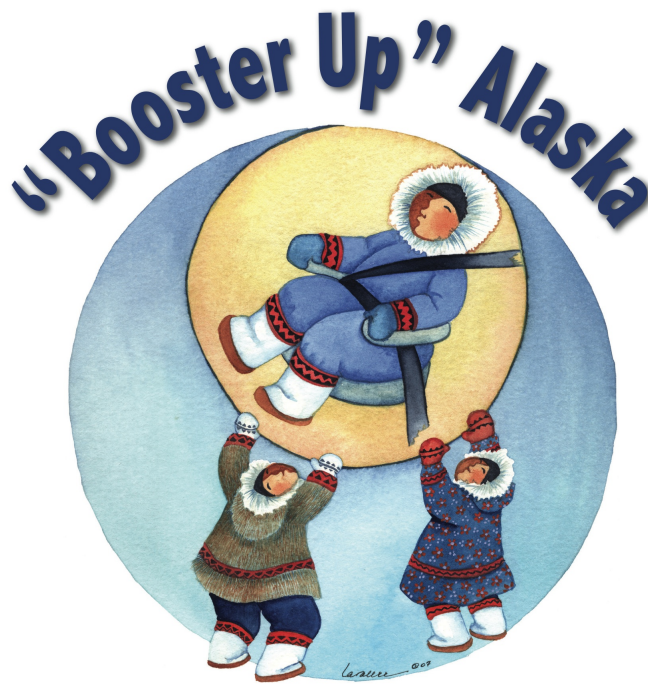


Anchorage Booster Seat Use 2009-2013

A Four-Year Follow-Up Observational Study of Child Passenger Safety Device Use



Keep Kids in Booster Seats up to 4' 9"

Alaska Injury Prevention Center 929-3939
Alaska Highway Safety Office 465-2446

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Abstract

The purpose of this study was to observe and assess the child passenger safety practices of children four to seven years old in the Anchorage bowl and serve as a follow up to previous booster seat observation studies conducted in the Anchorage area. Data from this study were collected from a cross-sectional study of children at four supermarkets located in Anchorage and Eagle River. Based on the responses provided by their caregivers, children that were between the ages of four and seven, under 65 pounds, and under 4'9" were included in the study sample. Descriptive statistics and frequency analyses were assessed for all study variables. Results from this study were compared to similar observations from previous years. A total of 102 children were included in analysis. The majority of children were appropriately restrained, with 78.4% of children restrained in a booster seat or five-point harness car seat. While more booster seat age children are appropriately restrained than prior to the law going into effect, observations from 2013 indicate that appropriate child passenger safety use among children between four and seven has declined since July 2011.

Introduction

Children that have outgrown forward-facing car seats, but are still less than 4'9" should use a booster seat, as seat belts are not designed for children. Booster seats position children so that the seat belt fits over the strongest bones of the body. Children aged 4 to 8 that use booster seats are 45% less likely to sustain injuries in a motor vehicle crash than children in the same age range using only the seat belt (Arbogast, K.B., Jermakian, J.S., Kallan, M.J., & Durbin, D.R, 2009).

As of September 2009, Alaska law requires children over 4 years and less than 8 years of age who are under 4'9" or less than 65 pounds to be properly secured in a car seat or booster seat (AS 28.05.095). Prior to the law going into effect, Alaska Injury Prevention Center (AIPC) along with multiple partners, conducted a pre-legislation observational study to determine a baseline measure of appropriate child passenger safety restraint use for children between the ages of four and seven. After the law went into effect and a multi-media promotional campaign had been implemented, additional observational studies were conducted in October 2009 and July 2010 and 2011. In July and August 2013 a four-year follow-up observation was conducted. The results of these observations showed continued improvement of the use of appropriate child passenger safety restraint. AIPC and community partners to use the results of the booster seat observation studies to demonstrate the efficacy of child passenger safety restraint laws, media campaigns, and educational programs, and to set priorities and goals for future efforts.

Methods

Each of the observations of child passenger safety practices were conducted at four supermarkets located in Anchorage and Eagle River. The store locations were chosen to capture socioeconomic diversity across neighborhoods in the Anchorage Bowl. Prior to the observations, AIPC obtained permission from the Anchorage Carrs Safeway District Office to conduct booster seat observations at select Carrs Safeway locations. After obtaining permission from the Carrs

Safeway District Office, AIPC contacted store managers at each of the four selected stores to receive permission at the individual store level.

Certified Child Passenger Safety Technicians trained on observation and study protocol completed the booster seat observations. Where possible, two observers were assigned to each location so that multiple store entrances could be observed. Observers watched store doors to identify caregivers exiting the store with at least one child who appeared to be between the ages of four and eight years old. Observers approached the caregiver after the child was secured in the car and asked the caregiver if they were willing to answer three questions regarding car seat safety. Caregivers that agreed to answer were asked the child's age, weight, and height. Without asking the caregiver, the observer then noted the child's seating position in the car, the type of child passenger safety restraint used, and the child's gender and ethnicity.

Child passenger safety restraints were categorized as a lap only seat belt, a shoulder lap seat belt, a car seat with harness, a no back booster with a shoulder lap seat belt, a no back booster with a lap only seat belt, a high back booster with shoulder lap seat belt, a high back booster with lap only seat belt, or a shield booster. As Certified Child Passenger Safety Technicians, all observers were previously trained to recognize all child passenger safety and seat belt types. The survey did not assess whether the child restraint or booster was properly installed. Both caregivers that refused and those that answered the survey questions were thanked for their time and offered an educational pamphlet. After obtaining permission from their caregiver, AIPC volunteers gave children a sticker promoting booster seat use.

Only children that met inclusion criteria were included in analysis. Children were excluded from analysis if they were over 65 pounds, over 4'9" or younger than 4 or older than 8, in keeping with Alaska's booster seat law. Statistical analyses were performed using IBM SPSS Statistics Version 21.0. Descriptive statistics and frequency analyses were assessed for all study variables.

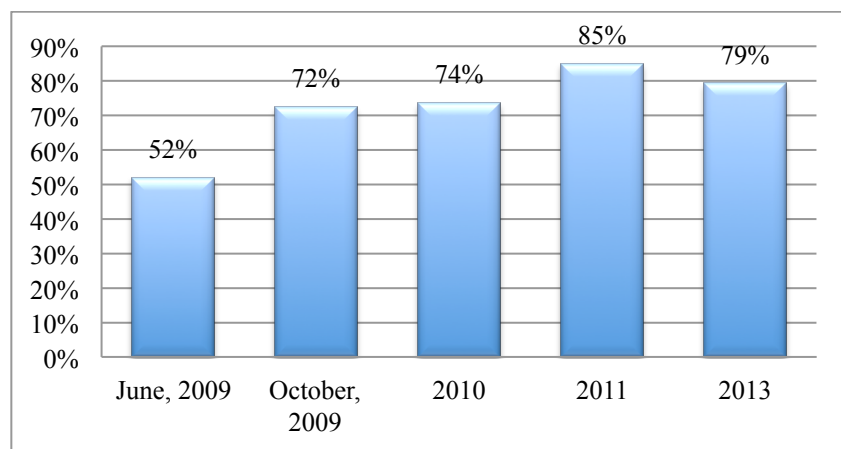
Results

A total of 102 children meeting inclusion criteria were observed during the 2013 booster seat use observations. Using similar methods as described in this report, AIPC conducted booster seat observations in June 2009, October 2009, July 2010, and July 2011. Demographic information for all observation periods is displayed in Table 1.

Figure 1 displays the appropriate child passenger safety device usage rates for children between ages four and seven over five different observation periods. Car seats, high back boosters used with a shoulder and lap belt, and backless booster seats used with a shoulder and lap belt are all considered age appropriate restraints for children ages 4-7. The majority of the children observed in 2013 were found to be using age appropriate restraint systems, with 79.2% ($n = 80$) of children secured in either a car seat or booster seat with a lap and shoulder seatbelt. The findings from AIPC's 2011 observations showed the greatest appropriate restraint use among children ages 4-7 with 85.4% of children observed using an appropriate child passenger safety device. Differences in appropriate restraint use between observation periods were found to be statistically significant ($\chi^2(4, n = 916) = 61.569, p = .000$).

Table 1. Demographic Characteristics of Children Observed Per Observation Period

| Characteristic | June 2009 (n = 227) | | October 2009 (n = 199) | | July 2010 (n = 219) | | July 2011 (n = 171) | | July/August 2013 (n =102) | |
|------------------|------------------------|--------|---------------------------|--------|------------------------|--------|------------------------|--------|------------------------------|--------|
| | n | (%) | n | (%) | n | (%) | n | (%) | n | (%) |
| <i>Age</i> | | | | | | | | | | |
| Four | 56 | (24.7) | 45 | (22.6) | 68 | (31.1) | 56 | (32.7) | 37 | (36.3) |
| Five | 58 | (25.6) | 45 | (22.6) | 51 | (23.3) | 47 | (27.5) | 27 | (26.5) |
| Six | 50 | (22.0) | 58 | (29.1) | 48 | (21.9) | 43 | (25.1) | 18 | (17.6) |
| Seven | 63 | (27.8) | 51 | (25.6) | 52 | (23.7) | 25 | (14.6) | 20 | (19.6) |
| <i>Gender</i> | | | | | | | | | | |
| Male | 92 | (40.9) | 80 | (40.6) | 105 | (49.5) | 88 | (51.5) | 44 | (43.1) |
| Female | 133 | (59.1) | 117 | (59.4) | 107 | (50.5) | 83 | (48.5) | 58 | (56.9) |
| <i>Ethnicity</i> | | | | | | | | | | |
| African American | 20 | (8.8) | 15 | (7.7) | 11 | (5.0) | 12 | (7.1) | 9 | (8.8) |
| Alaskan Native | 20 | (8.8) | 25 | (12.8) | 17 | (7.8) | 26 | (15.5) | 5 | (4.9) |
| Asian | 20 | (8.8) | 4 | (2.0) | 9 | (4.1) | 4 | (2.4) | 3 | (2.9) |
| Hispanic/Latino | 12 | (5.3) | 12 | (6.1) | 14 | (6.4) | 6 | (3.6) | 2 | (2.0) |
| Pacific Islander | 12 | (5.3) | 0 | (0) | 10 | (4.6) | 0 | (0) | 3 | (2.9) |
| White/Caucasian | 134 | (59.0) | 137 | (69.1) | 152 | (69.7) | 12 | (71.4) | 77 | (75.5) |
| Unknown | 9 | (4.0) | 3 | (1.5) | 5 | (2.3) | 0 | (0) | 2 | (2.0) |

Figure 1: Appropriate Restraint Usage Rate Trends Among Children Aged 4-7 in the Anchorage Bowl

NHTSA recommends that all children under 13 be restrained in the back seat of a vehicle. Figure 2 shows the percentage of children seated in the back seat of the vehicle across all five of AIPC's booster seat observations. In 2013, 96% of children were seated in the back seat of the vehicle—the highest rate observed to date. Results from a chi-square analysis show that differences in seating position across observations are statistically different ($\chi^2(4, n=893)=10.19, p=0.037$).

Figure 2: Percentage of Children Restrained in the Back Seat of the Vehicle Across Time

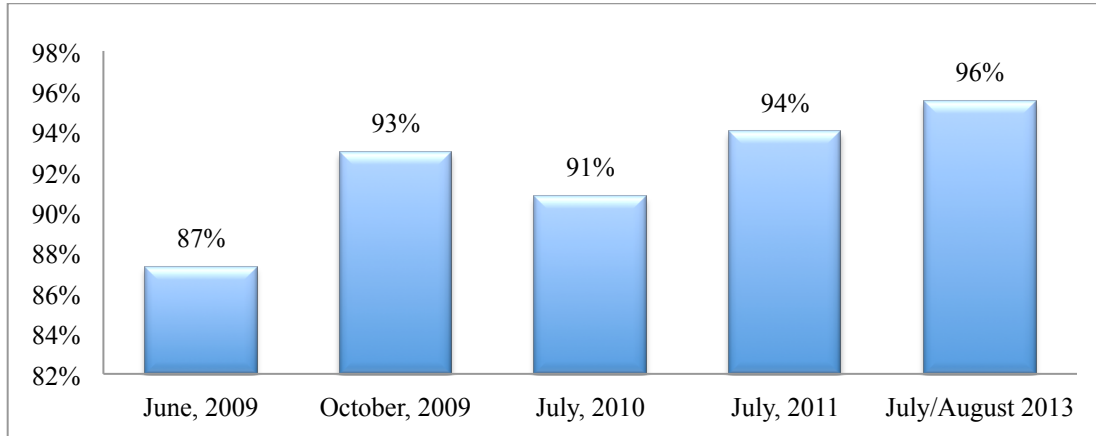


Figure 3 compares appropriate restraint usage rates of children by age for all five of AIPC's booster seat observations. Prior to Alaska's booster seat law going into effect, 72% of four year olds observed in the Anchorage Bowl were appropriately restrained; one month and one year after the law went into effect, 87% and 91% of four year olds observed were appropriately restrained, respectively. According to AIPC's 2013 booster seat observation study, restraint use among Anchorage four year olds has reduced to 76%. Restraint use for five and seven year olds reflect an upward trend, with 89% of five year olds and 80% of seven year olds appropriately restrained. The results of a Fisher's exact test indicate that there was no statistically significant difference between age groups for appropriate restraint use in 2013 ($\chi^2 = 7.92, p = .240$).

Figure 3: Percent of Children in the Anchorage Using An Appropriate Restraint By Age

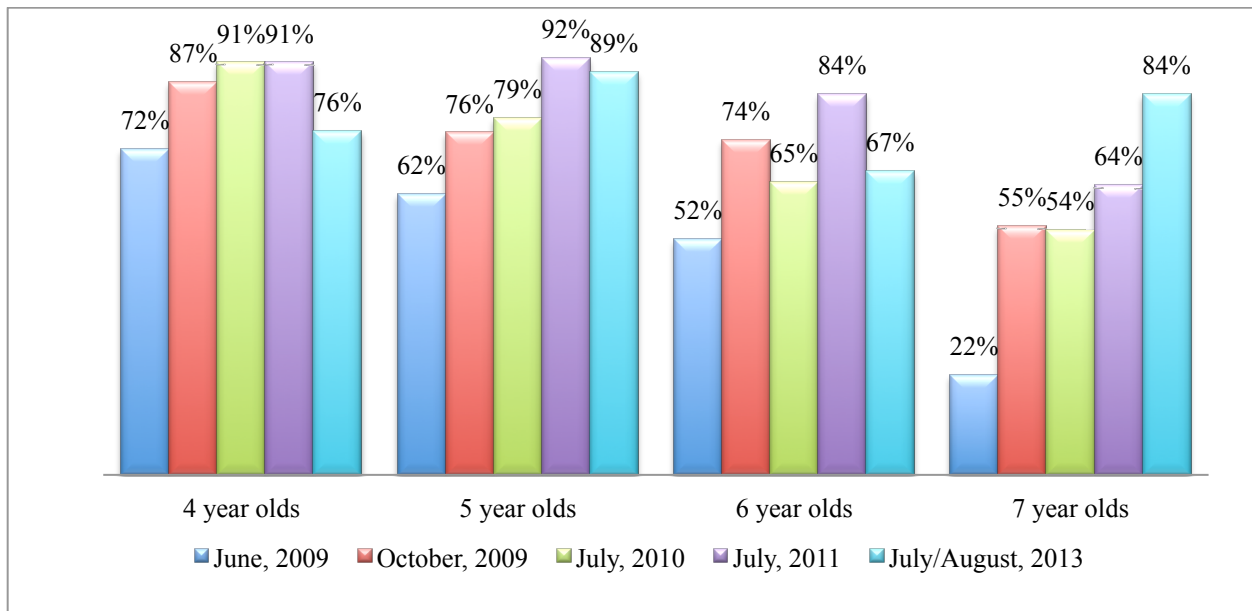
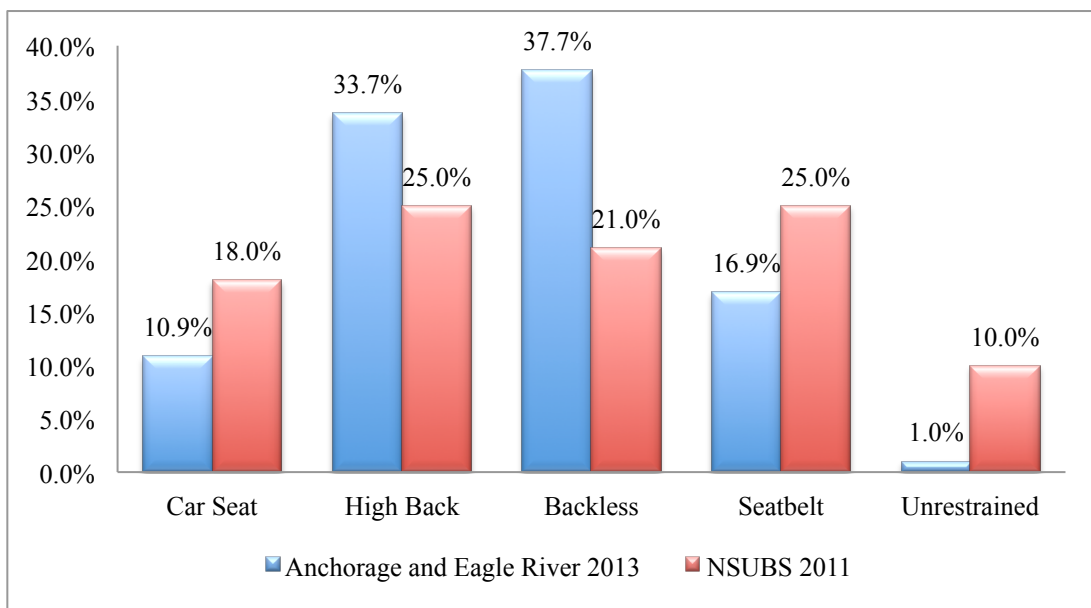


Figure 4 compares the results from AIPC’s 2013 Booster Seat Use observational study to the results from NHTSA’s 2011 National Survey of the Use of Booster Seats (NSUBS). NSUBS is the only probability-based nationwide child restraint survey that observes restraint use and obtains age by interview. While the current study and NSUBS 2011 explore similar behaviors, the studies may not be directly comparable to one another due to variations in study methods and analyses. Children in the current study show greater usage of high back and backless boosters. Of the 20.6% ($n = 21$) children that were improperly restrained, 71.4% ($n = 15$) were restrained using a lap and shoulder seatbelt. According to the results from NSUBS 2011, 35% of children ages 4-7 are improperly restrained in vehicles.

Figure 4: Restraint Use Among Children Aged 4-7 in the Anchorage Bowl ($n = 102$) and a National Sample of Children¹ ($n = 9,849$)



Conclusions

The dramatic increase in appropriately restrained children ages 4 to 7 in the Anchorage area between June 2009 and October 2009 can likely be attributed to the change in law and a corresponding multi-media promotional campaign promoting booster seat use. While more booster seat age children are appropriately restrained than prior to the law going into effect, observations from 2013 indicate that appropriate child passenger safety use among children between four and seven has declined since July 2011. These findings indicate a need for a continued campaign and promotion. A qualitative study should be undertaken to gain better understanding of the barriers and motivators caregivers confront concerning the appropriate use of child safety restraints in cars. Results from a qualitative study should then be used to guide the design of future campaigns and promotion.

¹ Pickrell, T.M. & Ye, T.J., 2013

References

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