

Race Paper Penultimate

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Data Munging

Analysis with Misdemeanor, Gross Misdemeanor, and Felony Cases

```
#bar graph - median household income comes from ACS 2017 5-year estimates
adj <- data.frame(Race = c("Asian", "Black", "Hispanic", "Nat. Am.", "Other", "White"),
                  race_med_inc = c(71865, 32743, 46232, 36017, 42476, 69069),
                  ovr_med_inc = rep(65699, 6))

monsanc.short %>%
  select(race_impute, total_ff) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(
    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  left_join(adj, by = "Race") %>%
  mutate(race_adj = (ovr_med_inc/race_med_inc)) %>%
  group_by(Race) %>%
  summarize(
    `Raw_USD` = mean(total_ff, na.rm = T),
    `Adjusted_USD` = mean(total_ff*race_adj, na.rm = T),
    `Raw_sd` = sd(total_ff, na.rm = T),
    `Adjusted_sd` = sd(total_ff*race_adj, na.rm=T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = c("adjusted", "stat"), sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
    c("Asian", "Hispanic", "White",
      "Other", "Nat. Am.", "Black"))),
```

```

  `Income Adjusted` = factor(adjusted, levels = c("Raw", "Adjusted")))) %>%
  select(-adjusted) %>%
ggplot()+
  geom_bar(aes(x=Race, y=USD, fill=`Income Adjusted`),
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=USD+25, group=`Income Adjusted`,
    label = round(USD,0)),
    position = position_dodge2(width = 1))+
  labs(title = "Figure 1: Fine/Fee Orders by Race")+
  scale_fill_manual(values = c("#00AFBB", "#FC4E07"))+
  theme_minimal()

```

```

## Warning: Column `Race` joining character vector and factor, coercing into
## character vector

```

```

## Warning: Removed 1 rows containing missing values (geom_bar).

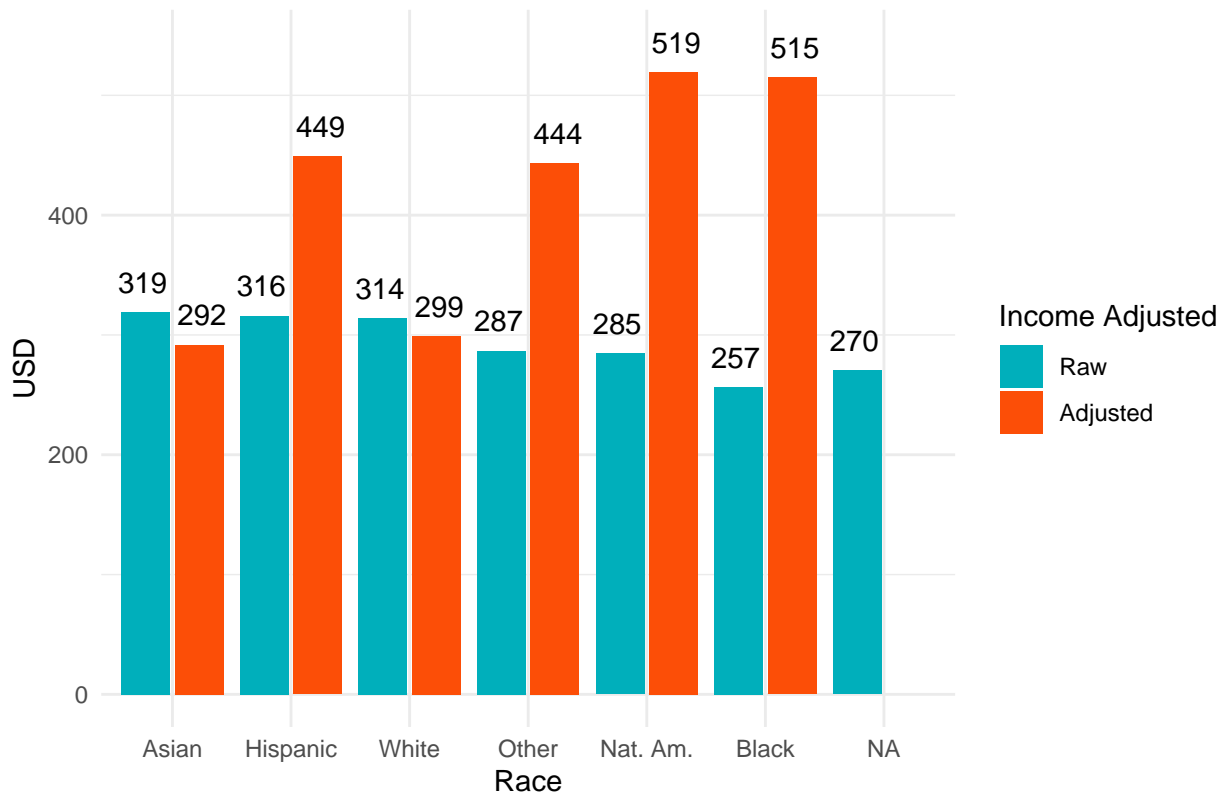
```

```

## Warning: Removed 1 rows containing missing values (geom_text).

```

Figure 1: Fine/Fee Orders by Race



```

#confinement bar graph
monsanc.short %>%
  select(race_impute, conf_minus_stayed) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(

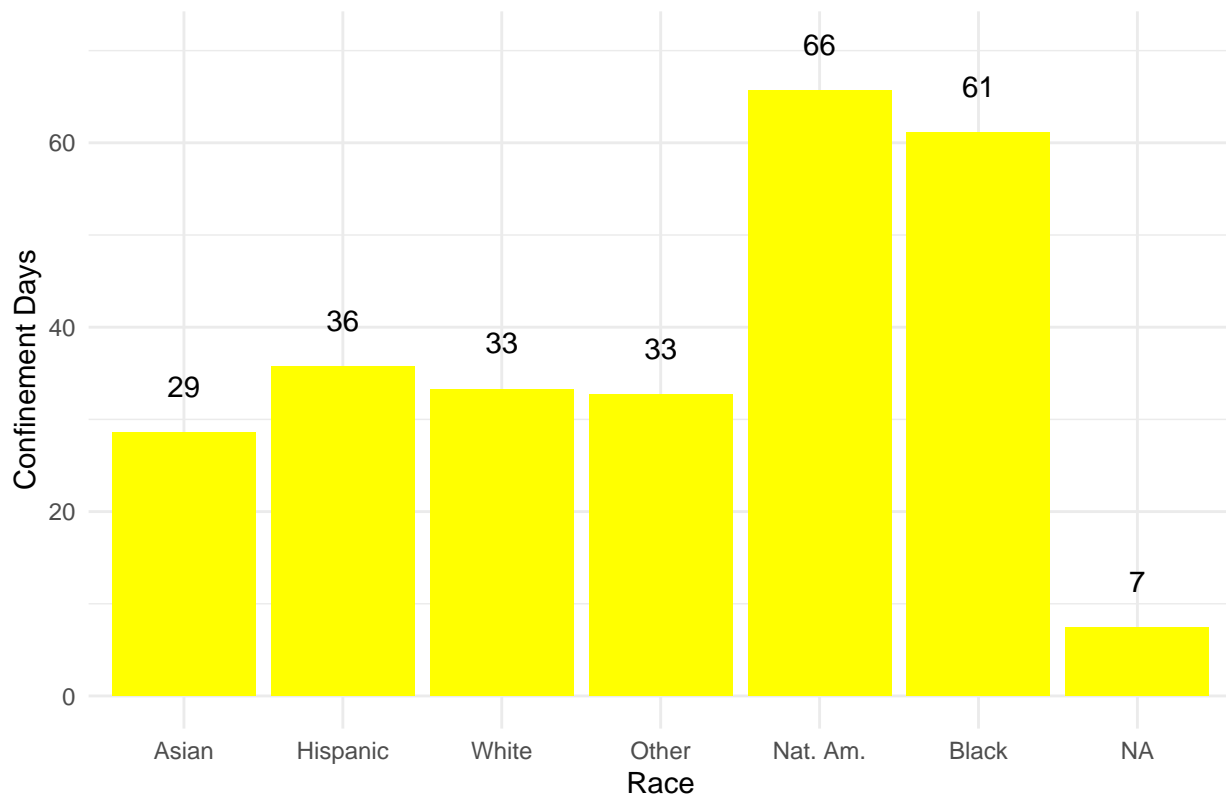
```

```

    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  group_by(Race) %>%
  summarize(
    `Confinement Days` = mean(conf_minus_stayed, na.rm = T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = "stat", sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
    c("Asian", "Hispanic", "White",
      "Other", "Nat. Am.", "Black"))
  ) %>%
  ggplot()+
  geom_bar(aes(x=Race, y=`Confinement Days`),
    fill = "yellow",
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=`Confinement Days`+5,
    label = round(`Confinement Days`,0)),
    position = position_dodge2(width = 1))+
  labs(title = "Figure 2: Confinement Length by Race")+
  theme_minimal()+
  theme(legend.position = "none")

```

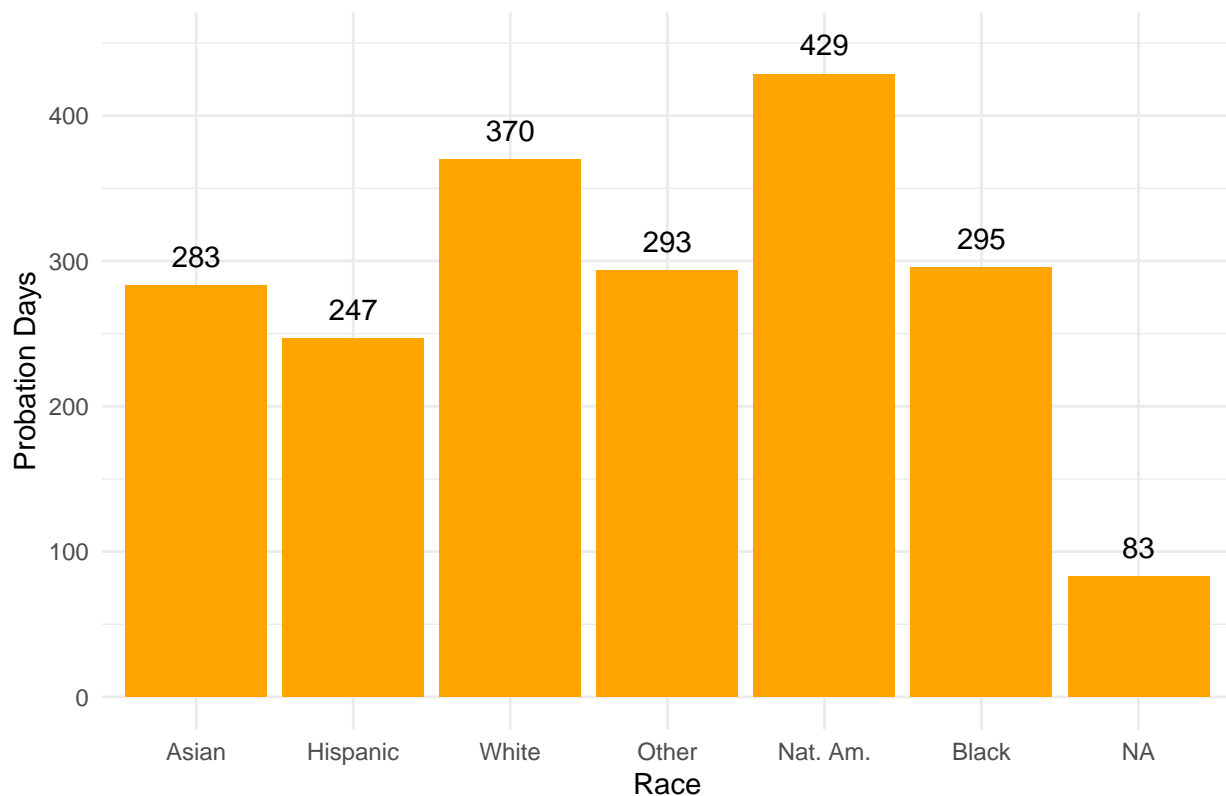
Figure 2: Confinement Length by Race



```
#probation plot
monsanc.short %>%
  select(race_impute, prob_days) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(
    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  group_by(Race) %>%
  summarize(
    `Probation Days` = mean(prob_days, na.rm = T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = "stat", sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
    c("Asian", "Hispanic", "White",
      "Other", "Nat. Am.", "Black"))
  ) %>%
```

```
ggplot()+
  geom_bar(aes(x=Race, y=`Probation Days`),
    fill = "orange",
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=`Probation Days`+20,
    label = round(`Probation Days`,0)),
    position = position_dodge2(width = 1))+
  labs(title = "Figure 3: Probation Length by Race")+
  theme_minimal()+
  theme(legend.position = "none")
```

Figure 3: Probation Length by Race



```
#Multivariate Regression - when all predictors are identical across models
#equivalent to separate OLS, but more efficient and takes into account error covariance

#multivariate fixed effects regression
mv.fe <- lm(cbind(total_ff_log, conf_minus_stayed_log, prob_days_log)~
  black+hispanic+asian+nativeam+other.race+race.miss+
  male+log(age)+priors+perc_credit+trial_flag+felony+gross.mis+
  drug+alcohol.oui+other.offense+
  as.factor(filed_county)+as.factor(sentence_year), data = monsanc.short)
summary(mv.fe)
```

```
## Response total_ff_log :
```

```
##
## Call:
## lm(formula = total_ff_log ~ black + hispanic + asian + nativeam +
##      other.race + race.miss + male + log(age) + priors + perc_credit +
##      trial_flag + felony + gross.mis + drug + alcohol. DUI + other.offense +
##      as.factor(filed_county) + as.factor(sentence_year), data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -6.299 -0.356  0.200  0.721 84.781
##
## Coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                       5.333e+00  2.267e-02 235.281
## black                             -3.356e-01  3.416e-03 -98.241
## hispanic                          5.894e-02  4.734e-03  12.450
## asian                             9.116e-03  7.212e-03   1.264
## nativeam                         -3.104e-01  6.196e-03 -50.095
## other.race                       -1.004e-01  9.383e-03 -10.696
## race.miss                        -5.844e-03  2.958e-03  -1.975
## male                             3.573e-02  2.452e-03  14.575
## log(age)                         -2.524e-02  3.237e-03  -7.797
## priors                           -1.387e-02  1.449e-04 -95.721
## perc_credit                      -2.289e-03  2.921e-05 -78.364
## trial_flagTRUE                   -5.215e-01  1.162e-01  -4.488
## felony                           -4.997e-01  5.347e-03 -93.449
## gross.mis                        1.154e-01  4.308e-03  26.799
## drug                             3.263e-01  7.701e-03  42.369
## alcohol. DUI                     5.351e-01  5.433e-03  98.488
## other.offense                    3.309e-01  4.756e-03  69.565
## as.factor(filed_county)Anoka County -5.791e-01  1.951e-02 -29.680
## as.factor(filed_county)Becker County  2.616e-01  2.323e-02  11.264
## as.factor(filed_county)Beltrami County -5.483e-02  2.127e-02  -2.578
## as.factor(filed_county)Benton County  -1.696e-01  2.582e-02  -6.567
## as.factor(filed_county)Big Stone County -1.237e-01  4.763e-02  -2.597
## as.factor(filed_county)Blue Earth County -1.285e-01  2.093e-02  -6.139
## as.factor(filed_county)Brown County   -5.843e-02  2.678e-02  -2.182
## as.factor(filed_county)Carlton County  -2.658e-02  2.306e-02  -1.152
## as.factor(filed_county)Carver County   -3.847e-02  2.164e-02  -1.778
## as.factor(filed_county)Cass County     -3.086e-01  2.387e-02 -12.924
## as.factor(filed_county)Chippewa County -1.104e-03  3.117e-02  -0.035
## as.factor(filed_county)Chisago County  -4.110e-01  2.284e-02 -17.991
## as.factor(filed_county)Clay County     -2.641e-02  2.076e-02  -1.272
## as.factor(filed_county)Clearwater County -9.251e-02  3.755e-02  -2.464
## as.factor(filed_county)Cook County     -3.072e-01  3.972e-02  -7.735
## as.factor(filed_county)Cottonwood County -5.781e-02  3.312e-02  -1.745
## as.factor(filed_county)Crow Wing County -1.315e-01  2.125e-02  -6.186
## as.factor(filed_county)Dakota County   -1.549e-01  1.933e-02  -8.011
```

## as.factor(filed_county)Dodge County	-5.408e-01	3.057e-02	-17.689
## as.factor(filed_county)Douglas County	3.777e-02	2.418e-02	1.562
## as.factor(filed_county)Faribault County	5.043e-02	3.097e-02	1.628
## as.factor(filed_county)Fillmore County	-6.910e-02	2.995e-02	-2.307
## as.factor(filed_county)Freeborn County	-2.231e-01	2.405e-02	-9.274
## as.factor(filed_county)Goodhue County	-3.890e-01	2.138e-02	-18.194
## as.factor(filed_county)Grant County	-9.491e-02	4.520e-02	-2.100
## as.factor(filed_county)Hennepin County	-5.959e-01	1.902e-02	-31.332
## as.factor(filed_county)Houston County	-3.103e-01	2.884e-02	-10.757
## as.factor(filed_county)Hubbard County	-1.691e-01	2.656e-02	-6.368
## as.factor(filed_county)Isanti County	-2.909e-01	2.465e-02	-11.800
## as.factor(filed_county)Itasca County	-2.564e-02	2.214e-02	-1.158
## as.factor(filed_county)Jackson County	-4.844e-02	3.360e-02	-1.442
## as.factor(filed_county)Kanabec County	-1.992e-01	2.896e-02	-6.877
## as.factor(filed_county)Kandiyohi County	-8.111e-02	2.252e-02	-3.602
## as.factor(filed_county)Kittson County	-6.688e-02	5.599e-02	-1.195
## as.factor(filed_county)Koochiching County	-5.626e-01	3.116e-02	-18.054
## as.factor(filed_county)Lac qui Parle County	-1.466e-01	4.360e-02	-3.364
## as.factor(filed_county)Lake County	-2.221e-01	3.338e-02	-6.655
## as.factor(filed_county)Lake of the Woods County	-2.963e-01	3.188e-02	-9.294
## as.factor(filed_county)LeSueur County	-1.554e-01	2.683e-02	-5.792
## as.factor(filed_county)Lincoln County	-8.523e-02	4.697e-02	-1.815
## as.factor(filed_county)Lyon County	-4.783e-02	2.464e-02	-1.941
## as.factor(filed_county)Mahnomon County	-5.791e-02	3.080e-02	-1.880
## as.factor(filed_county)Marshall County	-6.633e-02	3.711e-02	-1.788
## as.factor(filed_county)Martin County	-2.563e-01	2.655e-02	-9.654
## as.factor(filed_county)McLeod County	-3.283e-01	2.356e-02	-13.938
## as.factor(filed_county)Meeker County	1.538e-02	3.006e-02	0.512
## as.factor(filed_county)Mille Lacs County	1.487e-01	2.410e-02	6.171
## as.factor(filed_county>Morrison County	-6.570e-02	2.516e-02	-2.611
## as.factor(filed_county>Mower County	-1.006e-01	2.311e-02	-4.355
## as.factor(filed_county>Murray County	5.362e-02	4.321e-02	1.241
## as.factor(filed_county>Nicollet County	-9.734e-02	2.447e-02	-3.978
## as.factor(filed_county>Nobles County	-1.012e-01	2.468e-02	-4.100
## as.factor(filed_county)Norman County	-8.125e-02	4.186e-02	-1.941
## as.factor(filed_county>Olmsted County	-3.410e-01	2.021e-02	-16.876
## as.factor(filed_county>Otter Tail County	8.043e-02	2.253e-02	3.571
## as.factor(filed_county>Pennington County	-3.074e-01	2.847e-02	-10.798
## as.factor(filed_county>Pine County	-3.107e-01	2.485e-02	-12.503
## as.factor(filed_county>Pipestone County	-1.736e-02	3.558e-02	-0.488
## as.factor(filed_county>Polk County	-5.095e-02	2.300e-02	-2.215
## as.factor(filed_county>Pope County	-1.182e-01	3.420e-02	-3.456
## as.factor(filed_county>Ramsey County	1.495e-01	1.919e-02	7.789
## as.factor(filed_county>Red Lake County	-5.141e-01	4.403e-02	-11.677
## as.factor(filed_county>Redwood County	9.239e-02	2.722e-02	3.394
## as.factor(filed_county>Renville County	-5.375e-01	2.799e-02	-19.199
## as.factor(filed_county>Rice County	8.268e-03	2.217e-02	0.373
## as.factor(filed_county)Rock County	-1.668e-02	3.858e-02	-0.432

## as.factor(filed_county)Roseau County	-9.370e-02	2.666e-02	-3.514
## as.factor(filed_county)Scott County	-3.991e-02	1.994e-02	-2.001
## as.factor(filed_county)Sherburne County	-2.112e-01	2.165e-02	-9.753
## as.factor(filed_county)Sibley County	-3.838e-01	2.949e-02	-13.013
## as.factor(filed_county)St. Louis County	-1.646e-01	1.962e-02	-8.389
## as.factor(filed_county)Stearns County	4.072e-04	1.983e-02	0.021
## as.factor(filed_county)Steele County	-1.718e-02	2.347e-02	-0.732
## as.factor(filed_county)Stevens County	-2.435e-01	3.848e-02	-6.328
## as.factor(filed_county)Swift County	-3.116e-02	3.398e-02	-0.917
## as.factor(filed_county)Todd County	5.752e-02	2.718e-02	2.116
## as.factor(filed_county)Traverse County	-4.449e-01	5.929e-02	-7.505
## as.factor(filed_county)Wabasha County	-3.308e-01	2.624e-02	-12.608
## as.factor(filed_county)Wadena County	5.504e-03	2.908e-02	0.189
## as.factor(filed_county)Waseca County	-2.961e-01	3.033e-02	-9.761
## as.factor(filed_county)Washington County	-1.870e-01	1.974e-02	-9.472
## as.factor(filed_county)Watsonwan County	8.710e-03	3.150e-02	0.277
## as.factor(filed_county)Wilkin County	-1.023e-01	3.336e-02	-3.067
## as.factor(filed_county)Winona County	-2.959e-01	2.261e-02	-13.085
## as.factor(filed_county)Wright County	-4.762e-01	2.108e-02	-22.587
## as.factor(filed_county)Yellow Medicine County	3.485e-02	3.148e-02	1.107
## as.factor(sentence_year)2011	4.227e-02	4.041e-03	10.459
## as.factor(sentence_year)2012	2.651e-02	3.978e-03	6.664
## as.factor(sentence_year)2013	9.253e-02	4.197e-03	22.045
## as.factor(sentence_year)2014	1.108e-01	4.046e-03	27.371
## as.factor(sentence_year)2015	1.456e-01	4.110e-03	35.411
## as.factor(sentence_year)2016	2.238e-01	5.691e-03	39.324
## as.factor(sentence_year)2017	4.469e-01	1.021e-02	43.756
## as.factor(sentence_year)2018	5.499e-01	1.589e-02	34.601
##	Pr(> t)		
## (Intercept)	< 2e-16 ***		
## black	< 2e-16 ***		
## hispanic	< 2e-16 ***		
## asian	0.206231		
## nativeam	< 2e-16 ***		
## other.race	< 2e-16 ***		
## race.miss	0.048216 *		
## male	< 2e-16 ***		
## log(age)	6.36e-15 ***		
## priors	< 2e-16 ***		
## perc_credit	< 2e-16 ***		
## trial_flagTRUE	7.18e-06 ***		
## felony	< 2e-16 ***		
## gross.mis	< 2e-16 ***		
## drug	< 2e-16 ***		
## alcohol.dui	< 2e-16 ***		
## other.offense	< 2e-16 ***		
## as.factor(filed_county)Anoka County	< 2e-16 ***		
## as.factor(filed_county)Becker County	< 2e-16 ***		


```

## as.factor(filed_county)Beltrami County      0.009932 **
## as.factor(filed_county)Benton County        5.12e-11 ***
## as.factor(filed_county)Big Stone County      0.009406 **
## as.factor(filed_county)Blue Earth County     8.32e-10 ***
## as.factor(filed_county)Brown County          0.029145 *
## as.factor(filed_county)Carlton County        0.249213
## as.factor(filed_county)Carver County         0.075416 .
## as.factor(filed_county)Cass County           < 2e-16 ***
## as.factor(filed_county)Chippewa County       0.971754
## as.factor(filed_county)Chisago County        < 2e-16 ***
## as.factor(filed_county)Clay County           0.203352
## as.factor(filed_county)Clearwater County     0.013747 *
## as.factor(filed_county)Cook County           1.03e-14 ***
## as.factor(filed_county)Cottonwood County     0.080923 .
## as.factor(filed_county)Crow Wing County      6.17e-10 ***
## as.factor(filed_county)Dakota County         1.14e-15 ***
## as.factor(filed_county)Dodge County          < 2e-16 ***
## as.factor(filed_county)Douglas County        0.118298
## as.factor(filed_county)Faribault County      0.103432
## as.factor(filed_county)Fillmore County       0.021050 *
## as.factor(filed_county)Freeborn County       < 2e-16 ***
## as.factor(filed_county)Goodhue County        < 2e-16 ***
## as.factor(filed_county)Grant County          0.035739 *
## as.factor(filed_county)Hennepin County       < 2e-16 ***
## as.factor(filed_county)Houston County        < 2e-16 ***
## as.factor(filed_county)Hubbard County        1.92e-10 ***
## as.factor(filed_county)Isanti County         < 2e-16 ***
## as.factor(filed_county)Itasca County         0.246718
## as.factor(filed_county)Jackson County        0.149405
## as.factor(filed_county)Kanabec County        6.13e-12 ***
## as.factor(filed_county)Kandiyohi County      0.000316 ***
## as.factor(filed_county)Kittson County        0.232251
## as.factor(filed_county)Koochiching County    < 2e-16 ***
## as.factor(filed_county)Lac qui Parle County   0.000769 ***
## as.factor(filed_county)Lake County           2.84e-11 ***
## as.factor(filed_county)Lake of the Woods County < 2e-16 ***
## as.factor(filed_county)LeSueur County       6.95e-09 ***
## as.factor(filed_county)Lincoln County        0.069596 .
## as.factor(filed_county)Lyon County           0.052240 .
## as.factor(filed_county)Mahnommen County      0.060089 .
## as.factor(filed_county)Marshall County       0.073855 .
## as.factor(filed_county)Martin County         < 2e-16 ***
## as.factor(filed_county)McLeod County         < 2e-16 ***
## as.factor(filed_county)Meeker County        0.608957
## as.factor(filed_county)Mille Lacs County     6.79e-10 ***
## as.factor(filed_county)Morrison County       0.009024 **
## as.factor(filed_county)Mower County         1.33e-05 ***
## as.factor(filed_county)Murray County        0.214651

```

```

## as.factor(filed_county)Nicollet County      6.95e-05 ***
## as.factor(filed_county)Nobles County        4.14e-05 ***
## as.factor(filed_county)Norman County        0.052243 .
## as.factor(filed_county)Olmsted County       < 2e-16 ***
## as.factor(filed_county)Otter Tail County    0.000356 ***
## as.factor(filed_county)Pennington County    < 2e-16 ***
## as.factor(filed_county)Pine County          < 2e-16 ***
## as.factor(filed_county)Pipestone County     0.625745
## as.factor(filed_county)Polk County          0.026740 *
## as.factor(filed_county)Pope County          0.000548 ***
## as.factor(filed_county)Ramsey County        6.78e-15 ***
## as.factor(filed_county)Red Lake County      < 2e-16 ***
## as.factor(filed_county)Redwood County      0.000688 ***
## as.factor(filed_county)Renville County     < 2e-16 ***
## as.factor(filed_county)Rice County          0.709229
## as.factor(filed_county)Rock County          0.665597
## as.factor(filed_county)Roseau County        0.000441 ***
## as.factor(filed_county)Scott County         0.045367 *
## as.factor(filed_county)Sherburne County    < 2e-16 ***
## as.factor(filed_county)Sibley County       < 2e-16 ***
## as.factor(filed_county)St. Louis County    < 2e-16 ***
## as.factor(filed_county)Stearns County       0.983619
## as.factor(filed_county)Steele County       0.464133
## as.factor(filed_county)Stevens County      2.49e-10 ***
## as.factor(filed_county)Swift County        0.359075
## as.factor(filed_county)Todd County         0.034309 *
## as.factor(filed_county)Traverse County     6.15e-14 ***
## as.factor(filed_county)Wabasha County      < 2e-16 ***
## as.factor(filed_county)Wadena County       0.849870
## as.factor(filed_county)Waseca County       < 2e-16 ***
## as.factor(filed_county)Washington County  < 2e-16 ***
## as.factor(filed_county)Watsonwan County    0.782149
## as.factor(filed_county)Wilkin County       0.002162 **
## as.factor(filed_county)Winona County       < 2e-16 ***
## as.factor(filed_county)Wright County       < 2e-16 ***
## as.factor(filed_county)Yellow Medicine County 0.268223
## as.factor(sentence_year)2011              < 2e-16 ***
## as.factor(sentence_year)2012              2.67e-11 ***
## as.factor(sentence_year)2013              < 2e-16 ***
## as.factor(sentence_year)2014              < 2e-16 ***
## as.factor(sentence_year)2015              < 2e-16 ***
## as.factor(sentence_year)2016              < 2e-16 ***
## as.factor(sentence_year)2017              < 2e-16 ***
## as.factor(sentence_year)2018              < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.298 on 1387724 degrees of freedom

```

```

## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.09723,    Adjusted R-squared:  0.09715
## F-statistic: 1359 on 110 and 1387724 DF,  p-value: < 2.2e-16
##
##
## Response conf_minus_stayed_log :
##
## Call:
## lm(formula = conf_minus_stayed_log ~ black + hispanic + asian +
##     nativeam + other.race + race.miss + male + log(age) + priors +
##     perc_credit + trial_flag + felony + gross.mis + drug + alcohol. DUI +
##     other.offense + as.factor(filed_county) + as.factor(sentence_year),
##     data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -186.986   -0.363   -0.116    0.115    9.185
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)    3.706e-01  1.803e-02  20.556
## black          1.257e-01  2.717e-03  46.273
## hispanic       4.603e-02  3.765e-03  12.223
## asian        -1.044e-02  5.736e-03  -1.820
## nativeam       4.064e-01  4.928e-03  82.476
## other.race     3.932e-02  7.463e-03   5.270
## race.miss    -1.065e-01  2.353e-03 -45.283
## male          1.168e-01  1.950e-03  59.882
## log(age)       4.069e-02  2.574e-03  15.807
## priors         2.629e-02  1.152e-04 228.141
## perc_credit    5.138e-03  2.324e-05 221.134
## trial_flagTRUE 1.928e+00  9.241e-02  20.862
## felony         3.199e+00  4.253e-03 752.356
## gross.mis      1.708e+00  3.426e-03 498.446
## drug          -7.373e-01  6.125e-03 -120.368
## alcohol. dui  -2.893e-01  4.321e-03  -66.961
## other.offense  -6.113e-01  3.783e-03 -161.594
## as.factor(filed_county)Anoka County  -3.415e-03  1.552e-02  -0.220
## as.factor(filed_county)Becker County   2.519e-01  1.847e-02  13.639
## as.factor(filed_county)Beltrami County  2.109e-01  1.691e-02  12.471
## as.factor(filed_county)Benton County   1.901e-01  2.054e-02   9.257
## as.factor(filed_county)Big Stone County -3.353e-03  3.789e-02  -0.089
## as.factor(filed_county)Blue Earth County -1.744e-01  1.664e-02 -10.481
## as.factor(filed_county)Brown County    1.876e-02  2.130e-02   0.881
## as.factor(filed_county)Carlton County   3.208e-02  1.834e-02   1.749
## as.factor(filed_county)Carver County   -1.586e-01  1.721e-02  -9.217
## as.factor(filed_county)Cass County     -2.283e-01  1.899e-02 -12.025
## as.factor(filed_county)Chippewa County  2.209e-02  2.479e-02   0.891

```

## as.factor(filed_county)Chisago County	-9.107e-02	1.817e-02	-5.013
## as.factor(filed_county)Clay County	7.348e-02	1.651e-02	4.451
## as.factor(filed_county)Clearwater County	1.467e-01	2.986e-02	4.913
## as.factor(filed_county)Cook County	-2.334e-01	3.159e-02	-7.390
## as.factor(filed_county)Cottonwood County	-8.862e-02	2.635e-02	-3.364
## as.factor(filed_county)Crow Wing County	-2.171e-01	1.690e-02	-12.846
## as.factor(filed_county)Dakota County	-5.780e-02	1.538e-02	-3.759
## as.factor(filed_county)Dodge County	-2.161e-01	2.431e-02	-8.888
## as.factor(filed_county)Douglas County	1.885e-01	1.923e-02	9.802
## as.factor(filed_county)Faribault County	6.188e-03	2.463e-02	0.251
## as.factor(filed_county)Fillmore County	7.596e-03	2.382e-02	0.319
## as.factor(filed_county)Freeborn County	-2.045e-02	1.913e-02	-1.069
## as.factor(filed_county)Goodhue County	-1.479e-01	1.701e-02	-8.696
## as.factor(filed_county)Grant County	-6.395e-02	3.595e-02	-1.779
## as.factor(filed_county)Hennepin County	4.515e-02	1.513e-02	2.985
## as.factor(filed_county)Houston County	-7.998e-02	2.294e-02	-3.486
## as.factor(filed_county)Hubbard County	1.478e-01	2.112e-02	6.997
## as.factor(filed_county)Isanti County	1.336e-01	1.961e-02	6.811
## as.factor(filed_county)Itasca County	-2.555e-02	1.761e-02	-1.451
## as.factor(filed_county)Jackson County	-8.128e-02	2.672e-02	-3.041
## as.factor(filed_county)Kanabec County	1.298e-01	2.303e-02	5.634
## as.factor(filed_county)Kandiyohi County	1.697e-01	1.791e-02	9.478
## as.factor(filed_county)Kittson County	-2.104e-01	4.453e-02	-4.725
## as.factor(filed_county)Koochiching County	-2.293e-01	2.478e-02	-9.252
## as.factor(filed_county)Lac qui Parle County	2.380e-02	3.467e-02	0.687
## as.factor(filed_county)Lake County	-3.276e-02	2.655e-02	-1.234
## as.factor(filed_county)Lake of the Woods County	-4.428e-01	2.536e-02	-17.463
## as.factor(filed_county)LeSueur County	-2.096e-01	2.134e-02	-9.823
## as.factor(filed_county)Lincoln County	-6.761e-02	3.736e-02	-1.810
## as.factor(filed_county)Lyon County	4.534e-02	1.960e-02	2.314
## as.factor(filed_county)Mahnomon County	4.147e-02	2.450e-02	1.693
## as.factor(filed_county)Marshall County	-6.672e-02	2.952e-02	-2.261
## as.factor(filed_county)Martin County	1.264e-01	2.111e-02	5.985
## as.factor(filed_county)McLeod County	8.670e-02	1.874e-02	4.627
## as.factor(filed_county)Meeker County	1.126e-01	2.391e-02	4.710
## as.factor(filed_county)Mille Lacs County	1.731e-01	1.917e-02	9.030
## as.factor(filed_county>Morrison County	2.062e-01	2.001e-02	10.301
## as.factor(filed_county>Mower County	-2.599e-01	1.838e-02	-14.142
## as.factor(filed_county>Murray County	-1.386e-01	3.437e-02	-4.034
## as.factor(filed_county>Nicollet County	-1.466e-01	1.946e-02	-7.532
## as.factor(filed_county>Nobles County	-2.706e-03	1.963e-02	-0.138
## as.factor(filed_county)Norman County	3.483e-02	3.329e-02	1.046
## as.factor(filed_county>Olmsted County	-1.215e-01	1.607e-02	-7.563
## as.factor(filed_county>Otter Tail County	4.352e-02	1.792e-02	2.429
## as.factor(filed_county>Pennington County	3.977e-02	2.264e-02	1.756
## as.factor(filed_county>Pine County	1.381e-01	1.976e-02	6.988
## as.factor(filed_county>Pipestone County	-1.593e-01	2.830e-02	-5.629
## as.factor(filed_county>Polk County	3.982e-01	1.829e-02	21.767

## as.factor(filed_county)Pope County	-7.866e-02	2.720e-02	-2.892
## as.factor(filed_county)Ramsey County	1.347e-01	1.526e-02	8.826
## as.factor(filed_county)Red Lake County	-1.887e-01	3.502e-02	-5.389
## as.factor(filed_county)Redwood County	2.192e-01	2.165e-02	10.125
## as.factor(filed_county)Renville County	3.045e-02	2.227e-02	1.367
## as.factor(filed_county)Rice County	-8.796e-02	1.764e-02	-4.988
## as.factor(filed_county)Rock County	-6.353e-02	3.069e-02	-2.070
## as.factor(filed_county)Roseau County	-1.534e-01	2.121e-02	-7.235
## as.factor(filed_county)Scott County	-2.022e-01	1.586e-02	-12.749
## as.factor(filed_county)Sherburne County	1.030e-01	1.722e-02	5.981
## as.factor(filed_county)Sibley County	-1.303e-01	2.346e-02	-5.553
## as.factor(filed_county)St. Louis County	-5.435e-02	1.560e-02	-3.483
## as.factor(filed_county)Stearns County	1.404e-01	1.577e-02	8.898
## as.factor(filed_county)Steele County	1.672e-02	1.867e-02	0.895
## as.factor(filed_county)Stevens County	2.670e-03	3.060e-02	0.087
## as.factor(filed_county)Swift County	1.521e-01	2.702e-02	5.628
## as.factor(filed_county)Todd County	2.235e-02	2.162e-02	1.034
## as.factor(filed_county)Traverse County	1.163e-01	4.715e-02	2.465
## as.factor(filed_county)Wabasha County	-2.888e-01	2.087e-02	-13.840
## as.factor(filed_county)Wadena County	1.299e-01	2.313e-02	5.618
## as.factor(filed_county)Waseca County	-2.125e-01	2.412e-02	-8.807
## as.factor(filed_county)Washington County	1.307e-01	1.570e-02	8.326
## as.factor(filed_county)Watsonwan County	-7.447e-02	2.505e-02	-2.972
## as.factor(filed_county)Wilkin County	2.326e-02	2.653e-02	0.877
## as.factor(filed_county)Winona County	-1.836e-01	1.798e-02	-10.207
## as.factor(filed_county)Wright County	1.350e-01	1.677e-02	8.050
## as.factor(filed_county)Yellow Medicine County	8.134e-02	2.503e-02	3.249
## as.factor(sentence_year)2011	1.665e-02	3.214e-03	5.179
## as.factor(sentence_year)2012	2.110e-02	3.164e-03	6.671
## as.factor(sentence_year)2013	1.103e-02	3.338e-03	3.304
## as.factor(sentence_year)2014	1.365e-02	3.218e-03	4.240
## as.factor(sentence_year)2015	5.045e-03	3.269e-03	1.543
## as.factor(sentence_year)2016	7.474e-02	4.527e-03	16.511
## as.factor(sentence_year)2017	6.546e-02	8.124e-03	8.058
## as.factor(sentence_year)2018	-1.277e-01	1.264e-02	-10.102
##	Pr(> t)		
## (Intercept)	< 2e-16 ***		
## black	< 2e-16 ***		
## hispanic	< 2e-16 ***		
## asian	0.068789 .		
## nativeam	< 2e-16 ***		
## other.race	1.37e-07 ***		
## race.miss	< 2e-16 ***		
## male	< 2e-16 ***		
## log(age)	< 2e-16 ***		
## priors	< 2e-16 ***		
## perc_credit	< 2e-16 ***		
## trial_flagTRUE	< 2e-16 ***		

```

## felony < 2e-16 ***
## gross.mis < 2e-16 ***
## drug < 2e-16 ***
## alcohol.dui < 2e-16 ***
## other.offense < 2e-16 ***
## as.factor(filed_county)Anoka County 0.825829
## as.factor(filed_county)Becker County < 2e-16 ***
## as.factor(filed_county)Beltrami County < 2e-16 ***
## as.factor(filed_county)Benton County < 2e-16 ***
## as.factor(filed_county)Big Stone County 0.929478
## as.factor(filed_county)Blue Earth County < 2e-16 ***
## as.factor(filed_county)Brown County 0.378521
## as.factor(filed_county)Carlton County 0.080282 .
## as.factor(filed_county)Carver County < 2e-16 ***
## as.factor(filed_county)Cass County < 2e-16 ***
## as.factor(filed_county)Chippewa County 0.373051
## as.factor(filed_county)Chisago County 5.37e-07 ***
## as.factor(filed_county)Clay County 8.55e-06 ***
## as.factor(filed_county)Clearwater County 8.98e-07 ***
## as.factor(filed_county)Cook County 1.47e-13 ***
## as.factor(filed_county)Cottonwood County 0.000769 ***
## as.factor(filed_county)Crow Wing County < 2e-16 ***
## as.factor(filed_county)Dakota County 0.000171 ***
## as.factor(filed_county)Dodge County < 2e-16 ***
## as.factor(filed_county)Douglas County < 2e-16 ***
## as.factor(filed_county)Faribault County 0.801640
## as.factor(filed_county)Fillmore County 0.749826
## as.factor(filed_county)Freeborn County 0.285028
## as.factor(filed_county)Goodhue County < 2e-16 ***
## as.factor(filed_county)Grant County 0.075228 .
## as.factor(filed_county)Hennepin County 0.002835 **
## as.factor(filed_county)Houston County 0.000490 ***
## as.factor(filed_county)Hubbard County 2.62e-12 ***
## as.factor(filed_county)Isanti County 9.67e-12 ***
## as.factor(filed_county)Itasca County 0.146698
## as.factor(filed_county)Jackson County 0.002355 **
## as.factor(filed_county)Kanabec County 1.76e-08 ***
## as.factor(filed_county)Kandiyohi County < 2e-16 ***
## as.factor(filed_county)Kittson County 2.30e-06 ***
## as.factor(filed_county)Koochiching County < 2e-16 ***
## as.factor(filed_county)Lac qui Parle County 0.492383
## as.factor(filed_county)Lake County 0.217188
## as.factor(filed_county)Lake of the Woods County < 2e-16 ***
## as.factor(filed_county)LeSueur County < 2e-16 ***
## as.factor(filed_county)Lincoln County 0.070328 .
## as.factor(filed_county)Lyon County 0.020689 *
## as.factor(filed_county)Mahnomon County 0.090527 .
## as.factor(filed_county)Marshall County 0.023779 *

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## as.factor(filed_county)Martin County	2.16e-09 ***
## as.factor(filed_county)McLeod County	3.70e-06 ***
## as.factor(filed_county)Meeker County	2.48e-06 ***
## as.factor(filed_county)Mille Lacs County	< 2e-16 ***
## as.factor(filed_county)Morrison County	< 2e-16 ***
## as.factor(filed_county)Mower County	< 2e-16 ***
## as.factor(filed_county)Murray County	5.49e-05 ***
## as.factor(filed_county)Nicollet County	5.00e-14 ***
## as.factor(filed_county)Nobles County	0.890343
## as.factor(filed_county)Norman County	0.295387
## as.factor(filed_county)Olmsted County	3.95e-14 ***
## as.factor(filed_county)Otter Tail County	0.015134 *
## as.factor(filed_county)Pennington County	0.079040 .
## as.factor(filed_county)Pine County	2.80e-12 ***
## as.factor(filed_county)Pipestone County	1.81e-08 ***
## as.factor(filed_county)Polk County	< 2e-16 ***
## as.factor(filed_county)Pope County	0.003831 **
## as.factor(filed_county)Ramsey County	< 2e-16 ***
## as.factor(filed_county)Red Lake County	7.09e-08 ***
## as.factor(filed_county)Redwood County	< 2e-16 ***
## as.factor(filed_county)Renville County	0.171502
## as.factor(filed_county)Rice County	6.11e-07 ***
## as.factor(filed_county)Rock County	0.038426 *
## as.factor(filed_county)Roseau County	4.66e-13 ***
## as.factor(filed_county)Scott County	< 2e-16 ***
## as.factor(filed_county)Sherburne County	2.21e-09 ***
## as.factor(filed_county)Sibley County	2.81e-08 ***
## as.factor(filed_county)St. Louis County	0.000496 ***
## as.factor(filed_county)Stearns County	< 2e-16 ***
## as.factor(filed_county)Steele County	0.370619
## as.factor(filed_county)Stevens County	0.930482
## as.factor(filed_county)Swift County	1.83e-08 ***
## as.factor(filed_county)Todd County	0.301260
## as.factor(filed_county)Traverse County	0.013689 *
## as.factor(filed_county)Wabasha County	< 2e-16 ***
## as.factor(filed_county)Wadena County	1.93e-08 ***
## as.factor(filed_county)Waseca County	< 2e-16 ***
## as.factor(filed_county)Washington County	< 2e-16 ***
## as.factor(filed_county)Watonwan County	0.002955 **
## as.factor(filed_county)Wilkin County	0.380694
## as.factor(filed_county)Winona County	< 2e-16 ***
## as.factor(filed_county)Wright County	8.29e-16 ***
## as.factor(filed_county)Yellow Medicine County	0.001157 **
## as.factor(sentence_year)2011	2.23e-07 ***
## as.factor(sentence_year)2012	2.54e-11 ***
## as.factor(sentence_year)2013	0.000952 ***
## as.factor(sentence_year)2014	2.23e-05 ***
## as.factor(sentence_year)2015	0.122750

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## as.factor(sentence_year)2016          < 2e-16 ***
## as.factor(sentence_year)2017          7.76e-16 ***
## as.factor(sentence_year)2018          < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.032 on 1387724 degrees of freedom
## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.515, Adjusted R-squared:  0.515
## F-statistic: 1.34e+04 on 110 and 1387724 DF, p-value: < 2.2e-16
##
##
## Response prob_days_log :
##
## Call:
## lm(formula = prob_days_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + priors + perc_credit +
##     trial_flag + felony + gross.mis + drug + alcohol. DUI + other.offense +
##     as.factor(filed_county) + as.factor(sentence_year), data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -11.3809  -1.8539  -0.7265   2.3666  10.8618
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)    1.695e+00  4.397e-02  38.537
## black          1.280e-01  6.626e-03  19.316
## hispanic      -4.450e-01  9.185e-03 -48.446
## asian        -1.955e-01  1.399e-02 -13.974
## nativeam      2.978e-01  1.202e-02  24.776
## other.race     1.680e-02  1.820e-02   0.923
## race.miss    -1.531e+00  5.739e-03 -266.770
## male         -2.883e-01  4.756e-03 -60.618
## log(age)       3.874e-01  6.279e-03  61.690
## priors        -1.546e-02  2.811e-04 -54.996
## perc_credit    4.061e-04  5.667e-05   7.165
## trial_flagTRUE -2.086e+00  2.254e-01  -9.254
## felony         2.539e+00  1.037e-02 244.830
## gross.mis      3.268e+00  8.357e-03 391.043
## drug          -4.651e-01  1.494e-02 -31.134
## alcohol. dui    6.895e-01  1.054e-02  65.415
## other.offense  -9.273e-01  9.227e-03 -100.500
## as.factor(filed_county)Anoka County    -3.785e-02  3.785e-02  -1.000
## as.factor(filed_county)Becker County    5.822e-01  4.506e-02  12.921
## as.factor(filed_county)Beltrami County  2.538e-01  4.126e-02   6.152
## as.factor(filed_county)Benton County   -1.340e-01  5.010e-02  -2.674
## as.factor(filed_county)Big Stone County -7.016e-01  9.241e-02  -7.592

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## as.factor(filed_county)Blue Earth County	-1.152e+00	4.060e-02	-28.378
## as.factor(filed_county)Brown County	-2.591e-01	5.196e-02	-4.988
## as.factor(filed_county)Carlton County	-1.443e+00	4.474e-02	-32.258
## as.factor(filed_county)Carver County	2.904e-01	4.197e-02	6.920
## as.factor(filed_county)Cass County	-5.555e-01	4.632e-02	-11.993
## as.factor(filed_county)Chippewa County	-2.229e-01	6.048e-02	-3.685
## as.factor(filed_county)Chisago County	-1.495e-01	4.432e-02	-3.373
## as.factor(filed_county)Clay County	-8.432e-01	4.027e-02	-20.938
## as.factor(filed_county)Clearwater County	1.875e-01	7.284e-02	2.574
## as.factor(filed_county)Cook County	-5.966e-01	7.705e-02	-7.743
## as.factor(filed_county)Cottonwood County	-4.745e-01	6.426e-02	-7.385
## as.factor(filed_county)Crow Wing County	6.342e-01	4.123e-02	15.384
## as.factor(filed_county)Dakota County	6.414e-01	3.751e-02	17.101
## as.factor(filed_county)Dodge County	-3.856e-01	5.931e-02	-6.503
## as.factor(filed_county)Douglas County	-9.611e-01	4.691e-02	-20.487
## as.factor(filed_county)Faribault County	-3.126e-01	6.008e-02	-5.204
## as.factor(filed_county)Fillmore County	-4.047e-01	5.811e-02	-6.965
## as.factor(filed_county)Freeborn County	1.744e-01	4.666e-02	3.737
## as.factor(filed_county)Goodhue County	1.734e-01	4.148e-02	4.180
## as.factor(filed_county)Grant County	-8.447e-01	8.768e-02	-9.634
## as.factor(filed_county)Hennepin County	5.844e-02	3.689e-02	1.584
## as.factor(filed_county)Houston County	5.963e-01	5.596e-02	10.657
## as.factor(filed_county)Hubbard County	3.855e-01	5.152e-02	7.484
## as.factor(filed_county)Isanti County	2.529e-01	4.782e-02	5.287
## as.factor(filed_county)Itasca County	-5.595e-01	4.294e-02	-13.029
## as.factor(filed_county)Jackson County	-3.568e-01	6.518e-02	-5.474
## as.factor(filed_county)Kanabec County	2.088e-02	5.618e-02	0.372
## as.factor(filed_county)Kandiyohi County	-4.124e-01	4.368e-02	-9.441
## as.factor(filed_county)Kittson County	-3.944e-01	1.086e-01	-3.632
## as.factor(filed_county)Koochiching County	-2.691e-02	6.045e-02	-0.445
## as.factor(filed_county)Lac qui Parle County	-2.457e-01	8.457e-02	-2.906
## as.factor(filed_county)Lake County	-5.628e-01	6.476e-02	-8.691
## as.factor(filed_county)Lake of the Woods County	-1.040e+00	6.185e-02	-16.808
## as.factor(filed_county)LeSueur County	-1.703e-01	5.204e-02	-3.271
## as.factor(filed_county)Lincoln County	-4.383e-01	9.112e-02	-4.811
## as.factor(filed_county)Lyon County	-1.393e-01	4.780e-02	-2.913
## as.factor(filed_county)Mahnomon County	6.268e-01	5.975e-02	10.489
## as.factor(filed_county)Marshall County	-3.485e-01	7.199e-02	-4.841
## as.factor(filed_county)Martin County	5.505e-02	5.150e-02	1.069
## as.factor(filed_county)McLeod County	8.285e-02	4.570e-02	1.813
## as.factor(filed_county)Meeker County	-2.407e-01	5.831e-02	-4.127
## as.factor(filed_county)Mille Lacs County	7.121e-02	4.676e-02	1.523
## as.factor(filed_county)Morrison County	-5.237e-01	4.881e-02	-10.728
## as.factor(filed_county)Mower County	-3.735e-01	4.483e-02	-8.332
## as.factor(filed_county)Murray County	-1.804e-01	8.383e-02	-2.153
## as.factor(filed_county>Nicollet County	-5.165e-01	4.747e-02	-10.880
## as.factor(filed_county>Nobles County	-1.318e-01	4.787e-02	-2.752
## as.factor(filed_county)Norman County	1.153e-01	8.120e-02	1.420

## as.factor(filed_county)Olmsted County	4.368e-01	3.920e-02	11.142
## as.factor(filed_county)Otter Tail County	1.501e-01	4.370e-02	3.436
## as.factor(filed_county)Pennington County	-2.399e-01	5.523e-02	-4.344
## as.factor(filed_county)Pine County	-1.968e-01	4.820e-02	-4.082
## as.factor(filed_county)Pipestone County	-1.296e-01	6.903e-02	-1.877
## as.factor(filed_county)Polk County	-1.050e+00	4.462e-02	-23.532
## as.factor(filed_county)Pope County	-6.060e-01	6.635e-02	-9.134
## as.factor(filed_county)Ramsey County	-4.091e-01	3.723e-02	-10.988
## as.factor(filed_county)Red Lake County	-6.351e-01	8.541e-02	-7.436
## as.factor(filed_county)Redwood County	-2.537e-01	5.280e-02	-4.805
## as.factor(filed_county)Renville County	-2.201e-01	5.431e-02	-4.054
## as.factor(filed_county)Rice County	-8.918e-01	4.301e-02	-20.732
## as.factor(filed_county)Rock County	-4.419e-01	7.485e-02	-5.904
## as.factor(filed_county)Roseau County	-2.031e-01	5.173e-02	-3.927
## as.factor(filed_county)Scott County	-2.202e-01	3.869e-02	-5.692
## as.factor(filed_county)Sherburne County	-1.294e-01	4.200e-02	-3.081
## as.factor(filed_county)Sibley County	4.888e-01	5.721e-02	8.544
## as.factor(filed_county)St. Louis County	-4.430e-01	3.806e-02	-11.639
## as.factor(filed_county)Stearns County	-5.722e-01	3.847e-02	-14.874
## as.factor(filed_county)Steele County	-4.583e-01	4.554e-02	-10.065
## as.factor(filed_county)Stevens County	-1.054e+00	7.464e-02	-14.125
## as.factor(filed_county)Swift County	-1.020e-01	6.592e-02	-1.547
## as.factor(filed_county)Todd County	-7.007e-01	5.273e-02	-13.290
## as.factor(filed_county)Traverse County	-6.029e-01	1.150e-01	-5.242
## as.factor(filed_county)Wabasha County	-3.712e-01	5.090e-02	-7.293
## as.factor(filed_county)Wadena County	8.599e-02	5.641e-02	1.524
## as.factor(filed_county)Waseca County	-3.968e-01	5.884e-02	-6.744
## as.factor(filed_county)Washington County	-2.279e-01	3.829e-02	-5.952
## as.factor(filed_county)Watsonwan County	-1.679e-01	6.111e-02	-2.747
## as.factor(filed_county)Wilkin County	-1.004e+00	6.472e-02	-15.507
## as.factor(filed_county)Winona County	-1.038e-01	4.387e-02	-2.366
## as.factor(filed_county)Wright County	2.719e-01	4.090e-02	6.649
## as.factor(filed_county)Yellow Medicine County	-4.703e-01	6.106e-02	-7.702
## as.factor(sentence_year)2011	1.238e-01	7.839e-03	15.791
## as.factor(sentence_year)2012	2.180e-01	7.716e-03	28.246
## as.factor(sentence_year)2013	1.317e-01	8.143e-03	16.177
## as.factor(sentence_year)2014	3.253e-01	7.850e-03	41.439
## as.factor(sentence_year)2015	3.543e-01	7.974e-03	44.436
## as.factor(sentence_year)2016	6.211e-01	1.104e-02	56.258
## as.factor(sentence_year)2017	-2.118e-01	1.981e-02	-10.688
## as.factor(sentence_year)2018	-6.205e-01	3.083e-02	-20.125
##	Pr(> t)		
## (Intercept)	< 2e-16 ***		
## black	< 2e-16 ***		
## hispanic	< 2e-16 ***		
## asian	< 2e-16 ***		
## nativeam	< 2e-16 ***		
## other.race	0.356147		

```

## race.miss < 2e-16 ***
## male < 2e-16 ***
## log(age) < 2e-16 ***
## priors < 2e-16 ***
## perc_credit 7.77e-13 ***
## trial_flagTRUE < 2e-16 ***
## felony < 2e-16 ***
## gross.mis < 2e-16 ***
## drug < 2e-16 ***
## alcohol.dui < 2e-16 ***
## other.offense < 2e-16 ***
## as.factor(filed_county)Anoka County 0.317334
## as.factor(filed_county)Becker County < 2e-16 ***
## as.factor(filed_county)Beltrami County 7.65e-10 ***
## as.factor(filed_county)Benton County 0.007488 **
## as.factor(filed_county)Big Stone County 3.15e-14 ***
## as.factor(filed_county)Blue Earth County < 2e-16 ***
## as.factor(filed_county)Brown County 6.12e-07 ***
## as.factor(filed_county)Carlton County < 2e-16 ***
## as.factor(filed_county)Carver County 4.53e-12 ***
## as.factor(filed_county)Cass County < 2e-16 ***
## as.factor(filed_county)Chippewa County 0.000228 ***
## as.factor(filed_county)Chisago County 0.000743 ***
## as.factor(filed_county)Clay County < 2e-16 ***
## as.factor(filed_county)Clearwater County 0.010051 *
## as.factor(filed_county)Cook County 9.68e-15 ***
## as.factor(filed_county)Cottonwood County 1.53e-13 ***
## as.factor(filed_county)Crow Wing County < 2e-16 ***
## as.factor(filed_county)Dakota County < 2e-16 ***
## as.factor(filed_county)Dodge County 7.89e-11 ***
## as.factor(filed_county)Douglas County < 2e-16 ***
## as.factor(filed_county)Faribault County 1.95e-07 ***
## as.factor(filed_county)Fillmore County 3.29e-12 ***
## as.factor(filed_county)Freeborn County 0.000186 ***
## as.factor(filed_county)Goodhue County 2.91e-05 ***
## as.factor(filed_county)Grant County < 2e-16 ***
## as.factor(filed_county)Hennepin County 0.113180
## as.factor(filed_county)Houston County < 2e-16 ***
## as.factor(filed_county)Hubbard County 7.23e-14 ***
## as.factor(filed_county)Isanti County 1.24e-07 ***
## as.factor(filed_county)Itasca County < 2e-16 ***
## as.factor(filed_county)Jackson County 4.41e-08 ***
## as.factor(filed_county)Kanabec County 0.710198
## as.factor(filed_county)Kandiyohi County < 2e-16 ***
## as.factor(filed_county)Kittson County 0.000282 ***
## as.factor(filed_county)Koochiching County 0.656207
## as.factor(filed_county)Lac qui Parle County 0.003665 **
## as.factor(filed_county)Lake County < 2e-16 ***

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## as.factor(filed_county)Lake of the Woods County < 2e-16 ***
## as.factor(filed_county)LeSueur County 0.001070 **
## as.factor(filed_county)Lincoln County 1.51e-06 ***
## as.factor(filed_county)Lyon County 0.003576 **
## as.factor(filed_county)Mahnomon County < 2e-16 ***
## as.factor(filed_county)Marshall County 1.29e-06 ***
## as.factor(filed_county)Martin County 0.285096
## as.factor(filed_county)McLeod County 0.069852 .
## as.factor(filed_county)Meeker County 3.68e-05 ***
## as.factor(filed_county)Mille Lacs County 0.127807
## as.factor(filed_county)Morrison County < 2e-16 ***
## as.factor(filed_county)Mower County < 2e-16 ***
## as.factor(filed_county)Murray County 0.031351 *
## as.factor(filed_county)Nicollet County < 2e-16 ***
## as.factor(filed_county)Nobles County 0.005917 **
## as.factor(filed_county)Norman County 0.155650
## as.factor(filed_county)Olmsted County < 2e-16 ***
## as.factor(filed_county)Otter Tail County 0.000591 ***
## as.factor(filed_county)Pennington County 1.40e-05 ***
## as.factor(filed_county)Pine County 4.46e-05 ***
## as.factor(filed_county)Pipestone County 0.060500 .
## as.factor(filed_county)Polk County < 2e-16 ***
## as.factor(filed_county)Pope County < 2e-16 ***
## as.factor(filed_county)Ramsey County < 2e-16 ***
## as.factor(filed_county)Red Lake County 1.04e-13 ***
## as.factor(filed_county)Redwood County 1.55e-06 ***
## as.factor(filed_county)Renville County 5.04e-05 ***
## as.factor(filed_county)Rice County < 2e-16 ***
## as.factor(filed_county)Rock County 3.54e-09 ***
## as.factor(filed_county)Roseau County 8.61e-05 ***
## as.factor(filed_county)Scott County 1.26e-08 ***
## as.factor(filed_county)Sherburne County 0.002064 **
## as.factor(filed_county)Sibley County < 2e-16 ***
## as.factor(filed_county)St. Louis County < 2e-16 ***
## as.factor(filed_county)Stearns County < 2e-16 ***
## as.factor(filed_county)Steele County < 2e-16 ***
## as.factor(filed_county)Stevens County < 2e-16 ***
## as.factor(filed_county)Swift County 0.121749
## as.factor(filed_county)Todd County < 2e-16 ***
## as.factor(filed_county)Traverse County 1.59e-07 ***
## as.factor(filed_county)Wabasha County 3.04e-13 ***
## as.factor(filed_county)Wadena County 0.127434
## as.factor(filed_county)Waseca County 1.54e-11 ***
## as.factor(filed_county)Washington County 2.64e-09 ***
## as.factor(filed_county)Watsonwan County 0.006013 **
## as.factor(filed_county)Wilkin County < 2e-16 ***
## as.factor(filed_county)Winona County 0.017964 *
## as.factor(filed_county)Wright County 2.96e-11 ***

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## as.factor(filed_county)Yellow Medicine County    1.35e-14 ***
## as.factor(sentence_year)2011                    < 2e-16 ***
## as.factor(sentence_year)2012                    < 2e-16 ***
## as.factor(sentence_year)2013                    < 2e-16 ***
## as.factor(sentence_year)2014                    < 2e-16 ***
## as.factor(sentence_year)2015                    < 2e-16 ***
## as.factor(sentence_year)2016                    < 2e-16 ***
## as.factor(sentence_year)2017                    < 2e-16 ***
## as.factor(sentence_year)2018                    < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.518 on 1387724 degrees of freedom
## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.3077, Adjusted R-squared:  0.3077
## F-statistic: 5608 on 110 and 1387724 DF,  p-value: < 2.2e-16

#multivariate fixed effects regression
mv <- lm(cbind(total_ff_log, conf_minus_stayed_log, prob_days_log)~
         black+hispanic+asian+nativeam+other.race+race.miss+
         male+log(age)+priors+perc_credit+trial_flag+felony+gross.mis+
         drug+alcohol. DUI+other.offense, data = monsanc.short)
summary(mv)

## Response total_ff_log :
##
## Call:
## lm(formula = total_ff_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + priors + perc_credit +
##     trial_flag + felony + gross.mis + drug + alcohol. dui + other.offense,
##     data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -5.872 -0.333  0.276  0.699 77.686
##
## Coefficients:
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept)   5.264e+00  1.246e-02  422.409 < 2e-16 ***
## black         -4.300e-01  3.310e-03 -129.887 < 2e-16 ***
## hispanic       4.706e-02  4.770e-03   9.866 < 2e-16 ***
## asian         6.060e-02  7.271e-03   8.334 < 2e-16 ***
## nativeam     -2.449e-01  6.007e-03 -40.777 < 2e-16 ***
## other.race    -1.516e-01  9.571e-03 -15.841 < 2e-16 ***
## race.miss     -5.097e-02  2.992e-03 -17.037 < 2e-16 ***
## male          3.022e-02  2.501e-03  12.080 < 2e-16 ***
## log(age)      -3.555e-02  3.297e-03 -10.781 < 2e-16 ***
## priors        -1.442e-02  1.459e-04 -98.879 < 2e-16 ***

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## perc_credit      -2.094e-03  2.978e-05  -70.303  < 2e-16 ***
## trial_flagTRUE -6.742e-01  1.188e-01   -5.677  1.37e-08 ***
## felony          -4.584e-01  5.447e-03  -84.164  < 2e-16 ***
## gross.mis       1.176e-01  4.397e-03   26.741  < 2e-16 ***
## drug            2.848e-01  7.850e-03   36.281  < 2e-16 ***
## alcohol. DUI    5.063e-01  5.517e-03   91.765  < 2e-16 ***
## other.offense   2.902e-01  4.806e-03   60.388  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.327 on 1387818 degrees of freedom
## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.05559,    Adjusted R-squared:  0.05558
## F-statistic:  5106 on 16 and 1387818 DF,  p-value: < 2.2e-16
##
##
## Response conf_minus_stayed_log :
##
## Call:
## lm(formula = conf_minus_stayed_log ~ black + hispanic + asian +
##     nativeam + other.race + race.miss + male + log(age) + priors +
##     perc_credit + trial_flag + felony + gross.mis + drug + alcohol. dui +
##     other.offense, data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -185.458   -0.353    -0.113     0.067     9.189
##
## Coefficients:
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept)   3.756e-01  9.754e-03  38.510  < 2e-16 ***
## black         1.528e-01  2.591e-03  58.989  < 2e-16 ***
## hispanic      4.914e-02  3.733e-03  13.163  < 2e-16 ***
## asian         1.871e-02  5.691e-03   3.288  0.00101 **
## nativeam      4.425e-01  4.701e-03  94.129  < 2e-16 ***
## other.race     5.237e-02  7.491e-03   6.991  2.73e-12 ***
## race.miss     -9.856e-02  2.342e-03 -42.088  < 2e-16 ***
## male          1.129e-01  1.958e-03  57.678  < 2e-16 ***
## log(age)       4.396e-02  2.581e-03  17.034  < 2e-16 ***
## priors         2.671e-02  1.142e-04 233.946  < 2e-16 ***
## perc_credit    5.092e-03  2.331e-05 218.438  < 2e-16 ***
## trial_flagTRUE 1.998e+00  9.295e-02  21.493  < 2e-16 ***
## felony         3.202e+00  4.263e-03 751.128  < 2e-16 ***
## gross.mis      1.714e+00  3.442e-03 498.088  < 2e-16 ***
## drug          -7.313e-01  6.144e-03 -119.023  < 2e-16 ***
## alcohol. dui   -2.853e-01  4.318e-03  -66.077  < 2e-16 ***
## other.offense  -5.980e-01  3.762e-03 -158.978  < 2e-16 ***
## ---

```

```

## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.039 on 1387818 degrees of freedom
## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.5087, Adjusted R-squared:  0.5087
## F-statistic: 8.98e+04 on 16 and 1387818 DF,  p-value: < 2.2e-16
##
##
## Response prob_days_log :
##
## Call:
## lm(formula = prob_days_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + priors + perc_credit +
##     trial_flag + felony + gross.mis + drug + alcohol. DUI + other.offense,
##     data = monsanc.short)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -21.7633  -1.8864  -0.6254   2.4632  11.1797
##
## Coefficients:
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept)   1.626e+00  2.399e-02   67.768 < 2e-16 ***
## black         1.800e-01  6.373e-03   28.238 < 2e-16 ***
## hispanic     -4.031e-01  9.183e-03  -43.897 < 2e-16 ***
## asian        -2.030e-01  1.400e-02  -14.500 < 2e-16 ***
## nativeam      3.012e-01  1.156e-02   26.048 < 2e-16 ***
## other.race     8.281e-02  1.843e-02    4.494 6.99e-06 ***
## race.miss    -1.534e+00  5.760e-03 -266.352 < 2e-16 ***
## male         -3.135e-01  4.816e-03  -65.105 < 2e-16 ***
## log(age)      4.196e-01  6.348e-03   66.108 < 2e-16 ***
## priors       -1.230e-02  2.808e-04  -43.808 < 2e-16 ***
## perc_credit    7.088e-04  5.734e-05   12.363 < 2e-16 ***
## trial_flagTRUE -1.762e+00  2.286e-01   -7.707 1.29e-14 ***
## felony        2.547e+00  1.049e-02  242.838 < 2e-16 ***
## gross.mis     3.322e+00  8.466e-03  392.416 < 2e-16 ***
## drug         -4.050e-01  1.511e-02  -26.797 < 2e-16 ***
## alcohol.DUI    6.746e-01  1.062e-02   63.509 < 2e-16 ***
## other.offense -8.722e-01  9.253e-03  -94.260 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.555 on 1387818 degrees of freedom
## (117194 observations deleted due to missingness)
## Multiple R-squared:  0.2868, Adjusted R-squared:  0.2867
## F-statistic: 3.487e+04 on 16 and 1387818 DF,  p-value: < 2.2e-16

```

```

#descriptive stats for mv.fe model
monsanc.short$miss <- seq_len(nrow(monsanc.short)) %in% na.action(mv.fe)

#descriptive statistics for variables in analysis
ds <- monsanc.short %>%
  filter(miss==FALSE) %>%
  select(total_ff, conf_minus_stayed,
         white,black,hispanic,asian,nativeam,other.race, race.miss,
         male,age,priors,trial_flag,
         felony,gross.mis,mis, petty.mis,
         violent,drug,alcohol.dui,other.offense,
         cap_ratio) %>%
  gather() %>%
  group_by(key) %>%
  summarize(
    mean = round(mean(value, na.rm=T),2),
    sd = round(sd(value, na.rm=T),2),
    min = min(value, na.rm=T),
    max = max(value, na.rm=T)
  )

print(ds, n = Inf)

```

```

## # A tibble: 22 x 5
##   key                mean      sd   min     max
##   <chr>             <dbl>  <dbl> <dbl>   <dbl>
## 1 age              33.0   12.4   15     115
## 2 alcohol.dui       0.15   0.36    0         1
## 3 asian             0.03   0.16    0         1
## 4 black             0.17   0.37    0         1
## 5 cap_ratio         0.75   0.15   0.2     1.15
## 6 conf_minus_stayed 31.7  318.    0    44087
## 7 drug              0.03   0.17    0         1
## 8 felony            0.06   0.24    0         1
## 9 gross.mis         0.09   0.28    0         1
## 10 hispanic         0.06   0.25    0         1
## 11 male             0.71   0.46    0         1
## 12 mis              0.85   0.35    0         1
## 13 nativeam         0.04   0.19    0         1
## 14 other.offense     0.75   0.43    0         1
## 15 other.race       0.01   0.12    0         1
## 16 petty.mis        0         0        0         0
## 17 priors           6.28   8.38    0        236
## 18 race.miss        0.24   0.43    0         1
## 19 total_ff        294.   211.    0       1000
## 20 trial_flag       0        0.01    0         1
## 21 violent          0.05   0.22    0         1

```



```
## 22 white          0.45    0.5    0        1

#FE instrumental Variables Regression
monsanc.short.iv <- monsanc.short %>% drop_na(total_ff_log,conf_minus_stayed_log,
black,hispanic,asian,nativeam,other.race,race.miss,male,age,
priors,perc_credit,trial_flag,felony,gross.mis,prison_flag,
drug,alcohol.dui,other.offense,filed_county,sentence_year,conf_minus_stayed_log)

#LFO
iv.conf.fe <- ivreg(total_ff_log~conf_minus_stayed_log+
black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
priors+perc_credit+trial_flag+felony+gross.mis+
drug+alcohol.dui+other.offense+as.factor(filed_county)+as.factor(sentence_year)
.-conf_minus_stayed_log+cap_ratio,
data = monsanc.short.iv)

summary(iv.conf.fe, diagnostics=T)

##
## Call:
## ivreg(formula = total_ff_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + felony + gross.mis +
##       drug + alcohol.dui + other.offense + as.factor(filed_county) +
##       as.factor(sentence_year) | . - conf_minus_stayed_log + cap_ratio,
##       data = monsanc.short.iv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1978.579   -3.980   -1.185    1.366    98.123
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)      9.48130     5.37447   1.764
## conf_minus_stayed_log -11.18177    14.49171  -0.772
## black              1.07168     1.82790   0.586
## hispanic           0.56325     0.65505   0.860
## asian            -0.11287     0.17031  -0.663
## nativeam          4.24397     5.90918   0.718
## other.race         0.31520     0.54640   0.577
## race.miss        -1.19789     1.54405  -0.776
## male              1.33545     1.68465   0.793
## log(age)           0.43171     0.59397   0.727
## priors             0.28289     0.38491   0.735
## perc_credit        0.05441     0.07345   0.741
## trial_flagTRUE     20.80160    27.66040   0.752
## felony            35.30360    46.40845   0.761
## gross.mis         19.20896    24.74787   0.776
```

## drug	-7.97948	10.76655	-0.741
## alcohol. DUI	-2.71292	4.21096	-0.644
## other.offense	-6.52623	8.88958	-0.734
## as.factor(filed_county)Anoka County	-0.60774	0.17558	-3.461
## as.factor(filed_county)Becker County	3.09271	3.67292	0.842
## as.factor(filed_county)Beltrami County	2.31347	3.07386	0.753
## as.factor(filed_county)Benton County	1.96343	2.77400	0.708
## as.factor(filed_county)Big Stone County	-0.18230	0.42578	-0.428
## as.factor(filed_county)Blue Earth County	-2.06561	2.51677	-0.821
## as.factor(filed_county)Brown County	0.16372	0.37279	0.439
## as.factor(filed_county)Carlton County	0.34432	0.51999	0.662
## as.factor(filed_county)Carver County	-1.80131	2.29115	-0.786
## as.factor(filed_county)Cass County	-2.88395	3.35022	-0.861
## as.factor(filed_county)Chippewa County	0.26380	0.44009	0.599
## as.factor(filed_county)Chisago County	-1.43351	1.33914	-1.070
## as.factor(filed_county)Clay County	0.81042	1.10002	0.737
## as.factor(filed_county)Clearwater County	1.52280	2.11376	0.720
## as.factor(filed_county)Cook County	-2.20591	2.49182	-0.885
## as.factor(filed_county)Cottonwood County	-1.03501	1.30174	-0.795
## as.factor(filed_county)Crow Wing County	-2.55535	3.14847	-0.812
## as.factor(filed_county)Dakota County	-0.79209	0.84289	-0.940
## as.factor(filed_county)Dodge County	-2.93241	3.10930	-0.943
## as.factor(filed_county)Douglas County	2.17821	2.78212	0.783
## as.factor(filed_county)Faribault County	0.13566	0.29360	0.462
## as.factor(filed_county)Fillmore County	0.02834	0.29252	0.097
## as.factor(filed_county)Freeborn County	-0.45447	0.36602	-1.242
## as.factor(filed_county)Goodhue County	-2.02802	2.13113	-0.952
## as.factor(filed_county)Hennepin County	-0.07929	0.69300	-0.114
## as.factor(filed_county)Houston County	-1.22378	1.21218	-1.010
## as.factor(filed_county)Hubbard County	1.50273	2.17584	0.691
## as.factor(filed_county)Isanti County	1.21880	1.97025	0.619
## as.factor(filed_county)Itasca County	-0.30369	0.41018	-0.740
## as.factor(filed_county)Jackson County	-0.93857	1.19380	-0.786
## as.factor(filed_county)Kanabec County	1.26108	1.91010	0.660
## as.factor(filed_county)Kandiyohi County	1.81926	2.47035	0.736
## as.factor(filed_county)Kittson County	-2.40826	3.07321	-0.784
## as.factor(filed_county)Koochiching County	-3.13486	3.34470	-0.937
## as.factor(filed_county)Lac qui Parle County	0.14142	0.52799	0.268
## as.factor(filed_county)Lake County	-0.57581	0.54309	-1.060
## as.factor(filed_county)Lake of the Woods County	-5.25509	6.43231	-0.817
## as.factor(filed_county)Lincoln County	-0.83067	1.04950	-0.791
## as.factor(filed_county)Lyon County	0.46496	0.69933	0.665
## as.factor(filed_county)Marshall County	-0.79962	1.00348	-0.797
## as.factor(filed_county)Martin County	1.15821	1.84856	0.627
## as.factor(filed_county)McLeod County	0.64808	1.28329	0.505
## as.factor(filed_county)Meeker County	1.27519	1.65228	0.772
## as.factor(filed_county)Mille Lacs County	2.08620	2.51870	0.828
## as.factor(filed_county)Morrison County	2.25222	3.01292	0.748

## as.factor(filed_county)Mower County	-2.99647	3.75728	-0.798
## as.factor(filed_county)Murray County	-1.48597	2.03160	-0.731
## as.factor(filed_county)Nicollet County	-1.72712	2.12287	-0.814
## as.factor(filed_county)Nobles County	-0.12925	0.22007	-0.587
## as.factor(filed_county)Norman County	0.32564	0.64521	0.505
## as.factor(filed_county)Olmsted County	-1.68344	1.74832	-0.963
## as.factor(filed_county)Otter Tail County	0.57964	0.67696	0.856
## as.factor(filed_county)Pennington County	0.13651	0.62876	0.217
## as.factor(filed_county)Pine County	1.23798	2.01855	0.613
## as.factor(filed_county)Pipestone County	-1.78811	2.31593	-0.772
## as.factor(filed_county)Polk County	4.41082	5.78526	0.762
## as.factor(filed_county)Pope County	-0.99354	1.17232	-0.848
## as.factor(filed_county)Ramsey County	1.69221	2.00522	0.844
## as.factor(filed_county)Red Lake County	-2.60765	2.73829	-0.952
## as.factor(filed_county)Redwood County	2.56723	3.21372	0.799
## as.factor(filed_county)Renville County	-0.20626	0.49262	-0.419
## as.factor(filed_county)Rice County	-0.96186	1.27199	-0.756
## as.factor(filed_county)Rock County	-0.71165	0.96480	-0.738
## as.factor(filed_county)Roseau County	-1.79586	2.21731	-0.810
## as.factor(filed_county)Scott County	-2.29123	2.92276	-0.784
## as.factor(filed_county)Sherburne County	0.96365	1.53282	0.629
## as.factor(filed_county)Sibley County	-1.82434	1.88341	-0.969
## as.factor(filed_county)St. Louis County	-0.76217	0.79501	-0.959
## as.factor(filed_county)Stearns County	1.58178	2.05715	0.769
## as.factor(filed_county)Steele County	0.18332	0.33258	0.551
## as.factor(filed_county)Stevens County	-0.19691	0.34390	-0.573
## as.factor(filed_county)Swift County	1.70513	2.27036	0.751
## as.factor(filed_county)Todd County	0.32034	0.41670	0.769
## as.factor(filed_county)Traverse County	0.82700	1.71842	0.481
## as.factor(filed_county)Wabasha County	-3.54306	4.16846	-0.850
## as.factor(filed_county)Wadena County	1.47765	1.92623	0.767
## as.factor(filed_county)Waseca County	-2.66134	3.07615	-0.865
## as.factor(filed_county)Washington County	1.27700	1.90482	0.670
## as.factor(filed_county)Watonwan County	-0.81494	1.10083	-0.740
## as.factor(filed_county)Wilkin County	0.17277	0.46321	0.373
## as.factor(filed_county)Winona County	-2.36194	2.68599	-0.879
## as.factor(filed_county)Wright County	1.04908	1.98554	0.528
## as.factor(filed_county)Yellow Medicine County	0.97035	1.24214	0.781
## as.factor(sentence_year)2011	0.22376	0.23823	0.939
## as.factor(sentence_year)2012	0.25082	0.29319	0.855
## as.factor(sentence_year)2013	0.19220	0.13422	1.432
## as.factor(sentence_year)2014	0.24631	0.17859	1.379
## as.factor(sentence_year)2015	0.18604	0.06331	2.938
## as.factor(sentence_year)2016	1.03889	1.05610	0.984
## as.factor(sentence_year)2017	1.12774	0.88379	1.276
##	Pr(> t)		
## (Intercept)	0.077709	.	
## conf_minus_stayed_log	0.440353		

## black	0.557681
## hispanic	0.389873
## asian	0.507493
## nativeam	0.472634
## other.race	0.564035
## race.miss	0.437862
## male	0.427943
## log(age)	0.467335
## priors	0.462371
## perc_credit	0.458806
## trial_flagTRUE	0.452030
## felony	0.446828
## gross.mis	0.437639
## drug	0.458611
## alcohol.dui	0.519412
## other.offense	0.462861
## as.factor(filed_county)Anoka County	0.000538 ***
## as.factor(filed_county)Becker County	0.399772
## as.factor(filed_county)Beltrami County	0.451673
## as.factor(filed_county)Benton County	0.479072
## as.factor(filed_county)Big Stone County	0.668532
## as.factor(filed_county)Blue Earth County	0.411796
## as.factor(filed_county)Brown County	0.660524
## as.factor(filed_county)Carlton County	0.507857
## as.factor(filed_county)Carver County	0.431750
## as.factor(filed_county)Cass County	0.389335
## as.factor(filed_county)Chippewa County	0.548895
## as.factor(filed_county)Chisago County	0.284405
## as.factor(filed_county)Clay County	0.461283
## as.factor(filed_county)Clearwater County	0.471267
## as.factor(filed_county)Cook County	0.376016
## as.factor(filed_county)Cottonwood County	0.426556
## as.factor(filed_county)Crow Wing County	0.417012
## as.factor(filed_county)Dakota County	0.347352
## as.factor(filed_county)Dodge County	0.345625
## as.factor(filed_county)Douglas County	0.433667
## as.factor(filed_county)Faribault County	0.644029
## as.factor(filed_county)Fillmore County	0.922824
## as.factor(filed_county)Freeborn County	0.214373
## as.factor(filed_county)Goodhue County	0.341293
## as.factor(filed_county)Hennepin County	0.908903
## as.factor(filed_county)Houston County	0.312704
## as.factor(filed_county)Hubbard County	0.489789
## as.factor(filed_county)Isanti County	0.536178
## as.factor(filed_county)Itasca County	0.459075
## as.factor(filed_county)Jackson County	0.431749
## as.factor(filed_county)Kanabec County	0.509116
## as.factor(filed_county)Kandiyohi County	0.461464

## as.factor(filed_county)Kittson County	0.433257
## as.factor(filed_county)Koochiching County	0.348624
## as.factor(filed_county)Lac qui Parle County	0.788822
## as.factor(filed_county)Lake County	0.289030
## as.factor(filed_county)Lake of the Woods County	0.413938
## as.factor(filed_county)Lincoln County	0.428658
## as.factor(filed_county)Lyon County	0.506135
## as.factor(filed_county)Marshall County	0.425538
## as.factor(filed_county)Martin County	0.530959
## as.factor(filed_county)McLeod County	0.613549
## as.factor(filed_county)Meeker County	0.440245
## as.factor(filed_county)Mille Lacs County	0.407509
## as.factor(filed_county>Morrison County	0.454749
## as.factor(filed_county>Mower County	0.425154
## as.factor(filed_county>Murray County	0.464520
## as.factor(filed_county>Nicollet County	0.415889
## as.factor(filed_county>Nobles County	0.556995
## as.factor(filed_county)Norman County	0.613765
## as.factor(filed_county>Olmsted County	0.335602
## as.factor(filed_county>Otter Tail County	0.391867
## as.factor(filed_county>Pennington County	0.828127
## as.factor(filed_county>Pine County	0.539677
## as.factor(filed_county>Pipestone County	0.440062
## as.factor(filed_county>Polk County	0.445807
## as.factor(filed_county>Pope County	0.396716
## as.factor(filed_county>Ramsey County	0.398726
## as.factor(filed_county>Red Lake County	0.340948
## as.factor(filed_county>Redwood County	0.424387
## as.factor(filed_county>Renville County	0.675431
## as.factor(filed_county>Rice County	0.449538
## as.factor(filed_county>Rock County	0.460749
## as.factor(filed_county>Roseau County	0.417982
## as.factor(filed_county>Scott County	0.433083
## as.factor(filed_county>Sherburne County	0.529562
## as.factor(filed_county>Sibley County	0.332727
## as.factor(filed_county>St. Louis County	0.337710
## as.factor(filed_county>Stearns County	0.441943
## as.factor(filed_county>Steele County	0.581495
## as.factor(filed_county>Stevens County	0.566922
## as.factor(filed_county>Swift County	0.452629
## as.factor(filed_county>Todd County	0.442042
## as.factor(filed_county>Traverse County	0.630336
## as.factor(filed_county>Wabasha County	0.395343
## as.factor(filed_county>Wadena County	0.443011
## as.factor(filed_county>Waseca County	0.386955
## as.factor(filed_county>Washington County	0.502601
## as.factor(filed_county>Watsonwan County	0.459120
## as.factor(filed_county>Wilkin County	0.709159

```

## as.factor(filed_county)Winona County          0.379209
## as.factor(filed_county)Wright County          0.597249
## as.factor(filed_county)Yellow Medicine County 0.434692
## as.factor(sentence_year)2011                  0.347587
## as.factor(sentence_year)2012                  0.392281
## as.factor(sentence_year)2013                  0.152154
## as.factor(sentence_year)2014                  0.167833
## as.factor(sentence_year)2015                  0.003299 **
## as.factor(sentence_year)2016                  0.325264
## as.factor(sentence_year)2017                  0.201944
##
## Diagnostic tests:
##              df1      df2 statistic  p-value
## Weak instruments      1 1371643      0.582    0.445
## Wu-Hausman            1 1371642     45.299 1.69e-11 ***
## Sargan                0      NA        NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 11.4 on 1371643 degrees of freedom
## Multiple R-Squared: -68.4, Adjusted R-squared: -68.4
## Wald test: 18.08 on 107 and 1371643 DF, p-value: < 2.2e-16

#Probation
iv.prob.fe <- ivreg(prob_days_log~conf_minus_stayed_log+
                    black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
                    priors+perc_credit+trial_flag+felony+gross.mis+
                    drug+alcohol. DUI+other.offense+as.factor(filed_county)+as.factor(sentence_year)
                    .-conf_minus_stayed_log+cap_ratio,
                    data = monsanc.short.iv)

summary(iv.prob.fe, diagnostics=T)

##
## Call:
## ivreg(formula = prob_days_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + felony + gross.mis +
##       drug + alcohol. dui + other.offense + as.factor(filed_county) +
##       as.factor(sentence_year) | . - conf_minus_stayed_log + cap_ratio,
##       data = monsanc.short.iv)
##
## Residuals:
##      Min      1Q   Median      3Q      Max
## -73.9796 -1.9196 -0.7146  2.2889 10.9087
##
## Coefficients:
##
##                                     Estimate Std. Error t value

```

## (Intercept)	1.832625	1.192323	1.537
## conf_minus_stayed_log	-0.337435	3.214978	-0.105
## black	0.170044	0.405518	0.419
## hispanic	-0.433241	0.145323	-2.981
## asian	-0.199717	0.037783	-5.286
## nativeam	0.433613	1.310947	0.331
## other.race	0.026585	0.121219	0.219
## race.miss	-1.569676	0.342547	-4.582
## male	-0.248098	0.373739	-0.664
## log(age)	0.397180	0.131771	3.014
## priors	-0.006601	0.085393	-0.077
## perc_credit	0.002126	0.016294	0.130
## trial_flagTRUE	-1.410165	6.136445	-0.230
## felony	3.620926	10.295689	0.352
## gross.mis	3.846200	5.490300	0.701
## drug	-0.715695	2.388553	-0.300
## alcohol.dui	0.593600	0.934200	0.635
## other.offense	-1.136951	1.972148	-0.577
## as.factor(filed_county)Anoka County	-0.032877	0.038952	-0.844
## as.factor(filed_county)Becker County	0.669431	0.814836	0.822
## as.factor(filed_county)Beltrami County	0.325638	0.681934	0.478
## as.factor(filed_county)Benton County	-0.068742	0.615411	-0.112
## as.factor(filed_county)Big Stone County	-0.703651	0.094458	-7.449
## as.factor(filed_county)Blue Earth County	-1.211177	0.558345	-2.169
## as.factor(filed_county)Brown County	-0.251106	0.082702	-3.036
## as.factor(filed_county)Carlton County	-1.433516	0.115359	-12.427
## as.factor(filed_county)Carver County	0.239391	0.508291	0.471
## as.factor(filed_county)Cass County	-0.627715	0.743244	-0.845
## as.factor(filed_county)Chippewa County	-0.212205	0.097634	-2.173
## as.factor(filed_county)Chisago County	-0.177891	0.297086	-0.599
## as.factor(filed_county)Clay County	-0.819600	0.244039	-3.358
## as.factor(filed_county)Clearwater County	0.240660	0.468937	0.513
## as.factor(filed_county)Cook County	-0.628453	0.552810	-1.137
## as.factor(filed_county)Cottonwood County	-0.501236	0.288791	-1.736
## as.factor(filed_county)Crow Wing County	0.562792	0.698485	0.806
## as.factor(filed_county)Dakota County	0.626747	0.186994	3.352
## as.factor(filed_county)Dodge County	-0.457605	0.689796	-0.663
## as.factor(filed_county)Douglas County	-0.895228	0.617212	-1.450
## as.factor(filed_county)Faribault County	-0.307823	0.065134	-4.726
## as.factor(filed_county)Fillmore County	-0.400665	0.064895	-6.174
## as.factor(filed_county)Freeborn County	0.171338	0.081202	2.110
## as.factor(filed_county)Goodhue County	0.126393	0.472791	0.267
## as.factor(filed_county)Hennepin County	0.075836	0.153742	0.493
## as.factor(filed_county)Houston County	0.574973	0.268922	2.138
## as.factor(filed_county)Hubbard County	0.445547	0.482708	0.923
## as.factor(filed_county)Isanti County	0.304944	0.437099	0.698
## as.factor(filed_county)Itasca County	-0.565282	0.090998	-6.212
## as.factor(filed_county)Jackson County	-0.383923	0.264845	-1.450

## as.factor(filed_county)Kanabec County	0.066593	0.423754	0.157
## as.factor(filed_county)Kandiyohi County	-0.352369	0.548046	-0.643
## as.factor(filed_county)Kittson County	-0.463970	0.681789	-0.681
## as.factor(filed_county)Koochiching County	-0.104386	0.742019	-0.141
## as.factor(filed_county)Lac qui Parle County	-0.230123	0.117134	-1.965
## as.factor(filed_county)Lake County	-0.571636	0.120484	-4.745
## as.factor(filed_county)Lake of the Woods County	-1.189019	1.427003	-0.833
## as.factor(filed_county)Lincoln County	-0.459313	0.232832	-1.973
## as.factor(filed_county)Lyon County	-0.120274	0.155146	-0.775
## as.factor(filed_county)Marshall County	-0.368868	0.222621	-1.657
## as.factor(filed_county)Martin County	0.098262	0.410103	0.240
## as.factor(filed_county)McLeod County	0.112831	0.284697	0.396
## as.factor(filed_county)Meeker County	-0.205421	0.366557	-0.560
## as.factor(filed_county)Mille Lacs County	0.133152	0.558771	0.238
## as.factor(filed_county>Morrison County	-0.451933	0.668414	-0.676
## as.factor(filed_county>Mower County	-0.458710	0.833550	-0.550
## as.factor(filed_county>Murray County	-0.221541	0.450710	-0.492
## as.factor(filed_county>Nicollet County	-0.564075	0.470958	-1.198
## as.factor(filed_county>Nobles County	-0.130603	0.048822	-2.675
## as.factor(filed_county)Norman County	0.136564	0.143138	0.954
## as.factor(filed_county>Olmsted County	0.398358	0.387863	1.027
## as.factor(filed_county>Otter Tail County	0.168867	0.150183	1.124
## as.factor(filed_county>Pennington County	-0.221916	0.139490	-1.591
## as.factor(filed_county>Pine County	-0.145665	0.447814	-0.325
## as.factor(filed_county>Pipestone County	-0.178108	0.513788	-0.347
## as.factor(filed_county>Polk County	-0.913821	1.283457	-0.712
## as.factor(filed_county>Pope County	-0.633727	0.260078	-2.437
## as.factor(filed_county>Ramsey County	-0.359500	0.444858	-0.808
## as.factor(filed_county>Red Lake County	-0.701260	0.607487	-1.154
## as.factor(filed_county>Redwood County	-0.173332	0.712962	-0.243
## as.factor(filed_county>Renville County	-0.206205	0.109288	-1.887
## as.factor(filed_county>Rice County	-0.919748	0.282190	-3.259
## as.factor(filed_county>Rock County	-0.458400	0.214039	-2.142
## as.factor(filed_county>Roseau County	-0.251213	0.491909	-0.511
## as.factor(filed_county>Scott County	-0.285328	0.648412	-0.440
## as.factor(filed_county>Sherburne County	-0.089482	0.340056	-0.263
## as.factor(filed_county>Sibley County	0.447935	0.417833	1.072
## as.factor(filed_county>St. Louis County	-0.459399	0.176371	-2.605
## as.factor(filed_county>Stearns County	-0.523562	0.456377	-1.147
## as.factor(filed_county>Steele County	-0.450128	0.073782	-6.101
## as.factor(filed_county>Stevens County	-1.051849	0.076294	-13.787
## as.factor(filed_county>Swift County	-0.046054	0.503677	-0.091
## as.factor(filed_county>Todd County	-0.691312	0.092445	-7.478
## as.factor(filed_county>Traverse County	-0.563026	0.381231	-1.477
## as.factor(filed_county>Wabasha County	-0.466925	0.924771	-0.505
## as.factor(filed_county>Wadena County	0.130395	0.427333	0.305
## as.factor(filed_county>Waseca County	-0.466279	0.682443	-0.683
## as.factor(filed_county>Washington County	-0.184150	0.422584	-0.436

## as.factor(filed_county)Watonwan County	-0.188424	0.244219	-0.772
## as.factor(filed_county)Wilkin County	-0.996114	0.102763	-9.693
## as.factor(filed_county)Winona County	-0.163188	0.595885	-0.274
## as.factor(filed_county)Wright County	0.324712	0.440491	0.737
## as.factor(filed_county)Yellow Medicine County	-0.438594	0.275568	-1.592
## as.factor(sentence_year)2011	0.128036	0.052850	2.423
## as.factor(sentence_year)2012	0.224897	0.065043	3.458
## as.factor(sentence_year)2013	0.134888	0.029777	4.530
## as.factor(sentence_year)2014	0.330898	0.039620	8.352
## as.factor(sentence_year)2015	0.358461	0.014046	25.521
## as.factor(sentence_year)2016	0.648767	0.234296	2.769
## as.factor(sentence_year)2017	-0.188057	0.196068	-0.959
##	Pr(> t)		
## (Intercept)	0.124289		
## conf_minus_stayed_log	0.916410		
## black	0.674978		
## hispanic	0.002871	**	
## asian	1.25e-07	***	
## nativeam	0.740824		
## other.race	0.826405		
## race.miss	4.60e-06	***	
## male	0.506801		
## log(age)	0.002577	**	
## priors	0.938380		
## perc_credit	0.896183		
## trial_flagTRUE	0.818246		
## felony	0.725068		
## gross.mis	0.483587		
## drug	0.764455		
## alcohol.dui	0.525161		
## other.offense	0.564275		
## as.factor(filed_county)Anoka County	0.398653		
## as.factor(filed_county)Becker County	0.411332		
## as.factor(filed_county)Beltrami County	0.632991		
## as.factor(filed_county)Benton County	0.911061		
## as.factor(filed_county)Big Stone County	9.39e-14	***	
## as.factor(filed_county)Blue Earth County	0.030066	*	
## as.factor(filed_county)Brown County	0.002395	**	
## as.factor(filed_county)Carlton County	< 2e-16	***	
## as.factor(filed_county)Carver County	0.637661		
## as.factor(filed_county)Cass County	0.398356		
## as.factor(filed_county)Chippewa County	0.029745	*	
## as.factor(filed_county)Chisago County	0.549316		
## as.factor(filed_county)Clay County	0.000784	***	
## as.factor(filed_county)Clearwater County	0.607809		
## as.factor(filed_county)Cook County	0.255608		
## as.factor(filed_county)Cottonwood County	0.082628	.	
## as.factor(filed_county)Crow Wing County	0.420398		

## as.factor(filed_county)Dakota County	0.000803 ***
## as.factor(filed_county)Dodge County	0.507079
## as.factor(filed_county)Douglas County	0.146936
## as.factor(filed_county)Faribault County	2.29e-06 ***
## as.factor(filed_county)Fillmore County	6.66e-10 ***
## as.factor(filed_county)Freeborn County	0.034857 *
## as.factor(filed_county)Goodhue County	0.789213
## as.factor(filed_county)Hennepin County	0.621825
## as.factor(filed_county)Houston County	0.032511 *
## as.factor(filed_county)Hubbard County	0.355999
## as.factor(filed_county)Isanti County	0.485394
## as.factor(filed_county)Itasca County	5.23e-10 ***
## as.factor(filed_county)Jackson County	0.147166
## as.factor(filed_county)Kanabec County	0.875127
## as.factor(filed_county)Kandiyohi County	0.520254
## as.factor(filed_county)Kittson County	0.496176
## as.factor(filed_county)Koochiching County	0.888124
## as.factor(filed_county)Lac qui Parle County	0.049458 *
## as.factor(filed_county)Lake County	2.09e-06 ***
## as.factor(filed_county)Lake of the Woods County	0.404716
## as.factor(filed_county)Lincoln County	0.048527 *
## as.factor(filed_county)Lyon County	0.438205
## as.factor(filed_county)Marshall County	0.097532 .
## as.factor(filed_county)Martin County	0.810638
## as.factor(filed_county)McLeod County	0.691869
## as.factor(filed_county)Meeker County	0.575201
## as.factor(filed_county)Mille Lacs County	0.811654
## as.factor(filed_county)Morrison County	0.498960
## as.factor(filed_county)Mower County	0.582107
## as.factor(filed_county)Murray County	0.623047
## as.factor(filed_county>Nicollet County	0.231027
## as.factor(filed_county>Nobles County	0.007471 **
## as.factor(filed_county)Norman County	0.340050
## as.factor(filed_county>Olmsted County	0.304392
## as.factor(filed_county>Otter Tail County	0.260842
## as.factor(filed_county)Pennington County	0.111630
## as.factor(filed_county)Pine County	0.744968
## as.factor(filed_county)Pipestone County	0.728850
## as.factor(filed_county)Polk County	0.476465
## as.factor(filed_county)Pope County	0.014823 *
## as.factor(filed_county)Ramsey County	0.419019
## as.factor(filed_county)Red Lake County	0.248352
## as.factor(filed_county)Redwood County	0.807916
## as.factor(filed_county>Renville County	0.059187 .
## as.factor(filed_county)Rice County	0.001117 **
## as.factor(filed_county)Rock County	0.032221 *
## as.factor(filed_county)Roseau County	0.609569
## as.factor(filed_county)Scott County	0.659907

```
## as.factor(filed_county)Sherburne County      0.792442
## as.factor(filed_county)Sibley County          0.283701
## as.factor(filed_county)St. Louis County        0.009195 **
## as.factor(filed_county)Stearns County          0.251294
## as.factor(filed_county)Steele County           1.06e-09 ***
## as.factor(filed_county)Stevens County          < 2e-16 ***
## as.factor(filed_county)Swift County            0.927146
## as.factor(filed_county)Todd County             7.55e-14 ***
## as.factor(filed_county)Traverse County         0.139712
## as.factor(filed_county)Wabasha County          0.613623
## as.factor(filed_county)Wadena County           0.760261
## as.factor(filed_county)Waseca County           0.494449
## as.factor(filed_county)Washington County       0.663002
## as.factor(filed_county)Watsonwan County        0.440388
## as.factor(filed_county)Wilkin County           < 2e-16 ***
## as.factor(filed_county)Winona County           0.784193
## as.factor(filed_county)Wright County           0.461026
## as.factor(filed_county)Yellow Medicine County  0.111475
## as.factor(sentence_year)2011                   0.015409 *
## as.factor(sentence_year)2012                   0.000545 ***
## as.factor(sentence_year)2013                   5.90e-06 ***
## as.factor(sentence_year)2014                   < 2e-16 ***
## as.factor(sentence_year)2015                   < 2e-16 ***
## as.factor(sentence_year)2016                   0.005623 **
## as.factor(sentence_year)2017                   0.337486
```

```
##
## Diagnostic tests:
##              df1      df2 statistic p-value
## Weak instruments      1 1371643      0.582  0.445
## Wu-Hausman            1 1371642      0.006  0.940
## Sargan                 0      NA      NA      NA
##
## Residual standard error: 2.529 on 1371643 degrees of freedom
## Multiple R-Squared: 0.3018, Adjusted R-squared: 0.3018
## Wald test: 5647 on 107 and 1371643 DF, p-value: < 2.2e-16
```

#LFO - no FE

```
iv.conf <- ivreg(total_ff_log~conf_minus_stayed_log+
  black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
  priors+perc_credit+trial_flag+prison_flag+felony+gross.mis+
  drug+alcohol. DUI+other.offense|
  .-conf_minus_stayed_log+cap_ratio,
  data = monsanc.short.iv)

summary(iv.conf, diagnostics=T)
```

```
##
## Call:
```

```
## ivreg(formula = total_ff_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + prison_flag +
##       felony + gross.mis + drug + alcohol. DUI + other.offense |
##       . - conf_minus_stayed_log + cap_ratio, data = monsanc.short.iv)
##
```

```
## Residuals:
```

```
##      Min      1Q    Median      3Q      Max
## -908.5225  -1.7812  -0.4944   0.6275  44.6239
##
```

```
## Coefficients:
```

```
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      7.298428   0.113364  64.380 < 2e-16 ***
## conf_minus_stayed_log -5.386228   0.265922 -20.255 < 2e-16 ***
## black              0.389492   0.043054   9.047 < 2e-16 ***
## hispanic           0.306221   0.023831  12.850 < 2e-16 ***
## asian              0.156909   0.030895   5.079 3.8e-07 ***
## nativeam           2.138054   0.120756  17.706 < 2e-16 ***
## other.race          0.115911   0.042422   2.732 0.00629 **
## race.miss          -0.584537   0.029146 -20.055 < 2e-16 ***
## male               0.636214   0.031689  20.077 < 2e-16 ***
## log(age)           0.202126   0.018149  11.137 < 2e-16 ***
## priors             0.130651   0.007206  18.130 < 2e-16 ***
## perc_credit        0.024983   0.001341  18.631 < 2e-16 ***
## trial_flagTRUE     9.972275   0.726483  13.727 < 2e-16 ***
## prison_flag        0.418064   0.249752   1.674 0.09415 .
## felony             16.798573   0.852251  19.711 < 2e-16 ***
## gross.mis           9.346961   0.456076  20.494 < 2e-16 ***
## drug              -3.687622   0.198946 -18.536 < 2e-16 ***
## alcohol.DUI        -1.038272   0.079752 -13.019 < 2e-16 ***
## other.offense      -2.942611   0.160896 -18.289 < 2e-16 ***
##
```

```
## Diagnostic tests:
```

```
##              df1      df2 statistic p-value
## Weak instruments      1 1371732      405.1 <2e-16 ***
## Wu-Hausman            1 1371731     6852.8 <2e-16 ***
## Sargan                0      NA         NA      NA
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
##
```

```
## Residual standard error: 5.553 on 1371732 degrees of freedom
```

```
## Multiple R-Squared: -15.47, Adjusted R-squared: -15.47
```

```
## Wald test: 284.7 on 18 and 1371732 DF, p-value: < 2.2e-16
```

```
#Probation - No FE
```

```
iv.prob<- ivreg(prob_days_log~conf_minus_stayed_log+
                black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
                priors+perc_credit+trial_flag+prison_flag+felony+gross.mis+
```

```

        drug+alcohol. DUI+other.offense |
        .-conf_minus_stayed_log+cap_ratio,
data = monsanc.short.iv)

summary(iv.prob, diagnostics=T)

##
## Call:
## ivreg(formula = prob_days_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + prison_flag +
##       felony + gross.mis + drug + alcohol. dui + other.offense |
##       . - conf_minus_stayed_log + cap_ratio, data = monsanc.short.iv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -15.032  -1.635  -0.735   2.454  238.704
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)      1.108432   0.061374  18.060 < 2e-16 ***
## conf_minus_stayed_log 1.427921   0.143966   9.918 < 2e-16 ***
## black            -0.035595   0.023309  -1.527 0.126734
## hispanic         -0.475453   0.012902 -36.852 < 2e-16 ***
## asian            -0.228253   0.016726 -13.646 < 2e-16 ***
## nativeam        -0.357899   0.065375  -5.475 4.39e-08 ***
## other.race        0.009689   0.022967   0.422 0.673111
## race.miss        -1.396939   0.015779 -88.529 < 2e-16 ***
## male             -0.474481   0.017156 -27.657 < 2e-16 ***
## log(age)          0.351430   0.009826  35.767 < 2e-16 ***
## priors           -0.050655   0.003901 -12.984 < 2e-16 ***
## perc_credit      -0.006443   0.000726  -8.875 < 2e-16 ***
## trial_flagTRUE    -4.539251   0.393307 -11.541 < 2e-16 ***
## prison_flag       -0.219303   0.135212  -1.622 0.104820
## felony           -2.031704   0.461396  -4.403 1.07e-05 ***
## gross.mis         0.874501   0.246913   3.542 0.000398 ***
## drug              0.651068   0.107706   6.045 1.50e-09 ***
## alcohol. dui       1.084469   0.043176  25.117 < 2e-16 ***
## other.offense     -0.014576   0.087107  -0.167 0.867101
##
## Diagnostic tests:
##              df1      df2 statistic p-value
## Weak instruments      1 1371732      405.1 <2e-16 ***
## Wu-Hausman            1 1371731      156.3 <2e-16 ***
## Sargan                 0      NA      NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```
##
## Residual standard error: 3.007 on 1371732 degrees of freedom
## Multiple R-Squared: 0.01351, Adjusted R-squared: 0.01349
## Wald test: 2.217e+04 on 18 and 1371732 DF, p-value: < 2.2e-16
```

Felony Level Analysis

```
#bar graph - median household income comes from ACS 2017 5-year estimates
adj <- data.frame(Race = c("Asian", "Black", "Hispanic", "Nat. Am.", "Other", "White"),
  race_med_inc = c(71865, 32743, 46232, 36017, 42476, 69069),
  ovr_med_inc = rep(65699, 6))

monsanc.felony %>%
  select(race_impute, total_ff) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(
    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  left_join(adj, by = "Race") %>%
  mutate(race_adj = (ovr_med_inc/race_med_inc)) %>%
  group_by(Race) %>%
  summarize(
    `Raw_USD` = mean(total_ff, na.rm = T),
    `Adjusted_USD` = mean(total_ff*race_adj, na.rm = T),
    `Raw_sd` = sd(total_ff, na.rm = T),
    `Adjusted_sd` = sd(total_ff*race_adj, na.rm=T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = c("adjusted", "stat"), sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
    c("White", "Hispanic", "Nat. Am.",
      "Other", "Asian", "Black")),
    `Income Adjusted` = factor(adjusted, levels = c("Raw", "Adjusted"))) %>%
  select(-adjusted) %>%
ggplot()+
  geom_bar(aes(x=Race, y=USD, fill=`Income Adjusted`),
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=USD+25, group=`Income Adjusted`,
    label = round(USD,0)),
```

```

    position = position_dodge2(width = 1))+
  labs(title = "Figure 1: Fine/Fee Orders by Race",
       fill = "")+
  scale_fill_manual(values = c("#00AFBB", "#FC4E07"))+
  theme_minimal()

```

```

## Warning: Column `Race` joining character vector and factor, coercing into
## character vector

```

```

## Warning: Removed 1 rows containing missing values (geom_bar).

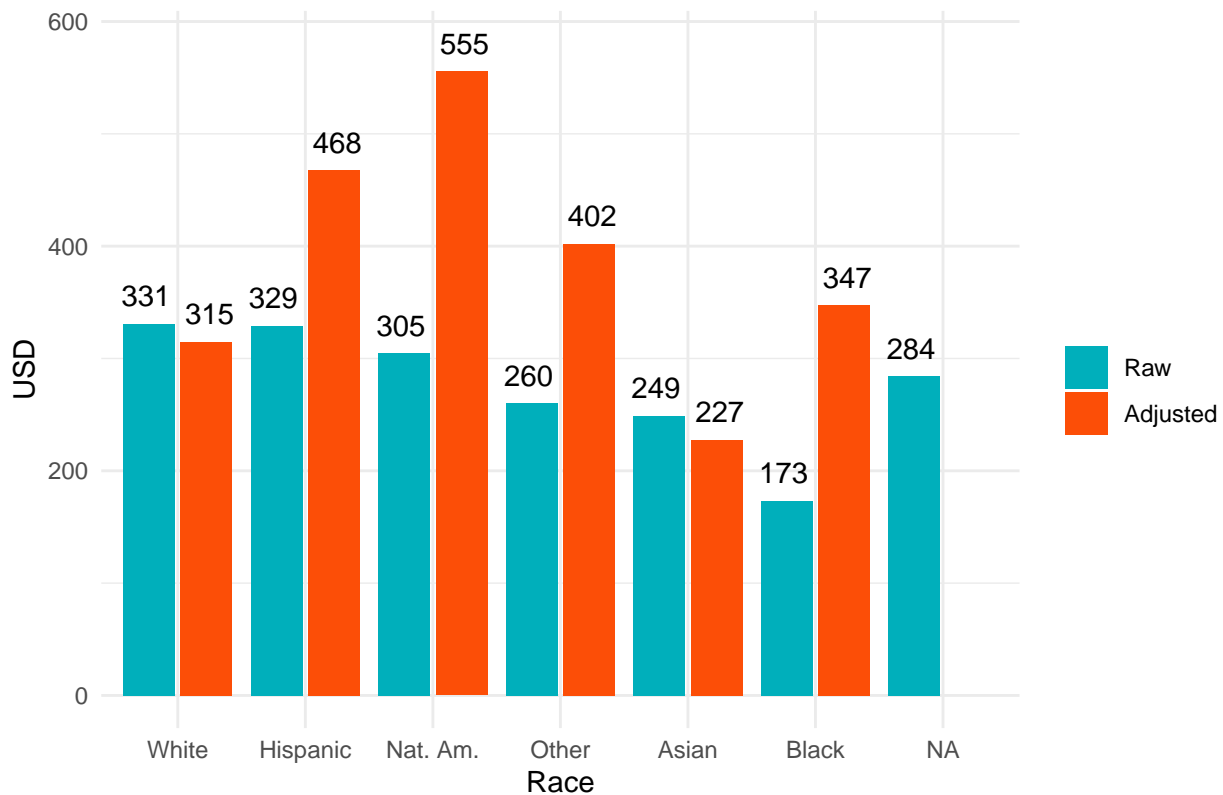
```

```

## Warning: Removed 1 rows containing missing values (geom_text).

```

Figure 1: Fine/Fee Orders by Race



```

ggsave("figure_1.png", device = "png")

```

```

## Saving 6.5 x 4.5 in image

```

```

## Warning: Removed 1 rows containing missing values (geom_bar).

```

```

## Warning: Removed 1 rows containing missing values (geom_text).

```

```

#confinement bar graph

```

```

monsanc.felony %>%
  select(race_impute, conf_minus_stayed) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(

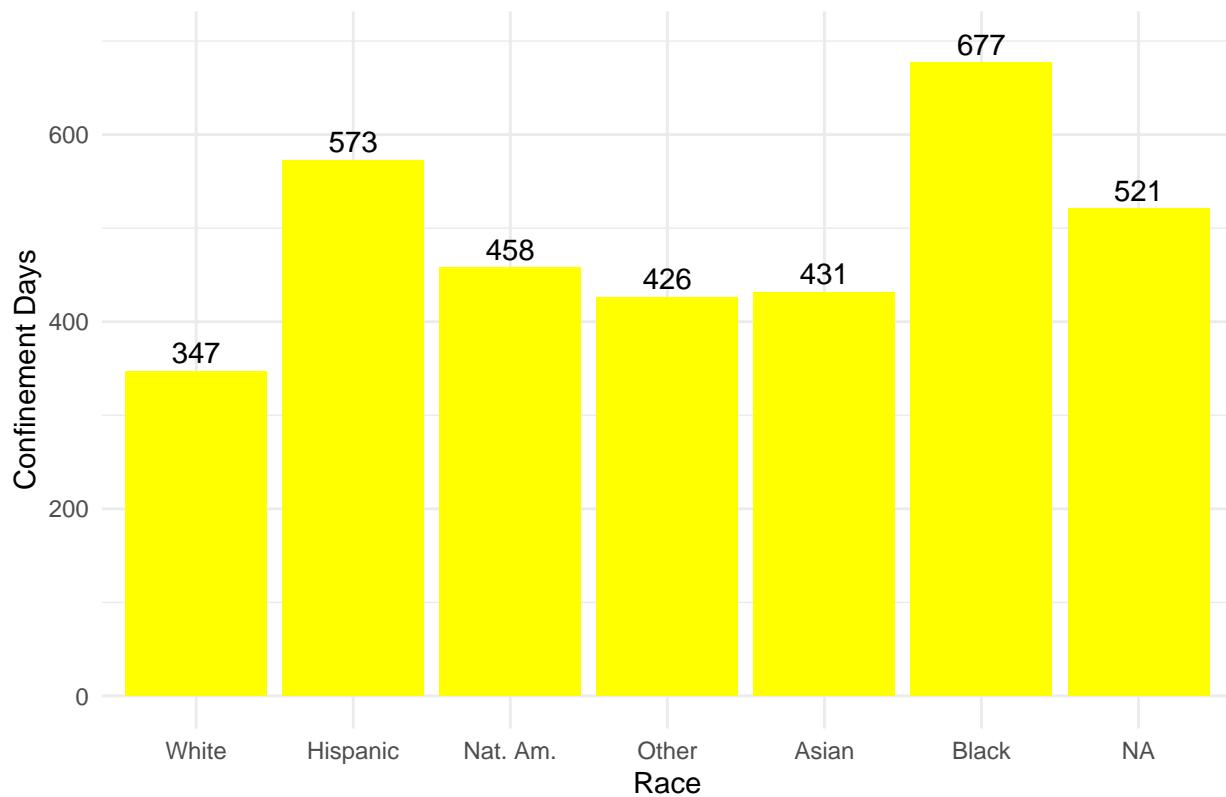
```

```

    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  group_by(Race) %>%
  summarize(
    `Confinement Days` = mean(conf_minus_stayed, na.rm = T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = "stat", sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
    c("White", "Hispanic", "Nat. Am.",
      "Other", "Asian", "Black")))
  ) %>%
ggplot()+
  geom_bar(aes(x=Race, y=`Confinement Days`),
    fill = "yellow",
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=`Confinement Days`+20,
    label = round(`Confinement Days`,0)),
    position = position_dodge2(width = 1))+
  labs(title = "Figure 2: Confinement Length by Race")+
  theme_minimal()+
  theme(legend.position = "none")

```


Figure 2: Confinement Length by Race



```
ggsave("figure_2.png", device = "png")
```

```
## Saving 6.5 x 4.5 in image
```

```
#probation bar graph
```

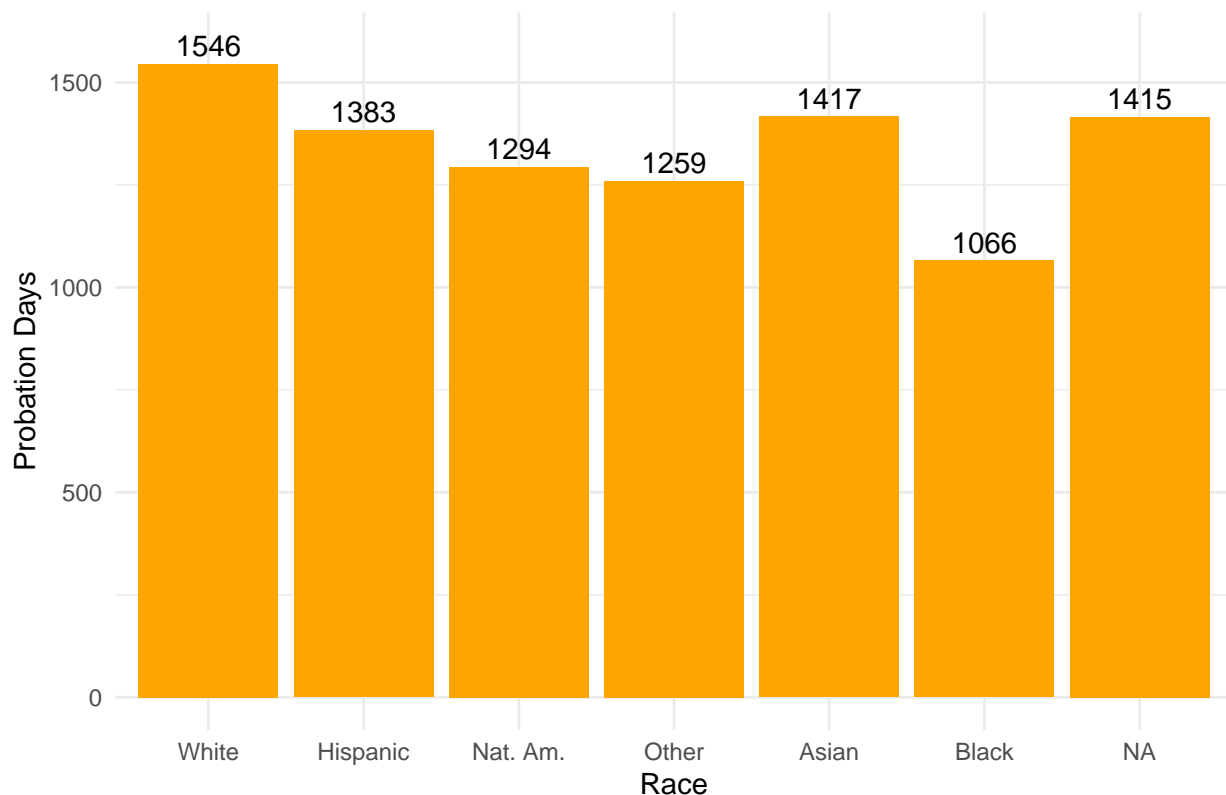
```
monsanc.felony %>%
  select(race_impute, prob_days) %>%
  filter(!is.na(race_impute)) %>%
  mutate(Race = case_when(
    race_impute=="asian"~"Asian",
    race_impute=="black"~"Black",
    race_impute=="hispanic"~"Hispanic",
    race_impute=="nat. am."~"Nat. Am.",
    race_impute=="other"~"Other",
    race_impute=="white"~"White"
  )) %>%
  select(-race_impute) %>%
  group_by(Race) %>%
  summarize(
    `Probation Days` = mean(prob_days, na.rm = T)
  ) %>%
  gather(key = "variable", value = "value", -Race) %>%
  separate(variable, into = "stat", sep = "_") %>%
  spread(key = "stat", value = "value") %>%
  mutate(Race = factor(Race, levels =
```

```

      c("White", "Hispanic", "Nat. Am.",
        "Other", "Asian", "Black"))
) %>%
ggplot()+
  geom_bar(aes(x=Race, y=`Probation Days`),
    fill = "orange",
    stat="identity",
    position = position_dodge2())+
  geom_text(aes(x=Race, y=`Probation Days`+45,
    label = round(`Probation Days`,0)),
    position = position_dodge2(width = 1))+
  labs(title = "Figure 3: Probation Length by Race")+
  theme_minimal()+
  theme(legend.position = "none")

```

Figure 3: Probation Length by Race



```

ggsave("figure_3.png", device = "png")

```

```

## Saving 6.5 x 4.5 in image

```

```

mv.fe.f <- lm(cbind(total_ff_log, conf_minus_stayed_log, prob_days_log)~
  black+hispanic+asian+nativeam+other.race+race.miss+
  male+log(age)+trial_flag+severity_conv+chpoints_final+
  drug+alcohol. DUI+other.offense+
  as.factor(filed_county)+as.factor(sentence_year), data = monsanc.felony)

```

```
summary(mv.fe.f)
```

```
## Response total_ff_log :
##
## Call:
## lm(formula = total_ff_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + trial_flag + severity_conv +
##     chpoints_final + drug + alcohol. DUI + other.offense + as.factor(filed_county) +
##     as.factor(sentence_year), data = monsanc.felony)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -6.5885 -0.5625  0.1786  0.9317  5.4991
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)      5.599000   0.136603  40.987
## black           -0.114509   0.019698  -5.813
## hispanic        -0.110085   0.032495  -3.388
## asian           -0.027410   0.046214  -0.593
## nativeam        -0.137100   0.030725  -4.462
## other.race      -0.012511   0.060363  -0.207
## race.miss        0.071843   0.035995   1.996
## male            0.145351   0.019174   7.581
## log(age)         0.028761   0.023658   1.216
## trial_flagTRUE   1.028593   0.203156   5.063
## severity_conv   -0.031745   0.003724  -8.524
## chpoints_final  -0.139734   0.003578 -39.059
## drug            -0.069031   0.019307  -3.575
## alcohol. DUI     0.316654   0.034308   9.230
## other.offense   -0.165249   0.019273  -8.574
## as.factor(filed_county)Anoka County -2.599164   0.110761 -23.466
## as.factor(filed_county)Becker County  0.328519   0.134357   2.445
## as.factor(filed_county)Beltrami County 0.036835   0.124180   0.297
## as.factor(filed_county)Benton County -1.461064   0.131775 -11.088
## as.factor(filed_county)Big Stone County -0.294504   0.297555  -0.990
## as.factor(filed_county)Blue Earth County -0.252049   0.120462  -2.092
## as.factor(filed_county)Brown County   0.284475   0.162600   1.750
## as.factor(filed_county)Carlton County -0.014493   0.131234  -0.110
## as.factor(filed_county)Carver County   0.227726   0.128670   1.770
## as.factor(filed_county)Cass County    -1.158842   0.133083  -8.708
## as.factor(filed_county)Chippewa County  0.181436   0.176811   1.026
## as.factor(filed_county)Chisago County -0.350926   0.131846  -2.662
## as.factor(filed_county)Clay County     0.062141   0.125676   0.494
## as.factor(filed_county)Clearwater County -0.287358   0.189693  -1.515
## as.factor(filed_county)Cook County    -0.743769   0.301434  -2.467
## as.factor(filed_county)Cottonwood County -0.488822   0.179104  -2.729
```

## as.factor(filed_county)Crow Wing County	0.118563	0.121345	0.977
## as.factor(filed_county)Dakota County	0.376131	0.108073	3.480
## as.factor(filed_county)Dodge County	-2.116351	0.177655	-11.913
## as.factor(filed_county)Douglas County	-0.116871	0.138871	-0.842
## as.factor(filed_county)Faribault County	0.205895	0.160529	1.283
## as.factor(filed_county)Fillmore County	-0.093280	0.191967	-0.486
## as.factor(filed_county)Freeborn County	-0.325806	0.136950	-2.379
## as.factor(filed_county)Goodhue County	-0.193253	0.125391	-1.541
## as.factor(filed_county)Grant County	-0.303315	0.314082	-0.966
## as.factor(filed_county)Hennepin County	-3.060679	0.106586	-28.716
## as.factor(filed_county)Houston County	-0.809084	0.170592	-4.743
## as.factor(filed_county)Hubbard County	-0.172306	0.150519	-1.145
## as.factor(filed_county)Isanti County	-0.938444	0.138309	-6.785
## as.factor(filed_county)Itasca County	0.134320	0.119917	1.120
## as.factor(filed_county)Jackson County	0.506037	0.212064	2.386
## as.factor(filed_county)Kanabec County	-0.244633	0.147121	-1.663
## as.factor(filed_county)Kandiyohi County	0.366999	0.129776	2.828
## as.factor(filed_county)Kittson County	-0.013649	0.383013	-0.036
## as.factor(filed_county)Koochiching County	-0.660076	0.187709	-3.516
## as.factor(filed_county)Lac qui Parle County	-0.021335	0.269620	-0.079
## as.factor(filed_county)Lake County	-0.595866	0.231128	-2.578
## as.factor(filed_county)Lake of the Woods County	-0.906316	0.318547	-2.845
## as.factor(filed_county)LeSueur County	-0.266307	0.158844	-1.677
## as.factor(filed_county)Lincoln County	0.436548	0.352261	1.239
## as.factor(filed_county)Lyon County	0.631121	0.145871	4.327
## as.factor(filed_county)Mahnommen County	0.020791	0.158814	0.131
## as.factor(filed_county)Marshall County	0.220650	0.224354	0.983
## as.factor(filed_county)Martin County	-0.600296	0.154976	-3.873
## as.factor(filed_county)McLeod County	-1.446731	0.132937	-10.883
## as.factor(filed_county)Meeker County	0.222749	0.156592	1.422
## as.factor(filed_county)Mille Lacs County	0.134242	0.127835	1.050
## as.factor(filed_county)Morrison County	-0.306883	0.135111	-2.271
## as.factor(filed_county)Mower County	-1.638781	0.132051	-12.410
## as.factor(filed_county)Murray County	0.282181	0.234072	1.206
## as.factor(filed_county>Nicollet County	0.227553	0.164839	1.380
## as.factor(filed_county>Nobles County	-0.148291	0.160447	-0.924
## as.factor(filed_county)Norman County	0.102189	0.267033	0.383
## as.factor(filed_county>Olmsted County	-1.658467	0.112383	-14.757
## as.factor(filed_county>Otter Tail County	0.435378	0.130589	3.334
## as.factor(filed_county>Pennington County	-0.225709	0.155093	-1.455
## as.factor(filed_county>Pine County	-0.621317	0.129161	-4.810
## as.factor(filed_county>Pipestone County	0.008128	0.231135	0.035
## as.factor(filed_county>Polk County	0.094970	0.121173	0.784
## as.factor(filed_county>Pope County	-0.226003	0.240431	-0.940
## as.factor(filed_county>Ramsey County	-0.391781	0.107387	-3.648
## as.factor(filed_county>Red Lake County	-0.013391	0.318550	-0.042
## as.factor(filed_county>Redwood County	-0.020269	0.146659	-0.138
## as.factor(filed_county>Renville County	-1.472337	0.168965	-8.714

## as.factor(filed_county)Rice County	0.487540	0.126529	3.853
## as.factor(filed_county)Rock County	-0.088931	0.314062	-0.283
## as.factor(filed_county)Roseau County	0.138499	0.167284	0.828
## as.factor(filed_county)Scott County	-0.263720	0.113484	-2.324
## as.factor(filed_county)Sherburne County	-0.571392	0.119419	-4.785
## as.factor(filed_county)Sibley County	-0.750801	0.178132	-4.215
## as.factor(filed_county)St. Louis County	-0.214395	0.109985	-1.949
## as.factor(filed_county)Stearns County	-0.162763	0.111224	-1.463
## as.factor(filed_county)Steele County	0.165021	0.133886	1.233
## as.factor(filed_county)Stevens County	-0.151758	0.257628	-0.589
## as.factor(filed_county)Swift County	0.057658	0.208143	0.277
## as.factor(filed_county)Todd County	0.200738	0.164819	1.218
## as.factor(filed_county)Traverse County	-0.809207	0.267145	-3.029
## as.factor(filed_county)Wabasha County	-1.407601	0.162572	-8.658
## as.factor(filed_county)Wadena County	0.201661	0.166277	1.213
## as.factor(filed_county)Waseca County	-1.272392	0.165114	-7.706
## as.factor(filed_county)Washington County	-0.714402	0.112718	-6.338
## as.factor(filed_county)Watsonwan County	-0.060999	0.186429	-0.327
## as.factor(filed_county)Wilkin County	-0.631705	0.275008	-2.297
## as.factor(filed_county)Winona County	-0.524173	0.127243	-4.119
## as.factor(filed_county)Wright County	-1.303952	0.117975	-11.053
## as.factor(filed_county)Yellow Medicine County	0.318047	0.183410	1.734
## as.factor(sentence_year)2011	0.023807	0.032323	0.737
## as.factor(sentence_year)2012	0.015942	0.031632	0.504
## as.factor(sentence_year)2013	0.126349	0.032391	3.901
## as.factor(sentence_year)2014	0.296747	0.031743	9.348
## as.factor(sentence_year)2015	0.412162	0.031028	13.283
## as.factor(sentence_year)2016	0.450241	0.034747	12.958
## as.factor(sentence_year)2017	0.326358	0.062945	5.185
## as.factor(sentence_year)2018	0.247924	0.144582	1.715
##	Pr(> t)		
## (Intercept)	< 2e-16	***	
## black	6.16e-09	***	
## hispanic	0.000705	***	
## asian	0.553110		
## nativeam	8.13e-06	***	
## other.race	0.835801		
## race.miss	0.045949	*	
## male	3.49e-14	***	
## log(age)	0.224100		
## trial_flagTRUE	4.14e-07	***	
## severity_conv	< 2e-16	***	
## chpoints_final	< 2e-16	***	
## drug	0.000350	***	
## alcohol.dui	< 2e-16	***	
## other.offense	< 2e-16	***	
## as.factor(filed_county)Anoka County	< 2e-16	***	
## as.factor(filed_county)Becker County	0.014483	*	

## as.factor(filed_county)Beltrami County	0.766756
## as.factor(filed_county)Benton County	< 2e-16 ***
## as.factor(filed_county)Big Stone County	0.322304
## as.factor(filed_county)Blue Earth County	0.036412 *
## as.factor(filed_county)Brown County	0.080203 .
## as.factor(filed_county)Carlton County	0.912062
## as.factor(filed_county)Carver County	0.076757 .
## as.factor(filed_county)Cass County	< 2e-16 ***
## as.factor(filed_county)Chippewa County	0.304821
## as.factor(filed_county)Chisago County	0.007779 **
## as.factor(filed_county)Clay County	0.620988
## as.factor(filed_county)Clearwater County	0.129815
## as.factor(filed_county)Cook County	0.013611 *
## as.factor(filed_county)Cottonwood County	0.006350 **
## as.factor(filed_county)Crow Wing County	0.328535
## as.factor(filed_county)Dakota County	0.000501 ***
## as.factor(filed_county)Dodge County	< 2e-16 ***
## as.factor(filed_county)Douglas County	0.400028
## as.factor(filed_county)Faribault County	0.199636
## as.factor(filed_county)Fillmore County	0.627026
## as.factor(filed_county)Freeborn County	0.017363 *
## as.factor(filed_county)Goodhue County	0.123273
## as.factor(filed_county)Grant County	0.334189
## as.factor(filed_county)Hennepin County	< 2e-16 ***
## as.factor(filed_county)Houston County	2.11e-06 ***
## as.factor(filed_county)Hubbard County	0.252320
## as.factor(filed_county)Isanti County	1.17e-11 ***
## as.factor(filed_county)Itasca County	0.262671
## as.factor(filed_county)Jackson County	0.017025 *
## as.factor(filed_county)Kanabec County	0.096359 .
## as.factor(filed_county)Kandiyohi County	0.004687 **
## as.factor(filed_county)Kittson County	0.971572
## as.factor(filed_county)Koochiching County	0.000438 ***
## as.factor(filed_county)Lac qui Parle County	0.936929
## as.factor(filed_county)Lake County	0.009938 **
## as.factor(filed_county)Lake of the Woods County	0.004441 **
## as.factor(filed_county)LeSueur County	0.093640 .
## as.factor(filed_county)Lincoln County	0.215249
## as.factor(filed_county)Lyon County	1.52e-05 ***
## as.factor(filed_county)Mahnomon County	0.895846
## as.factor(filed_county)Marshall County	0.325371
## as.factor(filed_county)Martin County	0.000107 ***
## as.factor(filed_county)McLeod County	< 2e-16 ***
## as.factor(filed_county)Meeker County	0.154891
## as.factor(filed_county)Mille Lacs County	0.293670
## as.factor(filed_county)Morrison County	0.023130 *
## as.factor(filed_county)Mower County	< 2e-16 ***
## as.factor(filed_county)Murray County	0.228004

```

## as.factor(filed_county)Nicollet County      0.167452
## as.factor(filed_county)Nobles County        0.355366
## as.factor(filed_county)Norman County        0.701957
## as.factor(filed_county)Olmsted County       < 2e-16 ***
## as.factor(filed_county)Otter Tail County    0.000857 ***
## as.factor(filed_county)Pennington County    0.145587
## as.factor(filed_county)Pine County          1.51e-06 ***
## as.factor(filed_county)Pipestone County     0.971948
## as.factor(filed_county)Polk County          0.433185
## as.factor(filed_county)Pope County          0.347226
## as.factor(filed_county)Ramsey County        0.000264 ***
## as.factor(filed_county)Red Lake County      0.966470
## as.factor(filed_county)Redwood County       0.890079
## as.factor(filed_county)Renville County     < 2e-16 ***
## as.factor(filed_county)Rice County          0.000117 ***
## as.factor(filed_county)Rock County          0.777052
## as.factor(filed_county)Roseau County        0.407715
## as.factor(filed_county)Scott County         0.020137 *
## as.factor(filed_county)Sherburne County     1.72e-06 ***
## as.factor(filed_county)Sibley County        2.50e-05 ***
## as.factor(filed_county)St. Louis County     0.051263 .
## as.factor(filed_county)Stearns County       0.143371
## as.factor(filed_county)Steele County        0.217749
## as.factor(filed_county)Stevens County       0.555824
## as.factor(filed_county)Swift County         0.781773
## as.factor(filed_county)Todd County          0.223257
## as.factor(filed_county)Traverse County      0.002454 **
## as.factor(filed_county)Wabasha County       < 2e-16 ***
## as.factor(filed_county)Wadena County        0.225211
## as.factor(filed_county)Waseca County        1.32e-14 ***
## as.factor(filed_county)Washington County    2.35e-10 ***
## as.factor(filed_county)Watonwan County      0.743521
## as.factor(filed_county)Wilkin County        0.021620 *
## as.factor(filed_county)Winona County        3.80e-05 ***
## as.factor(filed_county)Wright County       < 2e-16 ***
## as.factor(filed_county)Yellow Medicine County 0.082911 .
## as.factor(sentence_year)2011               0.461419
## as.factor(sentence_year)2012               0.614278
## as.factor(sentence_year)2013               9.60e-05 ***
## as.factor(sentence_year)2014               < 2e-16 ***
## as.factor(sentence_year)2015               < 2e-16 ***
## as.factor(sentence_year)2016               < 2e-16 ***
## as.factor(sentence_year)2017               2.17e-07 ***
## as.factor(sentence_year)2018               0.086394 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.647 on 53396 degrees of freedom

```

```

## (66860 observations deleted due to missingness)
## Multiple R-squared:  0.3913, Adjusted R-squared:  0.39
## F-statistic: 317.8 on 108 and 53396 DF,  p-value: < 2.2e-16
##
##
## Response conf_minus_stayed_log :
##
## Call:
## lm(formula = conf_minus_stayed_log ~ black + hispanic + asian +
##     nativeam + other.race + race.miss + male + log(age) + trial_flag +
##     severity_conv + chpoints_final + drug + alcohol. DUI + other.offense +
##     as.factor(filed_county) + as.factor(sentence_year), data = monsanc.felony)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -10.5825  -0.7022   0.2127   0.9912   6.9615
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)      2.626774    0.127361  20.625
## black              0.075430    0.018365   4.107
## hispanic          0.225332    0.030297   7.438
## asian             0.039454    0.043087   0.916
## nativeam          0.174917    0.028646   6.106
## other.race        -0.047551    0.056279  -0.845
## race.miss         -0.071251    0.033560  -2.123
## male              0.384028    0.017877  21.482
## log(age)         -0.230231    0.022057 -10.438
## trial_flagTRUE    0.015090    0.189411   0.080
## severity_conv     0.478359    0.003472 137.764
## chpoints_final    0.559552    0.003335 167.758
## drug              0.112398    0.018001   6.244
## alcohol. dui      0.573624    0.031987  17.933
## other.offense     -0.001314    0.017969  -0.073
## as.factor(filed_county)Anoka County    -0.703996    0.103268  -6.817
## as.factor(filed_county)Becker County    0.022875    0.125267   0.183
## as.factor(filed_county)Beltrami County  -0.120213    0.115779  -1.038
## as.factor(filed_county)Benton County   -0.328675    0.122859  -2.675
## as.factor(filed_county)Big Stone County  0.031980    0.277424   0.115
## as.factor(filed_county)Blue Earth County -1.129702    0.112312 -10.059
## as.factor(filed_county)Brown County     -0.784596    0.151599  -5.175
## as.factor(filed_county)Carlton County   -0.411281    0.122355  -3.361
## as.factor(filed_county)Carver County    -0.987827    0.119964  -8.234
## as.factor(filed_county)Cass County      -0.891691    0.124079  -7.186
## as.factor(filed_county)Chippewa County  -0.116422    0.164848  -0.706
## as.factor(filed_county)Chisago County   -0.635535    0.122926  -5.170
## as.factor(filed_county)Clay County      -0.130003    0.117173  -1.110
## as.factor(filed_county)Clearwater County -0.476445    0.176860  -2.694

```


## as.factor(filed_county)Cook County	-0.913160	0.281040	-3.249
## as.factor(filed_county)Cottonwood County	-0.786504	0.166987	-4.710
## as.factor(filed_county)Crow Wing County	-1.187973	0.113135	-10.500
## as.factor(filed_county)Dakota County	-0.831709	0.100761	-8.254
## as.factor(filed_county)Dodge County	-1.000789	0.165635	-6.042
## as.factor(filed_county)Douglas County	0.111582	0.129476	0.862
## as.factor(filed_county)Faribault County	-0.381914	0.149668	-2.552
## as.factor(filed_county)Fillmore County	-0.122684	0.178979	-0.685
## as.factor(filed_county)Freeborn County	-0.505784	0.127685	-3.961
## as.factor(filed_county)Goodhue County	-0.518991	0.116908	-4.439
## as.factor(filed_county)Grant County	0.283374	0.292833	0.968
## as.factor(filed_county)Hennepin County	-0.653296	0.099374	-6.574
## as.factor(filed_county)Houston County	-1.072176	0.159051	-6.741
## as.factor(filed_county)Hubbard County	-0.138523	0.140336	-0.987
## as.factor(filed_county)Isanti County	-0.006897	0.128952	-0.053
## as.factor(filed_county)Itasca County	-0.554302	0.111804	-4.958
## as.factor(filed_county)Jackson County	-1.096732	0.197716	-5.547
## as.factor(filed_county)Kanabec County	0.085552	0.137168	0.624
## as.factor(filed_county)Kandiyohi County	0.064257	0.120996	0.531
## as.factor(filed_county)Kittson County	-0.193676	0.357100	-0.542
## as.factor(filed_county)Koochiching County	-1.869432	0.175009	-10.682
## as.factor(filed_county)Lac qui Parle County	-0.939857	0.251379	-3.739
## as.factor(filed_county)Lake County	-0.699549	0.215490	-3.246
## as.factor(filed_county)Lake of the Woods County	-0.963108	0.296995	-3.243
## as.factor(filed_county)LeSueur County	-1.001085	0.148097	-6.760
## as.factor(filed_county)Lincoln County	0.302098	0.328428	0.920
## as.factor(filed_county)Lyon County	0.083073	0.136002	0.611
## as.factor(filed_county)Mahnommen County	-0.263787	0.148069	-1.782
## as.factor(filed_county)Marshall County	-0.400423	0.209175	-1.914
## as.factor(filed_county)Martin County	-0.311824	0.144491	-2.158
## as.factor(filed_county)McLeod County	-0.410507	0.123943	-3.312
## as.factor(filed_county)Meeker County	-0.071567	0.145997	-0.490
## as.factor(filed_county)Mille Lacs County	-0.185955	0.119186	-1.560
## as.factor(filed_county)Morrison County	-0.186915	0.125970	-1.484
## as.factor(filed_county)Mower County	-1.958134	0.123117	-15.905
## as.factor(filed_county)Murray County	-0.192031	0.218236	-0.880
## as.factor(filed_county>Nicollet County	-0.795060	0.153686	-5.173
## as.factor(filed_county>Nobles County	-0.323859	0.149592	-2.165
## as.factor(filed_county)Norman County	-0.054822	0.248967	-0.220
## as.factor(filed_county>Olmsted County	-0.822101	0.104779	-7.846
## as.factor(filed_county>Otter Tail County	-0.291588	0.121754	-2.395
## as.factor(filed_county>Pennington County	-0.537879	0.144600	-3.720
## as.factor(filed_county>Pine County	0.005115	0.120423	0.042
## as.factor(filed_county>Pipestone County	-1.047628	0.215497	-4.861
## as.factor(filed_county>Polk County	0.242192	0.112975	2.144
## as.factor(filed_county>Pope County	-0.012778	0.224165	-0.057
## as.factor(filed_county>Ramsey County	-0.550825	0.100122	-5.502
## as.factor(filed_county)Red Lake County	-0.130897	0.296998	-0.441

## as.factor(filed_county)Redwood County	-0.103346	0.136737	-0.756
## as.factor(filed_county)Renville County	-1.267682	0.157534	-8.047
## as.factor(filed_county)Rice County	-0.451824	0.117968	-3.830
## as.factor(filed_county)Rock County	-1.018883	0.292814	-3.480
## as.factor(filed_county)Roseau County	-0.585256	0.155967	-3.752
## as.factor(filed_county)Scott County	-1.140257	0.105806	-10.777
## as.factor(filed_county)Sherburne County	-0.184897	0.111340	-1.661
## as.factor(filed_county)Sibley County	-0.719196	0.166080	-4.330
## as.factor(filed_county)St. Louis County	-1.091973	0.102544	-10.649
## as.factor(filed_county)Stearns County	-0.550130	0.103699	-5.305
## as.factor(filed_county)Steele County	-0.538875	0.124828	-4.317
## as.factor(filed_county)Stevens County	0.132745	0.240198	0.553
## as.factor(filed_county)Swift County	0.005418	0.194061	0.028
## as.factor(filed_county)Todd County	0.002402	0.153668	0.016
## as.factor(filed_county)Traverse County	-0.078672	0.249072	-0.316
## as.factor(filed_county)Wabasha County	-0.820563	0.151573	-5.414
## as.factor(filed_county)Wadena County	-0.120575	0.155027	-0.778
## as.factor(filed_county)Waseca County	-1.646765	0.153943	-10.697
## as.factor(filed_county)Washington County	-0.377585	0.105092	-3.593
## as.factor(filed_county)Watonwan County	-0.539754	0.173816	-3.105
## as.factor(filed_county)Wilkin County	-0.307552	0.256402	-1.199
## as.factor(filed_county)Winona County	-1.228822	0.118634	-10.358
## as.factor(filed_county)Wright County	-0.423909	0.109993	-3.854
## as.factor(filed_county)Yellow Medicine County	-0.626781	0.171002	-3.665
## as.factor(sentence_year)2011	-0.056660	0.030136	-1.880
## as.factor(sentence_year)2012	0.010794	0.029492	0.366
## as.factor(sentence_year)2013	0.067224	0.030200	2.226
## as.factor(sentence_year)2014	0.021002	0.029595	0.710
## as.factor(sentence_year)2015	0.183818	0.028929	6.354
## as.factor(sentence_year)2016	0.059960	0.032396	1.851
## as.factor(sentence_year)2017	0.200069	0.058686	3.409
## as.factor(sentence_year)2018	0.415022	0.134800	3.079
##	Pr(> t)		
## (Intercept)	< 2e-16	***	
## black	4.01e-05	***	
## hispanic	1.04e-13	***	
## asian	0.359846		
## nativeam	1.03e-09	***	
## other.race	0.398157		
## race.miss	0.033749	*	
## male	< 2e-16	***	
## log(age)	< 2e-16	***	
## trial_flagTRUE	0.936501		
## severity_conv	< 2e-16	***	
## chpoints_final	< 2e-16	***	
## drug	4.30e-10	***	
## alcohol.dui	< 2e-16	***	
## other.offense	0.941702		

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## as.factor(filed_county)Anoka County          9.38e-12 ***
## as.factor(filed_county)Becker County         0.855102
## as.factor(filed_county)Beltrami County       0.299134
## as.factor(filed_county)Benton County        0.007470 **
## as.factor(filed_county)Big Stone County      0.908228
## as.factor(filed_county)Blue Earth County    < 2e-16 ***
## as.factor(filed_county)Brown County         2.28e-07 ***
## as.factor(filed_county)Carlton County       0.000776 ***
## as.factor(filed_county)Carver County        < 2e-16 ***
## as.factor(filed_county)Cass County          6.74e-13 ***
## as.factor(filed_county)Chippewa County      0.480045
## as.factor(filed_county)Chisago County       2.35e-07 ***
## as.factor(filed_county)Clay County          0.267219
## as.factor(filed_county)Clearwater County    0.007064 **
## as.factor(filed_county)Cook County          0.001158 **
## as.factor(filed_county)Cottonwood County    2.48e-06 ***
## as.factor(filed_county)Crow Wing County     < 2e-16 ***
## as.factor(filed_county)Dakota County        < 2e-16 ***
## as.factor(filed_county)Dodge County         1.53e-09 ***
## as.factor(filed_county)Douglas County       0.388802
## as.factor(filed_county)Faribault County     0.010721 *
## as.factor(filed_county)Fillmore County      0.493052
## as.factor(filed_county)Freeborn County      7.47e-05 ***
## as.factor(filed_county)Goodhue County       9.04e-06 ***
## as.factor(filed_county)Grant County         0.333199
## as.factor(filed_county)Hennepin County      4.94e-11 ***
## as.factor(filed_county)Houston County       1.59e-11 ***
## as.factor(filed_county)Hubbard County       0.323607
## as.factor(filed_county)Isanti County        0.957343
## as.factor(filed_county)Itasca County        7.15e-07 ***
## as.factor(filed_county)Jackson County       2.92e-08 ***
## as.factor(filed_county)Kanabec County       0.532827
## as.factor(filed_county)Kandiyohi County     0.595375
## as.factor(filed_county)Kittson County       0.587573
## as.factor(filed_county)Koochiching County   < 2e-16 ***
## as.factor(filed_county)Lac qui Parle County  0.000185 ***
## as.factor(filed_county)Lake County          0.001170 **
## as.factor(filed_county)Lake of the Woods County 0.001184 **
## as.factor(filed_county)LeSueur County       1.40e-11 ***
## as.factor(filed_county)Lincoln County       0.357666
## as.factor(filed_county)Lyon County          0.541322
## as.factor(filed_county)Mahnommen County     0.074834 .
## as.factor(filed_county)Marshall County      0.055588 .
## as.factor(filed_county)Martin County        0.030926 *
## as.factor(filed_county)McLeod County        0.000927 ***
## as.factor(filed_county)Meeker County        0.624001
## as.factor(filed_county)Mille Lacs County    0.118718
## as.factor(filed_county)Morrison County      0.137867

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## as.factor(filed_county)Mower County          < 2e-16 ***
## as.factor(filed_county)Murray County         0.378904
## as.factor(filed_county)Nicollet County        2.31e-07 ***
## as.factor(filed_county)Nobles County          0.030396 *
## as.factor(filed_county)Norman County          0.825719
## as.factor(filed_county)Olmsted County         4.37e-15 ***
## as.factor(filed_county)Otter Tail County      0.016628 *
## as.factor(filed_county)Pennington County      0.000200 ***
## as.factor(filed_county)Pine County            0.966122
## as.factor(filed_county)Pipestone County       1.17e-06 ***
## as.factor(filed_county)Polk County            0.032056 *
## as.factor(filed_county)Pope County            0.954544
## as.factor(filed_county)Ramsey County          3.78e-08 ***
## as.factor(filed_county)Red Lake County        0.659408
## as.factor(filed_county)Redwood County         0.449772
## as.factor(filed_county)Renville County        8.65e-16 ***
## as.factor(filed_county)Rice County            0.000128 ***
## as.factor(filed_county)Rock County            0.000503 ***
## as.factor(filed_county)Roseau County          0.000175 ***
## as.factor(filed_county)Scott County           < 2e-16 ***
## as.factor(filed_county)Sherburne County       0.096788 .
## as.factor(filed_county)Sibley County          1.49e-05 ***
## as.factor(filed_county)St. Louis County       < 2e-16 ***
## as.factor(filed_county)Stearns County         1.13e-07 ***
## as.factor(filed_county)Steele County          1.58e-05 ***
## as.factor(filed_county)Stevens County         0.580507
## as.factor(filed_county)Swift County           0.977725
## as.factor(filed_county)Todd County            0.987527
## as.factor(filed_county)Traverse County        0.752109
## as.factor(filed_county)Wabasha County         6.20e-08 ***
## as.factor(filed_county)Wadena County          0.436710
## as.factor(filed_county)Waseca County          < 2e-16 ***
## as.factor(filed_county)Washington County      0.000327 ***
## as.factor(filed_county)Watsonwan County       0.001902 **
## as.factor(filed_county)Wilkin County          0.230342
## as.factor(filed_county)Winona County          < 2e-16 ***
## as.factor(filed_county)Wright County          0.000116 ***
## as.factor(filed_county)Yellow Medicine County 0.000247 ***
## as.factor(sentence_year)2011                 0.060097 .
## as.factor(sentence_year)2012                 0.714372
## as.factor(sentence_year)2013                 0.026020 *
## as.factor(sentence_year)2014                 0.477933
## as.factor(sentence_year)2015                 2.11e-10 ***
## as.factor(sentence_year)2016                 0.064197 .
## as.factor(sentence_year)2017                 0.000652 ***
## as.factor(sentence_year)2018                 0.002079 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

```

##
## Residual standard error: 1.536 on 53396 degrees of freedom
## (66860 observations deleted due to missingness)
## Multiple R-squared: 0.5724, Adjusted R-squared: 0.5716
## F-statistic: 662 on 108 and 53396 DF, p-value: < 2.2e-16
##
##
## Response prob_days_log :
##
## Call:
## lm(formula = prob_days_log ~ black + hispanic + asian + nativeam +
## other.race + race.miss + male + log(age) + trial_flag + severity_conv +
## chpoints_final + drug + alcohol. DUI + other.offense + as.factor(filed_county) +
## as.factor(sentence_year), data = monsanc.felony)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -9.4860 -1.0618  0.1158  1.3289 11.5945
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)    9.853571   0.186666   52.787
## black          -0.229926   0.026917   -8.542
## hispanic       -0.491217   0.044404  -11.062
## asian          -0.130956   0.063151   -2.074
## nativeam       -0.256885   0.041985   -6.119
## other.race     -0.072941   0.082485   -0.884
## race.miss      -0.126442   0.049187   -2.571
## male          -0.367431   0.026201  -14.024
## log(age)       -0.105142   0.032328   -3.252
## trial_flagTRUE -0.536287   0.277609   -1.932
## severity_conv  -0.539578   0.005089 -106.025
## chpoints_final -1.077559   0.004889 -220.422
## drug           -0.255336   0.026383   -9.678
## alcohol.DUI    -0.249230   0.046882   -5.316
## other.offense  -0.582236   0.026336  -22.108
## as.factor(filed_county)Anoka County    0.095169   0.151354    0.629
## as.factor(filed_county)Becker County  -0.538069   0.183597   -2.931
## as.factor(filed_county)Beltrami County -0.190997   0.169691   -1.126
## as.factor(filed_county)Benton County  -0.013811   0.180068   -0.077
## as.factor(filed_county)Big Stone County -0.120797   0.406605   -0.297
## as.factor(filed_county)Blue Earth County  0.099107   0.164610    0.602
## as.factor(filed_county)Brown County    0.533295   0.222190    2.400
## as.factor(filed_county)Carlton County  -0.124911   0.179329   -0.697
## as.factor(filed_county)Carver County    0.450393   0.175825    2.562
## as.factor(filed_county)Cass County     0.118302   0.181856    0.651
## as.factor(filed_county)Chippewa County -0.136189   0.241609   -0.564
## as.factor(filed_county)Chisago County  -0.123020   0.180166   -0.683

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## as.factor(filed_county)Clay County	-0.524749	0.171734	-3.056
## as.factor(filed_county)Clearwater County	-0.176147	0.259213	-0.680
## as.factor(filed_county)Cook County	0.209518	0.411905	0.509
## as.factor(filed_county)Cottonwood County	0.299427	0.244743	1.223
## as.factor(filed_county)Crow Wing County	-0.391320	0.165816	-2.360
## as.factor(filed_county)Dakota County	0.127334	0.147680	0.862
## as.factor(filed_county)Dodge County	0.522759	0.242763	2.153
## as.factor(filed_county)Douglas County	-0.268576	0.189765	-1.415
## as.factor(filed_county)Faribault County	0.114993	0.219360	0.524
## as.factor(filed_county)Fillmore County	-0.049847	0.262320	-0.190
## as.factor(filed_county)Freeborn County	-0.326632	0.187141	-1.745
## as.factor(filed_county)Goodhue County	0.691590	0.171345	4.036
## as.factor(filed_county)Grant County	-0.714461	0.429189	-1.665
## as.factor(filed_county)Hennepin County	-0.478036	0.145648	-3.282
## as.factor(filed_county)Houston County	-0.043289	0.233112	-0.186
## as.factor(filed_county)Hubbard County	0.143156	0.205682	0.696
## as.factor(filed_county)Isanti County	-0.030820	0.188997	-0.163
## as.factor(filed_county)Itasca County	0.357569	0.163865	2.182
## as.factor(filed_county)Jackson County	0.935221	0.289782	3.227
## as.factor(filed_county)Kanabec County	0.118611	0.201039	0.590
## as.factor(filed_county)Kandiyohi County	-0.194089	0.177337	-1.094
## as.factor(filed_county)Kittson County	0.611685	0.523381	1.169
## as.factor(filed_county)Koochiching County	0.485417	0.256501	1.892
## as.factor(filed_county)Lac qui Parle County	0.160330	0.368432	0.435
## as.factor(filed_county)Lake County	0.316908	0.315833	1.003
## as.factor(filed_county)Lake of the Woods County	1.108264	0.435289	2.546
## as.factor(filed_county)LeSueur County	0.033829	0.217058	0.156
## as.factor(filed_county)Lincoln County	-0.357705	0.481359	-0.743
## as.factor(filed_county)Lyon County	0.032015	0.199331	0.161
## as.factor(filed_county)Mahnomen County	-0.851464	0.217017	-3.924
## as.factor(filed_county)Marshall County	0.115556	0.306577	0.377
## as.factor(filed_county)Martin County	-0.074249	0.211773	-0.351
## as.factor(filed_county)McLeod County	0.447139	0.181656	2.461
## as.factor(filed_county)Meeker County	-0.272024	0.213980	-1.271
## as.factor(filed_county)Mille Lacs County	-0.138393	0.174685	-0.792
## as.factor(filed_county)Morrison County	-0.196444	0.184627	-1.064
## as.factor(filed_county)Mower County	-0.325210	0.180446	-1.802
## as.factor(filed_county)Murray County	0.149618	0.319856	0.468
## as.factor(filed_county)Nicollet County	0.206845	0.225250	0.918
## as.factor(filed_county)Nobles County	-0.178101	0.219249	-0.812
## as.factor(filed_county)Norman County	-1.054127	0.364897	-2.889
## as.factor(filed_county)Olmsted County	0.609134	0.153569	3.967
## as.factor(filed_county)Otter Tail County	-0.167464	0.178448	-0.938
## as.factor(filed_county)Pennington County	-0.285458	0.211932	-1.347
## as.factor(filed_county)Pine County	-0.060713	0.176497	-0.344
## as.factor(filed_county)Pipestone County	0.338778	0.315842	1.073
## as.factor(filed_county)Polk County	-0.843382	0.165581	-5.093
## as.factor(filed_county)Pope County	-0.179879	0.328546	-0.547

## as.factor(filed_county)Ramsey County	-0.468219	0.146743	-3.191
## as.factor(filed_county)Red Lake County	-0.601190	0.435294	-1.381
## as.factor(filed_county)Redwood County	-0.263555	0.200408	-1.315
## as.factor(filed_county)Renville County	0.799534	0.230888	3.463
## as.factor(filed_county)Rice County	0.245546	0.172900	1.420
## as.factor(filed_county)Rock County	0.696803	0.429161	1.624
## as.factor(filed_county)Roseau County	0.409620	0.228592	1.792
## as.factor(filed_county)Scott County	0.146032	0.155074	0.942
## as.factor(filed_county)Sherburne County	-0.067696	0.163185	-0.415
## as.factor(filed_county)Sibley County	0.303943	0.243414	1.249
## as.factor(filed_county)St. Louis County	-0.198769	0.150292	-1.323
## as.factor(filed_county)Stearns County	0.096060	0.151986	0.632
## as.factor(filed_county)Steele County	0.092211	0.182954	0.504
## as.factor(filed_county)Stevens County	-0.458001	0.352045	-1.301
## as.factor(filed_county)Swift County	0.125145	0.284424	0.440
## as.factor(filed_county)Todd County	-0.388631	0.225223	-1.726
## as.factor(filed_county)Traverse County	-0.614768	0.365050	-1.684
## as.factor(filed_county)Wabasha County	0.572383	0.222152	2.577
## as.factor(filed_county)Wadena County	-0.363013	0.227215	-1.598
## as.factor(filed_county)Waseca County	0.558363	0.225626	2.475
## as.factor(filed_county)Washington County	-0.063526	0.154028	-0.412
## as.factor(filed_county)Watsonwan County	0.133217	0.254752	0.523
## as.factor(filed_county)Wilkin County	-0.593106	0.375794	-1.578
## as.factor(filed_county)Winona County	0.422086	0.173875	2.428
## as.factor(filed_county)Wright County	0.263101	0.161211	1.632
## as.factor(filed_county)Yellow Medicine County	-0.092586	0.250628	-0.369
## as.factor(sentence_year)2011	0.057169	0.044169	1.294
## as.factor(sentence_year)2012	-0.069543	0.043225	-1.609
## as.factor(sentence_year)2013	-0.074410	0.044262	-1.681
## as.factor(sentence_year)2014	-0.023131	0.043376	-0.533
## as.factor(sentence_year)2015	-0.195075	0.042400	-4.601
## as.factor(sentence_year)2016	-0.054338	0.047481	-1.144
## as.factor(sentence_year)2017	-0.276339	0.086013	-3.213
## as.factor(sentence_year)2018	-0.747601	0.197569	-3.784
##	Pr(> t)		
## (Intercept)	< 2e-16 ***		
## black	< 2e-16 ***		
## hispanic	< 2e-16 ***		
## asian	0.038111 *		
## nativeam	9.51e-10 ***		
## other.race	0.376540		
## race.miss	0.010154 *		
## male	< 2e-16 ***		
## log(age)	0.001145 **		
## trial_flagTRUE	0.053389 .		
## severity_conv	< 2e-16 ***		
## chpoints_final	< 2e-16 ***		
## drug	< 2e-16 ***		

```

## alcohol. DUI 1.06e-07 ***
## other.offense < 2e-16 ***
## as.factor(filed_county)Anoka County 0.529491
## as.factor(filed_county)Becker County 0.003383 **
## as.factor(filed_county)Beltrami County 0.260358
## as.factor(filed_county)Benton County 0.938863
## as.factor(filed_county)Big Stone County 0.766402
## as.factor(filed_county)Blue Earth County 0.547130
## as.factor(filed_county)Brown County 0.016391 *
## as.factor(filed_county)Carlton County 0.486091
## as.factor(filed_county)Carver County 0.010422 *
## as.factor(filed_county)Cass County 0.515357
## as.factor(filed_county)Chippewa County 0.572977
## as.factor(filed_county)Chisago County 0.494726
## as.factor(filed_county)Clay County 0.002247 **
## as.factor(filed_county)Clearwater County 0.496797
## as.factor(filed_county)Cook County 0.610995
## as.factor(filed_county)Cottonwood County 0.221171
## as.factor(filed_county)Crow Wing County 0.018280 *
## as.factor(filed_county)Dakota County 0.388567
## as.factor(filed_county)Dodge County 0.031294 *
## as.factor(filed_county)Douglas County 0.156985
## as.factor(filed_county)Faribault County 0.600127
## as.factor(filed_county)Fillmore County 0.849291
## as.factor(filed_county)Freeborn County 0.080924 .
## as.factor(filed_county)Goodhue County 5.44e-05 ***
## as.factor(filed_county)Grant County 0.095983 .
## as.factor(filed_county)Hennepin County 0.001031 **
## as.factor(filed_county)Houston County 0.852681
## as.factor(filed_county)Hubbard County 0.486428
## as.factor(filed_county)Isanti County 0.870463
## as.factor(filed_county)Itasca County 0.029107 *
## as.factor(filed_county)Jackson County 0.001250 **
## as.factor(filed_county)Kanabec County 0.555201
## as.factor(filed_county)Kandiyohi County 0.273756
## as.factor(filed_county)Kittson County 0.242522
## as.factor(filed_county)Koochiching County 0.058436 .
## as.factor(filed_county)Lac qui Parle County 0.663442
## as.factor(filed_county)Lake County 0.315669
## as.factor(filed_county)Lake of the Woods County 0.010898 *
## as.factor(filed_county)LeSueur County 0.876151
## as.factor(filed_county)Lincoln County 0.457416
## as.factor(filed_county)Lyon County 0.872398
## as.factor(filed_county)Mahnommen County 8.74e-05 ***
## as.factor(filed_county)Marshall County 0.706233
## as.factor(filed_county)Martin County 0.725886
## as.factor(filed_county)McLeod County 0.013840 *
## as.factor(filed_county)Meeker County 0.203643

```


## as.factor(filed_county)Mille Lacs County	0.428221
## as.factor(filed_county)Morrison County	0.287332
## as.factor(filed_county)Mower County	0.071511 .
## as.factor(filed_county)Murray County	0.639954
## as.factor(filed_county)Nicollet County	0.358471
## as.factor(filed_county)Nobles County	0.416608
## as.factor(filed_county)Norman County	0.003868 **
## as.factor(filed_county)Olmsted County	7.30e-05 ***
## as.factor(filed_county)Otter Tail County	0.348019
## as.factor(filed_county)Pennington County	0.178008
## as.factor(filed_county)Pine County	0.730855
## as.factor(filed_county)Pipestone County	0.283447
## as.factor(filed_county)Polk County	3.53e-07 ***
## as.factor(filed_county)Pope County	0.584038
## as.factor(filed_county)Ramsey County	0.001420 **
## as.factor(filed_county)Red Lake County	0.167250
## as.factor(filed_county)Redwood County	0.188484
## as.factor(filed_county)Renville County	0.000535 ***
## as.factor(filed_county)Rice County	0.155566
## as.factor(filed_county)Rock County	0.104458
## as.factor(filed_county)Roseau County	0.073150 .
## as.factor(filed_county)Scott County	0.346353
## as.factor(filed_county)Sherburne County	0.678260
## as.factor(filed_county)Sibley County	0.211793
## as.factor(filed_county)St. Louis County	0.185991
## as.factor(filed_county)Stearns County	0.527371
## as.factor(filed_county)Steele County	0.614255
## as.factor(filed_county)Stevens County	0.193274
## as.factor(filed_county)Swift County	0.659942
## as.factor(filed_county)Todd County	0.084437 .
## as.factor(filed_county)Traverse County	0.092176 .
## as.factor(filed_county)Wabasha County	0.009982 **
## as.factor(filed_county)Wadena County	0.110123
## as.factor(filed_county)Waseca County	0.013337 *
## as.factor(filed_county)Washington County	0.680025
## as.factor(filed_county)Watsonwan County	0.601027
## as.factor(filed_county)Wilkin County	0.114509
## as.factor(filed_county)Winona County	0.015206 *
## as.factor(filed_county)Wright County	0.102680
## as.factor(filed_county)Yellow Medicine County	0.711818
## as.factor(sentence_year)2011	0.195561
## as.factor(sentence_year)2012	0.107652
## as.factor(sentence_year)2013	0.092743 .
## as.factor(sentence_year)2014	0.593857
## as.factor(sentence_year)2015	4.22e-06 ***
## as.factor(sentence_year)2016	0.252457
## as.factor(sentence_year)2017	0.001315 **
## as.factor(sentence_year)2018	0.000154 ***

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.251 on 53396 degrees of freedom
## (66860 observations deleted due to missingness)
## Multiple R-squared:  0.6104, Adjusted R-squared:  0.6096
## F-statistic: 774.5 on 108 and 53396 DF,  p-value: < 2.2e-16

mv.f <- lm(cbind(total_ff_log, conf_minus_stayed_log, prob_days_log)~
           black+hispanic+asian+nativeam+other.race+race.miss+
           male+log(age)+trial_flag+severity_conv+chpoints_final+
           drug+alcohol.oui+other.offense, data = monsanc.felony)
summary(mv.f)

## Response total_ff_log :
##
## Call:
## lm(formula = total_ff_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + trial_flag + severity_conv +
##     chpoints_final + drug + alcohol.oui + other.offense, data = monsanc.felony)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -5.7929 -0.1641  0.6080  1.2692  3.9645
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)   5.5689959  0.1028792  54.131 < 2e-16 ***
## black         -0.9145103  0.0220653 -41.446 < 2e-16 ***
## hispanic      -0.0438447  0.0392237  -1.118  0.2637
## asian         -0.2320953  0.0558141  -4.158 3.21e-05 ***
## nativeam      -0.0001374  0.0348374  -0.004  0.9969
## other.race    -0.4628813  0.0742330  -6.236 4.54e-10 ***
## race.miss     -0.6318003  0.0437450 -14.443 < 2e-16 ***
## male          0.0764975  0.0236202   3.239  0.0012 **
## log(age)      -0.0654812  0.0290828  -2.252  0.0244 *
## trial_flagTRUE -0.3707913  0.2492668  -1.488  0.1369
## severity_conv -0.0695625  0.0045527 -15.280 < 2e-16 ***
## chpoints_final -0.1268816  0.0043915 -28.892 < 2e-16 ***
## drug          0.0065435  0.0235565   0.278  0.7812
## alcohol.oui   0.4062452  0.0421990   9.627 < 2e-16 ***
## other.offense -0.1578178  0.0237365  -6.649 2.98e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.034 on 53490 degrees of freedom
## (66860 observations deleted due to missingness)
## Multiple R-squared:  0.06983, Adjusted R-squared:  0.06959
```

```

## F-statistic: 286.8 on 14 and 53490 DF,  p-value: < 2.2e-16
##
##
## Response conf_minus_stayed_log :
##
## Call:
## lm(formula = conf_minus_stayed_log ~ black + hispanic + asian +
##     nativeam + other.race + race.miss + male + log(age) + trial_flag +
##     severity_conv + chpoints_final + drug + alcohol. DUI + other.offense,
##     data = monsanc.felony)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -10.8503  -0.6534   0.2659   1.0080   6.5520
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    2.008219    0.079659  25.210 < 2e-16 ***
## black           0.028926    0.017085   1.693  0.0904 .
## hispanic        0.256129    0.030371   8.433 < 2e-16 ***
## asian           0.002499    0.043217   0.058  0.9539
## nativeam        0.290920    0.026975  10.785 < 2e-16 ***
## other.race      -0.062709    0.057478  -1.091  0.2753
## race.miss       -0.086058    0.033872  -2.541  0.0111 *
## male            0.388015    0.018289  21.216 < 2e-16 ***
## log(age)        -0.225252    0.022519 -10.003 < 2e-16 ***
## trial_flagTRUE  0.039747    0.193007   0.206  0.8368
## severity_conv    0.483318    0.003525 137.107 < 2e-16 ***
## chpoints_final  0.566471    0.003400 166.591 < 2e-16 ***
## drug            0.128202    0.018240   7.029 2.11e-12 ***
## alcohol.DUI     0.594041    0.032675  18.180 < 2e-16 ***
## other.offense    0.011071    0.018379   0.602  0.5469
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.575 on 53490 degrees of freedom
## (66860 observations deleted due to missingness)
## Multiple R-squared:  0.5494, Adjusted R-squared:  0.5493
## F-statistic: 4659 on 14 and 53490 DF,  p-value: < 2.2e-16
##
##
## Response prob_days_log :
##
## Call:
## lm(formula = prob_days_log ~ black + hispanic + asian + nativeam +
##     other.race + race.miss + male + log(age) + trial_flag + severity_conv +
##     chpoints_final + drug + alcohol.DUI + other.offense, data = monsanc.felony)
##

```

```
## Residuals:
##      Min       1Q   Median       3Q      Max
## -8.9189 -1.0549  0.0964  1.2925 11.3216
##
## Coefficients:
##              Estimate Std. Error  t value Pr(>|t|)
## (Intercept)   9.915467   0.115073   86.167 < 2e-16 ***
## black        -0.437093   0.024681  -17.710 < 2e-16 ***
## hispanic     -0.558883   0.043873  -12.739 < 2e-16 ***
## asian        -0.288383   0.062429   -4.619 3.86e-06 ***
## nativeam     -0.408127   0.038966  -10.474 < 2e-16 ***
## other.race    -0.198800   0.083031   -2.394 0.01666 *
## race.miss    -0.294724   0.048930   -6.023 1.72e-09 ***
## male         -0.372016   0.026420  -14.081 < 2e-16 ***
## log(age)      -0.137950   0.032530   -4.241 2.23e-05 ***
## trial_flagTRUE -0.830175   0.278810   -2.978 0.00291 **
## severity_conv -0.552550   0.005092 -108.508 < 2e-16 ***
## chpoints_final -1.081705   0.004912 -220.215 < 2e-16 ***
## drug          -0.240392   0.026348   -9.124 < 2e-16 ***
## alcohol.dui   -0.246717   0.047201   -5.227 1.73e-07 ***
## other.offense -0.598423   0.026550  -22.540 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 2.275 on 53490 degrees of freedom
## (66860 observations deleted due to missingness)
## Multiple R-squared:  0.6011, Adjusted R-squared:  0.601
## F-statistic: 5758 on 14 and 53490 DF, p-value: < 2.2e-16

#descriptive stats for mv.fe model
monsanc.felony$miss <- seq_len(nrow(monsanc.felony)) %in% na.action(mv.fe.f)

#descriptive statistics for variables in analysis
ds <- monsanc.felony %>%
  filter(miss==FALSE) %>%
  select(total_ff, conf_minus_stayed,
         white,black,hispanic,asian,nativeam,other.race,race.miss,
         male,age,perc_credit,trial_flag,severity_conv,chpoints_final,
         violent,drug,alcohol.dui,other.offense,
         cap_ratio) %>%
  gather() %>%
  group_by(key) %>%
  summarize(
    mean = round(mean(value, na.rm=T),2),
    sd = round(sd(value, na.rm=T),2),
    min = min(value, na.rm=T),
    max = max(value, na.rm=T)
  )
)
```

```
print(ds, n = Inf)
```

```
## # A tibble: 20 x 5
##   key          mean      sd   min    max
##   <chr>        <dbl>  <dbl> <dbl>  <dbl>
## 1 age          31.9    10.6   15     91
## 2 alcohol.dui    0.05    0.22    0      1
## 3 asian         0.03    0.16    0      1
## 4 black         0.24    0.43    0      1
## 5 cap_ratio      0.73    0.15   0.2    1.15
## 6 chpoints_final 1.88     2.16    0      6
## 7 conf_minus_stayed 619.   1431.    0  40877
## 8 drug          0.26    0.44    0      1
## 9 hispanic       0.06    0.23    0      1
## 10 male          0.81    0.39    0      1
## 11 nativeam      0.07    0.26    0      1
## 12 other.offense  0.32    0.47    0      1
## 13 other.race     0.01    0.12    0      1
## 14 perc_credit   31.0    60.6    0  9060.
## 15 race.miss     0.04    0.21    0      1
## 16 severity_conv  3.88    2.18    1     12
## 17 total_ff      272.    280.    0  1000
## 18 trial_flag     0       0.04    0      1
## 19 violent        0.37    0.48    0      1
## 20 white         0.54    0.5     0      1
```

```
#FE instrumental Variables Regression
```

```
monsanc.felony.iv <- monsanc.felony %>% drop_na(total_ff_log, conf_minus_stayed_log,
  black, hispanic, asian, nativeam, other.race, race.miss, male, age,
  priors, perc_credit, trial_flag, prison_flag,
  drug, alcohol.dui, other.offense, filed_county, sentence_year, conf_minus_stayed_log)
```

```
#LFO
```

```
iv.conf.f <- ivreg(total_ff_log ~ conf_minus_stayed_log +
  black + hispanic + asian + nativeam + other.race + race.miss + male + log(age) +
  priors + perc_credit + trial_flag + prison_flag + felony + gross.mis +
  drug + alcohol.dui + other.offense + as.factor(filed_county) + as.factor(sentence_year) +
  . - conf_minus_stayed_log + cap_ratio,
  data = monsanc.felony.iv)
```

```
summary(iv.conf.f, diagnostics=T)
```

```
##
```

```
## Call:
```

```
## ivreg(formula = total_ff_log ~ conf_minus_stayed_log + black +
##   hispanic + asian + nativeam + other.race + race.miss + male +
##   log(age) + priors + perc_credit + trial_flag + prison_flag +
##   felony + gross.mis + drug + alcohol.dui + other.offense +
##   as.factor(filed_county) + as.factor(sentence_year) | . -
```

```
##      conf_minus_stayed_log + cap_ratio, data = monsanc.felony.iv)
##
## Residuals:
##      Min        1Q      Median        3Q        Max
## -16.3238  -2.6967   0.3497   2.8199  15.1680
##
## Coefficients:
##                                     Estimate Std. Error t value
## (Intercept)                       7.882992    1.961528   4.019
## conf_minus_stayed_log             -1.633940    1.490772  -1.096
## black                             0.637894    0.725963   0.879
## hispanic                          0.743673    0.800314   0.929
## asian                             0.326343    0.302982   1.077
## nativeam                          0.691601    0.767127   0.902
## other.race                       -0.013720    0.121536  -0.113
## race.miss                       -0.128341    0.166848  -0.769
## male                              1.834389    1.573710   1.166
## log(age)                          0.635178    0.684014   0.929
## priors                           0.093118    0.094616   0.984
## perc_credit                       0.001394    0.001419   0.982
## trial_flagTRUE                     4.434420    2.949150   1.504
## prison_flag                      -0.012284    0.204653  -0.060
## drug                             -1.525635    1.216048  -1.255
## alcohol.dui                       0.388843    0.093962   4.138
## other.offense                     -1.868667    1.479576  -1.263
## as.factor(filed_county)Anoka County -3.334646    0.957958  -3.481
## as.factor(filed_county)Becker County  2.283714    1.688736   1.352
## as.factor(filed_county)Beltrami County  1.386698    1.055763   1.313
## as.factor(filed_county)Benton County  -0.488020    0.556317  -0.877
## as.factor(filed_county)Big Stone County  0.318021    0.482359   0.659
## as.factor(filed_county)Blue Earth County -1.699432    1.675533  -1.014
## as.factor(filed_county)Brown County    -0.247304    0.694969  -0.356
## as.factor(filed_county)Carlton County  -0.403169    0.428237  -0.941
## as.factor(filed_county)Carver County   -1.008264    1.343858  -0.750
## as.factor(filed_county)Cass County     -2.155057    1.281159  -1.682
## as.factor(filed_county)Chippewa County -0.004675    0.395708  -0.012
## as.factor(filed_county)Chisago County  -0.870016    0.589509  -1.476
## as.factor(filed_county)Clay County      0.514472    0.303522   1.695
## as.factor(filed_county)Clearwater County -0.335089    0.330120  -1.015
## as.factor(filed_county)Cook County     -1.505030    0.979196  -1.537
## as.factor(filed_county)Cottonwood County -0.522242    0.492087  -1.061
## as.factor(filed_county)Crow Wing County -1.462288    1.575439  -0.928
## as.factor(filed_county)Dakota County   -0.118327    0.570794  -0.207
## as.factor(filed_county)Dodge County    -3.008763    1.406516  -2.139
## as.factor(filed_county)Douglas County   0.937547    0.747968   1.253
## as.factor(filed_county)Faribault County -0.239194    0.663959  -0.360
## as.factor(filed_county)Fillmore County  0.476054    0.334423   1.424
## as.factor(filed_county)Freeborn County -0.626209    0.543671  -1.152
```

## as.factor(filed_county)Goodhue County	-1.342655	1.115578	-1.204
## as.factor(filed_county)Hennepin County	-3.502406	0.306724	-11.419
## as.factor(filed_county)Houston County	-2.026167	1.291080	-1.569
## as.factor(filed_county)Hubbard County	0.581843	0.525053	1.108
## as.factor(filed_county)Isanti County	-0.282643	0.390256	-0.724
## as.factor(filed_county)Itasca County	0.333856	0.200189	1.668
## as.factor(filed_county)Jackson County	-0.195862	0.843108	-0.232
## as.factor(filed_county)Kanabec County	0.515581	0.674450	0.764
## as.factor(filed_county)Kandiyohi County	1.115641	0.657205	1.698
## as.factor(filed_county)Kittson County	-1.797429	1.550817	-1.159
## as.factor(filed_county)Koochiching County	-2.940386	2.387775	-1.231
## as.factor(filed_county)Lac qui Parle County	-0.622352	0.953395	-0.653
## as.factor(filed_county)Lake County	-1.267101	1.024230	-1.237
## as.factor(filed_county)Lake of the Woods County	-1.968624	1.904633	-1.034
## as.factor(filed_county)Lincoln County	1.201623	0.868574	1.383
## as.factor(filed_county)Lyon County	1.675604	0.874417	1.916
## as.factor(filed_county)Marshall County	0.534228	0.509957	1.048
## as.factor(filed_county)Martin County	0.242488	0.447409	0.542
## as.factor(filed_county)McLeod County	-0.513300	0.533256	-0.963
## as.factor(filed_county)Meeker County	0.502906	0.303683	1.656
## as.factor(filed_county)Mille Lacs County	0.331785	0.309097	1.073
## as.factor(filed_county)Morrison County	0.494547	0.675149	0.733
## as.factor(filed_county)Mower County	-3.390680	2.111707	-1.606
## as.factor(filed_county)Murray County	-0.246736	0.873184	-0.283
## as.factor(filed_county)Nicollet County	-0.764950	1.113657	-0.687
## as.factor(filed_county)Nobles County	-0.713148	0.898244	-0.794
## as.factor(filed_county)Norman County	0.651212	0.700068	0.930
## as.factor(filed_county)Olmsted County	-1.717228	0.244345	-7.028
## as.factor(filed_county)Otter Tail County	1.151498	0.565129	2.038
## as.factor(filed_county)Pennington County	0.277231	0.437170	0.634
## as.factor(filed_county)Pine County	-0.047590	0.606094	-0.079
## as.factor(filed_county)Pipestone County	-0.678877	1.082426	-0.627
## as.factor(filed_county)Polk County	3.392967	2.971107	1.142
## as.factor(filed_county)Pope County	-0.459266	0.513250	-0.895
## as.factor(filed_county)Ramsey County	0.270292	0.619559	0.436
## as.factor(filed_county)Red Lake County	-0.960158	0.931271	-1.031
## as.factor(filed_county)Redwood County	0.706323	0.594514	1.188
## as.factor(filed_county)Renville County	-2.298628	0.999453	-2.300
## as.factor(filed_county)Rice County	-0.212949	0.604919	-0.352
## as.factor(filed_county)Rock County	-1.268725	1.635116	-0.776
## as.factor(filed_county)Roseau County	-0.665932	1.008279	-0.660
## as.factor(filed_county)Scott County	-1.537298	1.399674	-1.098
## as.factor(filed_county)Sherburne County	0.504394	0.877510	0.575
## as.factor(filed_county)Sibley County	-1.776333	1.244176	-1.428
## as.factor(filed_county)St. Louis County	-0.803672	0.618202	-1.300
## as.factor(filed_county)Stearns County	0.788781	0.748530	1.054
## as.factor(filed_county)Steele County	-0.011042	0.278807	-0.040
## as.factor(filed_county)Stevens County	0.390054	0.870447	0.448

## as.factor(filed_county)Swift County	-0.126374	0.399687	-0.316
## as.factor(filed_county)Todd County	0.249226	0.272504	0.915
## as.factor(filed_county)Traverse County	-1.130519	0.490141	-2.307
## as.factor(filed_county)Wabasha County	-2.551502	1.455358	-1.753
## as.factor(filed_county)Wadena County	0.528772	0.295781	1.788
## as.factor(filed_county)Waseca County	-2.656153	1.624861	-1.635
## as.factor(filed_county)Washington County	-0.437498	0.231138	-1.893
## as.factor(filed_county)Watsonwan County	-0.824447	1.146574	-0.719
## as.factor(filed_county)Wilkin County	1.106511	1.560047	0.709
## as.factor(filed_county)Winona County	-1.922219	1.464454	-1.313
## as.factor(filed_county)Wright County	-1.233818	0.373634	-3.302
## as.factor(filed_county)Yellow Medicine County	0.624201	0.372158	1.677
## as.factor(sentence_year)2011	0.126489	0.090882	1.392
## as.factor(sentence_year)2012	0.272798	0.228360	1.195
## as.factor(sentence_year)2013	0.395193	0.253960	1.556
## as.factor(sentence_year)2014	0.294758	0.087798	3.357
## as.factor(sentence_year)2015	0.428698	0.080929	5.297
## as.factor(sentence_year)2016	0.597573	0.211672	2.823
## as.factor(sentence_year)2017	1.311103	0.987686	1.327
##	Pr(> t)		
## (Intercept)	5.85e-05	***	
## conf_minus_stayed_log	0.273066		
## black	0.379574		
## hispanic	0.352775		
## asian	0.281437		
## nativeam	0.367300		
## other.race	0.910117		
## race.miss	0.441771		
## male	0.243761		
## log(age)	0.353098		
## priors	0.325035		
## perc_credit	0.325951		
## trial_flagTRUE	0.132681		
## prison_flag	0.952136		
## drug	0.209633		
## alcohol.dui	3.50e-05	***	
## other.offense	0.206602		
## as.factor(filed_county)Anoka County	0.000500	***	
## as.factor(filed_county)Becker County	0.176276		
## as.factor(filed_county)Beltrami County	0.189033		
## as.factor(filed_county)Benton County	0.380362		
## as.factor(filed_county)Big Stone County	0.509703		
## as.factor(filed_county)Blue Earth County	0.310460		
## as.factor(filed_county)Brown County	0.721955		
## as.factor(filed_county)Carlton County	0.346471		
## as.factor(filed_county)Carver County	0.453091		
## as.factor(filed_county)Cass County	0.092550	.	
## as.factor(filed_county)Chippewa County	0.990573		


```

## as.factor(filed_county)Chisago County      0.139993
## as.factor(filed_county)Clay County          0.090078 .
## as.factor(filed_county)Clearwater County    0.310083
## as.factor(filed_county)Cook County          0.124296
## as.factor(filed_county)Cottonwood County    0.288566
## as.factor(filed_county)Crow Wing County     0.353318
## as.factor(filed_county)Dakota County        0.835774
## as.factor(filed_county)Dodge County         0.032426 *
## as.factor(filed_county)Douglas County       0.210042
## as.factor(filed_county)Faribault County     0.718658
## as.factor(filed_county)Fillmore County      0.154593
## as.factor(filed_county)Freeborn County      0.249400
## as.factor(filed_county)Goodhue County       0.228767
## as.factor(filed_county)Hennepin County      < 2e-16 ***
## as.factor(filed_county)Houston County       0.116568
## as.factor(filed_county)Hubbard County       0.267796
## as.factor(filed_county)Isanti County        0.468914
## as.factor(filed_county)Itasca County        0.095378 .
## as.factor(filed_county)Jackson County       0.816299
## as.factor(filed_county)Kanabec County       0.444603
## as.factor(filed_county)Kandiyohi County     0.089596 .
## as.factor(filed_county)Kittson County       0.246451
## as.factor(filed_county)Koochiching County   0.218164
## as.factor(filed_county)Lac qui Parle County  0.513904
## as.factor(filed_county)Lake County          0.216044
## as.factor(filed_county)Lake of the Woods County 0.301327
## as.factor(filed_county)Lincoln County       0.166533
## as.factor(filed_county)Lyon County          0.055337 .
## as.factor(filed_county)Marshall County      0.294829
## as.factor(filed_county)Martin County        0.587831
## as.factor(filed_county)McLeod County        0.335763
## as.factor(filed_county)Meeker County        0.097720 .
## as.factor(filed_county)Mille Lacs County    0.283094
## as.factor(filed_county)Morrison County      0.463865
## as.factor(filed_county)Mower County         0.108353
## as.factor(filed_county)Murray County        0.777507
## as.factor(filed_county)Nicollet County      0.492159
## as.factor(filed_county)Nobles County        0.427235
## as.factor(filed_county)Norman County        0.352264
## as.factor(filed_county)Olmsted County       2.11e-12 ***
## as.factor(filed_county)Otter Tail County    0.041595 *
## as.factor(filed_county)Pennington County    0.525986
## as.factor(filed_county)Pine County          0.937416
## as.factor(filed_county)Pipestone County     0.530542
## as.factor(filed_county)Polk County          0.253463
## as.factor(filed_county)Pope County          0.370887
## as.factor(filed_county)Ramsey County        0.662645
## as.factor(filed_county)Red Lake County      0.302535

```

```
## as.factor(filed_county)Redwood County          0.234810
## as.factor(filed_county)Renville County          0.021457 *
## as.factor(filed_county)Rice County              0.724818
## as.factor(filed_county)Rock County              0.437796
## as.factor(filed_county)Roseau County            0.508958
## as.factor(filed_county)Scott County             0.272065
## as.factor(filed_county)Sherburne County         0.565427
## as.factor(filed_county)Sibley County            0.153377
## as.factor(filed_county)St. Louis County         0.193599
## as.factor(filed_county)Stearns County           0.291989
## as.factor(filed_county)Steele County            0.968409
## as.factor(filed_county)Stevens County           0.654076
## as.factor(filed_county)Swift County             0.751865
## as.factor(filed_county)Todd County              0.360416
## as.factor(filed_county)Traverse County          0.021084 *
## as.factor(filed_county)Wabasha County           0.079575 .
## as.factor(filed_county)Wadena County            0.073826 .
## as.factor(filed_county)Waseca County            0.102117
## as.factor(filed_county)Washington County        0.058388 .
## as.factor(filed_county)Watonwan County          0.472111
## as.factor(filed_county)Wilkin County            0.478152
## as.factor(filed_county)Winona County            0.189327
## as.factor(filed_county)Wright County            0.000960 ***
## as.factor(filed_county)Yellow Medicine County   0.093498 .
## as.factor(sentence_year)2011                   0.163989
## as.factor(sentence_year)2012                   0.232248
## as.factor(sentence_year)2013                   0.119683
## as.factor(sentence_year)2014                   0.000788 ***
## as.factor(sentence_year)2015                   1.18e-07 ***
## as.factor(sentence_year)2016                   0.004757 **
## as.factor(sentence_year)2017                   0.184363
##
## Diagnostic tests:
##              df1    df2 statistic p-value
## Weak instruments      1 82149      1.403  0.2362
## Wu-Hausman           1 82148      6.191  0.0128 *
## Sargan               0    NA        NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 3.963 on 82149 degrees of freedom
## Multiple R-Squared: -2.309, Adjusted R-squared: -2.313
## Wald test: 90.63 on 106 and 82149 DF, p-value: < 2.2e-16
```

#Probation

```
iv.prob <- ivreg(prob_days_log~conf_minus_stayed_log+
                 black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
                 priors+perc_credit+trial_flag+prison_flag+felony+gross.mis+
```

```

        drug+alcohol.dui+other.offense+as.factor(filed_county)+as.factor(sentence_year)
    )-conf_minus_stayed_log+cap_ratio,
    data = monsanc.felony.iv)

summary(iv.prob, diagnostics=T)

```

```

##
## Call:
## ivreg(formula = prob_days_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + prison_flag +
##       felony + gross.mis + drug + alcohol.dui + other.offense +
##       as.factor(filed_county) + as.factor(sentence_year) | . -
##       conf_minus_stayed_log + cap_ratio, data = monsanc.felony.iv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -58.387  -3.923   1.295   3.231  19.866
##
## Coefficients:
##
##              Estimate Std. Error t value
## (Intercept)    10.115714    2.183397   4.633
## conf_minus_stayed_log    0.829268    1.659394   0.500
## black          -1.189279    0.808077  -1.472
## hispanic       -1.246302    0.890838  -1.399
## asian          -0.363120    0.337252  -1.077
## nativeam      -1.128027    0.853898  -1.321
## other.race     -0.293168    0.135283  -2.167
## race.miss      -0.111926    0.185720  -0.603
## male          -2.146904    1.751713  -1.226
## log(age)      -1.619333    0.761383  -2.127
## priors        -0.144290    0.105318  -1.370
## perc_credit    0.005955    0.001579   3.771
## trial_flagTRUE -4.016919    3.282730  -1.224
## prison_flag    0.717499    0.227802   3.150
## drug           1.420618    1.353596   1.050
## alcohol.dui    0.654859    0.104590   6.261
## other.offense  1.069760    1.646932   0.650
## as.factor(filed_county)Anoka County    0.728617    1.066313   0.683
## as.factor(filed_county)Becker County  -2.273765    1.879750  -1.210
## as.factor(filed_county)Beltrami County -1.164869    1.175181  -0.991
## as.factor(filed_county)Benton County  -0.780261    0.619242  -1.260
## as.factor(filed_county)Big Stone County  0.020171    0.536919   0.038
## as.factor(filed_county)Blue Earth County  0.329957    1.865054   0.177
## as.factor(filed_county)Brown County    0.545778    0.773577   0.706
## as.factor(filed_county)Carlton County  -0.680262    0.476675  -1.427
## as.factor(filed_county)Carver County    1.204019    1.495863   0.805

```

## as.factor(filed_county)Cass County	0.552494	1.426071	0.387
## as.factor(filed_county)Chippewa County	-0.110260	0.440467	-0.250
## as.factor(filed_county)Chisago County	-0.016687	0.656188	-0.025
## as.factor(filed_county)Clay County	-1.344577	0.337854	-3.980
## as.factor(filed_county)Clearwater County	-0.359611	0.367459	-0.979
## as.factor(filed_county)Cook County	-0.051378	1.089953	-0.047
## as.factor(filed_county)Cottonwood County	0.163606	0.547747	0.299
## as.factor(filed_county)Crow Wing County	0.547755	1.753638	0.312
## as.factor(filed_county)Dakota County	0.131013	0.635357	0.206
## as.factor(filed_county)Dodge County	1.105039	1.565608	0.706
## as.factor(filed_county)Douglas County	-1.128338	0.832571	-1.355
## as.factor(filed_county)Faribault County	0.391922	0.739060	0.530
## as.factor(filed_county)Fillmore County	-0.400983	0.372250	-1.077
## as.factor(filed_county)Freeborn County	-0.307071	0.605165	-0.507
## as.factor(filed_county)Goodhue County	0.465064	1.241761	0.375
## as.factor(filed_county)Hennepin County	-0.685096	0.341417	-2.007
## as.factor(filed_county)Houston County	0.496768	1.437115	0.346
## as.factor(filed_county)Hubbard County	-0.358775	0.584442	-0.614
## as.factor(filed_county)Isanti County	-0.215862	0.434398	-0.497
## as.factor(filed_county)Itasca County	-0.351410	0.222832	-1.577
## as.factor(filed_county)Jackson County	0.242801	0.938472	0.259
## as.factor(filed_county)Kanabec County	-0.636514	0.750738	-0.848
## as.factor(filed_county)Kandiyohi County	-0.888246	0.731542	-1.214
## as.factor(filed_county)Kittson County	1.774359	1.726231	1.028
## as.factor(filed_county)Koochiching County	1.707872	2.657858	0.643
## as.factor(filed_county)Lac qui Parle County	0.231053	1.061234	0.218
## as.factor(filed_county)Lake County	0.985003	1.140081	0.864
## as.factor(filed_county)Lake of the Woods County	1.891237	2.120066	0.892
## as.factor(filed_county)Lincoln County	-1.261952	0.966818	-1.305
## as.factor(filed_county)Lyon County	-0.701365	0.973323	-0.721
## as.factor(filed_county)Marshall County	-0.447903	0.567638	-0.789
## as.factor(filed_county)Martin County	-0.454890	0.498016	-0.913
## as.factor(filed_county)McLeod County	0.115674	0.593573	0.195
## as.factor(filed_county)Meeker County	-0.602440	0.338032	-1.782
## as.factor(filed_county)Mille Lacs County	-0.910903	0.344059	-2.648
## as.factor(filed_county)Morrison County	-0.921515	0.751515	-1.226
## as.factor(filed_county)Mower County	0.668023	2.350563	0.284
## as.factor(filed_county)Murray County	0.388803	0.971951	0.400
## as.factor(filed_county)Nicollet County	0.404688	1.239623	0.326
## as.factor(filed_county)Nobles County	0.143639	0.999845	0.144
## as.factor(filed_county)Norman County	-1.298143	0.779253	-1.666
## as.factor(filed_county)Olmsted County	-0.163598	0.271983	-0.602
## as.factor(filed_county)Otter Tail County	-0.643152	0.629051	-1.022
## as.factor(filed_county)Pennington County	-0.966830	0.486619	-1.987
## as.factor(filed_county)Pine County	-0.525687	0.674649	-0.779
## as.factor(filed_county)Pipestone County	0.746309	1.204860	0.619
## as.factor(filed_county)Polk County	-4.225802	3.307171	-1.278
## as.factor(filed_county)Pope County	-0.129273	0.571304	-0.226

## as.factor(filed_county)Ramsey County	-1.476389	0.689637	-2.141
## as.factor(filed_county)Red Lake County	-0.338021	1.036608	-0.326
## as.factor(filed_county)Redwood County	-0.457870	0.661760	-0.692
## as.factor(filed_county)Renville County	0.514058	1.112502	0.462
## as.factor(filed_county)Rice County	0.129636	0.673342	0.193
## as.factor(filed_county)Rock County	1.205158	1.820065	0.662
## as.factor(filed_county)Roseau County	0.974281	1.122326	0.868
## as.factor(filed_county)Scott County	0.828907	1.557992	0.532
## as.factor(filed_county)Sherburne County	-0.928381	0.976766	-0.950
## as.factor(filed_county)Sibley County	0.973107	1.384906	0.703
## as.factor(filed_county)St. Louis County	-0.450679	0.688127	-0.655
## as.factor(filed_county)Stearns County	-1.247398	0.833196	-1.497
## as.factor(filed_county)Steele County	-0.552079	0.310343	-1.779
## as.factor(filed_county)Stevens County	-1.365780	0.968903	-1.410
## as.factor(filed_county)Swift County	-0.175909	0.444896	-0.395
## as.factor(filed_county)Todd County	-0.230520	0.303327	-0.760
## as.factor(filed_county)Traverse County	-0.214478	0.545581	-0.393
## as.factor(filed_county)Wabasha County	0.987889	1.619974	0.610
## as.factor(filed_county)Wadena County	-0.547247	0.329237	-1.662
## as.factor(filed_county)Waseca County	1.506689	1.808650	0.833
## as.factor(filed_county)Washington County	-0.411838	0.257282	-1.601
## as.factor(filed_county)Watsonwan County	1.103529	1.276263	0.865
## as.factor(filed_county)Wilkin County	-2.394011	1.736505	-1.379
## as.factor(filed_county)Winona County	0.398242	1.630099	0.244
## as.factor(filed_county)Wright County	0.433286	0.415896	1.042
## as.factor(filed_county)Yellow Medicine County	-0.888002	0.414253	-2.144
## as.factor(sentence_year)2011	-0.019128	0.101161	-0.189
## as.factor(sentence_year)2012	-0.222850	0.254190	-0.877
## as.factor(sentence_year)2013	-0.195470	0.282686	-0.691
## as.factor(sentence_year)2014	-0.017626	0.097729	-0.180
## as.factor(sentence_year)2015	0.039511	0.090083	0.439
## as.factor(sentence_year)2016	-0.112929	0.235614	-0.479
## as.factor(sentence_year)2017	-1.367774	1.099403	-1.244
##	Pr(> t)		
## (Intercept)	3.61e-06	***	
## conf_minus_stayed_log	0.617258		
## black	0.141095		
## hispanic	0.161811		
## asian	0.281617		
## nativeam	0.186494		
## other.race	0.030231	*	
## race.miss	0.546737		
## male	0.220352		
## log(age)	0.033437	*	
## priors	0.170677		
## perc_credit	0.000163	***	
## trial_flagTRUE	0.221087		
## prison_flag	0.001635	**	

## drug	0.293945
## alcohol. DUI	3.84e-10 ***
## other.offense	0.515987
## as.factor(filed_county)Anoka County	0.494416
## as.factor(filed_county)Becker County	0.226432
## as.factor(filed_county)Beltrami County	0.321579
## as.factor(filed_county)Benton County	0.207664
## as.factor(filed_county)Big Stone County	0.970033
## as.factor(filed_county)Blue Earth County	0.859575
## as.factor(filed_county)Brown County	0.480486
## as.factor(filed_county)Carlton County	0.153555
## as.factor(filed_county)Carver County	0.420880
## as.factor(filed_county)Cass County	0.698444
## as.factor(filed_county)Chippewa County	0.802337
## as.factor(filed_county)Chisago County	0.979712
## as.factor(filed_county)Clay County	6.90e-05 ***
## as.factor(filed_county)Clearwater County	0.327760
## as.factor(filed_county)Cook County	0.962404
## as.factor(filed_county)Cottonwood County	0.765178
## as.factor(filed_county)Crow Wing County	0.754773
## as.factor(filed_county)Dakota County	0.836633
## as.factor(filed_county)Dodge County	0.480301
## as.factor(filed_county)Douglas County	0.175343
## as.factor(filed_county)Faribault County	0.595907
## as.factor(filed_county)Fillmore County	0.281399
## as.factor(filed_county)Freeborn County	0.611864
## as.factor(filed_county)Goodhue County	0.708018
## as.factor(filed_county)Hennepin County	0.044793 *
## as.factor(filed_county)Houston County	0.729592
## as.factor(filed_county)Hubbard County	0.539299
## as.factor(filed_county)Isanti County	0.619246
## as.factor(filed_county)Itasca County	0.114795
## as.factor(filed_county)Jackson County	0.795852
## as.factor(filed_county)Kanabec County	0.396523
## as.factor(filed_county)Kandiyohi County	0.224671
## as.factor(filed_county)Kittson County	0.304009
## as.factor(filed_county)Koochiching County	0.520502
## as.factor(filed_county)Lac qui Parle County	0.827647
## as.factor(filed_county)Lake County	0.387604
## as.factor(filed_county)Lake of the Woods County	0.372361
## as.factor(filed_county)Lincoln County	0.191807
## as.factor(filed_county)Lyon County	0.471165
## as.factor(filed_county)Marshall County	0.430076
## as.factor(filed_county)Martin County	0.361033
## as.factor(filed_county)McLeod County	0.845490
## as.factor(filed_county)Meeker County	0.074721 .
## as.factor(filed_county)Mille Lacs County	0.008110 **
## as.factor(filed_county)Morrison County	0.220123

```

## as.factor(filed_county)Mower County          0.776260
## as.factor(filed_county)Murray County          0.689140
## as.factor(filed_county)Nicollet County         0.744077
## as.factor(filed_county)Nobles County           0.885768
## as.factor(filed_county)Norman County           0.095741 .
## as.factor(filed_county)Olmsted County          0.547508
## as.factor(filed_county)Otter Tail County       0.306587
## as.factor(filed_county)Pennington County       0.046944 *
## as.factor(filed_county)Pine County             0.435864
## as.factor(filed_county)Pipestone County        0.535644
## as.factor(filed_county)Polk County             0.201334
## as.factor(filed_county)Pope County             0.820987
## as.factor(filed_county)Ramsey County           0.032292 *
## as.factor(filed_county)Red Lake County         0.744362
## as.factor(filed_county)Redwood County         0.489004
## as.factor(filed_county)Renville County         0.644029
## as.factor(filed_county)Rice County             0.847330
## as.factor(filed_county)Rock County             0.507876
## as.factor(filed_county)Roseau County           0.385347
## as.factor(filed_county)Scott County            0.594703
## as.factor(filed_county)Sherburne County        0.341879
## as.factor(filed_county)Sibley County           0.482274
## as.factor(filed_county)St. Louis County        0.512511
## as.factor(filed_county)Stearns County          0.134365
## as.factor(filed_county)Steele County           0.075254 .
## as.factor(filed_county)Stevens County          0.158657
## as.factor(filed_county)Swift County            0.692554
## as.factor(filed_county)Todd County             0.447274
## as.factor(filed_county)Traverse County         0.694233
## as.factor(filed_county)Wabasha County          0.541984
## as.factor(filed_county)Wadena County           0.096483 .
## as.factor(filed_county)Waseca County           0.404821
## as.factor(filed_county)Washington County       0.109441
## as.factor(filed_county)Watsonwan County        0.387230
## as.factor(filed_county)Wilkin County           0.168010
## as.factor(filed_county)Winona County           0.806995
## as.factor(filed_county)Wright County           0.297501
## as.factor(filed_county)Yellow Medicine County  0.032066 *
## as.factor(sentence_year)2011                  0.850031
## as.factor(sentence_year)2012                  0.380649
## as.factor(sentence_year)2013                  0.489270
## as.factor(sentence_year)2014                  0.856871
## as.factor(sentence_year)2015                  0.660950
## as.factor(sentence_year)2016                  0.631730
## as.factor(sentence_year)2017                  0.213464
##
## Diagnostic tests:
##              df1    df2 statistic p-value

```

```
## Weak instruments      1 82149      1.403 0.2362
## Wu-Hausman           1 82148      3.498 0.0614 .
## Sargan                0   NA        NA      NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 4.412 on 82149 degrees of freedom
## Multiple R-Squared:  -0.7262, Adjusted R-squared:  -0.7284
## Wald test: 88.49 on 106 and 82149 DF,  p-value: < 2.2e-16
```

#LFO - no FE

```
iv.conf.f <- ivreg(total_ff_log~conf_minus_stayed_log+
                    black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
                    priors+perc_credit+trial_flag+prison_flag+felony+gross.mis+
                    drug+alcohol. DUI+other.offense|
                    .-conf_minus_stayed_log+cap_ratio,
                    data = monsanc.felony.iv)

summary(iv.conf.f, diagnostics=T)
```

```
##
## Call:
## ivreg(formula = total_ff_log ~ conf_minus_stayed_log + black +
##       hispanic + asian + nativeam + other.race + race.miss + male +
##       log(age) + priors + perc_credit + trial_flag + prison_flag +
##       felony + gross.mis + drug + alcohol. dui + other.offense |
##       . - conf_minus_stayed_log + cap_ratio, data = monsanc.felony.iv)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -145.977  -23.132    2.663   22.629   97.607
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)    19.816297   4.153306   4.771 1.83e-06 ***
## conf_minus_stayed_log -12.991356   3.606772  -3.602 0.000316 ***
## black           6.331213   2.084677   3.037 0.002390 **
## hispanic        7.891151   2.275264   3.468 0.000524 ***
## asian           3.347761   1.236662   2.707 0.006789 **
## nativeam        8.696121   2.468309   3.523 0.000427 ***
## other.race       0.221527   0.904429   0.245 0.806507
## race.miss       -2.108103   0.630110  -3.346 0.000821 ***
## male            14.024127   3.875626   3.619 0.000296 ***
## log(age)         6.277957   1.806850   3.475 0.000512 ***
## priors           0.799951   0.227964   3.509 0.000450 ***
## perc_credit      0.014882   0.004173   3.567 0.000362 ***
## trial_flagTRUE   26.375488   8.237246   3.202 0.001365 **
## prison_flag      -0.927401   1.310860  -0.707 0.479273
```



```
## drug -11.342589 3.108412 -3.649 0.000263 ***
## alcohol. DUI -0.368865 0.533598 -0.691 0.489392
## other.offense -13.294428 3.645571 -3.647 0.000266 ***
##
## Diagnostic tests:
## df1 df2 statistic p-value
## Weak instruments 1 82239 12.99 0.000313 ***
## Wu-Hausman 1 82238 2712.44 < 2e-16 ***
## Sargan 0 NA NA NA
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 29.99 on 82239 degrees of freedom
## Multiple R-Squared: -188.7, Adjusted R-squared: -188.7
## Wald test: 2.59 on 16 and 82239 DF, p-value: 0.0004786
```

```
#Probation - no FE
iv.prob <- ivreg(prob_days_log~conf_minus_stayed_log+
  black+hispanic+asian+nativeam+other.race+race.miss+male+log(age)+
  priors+perc_credit+trial_flag+prison_flag+felony+gross.mis+
  drug+alcohol. DUI+other.offense|
  .-conf_minus_stayed_log+cap_ratio,
  data = monsanc.felony.iv)

summary(iv.prob, diagnostics=T)
```

```
##
## Call:
## ivreg(formula = prob_days_log ~ conf_minus_stayed_log + black +
## hispanic + asian + nativeam + other.race + race.miss + male +
## log(age) + priors + perc_credit + trial_flag + prison_flag +
## felony + gross.mis + drug + alcohol. DUI + other.offense |
## . - conf_minus_stayed_log + cap_ratio, data = monsanc.felony.iv)
##
## Residuals:
## Min 1Q Median 3Q Max
## -98.999 -8.022 2.206 7.580 34.057
##
## Coefficients:
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 16.502161 1.409801 11.705 < 2e-16 ***
## conf_minus_stayed_log -5.105589 1.224285 -4.170 3.05e-05 ***
## black 1.867232 0.707624 2.639 0.008323 **
## hispanic 2.236569 0.772317 2.896 0.003781 **
## asian 1.030988 0.419773 2.456 0.014049 *
## nativeam 2.549583 0.837844 3.043 0.002343 **
## other.race -0.109438 0.307000 -0.356 0.721484
## race.miss -0.849993 0.213885 -3.974 7.07e-05 ***
```

```

## male                4.182785    1.315545    3.180 0.001476 **
## log(age)            1.244095    0.613318    2.028 0.042516 *
## priors              0.230861    0.077380    2.983 0.002851 **
## perc_credit         0.011795    0.001416    8.328 < 2e-16 ***
## trial_flagTRUE      7.791964    2.796056    2.787 0.005325 **
## prison_flag         0.592120    0.444959    1.331 0.183282
## drug                -3.610323    1.055121   -3.422 0.000623 ***
## alcohol. DUI        0.266956    0.181125    1.474 0.140519
## other.offense       -4.873632    1.237455   -3.938 8.21e-05 ***
##
## Diagnostic tests:
##               df1    df2 statistic  p-value
## Weak instruments    1 82239    12.99 0.000313 ***
## Wu-Hausman         1 82238    222.57 < 2e-16 ***
## Sargan              0    NA        NA        NA
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.18 on 82239 degrees of freedom
## Multiple R-Squared: -8.201, Adjusted R-squared: -8.203
## Wald test: 99.21 on 16 and 82239 DF, p-value: < 2.2e-16

```