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SYNOPSIS

BECK, ALAN M. (Bureau of Animal Affairs, New York City Health Department), LORING, HONEY, and LOCKWOOD, RANDALL: *The ecology of dog bite injury in St. Louis, Missouri*. *Public Health Reports*, Vol. 90, May-June 1975, pp. 262-267.

A detailed analysis of all the reported dog bites that occurred over a 2-year period in St. Louis, Mo., provided new insight not only into the severity of the problem, but also the environmental context for injury. Dog bite is a major medical problem that affects at least 1

of every 222 people and specifically 1 of every 83 children, 5 to 9 years old. Nearly 20 percent of all the children bitten were injured on the head or face, a source of concern and expense for all concerned. Nearly 10 percent of all bites were classified as serious.

In only 25 percent of all injuries did the victim's behavior involve the dog at the time of the bite, and in only 10 percent of the cases was the victim interacting with the dog's owner. The victim was on the dog owner's property in about 10 percent of the incidents, and

in about 48 percent of the cases the bite took place near the owner's property. Bite incidents go up whenever the weather is conducive to street activity.

More than 85 percent of all the biting dogs had owners. These results indicate that society's views of dog bite injury, which tend to minimize the problem and find fault with the victim, must be re-evaluated. It is time to place less emphasis on the victim and even the animal and review the public health implications of dog ownership.

Dog Bites Among Letter Carriers in St. Louis

Subsequent to the preceding study, Randall Lockwood and Dr. Alan M. Beck carried out the following study to determine why letter carriers have more occupation-related dog bite injuries than other persons. Kent Hornberger of the St. Louis Postal Service Safety Unit made data available for this study.

THE U.S. POSTAL SERVICE reported that 6,708 of the nation's letter carriers were bitten by dogs in 1973. In St. Louis, letter carriers comprised more than 30 percent of all reported victims of occupation-related dog bite injuries in 1973.

For this study, information on letter carriers was obtained from two sources: (a) a questionnaire concerning bite history, attitudes toward dogs, dog ownership, and postal delivery problems because of dogs and (b) accident records of the St. Louis Postal Service for 1972 and 1973. The questionnaire was sent to a sample of 270 letter carriers in districts that represented a cross section of the postal routes in the city; 260 carriers responded. The accident records were analyzed by the same method used in the previous study. To determine if bite victims differed from accident victims in general or from the general letter carrier population, the bite victims were compared with a sample of victims of non-dog-related accidents (slips and falls) and with the general carrier population.



Results

Of a population of approximately 2,000 carriers in St. Louis, 132 were bitten in 1972 and 112 in 1973—an average rate of 6,120 per 100,000, which is more than 14 times the rate for the general population. (Fewer

carrier victims are reported in the earlier study because the data were based solely on bite incidents reported in the city of St. Louis. The St. Louis Postal District also includes much of St. Louis County.)

Among the 260 respondents to the questionnaire, 33 percent had been bitten on the job. Although letter carriers may be more likely to report injuries than the general public, it is believed that their dog bites are underreported. Dog bite is the third most common kind of accident among postal workers; it follows motor vehicle and manual handling (for example, lifting) accidents.

The questionnaire responses indicated that 71 percent of the carriers considered dogs a mild problem and 9.1 percent considered them a serious or severe problem. Of those who had been bitten, 19.9 percent said that dogs are a serious or severe problem. In their assessments of changes in the dog situation over the past few years, 16 percent thought it had improved, 16 percent thought it was worsening, and 68 percent noticed no change. Mail had been withheld because of dogs at least once by 86.5 percent of the respondents.

The carriers' legs and feet were the most frequent targets, 72.5 percent of all bites; followed by arms and hands, 21.7 percent; body, 5.7 percent; and head and neck, 0.4 percent. Professional treatment was received by 88 percent of the victims: 19.8 percent at first-aid units of the Post Office, 25.6 percent at hospitals, and 42.6 percent at private physicians' offices. Most bites were minor; only 1.6 percent resulted in a lost workday after the incident. However, there were individual instances of lost time that exceeded 21 days.

The U.S. Postal Service estimates that the direct cost of bite injuries for the 6,708 victims in 1973 was \$308,000 or about \$46 per bite; this cost was only for direct medical services and temporary replacement of personnel. The St. Louis Postal Service estimates a direct medical cost of \$15 for treatment of a minor bite and \$60 to \$100 for indirect costs to the agency. The preceding costs exclude damages won in private lawsuits by carriers, replacement of damaged uniforms, and expenses incurred by the local government for recordkeeping and rabies control. A conservative 4 to 1 ratio of indirect to direct costs reveals that even minor bites cost more than \$1.2 million a year for the nation's letter carriers.

No significant differences were seen in height, weight, age, sex, or race of the bitten and nonbitten carriers.

More than 80 percent of the respondents thought that those who do not travel the same route each day, such as relief, utility, and substitute workers, have more problems with dogs than do regular carriers. This belief is supported by the accident data. Carriers traveling different routes daily represented 16.4 percent of the bitten population but only 10.6 percent of the total population ($\chi^2 = 8.4$, $P < 0.01$). Presumably, such carriers have no opportunity to become familiar with the habits of the dogs on their routes or the dogs do not come to consider them part of the normal daily routine. A slight



Dog control sign in New York City

trend was seen toward more bites among less experienced carriers; however, new carriers usually are not assigned to regular routes.

Although all new carriers receive some instruction regarding dogs, 73.7 percent of the respondents could not recall having received special training, 14.4 percent received written material, 6.7 percent received a lecture, and 3.3 percent saw the film "You Can't Bite Back." However, the bite rate among carriers who had received orientation material was not significantly different from the rate among those who had no special training. This finding suggests that (a) there is no effective educational deterrent to dog bite or (b) present instructional programs must be improved and evaluated as to their effectiveness.

Most of the respondents considered their attitudes important in influencing the way dogs react to them; 89 percent agreed with the statement "Dogs can sense it when you are afraid of them." About 75 percent of the respondents "liked" dogs, 11.4 percent "disliked" dogs, and the remainder expressed no opinion. However, the bite rates of those who liked and those who disliked dogs did not differ significantly.

Carriers who had been bitten own more dogs than those who had not been bitten (0.98 dog per bitten carrier versus 0.66 per non-bitten carrier, $t = 1.92$, $df = 215$, $P < 0.05$). Also, the bitten carriers had owned more dogs in the past (3.98 dogs per bitten carrier versus 3.29 per non-bitten carrier, $t = 2.57$, $df = 215$, $P < 0.01$). It is possible that persons who own dogs are more

likely to approach and interact with dogs and thus are more likely to be bitten.

Concerning uniforms, 83.1 percent of the respondents agreed that dogs respond differently to uniformed persons than to those in street clothes. Perhaps some particular aspect of the uniform, such as the pouch or the keys, causes dogs to react. The role of the uniform in dog bites should be studied.

More than half of the respondents, 57.4 percent, reported having 10 or more dogs on their routes. Of the approximately 30 percent who named problem breeds, 43.3 percent stated German Shepherds; 20.1 percent, large dogs in general; 15 percent, mixed breeds; 10 percent, toy breeds; and 6.7 percent, poodles. The breeds specified in the accident reports were 24.5 percent German Shepherds, 17.5 percent mixed breeds, 15.8 percent poodles, and 8.8 percent toys.

Strays (no owner found) were implicated in only 2.5 percent of the dog bites, and 91 percent of the respondents did not consider stray dogs a problem. However, straying pets (those with owners) accounted for most of the biting dogs. According to the accident reports, 54.6 percent of the dogs were running loose when the carriers were bitten, 30 percent were in the house but ran out when the door was opened, 6.3 percent broke leashes or jumped fences, and only 7.8 percent were securely leashed, tied, or fenced. These percentages clearly reveal that many people do not obey the leash laws of the city, a fact that was corroborated by 77.2 percent of the respondents.

Rewarding the types of housing and the socioeconomic strata of the routes where the respondents had the most trouble with dogs, 62.2 percent named single-family houses, 33.3 percent two-family dwellings, and 2.2 percent apartments; 61.2 percent stated low income areas, 34.6 percent middle income, and 4.2 percent considered high income areas the most troublesome. Some socioeconomic factors may be related to how well individual owners restrain their dogs, but 33 percent of the carriers thought that owners did not try to keep their dogs indoors during delivery hours and 67 percent believed that the opposite was true.

It has been suggested that dogs may be frightened or aroused by unfamiliar persons or things, and thus black carriers may have more problems with dogs in predominantly white areas or vice versa. However, 86.1 percent of the respondents believed that race was not a factor, although they differed in their assessments of their most troublesome routes. White carriers characterized routes on which they had the greatest difficulty with dogs as predominantly white or predominantly black with equal frequency—30.5 percent white, 31.6 percent black, and 26.9 percent mixed. Black carriers reported greater difficulty in black areas, 48 percent, than in white areas, 10.9 percent, or in mixed areas, 39.8 percent. This difference in assessment is significant ($X^2 = 14.3 P < 0.001$).

In 30.7 percent of the bite incidents, the dog's owner or a child of the owner was outdoors. This situation in-

dicates that dogs may be more likely to attack when they believe they are protecting a family member from an intruder. In fact, 67 percent of the respondents stated that they had more difficulties with dogs when their owners were present. In 82.3 percent of the bite incidents, no reported interaction (as defined in the earlier paper) occurred between the letter carrier and the dog before the bite, as opposed to 35.2 percent of the bite incidents in the general population. In only 2.5 percent of the incidents was the carrier reported to have been petting the dog and in 2 percent to have been unintentionally provoking the animal. Although these reports are based on the testimony of the victims, and therefore may be biased, we can assume that generally their behavior was not provocative at the time of the bite.

For protection from attacking dogs, the postal service makes available to all carriers a chemical spray called HALT (Capasicin in an oil base with a freon propellant). Only 45.4 percent of the respondents said they carried HALT at all times, but 48.3 percent of these carriers had never used it. Of the remaining respondents, 16.9 percent never carried HALT, and 37.7 percent carried it occasionally. Reluctance to carry or use the spray was attributed to (a) fear of injuring dogs (although the spray is endorsed by veterinary and humane societies), (b) fear of antagonizing owners, (c) insufficient opportunity to use it during an attack, (d) ineffectiveness in wind, and (e) alleged ineffectiveness against large dogs.

According to the accident reports, 79.9 percent of the victims were carrying HALT at the time of the attack, but they did not have time to use it; 8.9 percent used it but were still attacked. There was no significant difference between the bite rate for carriers who always carried the spray and the rate for those who never carried it. The consensus of the carriers seemed to be that chemical spray is effective for preventing further injury after an initial attack but it is not a solution to the bite problem.

Prevention of Dog Bites

Although the following suggestions for prevention of dog bites are based on the study of letter carriers, they also apply to other persons who are exposed to dogs because of their occupations:

1. Training programs for carriers must be expanded, re-evaluated, and specifically made available to new carriers.
2. The effectiveness of chemical repellants must be re-evaluated and compared with other products, for example, ultrasonic horns.
3. Carriers should be encouraged to use their prerogative to withhold delivery in problem situations.
4. The public as well as service workers must be made aware that dog bites can create a serious health problem, that there are proper methods for dealing with dogs, that certain activities provoke dogs, and that dog owners are morally and legally responsible for preventing their pets from causing injury.