

CARE IMPACT Study of Young Drivers (5-15 Years) of ATVs, Bicycles and Motorcycles

2014-2018 Data

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August 21, 2019

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Introduction

This document currently contains the results of a study of young drivers (5-15) of All Terrain Vehicles (ATVs), Bicycles (Bic) and Motorcycles (Mot). It was part of a more comprehensive study of young victims of motor vehicle crashes that resulted in three closely related analyses of passengers and drivers in motor vehicle crashes with the following characteristics (brief filter designation):

- Passengers aged 0-15 (F2);
- Drivers of motor vehicles in the 10-15 age range (F3); and
- Drivers aged 5-15 of ATVs, Bicycles or Motorcycles (ATV/Bic/Mot); (filter F4).

This report contains the results and reasoning behind the third of these, drivers aged 5-15 of ATVs, Bicycles or Motorcycles. Because the filter for this study considered all persons aged 5-15 who were in the “Front” position of “Front Motorcycle – ATV – Bicycle,” this was assumed to include both motorcycle and motor-driven cycles. The next section gives a full description of the difference between a motorcycle and a motor-driven cycle,

Motorcycle Versus Motor-Driven Cycle

The Alabama DPS recognizes two classes of engine-equipped cycles—motor-driven cycles and motorcycles. You'll need to make sure you understand the difference, as some of the requirements for proper licensing and registration are bike-based.

A **motor-driven cycle** is defined as any motorcycle or motor scooter that has:

- A motor that produces no more than 5 HP (hp).
- An engine size of 150 CC (cc) or less.
- A weight of less than 200 lbs. when fully equipped.

If you're looking to get licensed for and register your scooter, moped, or motor-driven cycle, you'll want to visit our page on [Scooters and Mopeds in Alabama](#).

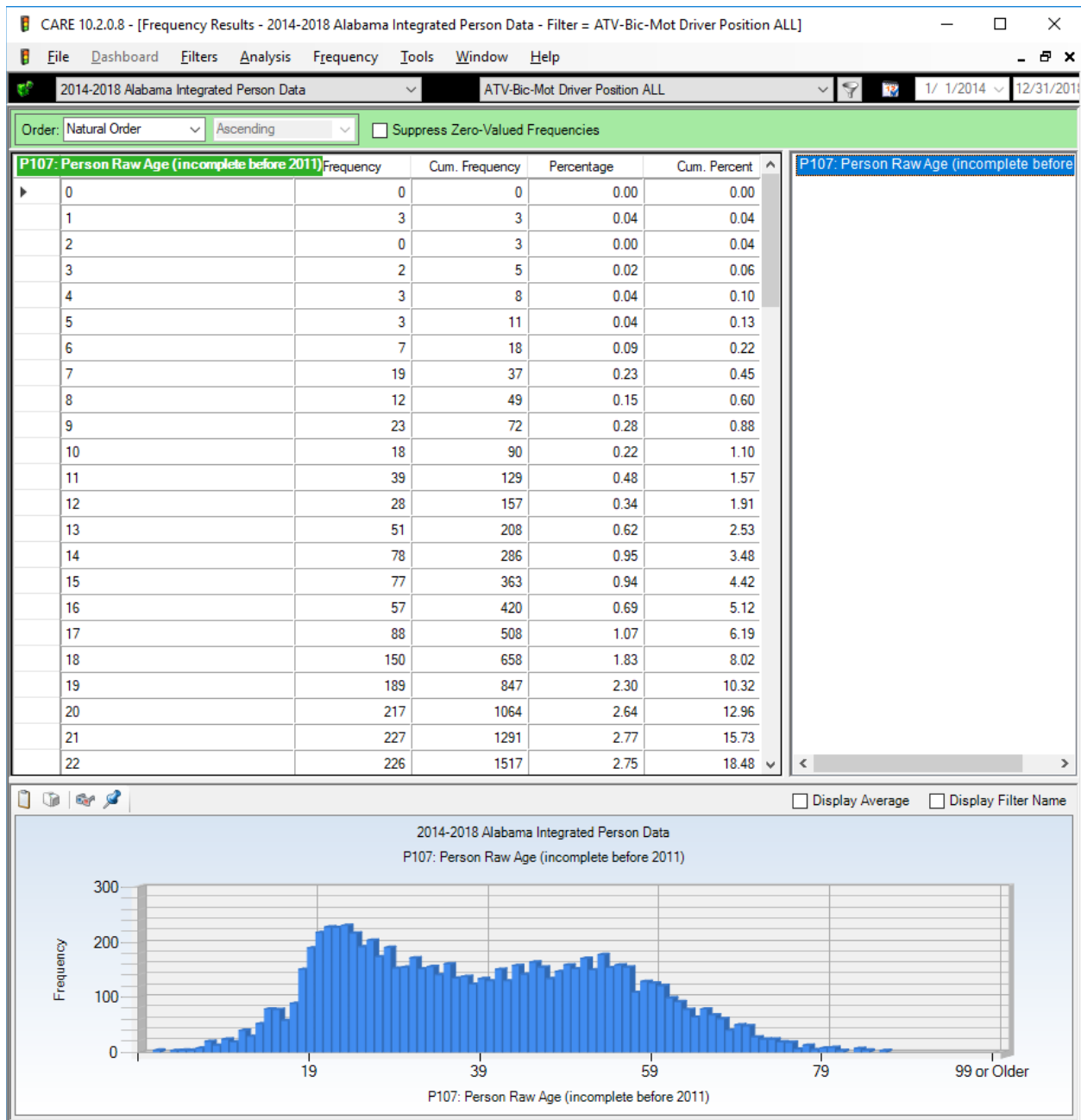
A **motorcycle** is defined as being:

- A motor vehicle having a seat or saddle for the use of the rider.

Source: <https://www.dmv.org/al-alabama/motorcycle-license.php>

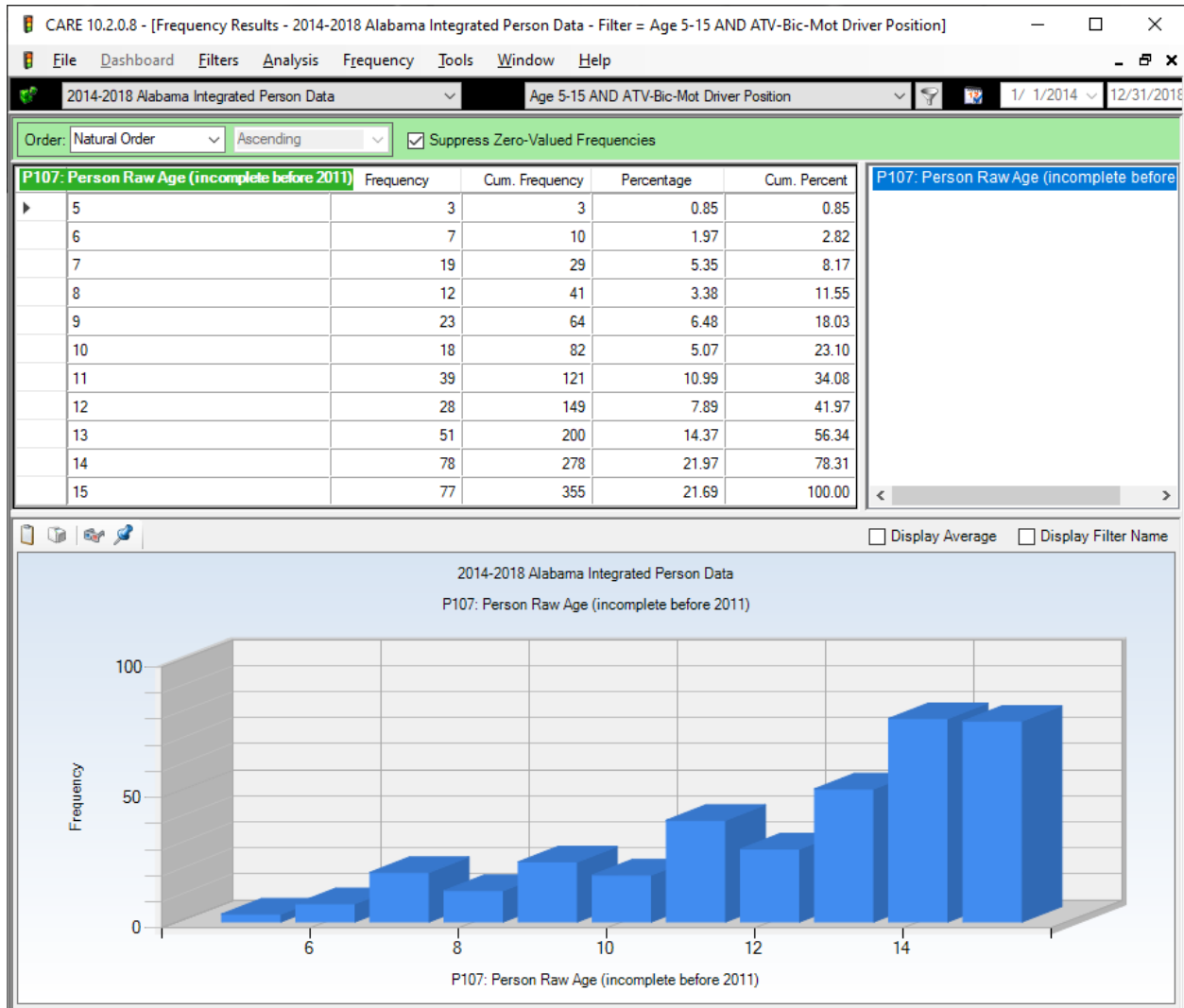
This distinction is given for reference purposes here, but the study considered both of these simultaneously, and labeled them both as motorcycles (MOT).

P107 General Ages of ATV/Bicycle/Motorcycle Drivers



The above display is given to see the overall age distribution from which the 5-15 year-old drivers have been selected. This is a bi-modal distribution with one mode at 23 and the second mode at 53. The distribution between them is fairly uniform compared to the two tails. The age distribution for just the 5-15 year-old drivers is given in the display below.

P107 Ages of ATV/Bicycle/Motorcycle Drivers Considered in this Study



As would be expected there is a fairly linear trend with age, indicating that those in the 14-15 age classifications have the most crashes, probably because of their increased involvement in driving these vehicle types. Ages 14 and 15 are almost identical. Many age 15 would be obtaining a learners' permit for a regular drivers' license. From: <https://www.permit.bike/alabama-motorcycle-license/> ... "Alabama also has age restrictions on this type of license. Alabama also makes a distinction between a motor-driven bicycle and a Class M motorcycle license. Drivers at the age of 16 and above are eligible for the Class M license while the motor-driven license can be given to drivers at the age of 14." So it could be that some aged 14 would be obtaining a motor-driven driven license.

Outline of the Report

A set of recommendations is given following this Introduction. This is followed by a section describing the filter generation for this study. Filters were developed at the same time for two other studies that were conducted in conjunction with the study documented here: (1) Automobile drivers under the age of 16; and (2) Drivers of All-Terrain Vehicles (ATVs), Bicycles and Motorcycles. A number of filters were tried before arriving at those that would best satisfy the requirements of each of these studies. The short code given to the one used in this study was F4.

The IMPACT and cross-tabulation analyses from which the recommendations were obtained are given in the final section. These are given in the same ordering, and referenced, according to the recommendations so that the sources of the recommendations can be easily located.

Recommendations

The following is a list of conclusions and recommendations that made from the IMPACT and cross-tabulation analyses presented in the next section:

- Time Factors
 - P003 Year of Crash. Crash numbers in general peaked in 2016 and then declined. While there were only 56 crashes by drivers 5-15 in 2018, this is expected to regress to the mean, and we urge traffic safety professionals to be aware of the ongoing problems of younger drivers in general and pre-auto driving in particular.
 - P004 Month of Crash. Very comparable to older drivers of ATV/Bic/Mot, Younger drivers have a significantly higher number of crashes in the May-August months. Weather conducive to driving as well as school being out probably accounts for this for the younger drivers. The over-representation in January and March shows that the problem with young drivers persists throughout the year, although those two months do not have the higher frequencies of the summer months. The recommendation is the programs for the younger drivers should be timed to start in late April or early May.
 - P006 Day of the Week. There are no significant differences between the younger and older drivers for the subject vehicles; the problems are concentrated on weekends. PI&E should time messages to pre-weekend times (e.g., Thursdays and Fridays).
 - P006 Day of the Week by P328 Person Injury. The worst injury counts correspond to the days of most crashes, so the recommendation above is equally valid for injury crashes.
 - P008 Time of Day. Enforcement efforts should be particularly aware of younger drivers of the target vehicles in the afternoon and early evening hours.
- Highway and Driver Behavior Characteristics (P011-P075)
 - P011 Highway Classification. Countermeasures are much different for County roadways than for Municipal streets. Both of these need to be given about the same emphasis in training for both bicycle and motorized travel at the young ages. In addition, County Sheriffs and local police need to be particularly perceptive in their concern for the youngest drivers.
 - P011 Highway Classification by P328 Person Injury Type. Of the two highest frequency classifications (County and Municipal), County roads are by far most lethal, with 5 fatalities and 43 Incapacitation injuries. While the temptation might be to discourage young drivers from getting on county roads, the other alternatives, which generally have more traffic, are probably no better. Municipal roadways, on the other hand, seem to have an advantage because of the slower average speeds.

- P015 Primary Contributing Circumstances (PCCs). This attribute indicates that most of the crashes recorded are preventable by drivers being aware of, and obeying, the traffic laws. For example, failure to yield by drivers of the three types of vehicles under consideration would seem to be almost suicidal. Most of the other PCCs are equally avoidable. The potential conclusion seems to correspond to the risk acceptance of drivers in these young ages, and the traffic safety community needs to put more effort in addressing the problem of young driver risk taking.
- P017 First Harmful Event. This reflects that large number of bicyclists in the 5-15 age group. There are many bicycle groups that promote safety within their ranks. They might be influenced to give additional attention to the youngest among them.
- P023 Manner of Crash. Side impact for bicycle crashes would indicate the bicycle pulling out in front of other vehicles. The bicyclist who does this because it is his right is quite foolish. Most drivers who hit bicyclists will say that they never saw them. We often fail to see what is right in front of our eyes because we are looking for something else (in this case a car or a truck). Bicyclists should recognize this – it is not that the driver is negligent as much as s/he is concentrating on other things. Wearing reflective clothing is a great help in this regard, and bicyclist should avoid dark or other colors that camouflage.
- P075 Person Relationship to Causal Unit. Since we are only considering drivers in our comparisons, this attribute would indicate fault. Young drivers have 6.347 times the fault proportion of the older drivers in the case of “Non-Motorist,” which in this case would be a bicyclist. To their credit, they have a lower proportion of fault than the older drivers for the motorized vehicles.
- Unit Type Characteristics (P101), Person Gender (P109), and Injury Severity (P328)
 - P101 Unit Type comparisons of the two age groups. There are no recommendations from this display with the exception of reading the blurb below it, and to be aware that the interpretation of everything in this report depends on an understanding of the different unit types in the two age categories being compared.
 - P101 Unit Type by P107 Age Cross-Tab for young ATV/Bic/Mot drivers. Bicycle safety education cannot start at too young an age, and should continue through early adolescence modified and adapted to the age. ATVs seem to become more of an issue at age 11, so starting at ages 9 or 10 would seem to be appropriate. Similarly motorcycles and mopeds become an issue at age 13, and so the training for them should start at age 11-12.
 - P101 Unit Type by P109 Person Gender. This shows that there are few patterns of unit type by gender. There is one significant over-representation, and that is a higher than expected number/proportion of females driving 4-Wheel Off Road ATVs. It is important that females receive the same consideration in preparation for this experience as do males. Generally, young females have a better safety

record that young males in most traffic safety areas. This may be one exception to that rule.

- P101 Unit Type by P328 Injury Type Cross-Tab for ATV/Bic/Mot. These results argue for strong programs promoting safety equipment and driver awareness for all vehicle types. Injury severity is almost totally dependent on (1) speed, and (2) protective safety equipment. The motorized vehicles produce the greater speeds, and if safety equipment is not applied, they will result in greater injury and fatalities.
- P107 Age Distribution of ATV/Bic/Mot aged 5-15. While the number of crashes in the target age group (5-15) are generally linearly increasing with age, it is important that education programs are not deferred. We will find the older ages involve motor vehicles as opposed to bicycles. It could be much more productive to introduce some information on the dangers of these vehicles as part of the early safety training programs. This attribute is given discussion in the Introduction section.
- P109 Person Gender. As noted above, the greater relative proportion of female drivers in the younger age group is unexpected. The recommendation is to assure that at least the same programs be applied to males and females, and consideration should be given to address the special needs of younger female drivers. For one thing males may be given more opportunities to drive toy electrical vehicles that prepare children at a very young age for vehicle operation. This pseudo-native ability that results is seen at the earliest driver license age (16). Females can be “ramped up” to this skill by initially restricting their driving to the lowest possible speeds.
- Severity and Safety Equipment Recommendations (P323 and P328)
 - P323 Person Safety Equipment. Clearly there is a necessity for concentration on those under 5-15 years of age in the benefits of proper safety equipment, and DOT-compliant helmets in particular, which had a relative proportion of only 15.58% for the younger drivers as compared to the older driver group in which the usage proportion was over 60%.
 - P328 Person Injury Type. No comfort should be taken from the fact that the younger age group seems to incur lower severity injuries. Some of those which are recorded as lower severity might have life-long effects if they involve head injuries. Concerted efforts should be put forth to promote bicycle helmets and other protective equipment in all vehicles.

Filter Definition

Filter 4: F4= Driver Age= 5-15 AND is the Driver of ATV/Bicycle/Motorcycle

F4 = Age 5-15 AND ATV/Bic/Mot Driver Position

This filter was created by ANDing the 0-15 person with those in the driver position of ATV-Bicycle-Motorcycle, and then removing the 0-4 aged persons from the filter.

Modified F4 = $F4 > 1 = \text{Age 5-15 AND ATV/Bic/Mot Driver Position} > 1$

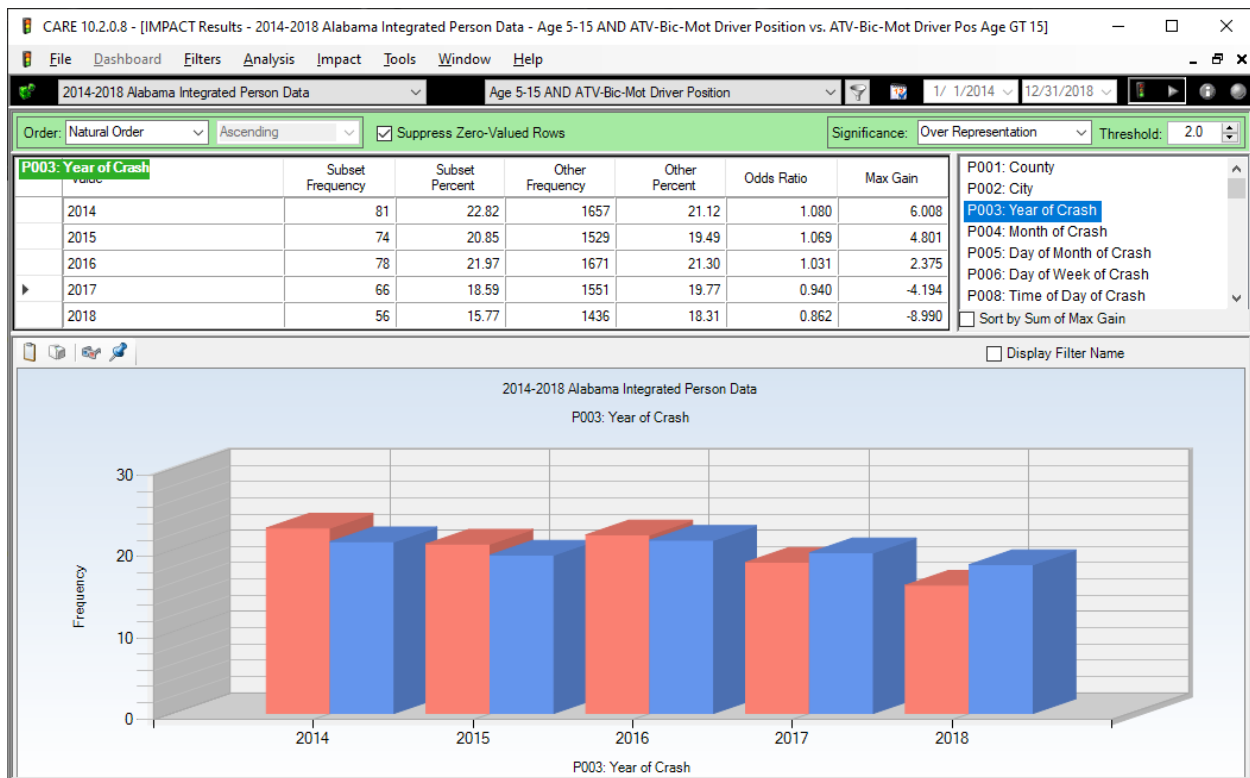
This filter is the same as F4 above, but ten Unit Types are eliminated because they only had one crash. The main objective of this filter is to do cross-tabulations involving P101Unit Type. Removing 10 unit types with one crash each will in no way modify the relative proportionate results obtained from the IMPACT analyses

Analysis for F4 Young Drivers (<16) of ATV, Bicycles and Motorcycles

F4 = Age 5-15 and ATV-Bic-Mot Driver Position

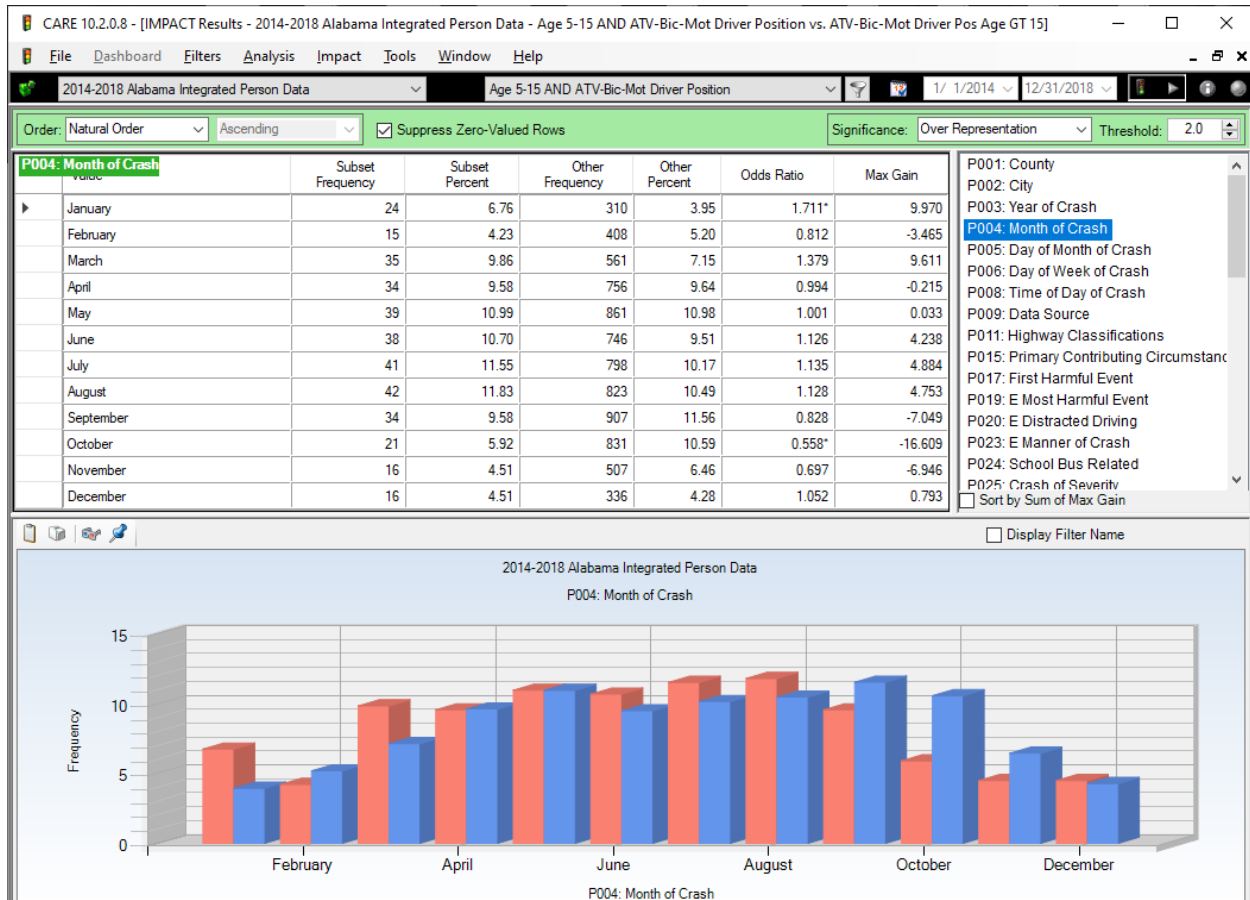
The following displays summarize findings over 2014-2018 for young (<16 years old) drivers of ATVs, Bicycles and Motorcycles. Unless otherwise stated the comparison will be the younger aged (5-15) drivers against older (16-99) ATV, Bicycle and Motorcycle drivers in the five year (2014-2018) dataset. For ease of reference, these will be called *younger* and *older* drivers, respectively.

P003 Year of Crash



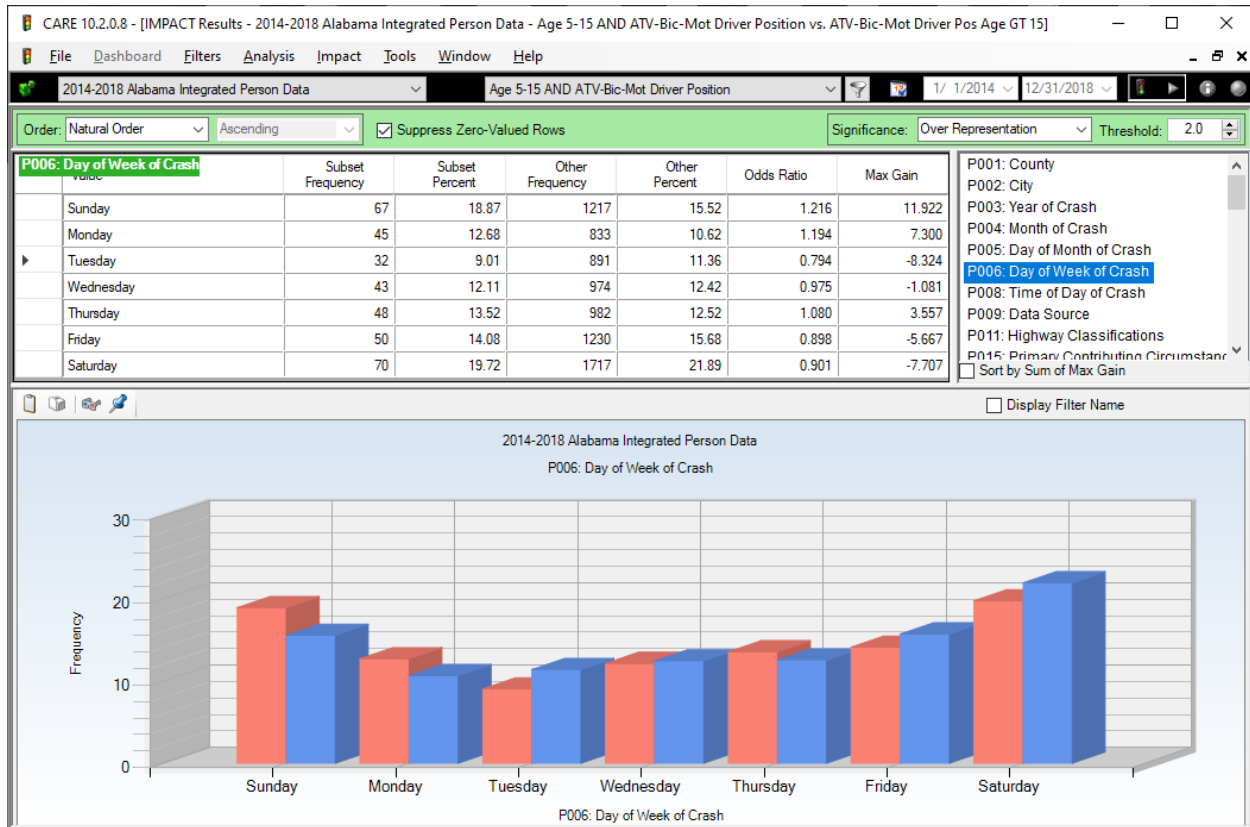
Generally, the number of crashes per year is going down at a greater rate (especially after 2016) when compared to the older drivers of ATV/Bic/Mot.

P004 Month of Crash



Clearly summer months (June, July and August) are over-represented. We know of no explanation that the young drivers are also over-represented in January and March, significantly so in January. October is significantly under-represented for the younger drivers.

P006 Day of the Week



There are no statistically significant differences in the days when the younger and older drivers have their collisions.

P006 Day of the Week by Person Injury

CARE 10.2.0.8 - [Crosstab Results - 2014-2018 Alabama Integrated Person Data - Filter = Age 5-15 AND ATV-Bic-Mot Driver Position]

File Dashboard Filters Analysis Crosstab Tools Window Help

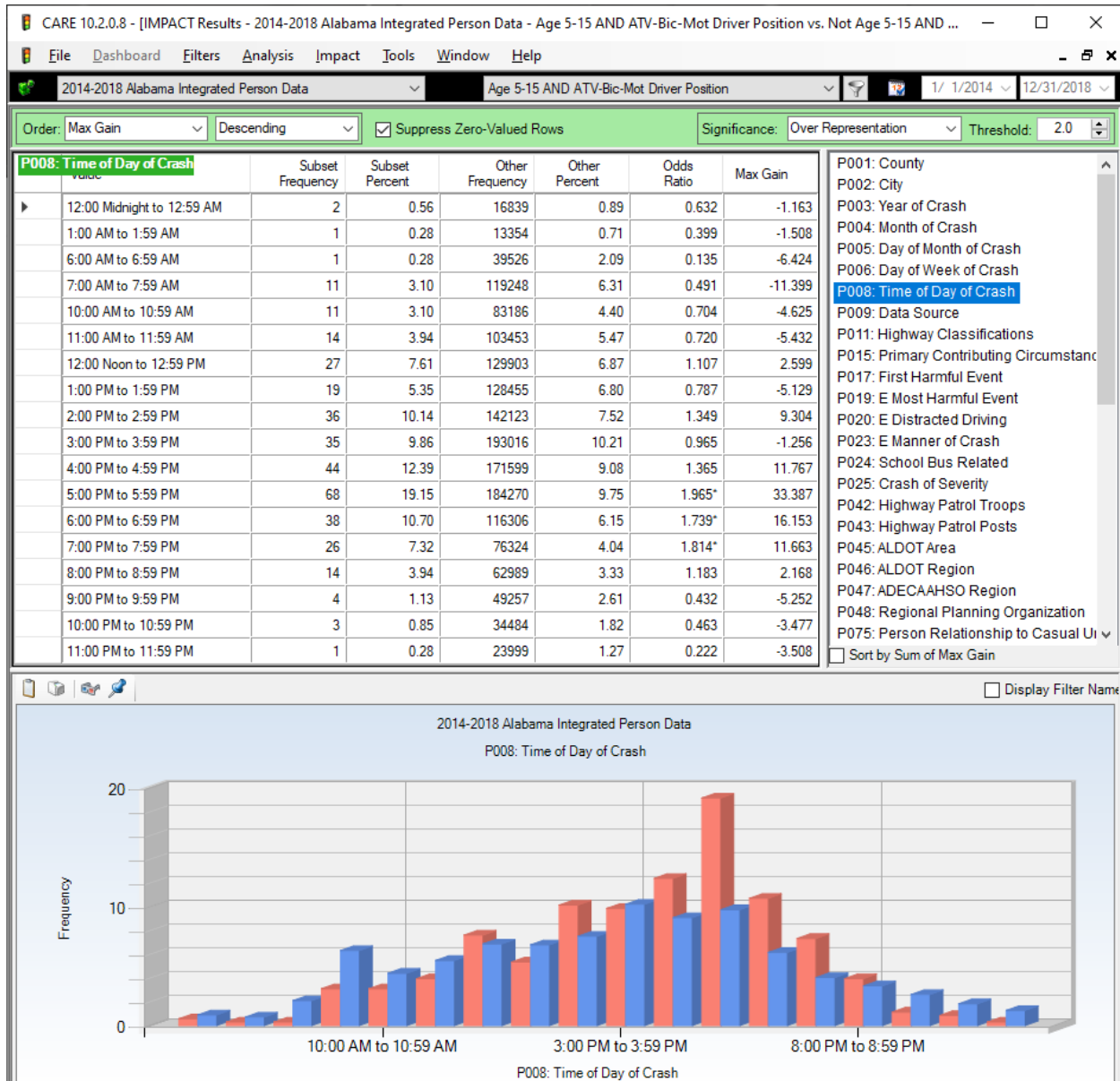
2014-2018 Alabama Integrated Person Data Age 5-15 AND ATV-Bic-Mot Driver Position 1/ 1/2014 12/31/2018

Suppress Zero Values: None Select Cells: Column: Day of Week of Crash ; Row: Person Injury Type

| | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | TOTAL |
|-----------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|
| Fatal Injury | 0 0.00% | 0 0.00% | 2 6.25% | 0 0.00% | 2 4.17% | 2 4.00% | 4 5.71% | 10 2.82% |
| Incapacitating Injury | 14 20.90% | 9 20.00% | 9 28.13% | 5 11.63% | 9 18.75% | 11 22.00% | 18 25.71% | 75 21.13% |
| Non-Incapacitating Inju | 27 40.30% | 21 46.67% | 13 40.63% | 24 55.81% | 17 35.42% | 20 40.00% | 22 31.43% | 144 40.56% |
| Not Visible but Complains of Pain | 2 2.99% | 6 13.33% | 2 6.25% | 5 11.63% | 3 6.25% | 4 8.00% | 3 4.29% | 25 7.04% |
| E Unknown Injury | 2 2.99% | 0 0.00% | 0 0.00% | 0 0.00% | 2 4.17% | 0 0.00% | 3 4.29% | 7 1.97% |
| Person was Not a Victim | 22 32.84% | 9 20.00% | 6 18.75% | 9 20.93% | 15 31.25% | 13 26.00% | 20 28.57% | 94 26.48% |
| TOTAL | 67 18.87% | 45 12.68% | 32 9.01% | 43 12.11% | 48 13.52% | 50 14.08% | 70 19.72% | 355 100.00% |

Severities are distributed fairly evenly over the days of the week.

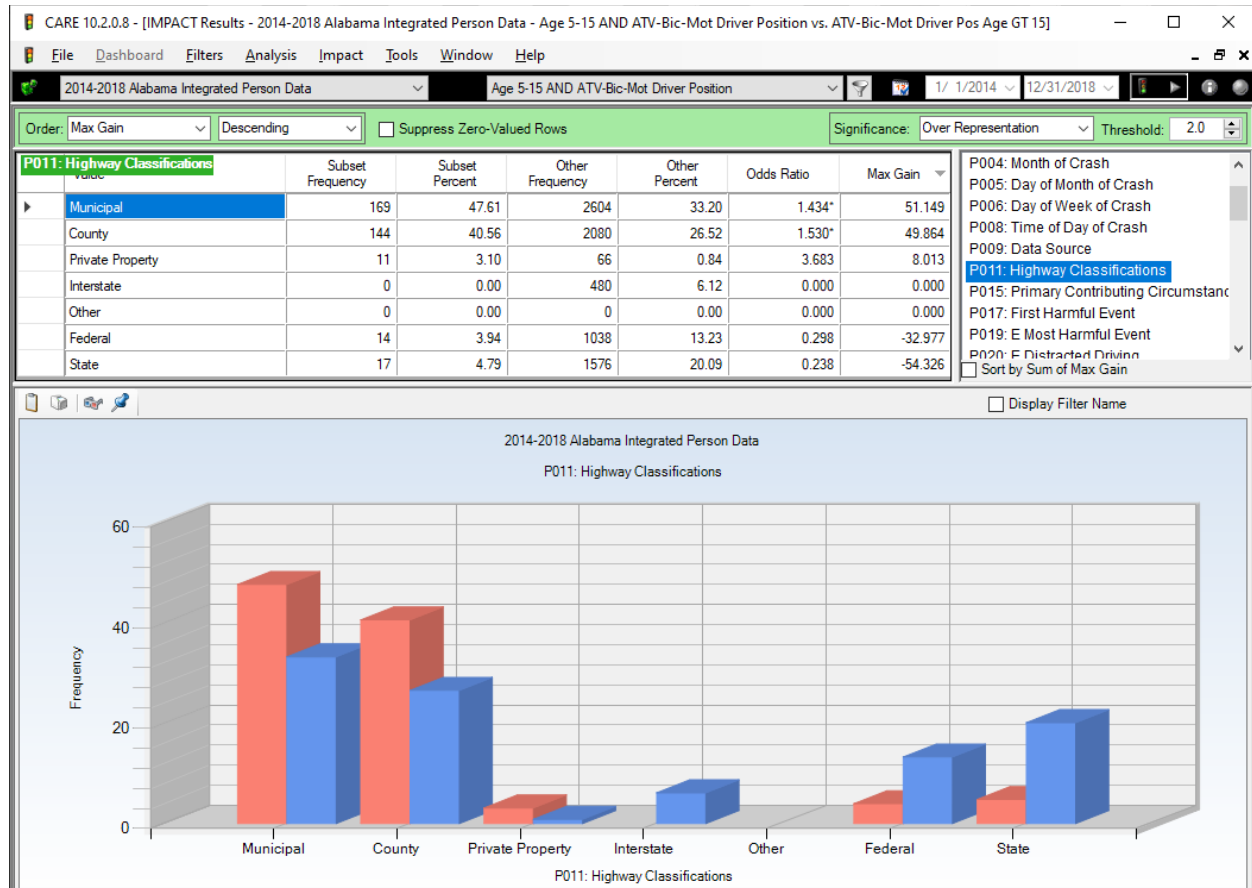
P008 Time of Day



Hours of 5 PM to 8 PM are significantly over-represented, with 5:00-5:59 being close to double what is expected from the older control group. The later hours of 8:00-8:59 PM is also over-represented, although not significantly so. The later hours support the summer months finding when these hours would still have light.

P011 Highway Classification for Age 5-15 Drivers ATV/Bic/Motorcycle

This comparison is between ATV/Bic/Mot drivers 5-15 of age vs. older ATV/Bic/Mot drivers.



There were no crashes of these vehicles driven by 5-15 year olds on Interstate Highways. The largest over-representation in the proportion is on Municipal Roads, with County Roads coming in a close second. Private Property shows relatively few, but this is probably because the proportion reported is low (reporting on private property is not mandatory, and the ones reported are most likely in parking lots). As expected, the number and proportion of crashes by older drivers is much higher on Federal and State roadways, which are obviously being avoided by the younger drivers.

P011 Highway Classification by P328 Person Injury Type for Young Drivers

CARE 10.2.0.8 - [Crosstab Results - 2014-2018 Alabama Integrated Person Data - Filter = Age 5-15 AND ATV-Bic-Mot Driver Position]

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2014-2018 Alabama Integrated Person Data Age 5-15 AND ATV-Bic-Mot Driver Position 1/ 1/2014 12/31/2018

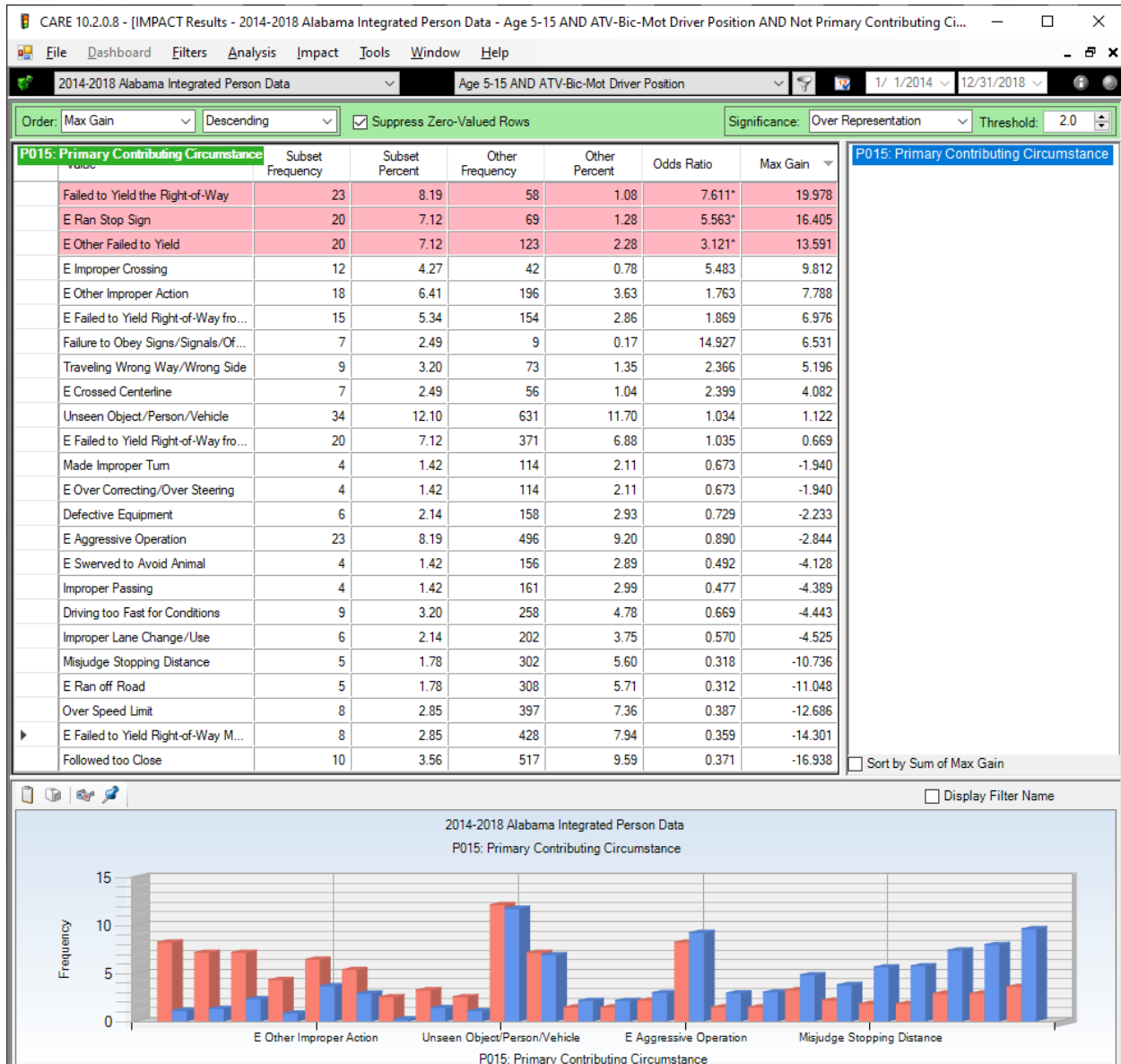
Suppress Zero Values: Rows and Columns Select Cells: Column: Highway Classifications ; Row: Person Injury Type

| | Federal | State | County | Municipal | Private Property | TOTAL |
|--------------------------------------|-------------|-------------|---------------|---------------|------------------|----------------|
| Fatal Injury | 2 14.29% | 0 0.00% | 5 3.47% | 3 1.78% | 0 0.00% | 10 2.82% |
| Incapacitating Injury | 4 28.57% | 4 23.53% | 43 29.86% | 22 13.02% | 2 18.18% | 75 21.13% |
| Non-Incapacitating Inju | 3 21.43% | 8 47.06% | 50 34.72% | 78 46.15% | 5 45.45% | 144 40.56% |
| Not Visible but Complains of Pain | 0 0.00% | 2 11.76% | 1 0.69% | 21 12.43% | 1 9.09% | 25 7.04% |
| E Unknown Injury | 0 0.00% | 0 0.00% | 1 0.69% | 5 2.96% | 1 9.09% | 7 1.97% |
| Person was Not a Victim | 5 35.71% | 3 17.65% | 44 30.56% | 40 23.67% | 2 18.18% | 94 26.48% |
| TOTAL | 14 3.94% | 17 4.79% | 144 40.56% | 169 47.61% | 11 3.10% | 355 100.00% |

County and Municipal Roads are the top two classifications, containing about 88% of the crashes. Of the two, county roads have by far the more severe crashes, with 98 crashes in the three highest severity classifications.

P015 Primary Contributing Circumstances Comparison

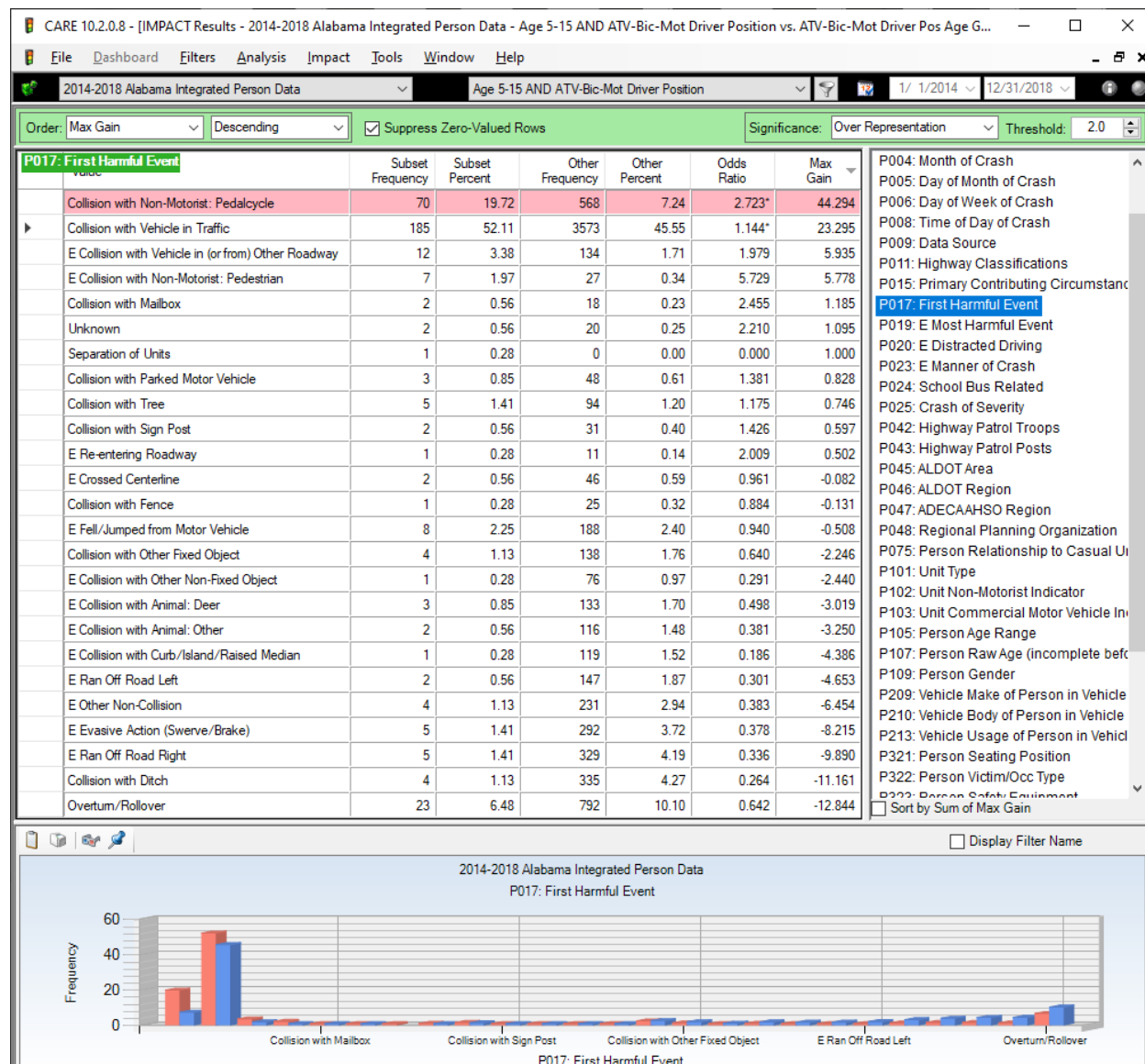
This comparison is between ATV/Bic/Mot drivers 5-15 of age vs. PCCs of drivers of the same vehicles by older drivers (> 15).



Items with less than 4 occurrences were suppressed from the display above. Adding all of the “Failure to Yield” categories gives 106 crashes (37.7%), which is over one-third, making it by far the most frequent contributing circumstance both in frequency and proportion. Most other PCCs are equally as avoidable.

P017 First Harmful Event for Age 5-15 Drivers ATV/Bic/Motorcycle

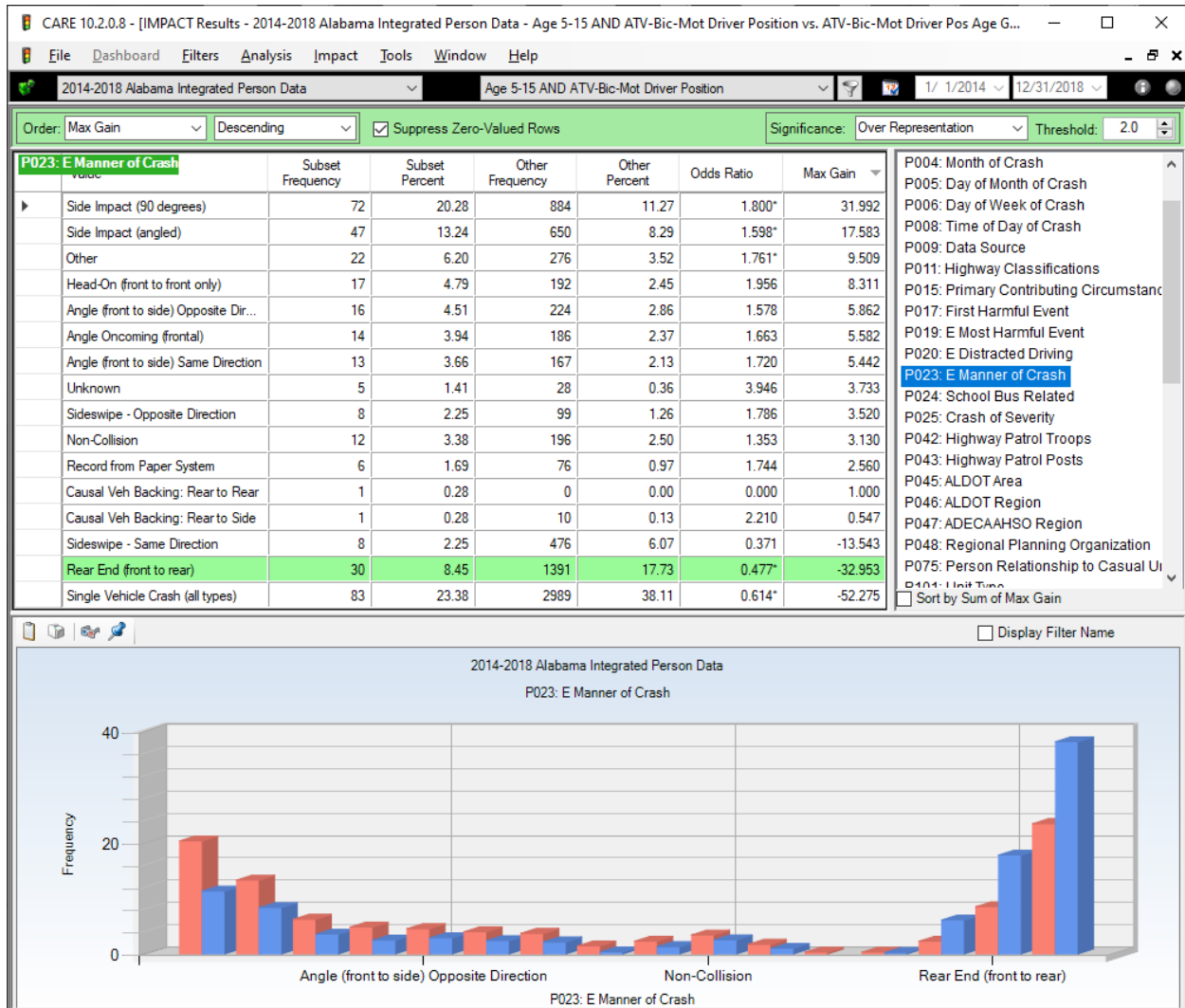
This comparison is between ATV/Bic/Mot drivers 5-15 of age vs. drivers of the same vehicle types of older age (> 15).



First Harmful Events with less than three occurrences were excluded from the display. The large proportion of bicycle crashes in the 5-15 age class overshadows all of the other categories except Collision with Vehicle in Traffic. The various collision types are fairly evenly distributed. While the young drivers have a relatively large number (23) of Overtum/Rollovers, the proportion of these crash types is considerably smaller than that for the older drivers.

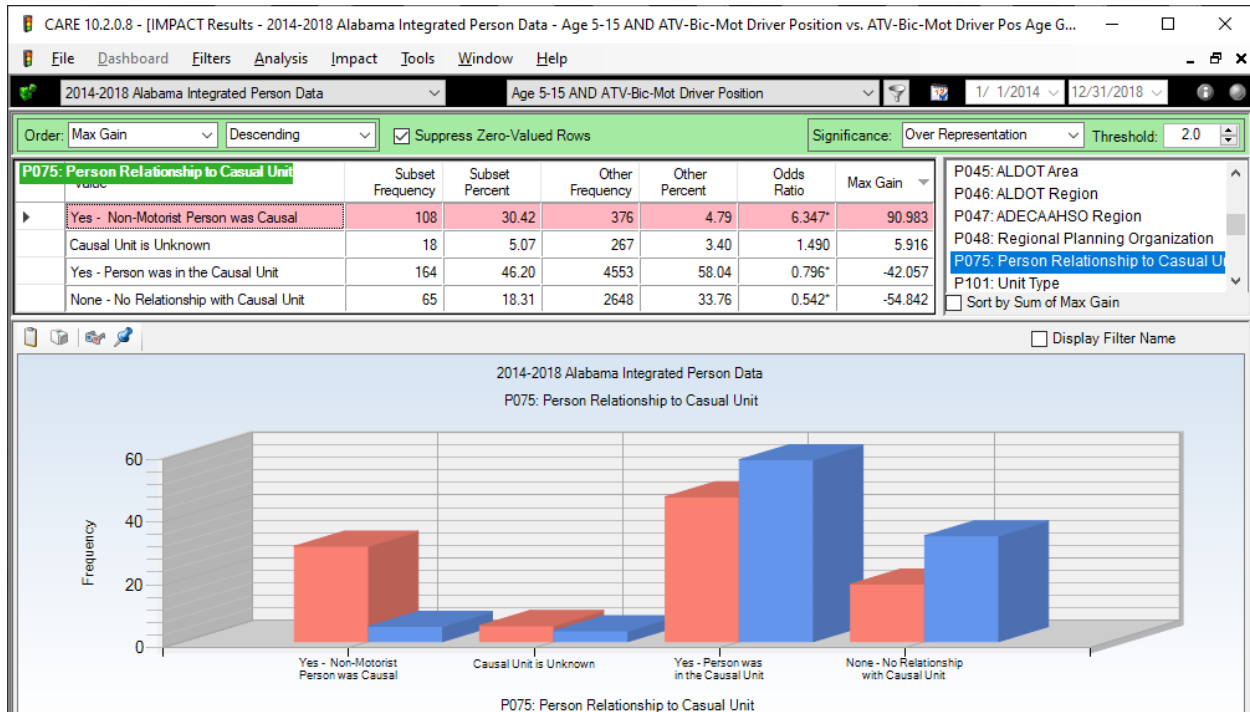
P023 Manner of Crash for Age 5-15 Drivers ATV/Bic/Motorcycle

This comparison is between ATV/Bic/Mot drivers 5-15 of age vs. Manner of Crash of older drivers of the same vehicles.



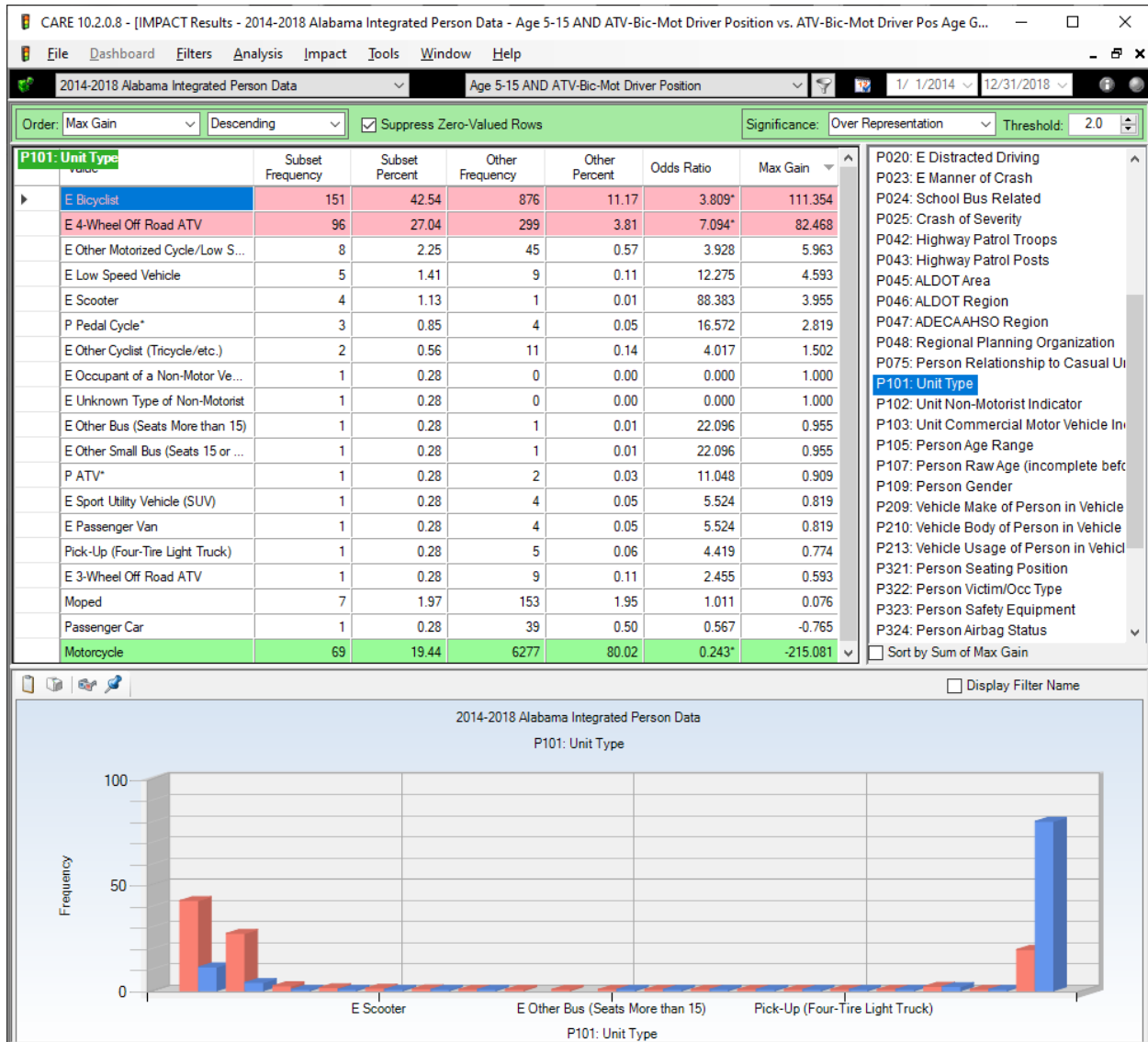
Younger drivers of ATV/Motorcycles/Bicycles clearly have proportions for the two Side Impact classifications that are both statistically significant. While the numbers are high, they are under-represented in both Rear End and Single Vehicle Crashes. Only 23.38% of the younger drivers' crashes were single vehicle as opposed to 38.11% for the older drivers.

P075 Person Relationship to Causal Unit



The Young Drivers seem to be at fault almost in twice the proportion as the older drivers for bicycle crashes. They are stated to not be in the causal unit 18.31% of the time, which means that they caused the crash about 82% of the time. Using the same metric, the older drivers would be at fault about 66% of the time. Each driver in a two-vehicle crash is assumed to have a 50% chance of being the causal driver, all other things being equal. This attribute does not fully take into consideration single-vehicle crashes for which the sole driver must assume responsibility.

P101 Unit Type for ATV/Bic/Mot Driven by Ages 5-15



It is important to recognize the differences in the vehicle mix when interpreting the IMPACT results. The younger drivers are 42.54% bicyclists (151), while their older counterparts are only 11.17% bicyclists. Even more dramatically different, 96 (27.04%) of the younger drivers were operating 4-Wheel Off Road ATVs, while only 3.81% of the older drivers crashed these types of vehicles. At the other end of the spectrum, young people had only 69 Motorcycle crashes (19.44%), while this accounted for over 80% of the older drivers' crashes.

P101 Unit Type by P107 Age Cross-Tab for ATV/Bic/Mot Driven by Ages 5-15

CARE 10.2.0.8 - [Crosstab Results - 2014-2018 Alabama Integrated Person Data - Filter = AGE 5-15 AND ATV-Bic-Mot Driver Position > 1]

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2014-2018 Alabama Integrated Person Data AGE 5-15 AND ATV-Bic-Mot Driver Position > 1 1/ 1/2014 12/31/2018

Suppress Zero Values: Rows and Columns Select Cells: Column: Unit Type ; Row: Person Age Range

| | Motorcycle | Moped | E 4-Wheel Off Road ATV | E Low Speed Vehicle | E Scooter | E Bicyclist | E Other Cyclist (Tricycle/etc.) | P Pedal Cycle* | E Other Motorized Cycle/Low Speed | TOTAL |
|-----------------------------------|--------------|--------------|------------------------|---------------------|-------------|---------------|---------------------------------|----------------|-----------------------------------|----------------|
| 4 to 5 Years (child booster seat) | 0 0.00% | 0 0.00% | 1 1.04% | 0 0.00% | 0 0.00% | 2 1.32% | 0 0.00% | 0 0.00% | 0 0.00% | 3 0.87% |
| 6 to 8 Years (possible booster) | 0 0.00% | 0 0.00% | 2 2.08% | 1 20.00% | 1 25.00% | 29 19.21% | 2 100.00% | 1 33.33% | 0 0.00% | 36 10.43% |
| 9 to 12 Years (pre-teen) | 6 8.70% | 0 0.00% | 29 30.21% | 0 0.00% | 1 25.00% | 62 41.06% | 0 0.00% | 1 33.33% | 3 37.50% | 102 29.57% |
| 13 to 15 Years (pre-driving teen) | 63 91.30% | 7 100.00% | 64 66.67% | 4 80.00% | 2 50.00% | 58 38.41% | 0 0.00% | 1 33.33% | 5 62.50% | 204 59.13% |
| TOTAL | 69 20.00% | 7 2.03% | 96 27.83% | 5 1.45% | 4 1.16% | 151 43.77% | 2 0.58% | 3 0.87% | 8 2.32% | 345 100.00% |

Units with 1 or fewer unit type occurrences are suppressed. Ages for the different types of vehicles being driven by 5-15 year-old drivers quantifies what is expected. The largest number of crashes involve 151 bicycle crashes that are fairly evenly distributed from age 9 through 15. The 96 ATVs come primarily from the 11-15 year olds, with a significantly larger numbers aged 14-15. None of the other unit types have any obvious patterns.

P101 Unit Type by P109 Person Gender for Younger Drivers

CARE 10.2.0.8 - [Crosstab Results - 2014-2018 Alabama Integrated Person Data - Filter = AGE 5-15 AND ATV-Bic-Mot Driver Position > 1]

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2014-2018 Alabama Integrated Person Data AGE 5-15 AND ATV-Bic-Mot Driver Position > 1 1/ 1/2014 12/31/2018

Suppress Zero Values: Rows and Columns Select Cells: Column: Unit Type ; Row: Person Gender

| | Motorcycle | Moped | E 4-Wheel Off Road ATV | E Low Speed Vehicle | E Scooter | E Bicyclist | E Other Cyclist (Tricycle/etc.) | P Pedal Cycle* | E Other Motorized Cycle/Low Speed | TOTAL |
|----------------|--------------|-------------|------------------------|---------------------|-------------|---------------|---------------------------------|----------------|-----------------------------------|----------------|
| Male | 67 97.10% | 4 57.14% | 67 69.79% | 5 100.00% | 3 75.00% | 125 82.78% | 1 50.00% | 3 100.00% | 7 87.50% | 282 81.74% |
| Female | 2 2.90% | 3 42.86% | 28 29.17% | 0 0.00% | 1 25.00% | 26 17.22% | 1 50.00% | 0 0.00% | 1 12.50% | 62 17.97% |
| Not Applicable | 0 0.00% | 0 0.00% | 1 1.04% | 0 0.00% | 0 0.00% | 0 0.00% | 0 0.00% | 0 0.00% | 0 0.00% | 1 0.29% |
| TOTAL | 69 20.00% | 7 2.03% | 96 27.83% | 5 1.45% | 4 1.16% | 151 43.77% | 2 0.58% | 3 0.87% | 8 2.32% | 345 100.00% |

Few if any patterns can be seen. Overall there were 282 (about 82%) males and 62 (about 18%) females driving the vehicles that crashed. See also the results for the P109 Person Gender comparison with older drivers below.

P101 Unit Type by P328 Person Injury Cross-Tab for Younger Drivers

CARE 10.2.0.8 - [Crosstab Results - 2014-2018 Alabama Integrated Person Data - Filter = AGE 5-15 AND ATV-Bic-Mot Driver Position > 1]

File Dashboard Filters Analysis Crosstab Tools Window Help

2014-2018 Alabama Integrated Person Data AGE 5-15 AND ATV-Bic-Mot Driver Position > 1 1/ 1/2014 12/31/2018

Suppress Zero Values: Rows and Columns Select Cells: Column: Unit Type ; Row: Person Injury Type

| | Motorcycle | Moped | E 4-Wheel Off Road ATV | E Low Speed Vehicle | E Scooter | E Bicyclist | E Other Cyclist (Tricycle/etc.) | P Pedal Cycle* | E Other Motorized Cycle/Low Speed | TOTAL |
|-----------------------------------|--------------|-------------|------------------------|---------------------|-------------|---------------|---------------------------------|----------------|-----------------------------------|----------------|
| Fatal Injury | 2 2.90% | 0 0.00% | 4 4.17% | 0 0.00% | 0 0.00% | 3 1.99% | 0 0.00% | 0 0.00% | 1 12.50% | 10 2.90% |
| Incapacitating Injury | 18 26.09% | 0 0.00% | 27 28.13% | 1 20.00% | 1 25.00% | 21 13.91% | 1 50.00% | 2 66.67% | 2 25.00% | 73 21.16% |
| Non-Incapacitating Inju | 23 33.33% | 1 14.29% | 29 30.21% | 1 20.00% | 3 75.00% | 78 51.66% | 0 0.00% | 1 33.33% | 4 50.00% | 140 40.58% |
| Not Visible but Complains of Pain | 3 4.35% | 1 14.29% | 2 2.08% | 0 0.00% | 0 0.00% | 19 12.58% | 0 0.00% | 0 0.00% | 0 0.00% | 25 7.25% |
| E Unknown Injury | 1 1.45% | 1 14.29% | 1 1.04% | 0 0.00% | 0 0.00% | 3 1.99% | 1 50.00% | 0 0.00% | 0 0.00% | 7 2.03% |
| Person was Not a Victim | 22 31.88% | 4 57.14% | 33 34.38% | 3 60.00% | 0 0.00% | 27 17.88% | 0 0.00% | 0 0.00% | 1 12.50% | 90 26.09% |
| TOTAL | 69 20.00% | 7 2.03% | 96 27.83% | 5 1.45% | 4 1.16% | 151 43.77% | 2 0.58% | 3 0.87% | 8 2.32% | 345 100.00% |

Fatalities are so few and random that no pattern can be determined. Fatality plus Incapacitating Injury is a good overall proxy for the inherent severity danger of the vehicle. Fatality plus Incapacitating Injury numbers line up as follows:

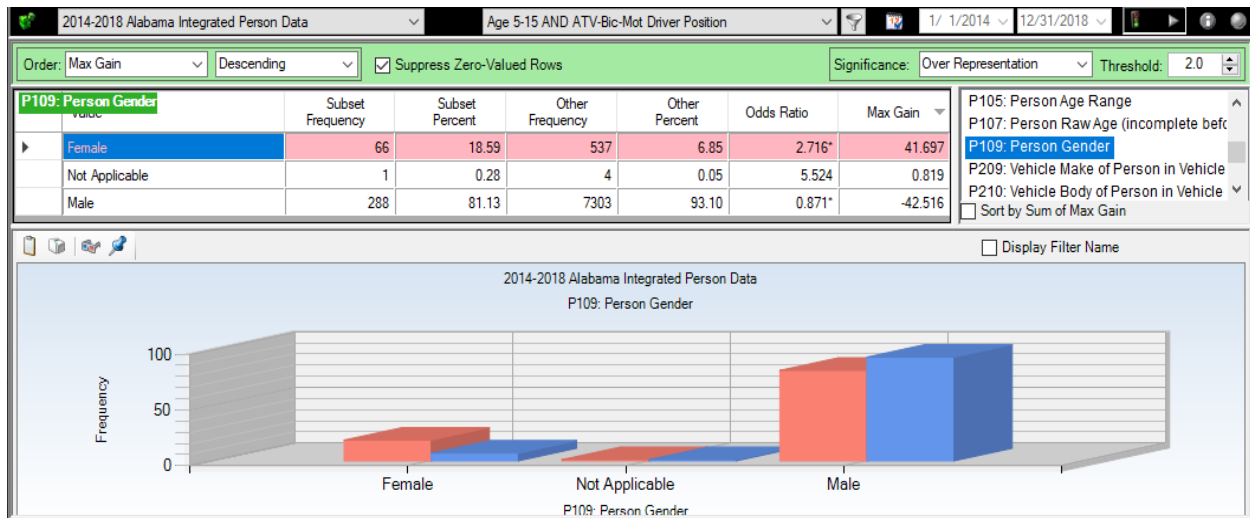
1. 4-Wheel Off Road ATV = $27 + 4 = 31$ (2nd highest Non-Incapacitating Injury = 29)
2. Bicycle = $21 + 3 = 24$ (highest Non-Incapacitating Injury with 78)
3. Motorcycle = $18 + 2 = 20$ (3rd highest Non-Incapacitating Injury = 23)

Most of the fatalities are coming from motorized vehicles. The three incapacitating injury cells in the double digits also have fatalities, which indicates a high correlation between these two severity classifications. This pattern continues down into the Non-Incapacitating injury classification as well. The concentration of bicycle crash injuries is of a lesser severity, but the proportion with no injury is low, showing the need for and effectiveness of bicycle safety equipment.

P107 Young Driver Age Distribution

This attribute was discussed in the Introduction section.

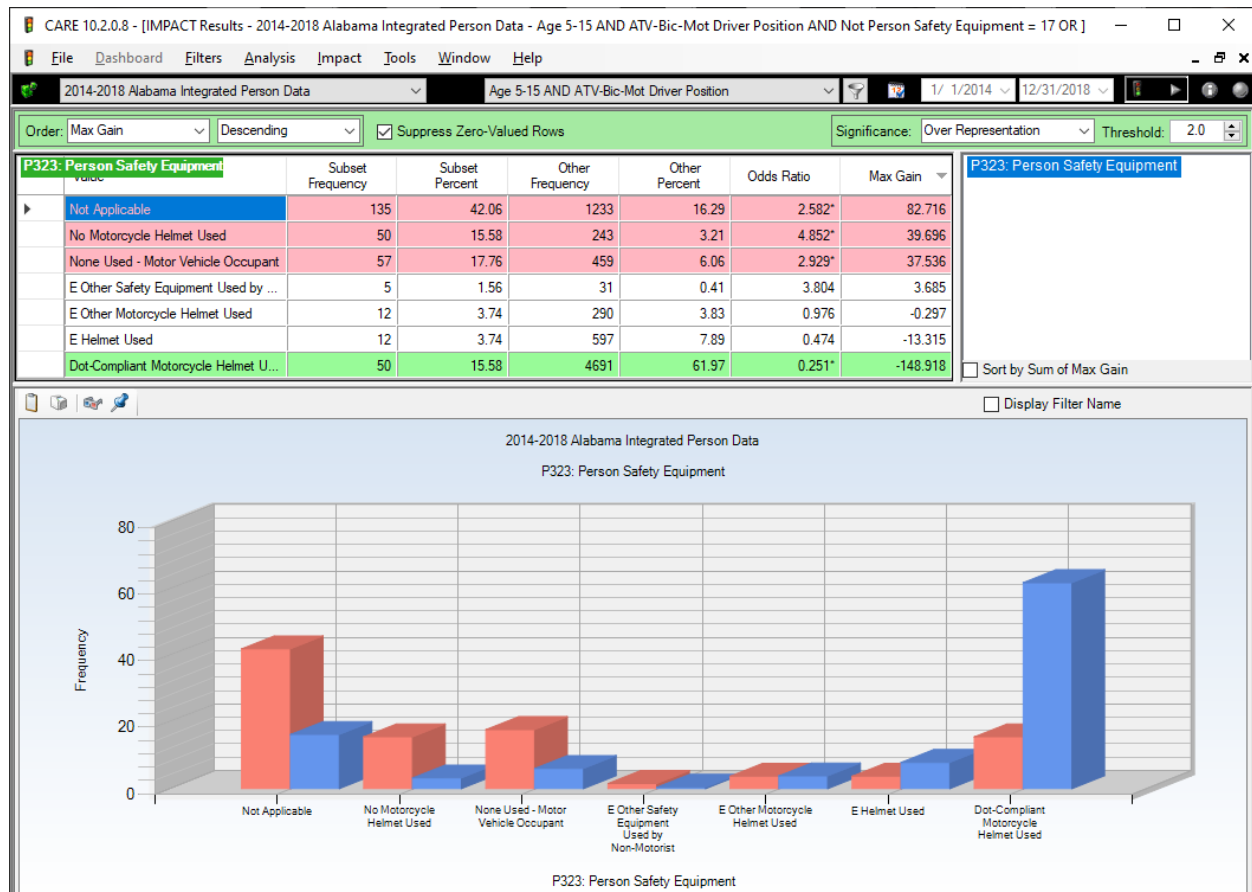
P109 Person Gender



The younger drivers have a very much higher proportion in female drivers that the older drivers.

P323 Person Safety Equipment

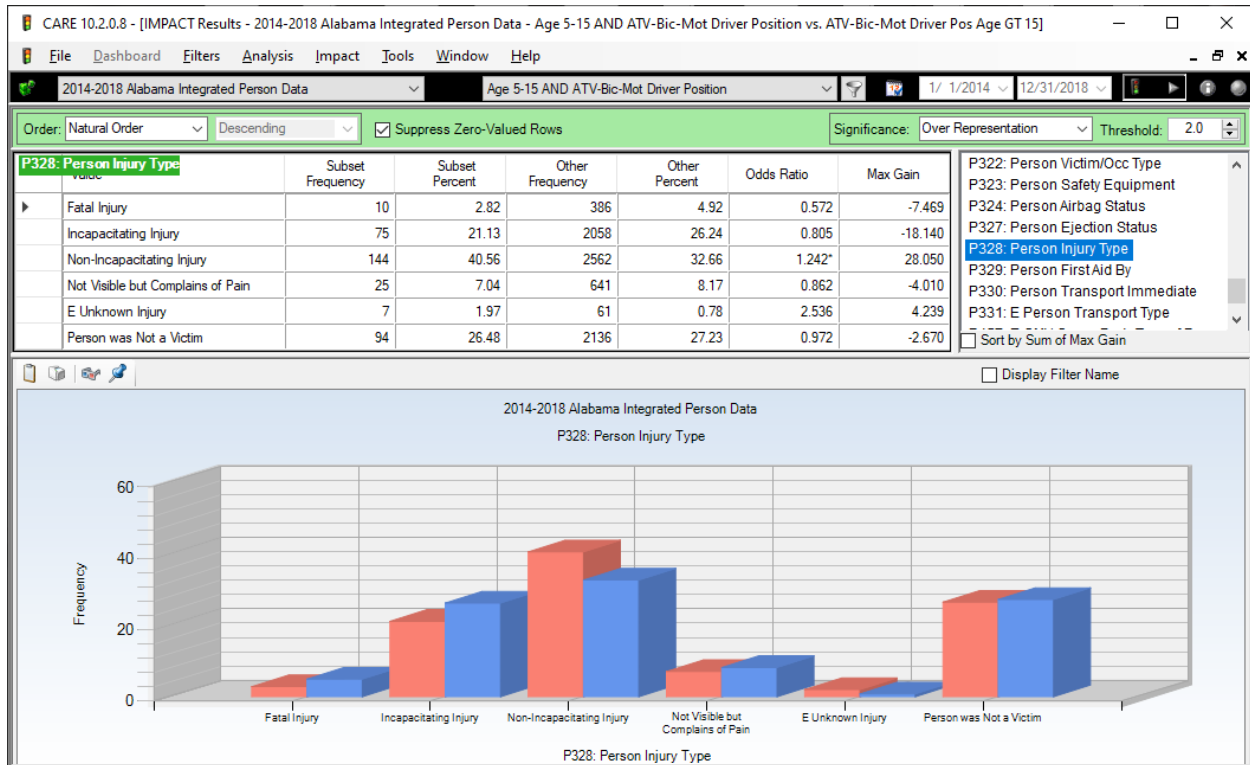
The comparison here is between 5-15 drivers of ATV/Motorcycle/Bicycle vehicles compared to all drivers of ATV/Motorcycle/Bicycle.



The 5-15 year-old drivers were by far in greater violation of safety equipment rules. For example, DOT compliant helmets were used in a proportion of 15.58% of the 0-15 cases as compared to the older driver group in which the usage proportion percentage was very close to 60%. Non-compliant helmets have been found to produce greater severity than they reduce, so the primary safety indicator for motorcycles would be in the DOT-Compliant category. The Not Applicable is probably applying to bicyclists as is the Helmet Used category, although this cannot be determined definitively from this display.

P328 Person Injury Type for Age 5-15 Drivers ATV/Bic/Motorcycle

This comparison is between ATV/Bic/Mot drivers 5-15 of age vs. older ATV/Bic/Mot drivers.



Generally, the younger drivers escape the most severe injuries (including fatalities), but have a significantly higher proportion of Non-Incapacitating Injuries than older drivers. This is the only category that had a statistically significant difference.