An Observational Study on Child Safety Seat Use in Region 3

Region 3 Office of Public Health, Thibodaux, LA 70301

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Overview:

- Two hundred fourteen children were observed.
- One hundred ninety of the observed children were approximated to be 0-5 years old.
- Children were more likely to be restrained in a child safety seat if they were observed at the health unit versus those observed at the shopping centers.
- Drivers who were restrained were more likely to have their children/passengers restrained.
- White female drivers were doing the most driving and were more likely to wear their seatbelts.

Introduction:

The purpose of this observational study was to determine to what extent child safety seats are not being used or are being used incorrectly in Region 3. Specifically, it was hoped that the data would show which populations were demonstrating a lack of use or misuse and from this, measures could be taken to potentially decrease misuse and increase safe and proper utilization of the child safety seat.

Background:

Region 3, Office of Public Health is composed of seven parishes in the southern part of Louisiana. The parishes of Region 3 are: St. Charles, St. John, St. James, Lafourche, Terrebonne, St. Mary, and Assumption. According to the 2000 census the total population of the Region 3 area is 383,697 and individual parish populations are as follows: Assumption (23,388);Lafourche (89,974); St. Charles (48,072); St. James (21,216); St. John (43,044); St. Mary (53,500); and Terrebonne (104,503).

Motor vehicle crashes remain the leading cause of unintentional injury-related death among children 14 and under. Child safety seats and safety belts, when correctly installed and used, can prevent injury and save lives. Unrestrained children have a greater chance of severe injury and death than do children who are restrained properly in a vehicle. In the year 2000, 1,654 children (aged $\leq$ 14) died in motor vehicle crashes. In the year 2001, 228,000 children (aged $\leq$ 14) suffered with injuries as a result of being an occupant in a motor vehicle crash. In addition, as of October 1, 2001, 137 children have been killed due to a passenger air bag.[1] These children killed by air bags, were either unrestrained or improperly restrained at the time of impact. Improper restraints can be defined as a child being in the wrong type of safety device for age and weight, being seated in the front seat versus the back seat, or the device may be improperly installed.

Many people may feel that if they are only traveling a short distance, it really makes no difference as to whether their child is restrained or not. Seventy-five percent of motor vehicle crashes occur within 25 miles of a person's home. To top this off, 60 percent of crashes occur on roads with posted speed limits of 40 mph or less. Region 3 is a rural area and it has been identified that rural areas have higher motor vehicle crash incidence rates and death rates, than do urban areas. In addition, crashes in rural areas tend to be more severe but yet, restraint use is lower in rural areas due to lack of access to affordable child safety seats. [2]

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[1] www.safekids.org

[2] www.safekids.org

Riding unrestrained is the greatest risk factor for death and injury among child occupants of motor vehicles. Fifty-five percent of those children (aged ≤ 14) killed in an auto accident in 2001 were not restrained at the time of the crash. [3]
From day to day and at her numerous child safety seat checkup events, the Region 3 Injury Prevention Coordinator has encountered many people/parents who are using vehicular/safety device restraints incorrectly. Many feel that since they have used a safety seat before, they know how to properly install them. The Safe Kids Campaign notes that nearly a third of children ride in the wrong restraints for their age and size. Ninety-six percent of parents believe they have installed their child safety seat correctly, yet it is estimated that 82% of children placed in child safety seats are inappropriately restrained. Recent data from the Crash Injury Research & Engineering Network indicated that children who are inappropriately restrained are three and a half times more likely to be seriously injured vs. the children who are appropriately restrained. [4]
Driver safety belt use is positively associated with child restraint use. Recent studies have shown that 40% of children riding with unrestrained drivers were completely unrestrained themselves.
These issues noted, and others, were looked at in the Region 3 Observational Study. To fully understand the numbers represented it is ideal if one has a brief knowledge as to what should be occurring. All children (age ≤ 12) should be properly restrained in the back seat on every ride. Infants should ride in rear-facing safety seats as long as possible, until they are at least 12 months old and weigh at least 20 pounds. Children who are at least 1 year old, weigh 20-40 pounds, and can no longer ride rear-facing should ride in forward-facing child safety seats. Children over 40 pounds should be correctly secured in belt-positioning boosters or other appropriate child restraints until the adult lap and shoulder belts fit correctly (around age 8).
As of October 1, 2003 Louisiana Law states that children under the age of 3 years must be in a child restraint system that is age and size appropriate, in accordance with manufacturers recommendations. Children under the age of 13 must be restrained by a lap belt, shoulder harness, or an age/size appropriate child safety seat. [5]

Method:

A similar study to Region 3's was performed in the Alexandria area (Region 6) in the spring of 2002. Much was learned and gained from that study in designing this study. In order to try and assess the use, or lack of use, of infant/child safety seat devices in Region 3, an observational study was carried out in Region 3 over a 7- week period (7/14/03 to 9/3/03). In each parish of Region 3, two separate observation sessions were conducted. One of the two sessions was completed at the parish health unit (h.u.) while the other was completed at a major shopping area in the given parish. The Office of Public Health does not have a health unit in St. Charles Parish so the h.u. observation portion was completed at the St. Charles Community Health Center. This is an OPH contract site and is the site, which took over the majority of the previous health unit's duties. When possible, the shopping center site, for a given parish, was chosen at the opposite side of the parish to obtain a more representative sample of the children being observed for that entire parish. Observers remained at the individual observation sites for one hour and recorded all children observed in vehicles during that time to the best of their ability. The information that was recorded for the observed child (ren) included items such as: gender of child, ethnicity of child, estimated age of child, location of where the child was sitting in the vehicle, if they were sitting in a safety seat or not, what type of safety seat they were sitting in, and if not in a safety seat, whether they had a seat belt on, were standing, or sitting on an adult. Information recorded for the observation of the driver(s) included: whether or not the driver wore a seatbelt, driver gender, driver ethnicity, estimated age of the driver, and the car type and condition. The site of the observation was also recorded, and any observatory comments by the

[3] www.safekids.org
[4] www.safekids.org
[5] www.legis.state.la.us

Injury Prevention Coordinator. The recorded information from the observational session was entered into an Access database. Analysis was completed utilizing Epi Info 2002.

Results:

A total of 214 children were observed throughout Region 3. Of this number, 48.6% were observed to be male and 44.9% were observed to be female. Gender could not be determined in 14 of the children that were observed. More than half of the children were observed to be White (56.1%); 39.3% were observed to be African American; 2.3% were observed to be Hispanic and 1.9% were observed to be of Asian decent. Ethnicity of one child could not be determined due to the child being in an infant seat covered by a blanket.

Table 1. Demographics of the Children Observed (N=214)

Gender	**Male**	**Female**	**Unknown**	
	104(48.6%)	96(44.9%)	14(6.5%)	
Ethnicity	**White**	**African American**	**Hispanic**	**Asian**
	120(56.1%)	84(39.3%)	5(2.3%)	4(1.9%)
Age Group	**<1**	**1-5**	**≥6**	
	61(28.5%)	129(60.3%)	24(11.2%)	
Location in Vehicle	**Front**	**Back**	**Unknown**	
	46(21.5%)	166(77.5%)	2(1%)	

Of the 214 children observed, 190 were estimated to be 5 years old or less, and 24 were estimated to be age 6 or older.

In comparing the children in child safety seats observed at the health units (h.u.) to those children in child safety seats observed at the shopping centers, a significant difference was noted. According to the analysis done using Chi Square, results were χ^2= 12.19; p value=.0005. Basically what this is telling us is that children were more likely to be restrained in a child safety seat at the h.u.s vs. those children observed at the shopping centers.

Site of Observation	Child Safety Seat Presence		Total
	Yes	No	
H.U.	76	27	103
Shop. Center	50	50	100
Total	126	77	203

χ^2=12.19; p-value=.0005

With this significant difference, additional analysis was performed separately for those individuals presenting to the h.u.s and for those presenting to the shopping centers.

Analysis, using the same variables, was done for each of the observation site categories (H.U. and Shopping Center).

One hundred ten children were observed at the H.U. sites and 104 children were observed at the shopping center sites. The variables selected to analyze were: whether the children were observed to be in a child safety seat; what position/direction the child safety seat was in; was the child seated in the front seat or the back seat; and what percentage of observed children were standing or sitting on an adult. Analysis by age groups for the children was also completed.

The adults driving the vehicles in which the observed children were passengers, were also assessed. The variables chosen for observance were: estimated age, driver ethnicity, condition of the car being driven, whether the driver was wearing a seatbelt and if the driver was wearing a seatbelt, was the child passenger restrained.
The following tables display the results for the children observed at the h.u.s compared to those observed at the shopping centers.

Table 2. Observation of Children at the Health Units (n=110)

In a Child Safety Seat	Yes	No	N/A	Don't Know
	76 (69.1%)	27 (24.5%)	1 (.9%)	6 (5.5%)

If in safety seat, Type of	FF	I	Booster	N/A	Don't Know
	40(36.4%)	28(25.5%)	6(5.5%)	31(28.2%)	5(4.5%)

Location of seat	Front Seat	Back Seat	Don't Know
	15 (13.6%)	93 (84.5%)	2 (1.8%)

Standing	Yes	No	Unknown
	7 (6.4%)	96 (87.3%)	7 (6.4%)

Sitting on Adult	Yes	No	Unknown
	4 (3.6%)	99 (90%)	7 (6.4%)

Legend of abbreviations:

Child Safety Seat N/A= Not age applicable in this instance
FF= Forward Facing Child Safety Seat
I= Infant Only Child Safety Seat
Type of Safety Seat N/A= Resultant from those vehicles where a child safety Seat was not present and therefore type could not be indicated

In looking at this data, approximately 69% of the children viewed at the health units were in a child safety seat. Of those children in a child safety seat, approximately 36% were in a forward facing seat, 25% were in an infant only seat, 5 % were in a booster seat. Most children were seated in the back seat, 6 % were noted to be standing and almost 4% were noted to be sitting on an adult.

Table 3. Observation of Children at the Shopping Centers (n=104)

In a Child Safety Seat	Yes	No	N/A	Don't Know
	50 (48.1%)	50 (48.1%)	3 (2.9%)	1 (1%)

If in safety seat, Type of	FF	I	RF	Booster	N/A	Don't Know
	38(36.5%)	6(5.8%)	3(2.9%)	5(4.8%)	51(49%)	1(1%)

Location of seat	Front Seat	Back Seat
	31 (29.8%)	73 (70.2%)

Standing	Yes	No	Unknown
	5 (4.8%)	98 (94.2%)	1 (1%)

Sitting on Adult	Yes	No	Unknown
	3(2.9%)	100 (96.2%)	1 (1%)

Legend of abbreviations:

Child Safety Seat N/A= Not age applicable in this instance
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Type of Safety Seat N/A= Resultant from those vehicles where a child safety Seat was not present and therefore type could not be indicated

In comparison to the children observed at the health units, about half of the children were in a child safety seat and half were not at the shopping centers. The forward facing child safety seat

was the most popular among those observed at the shopping centers. A third of the children were observed to be in the front seat. Almost 5% of the children were observed to be standing and almost 3% of the children were observed to be sitting on an adult.

Table 4. Observation of Children at the Health Units by Age 0-5, (n=104)

In a Child Safety Seat	**Yes**	**No**	**Unknown**		
	75 (72.1%)	23 (22.1%)	6 (5.8%)		
Child Ethnicity	**African American**	**Whit e**	**Asian**	**Hispanic**	**Unknown**
	55(52.8%)	45(43.2%)	4(4%)	0	0
Location of seat	**Front Seat**	**Back Seat**	**Unknown**		
	11 (10.5%)	91 (87.5%)	2 (2%)		
In Child Safety Seat By child ethnicity	**African American**	**White**	**Asian**	**Hispanic**	**Unknown**
	29 (52.7%)	42 (93.3%)	4 (100%)	0	0

A third of the children observed at the health unit, aged 0-5, were noted not to be in a child safety seat. Most were seated in the back seat. A little more than 50% of the the African American children were in a child safety seat, 93% of the White children were in a child safety seat, and all Asian children observed were in a child safety seat.

Table 5. Observation of Children at the Shopping Centers by Age 0-5 (n=86)

In a Child Safety Seat	**Yes**	**No**	**Unknown**	
	49 (57%)	36 (41.9%)	1 (1.1%)	
Child Ethnicity	**African American**	**White**	**Hispanic**	**Unknown**
	24 (27.9%)	57 (66.3%)	4 (4.6%)	1 (1.2%)
Location of seat	**Front Seat**	**Back Seat**		
	21 (24.4%)	65 (75.6%)		
In Child Safety Seat By child ethnicity	**African American**	**White**	**Hispanic**	**Unknown**
	9 (37.5%)	37 (64.9%)	2 (50%)	1 (100%)

Almost 42% of those children observed at the shopping centers, aged 0-5, were not in a child safety seat. Almost ¼ of the observed children, aged 0-5, were seated in the front seat. Not quite 38% of the African American children were seated in a child safety seat, almost 65% of the White children were seated in a safety seat and 50% of the Hispanic children were seated in a child safety seat.

Table 6. Observation of Drivers at the Health Units (n=87)

Age	**Average**	**Min.**	**Max.**	**Mode**	**Unknown**
	31.6	20	60	30	1
Gender	**Male**		**Female**		
	14 (16.1%)		73 (83.9%)		
Wearing Seatbelt	**Yes**	**No**		**Don't Know**	
	59 (67.8%)	19 (21.8%)		9 (10.4%)	
Car Condition	**Good**		**Poor**		
	62.8%		18.6%		

More females were observed driving the children to the health units. Nearly 22 % of the drivers were observed not wearing their seatbelts and almost 63% of the cars observed were noted to be in good condition.

Table 7. Observation of Drivers at the Shopping Centers (n=79)

Age	**Average**	**Min.**	**Max.**	**Mode**	**Unknown**
	34.9	20	60	30	1
Gender	**Male**		**Female**		
	10 (12.7%)		69 (87.3%)		
Wearing Seatbelt	**Yes**	**No**		**Don't Know**	
	42 (53.2%)	31 (39.2%)		6 (7.6%)	
Car Condition	**Good**		**Poor**		
	64.6%		10.1%		

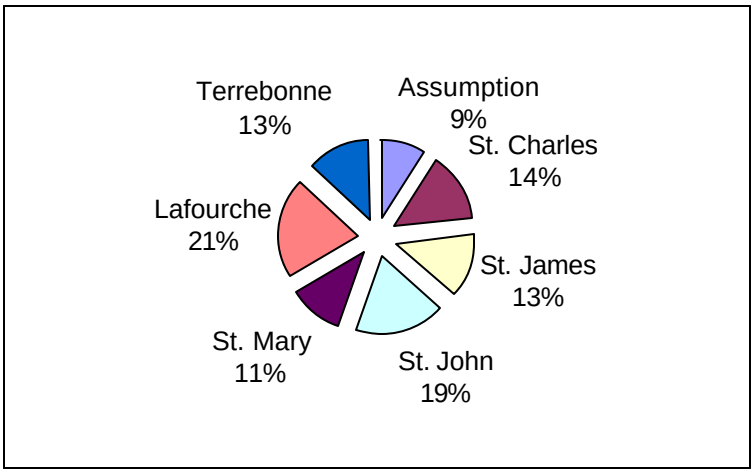
Lower percentages of the drivers observed at the shopping centers wore their seatbelts than did the drivers observed at the health units. More cars in good condition were observed vs. cars in fair or poor condition.

Further analysis of driver seatbelt use among African American females and White females showed that women drivers were more predominant than male drivers at both the health units and at the shopping centers. Approximately 55% of African American women who were observed as the drivers at the h.u.s wore their seatbelt compared to approximately 38% of the African American women drivers at the shopping centers wearing their seatbelts. Approximately 75% of the White women who were observed as the drivers at the h.u.s wore their seatbelt compared to approximately 59% of the White women drivers at the shopping centers wearing their seatbelts. Of all drivers observed, it appears that white females are the ones who are more likely to wear their seatbelts.

Of those drivers and children observed, it appeared that a positive relationship occurred between those drivers wearing seatbelts to those children being seated in a child safety seat. It appeared more likely that if a driver was restrained, their child had a better chance of being restrained in a child safety seat. Observation at the health unit revealed that 55% of the children who were traveling with an African American female driver who had her seatbelt on were also seated in a child safety seat. Approximately 57% of the children observed at the shopping center who were traveling with an African American female driver who had her seatbelt on were also seated in a

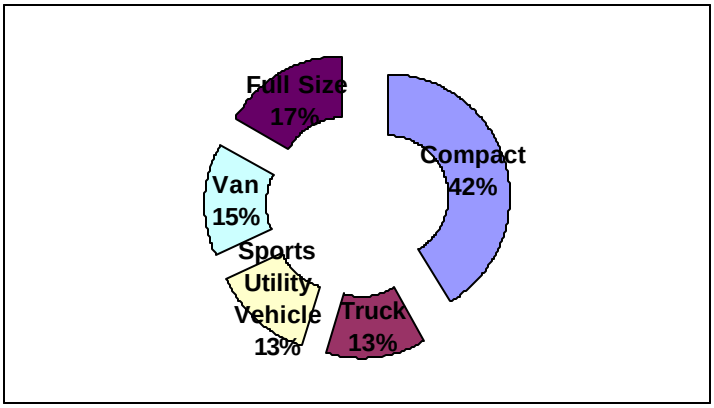
child safety seat. In comparison, 100% of those children observed at the h.u. traveling with a White female driver who had her seatbelt on were also seated in a child safety seat. Approximately 75% of the children observed at the shopping center who were traveling with a White female driver who had her seatbelt on were also seated in a child safety seat.

Figure 1. Distribution of Observation by Parish



The pie chart depicts what percentage of the whole, observed population was viewed in each particular parish.

Figure 2. Distribution of Car Types



The donut chart shows that more vehicles observed in this particular observational study were the compact type.

Conclusion:

Louisiana minimum law states that all kids to age 13 must be properly buckled up. Children aged birth to at least one year old and at least 20 pounds should be in a rear facing child safety seat. Children at least 1 year old and at least 20 pounds must ride in a forward facing child safety seat in a harness. Children who are 40-60 pounds (4-6 years old) must ride using a belt-positioning booster with a lap-shoulder belt. Law is law yet people choose not to abide. This was evident by 22% of the children (23) aged 0-5 at the health unit sites who were not in a child safety seat. It was evident by 41.9% (36) of the children aged 0-5 at the shopping centers who were not in a child safety seat.

It is also Louisiana law that states all drivers and passengers (according to age) should be restrained with a seatbelt when traveling in a motor vehicle. Yet, at least 21% of the drivers at the health units and almost 40% of the drivers at the shopping centers were not wearing seatbelts.

The population observed at the health units appears to be paying more attention to placing their children in a child safety seat vs. the population observed at the shopping centers. This might be due to the safety education re: child safety seat use that is given at the health units. It might be due to a sense of conditioning that the health unit population has experienced. This population may feel that if they do what they are suppose to (i.e. abide by the law re: seatbelts and child safety seats) they in turn, will receive what they desire (i.e. health unit services such as WIC, immunizations, Family Planning, etc.).

Drivers need to improve their own use of seatbelts. More importantly, drivers need to be more diligent in restraining and placing their children in the appropriate child safety seat devise according to their age and weight.

Recommendations:

- Provide Education. More education on the law and proper vehicular restraints of drivers and passengers is needed. This increase in education can come from many different sources such as health care providers, law enforcement, mass media, etc. Not only is education needed for the general public but it is also needed for health care providers, law enforcement officials, as well as other officials concerned with the safety of individuals. More of these individuals could be trained as Child Passenger Safety Techs.

- Get the word out. Since there was more misuse/lack of use at the shopping centers, pamphlets, billboards, and other forms of communication informing the general public of the law and proper restraint systems could be diffused into the communities.

- Stricter Enforcement. More enforcement by law officials is essential to decrease the lack of use and misuse of child safety seats and seatbelts. It was evident by this study that more of the misuse/lack of use of restraining devises was occurring in highly, general populized areas such as the shopping centers.

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Resources:

1. www.safekids.org Accessed 9/23/03.
2. www.legis.state.la.us Accessed 10/03.
3. www.nhsta.dot.gov Accessed 9/03.