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Misinformation Contributing to Safety Issues in Vehicle Restraints for Children: A Rural/Urban Comparison



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ABSTRACT

This study sought to determine current knowledge-levels of health care providers regarding child passenger safety issues and frequency of counseling on this topic. In addition, this study explored the differences in child restraint knowledge levels and current counseling frequency between rural and urban health care providers. A survey of rural and urban caregivers found that health care providers of rural caregivers were less likely to ask about the type of child restraint being used and were less likely to provide information about the type of restraint a child should be using in a vehicle. In addition, rural caregivers were less likely than urban caregivers to keep their child rear-facing for longer periods of time. Urban parents were twice as likely to list their child's health care provider as a primary source of information about child occupant protection issues. A survey of rural and urban health care providers found that rural health care providers were less likely than urban health care providers to always provide advice to caregivers regarding child occupant issues, were less confident about their ability to address caregiver questions and concerns related to specific child occupant issues, and were less likely to be knowledgeable about specific child occupant protection issues.

TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. METHODOLOGY	4
2.1 Parent Survey	4
2.2 Health Care Provider Survey	6
3. RESULTS	9
3.1 Parent Survey Results	9
3.1.1 Demographics	9
3.1.2 Concerning Most Recent Well-Child Visit	11
3.1.3 Child Occupant Protection Use	14
3.1.4 Primary Source of Information about Child Occupant Protection Issues	16
3.2 Health Care Provider Survey Results	16
3.2.1 Demographics	16
3.2.2 Frequency of Advice Provision.....	17
3.2.3 Importance of Counseling on Specific Child Safety Issues	19
3.2.4 Level of Agreement with Specific Statements Related to Child Occupant Counseling	20
3.2.5 Confidence of Ability to Address Caregiver Questions/Concerns Related to Specific Child Occupant Issues.....	23
3.2.6 Knowledge of Proper Child Occupant Protection Scenarios	24
4. SUMMARY AND CONCLUSIONS	26
4.1 Findings	26
4.2 Study Limitations.....	27
4.3 Future Research	27
REFERENCES.....	28
APPENDIX A: PARENT SURVEY.....	32
APPENDIX B: HEALTH CARE PROVIDER SURVEY.....	36
APPENDIX C: RESPONSES TO Q11	434

LIST OF TABLES

Table 2.1	Rural Counties Included in Parent Survey	6
Table 2.2	State Sources of Health Care Provider Contact Information.....	7
Table 2.3	County Rural-Urban Continuum Codes	8
Table 3.1	Parent Demographics	10
Table 3.2	Specific Activities Performed at Most Recent Well-Child Visit/Checkup by Health Care Provider by Rurality	11
Table 3.3	Specific Activities Performed at Most Recent Well-Child Visit/Checkup by Health Care Provider by Age of Child and Rurality	13
Table 3.4	Specific Activities Performed at Most Recent Well-Child Visit/ Checkup by Health Care Provider Type	13
Table 3.5	Specific Activities Performed at Most Recent Well-Child Visit/ Checkup by Health Care Provider Type and Rurality	14
Table 3.6	Health Care Provider Demographics.....	18
Table 3.7	Statements with Which Respondents Were Asked to Rate Their Agreement.....	22
Table 3.8	Knowledge of Proper Child Occupant Protection Scenarios.....	24
Appendix Table C1:	Knowledge Responses by Rurality	45

LIST OF FIGURES

Figure 2.1	Parent Survey States	5
Figure 2.2	Health Care Provider Survey States.....	7
Figure 3.1	Rear Facing by Age of Child and Rurality	15
Figure 3.2	Rear Facing by Weight of Child and Rurality	15
Figure 3.3	Primary Sources of Information about Child Occupant Protection Issues	16
Figure 3.4	Frequency of Advice Provision “Always” by Child Age	19
Figure 3.5	Importance of Counseling Parents/Children on Specific Safety Issues.....	20
Figure 3.6	Health Care Provider Confidence in Ability to Adequately Address Caregiver Questions/Concerns about Specific Child Occupant Protection Issues (Very Confident).....	23
Figure 3.7	Number of Correct Quiz Answers by Health Care Provider Rurality	25

1. INTRODUCTION

Lack of restraint use or misuse of restraints for children, especially those under the age of 13, is a real concern. Despite laws requiring the use of child safety seats in all 50 states, many children still do not travel safely in vehicles (IIHS 2010). Between 2000 and 2005 (2005 is the most recent year for leading causes of death), motor vehicle crashes were the number one cause of death of children between the age of 1 and 12 in the United States (CDC WISQARS). In 2007, more than one-quarter (28%) of children younger than age 1 were not in rear-facing seats, although the recommendation is that infants be kept rear-facing until a minimum of age one and at least 20 pounds (Glassbrenner 2008). Also, 44% of children who are 20-40 pounds were not in the recommended front-facing safety seats, with 8% totally unrestrained (Glassbrenner 2008). In addition, more than half of children aged 12 or younger who are 37 to 53 inches tall were not in safety seats or boosters, and 16% were totally unrestrained. More than 85% of children aged 12 or younger who are 54 to 56 inches tall were not in safety seats or boosters, and 15% were totally unrestrained (Glassbrenner 2008).

Lack of or improper parental education regarding proper child restraint within vehicles could be resulting in increased misuse of child restraints and lack of restraint use. Recent studies have shown that lack of parental knowledge of proper child restraints and misinformation were two of the main reasons that children were not properly restrained in vehicles (Simpson et al. 2002, Rivara et al. 2001, Ramsey et al. 2000). This lack of information and dissemination of misinformation could be the result of a general lack of child passenger protection knowledge among groups who should be well informed (i.e., pediatricians, family practitioners). Parents are not only getting little to no information and incorrect information, they are also getting unclear and inconsistent messages from multiple sources, such as sales associates, friends, family, manufacturer labels, even health care providers (Rivara et al. 2001, Will 2002). Recent research found that incorrect information given at health care facilities may actually contribute to child safety seat misuse (Will 2002). One study found that child seat misuse was the result of parents relying on information they received at well-child visits when their child was an infant, and haven't been updated with information relevant for their older child (Ramsey et al. 2000).

If used properly, child safety seats can reduce the risk of death by up to 54% for children aged 1 to 4 and by as much as 71% for infants (NHTSA 2001). Risk of hospitalization can be reduced by up to 67% when safety seats are used correctly (Winston & Durbin 1999). Fatality risks for children aged 12 or younger properly restrained in the rear seat of a vehicle are 38% lower than for children restrained in the front seat (Braver et al. 1998). These are very strong arguments for ensuring that all children are properly placed and restrained within vehicles by providing accurate information to their caregivers through a reliable source.

Health care providers are ideally placed in society to be on the front lines of prevention education regarding this issue (Rivara et al. 2001). Parents themselves report a desire for health care provider recommendations (Eichelberger et al. 1990, Price et al. 1995, Schuster et al. 2000). Cheng et al (1996) found that 83% of mothers felt that doctors could help in the reduction of injuries resulting from a "car accident." In addition, approximately half of parents say they already receive information on child vehicle restraints from a health care provider (NHTSA 2009). However, studies indicate physician knowledge of car seat safety is relatively low (McKay & Curtis 2002, McKay 2008, Will 2002, Rothenstein et al. 2004, Cohen & Runyan 1999). Cohen and Runyan (1999) found that only 58% of pediatric residents knew that a convertible car seat could be turned forward when a child is 20 pounds (which was correct at the time of the study), and only 42% knew that the safest place for an infant car seat is in the back middle. In a 2001 American Academy of Pediatrics (AAP) survey regarding anticipatory counseling practices of pediatricians, only 45% of physicians were confident that they could address a parent's question regarding properly installing a car seat or booster seat appropriate for the age and weight of a child (AAP

2001). Only 58% stated they were confident they would be able to answer a parent's question regarding referrals to reliable resources for further information on choosing and installing car seats.

Several studies show that physicians infrequently counsel their patients regarding child passenger safety issues (Williams et al. 2001, Rothenstein et al. 2004, AAP 2001, Cheng et al. 1999). Barkin et al. (1999) found that two-thirds of health care providers say they counsel parents of pediatric patients on injury prevention as it relates to motor vehicle crashes. In the 2001 AAP study, nearly 90% of pediatricians reported discussing passenger restraint systems with at least 75% of parents of children younger than 12 months old at least once, and 76% reported discussing this topic with most parents of toddlers (AAP 2001). However, the proportion of parents counseled on child passenger safety decreases as the child's age increases. And relatively few providers acknowledged providing information on this topic at every well-child visit. Barrios et al. (2001) found that parents of children under 7 months of age were asked about car seat use by physicians approximately 82% of the time, but the interactions regarding car seat use were superficial, and did not go beyond simply asking if the parents used a car seat.

There have been mixed results as to the effectiveness of office-based anticipatory guidance regarding injury prevention. Anticipatory guidance and other interventions in the clinic setting were found to increase the adoption of motor vehicle restraint use in some studies (DiGuseppi & Roberts 2000, Bass et al. 1993, Kelly et al. 1987, Scherz 1976, Reisinger et al. 1981, Kanthor 1976, Bass and Wilson 1964), while anticipatory guidance has been shown to have no effect in other studies (Leverence et al. 2005, Gielen et al. 2001). However, even with the inconsistent research results on anticipatory guidance regarding injury prevention counseling, the American Academy of Pediatrics (AAP) recommends that all children receive injury prevention counseling for "the most significant childhood injuries" and that it should be integrated into every well-child visit (Bass et al. 1993). Through The Injury Prevention Program (TIPP), the AAP sets out a well-defined set of guidelines and materials to help physicians implement injury prevention counseling (Bass et al. 1993). TIPP "provides physicians with a systematic, epidemiologically sound, developmentally appropriate, and effective way to conduct injury prevention counseling" (Bass & Micik 1997). TIPP includes a safety-counseling schedule, age-appropriate safety surveys, and age-appropriate safety sheets for families to take home (Gardner et al. 2007). Counseling topics regarding traffic safety are clearly delineated by age grouping (infants, preschool-aged children, school-aged children, and adolescents), with explicit talking points provided for the physician (Gardner et al. 2007). In addition, the AAP released a policy statement in 2002 that discusses the Academy's current recommendations on selecting and using the most appropriate vehicle restraints for growing children, and outline guidelines for counseling parents (AAP 2002). Injury prevention counseling is also included in the US Preventative Services Task Force Guide to Clinical Preventive Services (AHRQ 2008). A cost-benefit analysis of injury prevention counseling was conducted by Miller and Galbraith (1995), who found that if pediatricians were to regularly counsel their patients on the importance of proper child vehicle restraints, this could result in as much as \$72.50 in medical cost savings per child.

Of the research that has been conducted on anticipatory counseling regarding child vehicle occupant safety issues by health care providers, there has been no focus on the practice patterns of providers located in rural areas versus providers that practice in urban areas. Child restraint use in rural and urban areas is fairly comparable (86% in rural areas and 85% in urban areas, United States-2007) (Ye and Pickrell 2008). However, in regard to overall traffic safety, children aged 14 or younger who are involved in motor vehicle crashes in rural areas are two to five times more likely to be seriously or fatally injured than children who are involved in crashes in urban areas (Kmet & Macarthur 2006, Hwang et al. 1997, King et al. 1994, Lapidus et al. 1998, Niemcryk et al. 1997, Svenson et al. 1996a,b). Agran et al. (1998) found that the percent of children aged nine or younger involved in fatal motor vehicle occupant crashes using occupant restraints was much lower in rural areas than in urban areas (54% rural versus 61% urban). A recent study conducted by Huseth-Zosel (2012) found that children in rural areas were significantly more likely to be front-seated in a vehicle than children in urban areas. While child restraint

use in rural and urban areas is comparable, the differences in serious and fatal injuries could be the result of the lack of child restraint counseling on the proper way to restrain a child within a vehicle or the dissemination of misinformation regarding child restraints by physicians in rural areas.

Also, relatively little research has been directed toward determining differences in anticipatory guidance between midlevel providers and physicians. Mid-level health care providers (including physician assistants and nurse practitioners) are sometimes referred to as “physician extenders” – extending the availability of health care, especially to those in rural areas. While mid-levels are nationally certified and state licensed to provide diagnostic, treatment, and follow-up care, mostly under the direction of a physician, mid-levels receive less formal medical training than physicians. In 1977, Congress enacted the Rural Health Clinics Act, which encouraged the use of midlevel providers (including physician assistants and nurse practitioners) in rural communities largely because these small rural areas could not support an adequate number of physicians (Henry et al. 2011). As previously mentioned, mid-levels are not as extensively trained as physicians and in rural areas tend to take on activities normally performed by physicians, having a larger scope of practice than mid-levels in urban areas (Henry et al. 2011). While it is true that this extensive range of skills might be necessary in order to provide the health care needed in underserved rural areas, it is possible that this increase in responsibility matched with lower levels of medical training leads to the rural health care provider discontinuing duties that they might deem “less necessary,” such as anticipatory guidance. It is also possible the additional training that mid-levels lack is inclusive of anticipatory guidance subject matter, thereby depriving rural parents of necessary anticipatory guidance regarding child vehicle restraint.

Determining current knowledge levels of health care providers regarding child passenger safety issues and frequency of counseling on this topic would highlight problem areas in relation to misinformation being disseminated to parents/caregivers or lack of information being disseminated to parents/caregivers. This study seeks to ascertain if current child restraint knowledge levels differ between rural and urban health care providers.

2. METHODOLOGY

Parent and health care provider surveys were developed to determine:

1. The extent to which health care providers are providing any anticipatory guidance regarding child safety seats and proper child occupant restraint within a vehicle;
2. Whether health care providers are providing accurate anticipatory guidance regarding child safety seats and proper child occupant restraint within a vehicle;
3. Barriers to discussing child passenger safety during well-child checkups;
4. If there are differences in anticipatory counseling practices regarding child vehicle occupant safety between rural and urban providers;
5. If there are differences in the use of proper child restraints between parents whose provider discussed this topic with them versus parents whose provider did not discuss the topic; and
6. If there are differences in the use of proper child restraints between parents who are located in a rural area versus those located in an urban area – with the assumption that parents located in rural areas are taking their children to health care providers also located in rural areas.

Both the parent and health care provider surveys were created based on a review of the literature, findings from previous surveys, and feedback from people who work extensively with child passenger safety issues, including physicians.

2.1 Parent Survey

The parent survey can be found in Appendix A and includes questions about the most recent well-child visit/check-up by one of the children in their household aged 12 or younger. It was made clear that the survey questions pertained to regularly scheduled checkups and not visits to walk-in clinics, emergency rooms, or other visits when their child was ill. Survey questions focusing on the child include the age of the child who was most recently seen for a well-child visit/checkup, the size the child, how long ago the visit took place, and the type of doctor seen at this visit. Questions regarding the most recent well-child visit/checkup include if the child's doctor asked about the type of restraints currently being used by the child when riding in a vehicle, if the child's doctor asked if the parent had any questions regarding the type of restraint that should be used, if the child's doctor referred the parent to another resource for information on the type of restraint that should be used, and if the child's doctor provided any information about the type of restraint that the child should be using when riding in a vehicle. Parents were also asked about the type of restraint currently being used by the child, where the child usually sits within a vehicle, and their primary source of information regarding child vehicle occupant safety issues. In addition, basic demographic questions were asked, including age, gender, education, marital status, and household income.

For the parent survey, a random list of addresses of households, which were likely to have children aged 12 or younger, was obtained from USA Data. The sample was stratified by rurality, with the areas surveyed including urban and rural counties in the following states: North Dakota, South Dakota, Utah, Colorado, and Wyoming (Figure 2.1). These states, with the addition of Nevada, are inclusive of the National Highway Traffic Safety Administration's Region 8.

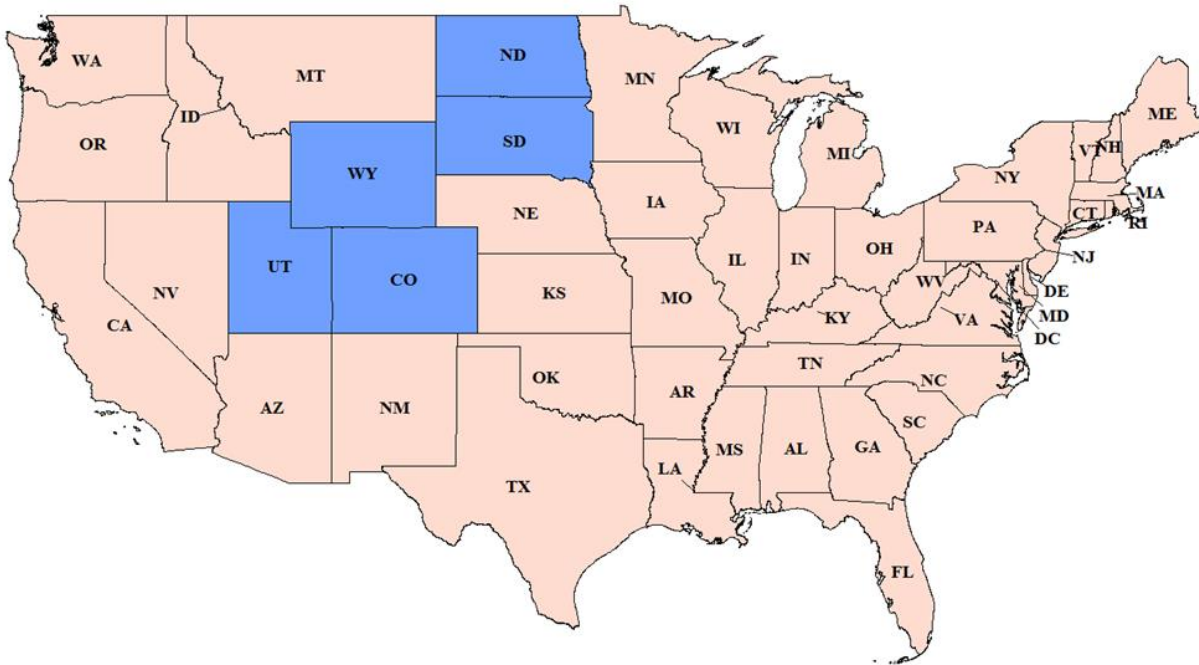


Figure 2.1 Parent Survey States

Urban areas were defined as those zip codes contained in the most urban city within each state, which included the zip codes for the following cities: Fargo, ND; Sioux Falls, SD; Denver, CO; Cheyenne, WY; and Salt Lake City, UT. A random list of 5,000 household addresses from these zip codes, which were likely to have children aged 12 or younger, was purchased from USA Data. From the list of 5,000 urban households, 2,000 were randomly selected for the initial survey.

The rural areas were defined by the U.S. Department of Agriculture Economic Research Service Rural-Urban Continuum Codes. Rural-Urban Continuum Codes provide a classification structure that classifies counties by population size, degree of urbanization, and adjacency to a metro area or areas. According to the Economic Research Service, the codes allow researchers who work with county-level data to break the data into a more sophisticated classification than just metropolitan or non-metropolitan counties, which is extremely useful for the analysis of data in those non-metro areas that are related to degree of rurality, as in this study. For each state, a random selection of five counties with code classification “9” according to the ERS Rural-Urban Continuum Codes were selected (Table 2.1). Wyoming has only four counties with a code classification of 9, so only these four counties from Wyoming were selected. Code classification 9 includes those counties that are completely rural or less than 2,500 urban population, and not adjacent to a metro area. The most rural counties were selected due to the assumption that households located in these counties would be more likely to seek routine primary care services (i.e., well child visits/checkups) locally, and not travel to a large metro area for these services. A random list of 5,000 household addresses from these counties, which were most likely to have children aged 12 or younger, was also purchased from USA Data. From the list of 5,000 rural households, 2,000 were randomly selected for the initial survey.

Table 2.1 Rural Counties Included in Parent Survey

<u>State</u>	<u>County</u>	<u>State</u>	<u>County</u>	<u>State</u>	<u>County</u>
North Dakota	Bottineau	South Dakota	Bon Homme	Wyoming	Big Horn
	Dunn		Buffalo		Crock
	Griggs		Dewey		Niobrara
	LaMoure		Stanley		Sublette
	Renville		Sully		
Colorado	Cheyenne	Utah	Beaver		
	Costilla		Emery		
	Phillips		Garfield		
	San Juan		Piute		
	Washington		Wayne		

After Institutional Review Board authorization was obtained from North Dakota State University to use the finalized survey, the initial round of surveys for both rural and urban parents was sent the last week of January 2011. Due to an extremely low response from the first round of surveys for both the rural and urban households, a second round of surveys was sent. A random selection of 2,000 additional addresses was selected from the remaining 3,000 addresses for both the rural and urban lists. The second round of surveys for both rural and urban parents was sent the last week of March 2011.

2.2 Health Care Provider Survey

The health care provider survey can be found in Appendix B and includes questions regarding anticipatory guidance for child passenger safety. Health care providers were asked what percent of their practice includes pediatric patients, what proportion of their workweek is usually spent on well-child visits, and the frequency with which they provide anticipatory guidance to parents of pediatric patients in specific age groups. In addition, they were asked to rate their level of agreement with several statements regarding child passenger safety anticipatory guidance issues including, but not limited to, level of parent concern about how to correctly secure their child in a vehicle, knowing where to obtain training on child passenger safety issues, whether or not health care providers should provide counseling on child passenger safety issues, and the consistency of counseling received by parents from health professionals. Health care providers were also asked their level of confidence in answering parents' questions and concerns regarding selecting an appropriate child restraint, determining appropriate size for a car seat or booster seat, and transporting children in vehicles with air bags. In addition, several questions were included on the frequency with which anticipatory guidance about child passenger safety issues was performed, frequency of seat belt use, if they have ever treated or consulted a child who had been involved in a motor vehicle crash, and demographic questions including specialty, how long they have been practicing, and if they have children or grandchildren aged 18 or younger. To assess knowledge regarding general child passenger safety, a short quiz was added asking relevant questions for this area with which health care providers should be familiar.

For the health care provider survey, provider contact information was obtained from state medical associations (Table 2.2). Physicians (MDs, DOs) and mid-levels (PAs, NPs) with a specialty of pediatrics or family medicine were selected for this study, based on the assumption that providers in these two specialties would perform the vast majority of well-child visits/checkups.

Table 2.2 State Sources of Health Care Provider Contact Information

<u>State</u>	<u>Source</u>
North Dakota	North Dakota Chapter Academy of Pediatrics North Dakota Academy of Family Physicians
South Dakota	South Dakota State Medical Association
Colorado	Colorado Medical Society
Utah	Utah Medical Association
Wyoming	Wyoming Medical Society
Nebraska	Nebraska Medical Association Health Care Facility websites
Iowa	Iowa Medical Society Health Care Facility websites

Similar to the parent survey, the health care provider contact information was also stratified by rurality, with the areas surveyed including urban and rural counties in the following states: North Dakota, South Dakota, Utah, Colorado, and Wyoming (Figure 2.2).

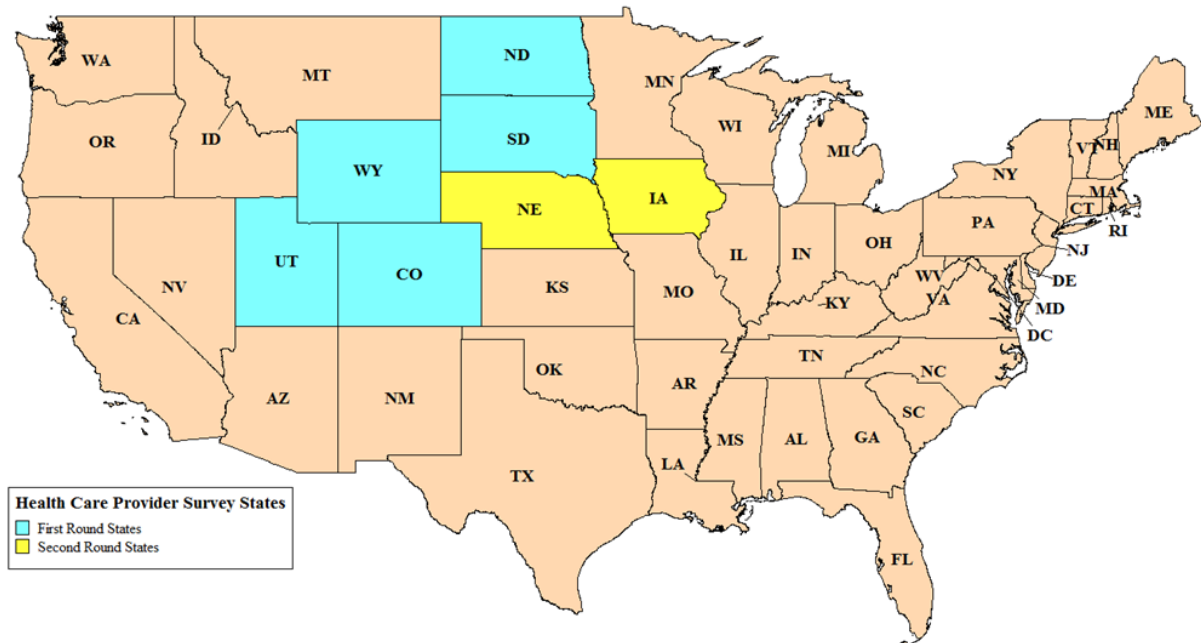


Figure 2.2 Health Care Provider Survey States

Because the population of health care providers is smaller than that of the general population, the definitions for the rural and urban areas were broadened to include additional county code classifications in order to obtain a larger population to survey. Urban areas were defined as counties with a rural-urban continuum code of 1, 2, or 3. The ERS describes these as metro counties. Rural areas were defined as counties with a code classification of 4 through 9. The ERS describes these as non-metro counties. Code classification descriptions are listed in Table 2.3.

Table 2.3 County Rural-Urban Continuum Codes

<u>Code</u>	<u>Description</u>
<i>Metro Counties:</i>	
1	Counties in metro areas of 1 million population or more
2	Counties in metro areas of 250,000 to 1 million population
3	Counties in metro areas of fewer than 250,000 population
<i>Non-metro Counties:</i>	
4	Urban population of 20,000 or more, adjacent to a metro area
5	Urban population of 20,000 or more, not adjacent to a metro area
6	Urban population of 2,500 to 19,999, adjacent to a metro area
7	Urban population of 2,500 to 19,999, not adjacent to a metro area
8	Completely rural or less than 2,500 urban population, adjacent to a metro area
9	Completely rural or less than 2,500 urban population, not adjacent to a metro area

A list of 2,000 health care providers from the designated urban counties and a list of 1,396 health care providers from the designated rural counties in the selected states were obtained from the specified state sources. After Institutional Review Board authorization was obtained from North Dakota State University to use the finalized survey, the initial round of surveys for both rural and urban health care providers was sent the first week of February 2011. Due to an extremely low response from the first round of surveys for both the rural and urban health care providers, a second round of surveys was sent. Two states were then added to the state selection pool: Nebraska and Iowa (Figure 2.2). The selection process for rural and urban health care providers for these two additional states was similar to that of the first round of health care provider surveys. The second round of surveys, which included the Nebraska and Iowa health care providers, comprised 740 rural and 950 urban health care providers.

3. RESULTS

3.1 Parent Survey Results

Response rate for the parent survey was 3.5% for the rural parents and 3.9% for the urban parents.

3.1.1 Demographics

Overall, 12.8% of respondents stated that the age of the child who was most recently seen for a well-child visit/checkup was younger than 1 year old, with 14.1% of urban parents and 11.4% of rural parents stating the age of the child who was most recently seen was younger than 1 year old (Table 3.1). More than 25% (25.3%) of respondents stated the age of the child who was most recently seen for a well-child visit was 1-2 years (20.5% urban; 30.7% rural); with 11.5% being aged 3-4, 12.2% being aged 5-6, 14.2% being aged 7-8, and 22.9% being aged 9 or older (Table 3.1).

Overall, 21.3% of respondents stated their most recent well-child visit/checkup for the previously identified child was less than one month ago, with 21.6% stating it was 2-3 months ago, 21.3% stating it was 4-6 months ago, and more than one-third stating it was more than 6 months ago (Table 3.1). More than half (53%) of overall respondents stated that the previously identified child was seen by a pediatrician during their most recent well-child visit/checkup, with significantly more urban parents stating that their child was seen by a pediatrician than rural parents (65.4% vs. 39.3%) (Table 3.1). Rural parents were more likely to state their child was seen by a family practitioner or a nurse practitioner/physician's assistant at their most recent well-child visit/checkup than urban parents (57.9% vs. 32%) (Table 3.1). According to a study by Randolph and Pathman (2001), an overarching imbalance exists in the proportion of pediatricians practicing in rural areas versus urban areas; with rural areas having much fewer pediatricians as these rural locations are often not first practice site choices for medical school graduates. In addition, nurse practitioners or physician's assistants are more likely to be used in rural areas as medical extenders, playing a substitute role in the place of MDs (Everett, Schumacher, Wright, & Smith 2009).

More than half of the respondents (51.5%) stated they were aged 31 to 40, while 28.1% stated they were aged 41 to 50; 14.6% were aged 26 to 30, 3.4% were aged 51 or older, and 2.4% were aged 25 or younger (Table 3.1). The majority of respondents were female (91.9%) and married (85.5%). Including all wage earners in the family, nearly one-fourth of respondents stated their total household income was between \$30,000 and \$49,999, with 21.6% stating it was between \$50,000 and \$69,999, 18.6% \$100,000 or more, 15.9% between \$70,000 and \$89,999, 12.5% less than \$30,000, and 7.6% at \$90,000 to \$99,999.

Table 3.1. Parent Demographics

	Rural	Urban	Overall
<i>Child Age</i>	n=140	n=156	n=296
Younger than 1 Yr	11.4%	14.1%	12.8%
1-2 Yrs	30.7%	20.5%	25.3%
3-4 Yrs	10.7%	12.2%	11.5%
5-6 Yrs	10.7%	13.5%	12.2%
7-8 Yrs	15.7%	12.8%	14.2%
9-10 Yrs	7.9%	14.1%	11.1%
11-12 Yrs	10.7%	12.8%	11.8%
Do Not Know/Refuse	2.1%	0.0%	1.0%
<i>Most Recent Visit</i>	n=140	n=156	n=296
Less than 1 Month Ago	20.0%	22.4%	21.3%
2-3 Months Ago	20.7%	22.4%	21.6%
4-6 Months Ago	24.3%	18.6%	21.3%
More than 6 Months Ago	32.1%	34.0%	33.1%
Do Not Know/Refuse	2.9%	2.6%	2.7%
<i>Health Care Provider Type</i>	n=140	n=156	n=296
Pediatrician	39.3%	65.4%	53.0%
Family Practitioner	43.6%	30.1%	36.5%
NP/PA	14.3%	1.9%	7.8%
Other	2.1%	2.6%	2.4%
Do Not Know/Refuse	0.7%	0.0%	0.3%
<i>Respondent Age</i>	n=140	n=155	n=295
25 or Younger	2.1%	2.6%	2.4%
26 to 30	17.1%	12.3%	14.6%
31 to 40	51.4%	51.6%	51.5%
41 to 50	24.3%	31.6%	28.1%
51 or Older	5.0%	1.9%	3.4%
<i>Respondent Gender</i>	n=140	n=155	n=295
Male	7.9%	8.4%	8.1%
Female	92.1%	91.6%	91.9%
<i>Respondent Education</i>	n=139	n=156	n=295
High School/GED	10.1%	5.8%	7.8%
Some College	23.7%	19.9%	21.7%
2-year Degree (Associate's)	16.5%	19.9%	18.3%
4-year Degree (Bachelor's)	35.3%	31.4%	33.2%
Master's Degree	10.1%	15.4%	12.9%
Doctoral Degree/Professional Degree	4.3%	7.7%	6.1%
<i>Respondent Marital Status</i>	n=140	n=156	n=296
Single, Never Married	5.7%	3.8%	4.7%
In a Relationship	2.1%	2.6%	2.4%
Married	87.1%	84.0%	85.5%
Separated	0.7%	0.0%	0.3%
Divorced	4.3%	9.0%	6.8%
Widowed	0.0%	0.6%	0.3%
<i>Household Income</i>	n=124	n=140	n=264
Less Than \$30,000	12.1%	12.9%	12.5%
\$30,000 to \$49,999	26.6%	21.4%	23.9%
\$50,000 to \$69,999	27.4%	16.4%	21.6%
\$70,000 to \$89,999	16.1%	15.7%	15.9%
\$90,000 to \$99,999	4.8%	10.0%	7.6%
\$100,000 or More	12.9%	23.6%	18.6%

3.1.2 Concerning Most Recent Well-Child Visit

Parents/guardians were asked if, during their child's most recent well-child visit/checkup, their child's health care provider had conducted specific activities. According to respondents, health care providers were most likely to have asked about the type of restraint a child uses when riding in a vehicle, followed by providing information about the type of restraint that a child should be using, asking if the parent/guardian had any questions about the type of restraint their child should be using, and referring the parent/guardian to someone who would be able to answer their questions about the type of restraint their child should be using (Table 3.2).

Overall, more than 27% of respondents stated that during their child's most recent well-child visit/checkup their child's health care provider had asked about the type of restraint their child uses when riding in a vehicle, with 30.9% of urban respondents and 23.5% of rural respondents stating their child's health care provider had asked this question (Table 3.2).

Nearly 15% of overall respondents stated their child's health care provider had asked if they had any questions about the type of restraint their child should be using during their child's most recent well-child visit/checkup, with 16.2% of urban respondents and 13.4% of rural respondents stating their child's health care provider had asked this question (Table 3.2).

Nearly 4% of overall respondents stated their child's health care provider referred them to someone who would be able to answer their questions about the type of restraint their child should be using, with 3.5% of urban respondents and 3.9% of rural respondents stating their child's health care provider provided referral information (Table 3.2).

More than 21% of overall respondents stated their child's health care provider provided information about the type of restraint their child should be using when riding in a vehicle, with 25.7% of urban respondents and 15.8% of rural respondents stating their child's health care provider provided this information (Table 3.2). The differences in responses for urban versus rural parents were significant for this variable ($\chi^2 = 4.156$, $df=1$, $p=0.041$).

Table 3.2 Specific Activities Performed at Most Recent Well-Child Visit/CheckUp by Health Care Provider by Rurality

During your child's most recent well-child visit/check-up your child's doctor:	Rural	Urban	Total
Asked about the type of restraint your child uses when riding in a vehicle	23.5%	30.9%	27.4%
Asked if you had any questions about the type of restraint your child should be using	13.4%	16.2%	14.9%
Referred you to someone who would be able to answer your questions about the type of restraint your child should be using	3.9%	3.5%	3.7%
Provided information about the type of restraint your child should be using when riding in a vehicle*	15.8%	25.7%	21.1%

*Significant at $p<0.05$ level

The responses to the questions related to specific activities conducted by a child's health care provider at their most recent well-child visit/checkup were broken down by age and rurality. Due to the small number of respondents, analysis could not be conducted by individual age category, but had to be aggregated into two larger age groups: 1) age 2 or younger and 2) age 3 or older. However, because of guidelines given to health care providers by the American Pediatric Association related to rear-facing versus forward-facing children, researchers felt this was a satisfactory aggregation to make.

For both age groups (children aged 2 or younger and 3 or older), urban respondents were more likely than rural respondents to state that their child's health care provider asked them about the type of restraint their child uses when riding in a vehicle at their child's most recent well-child visit/checkup (2 or younger: 26.4% vs. 22.4%; 3 or older: 33.3% vs. 24.0%) (Table 3.3).

For the question regarding if the health care provider had asked if the parent/guardian had any questions related to the type of restraint their child should be using when riding in a vehicle, rural respondents were more likely to have been asked this question than urban respondents for children aged 2 or younger (14.0% vs. 7.5%), but for children aged 3 or older urban respondents were more likely to have been asked this question than rural respondents (21.1% vs. 12.2%) (Table 3.3).

While relatively few respondents stated their child's health care provider referred them to someone who would be able to answer their questions related to the type of restraint their child should be using, for children aged 2 or younger, urban respondents were more likely than rural respondents to say their child's health care provider provided a referral (5.8% vs. 3.7%), while for children aged 3 or older, rural respondents were slightly more likely than urban respondents to say they received a referral from their child's health care provider (2.8% vs. 2.2%) (Table 3.3).

For both age groups (children aged 2 or younger and 3 or older), urban respondents were more likely than rural respondents to state that their child's health care provider provided information about the type of restraint their child should be using when riding in a vehicle (2 or younger: 27.8% vs. 17.9%; 3 or older: 24.5% vs. 13.5%) (Table 3.3).

The responses to the questions related to specific activities conducted by a child's health care provider at their most recent well-child visit/checkup were broken down by health care provider type. As stated earlier, rural populations are more likely to be seen by mid-levels (NPs/PAs) or general practitioners than medical doctors (Randolph and Pathman; 2001; Everett, Schumacher, Wright, & Smith, 2009). For this reason, it is important to determine if differences exist in anticipatory guidance practices between mid-levels, specialists, and general practitioners.

For all the specific issues related to a child's most recent well-child visit/checkup, based on survey participant responses of all health care provider types, pediatricians were most likely to have asked about the type of restraint a child should be using (35.8%), asked if the parent/guardian had any questions about the type of restraint to be used by a child (18.5%), provided a referral to someone who would be able to answer questions related to the type of restraint a child should be using (4.9%), and provided information about the type of restraint a child should be using when riding in a vehicle (29.8%) (Table 3.4). Following pediatricians, respondents stated that family practitioners were slightly less likely to provide this type of information, followed by mid-levels (nurse practitioners, physician assistants). Differences by health care provider type for asking about the type of restraint used when riding in a vehicle ($\chi^2 = 12.647$, $df=3$, $p=0.005$) and providing information about the type of restraint that should be used when riding in a vehicle ($\chi^2 = 15.992$, $df=3$, $p=0.0001$) are statistically significant.

Table 3.3 Specific Activities Performed at Most Recent Well-Child Visit/Checkup by Health Care Provider by Age of Child and Rurality

During your child's most recent well-child visit/check-up your child's doctor:	Age of child			
	2 or Younger		3 or Older	
	Rural	Urban	Rural	Urban
Asked about the type of restraint your child uses when riding in a vehicle	22.4%	26.4%	24.0%	33.3%
Asked if you had any questions about the type of restraint your child should be using when riding in a vehicle	14.0%	7.5%	12.2%	21.1%
Referred you to someone who would be able to answer your questions about the type of restraint your child should be using when riding in a vehicle	3.7%	5.8%	2.8%	2.2%
Provided information about the type of restraint your child should be using when riding in a vehicle	17.9%	27.8%	13.5%	24.5%

Table 3.4 Specific Activities Performed at Most Recent Well-Child Visit/Checkup by Health Care Provider Type

During your child's most recent well-child visit/check-up your child's doctor:	Health Care Provider Type			
	Family			
	Pediatrician	Practitioner	NP/PA	Other
Asked about the type of restraint your child uses when riding in a vehicle*	35.8%	20.8%	13.0%	0.0%
Asked if you had any questions about the type of restraint your child should be using when riding in a vehicle	18.5%	12.4%	8.7%	0.0%
Referred you to someone who would be able to answer your questions about the type of restraint your child should be using when riding in a vehicle	4.9%	3.1%	0.0%	0.0%
Provided information about the type of restraint your child should be using when riding in a vehicle*	29.8%	13.5%	4.5%	0.0%

*Significant at the 0.05 level

According to respondents, pediatricians located in either rural and urban areas were more likely than all other health care providers combined to have asked about the type of restraint a child was using when riding in a vehicle (Table 3.5). Pediatricians in rural areas were twice as likely as their other health care provider counterparts to ask about the type of restraint a child was using in a vehicle at their most recent well-child visit (34.6% vs. 16.9%). Pediatricians in rural areas were more than twice as likely as other health care providers to ask caregivers if they had any questions about the type of restraint their child

should be using when riding in a vehicle (20% vs. 9.6%). Pediatricians in rural areas were four times as likely as other health care providers to have referred caregivers to a resource that would best be able to answer their questions related to the type of restraint their child should be using within a vehicle (8.2% vs. 1.3%). Pediatricians in rural areas were three times as likely as other health care providers to provide information to caregivers about the type of restraint their child should be using (26.9% vs. 8.8%).

The differences between pediatricians and other health care providers were not as pronounced for urban health care providers, although there were still differences in the provision of certain information (Table 3.5). Pediatricians in urban areas were much more likely than other urban health care providers to have asked about the type of restraint children were using when riding in a vehicle (36.4% vs. 20.8%). Pediatricians in urban areas were more likely than other urban health care providers to have asked if the caregivers had any questions about the type of restraint their child should be using (17.7% vs. 13.5%). Pediatricians in urban areas were twice as likely as other health care providers to provide information to caregivers about the type of restraint their child should be using when riding in a vehicle (31.3% vs. 15.1%). However, pediatricians and other health care providers were just as likely to refer caregivers to someone who might best be able to answer their questions about the type of restraint their child should be using, which is to say, a very small number of urban health care providers overall provide this information.

Table 3.5 Specific Activities Performed at Most Recent Well-Child Visit/Checkup by Health Care Provider Type and Rurality

During your child's most recent well-child visit/check-up your child's doctor:	Pediatrician		All other HCP	
	Rural	Urban	Rural	Urban
Asked about the type of restraint your child uses when riding in a vehicle	34.6%	36.4%	16.9%	20.8%
Asked if you had any questions about the type of restraint your child should be using when riding in a vehicle	20.0%	17.7%	9.6%	13.5%
Referred you to someone who would be able to answer your questions about the type of restraint your child should be using when riding in a vehicle	8.2%	3.2%	1.3%	4.2%
Provided information about the type of restraint your child should be using when riding in a vehicle	26.9%	31.3%	8.8%	15.1%

3.1.3 Child Occupant Protection Use

The American Academy of Pediatrics recommends children to be rear facing until a minimum of age two. Analysis was conducted comparing rural and urban caregivers and the types of restraints they use for their child less than age 1 or who are between the ages of 1 and 2 years. Of those respondents with children younger than age 1, all the rural caregivers stated they had their child rear facing, while 87.5% of rural caregivers stated they had their child rear facing (Figure 3.1). Of those respondents with children between the ages of 1 and 2, three times as many urban parents as rural parents stated they continued to rear face those children (37.5% vs. 11.6%). These differences were significant ($\chi^2 = 8.013$, $df=2$, $p=0.018$).

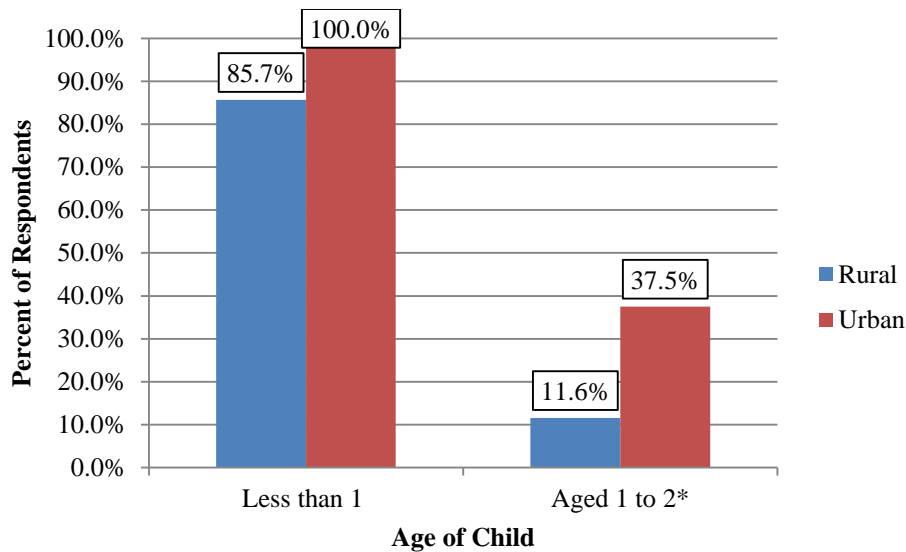


Figure 3.1 Rear Facing by Age of Child and Rurality

**Significant at the 0.05 level*

Rear seating was also analyzed by child weight. In addition to age recommendations, the American Academy of Pediatrics recommends that children remain rear facing to the upper limits of their seat, with most convertible car seats being able to be rear facing until 35 pounds. The previous weight recommendation was a minimum of 20 pounds to forward face, which was used as the baseline weight comparison. Nearly as many rural parents as urban caregivers stated they had their child who weighed 20 pounds or less rear facing (92.3% vs. 100%) (Figure 3.2). As children's weight increased, there was a trend for both rural and urban caregivers to be less likely to rear face. However, regardless of the weight of the child, as child weight increased, rural caregivers were still much less likely than urban parents to rear seat their children. The differences for rural/urban rear facing by weight were significant (Less than 35 pounds: $\chi^2 = 7.505$, $df=1$, $p=0.006$).

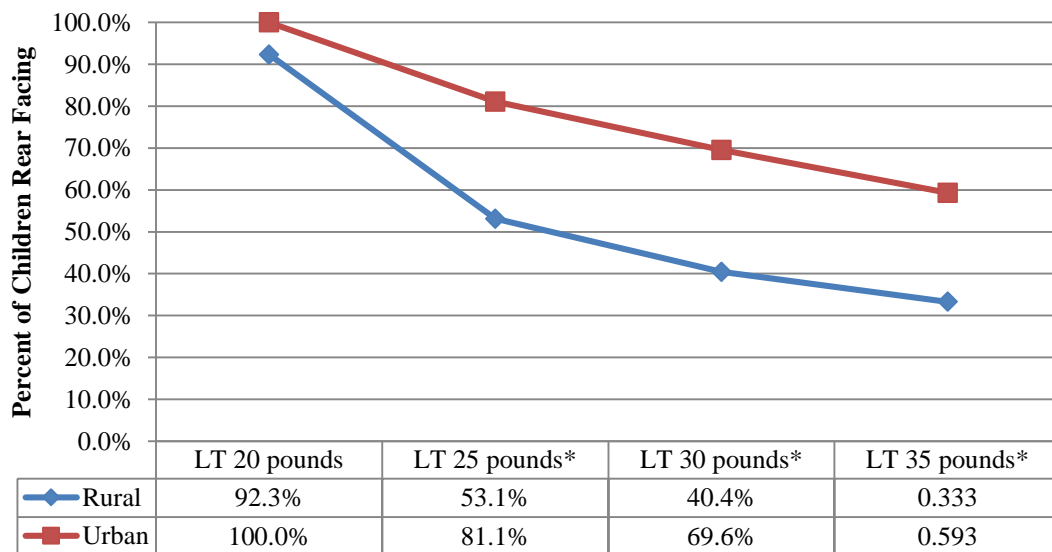
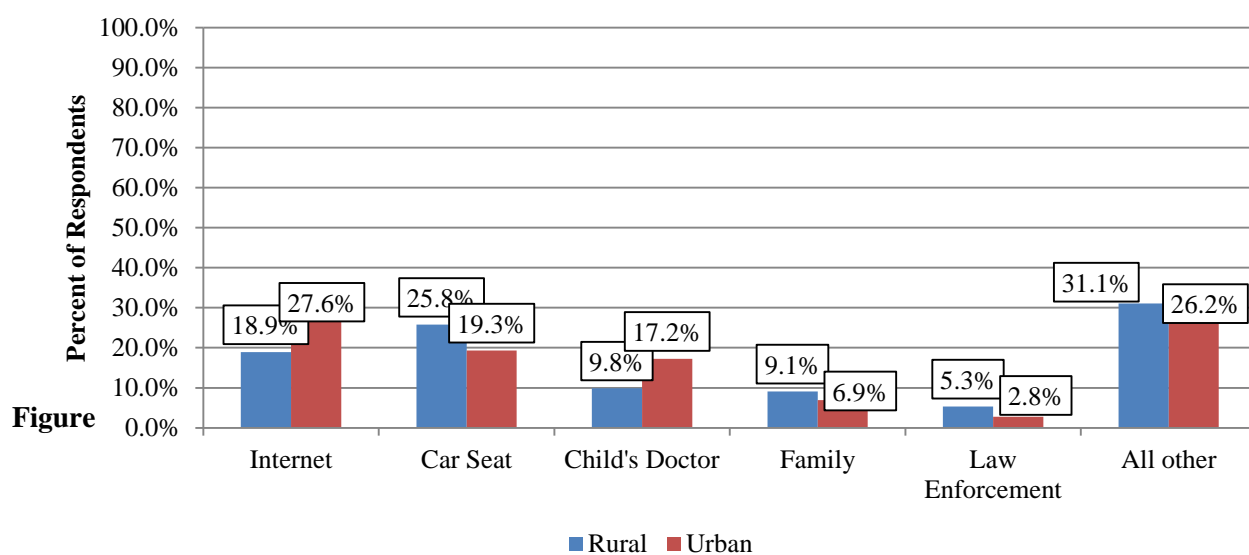


Figure 3.2 Rear Facing by Weight of Child and Rurality

**Significant at the 0.05 level.*

3.1.4 Primary Source of Information about Child Occupant Protection Issues

Respondents were asked to select their primary sources of information about child vehicle occupant safety issues – such as car seats, booster seats, and seat belt use. Urban caregivers were nearly twice as likely as rural caregivers to list their child’s doctor as their primary source of information about child occupant safety issues (17.2% vs. 9.8%) (Figure 3.3). The primary source of information listed most often by urban parents was the Internet (27.6%), while the primary source of information listed most often by rural parents was the car seat itself (25.8%) (i.e., the car seat manual).



Primary Sources of Information about Child Occupant Protection Issues

3.2 Health Care Provider Survey Results

The response rate for the health care provider survey was 5.5% for the rural providers and 5.4% for the urban providers.

3.2.1 Demographics

Overall, nearly 46% of respondents were male, with nearly 49% of rural respondents being male and nearly 44% of urban respondents being male (Table 3.6). Rural respondents were older than urban respondents, with nearly three times as many rural respondents stating they were aged 61 or older (17.1% vs. 6.2%). In addition, nearly 32% of rural respondents stated they were aged 51 to 60, while 20.1% of urban respondents stated they were in this age group.

Urban respondents were more likely than rural respondents to have an MD/DO (97.9% vs. 71.6%) (Table 3.6). Rural respondents were much more likely than urban respondents to be a PA/NP (28.4% vs. 2.1%). It has been found that, overall, mid-levels (PAs and NPs) are more likely than doctors to practice in rural areas and with underserved populations (Everett et al. 2009).

Respondents in rural areas were more likely to have their specialty in family practice (86.5% vs. 47.2%), while urban respondents were more likely to have their specialty in pediatrics (46.5% vs. 8.1%) (Table 3.6). It has been found that rural health care providers tend to practice in general primary care rather than

a specific specialty such as pediatrics, whereas urban areas tend to be replete in specialists (Everett et al. 2009; Randolph & Pathman 2001).

Rural respondents have been practicing more years in their current specialty than urban respondents, with more than half of rural respondents (51.4%) stating they have been practicing in their current specialty 15 or more years, while 36.8% of urban respondents stated they have been practicing in their current specialty for that length of time (Table 3.6).

3.2.2 Frequency of Advice Provision

Both rural and urban respondents were more likely to always provide advice to caregivers of children younger than age 1 on child passenger safety than any other age group and least likely to provide advice to caregivers of children aged 10 to 12 (Figure 3.4). However, urban respondents were more likely than rural respondents to provide advice on child passenger safety for any age group. Urban respondents were 1.2 times more likely than rural respondents to provide advice to parents of children younger than age 1, 1.5 times more likely to provide advice to parents of children aged 1 to 4, 1.9 times as likely to provide advice to parents of children aged 5 to 9, 1.8 times as likely to provide advice to parents of children aged 10 to 12, and 1.5 times more likely to provide advice to parents of children aged 13 to 17. The difference between rural and urban responses was statistically significant for children aged 1 to 4 ($\chi^2 = 14.317$, $df=3$, $p=0.003$), aged 5 to 9 ($\chi^2 = 14.908$, $df=3$, $p=0.002$), and aged 10 to 12 ($\chi^2 = 10.101$, $df=3$, $p=0.018$).

Table 3.6 Health Care Provider Demographics

	Rural	Urban	Overall
<i>Gender</i>	n=111	n=144	n=255
Male	48.6%	43.8%	45.9%
Female	51.4%	56.2%	54.1%
<i>Age</i>	n=111	n=144	n=255
30 or Younger	1.8%	6.2%	4.3%
31 to 40 Years Old	23.4%	39.6%	32.5%
41 to 50 Years Old	26.1%	27.8%	27.1%
51 to 60 Years Old	31.5%	20.1%	25.1%
61 Years or Older	17.1%	6.2%	11.0%
<i>Degree</i>	n=109	n=144	n=253
MD/DO	71.6%	97.9%	86.6%
PA/NP	28.4%	2.1%	13.4%
<i>Specialty</i>	n=111	n=144	n=255
Family Practice	86.5%	47.2%	64.3%
Internal Medicine	0.0%	0.7%	0.4%
General Pediatrics	8.1%	46.5%	29.8%
General Practice	0.9%	0.0%	0.4%
Pediatric Subspecialty	0.0%	3.5%	2.0%
Other	4.5%	2.1%	3.1%
<i>Years Practicing in Current Specialty</i>	n=111	n=144	n=255
Less Than 1 Year	4.5%	4.9%	4.7%
1-4 Years	13.5%	17.4%	15.7%
5-9 Years	15.3%	20.8%	18.4%
10-14 Years	15.3%	20.1%	18.0%
15 or More Years	51.4%	36.8%	43.1%

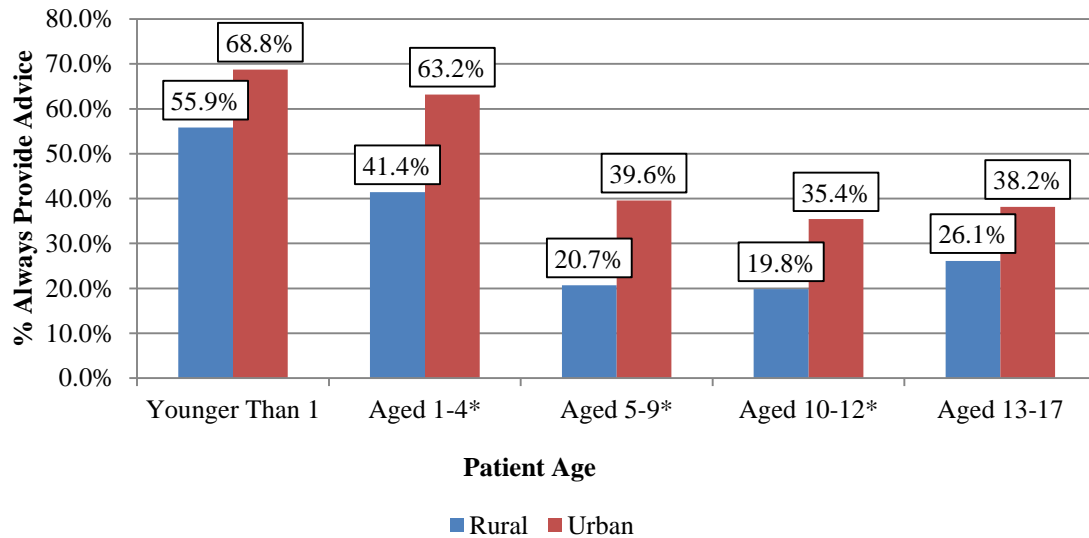


Figure 3.4 Frequency of Advice Provision “Always” by Child Age

**Significant at the 0.05 level*

3.2.3 Importance of Counseling on Specific Child Safety Issues

Respondents were asked to rate the importance of several safety issues to gauge their perception of the importance of child occupant safety on a continuum with other safety issues. Rural providers were slightly more likely than urban providers to say the following safety issues were important or very important: firearm safety (83.8% vs. 78.5%), poisoning (92.8% vs. 90.3%), and tobacco use (97.3% vs. 93.8%) (Figure 3.5). Urban providers were slightly more likely than rural providers to say the following safety issues were important or very important: water safety (89.0% vs. 83.8%) and child occupant safety (88.2% vs. 82.9%). While nearly 83% of rural providers stated that child occupant safety was important or very important in regard to office counseling, of the five issues listed it was ranked last in regards to percent of providers saying it was important or very important. While nearly 78% of urban providers stated that firearm safety was important or very important in regard to office counseling, of the five issues listed it was ranked last in regard to the percent of providers saying it was important or very important, with child occupant safety ranking fourth.

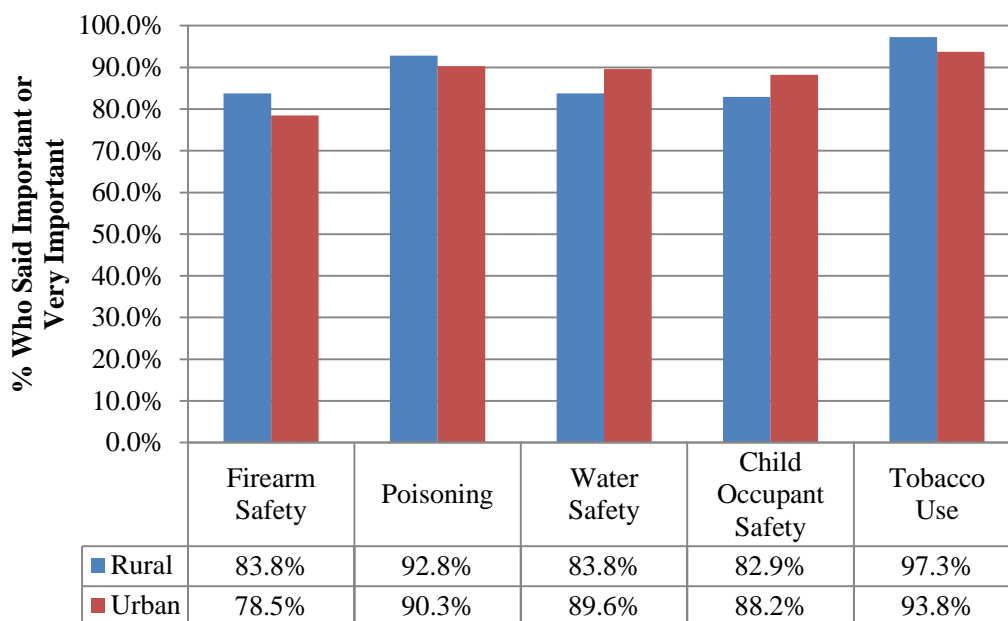


Figure 3.5 Importance of Counseling Parents/Children on Specific Safety Issues

3.2.4 Level of Agreement with Specific Statements Related to Child Occupant Counseling

Rural (91%) and urban (93.7%) respondents were both most likely to agree or strongly agree with this statement: “Health care providers should advise parents on child passenger safety issues” (Table 3.7). The statement with which both rural (3.6%) and urban (2.8%) respondents were least likely to agree or strongly agree was: “As a health care provider, it is not my responsibility to counsel parents on child passenger safety issues.” Both rural and urban respondents were as likely to state that health care providers should counsel parents on child passenger safety issues and that as a health care provider it is their responsibility to counsel parents on child passenger safety (Table 3.7: Statements [g] and [k]). A comparative majority of rural and urban respondents disagreed or strongly disagreed with the statement “Counseling is generally ineffective in increasing child seat/booster seat use” (Rural: 78.4%; Urban: 80.6%). The evidence seems to suggest that there is consensus with both rural and urban health care providers that they should be providing anticipatory guidance on child occupant safety issues and that counseling is effective in increasing child seat/booster seat use.

Both rural and urban respondents were mixed in their responses to the statement: “Parents do not get consistent advice on child passenger safety from health professionals.” In addition, more than half of both rural and urban respondents disagreed or strongly disagreed with the statement: “There are not enough resources for parents to get assistance with child passenger safety issues” (Rural: 54.6%; Urban: 54.8%). A majority of both rural and urban respondents knew where to obtain training on child passenger safety issues (Rural: 55.8%; Urban: 63.9%) and knew where to refer patients if they had questions regarding child passenger safety issues (Rural: 64.9%; Urban: 69.4%).

Rural respondents were less likely than urban respondents to agree or strongly agree with this statement: “Most parents in my practice seem concerned about how to correctly secure their child in their vehicle” (48.1% vs. 59.7%). The assumption could be made that rural health care providers feel parents in rural areas are less concerned about how to correctly secure their child within a vehicle.

Rural respondents were less likely than urban respondents to disagree or strongly disagree with this statement: “There is inadequate time during well-child visits to provide counseling regarding child passenger safety in my practice setting” (55.9% vs. 68.8%).

Rural respondents were less likely than urban respondents to disagree or strongly disagree with this statement: “In my practice, parents do not seem interested in learning about child passenger safety issues” (63.6% vs. 75.7%).

Table 3.7 Statements with Which Respondents Were Asked to Rate Their Agreement

	% Who Disagreed or Strongly Disagreed		% Who Agreed or Strongly Agreed	
	Rural	Urban	Rural	Urban
Statements with which respondents were asked to rate their agreement:				
a. Counseling is generally ineffective in increasing child seat/booster seat use	78.4%	80.6%	10.8%	11.8%
b. There is inadequate time during well-child visits to provide counseling regarding child passenger safety in my practice setting	55.9%	68.8%	20.2%	17.4%
c. In my practice, parents do not seem interested in learning about child passenger safety issues	63.6%	75.7%	11.8%	9.7%
d. Parents do not get consistent advice on child passenger safety from health professionals	29.1%	36.1%	31.8%	34.0%
e. In my practice, at well-child visits the topic of child passenger safety is usually first brought up by the parents	75.2%	78.1%	5.5%	6.3%
f. Counseling is generally ineffective in increasing seat belt use	66.0%	75.7%	13.7%	8.3%
g. As a health care provider, it is not my responsibility to counsel parents on child passenger safety	89.1%	97.2%	3.6%	2.8%
h. Most parents in my practice seem concerned about how to correctly secure their child in their vehicle	22.7%	22.9%	48.1%	59.7%
i. There are not enough resources for parents to get assistance with child passenger safety issues	54.6%	54.8%	17.3%	20.8%
j. As a health care provider, I know where to obtain training on child passenger safety issues in my community	28.8%	24.3%	55.8%	63.9%
k. Healthcare providers should advise parents on child passenger safety issues	1.8%	1.4%	91.0%	93.7%
l. I would be interested in learning more about child passenger safety	14.5%	10.4%	56.4%	59.8%
m. I know where to refer patients if they have questions regarding child passenger safety issues	20.7%	18.8%	64.9%	69.4%

3.2.5 Confidence of Ability to Address Caregiver Questions/Concerns Related to Specific Child Occupant Issues

Health care providers were asked to rate the confidence in their ability to adequately address caregiver questions/concerns related to specific child occupant protection issues. Urban health care providers were more likely than rural providers to state they are very confident in their ability to adequately address caregiver questions/concerns regarding: “The need for passenger safety restraint systems” (56.2% vs. 52.7%); “Selecting a car seat/booster seat appropriate for the age and weight of a child” (36.8% vs. 21.8%); “Determining the appropriate age/weight for use of a car seat/booster seat” (47.2% vs. 27.3%); and “Transporting children in vehicles with air bags” (49.3% vs. 40.0%) (Figure 3.6). Rural health care providers were slightly more likely than urban providers to state they are very confident in their ability to adequately address caregiver questions/concerns regarding “Referrals to reliable resources for further information in choosing/installing car seats” (38.2% vs. 35.4%).

The difference between rural and urban responses for confidence in health care provider ability to adequately address caregiver questions/concerns was statistically significant for “Selecting a car seat/booster seat appropriate for the age and weight of a child” ($F=5.626$, $df=1$, $p=0.018$) and “Determining the appropriate age/weight for use of a car seat/booster seat” ($F=8.399$, $df=1$, $p=0.004$), with urban health care providers being much more confident in addressing these concerns with caregivers.

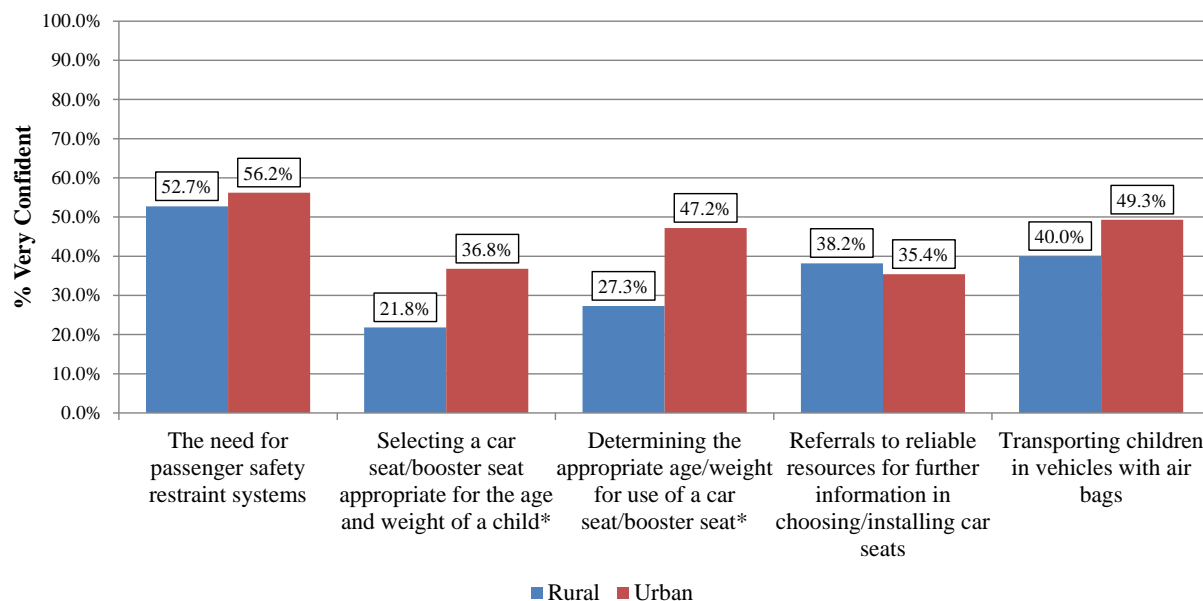


Figure 3.6 Health Care Provider Confidence in Ability to Adequately Address Caregiver Questions/Concerns about Specific Child Occupant Protection Issues (Very Confident)

**Significant at the 0.05 level*

3.2.6 Knowledge of Proper Child Occupant Protection Scenarios

Health care providers were asked a series of questions to test their knowledge regarding current child occupant safety issues. Urban health care providers were more likely than rural health care providers to answer the following questions correctly: “What is the most appropriate situation for a 25-pound 9 month old riding in a vehicle?” (93.7% vs. 89.1%); “When using a rear-facing infant seat, what is the most appropriate position of the harness straps?” (61.2% vs. 56.5%); “Where should most children ride in a vehicle?” (76.2% vs. 62.4%); and “Where is the safest place for a 50-pound 5 year old in a vehicle?” (97.9% vs. 90.8%) (Table 3.8). Rural health care providers were more likely than urban health care providers to answer the following questions correctly: “What is the most appropriate situation for a 45-pound 4 year old riding in a vehicle?” (45.4% vs. 37.3%) and “When using a forward facing convertible seat, what is the most appropriate position of the harness straps?” (54.7% vs. 50.0%). The question that most of the respondents answered incorrectly (both rural and urban health care providers) was: “What is the most appropriate situation for a 45-pound 4 year old riding in a vehicle?” (Rural: 45.4%; Urban: 37.3%).

The difference between rural and urban correct responses was statistically significant for “Where should most children ride in a vehicle?” ($\chi^2 = 6.150$, $df=1$, $p=0.013$) and “Where is the safest place for a 50-pound 5 year old in a vehicle?” ($\chi^2 = 5.425$, $df=1$, $p=0.020$), with urban health care providers more likely to answer these questions correctly.

More than three-fourths of urban health care providers answered four or more of the quiz questions correctly (78.5%), while 68.5% of the rural health care providers answered four or more of the quiz questions correctly (Figure 3.7).

Answers to the quiz questions and respondent rurality breakout for quiz responses can be found in Appendix C.

Table 3.8 Knowledge of Proper Child Occupant Protection Scenarios

	Correct Response			
	Rural		Urban	
Quiz Questions:	N	%	N	%
What is the most appropriate situation for a 25-pound 9 month old riding in a vehicle?	98	89.1%	134	93.7%
What is the most appropriate situation for a 45-pound 4 year old riding in a vehicle?	49	45.4%	53	37.3%
When using a forward-facing convertible seat, the harness straps should be located:	58	54.7%	71	50.0%
When using a rear-facing infant seat, the harness straps should be located:	61	56.5%	85	61.2%
Where should most children ride in a vehicle?*	68	62.4%	109	76.2%
Where is the safest place for a 50 pound 5 year old in a vehicle?*	99	90.8%	139	97.9%

*Significant at the 0.05 level

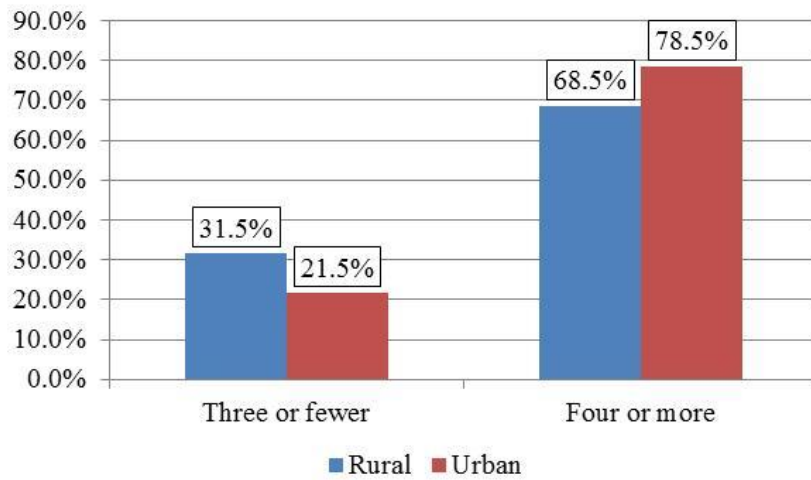


Figure 3.7 Number of Correct Quiz Answers by Health Care Provider Rurality

4. SUMMARY AND CONCLUSIONS

4.1 Findings

The objectives of this study were to determine: 1) the extent to which health care providers are providing anticipatory guidance regarding child safety seats and proper child occupant restraint within a vehicle; 2) whether health care providers are providing accurate counseling regarding child safety seats and proper child occupant restraint within a vehicle; 3) if there are differences in anticipatory counseling practices regarding child vehicle occupant safety between rural and urban providers; 4) if there is a difference in proper child occupant restraint between caregivers in urban areas versus caregivers in rural areas; and 5) if there is a difference in the primary source of child occupant protection information between caregivers in urban areas and caregivers in rural areas.

Overall, distinct differences existed between urban and rural caregivers regarding child occupant protection issues. Urban caregivers were more likely than rural caregivers to state that during their child's most recent well-child visit/checkup their health care provider asked about the type of restraint their child uses when riding in a vehicle; asked if they had any questions about the type of restraint their child should be using; and provided information about the type of restraint their child should be using when riding in a vehicle. These differences become even more pronounced when examined by child age, with urban health care providers more likely to have asked about specific child occupant protection issues. When broken down by health care provider type, the rural/urban differences for pediatricians is relatively small, with urban/rural differences for all other health care provider types (including mid-levels) remaining. In addition, urban caregivers were more likely than rural caregivers to keep their children rear facing longer.

Regarding sources of information for child occupant protection, urban caregivers were nearly twice as likely as rural caregivers to list their child's health care provider as their primary source of information regarding child occupant protection issues. It could be that rural caregivers are less likely to list their health care provider as a source due to a lack of information being received. Another explanation could be that rural caregivers are receiving the information, but choose to "check" this information with other sources they feel are more reliable, such as the Internet or the child's car seat instruction manual.

Overall, urban health care providers were more likely than rural health care providers to provide anticipatory counseling related to child passenger safety to children aged 17 or younger, regardless of specific age. It should be noted that counseling frequency declined for both rural and urban health care providers as a child's age increased. Urban health care providers were more likely than rural health care providers to believe the parents in their practices seemed concerned about how to correctly secure their child in their vehicle, and were less likely to feel that parents do not seem interested in learning about child passenger safety issues. In addition, urban health care providers were more likely than rural health care providers to know where to obtain training on child passenger safety issues, and were slightly more likely to know where to refer patients if they had questions related to child passenger safety issues. Urban health care providers were significantly more likely than rural health care providers to say they were very confident in their ability to adequately address caregiver concerns related to selecting a car seat/booster seat appropriate for the age and weight of a child and in determining the appropriate age/weight for use of a car seat/booster seat.

While results of the quiz to ascertain health care provider knowledge of proper child occupant protection scenarios were mixed, urban health care providers were more likely than rural health care providers to have answered at least four of the quiz questions correctly, showing a slight child occupant protection knowledge differential.

4.2 Study Limitations

This study was limited by a number of factors. The first limitation is related to the representativeness of the samples. These results reflect the responses of caregivers and health care providers whose names and contact information were made available either through a data clearinghouse or state medical associations. Persons whose contact information was not available through either of these sources were excluded from participating in the survey. Second, response rates were significantly less than ideal, decreasing the confidence in the data in regard to generalizability. Future research should focus on increasing response rates for both caregivers and health care providers. One of the issues that might have contributed to the low response rate was the survey length. Future iterations of this survey might do well in reducing the length of both of the survey tools. Third, results of both surveys could have been affected by self-report bias. Studies have shown that respondents tend to over-report safe behavior in self-report surveys, including restraint use, and this could have been a factor in these surveys as well (Webb et al. 1988, Abrogast et al. 2000, Korn et al. 2007). For example, health care providers might have over-reported the actual frequency of anticipatory guidance provision. Fourth, physicians might not have been completely honest regarding their answers to the knowledge quiz, and might have used supplementary material (i.e., Internet sources, child occupant protection specialists) to obtain answers to the questions.

4.3 Future Research

Future research in this area should focus on the reasons behind the differences in anticipatory guidance practices of health care providers located in rural and urban regions. Along these lines, focus could be given to the safety culture in rural versus urban areas. The results bear out rural/urban differences in health care provider perceptions and parental perceptions as related to anticipatory guidance. What would account for these differences and how does this relate to the larger “safety culture?”

In addition, the results showed a distinct gap in health care provider knowledge of where to refer patients to receive additional information on child occupant protection and where to receive training related to child occupant protection. Future research could focus on why these gaps exist, and how to provide this information to health care providers (both rural and urban) in a way that is easily accessible and easily understood.

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APPENDIX A: PARENT SURVEY



January 6, 2011

Dear Parent/Guardian:

The Upper Great Plains Transportation Institute at North Dakota State University in Fargo, North Dakota is conducting a study of child traffic safety issues. We are inviting you to participate in this research project. Enclosed with this letter is a brief survey that asks a variety of questions regarding child passenger safety issues. The purpose of this survey is to determine how often doctors are providing information about child passenger safety issues. We are asking you to look over the survey and, if you choose to do so, complete it and return it in the enclosed postage paid envelope no later than February 25, 2011. Please do not include your name or address on the return envelope or the survey.

Your participation is completely voluntary and because no identifying information is being collected, your identification will remain anonymous.

We hope you will take a few short minutes to complete this survey. There are no risks to you or to your privacy if you decide to participate in this study by completing and returning the enclosed survey. You are not required to participate.

If you have any questions or concerns about the survey or about participating in this study, feel free to contact Andrea Huseeth at (701) 231-6427 or at andrea.huseeth-zosel@ndsu.edu. If you have any questions about your rights as a research subject or if you would like to file a complaint regarding this research, you may contact the NDSU Human Research Protection Program at (701) 231-8908, ndsu.irb@ndsu.edu, or NDSU HRPP Office, NDSU Dept. 4000, PO Box 6050, Fargo, ND 58108-6050. The role of the IRB is to see that your rights are protected in this research; more information about your rights can be found at: www.ndsu.edu/research/irb. This project is funded by the Mountain-Plains Consortium through a grant from the U.S. Department of Transportation.

Sincerely,

Andrea Huseeth

NDSU Dept. 2880
P.O. Box 6050
Fargo, ND 58108-6050
Tel: 701.231.7767
www.ugpti.org

Please open booklet to start survey



Child Passenger Safety Survey: 2011



Are you aged 18 or older AND the parent or guardian of a child aged 12 or younger?

- ☐ Yes – PLEASE CONTINUE TO QUESTION #1.
- ☐ No - We're sorry but this survey is limited to parents or guardians aged 18 or older with at least one child aged 12 or younger.

The following questions are about the most recent well-child visit/check-up by one of the children in your household aged 12 or younger. These questions apply only to regularly scheduled check-ups, NOT visits to walk-in clinics, emergency rooms, or other visits when your child was sick.

1. How old is the child who was most recently seen for a well-child visit/check-up?

- | | |
|--|---|
| <input type="checkbox"/> Younger than 1 year old | <input type="checkbox"/> 7 to 8 years old |
| <input type="checkbox"/> 1 to 2 years old | <input type="checkbox"/> 9 to 10 years old |
| <input type="checkbox"/> 3 to 4 years old | <input type="checkbox"/> 11 to 12 years old |
| <input type="checkbox"/> 5 to 6 years old | |

2. What is the approximate height/weight of the child who was most recently seen for a well-child visit/check-up?

HEIGHT: _____feet _____inches WEIGHT: _____Pounds

3. How long ago was the most recent well-child visit/check-up for this child?

- | | |
|--|---|
| <input type="checkbox"/> Less than 1 month ago | <input type="checkbox"/> More than 6 months ago |
| <input type="checkbox"/> 2-3 months ago | <input type="checkbox"/> Do not know/refused |
| <input type="checkbox"/> 4-6 months ago | |

4. What type of doctor was your child seen by on their most recent well-child visit/check-up?

(Please select one)

- | | |
|---|--|
| <input type="checkbox"/> Pediatrician | <input type="checkbox"/> Other (please list) _____ |
| <input type="checkbox"/> Family practitioner | <input type="checkbox"/> Do not know/refused |
| <input type="checkbox"/> Nurse practitioner/physician's assistant | |

5. During your child's most recent well-child visit/check-up:

Yes

No

Do Not
Know/
Refuse

a. ...did your child's doctor ask about the type of restraint your child uses when riding in a vehicle?

☐☐☐

b. ...did your child's doctor ask if you had any questions about the type of restraint your child should be using when riding in a vehicle?

☐☐☐

c. ...did your child's doctor refer you to someone who would be able to answer your questions about the type of restraint your child should be using when riding in a vehicle?

☐☐☐

d. ...did your child's doctor provide information about the type of restraint your child should be using when riding in a vehicle?

☐☐☐

6. What type of restraint do you usually use for this child when riding in a vehicle? (Please select ONE)

☐ Rear Facing Car Seat/ Rear Facing Infant Seat

☐ Seat Belt

☐ Forward Facing Car Seat/Forward Facing Infant Seat

☐ Booster Seat

☐ No Restraints

☐ Other (please list) _____

☐ Do not know/refuse

7. After your child's most recent well-child visit/check-up, did you change the type of restraint you were using with your child because of information provided by your child's doctor? ☐ Yes ☐ No

8. Where in the vehicle does this child usually sit?

☐ Front Seat

☐ Other (Please list) _____

☐ Back Seat

☐ Do not know/refuse

9. What is your primary source of information about child vehicle occupant safety issues – such as car seats, booster seats, seat belt use? (Please select one)

☐ Child's doctor

☐ Family

☐ Friends

☐ Internet

☐ Car Seat Manual (if child is in car seat/booster seat)

☐ Store where you purchased your car seat/booster seat (if child is in car seat/booster seat)

☐ Other source (Please list) _____

☐ Do not know/refuse

10. What is your age? ☐ 25 or younger ☐ 26 to 30 ☐ 31 to 40 ☐ 41 to 50 ☐ 51 or older

11. What is your gender? ☐ Male ☐ Female

CONTINUED ON BACK PAGE



12. What is the highest level of education you have completed?

- | | |
|--|--|
| <input type="checkbox"/> Less than high school | <input type="checkbox"/> 4-year degree (Bachelor's) |
| <input type="checkbox"/> High school/GED | <input type="checkbox"/> Master's Degree |
| <input type="checkbox"/> Some college | <input type="checkbox"/> Doctoral Degree |
| <input type="checkbox"/> 2-year degree (Associate's) | <input type="checkbox"/> Professional Degree (MD/JD) |
| <input type="checkbox"/> Do not know/refuse | |

13. What is your current marital status?

- | | |
|---|------------------------------------|
| <input type="checkbox"/> Single, never married | <input type="checkbox"/> Separated |
| <input type="checkbox"/> In a relationship, not married | <input type="checkbox"/> Divorced |
| <input type="checkbox"/> Married | <input type="checkbox"/> Widowed |
| <input type="checkbox"/> Do not know/refuse | |

14. What is your total household income, including all wage earners in your family?

- | | |
|---|--|
| <input type="checkbox"/> Less than \$30,000 | <input type="checkbox"/> \$90,000-\$99,999 |
| <input type="checkbox"/> \$30,000-\$49,999 | <input type="checkbox"/> \$100,000 or more |
| <input type="checkbox"/> \$50,000-\$69,999 | |
| <input type="checkbox"/> \$70,000-\$89,999 | |
| <input type="checkbox"/> Do not know/refuse | |

Room is available below for any additional comments you may have.

Thank you for your response!

North Dakota State University does not discriminate on the basis of age, color, disability, gender identity, marital status, national origin, public assistance status, sex, sexual orientation, status as a U.S. veteran, race or religion. Direct inquiries to the Vice President for Equity, Diversity and Global Outreach, 205 Old Main, (701)231-7708.

Please return this survey in the envelope provided.

Additional Comments

APPENDIX B: HEALTH CARE PROVIDER SURVEY

Child Passenger Safety Survey: 2011



Q1 What is the best estimate of the percentage of patients in your main practice in the following age groups?

Younger than 1 year	_____ %
1 to 4 years	_____ %
5 to 9 years	_____ %
10 to 12 years	_____ %
13 to 17 years	_____ %
18 years or older	_____ %
TOTAL	100%

Q2 What percent of your workweek do you typically spend on well-child visits?

_____ %

Q3 During well-child visits, how often do you provide advice to parents of children in the age groups specified below on child passenger safety (e.g. car seats, booster seats, seat belts)?

	Seldom or Never	Occasionally	Frequently	Always	Do Not Know
Children younger than 1 year old	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children aged 1 to 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children aged 5 to 9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children aged 10 to 12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Children aged 13 to 17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q4 Please rate the importance of counseling parents and children on the following child safety issues during well-child visits:

	Very Unimportant	Unimportant	Neither Important nor Unimportant	Important	Very Important
Firearm Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Poisoning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Child Occupant Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tobacco Use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Continue to next page



Q5 Please rate your level of agreement with the following statements:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Counseling is generally ineffective in increasing <u>child seat/booster seat</u> use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is inadequate time during well-child visits to provide counseling regarding child passenger safety in my practice setting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In my practice, parents do not seem interested in learning about child passenger safety issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Parents do not get consistent advice on child passenger safety from health professionals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In my practice, at well-child visits the topic of child passenger safety is usually first brought up by the parents	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Counseling is generally ineffective in increasing <u>seat belt</u> use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a health care provider, it is not my responsibility to counsel parents on child passenger safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Most parents in my practice seem concerned about how to correctly secure their child in their vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There are not enough resources for parents to get assistance with child passenger safety issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a health care provider, I know where to obtain training on child passenger safety issues in my community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Healthcare providers should advise parents on child passenger safety issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would be interested in learning more about child passenger safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know where to refer patients if they have questions regarding child passenger safety issues	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6 How confident are you of your ability to adequately address parents' questions/concerns regarding:

	Very Unconfident	Somewhat Unconfident	Somewhat Confident	Very Confident
The need for passenger safety restraint systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Selecting a car seat/booster seat appropriate for the age and weight of a child	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Determining the appropriate age/weight for use of a car seat/booster seat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Referrals to reliable resources for further information on choosing/installing car seats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transporting children in vehicles with air bags	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7 Have you ever treated or consulted on a child who was seriously or fatally injured as a passenger in a motor vehicle crash?

Yes	No	Do Not Know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8 When was your most recent formal training on child vehicle occupant safety issues?

<input type="checkbox"/> Less than 6 months ago	<input type="checkbox"/> 7-12 months ago	<input type="checkbox"/> More than 1 year ago
<input type="checkbox"/> I have never had formal training on this topic	<input type="checkbox"/> Do not know	

Q9 How often do you counsel the parents of patients on their seat belt use?

Seldom or Never	Occasionally	Frequently	Always	Do Not Know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q10 How often do you wear your seat belt?

Seldom or Never	Occasionally	Frequently	Always	Do Not Know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Continue to next page



Q11 Please answer the following questions regarding child vehicle safety issues. Please circle the most appropriate response.

What is the most appropriate situation for a 25 pound 9 month old riding in a vehicle?

- a. In a forward facing toddler seat in the back seat
- b. In a rear facing convertible seat in the back seat
- c. In a rear facing infant seat in the back seat
- d. In a booster seat in the back seat

What is the most appropriate situation for a 45 pound 4 year old riding in a vehicle?

- a. A booster seat with a shield
- b. A booster seat with harness straps
- c. A booster seat with lap/shoulder belts
- d. A forward facing convertible seat

When using a forward-facing convertible seat, the harness straps should be located:

- a. At or slightly below the child's shoulders
- b. At or slightly above the child's shoulders

When using a rear-facing infant seat, the harness straps should be located:

- a. At or slightly below the child's shoulders
- b. At or slightly above the child's shoulders

Where should most children ride in a vehicle?

- a. In the back seat until they are at least 8 years old
- b. In the back seat until they are at least 10 years old
- c. In the back seat until they are at least 12 years old
- d. None of the above

Where is the safest place for a 50 pound 5 year old in a vehicle?

- a. In the front seat, as long as there is an air bag
- b. In a seat belt in the back seat
- c. In a booster seat in the back seat
- d. In the front seat, as long as there is not an air bag

Q12 To your knowledge, have you or any members of your office staff received training in proper use and installation of car seats?

Yes

☐

No

☐

Do Not Know

☐

Demographics

13. What is your age? ☐ 30 or younger ☐ 31 to 40 ☐ 41 to 50 ☐ 51 to 60 ☐ 61 or older
14. What is your gender? ☐ Male ☐ Female
15. In what state and county is your primary practice/position located? _____
16. Please specify your degree:
☐ MD/DO ☐ PA/NP ☐ Other (please list) _____
17. What is your specialty?
☐ Family Practice ☐ General Pediatrics ☐ Pediatric Subspecialty
☐ Internal Medicine ☐ General Practice ☐ Other (please list) _____
18. How many years have you been practicing in your current specialty?
☐ Less than one year ☐ 5 to 9 years ☐ 15 or more years
☐ 1 to 4 years ☐ 10 to 14 years ☐ Do not know
19. Do you have children or grandchildren in any of the following age groups?
Please mark all that apply.
- | | <u>Children</u> | <u>Grandchildren</u> |
|----------------------------|--|--|
| a. Younger than 1 year old | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| b. Aged 1 to 4 | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| c. Aged 5 to 9 | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| d. Aged 10 to 12 | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| e. Aged 13 to 17 | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |
| f. Aged 18 or older | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> Yes <input type="checkbox"/> No |

Room is available on the back of this survey for any additional comments you may have.

Thank you for your response!

Please return this survey in the envelope provided to you.

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Additional Comments

[illegible]

APPENDIX C: RESPONSES TO Q11

“Please answer the following questions regarding child vehicle safety issues”

Table C1: Knowledge Responses by Rurality

Q11: Please answer the following questions regarding child vehicle safety issues. Please circle the most appropriate response.

	Rural		Urban	
	N	%	N	%
NOTE: Correct answers are shaded.				
What is the most appropriate situation for a 25-pound 9 month old riding in a vehicle?				
a. In a forward facing toddler seat in the back seat	12	10.9%	9	6.3%
b. In a rear facing convertible seat in the back seat	37	33.6%	90	62.9%
c. In a rear facing infant seat in the back seat	61	55.5%	44	30.8%
d. In a booster seat in the back seat	0	0.0%	0	0.0%

What is the most appropriate situation for a 45-pound 4 year old riding in a vehicle?				
a. A booster seat with a shield	3	2.8%	1	0.7%
b. A booster seat with harness straps	39	36.1%	64	45.1%
c. A booster seat with lap/shoulder belts	49	45.4%	53	37.3%
d. A forward facing convertible seat	17	15.7%	24	16.9%

When using a forward-facing convertible seat, the harness straps should be located:				
a. At or slightly below the child's shoulders	48	45.3%	71	50.0%
b. At or slightly above the child's shoulders	58	54.7%	71	50.0%

When using a rear-facing infant seat, the harness straps should be located:				
a. At or slightly below the child's shoulders	61	56.5%	85	61.2%
b. At or slightly above the child's shoulders	47	43.5%	54	38.8%

Where should most children ride in a vehicle?				
a. In the back seat until they are at least 8 years old	20	18.3%	12	8.4%
b. In the back seat until they are at least 10 years old	10	9.2%	10	7.0%
c. In the back seat until they are at least 12 years old	68	62.4%	109	76.2%
d. None of the above	11	10.1%	12	8.4%

Where is the safest place for a 50 pound 5 year old in a vehicle?				
a. In the front seat, as long as there is an air bag	0	0.0%	0	0.0%
b. In a seat belt in the back seat	10	9.2%	3	2.1%
c. In a booster seat in the back seat	99	90.8%	139	97.9%
d. In the front seat, as long as there is not an air bag	0	0.0%	0	0.0%