An Analysis of OWI Arrests and Convictions in Iowa

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16 Abstract

The primary goal of the project was to document the demographic profile of OWI offenders in Iowa. The study is based on both aggregate and case-level data. The case level data produced a final sample of 118,675 OWI convictions. That occurred from 2000 through 2009. The great majority of convicted offenders were White males. From 2000 through 2009 the percentage of convictions received by women increased by 34%. Defendants' average age of was 30 years old, and the age cohorts of 15 to 24, 25 to 34, and 34 to 45 were overrepresented among convicted offenders. Whites were underrepresented among OWI defendants. African Americans, Hispanics and Native Americans were overrepresented. From 2000 through 2009, the percentage of aggravated misdemeanor felony OWI convictions received by Hispanics and African Americans increased significantly. The percentage of OWI convictions received by women and African Americans increased significantly after implementation of the .08 BAC law. We did not find convincing evidence of a direct relationship between enforcement trends and the alcohol related traffic fatalities (ARTFs). However, the ten year Iowa conviction trends did provide evidence of a conviction lag effect on Iowa's ARTFs. The research findings established the basis for a phase two project that would assess the efficacy of OWI sentencing practices in Iowa.

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An Analysis of OWI Arrests and Convictions in Iowa

Final Report
July 2011

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AN ANALYSIS OF OWI ARRESTS AND CONVICTIONS IN IOWA

Executive Summary

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This report presents an analysis of Iowa trends in OWI arrests, OWI convictions, and alcohol related traffic fatalities. The primary goal of the project was to document changes to the demographic profile of OWI offenders in Iowa. In addition, the report evaluates the influence of population shifts, OWI arrest rates, and OWI convictions of on the prevalence alcohol related traffic fatalities in Iowa.

The study is based on both aggregate and case-level data. Aggregate data were collected from FBI Uniform Crime Reports; the Iowa Department of Public Safety; the Iowa State Data Center of Iowa; and the National Highway Traffic Safety Administration's Fatality Analysis Reporting System. Case level data on OWI convictions in Iowa were provided by Iowa's Justice Data Warehouse via the Iowa Division of Criminal and Juvenile Justice Planning. The case level data produced a final sample of 118,675 cases that resulted in either a conviction or deferred judgment for OWI during the calendar years 2000 through 2009. Frequencies, crosstabs, comparison of means, and regression analysis were used to reveal trends and compare distributions of OWI cases across demographic variables.

Research Objectives

Objective 1: Produce a statistical overview of convicted OWI offenders regarding recidivism and the impact of lowering the blood alcohol content standard to .08.

Among all OWI convictions, 22% were for aggravated misdemeanors (second conviction) and 7.3% were for class D felonies (two or more prior convictions). Overall, women comprised 15.8 % of aggravated misdemeanor convictions and 10.4% of convictions for class D felonies. In terms of age, the highest percentages of aggravated misdemeanor convictions were received by defendants between the ages of 25 through 34. From 2000 through 2009, the percentage of aggravated misdemeanor convictions imposed against 25 to 34 year old defendants increased 15%. The second highest percentage of aggravated misdemeanor convictions was received by defendants between the ages of 35 and 44. From 2000 through 2005, the highest percentages of felony convictions were imposed against defendants between the ages 35 and 44. But during the ten year period that percentage declined steadily. From 2006 through 2009, defendants in the 25 through 34 age cohort had the highest percentage of felony convictions.

The racial and ethnic distribution of repeat convictions was similar for both aggravated misdemeanors and felony convictions. For both crimes, the highest percentage of convictions was imposed against White defendants. Eighty percent of aggravated misdemeanor convictions and 73% of felony convictions were imposed against Whites. For both offense categories African

Americans had the second highest percentage of convictions. Hispanics had the third highest percentage. Native America defendants accounted for less than 1 % of aggravated misdemeanor convictions and less than 2% of felony convictions. From 2000 through 2009, the percentage of felony OWI convictions received by Hispanics and African Americans increased 53% and 47%, respectively.

We found a statistically significant increase in the percentages of OWI convictions imposed against women after the 2003 reduction in the legal minimum BAC level to .08. The study also revealed changes in the race and ethnic distributions of OWI convictions coincided with changes in that reduction. There was a statistically significant increase in the percentages of convictions imposed against African Americans after the .08 law. After the decrease in the legal BAC level, there was a statistically significant decline in percentages of convictions received by Native Americans.

The data used in this study did not provide information about offenders' criminal histories or post conviction outcomes. Therefore, we were unable to determine the extent to which defendants reoffended after their conviction.

Objective 2: Produce statistical profiles of OWI offenders. Identify how social, biographical, legal, and criminal factors that differentiate first time offenders from repeat offenders.

Across the entire data set, 70% of defendants were convicted of serious misdemeanors (first conviction), 22% were convicted of aggravated misdemeanors, and 7% were convicted of class D felonies. Males comprised 81% of all OWI, but from 2000 through 2009 the percentage of convicted women increased 66%. Among all defendants, the average age was 30 years old. Defendants in the age cohorts of 15 to 24; 25 to 34; and 35 to 44 were dramatically overrepresented compared to the percentages of Iowa residents within those age cohorts. The highest percentage of convictions for serious misdemeanor OWO (first time conviction) was among 15 to 24 year olds.

Eighty percent the OWI defendants were White, 5.3% were African Americans, 6% were Hispanics, 0.9 % were Native Americans. Compared to their presence in Iowa's population White defendants were underrepresented among convicted offenders. African Americans, Hispanics and Native Americans were overrepresented.

Not surprisingly, Iowa's most populous counties supplied most of the states convicted OQI offenders. In fact, 40% of those offenders came from only six of the state's 93 counties. Two of those six counties are the location of state universities.

Consistent with findings reported in the literature review, the typical convicted OWI offender in Iowa was a White male approximately 30 to 33 years old who probably resides in an area that is more urban than rural. However from 2000 through 2009, the gaps between male and female offenders and between White offenders and some minority offenders have narrowed.

Only 6% of OWI convictions resulted in deferred adjudication. The highest percentages of those adjudications went to females, Whites, and persons under the age of 24 or over the age of 65.

The data used in this study did not provide information about offenders' social, biographical, legal, or criminal histories. Therefore, we were unable to determine the extent to which first time and repeat offenders differed on these variables.

Objective 3: Create a foundation for the second phase of research by generating hypotheses for further analysis and formatting the data so that additional variables from other state records systems (especially Corrections and Transportation) can be merged with the data set and matched to individuals.

The analysis of Iowa data is contextualized by findings related to trends that occurred both nationwide and in multiple states. Over the 16 year period covered in the analysis, the numbers, percentages, and rates of alcohol related traffic fatalities (ARTF) declined nationwide, as well as in Iowa, Kansas, Missouri, and Nebraska. We did not find convincing evidence of a direct relationship between enforcement trends and the declines in ARTFs. However, the ten year Iowa conviction trends did provide evidence of a conviction lag effect on Iowa's ARTFs.

The analysis also found ARTF trends were in part produced by changes in the broader population. For example, increases in the number of Iowa's African American and Hispanic residents fit well with the increased proportions of OWI convictions received by those populations. Likewise, declines in the populations of Iowa residents between the ages of 35 and 44, and the increase in residents between 45 and 54 years old, coincided with decreased percentages of convictions received by 35 to 44 year old defendants and increased convictions received by 45 to 54 year old defendants.

We conclude that changes in resident populations coincided with changes in OWI convictions and ARTFs because population shifts affected the supply of residents who are at risk for alcohol impaired driving. The report's conclusion about the influence of population shifts on ARTF's are consistent with findings that pertain to the impact of OWI arrests and convictions on alcohol impaired driving. For DUI/OWI arrests to influence alcohol impaired driving they must do so through a deterrent effect. For a deterrent effect to be effective, offenders must have the capacity to make rational calculations about the risk of apprehension. By definition, DUI/OWI offenders generally do not possess that capacity. By contrast, OWI sentencing might emphasize an incapacitation approach that is intended to reduce offenders' capacity to engage in alcohol impaired driving. Incapacitation may be accomplished through incarceration, electronic monitoring, alcohol interlock devices, and other means that reduce offenders' capacity to drink and drive. Many sentencing outcomes also require rehabilitative treatments that might reduce the likelihood of recidivism. Therefore, it is also possible that court ordered treatment programs might reduce the likelihood of post conviction drunk driving.

The findings from this study open important new questions for a second phase of research. For instance, we do not know if that effect is produced by the incapacitation or rehabilitation of convicted offenders. Likewise we do not know if these effects differ for first time offenders and multiple offenders. We do not know if they vary according to race/ethnicity, age, or gender. We hypothesize that rehabilitative sanctions tend to reduce reoffending among first time offenders and that incapacitation sanctions should tend to reduce reoffending among second and multiple OWI offenders. We also hypothesize that this relationship will be mediated by offender's criminal history, such that a prior criminal record or record of previous probation or parole violations will be directly related to the likelihood of reoffending. We hypothesize that after controlling for criminal history and age that treatment effects will be more likely to occur for women than for men.

The findings related to Iowa's alcohol related traffic fatalities do not provide detailed information about the characteristics of alcohol involved drivers involved in car crashes. For example, we do not the extent to which Iowa's alcohol impaired crashes, injuries, and fatalities are caused by first time offenders versus multiple offenders. We hypothesize that these events are more likely to have been caused by repeat offenders who at the time of the crash had relatively high BAC levels.

We do not know the extent to which Iowa drivers in alcohol related crashes previously convicted of OWI received rehabilitative sanctions and/or incapacitation sanctions. We hypothesize that Iowa drivers involved in alcohol related crashes were, at the time of the crash, not subject to incapacitation sanctions that would have reduced the likelihood of their attempting to operate a motor vehicle.

Recent research data indicates that drivers with suspended licenses represent a growing proportion of drivers involved in fatal crashes. We suspect this trend might be indirectly related to an overall increase in the number and rate of OWI convictions. To the extent that offenders are unable or unwilling to comply with the array of OWI criminal and civil sanctions they are not able to have their license to drive or car insurance reinstated. This does not mean that they stop driving. In these instances, OWI laws might actually produce a "backfire effect" in which unlicensed and uninsured high risk drivers cause crashes that are both physically and economically devastating to their victims. We hypothesize that the highest risk OWI defendants are also the defendants who are least likely to have their driver's license and insurance restored and that are the most likely to be involved in post-conviction crashes.

The current study made effective use of data collected from Iowa's Justice Data Warehouse via the Iowa Division of Criminal and Juvenile Justice Planning. A second phase of research would combine these data with data collected from the Iowa Department of Corrections, and the Iowa Department of Transportation.

INTRODUCTION

For more than 20 years, Iowa has experienced an overall decline in number of alcohol related traffic fatalities (ARTFs) and injuries (Iowa Governor's Traffic Safety Bureau 2001; Iowa Governor's Traffic Safety Bureau 2006, National Highway and Traffic Safety Administration 2011). These reductions have benefited all those who travel Iowa's roads and highways. Yet, the basic trend toward fewer alcohol related traffic incidents cannot be taken as evidence of continuing declines. Therefore, policy makers must seek to understand how these positive trends might be extended into the foreseeable future.

The primary goal of this project is to document changes to the demographic profile of OWI offenders in Iowa. In addition, the research evaluates the influence of population shifts, OWI arrest rates, and OWI convictions of on the prevalence ARTFs in Iowa.[1] In this manner, we seek to provide the basis for understanding what can be done to continue Iowa's reductions in OWI behavior. A second goal is build an analytical foundation for a second phase analysis focusing on the efficacy of Iowa's criminal and civil OWI sanctions. Together, these projects will provide guidance for statutory and policy changes that aim to further reduce alcohol impaired driving in Iowa.

The report is organized into four sections. Section one presents an overview of scholarly and agency based research pertaining to alcohol impaired driving and drunk-driving recidivism. Section two discusses the research methodology including primary and secondary aggregate data sources and the statistical tools that were used in the quantitative analysis. The third section present findings derived from the analysis. The fourth section discusses some of the policy and research implications inferred from the analysis.

LITERATURE REVIEW

Demographic Characteristics of Drunk Drivers

A large number of analyses have produced a great deal of information about the demographic characteristics of drunk drivers. Perhaps the most prevalent finding from these studies is the overrepresentation of males as alcohol impaired drivers. In their 1996 analysis, MacDonald and Mann observed, "virtually every study with a comparison group has found that no matter what methodology was employed or how the dependent measure of drinking and driving was defined, males were substantially more likely than females to drink and drive." (1996). A 2002 study of fatality injured drivers found that in contrast to drivers who had not consumed alcohol, fatality injured drivers were likely to be male (Baker, Braver, Chen, Li, and Williams 2002). Research conducted for the Montana Community Change Project and the

[1] In Iowa, drunk driving, including drug-impaired driving, is referred to as OWI: Operating a motor vehicle While Intoxicated. In this report, when referring to other states or research, we also use the labels DUI (Driving Under the Influence) and DWI (Driving While Intoxicated). We use the terms OWI, DUI, and DWI interchangeably.

Institute for Public Strategies produced similar findings. Based on survey data collected from 3,388 attendees of DUI classes, researchers found that males accounted for 74% of Montana's DUI offenders (Evalcorp 2009). Similarly, a New Mexico Department of Health study of DWI offenses that occurred from 2000 through 2007 found that males were "much more likely" than females to be DWI offenders (2009: 3).

At least one analysis indicates that changes to contemporary enforcement strategies might have contributed to a reduction in the gender gap associated with alcohol impaired driving (Schwartz 2008). Using time series analysis of data derived from Federal Bureau of Investigation, the Centers for Disease Control and Prevention, and National Highway Traffic and Safety Transportation Administration, Schwartz assessed the DUI sex ratio from 1984 through 2004. The analysis revealed that despite the absence of "systematic change" in the gender ratio of DUI behavior, and a decline in female arrests for other offenses, female DUI arrests increased during the assessment period. From these findings, Schwartz concluded that changes in legal definitions of alcohol impaired driving (reductions in the permissible BAC levels) inadvertently targeted female drunk driving patterns and consequently narrowed the gender gap in DUI convictions. She recommended that future state level analyses of alcohol impaired driving assess how changes in legislation and enforcement influence female arrest rates for drunk driving.

Research regarding alcohol impaired driving and drivers' age has produced rather consistent findings. Among 6,183 DUI offenders enrolled in an alcohol safety program the average age was 32.1 years (Snow 1988). Similar findings emerged from Gould and Gould's random sample of arrest records for 14,356 DWI offenders (1992). On average, drivers from that sample were 32.8 years old. A 1992 study of 499 drunk drivers revealed that they had an average age of 31.5 years (McMillen, Adams, Wells-Parker, Pang, and Anderson 1992). Baker, Braver, Chen, Li, and William's analysis of traffic fatalities found that drivers with high BAC's were mostly within the 30-49 age range (2002). Although the aforementioned Montana and New Mexico studies did not designate similar age cohort boundaries, their findings on the age variable were comparable. In the Montana study, 42% of DUI arrestees were between the ages of 26 and 45, while 13% were below the legal drinking age of 21 (Evalcorp 2009). New Mexico researchers found that persons 18-39 years old were over-represented in New Mexico's DWI population (New Mexico Department of Health 2009).

Researchers have focused much attention on the intersection between race/ethnicity and alcohol impaired driving. For example, a 1993 agency based study in Texas found that among the population of Texas drunk drivers there was a "widespread overrepresentation" of Hispanics and an underrepresentation of African Americans and Whites among DWI arrestees (Texas Transportation Institute 1993: 12-14). Similar findings were produced in Chang, Lapham, and Barton's survey of more than 5,000 DWI offenders in New Mexico (1996). Based on their logistic regression analysis, Chang, et al. concluded that young, single, male Hispanics and Mexican Nationals had comparatively high rates of DWI convictions. Likewise, the New

Mexico Department of Health (2009) study revealed that Hispanics were overrepresented among that state's population of alcohol impaired drivers. The New Mexico analysis also found an overrepresentation of American Indians and an underrepresentation of African Americans and Whites.

Because state and regional populations vary widely in their racial and ethnic populations, it is useful to consider nationwide data on race/ethnicity and alcohol impaired driving. A recent National Highway Traffic Safety Administration (NHSTA) survey of 6,999 randomly selected interviewees from all 50 states found that non-Hispanic Whites accounted for 85% of drivers who engaged in past month drinking and driving (Moulton, Peterson, Haddix, and Drew 2010). Regarding alcohol related crashes, the survey revealed that 32% of Hispanics versus 7% of non-Hispanic Whites stated that they had been involved in a crash where the driver was reported to have been drinking. In general, the report findings showed that non-Hispanic White males, American Indian males and Hispanic males were at the greatest risk for alcohol impaired driving (Moulton, Peterson, Haddix, and Drew 2010). A separate NHTSA report assessed the extant research findings related to race/ethnicity and alcohol involvement in fatal crashes (Voas and Lacey 2011). According to the report, 35.1% of fatally injured White drivers and 38.2% of fatally injured Black drivers had BAC levels greater than zero. For 30.4% of Whites and 32% of Blacks the BAC level was .08 or greater. By contrast, 57% of fatally injured Native Americans and 47.4% of fatally injured Hispanic drivers had BAC levels greater than zero and 52.7% of Native Americans and 42.1% of Hispanics, had BAC levels equal to or greater than .08.

A second 2010 report published by the NHTSA focused explicitly on race/ethnicity and alcohol impaired driving. In that study the authors asserted that, "extensive evidence that the risk of involvement in traffic crashes varies significantly across racial and ethnic groups." (Romano, Voas, and Lacey, 2010: 1). Their analysis relied upon large traffic data sets and a comprehensive review of, "the most scientifically reliable publications" related to race/ethnicity and alcohol impaired driving. According to Romano, Voas, and Lacey, White and Native American drivers were, "consistently reported among those most at risk for alcohol impaired driving, whereas Asians were among the least vulnerable." (2010: 3). Findings related to Hispanics and African Americans were less straightforward. Although both populations were overrepresented in alcohol impaired driving incidents they reported lower levels of alcohol impaired driving (Romano, Voas, and Lacey, 2010).

The NHTSA data fit within the broad contours of national DUI arrest data compiled for the FBI Uniform Crime Reports (UCR). Together, these data indicate that Whites and American Indians are overrepresented among persons arrested for alcohol impaired driving. From 1995 to 2009, White drivers consistently accounted for more than 85% of America's DUI arrests, with a 15 year average of 87.5% of the nation's DUI arrests (Uniform Crime Reports, 1995-2009). U.S. Census Bureau reports reveal that in 2010 Whites were 72.4 % of the population and non-Hispanic Whites were 63.7 % of the population (2011). From 1995 through 2009, drivers who

were American Indians or Alaskan Natives accounted for an average of 1.43% of nationwide DUI arrests (Uniform Crime Reports 1995-2009). In 2010, American Indians and Alaska Natives were 0.9% of the national population (U.S. Census Bureau 2011). From 1995 through 2009, Black drivers accounted for an average of 9.6% of the nation's DUI arrests (Uniform Crime Reports 1995-2009). In 2009, Blacks accounted for 12.6% of the U.S. population (U.S. Census Bureau 2011). UCR data indicate that from 1995-2009, drivers of Asian descent on average accounted for 1.26% of the nation's DUI arrests. U.S. Census reports indicate that in 2009, Asians were 4.8% of the national population

Unfortunately, UCR data does not include a separate category for Hispanic arrestees. Instead, Hispanic arrestees are frequently designated as White. Demographic findings related to Hispanics and alcohol impaired driving must therefore be interpreted with caution. This is especially true given the intra-population differences among Hispanics. For instance, Caetano and Clark's nationwide survey found that US-born Hispanics were roughly three times more likely than Hispanics born abroad to engage in drinking and driving (2000). Caetano and Clark speculated that their findings might have simply reflected a higher rate of vehicle ownership and miles driven among U.S.-born Hispanics.

Drunk-Driving Recidivists

Previous estimates indicate that about one-third of all drivers arrested for OWI are repeat offenders (National Highway Traffic Safety Administration 1995). By definition, drunk-driving recidivists are a subpopulation of offenders who are resistant to treatment and enforcement interventions. Despite an overall decrease in alcohol related crashes, and fatalities, repeat drunk drivers continue to pose a considerable risk to traffic safety. For this reason, researchers have focused increasingly on attempting to specify the demographic and psychological characteristics of drunk-driving recidivists.

Several studies indicate that males are more likely than females to be repeat drunk driving offenders. Meyer, Anderson, Perrine, and Fortini's survey of 1,355 convicted male and female DUI offenders found that males were significantly more likely to have multiple DUI offenses, higher alcohol consumption, and negative personality traits (1993). In its analysis of drunk-driving injuries, fatalities, and recidivism, the New Mexico Department of Health sought to link recidivism outcomes to characteristics of DWI offenders (2009). Using two statewide samples of 76,091 DWI convictions screened through the state DWI Screening and Tracking System researchers were able to assess recidivism risks among different categories of DWI offenders. According to the New Mexico study, males were more likely than females to reoffend; younger offenders were more likely to reoffend than were older offenders; and the risk of reoffending increased with offenders' prior record. The analysis revealed that first time OWI offenders were significantly less likely to be rearrested than drivers who had prior convictions

and that the recidivism risk was especially high among drivers who had three or more prior DWI convictions.

The New Mexico Department of Health study found that ethnicity was a significant predictor of recidivism, with American Indians almost twice as likely to reoffend as Non-Hispanic Whites (2009). According to the analysis, Blacks and Hispanics were at a 50% greater risk of re-arrest than Non-Hispanic Whites. Cherpitel and Bond's (2003) study of the driving records of 949 DUI offenders found that among convicted offenders in a northern California county, Mexican Americans were significantly more likely to recidivate in the year following their conviction. By contrast, among those arrested but not convicted, White offenders were more likely to be repeat DUI offenders. Again, it is worth noting that these findings might reflect regional differences in the racial/ethnic compositions within the broader populations from which the samples were drawn.

Most drunk driving research that includes data on drivers' age reveals that first time offenders tend to be younger than multiple offenders. Reynolds, Kunce, and Cope's (1991) assessment of first time and repeat DWI offenders found that on average the former were in their late 20's and were four years younger than multiple offenders. In their study of 77 DUI recidivists, Cavaiola, Strometz, and Abero found that the average age at the time of first offense was 29.6 and that the mean length of time between first and second offenses was six years (2007). Likewise, a recent NHTSA publication on alcohol and highway safety found that the largest percentage of drivers involved in alcohol related crashes was between the ages of 21 and 34 (Voas and Lacey 2011).

Rauch, Zador, Ahlin, Howard, Frissell, and Duncan (2010) assessed 100 million Maryland driver records from the years 1973 to 2004. They found that any alcohol impaired driving violation was a significant predictor of a future drunk driving arrest. However, the risk of reoffending increased dramatically for drivers who had more than one violation. For example, the drunk-driving rate for offenders with three prior violations was two times greater than the rate for drivers who had a single violation. In contrast to the analysis of New Mexico drivers, Rauch, et al. found that women and men who had at least one prior OWI conviction posed an equal risk of reoffending.

Psychological Traits

Over the past four decades, many researchers have examined the influence of psychological factors on drunk driving (Steer and Fine 1978; Johan and Wilson 1986; McMillen, Pang, Wells-Parker and Anderson 1991; Lapham, Smith, Baca, Chang, Skipper, Baum and Hunt 2001; Karlsson and Romelsjo 1997). An analysis of 729 repeat DUI offenders exemplifies much of the research regarding the personality traits of drunk driving recidivists (Shaffer, Nelson, Laplante, LaBrie, Albanese, and Caro 2007). DUI recidivists in that study, "evidenced high lifetime and 12 month prevalence of alcohol use and drug use disorders, conduct disorder,

posttraumatic stress disorder, generalized anxiety disorder, and bipolar disorder compared with the general population." (Shaffer, et al. 2007: 795).

We found fewer studies that explore whether single and multiple DUI offenders differ in terms of their psychological characteristics. Reynolds, Kunce, and Cope (1991) administered personality inventories to assess psychological differences between 64 repeat and 174 first-time DUI offenders. Findings derived from psychological assessment instruments led the authors to conclude that an orientation to stability might influence multiple offenders' reliance on alcohol as a means for releasing pent-up emotions (Reynolds, Kunce, and Cope 1991). Using psychological assessment and interview data collected from 499 DUI offenders, McMillen, Adams, Wells-Parker, Pang, and Anderson found that multiple offenders were more likely than first time offenders to have serious psychological problems (1992). The assessment instrument used in McMillen et al.'s analysis revealed that multiple offenders scored significantly higher on, "hostility, sensation seeking, psychopathic deviance, mania, and depression … and significantly lower in emotional adjustment and assertiveness." (1992: 407). Portions of those findings were affirmed by Nochajski, Wieczorek, and Miller (1996) who found that DUI offenders who recidivated within 12 months of their first offense were characterized by impulsivity and sensation seeking.

Recent research has called into question the extent to which psychological factors affect DUI recidivism. Using covariance structure modeling (path analysis) Schell, Chan, and Morral (2006) assessed the influence of personality, attitudinal, and behavioral variables on repeat DUI offending. In contrast to earlier analyses, sensation seeking was only indirectly related to DUI recidivism. Moreover, the indirect effect disappeared after including controls for drinking frequency and driving style. Likewise, the inclusion of control variables eliminated the influence of hostility and impulsivity on DUI behavior. The authors did find that respondents' attitudes about drinking had a significant impact on DUI recidivism. Specifically, respondents with positive expectations about alcohol consumption were significantly more likely to persist in drinking and driving.

At least one study found no significant psychological differences between first time and multiple offenders. Cavaiola, Strohmetz, and Abreo (2007) conducted a twelve year follow-up with subjects who participated as first time offenders in an earlier study. Each participant completed the Michigan Alcohol Screening Test (MAST) and the Minnesota Multiphasic Personality Inventory-2 (MMPI-2). The results revealed that 38% of the sample had been re-arrested for a second DWI offense. The average period of time between the first and second offense was six years. The analysis did not reveal significant psychopathological differences between recidivists and non-recidivists.

Criminal History

A newer line of research focuses on possible links between drunk driving recidivism and prior criminal records for crimes other than drunk driving. Gould and Gould (1992) used criminal records from a random sample of 723 Louisiana DWI offenders to evaluate the hypothesis that DWI recidivists would have more serious prior records than individuals with only a single DWI arrest. The analysis revealed that multiple-DWI offenders were more likely to have committed criminal acts than were first-time offenders. Multiple offenders were also more likely to have been arrested for acts of violence. Only 4.3% of single DWI offenders satisfied the "career criminal" criteria. By contrast, 30% of the multiple offenders fit within "career criminal" category. Peck, Arstein-Kerslake, and Herlander's (1994) regression analysis of data from the driving records of first time and multiple DUI offenders examined several possible predictors of DUI recidivism. Their analysis isolated prior involvement in traffic violations and accidents as the strongest predictor of having multiple DUI convictions. Siegal, Falck, Carlson, Rapp, Wang, and Cole (2000) interviewed and administered surveys to 126 male inmates incarcerated for multiple alcohol and/or drug related vehicular offenses. They found that 61% of the sample reported arrests for crimes other than drunk driving. On average, study participants reported 5.5 arrests for crimes other than DUI. Forty-one percent of the sample had been previously arrested for drug crimes.

The extant literature suggests several possibilities pertaining to the demographic characteristics of convicted OWI offenders in Iowa. In terms of gender, we expect that both first time and multiple offenders are more likely to be male rather than female. However, in accordance with the findings from Schwartz's 2008 study, we anticipate a narrowing of the OWI gender gap. Prior research findings predict that the majority of people convicted of OWI in Iowa will be between the ages of 25 and 40, and that defendants with one conviction will be significantly younger than those who have multiple convictions. A variety of the methodological issues make it difficult to generalize about the relationship between race/ethnicity and alcohol impaired driving. These difficulties notwithstanding, the existing literature suggest certain outcomes related to Iowa's population of convicted OWI offenders. We anticipate that during the period of interest, up to 80% of those offenders will be White. It is also likely that Native Americans will be overrepresented. Given the changing demographics of Iowa's Hispanic population we are reluctant to speculate as to the proportion of Hispanics convicted for OWI. However, the totality of research findings presented here suggest that the percentage of Iowa Hispanics convicted of OWI will be at least equal to, or exceed the proportion of Iowa's Hispanic population. The data collected for this report does not enable us to predict outcomes related to the prior criminal histories or personality traits of Iowa's population of OWI offenders.

METHODOLOGY

Both aggregate and case-level data were used for this analysis. Aggregate data were collected from the FBI Uniform Crime Reports, the Iowa Department of Public Safety, the Iowa

State Data Center of Iowa, and the National Highway Traffic Safety Administration's Fatality Analysis Reporting System data from 1995-2009. The data from these sources were downloaded into MS Excel files and used to create graphic presentations of national, multiple state, and Iowa trends related to alcohol impaired driving. Multiple state trends pertain to states within the U.S. Department of Transportation's (USDOT) Region VII comprised of Iowa, Kansas, Missouri, and Nebraska. Most of the aggregate information for this study was straightforward and required little or no recoding. Census data were merely organized into age range intervals appropriate for the analysis.

The problems associated with UCR data are well documented. Among other things the UCR program depends entirely on the willingness and ability of local law enforcement agencies to submit properly completed data reports to the FBI. Annual variations in the number of agencies and the population data reported to the UCR can make comparisons problematic. Therefore, an additional source of data that is often used to evaluate the prevalence and patterns in alcohol impaired driving is the NHTSA's Fatality Analysis Reporting System (FARS). FARS data files contain detailed information on every fatal traffic crash that has occurred in the United States since 1975. Because of its reliability, the FARS data on alcohol related fatalities is frequently used by researchers to evaluate prevalence and patterns in alcohol impaired driving, both nationally and in all 50 states and the District of Columbia.

Case level data on OWI convictions in Iowa were provided by Iowa's Justice Data Warehouse via the Iowa Division of Criminal and Juvenile Justice Planning. The data set contains information on OWI convictions adjudicated from January 1, 2000 through December 31, 2009. The data were downloaded from the Iowa Courts online record system and transferred to the researchers in a spreadsheet file. The initial data set contained over 400,000 records. Because the courts apparently enter a new record for each major disposition, there were many multiple records for single cases. For example, if a particular defendant entered a guilty plea and was sentenced to a jail term that suspended to probation, there could be as many as four records for that single case. Fortunately, each record included a case identification code, offender date of birth, race, and the county where the case was adjudicated. These data enabled us to use the SPSS ® *IDENTIFY DUPLICATE CASES* procedure and the *MERGE FILES* procedure to restructure the data so that the non-redundant information on each case could be placed into a single record. These procedures yielded a final sample of 118,675 cases that resulted in either a conviction or deferred judgment during the calendar years 2000 tthough 2009. We believe this to be a close approximation of all OWI convictions in Iowa courts during that time frame. The reader is reminded that the unit of analysis is *cases resulting in conviction*, and not individual offenders. It is possible, even highly likely, that some offenders appear in the data set multiple times. The main data set was used to create additional data sets, one with counties as the unit of analysis, and one organized by year. The data were analyzed using SPSS®. Frequencies, crosstabs, comparison of means, and regression analysis were used to reveal trends and compare distributions of OWI cases across demographic variables.

The original proposal for this project included plans to produce multivariate classification analyses using procedures such as cluster analysis. These analyses were performed, but did not lead to productive results. The main reason for this outcome was the heavily skewed distributions of several key variables. For example, persons convicted of OWI are overwhelmingly White males convicted of serious misdemeanor OWI. Therefore, classification procedures resulted in clusters that were virtually identical to the cells in a cross-tabulation of the variables (ethnic groups, offender sex and offense class). In other words, one cluster included White males convicted of serious misdemeanor OWI, the next included Hispanic males convicted of serious misdemeanor OWI, and so on. For these reasons, findings from the cluster analyses are not reported here, but are available upon request.

ANALYSIS

The analysis is divided into two major subsections. The first subsection discusses findings based on aggregate data related to alcohol impaired driving trends over the past 13-16 years. For comparative purposes, we have included national, multiple state, and Iowa trends. Multiple state trends are for three of the four states that comprise USDOT Region VII where Iowa is located. Iowa trends are considered separately. The second subsection presents an analysis of OWI convictions adjudicated in Iowa from 2000 through 2010.

ARRESTS AND FATALITIES: NATIONWIDE, MULTIPLE STATE, AND IOWA

National Trends

Beginning in the early 1980's the US began to enjoy a remarkable decline in alcohol impaired driving. The decline was evident in substantial nationwide decreases in ARTFs. From 1982 through 1994, nationwide percentages of ARTFs declined by almost one-third, from 55% to 38% (Voas and Lacey 2011). Similar declines were seen arrests for impaired driving. From 1986 through 1995, the number DUI arrests nationwide declined 25% (Uniform Crime Report 1995). At this same time, the nationwide DUI arrest rate (number of arrests per 100,000 residents) decreased 30% from 754 in 1986 to 526 in 1995 (Uniform Crime Report 1995). The next ten years witnessed a continued but somewhat slower rate of decline in DUI arrests.

Figure 1 shows nationwide DUI arrest rates among the total resident populations in jurisdictions that reported annual crime data to the FBI, and among the nationwide population of licensed drivers.[2] From 1995 through 2009, the resident arrest rate declined 11.8% and the licensed driver rate 9.3%. The trajectories of change were in sharp relief during the 1990's. From 1995 through1999, the DUI arrest trend for the resident population declined slightly. The

[2] For purposes of this report, resident rates and licensed driver rates do not refer to base populations that include *only* residents or *only* licensed drivers. These rates refer to the number of arrests, ARTFs, etc. *per* 100,000 residents or licensed drivers. For example, a licensed driver rate for OWI arrests or ARTFs might include many arrestees or fatalities who were not licensed drivers. Likewise, non-residents are included among the number of arrestees or fatalities per 100,000 residents. Data on the number of licensed drivers was derived from the NHTSA FARS.

resident rate declined 17% from 1999 through 2005, and then from 2005 through 2009 stabilized within a range of 460 to 480 arrests per 100,000 residents. By contrast, the licensed driver DUI arrest rate declined 17% from 1995 through 2000. During the following nine years, it slowly increased by 9%.

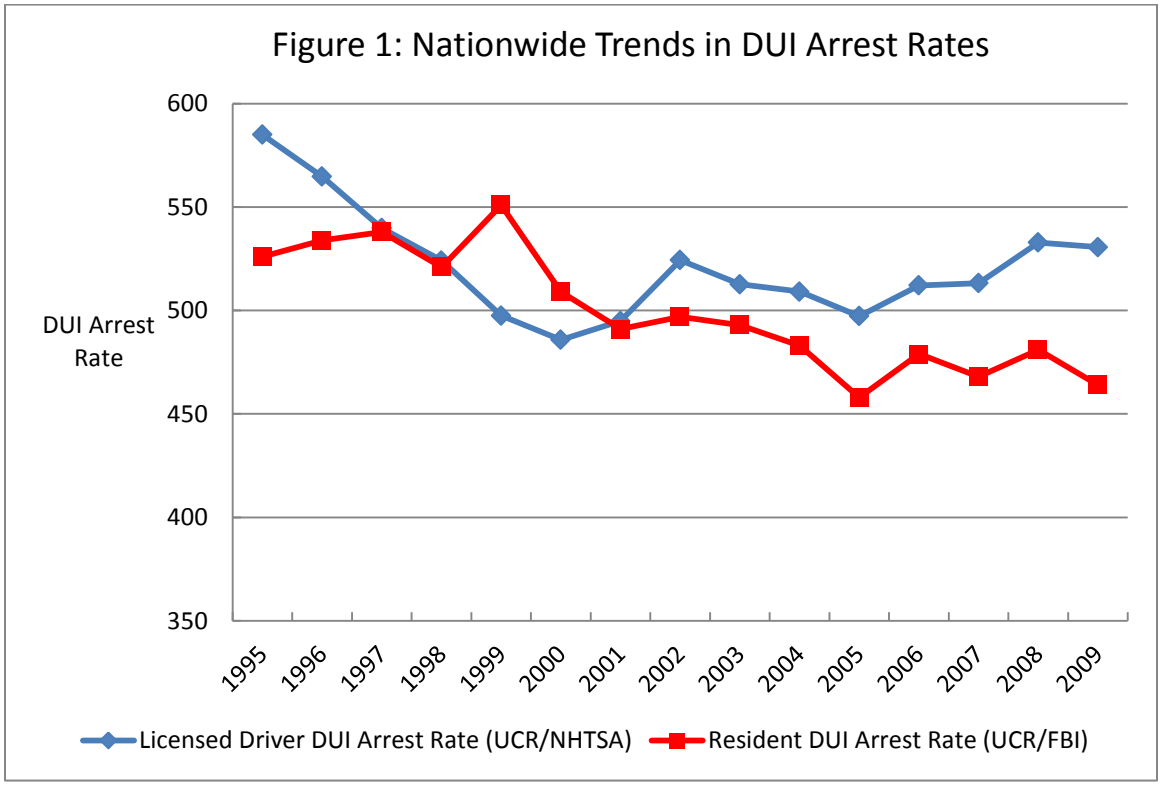
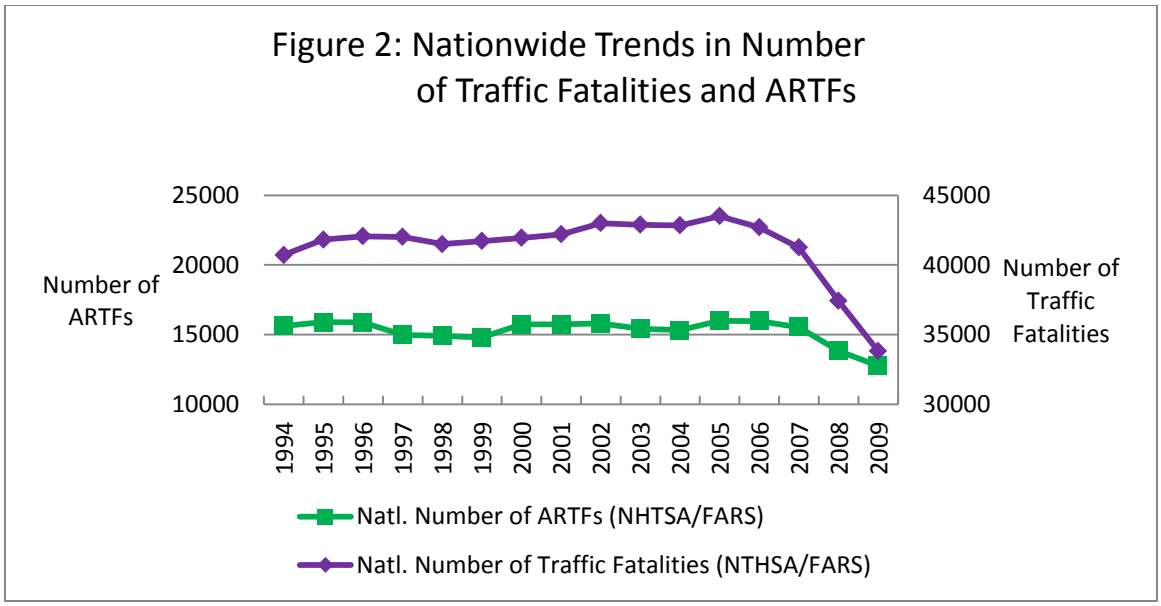


Figure 2 presents 1994 through 2009 nationwide trends in the number of traffic fatalities and ARTFs. During that period, the annual number of traffic fatalities declined 17%, from 40,716 in 1994 to 33,808 in 2009. From 1994 through 2005, traffic fatalities increased 6.8%, followed by a sharp four year decline of 22%. A similar pattern is present in the ARTF trend. Over the 15 year period, the number of ARTFs declined 18%. Virtually all that decline is attributable to the period of 2006 through 2009 when the number of ARTFs declined 20%.

Trends for nationwide traffic fatality rates are shown in Figure 3. The trends for both the resident population and licensed driver rates are fairly similar. From 1994 through 2009, the overall rate for the nationwide resident population declined 29.6% and the rate for the nation's licensed drivers decreased 30%. Most of the rate occurred between 2005 and 2009. During those years, both rates had declines of 25%.



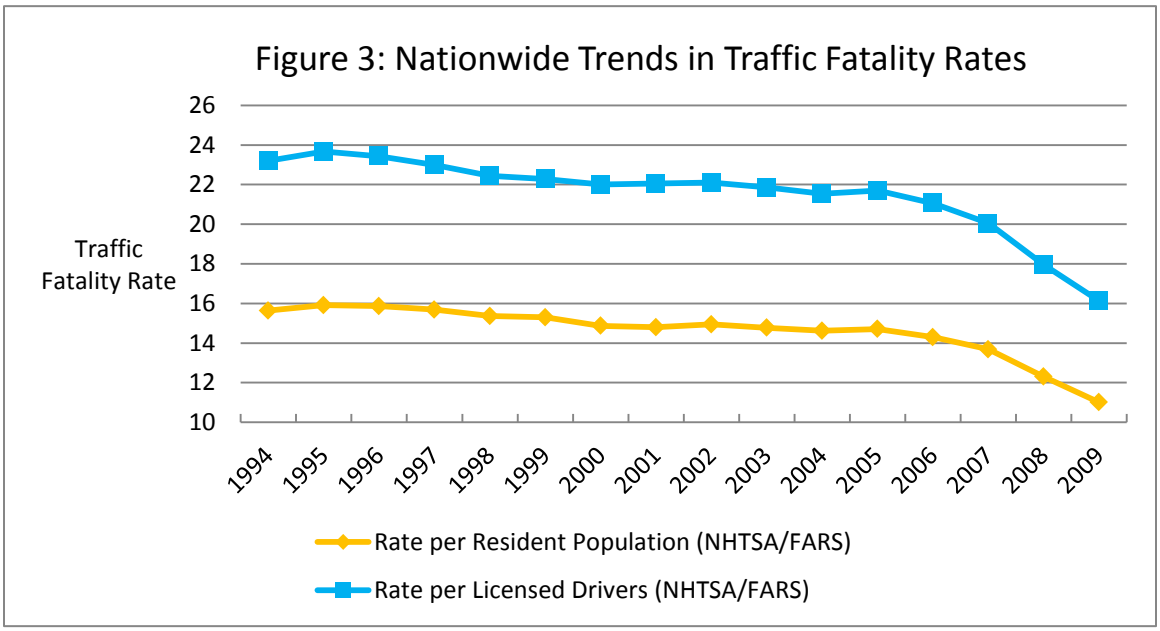
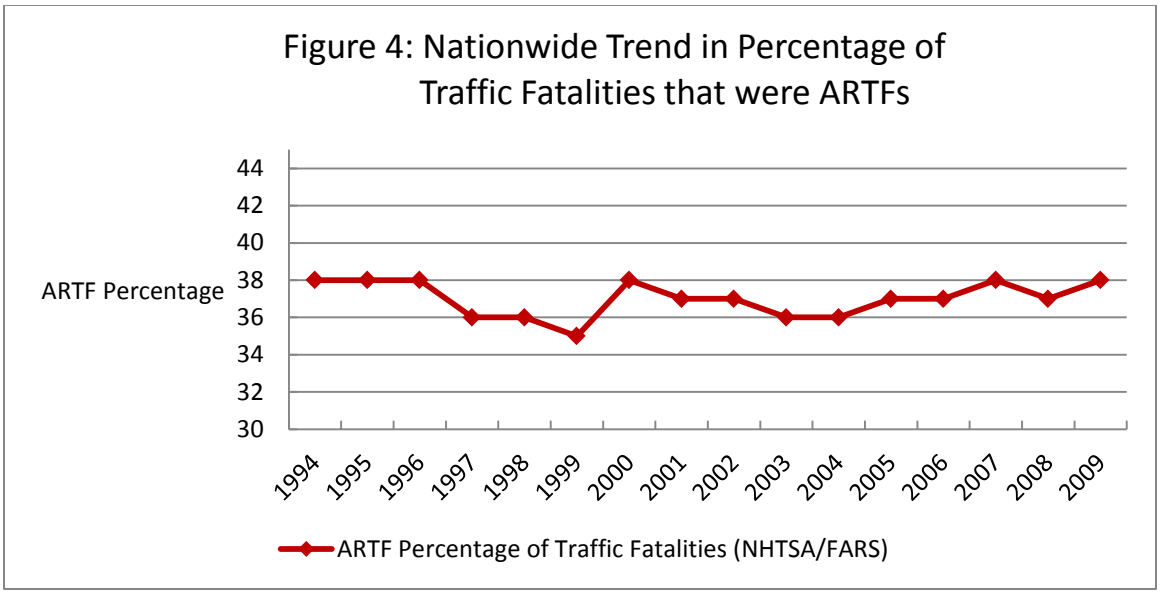
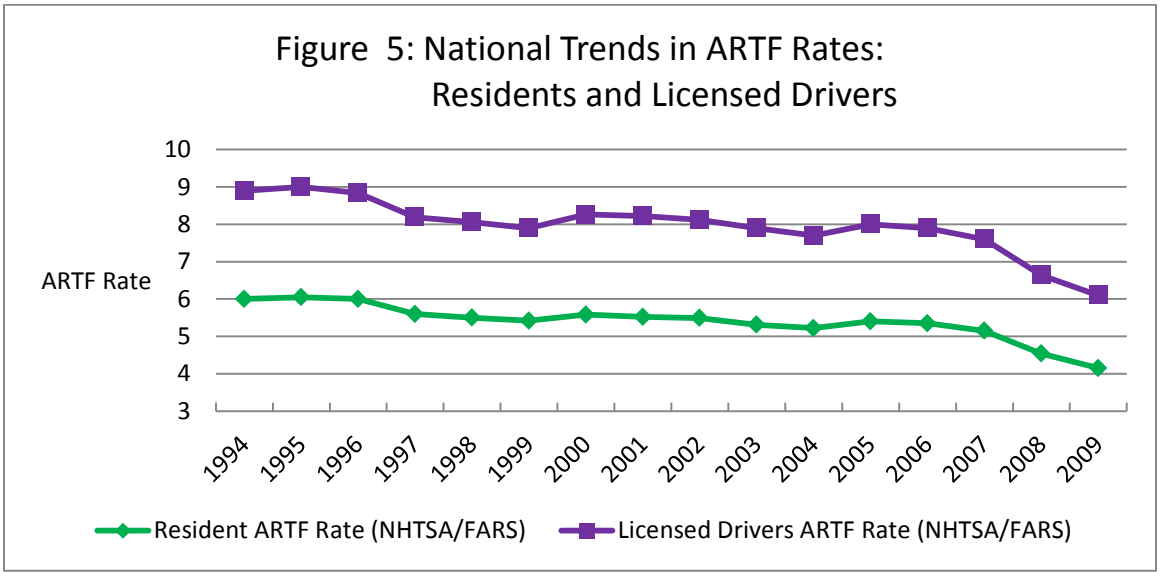


Figure 4 illustrates the 1994 through 2009 percentages of nationwide traffic fatalities that were alcohol related. Except for a three year period from 1997 to 1999, the ARTF percentage trended at around 37% or 38%. In both 1994 and 2009, ARTFs amounted to 38% of all traffic fatalities in America.



Because they help control for the effects of broader changes in the population, the nationwide trend in ARTF *rates* reveal different trajectories of change than the raw numbers presented in Figure 2. Figure 5 presents two rates, the number of ARTFs per 100,000 residents and the number of ARTFs per 100,000 licensed drivers.



From 1994 through 2009, the ARTF rate for population residents and licensed drivers decreased 31%. Both trend lines in Figure 5 show a similar pattern. From 1994 through 1999, the ARTF rate for residents declined 9.6% and the ARTF rate for licensed drivers decreased 11%. Between 1999 and 2005, both trends were relatively flat. Among population residents, the rate declined 0.3% and among licensed drivers it increased 1.3%. These trajectories were

followed by relatively steep four year declines of 23% in the ARTF rate among residents and a 24% drop in the ARTF rate among licensed drivers.

Summary of National Trends

Any effort to assert a causal relationship between national DUI arrest rates and declines in ARTFs is speculative at best. From 1994 through 2005, nationwide ARTF rates declined steadily to an overall decrease of about 10%. During the same period, both national DUI arrest rates also declined, albeit with different trajectories.

Evidence that arrest rates placed downward pressure on DUI rates would presumably involve an inverse relationship between the variables. In other words, an increase in DUI arrest rates would have contributed to a decrease in ARTFs and a decrease in arrest rates would have contributed to an increase in ARTFs. Therefore, it is hard to imagine how nationwide decline in DUI arrests would lead to declines in ARTFs.

From 1995 through 2005, the nationwide licensed driver DUI arrest rate increased 7%. During this period that ARTFs nationwide underwent a steep decline. It seems unlikely that a 7% increase in enforcement could generate a nationwide ARTF decline 300% higher than the increase in arrest rates.

It seems clear that for the 2005 through 2009 nationwide decline in ARTFs to be the product of enforcement patterns it would have to result from a *lag effect*. In other words, prior increases in enforcement trends would cause subsequent declines in ARTFs and declines in enforcement activity would lead to subsequent increases in ARTFs. Table 1 summarizes the national trends for five time periods. Of these the 1994/5 through 2000, 2000 through 2005, and 2005 through 2009 are helpful for explicating a possible lag effect of DUI enforcement on ARTFs. The shaded areas in Table 1 show the data cells that would be implicated in a lag effect. From 1995 through 2000, national DUI arrest rates were in decline. During the subsequent time period ARTF rates also declined. From 2000 to 2005, nationwide DUI arrest rates mostly declined. During the next five years ARTF rate also declined. These patterns are not consistent with an enforcement lag effect.

Another possibility is that national declines in ARTFs reflect a parallel decline in alcohol impaired driving that result from a correspondingly lower supply of drivers who were at risk for a DUI arrest. For this proposition to be true we would expect roughly similar nationwide trajectories for rates of DUI arrests and ARTF rates. The DUI and ARTF rates among licensed drivers reveal interesting departures from that expectation. From 1999 through 2000, the nationwide licensed driver DUI arrest rate increased 4.5% (see Figure 1). From 2004 through 2005, it increased 3.9%. The amounts of these single year increases are not trivial. From 1999 through 2000 and from 2004 through 2005, the nationwide ARTF rates among licensed drivers

produced single year declines of 2.3%. These opposing trends cast doubt upon the notion that nationwide declines in DUI arrests somehow contributed to corresponding declines in ARTFs.

Table 1: Summary of Nationwide Trends (Percentage of Change)

	1994/5 -* 2009	2000-2009	1994/5 -* 2009	2000-2005	2005-2009
Arrest Rates - Residents	-11.8	+8.8	**-3.2**	**-10**	+1.3
Arrest Rates - Lic Driv	-9.3	+9.2	**-17**	**+2.4**	+6.7
Number of T Fs	-17	-19.4	+3	+3.7	-22
T F Rate – Residents	-29.6	-26	-4.9	-1.1	-25
T F Rate - Lic. Drivers	-30.1	-26.7	-5.2	-1.3	-25
Number of ARTFs	-18	-19	+7.7	+1.5	-20
Percentage of ARTFs	no change	-8.6	no change	-2.7	-2.7
ARTF Rate - Residents	-31	-25.6	-7	**-3.2**	**-23**
ARTF Rate - Lic Driv	-31	-26.1	-7.2	**-3.1**	**-24**

*Fatality percentages are for 1994 through 2009. Arrest percentages are for 1995 to 2009

The comments above are not to suggest that nationwide DUI enforcement is unrelated to alcohol impaired driving nationwide. However, the relationship between these variables is sufficiently complex as to cast doubt upon the notion that intensified DUI enforcement will lead directly to significant declines in drunk driving.

Multiple State Trends Within USDOT Region VII

The analysis of multiple state variations in DUI arrests and ARTF trends are based on UCR and FARS data. Using these data we examined patterns in three states, Kansas, Missouri, and Nebraska that comprise thrre of the four states within USDOT Region VII. The remaining Region VII state, Iowa, is discussed separately.

DUI arrest data for the three states show evidence of inconsistent reporting of crime data from local police agencies to the FBI. For instance, from 1994 through 2001, Kansas did not report any usable crime data to the FBI's UCR program. In addition the data show unusual variations in DUI arrest rates in Missouri and Kansas from 1995 through 1997. For this reason, we present graphs that include the years 1995 and 1996 as well as graphs that do not include those years.

Figures 6-a and 6-b illustrate DUI arrest rates among the resident populations of jurisdictions that reported UCR crime data from 1995 through 2009. Figure 6-a shows dramatic declines in DUI arrest rates from 1995 through 1996 followed by steep increases from 1996 through 1997. Missouri arrest rates declined 82% in the first year, followed by an increase of more than 300% from 1996 through 1997. A similar, though not so dramatic decline occurred in

Nebraska. In that state an initial decline of 54% in the arrest rate among residents was followed in the next year by a 78% increase. Figure 6-a shows a 43% decline in Missouri's DUI arrest rate from 1995 through 2009. From 1995 through 2009, the DUI arrest rate in Nebraska declined 21%.

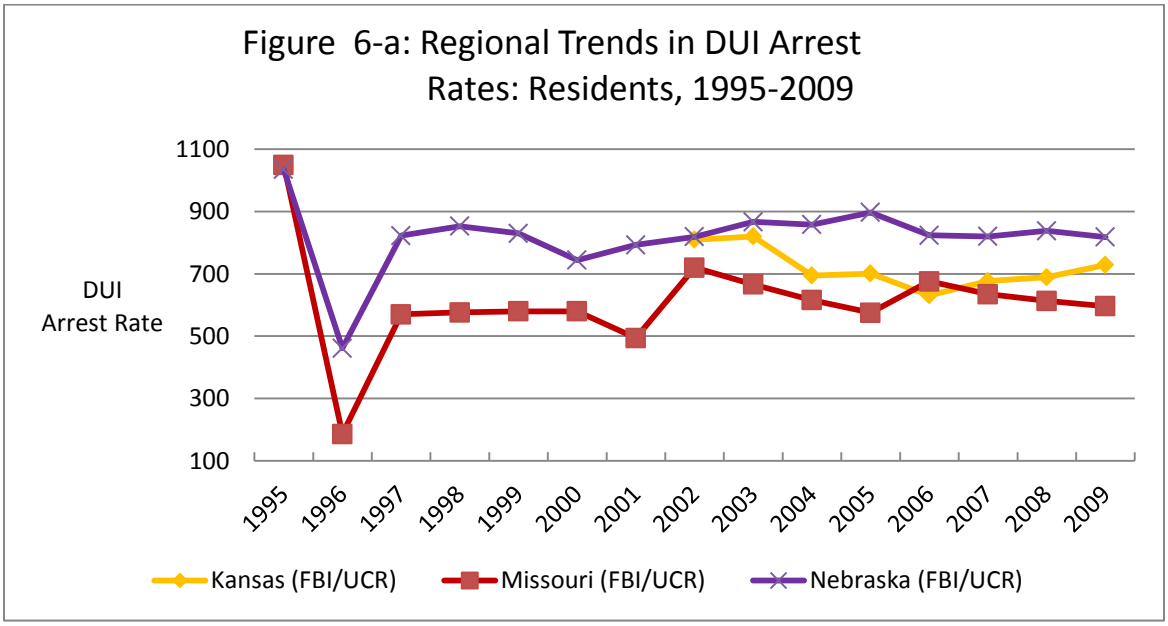
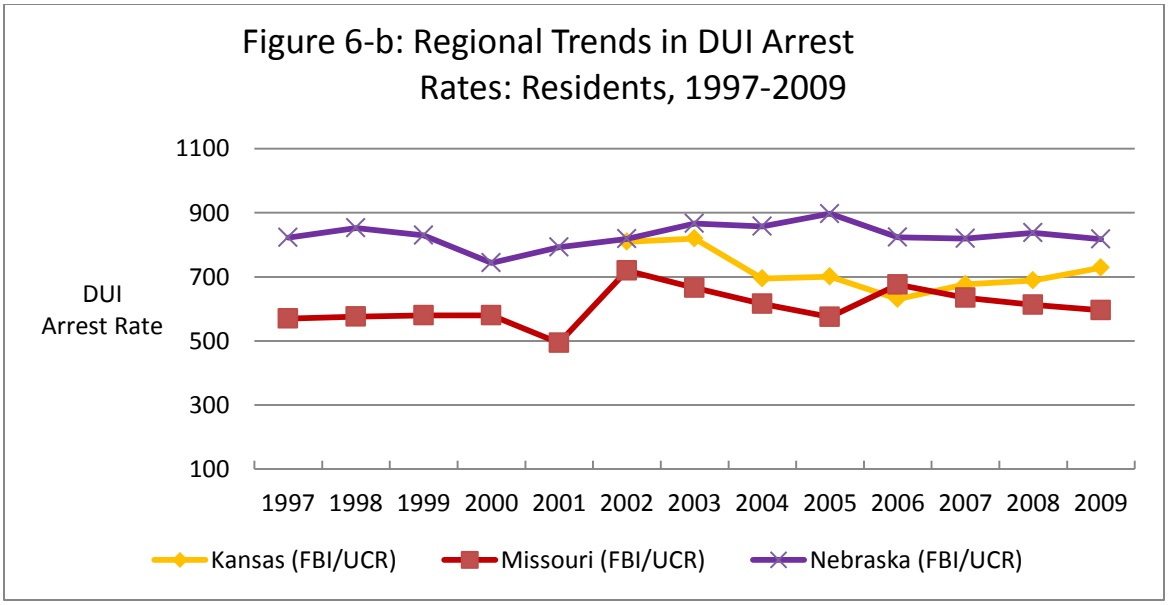


Figure 6-b does not include the DUI arrest rate data for 1995 and 1996. Although the Missouri and Nebraska trend lines in Figure 6-b show moderate fluctuations, the overall trends are relatively flat. From 1997 through 2009, Missouri's DUI arrest rate among the resident population culminated in an overall increase of 4.6%. A significant increase from 2001



through 2002 was followed by three years of decline in Missouri's DUI arrest rates. From 1997 through 2009, the rate of DUI arrests among Nebraska's resident population decreased 0.6%. After declining 22% from 2002 through 2006, Kansas arrest rates increased 16% during the next three years. From 2002 through 2009, there was a10% decline in Kansas's overall resident arrest rate.

Figures 7-a and 7-b illustrate DUI arrests rates among licensed drivers in Kansas, Missouri and Nebraska. As in the nationwide trends, data for the number of licensed drivers was acquired from the NHTSA FARS. Figure 7-a shows a 13% decline from 1995 through 2009, in Missouri's licensed driver DUI arrest rate. During the same period, the Nebraska rate decreased 27%. From 2002 through 2009, Kansas experienced a 17% increase in its licensed driver DUI arrest rate.

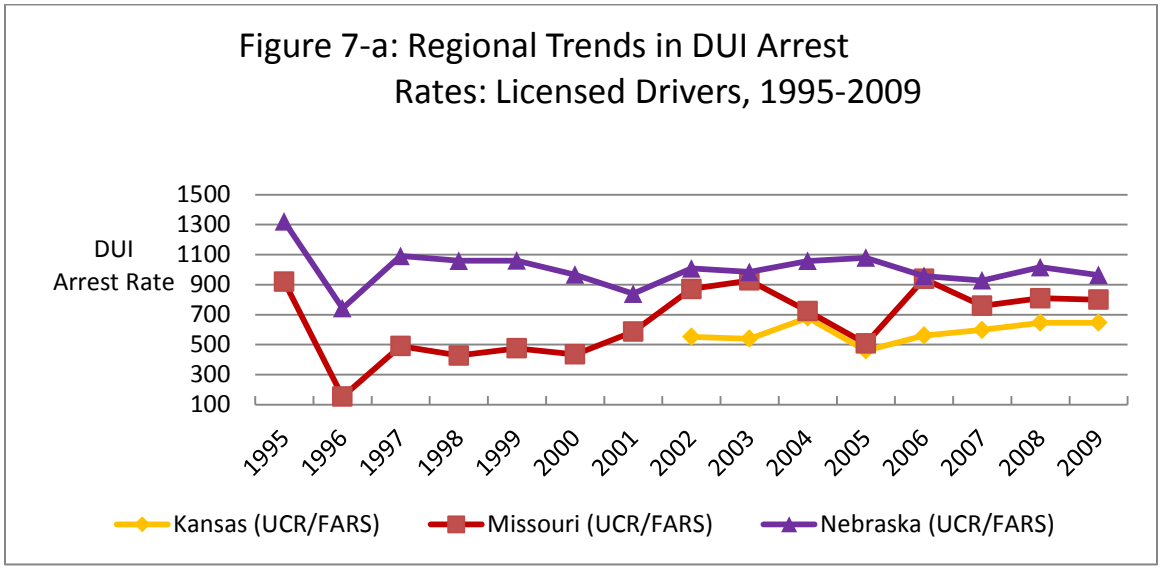
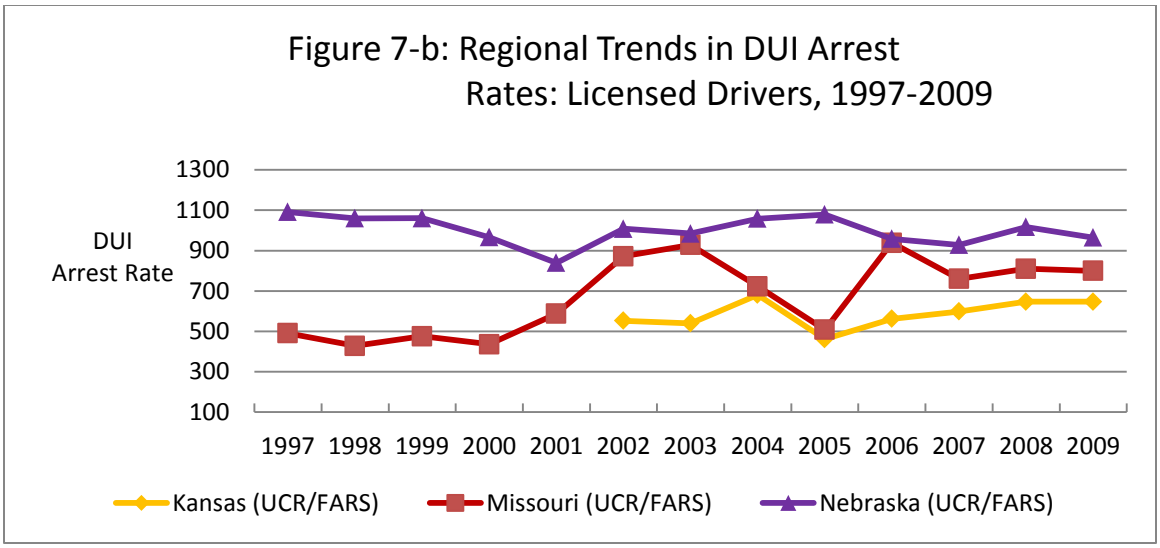


Figure 7-b does not provide licensed driver arrest data for 1995 and 1996. From 1997 through 2009, DUI arrests among Missouri's licensed drivers increased 63%. That trend is in sharp contrast to the 13% *decline* shown in Figure 7-a. From 1997 through 2009, the Nebraska licensed driver arrest rate declined 11.6%, compared to the 27% decline shown in Figure 7-a. Of course, the changes Kansas rates of arrest among licensed drivers from 2002 through 2009 are the same in Figure 7-a and 7b.

Where Figure 6-a shows a 43% decline in Missouri's 1995 through 2009 resident population arrest rate, Figure 7-a illustrates a decline of only 13% in the Missouri licensed driver arrest rate. In Figure 6-a, Kansas arrest rates among the resident population declined 10% from 2002 through 2009. By contrast, Figure 7-a shows the licensed driver arrest rate *increased* 17%. The Nebraska rates were comparable with overall declines of 21% among the resident population and 27% among licensed drivers.



Two of the statewide trends in Figures 6-b and 7-b are in sharp contrast. From 1997 through 2009, arrest rates among Missouri's resident population increased 4.6%. But during the same period, the rate among Missouri's licensed drivers increased 63%. Figure 6-b shows a 0.6% increase in the arrest rate among Nebraska's resident population, while Figure 7-b shows a 19 times greater increase of 11.6%. From 2002 through 2009, Kansas' residential population arrest rate decreased 10% while the licensed driver arrest rate increased 17%.

Figures 8-10 presents traffic fatality trends in Kansas, Missouri, and Nebraska. From 1994 through 2009, the number of traffic fatalities in Kansas, Missouri, and Nebraska declined 12.6%, 19.4% and 17.7%, respectively. The primary difference among these trends was the trajectory of decline. Most of the Missouri decline took place from 2005 through 2009 as fatalities declined 30%. By contrast, a 24% decline in Kansas traffic fatalities was spread over the seven year period of 2002 through 2009. These were the same years that Nebraska's number of traffic fatalities declined 27%.

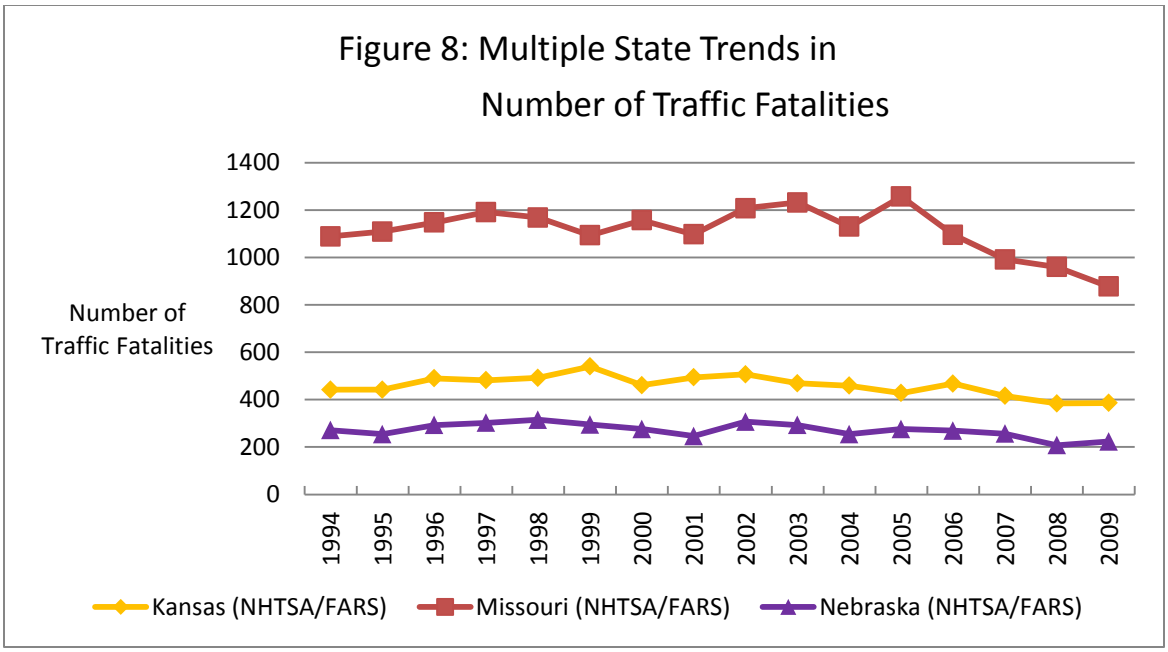
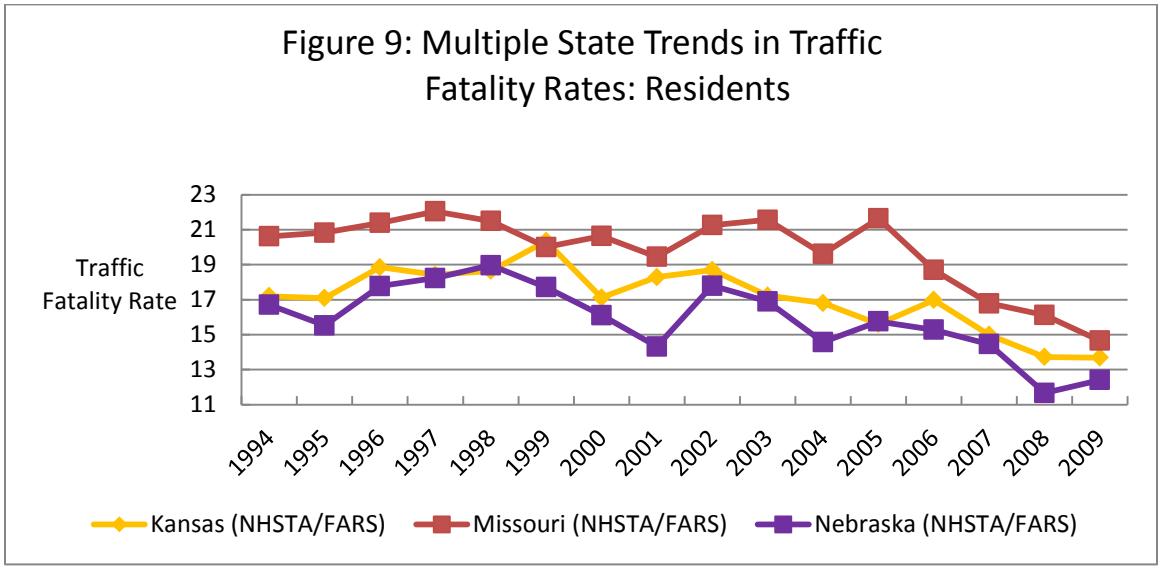
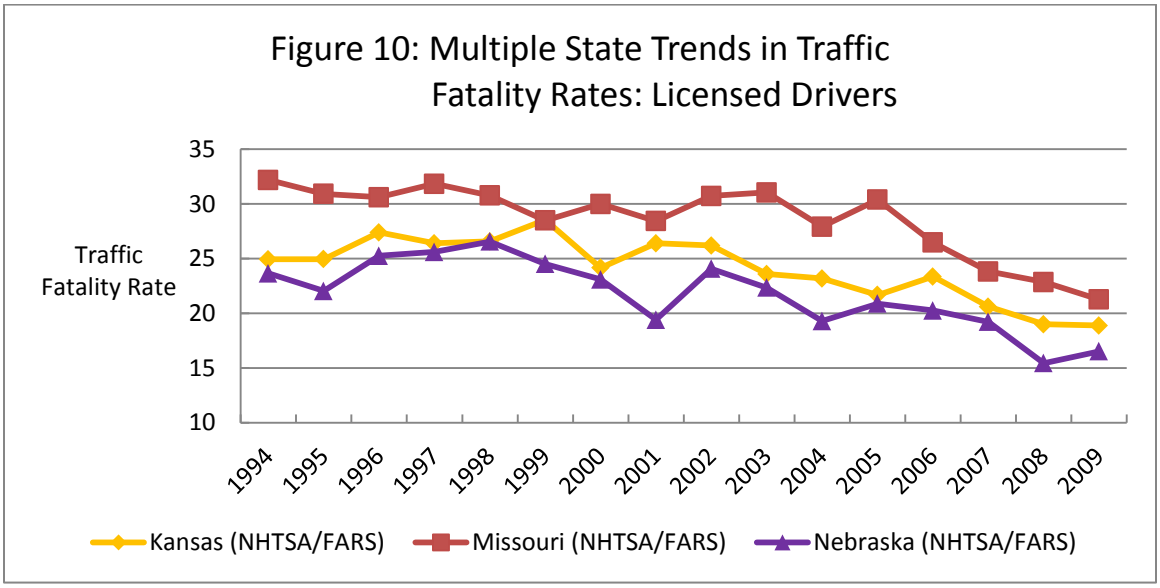


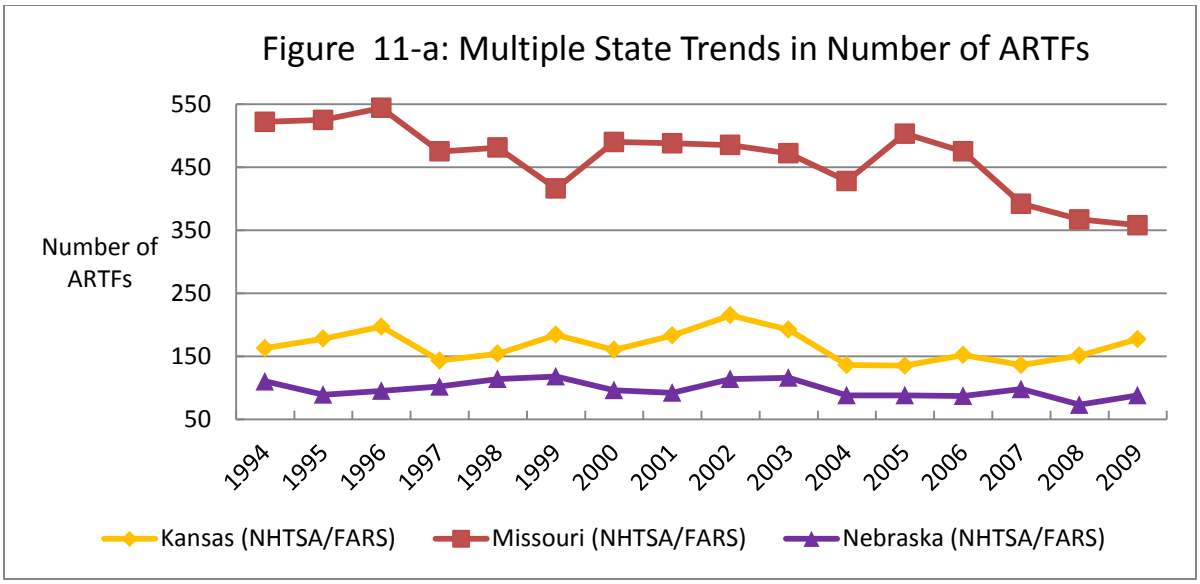
Figure 9 shows the relative declines in traffic fatality rates among the resident populations of Missouri, Kansas, and Nebraska. In all three states, the rate of decline in traffic fatalities among residents was larger than the decline in the number of fatalities. From 1994 through 2009, the traffic fatality rate among Kansas residents declined approximately 20%. The Missouri and Nebraska rates declined 29% and 26%, respectively.

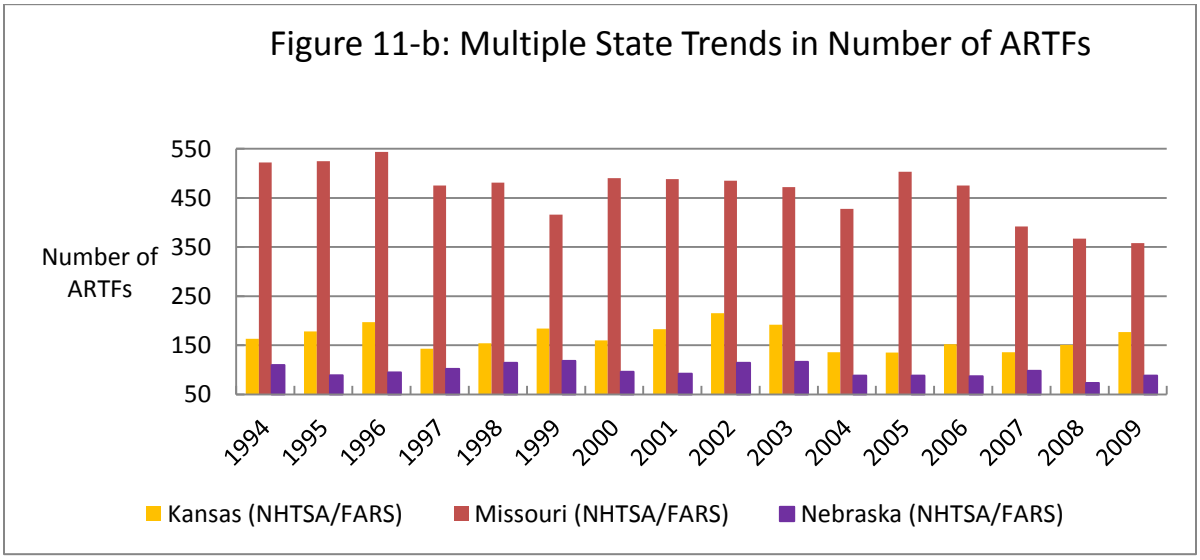


The licensed driver traffic fatality rates for Kansas, Missouri, and Nebraska are shown in Figure 10. From 1994 through 2009, the traffic fatality rate among licensed drivers in Kansas declined 24%. The Missouri and Nebraska rates declined 34% and 30%, respectively.



Figures 11-a and 11-b present trends in the numbers of ARTFs in Kansas, Missouri, and Nebraska. Of these, Missouri experienced the greatest change over the 16 year period. The number of ARTFs in Missouri declined 31%, from 522 deaths in 1994 to 358 fatalities in 2009. Although the graph is Figure 11-a gives the impression of a relatively flat trend in Nebraska ARTFs, alcohol related fatalities in that state actually declined by 20%, from 110 ARTFs in 1994 to 88 in 2009 (the Nebraska trend is more apparent in bar chart found in Figure 11-b).

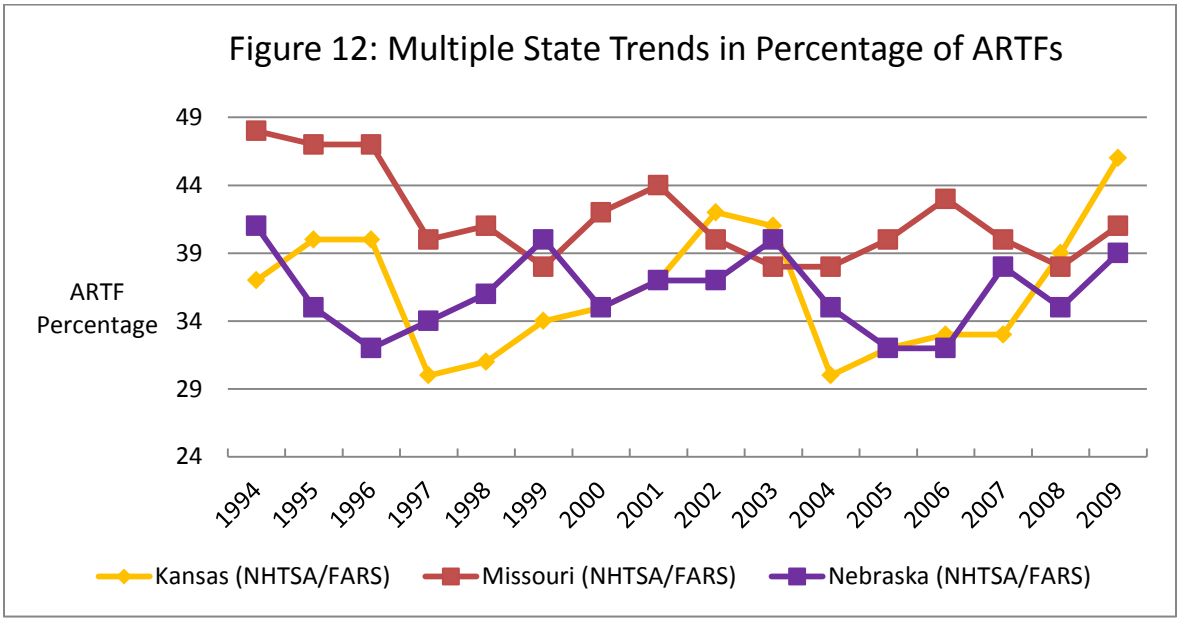




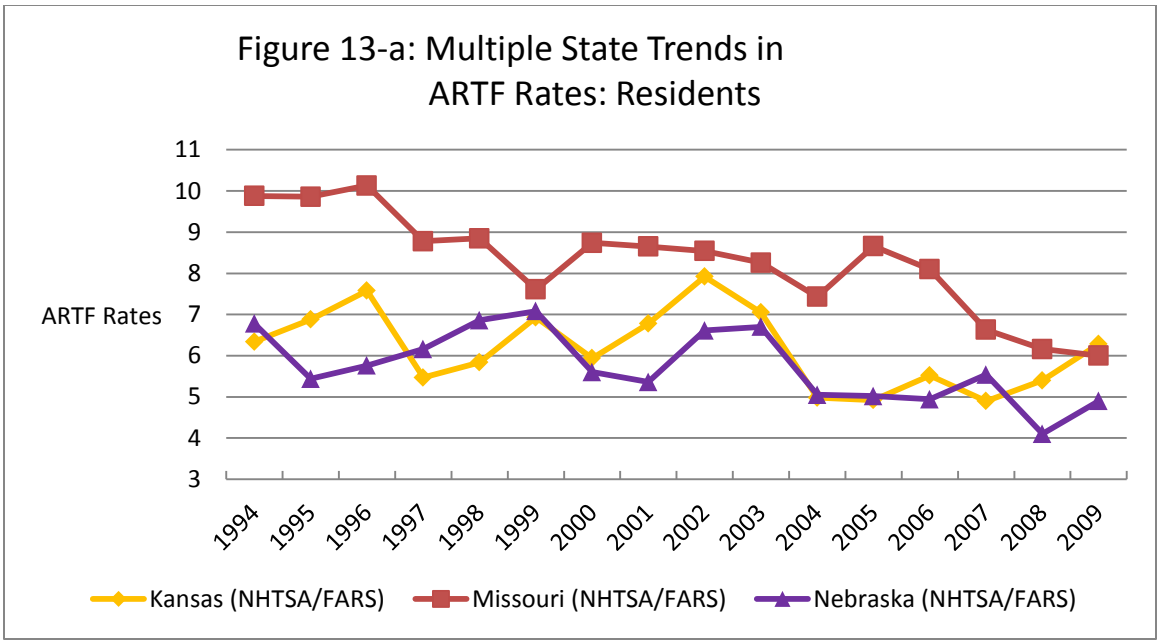
As illustrated in Figures 11-a and 11-b, the number of Kansas ARTFs increased 8.6% from 163 deaths in 1994 to 177 in 2009. However, when the Kansas ARTF trend is calculated only to 2008, a year when there were 151 ARTFs, the overall number of deaths *decreased* 7.4 %.

Given the possibility that the regional trends shown in Figures 11-a and 11-b are the product of demographic changes within each state, we include here, as we did for the nationwide data, graphs that illustrate trends in overall traffic fatality rates and the percentages of traffic fatalities that were alcohol related. Figure 12 presents the multiple state trends in the percentages of traffic fatalities that were alcohol related. Missouri experienced the clearest trend with a 15% decline from 48% ARTFs in 1994 to 41% in 2009. Extending the Missouri trend only to 2008, when the ARTF percentage was 38% causes an overall decline of 21%. The Nebraska trend tended to oscillate in the area of 36%. Overall, Nebraska had a 4.9% decrease in the ARTF percentage, from 41% in 1994 to 39% in 2009. Extending the Nebraska trend only to 2008 when

the ARTF percentage was 35% produces an overall decline of 14.6%. From 1994 through 2009, Kansas experienced a 24% increase in the ARTF percentage. However, extending the Kansas trend only to 2008 when the ARTF percentage was 39% produces an overall increase of 5.4%. Perhaps the most interesting aspect of Figure 12 is the percentage increase in all three states near the end of the 15 year period.



Figures 13-a and 13-b present trends in ARTFs rates for resident populations and licensed drivers. Both figures show steady declines in ARTF rates for all three states. From 1994 through 2009, the ARTF rate among Missouri residents declined 39%. Among Nebraska residents the ARTF rate declined 28%. The Kansas trajectory differs from the Missouri and Nebraska trends. From 1994 through 2009, the rate of ARTFs among Kansas residents declined by only 0.9%. However, extending the trend line for Kansas' resident ARTF rate to only 2008 produces a decline of 15%. Stopping the trend line at 2007 produces a decline of 22%.



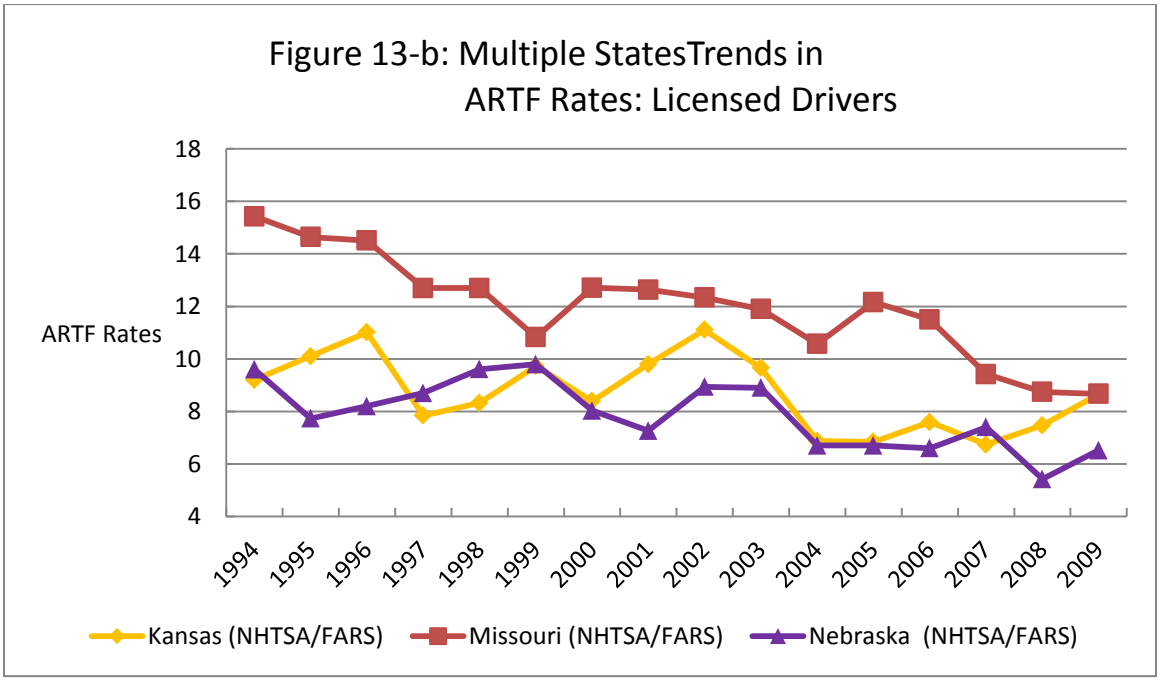


Figure 13-b shows the ARTF rates among licensed drivers in Kansas, Missouri, and Nebraska. From 1994 through 2009, the ARTF rate among Missouri's licensed drivers declined 44%. By contrast, the ARTF rates for Kansas and Nebraska declined 5.9% and 32%, respectively. Extending the Kansas trend line only to 2007 produced a 27% overall decline in the licensed driver ARTF rate.

Summary of Multiple State Trends Within USDOT Region VII

Two trends from the multiple state data are especially interesting. First, despite differences in their DUI arrest trends, all three states experienced significant overall declines in their ARTF rates. Missouri experienced the highest increases in arrest rates (63% among licensed drivers from 1997 to 2009) and the largest decreases in traffic fatalities and ARTFs.

DUI arrest data for Kansas extend only from 2002 through 2009. From 2002 through 2005 the licensed driver arrest rate in Kansas declined. From 2002 through 2005, Kansas' licensed driver ARTF rate also declined. The Missouri and Kansas trends suggest some support for the notion that intensified DUI enforcement might help produce reductions in ARTFs in those. In Nebraska, however, overall declines in arrest rates occurred in conjunction with 15 year declines in its ARTF rates.

A second interesting trend revealed by the multiple state findings pertains to the ARTF increases that occurred in the final years of the 16 year period. From 2008 through 2009, Nebraska's ARTF rate among licensed drivers increased 20% and the percentage of ARTFs increased 11%. During the same period, Nebraska's licensed driver traffic fatality rate decreased 14%. From 2007 to 2009, Kansas ARTF rate among licensed drivers increased approximately 28% and the percentage of ARTFs increased approximately 39%. During that same period, the Kansas traffic fatality rate decreased approximately 8.7%. Missouri trends were similar but not so pronounced. From 2008 to 2009, the Missouri ARTF rate for licensed drivers decreased 0.8%. However, the state's percentage of ARTFs increased approximately 8%. At the same time, Missouri's rate of traffic fatalities among licensed drivers decreased 8%. On the whole, these trends show that in the final years of the trend lines, ARTFs were increasing while traffic fatalities not related to alcohol were in decline.

Tables 2-4 summarize the multiple state trends in arrest and fatalities for Kansas, Missouri and Nebraska. As in Table 1, the shaded areas show the data cells that would be implicated in an enforcement lag effect. Because of the potentially unreliable Missouri and Kansas UCR arrest rate data for 1994 through 1996, Tables 2 and 3 reflect the trends shown in Figures 6-b and 7-b (1997 through 2009). In those tables, changes in the arrest trends begin in 1997 and changes in traffic fatality and ARTF trends begin 1994. From 1997 through 2000, Missouri DUI arrest rates declined, 11.2% among licensed drivers. During the subsequent five year period, Missouri's ARTF rates also declined. From 2000 through 2005, DUI arrest rates among licensed drivers in Missouri increased. During the subsequent time period ARTF rates declined. The 2005 through 2009 decline in Missouri ARTFs is suggestive of an enforcement lag effect. A similar pattern is shown in the Table 3 summary of Nebraska trends. From 1997 through 2000, DUI arrests in Nebraska declined, as did ARTF rates during the subsequent five years. From 2000 through 2005, DUI arrests increased and in the next five years ARTF rates decreased.

Table 2: Summary of Missouri Trends (Percentage of Change)

	1994/7-2009	2000-2009	1997-2000	2000-2005	2005-2009
Arrest Rates - Residents	+4.6	+2.8	**+1.8**	**-.9**	+3.7
Arrest Rates - Lic. Driv	+63	+84	**-11.2**	**+16.6**	+57.7
Number of T Fs	-19.4	-24	+4.3	+8.6	-30.2
T F Rate – Residents	-29	-29	-.9	+4.9	-32.2
T F Rate - Lic. Driv	-34	-29	-3	+1.3	-30
Number of ARTFs	-31.4	-27	-6.7	+2.6	-28.8
Percentage of ARTFs	-14.6	-2.4	-10.6	-4.8	+2.5
ARTF Rate - Residents	-39.3	-31.4	-11.4	**-.9**	**-30.7**
ARTF Rate - Lic. Driv	-43.8	-31.8	-13.2	**-4.3**	**-28.7**

Table 3: Summary of Nebraska Trends (Percentage of Change)

	1994/7-2009	2000-2009	1997-2000	2000-2005	2005-2009
Arrest Rates - Residents	-.6	+9.9	**-9.6**	**+20.6**	-8.8
Arrest Rates - Lic. Driv	-11.6	-.2	**-11.4**	**+11.7**	-10.6
Number of T Fs	-17.7	-19.2	+8.7	no change	-19.2
T F Rate – Residents	-25.7	-23	+3.7	-2.2	-21.2
T F Rate - Lic. Driv	-30.1	-28.4	+4.8	-9.6	-20.9
Number of ARTFs	-20	-8.3	+7.9	-8.3	no change
Percentage of ARTFs	-4.9	+11.4	no change	-8.6	+21.9
ARTF Rate - Residents	-27.7	-12.5	+2.9	**-10.3**	**-2.4**
ARTF Rate - Lic. Driv	-32	-18.8	+3.9	**-16.6**	**-2.7**

The data in Tables 2 and 3 indicate that in Missouri and Nebraska enforcement lag effects did not occur from 2000 through 2005, but might have occurred from 2005 through 2009. To the extent that enforcement effects were present they functioned much differently in Missouri than in Nebraska. In Missouri, a 16.6% increase in the DUI arrest rate from 2000 through 2005 was followed by an approximate 30% in the ARTF rate. In Nebraska, a 20% increase in the arrest rate would have presumably produced a mere 2.5% decline in ARTF rates.

The Kansas DUI arrest data presented in Table 4 is insufficient for commenting on the link between enforcement and ARTFs. On the whole, the multiple state data suggest a weak to moderate relationship between arrest rates and ARTF rates.

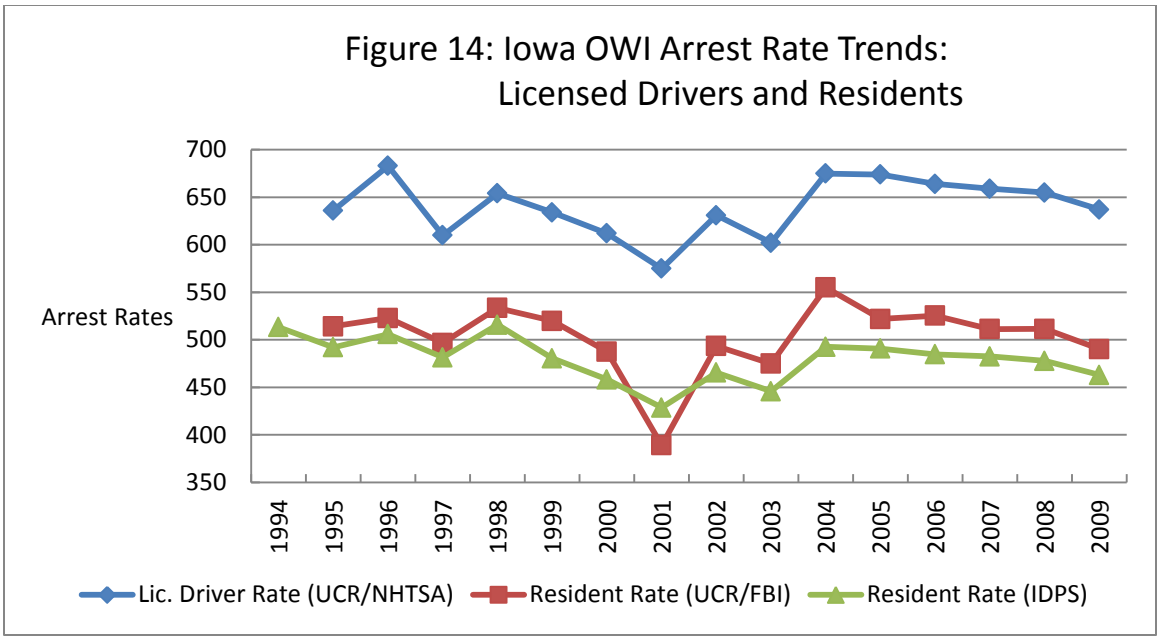
Table 4: Summary of Kansas Trends (Percentage of Change)

	1994-2009	2000-2009	1995-2000	2000-2005	2005-2009
Arrest Rates - Residents	no data	no data	no data	no data.	+4
Arrest Rates - Lic Driv	no data	no data	no data	no data	+40.3
Number of T Fs	-12.7	-16.3	+4.3	-7	-9.8
T F Rate – Residents	-20	-20	+.2	-8.8	-12.3
T F Rate - Lic. Driv.	-24.3	-21.8	-3.2	-10.3	-12.9
Number of ARTFs	+8.6	+10.6	-10.1	-15.6	-38.5
Percentage of ARTFs	+24.3	+31.4	-12.5	-8.6	+43.7
ARTF Rate - Residents	-.9	+5.7	-13.7	-17.1	+27.6
ARTF Rate - Lic. Driv	-5.9	+3.2	-16.9	-18.5	+26.6

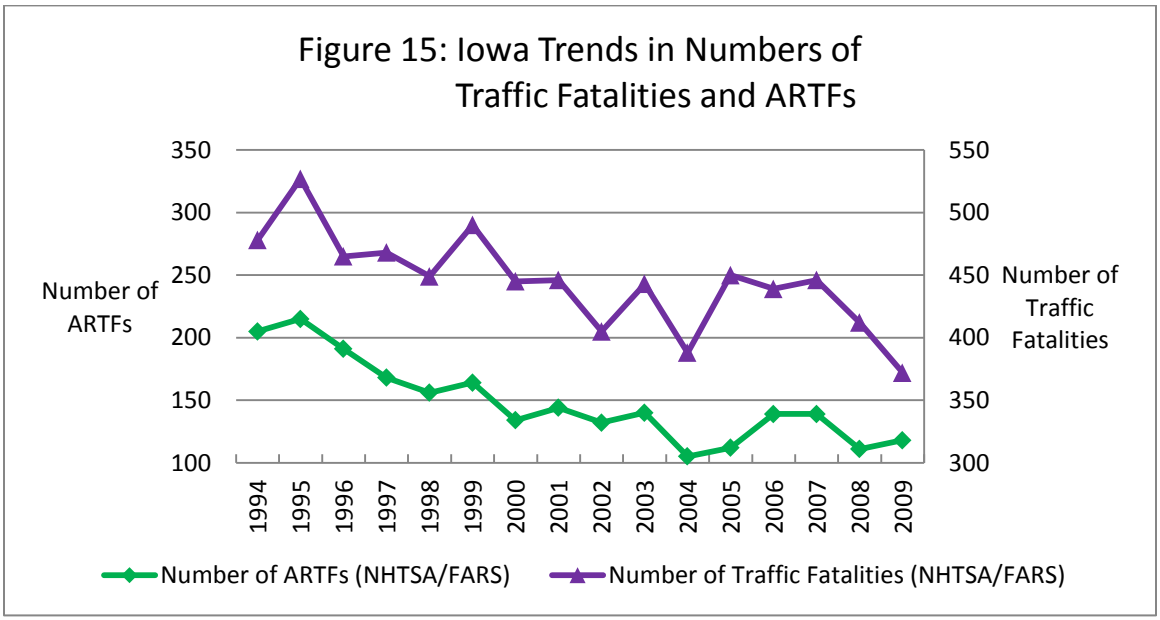
Iowa Trends

Data from the Iowa Department of Public Safety (IDPS) and the FBI's UCR program were used to assess the 16 year trend in Iowa drunk driving arrests. Both agencies use mostly the same data from the same crime reports. However, there are some differences. The FBI refers to drunk driving arrests as Driving Under the Influence (DUI) while Iowa statutes and the IDPS designate that criminal law violation as Operating While Intoxicated (OWI). From year to year, there are variations in the number cases the two agencies deem acceptable for inclusion into their respective data bases. The UCR relies upon arrest data and uses very precise reporting criteria that seek to bring uniformity to data originating from a large number of diverse law enforcement agencies. The IDPS crime date is organized according to an Incident Based Reporting System (IBRS) that employs a coding scheme that is different from the UCR program. IBRS data provided to the FBI are converted into a format suitable for the UCR. This section includes arrest data from both agencies.

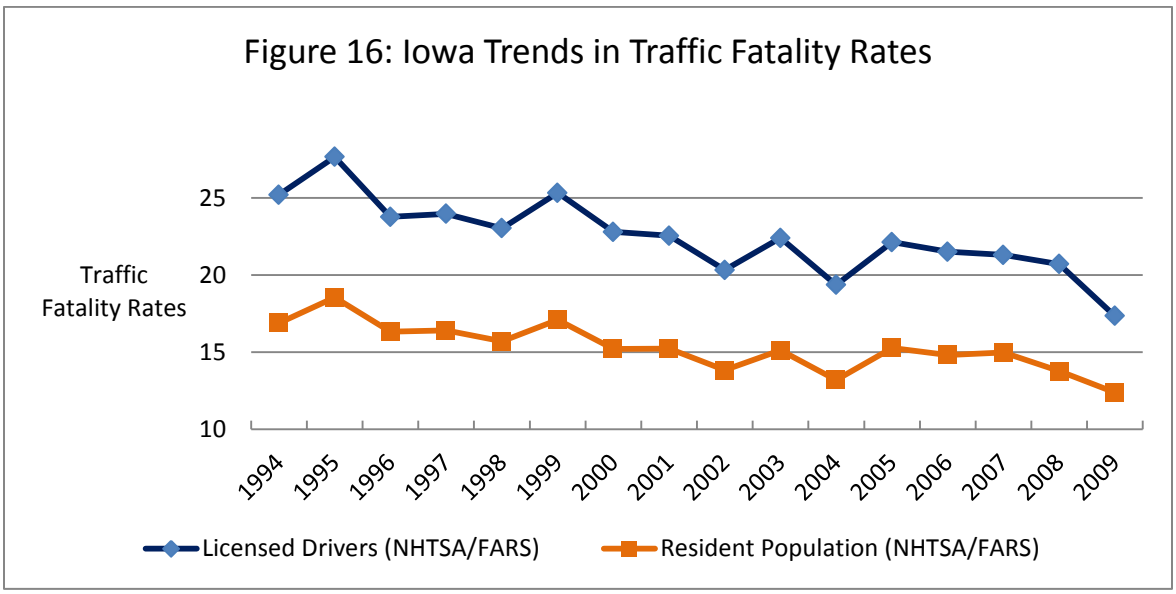
The trends in Figure 14 show moderate overall changes in Iowa OWI arrests. Among licensed drivers, the 1995 and 2009 rates were 636 and 637, respectively. Among Iowa residents, the UCR data show an overall drop of 4.6% in OWI arrests while the IDPS trend line declines approximately 9.8%. Each trend reveals a pattern of decreasing arrest rates prior to 2001 and increasing rates after 2001. From 1995 through 2001, the licensed driver OWI arrest rate declined 9.6%. From 2001 through 2009, it increased 10.8%. From 1995 through 2001, Iowa's OWI arrest rate for population residents, as reflected in the UCR data, declined 24%. That trend reversed during the next eight years with a 26% increase in the resident OWI arrest rate. The IDPS trend shows a 1994 through 2001 decrease of 16.5% in OWI arrests. From 2001 through 2009, the trend reversed to produce a 9.8% increase in the OWI arrest rate.



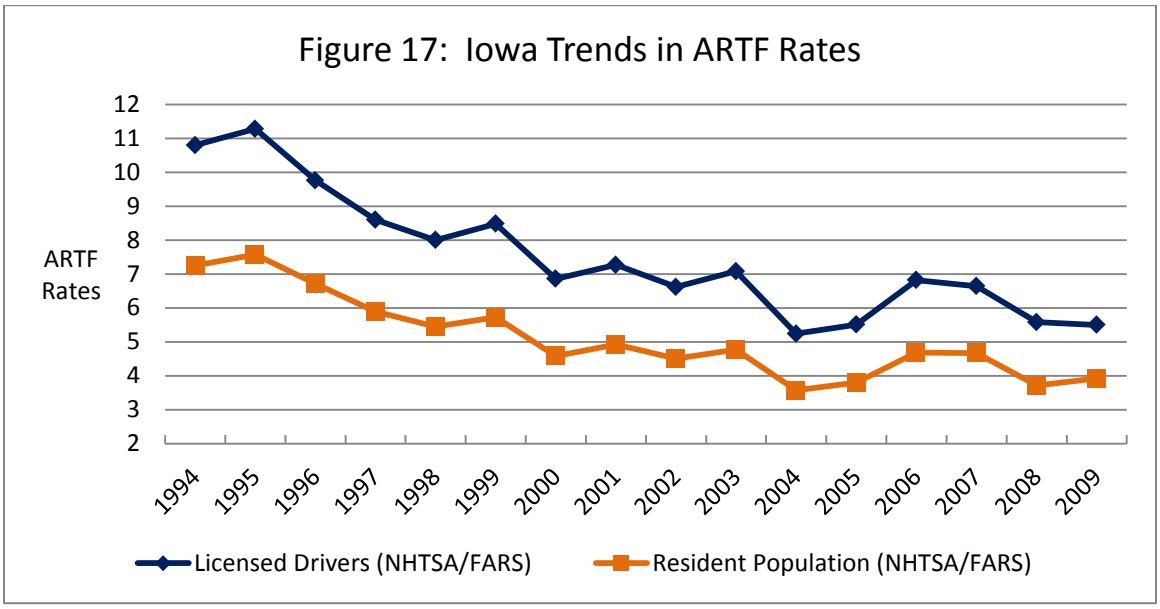
The FARS data for Iowa show that from 1994 through 2009, the number of traffic deaths and ARTFs in Iowa declined steadily. Figure 15 shows an overall drop of 42% in the number of traffic fatalities and a 22% decline in the number of ARTFs. Although the trend lines for these numbers are roughly parallel, one significant departure is apparent. From 2008 through 2009, traffic fatalities dropped 10%. During the same year, the number of ARTFs increased 6%.



To help control for the influence of broader population changes on the numbers of fatalities, we graphed the trends in the fatality rates among Iowa's licensed driver and resident populations. Figure 16 illustrates those trends. From 1994 through 2009, the traffic fatality rate declined approximately 27% among the licensed driver population and 24% among the resident population. Not surprisingly the two trend lines followed a similar trajectory. The most notable difference between them is the steeper decline in the licensed driver fatality rate from 2008 through 2009.



The 1994 though 2009 trends in Iowa ARTF rates are presented in Figure 17. During the 16 year period, there was a 50% decline in the licensed driver ARTF rate. Among the resident population the rate declined 46%. During the first ten years, the licensed driver ARTF rate in Iowa declined 51.5% and the resident rate declined 50.7%. From 2004 through 2006, both rates increased 30%. During the last two years, the licensed driver rate declined 20% while the rate among residents dropped 16%.



For purposes of comparison, two figures illustrate Iowa's traffic fatality and ARTF rates together. Figure 18 compares the trend lines for fatalities among licensed drivers. For the most part, the licensed driver trends are similar. Between the trends there is only one departure. From 2005 through 2006, the licensed driver traffic death rate declined 2.8% while the ARTF rate increased 23.7%. From 2008 through 2009, the licensed driver traffic fatality rate declined 16.2% compared to a 2.5% decline in the ARTF rate.

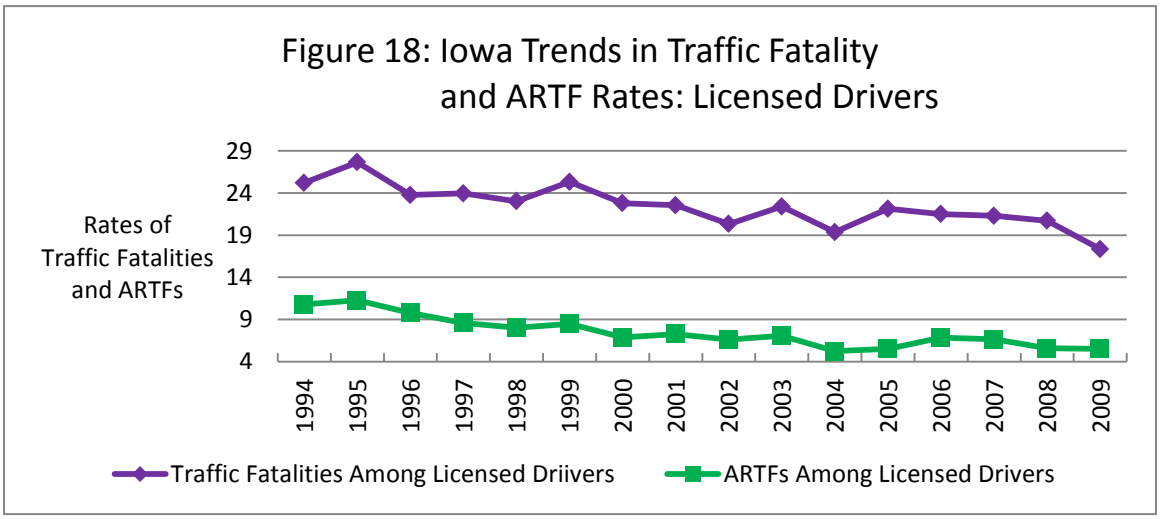
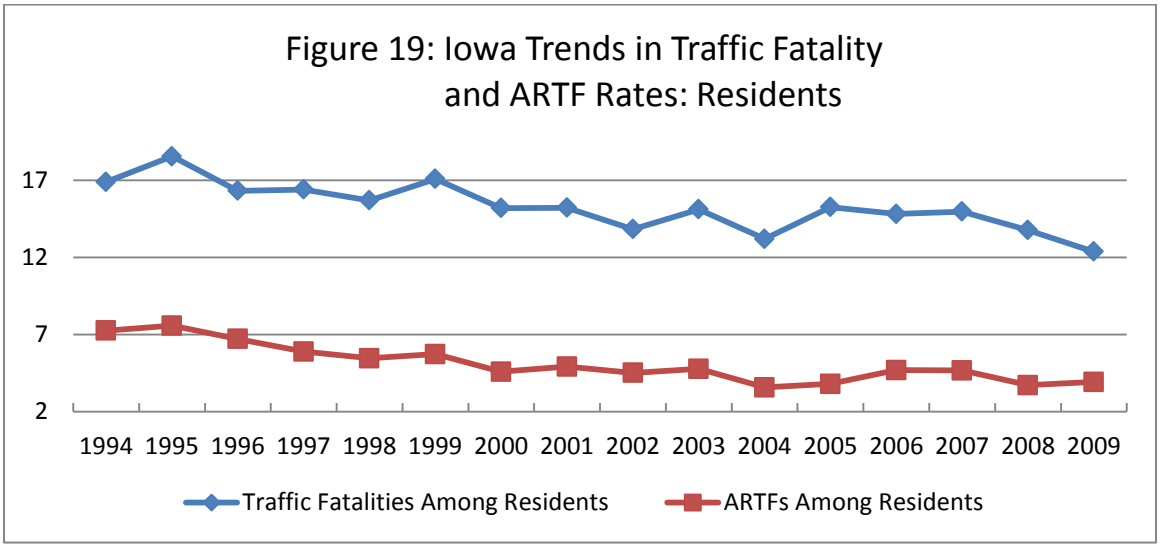
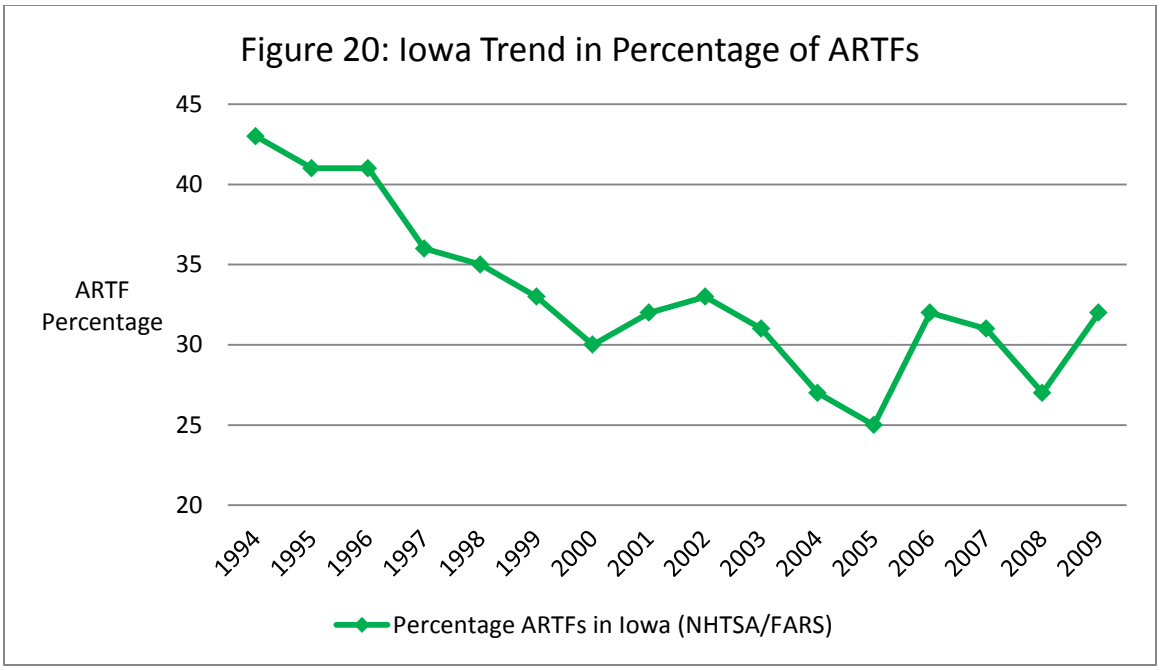


Figure 19 compares trend lines for the rate of traffic deaths and ARTFs among Iowa's resident population. Although the trends are very similar, they converge during two time periods. From 2005 through 2006, the traffic fatality rate among Iowa's resident population declined 2.9% while the resident ARTF rate increased 23.4%. From 2005 to 2006, the traffic fatality rate among the resident population declined 10% while the resident ARTF rate increased 5.6%.

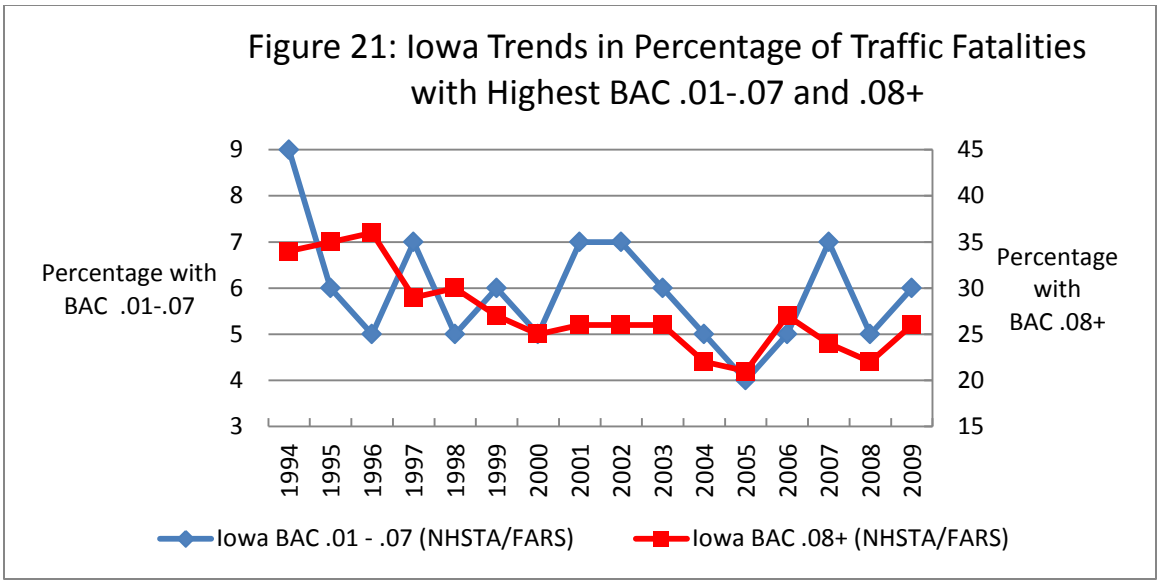


The trend lines in Figures 18 and 19 show slightly different relationships between traffic fatality and ARTF rates from 2008 to 2009. A graph of Iowa's percentages of traffic fatalities that were alcohol related helps place those trends into sharp relief.

Figure 20 illustrates changes in the percentage of Iowa's traffic fatalities that were alcohol related. During the 16 year period, the ARTF percentage declined 26%. Three exceptions to the trend include 2000 through 2002 when the percentage increased approximately 10%; 2005 through 2006 when there was a 28% increase: and 2008 through 2009 when the percentage increased 18.5%. The 2008 through 2009 increase in Iowa's ARTF percentage is similar to ARTF percentage increases that occurred in Kansas, Missouri, and Nebraska (see Figure 12).



The NHTSA /FARS data set provide percentages of ARTFs in which the highest BAC recorded in the crash is either between .01 and .07 or it is .08 and above. Iowa trend lines for these categories are presented in Figure 21. From 1995 through 2009, the percentages in both categories declined. The percentage of ARTFs with the highest BAC between .01 and .07 declined 33% and the percentage of ARTFs with the highest BAC at or above .08 declined 24%. From 1994 through 1999, the two trends moved in opposing directions. From 2000 through 2009, the trajectories were more alike, though the trend in fatalities with BACs between .01 to.07 tended to increase and decrease in greater percentages than the trend for BAC equal to or greater than 08.



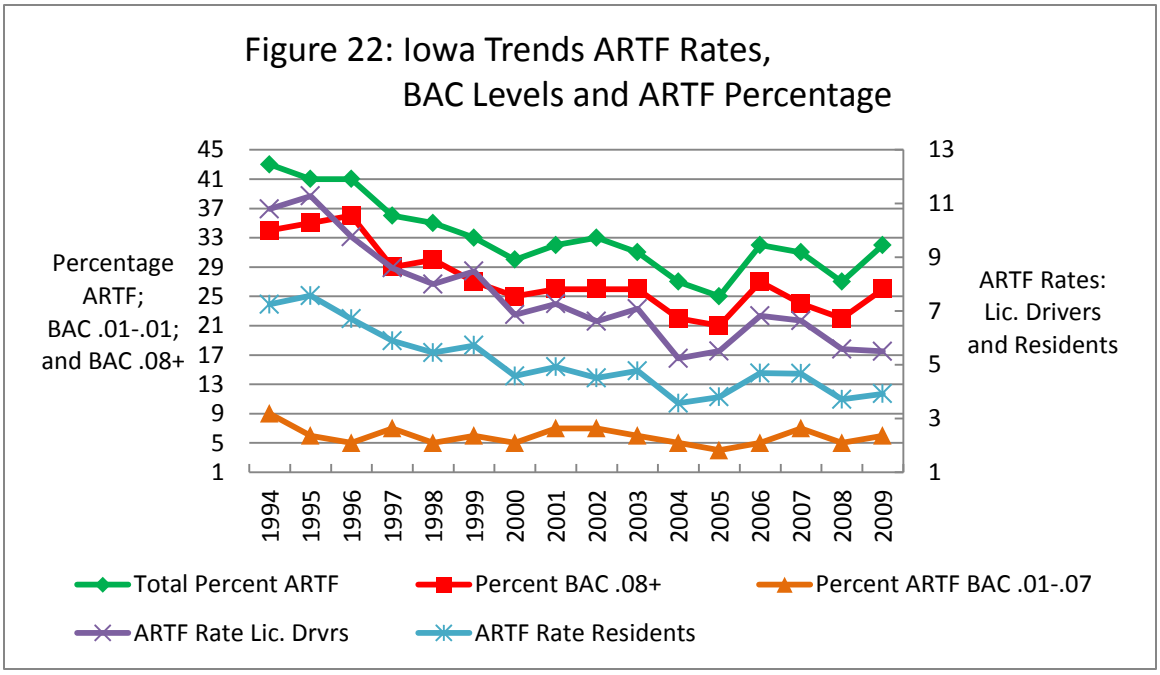


Figure 22 juxtaposes trends in the percentage of ARTFs; percentage of fatalities with BAC levels of .01-.07; percentage of traffic fatalities with BACs of .08+, and ARTF rates for Iowa's licensed drivers and resident population. Not surprisingly, BAC .08, percentage ARTF, and ARTF rates for licensed drivers and among residents follow very similar trajectories. From 1994 through 1995, the changes in the percentages of ARTFs involving the lower BAC levels tend to move in the opposite direction from changes in percentages of ARTFs involving the higher BAC levels.

Summary of Iowa Trends

From 1994/5 through 2009, OWI arrest rates in Iowa declined between 5% and 10%, depending which of the three data sources are used.[3] In general, OWI arrest rates increased during the first half of that period then declined during the second half. The Iowa decline in OWI arrest rates is comparable to the nationwide decrease of approximately 12%. Shortcomings in some the multiple state UCR data make comparisons to Kansas, Missouri, and Nebraska problematic. However, based on the trends previously presented in Figure 7-b (1997 through 2009 licensed driver arrest rates), the Iowa arrest rate trends are in contrast to increases in Missouri licensed driver arrest rate. The overall decline in Iowa's DUI arrest rates was considerably smaller than 11.6% that occurred in Nebraska's from 1997 through 2009. Because of the unreported Kansas arrest data for 1995 through 2001, changes in the DUI apprehension rate in that state are probably not comparable to trends in Iowa's OWI arrest rates.

Evidence of an enforcement lag effect on Iowa's ARTFs would be characterized by an inverse relationship between arrest rates and ARTF rates during separate time frames. Table 5 summarizes Iowa trends in OWI arrest and ARTF rates. The shaded areas show the data cells that would provide indications of enforcement lag effect. From 1995 to 2005, Iowa arrest rates declined. During the subsequent five years, ARTF rates declined also. From 2000 to 2005, the OWI arrest rate among licensed drivers increased. During the next five years, Iowa ARTF rates increased also. Neither set of trends is consistent with an enforcement lag effect on ARTFs.

Table 5: Summary of Iowa Trends (Percentage of Change)

	1994/5-2009	2000-2009	1995-2000	2000-2005	2005-2009
Arrest Rates - Residents	-4.6	+.6	**-5.2**	**+7**	-6
Arrest Rates - Lic. Driv	+.2	+4.1	**-3.8**	**+10.1**	-5.5
Number of T Fs	-22.2	-16.4	-15.6	+1	-17.3
T F Rate - Residents	-26.8	-18.6	-18.1	+.4	-19
T F Rate - Lic. Driv	-31.2	-24	-17.6	-2.9	-21.6
Number of ARTFs	-42.4	-11.9	-38	-16.4	+5.4
Percentage of ARTFs	-25.6	+6.7	-26.8	-16.7	+28
ARTF Rate - Residents	-45.9	-14.4	-39.5	**-17**	**-.2**
ARTF Rate - Lic. Driv	-49	-19.8	-39.2	**-19.7**	**+3.2**

Discussion of Arrest and Fatality Trends

All of the aggregate data show that for the 16 year period of 1994 through 2009, Iowa experienced a greater decline in the number, rate and percentage of ARTFs than both the nation as a whole and its regional neighbors. Table 6 presents the comparisons of arrest and fatality trends that occurred within each jurisdiction.

[3] Traffic fatality and ARTF trends begin in 1994, arrest trends begin in 1995.

Table 6: Comparisons of Arrest and Fatality Trends

	Nationwide	Iowa	Kansas	Missouri	Nebraska
Arrest Rates - Residents	-11.8	-4.6	-10 *	4.6*	-.6*
Arrest Rates - Lic. Driv	-9.3	+.2	-17 *	63*	-11.6*
Number of T Fs	-17	-22.2	-12.7	-19.4	-17.7
T F Rate - Residents	-29.6	-26.8	-20	-29	-25.7
T F Rate - Lic. Driv	-30.1	-31.2	-24.3	-34	-30.1
Number of ARTFs	-18	-42.4	+8.6	-31.4	-20
Percentage of ARTFs	no change	-25.6	+24.3	-14.6	-4.9
ARTF Rate - Residents	-31	-45.9	-.9	-39.3	-27.7
ARTF Rate - Lic. Driv	-31	-49	-5.9	-43.8	-32

* Kansas arrest data are for changes that occurred from 2002 through 2009. Missouri and Nebraska arrest rates are for changes that occurred from 1997 through 2009. Iowa changes are for licensed driver rates from 1994 through 2009 and resident rates from 1995 through 2009.

The nationwide, multiple state, and Iowa trends suggest three findings. First, the declines alcohol related fatalities during the 1980's and early 1990's have generally extended into the 21st Century. Second, the nationwide, multiple state, and Iowa trends suggest a modest to weak relationship between DUI/OWI law enforcement and changes in the number and rate of ARTFs. This is evidenced by declines in both arrest rates and ARTF rates. Third, from 2007/8 to 2009 the percentage of fatalities related to alcohol increased nationwide and in the four states that comprise UDDOT Region VII. These findings suggest that the prevalence of alcohol impaired driving is closely linked to common demographic conditions (e.g., changes in the supply of high risk drivers within state populations). The summary data in Table 6 add support to the argument that declines in ARTFs may be more closely linked to demographic trends, improved automobile safety features (e.g., air bags, braking technology, automated seat belts, etc.), and innovations in highway and road design, materials, and construction, than they are to traffic enforcement measures.

ANALYSIS OF IOWA CONVICTIONS

To better understand the changing demographic profile of Iowa's OWI offenders we analyzed age, race, and gender variables for OWI offenders whose cases were adjudicated in Iowa courts. Case level data were used in conjunction with demographic information and FARS data to assess whether population shifts in Iowa are related to OWI trends. Case level data for the analysis are from 118,675 cases adjudicated during the calendar years 2000 through 2009.

The variables included in the main data set are described in Table 7. The analysis begins with descriptive statistics of the annual number of OWI convictions in Iowa from 2000 through 2009. This same statistic is repeated for each type of OWI offense: serious misdemeanors, aggravated misdemeanors and class D felonies. The number and percent of OWI cases were then examined in relation to gender, age, ethnic categories, and geographic distribution. The prevalence of OWI convictions across and within demographic categories that occurred before and after the Iowa statutes lowered the legal BAC level for OWI from .1 to .08. Multivariate analysis was used to assess influence of extra-legal variables (e.g., race and gender) on the decision to approve a deferred judgment.

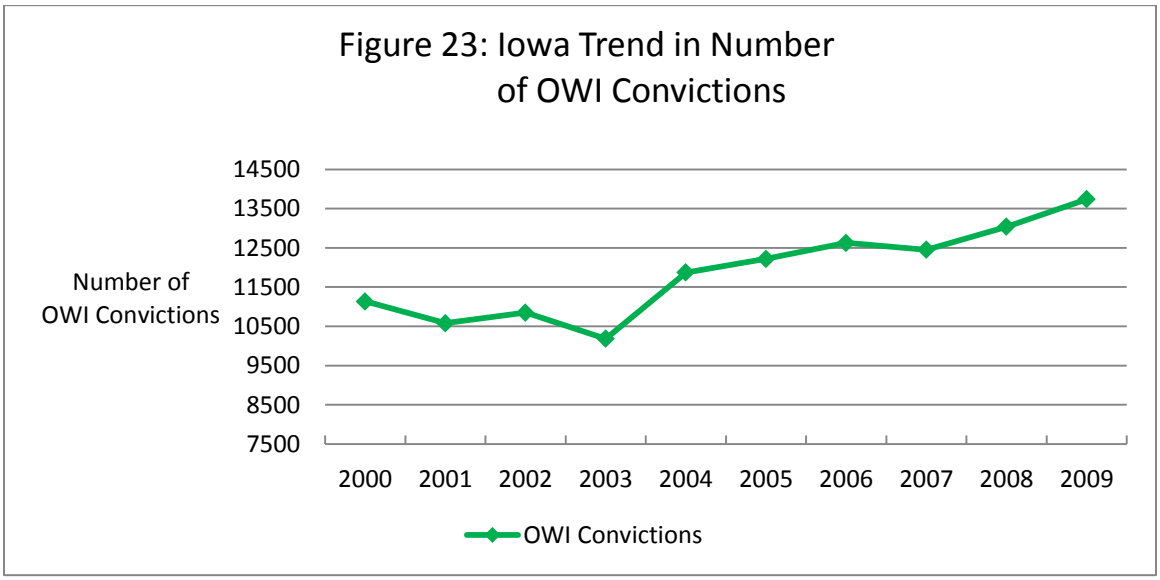
Table 7: Variable Coding and Descriptive Statistics

Variable	Coding / Description
Judicial District	1 through 8 represent First Judicial District, Second Judicial District, etc.
County	Identifying numbers 1-99
Date of Birth	mm-dd-yyyy
Date of Court Disposition	mm-dd-yyyy
Offense class	1 = serious misdemeanor (70.7%) 2 = aggravated misdemeanor (22.1%) 3 = Class D felony (7.3%)
Offender age	Age in years at date of court disposition Range = 15 to 98 Median = 30 Mean = 32.7 Standard Deviation = 11.3
Offender sex	1 = Female (19.1%) 2 = Male (80.9%)
Ethnicity	1 = White (79.8%) 2 = African American (5.3%) 3 = Hispanic (6.0%) 4 = Native American (0.9%) 5 = Other (8.0%)
Deferred Judgment	0 = No; 1 = Yes (6.1%)

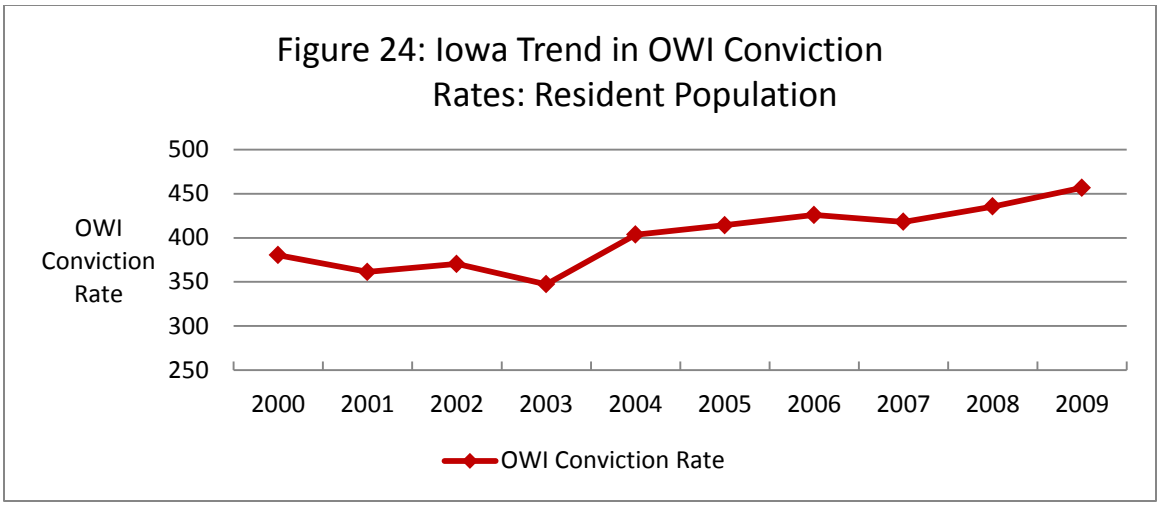
Statewide Conviction Trends

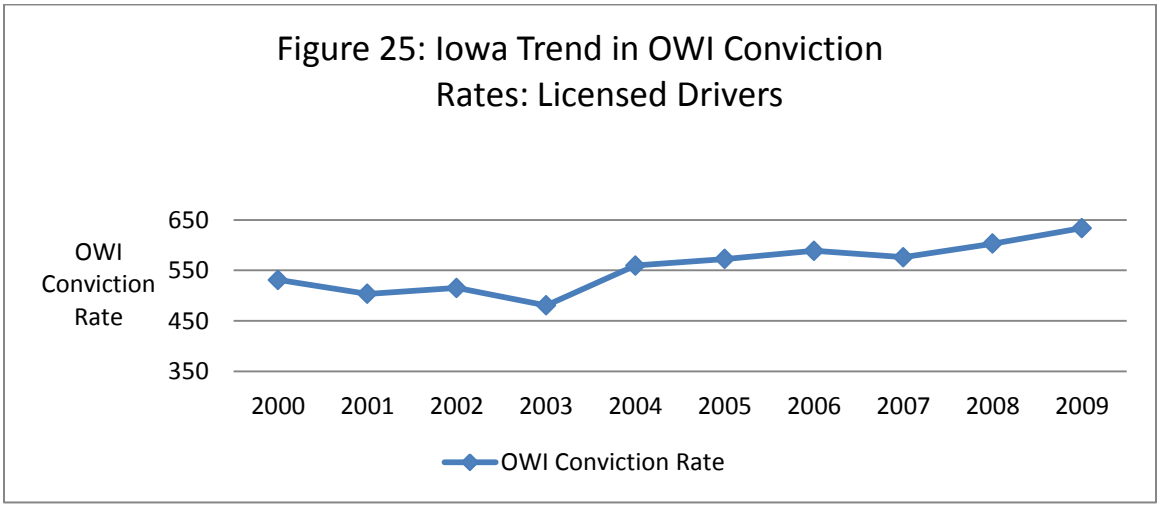
The case level data analysis revealed several statewide trends in OWI convictions from 2000 through 2009. Figure 23 shows that during the initial four years of that period, the number of OWI convictions in Iowa declined 8.5%. That initial decline was followed by significant increase. From 2003 through 2009, the number of convictions increased 35%, for an overall increase of 23%.

Because the number and overall rate of OWI convictions can be influenced by broader demographic conditions we calculated conviction rates for population residents (number of convictions per 100,000 residents) and licensed drivers (number of convictions per 100,000 licensed drivers).



As shown in Figure 24, the trend in conviction rate for residents matches the trend in numbers of convictions. From 2000 through 2003, the conviction rate for population residents declined approximately 8.75%. During the remaining six years it increased approximately 32%, for an overall increase of approximately 20%. Figure 25 illustrates a 2000 through 2003 decline of approximately 9.5% in the conviction rate among licensed drivers. The decline was followed by an increase from 2003 to 2009 of approximately 32%. From 2000 through 2009, the licensed driver conviction rate increased 19.3%.





The case level data were also used to calculate the proportion of OWI convictions for three offense categories. Figure 26 shows that from 2000 through 2009, more than two thirds of Iowa's OWI convictions were "serious misdemeanors." These are the least serious of the three types of OWI and almost always involve first time convictions. About one-fifth of the 118,675 convictions were for "aggravated misdemeanors." This sanction is usually for defendants who have one prior OWI conviction. From 2000 through 2009, 7.3% of Iowa's OWI convictions were class D felonies. Class D felonies are for OWI defendants who have two or more prior convictions, or who caused a serious injury because of their OWI behavior.

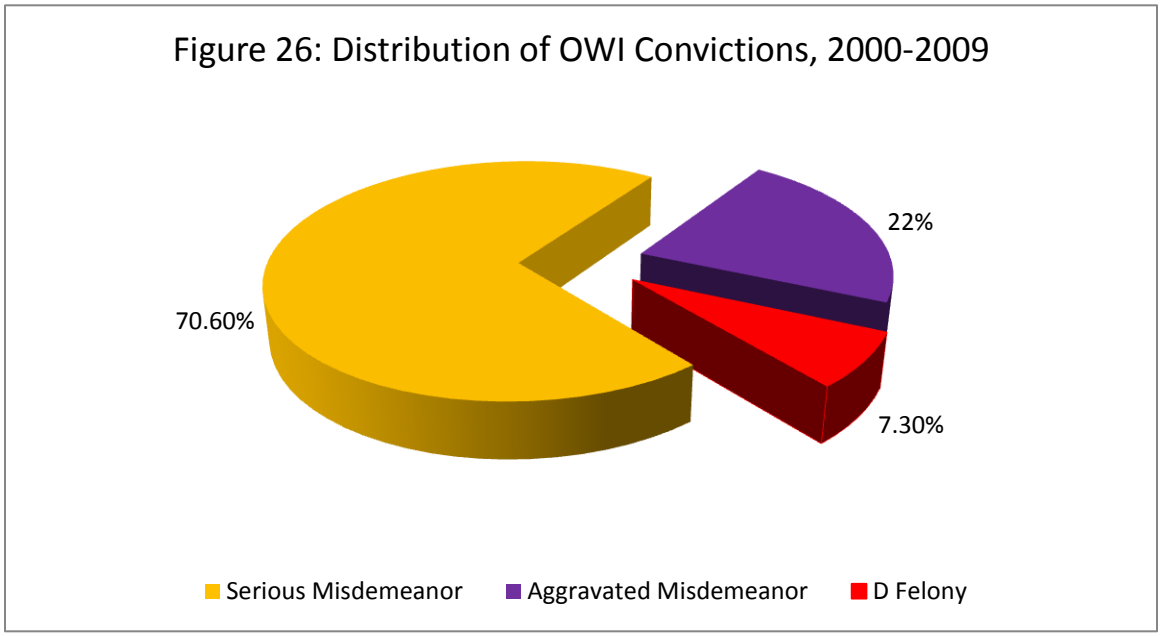
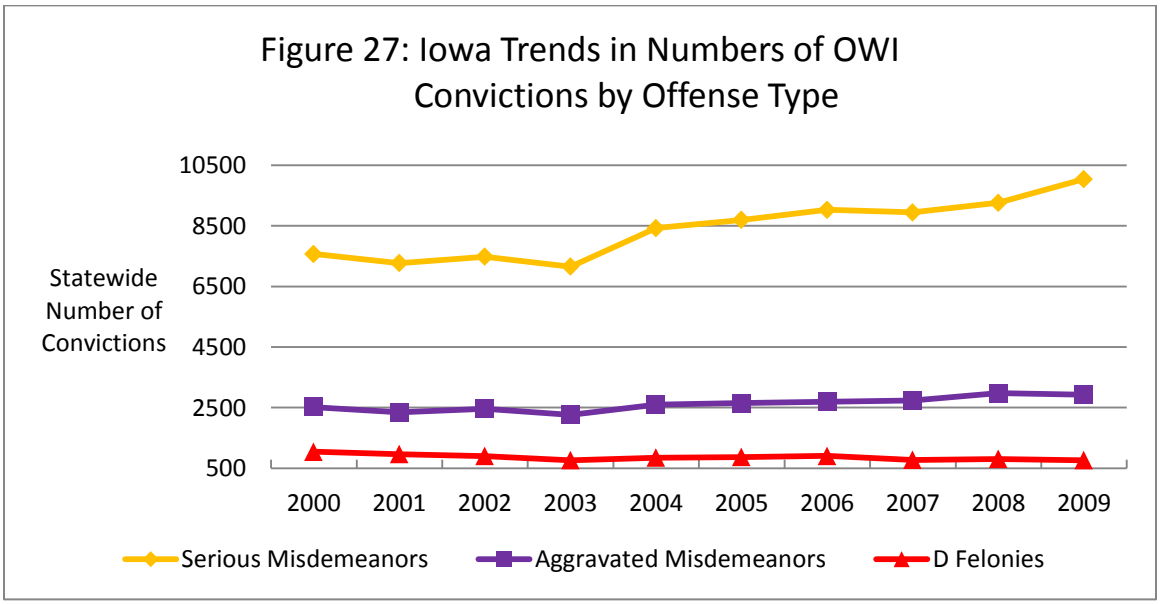
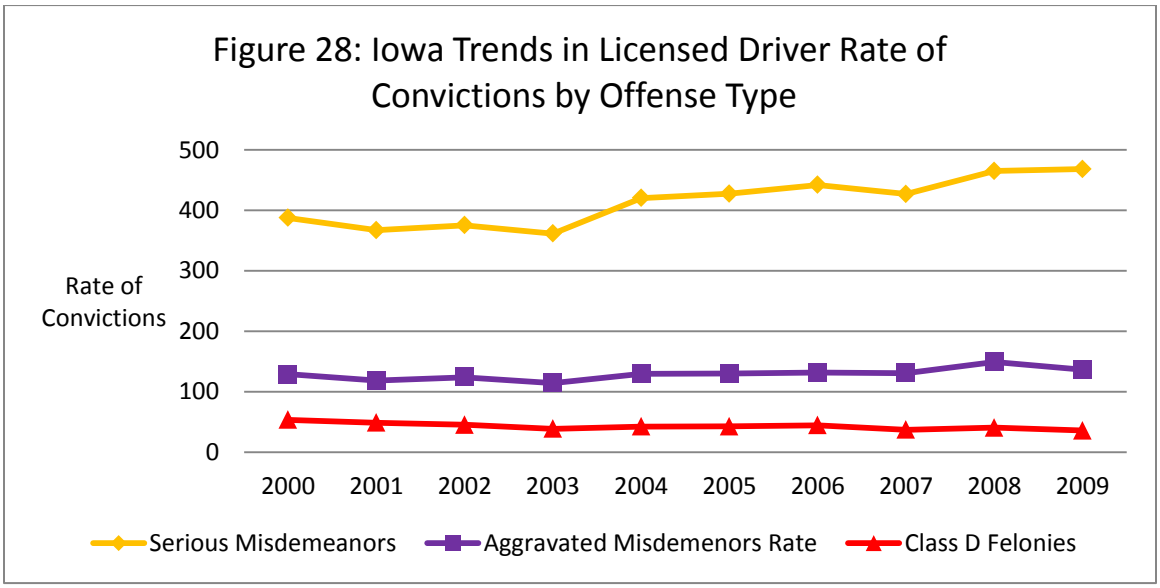


Figure 27 illustrates the ten year trends for the three types of OWI convictions. The most obvious change in those trends occurs during 2003 when serious misdemeanor convictions began to increase steadily. This change is possibly explained by Iowa statues that reduced the legal BAC level for operating a vehicle from .10 to .08. The new law became effective on July 1, 2003.



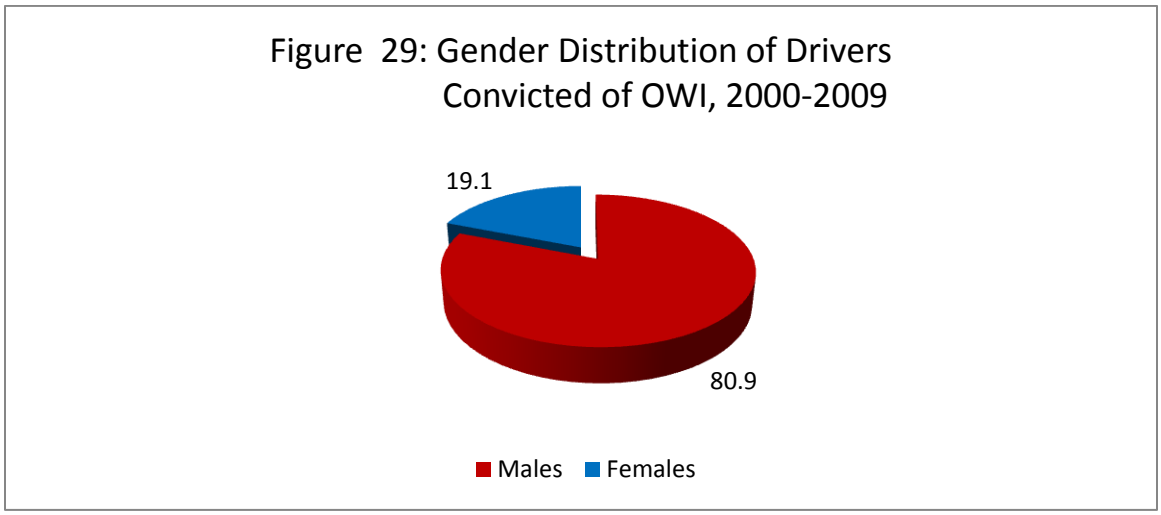
From 2000 through 2003, serious misdemeanor convictions declined 5.5%. During the remaining six years the number of those convictions increased 40%. In the first four years, the number of aggravated misdemeanors dropped 10.2%. During the next six years, the number increased 30%. The number of class D felony convictions declined 27% from 2000 to 2003. Six years later, the number of convictions had declined by less than one-third of one percent.

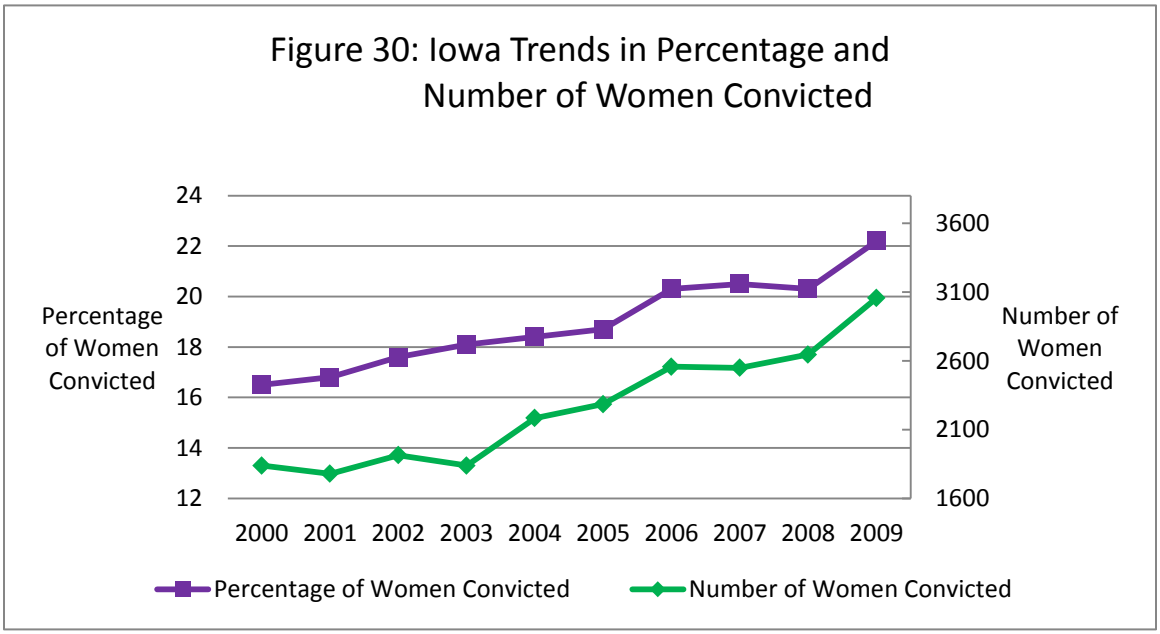
As shown in Figure 28, the trends for rates of convictions among Iowa's licensed driver population match closely the trends in Figure 27. From 2000 through 2003, the serious misdemeanor conviction rate declined 6.7%, and then from 2003 through 2009 increased 29%. The rate of aggravated misdemeanor convictions dropped 11.3% from 2000 through 2003. During the next six years, it increased 19.5%. From 2000 through 2003, the class D felony conviction rate decreased 28%. During the next six years, the rate of class D felony convictions declined 7.5%.



Gender Distribution

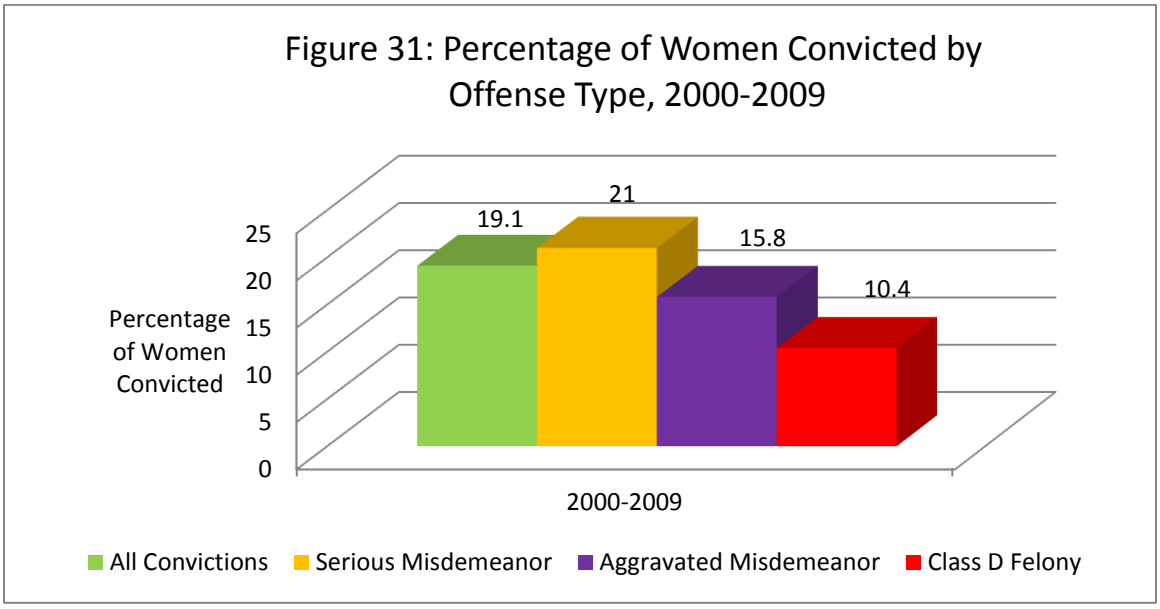
Figures 29-34 present the gender distributed for each type of OWI conviction. Consistent with the extant research into alcohol impaired driving, males were significantly overrepresented in the population of OWI defendants. Figure 28 indicates that from 2000 through 2009 males comprised four-fifths of persons convicted of OWI in Iowa.



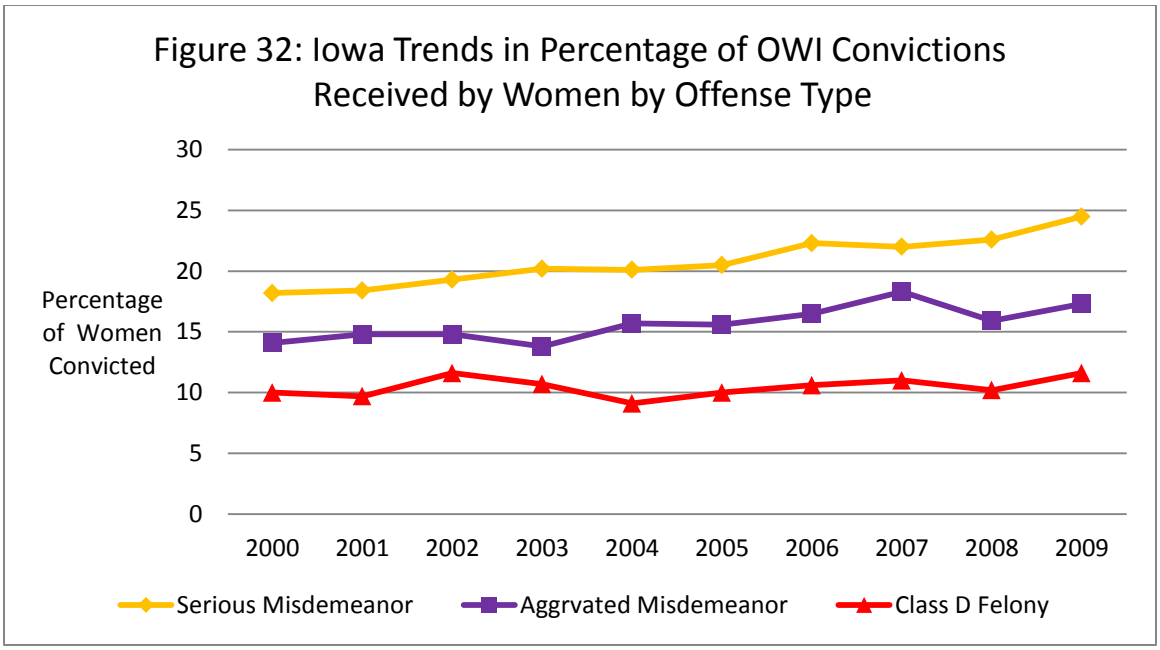


Females were less prevalent than men among convicted of OWI offenders. However, the number and percentage of women convicted of OWI increased steadily during the 10 year period. Changes in gender distribution are presented in Figure 30. From 2000 through 2009, the number and percentage of OWI convictions received by women increased 66.3% and 34.5%, respectively.

Figure 31 shows that as offense seriousness increased the percentage of women convicted declined. During the ten year period, women accounted for 21% of the convictions for serious misdemeanors, 15.8 of aggravated misdemeanor convictions, and 10.4% of the class D felony convictions.



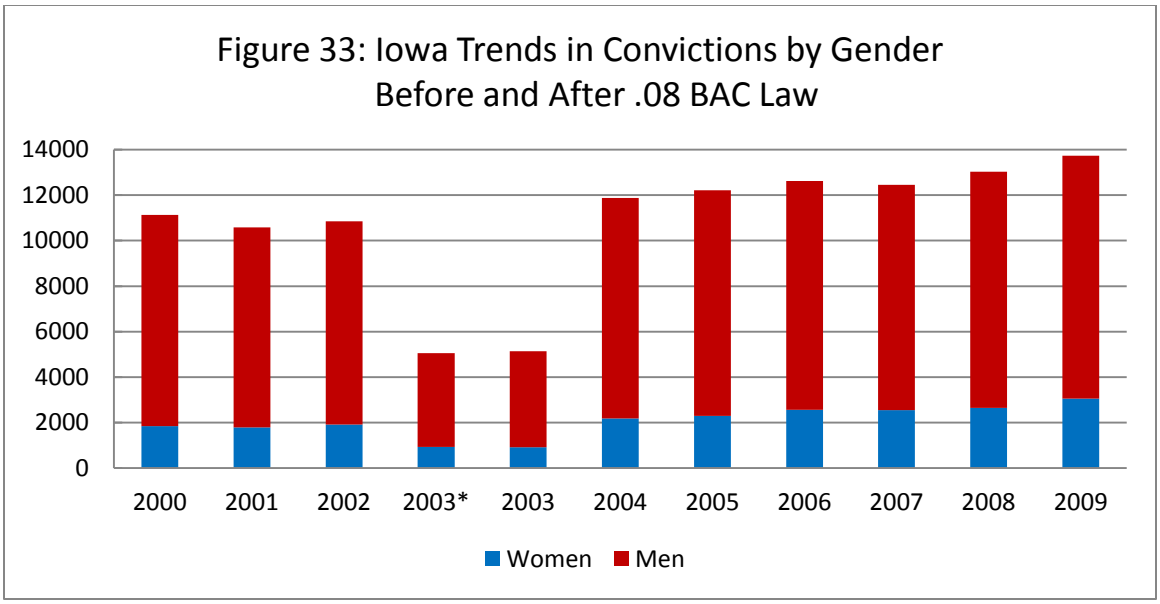
From 2000 through 2009, the convictions received by women increased for each type of OWI conviction. Figure 32 shows that the overall greatest increase was for serious misdemeanors. The percentage convicted women for that crime increased approximately 35%, while convictions for aggravated misdemeanors and class D felonies increased 22.6% and 16%, respectively. In the six years that followed the reduction in the legal BAC level, women as a percent of convictions increased 21% for serious misdemeanors, 25% for aggravated misdemeanors, and 8.4% for class D felonies.



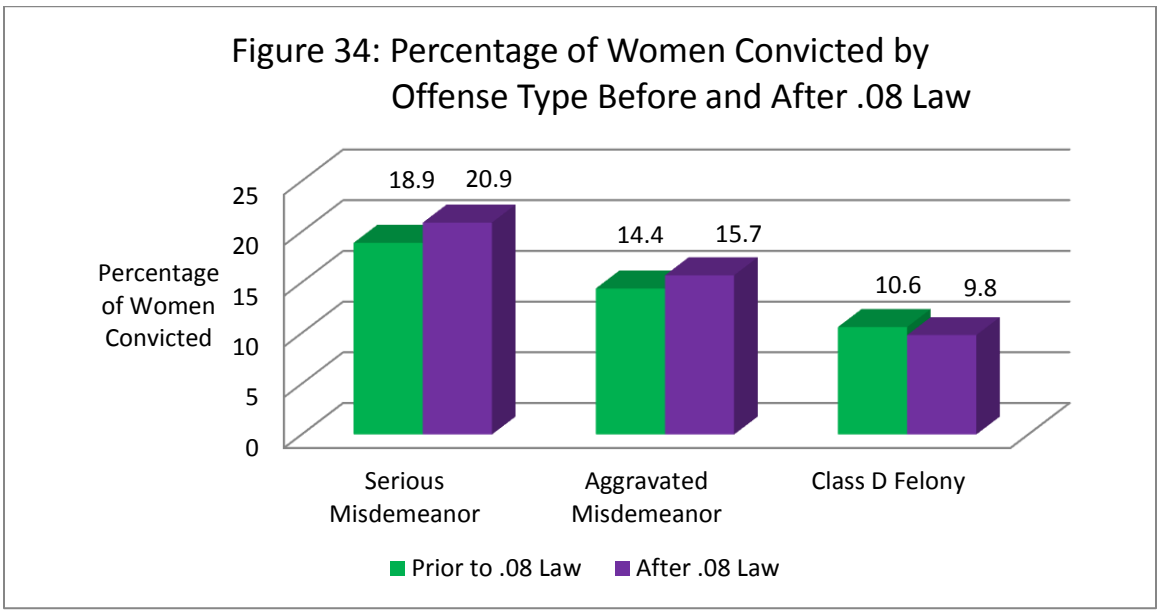
Given the increases in serious and aggravated misdemeanor convictions after 2003 we assessed changes for the numbers of women convicted before and after Iowa reduced the minimum BAC to .08.

To account for the timing of the new law, the chart in Figure 33 presents two bars for the year 2003. The first of these reflects the number of male and female convictions during the first six months of 2003 (n=927 females and n=4,124 males). The second bar for 2003 shows the number of convictions for July through December of that year (n=910 females and n=4,223 males). From 2000 through 2001, the number women convicted of OWI declined from 1,838 to 1,779. During the next year, the number of women convicted increased to 1,913. From 2004 to 2009 the number of women convicted increased approximately 40%.

The bar chart in Figure 34 illustrates changes in total number of women convicted for each type of OWI, before and after the reduction of the minimum BAC. The chart compares percentages of convictions during the pre-reduction period of January 2000 through June 2003 with the percentages during a matching three year post-reduction period of July 2003 through December 2006. Using these data, we assessed the statistical significance of changes in the number of women convicted before and after the change to the legal BAC level. The percentage of women convicted of serious misdemeanors increased from 18.9 to 20.9. That increase was statistically significant (Chi-square significant at $p = .001$). The somewhat smaller rise in the percentage of women convicted of aggravated misdemeanors was also statistically significant (Chi square significant at $p = .02$). The slight decline in the percent of felony convictions was not statistically significant.



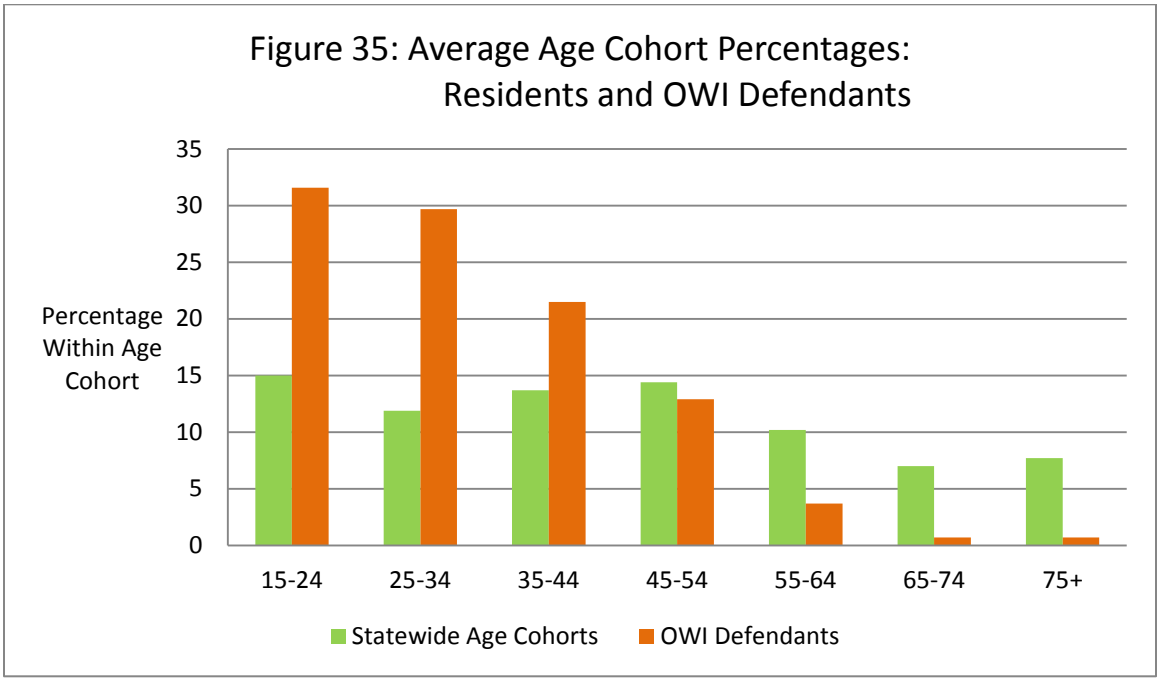
* Prior to the .08 BAC law.



Age Cohort Distribution

Three age cohorts were overrepresented among persons convicted of OWI. Figure 35 shows that the distribution of age categories is much different for OWIs than for the state population. Persons in the age ranges of 15 to 24, 25 to 34, and 35 to 44, were over-represented among OWI offenders. OWI defendants from the ages of 15 to 24 were overrepresented by a factor of 2. Defendants from the ages of 25 to 34 were overrepresented by a factor of approximately 2.5. The percentage of defendants from the ages of 35 to 44 was 57% greater

than the percentage of that cohort among Iowa residents. Persons over the age of 64 comprise about 14% of Iowans, but less than 5% of OWI convictions from 2000 through 2009.



Figures 36 to 38 illustrate conviction trends among four cohorts between the ages of 15 and 54. The trends for serious misdemeanor convictions are shown in Figure 36. During all ten years, 15 to 24 year old defendants had the highest percentage of convictions for serious misdemeanors. From 2000 through 2003, the percentage of convicted offenders in that age cohort declined slightly and then increased 4% between 2003 and 2004. During the next six years, the percentage of defendants in the cohort of 15 to 24 year olds declined 11%. By contrast, the percentage of offenders from age 25 to 34 years increased slightly in the first three years then decreased 6.5% between 2003 and 2004. From 2004 through 2009, the percentage of convicted OWI offenders within the 25 to 34 age range increased 12.8%. From 2000 through 2009, the percentage of offenders between 35 to 44 years old declined 22% while the percentage within cohort of 45 to 54 year olds increased 28%.

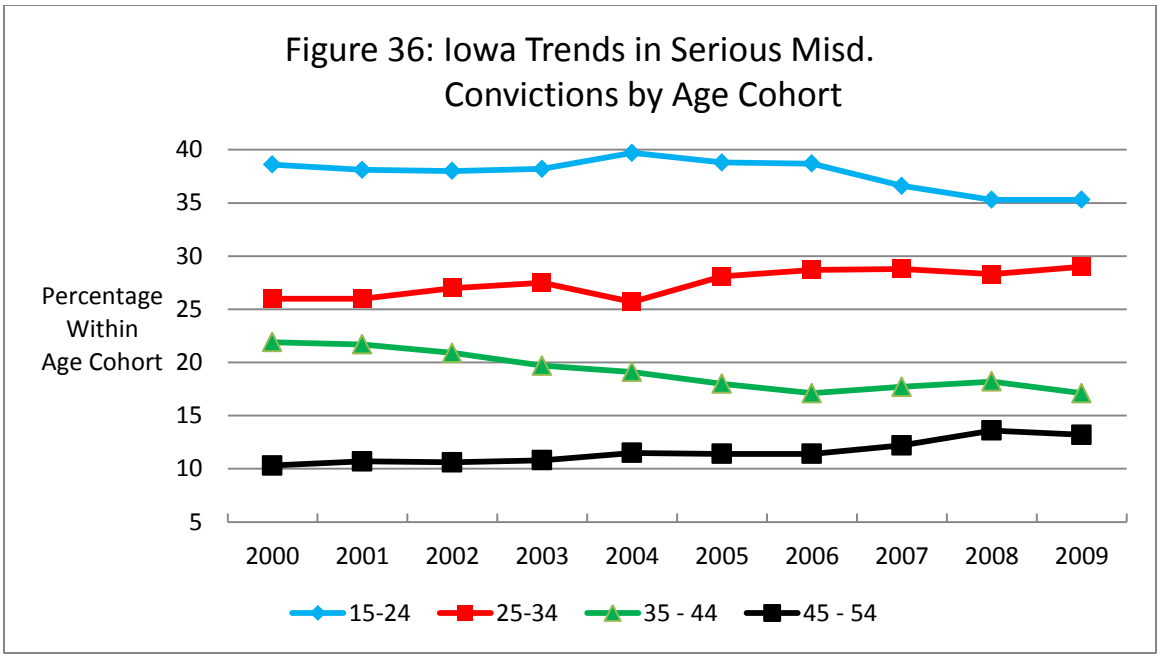
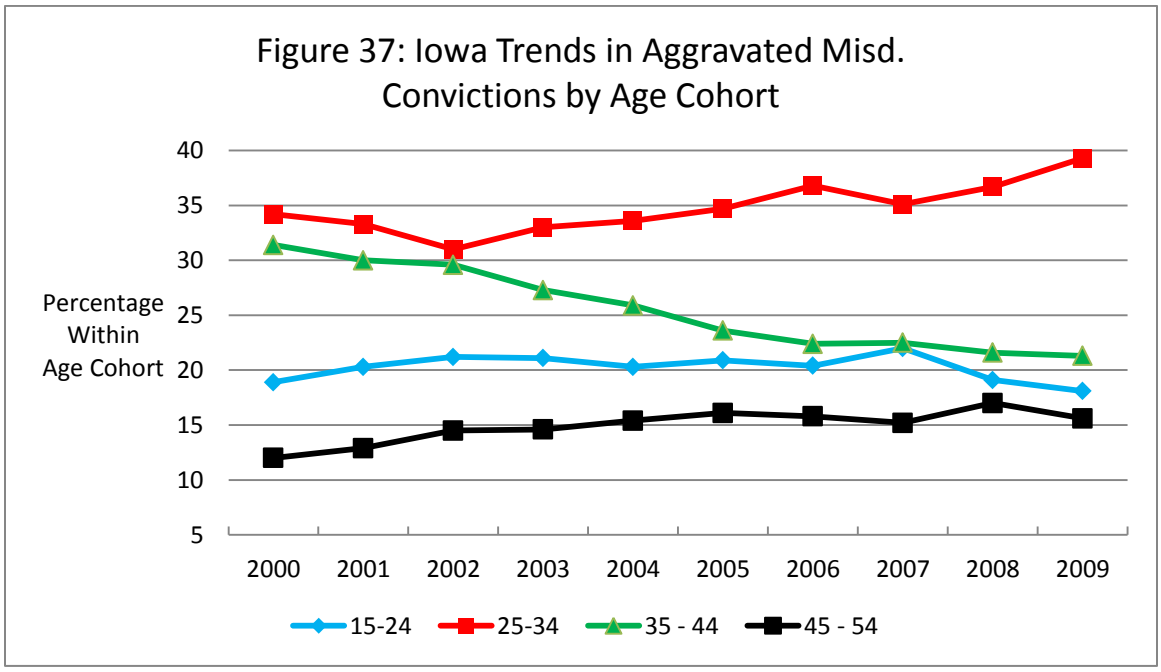
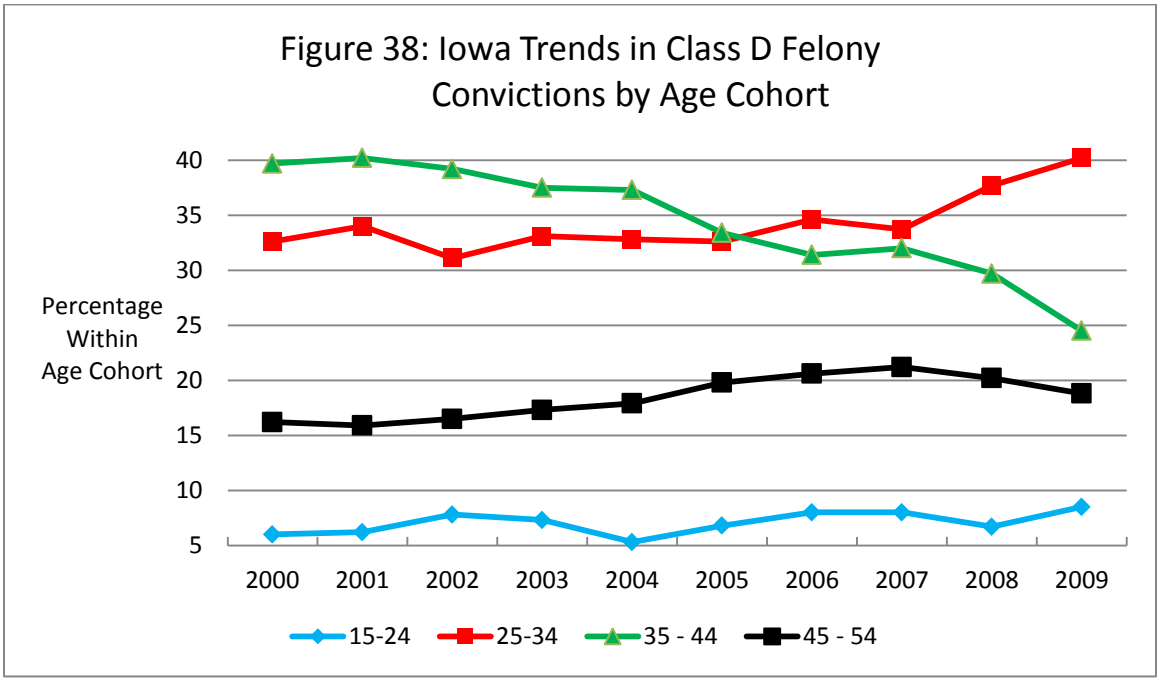


Figure 37 illustrates the conviction percentages by age cohort for aggravated misdemeanors. From 2000 through 2009, defendants in the cohort of 25 to 34 year olds had the highest percentages of convictions for aggravate misdemeanors. After an initial three years of decline, the percentage of 25 to 34 year old defendants rose to an overall increase of 15%.



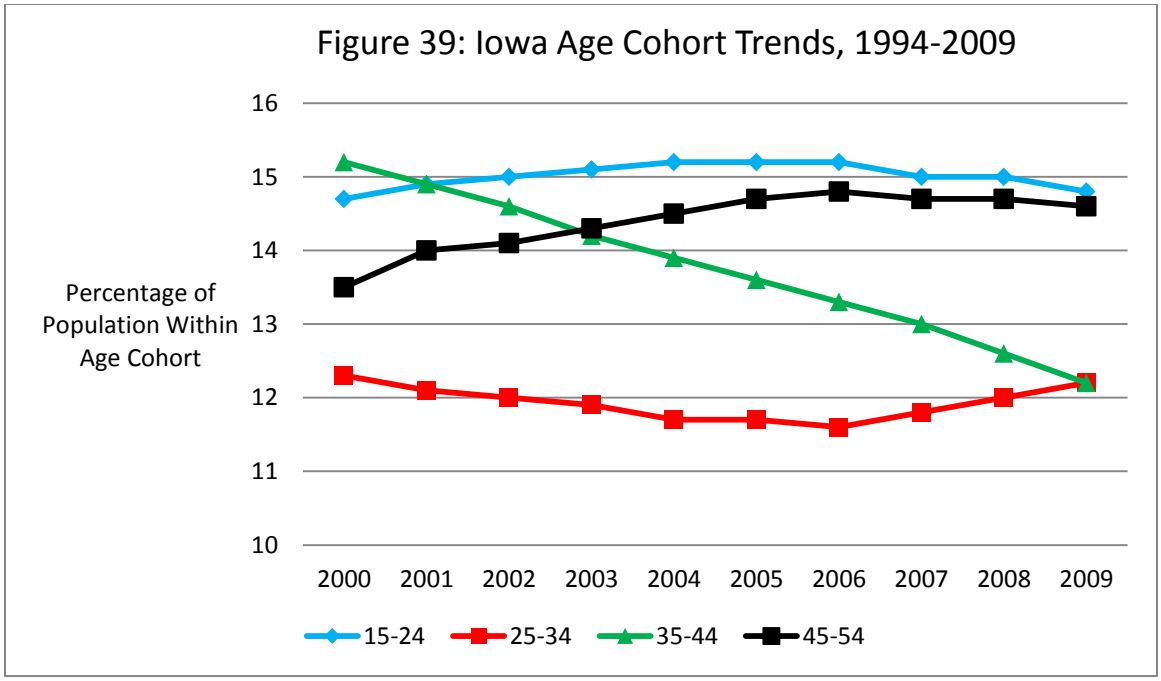
By contrast, the percentage defendants age 35 to 44 decreased 32% from 2000 through 2009. During the same period the percentage of convictions received by the youngest cohort declined 4% while percentage of convictions received by defendants from 45 to 54 years old increased 30%.

The class D felony OWI trends presented in Figure 38 show a somewhat different pattern for conviction percentages by age cohort. From 2001 through 2005, defendants in the 35 to 44 year old cohort had the highest percentage of convictions. During those years, the percentage of convictions within that cohort declined 16%. For the next four years, it dropped another 26.6%, for an overall decline of 38%. From 2000 through 2005, the percentage of convictions received by defendants who were within the ages of 25 to 34 oscillated around 32%, resulting in a five year trend that was relatively flat. During the next four years, the percentage of class D felony convictions received by defendants in 25 to 34 age range increased 24.5%. From 2005 through 2009, defendants in that age range received the highest percentages of felony OWI convictions. The percentage of convictions among the 45 to 54 year cohort increased 31% from 2000 through 2007, and then declined 11% during the next two years. Not surprisingly, the cohort of 15 to 25 year olds had the lowest percentages of felony convictions. From 2000 through 2004, percentages of 15 to 24 year defendants increased and then declined by an amount similar to the initial increase. From 2004 through 2009, the percentage of class D felonies convictions received by the youngest cohort increased 60% but still produced the lowest percentage of felony convictions.



The trends Figures 35 to 38 show that from 2000 through 2009, the percentages of convictions received by 15 to 24 year olds for serious and aggravate misdemeanors decreased, and the percentages of convictions received by that age cohort for class D felonies increased. From 2000 through 2009 the percentages of convicted offenders in the cohort of 25 to 34 year olds increased for all three crimes. For each type of conviction, most of the percentage increase among 25 to 34 year olds occurred during 2004 through 2009. From 2000 through 2009, the percentage of convicted offenders within the cohort of 35 to 44 year olds declined. For most of the 10 year period, the percentage of convictions of defendants from the ages of 45 to 54 increased for all three crime categories. From 2007/8 through 2009 the percentages of convictions received by that cohort declined.

One way to evaluate age cohort changes in the population of convicted OWI offenders is to compare those changes to trends in the broader population of Iowa residents. Figure 39 illustrates the changes in Iowa age cohort percentages from 2000 through 2009 (State Data Center of Iowa 2011a). During those years, misdemeanor convictions received by 15 to 24 years olds increased. From 2000 through 2006, the percentage of Iowa residents in that age range also increased. From 2006 through 2009, the percentage of Iowa residents between the ages of 15 and 24 declined. From 2006 through 2007 in the percentages of misdemeanor convictions among 15 to 24 year olds (see Figures 36 and 37).



From 2000 to 2009 the percentages of convicted offenders in the 25 to 34 cohort increased for all three crimes. Most of the percentage increase among 25 to 34 year olds occurred from 2004 through 2009. Figure 39 shows that from 2004 through 2009, the percentage of Iowa residents between the ages of 25 to 34 increased. From 2000 to 2009, the percentage offenders

within the cohort of 35 to 44 declined steadily in all three offense categories. That trend was not found among any of the other age cohorts. From 2000 to 2009, the percentage of Iowa residents between the ages of 35 to 44 declined 21%. Likewise, that trend was not found among any of the other age cohorts.

From 200 through 2007, the percentage of convictions within the 45 to 54 age cohort increased in all three crime categories. From 2007 to 2009, the percentage of convictions for that age cohort declined. Likewise, the percentage of Iowa residents increased from 2000 to 2006 and then declined slightly.

Together, the trends presented in Tables 36-39 provide solid evidence that from 2000 through 2009, changes in the age structure of its state population influenced the age distribution of OWI convictions in Iowa.

To help assess the relevance of the changes in the age cohort percentages we calculated the statistical correlations of the percentage of offenders convicted for each OWI offense with each of years for which we possessed data. The results, presented in Table 8, show that several correlations were statistically significant. The correlation analysis shows that some of the increases and decreases in prevalence of convictions were of a magnitude that did not occur by chance. For example, the 11% decline in the percentage of 15 to 24 year olds convicted of serious misdemeanors is statistically significant at the .01 level. The correlations for the 25 to 34 age interval indicate statistically significant ($p < .01$) increases in the percentages of that cohort who were convicted of serious and aggravated misdemeanors. For all offense categories, the declines in the percentage of convictions among 35 to 44 year olds were statistically significant ($p < .001$). Annual increases in convictions received by 45 to 54 year olds were statistically significant for each crime type. Statistically significant ($p < .01$) increases also occurred in the percentages of 55 to 64 year olds convicted of serious and aggravated misdemeanors.

Table 8: Correlations for Age Cohort by Percentage of Crime Convictions with Annual Magnitude of Change

Age Cohort	Serious misdemeanors	Aggravated misdemeanors	Class D Felonies
Under 25	-.682**	-.201	.544
25 - 34	.804**	.802**	.184
35 - 44	-.928***	-.974***	-.957**
45 - 54	.925***	.845**	.836**
55 - 64	.936**	.969**	.581
64+	.124	.211	.269
* $p < .05$ ** $p < .01$ *** $p < .001$			

Changes in the median ages of females and males convicted for each crime are shown in Figures 40 to 42. Figure 40 shows that in 2002, the median age of females convicted of serious misdemeanor OWI declined to 29 and in 2004, declined to 28. In 2003, the median age among males declined to 27 where it remained until 2007 when it increased to 28. From 2007 to 2008 the median age of males and females convicted of serious misdemeanor OWI was 28.

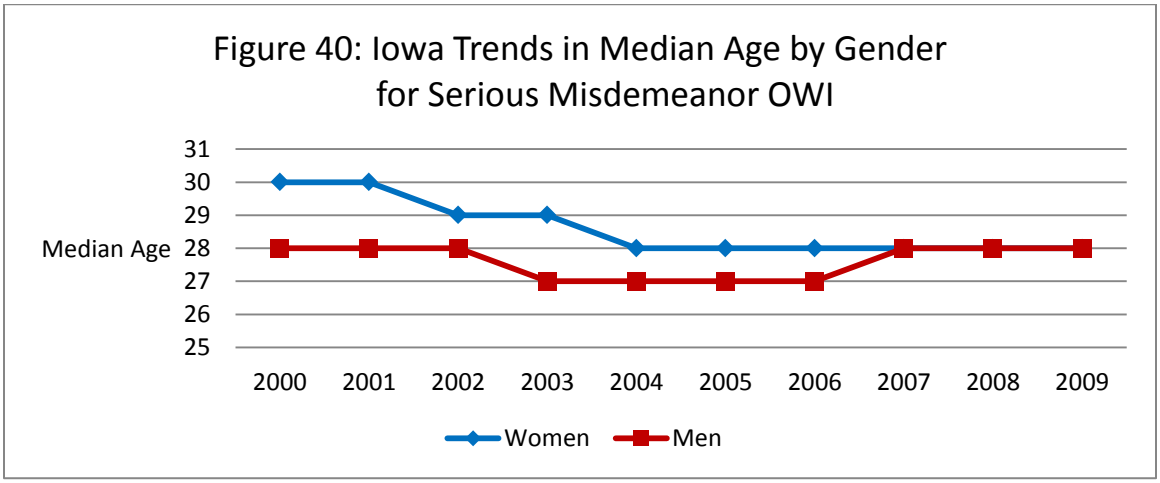
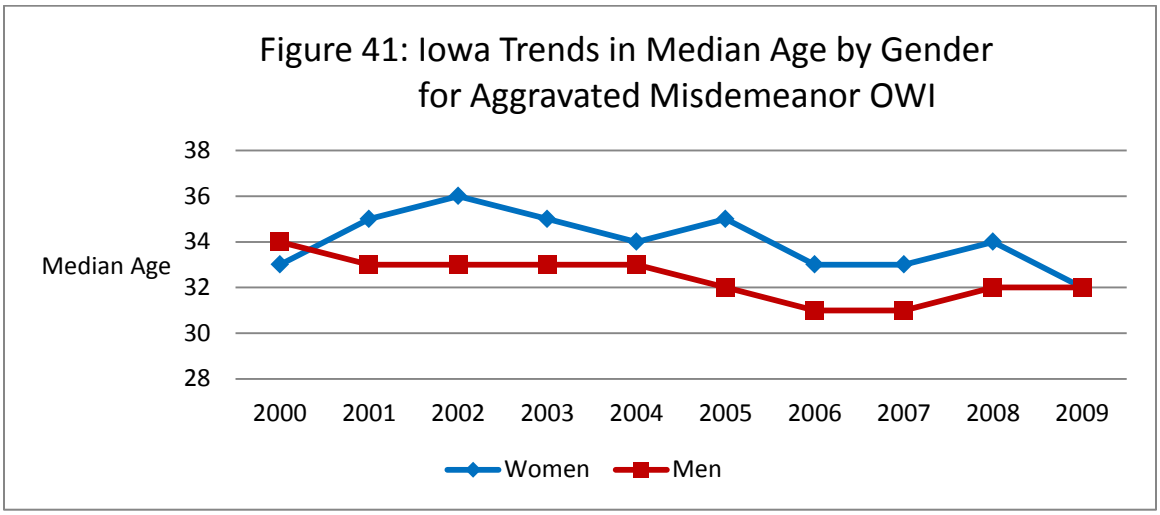
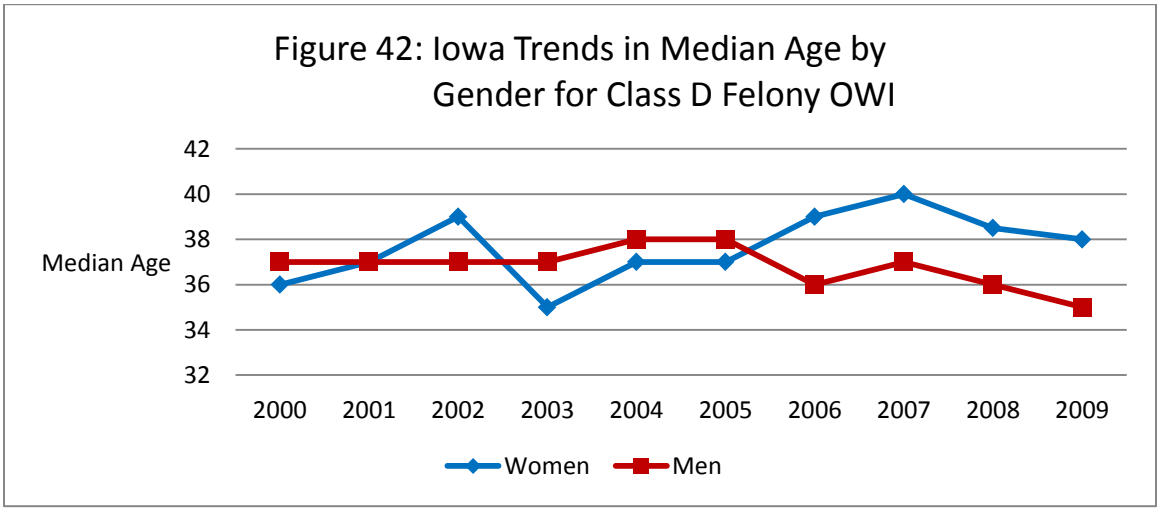


Figure 41 illustrates changes in the median ages of males and females convicted of aggravated misdemeanor OWI. On the whole, these individuals are older than the offenders convicted of serious misdemeanor OWI. The median ages for the two genders fluctuated from year to year and were slightly lower (32 years old) in 2009 than in 2000 (33 years old for females, 34 years old for males). For both genders, the overall trend was a decline in the median age. For eight of the ten years, the median age of females convicted of aggravated misdemeanors was higher than the median age of men convicted of that offense.



Changes to the median ages of males and females convicted of class D felony OWI are shown in Figure 42. During the first four years, the median age of convicted females increased then decreased. From 2003 through 2009, the median age of females convicted for class D felonies increased from 35 to 38.5. From 2000 to 2003, the median age for convicted males was 37 years old. During the next four years, the median age of males increased, decreased, and increased again. From 2007 through 2009, the median age for both women and men declined by two years. In general females convicted of OWI were older than their male counterparts.



Racial and Ethnic Distribution

Given the demographics of Iowa we were not surprised to find that in all of the OWI crime categories Whites were the highest percentages of convicted offenders. The data also show, as illustrated in Figure 43, that White residents were underrepresented among all three categories of convicted OWI offenders. The highest percentage of White defendants was among aggravated misdemeanors and lowest percentage was among those convicted of class D felony OWIs.

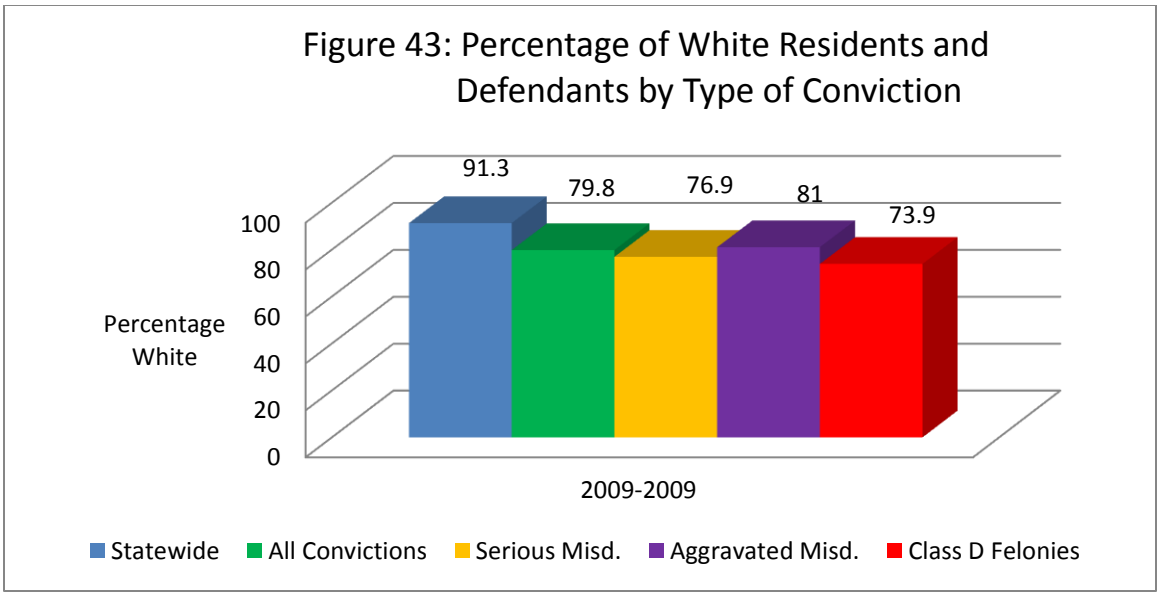
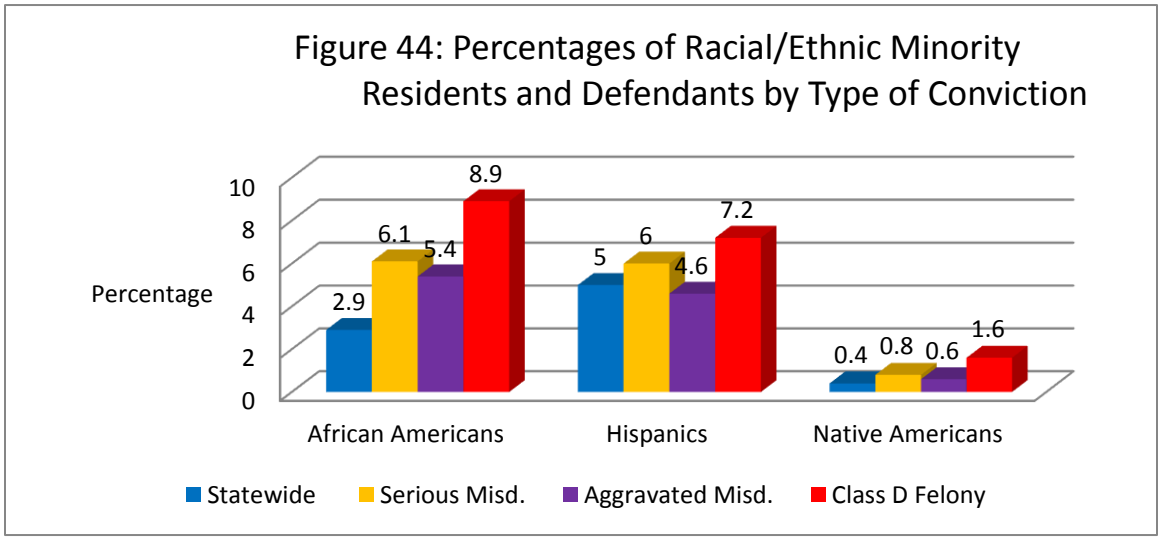


Figure 44 shows the percentages convictions received by African Americans, Hispanics, and Native Americans for each type of OWI offense. With one exception (Hispanics convicted of aggravated misdemeanor OWI), racial and ethnic minorities were overrepresented in the OWI convictions relative to their population in the state. African Americans were overrepresented by a factor of 2 for serious misdemeanors, a factor of 1.86 for aggravated misdemeanors, and a factor of 3 for class D felonies. The largest overrepresentation of Hispanics was for class D felony convictions. Native Americans were overrepresented by a factor of 2 for serious misdemeanors, a factor of 1.5 for aggravated misdemeanors, and a factor of 4 for class D felonies.



Figures 45-47 illustrate the ten year trends in percentages of convictions by race/ethnicity for each type of OWI conviction. Figure 45 shows that from 2000 through 2009, the percentage of convictions received by Native American's increased and decreased slightly within an overall flat trend line. Over the ten year period, the percentage of convictions received by White defendants decreased 3.5% and the percentage received by Hispanics declined 11.8%. The percentage of serious misdemeanor convictions received by African Americans increased 25%.

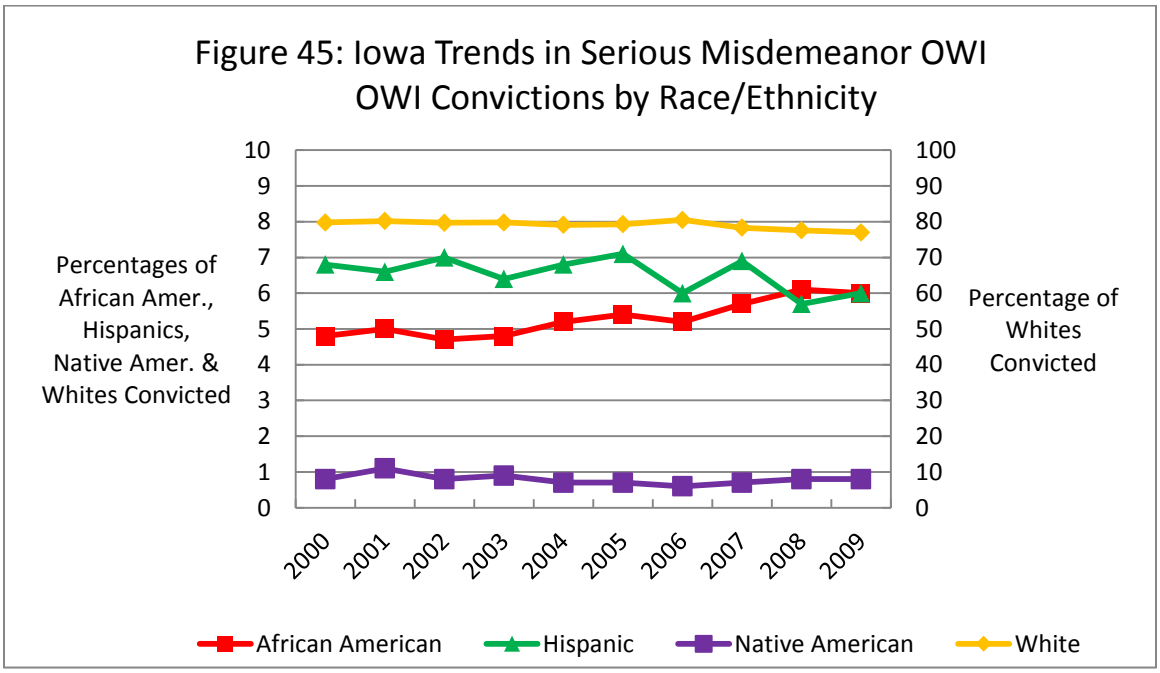
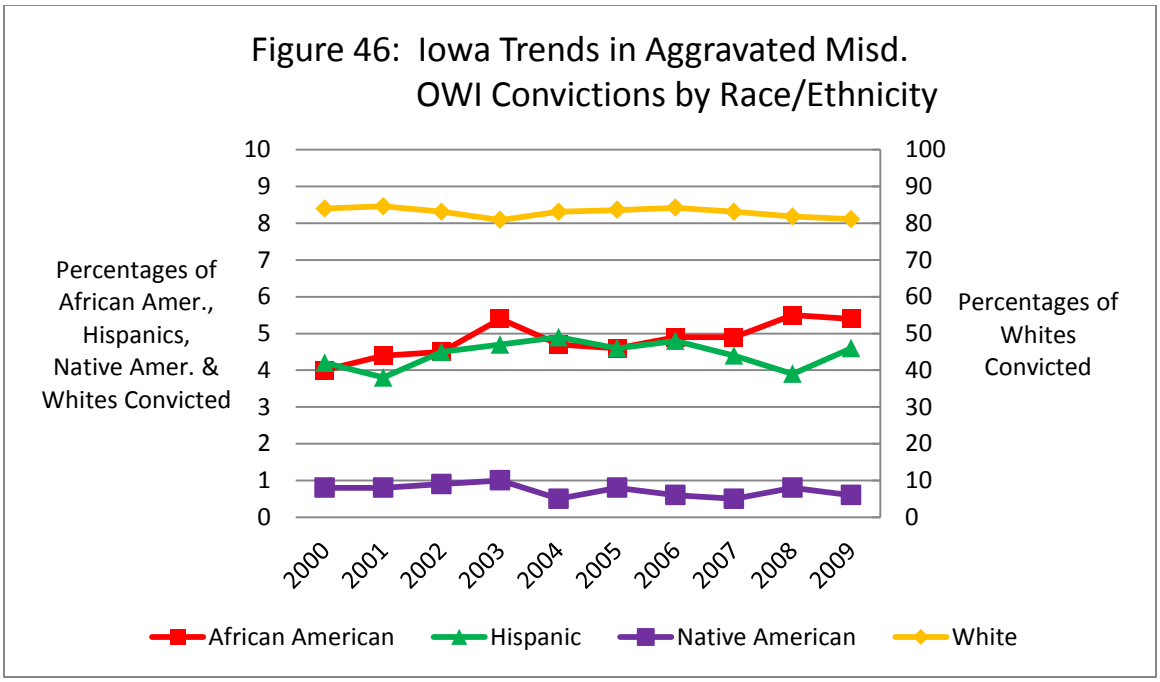
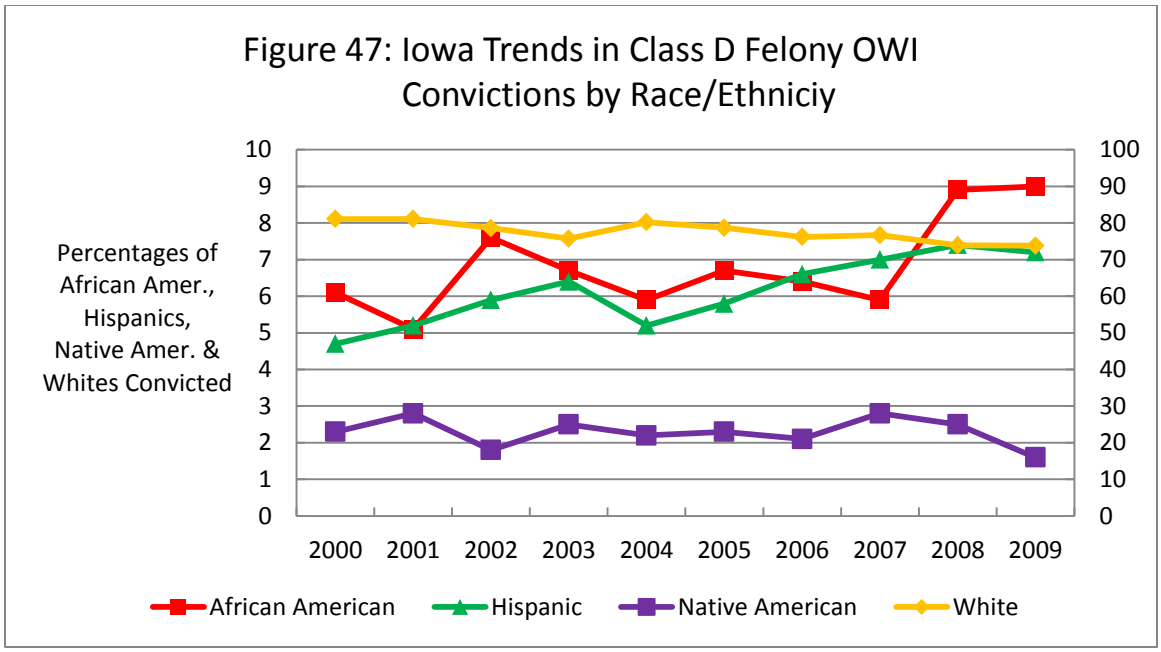


Figure 46 presents trends in the percentages of convictions for aggravated misdemeanors. From 2000 through 2009, there was a 25% decline in the percentage of convictions received by Native Americans. During the same period, the percentage of aggravated misdemeanor convictions received by White defendants was relatively flat, declining 3.5% over ten years. In contrast to the 11.8% decline in serious misdemeanor convictions received by Hispanics, the percentage of aggravated misdemeanor convictions received by Hispanics *increased* 9.5%. The largest magnitude of change in aggravated misdemeanor convictions was a 35% increase in the percentage of those convictions received by African Americans.



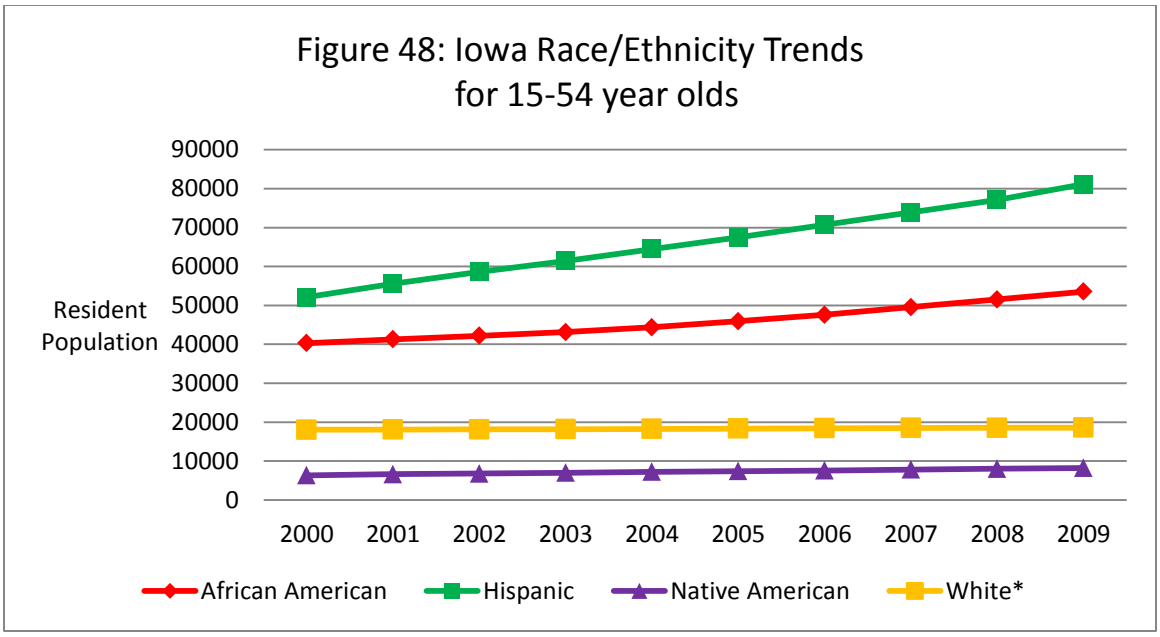
Changes in the percentages of class D felony OWI convictions are illustrated in Figure 47. From 2000 through 2009, the percentage of felony OWI convictions received by Native Americans declined 30%, with most of the decline occurring from 2007 through 2009. The percentage of felony convictions received by Whites declined 9%. During the same period, the percentage of convictions received by Hispanics and African Americans increased 53% and 47%, respectively.



Iowa census data was used to assess whether the race/ethnicity cohort changes in the population of convicted OWI offenders was possibly related to changes in the broader population of Iowa residents. Figure 48 illustrates changes in numbers of African Americans, Hispanics, Native Americans, and Whites who resided in Iowa from 2000 through 2009 (State Data Center of Iowa 2011b). To be consistent with the ages of the defendants who were most frequently convicted of OWI, the census population data include only those residents who were 15 to 54 years old.

Two population trends fit well with changes in the racial/ethnic distribution of OWI convictions. From 2000 through 2009, the number of 15 to 54 year old African Americans residing in Iowa increased 26%. The overall trend for that increase is a good match with increases in percentages of all three types of OWI convictions received by African American defendants. From 2000 through 2009, the number of Hispanics 15 to 54 years old residing in Iowa increased 33%. The ten year trend for Iowa's Hispanic population matches generally the trajectories of Hispanic conviction trends for aggravated misdemeanors and Class D felony convictions.

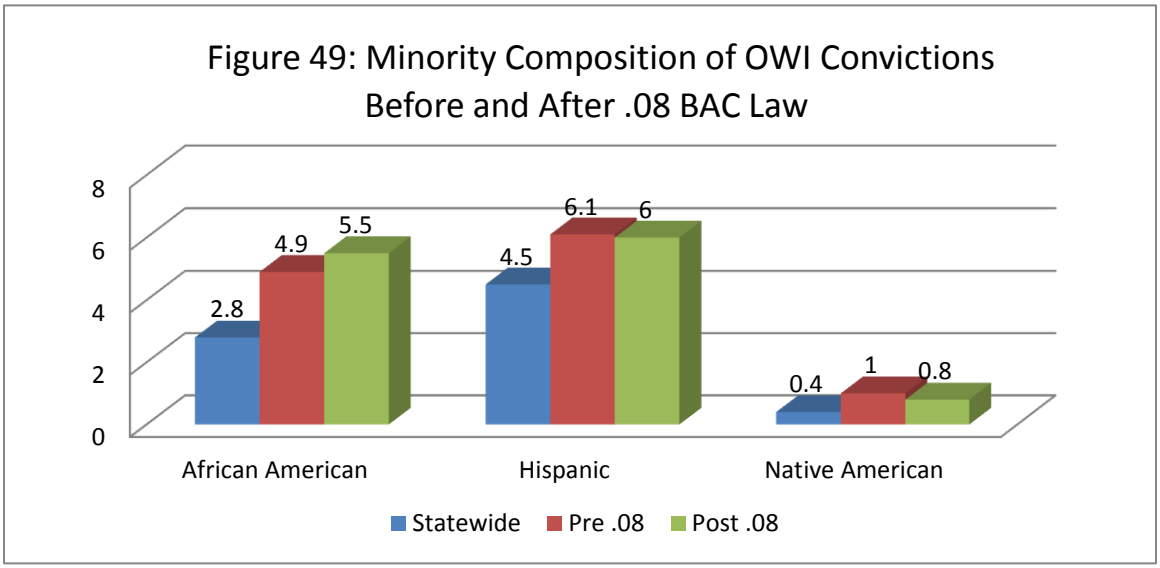
From 2000 through 2009, Iowa's population of 15 to 54 year old Whites increased only 3%. Spread over ten years, Iowa's White population increased slowly. The trajectory of change in the population of Whites age 15 to564 years old is not inconsistent with the trend in OWI convictions received by Whites who were within that same age range.



* The population for Whites is presented in hundreds. From 2000 through 2009, the population of Iowa's White residents age 15 to 54 increased from 1,805,846 to 1,854,768

The population trend for15 to 54 year old Native Americans was not a good match with the ten year trajectories for Native Americans convictions. From 2000 through 2009, the population of 15 to 54 Native Americans increased 29%. During that time the percentages of convictions for aggravated misdemeanor and felony OWI received by Native Americans decreased 25% and 30%, respectively. In addition, the ten year trend for serious misdemeanor convictions of Native Americans was generally flat.

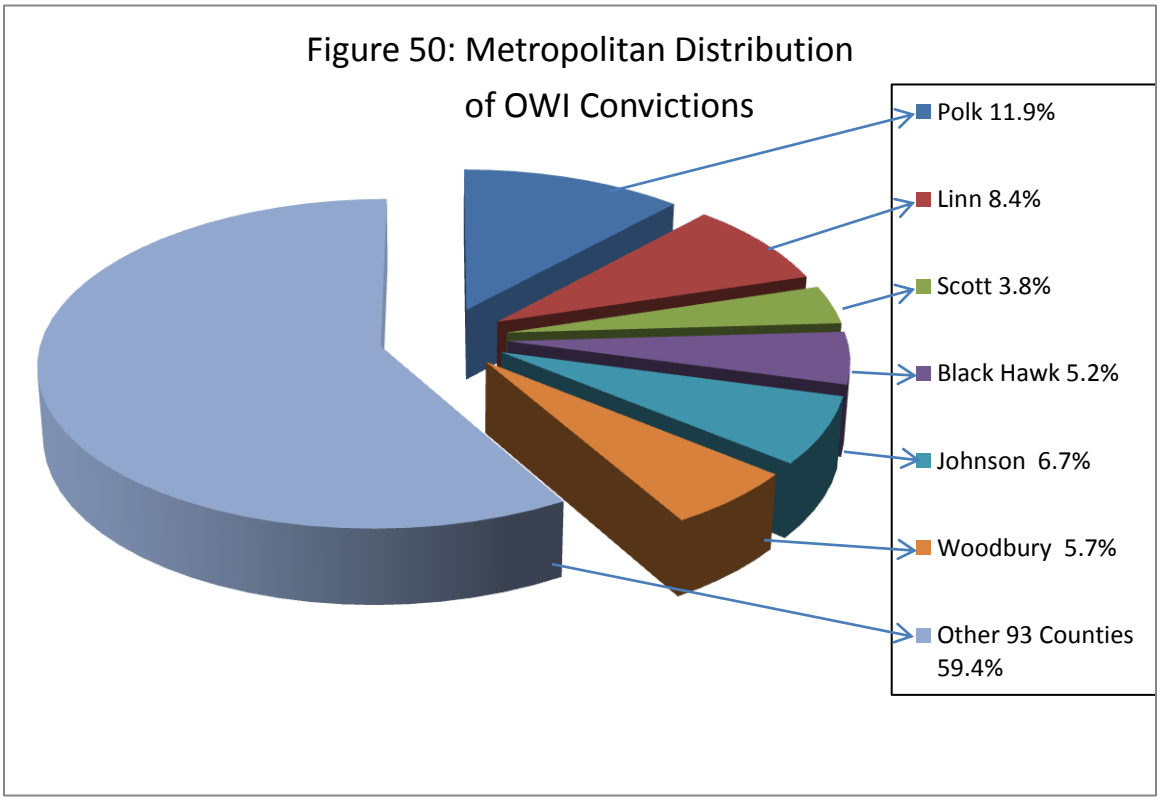
As shown in Figure 49, African Americans, Hispanics, and Native Americans were over represented in OWI convictions both prior to and after the reduction in the legal BAC limit.



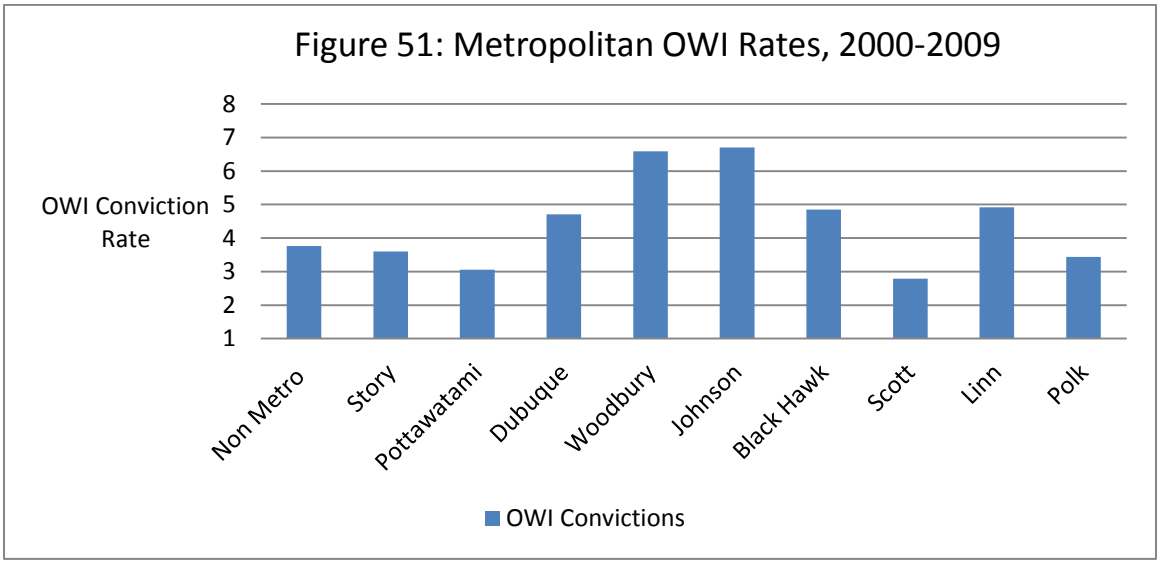
From January 1, 2000 through June 30, 2003 African Americans were 4.9% of the OWI convictions. From July 1, 2003 to December 31, 2009 African American defendants were 5.5% of convictions. The difference between the pre- and post-.08 BAC proportions for African Americans is statistically significant (Chi-square significant at p = .0001). The decrease in Hispanic convictions after the July 1, 2003 was not statistically significant. Prior to the reduction in the BAC standard, Native Americans were 1% of OWI convictions. After the BAC change, Native Americans were .08 of those convictions. The difference in the percentage of convictions of Native Americans was statistically significant (Chi-square significant at p = .0001). Though not shown in Figure 49, the percentage of White defendants convicted of OWI declined from 80.7% prior to the BAC change to 79.4% after the .08 law went into effect. The difference was statistically significant (Chi-square p =.01) but because Chi-square tests are sensitive to large sample sizes the results for White defendants must be interpreted with some caution.

Geographic Distribution

OWI convictions were largely concentrated in six of Iowa's 99 counties. Figure 50 illustrates the percentages of OWI convictions in those counties. From 2000 through 2009, 6% of Iowa's counties produced 40.6% of the state's OWI convictions.



The conviction rates per 100,000 residents for each of the metropolitan counties and the combined non-metropolitan counties are shown in Figure 51. Woodbury (Sioux City) and Johnson (Iowa City) had the highest overall rates of OWI convictions. The rates among Story, Pottawatami, Scott, and Polk counties were lower than the rate for the combined non-metropolitan counties.

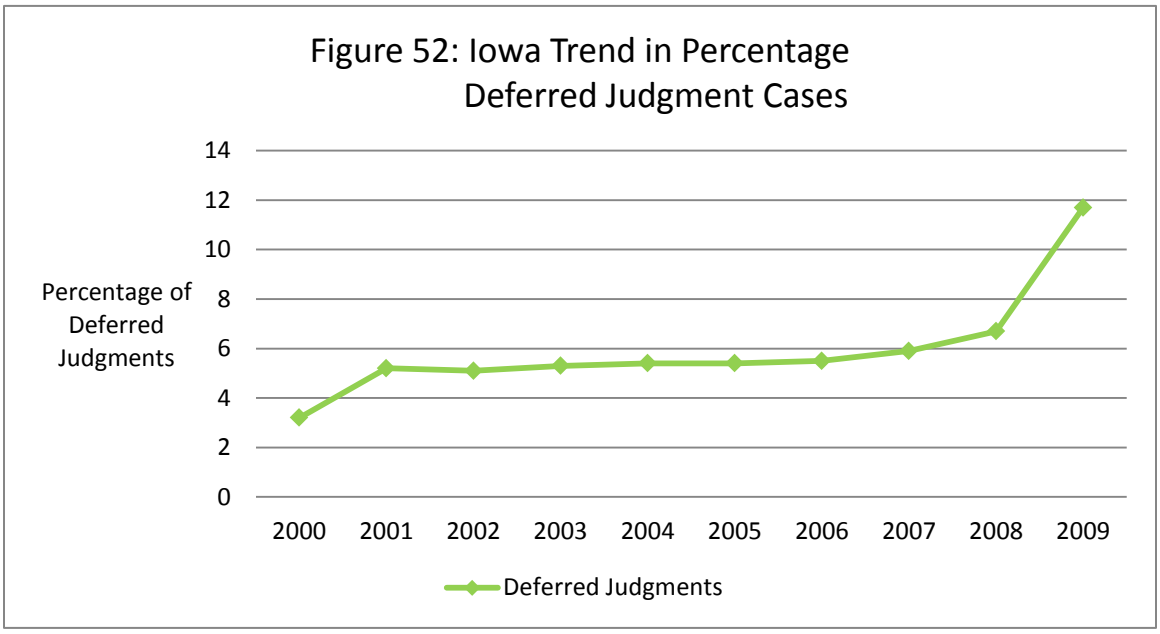


Deferred Judgments

Under Iowa OWI law, a deferred judgment can be given to some defendants as alternative to a criminal conviction. In OWI cases, deferred judgments are usually available only to first time offenders who plead guilty, were not involved in a personal injury crash, did not refuse chemical testing, and whose BAC level was less than .15. As part of the sentence, defendants are ordered to a term of probation. Conditions of probation may include community service and alcohol abuse treatment. After the offender satisfies all probation requirements, the OWI offense may be deferred by the sentencing court. Deferred judgments are not entered onto the defendant's criminal record. As with criminal convictions, various civil sanctions are imposed for offenders who accept a deferred judgment. These sanctions include fines and 30 to 60 day suspension of the defendant’s license to drive.

Deferred judgments are used almost exclusively in serious misdemeanor cases. Of 7,214 deferred judgments given from 2000 through 2009, none were made in felony OWI cases. Only 22 (0.3%) were received in aggravated misdemeanor cases.

Figure 52 illustrates the ten year trend in deferred adjudication for OWI cases in Iowa. From 2000 through 2009, the percentage of OWI convictions that resulted in a deferred judgment increased 350%. Most of the increase occurred from 2000 through 2001 when deferred judgments increased 63%, and 2006 through 2009 when they increased 113%.



The demographics of deferred adjudications are fairly straightforward. The highest percentages went to females, Whites, and persons under the age of 24 or over age of 65. The logistic regression model in Table 9 shows that males were significantly less likely than females to receive a deferred judgment. Being African American, Hispanic, or Native American also decreased significantly the odds of receiving a deferred judgment. With oldest offenders as the reference category, the youngest offenders had a slightly greater (statistically non-significant) chance of deferred judgment, while offenders age 25 through 64 were less likely to do so.

Table 9: Logistic Regression: Deferred Judgments Cases

Covariate	B	S.E.	Wald	Sig.	Exp(B)
Offender sex	-.341	.029	143.35	.000	.711
African American	-.303	.063	22.95	.000	.739
Hispanic	-.265	.057	21.35	.000	.767
Native American	-.530	.169	9.89	.002	.589
Age 24 & under	.056	.136	0.17	n.s.*	1.06
25-34	-.352	.137	6.58	.000	.703
35-44	-.594	.139	18.24	.000	.552
45-54	-.633	.141	20.01	.000	.531
55-64	-.409	.152	7.22	.007	.664

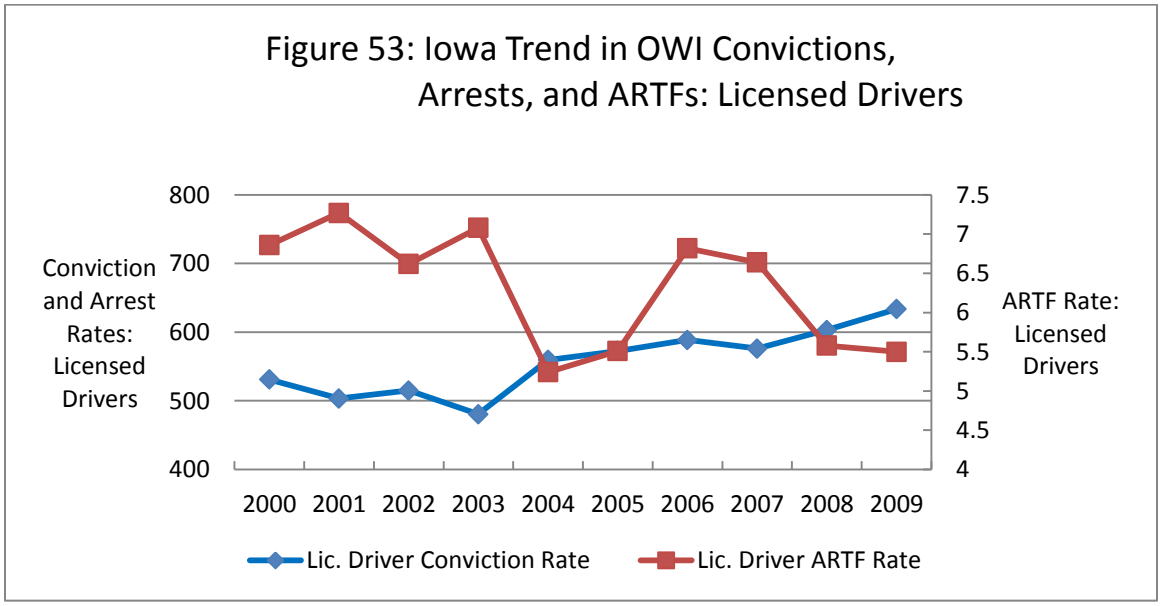
* Not statistically significant

The logistic regression model confirms that the effects of each of the predictor variables are independent of each other. However, the model does not control for defendants' prior records or whether defendants satisfied their conditions of probation. Offenders with prior criminal records and/or those who do not satisfy their conditions of probation were not eligible for a deferred judgment. To the extent that deferred judgment decisions are influenced by those legal factors the demographic variables might have only an indirect effect on deferred judgments or no effect at all. Therefore, the addition of variables that control for probation success and prior record could reduce the gender and race effects to levels of non-significance.

Conviction Lag Effect on Iowa ARTFs

Previous parts of the analysis have cast doubt upon the likelihood of a law enforcement lag effect on ARTFs. The Iowa court data used in this analysis provided an opportunity to examine the existence of a conviction lag effect. Evidence of such an effect would be present if increases in OWI convictions were followed by decreases in ARTFs and decreases in convictions were followed by increases in ARTFs.

Figure 53 illustrates the 2000 through 2009 trends in licensed driver rates for OWI convictions, and alcohol related traffic fatalities for licensed drivers. The graph shows that from 2000 through 2003, the OWI conviction rate declined 9.6%. During the following three years, Iowa's licensed driver ARTF rate increased 26.7%. From 2003 through 2006, the OWI conviction rate increased 22.4%. From 2006 through 2009, the ARTF rate declined approximately 19.3%.



Summary of Iowa Conviction Trends

During the ten year period for which we have data, the number and rate of OWI convictions increased approximately 20%. Almost all of the increases occurred after the 2003 reduction in the minimum BAC level (Figures 23-25).

The gender distribution of convicted OWI offenders fits well with two findings from our review of the OWI literature. First, males were more likely than females to be convicted for both first time (serious misdemeanor OWI) and multiple offenses (aggravated misdemeanors and class D felonies). As predicted, males comprised approximately 80% of convicted offenders. Second, the gender gap appears to have narrowed from 2000 to 2009. During that time, the percentage of OWI convictions received by women increased 35% for serious misdemeanors, 23% for aggravated misdemeanors, and 16% for class D felonies. For each type of conviction, the majority of the increase occurred after the 2003 reduction in the permissible BAC level. Chi-square tests revealed that the post-2003 increases in percentages of women convicted for serious and aggravated misdemeanor OWI were statistically significant.

The findings on gender are consistent with Schwartz's (2008) study of gender differences among drunk drivers. Her analysis concluded that changes in legal definitions of drunk driving may have inadvertently targeted female drunk driving patterns and consequently narrowed the gender gap in DUI convictions. Significant increases in the post-2003 conviction of women for OWI in Iowa indicate reducing Iowa's legal BAC limit contributed to increased arrests and convictions of female offenders.

The analysis revealed an overrepresentation of three age cohorts among persons convicted of OWI in Iowa (15-24, 25-34, and 35-44). For serious misdemeanor offenses, the highest percentages of convictions were among 15-24 year olds and the lowest percentages were among defendants between the ages of 45-54. The 25-34 year cohort had the highest percentages of convictions for aggravated misdemeanor OWIs while defendants between the ages of 45 and 54 had the lowest. From 2000 through 2005, the highest percentages of convictions for class D felony OWI were among defendants between the ages of 35 and 44. From 2006 through 2009, the highest percentage of felony OWI convictions was among drivers who were between 25 and 34 years old. During all ten years, defendants between the ages of 15 and 24 accounted for the lowest percentages of persons convicted of class D felony OWI.

An interesting finding from the analysis of Iowa age cohort trends was an apparent link between the percentages of residents with some age cohorts and the percentage of convictions within those cohorts. For each of the age cohorts examined in this study, changes in the percentages of Iowa residents generally followed similar trajectories as the changes in percentages of convicted OWI offenders. For example, the steady decline in the percentage of convictions among 35 to 44 year olds closely matched the 2000 through 2009 decline of that cohort within the resident population. From 2000 through 2009 the percentages of convicted

offenders in the 25 to 34 cohort increased for all three crimes. Most of the increases among 25 to 34 year olds occurred from 2006 through 2009. During those same years the percentage of Iowa residents between the ages of 25 and 34 increased also. From 2000 through 2006/7 the percentage of convictions within the 45 to 54 age cohort increased in all three crime categories. From 2007 through 2009, the percentage of convictions for the cohort of 45 to 54 year olds began to decline. Likewise, the percentage of 45-54 year old residing in Iowa increased during 2000 through 2006, then declined from 2007 through 2009.

The analysis revealed several trends related to the race and ethnicity of persons convicted of OWI in Iowa. Comparing those percentages with the racial and ethnic percentages within the resident population indicated that racial and ethnic minorities were consistently overrepresented among convicted OWI offenders. By contrast, Whites were underrepresented in all three offense categories. For the three types of OWI crimes, the highest percentages of OWI convictions were received by Whites. The percentages of convictions received by Whites ranged from a low of 73.8% for class D felonies to a high of 84.6% for aggravated misdemeanors.

From 2000 through 2009, the percentage of serious misdemeanor convictions received by Hispanics declined 11.7%. By contrast, the percentages of Hispanic convictions for aggravated misdemeanor and class D felony OWIs increased 9.5% and 53%, respectively.

For all three crimes, Native Americans comprised the lowest percentages of convictions. From 2000 through 2009, Native American convictions for serious misdemeanors ranged between .7% and 1.1%. Two trends related to Native Americans that would not have been predicted by the extant OWI research literature. For that population, aggravated misdemeanors *and* class D felony OWIs decreased 25% and 30%, respectively. More surprising was that these declines occurred during a period that Iowa's 15 to 54 year old Native American population increased by almost 30%.

African Americans were the only racial/ethnic population to experience substantial ten year increases in conviction percentages for all three types of OWI offenses. From 2000 through 2009, the serious misdemeanor conviction percentage for African Americans increased 25%. For aggravated misdemeanor and class D felony convictions the percentages of African American defendants increased 35% and 49%, respectively.

Some of differences in the percentages of conviction before and after the reduction in the permissible BAC level were statistically significant. Convictions among African Americans increased significantly after the reduction in the permissible BAC level. By contrast, Native Americans and Whites experienced statistically significant decreases after the reduction in the permissible BAC level.

Of the 99 counties that comprise Iowa, six accounted for 40.6% of the OWI convictions that were adjudicated 2000 through 2009. Among those six counties, two were the locations of

state universities (Johnson County - University of Iowa and Black Hawk County - University of Northern Iowa).

Logistic regression analysis indicated that Whites and females were significantly more likely than racial/ethnic minorities and males to receive deferred judgments. However, the regression model did not control for variables related to prior criminal record and the completion of probation requirements. We expect that a model that control for those factors would show that race and gender do not have independent direct effects on the deferred judgment outcomes.

DISCUSSION AND CONCLUSIONS

Despite more than 20 years of declines in alcohol related crashes, injuries, and fatalities the problem of alcohol impaired driving continues to pose a significant threat to the safety of motor vehicle drivers and occupants. One purpose of this analysis is to provide the basis for additional research that might further reduce that threat.

Consistent with findings reported in the literature review, the typical convicted OWI offender in Iowa was a White male approximately 30 to 33 years old. However, some of the conviction trends reported here indicate that the demographic profile of Iowa's OWI population is changing. From 2000 through 2009, the percentages of convictions received by women, Blacks, and Hispanics increased by relatively large amounts. The percentage of convictions received by Native Americans generally declined. On the whole, the gaps between male and female offenders and between White and some minority offenders are decreasing. An important exception to these trends was found in the substantial decreases in percentages of aggravated misdemeanor and class D felony OWI convictions received by Native Americans.

All of the aggregate data show that for the 16 year period of 1994 through 2009, Iowa experienced a greater decline in the number, rate and percentage of ARTFs than both the nation as a whole, and other states within USDOT Region VII.

Conventional wisdom holds that increases in DUI/OWI enforcement are a deterrent to alcohol impaired driving and can therefore be helpful in reducing ARTFs. For DUI/OWI arrests to reduce alcohol impaired driving it must do so through a deterrent effect. Deterrence effects occur when the risk of apprehension or the pain of punishment so outweigh the benefit of a crime that offenders are deterred from unlawful behavior. For a deterrent effect to be effective offenders must have the capacity to make rational calculations about the risk of apprehension. However, drunk drivers by definition generally lack sufficient reasoning ability to properly assess both the risks of apprehension and the painful consequences of arrest.

Our assessment provides little support for the view that law enforcement tactics helped to reduce ARTFs. At the national, level, overall declines in DUI arrests were followed by declines in ARTFs. Though some enforcement effect was indicated by the Missouri data, most of the

statewide outcomes were inconsistent with the notion that law enforcement tactics had a direct effect and beneficial effect on ARTFs.

By contrast, the Iowa conviction trends did provide evidence that increases in OWI convictions might help to produce declines in ARTFs. Juxtaposing Iowa's ten year licensed driver conviction rate with OWI conviction trends revealed two separate instances of possible conviction lag effects on ARTFs in Iowa.

The findings pertaining to enforcement, convictions, demographics and declines in ARTFs have interesting research and policy implications. Primarily, they invite us to think critically about the factors that might explain 16 years of decreases in ARTFs both nationally and throughout USDOT Region VII.

This study found evidence that ARTF declines were in part produced by changes in the broader population. For example, increases in the number of Iowa's African American and Hispanic residents coincided with the increased proportions of OWI convictions received by those populations. Likewise, declines in the populations of Iowa residents between 35 to 44 years old and the increase in residents between 45 and 54 years old, coincided with decreased percentages of convictions received by 35 to 44 year old defendants and increased convictions of 45 to 54 year old defendants.

Another finding related to broader population trends is the uniform decrease in the percentages of ARTFs that occurred nationwide and in each of the Region VII states. From 2008 through 2009, ARTF percentages increased nationally and in Iowa, Nebraska, and Missouri. The Kansas ARTF percentages occurred from 2007 to 2009. This pattern is additional evidence that changes in ARTF rates are influenced by common changes in the national and state populations.

Increases and decreases in resident populations coincided within increases and decreases of OWI convictions and ARTFs because they affect the supply of drivers at risk for alcohol impaired driving. Utah exemplifies the manner in which the supply of high risk drivers in a population can influence ARTF rates. Utah's relatively large Mormon population practices a religion that prohibits the use of alcohol. Consequently, that state annually has the nation's lowest percentage of ARTFs.

Demographic influences on ARTFs have probably operated in concert with criminal convictions to reduce ARTFs in Iowa. In many cases, sentences imposed for DUI/OWI convictions emphasize an incapacitation approach that is intended to reduce offenders' capacity to engage in crime. This may be accomplished by terms of incarceration, electronic monitoring, alcohol interlock devices and other means that reduce offenders' capacity to drink and drive.

We conclude that in Iowa, and probably elsewhere, ARTF reductions were in part produced by a combination of changes in resident populations and conviction trends that jointly altered the supply of drivers who were at risk for alcohol impaired driving. This is not to say that

OWI enforcement is irrelevant to reducing drunk-driving behavior. Among other things, the apprehension of OWI suspects is an important initial step in the identification, conviction, sentencing and incapacitation of alcohol impaired drivers.

Iowa has made major progress in reducing alcohol related crashes, injuries and fatalities. However, continued progress could be reversed by changes in the state's resident population. Such changes might be already linked to recent increases in Iowa's ARTF rates.

It was not the purpose of this analysis provide information sufficient for making recommendations about OWI sentencing. We expect that research focusing on this complex relationship could lead to policy guidance that will help forestall the potential growth in alcohol related crashes, injuries, and fatalities in Iowa. With that in mind, the following subsection specifies our findings as they relate to the specific research objectives for this study.

Research Objectives

Objective 1: Produce a statistical overview of convicted OWI offenders regarding recidivism and the impact of lowering the blood alcohol content standard to .08.

Among all OWI convictions, 22% were for aggravated misdemeanors (second conviction) and 7.3% were for class D felonies (two or more prior convictions). Overall, women comprised 15.8 % of aggravated misdemeanor convictions and 10.4% of convictions for class D felonies. In terms of age, the highest percentage of aggravated misdemeanor convictions were received by defendants between the ages of 25 through 34. From 2000 through 2009, the percentage of aggravated misdemeanor convictions imposed against 25 to 34 year old defendants increased 15%. The second highest percentage of aggravated misdemeanor convictions was received by defendants between the ages of 35 and 44. From 2000 through 2005, the highest percentages of felony convictions were imposed against defendants between the ages 35 and 44. But during the ten year period that percentage declined steadily. From 2006 through 2009, defendants in the 25 through 34 age cohort had the highest percentage of felony convictions.

The racial and ethnic distribution of repeat convictions was similar for both aggravated misdemeanors and felony convictions. For both crimes, the highest percentage of convictions was imposed against White defendants. Eighty percent of aggravated misdemeanor convictions and 73% of felony convictions were imposed against Whites. For both offense categories African Americans had the second highest percentage of convictions. Hispanics had the third highest percentage. Native America defendants accounted for less than 1 % of aggravated misdemeanor convictions and less than 2% of felony convictions.

We found a statistically significant increase in the percentages of OWI convictions imposed against women after the 2003 reduction in the legal minimum BAC level to .08. The study also revealed changes in the race and ethnic distributions of OWI convictions coincided with changes in that reduction. There was a statistically significant increase in the percentages of

convictions imposed against African Americans after the .08 law. After the decrease in the legal BAC level, there was a statistically significant decline in percentages of convictions received by Native Americans.

The data used in this study did not provide information about offenders' criminal histories or post conviction outcomes. Therefore, we were unable to determine the extent to which defendants reoffended after their conviction.

Objective 2: Produce statistical profiles of OWI offenders. Identify how social, biographical, legal, and criminal factors that differentiate first time offenders from repeat offenders.

Across the entire data set, 70% of defendants were convicted of serious misdemeanors (first conviction), 22% were convicted of aggravated misdemeanors, and 7% were convicted of class D felonies. Males comprised 81% of all OWI, but from 2000 through 2009 the percentage of convicted women increased 66%.

Among all defendants, the average age was 30 years old. Defendants in the age cohorts of 15 to 24; 25 to 34; and 35 to 44 were dramatically overrepresented compared to the percentages of Iowa residents within those age cohorts. The highest percentage of convictions for serious misdemeanor OWO (first time conviction) was among 15 to 24 year olds.

Eighty percent of the OWI defendants were White, 5.3% were African Americans, 6% were Hispanics, 0.9 % were Native Americans. Compared to their presence in Iowa's population White defendants were underrepresented among convicted offenders. African Americans, Hispanics and Native Americans were overrepresented.

Not surprisingly, Iowa's most populous counties supplied most of the states convicted OWI offenders. In fact, 40% of those offenders came from only six of the state's 93 counties. Two of those six counties are the location of state universities.

Consistent with findings reported in the literature review, the typical convicted OWI offender in Iowa was a White male approximately 30 to 33 years old who probably resides in an area that is more urban than rural. However from 2000 through 2009, the gaps between male and female offenders and between White offenders and some minority offenders have narrowed.

Only 6% of OWI convictions resulted in deferred adjudication. The highest percentages of those adjudications went to females, Whites, and persons under the age of 24 or over the age of 65.

The data used in this study did not provide information about offenders' social, biographical, legal, or criminal histories. Therefore, we were unable to determine the extent to which first time and repeat offenders differed on these variables.

Objective 3: Create a foundation for the second phase of research by generating hypotheses for further analysis and formatting the data so that additional variables from other state records systems (especially Corrections and Transportation) can be merged with the data set and matched to individuals.

The analysis of Iowa data is contextualized by findings related to trends that occurred both nationwide and in multiple states. Over the 16 year period covered in the analysis, the numbers, percentages, and rates of alcohol related traffic fatalities (ARTF) declined nationwide, as well as in Iowa, Kansas, Missouri, and Nebraska.

We did not find convincing evidence of a direct relationship between enforcement trends and the declines in ARTFs. However, the ten year Iowa conviction trends did provide evidence of a conviction lag effect on Iowa's ARTFs.

The analysis also found ARTF trends were in part produced by changes in the broader population. For example, increases in the number of Iowa's African American and Hispanic residents fit well with the increased proportions of OWI convictions received by those populations. Likewise, declines in the populations of Iowa residents between the ages of 35 and 44, and the increase in residents between 45 and 54 years old, coincided with decreased percentages of convictions received by 35 to 44 year old defendants and increased convictions received by 45 to 54 year old defendants.

We conclude that changes in resident populations coincided with changes in OWI convictions and ARTFs because population shifts affected the supply of residents who are at risk for alcohol impaired driving.

The report's conclusion about the influence of population shifts on ARTF's are consistent with findings that pertain to the impact of OWI arrests and convictions on alcohol impaired driving. For DUI/OWI arrests to influence alcohol impaired driving they must do so through a deterrent effect. For a deterrent effect to be effective, offenders must have the capacity to make rational calculations about the risk of apprehension. By definition, DUI/OWI offenders generally do not possess that capacity. By contrast, OWI sentencing might emphasize an incapacitation approach that is intended to reduce offenders' capacity to engage in alcohol impaired driving. Incapacitation may be accomplished through incarceration, electronic monitoring, alcohol interlock devices, and other means that reduce offenders' capacity to drink and drive. Many sentencing outcomes also require rehabilitative treatments that might reduce the likelihood of recidivism. Therefore, it is also possible that court ordered treatment programs might reduce the likelihood of post conviction drunk driving.

The findings from this study open important new questions for a second phase of research. For instance, we do not know if that effect is produced by the incapacitation or rehabilitation of convicted offenders. Likewise we do not know if these effects differ for first

time offenders and multiple offenders. We do not know if they vary according to race/ethnicity, age, or gender. We hypothesize that rehabilitative sanctions tend to reduce reoffending among first time offenders and that incapacitation sanctions should tend to reduce reoffending among second and multiple OWI offenders. We also hypothesize that this relationship will be mediated by offender's criminal history, such that a prior criminal record or record of previous probation or parole violations will be directly related to the likelihood of reoffending. We hypothesize that after controlling for criminal history and age that treatment effects will e more likely to occur for women than for men.

The findings related to Iowa's alcohol related traffic fatalities do not provide detailed information about the characteristics of alcohol involved drivers involved in car crashes. For example, we do not the extent to which Iowa's alcohol impaired crashes, injuries, and fatalities are caused by first time offenders versus multiple offenders. We hypothesize that these events are more likely to have been caused by repeat offenders who at the time of the crash had relatively high BAC levels.

We do not know the extent to which Iowa drivers in alcohol related crashes previously convicted of OWI received rehabilitative sanctions and/or incapacitation sanctions. We hypothesize that Iowa drivers involved in alcohol related crashes were, at the time of the crash, not subject to incapacitation sanctions that would have reduced the likelihood of their attempting to operate a motor vehicle.

Recent research data indicates that drivers with suspended licenses represent a growing proportion of drivers involved in fatal crashes. We suspect this trend might be indirectly related to an overall increase in the number and rate of OWI convictions. To the extent that offenders are unable or unwilling to comply with the array of OWI criminal and civil sanctions they are not able to have their license to drive or car insurance reinstated. This does not mean that they stop driving. In these instances, OWI laws might actually produce a "backfire effect" in which unlicensed and uninsured high risk drivers cause crashes that are both physically and economically devastating to their victims. We hypothesize that the highest risk OWI defendants are also the defendants who are least likely to have their driver's license and insurance restored and that are the most likely to be involved in post-conviction crashes.

The current study made effective use of data collected from Iowa's Justice Data Warehouse via the Iowa Division of Criminal and Juvenile Justice Planning. A second phase of research would combine these data with data collected from the Iowa Department of Corrections and the Iowa Department of Transportation.

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