

# Horse-Related Injuries and Deaths in North Carolina, 1995-1999

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Nationally, accidents are the leading cause of death for those under 35 years of age and the fifth leading cause of death among all age groups.<sup>1</sup> Injuries are a serious public health problem, which takes a toll on the health of the population and imposes social and economic costs on society. If the medical community is to prevent injuries and deaths, each activity should be individually evaluated.

This data presented here are based on a study of equestrian accidents in North Carolina resulting in injury or death. North Carolina has a horse population of 256,270 equines,<sup>2</sup> and many North Carolina citizens use horses for recreation and employment. There are an estimated 70,000 horseback riders in North Carolina. This study compared data from three sources for the years 1995 through 1999: the National Electronic Injury Surveillance System (NEISS)<sup>3</sup> (records for North Carolina), North Carolina Trauma Registry (NCTR),<sup>4</sup> and the North Carolina Medical Examiner's Database (NCME).<sup>5</sup> Records in the NCTR were selected with Ecodes indicating injuries caused by animals.

The age group at greatest risk for all injuries (NEISS), severe injuries (NCTR), and deaths (NCME) are equestrians between the ages of 25 and 44 years of age. Equestrians age 45-65 years are the second highest group at risk of injury. The largest percent of injuries among this age group can be seen in the NCME data, with smaller percentages in the NCTR and the NEISS data. It has been suggested that experience would decrease the number of accidents, but one would expect the equestrians age 25-64 years would have more experience in horse-related activities than younger equestrians.

Fractures represent the highest percent of injury type in the NEISS and NCTR data. The second most common injury in NEISS is contusion

and abrasion, but in NCTR, it is laceration. Neurological head injury is the most common cause of death, the third most common injury in the NCTR data, and the fourth most common injury in the NEISS data.

According to the NEISS data, the extremities are the most commonly injured body parts, while the NCTR and NCME data rank the head as the most commonly injured. The trunk ranks second in all three databases.

## Conclusions

The North Carolina data correspond with national medical studies of horse-related activities in that head injury is the leading injury. Head injuries are the most severe of the injuries in North Carolina, causing 56% of all horse-related deaths. Head injuries can be prevented or reduced in severity by wearing properly fitted and secured American Society for Testing and Materials (ASTM) equestrian standard/Safety Equipment Institute (SEI) certification protective headgear. Other factors that can play a role in injury prevention include: horse selection at the level of the rider, horse and rider conditioning for the activity, instruction from a qualified teacher, no use of alcohol while riding, and proper attire for the activity.

**Table 1.**  
**Age Groups from NEISS, NCTR, and NCME Databases, 1995-1999**

| Age     | NEISS (NC subset) |         | NC Trauma Registry |         | NC Medical Examiner |         |
|---------|-------------------|---------|--------------------|---------|---------------------|---------|
|         | Count             | Percent | Count              | Percent | Count               | Percent |
| 0-4     | 2                 | 0.5%    | 16                 | 3.1%    | 3                   | 12%     |
| 5-14    | 61                | 16.4%   | 68                 | 13.3%   | 1                   | 4%      |
| 15-24   | 59                | 15.8%   | 85                 | 16.6%   | 1                   | 4%      |
| 25-44   | 172               | 46.1%   | 211                | 41.2%   | 11                  | 44%     |
| 45-64   | 70                | 18.8%   | 104                | 20.3%   | 7                   | 28%     |
| 64+     | 9                 | 2.4%    | 28                 | 5.5%    | 2                   | 8%      |
| Unknown | 0                 | 0%      | 0                  | 0%      | 0                   | 0%      |
| Total   | 373               | 100%    | 512                | 100%    | 25                  | 100%    |

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**Table 2.**  
**Comparison of Diagnosis Categories from NEISS, NCTR, and NCME Databases, 1995-1999**

| Injury Type        | NEISS<br>(NC subset) |         | NC Trauma<br>Registry |         | NC Medical<br>Examiner |         |
|--------------------|----------------------|---------|-----------------------|---------|------------------------|---------|
|                    | Count                | Percent | Count                 | Percent | Count                  | Percent |
| Fracture           | 129                  | 34.6%   | 428                   | 35.5%   | 2                      | 8.0%    |
| Contusion/Abrasion | 118                  | 31.6%   | 75                    | 6.2%    | 0                      | 0%      |
| Strain/Sprain      | 36                   | 9.7%    | 14                    | 1.2%    | 0                      | 0%      |
| Laceration         | 31                   | 8.3%    | 188                   | 15.6%   | 0                      | 0%      |
| Neurological Head  | 31                   | 8.3%    | 160                   | 13.3%   | 14                     | 56%     |
| Internal Injury    | 0                    | 0%      | 153                   | 12.7%   | 0                      | 0%      |
| Other              | 23                   | 6.2%    | 89                    | 7.4%    | 6                      | 24%     |
| Spine              | 0                    | 0%      | 81                    | 6.7%    | 2                      | 8.0%    |
| Dislocation        | 5                    | 1.3%    | 18                    | 1.5%    | 0                      | 0%      |
| Perinatal*         | 0                    | 0%      | 0                     | 0%      | 1                      | 4.0%    |
| Total              | 373                  | 100%    | 1,206                 | 100%    | 25                     | 100%    |

\* Mother was kicked by horse resulting in premature delivery and death of baby.

**Table 3.**  
**Injured Body Region from NEISS, NCTR, and NCME Databases, 1995-1999**

| Injured Body Region             | NEISS<br>(NC subset) |         | NC Trauma<br>Registry |         | NC Medical<br>Examiner |         |
|---------------------------------|----------------------|---------|-----------------------|---------|------------------------|---------|
|                                 | Count                | Percent | Count                 | Percent | Count                  | Percent |
| Head (including brain and face) | 68                   | 18.2%   | 360                   | 33.6%   | 14                     | 56%     |
| Trunk                           | 109                  | 29.2%   | 319                   | 29.8%   | 6                      | 24%     |
| Extremity                       | 186                  | 49.9%   | 273                   | 25.5%   | 0                      | 0%      |
| Spine                           | 0                    | 0.0%    | 81                    | 7.6%    | 0                      | 0%      |
| Neck                            | 9                    | 2.4%    | 0                     | 0       | 2                      | 8.0%    |
| 25-50% of Body                  | 1                    | 0.3%    | 0                     | 0       | 2                      | 8.0%    |
| Perinatal                       | 0                    | 0       | 0                     | 0       | 1                      | 4.0%    |
| Unspecified                     | 0                    | 0       | 38                    | 3.5%    | 0                      | 0%      |
| Total                           | 373                  | 100%    | 1,206                 | 100%    | 25                     | 100%    |

## REFERENCES

- Centers for Disease Control and Prevention, National Center for Health Statistics. Deaths: Final Data for 2003. Available at: <http://www.cdc.gov/nchs/products/pubs/pubd/hestats/finaldeaths03/finaldeaths03.htm>. Accessed February 27, 2006.
- American Horse Council, Deloitte-Touche survey, Washington, DC. As reported by the NC Horse Council, 2005.
- National Electronic Injury Surveillance System, US Consumer Product Safety Commission, National Injury Information Clearing House, Office of Information Services, Vicky B. Leonard, vleonard@cpsc.gov. 2000.
- University of North Carolina at Chapel Hill North Carolina Department of Surgery, Trauma Registry. 2004.
- North Carolina Medical Examiner's Database. Chapel Hill, NC. 2000.