

# Industrial maxillofacial injuries in the United Kingdom

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## Abstract

The treatment of maxillofacial injuries forms a substantial part of the work in oral and maxillofacial units, but injuries sustained in work-related incidents are uncommon, mainly because of the strict enforcement of Health and Safety policies. We used data from the Health and Safety Executive in the United Kingdom to review the incidence and aetiology of maxillofacial injuries that result from industrial accidents in the UK, and highlight the case of a worker who sustained an isolated fracture of the nasoethmoidal complex when he was trapped in a cheese press. In 2010–2011, roughly 115 379 accidents or incidents at work were reported in the UK, and of the 1623 (1%) that were maxillofacial, 81% occurred in the service sector. The most common mechanism of injury was assault (37%) and the most common injury was contusion (30%). Since the introduction of the Health and Safety Act, work-related accidents in the UK have decreased considerably. However, they will continue to occur because of human error.

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**Keywords:** Maxillofacial Injuries; Industry Sector; Human Errors

## Introduction

Until the implementation of the Health and Safety at Work Act 1974,<sup>1</sup> injuries at work were common. The Act, which was designed to protect the health, safety, and welfare of workers, has radically reduced the incidence of both fatal and non-fatal injuries. A review in 2008 showed that between 1974 and 2007, the rate of injuries/100 000 employees fell by 76%. These data are available because the Reporting of

Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)<sup>2</sup> gave employers a statutory obligation to report all serious work-related accidents (fatal or non-fatal) or dangerous occurrences to the Health and Safety Executive (HSE).<sup>3–5</sup>

We know of only 5 studies that have looked at industrial maxillofacial injuries (Table 1).<sup>6–10</sup> The studies are regional and include relatively small numbers, but internationally, the percentage of maxillofacial injuries related to the workplace varies from 0.1% to 12%.<sup>6</sup> It is interesting to note that in Japan, despite a 27-year study period, there were only about 4 injuries/year compared with the United Kingdom and Austria where there were around 52 and 59/year, respectively.

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Table 1  
Studies that compare maxillofacial injuries sustained in the workplace. Data are number (%).

	Burnham 2012 <sup>6</sup>	Yamamoto 2011 <sup>7</sup>	Eggensperger 2006 <sup>8</sup>	Hächl 2002 <sup>9</sup>	Iizuka 1990 <sup>10</sup>
Region and country	Birmingham, UK	Nara, Japan	Berne, Switzerland	Innsbruck, Austria	Helsinki, Finland
Period studied	2009-2011 (2 years)	1982-2008 (27 years)	2000-2002 (2 years)	1991-1999 (8 years)	1981-1986 (6 years)
Industrial maxillofacial injuries treated	104 (2)	103 (4)	42 (8)	463 (5)	98 (5)
No. of injuries/year	52	4	21	59	16
Nature of work:					
Agriculture	-	31 (30)	15 (36)	43 (9)	3 (3)
Construction	40(39)	42 (41)	14 (33)	124 (27)	26 (26)
Manufacturing	-	15 (14)	9 (21)	102 (22)	39 (39)
Transportation	-	4 (4)	2 (5)	22 (5)	9 (9)
Services	64 (61)	7 (7)	2 (5)	69 (15)	21 (21)
Waste/water supply	-	-	-	-	-
Cause of injury:					
Animal	1 (1)	-	-	-	-
Assault	28 (27)	-	-	6 (1)	11 (11)
Collision with object/vehicle	-	24 (4)	2 (5)	15 (3)	27 (27)
Compressed, caught by object	-	7 (7)	5 (12)	-	-
Contact with machinery	5(5)	7 (7)	4 (10)	-	-
Fall between levels	5 (5)	31 (30)	6 (14)	129 (28)	12 (12)
Fall/slip/trip on same level	13 (12)	10 (10)	1 (2)	33 (7)	7 (7)
Harmful substance	-	-	-	-	-
Handling/carrying	-	-	-	-	-
Struck by thrown or falling object	11(10)	43 (42)	18 (43)	224 (48)	-

We have reviewed the number of industrial maxillofacial injuries and report the case of a worker who was injured in a cheese factory.

## Methods

We reviewed all HSE data from 2010-11 reported under RIDDOR on injuries of the midface, teeth, and jaws, to find out which workplaces pose the greatest risk, and the type and mechanism of injury. Annual statistics include the number and seriousness of injuries sustained by workers, and where and how they occurred. The information is freely available to any member of the public.

## Results

HSE statistics for 2010-11 reported under RIDDOR show that in the UK there were around 115 379 reported accidents or incidents at work and 123 deaths.<sup>5</sup> Of the non-fatal injuries, 77 593 (67%) were sustained by men, and 98% of those who died were also men. [Figure 1](#) shows the ages at which injuries occurred. The HSE was notified that 1623(1%) workers had sustained injuries to the midface, teeth, and jaws. None had been fatal. The service (81%), manufacturing (10%), and construction (5%) industries posed the highest risk of facial injury ([Fig. 2](#)). [Figure 3](#) shows the causes of injury.

### Nature of injuries

Most injuries involved only soft tissue, and bruising, lacerations, and superficial injuries were the most common (73%).

Only 2% were fractures of the facial skeleton (upper, mid, and lower face), and in 10% of these more than one site was affected. In 5%, injuries were either not classified or not recorded.

### Accident in a cheese factory

A 24-year-old man was cleaning the conveyor belt that delivers cheese into a press for final packaging ([Fig. 4a](#) and [b](#)). During cleaning, the setting on the conveyor belt should be changed from automatic to manual, which deactivates the sensor that switches on the press. As a default safety feature, the conveyor belt is automatically switched off when the protective gate is raised to allow access to the press, but on this occasion, the worker had asked his colleague to set the belt to automatic to allow it to be aligned and reset. For reasons unknown, the worker had entered the press and closed the gate behind him. The sensor was then activated when he put his head inside. He sustained compression to the frontonasothmoidal complex ([Fig. 5a](#) and [b](#)), a type 2 Manson-Markowitz fracture of the nasoethmoidal complex, and fractures of the walls of both anterior and posterior frontal sinuses. The globe of his left eye was also ruptured, and he had a full thickness laceration to the scalp in the occipital area but no underlying fracture of the skull. Components of the conveyor belt were impacted in the ethmoid sinus. All injuries were maxillofacial and no neurosurgical intervention was required.

After open reduction and internal fixation of the fracture with enucleation of the left globe he made a full recovery and is currently awaiting a prosthesis for his eye.

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