

# Decline in hospitalisations due to dog bite injuries in Catalonia, 1997–2008. An effect of government regulation?

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## ABSTRACT

**Objective** To analyse population-based data on hospitalisation caused by dog bite injuries after changes in legal regulations on dog ownership, including breed-specific regulations.

**Design** Descriptive study.

**Setting** Hospitals in Catalonia (Spain), 1997–2008.

**Subjects** Persons hospitalised with injuries caused by dog bites.

**Results** There has been a significant decline in hospitalisation caused by injuries from dog bites from 1.80/100 000 in 1997–9 to 1.11/100 000 in 2006–8, after the enactment of stricter regulations on dog ownership in 1999 and 2002. The magnitude of this change is significant (–38%), and has been greatest in less urban settings.

**Conclusions** Government regulations were associated with a sizable decrease in injuries caused by dog bites in Catalonia. More evaluative studies in this field may provide criteria to focus future regulations and other preventive interventions.

## BACKGROUND

Animal bites in humans are a public health problem. Over the last few years, dog bite injury episodes involving children have received high media exposure, resulting in rising public concern. As a result, regulations on dog ownership and breed-specific regulations have been adopted in many countries, sometimes with controversy.<sup>1–3</sup> The objective of this study was to analyse existing population-based data from Catalonia (Spain) on hospitalisations caused by dog bite injuries after the adoption of legal regulations in this field. The aim was to see if the data suggest noticeable changes after their adoption.<sup>4</sup>

## MATERIALS AND METHODS

The study is based in Catalonia, Spain (population 7.2 million). Since 1991, acute care hospitals have been reporting their activity through the CMBDAH (hospital discharge basic minimal dataset in its Catalan acronym); data in this information system include inpatient characteristics and details of each hospitalisation such as main and secondary diagnoses, currently coded with the 9th revision of the *International Classification of Diseases* (ICD).<sup>5</sup> These data are compiled and analysed, statistics and reports are published periodically, and information is available for specific enquiries or studies.<sup>5,6</sup>

For this study, information was collected on all hospital discharges financed by the Catalan Health Service for the 12 years from 1997 to 2008. All cases for which dog bite was present as an external cause code (ICD-9-CM code E906.0) were included, sorted by place of residence (the city of Barcelona versus the rest of Catalonia). The Catalan Statistics Institute (IDESCAT) provided the population estimates from the municipal population counts to be used as denominators. Annual hospitalisation rates were estimated for 3-year periods with 95% CIs to enable rate comparisons.

In 1999 and 2002, regulations on dog ownership, with specific reference to potentially dangerous dogs, were approved by both the Kingdom of Spain and the government of Catalonia.<sup>4</sup> They mandated that all dogs have to be identified, and that the dog owner is responsible for the dog's actions. The definition of potentially dangerous dogs included several breeds (in Catalonia: pit bull terrier, Staffordshire bull terrier, American Staffordshire terrier, Rottweiler, bull mastiff, Naples mastiff, Argentina mastiff, Bordeaux mastiff, Canary fighting dog, Brazilian Fila, Doberman, tosa inu, akita inu and their mixed breeds), those with certain physical traits (regarding size, weight, thorax size, muscle, head and jaws, etc), and also dogs declared dangerous by a veterinarian because of a history of aggression. Regulations mandated that a special licence is required to own such an animal (costing €48.88 for 5 years in Barcelona), which requires special insurance coverage (to cover damages up to €150 000, annual cost estimated at €70), and both a psychological aptitude certificate (estimated cost of about €40) and the absence of criminal records for the owner. They also mandated that such dogs had to be leashed and muzzled in public areas and identified with microchips or other suitable means. These regulations received extensive public attention and media coverage, and in successive years were often transposed in municipal ordinances, to ensure enforcement by local police.

## RESULTS

Figure 1 shows the number of hospitalisations for the 12 years studied, broken down by setting (Barcelona and the rest of Catalonia), including estimated 3-year moving averages. Although the relatively small numbers show some intrinsic variation from year to year, there is a noticeable decline during this period, mostly outside the city of Barcelona. Table 1 shows dog bite hospitalisation rates per 100 000 population with their 95% CI for

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