

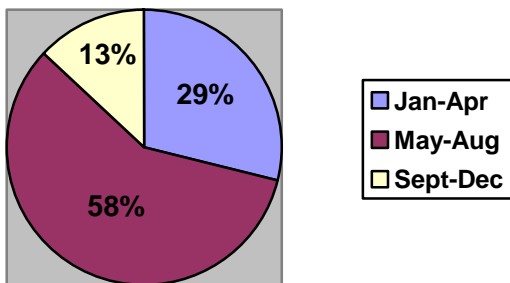
Virginia Department of Health Center for Injury and Violence Prevention Child Safety Seat Check Events 2001-2003

The Virginia Department of Health, Center for Injury and Violence Prevention (CIVP) routinely provides safety seat checklists to NHTSA certified technicians for community safety seat check events statewide. Upon completion of these forms, CIVP requests that all forms be returned to CIVP for analysis to obtain current misuse rates and to observe trends in occupant protection to better target program education efforts. The following is a summary of the data obtained from the 3,731 checklist forms submitted to CIVP throughout 2001-2003.

The misuse rate for safety seats in Virginia is alarmingly high. When viewing all three years comprehensively, the safety seat misuse rate was found to be 90%. This is inclusive of both minor and gross misuse scenarios. Virginia's rate A study in 2002 by National SAFE KIDS conducted a similar analysis of checklists nationwide determined that more than 81 percent of child restraints are used incorrectly. (Child Passengers at Risk in America: A National Study of Restraint Use, National SAFE KIDS Campaign, 2002.)

Graph 1

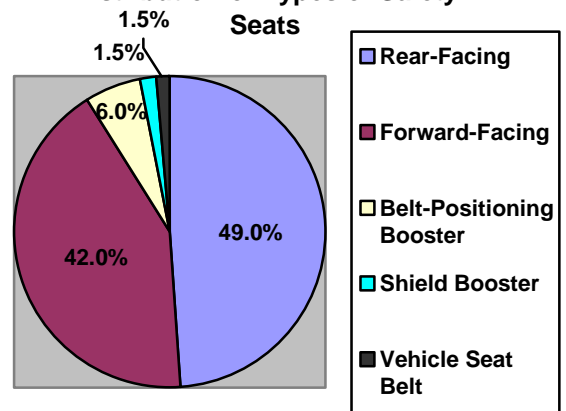
Safety Seat Check Event by Month



Although safety seat checks occurred in all twelve months, the majority of safety seat check events (58%) occurred during the summer months of May, June, July and August. (Graph 1)

Graph 2

Distribution of Types of Safety Seats



Graph 2 depicts the distribution of the types of safety seats that were inspected during 2001-2003. Rear-facing and forward-facing seats comprised the majority of seats inspected during 2001-2003. (91%)

Table 1

2001-2003 Consistent Misuse Scenarios	
Rear-Facing Seats	n=1,389
Locking clip not used correctly	26%
Safety belt not holding seat tightly in vehicle	24%
Seat reclines at more than 45 degrees	19%
Forward-Facing Seats	n=1,190
Harness straps are not snug	50%
Safety belt not holding seat tightly in vehicle	46%
Belt-Positioning Booster Seats	n=160
Lap/shoulder belt is positioned incorrectly	50%
Shield Booster Seats	n=42
Locking clip is used incorrectly	33%
Safety belt not holding seat tightly in vehicle	32%
Vehicle Safety Belts	n=41
Shoulder belt positioned incorrectly	53%
Lap belt positioned incorrectly	50%
Child is not restrained securely	50%
Child not within recommended weight/height range	48%

Analysis was conducted to determine if specific misuse scenarios were associated more frequently with one type of seat than another. Table 1 highlights the most consistent problems found for each seat type during the three-year period. Only misuse scenarios exceeding 15% were included.

Rear-Facing Safety Seats

Properly securing a safety seat in a vehicle is one of the most common misuse observed when inspecting safety seats. The top two misuses found for the rear-facing seat involved tightly installing the seat into the vehicle (Table 1). Incorrect use of a locking clip, when needed, prevents the seat belt from remaining in the position necessary to keep the safety seat tightly in place. This can be a contributing factor to the safety seat not being tightly secured in the vehicle, the second most common misuse scenario.

The misuse that raises a great deal of concern, especially for infants up to about six months of age, is having the safety seat reclined at an improper angle. It is extremely important to follow the safety seat instructions for the proper angle because children under six months of age do not have the neck muscle strength to support their heads. This could potentially result in a child's head falling forward in such a manner as to blocking the airway resulting in suffocation.

New parents often look for assistance in installing their child's safety seat for the first time. This could explain the lower misuse scenario rates for rear-facing seats.

Forward-Facing Safety Seats

Placing a child in a safety seat without adjusting the harness straps to snugly secure the child in the safety seat was the most common misuse found among the forward-facing safety seats inspected during 2001-2003 (Table 1). Situations adding to this problem are placing children in safety seats with multiple layers of clothing or outerwear. This makes it difficult to get a secure, snug harness fit. Many parents will loosen the harness to enable children to fit in the seat with these extra layers of clothing and then not readjust the harness when the child is without the extra clothing. The best recommended practice is to secure children in a safety seat without multiple layers of clothing or outerwear.

Repeated use also can be a factor in this type of misuse as well. Harness straps can become loosened from their original setting after placing children in and out of the seat repeatedly. The harness straps should be adjusted to be snug each time the child is placed in the safety seat. Older children that climb in and secure themselves in their safety seat are unable to make these types of adjustments.

Securing a safety seat tightly in the vehicle is often one of the most challenging aspects of installing a safety seat and it is the one step that is often not followed thru completely. It is alarming that almost half of the forward-facing safety seats inspected were found to have this problem. This situation can also be attributed to repeated use. As children are secured and removed from safety seats several times a day, it is not surprising that a seat would eventually become loose.

Belt-Positioning Booster Seats

The primary purpose of a belt-positioning booster seat is to position a child to enable the lap and shoulder belts to be properly positioned on the child. During the three-year timeframe, 50% of the belt-positioning booster seats inspected did not have the lap/shoulder belt positioned properly. (Table 1) This may be indicative of moving a child into a booster seat too early. Children should use the harness system of a safety seat as long as possible.

Shield Booster Seats

Shield boosters appear to be declining in use as indicated by graph 2. This is a positive trend, as these types of booster seats are no longer recommended. These seats do not provide children with enough upper body restraint in the event of a crash. Currently there is only one company that continues to manufacture this type of booster seat.

The top two misuse scenarios for shield booster seats highlighted in table 1, reflect the difficulty that many parents have in installing a safety seat tightly in a vehicle. As was seen with rear-facing safety seats the misuses involve incorrect use of a locking clip and not having the safety seat tight in the vehicle.

Seat Belts

Conducting a safety seat check event enables technicians to occasionally inspect children using the vehicle's lap/shoulder belt. Parents will often bring a child in to have his/her safety seat inspected and an older sibling will be present as well. The older sibling can then be evaluated as to proper positioning and fit of a lap/shoulder belt. Although this situation may not happen very frequently, it does allow for an important education opportunity. This type of scenario occurred on 41 different occasions during the three-year time period. Of those 41 inspections, almost half (48%) of the children observed should have been in a safety seat or a booster seat. (Table 1)

Conclusion

This analysis provided a first look at this type of information that is specific for Virginia as a whole. Much of the information obtained will be very useful in adapting the education and public information efforts conducted by the Virginia Department of Health, Center for Injury and Violence Prevention. Others should also use the results of this analysis in the child passenger safety field to target the areas that have been highlighted as misuse scenarios.

Education efforts aimed at parents should stress the importance of having a tightly installed safety seat and repeatedly checking a child's safety seat to make sure it has not loosened over time with repeated usage. In addition the importance of having a child snugly secured in the safety seat is critical. This requires the removal of outerwear before placing a child in the safety seat and adjusting the harness straps each time a child is placed in a safety seat.

Additional education efforts also need to focus on the correct positioning of lap/shoulder belts. This is important for any occupant in a motor vehicle regardless of age. The lap belt should be worn low over the hips and upper thighs and the shoulder belt should lay snug across the chest and collarbone. A belt-positioning booster seat enables lap and shoulder belts to fit a child in this manner. This will allow educators to delve into the issue of premature graduation, the moving of children from safety restraints to the vehicle's safety belts before they can properly use them. The data collected from the check events in Virginia is supportive of other Virginia data and national data that points to the extensive problem of premature graduation. Massive efforts need to be aimed at educating caregivers about this issue.

Limitations

The intended purpose of the checklist form is to act as a record of how the safety seat came into the check event as opposed to a checklist of how the technician installed the seat. It has become very clear that the current checklist form is difficult to complete in the proper manner. This resulted in problems with data entry. Because the information gathered at the safety seat checks is so important, the checklist will be revised by March 2004 to be user friendly to the technician and the data entry personnel. This will increase the amount of usable information collected from the forms. In the future, these reports will be conducted on a yearly basis.