examining helmet use as an intervention and with outcomes that included one or more of the following: death, head, neck or facial injury. Studies included any that compared an intervention and control group and, therefore, included any randomised controlled trials, non-randomised controlled trials, cohort, case-control and cross-sectional studies. Ecological and case series studies were excluded.

## **DATA COLLECTION AND ANALYSIS:**

Two reviewers independently screened reference lists for eligible articles. Two reviewers independently assessed articles for inclusion criteria. Data were abstracted by two independent reviewers using a standard abstraction form.

## **MAIN RESULTS:**

Fifty-three observational studies were identified of varying quality. Despite methodological differences there was a remarkable consistency in results, particularly for mortality and head injury outcomes. Motorcycle helmets appear to reduce the risk of mortality although, due to heterogeneity in study design, an overall estimate of effect was not calculated. There was some evidence that the effect of helmets on mortality is modified by speed. Motorcycle helmets were found to reduce the risk of head injury and from five well-conducted studies the risk reduction is estimated to be 72% (OR 0.28, 95%CI 0.23, 0.35). Insufficient evidence was found to estimate the effect of motorcycle helmets compared with no helmet on facial or neck injuries. However, studies of poorer quality suggest that helmets have no effect on the risk of neck injuries and are protective for facial injury. There was insufficient evidence to demonstrate whether differences in helmet type confer more or less advantage in injury reduction.

## **REVIEWERS' CONCLUSIONS:**

Motorcycle helmets reduce the risk of mortality and head injury in motorcycle riders who crash, although the former effect may be modified by other crash factors such as speed. Further well-conducted research is required to determine the effects of helmets and different helmet types on mortality, head, neck and facial injuries. However, the findings suggest that global efforts to reduce road traffic injuries may be facilitated by increasing helmet use by motorcyclists.