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ABSTRACT

This paper discusses data on the deaths of children aged 1-4 years in Washington State. A two-fold approach was used in the analysis. First, Washington State death certificate data for 1979-85 were used to characterize the deaths and identify hazardous situations. Second, death certificates were linked to birth certificates of children born in Washington in an effort to examine the role that birth and family characteristics play in early childhood death. The results indicate that the leading categories of early childhood injury death are motor vehicle accidents, drowning, fires, suffocation, and homicide. A total of 31 percent of the deaths occurred in the home, while 57 percent took place outside the home. Deaths from injury inside the home were particularly prevalent among children with low birth weights. The most common risk factor identified was the presence of other children in the family. In addition, certain lifestyle habits, such as drinking and smoking, place both parent and child at risk. (RJC)

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EARLY CHILDHOOD INJURY DEATHS IN WASHINGTON STATE

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INTRODUCTION

Young children are curious - they like to explore their environment. At the same time, they are unaware of the hazards to be found in the simplest household object. It is not surprising, therefore, that injuries are the leading killer of preschool children, accounting for nearly half of their deaths (1). Beacuse these young children are so vulnerable, it is incumbent upon adults to try to prevent their deaths whenever possible.

To assist prevention activities, this paper presents data on deaths of preschool children (i.e., those aged 1-4). A two-fold approach was used in the analysis. First, Washington State death certificate data for the years 1979-85 was used to characterize the deaths and identify hazardous situations. Second, death certificates were linked to birth certificates for children born in Washington, to examine the role that birth and family characteristics play in early childhood death. This linkage covered 80 percent of the 1979-85 childhood deaths of Washington State residents. There was no significant difference between the linked and unlinked records for either age at death or cause of death.

RESULTS

1. Causes of death: The leading categories of early childhood injury death are motor vehicle accidents, drowning, fires, suffocation, and homicide (Figure 1). Together, these five causes account for 88 percent of injury deaths and 43 percent of all deaths of preschool children. Motor vehicle accidents alone account for more than one-third of early childhood injury deaths. There are three major types of fatal motor vehicle accident: cases where the child is a passenger in a car, pedestrian traffic accidents where the child is hit by a car, and pedestrian nontraffic accidents where the child is run over in a driveway or parking lot. ('Other' deaths, which account for 12 percent of the total, are primarily due to falls, being struck or crushed by falling objects, and accidental poisonings.)

2. Timing of deaths: To study timing of injury deaths, the causes are grouped into two categories: inside causes (fire, suffocation, homicide) which occur primarily inside the house and outside causes (motor vehicle accidents, drowning) which occur in outside locations, generally away from home (except pedestrian nontraffic accidents, which are usually in the home driveway). Inside causes account for 31 percent of the deaths and outside causes account for 57 percent. 'Other' accidents, which are a mixture of both types, are not included in this part of the analysis.

Significant differences are found between these categories (Figure 2). Inside accidents tend to occur in the winter (when the child is likely to be inside) and on weekends (suggesting a link to parental alcohol or drug use). No particular time of day is involved except for fires, which tend to occur in the early morning. In contrast, outside accidents peak in summer afternoons and early evenings, when the child is likely to be outside playing, when traffic may be heavy, and the mother's attention may be focussed on household duties.

3. Birth and family characteristics: Deaths from inside types of injury (especially fires and suffocation) are particularly prevalent among children who were low weight at birth (Figure 3). Two possibilities could explain their increased sensitivity to these conditions. First, the premature or low birth weight child often has a poorly developed respiratory system, which could increase his or her susceptibility to smoke inhalation during fires or to choking. Alternatively, birth weight may simply be an indicator of some other problem (such as low socioeconomic status or parental stress resulting from poor parent-child bonding) (2). This finding is of concern because the increased survival past infancy of low birth weight infants means that more children may be at risk for injury death in early childhood.

Maternal inexperience (as measured by the proportion of teenage mothers) does not appear to play a large role in early childhood injury death. Children of teen mothers do have higher death rates for deaths from fires and motor vehicle accidents where the child was a passenger in the car, but these increased rates could be explained by certain lifestyle differences which place them at higher risk: Teenage mothers smoke more often than older mothers (3) and thus they (and their families) are more likely to be involved in a fire and teenagers also have a higher incidence of motor vehicle accidents (although lack of a child car seat could possibly also be a factor in these motor vehicle deaths).

In fact, maternal experience seems to be more strongly related to early childhood injury death. Injury deaths (of all types) occur significantly more often in families of higher parity (i.e., more children in the family). A similar relationship was found for infant accident deaths (4). Possibly, the mother's attention is divided between several siblings or she may leave the child in care of older siblings who are not well equipped to provide such care.

Recurrence of childhood death in families was studied using a birth certificate item which gives the number of other children born alive but now dead. No correlation was found between the current childhood death and previous deaths in the family.

DISCUSSION

The purpose of this study was not to assign blame for early childhood injury death but rather to understand whether particular groups are involved so that preventive steps may be taken. The most common risk factor identified in this analysis is the presence of other children in the family. Unfortunately, no data are available to say why this is a factor, but several possible explanations are: parents are not as attentive to the second or third child, the child is left in care of other siblings, or the parents are in a lower income/education group and cannot afford preventive measures (child safety seats, fenced yards) or are not aware of the hazards. In addition, certain lifestyle habits place both parent and child at risk. For example, the combination of smoking and drinking causes fires which kill adults as well as children.

Separating the deaths into outside and inside injuries serves to emphasize that different hazards exist for each season or time of day. Special attention should be focussed on summer afternoons or evenings, when many outside injury deaths occur. While it is possible to make individual homes safe and thus reduce inside injury deaths, the entire outside world cannot be made childproof. Thus, particular vigilance may be required at these times. In this respect, the role of geography should also be recognized. Washington State has many bodies of water, so the danger of drowning is greater.

This study has taken the first step, which is to provide an awareness of factors associated with early childhood injury death. The next step is to deepen that awareness through more detailed study and to translate that awareness into action either through educational materials or intervention strategies, to help protect those who cannot protect themselves.

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FIGURE 1.

CAUSES OF EARLY CHILDHOOD INJURY DEATHS
WASHINGTON STATE RESIDENTS, 1979-1985

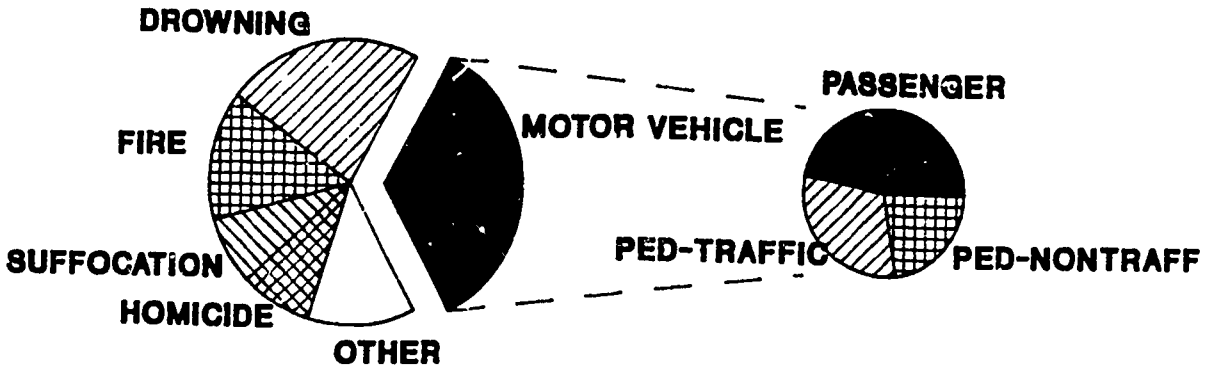


FIGURE 2.

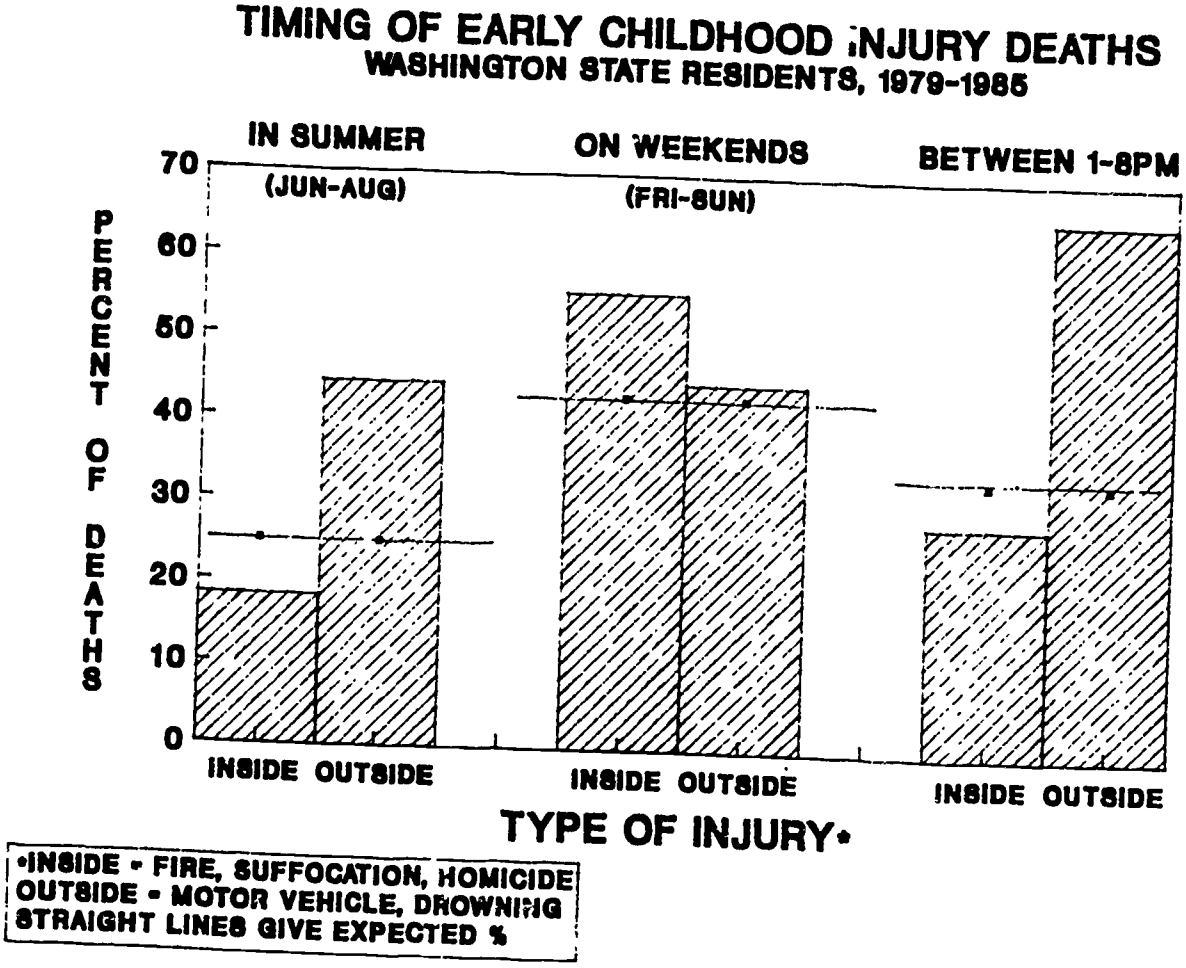
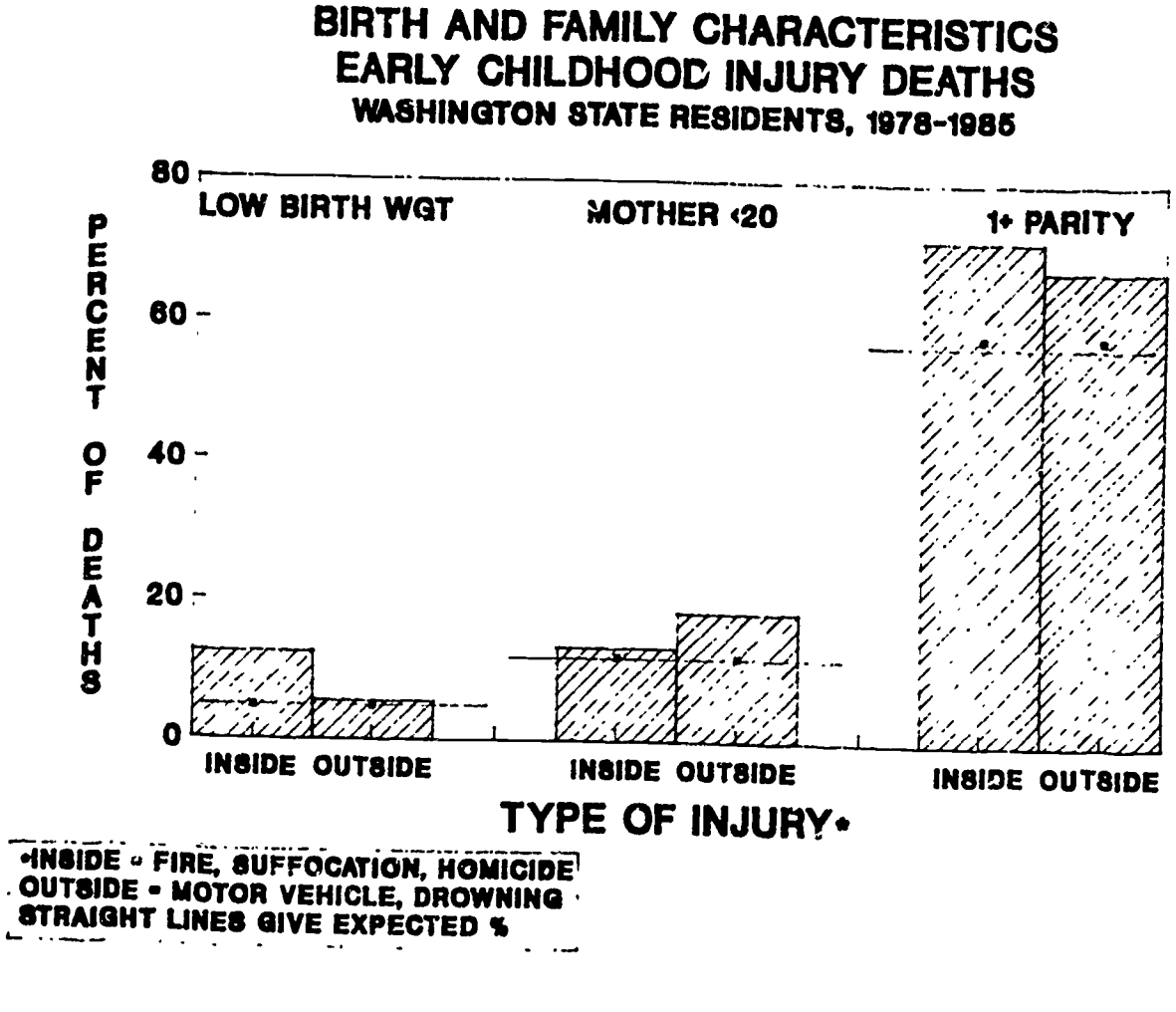

TIMING OF EARLY CHILDHOOD INJURY DEATHS
WASHINGTON STATE RESIDENTS, 1979-1985
IN SUMMER
(JUN-AUG)
ON WEEKENDS
(FRI-SUN)
BETWEEN 1-8PM
PERCENT OF DEATHS
70
60
50
40
30
20
10
0
INSIDE OUTSIDE
INSIDE OUTSIDE
INSIDE OUTSIDE
TYPE OF INJURY*
*INSIDE - FIRE, SUFFOCATION, HOMICIDE
OUTSIDE - MOTOR VEHICLE, DROWNING
STRAIGHT LINES GIVE EXPECTED %

FIGURE 3.


BIRTH AND FAMILY CHARACTERISTICS
EARLY CHILDHOOD INJURY DEATHS
WASHINGTON STATE RESIDENTS, 1978-1985
80
60
40
20
0
PERCENT OF DEATHS
LOW BIRTH WGT
MOTHER <20
1+ PARITY
INSIDE OUTSIDE
INSIDE OUTSIDE
INSIDE OUTSIDE
TYPE OF INJURY*
*INSIDE = FIRE, SUFFOCATION, HOMICIDE
OUTSIDE = MOTOR VEHICLE, DROWNING
STRAIGHT LINES GIVE EXPECTED %