Occupant Restraint Use in Michigan Crashes: 2015-2019

Patrick Bowman, Dawn Massie, Carol Flannagan
Center for the Management of Information for Safe and Sustainable Transportation,
University of Michigan Transportation Research Institute

Contents

1.0 Executive Summary

This report looks at restraint use for passenger-vehicle occupants in police-reported crashes in Michigan between 2015 and 2019. Various conditions that can influence restraint use are examined and reported.

Major findings include:

- Restraint use among crash-involved occupants has been very high in Michigan and even slightly increasing over five years; the highest rate for adults was 99.1% in 2018 and for children was 98.3%, in both 2017 and 2019.
- Many children involved in crashes are suboptimally restrained, particularly 5-8-year-olds, who are likely to be in lap and shoulder belts rather than booster seats.
- Restraint use is strongly associated with reduced levels of injury and fatality for adults and children, though children have generally lower rates of injury and fatality than adults. Less than 0.1% of restrained adults were killed, but more than 3.5% of unrestrained adults were killed.
- Adult and child occupants in vehicles with impaired drivers have lower restraint-use rates, with the lowest rates among those in vehicles with drivers impaired by both drugs and alcohol.
- Seat position influences restraint rates and types, especially among children. Five-to-eight-year-olds are restrained without child restraints almost 50% of the time in the second and third rows, suggesting that some parents are transitioning these children out of car seats in general. For 9-10-year-olds, just under 10% are restrained with child restraints in the second and third rows, and only 1.2% use a child restraint in the front row.
- For adult occupants, about 10% of rear-seat occupants over age 10 are unbelted, a much higher rate than for front-seat adult occupants.
- Patterns of use rates for specific car seat types (rear-facing, front-facing, and booster) mirror the age recommendations from the National Highway Traffic Safety Administration (NHTSA). However, booster-seat use is still relatively low for ages 4-8, with 40.5% of 6-year-olds and almost 76.1% of 8-year-olds using vehicle restraints without any child restraint.
- The unrestrained rate was lowest for children age 10 years at 1.4% and highest for 4- and 6-year-olds at 2.4% each. Among adults, restraint use increased with age, starting at 98.1% for young teens (11-14) and rising to 99.1% for those 25 and older.
- Finally, restraint use is the same by gender, lower on weekends compared to weekdays, and similar across different months of the year.

2.0 Introduction

This report analyzes occupant protection in police-reported motor vehicle crashes on public roadways in Michigan from 2015 through 2019. Michigan traffic crashes are defined as taking place on public roadways in Michigan, involving at least one motor vehicle in transport, and resulting in death, injury, or property damage of $1,000 or more. Michigan police reports classify occupant restraint use according to the following categories:

- No belts available: no provision of belts that the occupant could use at the time of crash
- Shoulder belt only: the occupant was only using a shoulder belt at the time of the crash
- Lap belt only: the occupant was wearing only a lap belt at the time of the crash
- Lap and shoulder belt: the occupant was wearing both lap and shoulder belts at the time of the crash
- No belts used: the occupant was not wearing/using any form of belt restraint at the time of the crash, although a belt was available at the occupant's seating position
- Restraint failure: the restraint was used but failed
- Restraint use unknown: the reporting officer could not identify the type of restraint use

Child restraint use is classified before 2016 as either "child restraint used" or "child restraint not used, unavailable or improper use." Proper use of a child restraint was not captured, and for each occupant, only one restraint category could be checked. Thus, if a child occupant was using a lap-shoulder belt even if a child restraint is recommended, the officer would most likely code restraint as "lap-shoulder belt" rather than "No child restraint used." Starting in 2016, new levels were added, including "Child Restraint Used—Forward Facing," "Child Restraint Used—Rearward Facing," and "Child Restraint Used—Booster Seat."

To address the change in coding, analyses covering the full five-year time frame collapse the 2016-2019 categories into the old categories of "child restraint used" or "child restraint not used" to use the full five years of data. However, some analyses focus on the newer information that specifies proper or improper use, and these are restricted to the 2016-2019 crash years. These differences are specified in the text. This analysis is limited to passenger-vehicle occupants, defined as those with a vehicle type of Car, SUV, Van or Pickup. Finally, occupants age 11 years and older are treated as adults and occupants age 10 years and younger as children for the purpose of classifying seat belt and child restraint usage based on Michigan laws.

3.0 Trends

The distribution of restraint type used and not used are shown in Figure 1 and Figure 2 for children age 0 to 10. Figure 3 and Figure 4 display belted and unbelted distributions for occupants age 11 years and older. Restraint types are categorized as above, but child restraint categories are coded as unknown for adults and are not included in the graph. In Figure 1, the categories for "Child Restraint Used" and "Belted" are included due increased belt use as children age. The "Shoulder Belt Only," "Lap Belt Only," "Lap and Shoulder Belt," and "Restraint Failure" are included in the belted group. Restraint failure is included as restrained because a restraint was worn. Both "No Belts Available" and "No Belts Used"

indicate unbelted. In general, restraint use for crash-involved occupants has been increasing over the five years examined.

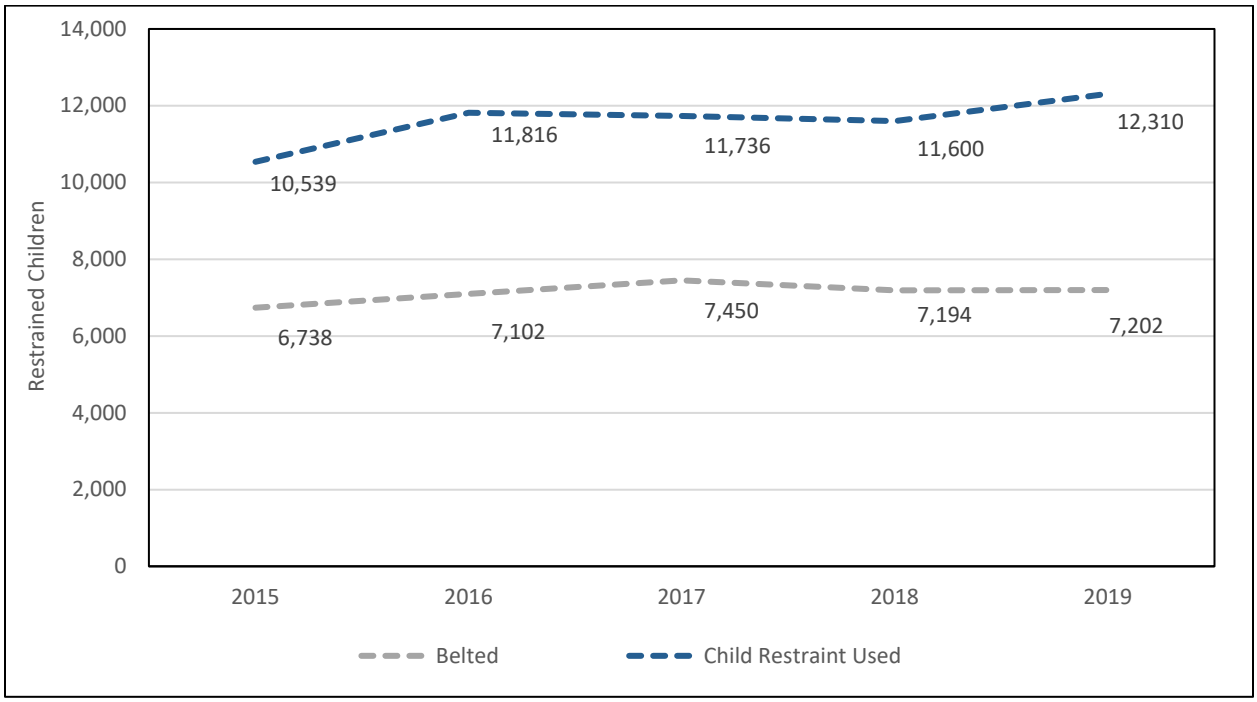

Figure 1 – Restrained Children Aged 0-10

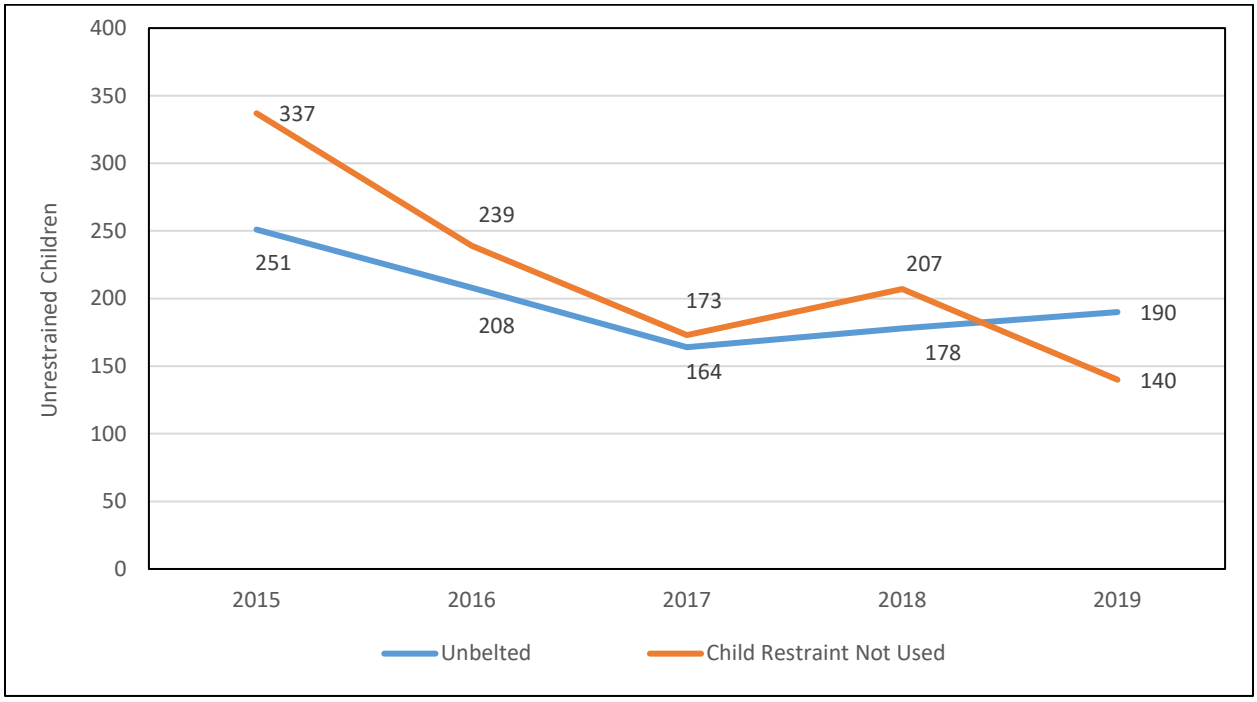

Figure 2 – Unrestrained Children Aged 0-10

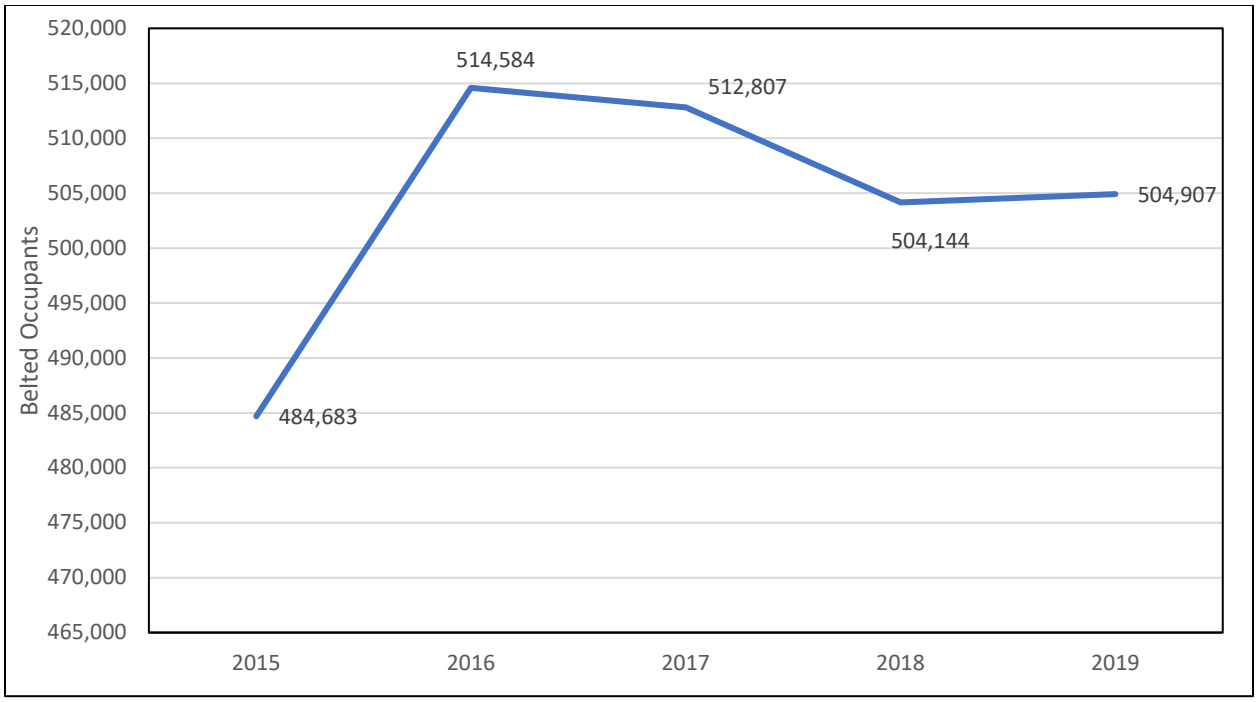

Figure 3 – Belted Occupants Aged 11+

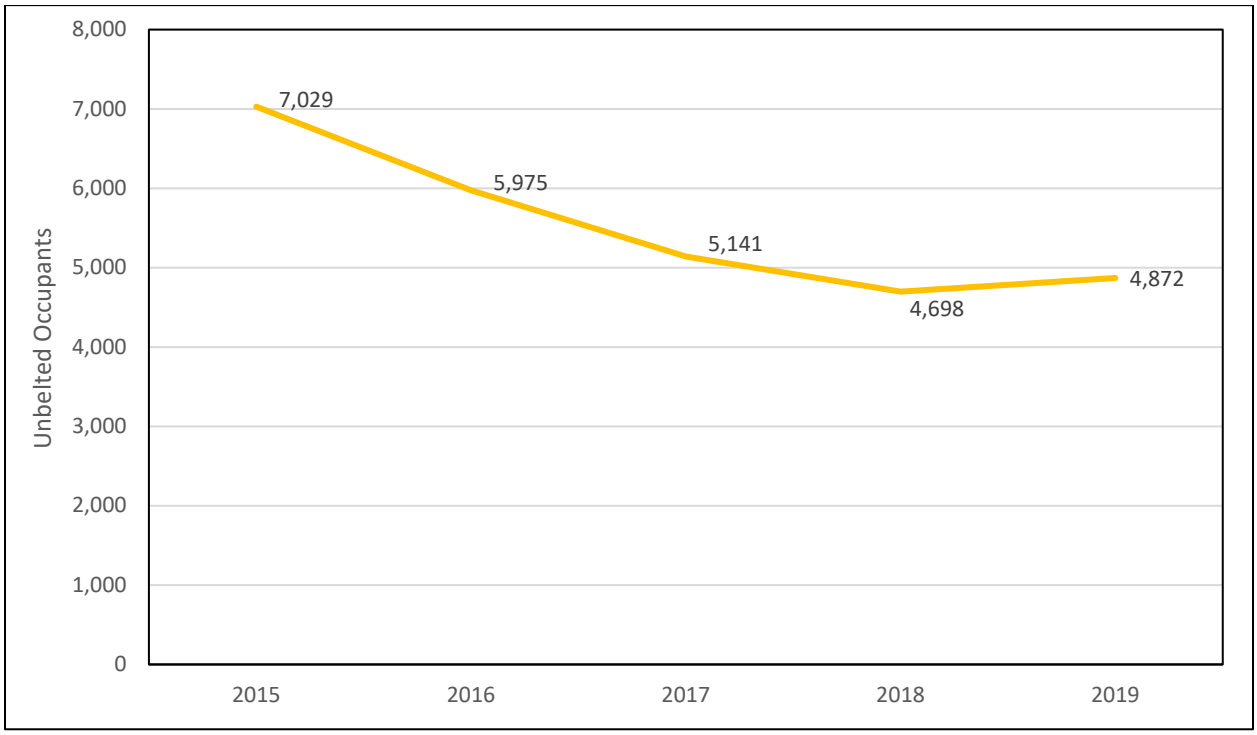

Figure 4 – Unbelted Occupants Aged 11+

In 2016, changes to the police crash report included more detailed coding of child restraint use to specify whether child seats were rear-facing, forward-facing or boosters. Combined with the child's age, it is possible to identify whether child-seat use was suboptimal or optimal. In Michigan, "proper" child seats are required through age 8. While "proper" is not defined in the law, the National Highway Transportation Safety Administration's (NHTSA) current recommendations found in "Car Seat Recommendations for Children" include overlapping age ranges: rear-facing for ages 0-3, forward-facing for ages 1-7, and booster seats for ages 4-12. Based on these age ranges and prior practice (which tended to move children into subsequent seat types sooner), we selected the following age ranges and definitions of "optimal" vs. "suboptimal" restraints. These are defined in Table 1.

Table 1. Definitions of Optimal and Suboptimal Restraints by Age Group

Age Group	Optimal Restraints	Suboptimal Restraints
0-1	Rear-Facing	Forward-Facing, Booster, or Seatbelt
2-4	Rear-Facing or Forward-Facing	Booster or Seatbelt
5-8	Forward-Facing or Booster	Rear-Facing or Seatbelt

Table 2 on the following page summarizes restraint use among crash-involved occupants. For occupants age 11 and older, "restrained" includes lap belt only, shoulder belt only, lap and shoulder belts, and restraint failure. For occupants age 10 and younger, the "restrained" category also includes any child-seat categories. "Optimal" restraints can only be categorized for 2016 through 2019, and the definition follows the guidelines above. "Suboptimal" restraint is any "restrained" category other than those considered optimal.

For adults, restraint use is very high and increased slightly to a peak of 99.1% in 2018. In 2019, the adult restraint use percent was 99.0%. In the overall driving population, the seat belt use rate is slightly lower, suggesting an inflated belt use rate among the crash population. According to an observational survey funded by the Michigan Office of Highway Safety Planning each year, the observed seat belt rate was 94.4% in 2019. Child restraint use is slightly lower than that of adults. For children, restraint use of some kind is also very high, decreasing slightly from 98.3% in 2017 to 98.0% in 2018, but increasing again to 98.3% in 2019. Many children are suboptimally restrained, particularly 5-8-year-olds, who are likely to be in lap and shoulder belts rather than booster seats. Interestingly, a high percentage of 0-1-year-olds were coded as suboptimally restrained in front-facing child seats in 2016 (65.0%), but substantially fewer of them were coded as such in 2017 (38.8%). By 2019, the suboptimal percentage decreased to 35.1%. NHTSA's recommendation to keep 1-year-olds in rear-facing seats until age 2 was released in 2011, and it may be that educational campaigns and car-seat clinics made a substantial difference in getting the message out to parents by 2017. However, it may also be that restraint coding has become more accurate over time as officers became more experienced at using the new codes. This is consistent with the fact that the proportional change from rear-facing restraints in 2016 to forward-facing restraints in 2017 was the same for children under 1 (for whom the rear-facing recommendation has been out for a longer time) and children age 1.

Table 2. Restraint Use by Age Group and Year

Age Group	Restraint Condition	2015	2016	2017	2018	2019
Adults (Age ≥ 11)	Restrained	98.6%	98.9%	99.0%	99.1%	99.0%
	Unrestrained	1.4%	1.1%	1.0%	0.9%	1.0%
Children (Age ≤ 10)	Restrained	96.7%	97.7%	98.3%	98.0%	98.3%
0-1	Optimal		33.2%	59.8%	60.8%	63.4%
	Suboptimal		65.0%	38.8%	37.6%	35.1%
2-4	Optimal		78.6%	73.6%	73.4%	74.4%
	Suboptimal		18.8%	24.3%	24.3%	23.8%
5-8	Optimal		48.5%	45.8%	46.5%	48.8%
	Suboptimal		48.9%	52.4%	51.3%	49.5%
Children (Age ≤ 10)	Unrestrained	3.3%	2.3%	1.7%	2.0%	1.7%

4.0 Injury Severity Level

Table 3 shows the distribution of restraint use by injury for all crash-involved occupants of passenger vehicles. Figure 5 shows the distribution of injury for five groups: restrained adults, unrestrained adults, restrained children without a child seat, restrained children with a child seat and unrestrained children. The figure shows that a substantially greater proportion of unrestrained occupants are injured or killed. Among adults, 87.9% of restrained occupants had no injury whereas 54.3% of unrestrained occupants had no injury; less than 0.1% of restrained adults were killed, but more than 3.5% of unrestrained adults were killed. For children, 81.2% of the restrained occupants without a child seat and 87.2% of the restrained occupants with a child seat were uninjured. Of the unrestrained child occupants, 62.0% were uninjured. Fatality rates for all children were lower than adults, but the difference between restrained children (0.049% killed without a child seat and 0.049% killed with a child seat) and unrestrained children (0.78% killed) is still quite dramatic, almost 16 times higher for unrestrained children.

Table 3. Distribution of Injury Severity by Occupant Restraint Use for All Occupants, 2015-2019

Person Restraint	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	No Injury (O)	Unknown Injury	Total
No Belts Available	32	137	306	603	4,438	59	5,575
No Belts Used	958	2,712	4,112	4,572	12,438	122	24,914
Lap and Shoulder Belt	1,659	14,864	71,003	219,273	2,227,090	1,665	2,535,554
Lap belt only	20	112	398	1,163	8,189	14	9,896
Shoulder Belt Only	13	152	389	1,481	10,457	17	12,509
Restraint Failure	3	20	41	92	738	12	906
Child Restraint Used	25	189	1,208	5,420	52,275	139	59,256
Unknown/ Error	493	2,180	4,504	11,518	99,557	177,703	295,955
Total	3,203	20,366	81,961	244,122	2,415,182	179,731	2,944,565

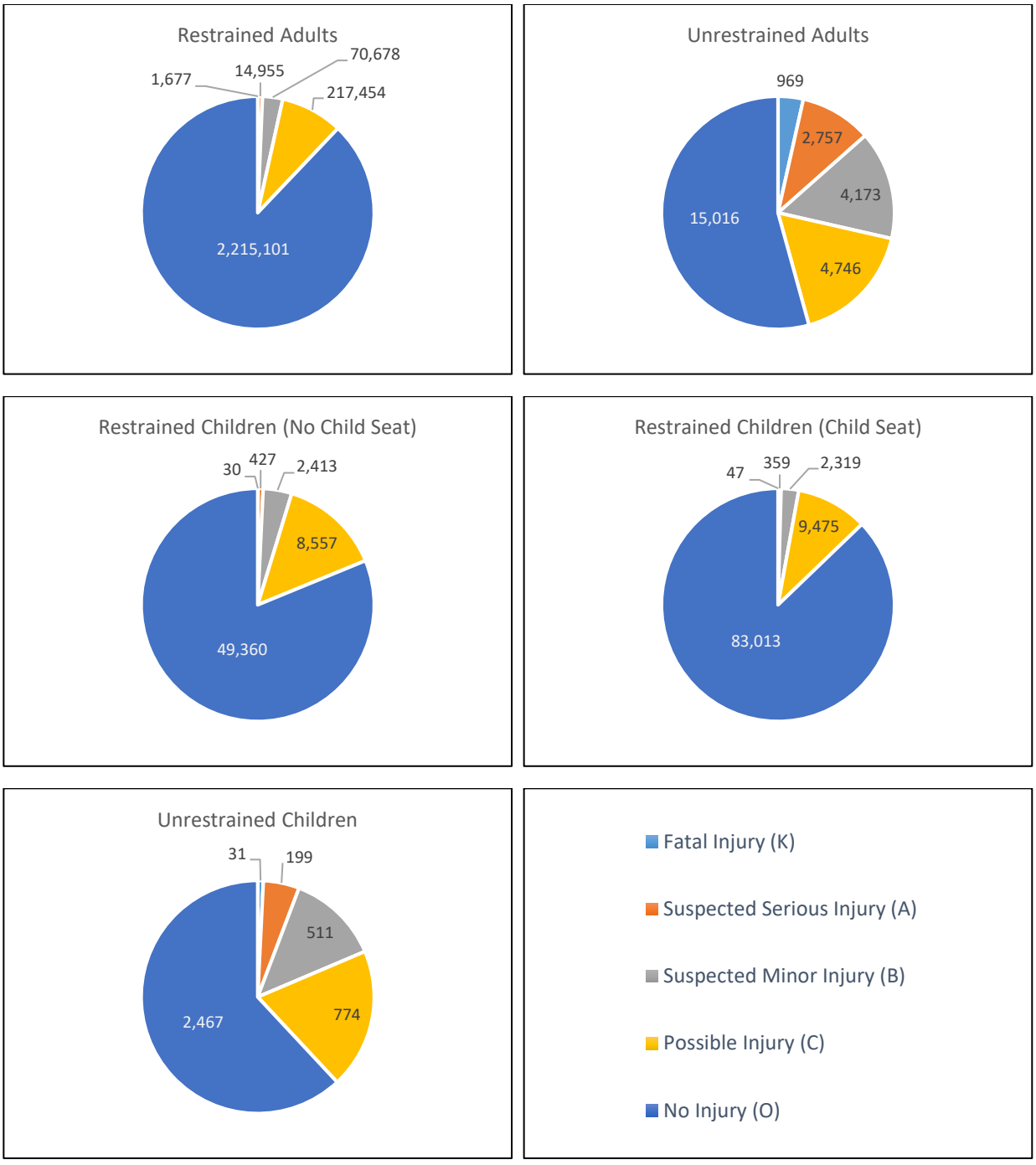

Figure 5 – Injury Severity Distribution Across Different Types of Restraint Use, 2015-2019

5.0 Impaired Driving and Restraint Use

Table 4 shows the percentage of adult and child motor vehicle occupants using restraints by impairment status of the driver of that vehicle. All passenger vehicle occupants are considered in this table. The general patterns are the same for adults and children, though children's restraint use rates in each group are below that of adults. When the driver is not impaired, restraint use rates for both adult and child occupants are very high (99.1% and 98.0%, respectively). However, when the driver is drinking, suspected of using drugs, or both, restraint use rates decrease in that order. This is true for children as well as adults. Lack of restraint use exacerbates the already high injury/fatality risk associated with impaired driving.

Table 4. Occupant Restraint Use Rates as Function of Driver Impairment, 2015-2019

Occupant Group	No Alcohol or Drugs	Alcohol Only	Drugs Only	Alcohol and Drugs
Adults	99.1%	91.9%	89.8%	84.5%
Children	98.0%	88.3%	83.2%	79.5%

6.0 Occupant Position and Restraint Use

Table 5 on the following page shows the count of child occupants by age, restraint, and seating row. The table also includes counts for occupants age 11 and older. Parents are advised not to place children under 12 in the front seat, but some vehicles (e.g., pickup trucks) have no second row or no second row with room for a car seat. When considering the first three rows of passenger vehicles, about 5.7% of children age 0-1, 1.8% of children age 2-4, 6.2% of children age 5-8, and 22.4% of children age 9-10 are in the front row of seats. Among infants (age 0-1) in the front row, 77.0% are restrained without a child seat and 19.6% are restrained with a child seat. In contrast, when these children are in the second row, they are restrained without a child seat 5.6% of the time and with a child seat 92.9% of the time. In the third row, these same percentages are 8.4% and 89.3%. The pattern for children age 2-4 is similar, but the child-seat-restraint rate for the front row (55.4%) is much higher than for infants and the child-seat-restraint rate in the second and third rows (87.8% and 83.4%, respectively) is slightly lower than for infants.

Five-to-eight-year-olds follow similar patterns to infants in that they are restrained without a child restraint in the front row 81.3% of the time. However, these children are also restrained without child restraints almost 50% of the time in the second and third rows, suggesting that some parents are transitioning these children out of car seats in general. Finally, for 9-10-year-olds, just under 10% are restrained with child restraints in the second and third rows, and only 1.2% use a child restraint in the front row. These children's front-row restraint rate is similar to the restraint rate for adult passengers. Interestingly, in the second and third rows, about 9-10% of children age 9-10 are restrained with a child seat, with only 1.5-1.8% unrestrained, but for adult occupants, these numbers are reversed and almost 10% of rear-seat occupants over age 10 are unrestrained.

Table 5. Child Restraint Use by Occupant Position, 2015-2019

		Count			Percent Restraint Category		
Age Group	**Restraint Category**	**Front Row**	**Second Row**	**Third Row**	**Front Row**	**Second Row**	**Third Row**
0-1	Restrained (no child seat)	833	874	195	77.0%	5.6%	8.4%
	Restrained (child seat)	212	14,392	2,074	19.6%	92.9%	89.3%
	Unrestrained	37	224	54	3.4%	1.4%	2.3%
2-4	Restrained (no child seat)	187	2,329	562	37.0%	10.1%	13.4%
	Restrained (child seat)	280	20,225	3,506	55.4%	87.8%	83.4%
	Unrestrained	38	488	134	7.5%	2.1%	3.2%
5-8	Restrained (no child seat)	1,615	11,434	2,888	81.3%	47.4%	48.4%
	Restrained (child seat)	292	12,180	2,944	14.7%	50.5%	49.3%
	Unrestrained	79	512	140	4.0%	2.1%	2.3%
9-10	Restrained (no child seat)	3,426	8,722	2,059	97.7%	88.5%	88.4%
	Restrained (child seat)	43	979	228	1.2%	9.9%	9.8%
	Unrestrained	38	151	41	1.1%	1.5%	1.8%
11+	Restrained (no child seat)	2,453,274	56,132	9,692	99.2%	90.6%	89.7%
	Restrained (child seat)	388	668	127	0.0%	1.1%	1.2%
	Unrestrained	19,922	5,151	984	0.8%	8.3%	9.1%

7.0 Restraint Use by Age

This section looks more closely at the relationship between age and restraint use. For children, the 2016-2019 data (excluding 2015), which is more detailed for child restraints, was used to identify the specific type of car seat and compare to recommendations. The distribution of restraint type for children aged 0-10 is shown in Figure 6. The percent unrestrained is dashed and plotted on the right axis. All other percentages of different restraint types are solid and plotted on the left axis. The unrestrained rate is lowest for children age 10 years (1.4%) and highest for children aged 4-6 (2.4% each). However, at 15.4%, a substantial fraction of children under age 1 are reported as restrained without a car seat (i.e., lap belt, shoulder belt, or both belts). It is unclear whether this is a coding error (of age or restraint) or whether these infants are riding in laps or actually restrained without a car seat. Otherwise, patterns of car seat use generally mirror the age recommendations. For example, rear-facing child restraint use is highest for children under 1 (62.7%) and decreases to 4.7% by age 3. Front-facing child restraints are used by 44.6% of 1-year-olds, peak at 73.2% for 3-year-olds and decrease steadily through age 10. Finally, booster-seat use peaks at age 6 at 25.7%.

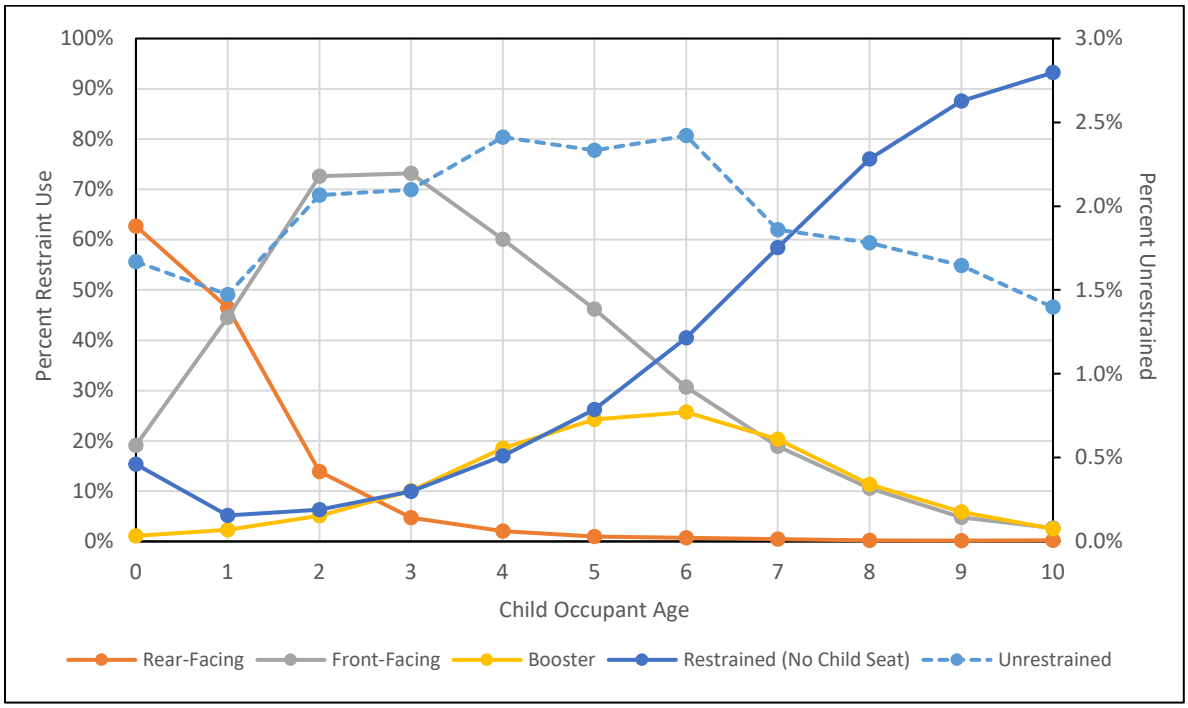

Figure 6 – Distribution of Restraint Type by Age for Children 0-10 Years Old, 2016-2019

Table 6 shows the breakdown of restraint type by age groups for adults. Ages are grouped into young teens (11-14), older teens (15-20), young adults (21-24) and all other older ages (25+). The table gives counts of passenger-vehicle occupants over the five-year period for each restraint and age category, as well as percentages out of all occupants (including unknown). The overall proportion of restraint use is also provided, calculated with unknown/error excluded. In general, restraint use is high for all groups, but does increase with age. Most importantly, optimal restraint use (lap and shoulder belt) generally increases with age. The 11-14 age group is much more likely to use lap belt only (about four times as likely) or a shoulder belt only (more than twice as likely) compared to other age groups. The overall percentage restrained in crashes across the age groups are 98.1% for young teens, 98.5% for both older teen and young adults, and 99.1% for the remaining older ages.

Table 6. Restraint Use by Age Group, 2015-2019

	Age Group			
Restraint Category	**11-14**	**15-20**	**21-24**	**25+**
No Belts Available	101 (0.3%)	788 (0.2%)	599 (0.2%)	3,738 (0.2%)
No Belts Used	527 (1.5%)	4,409 (1.2%)	3,361 (1.2%)	14,192 (0.7%)
Lap and Shoulder Belt	31,380 (89.1%)	340,745 (93.6%)	265,175 (92.8%)	1,862,519 (94.2%)
Lap Belt Only	710 (2.0%)	1,858 (0.5%)	895 (0.3%)	5,179 (0.3%)
Shoulder Belt Only	413 (1.2%)	1,680 (0.5%)	1,258 (0.4%)	8,568 (0.4%)
Restraint Failure	12 (0.0%)	102 (0.0%)	92 (0.0%)	539 (0.0%)
Unknown/Error	2,079 (5.9%)	14,480 (4.0%)	14,336 (5.0%)	83,411 (4.2%)
Total	35,222	364,062	285,716	1,978,146
Percent Restrained (Excluding Unknown)	98.1%	98.5%	98.5%	99.1%

8.0 Additional Variables

Table 7 shows restraint use rates broken down by three variables that could have an influence on restraint use. These variables are gender, day of the week (weekend vs. weekday), and month of the year (October-March vs. April-September). There are no notable differences in the gender breakdown of restraint use for either children or adults. Percentages across gender for each restraint group are very close. On weekends, adult restraint use is slightly lower, probably associated with the increased use of alcohol (and its relationship to restraint non-use; see Section 5.0). Children are more likely to be restrained without using a child seat on weekends, and their general unrestrained use rate is slightly higher on weekends. Finally, we might expect that child seat use would be lower during cold months when it is more difficult to secure children with bulky coats in car seats. However, no clear pattern appears to be present. Car seat use is slightly lower in warm months, and during those months, children are more likely to be unrestrained. For adults there is a negligible decrease in restraint use in warm months.

Table 7. Restraint Use for Children and Adults by Gender, Weekday/Weekend, and Cold/Warm Months, 2015-2019

Occupant Group	Restraint Category	Male	Female	Weekday	Weekend	Cold Months (Oct-Mar)	Warm Months (Apr-Sep)
Children	Restrained (no child seat)	17,846 (37.0%)	17,721 (37.5%)	25,495 (36.1%)	10,191 (40.5%)	17,179 (36.6%)	18,657 (38.1%)
	Restrained (child seat)	29,302 (60.7%)	28,557 (60.5%)	43,594 (61.7%)	14,407 (57.3%)	28,864 (61.5%)	29,137 (59.5%)
	Unrestrained	1,114 (2.3%)	962 (2.0%)	1,520 (2.2%)	567 (2.3%)	921 (2.0%)	1,166 (2.4%)
Adults	Restrained	1,319,893 (98.8%)	1,200,736 (99.1%)	1,962,830 (99.0%)	558,295 (98.5%)	1,352,963 (99.0%)	1,168,162 (98.8%)
	Unrestrained	16,402 (1.2%)	11,282 (0.9%)	19,151 (1.0%)	8,564 (1.5%)	13,881 (1.0%)	13,834 (1.2%)

9.0 Lives Saved

A model was constructed to determine the number of lives that have been saved by Michigan's primary enforcement seat belt law that went into effect in 2000. The model includes passenger vehicles (passenger cars, SUVs, vans, motorhomes, pickup trucks, and small trucks under 10,000 pounds), but excludes occupants under the age of 16, rear-seat passengers, and all other restraint types (child restraints and helmets). The observed seat belt use rate from 1999 at 70.1% was incorporated as a baseline for belt use rates before the law began. As a comparison, the current 2019 observational seat belt survey conducted by Michigan State University found the 2019 Michigan seat belt use rate to be 94.4%. The model found that there have been 3,647 lives saved over the past 20 years of available crash data (2000-2019) since Michigan's primary seat belt enforcement law took place. Over the past 10 years from 2010 to 2019 there have been 1,804 lives saved. This count is displayed in Table 8.

In order to determine the possible number of lives saved if all rear seat occupants had been belted, a logistic regression model with the possible outcome of killed or not killed in a traffic crash was applied to data reported over the most recent 10 years of crash data from 2010 to 2019. The variables included in the model were year, age, seat belt usage, vehicle model year, speed limit at the site of the crash, driver drinking status, and driver drugged status. The model only includes passenger vehicles and considers occupants in the second and third rows only. Restraints other than seat belts (child restraints and helmets) and people age 15 and under who are required by law to wear seat belts in the rear seat were excluded. There was a total of 279 rear seat fatalities from 2010 to 2019. If belts had been used by all occupants in rear seats of passenger vehicles in Michigan crashes from 2010-2019, the model predicts that there would have been about 97 fatalities. With the rear seat belt requirement in place, a total of 182 lives could have been saved. This count is also displayed in Table 8.

Table 8. Predicted Lives Saved Based on the Active Primary and Possible Secondary Seat Belt Laws, 2010-2019

Occupant Group	Lives Saved
Active Primary Law – Front Seating Positions	1,804
Possible Secondary Law – Rear Seating Positions	182

10.0 Conclusions

In this report, the relationship between restraint use and a variety of other crash and person characteristics was analyzed. This analysis focused on passenger vehicle occupants involved in crashes in 2015-2019, and generally separated analysis of occupants age 0-10, labeled “children,” and occupants age 11 and older, labeled “adults,” for restraint use purposes. The new UD-10 crash report form allows us to identify specific types of car seats for crashes beginning in 2016, but prior to that, only the use or nonuse of a car seat of any kind is coded.

Over the 5-year time frame, restraint use has been very high in Michigan and even slightly increasing. The highest rate for adults was 99.1% in 2018 and for children was 98.3%, both in 2017 and 2019. That said, many children are suboptimally restrained, particularly 5-8-year-olds, who are likely to be in lap and shoulder belts rather than booster seats. Interestingly, the percentage of 0-1-year-olds coded as suboptimally restrained in front-facing child seats decreased substantially between 2016 and 2017. NHTSA’s recommendation to keep 1-year-olds in rear-facing seats until age 2 came out in 2011, and it may be that educational campaigns and car-seat clinics made a substantial difference in getting the message out to parents by 2017.

Restraint use is strongly associated with reduced levels of injury and fatality for adults and children, though children have generally lower rates of injury and fatality than adults. Less than 0.1% of restrained adults were killed, but more than 3.5% of unrestrained adults were killed. For children, the difference between restrained children (0.049% killed without a child seat and 0.049% killed with a child seat) and unrestrained children (0.78% killed) is still quite dramatic.

Adult and child occupants in vehicles with impaired drivers have lower restraint-use rates, with the lowest rates among those in vehicles with drivers impaired by both drugs and alcohol. Seat position also influences restraint rates and types, especially among children. For example, 7.5% of children under age 11 are riding in the front row. Among infants (age 0-1) in the front row, 77.0% are restrained without a child seat and 19.6% are restrained with a child seat. In contrast, when these children are in the second row, they are restrained without a child seat 5.6% of the time and with a child seat 92.9% of the time. In the third row, they are restrained without a child seat 8.4% of the time and with a child seat 89.3% of the time. Five-to-eight-year-olds are restrained without child restraints almost 50% of the time in the second and third rows, suggesting that some parents are transitioning these children out of car seats in general. Finally, for 9-10-year-olds, just under 10% are restrained with child restraints in the second and third rows, and only 1.2% use a child restraint in the front row. For adult occupants, almost 10% of rear-seat occupants over age 10 are unbelted, a much higher rate than for front-seat adult occupants.

Restraint use rates change with age. The unrestrained rate was lowest for children age 10 years at 1.4% and highest for 4- and 6-year-olds at 2.4% each. Among adults, restraint use increased with age, starting at 98.1% for young teens (11-14) and rising to 99.1% for those 25 and older. The newer child-restraint codes allow us to see patterns of use rates for specific car seat types (rear-facing, front-facing, and booster), which mirror the age recommendations from NHTSA. However, booster-seat use is still relatively low for ages 4-8, with 40.5% of 6-year-olds and 76.1% of 8-year-olds using vehicle restraints without any child restraint. Finally, restraint use is the same by gender, lower on weekends (compared to weekdays), and the same across different months of the year.