



INDIANA CHILD PASSENGER SAFETY FACTS

May 2008

The mission of the Automotive Safety Program at Riley Hospital for Children, Indiana University School of Medicine is to reduce injuries and fatalities resulting from motor vehicle crashes in Indiana. The Automotive Safety Program was founded in 1981 by Dr. Marilyn Bull. Funded by the Governor's Council on Impaired & Dangerous Driving, the program directs child passenger safety research, education, and training in the state of Indiana. To assist in these efforts, the Indiana University Center for Criminal Justice Research is partnering with the Automotive Safety Program to analyze Indiana child restraint survey data to identify trends in Indiana child passenger safety and child restraint usage.



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INDIANA CHILD RESTRAINT SURVEY 2007

AGES 0 - 15

Motor vehicle crashes are the leading cause of death in the United States for children between the ages of two and 14.¹ In Indiana, over 5,000 child injuries occurred in motor vehicle collisions in 2007, 49 of which were fatal.² This report presents results from the 2007 Indiana Child Restraint Survey conducted by the Automotive Safety Program, Riley Hospital for Children and the Indiana University School of Medicine, Division of Biostatistics. Findings cover areas of child restraint device usage, child passenger seating positions, and driver awareness of recommended child passenger safety standards and legislation.

Indiana Child Restraint Survey Methodology and Sampling Strategy

Since 1998, the Automotive Safety Program (ASP) at Riley Hospital for Children has commissioned field surveys of child safety seat usage patterns conducted at various sites across the state of Indiana by certified child passenger safety technicians (CCPSTs). Survey databases were then created and maintained by the Indiana University School of Medicine, Division of Biostatistics. Surveys were administered in 1998, 2001, 2003, 2005, 2006, and 2007.³ While sampling strategies varied slightly for each survey year, statisticians continually considered county population estimates to identify counties as urban or rural. A random sample of both urban and rural counties was then selected. Child safety technicians

In Indiana, over 5,000 child injuries occurred in motor vehicle collisions in 2007, 49 of which were fatal.

¹National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: Children (2006 data)*.

²Indiana State Police Automated Reporting Information Exchange System (ARIES), as of March 16, 2008

³A report summarizing survey data trends during the period 2001 to 2006 is available at http://www.preventinjury.org/uploads/researchinfo/ResearchInfo_10.pdf





selected random sites within the sample counties, with the number of sites in urban counties exceeding the number of sites in rural counties. In 2007, 736 drivers and vehicles transporting 1154 child occupants under the age of 16 were surveyed at 25 sites.⁴

Typically, the surveys consist of two parts—an observational evaluation of each child passenger within a selected vehicle and a survey with a set of questions completed by the driver. The child safety seat survey generally covers driver and occupant position, occupant age, gender, weight, child restraint device type used, and manner of usage. In conjunction with the child safety seat survey, vehicle type, age, and airbag information is also collected. The driver survey instrument typically includes questions about participants' demographic attributes, perception and awareness of current regulations and best practices regarding restraint usage, and the various means and resources drivers access in learning how to use child restraint devices.

CHILD RESTRAINT USAGE

Child Restraint Laws and Best Practices

According to the National Highway Traffic Safety Administration (NHTSA), "child safety seats reduce the risk of fatal injury by 71 percent for infants and by 54 percent for toddlers in passenger cars."⁵ NHTSA research also shows that proper usage of lap/shoulder seat belts greatly reduces the risk of fatal injury to child occupants age 5 and older. Nationally, in 2005, 53 percent of children (0 to 14 years old) who were fatally injured in a traffic accident were unrestrained.⁶

The current Indiana child passenger restraint law requires all child occupants under the age of eight to be properly restrained in a child restraint device (CRD) and all child occupants ages

eight through 15 to be properly restrained in a CRD or seat belt in all seating positions in all vehicles. A detailed description and history of Indiana child passenger restraint laws and regulations is provided in Text Box 1.

Text Box 1: Indiana Child Passenger Restraint Laws and Regulations

Legislative History of Indiana Child Passenger Restraint Regulations

- January 1, 1984: Children in a motor vehicle who were four years or younger required to be restrained; aged two or younger required to be in a child restraint and aged three or four required to be in a child restraint or seat belt.
- July 1, 1998: Children from birth up to age four required to be in some type of child restraint. Children from age four to 12 required to be in child restraints or seat belts.
(Both the 1984 and 1998 laws applied anywhere in a motor vehicle; primary enforcement. There are two types of restraint laws, primary and secondary. Primary (standard) restraint laws allow a law enforcement officer to stop a vehicle and issue a citation when the officer observes an unrestrained driver or passenger. Secondary enforcement means that a citation for being unrestrained can only be written after the officer stops the vehicle or cites the offender for another infraction.)
- July 1, 2005: Children are required to ride properly restrained in a child restraint system until they reach their 8th birthday. Children at least 8 years old until their 16th birthday are required to ride properly restrained in a child restraint system or seat belt; law applies to all seating positions in all vehicles; primary enforcement.

(Above summary text regarding the 2005 Indiana Child Restraint Law was excerpted from Automotive Safety Program, Riley Hospital for Children website on November 19, 2007, <http://www.preventinjury.org/GIRestraintLaws.asp>)

Legislative History of Indiana Seat Belt Law

- July 1, 1987: Occupants five years of age or older required to be restrained in a safety belt. This law applied to the front seat only; secondary enforcement with vehicles plated as trucks considered exempt. In 1998, the law was changed to apply primary enforcement, with vehicles plates as trucks exempt.
- July 1, 2007: All occupants of a motor vehicle 16 and older required to be restrained with seat belts; legislation applies to any seating position in vehicle and includes vehicles plated as trucks.
(Passenger Restraint Systems, IC 9-19-10-2; available at <http://www.ai.org/legislative/ic/code/title9/ar19/ch10.html>)

Source: Automotive Safety Program, Riley Hospital for Children, November 8, 2007

⁴Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

⁵National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: Children (2006 data)*.

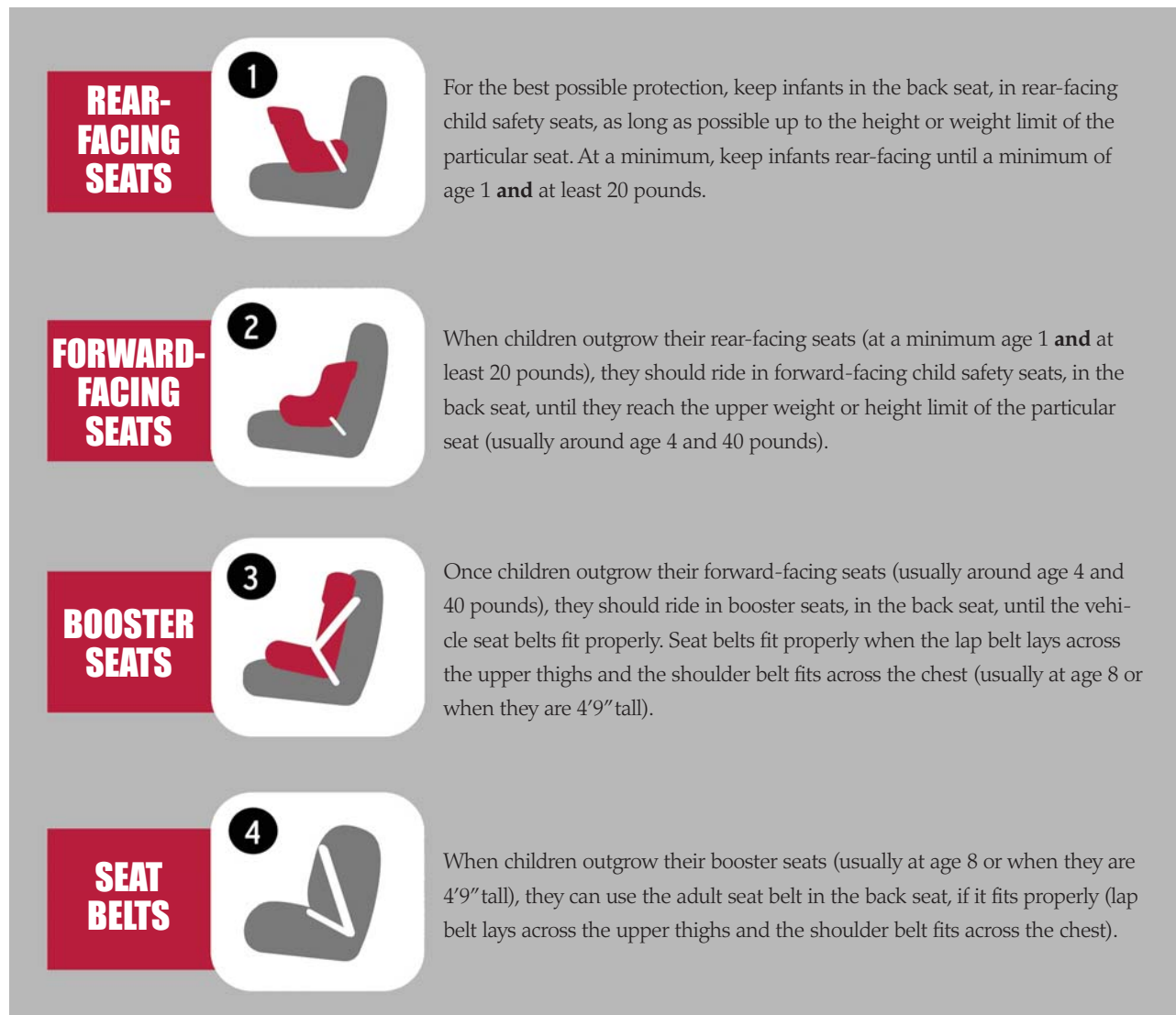
⁶National Center for Statistics and Analysis, National Highway Traffic Safety Administration (February 2007), *Traffic Safety Facts: Strengthening Child Passenger Safety Laws*.

In addition to legislative efforts, child passenger safety experts have developed further recommended safety standards and best practices. NHTSA advocates that child occupants graduate through four phases of restraint usage from birth to adulthood (Figure 1). The Automotive Safety Program has incorporated these steps into their recommended best practices in child passenger safety. These guidelines include the use of rear facing child safety seats as long as possible, to the weight or height

limit of the seat; at a minimum, until a child is a year old and at least 20 pounds. These guidelines also include the use of forward facing seats until the child reaches the upper weight or height of the seat (usually when the child is about four years old and 40 pounds) and the use of belt positioning booster seats (BPBs) for children who have outgrown forward facing child safety seats with harnesses and are too small to fit properly in an adult seat belt.

Figure 1: NHTSA's Four Steps for Kids

GROWING UP SAFE: It's a four-step process. As children grow, how they sit in your car, truck or SUV should change. Save your child from injury or death by observing all four steps.



Source: <http://www.boosterseat.gov/4StepsFlyer.pdf>

Note: All children under 13 should ride in the back seat. Always read the child restraint instructions and the vehicle owner's manual.



Table 1: The Percentage of Child Occupants Utilizing Specified Child Restraint Device (CRD) Type by Age Group

| CRD Type | < 1 year old | | 1 to 3 years old | | 4 to 7 years old | | 8 to 12 years old | | 13 to 15 years old | |
|---------------------------------|--------------|-------|------------------|-------|------------------|-------|-------------------|-------|--------------------|-------|
| | Count | %* | Count | %* | Count | %* | Count | %* | Count | %* |
| Infant only seat | 88 | 79.3 | 5 | 1.4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Convertible | 21 | 18.9 | 161 | 46.5 | 12 | 3.5 | 0 | 0.0 | 0 | 0.0 |
| Integrated seat | 0 | 0.0 | 12 | 3.5 | 1 | 0.3 | 0 | 0.0 | 0 | 0.0 |
| Combination w/harness | 1 | 0.9 | 86 | 24.9 | 21 | 6.2 | 0 | 0.0 | 0 | 0.0 |
| Forward facing only | 1 | 0.9 | 38 | 11.0 | 7 | 2.1 | 1 | 0.4 | 0 | 0.0 |
| Shield booster | 0 | 0.0 | 1 | 0.3 | 1 | 0.3 | 0 | 0.0 | 0 | 0.0 |
| Highback BPB | 0 | 0.0 | 27 | 7.8 | 85 | 25.0 | 7 | 2.5 | 0 | 0.0 |
| Backless BPB | 0 | 0.0 | 13 | 3.8 | 146 | 42.9 | 13 | 4.6 | 0 | 0.0 |
| Lap belt | 0 | 0.0 | 0 | 0.0 | 5 | 1.5 | 28 | 10.0 | 1 | 1.5 |
| Shoulder belt | 0 | 0.0 | 0 | 0.0 | 1 | 0.3 | 1 | 0.4 | 0 | 0.0 |
| Lap/shoulder belt | 0 | 0.0 | 2 | 0.6 | 56 | 16.5 | 217 | 77.2 | 62 | 91.2 |
| Lap/shoulder belt with adjuster | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 1.5 |
| On lap | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| None | 0 | 0.0 | 1 | 0.3 | 4 | 1.2 | 14 | 5.0 | 4 | 5.9 |
| Other | 0 | 0.0 | 0 | 0.0 | 1 | 0.3 | 0 | 0.0 | 0 | 0.0 |
| Total | 111 | 100.0 | 346 | 100.0 | 340 | 100.0 | 281 | 100.0 | 68 | 100.0 |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Percentage totals are calculated as the percentage of all child occupants in a particular age group that utilized the specified child restraint device.

**Percentage totals may not add up to 100 due to rounding.

***Age groups are defined as the beginning age in any given category up to the beginning age of the next category (e.g., the 1 to 3 years old age group includes all child passengers reported as ages 1, 2, or 3 years old).

Child Restraint Device Types

Table 1 depicts the percentage of child occupants utilizing specified CRD types by age group. Both infant only seats and convertible (rear facing) CRDs are appropriate for child passengers under one year old. In 2007, the majority (79 percent) of child occupants in the < 1 year old age group were restrained in an infant only seat and nearly one-fifth of child passengers were restrained in a convertible CRD. Among child occupants in the 1 to 3 year old age bracket, 47 percent were restrained in convertible CRDs, and one-quarter in combination with harness CRD types. Overall, two-thirds of child passengers in the 4 to 7 year old age group were restrained by some type of belt-positioning booster (BPB)—including both highback and backless BPBs. Seventeen percent of occupants in this age bracket were restrained with lap shoulder belts.

Child occupants between eight and 15 years of age have historically been more likely to be unrestrained in a vehicle. Over three-quarters of child passengers 8 to 12 years old were restrained with lap/shoulder belt and seven percent were restrained in either a highback or backless BPB, and 10 percent with a lap belt only. Among child occupants in the 13 to 15 year old group, 91 percent were restrained by lap/shoulder belts. The

largest share (6 percent) of child occupants wearing no restraints was among 13 to 15 year olds.

Child Occupant Seating Positions

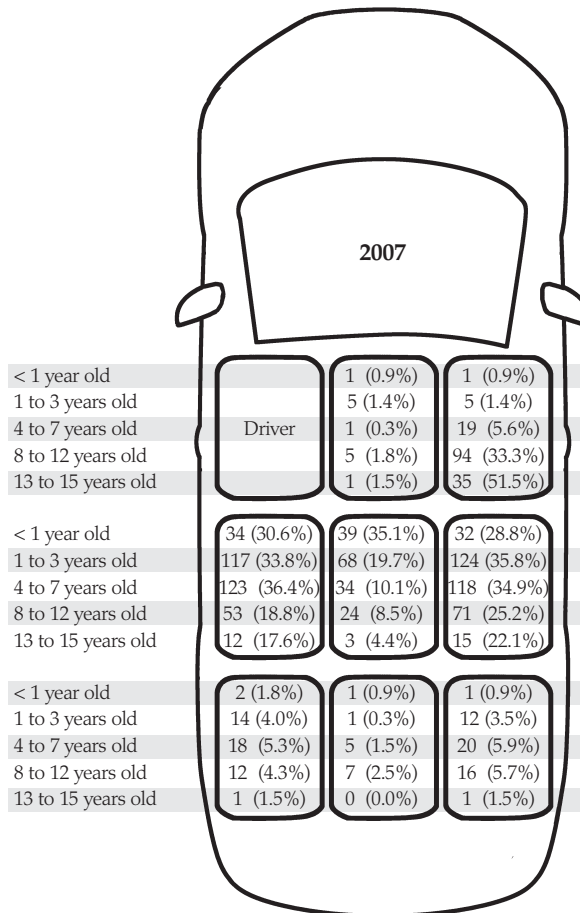
The federal Centers for Disease Control and Prevention reports that children less than 16 years old, riding in the back-seat, are 40 percent less likely to be seriously injured in traffic collisions.⁷ Current child passenger safety best practices urge



An 18 month old child properly positioned in a rear-facing convertible child safety seat.

⁷Centers for Disease Control and Prevention, Department of Health and Human Services, *Child Passenger Safety: Fact Sheet*, extracted from website, November 19, 2007, <http://www.cdc.gov/ncipc/factsheets/childpas.htm>

Figure 2: Vehicle Occupant Seating Position by Age Group



Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

Notes: *Percentage totals may not add up to 100 due to rounding.
 **Age groups are defined as the beginning age in any given category up to the beginning age of the next category (e.g., the 1 to 3 years old age group includes all child passengers reported as ages 1, 2, or 3 years old).

all child occupants less than 13 years old to ride in the rear seat of passenger vehicles (Figure 1). NHTSA reports that “children age 12 and under are safest when properly buckled in the back seat of a motor vehicle” away from front passenger-side air bags.⁸

As depicted in Figure 2, child restraint survey results show less than 2 percent of infants under the age of 1 and less than 3 percent of child passengers between 1 and 3 years of age were seated in the front seat. Among 1 to 3 year olds, just over 1 percent of occupants were seated in the front right passenger position. More dramatically, nearly 6 percent of 4 to 7 year olds and one-third of 8 to 12 year olds were seated in this position.

Rear Facing Position

To minimize the risk of serious injuries, best practice guidelines encourage the rear facing position as long as possible, to the upper weight or height allowed by the manufacturer of the child safety seat. For the 2007 survey, CCPSTs recorded the ages of children who were younger than two years by months, in order to gauge how long child passengers were riding rear facing. As shown in Table 2, whereas 87 percent of children under the age of one were rear facing, only 7 percent of children between 12 and 23 months were rear facing.

Child Safety Seat Misuse

As previously mentioned, motor vehicle crashes are the leading cause of death in children between two and 14 years of age. When used correctly, child safety seats can protect child passengers from injury and potentially fatal collisions. During the survey, deviations from established standard practices for car seat use and installation were recorded as misuse. Only visual observations were used by CCPSTs to measure misuse of infant only, convertible, integrated, combination, and forward facing only seats.

Table 2: The Percentage of Children 1-11 Months and 12-23 Months Rear Facing and Forward Facing

| | Rear Facing | | Forward Facing | | Total Cases Observed |
|-----------------------|-------------|------|----------------|------|----------------------|
| | Count | %* | Count | %* | |
| Children 1-11 months | 97 | 87.4 | 14 | 12.6 | 111 |
| Children 12-23 months | 9 | 7.0 | 120 | 93.0 | 129 |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Percentage totals may not add up to 100 due to rounding.

⁸National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Traffic Safety Facts: Children* (2006 data).



Table 3: The Percentage of Observed Child Safety Seat (CSS) Misuse

| | Count* | % | Total cases observed |
|---|--------|------|----------------------|
| Child not buckled into CSS | 12 | 2.7 | 446 |
| Harness not at or below shoulders (rear facing) OR not at or above (forward facing) | 115 | 25.7 | 447 |
| Harness does not appear snug with no slack | 212 | 47.5 | 446 |
| Chest clip not at mid chest | 206 | 46.5 | 443 |
| LATCH system not stored when not in use | 80 | 28.1 | 285 |
| Seat belt not through correct CSS belt path | 14 | 3.8 | 372 |
| Seat belt does not appear snug | 104 | 27.7 | 376 |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*CRD types observed by certified child passenger safety technicians (CCPSTs) for misuse included infant only, convertible, integrated, combination, and forward facing only seats.

Table 4: The Percentage of Observed LATCH (Lower Anchors and Tethers for Children) Misuse

| | Count* | % | Total cases observed |
|--|--------|------|----------------------|
| Top tether not used with lower anchors | 32 | 49.2 | 65 |
| Seat belt system also used with lower anchors | 18 | 23.1 | 78 |
| Lower anchors not through appropriate CSS belt path | 7 | 10.4 | 67 |
| Lower anchors not attached to correct vehicle anchor | 8 | 11.3 | 71 |
| LATCH straps not snug | 5 | 7.5 | 67 |
| More than one restraint used per LATCH anchor | 4 | 6.0 | 67 |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*CRD types observed by CCPSTs for misuse included infant only, convertible, integrated, combination, and forward facing only seats.

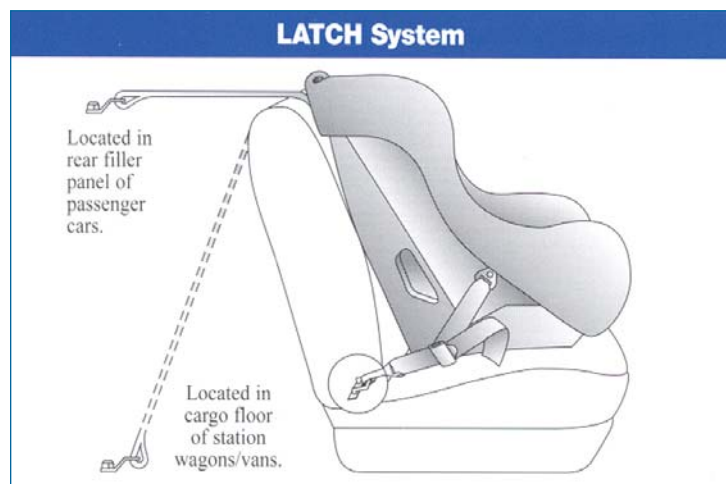
Table 3 shows the percentage of CSS misuse noted by CCPSTs. In nearly one-half of cases, the harness did not appear snug enough and with 47 percent the chest clip was not mid chest as required. With over one-quarter, the harness was not at or below the child's shoulders (rear-facing) or not at or above for forward-facing. Similarly, in 28 percent of cases, the seat belt did not appear snug and the LATCH system was not stored when not in use. Lower rates of misuse included the following:

child not buckled into CSS (3 percent), and seat belt not through correct CSS belt path (4 percent).

LATCH Misuse

Lower Anchors and Tethers for Children (LATCH), is an alternative installation system designed to help standardize the way child restraints are attached to vehicles without using a seat belt. LATCH-equipped vehicles have two sets of small bars, called anchors, located in the back seat. LATCH-equipped child safety seats have a lower set of attachments that fasten to these vehicle anchors. Most forward-facing child safety seats also have a top strap (top tether) that attaches to a top anchor in the vehicle.⁹

Child restraint survey results show that among six measures of correct LATCH usage, four reflected relatively low rates of misuse. As depicted in Table 4, these included the following: lower anchors not attached to correct vehicle (11 percent), lower anchors not through appropriate CSS belt path (10 percent), LATCH straps not snug (8 percent) and



⁹National Highway Traffic Safety Administration, *LATCH Makes Child Safety Seat Installation As Easy As 1, 2, 3.*

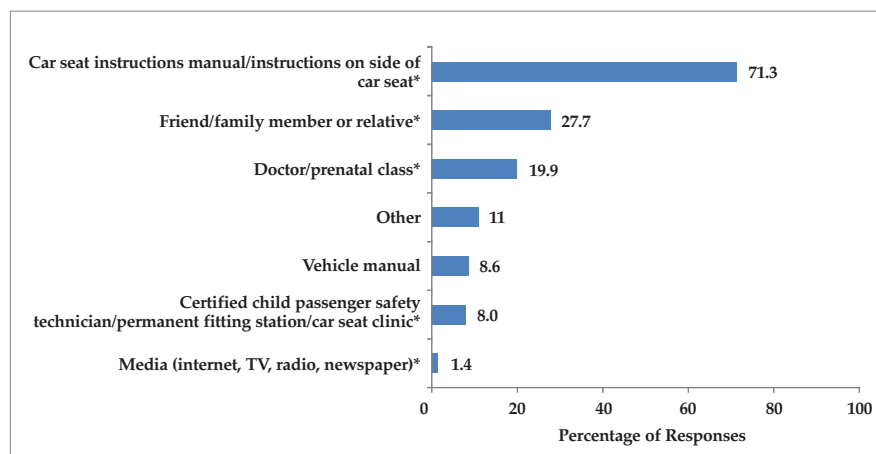
Table 5: The Percentage of Observed Booster Misuse

| | Count* | % | Total cases observed |
|---|--------|------|----------------------|
| Shoulder belt not mid-shoulder | 80 | 28.9 | 277 |
| Lap belt not low on hips | 37 | 13.2 | 281 |
| Shoulder belt adjuster/guide not used properly | 56 | 30.4 | 184 |
| Lap belt portion not under armrest | 36 | 13.8 | 261 |
| Shoulder portion of seat belt not under armrest | 92 | 36.2 | 254 |
| Seat belt not snug | 56 | 20.0 | 280 |
| Seat belt behind back | 28 | 10.0 | 280 |
| Seat belt under arm | 23 | 8.2 | 282 |
| Booster used with lap only belt | 12 | 4.3 | 278 |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*CRD types observed by CCPSTs for misuse and those included in this analysis included the highback and backless belt-positioning booster (BPB).

Figure 3: Where did you learn to install your car seat(s)? (Check all that apply)



Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*This table and subsequent analysis regarding this question include combined categories to allow for more meaningful analysis and effective presentation of results. The “car seat instruction manual” and “instructions on the side of the car seat” are considered similar and thus are combined. Responses related to informal consultation with friends and/or family members or relatives are also collapsed into one group. Modes that involve child passenger safety trained personnel are combined under “certified child passenger safety technician/permanent fitting station or car seat clinic.” Similarly, “doctor” and “prenatal class” categories are grouped together as both are related to healthcare.

**Due to the fact that this survey question allowed for multiple responses, percentages do not total 100. Percentages are calculated based on the total number of respondents that answered this question.

more than one restraint used per LATCH anchor (6 percent). In contrast, roughly one-quarter of observed cases indicated misuse with regards to the seat belt system also used with lower anchors. The highest rate of misuse—nearly 50 percent—was found with top tether not used with lower anchors.

Booster Misuse

According to current Indiana Child Restraint Law, children are required to ride properly restrained in a child restraint, which can include a belt positioning booster seat, until they reach

their 8th birthday. Table 5 shows rates of observed booster (both high-back and backless BPBs) misuse. In over one-third (36 percent) of cases, the shoulder portion was not under the armrest. Similarly, among 30 percent the shoulder belt adjuster/guide was not used properly, and in 29 percent of cases the shoulder belt was not mid-shoulder. Lower rates of booster misuse were observed with regards to the following practices: lap belt portion not under armrest (14 percent) and lap belt not low on hips (13 percent). In 10 percent or less, the seat belt was behind the child’s back, the seat belt was under the child’s arm, and the booster was used with a lap only belt instead of a shoulder belt.

DRIVER AWARENESS

Car Seat Installation

The primary means by which a substantial majority of survey participants reported learning to install their car seats was by consulting either the car seat manual and/or instructions on the side of the car seat. As depicted in Figure 3, approximately 70 percent of respondents reported using car seat specific materials. This method was followed by over one-quarter of

respondents that indicated either friends and/or family members assisted them with this task. Twenty percent of responses were associated with learning from a doctor and/or prenatal class. Use of a vehicle manual was less than 10 percent. Eight percent cited the use of trained and certified personnel and/or venues where such qualified individuals were available. Just over one percent indicated they consulted media resources.

Respondents with higher levels of education were more likely to consult car seat manuals or instructions on car seats.



Table 6: Where did you learn to install your car seat(s)? (Check all that apply), by Educational Attainment

| | Less than high school | | High school graduate | | Some college/trade school | | College graduate | |
|--|-----------------------|------|----------------------|------|---------------------------|------|------------------|------|
| | Count | %* | Count | %* | Count | %* | Count | %* |
| Car seat instruction manual/instructions on side of car seat | 17 | 51.5 | 158 | 64.0 | 158 | 73.1 | 169 | 80.9 |
| Friend/family member or relative | 14 | 42.4 | 75 | 30.4 | 59 | 27.3 | 47 | 22.5 |
| Doctor/prenatal class | 11 | 33.3 | 49 | 19.8 | 50 | 23.1 | 32 | 15.3 |
| Vehicle manual | 3 | 9.1 | 20 | 8.1 | 13 | 6.0 | 22 | 10.5 |
| Certified child passenger safety technician | 4 | 12.1 | 7 | 2.8 | 15 | 6.9 | 29 | 13.9 |
| Media (internet, TV, radio, newspaper) | 0 | 0.0 | 3 | 1.2 | 4 | 1.9 | 2 | 1.0 |
| Other | 4 | 12.1 | 28 | 11.3 | 22 | 10.2 | 21 | 10.0 |
| Total respondents* | 33 | | 247 | | 216 | | 209 | |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Due to the fact that this survey question allowed for multiple responses, percentages do not total 100. Percentages are calculated based on the total number of respondents that answered this question.

Table 7: Where did you learn to install your car seat(s)? (Check all that apply), by Annual Household Income

| | Less than \$20,000 | | \$20,000 - \$34,999 | | \$35,000 - \$49,999 | | More than \$50,000 | |
|--|--------------------|------|---------------------|------|---------------------|------|--------------------|------|
| | Count | %* | Count | %* | Count | %* | Count | %* |
| Car seat instruction manual/instructions on side of car seat | 85 | 65.9 | 110 | 68.3 | 107 | 66.5 | 209 | 80.1 |
| Friend/family member or relative | 46 | 35.7 | 51 | 31.7 | 42 | 26.1 | 61 | 23.4 |
| Doctor/prenatal class | 33 | 25.6 | 39 | 24.2 | 36 | 22.4 | 34 | 13.0 |
| Vehicle manual | 9 | 7.0 | 7 | 4.3 | 18 | 11.2 | 28 | 10.7 |
| Certified child passenger safety technician | 5 | 3.9 | 6 | 3.7 | 17 | 10.6 | 26 | 10.0 |
| Media (internet, TV, radio, newspaper) | 1 | 0.8 | 1 | 0.6 | 3 | 1.9 | 5 | 1.9 |
| Other | 16 | 12.4 | 13 | 8.1 | 14 | 8.7 | 36 | 13.8 |
| Total respondents* | 129 | | 161 | | 161 | | 261 | |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Due to the fact that this survey question allowed for multiple responses, percentages do not total 100. Percentages are calculated based on the total number of respondents that answered this question.

As shown in Table 6, just over 80 percent of college graduates cited the latter. Sixty-four percent of high school graduates and nearly three-quarters of respondents who had some college or attended trade school reported using car seat materials. Respondents with lower educational attributes were more likely than those in other groups to acquire this information from friends and/or family members. Over 40 percent of those with less than a high school education cited using friends or family members compared with 23 percent of college graduates. Acquiring this information from a doctor or prenatal class was higher among those in groups with less education and decreased as educational status rose—over one-third of those with less than a high school education compared with just 15 percent of college graduates.

The majority of survey respondents across all four income categories were most likely to consult car seat materials

regarding installation. However, as Table 7 illustrates, those with annual household incomes of more than \$50,000 appeared more apt to do so, with 80 percent identifying these resources. In all income groups, the category of friends and/or family members was the second most commonly reported method for obtaining installation information. With the exception of those earning more than \$50,000, this was followed by doctor/prenatal classes as the third most common means.

Given the overall reported dominance of car seat material usage, followed by consulting friends and family members, and doctors and/or prenatal classes, these three categories also topped the list among nearly all age groups. Table 8 demonstrates that the vast majority of respondents—over three-quarters—in age clusters 25 to 34 and 35 to 44 tended to consult car seat manuals and/or instructions on restraint

Table 8: Where did you learn to install your car seat(s)? (Check all that apply), by Age Group*

| | 16 - 24 | | 25 - 34 | | 35 - 44 | | 45 - 54 | | 55 or older | |
|--|---------|------|---------|------|---------|------|---------|------|-------------|------|
| | Count | %** | Count | %** | Count | %** | Count | %** | Count | %** |
| Car seat instruction manual/instructions on side of car seat | 64 | 64.6 | 220 | 77.2 | 166 | 78.7 | 43 | 55.1 | 27 | 48.2 |
| Friend/family member or relative | 41 | 41.4 | 69 | 24.2 | 48 | 22.7 | 19 | 24.4 | 25 | 44.6 |
| Doctor/prenatal class | 26 | 26.3 | 71 | 24.9 | 32 | 15.2 | 14 | 17.9 | 2 | 3.6 |
| Vehicle manual | 1 | 1.0 | 30 | 10.5 | 20 | 9.5 | 7 | 9.0 | 5 | 8.9 |
| Certified child passenger safety technician | 6 | 6.1 | 31 | 10.9 | 15 | 7.1 | 3 | 3.8 | 3 | 5.4 |
| Media (internet, TV, radio, newspaper) | 0 | 0.0 | 5 | 1.8 | 3 | 1.4 | 1 | 1.3 | 1 | 1.8 |
| Other | 12 | 12.1 | 32 | 11.2 | 26 | 12.3 | 9 | 11.5 | 1 | 1.8 |
| Total respondents** | 99 | | 285 | | 211 | | 78 | | 56 | |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*For analytical purposes, survey participant ages are collapsed into five categories.

**Due to the fact that this survey question allowed for multiple responses, percentages do not total 100. Percentages are calculated based on the total number of respondents that answered this question.

devices. Those least likely to identify these resources were 55 or older. Those who frequently reported that doctors and/or prenatal classes had assisted them fell within the age brackets of 16 to 24 and 25 to 34 years old.

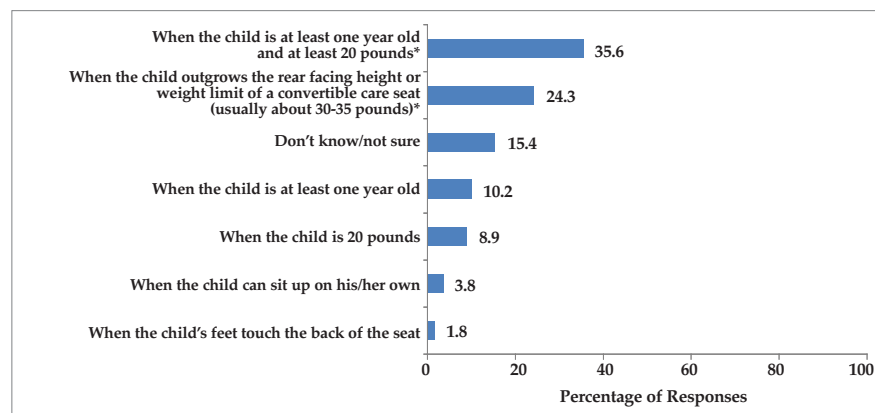
Driver Knowledge of Recommended Conditions to Turn a Child from Rear Facing to Forward Facing Position

The American Academy of Pediatrics recommends that children ride rear facing until they are at least one year of age and weigh at least 20 pounds, and remain rear facing in a convertible child safety seat until they have reached the maximum weight or height allowed by the manufacturer.¹⁰ As shown in Figure 4, 36 percent of respondents identified *when a child is at least one year old and at least 20 pounds*. When the latter response was combined with the additional condition of *when a child outgrows the rear facing height or weight limit of a convertible car seat*, the rate of driver awareness or recommended conditions

increased to 60 percent. One-quarter of respondents specified circumstances that did not correspond with best practices. Additionally, 15 percent of respondents indicated they were unsure of recommended conditions.

The 2007 survey included a question about the means by which drivers learned about best practices regarding when to turn a

Figure 4: When is it recommended to turn a child from a rear facing position to a forward facing position?



Source: Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Child Passenger Safety best practices include both conditions.

**Percentage totals may not add up to 100 due to rounding.

¹⁰Retrieved from Automotive Safety Program, Riley Hospital for Children web page regarding *Rear Facing: Why it is Beneficial* on November 18, 2007, from <http://www.preventinjury.org/GIBeneficial.asp>



Table 9: Reported Means by Which Survey Participants Learned About Best Practices Regarding Child Safety Seat Position and Transitioning Children to Booster Seats and Seat Belts

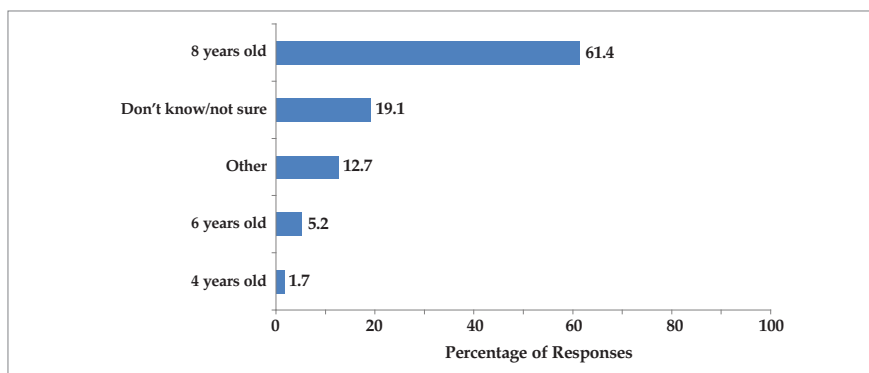
| | How did you learn when it was time to turn a child from a rear facing position to a forward facing position? | | How did you learn when it was time to switch a child from a toddler seat to a booster seat? | | How did you learn when it was time to switch a child from a booster seat to a seat belt? | |
|--|--|------|---|------|--|------|
| | Count | %* | Count | %* | Count | %* |
| Car seat instruction manual/instructions on side of car seat | 358 | 50.5 | 271 | 38.2 | 139 | 19.7 |
| Friend/family member or relative | 203 | 28.6 | 204 | 28.8 | 198 | 28.1 |
| Doctor/prenatal class | 260 | 36.7 | 182 | 25.7 | 123 | 17.5 |
| Vehicle manual | 21 | 3.0 | 11 | 1.6 | 14 | 2.0 |
| Certified child passenger safety technician | 47 | 6.6 | 47 | 6.6 | 34 | 4.8 |
| Media (internet, TV, radio, newspaper) | 31 | 4.4 | 90 | 12.7 | 146 | 20.7 |
| Other | 68 | 9.6 | 75 | 10.6 | 85 | 12.1 |
| Total respondents* | 709 | | 709 | | 704 | |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Due to the fact that this survey question allowed for multiple responses, percentages do not total 100. Percentages are calculated based on the total number of respondents that answered this question.

child from a rear to forward facing position. As shown in Table 9, the majority (51 percent) of respondents reported using the car seat manual and/or consulting instructions on the side of the car seat. Over one-third identified doctors and/or prenatal classes as their source of this information. Roughly 29 percent cited family or friends as the means by which they learned. Few (7 percent) reported learning this information from a CCPST. With regards to switching a child from a toddler to a booster seat, most respondents (38 percent) indicated they learned this information from car seat specific materials. Nearly 30 of survey participants specified a friend and/or family member. Just over one-quarter reported that they were informed by a doctor and/or via a prenatal class, and 13 percent cited the media. When asked about how they became aware of when to switch a child from a booster seat to a seat belt, nearly 30 percent cited friends and/or family members, 21 percent of respondents identified the media and similarly, 20 percent indicated they became aware of the practice via car seat related resources.

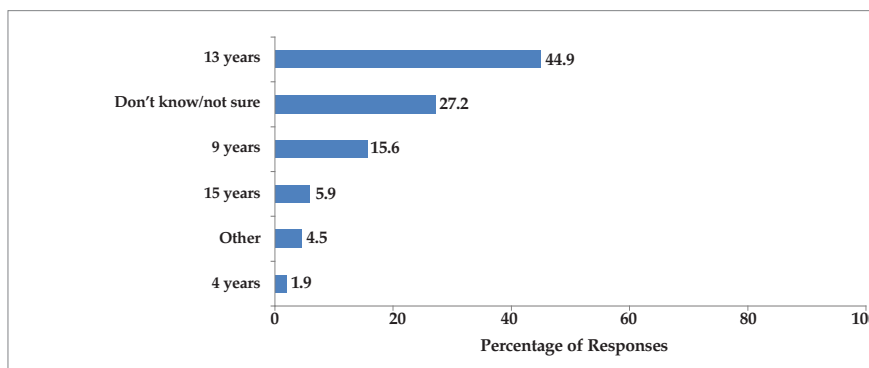
Figure 5: According to Indiana law, when is it legal for a child to ride in a vehicle using only a seat belt?



Source: Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Percentage totals may not add up to 100 due to rounding.

Figure 6: What is the minimum age when a child can ride in the front seat of a vehicle?*



Source: Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Percentage totals may not add up to 100 due to rounding.

Driver Awareness of Indiana Law Regarding Legal Age for Child to Ride in Vehicle Using Only a Seat Belt

According to current Indiana law, all children ages 8 to 16 are required to be in either child restraints or seat belts, in all seating positions at all times. As with previous surveys, the 2007 instrument included a question designed to gauge public awareness of the legal age to ride in a vehicle while using only a seat belt. As illustrated in Figure 5, results reveal that the majority of survey participants selected the correct response of eight years (from a list that included four and six years). Roughly one-fifth of respondents opted for a choice of either four or six years or other and similarly, 20 percent were unsure or did not know the legal minimum age requirement.

Driver Awareness of Recommended Minimum Child Age to Ride in Front Seat

The recommended minimum age to ride in the front seats of a vehicle is 13 years. As shown in Figure 6, from a list of four possible ages—four, nine, 13, and 15 years old—45 percent of respondents cited the correct response of 13 years. However, if those that chose 15 years—an option that does not contradict best practices—are taken into account, the percentage increased to 51 percent. Seventeen percent of respondents selected a younger age (four or nine years) that deviates from best practices. Over one-quarter of respondents indicated they did not know the recommended minimum age.

Driver Awareness of LATCH

Drivers surveyed were presented with images of LATCH components and asked to identify lower anchors and tether parts and function. As shown in Table 10, 37 percent of drivers surveyed correctly identified “lower anchors” terminology and just over one-third specified the “tether” term. When asked about the function of lower anchors and tether, nearly one-half were aware of their purpose. According to a national survey regarding LATCH use, 55 percent of parents who did not use lower attachments indicated lack of knowledge as the primary reason for nonuse.¹¹

Table 10: Driver Awareness of LATCH (Lower Anchors and Tethers for Children) Components and Functions

| | Count* | %* |
|--|--------|------|
| Driver knows what <i>lower anchor</i> is | 260 | 36.9 |
| Driver knows what <i>lower anchor</i> does | 339 | 48.2 |
| Driver knows what <i>tether</i> is | 234 | 33.2 |
| Driver knows what <i>tether</i> does | 346 | 49.1 |
| Total Respondents* | 704 | |

Source: Indiana Child Restraint Survey Data (2007), Automotive Safety Program, Riley Hospital for Children and Indiana University School of Medicine, Division of Biostatistics

*Drivers surveyed were presented with images of LATCH components. The percentages in the table are calculated based on the total number of drivers that correctly identified the terms “lower anchor” and “tether” and their respective functions.

CONCLUSION

Research shows that child passenger safety improves greatly through proper usage of child restraints and seat belts and through proper child occupant seating positions. Experts suggest that all children should ride in the back seat of passenger vehicles until they reach 13 years of age. Public awareness campaigns, combined with the enactment and enforcement of strong laws, are the most effective way to increase child restraint usage.¹² While overall findings from the 2007 survey reflect fairly broad awareness and adherence to the Indiana child passenger restraint law and the Automotive Safety Program recommended best practices, results also demonstrate the need for continued child restraint device training and education.

According to current Indiana law, all children ages 8 to 16 are required to be in either child restraints or seat belts, in all seating positions at all times.

¹¹National Center for Statistics and Analysis, National Highway Traffic Safety Administration, *Child Restraint Use Survey: LATCH Use and Misuse* (December 2006).

¹²National Center for Statistics and Analysis, National Highway Traffic Safety Administration (February 2007), *Traffic Safety Facts: Strengthening Child Passenger Safety Laws*.

This publication was prepared on behalf of the Automotive Safety Program by the Center for Criminal Justice Research. Please direct any questions concerning data in this document to the Automotive Safety Program at 317-274-2977.

An electronic copy of this document can be accessed via the Center website (www.criminaljustice.iupui.edu), the Automotive Safety Program website (www.preventinjury.org), or you may contact the Center for Criminal Justice Research at 317-261-3000.

Automotive Safety Program at Riley Hospital for Children, Indiana University School of Medicine

The mission of the Automotive Safety Program at Riley Hospital for Children, Indiana University School of Medicine is to reduce injuries and fatalities resulting from motor vehicle crashes in Indiana. The Automotive Safety Program was founded in 1981 by Dr. Marilyn Bull. Funded by the Governor's Council on Impaired & Dangerous Driving, the program directs child passenger safety research, education, and training in the state of Indiana. In addition, the Automotive Safety Program has long been a national leader and expert in transportation of children with special health care needs.

The Indiana Criminal Justice Institute (ICJI)

Guided by a Board of Trustees representing all components of Indiana's criminal and juvenile justice systems, the Indiana Criminal Justice Institute serves as the state's planning agency for criminal justice, juvenile justice, traffic safety, and victim services. ICJI develops long-range strategies for the effective administration of Indiana's criminal and juvenile justice systems and administers federal and state funds to carry out these strategies.

The Governor's Council on Impaired & Dangerous Driving

The Governor's Council on Impaired & Dangerous Driving, a division of the Indiana Criminal Justice Institute, serves as the public opinion catalyst and the implementing body for statewide action to reduce death and injury on Indiana roadways. The Council provides grant funding, training, coordination and ongoing support to state and local traffic safety advocates.

The Center for Criminal Justice Research (CCJR)

The Center for Criminal Justice Research, one of three applied research centers currently affiliated with the Indiana University Public Policy Institute, works with public safety agencies and social services organizations to provide impartial applied research on criminal justice and public safety issues. CCJR provides analysis, evaluation, and assistance to criminal justice agencies; and community information and education on public safety questions. CCJR research topics include traffic safety, crime prevention, criminal justice systems, drugs and alcohol, policing, violence and victimization, and youth.

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